Intermec

System Manual

Trakker Antares® Application Development Tools

System Manual Contents

The *Trakker Antares Application Development Tools System Manual* contains two manuals. These manuals help you design, create, test, and debug Microsoft C applications for Intermec's Trakker Antares® terminals with the programmable option.

Note: Although this manual specifically references Microsoft C functions, the PSK also supports the equivalent Borland C functions.

The system manual is divided into two parts, and each part contains one manual. Each manual contains its own table of contents and index.

Part I

Trakker Antares PSK Reference Manual

This manual covers the Trakker Antares Programmer's Software Kit (PSK), which is a set of functions that you can use when developing Microsoft C applications for Trakker Antares terminals. The manual also describes the special methods you should follow when developing the applications.

Part II

Trakker Antares Application Simulator User's Manual

This manual describes how to use the Trakker Antares Application Simulator, which helps you test and debug applications for Trakker Antares terminals by allowing you to run the applications on a PC.

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Reference Manual

Trakker Antares® Programmer's Software Kit (PSK)

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Document Change Record

This page records changes to this document. The document was originally released as version 001.

Version	Date	Description of Change
002	5/1997	Updated for Version 2.0 software release: • Added support for RS-232 serial communications. • Updated list of certified functions for file manipulation. • Updated status return code values in Appendix A. • Added information on CodePage 850, Western European character set support. Added information on building an application from a command prompt and added information on the FileCopy Utility. Updated information on Microsoft C/C++ version 1.52 and version 5.0.
003	4/1998	Updated for Version 3.0 software release.
004	1/1999	Updated for Version 4.0 software release by adding five new application functions. Identified five functions that are only valid on a 248X with the enhanced input/output board option. Made corrections and revisions throughout the manual. Added an addendum (P/N 068343-001) for new application functions after revisions mentioned above.
005	7/1999	Updated for Version 4.1 software release. Added new functions: im_putchar_kana_8x16, im_puts_kana_8x16. Added support for the 2410 and 2415 terminals. Incorporated addendum (P/N 068343-001) into the manual.
006	1/2000	Updated for Version 4.2 software release. Added information on using the PSK with Trakker Antares terminals that are running DOS .EXE programs.
007	2/2001	Added DisplayUserBMP function and clarified use of imstdio.h.
008	9/2001	Updated for Version 4.4 software release. Incorporated addendum (P/N 071867-001), which included information on using the Berkeley Software Distribution (BSD) sockets interface. Added information to support the 243X terminals.
009	6/2004	Updated for Version 5.0 software release: • Included references to Borland Turbo C++ 4.5. • Added the im_get_rx_status and im_set_no_autosend functions. • Included an enhanced description of the PSK, more information about BSD sockets, and general programming guidelines for the network communications functions. • Added references to the Trakker Antares 2475 Vehicle-Mount Terminal. • Added references to the Intermec Gateway.

Contents

Before You Begin

This section provides you with safety information, technical support information, and sources for additional product information.

Safety Summary

Your safety is extremely important. Read and follow all warnings and cautions in this document before handling and operating Intermec equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the safety warnings and cautions.

Do not repair or adjust alone

Do not repair or adjust energized equipment alone under any circumstances. Someone capable of providing first aid must always be present for your safety.

First aid

Always obtain first aid or medical attention immediately after an injury. Never neglect an injury, no matter how slight it seems.

Resuscitation

Begin resuscitation immediately if someone is injured and stops breathing. Any delay could result in death. To work on or near high voltage, you should be familiar with approved industrial first aid methods.

Energized equipment

Never work on energized equipment unless authorized by a responsible authority. Energized electrical equipment is dangerous. Electrical shock from energized equipment can cause death. If you must perform authorized emergency work on energized equipment, be sure that you comply strictly with approved safety regulations.

Safety Icons

This section explains how to identify and understand warnings, cautions, and notes that are in this document.

Warning

A warning alerts you of an operating procedure, practice, condition, or statement that must be strictly observed to avoid death or serious injury to the persons working on the equipment.

Avertissement: Un avertissement vous avertit d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour éviter l'occurrence de mort ou de blessures graves aux personnes manupulant l'équipement.

Caution

A caution alerts you to an operating procedure, practice, condition, or statement that must be strictly observed to prevent equipment damage or destruction, or corruption or loss of data.

Attention: Une précaution vous avertit d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour empêcher l'endommagement ou la destruction de l'équipement, ou l'altération ou la perte de données.

Note: Notes either provide extra information about a topic or contain special instructions for handling a particular condition or set of circumstances.

Global Services and Support

Warranty Information

To understand the warranty for your Intermec product, visit the Intermec web site at http://www.intermec.com and click **Service & Support**. The **Intermec Global Sales & Service** page appears. From the **Service & Support** menu, move your pointer over **Support**, and then click **Warranty**.

Disclaimer of warranties: The sample code included in this document is presented for reference only. The code does not necessarily represent complete, tested programs. The code is provided "as is with all faults." All warranties are expressly disclaimed, including the implied warranties of merchantability and fitness for a particular purpose.

Web Support

Visit the Intermec web site at http://www.intermec.com to download our current documents as PDF files. To order printed versions of the Intermec manuals, contact your local Intermec representative or distributor.

Visit the Intermec technical knowledge base (Knowledge Central) at http://intermec.custhelp.com to review technical information or to request technical support for your Intermec product.

Telephone Support

These services are available from Intermec Technologies Corporation.

Service	Description	In the U.S.A. and Canada call 1-800-755-5505 and choose this option
Factory Repair and On-site Repair	Request a return authorization number for authorized service center repair, or request an on-site repair technician.	1
Technical Support	Get technical support on your Intermec product.	2
Service Contract Status	Inquire about an existing contract, renew a contract, or ask invoicing questions.	3
Schedule Site Surveys or Installations	Schedule a site survey, or request a product or system installation.	4
Ordering Products	Talk to sales administration, place an order, or check the status of your order.	5

Outside the U.S.A. and Canada, contact your local Intermec representative. To search for your local representative, from the Intermec web site, click **Contact**.

Who Should Read This Document?

This manual describes the special features and methods needed for programming the Trakker Antares® terminals with Microsoft® C.

Note: Although this manual specifically references Microsoft C functions, the PSK also supports the equivalent Borland® C functions.

This manual is intended for experienced PC programmers who already understand return values, know how to program in C, and know how to use either Microsoft Visual C/C++ or Borland Turbo C++.

Related Documents

The Intermec web site at http://www.intermec.com contains our current documents that you can download as PDF files.

To order printed versions of the Intermec manuals, contact your local Intermec representative or distributor.

1 Getting Started

This chapter introduces the PSK, explains how to install the PSK, and helps you decide what to read next.

This chapter covers these topics:

- What is the Trakker Antares PSK
- What's new in this revision
- Installing the programmer's software kit

What Is the Trakker Antares PSK?

The Trakker Antares® Programmer's Software Kit (PSK) is a set of C language functions for programming Intermec's Trakker Antares programmable terminals. You use the PSK to design and build applications on a PC, and then you download the applications to a Trakker Antares terminal.

What's New In This Revision

Enhancements and changes in this release of the PSK reference manual support software release version 5.0 and include:

- adding references to Borland® Turbo C++ 4.5.
- adding or modifying these functions:
  - im_get_rx_status
  - im_set_no_autosend
- an enhanced description of the PSK, more information about BSD sockets, and general programming guidelines for the network communications functions.
- references to the Trakker Antares 2475 Vehicle-Mount Terminal.
- references to the Intermec Gateway.

Installing the Programmer's Software Kit

To install the PSK, you need these items:

- Microsoft® Windows® 95/98/ME/NT v4.0/2000/XP
- Microsoft Visual C/C++ Professional Edition, v1.0, v1.5x, or v4.x

  Or, Borland Turbo C++ 4.5

  For more information, see "Trakker Antares PSK Version Requirements" on page 4.
- At least 1MB of free disk space
- Trakker Antares PSK download (available at no charge from the Intermec web site at www.intermec.com), which installs these files and utilities:
  - PSK functions library
  - Header files
  - Example files
  - Application Simulator/Simulator Editor

- FileCopy
- EXE2ABS.EXE, which converts .EXE applications to .BIN applications

To install the PSK library files, Application Simulator, Simulator Editor, and FileCopy

Note: If you are using Microsoft Visual C/C++, install it before you install the PSK library.

1. Download the Trakker Antares PSK version 4.4 to your PC.
2. On your PC, click the **Start** button and choose **Run**.
3. In the **Open** field, type:

   ```
   drive:setup.exe
   ```

   where *drive* is the appropriate disk drive and location.
4. Choose **OK**, and then follow the setup instructions on your screen.
5. When Setup prompts you to view the README file, choose **Yes**. This file may contain information that was not available when this manual was printed.
6. When the installation is complete, shut down your PC and restart it. You are ready to use the PSK, the Application Simulator, Simulator Editor, and FileCopy.

The setup program creates a Trakker Antares Sim Editor group. For details, see Part II, *Trakker Antares Application Simulator User's Manual.*

The setup program also creates and fills the following subdirectories.

Trakker Antares PSK Subdirectories

Directory	Description
INTERMEC\IMT24\LIB	Intermec library files, EXE2ABS.EXE
INTERMEC\IMT24\INCLUDE	Include files
INTERMEC\IMT24\EXAMPLES\PSK	Sample programs
INTERMEC\IMT24\SIM	Application Simulator
INTERMEC\TOOLS	FileCopy and Simulator Editor

Copying FileCopy to Another PC

You may copy the FileCopy utility and EXE2ABS.EXE to more than one PC. FileCopy lets you transfer files between your PC and your Trakker Antares terminal. EXE2ABS.EXE lets you convert .EXE applications to .BIN applications. You may not copy the PSK library.

To copy FileCopy to another PC

1 Install the PSK on the first PC.

2 Copy these files to a disk:

```
C:\INTERMEC\IMT24\FILECOPY\FILECOPY.EXE
C:\INTERMEC\IMT24\FILECOPY\FILECOPY.HLP
C:\INTERMEC\IMT24\LIB\EXE2ABS.EXE
```

3 Create these directories on the second PC:

```
C:\INTERMEC\IMT24\FILECOPY
C:\INTERMEC\IMT24\LIB
```

4 Copy the files from the disk in Step 2 to the appropriate directories on the PC.

Trakker Antares PSK Version Requirements

You can use any version of the Trakker Antares PSK version to develop programs for your terminals. However, newer features will not necessarily work with older firmware. Contact your local Intermec representative for information on upgrading your terminal firmware or visit the Intermec web site at www.intermec.com.

The Trakker Antares PSK version 4.4 and earlier requires Microsoft Visual C/C++ Professional Edition v1.0 or v1.5x. The Trakker Antares PSK version 5.0 and later requires Borland Turbo C++ version 4.5. This reference manual mainly describes how to use Microsoft Visual C/C++ with the Trakker Antares PSK. For help using Borland Turbo C++ 4.5, see the documentation that came with Turbo C++.

Microsoft Visual C/C++

Microsoft Visual C/C++ Professional Edition v1.0 or v1.5x can create 16-bit DOS applications. If you are using a different version, you must also install either v1.0 or v1.5x.

Note: The Microsoft Visual C/C++ Professional Edition v4.X package includes a disk for v1.5. However, the Microsoft Visual C/C++ Professional Edition v5.0 and later does not contain the 16-bit version of C.

Borland Turbo C++

Borland Turbo C++ version 4.5 can create 16-bit or 32-bit DOS applications. However, the PSK only supports 16-bit applications.

Note: Although this manual references Microsoft C functions, the PSK also supports the equivalent Borland C functions.

2 Programming Guidelines

This chapter explains the types of functions included in the PSK library and lists the Intermec-certified C runtime library functions. Refer to this chapter for guidance in selecting Intermec functions and valid Microsoft® C functions or the equivalent Borland® C functions.

This chapter covers these topics:

- What is the PSK library
- Communications functions
- Display functions
- Input functions
- Sound function
- Status code macros
- System functions
- Viewport functions
- Certified Microsoft C functions
- Unsupported Microsoft C/C++ functions

What Is the PSK Library?

The PSK library is a library of C functions for programming the Trakker Antares® terminals. You can program a terminal to display prompts and error messages, to collect and display data, and to transmit data to the Intermec Gateway, a DCS 30X, or a host. You can also design beep sequences for audio feedback.

The PSK functions work with most standard Microsoft® C functions and the equivalent Borland® C functions. You can create complex applications that collect, store, manipulate, and transmit data to meet your system needs.

The PSK is packaged as libc.lib and ships with these files:

- imt24lib.h
- imstdio.h
- pollux.h

Include the Intermec header file imstdio.h instead of the Microsoft header file stdio.h, and include imt24lib.h. You can put libc.lib and the header files in any folder or directory as long as you set up the project to retrieve the library at link time.

Although libc.lib is sometimes referred to as the PSK, the term PSK also refers to Intermec-specific library functions. These functions are usually in the form of im_*function_name*.

Communications Functions

Use the communications functions to send or receive data through a communications port, to check the buffer status for a port, or to cancel a transmission. You can transmit and receive the contents of a buffer or a file. You can also receive data or one or more characters from the keyboard, scanner, or communications port. You can specify several input sources, and then test for a specific source before acting on the input. You can transmit a maximum of 1024 bytes in one record.

For more information about programming with the network communications functions, see “Programming Guidelines for Network Communications” on page 24.

Trakker PSK Communications Functions

im_flush_rcv_buffer	im_transmit_buffer
im_get_rcv_errors	im_transmit_buffer_no_wait
im_get_rx_status	im_transmit_buffer_no_wait_t
im_get_tx_status	im_transmit_file
im_receive_buffer	im_udp_close_socket
im_receive_field	im_udp_open_socket
im_receive_file	im_udp_receive_data
im_receive_input	im_udp_send_data
im_set_eom	im_xm_receive_file
im_set_no_autosend	im_xm_transmit_file
im_set_validation_callback	im_xm1k_receive_file
im_standby_wait	im_xm1k_transmit_file
im_status_line	im_ym_receive_file
im_tcp_reconnect_notify	im_ym_transmit_file

Example: Receiving Data From the NET Port or From the Keyboard

```
// This segment waits for input, and then makes it available by calling
// im_receive_input( ).
//
// Use this method when you want to receive input from multiple sources and
you
// don't know the input source.
#include "imt24lib.h"

void main()
{
char input[1024];    // Input buffer (input from network must be 1024
characters)
IM_ORIGIN  source;   // Source(s) where input is to come from
IM_STATUS  status;   // Results of call

      // Wait for input from either the keyboard or from NET
      status = im_receive_input
            (IM_KEYBOARD_SELECT | IM_NET_SELECT,
            IM_INFINITE_TIMEOUT, &source, input);

// Data is now available in the buffer input
// if (status == IM_SUCCESS)
// Add your code segment here

}
```

BSD Sockets

The Trakker Antares TCP/IP terminals (firmware version 6.20 or later) support a subset of the BSD (Berkeley Software Distribution) sockets interface for network communications. The terminals support this subset of BSD 4.3 socket-specific functions:

Trakker PSK BSD 4.3 Socket-Specific Functions

bind	im_get_IP_addr (gethostbyname)
closesocket	recv
connect	send
fcntlsocket	socket

The Trakker Antares socket interface supports the BSD sockets function calls and requires function calls that are different for the client and the server. You can use the Trakker Antares socket interface to create the following types of sockets:

- `SOCK_STREAM` Stream socket (TCP/IP)
- `SOCK_DGRAM` Datagram socket (UDP/IP)

When programming with BSD socket functions, keep these important points in mind:

- A BSD socket can be any combination of an IP address and a port. However, the Trakker Antares socket interface operates with one host or controller IP address that is set using the TRAKKER Antares 2400 Menu System. The client port number can also be set using the Main Menu.
- BSD socket functions do not support low power pending functions, such as the functional equivalent functions im_receive_input, im_receive_field, im_receive_buffer, and im_event_wait. Therefore, if you choose to use BSD socket functions for input, you may adversely affect battery life.
- After a socket is created and before any read, you should use the fcntlsocket function to set up a non-blocking read there after. For more information, see "fcntlsocket" on page 50.

Using the sockaddr_in Structure

The socket functions use a `sockaddr` structure to pass internet addresses and port numbers. The generic `sockaddr` structure accepts communications protocols. Because the Trakker Antares terminals use the internet protocol (IP), the socket functions use the internet version of the structure `sockaddr_in`.

Although the generic `sockaddr` structure is not used by the Trakker Antares socket functions, it is provided as a reference for the standard socket interface. Values are assigned to `sockaddr` and passed to the socket routine through the `sockaddr` parameter. This action requires a typecast to a `sockaddr*`. For an example of a typecast to a `sockaddr*`, see "connect" on page . The generic `sockaddr` structure is defined as follows:

```
struct sockaddr /* generic socket address */
{
  unsigned short sa_family; /* address family */
  char sa_data[14];   /* up to 14 bytes of direct address
*/
}
```

For the socket functions used on Trakker Antares terminals, the structure that is passed to the socket routine is `sockaddr_in`. This structure is assigned values and typecast to a `sockaddr*` when it is passed to a socket function. For an example of a typecast to a `sockaddr*`, see "connect" on page . The `sockaddr_in` structure is defined as follows:

```
struct in_addr
{
  unsigned long s_addr;     /* Internet address */
  struct sockaddr_in  /* Internet socket address */
  {
    short sin_family;
    unsigned short sin_port;
    struct in_addr sin_addr;
    char sin_zero[8];
  }
}
```

Display Functions

Use the display functions to change or retrieve the display attributes. You can define screen size, font size, inverse and blinking characters, and cursor shape. You can also send text to the screen, erase all or part of the display, and relocate the cursor.

Trakker PSK Display Functions

DisplayUserBMP	im_get_display_type	im_puts_dbyte *
im_clear_screen	im_get_follow_cursor	im_puts_kana_8x16 *
im_cputs	im_get_screen_char	im_puts_mixed *
im_display_thai_char	im_get_text	im_set_cursor_style
im_erase_display	im_overlay_setup *	im_set_cursor_xy
im_erase_line	im_overlay_status *	im_set_display_mode

Trakker PSK Display Functions (continued)

im_get_cursor_style	im_put_text	im_set_follow_cursor
im_get_cursor_xy	im_putchar	im_set_mixed_mode *
im_get_display_mode	im_putchar_dbyte *	im_set_screen_size
im_get_display_size_physical	im_putchar_kana_8x16 *	im_set_thai_cursor_mode
im_get_display_size_virtual	im_puts	im_setup_follow_cursor
im_get_dbyte_font_info		

Note: The 2460 and 2461 terminals do not support double-byte functions, which are indicated in the list with asterisks (*).

Example: Clearing the Screen

```
// This segment clears the display and returns the cursor to the
// upper left corner.
// Next, it sets the cursor to an underline.
//
#include "imt24lib.h"

void main()
{
IM_STATUS  status;   // Results of call

      im_clear_screen();
      status = im_set_cursor_style (IM_UNDERLINE);

// Add your code segment here
}
```

Input Functions

Use the input functions to receive data or to retrieve the length or bar code symbology of previous input. You can receive a file, a field, a buffer, or one or more characters from the keyboard, scanner, or communications port.

For compatibility with JANUS® devices, the PSK supports input mode functions. For more information on input modes, see Chapter 4, “Converting Trakker Antares and JANUS Applications.”

Trakker PSK Input Functions

im_dbyte_symbology_set *	im_get_sensor_all
im_file_size	im_get_sensor_input
im_file_time	im_input_status
im_flush_rcv_buffer	im_readdir
im_free_mem	im_receive_buffer
im_free_space	im_receive_field

Trakker PSK Input Functions (continued)

im_get_input_mode	im_receive_input
im_get_label_symbology	im_set_input_mode
im_get_label_symbologyid	im_set_repeat_key
im_get_length	im_set_scanning
im_get_rcv_errors	im_set_validation_callback
im_get_relay	

Note: The 2460 and 2461 terminals do not support double-byte functions, which are indicated in the list with asterisks (*).

Example: Setting Input Mode and Source

```
// This segment sets the terminal in programmer mode to accept a
// string of characters.
// The string is NOT sent until you press Enter, and you can use backspace to
// make a correction before pressing Enter.
//
#include "imstdio.h"
#include "imt24lib.h"

void main()
{
IM_UCHAR  input [1024];
IM_STATUS  status;   // Results of call
IM_USHORT  source;   // Input sources

    im_clear_screen();
       im_set_input_mode(IM_PROGRAMMER);
       printf("Scan or Type data.\nPress Enter to \nend line.\n");

       /* Request input from label or keypad*/
       source = IM_LABEL_SELECT | IM_KEYBOARD_SELECT;
       status = im_receive_input(source, IM_INFINITE_TIMEOUT, &source, input);

}
```

Sound Function

Use the im_sound function anytime to make the terminal beep. You can use this function to control the volume, pitch, and duration of the terminal beep.

Example: Sound

```
// This segment beeps a high note, pauses 5 seconds, and then beeps a
// low note.
#include "imt24lib.h"

void main()
{
      im_sound( IM_HIGH_PITCH, IM_BEEP_DURATION, IM_NORMAL_VOLUME);
      im_standby_wait(5000);
      im_sound( IM_LOW_PITCH, IM_BEEP_DURATION, IM_NORMAL_VOLUME);
}
```

Status Code Macros

Use the status code macros to determine the success of a function without testing for an explicit value. Each PSK library function returns a specific status value. For most functions, you only need to know if the result was success or failure.

Your program is easier to maintain, update, and port to another terminal type when you check for success or failure instead of checking for a specific value.

Status Code Macros to Determine Success or Failure of a Function

Status Code Macro	Return Value	Meaning
IM_ISERROR(status)	nonzero	error
	zero (0)	success or warning
IM_ISSUCCESS(status)	nonzero	success or warning
	zero (0)	error
IM_ISGOOD(status)	nonzero	success
	zero (0)	warning or error
IM_ISWARN	nonzero	warning
	zero (0)	success or error

For more information, see Chapter 5, "PSK Function Descriptions."

Note: For compatibility with other Intermec products, use the status code macros. You can use the exact status code for debugging programs, but you need to adjust the routines before you attempt porting the application to a JANUS device. For help, see Chapter 4, "Converting Trakker Antares and JANUS Applications."

Example: Status Code Macros

```
/* This segment requests label input and then checks for success.  */
/* If successful, then retrieve the label symbology.               */
/* If an error occurs, then display the error message.             */
#include "imt24lib.h"

void main()
{
char input[1024];    // Input buffer (input from network must be 1024 
characters)
IM_ORIGIN  source;   // Source(s) where input is to come from
IM_STATUS  status;   // Results of call
IM_DECTYPE symbol;   // Symbology

      status = im_receive_input(IM_LABEL_SELECT, IM_INFINITE_TIMEOUT,
           &source, input);

      if ( IM_ISSUCCESS(status))
      im_get_label_symbology( &symbol);

      if ( IM_ISERROR(status))
      im_message(status);
}
```

System Functions

Use the system functions to control the terminal configuration or to set an event timer.

Trakker PSK System Functions

im_battery_status	im_get_system_julian_date
im_closedir	im_message
im_command	im_offset_dbyte *
im_event_wait	im_opendir
im_file_duplicate	im_set_input_mode
im_fmalloc	im_set_optical_callback
im_free	im_set_relay
im_free_mem	im_set_time_event
im_free_space	im_tcp_reconnect_notify
im_get_config_info	im_timed_status_line

Note: The 2460 and 2461 terminals do not support double-byte functions, which are indicated in the list with asterisks (*).

Example: Configuring the Terminal

```
// This segment turns on the terminal backlight and raises the volume.
#include "imt24lib.h"

void main()
{
char        *setlite_vol="%.1$+BV9";      //  Turn on backlight and raise
beep volume
IM_USHORT   length=8;                     //  Command is 8 characters long

      im_command(setlite_vol, length);
}
```

Viewport Functions

Use the viewport functions to turn on the virtual display and move around in the virtual display. The terminals can use a virtual display that is 25 lines high by 80 characters wide, the same as a CGA monitor.

Trakker PSK Viewport Functions

im_cursor_to_viewport	im_viewport_getxy
im_get_viewport_lock	im_viewport_home
im_get_viewporting	im_viewport_move
im_set_cursor_style	im_viewport_page_down
im_set_follow_cursor	im_viewport_page_left
im_set_viewport_lock	im_viewport_page_right
im_set_viewporting	im_viewport_page_up
im_setup_follow_cursor	im_viewport_setxy
im_setup_manual_viewporting	im_viewport_to_cursor
im_viewport_end	

Note: The 2460 and 2461 terminals do not support viewporting functions.

Example: Moving the Viewport

```
// This segment turns on the viewport and then moves the viewport one page to
// the right.
#include "imt24lib.h"

void main()
{
IM_STATUS  status;   // Results of call

      im_set_viewporting (IM_ENABLE);
      status = im_viewport_page_right();
}
```

Certified Microsoft C Functions

This table lists all Microsoft C functions that work with the PSK library functions; however, the equivalent Borland C functions are also supported.

The PSK does not support C++, classes, application-wide constructors or destructors, or Windows functions.

Note: The Trakker Antares PSK version 4.4 and earlier requires Microsoft Visual C/C++ Professional Edition v1.0 or v1.5x. The Trakker Antares PSK version 5.0 and later requires Borland Turbo C++ version 4.5. For more information, see "Trakker Antares PSK Version Requirements" on page 4.

Certified Microsoft C Functions For the Trakker PSK Library

_cabs	_fstrnicmp	_putch	ceil
_cputs	_fstrnset	_rotl	clock
_ecvt	_fstrpbrk	_rotr	cos
_fabs	_fstrrchr	_strdup	cosh
_fatexit	_fstrrev	_stricmp	cputs
_fcloseall	_fstrset	_strlwr	ctime
_fcvt	_fstrspn	_strnicmp	difftime
_ffree	_fstrtok	_strnset	div
_fmalloc	_ftime	_strrev	errno
_fmemccpy	_gcvt	_strset	exit
_fmemchr	_getch	_strupr	exp
_fmemcmp	_getchar	_swab	fabs
_fmemcpy	_getche	_toascii	fclose
_fmemicmp	_hypot	_tolower	fcloseall
_fmemmove	_isascii	_toupper	feof
_fmemset	_iscsym	_ultoa	ferror
_FP_OFF	_iscsymf	_ungetch	fflush
_FP_SEG	_itoa	abs	fgetc
_fstrcat	_lrotl	acos	fgets
_fstrcmp	_lrotr	asctime	floor
_fstrcpy	_ltoa	asin	fmod
_fstrcspn	_max	atan	fopen
_fstricmp	_memccpy	atan2	fputs
_fstrlen	_memicmp	atof	fprintf
_fstrlwr	_min	atoi	fread
_fstrncat	_nstrdup	atol	free
_fstrncmp	_onexit	calloc	frexp

Certified Microsoft C Functions For the Trakker PSK Library (continued)

fscanf	localtime	rand	strncpy
fseek [1]	log	remove	strpbrk
ftell	log10	rename	strrchr
fwrite	malloc	scanf	strspn
gets	mblen	sin	strstr
gmtime [2]	mbstowcs	sinh	strtime
isalnum	mbtowc	sprintf	strtod
isalpha	memchr	sqrt	strtok
iscntrl	memcmp	srand	strtol
isdigit	memcpy	sscanf	strtoul
isgraph	memicmp	strcat	tan
islower	memmove	strchr	tanh
isprint	memset	strcmp	time
ispunct	mktime	strcpy	tolower
isspace	modf	strcspn	toupper
isupper	pow	strdate	va_arg
isxdigit	printf	strftime	va_end
labs	putch	strlen	va_start
ldexp	puts	strncat	wcstombs
ldiv	qsort	strncmp	wctomb

[1] If you seek beyond the end of file (EOF), fseek returns an error.

[2] The terminals do not support time zones, so gmtime() returns the local time instead of Greenwich time.

Buffer Manipulation Functions

Use the buffer manipulation functions to work with areas of memory, byte by byte. A buffer is similar to a character string, but it is not terminated with a NULL character (\0). A buffer can contain ASCII data or other data formats.

Certified Microsoft C Buffer Manipulation Functions

_fmemccpy	_fmemicmp	_swab	memicmp
_fmemchr	_fmemmove	memchr	memmove
_fmemcmp	_fmemset	memcmp	memset
_fmemcpy	_memccpy	memcpy	

Character Functions

Use the character classification and conversion routines to test for individual characters and convert characters from uppercase to lowercase.

Certified Microsoft C Character Functions

_isaccii	_toupper	isgraph	isupper
_iscsym	isalpha	islower	isxdigit
_iscsymf	isalum	isprint	tolower
_toascii	iscntrl	ispunct	toupper
_tolower	isdigit	isspace	

Data Conversion Functions

Use the data conversion functions to convert numbers to ASCII strings and vice versa.

Certified Microsoft C Data Conversion Functions

_atold	_strtold	atol	strftime
_ecvt	_ultoa	labs	strtod
_fct	abs	localeconv	strtol
_gcvt	atof	setlocale	strtoul
_itoa	atoi	strcoll	strxfrm
_ltoa			

File Functions

Use the file functions to manage file input and output (I/O), such as writing characters to an open file.

Note: Use the imstdio.h file as the include file associated with these functions rather than stdio.h.

Certified Microsoft C File Functions

clearerr	fgetc	fputs	fseek
fclose	fgets	fread	ftell
feof	fopen	fscanf	fwrite
ferror	fprintf	remove	

Math Functions

Use the math functions to perform various mathematical operations and to convert numbers to ASCII strings and vice versa.

Certified Microsoft C Math Functions

_cabs	_rotl	dmsbintoieee	modf
_fieeetomsbin	_rotr	exp	pow
_fmsbintoieee	acos	fabs	rand
_fpreset	asin	floor	sin
_hypot	atan	fmod	sinh
_lrotl	atan2	frexp	sqrt
_lrotr	ceil	ldexp	srand
	cos	ldiv	tan
_max	cosh	log	tanh
_min	div	log10	

Memory Functions

Use the memory functions to dynamically allocate and de-allocate memory for your application to use.

Certified Microsoft C Memory Functions

_ffree	_fmemcpy	_memccpy	memcmp
_fmalloc	_fmemicmp	_memicmp	memcpy
_fmemccpy	_fmemmove	_swab	memmove
_fmemchr	_fmemset	memchr	memset
_fmemcmp			

String Functions

Use the string functions to manipulate ANSI character strings.

Certified Microsoft C String Functions

_fstrcat	_fstrpbrk	_strlwr	strerror
_fstrcmp	_fstrrchr	_strnicmp	strlen
_fstrcpy	_fstrset	_strnset	strncat
_fstrcspn	_fstrrev	_strrev	strncmp
_fstricmp	_fstrspn	_strset	strncpy
_fstrlen	_fstrstr	_strupr	strpbrk
_fstrlwr	_fstrtok	strcat	strrchr
_fstrncat	_fstrupr	strchr	strspn

Certified Microsoft C String Functions (continued)

_fstrncmp	_nstrdup	strcmp	strstr
_fstrnicmp	_strdup	strcpy	strtok
_fstrnset	_stricmp	strcspn	

Time Functions

Use the time functions to retrieve or set the system time. You can use a variety of formats for time.

Certified Microsoft C Time Functions

difftime	localtime	mktime	gmtime
asctime	strftime	clock	time

Note: The terminals do not support time zones. The gmtime() function returns the local time instead of Greenwich time.

Miscellaneous Functions

Use the miscellaneous functions to write characters to the display, to perform searches, and to handle functions with a variable number of arguments.

Certified Microsoft C Miscellaneous Functions

cputs	puts	va_arg	va_start
putchar	qsort	va_end	

Unsupported Microsoft C/C++ Functions

The PSK does not support C++, classes, application-wide constructors or destructors, or Windows. You **cannot** use these Microsoft C/C++ functions or the equivalent Borland C/C++ functions.

Microsoft C/C++ Functions Not Supported By the PSK Library

_access	_dos_allocmem	_ellipse	_fullpath
_arc	_dos_close	_ellipse_w	_getactivepage
_arc_w	_dos_commit	_ellipse_wxy	_getarcinfo
_arc_wxy	_dos_creat	_enable	_getbkcolor
_bdos	_dos_creatnew	_eof	_getcolor
_bios_disk	_dos_findfirst	_execl	_getcurrentposition

Microsoft C/C++ Functions Not Supported By the PSK Library (continued)

_bios_equiplist	_dos_findnext	_execle	_getcurrentposition_w
_bios_keybrd	_dos_freemem	_execlp	_getcwd
_bios_memsize	_dos_getdate	_execlpe	_getdrive
_bios_printer	_dos_getdiskfree	_execv	_getfillmask
_bios_serialcom	_dos_getdrive	_execve	_getfontinfo
_bios_timeofday	_dos_getfileattr	_execvp	_getgtextextent
_c_exit	_floodfill	_execvpe	_pg_resetpalette
_cexit	_floodfill_w	_int86	_pg_resetstyleset
_cgets	_flushall	_int86x	_pg_setchardef
_chain_intr	_fmsbintoieee	_intdos	_pg_setpalette
_chdir	_fonexit	_intdosx	_pg_setstyleset
_chdrive	_fputchar	_isatty	_pg_vlabelchart
_chmod	_fsopen	_kbhit	_pie
_chsize	_fstat	_lineto	_pie_w
_clearscreen	_fstrchr	_lineto_w	_pie_wxy
_close	_fstrdup	_locking	_polygon
_commit	_getgtextvector	_lseek	_polygon_w
_cprintf	_getimage	_makepath	_polygon_wxy
_creat	_getimage_w	_MK_FP	_putenv
_cscanf	_getimage_wxy	_mkdir	_putimage
_disable	_getlinestyle	_mktemp	_putimage_w
_displaycursor	_getphyscoord	_moveto	_putw
_dmwbintoieee	_getpid	_moveto_w	_read
_dos_getftime	_getpixel	_onexit	_rectangle
_dos_gettime	_getpixel_w	_open	_rectangle_w
_dos_getvect	_gettextcolor	_outgtext	_rectangle_wxy
_dos_keep	_gettextcursor	_outmem	_registerfonts
_dos_open	_gettextposition	_outp	_remapallpalette
_dos_read	_gettextwindow	_outpw	_remappalette
_dos_setblock	_getvideoconfig	_outtext	_rmdir
_dos_setdate	_getviewcoord	_pg_analyzechart	_rmtmp
_dos_setdrive	_getviewcoord_w	_pg_analyzechartms	_scrolltextwindow
_dos_setfileattr	_getviewcoord_wxy	_pg_analyzepie	_searchenv
_dos_setftime	_getvisualpage	_pg_analyzescatter	_segread
_dos_settime	_getw	_pg_analyzescatterms	_selectpalette
_dos_setvect	_getwindowcoord	_pg_chart	_setactivepage
_dos_write	_getwritemode	_pg_chartms	_setbkcolor
_dosexterr	_grstatus	_pg_chartpie	_settextcursor
_dup	_harderr	_pg_chartscatter	_settextposition
_dup2	_hardresume	_pg_chartscatterms	_settextrows

Microsoft C/C++ Functions Not Supported By the PSK Library (continued)

_exit	_hardretn	_pg_defaultchart	_settextwindow
_fatexit	_imagesize	_pg_getchardef	_setvideomode
_fdopen	_imagesize_w	_pg_getpalette	_setvideomoderows
_fgetchar	_imagesize_wxy	_pg_getstyleset	_setvieworg
_filelength	_inp	_pg_hlabelchart	_setviewport
_setwindow	_inpw	_pg_initchart	_setvisualpage
_setwritemode	_unregisterfonts	abort	raise
_snprintf	_vfree	assert	realloc
_spawnv	_vheapinit	atexit	rewind
_spawnve	_vheapterm	exit	setbuf
_spawnvp	_vload	fflushall	setjmp
_spawnvpe	_vlock	fgetpos	setvbuf
_splitpath	_vlockcnt	fputc	signal
_stat	_vmalloc	freopen	strerror
_strerror	_vmsize	fsetpos	system
_tell	_vrealloc	getc	tmpfile
_tempnam	_vsnprintf	getenv	tmpnam
_umask	_vunlock	longjmp	vfprintf
_ungetch	_wrapon	perror	vprintf
_unlink	_write	putc	vsprintf

3 Building Applications

This chapter explains how to use the Microsoft® Visual C/C++ interactive developer's environment (IDE) to build, link, and debug your Trakker Antares PSK applications. To learn how to use Borland® Turbo C++ 4.5, see the documentation that came with Turbo C++.

This chapter also explains how to build an application from a command line.

This chapter covers these topics:

- Programming guidelines for network communications
- Building a sample program
- Building a .BIN program using Microsoft Visual C/C++
- Building a DOS .EXE program using Microsoft Visual C/C++
- Building your own program from a command line
- Downloading applications

Programming Guidelines for Network Communications

Applications that run on the Trakker Antares® terminal and your host computer are implemented based on the client/server model. Therefore, when you build a client/server application, you should pay special attention to these network communications functions:

- im_get_rx_status
- im_get_tx_status
- im_input_status
- im_set_no_autosend
- im_transmit_buffer
- im_transmit_buffer_no_wait
- im_transmit_buffer_no_wait_t
- im_receive_input

For more information about each of these functions, see Chapter 5, "PSK Function Descriptions."

Trakker Antares terminals support UDP/IP and TCP/IP transport protocols. The network communications functions need to be interpreted based on the configuration of your Trakker Antares terminal: UDP Plus or TCP/IP.

For example, a common scenario for Trakker Antares terminals is to collect data from a scanned bar code and send the data to a host over a TCP/IP network. The terminal tries to form a TCP connection, which is transparent to the client, the first time the im_transmit_buffer function is called. After a TCP connection is formed by calling im_transmit_buffer, the connection stays open unless one of the following events occurs:

- There is an un-recoverable network error.
- The client requests a CLOSE.
- The terminal is reset. For example, if the terminal is suspended while power management resume is not allowed.
- The terminal battery becomes discharged.

It is also important to maintain the status of network communications so the client can effectively handle communication failures, such as the server going down or the RF terminal moving out of range. TCP attempts to recover from some failures, such as re-estabilishing a connection closed by the host; however, if the host attempt fails, the client is responsible for initiating the recovery. The client's most effective recovery mechanism is to reset the terminal.

Although a host can call for a CLOSE, TCP will not close a connection for the client. TCP on the terminal only supports closing initiated by the application through the socket interface.

Building a Sample Program

The PSK library includes sample source files and make files, which were installed to the C:\INTERMEC\IMT24\EXAMPLES\PSK directory. Three samples are discussed in this section. You build your sample program differently for terminals running .BIN applications and terminals running DOS .EXE applications.

PSK Library Sample Source Files and Make Files

Source File	Make File	Description
DEFAPP.C	DEFAPP.MAK	Accepts user input, transmits the input to the host, and displays any data received.
GETFLDS.C	GETFLDS.MAK	Demonstrates a forms-based application with several fields. Displays several fields for input, manages the navigation between fields, and checks the length of any input. It shows how to display an error message if the input validation fails, and how to force the cursor back into the field that was being processed.
ISMT24.C	ISMT24.MAK	Demonstrates a forms-based application with several fields. Displays several fields for input, manages the navigation between fields, and checks the length of any input. It shows how to display an error message if the input validation fails and how to force the cursor back into the field that was being processed.

To build a sample .BIN program for terminals

1 Start Visual C/C++.

2 From the **Project** menu, choose **Open**.

3 From the directory INTERMEC\IMT24\EXAMPLES\PSK, select the desired make file (.MAK).

4 From the **Project** menu, choose **Build**.

5 Debug the program with the Trakker Antares Application Simulator. See Part II, *Trakker Antares Application Simulator User's Manual,* for more information.

6 Convert the application to a binary file using EXE2ABS.EXE. See the set of steps on page 28.

7 Download the application to the terminal. See the set of steps on page 31.

8 Run the application.

Note: If you have trouble compiling the sample project, verify the project settings. Use the Project Settings Checklist in the next section, "Building A .BIN Program Using Microsoft Visual C/C++."

To build a sample DOS .EXE program for terminals using Microsoft Visual C/C++

1 Start Visual C/C++.

2 From the **Project** menu, choose **Open**.

3 From the directory INTERMEC\IMT24\EXAMPLES\PSK, select the make file (.MAK).

4 Use the project settings checklist to set the compiler and linker options. See the checklist on page 29.

5 From the **Project** menu, choose **Build**.

6 Debug the program with the Trakker Antares Application Simulator. See Part II, *Trakker Antares Application Simulator User's Manual,* for more information.

7 Download the application to the terminal. See the set of steps on page 31.

8 Verify the terminal is running ROM-DOS.

9 Run the application.

Note: If you have trouble compiling the sample project, verify the project settings. Use the Project Settings Checklist from "Building A DOS .EXE Program" on page 28.

Building a .BIN Program Using Microsoft Visual C/C++

This section describes how to build a .BIN application using Microsoft Visual C/C++. To learn how to build a .BIN application using Borland Turbo C++, see the documentation that came with your software.

When you build your own programs, you need to set several project and compiler options. The sample programs already include these settings in the .MAK files.

Make sure that your source code uses only the Intermec-certified C functions. If you use uncertified functions, the link operation will fail. See Chapter 2, "Programming Guidelines," for a list of certified C functions.

Make sure that you have configured the environment for building PSK applications in Microsoft Visual C/C++. You use different settings for terminals that are running .BIN applications than for terminals that are running DOS .EXE applications. Appendix B, "Microsoft Visual C/C++ Settings," shows the dialog boxes.

Note: If your program uses file actions such as open or close file, you need to include imstdio.h instead of stdio.h. See the example "TMP.MAK" on page 30.

To build a .BIN program using Microsoft Visual C/C++

1. On your PC, start Visual C/C++.
2. Create a new project.
3. Use the project settings checklist to set the project options.
4. From the **Project** menu, choose **Build**.

   Or, you can build a program from the command line. For help, see "Building Your Own Program from a Command Line" on page 29.
5. Debug the program with the Trakker Antares Application Simulator. See Part II, *Trakker Antares Application Simulator User's Manual,* for more information.
6. Convert the application to a binary file. See the set of steps on page 28.
7. Download the application to the terminal. See the set of steps on page 31.
8. Run the application.

Project Settings Checklist for Microsoft Visual C/C++ .BIN Programs

Dialog Box or Command	For This Variable	Select This Setting
Project Options	Project Type	MS-DOS application
	Use Foundation Classes	uncheck
Compiler Options	Code Generation CPU Floating Point Calls Disable stack checking	 8086/8088 Alternate Math uncheck
	Memory Model Model Segment	 Large SS == DS
Linker Options	Libraries	oldnames, llibca, IMT24LIB
Directories	Include Files Path	\INTERMEC\IMT24\INCLUDE must be listed first, followed by \MSVC\INCLUDE
	Library Files Path	\INTERMEC\IMT24\LIB must be listed first, followed by \MSVC\LIB

Converting an Application to a Binary File

For your application to run on a Trakker Antares terminal that is not running ROM-DOS, it must be stored as an executable binary file (.BIN). Use the EXE2ABS.EXE program that comes with the PSK to convert the .EXE file to a .BIN file.

Note: The FileCopy utility automatically converts an executable file (.EXE) to an executable binary file (.BIN) if you select the **Convert.EXE** check box.

To convert an executable file to a binary file

- On your PC in the directory where you want to create the .BIN file, type this command and then press **Enter**:

  ```
  c:\intermec\imt24\lib\exe2abs filename.exe
  ```

  where *filename* is the name of your application.

Building a DOS .EXE Program Using Microsoft Visual C/C++

This section describes how to build an .EXE application using Microsoft Visual C/C++. To learn how to build an .EXE application using Borland Turbo C++, see the documentation that came with your software.

When you build your own programs, you must set several project and compiler options. If you want to run the sample programs on your terminals running in DOS mode, you must create a new .MAK file.

Make sure that your source code uses only the Intermec-certified C functions. If you use uncertified functions, the link operation will fail. See Chapter 2, “Programming Guidelines,” for a list of certified C functions.

Make sure that you have configured the environment for building PSK applications in Microsoft Visual C/C++. There are different project settings for terminals that are running DOS .EXE applications than for terminals that are running .BIN applications. After this procedure, there is a project settings checklist that you can use. Appendix B, “Microsoft Visual C/C++ Settings,” shows the dialog boxes.

Note: If your program uses file actions such as open or close file, you must include imstdio.h instead of stdio.h. See the example “TMP.MAK” on page 30.

To build a DOS .EXE program using Microsoft Visual C/C++

1. On your PC, start Visual C/C++.
2. Create a new project.
3. Use the project settings checklist to set the project options.

4 From the **Project** menu, choose **Build**.

Or, you can build a program from the command line. For help, see the next section, “Building Your Own Program From a Command Line.”

5 Debug the program with the Trakker Antares Application Simulator. See Part II, *Trakker Antares Application Simulator User’s Manual,* for more information.

6 Download the application to the terminal. See the set of steps on page 31.

7 Verify the terminal is running ROM-DOS.

8 Run the application.

Project Settings Checklist for Microsoft Visual C/C++ DOS .EXE Programs

Dialog Box or Command	For This Variable	Select This Setting
Project Options	Project Type	MS-DOS application
	Use Foundation Classes	uncheck
Compiler Options	Code Generation CPU Floating Point Calls Disable stack checking	 8086/8088 Use Emulator check
	Memory Model Model Segment	 Large SS == DS
Linker Options	Libraries	oldnames, llibce, IMT24LIB
Directories	Include Files Path	\INTERMEC\IMT24\INCLUDE must be listed first, followed by \MSVC\INCLUDE
	Library Files Path	\INTERMEC\IMT24\LIB must be listed first, followed by \MSVC\LIB

Building Your Own Program From a Command Line

You can build your program from the command line (DOS prompt) instead of from within the Microsoft Visual C/C++ or Borland Turbo C++ environment. Your .MAK file must set the correct compile options for the application to run on the Trakker Antares terminals.

CFLAGS Settings Required for a Successful Compile

Setting	Meaning
/G0	Target CPU is an 8086 processor. If you omit the /G switch, the build defaults to /G0. Using any other /G setting followed by a number other than 0 will cause failure that is difficult to debug.

CFLAGS Settings Required for a Successful Compile (continued)

Setting	Meaning
/AL	Use large memory model. This switch is required for all applications.
/FPa	Use alternate math for the floating point calls. This switch is required to compile .BIN applications.
/Gs	Disables stack checking. This switch is required to compile DOS .EXE applications.

These examples show the correct settings to build your own .BIN program from a command line. The bold settings represent the CFLAGS settings that are required. Refer to your C/C++ documentation for more information on make files, command files, and batch files.

TMP.MAK

```
# MAKE FILE FOR TEST1
CCPP     = cl >>err
CC       = cl >>err

CFLAGS   = /FPa /W3 /Zi /AL /Od /D "_DEBUG" /D "_DOS"\
          /I "\msvc\include" /I "C:\INTERMEC\IMT24\INCLUDE" /Fa /Fr
/Fd"TEST1.PDB"
OBJ     = test1.obj big0.obj
POBJ    = test1.obj+big0.obj

SRC     = $(OBJ:.c=.obj)

H       = IMT24.h

$(OBJ):$(H)

MAPFILE  = proj.map
LFLAGS   = /NOLOGO /NOI /STACK:5120 /ONERROR:NOEXE /CO

proj_DEP =  c:\intermec\imt24\include\imstdio.h \
        c:\intermec\imt24\include\IMT24.h

test1.OBJ:     test1.C
        $(CC) $(CFLAGS) $(CCREATEPCHFLAG) /c TEST1.C

big0.OBJ:     big0.C
        $(CC) $(CFLAGS) $(CCREATEPCHFLAG) /c big0.C

TEST1.exe:   $(OBJ)  $(PLIBS)
        link       $(LFLAGS) @tmp.cmd >>err
```

TMP.CMD

```
TEST1.OBJ +
BIG0.OBJ
test1.EXE
test1.map
c:\intermec\imt24\lib\+
c:\msvc\lib\+
c:\msvc\mfc\lib\+
oldnames llibca IMT24
```

TMP.BAT

```
DEL ERR
NMAKE /F TMP.MAK TEST1.EXE >> ERR
TYPE ERR
```

Downloading Applications

You can download applications and files to a terminal using either the serial port or network communications. The advantage to downloading files using network communications (RF or Ethernet) is that you can download multiple files to one or more terminals.

Using the Serial Port to Transfer Applications and Files

The PSK includes a FileCopy utility for transferring files and applications from your PC to a terminal connected to your PC serial port. FileCopy was installed on your PC when you ran the PSK setup program. The FileCopy online help contains detailed information about using the utility.

To download an application or other file

1 Connect the Trakker Antares terminal to your PC. For more information, refer to your terminal user's manual.

2 Start the FileCopy utility.

3 Select the **COM Port Setup** tab and the **Serial communications Setup** tab to verify that the settings for your PC match the settings for the terminal. Any changes you make in these tabs are automatically saved for you.

Note: Use the TRAKKER Antares 2400 Menu System to view or configure the communications settings on the terminal.

4 Select the **FileCopy** tab and type your filename information. The Trakker Antares terminals support drives C, D (248X only), E, and G. Do not include a "\" in the Trakker Antares filename.

5 (.BIN applications only) Select the **Convert.EXE** check box.

6 (.BIN applications only) If you want to run the application on the terminal immediately after it is downloaded, select the **Run Program** check box.

7 Click **Download** to copy the file from the PC to the terminal.

8 Click **Exit** to close the FileCopy utility.

Using the DCS 300 to Download Applications

You use RF or Ethernet communications to download applications and files from the DCS 300 to terminals running UDP Plus or from the host to terminals running TCP/IP. This section provides a brief overview of how to use the DCS 300 to download applications and files. For detailed instructions, see your terminal user's manual or your *DCS 300 User's Manual* (P/N 067296). Before you start, make sure the terminal is communicating with the DCS 300.

For help downloading applications from your host, see your host user's manual.

To download applications and files using RF or Ethernet communications

1 Copy the applications and files to the DCS 300.

2 Use the **Configure Download Server** option to download the applications and files to the terminal.

3 On the terminal, enter the TRAKKER Antares 2400 Menu System.

4 Use the System Menu to load and run an application.

4 Converting Trakker Antares and JANUS Applications

This chapter describes the differences between the Trakker Antares® PSK and JANUS® PSK libraries and explains how to convert your applications from one environment to the other.

This chapter covers these topics:

- Differences between Trakker Antares PSK functions and JANUS PSK functions
- Creating compatible applications
- Converting applications: Trakker Antares to JANUS
- Converting applications: JANUS to Trakker Antares

Differences Between Trakker Antares PSK Functions and JANUS PSK Functions

Some of the features and functions from the JANUS PSK do not work with Trakker Antares terminals. The Trakker Antares PSK supports either Microsoft® C/C++ or Borland® C/C++. The JANUS PSK supports Microsoft C/C++, Borland C/C++, Microsoft QuickBasic, Microsoft Visual Basic, and ADA. This chapter discusses only the C/C++ library differences.

In general, a C/C++ application written for a Trakker Antares terminal requires minor changes to run on a JANUS device. However, an application written for a JANUS device can require major changes to work properly on a Trakker Antares terminal.

You can handle the differences between the JANUS PSK and Trakker Antares PSK libraries using one of these methods:

- Use the information in this chapter to rewrite entire sections of code.
- Locate each occurrence of the unsupported command in the file and place an #ifdef statement before each occurrence.
- Create a compatibility file (compat.h) to redefine the incompatible functions. Use an #include statement at the beginning of your program to reference this file.

The first two methods are time consuming and must be performed for each program to be converted. The third method provides a reusable filter that you can quickly customize for individual programs.

Note: This chapter refers to the Trakker Antares PSK as the "Trakker PSK."

Creating Compatible Applications

To create applications that run on both JANUS devices and Trakker Antares terminals, use compatible PSK functions and plan your program flow and logic. Keep these points in mind:

- Use compatible functions to minimize rewriting program segments.
- Use status code macros to test function return values.
- Some JANUS PSK functions have runtime requirements, such as a protocol handler. Refer to your JANUS PSK reference manual for more information.

Note: Be sure that when you compile your program you set the appropriate options for the destination. JANUS PSK make files use the 80386 compiler option. Trakker PSK make files use the 8086/8088 compiler option. For help, see one of the Project Settings Checklists in Chapter 3, "Building Applications."

Compatible Functions

These functions work with both PSKs without modifications.

Compatible Functions for the JANUS and Trakker PSKs

im_command	im_set_follow_cursor
im_cursor_to_viewport	im_set_input_mode
im_get_config_info	im_sound
im_get_display_type	im_standby_wait
im_get_follow_cursor	im_transmit_buffer
im_get_label_symbology	im_transmit_buffer_no_wait
im_get_length	im_viewport_end
im_get_viewport_lock	im_viewport_getxy
im_input_status	im_viewport_home
im_irl_a	im_viewport_move
im_irl_k	im_viewport_page_down
im_irl_n	im_viewport_page_up
im_irl_v	im_viewport_setxy
im_irl_y	im_viewport_to_cursor
im_message	im_viewport_setxy
im_receive_buffer	im_viewport_to_cursor
im_receive_input	im_set_viewport_lock

Note: Incompatible functions and suggested alternatives are listed later in this chapter. See "Converting Applications: Trakker Antares to JANUS" on page 37, and "Converting Applications: JANUS to Trakker Antares " on page 40.

Using Status Code Macros

Each PSK library function returns a specific status value. The PSK provides status code macros that determine the success of the function without testing for an explicit value. For most functions, you only need to know if the result was success or failure. Your program is easier to maintain, update, and port to another terminal type when you check for success or failure instead of a specific value.

The next example tests for success or failure and then provides an action for each condition.

Example: Using Status Code Macros

```
/* This segment requests label input, then checks for
success */

/* If successful, then retrieve the label symbology  */

/* If an error occurred, display the error message   */

/* Request input */

status = im_receive_input(IM_LABEL_SELECT,
IM_INFINITE_TIMEOUT,

         &source, input);

if ( IM_ISSUCCESS(status))

     im_get_label_symbology( &symbol);

if ( IM_ISERROR(status))

     im_message(status);
```

You may want to take different actions depending on the type of error. You can test for success with IM_ISSUCCESS and provide more detailed tests for a specific returned status code. You can use the exact status code for debugging programs, but you need to adjust the routines before you attempt to port the application. For more information, see Chapter 5, "PSK Function Descriptions."

Status Code Macros to Determine Success or Failure of a Function

Status Code Macro	Return Value	Meaning
IM_ISERROR(status)	nonzero	error
	zero (0)	success or warning
IM_ISSUCCESS(status)	nonzero	success
	zero (0)	error
IM_ISGOOD(status)	nonzero	success
	zero (0)	warning or error
IM_ISWARN	nonzero	warning
	zero (0)	success

Creating Your Own Include File

You can handle the JANUS and Trakker PSK library differences by creating a compatibility file (compat.h) to redefine the incompatible functions. Use an #include statement at the beginning of your program to reference this file.

The include file provides a reusable filter that you can customize for your needs. The include file needs to rename some functions and assign specific values to other functions.

Renaming a Function

The Trakker PSK replaces some C functions with Intermec functions. For example, im_clear_screen() in the Trakker PSK replaces the Borland C clrscr() function.

Note: The JANUS PSK supports Borland C/C++ and Microsoft C/C++. The Trakker Antares PSK only supports Microsoft Visual C/C++, Professional Edition v1.0 or v1.5x, which can create 16-bit DOS applications. For more information, see "Trakker Antares PSK Version Requirements" on page 4.

To rename the clrscr() function to work with the Trakker PSK, add this line to the compatibility file (compat2t.h):

```
#define clrscr() im_clear_screen()
```

Use the tables later in this chapter to determine the changes you need to make.

Defining Function Values

Some PSK functions do not have a clear replacement function. For these functions, you can assign a success value or another significant value.

For example, many JANUS PSK functions require that the im_link function has been called. There is no equivalent function in the Trakker PSK. You can assign the success value to im_link so that your program handles the function without disrupting your program.

To assign a success value to im_link for Trakker PSK programs, add this line to the compatibility file:

```
#define im_link(x,x,x) atoi("0")
```

Converting Applications: Trakker Antares to JANUS

Since most of the Trakker PSK functions are a subset of the JANUS PSK function library, converting applications is usually easy. Some Trakker PSK functions are not part of the JANUS PSK. If you use any of the incompatible functions, you must change your program or create an include file that traps the newer functions.

This table lists the Trakker PSK functions that you must modify to use with the JANUS PSK.

Trakker PSK Functions That Need to be Modified for the JANUS PSK

Trakker PSK Function	JANUS PSK Differences and Solutions
im_clear_screen	Not supported on JANUS devices. Use standard C functions.
im_cputs	Not supported on JANUS devices. Use standard C functions.
im_erase_display	Not supported on JANUS devices. Use standard C functions.
im_erase_line	Not supported on JANUS devices. Use standard C functions.
im_event_wait	Similar to im_input_wait on JANUS devices.
im_get_cursor_style	Not supported on JANUS devices.
im_get_cursor_xy	Not supported on JANUS devices.
im_get_screen_char	Not supported on JANUS devices. Use standard C functions.
im_get_text	Not supported on JANUS devices. Use standard C functions.
im_get_tx_status	Not supported on JANUS devices.
im_get_viewporting	Not supported on JANUS devices. See “Changing Viewport Functions” on page 39.
im_put_text	Not supported on JANUS devices. Use standard C functions.
im_putchar	Not supported on JANUS devices. Use standard C functions.
im_puts	Not supported on JANUS devices. Use standard C functions.
im_receive_buffer	JANUS devices use a smaller buffer and a smaller maximum timeout value. See “Setting Timeout Values” on page 44.
im_receive_field	Not supported on JANUS devices. Use im_receive_input.
im_receive_file	Not supported on JANUS devices. Use the Communications Manager to receive ASCII files.
im_set_cursor_style	Not supported on JANUS devices.
im_set_cursor_xy	Not supported on JANUS devices.
im_set_time_event	Not supported on JANUS devices.
im_set_viewporting	Not supported on JANUS devices. See “Changing Viewport Functions” on page 39.
im_setup_follow_cursor	Not supported on JANUS devices.
im_setup_manual_viewporting	Not supported on JANUS devices. Use im_command with the appropriate viewport configuration commands. See your Trakker Antares terminal user’s manual or JANUS device user’s manual.
im_transmit_buffer	JANUS devices use a smaller maximum timeout value. See “Setting Timeout Values” on page 44.
im_transmit_buffer_no_wait_t	Not supported on JANUS devices. Use im_transmit_buffer_no_wait.
im_transmit_file	Not supported on JANUS devices. Use the Communications Manager to transmit ASCII files.
im_viewport_page_left	Not supported on JANUS devices. Use im_viewport_move.
im_viewport_page_right	Not supported on JANUS devices. Use im_viewport_move.

Changing Viewport Functions

JANUS devices and Trakker Antares terminals both support a 25x80 virtual display. However, you use different functions to turn the viewport on and off. The Trakker PSK also contains two additional functions: im_viewport_page_left and im_viewport_page_right.

Changing Viewport Functions for the JANUS PSK

Trakker PSK Method	JANUS PSK Method
`im_set_viewporting (IM_ENABLE)`	`im_set_display_mode (IM_SIZE_MODE_80X25, `*`video`*`, `*`scroll`*`, `*`char_ht`*`)`
`im_set_viewporting (IM_DISABLE)`	`im_set_display_mode (`*`other_size`*`, `*`video`*`, `*`scroll`*`, `*`char_ht`*`)`
`im_get_viewporting (mode)` where: mode is IM_ENABLE or IM_DISABLE.	`im_get_display_mode (`*`size`*`, `*`video`*`, `*`scroll`*`, `*`char_ht`*`)` where: *video* is the video mode parameter. *scroll* is the scrolling mode parameter. *char_ht* is the character height parameter. *size* is the screen size. *other_size* is the screen size, other than 80x25.

`im_viewport_move (IM_VIEWPORT_LEFT, `*`distance`*`, `*`row`*`, `*`col`*`)`
Or
`im_viewport_page_left()`
	`im_viewport_move (IM_VIEWPORT_LEFT, `*`distance`*`, `*`row`*`, `*`col`*`)`

`im_viewport_move (IM_VIEWPORT_RIGHT, `*`distance`*`, `*`row`*`, `*`col`*`)`
Or
`im_viewport_page_right()`
	`im_viewport_move (IM_VIEWPORT_RIGHT, `*`distance`*`, `*`row`*`, `*`col`*`)`
	where:
	distance is the width of one screen, from 1 to 70
	row is a returned parameter
	col is a returned parameter

Changing Display Modes

The JANUS devices use different display modes than the Trakker Antares terminals. Both use im_get_display_mode and im_set_display_mode, but they pass a different number of parameters and set different attributes. You need to rewrite program segments that set or check for display mode values.

Changing Display Modes for the JANUS PSK

Trakker PSK Display Mode Syntax	JANUS PSK Display Mode Syntax

`#include "imt24lib.h"`
`IM_STATUS im_get_display_mode`
`    (IM_FONT_TYPE far *font,`
`    IM_UCHAR far *phys_width,`
`    IM_UCHAR far *phys_height,`
`    IM_BOOL far *scroll,`
`    IM_BOOL far *wrap);`
	`#include "im20lib.h"`
	`IM_USHORT im_get_display_mode`
	`    (IM_STD_SIZE_MODE *size_mode,`
	`    IM_STD_VIDEO_MODE *video_mode,`
	`    IM_SCROLL_MODE *scroll_mode,`
	`    IM_CHARACTER_HEIGHT *char_ht);`

Converting Applications: JANUS to Trakker Antares

The JANUS PSK library provides many functions that are not part of the Trakker PSK. If you use any of the incompatible functions, you must change your program or create an include file that traps the unsupported functions.

This table lists the functions from the JANUS PSK that you must modify to use with the Trakker PSK.

JANUS PSK Functions That Need to be Modified for the Trakker PSK

JANUS PSK Function	Trakker PSK Differences and Solutions
im_appl_break_status	Trakker Antares terminals use a hot key to break out of an application.
im_backlight_off	Use im_command("%.0").
im_backlight_on	Use im_command("%.1").
im_backlight_toggle	Use im_command("%.")
im_cancel_rx_buffer	Not supported on Trakker Antares terminals. Do not use.
im_cancel_tx_buffer	Not supported on Trakker Antares terminals. Do not use.
im_clear_abort_callback	Not supported on Trakker Antares terminals. Use the hot key to control the application instead.
im_decrease_contrast	Use im_command("DJ9").
im_get_contrast	Use im_get_config_info("DJ").
im_get_control_key	Use im_get_config_info("KB").
im_get_display_mode	Trakker PSK passes different arguments. See “Changing Display Modes” on page 42.
im_get_input_mode	See “Using Input Modes” on page 43.
im_get_keyclick	Use im_get_config_info("KC").
im_get_postamble	Use im_get_config_info("AE").
im_get_preamble	Use im_get_config_info("AD").
im_get_reboot_flag	Not supported on Trakker Antares terminals. Do not use.
im_get_warmboot	Not supported on Trakker Antares terminals. Do not use.
im_increase_contrast	Use im_command("DJ8").

JANUS PSK Functions That Need to be Modified for the Trakker PSK (continued)

JANUS PSK Function	Trakker PSK Differences and Solutions
im_input_status	Trakker PSK does not support COM2. References to COM4 are treated as NET port by the IMT24LIB.H include file.
im_link_comm	Trakker Antares terminals do not need to link or unlink to use communications ports. Do not use.
im_number_pad_off	Not supported on Trakker Antares terminals. Do not use.
im_number_pad_on	Not supported on Trakker Antares terminals. Do not use.
im_parse_host_response	Not supported on Trakker Antares terminals. Do not use.
im_power_status	Not supported on Trakker Antares terminals. Do not use.
im_protocol_extended_status	Use im_get_config_info("PS") to retrieve the protocol settings. Use im_command("PS*data*") to set the protocol. Refer to your Trakker Antares terminal user's manual for valid *data* values.
im_receive_buffer	Trakker PSK has a larger receive buffer and uses a larger maximum for timeout. See "Setting Timeout Values" on page 44.
im_receive_buffer_noprot	Not supported on Trakker Antares terminals. Do not use.
im_receive_buffer_no_wait	Use im_receive_input or im_receive_buffer and set the timeout to 0.
im_receive_byte	Use im_receive_input.
im_rs_installed	Reader services are built into Trakker Antares terminals. This function is not used.
im_rx_check_status	Use im_input_status.
im_serial_protocol_control	Use im_get_config_info(PS) to retrieve the protocol settings. Use im_command("PS*data*") to set the protocol. Refer to your Trakker Antares terminal user's manual for valid *data* values.
im_set_abort_callback	Not supported on Trakker Antares terminals. Use the hot key to control the application instead.
im_set_contrast	Use im_command("DJ*data*"), where *data* is the contrast level from 0 to 7. Refer to your Trakker Antares terminal user's manual for valid *data* values.
im_set_control_key	Not supported on Trakker Antares terminals. Use the menu to reboot the terminal.
im_set_display_mode	Trakker PSK passes different arguments. See "Changing Display Modes" on page 42.
im_set_input_mode	See "Using Input Modes" on page 43.
im_set_keyclick	Use im_command("KC*data*"), where data is 0 (disable) or 1 (enable). Refer to your Trakker Antares terminal user's manual.
im_set_warmboot	Not supported on Trakker Antares terminals. Use the hot key to control application instead.
im_setup_trx	Not supported on Trakker Antares terminals. Do not use.
im_standard_trx	Not supported on Trakker Antares terminals. Do not use.
im_transmit_buffer	Trakker PSK has a larger maximum for timeout. See "Setting Timeout Values" on page 44.
im_transmit_buffer_noprot	Not supported on Trakker Antares terminals. Do not use.
im_transmit_byte	Use im_transmit_buffer.
im_unlink_com	Trakker Antares terminals do not need to link or unlink to use communications ports. Do not use.

Changing Viewport Functions

The JANUS devices and Trakker Antares terminals both support a 25x80 virtual display. However, you use different functions to turn the viewport on and off. If your JANUS program uses viewporting, you need to use the Trakker PSK functions im_get_viewporting and im_set_viewporting.

Changing Viewport Functions for the Trakker PSK

JANUS PSK Method	Trakker PSK Method
`im_set_display_mode (IM_SIZE_MODE_80X25, `*`video`*`, `*`scroll`*`, `*`char_ht`*`)`	`im_set_viewporting (IM_ENABLE)`
`im_set_display_mode (`*`other_size`*`, `*`video`*`, `*`scroll`*`, `*`char_ht`*`)`	`im_set_viewporting (IM_DISABLE)`
`im_get_display_mode (`*`size`*`, `*`video`*`, `*`scroll`*`, `*`char_ht`*`)` where: *video* is the video mode parameter. *scroll* is the scrolling mode parameter. *char_ht* is the character height parameter. *size* is the screen size. *other_size* is the screen size, other than 80x25.	`im_get_viewporting (mode)` where: *mode* is IM_ENABLE or IM_DISABLE.

`im_viewport_move (IM_VIEWPORT_LEFT, `*`distance`*`, `*`row`*`, `*`col`*`)`	`im_viewport_move (IM_VIEWPORT_LEFT, `*`distance`*`, `*`row`*`, `*`col`*`)`
	Or
	`im_viewport_page_left()`

`im_viewport_move (IM_VIEWPORT_RIGHT, `*`distance`*`, `*`row`*`, `*`col`*`)`
where:
distance is the width of one screen, from 1 to 70.
row is a returned parameter.
col is a returned parameter.
	`im_viewport_move (IM_VIEWPORT_RIGHT, `*`distance`*`, `*`row`*`, `*`col`*`)`
	Or
	`im_viewport_page_right()`

Changing Display Modes

The JANUS devices use different display modes than the Trakker Antares terminals. Both use im_get_display_mode and im_set_display_mode, but they pass a different number of parameters and set different attributes. You need to rewrite program segments that set or check for display mode values.

Changing Display Modes for the Trakker PSK

JANUS PSK Display Mode Syntax	Trakker PSK Display Mode Syntax

`#include "im20lib.h"`
`IM_USHORT im_get_display_mode`
`    (IM_STD_SIZE_MODE *size_mode,`
`    IM_STD_VIDEO_MODE *video_mode,`
`    IM_SCROLL_MODE *scroll_mode,`
`    IM_CHARACTER_HEIGHT *char_ht);`
	`#include "imt24lib.h"`
	`IM_STATUS im_get_display_mode`
	`    (IM_FONT_TYPE far *font,`
	`    IM_UCHAR far *phys_width,`
	`    IM_UCHAR far *phys_height,`
	`    IM_BOOL far *scroll,`
	`    IM_BOOL far *wrap);`

Using Input Modes

The Trakker PSK and JANUS PSK support three different input modes: Wedge mode, Programmer mode, and Desktop mode. The differences between these modes are more important on JANUS devices than on Trakker Antares terminals.

Wedge Mode

In Wedge mode, keypad and label inputs go directly into the keyboard buffer. Any reader commands are executed and saved. For JANUS devices, Wedge mode is the default mode at the DOS prompt after you load reader services (RSERVICE.EXE). Use Wedge mode when your program uses Microsoft C functions on the JANUS device.

When the reader is in Wedge mode, use standard input functions such as getch to retrieve keypad or label input. Keypad input terminates when you press the **Enter** key.

On the Trakker Antares terminals, Wedge mode works with all of the keypad input functions.

Programmer Mode

In Programmer mode, keypad input is echoed to the screen as the keys are pressed, and any reader commands are executed and saved. Keypad input terminates when you press the **Enter** key.

JANUS devices require Programmer mode to use the PSK functions and to execute Interactive Reader Language (IRL) commands.

Programmer mode is the default mode for Trakker Antares terminals, and it works with all of the keypad input functions. Trakker Antares terminals do not support IRL commands.

Desktop Mode

In Desktop mode, your application is responsible for retrieving and displaying keypad input. The input terminates with each keystroke, and Desktop mode returns detailed information about each key pressed.

Use the input function im_receive_input to capture the keys pressed. Each character returned uses the structure IM_KEYCODE, described in IM20LIB.H and IMT24LIB.H. This structure consists of four bytes: the ASCII code, the scan code, and two bytes of keyboard flags (Shift, Control, Alt).

Setting Timeout Values

The Trakker PSK uses two different maximum timeout values, but the JANUS PSK uses only one maximum value. Trakker PSK functions that access the network port use a much larger value and use the data type IM_LTIME.

Setting Timeout Values for the Trakker PSK

JANUS PSK Values	Trakker PSK Values
Numeric range: 1 to 65,534 ms Wait forever: IM_INFINITE_TIMEOUT	Numeric range: 0 to 4,294,967,294 ms Wait forever: IM_INFINITE_NET_TIMEOUT

To convert the JANUS PSK values to work with the Trakker PSK

- Add this line to your include file:

```
#define IM_INFINITE_TIMEOUT  IM_INFINITE_NET_TIMEOUT
```

5 PSK Function Descriptions

This chapter describes the syntax and parameters for each function in the Trakker Antares® Programmer's Software Kit (PSK) library.

Understanding the Function Descriptions

The function descriptions in this chapter use these conventions:

- The descriptions refer to many named constant variables, such as IM_COM1. These variables always appear in uppercase and are described in IMT24LIB.H.
- The descriptions use common C/C++ notation.
- *Italic* type indicates a variable that you replace with a real value.
- Straight quotation marks (" ") indicate literal string entries. Include the quotation marks in the command, such as:

  ```
  char *high_trast ="$+DJ7";.
  ```
- You can indent program statements with leading spaces to make your program easier to read.
- C/C++ is case sensitive. Follow the capitalization used in the descriptions.

The following example (function_name) explains the parts of the function descriptions.

function_name

Purpose	Briefly describes the function and its typical use.
Syntax	Lists the C-language function prototype and the required include file.
IN Parameters	Describes the input parameters for the function and lists acceptable values.
OUT Parameters	Describes the output parameters for the function and lists acceptable values.
IN/OUT Parameters	Describes the parameters that are passed into and then back out of the function. Lists acceptable values. The function usually changes the value before returning.
Return Value	Describes the value returned by the function and lists acceptable values. For more information about the return values, look in the rc.h file, which is at \intermec\imt24\include\rc.h for a standard installation.
Notes	Describes any additional information about the function.
See Also	Lists similar PSK functions.

Example

```
/* A short code segment showing how to use the function.  */
```

bind

Purpose This BSD socket-specific function binds a name to an existing socket. The bind function call specifies the local port number and local IP address of a connection. You can use this function call before the connect call; however, it is not required.

Syntax `int bind(int s, struct sockaddr *name, int namelen);`

IN Parameters

s	Socket identifier.
name	Port number and IP address of the remote host.
namelen	Size of name.

OUT Parameters None

Return Value This function returns one of these values:

0	Success
-1	Error

Notes BSD socket functions do not support low power pending functions, such as the functional equivalent functions im_receive_input, im_receive_field, im_receive_buffer, and im_event_wait. Therefore, if you choose to use BSD socket functions for input, you may adversely affect battery life.

Example

```
/****************************** bind ******************************/
int rc                                /* return code */
int s;                                /* socket identifier */
struct sockaddr_in socka;             /* IP address and port number */

••••

memset(&socka, 0, sizeof(socka));  /* clear socket structure */
socka.sin_family = AF_INET;
socka.sin_port = 69;

rc = bind(s, (struct sockaddr *)&socka, sizeof(socka));
if (rc < 0)
  printf ("Error:  binding\n");
```

closesocket

Purpose This BSD socket-specific function closes the socket.

Syntax `int closesocket(int s)`

IN Parameters *s* Socket identifier.

OUT Parameters None

closesocket (continued)

Return Value This function returns one of these values:

0	Success
-1	Error

Notes BSD socket functions do not support low power pending functions, such as the functional equivalent functions im_receive_input, im_receive_field, im_receive_buffer, and im_event_wait. Therefore, if you choose to use BSD socket functions for input, you may adversely affect battery life.

Example

```
/****************************** closesocket ******************************/
int rc      /* return code */
unsigned long addr;     /* for octet IP address */
struct sockaddr_in socka;     /* IP address and port number */

••••

rc = connect(s, (struct sockaddr *)&socka, sizeof(socka));
if (rc < 0)
  printf("Error:  Error connecting to remote server\n");
••••

rc = closesocket(s);
if (rc < 0)
  printf("Error:  Error closing socket\n");
```

connect

Purpose This BSD socket-specific function initiates a connection on an existing socket. You use this call to perform an active client open and establish a connection with a remote server.

Syntax `int connect(int s, struct sockaddr *name, int namelen);`

IN Parameters

s	Socket identifier.
name	Port number and IP address of the remote host.
namelen	Size of *name*.

OUT Parameters None

Return Value This function returns one of these values:

0	Passive open success
1	Active open success
-1	Error

Notes You can use im_get_IP_addr to retrieve the IP address.

In the example, Iid_SZ is defined as 4, which corresponds to four octets in the dot-quad notation.

In the example, &socka, which is of type sockaddr_in*, must be cast to a `sockaddr*`.

BSD socket functions do not support low power pending functions, such as the functional equivalent functions im_receive_input, im_receive_field, im_receive_buffer, and im_event_wait. Therefore, if you choose to use BSD socket functions for input, you may adversely affect battery life.

See Also socket

Example

```
/******************************** connect ********************************/
int rc                                   /* return code */
unsigned long addr;                      /* for octet IP address */
struct sockaddr_in socka;                /* IP address and port number */

••••

memset(&socka, 0, sizeof(socka));        /* clear socket structure */

rc = im_get_IP_addr(REMOTE_IP, &addr)    /* get host addr from HW setup */
if(rc < 0)
  printf("Error:  im_get_IP_addr\n");

socka.sin_family = AF_INET;

memcpy((char *)socka.sin_addr, (char *)&addr, Iid_SZ); /* init IP addr */
socka.sin_port = 69;

rc = connect(s, (struct sockaddr *)&socka, sizeof(socka));
if (rc < 0)
  printf("Error:  Error connecting to remote server\n");
```

DisplayUserBMP

Purpose This function displays a .BMP file on the terminal screen at a specified location.

Syntax `USHORT  far DisplayUserBMP(char *name, IM_SHORT row, IM_SHORT col);`

IN Parameters

name	Pointer to a string containing the file name of the .BMP file.
row	The top row where the upper left corner of the .BMP file will be displayed.
col	The left column where the upper left corner of the .BMP file will be displayed.

OUT Parameters None

DisplayUserBMP (continued)

Return Value This function returns one of these codes:

IM_SUCCESS	Success
E_MALOC	Insufficient memory to process the .BMP file
E_FOPEN	Cannot open or find the .BMP file

fcntlsocket

Purpose This BSD socket-specific function sets or resets the non-blocking or blocking, respectively. You can also use the fcntlsocket function call to get the current state of the non-blocking flag. Networking only uses one flag, FNDELAY or O_NDELAY, for non-blocking I/O. The networking commands are:

`F_GETFL`	get flags
`F_SETFL`	set flags

Syntax `int fcntlsocket(int s, int cmd, int arg);`

IN Parameters

s	Socket identifier.
cmd	Command specifying a get or set.
arg	Argument specifying blocking or non-blocking.

OUT Parameters None

Return Value This function returns one of these values:

0	Successful SETFL
-1	Error
flag	Current value of the flags for successful GETFL

Notes After a socket is created and before any read, you should use the fcntlsocket function to set up a non-blocking read there after.

BSD socket functions do not support low power pending functions, such as the functional equivalent functions im_receive_input, im_receive_field, im_receive_buffer, and im_event_wait. Therefore, if you choose to use BSD socket functions for input, you may adversely affect battery life.

Example

```
/****************************** fcntlsocket ******************************/
int rc;      /* return value */
int s;       /* socket identifier */
••••
rc = fcntlsocket(s, F_SETFL, FNDELAY);    /* set sockets for non-blocking */
if(rc < 0)
  printf("Error setting flag\n");
rc = fcntlsocket(s, F_SETFL, 0);          /* set sockets for blocking */
if(rc < 0)
  printf("Error setting flag\n");
```

im_battery_status

Purpose This function checks the status of the main battery and returns a number from 0 to 100 (in increments of 10) that indicates the amount of charge in the battery.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_battery_status
    (IM_SHORT *main_battery_level);
```

IN Parameters None

OUT Parameters

main_battery_level	Specifies the status of the main battery and is a number from 0 to 100, in increments of 10, where a 0 indicates that the battery has no charge left, and a 100 indicates that the battery is fully charged.

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_MAIN_BATTERY_ERROR	Error testing the battery, or the battery is not installed
IM_MAIN_BATTERY_CHARGING	Battery is charging now

Example

```
// example of checking battery status and printing the status.
#include <stdio.h>
#include "imt24lib.h"

void main(void)
{
  IM_STATUS iStatus;  //status
  IM_USHORT bLevel;   //battery status

  iStatus = im_battery_status(&bLevel);

  if(iStatus==IM_OK && bLevel > 50)
    printf("Good Battery\n");
  else
    printf("No or bad battery - Replace\n");

}
```

im_clear_screen

Purpose	This function erases the entire display and moves the cursor to the upper left corner (home).

Syntax	`#include "imt24lib.h"`
	`void im_clear_screen`
	`    (void);`

IN Parameters	None
OUT Parameters	None
Return Value	None
See Also	im_erase_display; im_erase_line

Example

See example for im_command on page 54.

im_closedir

Purpose	This function closes the directory structure opened with im_opendir.

Syntax	`#include "imstdio.h"`
	`IM_STATUS im_closedir`
	`    (IM_READDIR *pzOpenDir)`

IN Parameters	*pzOpenDir* Pointer to the current open read directory structure.
OUT Parameters	None
Return Value	This function returns one of these codes:

IM_SUCCESS	Success
Any other value	Fail

Notes	This function works with im_opendir and im_readdir.
See Also	im_opendir, im_readdir.

Example

See example for im_opendir on page 123.

im_command

Purpose This function sends reader commands to the terminal. For example, you can use this function to toggle the backlight, set the contrast, or change the beep volume on the terminal. For more information on using terminal commands, see “Using Reader Commands” and “Using Configuration Commands” in the *Trakker Antares 2400 Family System Manual* (P/N 071389).

Syntax

```
#include "imt24lib.h"
IM_STATUS im_command
    (IM_UCHAR far *command,
    IM_USHORT command_length);
```

IN Parameters

command	Terminal command string that may include more than one command. For example, the command string %.1$+BV9 turns on the backlight and raises the beep volume. Your Trakker Antares terminal user’s manual lists all of the commands available to the terminal.
command_length	Length of the terminal command string.

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully parsed and implemented command
IM_PARSE_ERROR	Unable to parse command

Notes Command strings must be included in quotation marks.

If you are using ANSI escape sequences in the command string, such as “$+PF\x02”, and you are not using STRLEN() to get the length, the escape sequences count as one character. For example:

```
im_command ("$+PF"\x02"",7); /*wrong*/
```

```
im_command ("$+PF"\x02"",5); /*right*/
```

For more information on using reader commands, see the *Trakker Antares 2400 Family System Manual* (P/N 071389).

im_command (continued)

Example

```
/******************** im_command ***********************************/
#include <string.h>
#include "imstdio.h"
#include "imt24lib.h"

void main (void)
{
   /* Command string to set contrast */
   char   *high_trast   ="$+DJ7";       /* 7 (dark) */
   char   *normal_trast ="$+DJ3";
   char   *low_trast    ="$+DJ0";       /* 0 (light)*/

   im_clear_screen();
/* Set high contrast */
   printf("\nSet high contrast\n");
   im_command(high_trast, strlen(high_trast));

   /* Wait for two seconds */
   im_standby_wait(2000);

   /* Set low contrast */
   printf("Set low contrast\n");
   im_command(low_trast, strlen(low_trast));

   /* Wait for two seconds */
   im_standby_wait(2000);

   /* Set normal contrast */
   printf("Set normal contrast\n");
   im_command(normal_trast, strlen(normal_trast));
}
```

im_cputs

Purpose This function places a string on the screen at the current cursor location without appending a carriage return and line feed (CR LF) to the string.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_cputs
    (IM_UCHAR far *string,
    IM_ATTRIBUTES attrib);
```

IN Parameters

string	Far pointer to the text string to be displayed.	
attrib	Attribute mask and is any combination of these constants:	
	IM_NORMAL	Plain text
	IM_BLINK	Blinking text
	IM_BOLD	Bold text
	IM_INVERSE	Inverse color text
	IM_UNDERLINE	Underlined text

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_BAD_ADDRESS	Invalid string address
IM_INVALID_PARAM_1	Invalid attribute value

Notes This function is similar to im_puts, except that it does not append a carriage return or line feed (CR LF) to the string.

See Also im_get_screen_char, im_get_text, im_putchar, im_puts

Example

See example for im_get_display_mode on page 72.

im_cursor_to_viewport

Purpose This function moves the cursor to the center of the current viewport. Since the viewport can move around with or without the cursor, you can use this function to center the cursor.

Syntax

```
#include "imt24lib.h"
void im_cursor_to_viewport(void);
```

IN Parameters None

OUT Parameters None

Return Value None

Notes The 2460 and 2461 terminals do not support this function.

See Also im_viewport_end, im_viewport_home, im_viewport_page_down, im_viewport_page_up, im_viewport_to_cursor, im_viewport_move

Example

See example for im_viewport_setxy on page 204.

im_dbyte_symbology_set

Purpose This function determines if you are scanning a double-byte symbology.

Syntax

```
#include "imt24lib.h"
IM_BOOL im_dbyte_symbology_set( )
```

IN Parameters None

OUT Parameters None

Return Value This function returns one of these codes:

IM_TRUE	Double-byte symbology was scanned
IM_FALSE	Single-byte symbology was scanned

Notes A double-byte symbology encodes data that may contain a Chinese, Japanese, or Korean font. These international fonts require two bytes to present a character in the font. When a double-byte symbology is scanned, you need to double the length of the buffer to store the double-byte character.

Currently, the Application Simulator cannot simulate double-byte symbologies.

The 2460 and 2461 terminals do not support this function.

im_display_thai_char

Purpose This function displays a Thai character on the terminal screen.

Syntax

```
#include "imt24lib.h"
IM_STATUS far im_display_thai_char
(IM_USHORT basechar,
IM_SHORT phonetic1,
IM_SHORT phonetic2,
IM_SHORT phonetic4,
IM_ATTRIBUTES attrib)
```

IN Parameters

basechar	Base Thai character that appears at level 3.
phonetic1	Phonetic character that appears at level 1.
phonetic2	Phonetic character that appears at level 2.
phonetic4	Phonetic character that appears at level 4.
attrib	Attributes mask and is any combination of these constants:

IM_NORMAL	Plain text
IM_BLINK	Blinking text
IM_INVERSE	Inverse color text
IM_UNDERLINE	Underlined text

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_COLUMN	Invalid column set for *phonetic1*, *phonetic2*, or *phonetic4*
IM_INVALID_ROW	Invalid row set for *basechar*
IM_ACCESS_DENIED	Thai character set not found

Notes You must have the Thai character set installed on the host and enable mixed mode in order to use this function. The Thai language is a single-byte character set in which the characters can occupy four zones or levels. Most Thai characters are consonants that occupy the middle level 3. Tone and vowel characters occupy the upper levels 1 and 2 and the lower level 4. As a result, Thai words are composed of multiple characters that can occupy several zones of the same character space.

If you set *phonetic1*, *phonetic2*, or *phonetic4* to -1, the parameter is ignored.

im_erase_display

Purpose This function erases a portion of the display.

Syntax

```
#include "imt24lib.h"
void im_erase_display
    (IM_ERASE_CONTROL erase);
```

IN Parameters *erase* Flag that specifies the area to erase and is one of these constants:

IM_ALL	Erases the entire screen
IM_CURS_TO_END	Erases from the current cursor position to the end of the display
IM_START_TO_CURS	Erases from the start of the display to the current cursor position

im_erase_display (continued)

OUT Parameters None

Return Value None

Notes If viewporting is enabled, this function erases to the beginning or end of the virtual display. The “erased” portion of the display is filled with spaces without display attributes.

See Also im_clear_screen, im_erase_line

Example

See example for im_erase_line on page 59.

im_erase_line

Purpose This function erases a portion of the current line.

Syntax

```
#include "imt24lib.h"
void im_erase_display
    (IM_ERASE_CONTROL erase);
```

IN Parameters *erase* Flag that specifies the area to erase and is one of these constants:

IM_ALL	Erases the entire line
IM_CURS_TO_END	Erases from the current cursor position to the end of the line
IM_START_TO_CURS	Erases from the start of the line to the current cursor position

OUT Parameters None

Return Value None

Notes If viewporting is enabled, this function erases to the beginning or end of the virtual line. The “erased” portion of the display is filled with spaces without display attributes.

See Also im_clear_screen; im_erase_display

Example

```
/******************** im_erase_line ********************************/
#include "imt24lib.h"
#include "imstdio.h"

IM_ERASE_CONTROL   fErase;

void main(void)
{

   int x;
   im_clear_screen();        /* Clear the screen */
   /* Print sample lines to be erased */
   for(x=0;x<16;x++)
      printf("ABCDEFGHIJKLMOPQRST\n");

   /* Move cursor to desire position Row,Col */
   im_set_cursor_xy(5,5);

   /* Set fErase flag  */
   /*    IM_CURS_TO_END - delete from cursor to end of line */
   /*    IM_START_TO_CURS - delete from start to end of line */
   /*    IM_ALL - delete entire line */

   fErase = IM_START_TO_CURS;

   /* Erase line as specified by fErase flag */
   im_erase_line(fErase);

   getch();

   im_erase_display(IM_START_TO_CURSOR);
   getch();
}
```

im_event_wait

Purpose This function waits for one or more events and returns a flag indicating that the event occurred or a timeout occurred.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_event_wait
    (IM_UINT timeout,
    IM_ORIGIN far *source);
```

IN Parameters *timeout* Numeric value or a constant:

1 to 65,534 ms	Numeric range
IM_INFINITE_TIMEOUT	Wait forever
IM_ZERO_TIMEOUT	No wait

IN/OUT Parameters *source* Passes in the sources allowed and passes out 0 (zero) or the first source with a complete event. The source passed in is any combination of these constants:

IM_COM1_SELECT	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2_SELECT	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3_SELECT	COM3 input: 2420 - Modem
IM_NET_SELECT	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board Does not know if a socket was opened using a BSD sockets interface function.
IM_SCAN_PORT_ SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board
IM_LABEL_SELECT	Label input: 241X, 242X, 243X, 2455, and 2475 - Integrated scan module or module for cabled scanners, 2475 - any attached scanner, 248X - Badge scanner or any attached scanner

IM_OPTICAL_ SELECT	248X - Optical sensor input
IM_KEYBOARD_ SELECT	Keypad input
IM_ALL_SELECT	All input sources
IM_TIMER_SELECT	Timer expired

The source passed out is any one of the above constants.

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_TIMEDOUT	Timeout occurred before receiving data

Notes This function is not required for any of the input or output functions.

This function does not clear the source state flags. To clear the flags, call an input function such as im_receive_buffer or im_receive_input.

Use IM_TIMER_SELECT for the *source* to act on a timed event instead of waiting for a keyboard, COM port, optical sensor, or network event.

Because no events are assigned to serial data transmission, im_event_wait is not valid for transmits using serial ports.

Example

```
/******************** im_event_wait ********************************/
#include "imt24lib.h"
#include "imstdio.h"
#include "ctype.h"
#include "conio.h"

void main (void)
{
   IM_UCHAR inChar='x', szNetBuffer[1024];
   IM_USHORT iLength, iCountMinutes=0;
   IM_ORIGIN iSource;
   IM_STATUS iStatus;

   im_set_time_event (60000);
   while ( toupper (inChar != 'Q') )
   {
      iSource = IM_KEYBOARD_SELECT | IM_TX_NET_SELECT | IM_TIMER_SELECT;
      iStatus = im_event_wait(3000, &iSource);
      if (IM_ISGOOD (iStatus) )
      {
         if (iSource == IM_KEYBOARD_SELECT)
            inChar = getch ( );
         if (iSource == IM_TX_NET_SELECT)
            iStatus = im_receive_buffer( IM_NET, 1024, szNetBuffer, 600,
&iLength);
```

im_event_wait (continued)

```
         if (iSource == IM_TIMER_SELECT)   /* Get this once per minute even
if receive messages in between */
            {
               iCountMinutes++;
               im_set_time_event (60000);
            }
      }
      else
      {
         im_puts((IM_UCHAR *)"Timeout on event wait", IM_BOLD);
      }
   }
   printf ("Ran %d minutes\n\r", iCountMinutes);
}
```

im_file_duplicate

Purpose This function copies an existing file.

Syntax

```
#include "imstdio.h"
#include "imt24lib.h"
IM_STATUS  im_file_duplicate
     (IM_UCHAR *source,
      IM_UCHAR *destination)
```

IN Parameters

source	Pointer to the source file name. The file name must contain the drive letter and the name.
destination	Pointer to the destination file name. The file name must contain the drive letter and the name.

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	File copy was successful
IM_INVALID_FILE	Invalid file specified or destination file already exists

Notes This function does not overwrite an existing file and will fail if the destination file exists.

Example

```
/*********************** im_file_duplicate ********************/
/* im_free_space, im_file_size, im_file_time                  */
#include  <string.h>
#include  <time.h>
#include  "imstdio.h"
#include  "imt24lib.h"
#include  <conio.h>

void main( void)
{
int   iStatus;
long  lDisk_space = 0L;
time_t   ltime;

   im_clear_screen();

/* Check available free space of file system */
   iStatus = im_free_space("c:", &lDisk_space);
   printf("Free Space: %ld\n", lDisk_space);

   getch();

/* Duplicate the current executable file */
   iStatus = im_file_duplicate("c:filesys.bin", "c:im_xxx.bin");
   printf("copy: %x\n", iStatus);
   getch();

/* Check new available free space of file system */
   iStatus = im_free_space("c:", &lDisk_space);
   printf("New free Space: %ld\n", lDisk_space);
   getch();

   /* Display file's time stamp */
   iStatus = im_file_time("c:filesys.bin", &ltime);
   printf("time: %x\n", iStatus);
   printf("%s\n", ctime(&ltime));
   getch();

   /* display file's date stamp */
   iStatus = im_file_size("c:filesys.bin", &lDisk_space);
   printf("size: %x\n", iStatus);
   printf("%ld\n", lDisk_space);
   getch();
}
```

im_file_size

Purpose This function returns the size of the target file.

Syntax

```
#include "imstdio.h"
#include "imt24lib.h"
IM_STATUS im_file_size
     (IM_CHAR *fname,
      IM_LONG *size)
```

IN Parameters	*fname*	A pointer to IM_CHAR. This variable points to a string that must include the drive letter and filename.
OUT Parameters	*size*	A pointer to IM_LONG. im_file_size places the size of the specified file here.

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_FILE	Invalid file specified

Example

See example for im_file_duplicate on page 63.

im_file_time

Purpose This function returns the time stamp of the target file.

Syntax

```
#include "imstdio.h"
#include "imt24lib.h"
IM_STATUS im_file_time
     (IM_CHAR *fname,
      time_t far *ltime)
```

IN Parameters	*fname*	Pointer to IM_CHAR. This variable points to a string that must contain a drive letter and a file name.
OUT Parameters	*ltime*	Far pointer to standard C-type time variable. im_file_time places the time stamp here.

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_FILE	Target file not found or does not exist

Notes The time_t variable is the same as the one used in the MS-DOS C standard time definition and is defined as:

typedef long time_t;

Example

See example for im_file_duplicate on page 63.

im_flush_rcv_buffer

Purpose This function flushes the receive buffer.

Syntax

```
#include "imt24lib.h"
IM_STATUS far im_flush_rcv_buffer
    (IM_COM_PORT port_id,
     IM_PTR_ERROR_LOG errorlog)
```

IN Parameters *port_id* Communications port:

IM_COM1	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3	COM3 input: 2420 - Modem
IM_SCAN_PORT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board

OUT Parameters *errorlog* Pointer to the log structure.

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_NET_PORT_HANDLE	Port handle is unknown

Notes See IM_PTR_ERROR_LOG structure in imt24lib.h for more information on different kinds of errors.

im_fmalloc

Purpose	This function allocates a memory block larger than 64K.

Syntax	`#include "imt24lib.h"`
	`void far *im_fmalloc`
	`    (IM_ULONG lsize)`

IN Parameters	*lsize* Size of memory, in bytes, to allocate.
OUT Parameters	None
Return Value	This function returns one of these values:

Far void pointer	Allocation was successful. The pointer indicates the allocated space.
NULL	Not enough available free memory to allocate

Notes The system uses 16 bytes of overhead, so if you want to allocate the largest free memory block available, specify *lsize* as 16 bytes less than the available memory block size.

The Application Simulator cannot simulate this function.

Example

```
/* Example of doing a set/get relay digital I/O */

#include  <string.h>
#include  "imstdio.h"
#include  "imt24lib.h"
#include  <conio.h>
#include  <stdlib.h>

void main(void)
{
IM_ULONG    lsize;
IM_ULONG    ltotal;
char        *pz1;
char        c;

   /* Inquire about system memory */
   im_free_mem(&lsize, &ltotal);
   printf("Largest size: %ld\nTotalsize:%ld\n", lsize, ltotal);

   /* Allocate the largest block, it must be 16 bytes less than block size */
   pz1 = im_fmalloc(lsize - 16L);

if (pz1 == NULL)
   {
        printf("Fails to allocate memory\n");
   }
   else
   {
        im_free(pz1);
   }

   c = getch();
}
```

im_free

Purpose This function deallocates space that was allocated by im_fmalloc( ). The number of bytes freed is the number of bytes specified when the block was allocated.

Syntax

```
#include "imt24lib.h"
void im_free (void far *\pmemblk);
```

IN Parameters

\pmemblock	where pmemblock points to a memory block previously allocated to fmalloc.

OUT Parameters None

Return Value None

Notes The Application Simulator cannot simulate this function.

Example

See example for im_fmalloc on page 66.

im_free_mem

Purpose This function returns free memory block information.

Syntax

```
#include "imt24lib.h"
void im_free_mem
     (IM_ULONG *largest,
      IM_ULONG *ltotal);
```

IN Parameters None

OUT Parameters

largest	Pointer to an unsigned long. This function places the amount of the largest available free memory block here.
ltotal	Pointer to an unsigned long. This function places the amount of the free memory blocks here.

Return Value None

Notes The Application Simulator cannot simulate this function.

Example

See example for im_fmalloc on page 66.

im_free_space

Purpose This function returns the amount of storage space, in bytes, available on the terminal drive you specify.

Syntax

```
#include "imstdio.h"
IM_STATUS im_free_space
    (IM_CHAR *drive,
     IM_LONG *freespace);
```

IN Parameters *drive* Pointer to IM_CHAR. This variable is a drive letter on the terminal.

OUT Parameters *freespace* Pointer to IM_LONG. im_free_space places the amount of drive space available here.

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_FILE	Target drive not found or does not exist

Example

See example for im_file_duplicate on page 63.

im_get_config_info

Purpose This function retrieves the current terminal configuration information string and its length. The command code is passed in as a string, and the current configuration is returned in the same string.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_get_config_info
    (IM_UCHAR far *config,
    IM_USHORT far *length);
```

IN Parameters None

IN/OUT Parameters *config* As input, this parameter is the desired terminal command (two characters).

You can pass in several command codes at one time. As output, this parameter contains the requested configuration information string. The first two characters specify the configuration command returned. Any subsequent characters specify the configuration options currently set. For example, to get the beep duration setting, set *config* to “BD”. The function returns BD and the current configuration for beep duration.

OUT Parameters *length* Length of the configuration information string.

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully parsed and returned command string
IM_PARSE_ERROR	Unable to parse command string

Notes For a list of the configuration commands, see your Trakker Antares terminal user's manual.

This function differs from im_command in that you only pass the two-character command identifier. The im_command function passes an entire command string.

See Also im_command

Example

```
/******************** im_get_config_info ***************************/
#include <string.h>
#include "imstdio.h"
#include "imt24lib.h"

void main(void)
{
   IM_USHORT status;
   IM_USHORT length;
   IM_UCHAR  config_string[128];

   im_clear_screen();
/* Use im_get_config_info to get the Beeper Volume  */
   printf("\nim_get_config_info example: \n");

/* Set config request for Beeper Volume  */
   strcpy(config_string, "BV");
   status = im_get_config_info(config_string, &length);

/* Print the results  */
   printf("\nBeeper Volume: %s", config_string);
   printf("\nlength: %d", length);
   printf("\nstatus: %d", status);
}
```

im_get_cursor_style

Purpose This function returns the style used to display the cursor.

Syntax
```
#include "imt24lib.h"
IM_CURS_TYPE im_get_cursor_style
    (void);
```

IN Parameters None

OUT Parameters None

Return Value This function returns a flag indicating cursor style:

IM_BLINKING_BLOCK	Blinking block
IM_BLINKING_UNDERLINE	Single blinking underline
IM_BLOCK	Block
IM_UNDERLINE	Single underline
IM_NO_CURSOR	No cursor displayed

Example

See example for im_get_display_mode on page 72.

im_get_cursor_xy

Purpose This function retrieves the current cursor position. If viewporting is disabled, the cursor position is relative to the terminal display. If viewporting is enabled, the cursor position is relative to the virtual display.

Syntax
```
#include "imt24lib.h"
IM_STATUS im_get_cursor_xy
    (IM_USHORT far *row,
    IM_USHORT far *col);
```

IN Parameters None

OUT Parameters

row	Pointer to the vertical position. The top of the display is row 0 and the bottom of the display is row 24.
col	Pointer to the horizontal position. The left edge of the display is column 0.

Return Value This function returns this code:

IM_SUCCESS	Success

Example

See example for im_get_display_mode on page 72.

im_get_display_mode

Purpose This function returns the display font, character height and width, and scrolling and wrapping status.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_get_display_mode
    (IM_FONT_TYPE far *font,
    IM_UCHAR far *phys_width,
    IM_UCHAR far *phys_height,
    IM_BOOL far *scroll,
    IM_BOOL far *wrap);
```

IN Parameters None

OUT Parameters

font Font type code and is one of these constants:

IM_FONT_STANDARD	Text is 8 x 8 pixels
IM_FONT_5X6	Text is 5 x 6 pixels
IM_FONT_6X8	Text is 6 x 8 pixels
IM_FONT_8X10	Text is 8 x 10 pixels
IM_FONT_12X16	Text is 12 x 16 pixels
IM_FONT_DOUBLEBYTE	Double byte text is 16 x 16 pixels
IM_FONT_KANA	Kana text is 8 x 16 pixels
IM_FONT_LARGE	Text is 8 x 16 pixels
IM_FONT_NONE	No text
IM_FONT_SPECIAL	Text is 16 x 16 pixels

phys_width Width of the physical display given in the number of characters in the current font that the display can hold.

phys_height Height of the physical display given in the number of characters in the current font that the display can hold.

scroll Status of the flag for scroll at bottom of window/viewport.

wrap Status of the flag for wrap at right edge of window/viewport.

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_ ADDRESS	One of the parameters has an address other than 0 (zero) and is outside of the application address space

Notes To omit a parameter, set it to 0. No information for that parameter is returned.

See Also im_set_display_mode

im_get_display_mode (continued)

Example

```
/******************** im_get_display_mode **************************/
/*  This function draws a line somewhere on the screen relative to   */
/*  the bottom line.                                                 */

#include "imt24lib.h"

void far status_line(char far * pszStatusLine, IM_BOOL iWait, IM_USHORT
iLine)
{
   IM_UCHAR iPhyWidth, iPhyHeight;
   IM_USHORT iListLine, iRow, iCol, iVpRow, iVpCol;
   IM_CONTROL iFollowCursor;
   IM_CURS_TYPE iCursType;

   /* Get current conditions */
   im_get_cursor_xy (&iRow, &iCol);
   im_get_display_mode (0, &iPhyWidth, &iPhyHeight, 0, 0);
   iCursType = im_get_cursor_style ( );
   im_get_follow_cursor (&iFollowCursor);

   /* Set temporary conditions */
   im_set_cursor_style (IM_NO_CURSOR);
   /* Don't want to follow cursor while putting up display. */
   im_set_follow_cursor (IM_DISABLE);

   /* Find out where in viewport to put it. */
   if ( iLine >= iPhyHeight)
      iListLine = iPhyHeight-1; /* Get the 0-based offset & keep inside the
window. */
   else
      iListLine = iLine;

   im_viewport_getxy (&iVpRow, &iVpCol);
   im_set_cursor_xy (iVpRow+iListLine, iVpCol);
   im_cputs ( (IM_CHAR far *) pszStatusLine, 0);
   im_standby_wait (3000);    /* Sleep 3 seconds. */

   /* Restore original conditions. */
   im_set_cursor_xy (iRow, iCol);
   im_set_follow_cursor (iFollowCursor);
   im_set_cursor_style (iCursType);
}
```

im_get_display_size_physical

Purpose This function returns the current display size.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_get_display_size_physical
    (IM_USHORT far *rows,
    IM_USHORT far *cols);
```

IN Parameters None

OUT Parameters

rows	Current setting for the number of rows in the physical display.
cols	Current setting for the number of columns in the physical display.

Return Value

IM_SUCCESS	Success

Notes

241X, 242X, 243X	Default physical display is 20 columns by 16 rows.
2455	Default physical display is 80 columns by 25 rows.
2460/2461	Default physical display is 16 columns by 2 rows.
2475	Default physical display is 40 columns by 25 rows.
2480/2485	Default physical display is 40 columns by 4 rows.
2481/2486	Default physical display is 40 columns by 25 rows.

Trakker Antares terminals can also use a virtual display that is 80 columns by 25 rows with the viewport feature.

See Also im_get_display_mode, im_get_display_type, im_set_display_mode, im_set_display_type

Example

```
/******************** im_get_display_size_physical *****************/
/* This function draws a line somewhere on the screen relative to    */
/* the bottom line.                                                  */

#include "imt24lib.h"

void far status_line(char far * pszStatusLine, IM_BOOL iWait, IM_USHORT
iLine)
{
   IM_UCHAR iPhyWidth, iPhyHeight;
   IM_USHORT iListLine, iRow, iCol, iVpRow, iVpCol;
   IM_CONTROL iFollowCursor;
   IM_CURS_TYPE iCursType;
```

im_get_display_size_physical (continued)

```
   /* Get current conditions */
   im_get_cursor_xy (&iRow, &iCol);
   im_get_display_size_physical (&iPhyWidth, &iPhyHeight);
   iCursType = im_get_cursor_style ( );
   im_get_follow_cursor (&iFollowCursor);

   /* Set temporary conditions */
   im_set_cursor_style (IM_NO_CURSOR);
   /* Don't want to follow cursor while putting up display. */
   im_set_follow_cursor (IM_DISABLE);

   /* Find out where in viewport to put it. */
   if ( iLine >= iPhyHeight)
      iListLine = iPhyHeight-1; /* Get 0-based offset & keep inside window.
*/
   else
      iListLine = iLine;
   im_viewport_getxy (&iVpRow, &iVpCol);
   im_set_cursor_xy (iVpRow+iListLine, iVpCol);
   im_cputs ( (IM_CHAR far *) pszStatusLine, 0);
   im_standby_wait (3000);    /* Sleep 3 seconds. */

   /* Restore original conditions. */
   im_set_cursor_xy (iRow, iCol);
   im_set_follow_cursor (iFollowCursor);
   im_set_cursor_style (iCursType);
}
```

im_get_display_size_virtual

Purpose This function returns the current size of the virtual display.

Syntax

```
#include "imt24lib.h"
void far im_get_display_size_virtual
    (IM_USHORT far *rows,
    IM_USHORT far *cols);
```

IN Parameters None

OUT Parameters

rows	Current setting for the number of rows in the virtual display.
cols	Current setting for the number of columns in the virtual display.

Return Value None

Notes The default virtual display is 80 columns by 25 rows.

See Also im_get_display_mode, im_get_display_type, im_set_display_mode, im_set_display_type, im_set_viewporting, im_setup_manual_viewporting

Example

See example for im_get_display_size_physical on page 73.

im_get_display_type

Purpose This function gets the display type for the terminal.

Syntax

```
#include "imt24lib.h"
IM_USHORT im_get_display_type
    (IM_DISPLAY_TYPE *type);
```

IN Parameters *type* Pointer to IM_DISPLAY_TYPE. This variable is the hardware display type.

OUT Parameters None

Return Value This function returns one of these codes:

IM_CRT_80x25	2455 cathode ray tube vehicle-mount terminal display (80 x 25)
IM_EL_80x25	2455 electro-luminescent vehicle-mount terminal (2455) display (80 x 25)
IM_LCD_20x16	241X, 242X, or 243X handheld terminal display (20 x 16)
IM_LIGHT_INDUSTRIAL_16x2	246X light-industrial stationary terminal display (16 x 2)
IM_STATIONARY	Standard stationary terminal display (40 x 12)
IM_STATIONARY_REDUCE	Reduced stationary terminal display (40 x 4)

Example

```
/******************** im_get_display_type **************************/
#include "imstdio.h"
#include <string.h>
#include "imt24lib.h"

void main(void)
{
   IM_DISPLAY_TYPE type;
   IM_USHORT status;

// Use im_get_display_type to get the Display Type
   printf("\nim_get_display_type example: \n");

   status = im_get_display_type(&type);

// Print the results
   if(type == IM_LCD_20X16)   /* Standard 2400 Display   */
      printf("\nDisplay type is Standard 2400 display");
   else
   if(type == IM_CRT_80X25)   /* 2455 VMT Display        */
      printf("\nDisplay type is 2455 VMT display");
}
```

im_get_follow_cursor

Purpose This function retrieves the current setting for the follow-the-cursor feature. When you enable viewporting, you can set the viewport to follow the cursor as it moves off the screen.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_get_follow_cursor
    (IM_CONTROL far *follow_cursor);
```

IN Parameters None

OUT Parameters

follow_cursor	One of these constants:	
	IM_ENABLE	Follow-the-cursor mode enabled
	IM_DISABLE	Follow-the-cursor mode disabled

Return Value This function returns this code:

IM_SUCCESS	Success

Notes This function does not work on terminals that are running DOS .EXE applications if you use standard C functions to write to the screen.

See Also im_set_follow_cursor, im_cursor_to_viewport, im_viewport_to_cursor

Example

```
/******************** im_get_follow_cursor *************************/
#include <conio.h>
#include <stdlib.h>
#include <ctype.h>
#include "imstdio.h"
#include "imt24lib.h"

#define  ESC_CHAR      0x1B

void main (void)
{
IM_UCHAR    ch, user_option;
IM_CONTROL  old_lock_cursor;
IM_CONTROL  new_lock_cursor;

   im_clear_screen();          /* Clear screen */
   im_set_cursor_xy(0, 0);     /* Position message */

  /* Have to enable viewporting before using any viewport display function */
   im_set_viewporting( IM_ENABLE );
   /* Get the current status of viewport follow cursor for restore later */
   im_get_follow_cursor(&old_lock_cursor);

   /* Get user's input option, 'y' for disable viewport follow cursor */
   printf("\nEnable viewport\nfollows cursor(y)?");
   user_option =  getche();
   user_option = toupper(user_option);
if (user_option == 'Y')
   {
      im_set_follow_cursor(IM_ENABLE);    /* Enable viewport follow cursor */
   }
   else             /* Disable viewport follow cursor */
   {
      im_set_follow_cursor(IM_DISABLE);
   }

   /* Get new viewport follow cursor status after setting */
   im_get_follow_cursor(&new_lock_cursor);

   /* Display user's input message */
   printf("\n\n'ESC' to quit!\nType keys to check\n");
   printf("viewport follow\n");
   if (new_lock_cursor == IM_ENABLE)
      printf("cursor ON !!!!!");
   else
      printf("cursor OFF !!!!");

  /* Enter any characters to check viewport follow cursor until 'ESC' key. */
   while ( (ch = getche()) != ESC_CHAR )
      ;

   /* Restore original follow cursor setting */
   im_set_follow_cursor(old_lock_cursor);
}
```

im_get_input_mode

Purpose This function provides compatibility with the JANUS® PSK functions. This function retrieves the current input mode setting. Input modes affect how the reader interprets and stores input.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_get_input_mode ();
```

IN Parameters None

OUT Parameters None

Return Value This function returns one of these codes:

IM_PROGRAMMER	Input is returned as a string (default). Line editing is permitted.
IM_WEDGE	Input is returned as a string. Use Backspace for simple line editing.
IM_DESKTOP	Keyboard characters are returned as 4 bytes. The first byte is the ASCII code. The second byte is the scan code, and the last 2 bytes are flags for modifier keys (Shift and Control). For label input, the entire string is returned.

im_get_input_mode (continued)

Notes For more information on input modes, see Chapter 2, "Programming Guidelines."

See Also im_set_input_mode, im_receive_input

Example

No example. This function provides compatibility with the JANUS PSK functions.

im_get_IP_addr (gethostbyname)

Purpose This function call is a BSD socket-specific function. The `im_get_IP_addr` function call replaces the `gethostbyname` function call. This call returns one of the two pre-configured IP addresses as a long integer that represents the four octets in the dot-quad notation. This format is required for the Trakker Antares socket interface. For example, the `im_get_IP_addr` function returns the IP address 192.168.1.98 as the long integer 6201a8c0h.

The socket structure is filled in by copying the four octets contained in the long integer one byte at a time to the `sockaddr_in` structure. This method replaces the `gethostbyname` function call in a way that is compatible with the Trakker Antares socket interface.

Syntax `IM_INT im_get_IP_addr(IM_INT host, IM_ULONG *addr);`

IN Parameters

host IP address to return, where *host* is one of the following values:

LOCAL_IP	IP address of the Trakker Antares terminal
REMOTE_IP	IP address of the preconfigured remote host

addr Pointer to the location where the function will return the host address.

OUT Parameters

addr IP address returned to the location specified by the pointer to *addr.*

Return Value This function returns one of these values:

0	Success
-1	Conversion error
-2	Unknown error

Notes The `gethostbyname` function call returns the IP address of the specified host by its name. However, the only pre-configured hosts that are available for Trakker Antares terminals are the local Trakker Antares terminal and a remote host IP address identified in the Trakker Antares menu system as “Host IP Addr.” No other IP addresses are currently supported in the Trakker Antares terminals. Therefore, the `gethostbyname` function call is not used, because a unique host name cannot be defined for each Trakker Antares terminal.

BSD socket functions do not support low power pending functions, such as the functional equivalent functions im_receive_input, im_receive_field, im_receive_buffer, and im_event_wait. Therefore, if you choose to use BSD socket functions for input, you may adversely affect battery life.

In the following example, `Iid_SZ` is defined as 4, which corresponds to four octets in the dot-quad notation.

Example

```
/***************************** im_get_IP_addr ***************************/
int rc                          /* return code */
unsigned long addr;             /* four octet IP address */
struct sockaddr_in socka;       /* IP address and port number */
••••

memset(&socka, 0, sizeof(socka));           /* clear socket structure */

rc = im_get_IP_addr(REMOTE_IP, &addr);      /* get host addr from HW setup */
if(rc  0)
  printf("Error:  im_get_IP_addr\n");

socka.sin_family = AF_INET;

memcpy((char *)socka.sin_addr, (char *)&addr, Iid_SZ); /* init IP addr */
socka.sin_port = 69;
```

im_get_label_symbology

Purpose This function gets the symbology, such as Code 39, from the most recently scanned label. Call this function after receiving the data using im_receive_input, im_receive_field, gets, or scanf.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_get_label_symbology
    (IM_DECTYPE far *symb);
```

IN Parameters None

OUT Parameters *symb* Label symbology and is one of these constants:

IM_UNKNOWN_DECODE	Unknown bar code
IM_CODABAR	Codabar bar code
IM_CODE_11	Code 11 bar code
IM_CODE_16K	Code 16K bar code
IM_CODE_39	Code 39 bar code
IM_CODE_49	Code 49 bar code
IM_CODE_93	Code 93 bar code
IM_CODE_128	Code 128 bar code
IM_I_2_OF_5	Interleaved 2 of 5
IM_MSI	MSI bar code
IM_PLESSEY	Plessey bar code
IM_UPC	Universal Product bar code

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully retrieved
IM_NO_SYMBOLOGY	No symbology code available, or no scans received

See Also im_receive_input, im_receive_field

Example

```
/******************** im_get_label_symbology ***********************/
#include <conio.h>
#include "imstdio.h"
#include "imt24lib.h"

static char *bar_code[] = {
  "unknown",
  "Code 39",          /* See typedef enum { ...} IM_DECTYPE in IMT24LIB.h*/
  "Code 93",
  "Code 49",
  "I 2 of 5",
  "Codabar",
  "UPC and EAN",
  "Code 128",
  "Code 16K",
  "Plessey/Anker",
  "Code 11",
  "MSI"
};

void main (void)
{
   IM_UCHAR   input[256];
   IM_ORIGIN  source;
   IM_DECTYPE symbol;

   im_clear_screen(); /* Clear the screen  */
   printf("Demo im_get_label_symbology\n'q' to quit\n");

   /* Input loop  */
   do
   {
      source = IM_LABEL_SELECT | IM_KEYBOARD_SELECT;
      im_receive_field(source, IM_INFINITE_TIMEOUT, IM_BOLD,
          IM_RETURN_ON_FULL, 10, &source, input);

      printf("\nReceive Field:\n");
      printf("%s\n", input);

      im_get_label_symbology( &symbol);

      /* Display symbology */
      printf("\nSYMBOLOGY: %d\n%s\n", symbol, bar_code[symbol]);

   } while (input[0] != 'q' && input[0] != 'Q');  /* 'q' to quit */
}
```

im_get_label_symbologyid

Purpose This function returns the symbology identifier for the most recently scanned bar code label.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_get_label_symbologyid
    (IM_UCHAR far *symbologyID)
```

IN Parameters None

OUT Parameters

symbologyID	Far pointer to IM_UCHAR. im_get_label_symbologyid places the identifier at this buffer. The buffer size must be at least 6 bytes long.

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_NONE	Symbology identifier does not exist

Notes A symbology identifier is an ASCII character string prefixed by the reading equipment to the data contained in a bar code symbol. The structure of the symbology identifier string is:

] *cm...*

where:

]	represents the symbology identifier flag character (ASCII value 93).
c	represents the code character.
m…	represents the modifier characters defined for the symbology.

Note: When the symbology identifier characters are transmitted in a 16-bit (double-byte) system, an 8-bit byte of all zeros is transmitted before each of the above characters (bytes). For more detailed information about symbology identifiers, refer to the AIM Guidelines for Symbology Identifiers.

The symbology identifiers for numerous bar code symbologies are listed in the table on the next pages.

Symbology Identifiers

Symbology	Code Char.	Modifier Characters	
Code 39	A	0	No check character validation or full ASCII processing; all data transmitted as decoded.
		1	Modulo 43 check character validated and transmitted.
		3	Modulo 43 check character validated but not transmitted.
		4	Full ASCII character conversion performed; no check character validation.
		5	Full ASCII character conversion performed; modulo 43 check character validated and transmitted.
		7	Full ASCII character conversion performed; modulo 43 check character validated but not transmitted.
Telepen	B	0	Full ASCII mode.
		1	Double density numeric only mode.
		2	Double density numeric followed by full ASCII.
		4	Full ASCII followed by double density numeric.
Code 128	C	0	Standard data packet. No FNC1 in first or second symbol character position after start character.
		1	EAN/UCC-128 data packet - FNC1 in first symbol character position after start character.
		2	FNC1 in second symbol character position after start character.
		4	Concatenation according to International Society for Blood Transfusion specifications has been performed; concatenated data follows.
Channel Code	c	3	Channel 3 decoded.
		4	Channel 4 decoded.
		5	Channel 5 decoded.
		6	Channel 6 decoded.
		7	Channel 7 decoded.
		8	Channel 8 decoded.
		9	Composite format.
Code One	D	0	No special characters in first or second symbol character position.
		1	FNC1 implied in first symbol character position.
		2	FNC1 in second symbol character position.
		4	Pad character in first symbol character position. The first data character in the symbol defines the escape character. An escape character of \ indicates that the symbol contains ECI escape sequences.

Symbology Identifiers (continued)

Symbology	Code Char.	Modifier Characters	
Data Matrix	d	0	ECC 000-140.
		1	ECC 200.
		2	ECC 200, FNC1 in first or fifth position.
		3	ECC 200, FNC1 in second or sixth position.
		4	ECC 200, ECI protocol implemented.
		5	ECC 200, FNC1 in first or fifth position, ECI protocol implemented.
		6	ECC 200, FNC1 in second or sixth position, ECI protocol implemented.
EAN/UPC	E	0	Standard data packet in full EAN format, i.e., 13 digits for EAN-13, UPC-A, and UPC-E (does not include add-on data).
		1	Two digit add-on data only.
		2	Five digit add-on data only.
		3	Combined data packet comprising 13 digits from EAN-13, UPC-A, or UPC-E symbol and 2 or 5 digits from add-on symbol.
		4	EAN-8 data packet.
		Note: EAN/UPC symbols with supplements should be considered as two separate symbols. The first symbol is the main data packet and the second symbol is the two or five digit supplement. These symbols should be transmitted separately, each with its own symbology identifier.	
Codabar	F	0	Standard Codabar symbol. No special processing.
		1	ABC Codabar (American Blood Commission) concatenate/message append performed.
		2	Reader has validated the check character.
		4	Reader has stripped the check character before transmission.
Code 93	G	0	No options specified at this time. Always transmit 0.
Code 11	H	0	Single modulo 11 check character validated and transmitted.
		1	Two modulo 11 check characters validated and transmitted.
		3	Check characters validated but not transmitted.
Interleaved 2 of 5	I	0	No check character validation.
		1	Modulo 10 symbol check character validated and transmitted.
		3	Modulo 10 symbol check character validated but not transmitted.
Code 16K	K	0	No special characters in first or second symbol character position after start character.
		1	FNC1 implied or explicit in first symbol character position after start character.
		2	FNC1 in second symbol character position after start character.
		4	Pad character in first symbol character position after start character.

Symbology Identifiers (continued)

Symbology	Code Char.	Modifier Characters	
PDF417 and MicroPDF417	L	0	Reader set to conform to protocol defined in 1994 PDF417 symbology specifications.
		1	Reader set to follow protocol of ENV 12925 for Extended Channel Interpretation (All data characters 92 doubled).
		2	Reader set to follow protocol of ENV 12925 for Basic Channel Interpretation (Data characters 92 are not doubled).
		3	Code 128 emulation: implied FNC1 in first position.*
		4	Code 128 emulation: implied FNC1 after initial letter or pair of digits.*
		5	Code 128 emulation: no implied FNC1.*
		* Applicable only to MicroPDF417 symbols.	
MSI	M	0	Modulo 10 symbol check character validated and transmitted.
		1	Modulo 10 symbol check character validated but not transmitted.
Anker Code	N	0	No options specified at this time. Always transmit 0.
Codablock	O	0	Codablock 256: FNC1 not used.
		1	Codablock 256: FNC1 in first data character position; subsequent occurrences converted to ASCII 29 (GS).
		4	Codablock F: FNC1 not used.
		5	Codablock F: FNC1 in first data character position; subsequent occurrences converted to ASCII 29 (GS).
		6	Codablock A.
Plessey Code	P	0	No options specified at this time. Always transmit 0.
QR Code	Q	0	Model 1 symbol.
		1	Model 2 symbol, ECI protocol not implemented.
		2	Model 2 symbol, ECI protocol implemented.
		3	Model 2 symbol, ECI protocol not implemented, FNC1 implied in first position.
		4	Model 2 symbol, ECI protocol implemented, FNC1 implied in first position.
		5	Model 2 symbol, ECI protocol not implemented, FNC1 implied in second position.
		6	Model 2 symbol, ECI protocol implemented, FNC1 implied in second position.
Straight 2 of 5: 2-bar start/stop codes	R	0	No check character validation.
		1	Modulo 7 check character validated and transmitted.
		3	Modulo 7 check character validated but not transmitted.
Straight 2 of 5: 3-bar start/stop codes	S	0	No options specified. Always transmit 0.

Symbology Identifiers (continued)

Symbology	Code Char.	Modifier Characters	
Code 49	T	0	No special characters in the first or second data character positions.
		1	FNC1 in the first data character position.
		2	FNC1 in the second data character position.
		4	FNC2 in the first data character position.
MaxiCode	U	0	Symbol in Mode 4 or 5.
		1	Symbol in Mode 2 or 3.
		2	Symbol in Mode 4 or 5, ECI protocol implemented.
		3	Symbol in Mode 2 or 3, ECI protocol implemented in secondary message.
Other Bar Code	X	0-F	May be assigned by the decoder manufacturer to identify those symbologies and options implemented in the reader.
Non-Bar Code	Z	0	Keyboard.
		1	Magnetic stripe.
		2	Radio Frequency (RF) tag.
		3-F	May be assigned by the device manufacturer to identify the source of data that is originating from a device other than a bar code reader.
Aztec Code	z	0	No options.
		1	FNC1 preceding 1st message character.
		2	FNC1 following an initial letter or pair of digits.
		3	ECI protocol implemented.
		4	FNC1 preceding 1st message character, ECI protocol implemented.
		5	FNC1 following an initial letter or pair of digits, ECI protocol implemented.
		6	Structured Append header included.
		7	Structured Append header included, FNC1 preceding 1st message character.
		8	Structured Append header included, FNC1 following an initial letter or pair of digits.
		9	Structured Append header included, ECI protocol implemented.
		A	Structured Append header included, FNC1 preceding 1st message character, ECI protocol implemented.
		B	Structured Append header included, FNC1 following an initial letter or pair of digits, ECI protocol implemented.
		C	Aztec Rune decoded.

im_get_length

Purpose This function returns the length of the string received from the designated source by the most recent input function (im_receive_input, im_receive_field, gets, or scanf).

Syntax

```
#include "imt24lib.h"
IM_USHORT im_get_length
    (IM_ORIGIN source);
```

IN Parameters *source* One of these constants:

IM_COM1_SELECT	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2_SELECT	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3_SELECT	COM3 input: 2420 - Modem
IM_NET_SELECT	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
IM_SCAN_PORT_SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board
IM_LABEL_SELECT	Label input: 241X, 242X. 243X, 2455, and 2475 - Integrated scan module or module for cabled scanners, 2475 - any attached scanner, 248X - Badge scanner or any attached scanner
IM_OPTICAL_SELECT	248X - Optical sensor input
IM_KEYBOARD_SELECT	Keypad input

OUT Parameters None

Return Value This function returns the length of the last input string read from the designated source.

im_get_length (continued)

Notes All input from the keypad or labels has a null termination character added to the end of the string so that it can be used as a normal C string. However, some data might contain embedded null characters, such as data from COM or NET sources. If so, this function supplies the true data length.

See Also im_receive_input, im_receive_field

Example

See example for im_receive_input on page 148.

im_get_rcv_errors

Purpose This function counts the number and type of errors in the terminal serial data. This function only applies to COM ports.

Syntax

```
#include "imt24lib.h"
IM_STATUS far im_get_rcv_errors
     (IM_COM_PORT port_id,
      IM_PTR_ERROR_LOG ErrorLog)
```

IN Parameters *port_id* Communications port:

IM_COM1	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3	COM3 input: 2420 - Modem
IM_SCAN_PORT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board

OUT Parameters *ErrorLog* Pointer to the log structure.

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_NET_PORT_HANDLE	Port handle is unknown

Notes See IM_PTR_ERROR_LOG structure in imt24lib.h for more information on different kinds of errors.

im_get_relay

Purpose This function gets the current status of the specified relay. This function is valid only on a 248X with the enhanced input/output board option.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_get_relay
    (IM_RELAY_PORT iRelayId);
```

IN Parameters *iRelayId* One of these constants:

IM_RELAY1	Relay 1 selected
IM_RELAY2	Relay 2 selected
IM_RELAY3	Relay 3 selected
IM_RELAY4	Relay 4 selected

Return Value This function returns one of these codes:

IM_CONTACT_ON	Relay is closed or energized
IM_CONTACT_OFF	Relay is open or de-energized
IM_CONFIG_ERROR	Relay configuration error

Notes *iRelayId* is mutually exclusive and cannot be ORed together.

See Also im_set_relay

Example

```
/********************** im_get_relay ********************/
/* Example of doing a set/get relay digital I/O          */
#include  <string.h>
#include  "imstdio.h"
#include  "imt24lib.h"

void main(void)
{
int   iStatus;
int   ii;

   /* Energizing/Unenergizing  digital I/O relay channel from 1 to 4 */
   for (ii= IM_RELAY1; ii <= IM_RELAY4; ii++)
   {
       iStatus = im_set_relay(ii, IM_ENABLE);
       iStatus = im_get_relay(ii);
       printf("Relay %d status:%d\n", ii, iStatus);
       im_standby_wait(5000);
       iStatus = im_set_relay(ii, IM_DISABLE);
       iStatus = im_get_relay(ii);
       printf("Relay %d status:%d\n", ii, iStatus);
   }
}
```

im_get_rx_status

Purpose This function returns the current status of receive communications for im_transmit_buffer.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_get_rx_status
    (IM_COM_PORT portid);
```

IN Parameters *portid* Desired communications port:

IM_COM1_SELECT	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2_SELECT	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3_SELECT	COM3 input: 2420 - Modem
IM_NET_SELECT	Network input (UDP Plus only): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
IM_SCAN_PORT_ SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board

OUT Parameters None

Return Value This function returns one of these codes:

IM_COMM_INUSE	Communications port in use
IM_NS_COMPLETE	Transmission completed
IM_NS_CANCELLED	Transmission canceled
IM_NS_ERROR	Communications error
IM_INVALID_PORT	Invalid network port (terminal is configured for TCP/IP instead of UDP Plus)

Notes im_get_rx_status is a passive function. Although the function returns data from a struct, the network services update this variable in the background between calls.

See Also im_get_tx_status, im_transmit_buffer, im_transmit_buffer_no_wait_t, im_transmit_buffer_no_wait

im_get_screen_char

Purpose	This function returns the character at the current cursor position in the 80x25 virtual display.

Syntax	`#include "imt24lib.h"`
	`IM_STATUS im_get_screen_char`
	`    (IM_UCHAR far *char);`

IN Parameters	None
OUT Parameters	*char* Pointer to the variable for the retrieved character.
Return Value	This function returns this code: IM_SUCCESS Success
Notes	This function returns only the character. Use im_get_text to retrieve the character and its attributes.
See Also	im_get_text, im_putchar, im_puts

Example

```
/******************** im_get_screen_char ****************************/
#include "imt24lib.h"
#include "imstdio.h"

IM_UCHAR   value;

void main()
{
   int x = 1;         /* Row Value */
   int y = 10;        /* Column Value */
   im_clear_screen(); /* Clear display screen */

    /* Display letters and numbers to chose from */
   printf("ABCDEFGHIJKLMNOPQRST\n");
   printf("UVWXYZ-0123456789\n");

   /* Chose character by setting Row and Col values */
   im_set_cursor_xy(x,y);

   /* Retrieve character at position specified */
   im_get_screen_char(&value);

   /* State which character was chosen */
   im_set_cursor_xy(3,0);
   printf("The character chosen:\n");
   printf("is:  %1c",value);
   /* Wait for user input before exiting */
   im_set_cursor_xy(14,0);
   puts("Press any key to");
   puts("exit.");

/* Move cursor to character chosen */
   im_set_cursor_xy(x,y);
   getch();
}
```

im_get_sensor_all

Purpose This function gets the current state of all optical input sensors. This function is valid only on a 248X with the enhanced input/output board option.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_get_sensor_all
    (IM_SENSOR_STATE *sensorstate)
```

IN Parameters None

OUT Parameters

sensorstate Pointer to IM_SENSOR_STATE. This function places the sensor state information here.

```
typedef struct
{
   IM_UCHAR SensorState;
   IM_UCHAR SensorChanged;
} IM_SENSOR_STATE;
```

For both elements, SensorState and SensorChanged, bit 0 represents sensor 1, bit 1 represents sensor 2, bit 2 represents sensor 3, and bit 3 represents sensor 4.

SensorState Actual state when call occurs.

0	Sensor is off
1	Sensor is on

SensorChanged Accumulated changed bits when call occurs.

0	State has not changed since last read
1	State has changed since last read

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_SENSOR_CONFIG_ERROR	Configuration error

Example

```
/********************** im_get_sensor_all ********************/
/* Example of getting one or all optical sensor inputs      */

#include  <string.h>
#include  "imstdio.h"
#include  "imt24lib.h"
#include  <conio.h>
```

im_get_sensor_all (continued)

```
void main(void)
{
IM_SENSOR_STATE iSensorState;
int   iStatus;
int   ii;

   /* Get an individual optical sensor input one at time from 1 to 4 */
   for (ii= IM_SENSOR1; ii <= IM_SENSOR4; ii++)
   {
       iStatus = im_get_sensor_input(ii);
       printf("Optical %d status:%d\n", ii, iStatus);
       im_standby_wait(2000);
   }

   /* Get 4 optical sensor at one time */
   im_get_sensor_all(&iSensorState);
   printf("Opt-State: %X\n", iSensorState.SensorState);
   printf("Opt-Change: %X\n", iSensorState.SensorChanged);
   getch();

}
```

im_get_sensor_input

Purpose This function gets the current state of the specified optical sensor.

Syntax

```
#include "imt24lib.h"
IM_SENSOR_CONTROL im_get_sensor_input
    (IM_SENSOR_PORT SensorId)
```

IN Parameters *SensorId* One of these constants:

IM_OPTICAL1	Optical sensor 1 input
IM_OPTICAL2	Optical sensor 2 input
IM_OPTICAL3	Optical sensor 3 input
IM_OPTICAL4	Optical sensor 4 input

OUT Parameters None

Return Value This function returns one of these codes:

IM_SENSOR_ON	The optical sensor is on
IM_SENSOR_OFF	The optical sensor is off

Notes *SensorId* is mutually exclusive and cannot be ORed together.

Example

See example for im_get_sensor_all on page 92.

im_get_system_julian_date

Purpose This function gets the current system date in Julian format. The Julian date is a method of representing the date as the number of days elapsed since the beginning of the year. For example, “98167” would be the 167th day of 1998.

Syntax

```
#include "imt24lib.h"
void im_get_system_julian_date
    (IM_USHORT digitsinyear,
     IM_CHAR *juliandate)
```

IN Parameters	*digitsinyear*	Number of digits in year (0-4).
OUT Parameters	*juliandate*	Pointer to the character string where you want to place the Julian date.

Return Value None

Notes The character buffer must be at least eight characters long.

Currently, the Application Simulator does not support Julian dates.

im_get_text

Purpose This function returns a rectangular section of text and its attributes from the 80 x 25 virtual display. You specify a starting row and column and ending row and column.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_get_text
    (IM_USHORT start_col,
    IM_USHORT start_row,
    IM_USHORT end_col,
    IM_USHORT end_row,
    IM_DISPLY_TEXT_S far *text_array);
```

IN Parameters *digitsinyear* Number of digits in year (0-4).

start_col	Starting column.
start_row	Starting row.
end_col	Ending column.
end_row	Ending row.

OUT Parameters *text_array* Array of type display text large enough to receive the data represented by the screen section.

text_array[*n*]	Contains the attribute, where *n* is an odd number.
text_array[*m*]	Contains the character, where *m* is an even number.

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully returned text and attributes
IM_INVALID_END	The ending location is outside the virtual display. No data returned.
IM_INVALID_PAIR	The end row/column combination are before the start row/column combination. No data returned.
IM_INVALID_START	The starting location is outside the virtual display. No data returned.

Notes The retrieved data includes a one-byte attribute and a one-byte character. The order is character, attribute, character, attribute, and so on. The buffer size must be larger than (*end_col* – *start_col* + 1) × (*end_row* – *start_row*+ 1) × 2.

See Also im_get_screen_char, im_put_text, im_putchar, im_puts

im_get_text (continued)

Example

```
/******************** im_get_text **********************************/
#include "imt24lib.h"
#include "imstdio.h"

IM_DISPLAY_TEXT_S tArray[100];    /* Array containing char. and attr. */
IM_UCHAR   sArray[100];           /* for each char. pos. in the range.*/

IM_STATUS   status;               /* Return status of calling function */

void main()
{
    int   x;

   im_clear_screen();             /* Display a clean screen */

   /* Print text to be retrieved and put at different location */
   for (x = 0; x < 2; x++)
   {
      im_cputs("AaA",2);
      im_puts("BbBbBbBbBbBb",4);
      im_cputs("CcC",3);
      im_puts("DdDdDdDdDdDd",4);
   }
   /* Get text at specified location including attributes */
   im_get_text(3,0,7,6,tArray);
   im_set_cursor_xy(5,0);
   puts("Press enter to see");
   printf("marked text moved.");
   getch();
   im_clear_screen();

   /* Display the text and attribute at position specified */
   im_set_cursor_xy(0,0);
   puts("Block of Text chosen");
   puts("to be move was..");
   status = im_put_text(0,5,4,11,tArray);

   /* Display return status of the calling function */
    // im_message(status);

   getch();
}
```

im_get_tx_status

Purpose This function returns the status of the last call to im_transmit_buffer.

Syntax

```
#include "imt24lib.h"
IM_USHORT im_get_tx_status
    (IM_COM_PORT portid);
```

IN Parameters *portid* Desired communications port:

IM_COM1_SELECT	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2_SELECT	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3_SELECT	COM3 input: 2420 - Modem
IM_NET_SELECT	Network input (UDP Plus only): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
IM_SCAN_PORT_ SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board

OUT Parameters None

Return Value This function returns one of these codes:

IM_COMM_INUSE	Communications port in use
IM_NS_COMPLETE	Transmission completed
IM_NS_CANCELLED	Transmission canceled
IM_NS_ERROR	Communications error
IM_INVALID_PORT	Invalid network port (terminal is configured for TCP/IP instead of UDP Plus)

im_get_tx_status (continued)

Notes If you need to determine if the buffer is empty, use im_event_wait or im_input_status instead of this function.

The status is invalid until you call im_transmit_buffer or im_transmit_buffer_nowait_t.

Do not use this function with im_transmit_buffer_no_wait.

See Also im_get_rx_status, im_transmit_buffer, im_transmit_buffer_no_wait_t, im_transmit_buffer_no_wait

Example

```
/********************** im_get_tx_status *****************************/
#include <string.h>
#include "imstdio.h"
#include "imt24lib.h"

void main(void)
{
   char szBuffer[1024];
   IM_STATUS   iStatus, xStatus;
   IM_USHORT   iCommLength;
   IM_COM_PORT   portid;

   im_clear_screen();        /* clear the display screen */

   portid = IM_NET;          /* set port to network */

   /* transmit buffer and get return status */
   xStatus = im_transmit_buffer(portid,
strlen(szBuffer),szBuffer,IM_ZERO_TIMEOUT);

   /* get status of the last call to im_transmit_buffer */
   iStatus = im_get_tx_status(portid);

   if( iStatus == IM_SUCCESS)
   {
      /* if successful, display data in buffer and data length */
      printf("Data receive is:%s\n\n",szBuffer);
      printf("Length of data is:%u\n\n",iCommLength);
   }
   else
   {
      /* if not successful, print error values and code */
      printf("Transmit buffer error\n");
      printf("The status is %i\n",iStatus);
      im_message(xStatus);
   }
}
```

im_get_viewport_lock

Purpose This function retrieves the current setting of the viewport lock. The viewport lock enables or disables moving the viewport with the keyboard. Your application program may require the viewport to be locked or unlocked.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_get_viewport_lock
    (IM_CONTROL far *view_lock);
```

IN Parameters None

OUT Parameters *view_lock* One of these constants:

IM_ENABLE	Viewport is locked
IM_DISABLE	Viewporting is not enabled, but the viewport is locked for when viewporting is enabled

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_VP_DISABLED	Viewporting is not enabled, but the viewport is locked for when viewporting is enabled

Notes When the viewport is “locked,” the viewport movement keys do not move the viewport. The viewport can still move if follow-the-cursor mode is enabled. The Trakker Antares terminals default to viewport unlocked when viewporting is enabled. This function is meaningless if viewporting is disabled.

The 2460 and 2461 terminals do not support this function.

See Also im_set_viewport_lock, im_get_follow_cursor, im_set_follow_cursor

im_get_tx_status (continued)

Example

```
/******************** im_get_viewport_lock *************************/
#include <conio.h>
#include <ctype.h>
#include <stdlib.h>
#include "imstdio.h"
#include "imt24lib.h"

#define  ESC_CHAR      0x1B

void main (void)
{

IM_UCHAR    ch,
            user_option;
IM_CONTROL  current_viewport_lock;

   im_clear_screen(); /* clear screen */


 /* Have to enable viewporting before using any viewport display functions */
   im_set_viewporting ( IM_ENABLE );

   /* Get the current status of viewport lock for restore later */
   im_get_viewport_lock(&current_viewport_lock);

   /* Get user's input option, 'y' for disable viewport lock */
   printf("\nEnable viewport\nlock(y)?");
   user_option = getche();
   user_option = toupper( user_option);

   if (user_option == 'Y')
   {
      /* Enable viewport lock */
      im_set_viewport_lock(IM_ENABLE);
      printf("\n\n'ESC' to quit!\nType _f and arrow keys\n");
      printf("to see viewport lock!\n");
   }
   else
   {
      /* Disable viewport lock */
      im_set_viewport_lock(IM_DISABLE);
      printf("\n'ESC' to quit\nType _f and arrow keys\n");
      printf("to see viewport unlock!\n");
   }

   /* Enter characters loop to check viewport movement until 'ESC' key. */
   while ( (ch = getche()) != ESC_CHAR )
    ;

   /* Restore viewport lock */
   im_set_viewport_lock(current_viewport_lock);
}
```

im_get_viewporting

Purpose This function determines if viewporting is enabled or if the terminal is treated as a device with a small screen.

Syntax

```
#include "imt24lib.h"
void im_get_viewporting
    (IM_CONTROL viewport);
```

IN Parameters *viewport* Flag and is one of these constants:

IM_ENABLE	Viewporting is enabled
IM_DISABLE	Viewporting is disabled

OUT Parameters None

Return Value None

Notes If viewporting is enabled, the terminal accepts viewport movement commands, including follow-the-cursor mode. All cursor positioning is relative to the virtual display. Scrolling and wrapping occur at the virtual screen (80 x 25) boundaries.

If viewporting is disabled, the terminal does not accept any viewport movement commands. All cursor positioning is relative to the viewport upper left corner. Scrolling and wrapping occur at the viewport edges.

The 2460 and 2461 terminals do not support this function.

See Also im_get_viewport_lock, im_set_follow_cursor, im_set_viewport_lock, im_set_viewporting

Example

```
/***************** im_get_viewporting ******************/
#include "imt24lib.h"
#include "imstdio.h"
#include <ctype.h>
#include <conio.h>
#include <stdlib.h>

IM_CONTROL   viewport;
IM_UCHAR     ch;

char ii;

void main(void)
{

   char cChoice,exit;
   do
   {
      /* Display a new screen */
      im_clear_screen();
```

im_get_viewporting (continued)

```
      /* Print the header */
         printf("Get Viewport Test\n\n");
         printf("Enable Viewporting? Y/N\n");
         cChoice = getch();
         cChoice = toupper(cChoice);

      /* Set the viewporting parameter */
      if(cChoice == 'Y')
      {
         im_set_viewporting(IM_ENABLE);
         printf("hi howdy");
      }
      else if(cChoice == 'N')
      {
         im_set_viewporting(IM_DISABLE);
         printf("ho ho ho");
      }
      else
         printf("Choose Y or N");

      /* Get viewport mode set */
      viewport = im_get_viewporting();
      printf("setting viewport");

      if (viewport == IM_ENABLE)
      {
         im_clear_screen();
         printf("The viewport is now enabled\n");
         printf("Move cursor off screen to\n");
         printf("check viewport movement.\n");
         printf("Press 'Q' to quit\n\n");
         im_set_follow_cursor(viewport);
         while ((ch = getche()) != 'Q');
      }
      else
      {
         im_clear_screen();
         printf("The viewport is now disabled\n");
         printf("Move cursor off screen to\n");
         printf("check viewport movement.\n");
         printf("Press 'Q' to quit\n\n");
         im_set_follow_cursor(viewport);
         while ((ch = getche()) != 'Q');
        }
        printf("\n\nExit?");
        exit = getch();
        exit = toupper(exit);
    }while(exit != 'Y');
}
```

im_input_status

Purpose This function provides compatibility with the JANUS PSK functions. This function checks to see if any input buffers have data and returns the buffer identification.

Syntax

```
#include "imt24lib.h"
IM_ORIGIN im_input_status (void);
```

IN Parameters None

OUT Parameters None

Return Value This function returns one or more of these constants:

IM_NO_SELECT	No input buffer has data
IM_COM1_SELECT	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2_SELECT	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_NET_SELECT	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
IM_SCAN_PORT_ SELECT	RS232 port input: 248X - Physical port labeled COM4 on enhanced I/O board
IM_LABEL_SELECT	Label input: 241X, 242X, 243X, and 2455 - Integrated scan module or module for cabled scanners, 2475 - any attached scanner, 248X - Badge scanner or any attached scanner
IM_OPTICAL_SELECT	248X - Optical sensor input
IM_KEYBOARD_ SELECT	Keypad input
IM_ALL_SELECT	All input sources
IM_TIMER_SELECT	Timer expired on an event set with im_set_time_event

Notes To avoid entering a battery-wasting infinite loop waiting for input, use an input function instead or use im_event_wait.

See Also im_receive_input, im_receive_field, im_event_wait

Example

No example. This function provides compatibility with the JANUS PSK functions.

im_irl_a

Purpose This function returns input from bar code labels or the keypad in the same manner as IRL command A (ASCII input). This function returns the input data to the buffer and displays the data.

Syntax

```
#include "imt24lib.h"
IM_USHORT im_irl_a
    (IM_USHORT timeout,
    IM_LENGTH_SPEC test_table[],
    IM_UCHAR mask_string[],
    IM_UCHAR *instring,
    IM_USHORT *cmd_count,
    IM_DECTYPE *symbology);
```

IN Parameters

timeout Receive timeout period and is a numeric value or one of these constants:

1 to 65,534 ms	Numeric range
IM_ZERO_TIMEOUT	No wait
IM_INFINITE_TIMEOUT	Wait forever. The function does not return until the end of message character has been received.

test_table Specifies acceptable lengths for input. Data is returned only if its length matches one of the five lengths specified in the *test_table.* The *test_table* parameter is a matrix in this form:

{a, b, c, d},
{a, b, c, d},
{a, b, c, d},
{a, b, c, d},
{a, b, c, d},

a This position in the matrix is one of these values:

IM_NO_ LENGTH	Accept data of any length. Set any unused table entries to {IM_NO_LENGTH,0,0,0}.
IM_LENGTH	Accept data with a specific length. The actual length of the data string is placed in the *d* position (and *b* and *c* are not used).
IM_RANGE	Accept data within a length range. The data length must be within the range of *b* and *c* (and *d* is not used).

mask_string Sets up a data mask that received data must match. *mask_string* can accept a string of constants or wildcard characters. For example, use the string ### - #### to accept only phone numbers. If you define a mask, the terminal beeps when input does not fit the mask.

You can use one or more of these wildcard characters to define the mask:

# (Numeric), @ (Alpha), ? (Alphanumeric printable), and NULL or zero (No mask).

OUT Parameters

instring Input string. You must allocate at least 1024 bytes for *instring* if the input source includes the network port, COM1 or COM2.

cmd_count Returns a 0.

symbology One of these constants:

IM_UNKNOWN_DECODE	Unknown bar code
IM_CODABAR	Codabar bar code
IM_CODE_11	Code 11 bar code
IM_CODE_16K	Code 16K bar code
IM_CODE_39	Code 39 bar code
IM_CODE_49	Code 49 bar code
IM_CODE_93	Code 93 bar code
IM_CODE_128	Code 128 bar code
IM_I_2_OF_5	Interleaved 2 of 5
IM_MSI	MSI bar code
IM_PLESSEY	Plessey bar code
IM_UPC	Universal Product bar code

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully received input
IM_EDIT_ERROR	Error occurred in a terminal command
IM_TIMEDOUT	A timeout occurred

Notes Trakker Antares terminals do not support IRL. This function provides compatibility with the JANUS PSK functions. For more information on IRL and command A, refer to the *IRL Programming Reference Manual* (P/N 048609).

See Also im_irl_k, im_irl_n, im_irl_v, im_irl_y

im_irl_a (continued)

Example

```
/******************** im_irl_a *************************************/
#include "imstdio.h"
#include <conio.h>
#include "imt24lib.h"

IM_LENGTH_SPEC length_table[IM_LENGTH_SPEC_MAX] = {
    {IM_LENGTH,   0,   0,   2},
    {IM_RANGE,    7,  10,   0},
    {IM_LENGTH,   0,   0,   4},
    {IM_RANGE,   15,  17,   0},
    {IM_LENGTH,   0,   0,   6}
};

IM_UCHAR ssn_mask[] = "###-##-####";
   /* Input must be in SSN format. The terminal beeps when input */
   /* does not fit the mask. To exit, you must enter 999-99-9999.*/
void main (void)
{
IM_UCHAR   input[1024];
IM_USHORT  cc;
IM_DECTYPE symbol;

   im_clear_screen();        /* Clear the screen  */

   printf("Demo IRL A Bar Code\n'9' to quit\n");
        /* For this defined mask, enter 999-99-9999 to exit.          */

   /* Input loop  */
   do
   {
      /* Display IRL A mask pattern */
      printf("IRL A test mask = %s\n", ssn_mask);

      /* Request input from Reader Wedge */
      im_irl_a(IM_INFINITE_TIMEOUT, length_table,
               ssn_mask, input, &cc, &symbol);

      printf("\n%s\n", input);

   } while (input[0] != '9');  /* '9' to quit */
         /* Input must match the mask in order to exit this function.  */
         /* For this defined mask, enter 999-99-9999 to exit.          */
}
```

im_irl_k

Purpose This function receives input from the keypad in any format in the same manner as IRL command K (ASCII input). This function returns the input data to the buffer and displays the data.

Syntax

```
#include "imt24lib.h"
IM_USHORT im_irl_k
    (IM_USHORT timeout,
    IM_LENGTH_SPEC test_table[],
    IM_UCHAR mask_string[],
    IM_UCHAR *instring,
    IM_USHORT *cmd_count);
```

IN Parameters

timeout Receive timeout period. The return status indicates whether the function was successful or a timeout occurred. The *timeout* parameter is a numeric value or one of these constants:

1 to 65,534 ms	Numeric range
IM_ZERO_TIMEOUT	No wait
IM_INFINITE_TIMEOUT	Wait forever. The function does not return until the end of message character has been received.

test_table Specifies acceptable lengths for input. Data is returned only if its length matches one of the five lengths specified in the *test_table.* The *test_table* parameter is a matrix in this form.

{a, b, c, d},
{a, b, c, d},
{a, b, c, d},
{a, b, c, d},
{a, b, c, d},

a This position in the matrix is one of these values:

IM_LENGTH	Accept data of a specific length. The actual length of the data string is placed in the *d* position (and *b* and *c* are not used).
IM_NO_LENGTH	Accept data of any length. Set any unused table entries to {IM_NO_LENGTH,0,0,0}.

im_irl_k (continued)

IM_RANGE	Accept data within a length range. The data length must be within the range of *b* and *c* (and *d* is not used).

mask_string Sets up a data mask that received data must match. *mask_string* can accept a string of constants or wildcard characters. For example, use the string ### - #### to accept only phone numbers. If you define a mask, the terminal beeps when input does not fit the mask.

You can use one or more of these wildcard characters to define the mask:

# (Numeric), @ (Alpha), ? (Alphanumeric printable), and NULL or zero (No mask).

OUT Parameters *instring* Input string. You must allocate at least 1024 bytes for this parameter if the input source includes the network port, COM1 or COM2.

cmd_count Returns a 0.

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully received input
IM_EDIT_ERROR	Error occurred in a terminal command
IM_TIMEDOUT	A timeout occurred

Notes Trakker Antares terminals do not support IRL. This function provides compatibility with the JANUS PSK functions. For more information on IRL and command K, refer to the *IRL Programming Reference Manual* (P/N 048609).

See Also im_irl_a, im_irl_n, im_irl_v, im_irl_y

Example

```
/********************* im_irl_k *************************************/
#include "imstdio.h"
#include <conio.h>
#include <stdlib.h>
#include "imt24lib.h"

IM_LENGTH_SPEC length_table[IM_LENGTH_SPEC_MAX] = {
   {IM_LENGTH,   0,   0,   2},
   {IM_RANGE,    7,  10,   0},
   {IM_LENGTH,   0,   0,   4},
   {IM_RANGE,   15,  17,   0},
   {IM_LENGTH,   0,   0,   6}};

IM_UCHAR mix_mask[] = "?#@#";
```

```
void main (void)
{
IM_UCHAR   input[1024];
IM_USHORT  cc;

   im_clear_screen();        /* Clear the screen  */
   printf("Demo IRL K Bar Code\n 'Q' to quit\n");

   /* Set terminal to PROGRAMMER mode */
   im_set_input_mode(IM_PROGRAMMER);

   /* Input loop --Display IRL K mask pattern */
   do
   {
      printf("IRL K test mask = %s\n", mix_mask);

      /* Request input from terminal */
      im_irl_k(IM_INFINITE_TIMEOUT, length_table,
               mix_mask, input, &cc);

      printf("\n%s\n", input);

      /* Upper case first char of input for testing quit */
      input[0] = toupper(input[0]);
   } while (input[0] != 'Q');              /* 'Q' to quit */
}
```

im_irl_n

Purpose This function receives numeric input from the keypad or a label in the same manner as IRL command N (numeric input). Nonnumeric data is ignored. This function returns the input data to the buffer and displays the data. For more information on IRL and command N, refer to the *IRL Programming Reference Manual* (P/N 048609).

Syntax

```
#include "imt24lib.h"
IM_USHORT im_irl_n
    (IM_USHORT timeout,
    IM_LENGTH_SPEC test_table[],
    IM_UCHAR *instring,
    IM_USHORT *cmd_count,
    IM_DECTYPE *symbology);
```

im_irl_n (continued)

IN Parameters

timeout Receive timeout period. The return status indicates whether the function was successful or a timeout occurred. The *timeout* parameter is a numeric value or one of these constants:

1 to 65,534 ms	Numeric range
IM_ZERO_TIMEOUT	No wait
IM_INFINITE_TIMEOUT	Wait forever. The function does not return until the end of message character has been received.

test_table Acceptable lengths for input. Data is returned only if its length matches one of the five lengths specified in the *test_table.* The *test_table* parameter is a matrix in this form:

{a, b, c, d},
{a, b, c, d},
{a, b, c, d},
{a, b, c, d},
{a, b, c, d},

a This position in the matrix is one of these values:

IM_LENGTH	Accept data of a specific length. The actual length of the data string is placed in the *d* position (and *b* and *c* are not used).
IM_NO_LENGTH	Accept data of any length. Set any unused table entries to {IM_NO_LENGTH,0,0,0}.
IM_RANGE	Accept data within a length range. The data length must be within the range of *b* and *c* (and *d* is not used).

OUT Parameters

instring Input string. You must allocate at least 1024 bytes for *instring* if the input source includes the network port, COM1 or COM2.

cmd_count Returns a 0.

symbology One of these constants:

IM_UNKNOWN_DECODE	Unknown bar code
IM_CODABAR	Codabar bar code
IM_CODE_11	Code 11 bar code
IM_CODE_16K	Code 16K bar code
IM_CODE_39	Code 39 bar code
IM_CODE_49	Code 49 bar code

IM_CODE_93	Code 93 bar code
IM_CODE_128	Code 128 bar code
IM_I_2_OF_5	Interleaved 2 of 5
IM_MSI	MSI bar code
IM_PLESSEY	Plessey bar code
IM_UPC	Universal Product bar code

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully received input
IM_EDIT_ERROR	Error occurred in a terminal command
IM_TIMEDOUT	A timeout occurred

Notes Trakker Antares terminals do not support IRL. This function provides compatibility with the JANUS PSK functions. For more information on IRL and command N, refer to the *IRL Programming Reference Manual* (P/N 048609).

See Also im_irl_a, im_irl_k, im_irl_v, im_irl_y

Example

```
/******************** im_irl_n *************************************/
#include "imstdio.h"
#include <conio.h>
#include "imt24lib.h"

IM_LENGTH_SPEC length_table[IM_LENGTH_SPEC_MAX] = {
   {IM_LENGTH,   0,   0,   2},
   {IM_RANGE,    7,  10,   0},
   {IM_LENGTH,   0,   0,   4},
   {IM_RANGE,   15,  17,   0},
   {IM_LENGTH,   0,   0,   6}};

void main (void)
{
IM_UCHAR   input[1024];
IM_USHORT  cc;
IM_DECTYPE symbol;

   im_clear_string();        /* Clear the screen  */
   printf("Demo IRL N Bar Code\n'9' to quit\n");

   /* Input loop */
   do
   {
      /* Display IRL N test */
      printf("IRL N test\n");

      /* Request input from Reader Wedge */
      im_irl_n(IM_INFINITE_TIMEOUT, length_table,
               input, &cc, &symbol);

      printf("\n%s\n",input);

   } while (input[0] != '9' );         /* '9' to quit */
}
```

im_irl_v

Purpose This function receives input from any specified source in any format, in the same manner as an IRL command V (universal input). For more information on IRL and command V, refer to the *IRL Programming Reference Manual* (P/N 048609).

Syntax

```
#include "imt24lib.h"
IM_USHORT im_irl_v
    (IM_USHORT timeout,
    IM_CONTROL edit,
    IM_LABEL_BEEP_CONTROL beep,
    IM_CONTROL display,
    IM_ORIGIN *source,
    IM_UCHAR *instring,
    IM_USHORT *cmd_count,
    IM_DECTYPE *symbology);
```

IN Parameters

timeout Receive timeout period. The return status indicates whether the function was successful or a timeout occurred.

timeout Numeric value or one of these constants:

1 to 65,534 ms	Numeric range
IM_ZERO_TIMEOUT	No wait
IM_INFINITE_TIMEOUT	Wait forever. The function does not return until the end of message character has been received.

edit Determines whether the wedge reader parses reader commands. Use one of these constants:

IM_ENABLE	Enable reader command parsing.
IM_DISABLE	Disable reader command parsing. Reader commands are treated as data.

beep Determines whether the IRL V command beeps or not when data is entered. The *beep* parameter is one of these constants:

IM_APPLI_BEEP	Application controls the beep. You code the application to sound a beep when your program design requires one.
IM_WEDGE_BEEP	Beeps occur automatically. The reader always beeps when data is entered.

display Determines if the data is displayed as it is entered. The *display* parameter is one of these constants:

IM_ENABLE	Enable display of data.
IM_DISABLE	Disable display of data.

IN/OUT Parameters *source*

Determines which input sources are allowed. When the IRL V command returns, *source* indicates where the data came from. When both keypad and label inputs are allowed, the *source* always returns keypad because it is possible for keyed and scanned data to be intermixed. Although intermixing is possible, it is not likely to occur.

If you have both the keypad and scanner enabled, and you want to know where the data came from, first check:

- if the symbology is IM_UNKNOWN_DECODE, then the data came from the keypad.
- if the symbology is one of the other values (such as IM_CODE_39), then some or all of the data came from the scanner.
- if only the scanner is enabled, then all of the data came from the scanner.

source can be one of these constants:

IM_NO_SELECT	No input source selected
IM_COM1_SELECT	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2_SELECT	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM4_SELECT	Means IM_NET_SELECT and is provided for compatibility with past systems
IM_NET_SELECT	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
IM_SCAN_PORT_SELECT	RS232 port input: 248X - Physical port labeled COM4 on enhanced I/O board
IM_LABEL_SELECT	Label input: 241X, 242X, 243X, and 2455 - integrated scan module or module for cabled scanners, 2475 – any attached scanner, 248X - Badge scanner or any attached scanner

im_irl_v (continued)

IM_OPTICAL_ SELECT	248X - Optical sensor input
IM_KEYBOARD_ SELECT	Keypad input
IM_ALL_SELECT	All input sources

OUT Parameters

instring Input string. You must allocate at least 1024 bytes for *instring* if the input source includes the network port, COM1, or COM2.

cmd_count Returns a 0.

symbology One of these constants:

IM_UNKNOWN_DECODE	Unknown bar code
IM_CODABAR	Codabar bar code
IM_CODE_11	Code 11 bar code
IM_CODE_16K	Code 16K bar code
IM_CODE_39	Code 39 bar code
IM_CODE_49	Code 49 bar code
IM_CODE_93	Code 93 bar code
IM_CODE_128	Code 128 bar code
IM_I_2_OF_5	Interleaved 2 of 5
IM_MSI	MSI bar code
IM_PLESSEY	Plessey bar code
IM_UPC	Universal Product bar code

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully received input
IM_TIMEDOUT	A timeout occurred

Notes Because the Trakker Antares terminals have no left Delete key, this function returns the left Delete scan code when the left arrow is pressed.

Trakker Antares terminals do not support IRL. This function provides compatibility with the JANUS PSK functions. For more information on IRL and command V, refer to the *IRL Programming Reference Manual* (P/N 048609).

See Also im_irl_a, im_irl_k, im_irl_n, im_irl_y

Example

```
/******************** im_irl_v ************************************/
#include "imstdio.h"
#include <conio.h>
#include <stdlib.h>
#include "immsg.h"
#include "imt24lib.h"

#define  COM_BUFSIZE 1024    /* allocate 1024 bytes for comm buffer */

void main (void)
{
IM_UCHAR        *com_buffer;
IM_UCHAR        COM_BUFSIZE[1024];
IM_ORIGIN       source;
IM_USHORT       cc;
IM_DECTYPE      symbol;

   /* FUNCTION BODY */

   im_clear_screen();        /* Clear the screen  */
   printf("Demo IRL V Bar code\n'C' to clear screen\n'Q' to quit\n");
do
   {
/* Display IRL V test */
      printf("IRL V test\n");
/* Set up input source with labels, keypad, and NET */
      source = IM_LABEL_SELECT | IM_KEYBOARD_SELECT | IM_NET_SELECT;
/* Request input from Reader Wedge */
      im_irl_v(IM_INFINITE_TIMEOUT,
               IM_ENABLE, IM_WEDGE_BEEP, IM_ENABLE,
               &source, input, &cc, &symbol);
/* Display input data */
      printf("\n%s\n", input);
/* Upper case first char of input for simplifying to test input */
      input[0] = toupper(input[0]);
/* If the first char in string is 'C', then clear screen.*/
      if (input[0] == 'C')
         clrscr();
} while (input[0] != 'Q');        /* 'Q' for quit */
im_set_beep_control(IM_WEDGE_BEEP);
}
```

im_irl_y

Purpose The im_irl_y function receives input from the designated communications port the same as IRL command Y (ASCII input). This function receives a single block, not an entire file. This function always clears input from the host and checks the data for terminal commands from input. Unlike the other IRL-type instructions, the data is not automatically displayed. For more information on IRL and command Y, refer to the *IRL Programming Reference Manual* (P/N 048609).

Syntax

```
#include "imt24lib.h"
IM_STATUS im_irl_y
    (IM_USHORT timeout,
    IM_COM_PORT port_id,
    IM_UCHAR *eom_char,
    IM_PROTOCOL_CMD protocol,
    IM_UCHAR *instring,
    IM_USHORT *cmd_count);
```

IN Parameters

timeout Receive timeout period. The return status indicates whether the function was successful or a timeout occurred. The *timeout* parameter is a numeric value or one of these constants:

1 to 65,534 ms	Numeric range
IM_ZERO_ TIMEOUT	No wait
IM_INFINITE _TIMEOUT	Wait forever. The function does not return until the end of message character has been received.

port_id Communications port:

IM_COM1_SELECT	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2_SELECT	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board

IM_COM3_SELECT	COM3 input: 2420 - Modem
IM_NET_SELECT	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
IM_SCAN_PORT_ SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board

	eom_char	Provides compatibility with the JANUS PSK. This parameter is ignored on the Trakker Antares terminals.
	protocol	Provides compatibility with the JANUS PSK. This parameter is ignored on the Trakker Antares terminals. Use the Trakker Antares menu system or im_command to control protocol on the terminal.
OUT Parameters	*instring*	Input string. You must allocate at least 1024 bytes for *instring* if the input source includes the network port, COM1, or COM2.
	cmd_count	Returns a 0.

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully received input
IM_TIMEDOUT	A timeout occurred

Notes Trakker Antares terminals do not support IRL. This function provides compatibility with the JANUS PSK functions. For more information on IRL and command Y, refer to the *IRL Programming Reference Manual* (P/N 048609).

Protocol is ignored for IM_COM4 and IM_NET input.

See Also im_irl_a, im_irl_k, im_irl_n, im_irl_v

im_irl_y (continued)

Example

```
/******************** im_irl_y *************************************/
#include "imstdio.h"
#include <conio.h>
#include <stdlib.h>
#include "immsg.h"
#include "imt24lib.h"

void main (void)
{
IM_UCHAR        input[1024];
IM_USHORT       cc;
IM_USHORT       status;

   im_clear_screen();        /* Clear the screen  */

   printf("Demo IRL Y Bar Code\n'Q' to quit\n\'C' to clear screen\n");

   /* Using protocol by passing IM_PROTOCOL_ON */
   printf("\nUsing protocol\n");
   status = im_irl_y(IM_INFINITE_TIMEOUT, IM_NET, &eom_null,
                             IM_PROTOCOL_ON, input, &cc);
   /* Display input data */
   printf("\nstatus: %x\n%s", status, input);

   /* im_irl_y input loop */
   do
   {
   } while (input[0] != 'Q');  /* 'Q' to stop */
}
```

IM_ISERROR

Purpose This macro determines if the return status code from another PSK function is an error (either fatal or nonfatal).

Syntax

```
#include "imt24lib.h"
IM_ISERROR(status);
```

IN Parameters

status	Any PSK function that returns a status code.

OUT Parameters None

Return Value This function returns one of these codes:

0	Success or warning
Nonzero	Error (either fatal or nonfatal)

See Also For more information, see “Status Code Macros” on page 12.
IM_ISGOOD, IM_ISSUCCESS, IM_ISWARN

Example

```
/******************** IM_ISERROR ***********************************/
#include "imt24lib.h"
#include "imstdio.h"
printf("IM_ISERROR example:")

status = im_sound(IM_LOW_PITCH, IM_BEEP_DURATION, IM_NORMAL_VOLUME)
if IM_ISERROR(status)
   printf("Beep error!");
else
   printf("Beep success or warning!");
```

IM_ISGOOD

Purpose This macro determines if the return status code from another PSK function is a success. For more information, see “Status Code Macros” on page 12.

Syntax

```
#include "imt24lib.h"
IM_ISGOOD(status);
```

IN Parameters

status	Any PSK function that returns a status code.

OUT Parameters None

Return Value This function returns one of these codes:

0	Warning or error
Nonzero	Success

See Also IM_ISERROR, IM_ISSUCCESS, IM_ISWARN

Example

```
/******************** IM_ISGOOD ***********************************/
#include "imt24lib.h"
#include "imstdio.h"
printf("IM_ISGOOD example:")

status = im_sound(IM_LOW_PITCH, IM_BEEP_DURATION, IM_NORMAL_VOLUME)
if IM_ISGOOD(status)
   printf(“Beep Successful!”);
else
   printf(“Beep warning or error!”);
```

IM_ISSUCCESS

Purpose This macro determines if the return status code from another PSK function is either success or warning.

Syntax
```
#include "imt24lib.h"
IM_ISSUCCESS(status);
```

IN Parameters	*status*	Any PSK function that returns a status code.
OUT Parameters	None	

Return Value This function returns one of these codes:

0	Error
Nonzero	Success or warning

See Also For more information, see “Status Code Macros” on page 12. IM_ISERROR, IM_ISGOOD, IM_ISWARN

Example

```
/******************** IM_ISSUCCESS ************************************/
#include "imt24lib.h"
#include "imstdio.h"
printf("IM_ISSUCCESS example:")

status = im_sound(IM_LOW_PITCH, IM_BEEP_DURATION, IM_NORMAL_VOLUME)
if IM_ISSUCCESS(status)
   printf(“Beep success or warning!”);
else
   printf(“Beep error!”);
```

IM_ISWARN

Purpose This macro determines if the return status code from another PSK function is a warning.

Syntax
```
#include "imt24lib.h"
IM_ISWARN(status);
```

IN Parameters	*status*	Any PSK function that returns a status code.
OUT Parameters	None	

Return Value This function returns one of these codes:

0	Success or an error (either fatal or nonfatal)
Nonzero	Warning

See Also For more information, see “Status Code Macros” on page 12.
IM_ISERROR, IM_ISGOOD, IM_ISSUCCESS

Example

```
/******************** IM_ISWARN ************************************/
#include "imt24lib.h"
include "imstdio.h"
printf("IM_ISWARN example:")

status = im_sound(IM_LOW_PITCH, IM_BEEP_DURATION, IM_NORMAL_VOLUME)
if IM_ISWARN(status)
   printf("Beep warning!");
else
   printf("Beep success or error!");
```

im_message

Purpose This function displays the error message associated with a specific status code returned by a PSK function. Use this function to display additional information about status codes during application development.

Syntax

```
#include "imt24lib.h"
void im_message(IM_USHORT status_code);
```

IN Parameters *status_code* Standard status code returned from various PSK functions.

OUT Parameters None

Return Value None

Notes The status message is displayed at the current cursor location without any formatting. This function links all the error messages into your application and increases the program size about 5K.

Example

See example for im_receive_buffer on page 136.

im_offset_dbyte

Purpose This function sets an internal global value that is used as an offset to adjust a double-byte font table address.

Syntax

```
#include "imt24lib.h"
void im_offset_dbyte
    (IM_USHORT iDByteOffset);
```

Notes The Intermec customized double-byte font table does not exactly match the BIG5 font table. As a result, this function sets an internal global value to offset the starting character address between the two font tables. For example, if the first character in the Intermec double-byte font table starts at 0xA440 in the BIG5 font table, use this function to set the internal global value to 0xA440. The PSK double-byte display functions will subtract 0xA440 from each double-byte character in the table so that the proper character appears on the terminal.

Intermec recommends that you use the default input parameter of 0.

Currently, the Application Simulator cannot simulate double-byte characters.

The 2460 and 2461 terminals do not support this function.

im_opendir

Purpose This function opens a directory in the terminal file system. This function must be called before im_readdir.

Syntax

```
#include "imstdio.h"
IM_READDIR far *im_opendir
    (IM_UCHAR *drive)
```

IN Parameters *drive* Pointer to IM_UCHAR. This variable points to a terminal drive letter.

OUT Parameters None

Return Value Far pointer to the IM_READDIR directory structure. This pointer is the input argument to pass to im_readdir. See imstdio.h for a definition of IM_READDIR.

Notes This function opens a directory on the terminal. Use im_readdir to read the contents of the directory. You can continually repeat the call to im_readdir to read each successive entry in the directory.

See Also im_closedir, im_readdir

Example

```
/*********************** im_opendir  ***************************/
/* Example of reading file information from a directory chain */
#include  <string.h>
#include  "imstdio.h"
#include  "imt24lib.h"
#include  <conio.h>

void main(void)
{
IM_READDIR  *pzReadDir;
IM_DIR      *pzDir;

   if ( (pzReadDir = im_opendir("c:")) != NULL)
   {
      /* Walking down the directory chain */
      while ( (pzDir = im_readdir(pzReadDir) ) != NULL)
      {
         printf("File Name: %s\n", pzDir->name);   /* Display file name */
         printf("File Size: %ld",  pzDir->size);   /* Display file size */
         getch();
      }
      im_closedir(pzReadDir);
   }
   else
   {
      printf("Invalid Drive.\n");
   }
}
```

im_overlay_setup

Purpose This function superimposes glyph font characters at the same character position.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_overlay_setup
    (IM_UCHAR start_font_scan_row,
    IM_UCHAR start_video_scan_row,
    IM_UCHAR scan_lines) ;
```

IN Parameters

start_font_scan_row	The starting scan row (0 to 15) of the glyph font to be displayed.
start_video_scan_row	The starting scan row (0 to 15) of the 16 by 16 area of the display panel.
scan_lines	The number of scan rows (1 to 16) of the font to be displayed. To cancel overlay mode, set this parameter to 0.

OUT Parameters None

im_overlay_setup (continued)

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_ROW	Value for an input parameter is out of range

Notes Overlay mode can be used only when the terminal is in 16 x 16 display mode. You can set up overlay mode while the terminal is in another display mode (8 x 8 or 8 x 16), but overlay mode will not become active until the terminal is in 16 x 16 display mode.

To cancel overlay mode, issue the im_overlay_setup function with the *scan_lines* input parameter set to 0.

The 2460 and 2461 terminals do not support this function.

See Also im_overlay_status

Example

```
/********************** im_overlay_setup **************************/
// Example of printing upper and lower part of a slash
// by setting up the overlay mode.

#include  "imt24lib.h"

void main(void)
{
   // turn off cursor
   im_set_cursor(CURSOR_OFF);

   //clear character location where overlaying will occur
     im_putchar(‘ ‘, HOLD_CURSOR);

   //print the upper part of a slash starting at top of the character
position
     im_overlay_setup(0, 0, 8);
     im_putchar(‘/’, HOLD_CURSOR);

   //print the lower part of a slash starting at top of the character
position
     im_overlay_setup(7,0,8);
     im_putchar(‘/’, HOLD_CURSOR);

   //cancel the overlay mode
     im_overlay_setup(0,1,0);
 }
```

im_overlay_status

Purpose This function returns the values that were specified in the last call of the im_overlay_setup function.

Syntax

```
#include "imt24lib.h"
IM_STATUS *im_overlay_status
    (IM_UCHAR *start_font_scan_row,
    IM_UCHAR *start_video_scan_row,
    IM_UCHAR *scan_lines) ;
```

IN Parameters None

OUT Parameters

start_font_scan_row	Pointer to the starting scan row (0 to 15) of the glyph font to be displayed.
start_video_scan_row	Pointer to the starting scan row (0 to 15) of the 16 by 16 area of the display panel.
scan_lines	Pointer to the number of scan rows (1 to 16) of the glyph font to be displayed.

Return Value This function returns this code:

IM_SUCCESS	Success

Notes To cancel overlay mode, set the *scan_lines* input parameter to 0.

The 2460 and 2461 terminals do not support this function.

See Also im_overlay_setup

Example

```
/************************** im_overlay_status ******************************/
// Example of printing upper and lower part of a slash using overlay mode.

#include  "imt24lib.h"
void main(void)
{
 IM_USHORT iStartFontScanRow;
 IM_USHORT iStartVideoScanRow;
 IM_USHORT iNumberScanLines;
   //turn off cursor
     im_set_cursor(CURSOR_OFF) ;

   //setup overlay mode and read out
     im_overlay_setup(2, 1, 8) ;

     im_overlay_status(&iStartFontScanRow,
        &iStartVideoScanRow, &iNumberScanLines) ;

   //cancel the overlay mode
     im_overlay_setup(0,1,0);
}
```

im_put_text

Purpose This function places a rectangular section of text on the virtual screen at the specified starting row and column and ending row and column.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_put_text
    (IM_USHORT start_col,
    IM_USHORT start_row,
    IM_USHORT end_col,
    IM_USHORT end_row,
    IM_UCHAR far *text_array);
```

IN Parameters

start_col	Starting column.
start_row	Starting row.
end_col	Ending column.
end_row	Ending row.
text_array	Character array large enough to hold a character and an attribute for each character position in the display range.
text_array[*n*]	Contains the attribute, where *n* is an odd number.
text_array[*m*]	Contains the character, where *m* is an even number.

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully placed the text
IM_INVALID_PAIR	The end row/column combination are before the start row/column combination. No data placed.
IM_INVALID_START	The starting location is outside the virtual display. No data placed.
IM_INVALID_END	The ending location is outside the virtual display. No data placed.

Notes The placed data includes a one-byte character and a one-byte attribute for each screen position.

See Also im_get_screen_char, im_get_text

Example

See example for im_get_text on page 96.

im_putchar

Purpose This function places a character on the screen with the specified attributes.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_putchar
    (IM_UCHAR char,
    IM_ATTRIBUTES attrib);
```

IN Parameters

char Character to be displayed.

attrib Attribute mask and is any combination of these constants:

IM_NORMAL	Plain text
IM_BLINK	Blinking text
IM_BOLD	Bold text
IM_INVERSE	Inverse color text
IM_UNDERLINE	Underlined text

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_PARAM_1	Invalid attribute value

See Also im_get_screen_char, im_get_text, im_puts

Example

See examples of im_puts in im_get_text on page 96 or im_event_wait on page 61.

im_putchar_dbyte

Purpose This function displays a double-byte international character on the screen with the specified attributes.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_putchar_dbyte
    (IM_USHORT char,
     IM_ATTRIBUTES attrib)
```

IN Parameters

char Unsigned short that represents the double-byte international character to display.

attrib Any combination of these constants:

IM_NORMAL	Plain text
IM_BLINK	Blinking text
IM_INVERSE	Inverse color text
IM_UNDERLINE	Underlined text

im_putchar_dbyte (continued)

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_PARAM_1	Invalid attribute value

Notes Double-byte characters are used in character sets (Chinese, Japanese, Korean) where the number of characters exceeds 256.

You must have a double-byte character set installed on the host in order to use this function.

Currently, the Application Simulator cannot simulate double-byte characters.

The 2460 and 2461 terminals do not support this function.

im_putchar_kana_8x16

Purpose This function places an 8x16 Kana character on the screen.

Syntax

```
#include "imt24lib.h"
IM_USHORT far im_putchar_kana_8x16
    (IM_UCHAR char,
    IM_ATTRIBUTES attrib);
```

IN Parameters

char Kana character to be displayed.

attrib Attribute mask and is any combination of these constants:

IM_NORMAL	Plain text
IM_BLINK	Blinking text
IM_BOLD	Bold text
IM_INVERSE	Inverse color text
IM_UNDERLINE	Underlined text

OUT Parameters None

Return Value This function returns this code:

IM_SUCCESS	Success

Notes Currently, the Application Simulator cannot simulate double-byte characters.

The 2460 and 2461 terminals do not support this function.

See Also im_putchar, im_puts, im_puts_kana_8x16, im_puts_mixed

Example

```
/************************* im_putchar_kana_8x16 *********************/
// Example of placing 1/2 width Japanese Kana string and character

#include "imt24lib.h"
#include <conio.h>
#include <stdio.h>

void main(void)
{
   char szKanaString[6] = {0xb7, 0xb8, 0xb9, 0xba, 0xbb, '\0'};  // A Kana
string
   char szKanaChar = 0xb7;
   // Set font character size to 8x16 to display Kana characters in 1/2
width.
   // If the character size is 16x16, then the Kana characters will display
the
   // same size as double byte characters.
   im_set_display_mode(IM_FONT_LARGE,0,0);

   im_puts_kana_8x16(szKanaString, IM_NORMAL);
   im_putchar_kana_8x16(szKanaChar, IM_NORMAL);

   getch();
}
```

im_puts

Purpose This function places a string on the screen at the current cursor location and appends a carriage return and line feed after the string.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_puts
    (IM_UCHAR far *string,
    IM_ATTRIBUTES attrib);
```

IN Parameters

string Far pointer to the text string to be displayed.

attrib Attribute mask and is any combination of these constants:

IM_NORMAL	Plain text
IM_BLINK	Blinking text
IM_BOLD	Bold text
IM_INVERSE	Inverse color text
IM_UNDERLINE	Underlined text

OUT Parameters None

im_puts (continued)

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_BAD_ADDRESS	Invalid string address
IM_INVALID_PARAM_2	Invalid attribute value

Notes This function is similar to im_cputs, except that it appends a carriage return and linefeed.

See Also im_cputs, im_get_screen_char, im_get_text, im_putchar, im_putchar_kana_8x16, im_puts_kana_8x16, im_puts_mixed

Example

See example for im_event_wait on page 61 or im_setup_follow_cursor on page 165.

im_puts_dbyte

Purpose This function displays a string of double-byte characters on the screen at the current cursor location and appends a carriage return and a line feed after the string.

Syntax

```
IM_STATUS im_puts_dbyte
(IM_USHORT far *string,
IM_ATTRIBUTES attrib)
```

IN Parameters

string Far pointer to the double-byte text string to be displayed.

attrib Any combination of these constants:

IM_NORMAL	Plain text
IM_BLINK	Blinking text
IM_INVERSE	Inverse color text
IM_UNDERLINE	Underlined text

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_PARAM_1	Invalid attribute value

Notes Double-byte characters are used in character sets (Chinese, Japanese, Korean) where the number of characters exceeds 256. You must have a double-byte character set installed on the host in order to use this function.

Currently, the Application Simulator cannot simulate double-byte characters.

The 2460 and 2461 terminals do not support this function.

Example

```
/************************ im_puts_dbyte **************************/
// Example of placing double byte (BIG5) character and string


#include "imt24lib.h"
#include <conio.h>
#include <stdio.h>

void main(void)
{
   IM_BOOL iBool;

   int sX[6] = {'A', 'b', 'C', 'd', 'E', '\0'};
   int sY[6] = {0xa4f4,0xa4f5, 'U', 'b', 0xbc42, '\0'};
   int sU[6] = { 0xbb41, 'b', 0xbbf5, 'd', 0xaba5, '\0'};
   int sW[6] = { 'A', 0xbb41, 'C', 0xbbf5, 'E', '\0'};
   int sZ[6] = {0xa4f4, 0xa4f5, 0xa4f6, 0xa4f7, 0xa4f8, '\0'};

   // Need to check for the font offset for the font you are using
   im_offset_dbyte( 0xa140);  // This is BIG5 font offset
   im_set_display_mode(IM_FONT_SPECIAL,0,0);

   //display dbyte font at the locations.
   im_puts_mixed(sX, IM_NORMAL);
   im_puts_mixed(sY, IM_NORMAL);
   im_puts_mixed(sU, IM_NORMAL);
   im_puts_mixed(sW, IM_NORMAL);
   im_puts_dbyte(sZ, IM_NORMAL);

   //display mixed mode

   getch();

}
```

im_puts_kana_8x16

Purpose This function places an 8x16 Kana character string at the current cursor location and appends a carriage return and line feed after the string.

Syntax

```
#include "imt24lib.h"
IM_USHORT far im_puts_kana_8x16
    (IM_UCHAR far *string,
    IM_ATTRIBUTES attrib);
```

IN Parameters

string Far pointer to the Kana character string to be displayed.

attrib Attribute mask and is any combination of these constants:

IM_NORMAL	Plain text
IM_BLINK	Blinking text
IM_BOLD	Bold text
IM_INVERSE	Inverse color text
IM_UNDERLINE	Underlined text

OUT Parameters None

Return Value This function returns this code:

IM_OK	Success

Notes Currently, the Application Simulator cannot simulate double-byte characters.

The 2460 and 2461 terminals do not support this function.

See Also im_putchar, im_putchar_kana_8x16, im_puts, im_puts_mixed

Example

See example for im_putchar_kana_8x16 on page 129.

im_puts_mixed

Purpose This function displays a string of mixed single and double-byte characters on the screen at the current cursor location and appends a carriage return and a line feed after the string.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_puts_mixed
    (IM_USHORT far *string,
     IM_ATTRIBUTES attrib)
```

IN Parameters

string Far pointer to the mixed single and double-byte text string to be displayed.

attrib Any combination of these constants:

IM_NORMAL	Plain text
IM_BLINK	Blinking text
IM_INVERSE	Inverse color text
IM_UNDERLINE	Underlined text

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_PARAM_1	Invalid attribute value

Notes Double-byte characters are used in character sets (Chinese, Japanese, Korean) where the number of characters exceeds 256.

You must have a double-byte character set installed on the host in order to use this function.

If you are using Japanese Kana characters, you cannot mix half widths and full widths. You can use this function to display half width Japanese Kana characters only.

Currently, the Application Simulator cannot simulate double-byte characters.

The 2460 and 2461 terminals do not support this function.

See Also im_putchar, im_putchar_kana_8x16, im_puts, im_puts_kana_8x16, im_puts_mixed

Example

See example for im_puts_dbyte on page 131.

im_readdir

Purpose This function returns the contents of the current directory in the file system. A call to im_opendir must be made before using im_readdir.

Syntax

```
#include "imstdio.h"
IM_DIR far *im_readdir
    (IM_READDIR *OpenDir)
```

IN Parameters *OpenDir* Pointer to the current directory structure. See imstdio.h for definitions of IM_READDIR.

OUT Parameters None

Return Value Far pointer to the current directory structure. See imstdio.h for definitions of IM_CLOSEDIR.

Notes To read a directory in the file system, call im_opendir to open a directory. Then call im_readdir to read the contents of the current directory one entry at a time. An entry consists of a filename, date and time stamp, and file size.

Repeat the call to im_readdir for each successive entry in the directory you want to read. This is a one-way function that reads from the first entry to the next entry in the file directory. You cannot jump entries or read backward through the file system. If the return pointer is NULL, you have reached the end of the directory.

Use im_closedir to stop reading directories or when you have reached the end of the directory.

Example

See example for im_opendir on page 123.

im_receive_buffer

Purpose This function automatically opens a socket and receives the contents of a data buffer from a designated communications source. If the terminal is communicating in a TCP/IP network, you can also use the BSD sockets interface for network communications. However, the im_receive_buffer function uses power management; it is designed to conserve battery power better than the BSD sockets interface function.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_receive_buffer
    (IM_COM_PORT port_id,
    IM_USHORT length,
    IM_UCHAR far *data_buffer,
    IM_LTIME timeout,
    IM_USHORT far *comm_length);
```

IN Parameters

port_id	Communications port:	
	IM_COM1	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
	IM_COM2	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
	IM_COM3	COM3 input: 2420 - Modem
	IM_NET	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
	IM_SCAN_ PORT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board
length	Maximum number of bytes to receive and must be 1024 bytes.	
data_buffer	Far pointer to the data array where you want to place the received data. This buffer must hold at least the number of bytes passed in as *length* (1024 or more).	
timeout	Receive timeout period and is one of these values:	
	1 to 4,294,966 ms	Numeric range
	IM_ZERO_TIMEOUT	No wait
	IM_INFINITE_NET_ TIMEOUT	Wait forever. The function does not return until the end of message character has been received.
comm_length	Far pointer to the variable that holds the actual number of bytes received upon completion of the call. This variable is valid only if a successful status code is returned. Otherwise, no data is received.	

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully received data
IM_NET_BAD_CTRL_BLOCK	Net control block pointer is null
IM_NET_BAD_DATA	Data pointer is null or invalid data length
IM_NET_CONFIG_ERROR	Incorrect RF configuration
IM_NET_NOT_READY	Network not active or not properly configured

im_receive_buffer (continued)

Notes This function does not return until an end of message, a buffer is full, a timeout occurs, or an error occurs.

For COM input, if no EOM character is defined, the function returns after a character is received.

For TCP/IP communications, individual records can get combined into one packet during transmission. As a result, you can use im_set_eom to detect the end of data in each TCP/IP message by: (1) reading the one or two EOM characters at the end of the message or (2) reading a two-byte binary number at the beginning of the message to identify the message length.

Data in the receive buffer is appended with a null character unless the data is 1024 bytes in length, in which case the null character is not appended to the data.

See Also im_cancel_rx_buffer, im_receive_field, im_receive_file, im_transmit_buffer

Example

```
/******************** im_receive_buffer ****************************/
#include <string.h>
#include <conio.h>
#include "imstdio.h"
#include "imt24lib.h"

void main ( void )
{
char      szRxBuffer[1024];
IM_STATUS iStatus;
IM_USHORT iCommLength;

    im_clear_screen();

    iStatus = im_receive_buffer ( IM_NET, 1024, szRxBuffer, 10000,
&iCommLength );

    if(iStatus == IM_SUCCESS)
      printf("\nData Receive: %s, Length: %u\n", szRxBuffer, iCommLength);
    else
    {
      printf("\nReceive Buffer Err:\nStatus Code#: %x\n", iStatus);
      im_message(iStatus);
    }

    getch();
}
```

im_receive_field

Purpose This function works on an input field area on the screen. You can specify display attributes for the field and control the length of the input data.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_receive_field
    (IM_ORIGIN allowed,
     IM_UINT timeout,
     IM_ATTRIBUTES attrib,
     IM_USHORT flags,
     IM_SHORT length,
     IM_ORIGIN far *source,
     IM_UCHAR *received);
```

IN Parameters *allowed* Available input source and is one or more of these constants:

IM_COM1_SELECT	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2_SELECT	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3_SELECT	COM3 input: 2420 - Modem
IM_COM4_SELECT	Means IM_NET_SELECT and is provided for compatibility with past systems
IM_NET_SELECT	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
IM_SCAN_PORT_ SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board
IM_LABEL_SELECT	Label input: 241X, 242X, 243X, and 2455 - Integrated scan module or module for cabled scanners, 2475 - any attached scanner, 248X - Badge scanner or any attached scanner
IM_OPTICAL_ SELECT	248X - Optical sensor input
IM_KEYBOARD_ SELECT	Keypad input
IM_ALL_SELECT	All input sources

im_receive_field (continued)

timeout Receive timeout period and is one of these values:

1 to 65,534 ms	Numeric range
IM_ZERO_TIMEOUT	No wait
IM_INFINITE_NET_ TIMEOUT	Wait forever. The function will not return until the end of message character has been received, a return is entered, or one of the conditions set with the *flags* parameter is met.

When you select COM1 or the Network port, the value IM_INFINITE_TIMEOUT and the value 0xFFFF are treated as IM_INFINITE_NET_TIMEOUT.

attrib Display attributes and can be any combination of these constants:

IM_NORMAL	Normal characters
IM_BLINK	Blinking characters
IM_BOLD	Bold characters
IM_INVERSE	Reverse video for characters
IM_UNDERLINE	Underlined characters

flags Controls the field action and is one or more of these constants:

IM_ERASE_FIELD	Clear field data, but display any attributes in the field area. If this flag is not set, the old data is displayed and the attributes are applied to the field.
IM_RETURN_ON_ BACK_TAB	Directs im_receive_field to return if the BACK TAB key is pressed.
IM_RETURN_ON_ TAB	Directs im_receive_field to return if the TAB key is pressed.
IM_RETURN_ON_ FULL	Directs im_receive_field to return if the field becomes full.
IM_RETURN_ON_ FUNCTION	Directs im_receive_field to return if a function key (F1 - F10) is pressed.
IM_RETURN_ON_ ESC	Directs im_receive_field to return if the ESC key is pressed.

IM_RETURN_ON_ UD_ARROWS	Directs im_receive_field to return if the up or down arrow key is pressed.
IM_DISPLAY_ONLY	Display the field and its attributes without waiting for input.
IM_AT_END	Move the cursor to the end of the data already in the field.
IM_NO_DISPLAY	Receive input but do not echo the input to the display.
IM_UPCASE	Changes input to uppercase.
IM_LOCASE	Changes input to lowercase.
IM_STAY_IN_FIELD	Cursor stays in the input field upon field exit.
IM_START_IN_ OVERSTRIKE	Line editing mode is set to overstrike.
IM_START_IN_ INSERT	Line editing mode is set to insert (default value).

Note: If both IM_UPCASE and IM_LOCASE are set, then IM_UPCASE is used. If neither flag is set, keys are interpreted as pressed.

length Display field size. The buffer needs to be at least one byte larger than the display field size.

OUT Parameters *source* Far pointer to IM_ORIGIN. This function places the actual source of received data at this location and is one of these constants:

IM_COM1_SELECT	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2_SELECT	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3_SELECT	COM3 input: 2420 - Modem
IM_NET_SELECT	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board

im_receive_field (continued)

	IM_SCAN_PORT_ SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board
	IM_LABEL_ SELECT	Label input: 241X, 242X, 243X, and 2455 - Integrated scan module or module for cabled scanners, 2475 - any attached scanner, 248X - Badge scanner or any attached scanner
	IM_OPTICAL_ SELECT	248X - Optical sensor input
	IM_KEYBOARD_ SELECT	Keypad input
	IM_NO_SELECT	No input source selected
received	Pointer to IM_UCHAR. This function places the received data at this location.	

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully received input.
IM_TIMEDOUT	Timeout occurred.
IM_INPUT_FULL	Maximum number of characters was received and input was stopped. All characters entered are returned.
IM_RETURN_F1	F1 was received.
IM_RETURN_F2	F2 was received.
IM_RETURN_F3	F3 was received.
IM_RETURN_F4	F4 was received.
IM_RETURN_F5	F5 was received.
IM_RETURN_F6	F6 was received.
IM_RETURN_F7	F7 was received.
IM_RETURN_F8	F8 was received.
IM_RETURN_F9	F9 was received.
IM_RETURN_F10	F10 was received.
IM_RETURN_TAB	Tab was received.
IM_RETURN_BACK_TAB	Backtab was received.
IM_RETURN_ESC	ESC character was received.
IM_RETURN_UP_ARROW	Up arrow was received.
IM_RETURN_DOWN_ARROW	Down arrow was received.

Notes If input from more than one source is received before this function is called, the first available input is returned in this order: label, keypad, optical sensor input, COM1, COM2, COM3, scanner port, and network.

For optical sensor input, the first byte in the input buffer is the current optical sensor state for each sensor and the second byte is the optical sensor state change for each sensor since the last read.

For each byte - Bit 0 represents sensor 1, bit 1 represents sensor 2, bit 2 represents sensor 3, and bit 3 represents sensor 4.

First byte (Sensor State)

0	Sensor off
1	Sensor on

Second byte (Sensor Change)

0	Sensor state has not changed since the last call
1	Sensor state has changed since the last call

See Also im_cancel_rx_buffer, im_receive_buffer, im_receive_field, im_receive_file

Example

See also the example getflds.c in the \intermec\imt24\examples\psk directory.

```
/******************** im_receive_field*****************************/
/*Example of doing a data input screen using im_receive_field */
/* Also validates input for length and draws box.            */

#include "imt24lib.h"
#include "string.h"

/* Fields and prompts */
char sBadge[10] ={0}, sPart[26]={0}, sOrderNo[10]={0};
char Lable0[] ="Job Setup",         Lable1[]="Enter Badge:",
     Lable2[] ="Scan Part Number:", Lable3[] = "Enter Order Number:";

#define FIELD_FLAGS IM_RETURN_ON_TAB | IM_RETURN_ON_FULL | IM_AT_END
#define H1 0xC4
#define V1 0xB3
#define UL1 0xDA
#define UR1 0xBF
#define LL1 0xC0
#define LR1 0xD9

/* Table of information to drive display and data input */

struct screen{
    char * pszText;
    IM_USHORT iRow, iCol, iLength, iMinLength;
    IM_ATTRIBUTES  iAttribute;
    IM_USHORT iFlags;
    } aScreen[] = {
     { Lable0  ,  1, 5,  sizeof(Lable0)-1, 0, IM_BOLD,     IM_DISPLAY_ONLY },
     { Lable1  ,  4, 1,  sizeof(Lable1)-1, 0, IM_BOLD,     IM_DISPLAY_ONLY },
```

im_receive_field (continued)

```
      { Lable2  ,  7, 1,  sizeof(Lable2)-1, 0, IM_BOLD,     IM_DISPLAY_ONLY },
      { Lable3  , 12, 1,  sizeof(Lable3)-1, 0, IM_BOLD,     IM_DISPLAY_ONLY },
      { sBadge  ,  5, 1,     9,             3, IM_INVERSE,  FIELD_FLAGS },
      { sPart   ,  8, 1,    25,             0, IM_INVERSE,  FIELD_FLAGS },
      { sOrderNo, 13, 1,     9,             7, IM_INVERSE,  FIELD_FLAGS },
      {(void *)0,0,0,0,0,0} /*Termination line*/
    };
    /*note that sizeof includes the null terminator and we pass in the
displayable size*/

void DrawBox ( IM_USHORT iRow1, IM_USHORT iCol1, IM_USHORT iRow2, IM_USHORT
iCol2 )
{
   IM_USHORT ii;
   im_set_cursor_xy( iRow1, iCol1 );
   for ( ii = iCol1+1; ii <= iCol2; ii++)
      im_putchar ( H1, IM_BOLD );

   im_set_cursor_xy( iRow2, iCol1 );
   for ( ii = iCol1+1; ii <= iCol2; ii++)
      im_putchar ( H1, IM_BOLD  );

   for ( ii = iRow1+1; ii < iRow2 ; ii++)
   {
      im_set_cursor_xy( ii, iCol1 );
      im_putchar ( V1, IM_BOLD  );
      im_set_cursor_xy( ii, iCol2 );
      im_putchar ( V1, IM_BOLD  );
   };
/* do the corners */
   im_set_cursor_xy( iRow1, iCol1 );   im_putchar ( UL1, IM_BOLD  );
   im_set_cursor_xy( iRow1, iCol2 );   im_putchar ( UR1, IM_BOLD  );
   im_set_cursor_xy( iRow2, iCol1 );   im_putchar ( LL1, IM_BOLD  );
   im_set_cursor_xy( iRow2, iCol2 );   im_putchar ( LR1, IM_BOLD  );
}

/* call this function when keypad is entered in the fields with
   im_set_validation_callback */

void callsound(void)
{
   im_sound(IM_HIGH_PITCH,100,IM_NORMAL_VOLUME);
}

/* Simple example validation routine. */
IM_BOOL DoValidation ( char * szField, IM_USHORT iMinLength )
{
  if ( (IM_USHORT)strlen( szField ) >= iMinLength )
    return IM_TRUE;
  else
  {
    im_status_line("Input to short", IM_TRUE, 50);
    return IM_FALSE;
  }
}
```

```
void main (void)
{
   IM_ULONG  iSetup = IM_DISPLAY_ONLY, iPassFlags, ii=0;
   IM_STATUS iStatus;
   IM_ORIGIN iSource;
   VALCALLBACK pFun = callsound;  //setup for im_set_validation_callback()

   /* set up display */
   im_clear_screen();
   im_set_viewporting (IM_DISABLE);
   DrawBox( aScreen[0].iRow -1, aScreen[0].iCol -1, aScreen[0].iRow +1,
            aScreen[0].iCol +sizeof(Lable0)  );
   im_set_validation_callback(pFun);  //call sound if keypad is entered in
the field

/*********************************************************************/
/* loops through once to display prompts and fields then comes back    */
/* through to gather input. If validation fails stays in field until   */
/* validation passes.                                                   */
/*********************************************************************/
   do
   {
      im_set_cursor_xy( aScreen[ii].iRow, aScreen[ii].iCol );
      iPassFlags = aScreen[ii].iFlags | iSetup ;
      iStatus = im_receive_field( IM_KEYBOARD_SELECT | IM_LABEL_SELECT,
                                  IM_INFINITE_TIMEOUT,
aScreen[ii].iAttribute,
                                  iPassFlags,aScreen[ii].iLength, &iSource,
                                  aScreen[ii].pszText);
      /* Validate if not display pass */
      if (iPassFlags & IM_DISPLAY_ONLY)
      {
         ii++;
      }
      else if (DoValidation(aScreen[ii].pszText, aScreen[ii].iMinLength ) )
      {
         ii++;
         iSetup = iSetup & !IM_AT_END;

      }
      else  /* Must have been error, go to end of same field */
        iSetup = iSetup | IM_AT_END;

      /*See if display pass done and if is, turn into data input pass. */
      if ((iSetup & IM_DISPLAY_ONLY) && ( aScreen[ii].pszText == (void *)0 )
)
      {
          iSetup = iSetup & !IM_DISPLAY_ONLY ; /*reset the display only bit
*/
          ii = 0;                             /* and start again at the top
*/
      }

   } while ( aScreen[ii].pszText != (void *)0 ) ;
}
```

im_receive_file

Purpose This function receives a file from the Intermec Gateway or the DCS 30X or from a TFTP server via TCP/IP direct connect and writes the file to disk on the terminal.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_receive_file
    (IM_UCHAR far *con_file,
    IM_UCHAR far *trakker_file);
```

IN Parameters

con_file Path and filename for the file on the Intermec Gateway, DCS 30X, or the TFTP server you want to download. This parameter can be a string in quotes or a far pointer to a variable containing the filename.

Note: If you are using UDP Plus, the file you want to download must reside on a path relative to D:\USERDATA on the Intermec Gateway or the DCS 30X. If you are using TCP/IP, you can use an absolute or true path to download the file you want from the TFTP server.

trakker_file Is the drive letter and filename for saving the file on the Trakker Antares terminal. This parameter can be a string in quotes or a far pointer to a variable containing the filename. The Trakker Antares terminals do not use directories. All file names use this format: *drive:abcdefgh.ext*.

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully transferred file to the terminal.
IM_NET_BAD_CTRL_ BLOCK	Net control block pointer is null.
IM_NET_BAD_DATA	Data pointer is null or invalid data length.
IM_GENERR	Error occurred. View the error log from the Trakker Antares menu system.
IM_NET_NOT_READY	Network not active or not properly configured.

Notes You can use a literal string for either filename. Use a statement in this format:

```
im_receive_file( (IM_UCHAR *) "c:\\apps\\vtxxx.bin",
    (IM_UCHAR *) "c:vtxxx.bin")
```

See Also im_cancel_rx_buffer, im_receive_buffer, im_receive_field, im_receive_input

Example

See example for im_transmit_file on page 187.

im_receive_input

Purpose This function gets input from the specified sources and places it into the specified location. You can use the im_get_length function after this function to get the input length.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_receive_input
    (IM_ORIGIN allowed,
    IM_UINT timeout,
    IM_ORIGIN *source,
    IM_CHAR *received);
```

IN Parameters *allowed* Available input source and is one or more of these constants:

IM_COM1_SELECT	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2_SELECT	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3_SELECT	COM3 input: 2420 - Modem
IM_NET_SELECT	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
IM_SCAN_PORT_ SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board
IM_LABEL_SELECT	Label input: 241X, 242X, 243X, and 2455 - Integrated scan module or module for cabled scanners, 2475 - any attached scanner, 248X - Badge scanner or any attached scanner
IM_OPTICAL_ SELECT	248X - Optical sensor input

im_receive_input (continued)

IM_KEYBOARD_ SELECT	Keypad input
IM_ALL_SELECT	All input sources

Use these variables to modify the input by performing a logical OR with the previous input sources.

IM_KEYCODE_ ENABLE	Overrides the current input mode by temporarily placing the terminal in a unique mode for this call only. While the terminal is in this mode, keyboard and scanned label input is returned one character per call to im_receive_input.

A character is returned as 4 bytes. The first byte is the ASCII code, the second byte is the scan code, and the last 2 bytes are flags for modifier keys (Shift and Control).

timeout Receive timeout period and is one of these values:

1 to 65,534 ms	Numeric range
IM_ZERO_TIMEOUT	No wait
IM_INFINITE_ TIMEOUT	Wait forever. The function will not return until the end of message character has been received. If you select COM1 or the Network port, IM_INFINITE_TIMEOUT and 0xFFFF are treated as IM_INFINITE_NET_ TIMEOUT.

OUT Parameters *source* Pointer to IM_ORIGIN. This function places the actual source of received data at this location and is one of these constants:

IM_COM1_SELECT	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2_SELECT	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3_SELECT	COM3 input: 2420 - Modem

IM_NET_SELECT	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
IM_SCAN_PORT_ SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board
IM_LABEL_SELECT	Label input: 241X, 242X, 243X, and 2455 - Integrated scan module or module for cabled scanners, 2475 - any attached scanner, 248X - Badge scanner or any attached scanner
IM_OPTICAL_SELECT	248X - Optical sensor input
IM_KEYBOARD_ SELECT	Keypad input
IM_NO_SELECT	No input sources selected

received Pointer to where the data is to be placed.

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_TIMEDOUT	Timeout occurred

Notes If input from more than one source is received before this function is called, the first available input is returned in this order: label, keypad, optical sensor input, COM1, COM2, COM3, scanner port, and network.

For optical sensor input, the first byte in the input buffer is the current optical sensor state for each sensor and the second byte is the optical sensor state change for each sensor since the last read.

For each byte - Bit 0 represents sensor 1, bit 1 represents sensor 2, bit 2 represents sensor 3, and bit 3 represents sensor 4.

First byte (Sensor State)

0	Sensor off
1	Sensor on

Second byte (Sensor Change)

0	Sensor state has not changed since the last call
1	Sensor state has changed since the last call

See Also im_cancel_rx_buffer, im_receive_buffer, im_receive_field, im_receive_file

im_receive_input (continued)

Example

```
/******************** im_receive_input *****************************/
#include "imstdio.h"
#include <stdlib.h>
#include "imt24lib.h"

IM_UCHAR   input[1024];

void main (void)
{
IM_USHORT  length;
IM_ORIGIN  source;
IM_STATUS  status;

   im_clear_screen();          /* Clear the screen  */

   printf("Demo \nim_receive_input\n'Q' to quit\n\'C' to clear screen\n");

   /* Input loop  */
   do
   {
      /* Set up input source */
      source = IM_LABEL_SELECT | IM_KEYBOARD_SELECT | IM_NET_SELECT;

      /* Request input from label, keypad or NET */
      status = im_receive_input(source, IM_INFINITE_TIMEOUT, &source, input);
      length = im_get_length(source);
      if (IM_ISGOOD(status))
      {
         /* Show the input source */
         if (source == IM_LABEL_SELECT)
            printf("\nLabel input:\n");
         else if (source == IM_KEYBOARD_SELECT)
            printf("\nKeybd input:\n");
         else if ( source == IM_NET_SELECT)
            printf("\nNet input:\n");
/* Display input data */
         printf("%s\nInput length: %d\n", input, length);
      }
      else /* input error */
         printf("input error\n");

      /* Upper case first char of input for simplifying to test input */
      input[0] = toupper(input[0]);

      /*If the first char in string is 'C', then clear screen.*/
      if (input[0] == 'C')
         im_clear_screen();

   } while (input[0] != 'Q');  /* First number in string is 'Q', then stop */

}
```

im_set_cursor_style

Purpose Defines the style used to draw the cursor.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_set_cursor_style
    (IM_CURS_TYPE cursor);
```

IN Parameters *cursor* Flag that is one of these constants:

IM_BLINKING_BLOCK	Blinking block
IM_BLINKING_UNDERLINE	Single blinking underline
IM_BLOCK	Block
IM_UNDERLINE	Single underline
IM_NO_CURSOR	No cursor displayed

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_NOT_SUPPORTED	Not supported for the current firmware level or the current font type

Notes Use this function to reduce screen flicker and speed up repainting a full screen a character at a time. Turn off the cursor before painting the screen, then restore the cursor after all the text is displayed.

Example

See example for im_get_display_mode on page 72.

im_set_cursor_xy

Purpose This function sets the current cursor position. If viewporting is disabled, the cursor position is relative to the terminal display. If viewporting is enabled, the cursor position is relative to the virtual display.

Syntax

```
#include "imt24lib.h"
IM_STATUS far im_set_cursor_xy
    (IM_USHORT row,
     IM_USHORT col)
```

IN Parameters

row	Current vertical position. The top of the display is 0.
col	Current horizontal position. The left edge of the display is 0.

OUT Parameters None

im_set_cursor_xy (continued)

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_X_RANGE	*col* value out of range, cursor moved to right edge
IM_Y_RANGE	*row* value out of range, cursor moved to bottom
IM_BOTH_RANGE	*col* and *row* values out of range, cursor moved to lower right corner

Notes If viewporting is enabled:

col	Cursor at X-position in virtual display mode.
row	Cursor at Y-position in virtual display mode.

If viewporting is disabled:

row	Cursor at X-position in physical display mode.
col	Cursor at Y-position in physical display mode.

If you call im_set_thai_cursor_mode and enable ThaiCursorMode, the cursor moves to display Thai characters.

Example

See example for im_receive_field on page 141.

im_set_display_mode

Purpose This function sets the scroll mode, wrap mode, and character height of the display.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_set_display_mode
    (IM_FONT_TYPE font,
    IM_BOOL scroll
    IM_BOOL wrap);
```

IN Parameters *font* Font type code and is one of these constants:

IM_FONT_STANDARD	Text is 8 x 8 pixels and the scroll boundary is line 25 and the wrap boundary is column 80
IM_FONT_5X6	Text is 5 x 6 pixels
IM_FONT_6X8	Text is 6 x 8 pixels
IM_FONT_8X10	Text is 8 x 10 pixels
IM_FONT_12X16	Text is 12 x 16 pixels

IM_FONT_LARGE	Text is 8 x 16 pixels and the scroll boundary is line 12 and the wrap boundary is column 40
IM_FONT_SPECIAL	Text is 16 x 16 pixels

scroll Determines if the text scrolls at the bottom of the screen and is one of these values:

0 (zero)	No scrolling
Nonzero	Scroll at bottom of screen

wrap Determines if the text wraps at the right edge of the screen and is one of these values:

0 (zero)	No wrapping
Nonzero	Wrap at right edge of screen

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_PARAM_1	Invalid font parameter

Notes If scroll and wrap are set to true and viewporting is disabled, then scrolling or wrapping occur at the viewport boundaries.

If scroll and wrap are set to true and viewporting is enabled, then scrolling or wrapping occur at the virtual window boundaries.

The Application Simulator cannot simulate this feature if you have compiled the application as a DOS .EXE application for terminals.

See Also im_get_display_mode, im_set_follow_cursor

Example

See example for im_viewport_setxy on page 204.

im_set_eom

Purpose This function determines the end of data in each TCP/IP message by reading the one or two EOM characters at the end of the message or by reading a two-byte binary number at the beginning of the message that identifies the message length.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_set_eom
    (IM_TCP_DELINEATION eom,
     IM_CHAR eom1,
     IM_CHAR eom2,
     IM_COM_PORT port_id)
```

im_set_eom (continued)

IN Parameters

eom Pointer to the message delimiter and is one of these constants:

IM_NO_EOM	No EOM character in the message.
IM_ONE_EOM	EOM1 character at end of message.
IM_TWO_EOMS	EOM1 and EOM2 characters at end of message.
IM_TCP_LENGTH	Two-byte message length value at start of message.
IM_TCP_LEN_NETORDER	From top to bottom in network order.

eom1 First EOM character appended to the message.

eom2 Second EOM character appended to the message.

port_id Pointer to IM_COM_PORT and is this constant:

IM_NET	Network input (TCP/IP): 241X, 242X, 2455, 2475, and 248X - RF port

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_PARAM_1	Invalid parameter specified

Notes This function notifies IM_RECEIVE_BUFFER and IM_TRANSMIT_BUFFER which delineation method to use to determine the end of message when TCP/IP records have been concatenated.

Intermec does not recommend using this approach for COM ports. If you set EOM detection for a serial COM port, this setting is not the same as the configurable protocol that is done by using reader commands or by using the Trakker Antares menu system. You should use the configurable protocol because it supports configuration command via serial port, handshake, and LRC.

The delineation characters specified with this function are not the same as the lower level EOMs set in the serial communications configuration.

See Also im_receive_buffer, im_transmit_buffer

im_set_follow_cursor

Purpose This function enables or disables the follow-the-cursor feature.

Syntax
```
#include "imt24lib.h"
IM_STATUS im_set_follow_cursor
    (IM_CONTROL follow);
```

IN Parameters *follow* One of these constants:

IM_ENABLE	Enable follow-the-cursor mode
IM_DISABLE	Disable follow-the-cursor mode

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully locked
IM_DISABLED	Viewporting not enabled, but follow the cursor is set for when viewporting is enabled

Notes When follow the cursor is enabled and the application is receiving input from the keyboard or a label, the viewport moves to ensure that the cursor is within the viewport.

This function does not work on terminals that are running DOS .EXE applications if you use standard C functions to write to the screen.

The 2460 and 2461 terminals do not support this function.

See Also im_get_follow_cursor

Example

See example for im_get_follow_cursor on page 76.

im_set_input_mode

Purpose This function sets the device input mode to Wedge, Programmer, or Desktop. These modes affect how the device interprets and stores input.

Syntax
```
#include "imt24lib.h"
void im_set_input_mode
    (IM_MODE mode);
```

im_set_input_mode (continued)

IN Parameters *mode* One of these constants:

IM_PROGRAMMER	Input is returned as a string (default). Line editing is permitted.
IM_WEDGE	Input is returned as a string. Use Backspace for simple line editing.
IM_DESKTOP	Keyboard characters are returned as 4 bytes. The first byte is the ASCII code. The second byte is the scan code, and the last 2 bytes are flags for modifier keys (Shift and Control).

Labels are returned as a string of all the characters in the label. Make sure you pass in a buffer large enough to receive the scanned data.

OUT Parameters None

Return Value None.

Notes For more information on input modes, see Chapter 2, "Programming Guidelines."

See Also im_get_input_mode, im_receive_input

Example

See example for im_irl_a on page 106.

im_set_mixed_mode

Purpose This function sets the display to use single- and double-byte characters.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_set_mixed_mode
    (IM_UCHAR EnableDisable)
```

IN Parameters *EnableDisable* IM_UCHAR and is one of these constants:

IM_ENABLE	Enable mixed mode
IM_DISABLE	Disable mixed mode

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_ACCESS_DENIED	Mixed mode not allowed

Notes You need to enable mixed mode to display Thai characters on the terminal.

Currently, the Application Simulator cannot support double-byte characters.

The 2460 and 2461 terminals do not support this function.

im_set_no_autosend

Purpose This function determines how im_transmit_buffer and its variations should remember the data buffer last sent to the host. If the autosend feature is enabled and a network error was detected since the last call to im_transmit_buffer, the old data buffer will be re-sent.

Syntax

```
#include "imt24lib.h"
void im_set_no_autosend
    ( IM_BOOL iBValue);
```

IN Parameters *iBValue* One of these constants:

IM_TRUE	Disable autosend feature
IM_FALSE	Enable autosend feature

Note: Intermec recommends that you **not** rely on the default iBValue constant (IM_TRUE), because it is compiler dependent.

OUT Parameters None

Return Value None

Notes The application is responsible for ensuring that a data buffer is not sent twice. The autosend feature is only appropriate in some cases. For example, this is one scenario demonstrating how extra data can be sent:

1. The im_set_no_autosend function is enabled.
2. Client sends a data buffer to the host.
3. Server acknowledges the data and the client ignores it.
4. Period of inactivity in the network.
5. Server goes down while the client is not checking for network status.
6. Server comes up.
7. Client requests to send more data.
8. Client machine's transport realizes and error has occurred and attempts to re-establish a new TCP connection.
9. PSK re-sends the old data buffer before sending the new data buffer.
10. Server ACK'd two data packets for the new connection.

im_set_optical_callback

Purpose This function sets a pointer to a function that will be called if an optical sensor input changes during a call to im_receive_field. This is very similar to an interrupt handler. This allows im_receive_field to continue looking for input from the allowed sources even if a change in an optical sensor occurs. When this happens, the specified function is called that then returns IM_TRUE or IM_FALSE to im_receive_field that will either continue or return back to its calling routine.

This function is valid only on a 248X with the enhanced input/output board option.

Syntax

```
#include "imt24lib.h"
void im_set_optical_callback
    (OPTCALLBACK pCallBack);
```

IN Parameters *pCallBack* Pointer to a callback function. OPTCALLBACK is defined as:

```
typedef IM_STATUS (* OPTCALLBACK )( void );
```

If set, pCallBack points to a function that is called if the status of the optical sensor changes during a call to im_receive_field. If im_receive_field detects a change in the sensor status, im_receive_field calls the specified function. This callback function can do whatever you want it to, but should return either IM_TRUE or IM_FALSE to im_receive_field.

If the callback function returns IM_TRUE, im_receive_field returns the status of the optical sensors in the buffer to the caller. See im_receive_field for more details on the format of the returned data.

If the callback function returns IM_FALSE, im_receive_field continues to wait for input from the specified sources. To cancel the callback function, pass a NULL pointer as a parameter to this function. For example,

```
im_set_optical_callback(NULL);
```

OUT Parameters None

Return Value None

Example

```
/******************** im_set_optical_callback **************/

/* Use this function with im_receive_field                 */
#include  <string.h>
#include  "imstdio.h"
#include  "imt24lib.h"

IM_UCHAR szRxBuffer[256];

/* prototype call back function */
IM_STATUS  optical_callback(void);

main(void)
{
char  c;
int   iStatus;
IM_SENSOR_STATE iSensorState;
IM_ORIGIN iOrigin,
          iSource;

   /* Use im_receive_field() */
   do
   {
      im_set_optical_callback( (OPTCALLBACK) optical_callback);

      /* Trigger optical sensor input */
      /* Shall see call back message  */
      iOrigin = IM_OPTICAL_SELECT | IM_KEYBOARD_SELECT;
      iStatus = im_receive_field(iOrigin, IM_INFINITE_TIMEOUT,0,
IM_RETURN_ON_FULL,
                                 20, &iSource, szRxBuffer);

      printf("iSource: %X\n", iSource);
      printf("Opt-State: %X\n", *szRxBuffer);
      printf("Opt-Change: %X\n", *(szRxBuffer+1));
      getch();

      /* Clear call back function's pointer */
      im_set_optical_callback(NULL);
      /* Trigger optical sensor input */
      /* Shall not see call back message  */
      iOrigin = IM_OPTICAL_SELECT | IM_KEYBOARD_SELECT;
      iStatus = im_receive_field(iOrigin, IM_INFINITE_TIMEOUT,0,
IM_RETURN_ON_FULL,
                                 20, &iSource, szRxBuffer);

      printf("iSource: %X\n", iSource);
      printf("Opt-State: %X\n", *szRxBuffer);
      printf("Opt-Change: %X\n", *(szRxBuffer+1));
      getch();

      printf("Continue(Y/N)?");
      c = getch();
   } while ( c== 'Y' || c == 'y'  );

}
```

im_set_relay

Purpose This function opens or closes the specified terminal relay. This function is valid only on a 248X with the enhanced input/output board option.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_set_relay
   (IM_RELAY_PORT iRelayID,
    IM_RELAY_CONTROL fEnergizeRelay)
```

IN Parameters

iRelayID	One of these constants:	
	IM_RELAY1	Relay 1 selected
	IM_RELAY2	Relay 2 selected
	IM_RELAY3	Relay 3 selected
	IM_RELAY4	Relay 4 selected
fEnergizeRelay	One of these constants:	
	IM_CONTACT_ON	Close or energize the relay
	IM_CONTACT_OFF	Open or de-energize the relay

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_DIO_CONFIG_ERROR	Relay configuration error
IM_INVALID_PORT	Invalid relay port selected

Notes *iRelayId* is mutually exclusive and cannot be ORed together.

Example

See example for im_get_relay on page 89.

im_set_repeat_key

Purpose This function sets the repeat key delay so you can press and hold a key and get the same character to repeat on the terminal display. This function is only valid on 242X terminals.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_set_repeat_key
    (IM_USHORT initDelay,
     IM_USHORT repeatDelay)
```

IN Parameters

initDelay	Delay, in milliseconds, after first key is pressed. Zero disables this parameter.
repeatDelay	Delay, in milliseconds, after the key is held down. Zero disables this parameter.

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_SUB_FUNC_INVALID	Invalid function request. Older version of firmware is loaded.

im_set_scanning

Purpose This function enables or disables the scanner port.

Syntax

```
#include "imt24lib.h"
void im_set_scanning
    (IM_CONTROL EnableDisable)
```

IN Parameters *EnableDisable* Pointer to IM_UCHAR and is one of these constants:

IM_ENABLE	Enable scanner port
IM_DISABLE	Disable scanner port

OUT Parameters None

Return Value None

Notes The Application Simulator does not simulate this function.

im_set_screen_size

Purpose This function lets you easily configure a proportional screen for a handheld terminal (241X, 242X, 243X). You define the number of rows and columns that you want the screen to display and the largest font that will fit in the screen using these constraints is chosen. Then, the row and column spacing is adjusted for the best fit on the screen.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_set_screen_size
    (IM_USHORT iColumns,
     IM_USHORT iRows)
```

IN Parameters

iColumns	Number of columns (up to 31) that you want the screen to display. If you enter a number greater than 31, 31 is used.
iRows	Number of rows (up to 21) that you want the screen to display. If you enter a number greater than 21, 21 is used.

im_set_screen_size (continued)

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_SUB_FUNC_INVALID	Invalid function request. Older version of firmware is loaded.

Notes If you set both the row and column to 0, the default 8x8 font will be used.

If the terminal is not a handheld terminal, the same process to choose the fonts and spacing is used as if the terminal is a handheld terminal.

Functions that return screen size values for rows and columns will return the actual values instead of the values that you set using this function.

Some row/column combinations may not be valid because of the underlying capability of the terminal screen. If you choose an invalid combination, the screen will display the closest size that has at least the requested rows and columns. For example, if you request 15x20, the screen will display 16x20.

The Application Simulator does not attempt to simulate the font and spacing set by this function. However, it will use the results to determine where to draw the screen boundaries and where to apply wrap and scroll properties to text.

The 2460 and 2461 terminals do not support this function.

im_set_thai_cursor_mode

Purpose This function sets the cursor mode for Thai characters.

Syntax
```
#include "imt24lib.h"
void im_set_thai_cursor_mode
    (IM_USHORT ThaiCursorMode);
```

IN Parameters *ThaiCursorMode* Pointer to IM_USHORT and is one of these constants:

IM_TRUE	Turn on cursor mode for Thai characters
IM_FALSE	Turn off cursor mode for Thai characters

OUT Parameters None

Return Value None

Notes You must have the Thai character set installed on the host in order to use this function.

im_set_time_event

Purpose This function starts a timer that runs from 0 to 65,534 ms. After reaching the upper limit, a timeout event occurs that can be recognized by the im_event_wait function or any of the input functions.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_set_time_event
    (IM_UINT timeout)
```

IN Parameters *timeout* Number of milliseconds, from 0 to 65,534, to wait before a timeout event occurs.

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully started timer
E_TABLE_FULL	No more timer services available, timeout not established

Notes The timer is accurate within 5 ms. If you call this function again before the timer reaches the value passed in, the timer is reset to 0 and starts counting toward the passed in value again.

When the timeout occurs and IM_TIMER_SELECT is an allowed source for the im_event_wait or im_event_status function, IM_TIMER_SELECT is returned as the source for that function.

See Also im_event_wait, im_event_status, im_receive_input, im_receive_field

Example

See example for im_event_wait on page 61.

im_set_validation_callback

Purpose This function sets a pointer to a function that will be called when im_receive_field is receiving data (characters) from the terminal keypad in order to validate the data or to control the editing of the data.

Syntax

```
#include "imt24lib.h"
void im_set_validation
    (VALCALLBACK callback)
```

IN Parameters

callback Pointer to a callback function. VALCALLBACK is defined as:

```
typedef IM_STATUS (* VALCALLBACK )( void );
```

If set, *pCallBack* points to a callback function that is called when data from the terminal keypad is received during a call to im_receive_field. For each key that is pressed, im_receive_field passes the ASCII value of the key, a pointer to a variable containing the character offset in the string/field, and a pointer to the string as it currently exists to the callback function. The function can validate the data and return IM_TRUE for success, IM_FALSE for fail, or IM_USER_MODIFIED if the function modified the string.

- If the callback function returns IM_TRUE, im_receive_field handles the keypad data as normal input and inserts/appends data to string. See im_receive_field for more details on the format of the returned data.
- If the callback function returns IM_FALSE, im_receive_field ignores the keystrokes and continues to wait for input from the keypad. To cancel the callback function, pass a NULL pointer as a parameter to this function. For example,

  ```
  im_set_validation(NULL);
  ```
- If the callback function returns IM_USER_MODIFIED, im_receive_field ignores the keystrokes, assuming that the callback function already inserted the data, and redisplays the field.

OUT Parameters None

Return Value None

Example

See example for im_receive_field on page 141.

im_set_viewport_lock

Purpose This function enables or disables the keys that move the viewport.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_set_viewport_lock
    (IM_CONTROL view_lock);
```

IN Parameters *view_lock* One of these constants:

IM_ENABLE	Lock the viewport (keys cannot move viewport)
IM_DISABLE	Unlock the viewport

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully locked
IM_VP_DISABLED	Viewporting disabled, but viewport lock is set for when viewporting is enabled

Notes This function controls whether the viewport moves (unlocked) or does not move (locked) when the cursor movement keys are pressed.

The 2460 and 2461 terminals do not support this function.

See Also im_get_viewport_lock, im_set_follow_cursor

Example

See example for im_get_viewport_lock on page 100.

im_set_viewporting

Purpose This function enables and disables viewporting without changing the viewport lock. When viewporting is enabled, the terminal accepts viewport movement commands.

Syntax

```
#include "imt24lib.h"
void im_set_viewporting
    (IM_CONTROL viewport);
```

IN Parameters *viewport* Flag that is one of these constants:

IM_ENABLE	Enable viewporting
IM_DISABLE	Disable viewporting

OUT Parameters None

Return Value None

im_set_viewporting (continued)

Notes If viewporting is enabled, the terminal accepts viewport movement commands, including follow-the-cursor mode. All cursor positioning is relative to the virtual display. When viewporting is enabled and the viewport lock is disabled, you can move the viewport with the cursor movement keys, such as Viewport Page Up (f 9).

If viewporting is disabled, the terminal does not accept any viewport movement commands. All cursor positioning is relative to the viewport upper left corner.

The 2460 and 2461 terminals do not support this function.

See Also im_get_viewport_lock, im_set_follow_cursor, im_set_viewport_lock

Example

See example for im_receive_field on page 141.

im_setup_follow_cursor

Purpose This function specifies how close the cursor can get to the edge of the viewport, and how far it should move when follow-the-cursor is enabled. Viewport movement is bounded by the virtual screen.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_setup_follow_cursor
     (IM_UCHAR side_boundary,
     IM_UCHAR vert_boundary,
     IM_UCHAR side_move,
     IM_UCHAR vert_move);
```

IN Parameters

side_boundary	Defines the right edge limit. The viewport moves when the cursor is within the specified number of characters from the edge. The default value is 1.
vert_boundary	Defines top and bottom edge limit. The viewport moves when the cursor is within the specified number of characters from the top or bottom. The default value is 1.
side_move	Defines the number of characters to move the viewport left or right. The default value is 10.
vert_move	Defines the number of characters to move the viewport up or down. The default value is 8.

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_TO_FAR	Moving this distance would move the viewport past the cursor

Notes Viewport movement is bounded by the virtual screen. If moving the viewport by the set increment would move the viewport off the virtual screen, a smaller movement value is used.

If the boundaries are larger than half of the viewport size, the viewport moves so that the cursor is offset from the right or bottom edge by the size of the boundary.

This function does not work on terminals that are running DOS .EXE applications if you use standard C functions to write to the screen.

The 2460 and 2461 terminals do not support this function.

Example

```
/******************** im_setup_follow_cursor ***********************/
#include <string.h>
#include <conio.h>
#include "imstdio.h"
#include "imt24lib.h"

void main ( void )
{
   im_clear_screen();

   /* Have to enable viewporting before using any viewport display function
*/
   im_set_viewporting( IM_ENABLE );

   im_set_follow_cursor( IM_ENABLE );

   im_puts((IM_UCHAR *)"setting follow cursor to center",0);
   im_setup_follow_cursor( 10,8,1,1 );

   getch();

   im_puts((IM_UCHAR *)"setting follow cursor to overlap but move 1",0);
   im_setup_follow_cursor( 18,14,1,1 );

   getch();

   im_puts((IM_UCHAR *)"Setting follow cursor back to the default value",0);
   im_setup_follow_cursor( 1,1,10,8 );

   getch();
}
```

im_setup_manual_viewporting

Purpose This function overrides the default settings for the viewport movement keys and the move distance when the viewport is in manual browse mode. By default, you use the numeric keypad and the left function key (f) to move the viewport. You use the numeric keypad and the right function key (f) to move the cursor.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_setup_manual_viewporting
    (IM_MANUAL_S far manual);
```

IN Parameters *manual* Is a structure containing override values for each control characteristic. If the override value is 0, that element in the structure is ignored. For all other values, the element is copied to the viewport management structure.

Structure Elements

Structure Element	Key Equivalent	Default Value
Viewport Page up	f 9	7E00H
Viewport Page down	f 3	5100H
Viewport Page left	f 4	9B00H
Viewport Page right	f 6	9D00H
Viewport Home key	f 7	4700H
Viewport End key	f 1	4F00H
Vertical page move distance		Viewport width – 1
Horizontal page move distance		Viewport height – 1

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_VP_DISABLED	Viewporting is not enabled, but viewport lock is set for when viewporting is enabled
IM_INVALID_KEYCODE	Invalid keycode in structure
IM_INVALID_ADDRESS	Address not in valid range for data

Notes For a list of valid override values, see your terminal user's manual.

Viewport movement is bounded by the virtual screen. If moving the viewport by the set increment would move the viewport off the virtual screen, it moves a smaller amount.

The 2460 and 2461 terminals do not support this function.

Example

```
/******************** im_setup_manual_viewporting ******************/
#include <conio.h>
#include <stdlib.h>
#include <ctype.h>
#include "imstdio.h"
#include "imt24lib.h"

#define  ESC_CHAR      0x1B

void main (void)
{
   IM_UCHAR    ch;

   IM_MANUAL_S gsSetup={0,0,0,0,0,0,0,0,0,0};

   im_clear_screen();

  /* Have to enable viewporting before using any viewport display function */
   im_set_viewporting( IM_ENABLE );

   printf("Setting the viewport page vertical and horizontal move distance to 
8 and 10\n");
   gsSetup.iPageVertDist = 8;
   gsSetup.iPageHorDist  = 10;
   im_setup_manual_viewporting( &gsSetup );

   /* Enter any characters, PgUp, PgDn, PgRt, PgLft to check */
   /* viewport follow cursor until 'ESC' key. */
   while ( (ch = getche()) != ESC_CHAR )
       ;

   im_puts((IM_UCHAR *)"Setting the viewport page vertical and horizontal", 
0);
   im_puts((IM_UCHAR *)"move distance back to normal\n", 0);
   gsSetup.iPageVertDist = 1;
   gsSetup.iPageHorDist  = 1;
   im_setup_manual_viewporting( &gsSetup );

  /* Enter any characters to check viewport follow cursor until 'ESC' key. */
   while ( (ch = getche()) != ESC_CHAR )
       ;
}
```

im_sound

Purpose This function generates a beep of specified pitch and duration. For example, use a soft beep for library use, a loud beep for manufacturing use, or a unique beep to distinguish among other terminals.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_sound
    (IM_USHORT pitch,
    IM_USHORT duration,
    IM_USHORT volume);
```

IN Parameters

pitch Specifies the frequency of the beep and is one of these values:

20 to 8189 Hz	Numeric range
IM_HIGH_PITCH	2400 Hz
IM_LOW_PITCH	1200 Hz
IM_VERY_LOW_PITCH	600 Hz

duration Is the length of the beep and is one of these values:

2 to 7999 ms	Numeric range
IM_BEEP_DURATION	50 ms
IM_CLICK_DURATION	5 ms

volume Is one of these constants:

IM_OFF_VOLUME	Off
IM_QUIET_VOLUME	Quiet
IM_NORMAL_VOLUME	Normal
IM_LOUD_VOLUME	Loud
IM_EXTRA_LOUD_VOLUME	Extra loud
IM_CURRENT_VOLUME	Use volume from configuration menu

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Successful beep
IM_INVALID_PITCH	Pitch is outside allowed range
IM_INVALID_VOLUME	Volume is outside allowed range

Example

```
/********************* im_sound *************************************/
#include <time.h>
#include "imt24lib.h"

enum NOTES    /* Enumeration of notes and frequencies     */
{
   C0 = 262, D0 = 296, E0 = 330, F0 = 349, G0 = 392, A0 = 440, B0 = 494,
   C1 = 523, D1 = 587, E1 = 659, F1 = 698, G1 = 784, A1 = 880, B1 = 988,
   EIGHTH = 125, QUARTER = 250, HALF = 500, WHOLE = 1000, END = 0
} song[] =    /* Array initialized to notes of song     */
{
    C1, HALF, G0, HALF, A0, HALF, E0, HALF, F0, HALF, E0, QUARTER,
    D0, QUARTER, C0, WHOLE, END
};

/* Predefined the play volume */
  IM_USHORT volume[] = {
  IM_NORMAL_VOLUME,                /* Play normal volume     */
  IM_EXTRA_LOUD_VOLUME,            /* Play extra loud volume */
  IM_QUIET_VOLUME,                 /* Play quiet volume      */
  IM_NORMAL_VOLUME                 /* Play normal volume     */
};

void main (void)
{
int note;
int index;

   im_clear_screen();

   /* Play 4 times with 5 seconds delay between each play */
   for ( index = 0; index < 4; index++)
   {

      for ( note = 0; song[note] != 0; note += 2 )
         im_sound( song[note], song[note + 1], volume[index]);

      /* Delay 5 seconds for next throughput*/
      im_standby_wait(5000);
   }
}
```

im_standby_wait

Purpose This function places the application and terminal in standby mode for a specific period of time to save the battery power.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_standby_wait
    (IM_USHORT timeout);
```

IN Parameters *timeout* Amount of time to wait in standby mode or one of these constants:

1 to 65,535 ms	Numeric range (resolution of 10 ms)
IM_ZERO_TIMEOUT	No wait
IM_INFINITE_TIMEOUT	Wait forever

OUT Parameters None

Return Value This function returns this code:

IM_SUCCESS	Success

Example

See example for im_sound on page 169.

im_status_line

Purpose This function briefly displays an error message in the status line without wrapping or scrolling the display. The status line is displayed until a key is pressed or a time out occurs. The original contents of the line reappear after the message is erased.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_status_line
    (char far *stmessage
    IM_BOOL wait
    IM_USHORT row);
```

IN Parameters

stmessage Pointer to the error message string to display.

wait Flag indicating if the application should wait for a key to be pressed.

0 (zero)	Do not wait for a key.
Nonzero	Pause until any key is pressed or until a timeout occurs.

row Row number to display the message in. If this number is larger than the viewport, the last row is used. The first row is 0.

OUT Parameters	None
Return Value	Returns 0 (zero) or the key pressed to terminate waiting
Notes	If the *wait* parameter is set, the message is erased after 20 seconds or when a key is pressed. Then, the screen is refreshed to look as it did before displaying the message.

Example

See example for im_receive_field on page 141.

im_tcp_reconnect_notify

Purpose This function determines if im_transmit_buffer returns the code IM_TCP_RECONNECT when the terminal TCP/IP stack reconnects to the host from a broken connection. This function must be called before im_transmit_buffer.

Syntax `void im_tcp_reconnect_notify(IM_BOOL flag)`

IN Parameters *flag* Configures the TCP/IP stack as follows:

IM_TRUE	Directs im_transmit_buffer to return the code IM_TCP_RECONNECT when the terminal reconnects to the host. The data from the last im_transmit_buffer command was not sent from the terminal to the host and needs to be transmitted again. Also directs the PSK to not resend the message that was being sent when the network was identified as down.
IM_FALSE	Directs im_transmit_buffer to withhold the return code IM_TCP_RECONNECT. The terminal sends data from the last im_transmit_buffer command to the host when the connection has been reestablished. This is the default behavior of im_transmit_buffer.

OUT Parameters None

Return Value None

Notes Use this function only if you want the TCP/IP stack to notify you that the host connection has been reestablished. The default behavior of im_transmit_buffer does not notify the caller.

This function does not affect im_transmit_buffer if you are using UDP Plus.

See Also im_transmit_buffer

im_tcp_reconnect_notify (continued)

Example

```
/*************************** im_tcp_reconnect_notify *********************/
#include      <string.h>
#include      <conio.h>
#include      "imstdio.h"
#include      "imt24lib.h"

void main(void)
{
     IM_STATUS  iStatus;
     IM_UCHAR   pszComBuf[160];

     im_clear_screen();

     im_tcp_reconnect_notify(IM_TRUE);
/* Indicates TCP/IP notify im_transmit_buffer when connection reestablished */

    strcpy(pszComBuf, "Test TCP/IP notify text");     /* stuff test string */
     iStatus = im_transmit_buffer(IM_NET, strlen(pszComBuf), pszComBuf,
5000L);

     if ( iStatus == IM_NET_TCP_RECONNECT)      /* Reconnection occurs */
     {
       im_timed_status_line("Reconnecting", 500, 16);   /* Display message */

          /* Resend the data */
          iStatus = im_transmit_buffer(IM_NET, strlen(pszComBuf),  pszComBuf,
5000L);
     }

     getch();
}
```

im_timed_status_line

Purpose This function displays an error message on the status line without wrapping or scrolling the display. The status line remains on the screen until you press a key or the timeout occurs. The original contents of the screen appear after the message disappears.

Syntax

```
#include "imt24lib.h"
int far im_timed_status_line
    (char far *pszStatusLine,
    IM_USHORT iWait,
    IM_USHORT iLine);
```

IN Parameters	*pszStatusLine*	Far pointer to the string to be displayed.
	iWait	Time out value in milliseconds to wait before the status message disappears.
	iLine	Positive number for the line, relative to the top of the viewport, where the message appears. If the line number is larger than the viewport, the last line of the viewport is used.

OUT Parameters None

Return Value None

Example

See example for im_tcp_reconnect_notify on page 172.

im_tm_callback_cancel

Purpose This function removes a registered function from the timer callback database.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_tm_callback_cancel
    (IM_USHORT index);
```

IN Parameters	*index*	The number that identifies the registered function in the timer callback database. (This number was returned by im_tm_callback_register when the function was added to the timer callback database.)

OUT Parameters None

Return Value The function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_TMCALLBK_INDEX	The value for *index* is invalid

See Also im_tm_callback_register

Example

See example for im_tm_callback_register on page 175.

im_tm_callback_register

Purpose This function adds a function to the timer callback database and specifies how the function will be called back.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_tm_callback_register
    (PTIMERCALLBACK function,
    time_t start_time,
    IM_USHORT repeat_count
    IM_ULONG period,
    IM_BOOL fDisable,
    IM_USHORT *index);
```

IN Parameters

function Pointer to the function to be called.

start_time Specifies when to perform the first callback. Either enter the time as the number of seconds elapsed since midnight on January 1, 1970, or choose this constant:

IM_CALLBK_NOW	Start the first callback immediately

repeat_count Specifies the number of callbacks. Either enter any number from 2 to 65534 (two-byte range of IM_USHORT), or choose one of these constants:

IM_CALLBK_ONCE	Callback once
IM_CALLBK_ CONTINUOUS	Callback continuously

period Specifies the interval between callbacks. Either enter any number to indicate the length of the interval in 10-millisecond units, or choose one of these constants:

IM_CALLBK_10MS	Callback every 10 ms
IM_CALLBK_SECOND	Callback every second
IM_CALLBK_MINUTE	Callback every minute
IM_CALLBACK_HOUR	Callback every hour
IM_CALLBK_DAY	Callback every day
IM_CALLBK_WEEK	Callback every week
IM_CALLBK_MONTH	Callback every month
IM_CALLBK_QUARTER	Callback every quarter
IM_CALLBK_YEAR	Callback every year

	fDisable	Specifies whether callback is enabled or disabled if the application does not control the screen. The application does not control the screen when another application or the terminal software controls the screen. For example, if the user has displayed the Trakker Antares menu system, you might not want a callback function to overwrite the screen.
		Choose one of these constants:

IM_TRUE	Disable callback if the application does not control the screen at the call time. The current callback is skipped.
IM_FALSE	Enable callback whether or not the application controls the screen.

OUT Parameters *index* Index number for the application in the timer callback database.

Return Value The function returns one of these codes:

IM_SUCCESS	Success
IM_INVALID_TMCALLBK_PERIOD	The *period* value is out of range
IM_INVALID_TMCALLBK_REPETITION	The *repeat_count* value is out of range

Notes When you create functions that will be called back, keep these points in mind:

The functions (and any functions they call) must not be built with stack checking because the operating system stack is used during the callback.

The functions should minimize the amount of dynamic variable space used.

You must specify the *index* value when you use im_tm_callback_cancel to remove the function from the timer callback database.

See Also im_tm_callback_cancel

Example

```
/*********************** im_tm_callback_register ************************/
#include <time.h>
#include <stdio.h>
#include "imt24lib.h"

void printHello(void)
{
  im_sound(1000,50,IM_NORMAL_VOLUME);
  im_puts("... ",IM_NORMAL);
}
```

im_tm_callback_register (continued)

```
void main(void)
{

    IM_UCHAR input[300];
    IM_ORIGIN source;
    IM_STATUS iStatus = 11;

    PTIMERCALLBACK pFunction;
    IM_USHORT iIndex = 0;
    time_t timeToStart;
    IM_BOOL fDisplay;
    IM_USHORT iRepeatCount;
    IM_ULONG iPeriod;

    //initialize

    // callback forever
    iRepeatCount = IM_CALLBK_CONTINUOUS;

    // 10-second period
    iPeriod = IM_CALLBK_SECOND*10;

    //print hello
    pFunction = printHello;

    //enable callback
    fDisplay = IM_FALSE;

    //time to first callback
    time(&timeToStart);    //get current time

    timeToStart += 16;    //future after 16seconds or
    //timeToStart -= 20;    // or pass current 20 seconds
    //timeToStart = IM_CALLBK_NOW;

    //register the application
    iStatus = im_tm_callback_register(pFunction, timeToStart,
                              iRepeatCount, iPeriod, fDisplay, &iIndex);
    for(;;)
    {
       im_receive_input(IM_LABEL_SELECT|IM_KEYBOARD_SELECT,
          IM_INFINITE_TIMEOUT, &source, input);

       //type 'Q' to cancel the application
       if(input[0]=='Q')
         im_tm_callback_cancel(iIndex);
    }

}
```

im_transmit_buffer

Purpose This function automatically opens a socket and transmits the contents of a data buffer through a designated communications port. This function continues operating until the buffer transmission is complete or until an error status is detected. If the terminal is communicating in a TCP/IP network, you can also use the BSD sockets interface for network communications.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_transmit_buffer
    (IM_COM_PORT port_id,
     IM_USHORT length,
     IM_UCHAR far *data_buffer,
     IM_LTIME timeout);
```

OUT Parameters

port_id	Communications port:	
	IM_COM1	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
	IM_COM2	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
	IM_COM3	COM3 input: 2420 - Modem
	IM_NET	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
	IM_SCAN_ PORT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board
length	Length of the data string that you want to transmit.	
data_buffer	Far pointer to the data array that you want to transmit.	
timeout	Transmit timeout period and is one of these values:	
	1 to 4,294,966 ms	Numeric range. For IM_COM1, a numeric timeout larger than 4,294,966 is converted to 65534. The hardware cannot support long timeout values.
	IM_ZERO_TIMEOUT	No wait.

im_transmit_buffer (continued)

IM_INFINITE_NET_ TIMEOUT	Wait forever. The function will not return until the end of message character has been received. If you select COM1 or the Network port, IM_INFINITE_TIMEOUT and 0xFFFF are treated as IM_INFINITE_NET_ TIMEOUT.

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Transmit completed.
IM_NET_BAD_CTRL_BLOCK	Net control block pointer is null.
IM_NET_BAD_DATA	Data pointer is null or invalid data length.
IM_NET_CONFIG_ERROR	Incorrect RF configuration.
IM_NET_DATA_LENGTH	Data length exceeds 1024 characters.
IM_NET_FULL	Send buffer contains a previous application message. The data is not lost, but it has not left the host.
IM_NET_NOT_READY	Network not active or not properly configured.
IM_TCP_RECONNECT	Terminal reestablished the TCP/IP connection with the host, but no data was sent from the terminal to the host.

Notes If the transmit buffer is in use, the program waits until the buffer is available. Once the transmission begins, program control remains inside this function until the transmission is completed. There is no way to check the transmission status while transmitting.

To detect end of data for TCP/IP transfers, call im_set_eom.

IM_TCP_RECONNECT is only returned when im_tcp_reconnect_notify is called with the IM_TRUE parameter using TCP/IP.

im_tcp_reconnect_notify does not affect this function if you are using UDP Plus.

The return status from im_transmit_buffer and its variations indicates if the data to be sent was successfully accepted by the communications medium. The actual data transmission occurs at a later time. In an RF environment, this delay can be significant due to retries or roaming. The status of the transaction can be obtained through a status check at a later time by the client. Before the next data buffer is sent, the terminal's TCP attempts to re-establish any lost connections. TCP cannot interrupt the client to report an error. As a result, TCP tries to recover from an old communications error when new data is to be sent. It is a good practice for the client to monitor the communication and to implement its own network "heart-beat".

See Also im_receive_buffer

Example

```
/******************** im_transmit_buffer ***************************/
#include <string.h>
#include <conio.h>
#include "imstdio.h"
#include "imt24lib.h"

void main ( void )
{
   char szTxBuffer[1024];
   IM_STATUS iStatus;

   im_clear_screen();

   strcpy ( szTxBuffer, "MSG_HEADER,Testing Message 1, 2, 3, ..." );

   iStatus = im_transmit_buffer ( IM_NET, strlen(szTxBuffer), szTxBuffer,
5000 );
   if(iStatus == IM_SUCCESS)
   {
      printf("\nData sent: %s\n", szTxBuffer);
   }
   else
{
      printf("\nTransmit Buffer Error: ");
      im_message(iStatus);
   }

   getch();
}
```

im_transmit_buffer_no_wait

Purpose This function transmits the contents of a user-defined data buffer through a designated communications port without a timeout or wait. When this function is called, the user can input data to the terminal while the transmission is in progress.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_transmit_buffer_no_wait
    (IM_COM_PORT port_id,
     IM_COM_DATA_BUFFER far *psDataStruct);
```

IN Parameters

port_id	Communications port:	
	IM_COM1	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
	IM_COM2	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
	IM_COM3	COM3 input: 2420 - Modem
	IM_NET	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
	IM_SCAN_PORT_ SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board
psDataStruct	You must build and maintain a structure of the type IM_COM_DATA_BUFFER as described in IMT24LIB.H.	

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Transmit completed.
IM_NET_BAD_CTRL_BLOCK	Net control block pointer is null.
IM_NET_BAD_DATA	Data pointer is null or invalid data length.
IM_NET_CONFIG_ERROR	Incorrect RF configuration.
IM_NET_DATA_LENGTH	Data length exceeds 1024 characters.
IM_NET_FULL	Send buffer contains a previous application message. The data is not lost, but it has not left the host.
IM_NET_NOT_READY	Network not active or not properly configured.

The status block returns one of these values:

IM_COMM_INUSE	COM in use
IM_NS_COMPLETE	Transmission completed
IM_NS_CANCELLED	Transmission cancelled
IM_NS_ERROR	Transmission error

Notes This function provides compatibility with the JANUS PSK. If your application does not need this compatibility, use im_transmit_buffer_no_wait_t or im_transmit_buffer instead.

If your application needs a wait period, use im_event_wait rather than continually checking the return status bits.

You cannot use the im_get_tx_status function to check on the transmit progress. Instead, use im_event_wait or im_event_status to check the transmission status. Check for the event IM_TX_NET_SELECT, which indicates that the network is ready to send another message.

See Also im_event_wait, im_event_status, im_transmit_buffer, im_transmit_buffer_no_wait_t

Example

No example. This function provides compatibility with the JANUS PSK.

im_transmit_buffer_no_wait_t

Purpose This function transmits the contents of a data buffer through a designated communications port without a timeout or wait. When this function is called, the user can input data to the terminal while the transmission is in progress.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_transmit_buffer_no_wait_t
    (IM_COM_PORT port_id,
     IM_USHORT userlength,
     IM_UCHAR far *pszdata_buffer);
```

IN Parameters

port_id	Communications port:	
	IM_COM1	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
	IM_COM2	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
	IM_COM3	COM3 input: 2420 - Modem
	IM_NET	Network input (UDP Plus or TCP/IP): 2415, 2425, 2435, 2455, and 2475 - RF port, 248X - RF port or Ethernet port on enhanced I/O board
	IM_SCAN_PORT_ SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board
userlength	Length of the data string that you want to transmit.	
pszdata_buffer	Far pointer to the data array that you want to transmit.	

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Transmit completed.
IM_NET_BAD_CTRL_BLOCK	Net control block pointer is null.
IM_NET_BAD_DATA	Data pointer is null or invalid data length.
IM_NET_CONFIG_ERROR	Incorrect RF configuration.
IM_NET_DATA_LENGTH	Data length exceeds 1024 characters.
IM_NET_FULL	Send buffer contains a previous application message. The data is not lost, but it has not left the host.
IM_NET_NOT_READY	Network not active or not properly configured.

The status block returns one of these values:

IM_COMM_INUSE	COM in use
IM_NS_COMPLETE	Transmission completed
IM_NS_CANCELLED	Transmission cancelled
IM_NS_ERROR	Transmission error

Notes Use im_get_tx_status or im_event_wait to determine if the transmission has completed.

See Also im_event_wait, im_get_tx_status, im_transmit_buffer, im_transmit_buffer_no_wait

im_transmit_buffer_no_wait_t (continued)

Example

```
/*************** im_transmit_buffer_no_wait_t ************************/
/*  accepts user input, transmits it, then displays any received data. */
/*  Task switch occurs at least once per sec (to update time display). */
/*  The battery runs down faster than if time was not being displayed. */
/**********************************************************************/

#include <string.h>
#include <imstdio.h>
#include <time.h>
//#include <conio.h>
#include "imt24lib.h"

IM_UCHAR gszString[1024];

/* Routine to display the time and other header info */
void doHeader ( void )
{
   IM_USHORT iX, iY;
   char szTime[9], szData[9];

   im_get_cursor_xy( &iY, &iX ); /* Save cursor so can restore after paint
heading */
im_set_cursor_xy(0,0);
/* Display the time */
szTime[0] = '\0';
strdate(szDate);
strTime(szTime);
printf(" %s %s \n" , szDate, szTime);

/* if cursor on top move down, then restore cursor */
if ( iY < 2 ) { iY = 2; iX = 0 }
im_set_cursor_xy (iY, iX );
}

void TryTransmit ( IM_UCHAR * szString )
{
   IM_STATUS iStatus;
   IM_ORIGIN iSource;
   /* make sure last transmit completed */
   iSource = IM_TX_NET_SELECT;
   iStatus = im_event_wait (60000L, &iSource );
   if (iStatus == IM_SUCCESS)
      iStatus = im_transmit_buffer_no_wait_t ( IM_NETUDP, strlen( szString ),
szString
);
   if ( iStatus == IM_TIMEOUT )
      puts ( "Timed out on Transmit");
   else if ( iStatus != IM+SUCCESS )
      printf ("Error on Transmit\nError Code=%x\n", iStatus);
}

void main (void)
{
   IM_USHORT ii;
   IM_ORIGIN iSource;
   IM_STATUS iStatus;

   im_set_viewporting( IM_DISABLE );
   im_clear_screen();

   im_command("$+DA1", 5);
   /* Turn on the time in seconds display */
   dpHeader();
   im_puts (" Default App ", IM_BOLD);
   puts ("\n\rKeypad input with\n\ra comma in the \n\rfirst 6 chars
and\n\rscanned input will \n\rbe transmitted\n\r");
   /* Set the timer event so can update clock once per second */
   iStatus = im_set_time_event(1000);

/* forever and ever just watch for input and send it up, */
/* and display any return messages                       */
   for (;;)
   {
   /* event wait is only needed b/c IM_TIMER_SELECT is not an input event  */
   /* so not handled by im_receive_input. Normally next 2 lines not needed */
      iSource = IM_ALL_SELECT | IM_TIMER_SELECT;
      im_event_wait ( IM_INFINITE_TIMEOUT, &iSource );

      if ( !( iSource & IM_TIMER_SELECT )) /* not a timeout so get data */
      {
        iStatus = im_receive_input(IM_ALL_SELECT , IM_INFINITE_TIMEOUT ,
&iSource, gszString);
        if ( iSource & IM_KEYBOARD_SELECT ) /**/
        {
          ii =strcspn ( gszString, ",");
          if ( ( ii<= 6) && (ii < strlen(gszString) ) )
          {
            TryTransmit (gszString);
          }
        }
        else if ( iSourse & IM_LABEL_SELECT ) /**/
        {
           TryTransmit (gszString);
        }

        else if ( iSource & IM_NET_SELECT )
        /* strip the data identifier and display */
        {
          ii = strcspn ( gszString, ",");
          im_puts("\n\rReceived:", IM_INVERSE);
          if ( ( ii<= 6) && ( ii > 0 ) && (ii+i < strlen(gszString) ) )
          {
              im_puts ( &gszString[ii+i], IM_BOLD );
           }
           else im_puts ( gszString, IM_BOLD );
         }
       } /* end of not timer */
       do Header();
       iStatus = im_set_time_event( 1000);
   }
}
```

im_transmit_file

Purpose This function transmits a file to the Intermec Gateway, DCS 30X, or to a TFTP server via a TCP/IP direct connection.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_transmit_file
    (IM_UCHAR far *trakker_file,
    IM_UCHAR far *con_file);
```

IN Parameters

trakker_file	Drive letter and name for the source file on the Trakker Antares terminal. This parameter can be a string in quotes or a far pointer to a variable containing the filename. The Trakker Antares terminals do not use directories. All file names use the format: *drive:abcdefgh.ext*
con_file	Destination name and path of the file on the Intermec Gateway, DCS 30X, or the TFTP server. This parameter can be a string in quotes or a far pointer to a variable containing the filename.

Note: If you are using UDP Plus, you must specify a path relative to D:\USERDATA on the Intermec Gateway or the DCS 30X to save the transmitted file. If you are using TCP/IP, you can use any valid path on the TFTP server to save the transmitted file.

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Successfully transferred file to the terminal.
IM_GENERR	Error occurred. View the error log from the Trakker Antares menu system.
IM_NET_BAD_CTRL_BLOCK	Net control block pointer is null.
IM_NET_BAD_DATA	Data pointer is null or invalid data length.
IM_NET_FULL	Send buffer contains a previous application message.
IM_NET_NOT_READY	Network not active or not properly configured.

Notes If the terminal has UDP Plus loaded, this function transmits a file to the Intermec Gateway or the DCS 30X. If the terminal has TCP/IP loaded, this function transmits a file to a TFTP server through a TCP/IP direct connection.

See Also im_cancel_rx_buffer, im_receive_buffer, im_receive_field, im_receive_input, im_rx_check_status

Example

```
/******************** im_transmit_file ******************************/
#include <string.h>
#include <conio.h>
#include "imstdio.h"
#include "imt24lib.h"

void main ( void )
{
    char szControllerFileName1[] = "controlr.txt";
    char szControllerFileName2[] = "check.txt";
    char szAntaresFileName[] = "c:antares.txt";
    IM_STATUS iStatus;

    im_clear_screen();

    /*  Receive file from the controller and place it on the Antares file
system */
    iStatus = im_receive_file ( szControllerFileName1, szAntaresFileName );
    if(iStatus == IM_SUCCESS)
    {
       printf("Receive file \nsuccess\n");
    }
    else
    {
       printf("Receive File Error: \n");
       im_message(iStatus);
    }

    /* Transmit file from Antares file system back to the controller */
    iStatus = im_transmit_file ( szAntaresFileName, szControllerFileName2 );
    if(iStatus == IM_SUCCESS)
    {
    printf("\nTransmit file \nsuccess\n");
    }
    else
    {
       printf("\nTransmit File Error: \n");
       im_message(iStatus);
    }

    getch();
}
```

im_udp_close_socket

Purpose This function requests the Intermec Gateway or the DCS 30X to close a direct socket connection on behalf of the client application. This function should only be used on terminals with UDP Plus. Do **not** use this function on terminals running TCP/IP.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_udp_close_socket
    (IM_UCHAR session_id,
     IM_USHORT error_code,
     IM_UCHAR far *error_text,
     IM_LTIME timeout);
```

IN Parameters

session_id	Session number of the direct socket connection to close.
error_code	Optional error code to be placed in the Intermec Gateway or the DCS 30X error log file. This code must be greater than 0 and is entirely the discretion of the client application. If no code is specified, this argument should be 0.
error_text	Far pointer to optional null-terminated error text to be placed in the Intermec Gateway or the DCS 30X error log file. This text is entirely the discretion of the client application. If there is no text, this argument should be 0.
timeout	Number in the range of 1 to 65,534 ms or one of these constants:

IM_ZERO_TIMEOUT	No wait
IM_INFINITE_TIMEOUT	Wait forever

OUT Parameters None

Return Value This function returns a status code that is defined in Appendix A.

Notes Do not use IM_INFINITE_TIMEOUT because this function will never return if the unit cannot send the CLOSE request.

See Also im_udp_send_data, im_udp_receive_data, im_udp_open_socket

Example

See example for im_udp_receive_data on page 193.

im_udp_open_socket

Purpose This function requests the Intermec Gateway or the DCS 30X to open a direct socket connection to a specified host on behalf of the client application. The host must be a server application that passively waits on a selected port for client connections. This function should only be used on terminals with UDP Plus. Do **not** use this function on terminals running TCP/IP.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_udp_open_socket
    (IM_UCHAR session_id,
     IM_USHORT port_num,
     IM_UCHAR far *host_name,
     IM_LTIME timeout);
```

IN Parameters

session_id	Session number the Intermec Gateway or the DCS 30X uses to identify the connection. Any data sent or received regarding this connection uses this session number. A maximum of 255 sessions may be opened (0 - 254).
port_num	Port number you are connecting to on the host.
host_name	Name or IP address of the host. This name must be defined in the Intermec Gateway or the DCS 30X Telnet Terminal Emulation Configuration screen. An IP address may be used instead.
timeout	Number in the range of 1 to 65,534 ms or one of these constants:

IM_ZERO_TIMEOUT	No wait
IM_INFINITE_TIMEOUT	Wait forever

OUT Parameters None

Return Value This function returns a status code that is defined in Appendix A.

Notes Do not use IM_INFINITE_TIMEOUT because this function will not return if the unit cannot send the OPEN request.

See Also im_udp_send_data, im_udp_receive_data, im_udp_close_socket

Example

See example for im_udp_receive_data on page 193.

im_udp_receive_data

Purpose This function receives a UDP Plus packet from the Intermec Gateway or the DCS 30X and dissects the packet, placing the information into a structure for the calling routine. This function should only be used on terminals with UDP Plus. Do **not** use this function on terminals running TCP/IP.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_udp_receive_data
    (struct im_udp_packet far *in_packet,
    IM_LTIME timeout);
```

IN Parameters

timeout Number in the range of 1 to 65,534 ms or one of these constants:

IM_ZERO_TIMEOUT	No wait
IM_INFINITE_TIMEOUT	Wait forever

OUT Parameters

in_packet Far pointer to a structure of type im_udp_packet. This structure is defined in imt24lib.h.

```
struct im_udp_packet {
  IM_USHORT  data_length;
  /* length of received data           */
  IM_UCHAR   message_type;
  /* direct sockets message type       */
  IM_UCHAR   session_id;
  /* direct sockets Session ID         */
  union {
    struct {
      IM_USHORT  error_code;
      /* direct sockets error code     */
      IM_UCHAR
error_text[IM_UDP_REC_ERROR_SIZE];
      /*  text  */
     } error;
     IM_UCHAR data_text[IM_UDP_REC_DATA_SIZE];
     /*  data     */
     } remaining_packet;
    };
```

data_length Length of the received data.

message_type	One of the following constants:	
	IM_UDP_OPEN_ACK	This value is returned in response to an OPEN request sent from the client application. It indicates that the connection was opened successfully.
	IM_UDP_OPEN_NAK	This value is returned in response to an OPEN request sent from the client application. It indicates that the connection could not be opened. Error code and error text accompany this message.
	IM_UDP_DATA_CMD	This value is returned upon a successful receipt of data from the Intermec Gateway or the DCS 30X. Data accompany this message.
	IM_UDP_CLOSE_CMD	This value is returned if a connection has been closed by the host, the Intermec Gateway, or the DCS 30X, or has been closed for any other reason. Error code and error text will accompany this message.
	Any other value indicates an invalid message received from the Intermec Gateway or the DCS 30X.	
session_id	Session for which data was received.	
error_code	If message_type is IM_UDP_OPEN_NAK or IM_UDP_CLOSE_CMD, this element is one of the error codes listed in the following table. The client software should be aware of these conditions, handle the errors, and be able to recover.	
error_text	If messa*ge_type* is IM_UDP_OPEN_NAK or IM_UDP_CLOSE_CMD, this element is the null-terminated text string associated with the error code listed in the following table.	

im_udp_receive_data (continued)

Error Code Descriptions

Code	Description
0	Host session closed
1	Host Lookup failed
2	Session not active
3	ISM Terminated
4	ISM resource error
5	Map protocol name to number failed
6	Socket call failed
7	Connect call failed
10001	Not owner
10003	No such process
10004	Interrupted system call
10006	No such device or address
10009	Bad file number
10013	Permission denied
10014	Bad address
10022	Invalid argument
10024	Too many files open
10032	Broken pipe
10035	Operation would block
10036	Operation now in progress
10037	Operation already in progress
10038	Socket operation on non-socket
10039	Destination address required
10040	Message too long
10041	Protocol wrong for type of socket
10042	Protocol not available
10043	Protocol not supported
10044	Socket type not supported
10045	Operation not supported on socket
10046	Protocol family not supported
10047	Address family not supported by protocol family
10048	Address already in use
10049	Can't assign requested address
10050	Network is down
10051	Network is unreachable
10052	Network dropped connection on reset

Error Code Descriptions (continued)

Code	Description
10053	Software caused connection abort
10054	Connection reset by peer
10055	No buffer space available

data_text If the *message_type* is IM_UDP_DATA_CMD, this element is the data from a successful receive request.

Return Value This function returns a status code that is defined in Appendix A.

Notes It is not recommended that you use IM_INFINITE_TIMEOUT because this function will not return if the unit cannot send the data.

See Also im_udp_close_socket, im_udp_send_data, im_udp_open_socket

Example

```
/************************ im_udp_receive_data ********************/
 #include <conio.h>
 #include <string.h>
 #include <ctype.h>
 #include <stdlib.h>
 #include "imstdio.h"
 #include "imt24lib.h"

 #define  ESC_KEY 27

 /*************************************************************/
 /* The main program prompts the user for screen parameters and    */
 /* them sets them based on the user's selections.  It then        */
 /* prompts for host name, port number and session ID and attempts */
 /* to open a Direct Socket connection via the 0200 controller.    */
 /* It then goes into a loop checking keyboard & net port for data.*/
 /* If data from the net port is received it is put on the display.*/
 /* If a key is pressed, it is sent out the net port.              */
 /* This program is simply a dumb terminal.                        */
 /* Keys pressed should be sent to a host echo server              */
 /* which sends the data right back.                               */
 /*************************************************************/
 void main ( void )
 {
 IM_STATUS  iStatus;         /* return status for PSK functions    */
 char       ch;              /* character represented by keypress  */
 IM_ORIGIN  source;          /* source of input                    */
 IM_BOOL    scroll;          /* scrolling on or off                */
 IM_BOOL    wrap;            /* line wrap on or off                */
 IM_CONTROL viewporting;     /* viewporting on or off              */
 IM_CONTROL follow;          /* viewport follow the cursor on/off  */
 char       vp, fc, sc, wp;  /* dummy variables                    */
 IM_UCHAR   session_id;         /* session ID of connection        */
 IM_UCHAR   session_id_str[3];   /* session_id in string format    */
 IM_USHORT  port_num;            /* server port number             */
 IM_UCHAR   port_number_str[4];  /* port_num in string format      */
 IM_UCHAR   host_name[20];       /* host name or IP address        */
```

im_udp_receive_data (continued)

```
 struct im_udp_packet  packet;   /* packet struct containing input */
 IM_UCHAR   close_str[20];   /* string to appear in 0200 error log */
 IM_UCHAR   key_buf[5];     /* keyboard buffer                     */


    im_clear_screen();
    printf("Direct Socket Demo\n\n");

    /* get user's screen preferences                                */
    printf("\n  viewporting? Y/N:");
    vp = getche();

    printf("\nfollow cursor? Y/N:");
    fc = getche();

    printf("\n    scrolling? Y/N:");
    sc = getche();

    printf("\n    line wrap? Y/N:");
    wp = getche();
    if (toupper(vp) == 'Y')
        viewporting = IM_ENABLE;
    else
        viewporting = IM_DISABLE;

    if (toupper(fc) == 'Y')
        follow = IM_ENABLE;
    else
        follow = IM_DISABLE;

    if (toupper(sc) == 'Y')
        scroll = IM_TRUE;
    else
        scroll = IM_FALSE;
if (toupper(wp) == 'Y')
        wrap = IM_TRUE;
    else
        wrap = IM_FALSE;

    im_clear_screen();
    printf("  UDP Socket Demo\n\n");
    printf("When prompted for  \n");
    printf("for a host, choose \n");
    printf("one with an echo   \n");
    printf("server port.       \n\n");
    printf("Each key you press \n");
    printf("will be sent to the\n");
    printf("host and echoed    \n");
    printf("back to the screen.\n\n");
    printf("   ESC to quit     \n\n");
    printf("     Press any \n     key to Begin");
    getch();

    /* set screen parms according to user's selections              */
    im_set_viewporting(viewporting);
    im_set_follow_cursor(follow);
```

```
im_set_display_mode(IM_FONT_STANDARD, scroll, wrap);

im_clear_screen();
im_set_input_mode(IM_PROGRAMMER);


/* prompt for host name                                        */
printf("Enter Host Name:\n");
source = IM_KEYBOARD_SELECT;
im_receive_input(IM_KEYBOARD_SELECT, IM_INFINITE_TIMEOUT,
                &source, (IM_UCHAR far *) host_name);

/* prompt for port number                                      */
printf("\nEnter Port Number:\n");
im_receive_input(IM_KEYBOARD_SELECT, IM_INFINITE_TIMEOUT,
                &source, (IM_UCHAR far *) port_number_str);
port_num = (IM_USHORT) atoi(&port_number_str[0]);

/* prompt for session ID                                       */
printf("\nEnter Session ID:\n");
im_receive_input(IM_KEYBOARD_SELECT, IM_INFINITE_TIMEOUT,
                &source, (IM_UCHAR far *) session_id_str);
session_id = (IM_UCHAR) atoi(&session_id_str[0]);

/* call the Direct Sockets OPEN function */
iStatus = im_udp_open_socket(session_id, port_num,
                             host_name, 500);

/* put reader in DESKTOP mode (single keypress) and simulate   */
/* a dumb terminal                                             */
im_set_input_mode(IM_DESKTOP);
while (1)
    {
    /* check to see if anything waiting at the net port */
    iStatus = im_udp_receive_data((struct im_udp_packet *)
                                  &packet, 200);

    /* if there was data from the net port */
    if (iStatus == IM_SUCCESS)
        {
        /* if the OPEN was successful                          */
        if (packet.message_type == IM_UDP_OPEN_ACK)
              printf("Session %d Opended\n", session_id);

        /* else if NOT Successful                              */
        else if (packet.message_type == IM_UDP_OPEN_NAK)
              {
              printf("Error Code: %d\n",
                      packet.remaining_packet.error.error_code);
              printf("%s\n",
                      packet.remaining_packet.error.error_text);
              }

        /* else if data was received                           */
        else if (packet.message_type == IM_UDP_DATA_CMD)
              {
              printf("%s", packet.remaining_packet.data_text);
              }
```

im_udp_receive_data (continued)

```
            /* else if the CLOSE command received                  */
            else if (packet.message_type == IM_UDP_CLOSE_CMD)
                  {
                  printf("Socket Closed: %d\n",
                          packet.remaining_packet.error.error_code);
                  printf("%s\n",
                          packet.remaining_packet.error.error_text);
                  }

            else
                  /* else an invalid packet was received              */
                  printf("\nReceived Invalid Packet\n");

            }

        /* check for other than timeout status */
        else if (iStatus != IM_TIMEDOUT)
            printf("\nError: %x\n", iStatus);

        /* check to see if a key has been pressed */
        iStatus = im_receive_input(IM_KEYBOARD_SELECT,
                                   200, &source, key_buf);

        /* if there was a keypress */
        if (iStatus == IM_SUCCESS)
            {
            ch=key_buf[0];  /* get the key */

            /* if the ESC key, get out */
            if(ch == ESC_KEY)
                  break;

            /* send the key out the Network port */
            iStatus = im_udp_send_data(session_id,
                                        (IM_UCHAR far *) &ch, 1, 200);

            /* check for other than success or timeout status */
            if ((iStatus != IM_SUCCESS) && (iStatus != IM_TIMEDOUT))
                  printf("\nError:%x\n", iStatus);
}
        }

    /* send the socket close command, error code and text will */
    /* appear in 0200 error log */
    strcpy(close_str, "Client Closed Session");
    iStatus = im_udp_close_socket(session_id, 9876,
                                  (IM_UCHAR far *) &close_str[0], 500);

    /* if anything other than success                                  */
    if (iStatus != IM_SUCCESS)
      {
      printf("\nError: %x\n%s\n",
              packet.remaining_packet.error.error_code,
              packet.remaining_packet.error.error_text);
      getch();
      }
 }
```

im_udp_send_data

Purpose This function requests the Intermec Gateway or the DCS 30X to send data to the host specified by the session ID on behalf of the client application. This function should only be used on terminals with UDP Plus. Do **not** use this function on terminals running TCP/IP.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_udp_send_data
    (IM_UCHAR session_id,
     IM_UCHAR far *data,
     IM_USHORT data_length,
     IM_LTIME timeout);
```

IN Parameters

session_id	Session number of the connection where the Intermec Gateway or the DCS 30X sends the data.
data	Far pointer to the data to be sent.
data_length	Length of the data. Since the data can be binary, the length must be specified.
timeout	Number in the range of 1 to 65,534 ms or one of these constants:

IM_ZERO_TIMEOUT	No wait
IM_INFINITE_TIMEOUT	Wait forever

OUT Parameters None

Return Value This function returns a status code that is defined in Appendix A.

Notes It is not recommended that you use IM_INFINITE_TIMEOUT because this function will never return if the unit cannot send the data.

See Also im_udp_close_socket, im_udp_receive_data, im_udp_open_socket

Example

See example for im_udp_receive_data on page 193.

im_viewport_end

Purpose This function sets the viewport to the lower right corner (end) of the virtual display.

Syntax

```
#include "imt24lib.h"
void im_viewport_end(void);
```

IN Parameters None

OUT Parameters None

Return Value None

Notes This function is valid only when viewporting is enabled.

The 2460 and 2461 terminals do not support this function.

See Also im_cursor_to_viewport, im_viewport_home, im_viewport_move, im_viewport_page_down, im_viewport_page_up, im_viewport_to_cursor

Example

See example for im_viewport_setxy on page 204.

im_viewport_getxy

Purpose This function retrieves the column and row of the upper left corner of the viewport.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_viewport_getxy
    (IM_USHORT far *row,
    IM_USHORT far *col);
```

IN Parameters None

OUT Parameters

row	Returns the row value (Y-coordinate) of the viewport.
col	Returns the column value (X-coordinate) of the viewport.

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_VP_DISABLED	Viewporting currently disabled

Notes This function is valid only when viewporting is enabled.

The 2460 and 2461 terminals do not support this function.

See Also im_viewport_end, im_viewport_home, im_viewport_move, im_viewport_page_up, im_viewport_page_down, im_viewport_setxy, im_viewport_to_cursor

Example

See example for im_viewport_setxy on page 204.

im_viewport_home

Purpose This function sets the viewport to the upper left corner (home) of the virtual display.

Syntax
```
#include "imt24lib.h"
void im_viewport_home(void);
```

IN Parameters None

OUT Parameters None

Return Value None

Notes This function is valid only when viewporting is enabled.

The 2460 and 2461 terminals do not support this function.

See Also im_cursor_to_viewport, im_viewport_end, im_viewport_move, im_viewport_page_down, im_viewport_page_up, im_viewport_to_cursor

Example

See example for im_viewport_setxy on page 204.

im_viewport_move

Purpose This function moves the viewport the specified distance and direction.

Syntax
```
#include "imt24lib.h"
IM_STATUS im_viewport_move
    (IM_VIEWPORT_DIRECTION direction,
    IM_USHORT distance,
    IM_USHORT far *row,
    IM_USHORT far *col);
```

IN Parameters

direction One of these constants:

IM_VIEWPORT_LEFT	Move left
IM_VIEWPORT_RIGHT	Move right
IM_VIEWPORT_UP	Move up
IM_VIEWPORT_DOWN	Move down

distance Number of units to move the viewport. This distance is either a numeric value between 1 and 70 or IM_DEFAULT_DISTANCE. If the distance parameter is IM_DEFAULT_DISTANCE, the default step size is used.

im_viewport_move (continued)

OUT Parameters

row	Pointer to the row number to which the viewport has moved.
col	Pointer to the column number to which the viewport has moved.

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_VP_DISABLED	Viewporting currently disabled
IM_INVALID_DIRECTION	Invalid direction was passed in
IM_TO_LARGE	Distance was too large for that direction, moved as far as possible

Notes The (*row, col*) pair represents the upper left corner of the viewport being displayed.

This function is valid only when viewporting is enabled.

The 2460 and 2461 terminals do not support this function.

See Also im_viewport_end, im_viewport_home, im_viewport_page_down, im_viewport_page_up, im_viewport_to_cursor, im_cursor_to_viewport

Example

See example for im_viewport_setxy on page 204.

im_viewport_page_down

Purpose This function moves the viewport down one page size on the virtual screen. The viewport cannot move beyond the bottom edge of the virtual screen.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_viewport_page_down
    (void);
```

IN Parameters None

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_AT_EDGE	Moved to edge of virtual display
IM_VP_DISABLED	Viewporting currently disabled

Notes This function is valid only when viewporting is enabled.

The 2460 and 2461 terminals do not support this function.

See Also im_cursor_to_viewport, im_viewport_end, im_viewport_home, im_viewport_move, im_viewport_page_up, im_viewport_to_cursor

Example
See example for im_viewport_setxy on page 204.

im_viewport_page_left

Purpose This function moves the viewport left one page size on the virtual screen. The viewport cannot move beyond the left edge of the virtual screen.

Syntax
```
#include "imt24lib.h"
IM_STATUS im_viewport_page_left
    (void);
```

IN Parameters None

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_AT_EDGE	Moved to edge of virtual display
IM_VP_DISABLED	Viewporting currently disabled

Notes This function is valid only when viewporting is enabled.

The 2460 and 2461 terminals do not support this function.

See Also im_cursor_to_viewport, im_viewport_end, im_viewport_home, im_viewport_move, im_viewport_page_up, im_viewport_to_cursor

Example
See example for im_viewport_setxy on page 204.

im_viewport_page_right

Purpose This function moves the viewport right one page size on the virtual screen. The viewport cannot move beyond the right edge of the virtual screen.

Syntax
```
#include "imt24lib.h"
IM_STATUS im_viewport_page_right
    (void);
```

im_viewport_page_right (continued)

IN Parameters None

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_AT_EDGE	Moved to edge of virtual display
IM_VP_DISABLED	Viewporting currently disabled

Notes This function is valid only when viewporting is enabled.

The 2460 and 2461 terminals do not support this function.

See Also im_cursor_to_viewport, im_viewport_end, im_viewport_home, im_viewport_move, im_viewport_page_up, im_viewport_to_cursor

Example

See example for im_viewport_setxy on page 204.

im_viewport_page_up

Purpose This function moves the viewport up one page size on the virtual screen. The viewport cannot move beyond the top edge of the virtual screen.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_viewport_page_up
    (void);
```

IN Parameters None

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_AT_EDGE	Moved to edge of virtual display
IM_VP_DISABLED	Viewporting currently disabled

Notes This function is valid only when viewporting is enabled.

The 2460 and 2461 terminals do not support this function.

See Also im_cursor_to_viewport, im_viewport_end, im_viewport_home, im_viewport_move, im_viewport_page_down, im_viewport_to_cursor

Example

See example for im_viewport_setxy on page 204.

im_viewport_setxy

Purpose This function sets the viewport row and column to a specific value when moving between two screens.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_viewport_setxy
    (IM_USHORT row,
    IM_USHORT col);
```

IN/OUT Parameters

row	Sets the row value (Y-coordinate) of the viewport. The top of the virtual screen equals 0.
col	Sets the column value (X-coordinate) of the viewport. The left edge of virtual screen equals 0.

As input parameters, *row* and *col* set the desired location for the viewport.

As output parameters, *row* and *col* return the actual location.

Return Value This function returns one of these codes:

IM_SUCCESS	Success.
IM_VP_DISABLED	Viewporting currently disabled.
IM_INVALID_ROW	Row number out of range, moved as far as possible.
IM_INVALID_COLUMN	Column number out of range, moved as far as possible.
IM_INVALID_BOTH	Row and column out of range, moved to lower right corner.

Notes The (*row, col*) pair represents the upper left corner of the viewport being displayed. The minimum values for both the *row* and *col* are (0,0), which is the upper left corner of the virtual window.

For the 20 x 16 display character size, the maximum value of *row* is 9 (25 minus 16) and the maximum value of *col* is 60 (80 minus 20).

This function is similar to the JANUS PSK function, except that this function passes a value rather than a variable containing a value.

This function is valid only when viewporting is enabled.

The 2460 and 2461 terminals do not support this function.

See Also im_viewport_move

im_viewport_setxy (continued)

Example

```
/******************** im_viewport_setxy   ***************************/
#include <dos.h>
#include <conio.h>
#include <stdlib.h>
#include "imstdio.h"
#include "imt24lib.h"

#define  SOUND_TIME   200           /* 200 milliseconds */

void main (void)
{
IM_USHORT         row,   col;
IM_FONT_TYPE      std_font_size, cfont_size;
IM_UCHAR          cphy_width, cphy_height;
IM_BOOL           cpf_scroll, cpf_wrap, std_scroll, std_wrap;

/* Have to enable viewporting before using any viewport display function */
   im_set_viewporting( IM_ENABLE );

/* Must disable viewport follow cursor before doing any viewport movement */
   im_set_follow_cursor( IM_DISABLE );

   std_font_size = IM_FONT_STANDARD;
   std_scroll = IM_TRUE;
   std_wrap = IM_TRUE;

   im_set_display_mode(std_font_size, std_scroll, std_wrap);

   /* Set up mark for viewport operation functions */
   im_set_cursor_xy(  0,  0  );
   cputs("1-viewport_home");      /* viewport_home mark*/
   im_set_cursor_xy(  0,  1  );
   cputs("  row:0, col:0");

   im_set_cursor_xy( 9, 20  );
   cputs("2-viewport_page_right");/* viewport_right */
   im_set_cursor_xy( 10, 20 );
   cputs("   row:9,  col:20");

   im_set_cursor_xy(  9, 0  );
   cputs("3-Viewport_page_left"); /* viewport_left */
   im_set_cursor_xy(  10, 0 );
   cputs("   row:9,  col:0");

   im_set_cursor_xy( 23, 60  );
   cputs("4-viewport_end");       /* viewport_end mark*/
   im_set_cursor_xy( 24, 60  );
   cputs("  row:23, col:60");

   im_set_cursor_xy( 0, 60  );
   cputs("5-viewport_page_up");   /* viewport_page_up */
   im_set_cursor_xy( 1, 60  );
   cputs("  row:0, col:60");
```

```
im_set_cursor_xy( 0, 20  );
cputs("6-viewport_setxy");      /* viewport_setxy */
im_set_cursor_xy( 1, 20  );
cputs("  row:0, col:20");

im_set_cursor_xy( 0, 40  );
cputs("7-viewport_move");       /* viewport_move */
im_set_cursor_xy( 1, 40  );
cputs("  row:0, col:40");

im_set_cursor_xy( 18, 40  );
cputs("8-viewport_page_down"); /* vewport_page_down */

im_set_cursor_xy( 19, 40  );
cputs("  row:18, col:40");

im_set_cursor_xy( 18, 20  );
cputs("9-viewport_to_cursor"); /* viewport_to_cursor*/
im_set_cursor_xy( 19, 20  );
cputs("   row:18, col:20");

/* Bring cursor back so that viewport will stay with it */
im_set_cursor_xy(  0,  0);

/* Action 1: Set viewport back to Home */
im_viewport_home();
im_sound(IM_LOW_PITCH,SOUND_TIME,IM_LOUD_VOLUME);
getch();

/* Action 2: Set viewport page right */
im_viewport_page_right();
im_sound(IM_LOW_PITCH,SOUND_TIME,IM_LOUD_VOLUME);
getch();

/* Action 3: Set viewport page left */
im_viewport_page_left();
im_sound(IM_LOW_PITCH,SOUND_TIME,IM_LOUD_VOLUME);
getch();

/* Action 4: Viewport End */
im_viewport_end();
im_sound(IM_LOW_PITCH,SOUND_TIME,IM_LOUD_VOLUME);
getch();

/* Action 5: Viewport Page Up */
im_viewport_page_up();
im_sound(IM_LOW_PITCH,SOUND_TIME,IM_LOUD_VOLUME);
getch();

/* Action 6: Viewport Setxy */
row = 0;  col = 20;
im_viewport_setxy(&row, &col);
im_sound(IM_LOW_PITCH,SOUND_TIME,IM_LOUD_VOLUME);
getch();

/* Action 7: Viewport Move */
im_viewport_move(IM_VIEWPORT_RIGHT, 20, &row, &col);
im_sound(IM_LOW_PITCH,SOUND_TIME,IM_LOUD_VOLUME);
```

im_viewport_setxy (continued)

```
   getch();

   /* Action 8: Viewport Page Down */
   im_viewport_page_down();
   im_sound(IM_LOW_PITCH,SOUND_TIME,IM_LOUD_VOLUME);

   getch();

   /* Action 9: set cursor at row:18, column:10 and viewport_to_cursor */
   /*          Note: Cursor at the center of viewport                  */
   im_set_cursor_xy( 18, 10);
   /* Need offset 10 to let cursor at center*/
   im_viewport_to_cursor();
   im_sound(IM_LOW_PITCH,SOUND_TIME,IM_LOUD_VOLUME);
   getch();

   /* Action 10: Viewport Getxy */
   im_viewport_end();                         /* Force viewport to end */
   /* In 80X25 mode, viewport_end causes the viewport move at (9,60) */
   /* You should see value is row:9, col:60 */
   im_viewport_getxy(&row, &col);
   im_viewport_home();                        /* Force viewport to home */
   im_set_cursor_xy(0, 0  ); cputs  ("10-viewport_getxy");  /* Start at home
again */
   im_set_cursor_xy(1, 0  ); printf("  Row:%d, Col:%d", row, col);
   im_sound(IM_LOW_PITCH,SOUND_TIME,IM_LOUD_VOLUME);
   getch();

   /* Action 11: Mark ref. c->v  */
   im_clear_screen();
   im_set_cursor_xy( 9, 50 );  cputs("Ref. C->V"); /* viewport_to_cursor*/
   im_set_cursor_xy( 0, 0);   cputs("11-C->V");
   im_set_cursor_xy( 1, 0 );  cputs("Cursor at Ref.");
   getch();

   /* Action 12: Move viewport to end, then Do cursor_to_viewport */
   row = 1;  col = 39;
   im_viewport_setxy(&row, &col);
   im_viewport_end();              /* Force viewport to end */
   im_cursor_to_viewport();        /* Cursor go to center */
   im_sound(IM_LOW_PITCH,SOUND_TIME,IM_LOUD_VOLUME);
   getch();

   /* Action 13: Get Display Mode */
   im_get_display_mode(&cfont_size, &cphy_width, &cphy_height,
                       &cpf_scroll, &cpf_wrap);
   if ( (std_font_size == cfont_size) && (std_scroll == cpf_scroll) &&
                                      (std_wrap == cpf_wrap) )
      printf("\nDisplay mode setup ok\n");
   else
      printf("\nError in display_mode\nsetup\n");

   im_sound(IM_LOW_PITCH,SOUND_TIME,IM_LOUD_VOLUME);
   getch();
}
```

im_viewport_to_cursor

Purpose This function attempts to center the viewport around the cursor.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_viewport_to_cursor
    (void);
```

IN Parameters None

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_VP_DISABLED	Viewporting currently disabled

Notes This function is valid only when viewporting is enabled.

When the cursor is not displayed, use this function to move the viewport to the cursor.

Movement of the viewport is limited by the virtual display boundaries. If the cursor is near any edge, the viewport will contain the cursor, but it may not be centered in the viewport.

The 2460 and 2461 terminals do not support this function.

See Also im_cursor_to_viewport, im_viewport_end, im_viewport_home, im_viewport_move, im_viewport_page_down

Example

See example for im_viewport_setxy on page 204.

im_xm_receive_file

Purpose This function sets the terminal to receive a file from the host using XMODEM protocol.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_xm_receive_file
    (IM_CHAR far *filename,
     IM_COM_PORT port_id)
```

IN Parameters

filename Far pointer to IM_CHAR and is the filename in the terminal. The terminal filename has the format *drive:filename*.

port_id Communications port:

IM_COM1	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3	COM3 input: 2420 - Modem
IM_SCAN_ PORT_SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_NET_PORT_HANDLE	Port handle is unknown

Notes The host must be set up to send a file (using XMODEM protocol) to the terminal for this function to execute successfully.

See Also im_xm_transmit_file

Example

```
/************************* im_xm_receive_file *********************/
#include <time.h>
#include <string.h>
#include <stdio.h>
#include <stdlib.h>
#include <conio.h>
#include "imt24lib.h"

void main()
{
```

```
//   char Rxfilename[] = "e:\\works\\h3test\\xtest\\getvp2.bin";
   char Rxfilename[] = "c:getvp2.bin";
   char Txfilename[] = "c:getvp.bin";
   IM_STATUS istatus;
im_clear_screen();

    printf("Enter any character for beginning\n");
    printf("of receive file.\n");

    getch();

    //  Test im_xm_receive_file function

    istatus = im_xm_receive_file(Rxfilename,IM_COM1);

    printf("\nistatus for receive is %x \n", istatus);
    im_message(istatus);
    if(istatus == IM_OK)
    {
            printf("\nReceive file success\n");
            im_message(istatus);
      }
    else
    {
            printf("\nReceive File Error:  ");
            im_message(istatus);
    }

    getch();

    im_clear_screen();

    printf("Enter any character for beginning\n");
    printf("of transmit file.\n");

    getch();

    //  Test im_xm_transmit_file function

    istatus = im_xm_transmit_file(Txfilename,IM_COM1);

    printf("\nistatus for  transmit is %x \n",istatus);

    if(istatus == IM_OK)
    {
            printf("\nTransmit file success\n");
    }
    else
    {
            printf("\nTransmit File Error:  ");
            im_message(istatus);
    }

    getch();

      return;
}
```

im_xm_transmit_file

Purpose This function sets the terminal to transmit a file to the host using XMODEM protocol.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_xm_transmit_file
     (IM_CHAR far *filename,
      IM_COM_PORT port_id)
```

IN Parameters

filename Far pointer to IM_CHAR and is the filename in the terminal. The terminal filename has the format *drive:filename*.

port_id Communications port:

IM_COM1	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3	COM3 input: 2420 - Modem
IM_SCAN_PORT_SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_NET_PORT_HANDLE	Port handle is unknown

Notes The host must be set up to receive a file (using XMODEM protocol) from the terminal for this function to execute successfully.

See Also im_xm_receive_file

Example

See example for im_xm_receive_file on page 208.

im_xm1k_receive_file

Purpose This function sets the terminal to receive a file from the host using XMODEM-1K protocol.

Syntax
```
#include "imt24lib.h"
IM_STATUS im_xm1k_receive_file
    (IM_CHAR far *filename,
     IM_COM_PORT port_id);
```

IN Parameters

filename	Far pointer to IM_CHAR and is the filename in the terminal. The terminal filename has the format *drive:filename*.	
port_id	Communications port:	
	IM_COM1	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
	IM_COM2	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
	IM_COM3	COM3 input: 2420 - Modem
	IM_SCAN_PORT_ SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board

OUT Parameters None

Return Value This function returns one of these values:

IM_SUCCESS	Success
IM_NET_PORT_HANDLE	Port handle is unknown

Notes The host must be set up to send a file (using XMODEM-1K protocol) to the terminal for this function to execute successfully.

See Also im_xm1k_transmit_file

Example
```
/************************* im_xm1k_receive_file *********************/
#include <time.h>
#include <string.h>
#include <stdio.h>
#include <stdlib.h>
#include <conio.h>
#include "imt24lib.h"

void main()
```

im_xm1k_receive_file (continued)

```
{
//   char Rxfilename[] = "e:\\works\\h3test\\xtest\\getvp2.bin";
   char Rxfilename[] = "c:getvp2.bin";
   char Txfilename[] = "c:getvp.bin";
   IM_STATUS istatus;

    im_clear_screen();

    printf("Enter any character for beginning\n");
    printf("of receive file.\n");

    getch();

    //  Test im_xm1k_receive_file function

    istatus = im_xm1k_receive_file(Rxfilename,IM_COM1);

    printf("\nistatus for receive is %x \n", istatus);
    im_message(istatus);

    if(istatus == IM_OK)
    {
            printf("\nReceive file success\n");
            im_message(istatus);
      }
    else
    {
            printf("\nReceive File Error:  ");
            im_message(istatus);
    }

    getch();

    im_clear_screen();

    printf("Enter any character for beginning\n");
    printf("of transmit file.\n");

    getch();

    //  Test im_xm1k_transmit_file function
    istatus = im_xm1k_transmit_file(Txfilename,IM_COM1);
    printf("\nistatus for  transmit is %x \n",istatus);
    if(istatus == IM_OK)
    {
            printf("\nTransmit file success\n");
    }
    else
    {
            printf("\nTransmit File Error:  ");
            im_message(istatus);
    }

    getch();

    return;
}
```

im_xm1k_transmit_file

Purpose This function sets the terminal to transmit a file to the host using XMODEM-1K protocol.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_xm1k_transmit_file
    (IM_CHAR far *filename,
     IM_COM_PORT port_id)
```

IN Parameters

filename Far pointer to IM_CHAR and is the filename in the terminal. The terminal filename has the format *drive:filename*.

port_id Communications port:

IM_COM1	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3	COM3 input: 2420 - Modem
IM_SCAN_PORT_ SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board

OUT Parameters None

Return Value This function returns one of these values:

IM_SUCCESS	Success
IM_NET_PORT_HANDLE	Port handle is unknown

Notes The host must be set up to receive a file (using XMODEM-1K protocol) from the terminal for this function to execute successfully.

See Also im_xm1k_receive_file

Example

See example for im_xm1k_receive_file 211.

im_ym_receive_file

Purpose This function sets the terminal to receive a file from the host using YMODEM protocol.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_ym_receive_file
    (IM_CHAR far *filename,
     IM_COM_PORT port_id)
```

IN Parameters

filename	Far pointer to IM_CHAR and is the filename in the terminal. The terminal filename has the format *drive:filename*.
port_id	Communications port:

IM_COM1	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3	COM3 input: 2420 - Modem
IM_SCAN_PORT_SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_NET_PORT_HANDLE	Port handle is unknown

Notes The host must be set up to send a file (using YMODEM protocol) to the terminal for this function to execute successfully.

See Also im_ym_transmit_file

Example

```
/************************ im_ym_receive_file ********************/
#include <time.h>
#include <string.h>
#include <stdio.h>
#include <stdlib.h>
#include <conio.h>
#include "imt24lib.h"

void main()
```

```
{
//   char Rxfilename[] = "e:\\works\\h3test\\xtest\\getvp2.bin";
   char Rxfilename[] = "c:getvp2.bin";
   char Txfilename[] = "c:getvp.bin";
   IM_STATUS istatus;
im_clear_screen();

    printf("Enter any character for beginning\n");
    printf("of receive file.\n");

    getch();

    //  Test im_xm_receive_file function
    istatus = im_ym_receive_file(Rxfilename,IM_COM1);

    printf("\nistatus for receive is %x \n", istatus);
    im_message(istatus);

    if(istatus == IM_OK)
    {
            printf("\nReceive file success\n");
            im_message(istatus);
      }
    else
    {
            printf("\nReceive File Error:  ");
            im_message(istatus);
    }

    getch();

    im_clear_screen();

    printf("Enter any character for beginning\n");
    printf("of transmit file.\n");

    getch();

    //  Test im_ym_transmit_file function

    istatus = im_ym_transmit_file(Txfilename,IM_COM1);

    printf("\nistatus for  transmit is %x \n",istatus);

    if(istatus == IM_OK)
    {
            printf("\nTransmit file success\n");
    }
    else
    {
            printf("\nTransmit File Error:  ");
            im_message(istatus);
    }

    getch();

      return;
}
```

im_ym_transmit_file

Purpose This function sets the terminal to transmit a file to the host using YMODEM protocol.

Syntax

```
#include "imt24lib.h"
IM_STATUS im_ym_transmit_file
    (IM_CHAR far *filename,
     IM_COM_PORT port_id)
```

IN Parameters

filename Far pointer to IM_CHAR and is the filename in the terminal. The terminal filename has the format *drive:filename*.

port_id Communications port:

IM_COM1	COM1 input: 241X, 242X, 243X, and 2455 - Port on bottom end of terminal, 2475 and 248X - Physical port labeled COM1
IM_COM2	COM2 input: 248X - Physical port labeled COM2 on enhanced I/O board
IM_COM3	COM3 input: 2420 - Modem
IM_SCAN_PORT_SELECT	RS-232 port input: 242X - Serial interface module, 2455 - Adapter cable, 248X - Physical port labeled COM4 on enhanced I/O board

OUT Parameters None

Return Value This function returns one of these codes:

IM_SUCCESS	Success
IM_NET_PORT_HANDLE	Port handle is unknown

Notes The host must be set up to receive a file (using YMODEM protocol) from the terminal for this function to execute successfully.

See Also im_ym_receive_file

Example

See example for im_ym_receive_file on page 214.

recv

Purpose	This BSD socket specific function receives a message. You can use the recv function call to receive a message from a socket on an open connection.	
Syntax	`int recv(int s, char *buf, int len, int flags);`	
IN Parameters	*s*	Socket identifier.
	buf	Pointer to buffer that will receive the message.
	len	Size of the buffer.
	flags	0. This parameter is not used by the Trakker Antares socket interface.
OUT Parameters	*buf*	Buffer that will receive the message.
Return Value	*n* >= 0	Success, where *n* is the number of bytes sent.
	n < 0	Error
Notes	BSD socket functions do not support low power pending functions, such as the functional equivalent functions im_receive_input, im_receive_field, im_receive_buffer, and im_event_wait. Therefore, if you choose to use BSD socket functions for input, you may adversely affect battery life.	

Example

```
/******************************** recv **********************************/
int rc;     /* return code */
int s1;     /* socket identifier */
unsigned char buff[BUFFLEN);  /* read buffer */

••••

rc = connect(sl, (struct sockaddr *)&socka, sizeof(socka));
if(rc < 0)
  printf("Connection error.\n");
••••

rc = recv(s1, buff, 2, 0);
if(rc < 0)
  printf("Error: receiving data\n");
else if(rc == 2)
  printf ("Success: read 2 bytes\n");
else
  printf("Error: read did not retrieve 2 bytes\n");
```

send

Purpose This BSD socket-specific function sends a message. You can use the send function call to send a message to a socket on an open connection.

Syntax `int send(int s, char *buf, int len, int flags);`

IN Parameters

s	Socket identifier.
buf	Buffer that will receive the message.
len	Size of the buffer.
flags	0. This parameter is not used by the Trakker Antares socket interface.

OUT Parameters None

Return Value This function returns one of these values:

n	Success, where *n* is the number of bytes sent
-1	Error
c	Error condition where *c* is one of the following values:

NE_PARM	An error occurred with a parameter to `recv`
NE_TIMEOUT	Timed out before data became available

Notes BSD socket functions do not support low power pending functions, such as the functional equivalent functions im_receive_input, im_receive_field, im_receive_buffer, and im_event_wait. Therefore, if you choose to use BSD socket functions for input, you may adversely affect battery life.

Example

```
/******************************* send *********************************/
int s2;     /* socket identifier */
int rc;     /* return code */
unsigned char buff[BUFFLEN];  /* send buffer */

••••

rc = send(s2, buffer, sizeof(buffer), 0);
if (rc < 0)
  printf("Error: sending data\n");
```

socket

Purpose This BSD socket-specific function creates a socket. You must create a socket before you can use any of the other socket function calls. This call returns an integer value that identifies the socket you create. Both the client and the server must perform the `socket` call as an initialization routine.

Syntax `int socket(int domain, int type, int protocol);`

IN Parameters None

OUT Parameters

domain	PF_INET (TCP/IP and related).	
type	Socket type:	
	SOCK_STREAM	stream socket (TCP/IP)
	SOCK_DGRAM	datagram socket (UDP/IP)
	SOCK_RAW	raw protocol interface (link layer)
protocol	0. This parameter is not used by the Trakker Antares socket interface.	

Return Value This function returns one of these values:

0	Success
-1	Error

Notes In the following example, the type parameter is `SOCK_DGRAM`.; therefore, the `socket` function creates a UDP socket.

Example

```
/****************************** socket ********************************/
int s;      /* a socket */

s = socket(PF_INET, SOCK_DGRAM, 0);
if (s < 0)
  printf("Error opening socket\n");
```

A Status Codes and ASCII Character Set

This appendix lists the status code hex values and their meanings and contains a table of the ASCII character set and ASCII control characters.

This chapter covers these topics:

- Using the status code return values
- Trakker Antares status code return values
- ASCII character set

Using the Status Code Return Values

Most of the Trakker Antares® PSK functions return status codes. You can use the codes to test for error conditions that your application will act upon. How you test for the status codes depends on the complexity of the function returning the status and your application needs.

In most cases, you can use the status code macros discussed in Chapter 2, "Programming Guidelines," to determine success or failure. In other cases, you can check for the exact status code value.

The next table lists the status code return values and the error message text provided by im_message. The status codes are in hexadecimal format.

Note: The status codes are IM_USHORT (unsigned short) values.

Trakker Antares Status Code Return Values

Status Code	Message Text
0x000	Successful operation (IM_SUCCESS or IM_OK)
0x051	Response larger than buffer
0x052	Invalid command
0x053	Set attribute with bad value
0x054	Write to read-only attribute Attempted to write a value to a read-only attribute
0x055	General error not covered
0x056	Incorrect parameter or string length
0x057	Queue or pool empty
0x058	Action not permitted from this origin
0x059	Indicates that a DLE character has been found must be removed from the input string
0x05A	During config. parsing, a digit was expected While parsing a configuration command, expected a digit but encountered another value.
0x060	Queue is full
0x061	UDP+: Buffer too large to send
0x062	UDP+: NULL buffer was passed
0x063	UDP+: Msg received bigger than buffer
0x064	UDP+: Msg already transmitted
0x065	UDP+: Invalid param block
0x066	Network is inactive or improperly configured
0x067	Network control block pointer is null
0x068	Data pointer is null or data length is invalid
0x069	Data length exceeds 1024
0x06A	Send buffer contains a previous application message

Trakker Antares Status Code Return Values (continued)

Status Code	Message Text
0x06B	Incorrect RF configuration
0x070	The Ninit usnet call failed
0x071	The Nportinit usnet call failed
0x072	The Nterm usnet call failed
0x073	The Portterm usnet call failed
0x074	The Nopen usnet call failed
0x075	The Nclose usnet call failed
0x076	The Nread usnet call failed
0x077	The Nwrite usnet call failed
0x078	Invalid group event
0x079	Network PM failed
0x07A	Invalid send buffer
0x07B	The send buff is not empty
0x07C	A failure occurred in udp timer
0x07D	Maximum number of bad sequence numbers has occurred. Possible duplicate IP address in network.
0x07E	Could not connect to controller
0x080	File open failed
0x081	Read or Write request failed
0x082	The getbuf usnet call failed
0x083	Data or ACK receive failed
0x084	File write failed
0x085	File close failed
0x0A1	Invalid sub-function request
0x0A2	Table is full
0x0A3	Index out of range
0x0A4	Time value at that index is zero
0x0A5	Pointers do not match
0x0A6	Requested row value not supported
0x0A7	Requested column value not supported
0x0A8	Invalid Command
0x0A9	Invalid Configuration Combination
0x0AA	Invalid viewport request
0x0AD	Invalid Logical Key requested
0x0AE	Invalid Modifier requested
0x0B0	Invalid device
0x110	No TCB slot available
0x111	No RAM available for stack
0x112	Invalid time

Trakker Antares Status Code Return Values (continued)

Status Code	Message Text
0x113	Invalid slot
0x114	Invalid delay type
0x115	Invalid event
0x116	Invalid group event
0x117	Invalid resource
0x118	Invalid mailbox
0x119	Invalid memory release
0x11A	Function timeout expired
0x11B	Periodic event table full
0x11C	Invalid profile_type code
0x11D	Invalid MMU180 page number
0x11E	Device not open
0x11F	Device not open or not device owner
0x120	Invalid pool id
0x121	Invalid block size for pool
0x122	Invalid pool type
0x123	No table space available for message
0x134	Invalid file descriptor pointer
0x135	Task not suspended
0x136	Not owner of stream
0x137	Stream access error
0x138	Color requested > NUMCOLORS
0x139	Missed system time required
0x13A	mtenv table full
0x13B	Acquire/release table full
0x13C	Too small of memory release to MTmeminit
0x13D	chkmem detects memory chain corrupt
0x13E	MBXLIMIT messages in mailbox
0x13F	Too small of memory passed to MTmeminit
0x1F0	Add Decode - The Decode symbology is already present in the auto-discrimination table.
0x1F1	Drop Decode - The Decode symbology was not found in the auto-discrimination table.
0x1F2	Intermediate row which was already read
0x1F3	Intermediate row successfully decoded
0x1F4	Command symbology (code39)
0x1F5	Code39 half-ASCII
0x1F6	Good decode
0x1F7	Label has already been read this trigger pull
0x1F8	Votes aren't all in for the label
0x200	Decodes auto-discrimination tbl full
0x201	Decode Data command error: Not enough resources to attempt to decode the counts.

Trakker Antares Status Code Return Values (continued)

Status Code	Message Text
0x202	Invalid Decodes command
0x203	Invalid Decode symbology specified
0x204	Unable to decode input scan
0x205	Missing start or stop character
0x206	Number of counts less than min
0x207	Invalid character found
0x208	Invalid acceleration between characters
0x20A	Label length less than min
0x20B	Incorrect check digit
0x20C	Output string too short
0x20D	Leading margin not found
0x20E	Invalid start or stop pattern
0x20F	Not enough counts for whole label
0x210	Missing trailing margin
0x211	Invalid supplement to UPC label
0x212	Parity error while decoding character
0x213	Guard character not found
0x214	Invalid row number (Code 49 Code 16K)
0x215	Unable to scale counts buffer
0x216	Error in 2 of 5 label
0x217	Wrong length 2 of 5 label
0x218	Longer than max 2 of 5 label length
0x219	Valid label region not found
0x21A	Ink spread exceeded threshold
0x21B	The denominator of an expression is 0
0x21C	ASCIIfication of Full ASCII failed
0x21D	Raw scan buffer. No decode attempted yet
0x21E	Field is full no more input allowed until this is returned
0x21F	Address not in the application data space range.
0x221	Movement direction parameter invalid, not one of 4 viewport directions
0x222	End of display block outside virtual display
0x223	A printable keycode was passed in a command to set manual movement
0x224	Both start and end outside of virtual display
0x225	First parameter to function invalid
0x226	Invalid com source number
0x227	Input requested with no valid source to receive it from
0x228	Start of display block outside virtual display
0x229	Informational browse mode active
0x22A	PSK coding error

Trakker Antares Status Code Return Values (continued)

Status Code	Message Text
0x22B	Network error
0x22C	Network error
0x22D	Informational Follow cursor mode not enabled
0x22E	The cursor detection value in a set follow cursor command is larger than the viewport size
0x230	The viewport movement value is larger than the viewport size
0x231	Data transmitted before cancel request accepted
0x4233	Function key F1 pressed
0x4234	Function key F2 pressed
0x4235	Function key F3 pressed
0x4236	Function key F4 pressed
0x4237	Function key F5 pressed
0x4238	Function key F6 pressed
0x4239	Function key F7 pressed
0x423A	Function key F8 pressed
0x423B	Function key F9 pressed
0x423C	Function key F10 pressed
0x423D	Tab key pressed
0x423E	BackTab key pressed
0x4240	Esc key pressed
0x5220	Both row and column in viewport set xy invalid but adjusted to end
0x5229	Informational browse mode active
0x522F	Attempted to cancel transmit buffer that was never called before
0x5232	Viewporting is turned off-physical and virtual screens same size
0x523F	Viewport moved as far as possible and is hitting edge

ASCII Character Set

Binary[0]	Hex[1]	Dec[2]	C39[3]	Char[4]	Binary	Hex	Dec	C39	Char	Control[5]	Character Definitions
00000000	00	00	%U	NUL	01000000	40	64	%V	@	NUL	Null, or all zeroes
00000001	01	01	$A	SOH	01000001	41	65	A	A	SOH	Start of Heading
00000010	02	02	$B	STX	01000010	42	66	B	B	STX	Start of Text
00000011	03	03	$C	ETX	01000011	43	67	C	C	ETX	End of Text
00000100	04	04	$D	EOT	01000100	44	68	D	D	EOT	End of Transmission
00000101	05	05	$E	ENQ	01000101	45	69	E	E	ENQ	Enquiry
00000110	06	06	$F	ACK	01000110	46	70	F	F	ACK	Acknowledgement
00000111	07	07	$G	BEL	01000111	47	71	G	G	BEL	Bell
00001000	08	08	$H	BS	01001000	48	72	H	H	BS	Backspace
00001001	09	09	$I	HT	01001001	49	73	I	I	HT	Horizontal Tab
00001010	0A	10	$J	LF	01001010	4A	74	J	J	LF	Line Feed
00001011	0B	11	$K	VT	01001011	4B	75	K	K	VT	Vertical Tab
00001100	0C	12	$L	FF	01001100	4C	76	L	L	FF	Form Feed
00001101	0D	13	$M	CR	01001101	4D	77	M	M	CR	Carriage Return
00001110	0E	14	$N	SO	01001110	4E	78	N	N	SO	Shift Out
00001111	0F	15	$O	SI	01001111	4F	79	O	O	SI	Shift In
00010000	10	16	$P	DLE	01010000	50	80	P	P	DLE	Data Link Escape
00010001	11	17	$Q	DC1	01010001	51	81	Q	Q	DC1	Device Control 1 (XON)
00010010	12	18	$R	DC2	01010010	52	82	R	R	DC2	Device Control 2
00010011	13	19	$S	DC3	01010011	53	83	S	S	DC3	Device Control 3 (XOFF)
00010100	14	20	$T	DC4	01010100	54	84	T	T	DC4	Device Control
00010101	15	21	$U	NAK	01010101	55	85	U	U	NAK	Negative Acknowledge
00010110	16	22	$V	SYN	01010110	56	86	V	V	SYN	Syncronous Idle
00010111	17	23	$W	ETB	01010111	57	87	W	W	ETB	End Transmission Block
00011000	18	24	$X	CAN	01011000	58	88	X	X	CAN	Cancel
00011001	19	25	$Y	EM	01011001	59	89	Y	Y	EM	End of Medium
00011010	1A	26	$Z	SUB	01011010	5A	90	Z	Z	SUB	Substitute
00011011	1B	27	%A	ESC	01011011	5B	91	%K	[	ESC	Escape
00011100	1C	28	%B	FS	01011100	5C	92	%L	\	FS	File Separator
00011101	1D	29	%C	GS	01011101	5D	93	%M	]	GS	Group Separator
00011110	1E	30	%D	RS	01011110	5E	94	%N	^	RS	Record Separator
00011111	1F	31	%E	US	01011111	5F	95	%O	_	US	Unit Separator
00100000	20	32	SP	SP[6]	01100000	60	96	%W	‘	SP	Space
00100001	21	33	/A	!	01100001	61	97	+A	a	DEL	Delete
00100010	22	34	/B	"	01100010	62	98	+B	b		
00100011	23	35	/C	#	01100011	63	99	+C	c		
00100100	24	36	/D	$	01100100	64	100	+D	d		
00100101	25	37	/E	%	01100101	65	101	+E	e		
00100110	26	38	/F	&	01100110	66	102	+F	f		
00100111	27	39	/G	’	01100111	67	103	+G	g		
00101000	28	40	/H	(	01101000	68	104	+H	h		
00101001	29	41	/I	)	01101001	69	105	+I	i		
00101010	2A	42	/J	*	01101010	6A	106	+J	j		
00101011	2B	43	/K	+	01101011	6B	107	+K	k		
00101100	2C	44	/L	,	01101100	6C	108	+L	l		
00101101	2D	45	/M	-	01101101	6D	109	+M	m		
00101110	2E	46	/N	.	01101110	6E	110	+N	n		
00101111	2F	47	/O	/	01101111	6F	111	+O	o		
00110000	30	48	/P[7]	0	01110000	70	112	+P	p		
00110001	31	49	/Q	1	01110001	71	113	+Q	q		
00110010	32	50	/R	2	01110010	72	114	+R	r		
00110011	33	51	/S	3	01110011	73	115	+S	s		
00110100	34	52	/T	4	01110100	74	116	+T	t		
00110101	35	53	/U	5	01110101	75	117	+U	u		
00110110	36	54	/V	6	01110110	76	118	+V	v		
00110111	37	55	/W	7	01110111	77	119	+W	w		
00111000	38	56	/X	8	01111000	78	120	+X	x		
00111001	39	57	/Y	9	01111001	79	121	+Y	y		
00111010	3A	58	/Z	:	01111010	7A	122	+Z	z		
00111011	3B	59	%F	;	01111011	7B	123	%P	{		
00111100	3C	60	%G	<	01111100	7C	124	%Q	|		
00111101	3D	61	%H	=	01111101	7D	125	%R	}		
00111110	3E	62	%I	>	01111110	7E	126	%S	~		
00111111	3F	63	%J	?	01111111	7F	127	%T[8]	■[9]		

Notes

0	Bit positions are 76543210
1	Hexadecimal value
2	Decimal value
3	Code 39 character(s)
4	ASCII character
5	Hold Ctrl and press key in Char column
6	SPACE character
7	Code 39 characters /P through /Y may be interchanged with the numbers 0 through 9
8	May be interchanged with %X or %Y or %Z
9	DELETE character

ASCI7x10

B Microsoft Visual C/C++ Settings

This appendix shows the settings for Microsoft® Visual C/C++ v1.52.

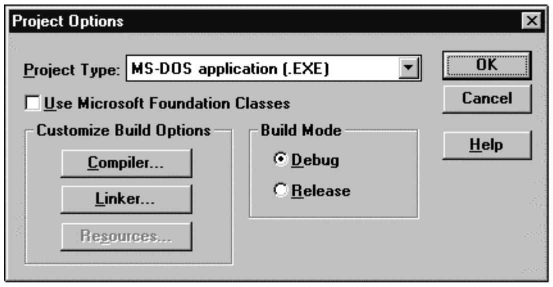
Project Options for .BIN Programs

The Trakker Antares® PSK version 4.4 and earlier requires Microsoft Visual C/C++, Professional Edition v1.0 or v1.5x, which can create 16-bit DOS applications. For more information, see "Trakker Antares PSK Version Requirements" on page 4.

Note: These examples use Microsoft Visual C/C++, Professional Edition v1.52. Your screen may look different.

To set the project options

1 From the **Options** menu, choose **Project**. The Project Options dialog box appears.

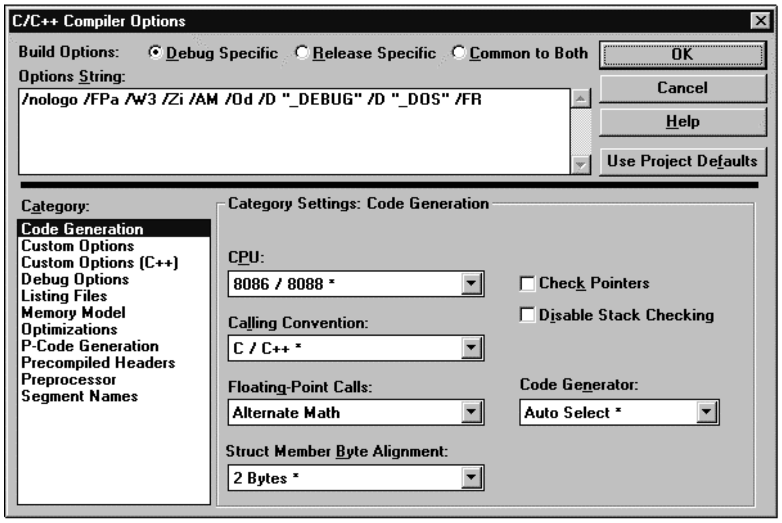


2 In the **Project Type** field, choose **MS-DOS application (.EXE)**.

3 Make sure that the **Use Microsoft Foundation Classes** check box is not selected.

Compiler Options: Code Generation

1 In the Project Options dialog box, choose **Compiler**. The Compiler Options dialog box appears.



Options String:
```
/nologo /FPa /W3 /Zi /AM /Od /D "_DEBUG" /D "_DOS" /FR
```
CPU: 8086 / 8088 *
Calling Convention: C / C++ *
Floating-Point Calls: Alternate Math
Code Generator: Auto Select *
Struct Member Byte Alignment: 2 Bytes *

2 In the **Category** list box, choose **Code Generation**.

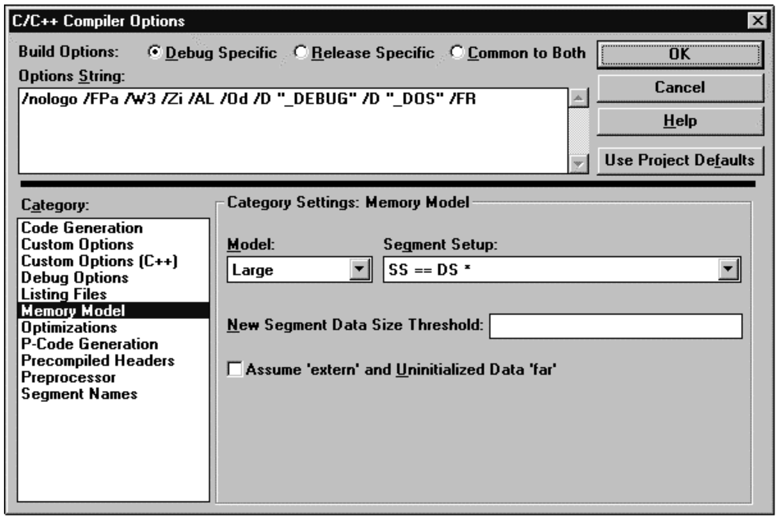
3 In the **CPU** field, choose **8086/8088**.

4 In the **Floating Point Calls** field, choose **Alternate Math**.

5 Make sure that the **Disable Stack Checking** check box is not selected.

Compiler Options: Memory Model

1 In the Project Options dialog box, choose **Compiler**. The Compiler Options dialog box appears.



Build Options: (● Debug Specific) ○ Release Specific ○ Common to Both

Options String:

```
/nologo /FPa /W3 /Zi /AL /Od /D "_DEBUG" /D "_DOS" /FR
```

Category:
- Code Generation
- Custom Options
- Custom Options (C++)
- Debug Options
- Listing Files
- Memory Model
- Optimizations
- P-Code Generation
- Precompiled Headers
- Preprocessor
- Segment Names

Category Settings: Memory Model

Model: Large

Segment Setup: SS == DS *

New Segment Data Size Threshold:

☐ Assume 'extern' and Uninitialized Data 'far'

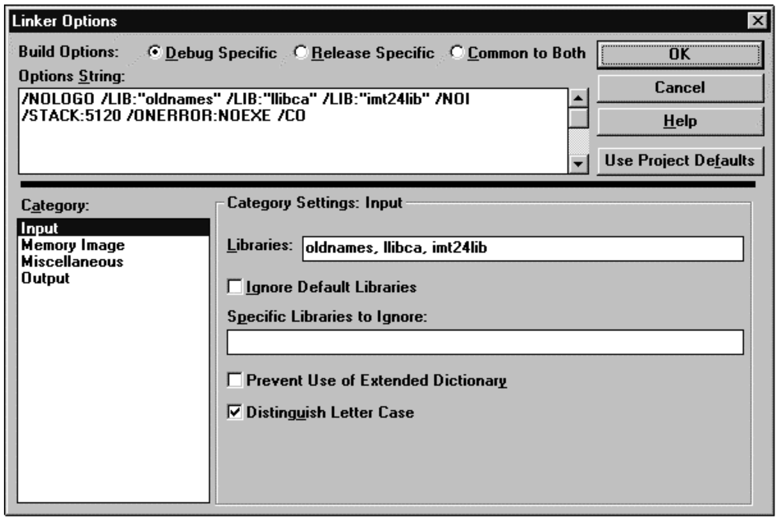
2 In the **Category** list box, choose **Memory Model**.

3 In the **Model** field, choose **Large**.

4 In the **Segment Setup** field, choose **SS == DS**.

Linker Options

1 In the Project Options dialog box, choose **Linker**. The Linker Options dialog box appears.



Options String:

```
/NOLOGO /LIB:"oldnames" /LIB:"llibca" /LIB:"imt24lib" /NOI
/STACK:5120 /ONERROR:NOEXE /CO
```

Libraries: oldnames, llibca, imt24lib

☐ Ignore Default Libraries

Specific Libraries to Ignore:

☐ Prevent Use of Extended Dictionary

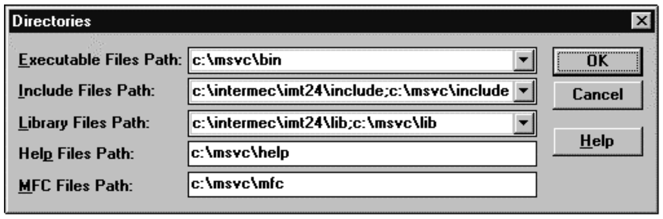
☑ Distinguish Letter Case

2 In the Libraries field, type:

```
oldnames, llibca, IMT24LIB
```

Directory Settings

1 From the **Options** menu, choose **Directories**. The Directories dialog box appears.



Executable Files Path: c:\msvc\bin

Include Files Path: c:\intermec\imt24\include;c:\msvc\include

Library Files Path: c:\intermec\imt24\lib;c:\msvc\lib

Help Files Path: c:\msvc\help

MFC Files Path: c:\msvc\mfc

2 In the **Include Files Path**, make sure that the first file is \INTERMEC\IMT24\INCLUDE.

3 In the **Include Files Path**, make sure that the second file is \MSVC\INCLUDE.

4 In the **Library Files Path**,, make sure that the first file is \INTERMEC\IMT24\LIB.

5 In the **Library Files Path**, make sure that the second file is \MSVC\LIB.

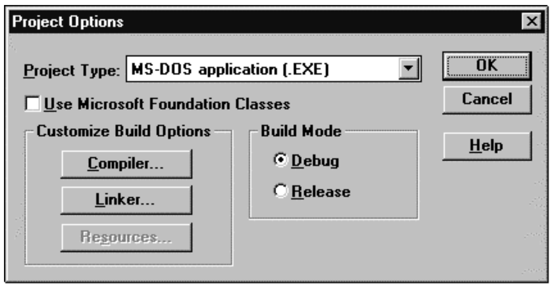
Project Options for DOS .EXE Programs

The PSK version 4.4 and earlier requires Microsoft Visual C/C++, Professional Edition v1.0 or v1.5x, which can create 16-bit DOS applications. For more information, see “Trakker Antares PSK Version Requirements” on page 4.

Note: These examples use Microsoft Visual C/C++, Professional Edition v1.52. Your screen may look different.

To set the project options

1 From the **Options** menu, choose **Project**. The Project Options dialog box appears.



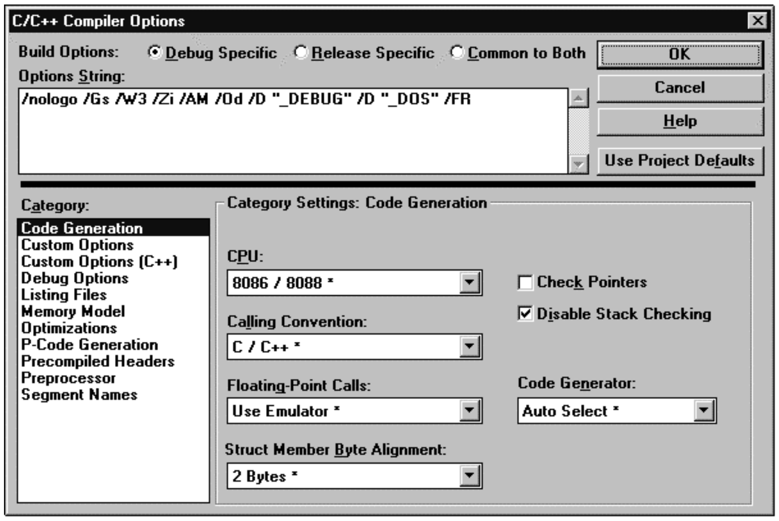
Project Type: MS-DOS application (.EXE)
☐ Use Microsoft Foundation Classes
Build Mode: [✓ Debug] Release

2 In the **Project Type** field, choose **MS-DOS application (.EXE)**.

3 Make sure that the **Use Foundation Classes** check box is not selected.

Compiler Options: Code Generation

1 In the Project Options dialog box, choose **Compiler**. The Compiler Options dialog box appears.



Build Options: [✓ Debug Specific] Release Specific Common to Both
Options String:

```
/nologo /Gs /W3 /Zi /AM /Od /D "_DEBUG" /D "_DOS" /FR
```

Category Settings: Code Generation
CPU: 8086 / 8088 *
Calling Convention: C / C++ *
Floating-Point Calls: Use Emulator *
Struct Member Byte Alignment: 2 Bytes *
☐ Check Pointers
☑ Disable Stack Checking
Code Generator: Auto Select *

2 In the **Category** list box, choose **Code Generation**.

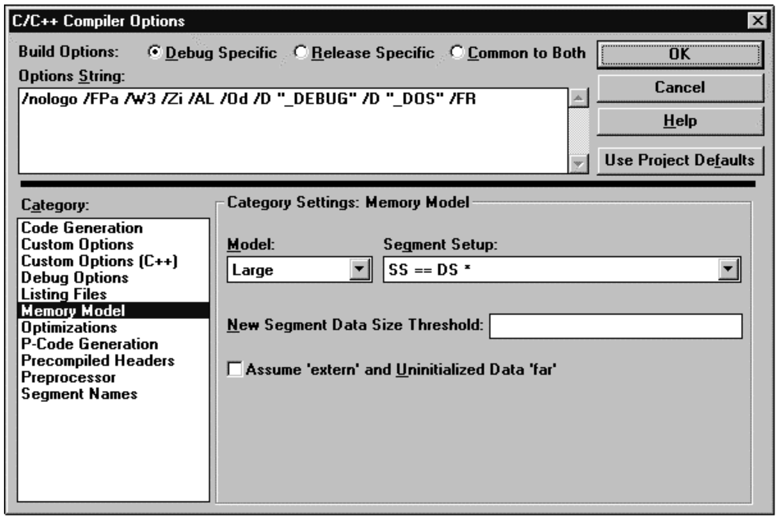
3 In the **CPU** field, choose **8086/8088**.

4 In the **Floating Point Calls** field, choose **Use Emulator**.

5 Make sure that the **Disable Stack Checking** check box is selected.

Compiler Options: Memory Model

1 In the Project Options dialog box, choose **Compiler**. The Compiler Options dialog box appears.



Build Options: [✓ Debug Specific] Release Specific Common to Both

Options String:
```
/nologo /FPa /W3 /Zi /AL /Od /D "_DEBUG" /D "_DOS" /FR
```

Category:
- Code Generation
- Custom Options
- Custom Options (C++)
- Debug Options
- Listing Files
- Memory Model
- Optimizations
- P-Code Generation
- Precompiled Headers
- Preprocessor
- Segment Names

Category Settings: Memory Model

Model: Large

Segment Setup: SS == DS *

New Segment Data Size Threshold:

☐ Assume 'extern' and Uninitialized Data 'far'

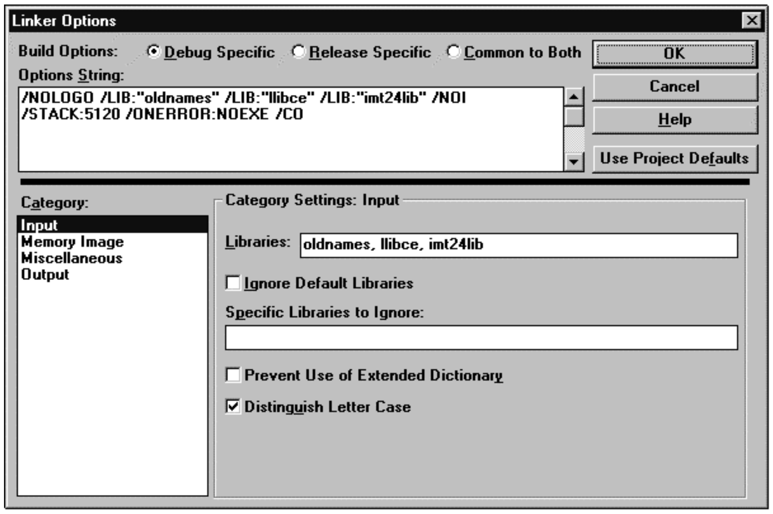
2 In the **Category** list box, choose **Memory Model**.

3 In the **Model** field, choose **Large**.

4 In the **Segment Setup** field, choose **SS == DS**.

Linker Options

1 In the Project Options dialog box, choose **Linker**. The Linker Options dialog box appears.



Build Options: [✓ Debug Specific] Release Specific Common to Both

Options String:
```
/NOLOGO /LIB:"oldnames" /LIB:"llibce" /LIB:"imt24lib" /NOI
/STACK:5120 /ONERROR:NOEXE /CO
```

Category:
- Input
- Memory Image
- Miscellaneous
- Output

Category Settings: Input

Libraries: oldnames, llibce, imt24lib

☐ Ignore Default Libraries

Specific Libraries to Ignore:

☐ Prevent Use of Extended Dictionary

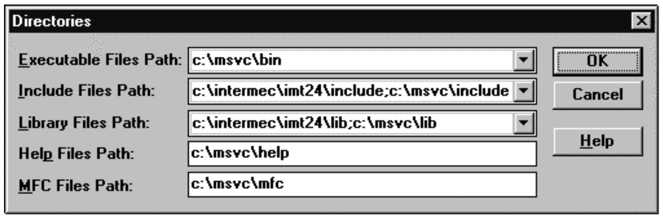
☑ Distinguish Letter Case

2 In the **Libraries** field, type:

```
oldnames, llibce, IMT24LIB
```

Directory Settings

1 From the **Options** menu, choose **Directories**. The Directories dialog box appears.



Directories

Executable Files Path:	c:\msvc\bin
Include Files Path:	c:\intermec\imt24\include;c:\msvc\include
Library Files Path:	c:\intermec\imt24\lib;c:\msvc\lib
Help Files Path:	c:\msvc\help
MFC Files Path:	c:\msvc\mfc

2 In the **Include Files Path**, make sure that the first file is \INTERMEC\IMT24\INCLUDE.

3 In the **Include Files Path**, make sure that the second file is \MSVC\INCLUDE.

4 In the **Library Files Path**, make sure that the first file is \INTERMEC\IMT24\LIB.

5 In the **Library Files Path**, make sure that the second file is \MSVC\LIB.

I Index

Intermec

User's Manual

Trakker Antares® Application Simulator

Intermec Technologies Corporation

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Document Change Record

This page records changes to this document. The document was originally released as version 001.

Version	Date	Description of Change
002	5/1997	Added information on the keypad_type and serial_receive_mode INI parameters. Also explained how to configure the Simulator to support international characters.
003	4/1998	Added information on the Optical Input and Screen Type INI parameters.
004	1/1999	No changes to Simulator manual for release -004.
005	7/1999	Added 14 new INI parameters to Chapter 3. Documented the new Simulator Editor in Chapter 4. Added new error and status messages to Chapter 5.
006	1/2000	Minor changes were made to Simulator manual for release -006.
007	2/2001	No changes to Simulator manual for release -007.
008	9/2001	No changes to Simulator manual for release -008.
009	6/2004	Minor changes were made to Simulator manual for release -009.

Contents

Before You Begin

This section provides you with safety information, technical support information, and sources for additional product information.

Safety Summary

Your safety is extremely important. Read and follow all warnings and cautions in this document before handling and operating Intermec equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the safety warnings and cautions.

Do not repair or adjust alone

Do not repair or adjust energized equipment alone under any circumstances. Someone capable of providing first aid must always be present for your safety.

First aid

Always obtain first aid or medical attention immediately after an injury. Never neglect an injury, no matter how slight it seems.

Resuscitation

Begin resuscitation immediately if someone is injured and stops breathing. Any delay could result in death. To work on or near high voltage, you should be familiar with approved industrial first aid methods.

Energized equipment

Never work on energized equipment unless authorized by a responsible authority. Energized electrical equipment is dangerous. Electrical shock from energized equipment can cause death. If you must perform authorized emergency work on energized equipment, be sure that you comply strictly with approved safety regulations.

Safety Icons

This section explains how to identify and understand warnings, cautions, and notes that are in this document.

A warning alerts you of an operating procedure, practice, condition, or statement that must be strictly observed to avoid death or serious injury to the persons working on the equipment.

Avertissement: Un avertissement vous avertit d’une procédure de fonctionnement, d’une méthode, d’un état ou d’un rapport qui doit être strictement respecté pour éviter l’occurrence de mort ou de blessures graves aux personnes manupulant l’équipement.

A caution alerts you to an operating procedure, practice, condition, or statement that must be strictly observed to prevent equipment damage or destruction, or corruption or loss of data.

Attention: Une précaution vous avertit d’une procédure de fonctionnement, d’une méthode, d’un état ou d’un rapport qui doit être strictement respecté pour empêcher l’endommagement ou la destruction de l’équipement, ou l’altération ou la perte de données.

Note: Notes either provide extra information about a topic or contain special instructions for handling a particular condition or set of circumstances.

Global Services and Support

Warranty Information

To understand the warranty for your Intermec product, visit the Intermec web site at http://www.intermec.com and click **Service & Support**. The **Intermec Global Sales & Service** page appears. From the **Service & Support** menu, move your pointer over **Support**, and then click **Warranty**.

Disclaimer of warranties: The sample code included in this document is presented for reference only. The code does not necessarily represent complete, tested programs. The code is provided "as is with all faults." All warranties are expressly disclaimed, including the implied warranties of merchantability and fitness for a particular purpose.

Web Support

Visit the Intermec web site at http://www.intermec.com to download our current documents as PDF files. To order printed versions of the Intermec manuals, contact your local Intermec representative or distributor.

Visit the Intermec technical knowledge base (Knowledge Central) at http://intermec.custhelp.com to review technical information or to request technical support for your Intermec product.

Telephone Support

These services are available from Intermec Technologies Corporation.

Service	**Description**	**In the U.S.A. and Canada call 1-800-755-5505 and choose this option**
Factory Repair and On-site Repair	Request a return authorization number for authorized service center repair, or request an on-site repair technician.	1
Technical Support	Get technical support on your Intermec product.	2
Service Contract Status	Inquire about an existing contract, renew a contract, or ask invoicing questions.	3
Schedule Site Surveys or Installations	Schedule a site survey, or request a product or system installation.	4
Ordering Products	Talk to sales administration, place an order, or check the status of your order.	5

Outside the U.S.A. and Canada, contact your local Intermec representative. To search for your local representative, from the Intermec web site, click **Contact**.

Who Should Read This Document?

This manual describes how to use the Trakker Antares® Application Simulator, which helps you create, test, and debug applications for Trakker Antares terminals with the Programmable Option.

Use this manual in conjunction with Part I, *Trakker Antares PSK Reference Manual*, which describes the PSK library functions that the Application Simulator captures and simulates.

This manual is intended for experienced PC programmers who already understand return values, know how to program in C, and know how to use the Microsoft® Visual C/C++ and Microsoft CodeView for DOS debugger. They have already read Part I, *Trakker Antares PSK Reference Manual,* so they understand how to create programs for Trakker Antares terminals.

Note: Although this manual specifically references Microsoft C Visual C/C++, the Application Simulator also supports Borland® Turbo C++.

Related Documents

The Intermec web site at http://www.intermec.com contains our current documents that you can download as PDF files.

To order printed versions of the Intermec manuals, contact your local Intermec representative or distributor.

1 Getting Started

This chapter introduces the Trakker Antares® Application Simulator, describes its installation, explains how to use the Simulator with other products as part of your development process, and ends with instructions for starting and exiting the TSR.

This chapter covers these topics:

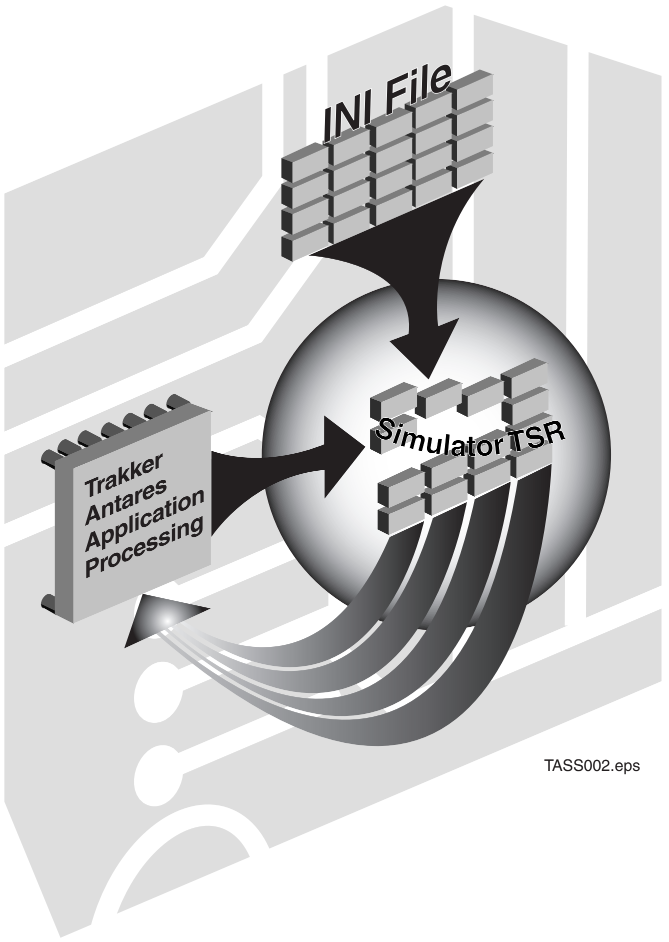
- Introduction to the Application Simulator
- Installing the Simulator
- Using the Simulator with other products
- Using the Simulator in the development process
- Starting the Simulator
- Exiting the Simulator

Introduction to the Application Simulator

The Trakker Antares Application Simulator helps you create, debug, test, and run on your PC any applications you create for Trakker Antares terminals. The Simulator lets you use Microsoft® Visual C/C++ and Microsoft Codeview for DOS to develop Trakker Antares applications.

Note: You can also use the Application Simulator with Borland® Turbo C++ 4.5; however, this manual describes Microsoft Visual C/C++.

Without the Simulator, you cannot run Trakker Antares applications on a PC because the applications contain PSK functions that are not PC-compatible. With the Simulator, however, you can run these applications on a PC. The Simulator captures the PSK functions and terminal-specific interrupts before they disrupt the PC.



Trakker Antares Application Simulator: *This illustration shows how the Simulator operates.*

While a Trakker Antares application is processing on a PC, it issues a terminal-specific system interrupt.

The Simulator terminate and stay resident (TSR) program captures the interrupt, uses values from the initialization (INI) file to assemble a response, and sends the response to the application.

The application accepts the response and continues processing.

For a detailed technical description, see "How the Simulator Works" on page 8.

Installing the Simulator

The Application Simulator is installed automatically when you install the Trakker Antares Programmer's Software Kit (PSK). For instructions, see Chapter 1 in Part I, *Trakker Antares PSK Reference Manual*.

The installation creates and fills these directories on your PC:

- C:\INTERMEC\IMT24\SIM
- C:\INTERMEC\IMT24\LIB
- C:\INTERMEC\IMT24\INCLUDE
- C:\INTERMEC\IMT24\SAMPLES

The installation creates a batch file in the WINDOWS or WIN95 directory called IMT24SIM.BAT that lets you use the IMT24SIM.EXE command from any directory. The installation also adds the IMT24SIM environment variable to AUTOEXEC.BAT. The environment variable points to the locations of the Simulator software.

The installation creates a Trakker Antares Development Tools group on the Windows desktop. The group contains icons for the FileCopy utility, the Editor, the Editor's online help system, and the README file.

Read the README file before you use the Simulator. This file may contain information that was not available when the manual was printed. For help using the Editor, see Chapter 4, "Customizing INI Files With the Editor."

If Microsoft Visual C/C++ is already installed when you install the Application Simulator, the installation adds two commands to the **Tools** menu: **Codeview for Trakker** and **Simulation for Trakker**. You can choose **Codeview for Trakker** to load the Simulator TSR into memory and start Microsoft Codeview for DOS, or you can choose **Simulation for Trakker** to load the Simulator TSR into memory and run the application you are currently editing.

Using the Simulator With Other Products

The Application Simulator was designed to be used with the Microsoft Visual C/C++ Professional Edition (version 1.0 or 1.5x) application development software. You can use Microsoft Visual C/C++ and Microsoft Codeview for DOS to create and debug applications for your Trakker Antares terminals.

Note: The Microsoft Visual C/C++ Professional Edition v4.X package includes a disk for v1.5. However, the Microsoft Visual C/C++ Professional Edition v5.0 and later does not contain the 16-bit version of C.

You can install an Intermec wedge on your PC to simulate bar code input. For help configuring a wedge, see “Bar Code Input” on page 12.

The Simulator TSR should not interfere with the normal operation of other software on your PC. Therefore, you can load the Simulator TSR into memory and leave it running if you have sufficient RAM available.

Using the Simulator in the Development Process

The Application Simulator can be an integral part of your application development process. For example, if you installed Microsoft Visual C++ before you installed the Simulator, you can follow these steps:

1. Start Microsoft Visual C/C++.
2. Open your Trakker Antares project or create a new project.
3. Select **Simulation for Trakker** from the **Tools** menu to load the Simulator into memory.
4. Run and debug the application.
5. Exit the debugger. The Simulator is unloaded from memory and you are returned to Microsoft Visual C/C++.

Note: If you are using Windows 95, you may receive a DOS informational message when you exit the debugger and terminate the Simulator. The message tells you to press **Ctrl-C** to exit the DOS session.

Starting the Simulator

The Application Simulator is a TSR program, which is a program that is loaded into DOS memory and runs in the background.

Methods for Starting the Simulator

Operating System	Method of Starting the Simulator	How Long the Simulator Is Valid
Windows 95, 98, or NT	Start the TSR from a DOS window while Windows is running.	The TSR is valid only in that DOS window.
	Choose **Simulation for Trakker** from the **Tools** menu of Microsoft Visual C/C++.	The TSR is valid until you exit the DOS session that is created.
	Choose **Codeview for Trakker** from the **Tools** menu of Microsoft Visual C/C++.	The TSR is valid until you exit Codeview.
Windows 3.1	Start the TSR from DOS before you start Windows.	The TSR is valid until you shut down your PC, or you exit Windows and unload the TSR.
	Start the TSR from your AUTOEXEC.BAT file.	The TSR is valid until you shut down your PC, or you exit Windows and unload the TSR.
	Start the TSR from a DOS window while Windows is running.	The TSR is valid only in that DOS window.
	Choose **Simulation for Trakker** from the **Tools** menu of Microsoft Visual C/C++.	The TSR is valid until you exit the DOS session that is created.
	Choose **Codeview for Trakker** from the **Tools** menu of Microsoft Visual C/C++.	The TSR is valid until you exit Codeview.
	Start the TSR from a DOS session created from Codeview.	The TSR is valid until you exit Codeview.

If you are using Windows 95, follow these guidelines:

- Do not start Codeview, spawn a DOS session, and start the TSR because the TSR will remain valid only until you exit the spawned DOS session. It will not be valid when you return to Codeview.
- Do not start the TSR from the AUTOEXEC.BAT file because it may crash your PC.

Here are the commands for starting the Simulator. You can use these commands from the DOS prompt.

To start the Simulator using default INI file

- At the DOS prompt, type this command:

```
imt24sim
```

When the software finishes loading, this message appears:

```
Simulator has been loaded with:  IMT24SIM.INI
```

You can now use your application development software to run and debug Trakker Antares applications. IMT24SIM.INI is the default INI file.

To start the Simulator using a custom INI file

- At the DOS prompt, type this command:

  ```
  imt24sim filename.ini
  ```

  Where *filename.ini* is the name of your customized INI file.

  When the software finishes loading, this message appears:

  ```
  Simulator has been loaded with:  filename.ini
  ```

  You can now use your application development software to run and debug Trakker Antares applications.

Note: If you are using Windows 3.1, you can also include these commands in your AUTOEXEC.BAT file so the TSR is loaded automatically when you boot the PC.

Exiting the Simulator

To unload the Application Simulator from memory, type this command at the DOS prompt:

```
imt24sim /d
```

This message appears:

```
Simulator has been unloaded.
```

2 Working With the Application Simulator

This chapter describes how the Simulator works and how it simulates various terminal features and PSK functions.

This chapter covers these topics:

- How the Simulator works
- Understanding the limitations of the Simulator
- Simulated features and functions

How the Simulator Works

The Application Simulator consists of three parts:

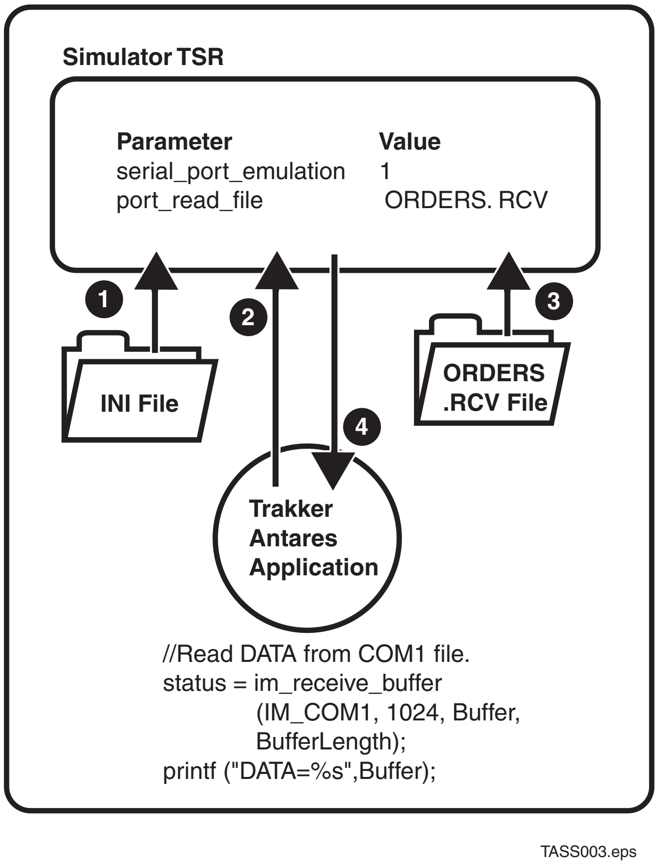
- Simulator. The Simulator terminate and stay resident (TSR) program runs in the background on your PC. The Simulator captures terminal-specific system interrupts and makes your PC mimic a Trakker Antares® terminal.
- INI File. The initialization (INI) file specifies how the Simulator simulates terminal features such as communications. IMT24SIM.INI is the default INI file. To learn about the parameters in the INI file, see Chapter 3, "INI File Parameter Descriptions."
- Simulator Editor. The Simulator Editor is a Windows-based tool that you use to set the parameters that are stored in the IMT24SIM.INI file. For help using the Editor, see Chapter 4, "Customizing INI Files With the Editor."

The Simulator uses the parameters in the INI file to simulate some terminal features and PSK functions, as described in "Simulated Features and Functions" on page 10. For example, you can use INI parameters to test how the Trakker Antares application handles incoming serial communications.

Example: How to Simulate Incoming Serial Communications

1. In the INI file, set the serial_port_emulation parameter to `1` to indicate that you are simulating serial communications through an ASCII file.
2. In the INI file, set the port_read_file parameter to `ORDERS.RCV` to identify the ASCII file that contains the data to be input as if received on the terminal's COM1 port.
3. Create the ORDERS.RCV file and fill it with data. The data will be input to the application as if received on the terminal's COM1.

   For help formatting the data, see Step 1 in the "To simulate data input to the application through NET" procedure on page 13.
4. Start the Simulator and run your Trakker Antares application. When the application issues the im_receive_buffer PSK function, the Simulator reads from ORDERS.RCV to simulate incoming serial communications.
5. Test how the application responds to the incoming communication.



```
//Read DATA from COM1 file.
status = im_receive_buffer
         (IM_COM1, 1024, Buffer,
         BufferLength);
printf ("DATA=%s",Buffer);
```

Simulator TSR: *This illustration shows how the Simulator TSR simulates incoming data.*

{ When you start the Simulator, it reads the parameters from the INI file, parses the parameter names, and saves the values into variables in memory.

} The Trakker Antares application executes on the PC. To read incoming data, the application runs the im_receive_buffer function, which issues a terminal-specific interrupt.

The Simulator TSR captures the interrupt. Because serial_port_emulation is enabled, the Simulator TSR reads data from the port_read_file until it reaches a CR/LF. The Simulator TSR uses this data to assemble the response to the im_receive_buffer function.

The Simulator passes the response to the application, which accepts the information as the status and return values of the im_receive_buffer function. The application continues executing.

Understanding the Limitations of the Simulator

Read these notes to understand the limitations of the Application Simulator:

- Start the Simulator before you run any Trakker Antares applications on your PC. Otherwise, you receive an error message and the application does not run.
- The Simulator does not help you test the application's user interface or performance. You can test those characteristics far better with a Trakker Antares terminal. Always test your application by running it on a terminal after you have finished debugging the logic.
- Intermec provides you with the LLIBCA.LIB library to link to when you are creating applications for terminals that are not running in DOS mode. If you link to the Microsoft® LLIBCA.LIB library instead, you may find that an application containing an erroneous input combination will fail on the Trakker Antares terminal, but will not be detected by the Simulator.

Simulated Features and Functions

The Simulator automatically simulates many features of the Trakker Antares terminal's performance as well as many PSK functions. Other features and functions are simulated according to values you set for parameters in an initialization (INI) file.

This section describes:

- Features that are automatically simulated
- Features that are configured with an INI file
- Features that are not simulated
- How PSK functions are simulated

Features That Are Automatically Simulated

The Simulator can reproduce these terminal features:

- Text Display
- Function Left and Function Right Keys
- Viewport

Text Display

If the application calls the im_set_input_mode function to select the programmer input mode, the Simulator limits character echoing to the lines and columns based on the display size you specified by calling the im_set_display_mode function.

Some display characteristics are represented on the PC in color, as shown in the next table.

Text Display Characteristics

Display Characteristics	Background Color	Foreground Color	Blinking
Normal	Black	Light gray	
Reverse video	Light gray	Black	
Underline	Black	Magenta	
Underline and reverse video	Magenta	Black	
Normal and blinking	Black	Light gray	Yes
Reverse video and blinking	Light gray	Black	Yes
Underline and blinking	Black	Magenta	Yes
Underline, reverse video, and blinking	Magenta	Black	Yes
Bold	Black	White	
Bold and reverse video	Light gray	Dark gray	
Bold and underline	Black	Magenta	
Bold, underline, and reverse video	Magenta	White	
Bold and blinking	Black	White	Yes
Bold, reverse video, and blinking	Light gray	Dark gray	Yes
Bold, underline, and blinking	Black	Magenta	Yes
Bold, underline, reverse video, and blinking	Magenta	White	Yes

Note: Text will blink only in the DOS environment.

Function Left and Function Right Keys

The Simulator simulates the terminal's Function Left (_f) and Function Right (=f) keys.

Function Left and Function Right Keys

To Simulate This Key	Press These Keys
_f (Function Left)	Alt
=f (Function Right)	Alt Shift

For example, to use viewport page down on a terminal, you press f 3. To use viewport page down on a PC using the Simulator, you sequentially press **Alt 3** (you must press the 3 on the number pad).

Viewport

The Simulator simulates the viewport for the terminal.

Features That Are Configured With an INI File

If you set the corresponding parameters in the INI file, the Simulator can reproduce these features:

- Bar Code Input
- Communications Input and Output
- File Transfer
- International Characters
- Terminal Emulation Keypad or Programmable Keypad

Bar Code Input

You can simulate bar code input using either of these two methods:

- By pressing a special key sequence and typing "bar code" data.
- By configuring an Intermec wedge and scanning actual bar code labels.

To simulate bar code input with a keyboard

1 Press the key sequence specified by the sim_wand_key in the INI file. (The default key sequence is **Ctrl–G**.)

Note: You specify the symbology of the simulated bar code label with the label_symbology parameter in the INI file.

2 Type the data you want entered into the application as if it were bar code input from a scanner or wand.

3 Press **Enter** to terminate the simulated bar code input.

To simulate bar code input with an Intermec wedge

1 Attach an Intermec wedge to your PC.

2 Set the first preamble characters to match the sim_wand_key value. For help, see the next set of steps, "To determine how to set the preamble for the Intermec wedge."

3 Use the wedge to scan bar code labels. The bar code data is entered into the Trakker Antares application.

4 Scan Enter or have a Return in the postamble to terminate the bar code input.

To determine how to set the preamble for the Intermec wedge

- See your wedge or scanner documentation for help setting the preamble. Also, consider this example:

  Your sim_wand_key is **Ctrl–G**, so you must set the preamble to **Ctrl–G**. Because the wedge is in Set Preamble mode, you cannot scan the BEL character, even though it represents **Ctrl–G** in the full ASCII chart. Instead, you must consult the PC/Workstation Keyboard Mapping table (in your wedge or scanner documentation) to learn which characters to scan for **Ctrl** and **G**. According to the table, you must scan the SO character for **Ctrl** and the lowercase g character for **G**. (If you were to scan SO and uppercase G, the preamble would be set to **Ctrl–Shift–G**.)

Communications Input and Output

The Simulator can simulate input and output data through the terminal's COM1, COM2, and network port (NET). The next two procedures illustrate how to simulate I/O through NET.

To simulate data input to the application through NET

1. Type sample data in an ASCII file. You need to know which PSK function you will use in the Trakker Antares application to read data from the file.

   For example, both im_receive_buffer and im_receive_input read a line of data from the file each time they are called. A line of data is either:

   - A data string that ends in a <CR><LF>
   - A data string that is 1024 bytes long (without a <CR><LF>)

   With each subsequent call, both functions continue reading data where they left off in the file until they reach an EOF. If the functions are called again after reaching the EOF, they respond differently:

   - im_receive_buffer. This function starts reading data at the top of the file.
   - im_receive_input. This function does not start reading data at the beginning of the file. This practice allows keyboard, scanner, or wand input.

2. Specify the path and filename of the ASCII file in the network_read_file INI parameter.
3. Set the network_emulation INI parameter to 1 to enable the Simulator to conduct its network communications through ASCII data files.
4. Load the Simulator and run the application.
5. Verify that the application read the data correctly from the ASCII file.

To simulate data output from the application through NET

1. Specify the path and filename of the output file in the network_write_file INI parameter.
2. Set the network_emulation INI parameter to 1 to enable the Simulator to conduct its network communications through ASCII data files.
3. Load the Simulator and run the application.
4. The application creates the ASCII file and writes data to it when the im_transmit_buffer or im_transmit_file functions execute.
5. Verify that the application wrote the data correctly to the ASCII file.
6. Test the application on a Trakker Antares terminal to make sure that the application is handling the input and output communications protocols correctly.

File Transfer

The Simulator can simulate the return values for im_receive_file and im_transmit_file functions, which let you transfer files between the terminal and a DCS 300. However, the Simulator does not transfer or simulate transferring the file specified in the im_receive_file and im_transmit_file functions.

International Characters

You can configure the Simulator to support Western European characters (such as é, ü, and õ).

To configure the Simulator to support international characters

1. Set the keypad_type INI parameter to `1` for the programmable keypad.
2. Set your PC's display to `Code Page 850` by adding these commands to your AUTOEXEC.BAT and CONFIG.SYS files:

   -
     ```
     AUTOEXEC.BAT
     nlsfunc
     mode con cp prep=((850)c:\windows\command\ega.cpi)
     chcp 850
     ```

   -
     ```
     CONFIG.SYS
     country=001, ,c:\windows\command\country.sys
     device=c:\windows\command\display.sys con=(ega,850,1)
     ```

3. Make sure you run the Simulator in a true DOS window, not a DOS screen. The international characters will not be displayed in a DOS screen.

If you start the Simulator by selecting **Simulator for Trakker** from the **Tools** menu of Microsoft Visual C/C++, you are running the Simulator in a DOS screen and international characters will not be displayed. Windows 95 users can press **Alt–Enter** to change the DOS screen to a true DOS window.

Terminal Emulation Keypad or Programmable Keypad

You can simulate either the terminal emulation keypad or the programmable keypad by setting the keypad_type parameter in the INI file. You should choose the keypad that will be used on the terminals that will run the application being tested with the Simulator.

Setting the keypad_type parameter is equivalent to selecting Configuration Menu, Terminal Menu, and Keypad from the TRAKKER Antares 2400 Menu System and then setting the keypad type for the terminal.

Features That Are Not Simulated

The Simulator cannot reproduce the following features.

Features That Are Not Simulated

Feature	**Description**
Contrast level	The Simulator does not simulate the contrast set for the terminal.
Speed and performance	The Simulator does not simulate the speed or performance of a Trakker Antares terminal. Your Trakker Antares applications run as fast as your PC can run them.
Special key sequences	The terminal's keypad contains fewer keys than a standard PC-AT keyboard, but you can produce all 102 PC-AT keys with the terminal by pressing a variety of key combinations. The special key sequences are listed in your Trakker Antares terminal user's manual. When using the Simulator to run Trakker Antares applications on a PC, you do not use special key sequences because your PC keyboard contains all 102 PC-AT keys. For example, to type a comma (,) on a terminal, you press the $\boxed{f}$ $\boxed{V}$ keys. During a simulation, you simply press the comma key on the PC keyboard or you can press the **Alt V** keys sequentially. **Note:** As described in "Function Left and Function Right Keys" earlier in this chapter, you can press Alt on your PC keyboard to simulate the $\boxed{f}$ key.
Double-byte functions	The Simulator does not simulate double-byte symbologies nor does it simulate double-byte characters.

How PSK Functions Are Simulated

Most PSK functions are automatically simulated by the Simulator. However, the Simulator can simulate some PSK functions only with the preset values in the INI file.

The next table lists the functions that require the INI file configuration.

Functions That Require the INI File Configuration

PSK Function	INI File Parameter
im_get_label_symbology	label_symbology
im_receive_buffer	network_read_file port*n*_read_file serial_receive_mode
im_receive_field	keypad_type label_postamble label_postamble_string label_preamble label_preamble_string label_time_stamp network_read_file port*n*_read_file
im_receive_file	receive_file_return
im_receive_input	keypad_type label_postamble label_postamble_string label_preamble label_preamble_string label_symbology label_time_stamp network_read_file port*n*_read_file
im_transmit_buffer	network_write_file port*n*_write_file
im_transmit_file	transmit_file_return

For a complete list of PSK functions, see Part I, *Trakker Antares PSK Reference Manual*.

3 INI File Parameter Descriptions

This chapter explains why you should customize your INI file, describes the parameters in the INI file, and explains which PSK library functions will receive the INI parameters as return values and out parameters.

This chapter covers these topics:

- Why and how you customize INI files
- Parameter descriptions

Why and How You Customize INI Files

The INI parameters control how the Application Simulator simulates a Trakker Antares® terminal executing an application. You can customize the parameters so the Simulator mimics the conditions against which you want to test your Trakker Antares applications.

Note: Customizing the INI file is optional. You do not have to customize the INI file if you are satisfied with the default values in IMT24SIM.INI.

You can customize INI parameters using the Simulator Editor or any ASCII text editor:

- The Editor provides a graphic environment for changing your INI files. Instead of typing the settings, you select them from menus, and dialog boxes. For help using the Editor, see Chapter 4, "Customizing INI Files With the Editor."
- If you create and edit INI files with an ASCII text editor, use a copy of the default INI file to make sure you conform to the formatting conventions.

Parameter Descriptions

This section contains descriptions of the parameters in the INI file, in alphabetical order. The first description, "Sample," illustrates the type of information presented for each parameter and is not a valid parameter.

Note: Before setting a parameter that refers to the communications ports COM1, COM2, or NET, check your terminal user's manual to make sure those ports are available on your terminal.

Sample

Purpose	The purpose of the parameter.
Default	The default value for the parameter.
Values	The values you can set for the parameter.
Function	The PSK library function that receives the parameter as a return value or out parameter. An out parameter specifies a value that is returned by the function. Some parameters do not have a PSK function associated with them.
Notes	Optional information about the parameter.

add_carriage_return

Purpose	Enables or disables adding a carriage return character to the end of each buffer written to the port*n*_write_file using im_transmit_buffer.
Default	1 - enable
Values	0 - disable 1 - enable
Function	im_transmit_buffer
Notes	Each time you use im_transmit_buffer to write a string into the port*n*_write_file, the Simulator adds a carriage return character after the string. This helps delineate each string. If you disable this parameter, each string is appended directly to the previous string.

battery_status_return

Purpose	Specifies the value to be returned when the application checks the power remaining in the main battery.
Default	100
Values	A number from 0 to 100 (in increments of ten)
Function	im_battery_status
Notes	You can use this parameter to test how the Trakker Antares application responds when the main battery power needs to be charged.

font_scan_row_select

Purpose	Specifies the starting row number (0 to 15) of the glyph font to be displayed.
Default	0
Values	0 to 15
Function	im_overlay_setup

keypad_type

Purpose	Specifies the Trakker Antares terminal keypad that the Simulator will mimic.
Default	0 - terminal emulation

Values	0 - terminal emulation 1 - programmable
Function	im_receive_field im_receive_input
Notes	Setting the keypad_type parameter is the equivalent of selecting the Configuration Menu, Terminal Menu, and Keypad from the TRAKKER Antares 2400 Menu System and then selecting the keypad type for the terminal. The Simulator can support Western European characters (such as é, ü, and õ) when you choose the programmable keypad. For help configuring the Simulator to support these characters, see “International Characters” on page 14.

label_preamble

Purpose	Lets you add a user-defined string to the front of the label data. The user-defined string is specified in the label_preamble_string parameter.
Default	0 - disabled
Values	0 - disabled 1 - enabled
Function	im_receive_field im_receive_input

label_preamble_string

Purpose	Specifies the user-defined string to be added to the front of the label data if the label_preamble parameter is enabled.
Default	blank
Values	Any ASCII text
Function	im_receive_field im_receive_input

label_postamble

Purpose	Lets you append a user-defined string to the end of the label data. The user-defined string is specified in the label_postamble_string parameter.
Default	0 - disabled
Values	0 - disabled 1 - enabled

Function	im_receive_field im_receive_input

label_postamble_string

Purpose	Specifies the user-defined string that can be appended to the end of the label data if the label_postamble parameter is enabled.
Default	blank
Values	Any ASCII text
Function	im_receive_field im_receive_input

label_time_stamp

Purpose	Specifies whether the current date and time will be appended to the label data.
Default	0 - disabled
Values	0 - disabled 1 - enabled
Function	im_receive_field im_receive_input

label_symbology

Purpose	Specifies the symbology of the last simulated scanned label.
Default	1 – Code 39
Values	0 - Unknown 1 - Code 39 2 - Code 93 3 - Code 49 4 - Interleaved 2 of 5 (I 2 of 5) 5 - Codabar 6 - UPC/EAN 7 - Code 128 8 - Code 16K 9 - Plessey 10 - Code 11 11 - MSI
Function	im_get_label_symbology im_receive_input

Notes	The value of this INI parameter is returned to the application in the symbology parameter of the function calls that use this INI parameter. When testing a Trakker Antares application, you can simulate the act of scanning a label by pressing the key sequence specified in the sim_wand_key parameter. When testing a T2090 application, you can press **Ctrl-G** to simulate scanning a label.

label_symbologyid

Purpose	Specifies the AIM symbology ID of the data entered while simulating bar code input.
Default	None
Values	Enter up to four ASCII characters, such as]A1.
Function	im_get_label_symbologyid
Notes	The value of this INI parameter is returned to the application in the symbologyID parameter of the function calls that use this INI parameter.

network_emulation

Purpose	Specifies whether the network operations are emulated through ASCII data files, which are named in the network_read_file and network_write_file parameters.
Default	1 - enabled
Values	0 - disabled 1 - enabled
Function	Not applicable

network_read_file

Purpose	Names the ASCII text file that contains data to be read by the application as if it were received on the network port (NET).
Default	netread.rcv
Values	Any filename
Function	im_receive_buffer im_receive_input
Notes	Test the application on a terminal to ensure that the application is handling the input communications protocols correctly.

The PSK function you use to read data from the RCV file affects how you format the data in the file:

- im_receive_buffer. Reads a buffer of data each time it is called. The RCV file should contain one or more data strings. Each data string is terminated by a CR/LF character, which indicates the end of the buffer. If there is no CR/LF, the function reads up to 1024 bytes of data. With each subsequent call, im_receive_buffer continues reading data where it left off in the file until it reaches an EOF. If the function is called again after reaching EOF, it starts reading data from the beginning of the file.
- im_receive_input. Reads a line at a time, similar to im_receive_buffer. However, because im_receive_input accepts input from multiple sources, when the function reaches the EOF, it does not start reading data at the beginning of the file again. This practice allows keyboard, scanner, and wand input.

network_receive_file_return

Purpose	Specifies the value to be returned to your application when you use an im_receive_file function to request that a file be sent to the terminal from the DCS 300.
Default	00H - success
Values	00H - success
	56H - invalid_param
	74H - net_open_error
	75H - net_close_error
	81H - request_failure
	80H - file_open_error
	85H - file_close_error
	83H - receive_failure
	84H - file_write_error
	55H - general_error
	11AH - timed_out_error
	6BH - net_config_error
	77H - net_write_error
	86H - controller_deny
Function	im_receive_file
Notes	The Simulator does not receive or simulate receiving the file specified in the im_receive_file function. If your application opens the file after

receiving it, you must make sure that a copy of the file is in your current directory when you run the application through the Simulator. Otherwise, your open command will fail.

You must test the application on a terminal to make sure that the application handles the communications protocols correctly and that the file is received on the terminal without error.

network_transmit_file_return

Purpose	Specifies the value to be returned to your application when you use an im_transmit_file function to send a file from the terminal to the DCS 300.
Default	00H - success
Values	00H - success 56H - invalid_param 74H - net_open_error 75H - net_close_error 81H - request_failure 80H - file_open_error 85H - file_close_error 83H - receive_failure 84H - file_write_error 55H - general_error 11AH - timed_out_error 6BH - net_config_error 77H - net_write_error 86H - controller_deny
Function	im_transmit_file
Notes	The Simulator does not transmit or simulate transmitting the file specified in the im_transmit_file function. If your application opens the file before transmitting it, you must make sure that a copy of the file is in your current directory when you run the application through the Simulator. Otherwise, your open command will fail. You must test the application on a terminal to make sure that the application handles the communications protocols correctly and that the file is transmitted to the DCS 300 without error

network_write_file

Purpose	Names the ASCII text file that will receive the data that the application writes to the network port.
Default	netwrite.trx
Values	Any filename
Function	im_transmit_buffer im_transmit_file
Notes	Test the application on a terminal to make sure that the application is handling the output communications protocols correctly.

number_scan_line_select

Purpose	Specifies the number of scan rows (1 to 16) of the glyph font to be displayed.
Default	1
Values	1 to 16
Function	im_overlay_setup

optical_input_n

Purpose	Specifies the optical sensor input status while simulating optical sensor input. *n* in this parameter designates the optical sensor channel (1, 2, 3 or 4).
Default	0 - OFF
Values	0 - OFF 1 - ON
Function	im_get_sensor_all im_get_sensor_input im_receive_field im_receive_input
Notes	The value of this INI parameter is returned to the application in the optical sensor status parameter of the function calls that use this INI parameter. When testing an application, you can simulate the act of optical sensor input by pressing the key sequence specified in the sim_optical_key parameter. The optical sensor channel and optical state value parameter specifies the value of the simulated optical sensor input.

portn_read_file

Purpose Names the ASCII text file that contains data to be read by the application as if it were received on a COM port. The *n* in port*n*_read_file is the COM port number (1, 2 or 3).

Default comport*n*.rcv, where *n* is the COM port number (1, 2 or 3)

Values Any filename

Function im_receive_buffer
im_receive_input

Notes Do **not** set this parameter to com*n*.rcv. Your PC will expect data from its own COM*n* port. Test the application on a terminal to make sure that the application is handling the input communications protocols correctly.

The PSK function you use to read data from the RCV file affects how you format the data in the file:

- im_receive_buffer. Reads a buffer of data each time it is called. The RCV file should contain one or more data strings. Each data string is terminated by a CR/LF character, which indicates the end of the buffer. If there is no CR/LF, the function reads up to 1024 bytes of data. With each subsequent call, im_receive_buffer continues reading data where it left off in the file until it reaches an EOF. If the function is called again after reaching EOF, it starts reading data from the beginning of the file.
- im_receive_input. Reads a line at a time, similar to im_receive_buffer. However, because im_receive_input accepts input from multiple sources, when the function reaches the EOF, it does not start reading data at the beginning of the file again. This practice allows keyboard, scanner, and wand input.

portn_write_file

Purpose Names the ASCII text file that will receive data the application writes to a COM port. The *n* in port*n*_write_file is the COM port number (1, 2 or 3).

Default comport*n*.trx, where *n* is the COM port number (1, 2 or 3)

Values Any filename

Function im_transmit_buffer
im_transmit_file

Notes Do **not** set this parameter to com*n*.trx. Your PC will try to send data to its own COM*n* port. You must test the application on a terminal to make sure that the application is handling the output communications protocols correctly.

scan_port_read_file

Purpose	Identifies the ASCII file that contains data to be read by the application as if it were received on the scanner port.
Default	scanport.rcv
Values	Any filename
Function	im_receive_buffer im_receive_input

Notes Do **not** set this parameter to com*n*.rcv. Your PC will expect data from its COM*n* port.

Test the application on a terminal to make sure the application is handling the communications protocols correctly.

The PSK function you use to read data from the RCV file affects how you format the data in the file:

- im_receive_buffer. Reads a buffer of data each time it is called. The RCV file should contain one or more data strings. Each data string is terminated by a CR/LF character, which indicates the end of the buffer. If there is no CR/LF, the function reads up to 1024 bytes of data. With each subsequent call, im_receive_buffer continues reading data where it left off in the file until it reaches an EOF. If the function is called again after reaching EOF, it starts reading data from the beginning of the file.
- im_receive_input. Reads a line at a time, similar to im_receive_buffer. However, because im_receive_input accepts input from multiple sources, when the function reaches the EOF, it does not start reading data at the beginning of the file again. This practice allows keyboard, scanner, and wand input.

scan_port_write_file

Purpose	Identifies the file that will receive data the application writes to the scanner port.
Default	scanport.trx
Values	Any filename
Function	im_receive_buffer im_receive_input

Notes Do not set this parameter to com*n*.trx. Your PC will try to send data to its COM*n* port.

Test the application on a terminal to make sure the application is handling the communications protocols correctly.

screen_type_select

Purpose	Specifies the Trakker Antares terminal display type that the Simulator will mimic.
Default	0 - 20x16 (242X)
Values	0 - 20x16 (242X) 1 - 80x25 (2455 LCD display) 2 - 40x25 (2481/2486) 3 - 40x4 (2480/2485) 4 - 80x25 (2455 EL (electroluminescent) display) 5 - 16x2 (2460/2461) 6 - 20x16 (2410/2415)
Function	im_get_display_type
Notes	Setting this parameter is equivalent to selecting Configuration Menu, Terminal Menu, and Display from the TRAKKER Antares 2400 Menu System and then setting the display type for the terminal.

serial_port_emulation

Purpose	Specifies whether the serial port operations are simulated.
Default	1 - enabled
Values	0 - disabled 1 - enabled
Function	Not applicable
Notes	For Trakker Antares applications, serial port operations are simulated through ASCII data files, which are named in the port*n*_read_file and port*n*_write_file (where *n* is 1, 2 or 3 to identify the port number).

serial_receive_mode

Purpose	Specifies whether the Simulator receives serial data one line at a time (Line mode) or one character at a time (Character mode).
Default	0 - line_mode
Values	0 - line_mode 1 - character_mode
Function	im_receive_buffer

Notes In Line mode, the Simulator reads a line of characters till it reaches <CR><LF> and returns from im_receive_buffer with that string. In Character mode, the Simulator reads and returns only one character at a time.

sim_optical_key

Purpose Specifies the key sequence that causes the application to accept keyboard input as if it were optical sensor input.

Default Ctrl-O

Values A key combination that includes one or more control keys (Ctrl, Shift, or Alt) and a character key (A to Z). Sample key combinations include: **Ctrl-B**, **Shift-C**, and **Alt-L**.

Function im_get_sensor_all
im_get_sensor_input
im_receive_input
im_receive_field

Notes To simulate optical sensor input:

1. Press a key sequence, for example, **Ctrl-O**.

   Although you can press the keys simultaneously or sequentially, you may decide to press them sequentially to avoid conflict with Microsoft® Windows® key code capture.

2. Press 1, 2, 3, or 4 to designate the optical sensor channel.
3. Press one of the status keys, 0 (OFF) or 1 (ON), to end the input.

   If the input sequence is not entered in the right order, it will be reset to the beginning.

sim_wand_key

Purpose Specifies the key sequence that causes the application to accept subsequent keyboard input as if it were wand input.

Default **Ctrl–G**

Values A key combination that includes one or more control keys (Ctrl, Shift, Alt) and a character key (A to Z).

Function Not applicable

Notes The user presses the key sequence either simultaneously or sequentially, types data that the application accepts as input from a wand, and presses **Enter** to indicate the end of the input.

You can set the sim_wand_key parameter to one or more control keys (Ctrl, Shift, Alt) and a character key (A to Z). For example:

- **Alt–A**
- **Shift–Alt–B**
- **Ctrl–Shift–C**
- **Ctrl–Shift–Alt–D**

video_scan_row_select

Purpose	Specifies the starting row number (0 to 15) of the 16 by 16 area of the display panel.
Default	0
Values	0 to 15
Function	im_overlay_setup

xmodem_receive_file_return

Purpose	Specifies the value to be returned to your application when you use an im_xm_receive_file function to request that a file be sent to the terminal from the host using XMODEM protocol.
Default	00H - success
Values	00H - success
	55H - general_error
	56H - invalid_param
	74H - connection_open_error
	75H - connection_close_error
	80H - file_open_error
	84H - file_write_error
	85H - file_close_error
	11AH - timed_out_error
	140H - malloc_error
	150H - file_transfer_user_abort
	151H - file_transfer_lost_connection
	152H - file_transfer_receiver_cancelled
	226H - invalid_com_port_number

Function	im_xm_receive_file
Notes	The Simulator does not receive or simulate receiving the file specified in the im_xm_receive_file function. If your application opens the file after receiving it, you must make sure that a copy of the file is in your current directory when you run the application with the Simulator. Otherwise, your open command will fail.
	You must test the application on a terminal to make sure that the application handles the communications protocols correctly and that the file is received on the terminal without error.

xmodem_transmit_file_return

Purpose	Specifies the value to be returned to your application when you use an im_xm_transmit_file function to send a file from the terminal to the host using XMODEM protocol.
Default	00H - success
Values	00H - success
	55H - general_error
	56H - invalid_param
	74H - connection_open_error
	75H - connection_close_error
	80H - file_open_error
	84H - file_write_error
	85H - file_close_error
	11AH - timed_out_error
	140H - malloc_error
	150H - file_transfer_user_abort
	151H - file_transfer_lost_connection
	153H - file_transfer_transmitter_cancelled
	226H - invalid_com_port_number
Function	im_xm_transmit_file
Notes	The Simulator does not transmit or simulate transmitting the file specified in the im_xm_transmit_file function. If your application opens the file before transmitting it, you must make sure that a copy of the file is in your current directory when you run the application with the Simulator. Otherwise, your open command will fail.

You must test the application on a terminal to make sure that the application handles the communications protocols correctly and that the file is transmitted to the DCS 300 without error.

xmodem1k_receive_file_return

Purpose Specifies the value to be returned to your application when you use an im_xm1k_receive_file function to request that a file be sent to the terminal from the host using XMODEM-1K protocol.

Default 00H - success

Values 00H - success

55H - general_error

56H - invalid_param

74H - connection_open_error

75H - connection_close_error

80H - file_open_error

84H - file_write_error

85H - file_close_error

11AH - timed_out_error

140H - malloc_error

150H - file_transfer_user_abort

151H - file_transfer_lost_connection

152H - file_transfer_receiver_cancelled

226H - invalid_com_port_number

Function im_xm1k_receive_file

Notes The Simulator does not receive or simulate receiving the file specified in the im_xm1k_receive_file function. If your application opens the file after receiving it, you must make sure that a copy of the file is in your current directory when you run the application with the Simulator. Otherwise, your open command will fail.

You must test the application on a terminal to make sure that the application handles the communications protocols correctly and that the file is received on the terminal without error.

xmodem1k_transmit_file_return

Purpose	Specifies the value to be returned to your application when you use an im_xm1k_transmit_file function to send a file from the terminal to the host using XMODEM-1K protocol.
Default	00H - success
Values	00H - success 55H - general_error 56H - invalid_param 74H - connection_open_error 75H - connection_close_error 80H - file_open_error 84H - file_write_error 85H - file_close_error 11AH - timed_out_error 140H - malloc_error 150H - file_transfer_user_abort 151H - file_transfer_lost_connection 153H - file_transfer_transmitter_cancelled 226H - invalid_com_port_number
Function	im_xm1k_transmit_file
Notes	The Simulator does not transmit or simulate transmitting the file specified in the im_xm1k_transmit_file function. If your application opens the file before transmitting it, you must make sure that a copy of the file is in your current directory when you run the application with the Simulator. Otherwise, your open command will fail. You must test the application on a terminal to make sure that the application handles the communications protocols correctly and that the file is transmitted to the DCS 300 without error.

ymodem_receive_file_return

Purpose	Specifies the value to be returned to your application when you use an im_ym_receive_file function to request that a file be sent to the terminal from the host using YMODEM protocol.
Default	00H - success
Values	00H - success 55H - general_error 56H - invalid_param 74H - connection_open_error 75H - connection_close_error 80H - file_open_error 84H - file_write_error 85H - file_close_error 11AH - timed_out_error 140H - malloc_error 150H - file_transfer_user_abort 151H - file_transfer_lost_connection 152H - file_transfer_receiver_cancelled 226H - invalid_com_port_number
Function	im_ym_receive_file
Notes	The Simulator does not receive or simulate receiving the file specified in the im_ym_receive_file function. If your application opens the file after receiving it, you must make sure that a copy of the file is in your current directory when you run the application with the Simulator. Otherwise, your open command will fail. You must test the application on a terminal to make sure that the application handles the communications protocols correctly and that the file is received on the terminal without error.

ymodem_transmit_file_return

Purpose Specifies the value to be returned to your application when you use an im_ym_transmit_file function to send a file from the terminal to the host using YMODEM protocol.

Default 00H - success

Values 00H - success

55H - general_error

56H - invalid_param

74H - connection_open_error

75H - connection_close_error

80H - file_open_error

84H - file_write_error

85H - file_close_error

11AH - timed_out_error

140H - malloc_error

150H - file_transfer_user_abort

151H - file_transfer_lost_connection

153H - file_transfer_transmitter_cancelled

226H - invalid_com_port_number

Function im_ym_transmit_file

Notes The Simulator does not transmit or simulate transmitting the file specified in the im_ym_transmit_file function. If your application opens the file before transmitting it, you must make sure that a copy of the file is in your current directory when you run the application with the Simulator. Otherwise, your open command will fail.

You must test the application on a terminal to make sure that the application handles the communications protocols correctly and that the file is transmitted to the DCS 300 without error.

4 Customizing INI Files With the Editor

This chapter introduces the Simulator Editor and describes how to use it to customize the initialization (INI) file for the Trakker Antares® Application Simulator.

This chapter covers these topics:

- Introduction to the Simulator Editor
- Starting the Simulator Editor
- No INI file found
- Introduction to the user interface
- Creating a new INI file
- Opening an existing INI file
- Setting INI parameters
- Saving changes
- Discarding changes
- Restoring the default values
- Printing INI files
- Exiting the Simulator Editor

Introduction to the Simulator Editor

The Simulator Editor is a Windows-based tool for viewing and setting the parameters stored in the IMT24SIM.INI file. The INI file contains parameters that specify how certain features are simulated. For descriptions of the parameters, see Chapter 3, "INI File Parameter Descriptions."

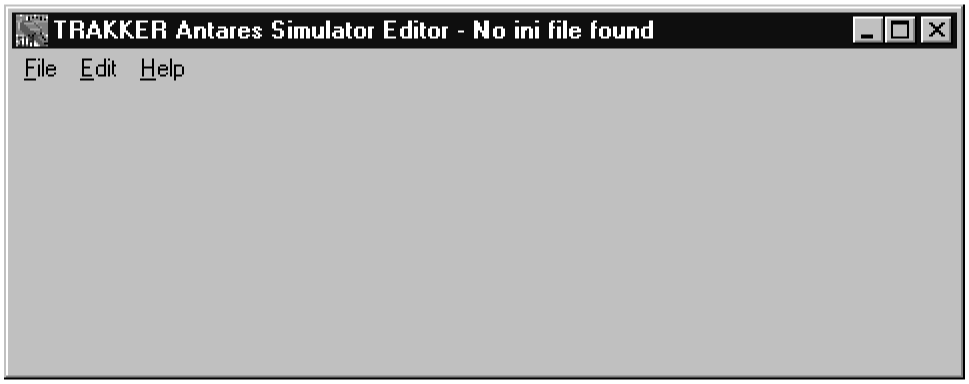
Note: Because IMT24SIM.INI is a text file, you can use any text editor to change the values of the parameters. You do not need to use the Simulator Editor.

The Editor can be used with Intermec's two application simulators:

- Trakker Antares Application Simulator, which simulates applications for the Trakker Antares 2400 Family of terminals, including the 2425 handheld terminal and the 248X stationary terminal.
- Trakker T2090 Application Simulator, which simulates applications for the T2090 computer.

Starting the Simulator Editor

Start the Simulator Editor from the Trakker Antares Development Tools group on the Windows desktop or on the Start menu. The Editor window appears.



Simulator Editor Window

No INI File Found

When you start the Editor, it attempts to open the default INI file, IMT24SIM.INI, in the working directory. If the Editor does not find the IMT24SIM.INI file in the working directory, the message, No ini file found, is displayed in the title bar of the window.

You can open IMT24SIM.INI or another INI file by choosing Open from the File menu. Or you can exit the Editor, copy IMT24SIM.INI to the working directory, and restart the Editor.

Introduction to the User Interface

This utility conforms to standard Microsoft® Windows® conventions, so it should be easy to familiarize yourself with the user interface.

Menu Bar

The main menu bar contains the File, Edit, and Help commands.

Main Menu Bar

Command	Description
File	Lets you open, create, and save INI files. Also lets you restore the parameters to their defaults, print INI files, and exit the Editor.
Edit	Lets you select a category of parameters (such as Communications and Labels), causing the corresponding tab section to become active in the Editor window.
Help	For details, see “Online Help” later on this page.

Tabs

The parameters are divided into categories, and each category has its own tab in the Editor window. To view the parameters in each category, click the corresponding tab or choose the category name from the **Edit** menu.

You set the value for each parameter by:

- selecting buttons.
- checking boxes.
- typing into the fields.
- choosing items from drop-down lists.

You can set reset a parameter to its default value by clicking the **Default** button next to the parameter. You can reset all parameters to their defaults by choosing **Restore defaults** from the **File** menu.

Online Help

You can access the online help from the **Help** menu on the Editor’s menu bar. The online help contains all the information in this chapter and describes how to use the Editor with both application simulators.

The online help also contains the parameter descriptions from Chapter 3, “INI File Parameter Descriptions.” If you click any parameter’s field, option button, or check box, you can press **F1** to display the parameter's description.

Creating a New INI File

You can create and customize new INI files with the Editor. Each new file is a duplicate of the default INI file with all the parameters set to their default values.

To create a new INI file

1. Select **File** > **New**.
2. The Select File Type dialog box appears. Select the T24xx file type and click **OK**. The Editor creates an untitled file with its parameters set to their defaults.
3. Customize the parameters if necessary.
4. Select **File** > **Save**.
5. Specify a file name with the INI extension. If necessary, select the path for the new file. Click **Save**.
6. Click **OK** when the Editor prompts you to save all the values in the file.

Opening an Existing INI File

You can open an existing INI file to view, edit, or print the file.

To open an existing INI file

- From the bottom of the **File** menu, choose the INI file from the list of five most recently opened files.

Or,

1. Select **File** > **Open**. The Open dialog box appears.
2. Select the file name. If necessary, you can browse for the file.
3. Click **Open**. The file opens, you return to the main menu, and the filename is displayed in the title bar. You can begin customizing the file.

Setting INI Parameters

The INI parameters are divided into functional categories, and each category is included on a tab in the Editor window. For descriptions of the INI parameters, see Chapter 3, "INI File Parameter Descriptions." For help customizing the parameters, see the next procedure.

To set a parameter

1 Click the tab to choose the type of parameter you want to edit. The tab you select moves forward in the Editor window.

2 To set the value for each parameter, select the button, type in the field, or choose an item from the drop-down list.

For help deciding which value to set for each parameter, see Chapter 3, "INI File Parameter Descriptions."

Saving Changes

You can save the changes to an INI file:

- into the current INI file and continue working.
- into the current INI file when you exit the Editor.
- into a new INI file.
- into an existing INI file.

Note: The current file is the file that is currently open. The current file name is displayed in the title bar of the Editor window.

To save the changes into the current INI file and continue working

1 Select **File** > **Save**. The Editor saves the file and displays this message:

```
Saved all values in file.
```

2 Click **OK**.

To save the changes into the current INI file when you exit the Editor

1 Select **File** > **Exit**. If you made changes to the INI file that you have not saved yet, the Editor displays this message:

```
The filename file has been changed.
Do you want to save the changes?
```

2 Click **Yes**. The changes are saved into the current INI file, the Editor shuts down, and you return to the Windows desktop.

To save the changes into a new INI file

1 Select **File** > **Save As**. The Save As dialog box appears.

2 In the **File name** field, type the new filename. If necessary, select a directory from the **Directories** list box.

3 Click **Save**. The Editor creates the new file, saves the changes, and displays this message:

```
Saved all values in file.
```

4 Click **OK**.

To save the changes into an existing INI file

1 Select **File** > **Save As**. The Save As dialog box appears.

2 Select the name of the file where you want to save the changes. You may need to browse for the correct directory.

3 Click **Save**. The Editor displays this message:

```
This file already exists. Replace existing file?
```

4 Click **Yes**. The Editor saves the changes into the file and displays this message:

```
Saved all values in file.
```

5 Click **OK**.

Discarding Changes

You can discard changes when you exit the Editor.

To discard the changes

1 Select **File** > **Close**. If you made changes to the INI file that you have not saved yet, the Editor displays a message similar to this one:

```
The filename file has been changed.
Do you want to save the changes?
```

2 Click **No**. The file is closed and the changes are not saved.

Or,

1 Select **File** > **Exit**. If you made changes to the INI file that you have not saved yet, the Editor displays a message similar to this one:

```
The filename file has been changed.
Do you want to save the changes?
```

2 Click **No**. The changes are not saved, the Editor shuts down, and you return to your Windows desktop.

Restoring the Default Values

You can reset all the parameters in the current INI file to their default settings at any time while the Editor is running.

To restore one parameter to its default

- Click the Default button next to the parameter.

To restore all parameters to their defaults

1 Select **File** > **Restore Defaults**. The Editor displays this message:

```
All parameters will be reset to their default values.
Do you want to proceed?
```

2 Click **Yes**. The Editor resets the parameters to their defaults and displays the message:

```
All defaults have been restored.
```

3 Click **OK**.

Printing INI Files

You can print INI files from the Editor or with any ASCII text editor. Printing INI files is a good way to keep track of contents of the INI files, especially if you are using multiple files.

Note: If you have not set up the printer for the Editor, choose Print Setup from the File menu and select the printer options as you would for any Windows application.

To print an INI file

1 Select **File** > **Print**. The Print dialog box appears.

2 Click **OK**.

Exiting the Simulator Editor

When you exit the Editor, you shut down the Editor and close the current INI file. If you changed the current file and have not saved those changes yet, the Editor prompts you to save or discard the changes.

To exit the Editor

- Select **File** > **Exit**.

  If you saved all changes to the current INI file, the Editor simply shuts down and you return to your Windows desktop.

  If you made changes to the INI file that you have not saved yet, the Editor prompts you to save or discard the changes.

  ```
  The filename file has been changed.

  Do you want to save the changes?
  ```

  Click **Yes** if you want to save the changes. Click **No** if you do not want to save the changes.

5 Troubleshooting

This chapter describes problems you may encounter while using the Simulator and error messages you may see while using the Editor.

This chapter covers these topics:

- Problems operating the Simulator
- Error and status messages

Problems Operating the Simulator

This section describes problems you may see when using the Application Simulator.

Linking to the Wrong Library

Both Intermec and Microsoft® provide you with the LLIBCA.LIB library. If you are creating .BIN applications, you must link to the Intermec LLIBCA.LIB library. If you link to the Microsoft LLIBCA.LIB library, an application containing an erroneous input combination will fail on the Trakker Antares® terminal, but will not be detected by the Simulator.

If you are creating DOS .EXE applications for terminals running ROM-DOS, you must link to the LLIBCE.LIB library.

Problems Simulating Bar Code Input With a Wedge

If you are having difficulty using an Intermec wedge to provide bar code input while you run a Trakker Antares application, you may have set the wedge preamble incorrectly.

For help setting the preamble to match the value of the sim_wand_key parameter, see “Bar Code Input” on page 12.

Problems Displaying International Characters

If Western European characters (such as é, ü, and õ) are not displayed when you run a Trakker Antares application, make sure you are complying with these guidelines:

- You set the keypad_type INI parameter to 1 for the programmable keypad.
- You set your PC’s display to Code Page 850.
- You are running the Simulator in a true DOS window, not a DOS screen.

For help, see the commands listed in “International Characters” on page 14.

Only the Communications and Labels Tabs Appear

The Simulator Editor displays only the Communications and Labels tabs when you edit an INI file for the T2090 Application Simulator instead of the Trakker Antares Application Simulator.

To correct the problem, open an existing Trakker Antares INI file. Or you can select **New** from the **File** menu and choose **T24xx** from the **Select Type** dialog box. The rest of the tabs should appear.

Error and Status Messages

This table describes the error and status messages you may see when using or installing the Simulator TSR or Editor. Follow the instructions in the Suggested Action column to recover from the error.

Error and Status Messages

Message	Description	Suggested Action
All parameters will be reset to their default values. Do you want to proceed?	You have chosen Restore Defaults from the File menu. All parameters in the INI file will be reset to their default values.	Click **Yes** to restore the defaults, or click **No** to cancel the request.
All defaults have been restored.	This message confirms that all the parameters in the INI file have been restored to their default values.	Click **OK**.
Cannot change to directory.	You specified a directory name that is invalid or does not exist.	Make sure you specified the directory name correctly. Make sure the directory exists. Then try again.
Cannot open file name.	The Simulator TSR could not find either the INI file supplied on the command line or the default IMT24SIM.INI file. The TSR was loaded with the default INI values.	Make sure you specified the filename correctly, and make sure the file exists. Make sure the IMT24SIM.INI file is in the directory specified by the IMT24SIM environment variable.
Cannot open TSR communication file.	You selected the Update Simulator command from the File menu, but the Editor could not create the EDITTSR.TMP file required for loading new parameter values. The Simulator will not be updated with the new parameter values. Your PC may not have enough disk space available to create the EDITTSR.TMP file.	Check how much disk space is free and delete unnecessary files.
File name must be imt209sm.ini.	The Simulator Editor thinks you are editing an INI file for the T2090 Application Simulator.	Open a new INI file and make sure you choose T24xx at the Select Type dialog box to indicate that you are using the Trakker Antares Application Simulator.
Filename file not found. Please verify the correct file name was given.	You specified a file that the application cannot find.	Make sure you entered the file name correctly. Make sure the file exists.
Incorrect DOS version (need 3.0 or greater).	You attempted to load the Simulator TSR, but your version of DOS is not correct.	Upgrade DOS to 3.0 or later, or run the Simulator TSR on another PC with the correct version of DOS.
Initialization file does not exist.	You tried to load the TSR, and DOS could not locate the INI file.	Make sure the INI file exists and is mentioned in your AUTOEXEC.BAT file as follows: the PATH statement should include the directory, or the IMT24SIM environment variable should point to the directory.

Error and Status Messages (continued)

Message	Description	Suggested Action
Initialization file invalid.	You tried to load the TSR with an invalid INI file.	Verify the file's type and contents. Recreate the file with the Editor.
Insufficient memory.	You tried to load the Simulator TSR without sufficient conventional memory. The Simulator requires 50K of conventional memory.	Free some memory and reissue the command to load the Simulator.
No INI File Found	The Simulator Editor did not find the default INI file for the Trakker Antares Application Simulator in the working directory.	Open an INI file by choosing Open from the File menu. Or you can choose from the list of recently opened files at the bottom of the File menu.
Parameter name is invalid.	The parameter is not valid for the Trakker Antares Application Simulator.	Delete the parameter from the INI file and restart the application.
Save all values in filename.	This message confirms that all the parameters will be saved in the specified file.	Click **OK**.
Simulator has been loaded with filename.	You chose the Load Simulator command from the File menu, and the Editor loaded the changes in the specified INI file.	No action required.
Simulator is already loaded with filename.INI.	You attempted to load the Simulator TSR when it was already resident in memory. Only one copy of the Simulator TSR can be resident in memory at a time.	No action required.
The Simulator is not loaded. Exit the editor, shut down Windows, and start the TSR.	You chose the Load Simulator command from the File menu, but the Simulator TSR is not currently running.	Save the changes to the INI file, exit the Editor, exit Windows, and start the TSR with a command that also loads the INI file.
The filename file has been changed. Do you want to save the changes?	You have made changes that have not been saved yet.	Click **Yes** to save the changes, or click **No** to discard the changes.
TSR memory corruption - reboot is required!	You attempted to remove the Simulator TSR from memory and DOS memory became corrupted.	Reboot your PC.
Unable to copy or decompress file: filename	During the installation, SETUP.EXE was unable to copy or decompress a file. Even if the installation appears to complete successfully, the software may not be fully installed. You must take corrective action and run SETUP.EXE again. This problem usually occurs if you reinstall the Simulator and the IMT24SIM.DEF file is read only. Because SETUP.EXE cannot overwrite the IMT24SIM.DEF file, the installation fails.	Choose **OK**. SETUP.EXE may terminate immediately or continue. When SETUP.EXE completes, delete IMT24SIM.DEF from the INTERMEC\IMT24\SIM directory. Run SETUP.EXE again. If you still encounter problems, contact your Intermec representative.

Error and Status Messages (continued)

Message	Description	Suggested Action
Windows is Active! Shut down Windows before unloading the Simulator.	You loaded the Simulator TSR from DOS before you started Windows. Later you attempted to unload the Simulator TSR from Windows.	Exit Windows and unload the TSR from DOS.

A Adding the Simulator to the Microsoft Visual C/C++ Tools Menu

This appendix shows how to add two Application Simulator commands to the Tools menu in Microsoft® Visual C/C++.

Adding the Simulator to the Tools Menu

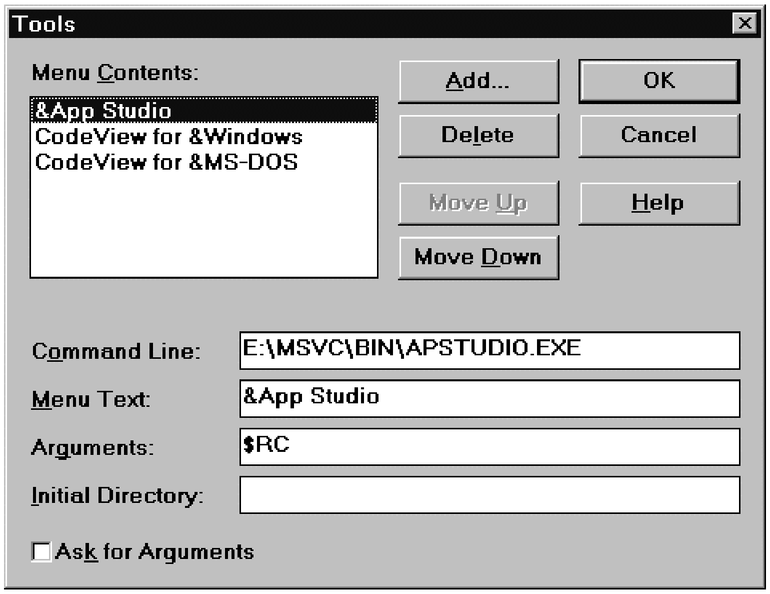
If Microsoft Visual C/C++ was installed before you installed the Trakker Antares® PSK and Application Simulator on your PC, two commands were automatically added to the **Tools** menu of Microsoft Visual C/C++:

- Simulation for Trakker loads the Simulator TSR into memory.
- Codeview for Trakker loads the Simulator TSR into memory and starts Microsoft Codeview for DOS.

If these commands were not added to the **Tools** menu, you can add them manually at any time by following the instructions in this appendix.

To add the Simulator to the Tools menu

1 Start Microsoft Visual C/C++, and select **Options** > **Tools**. The Tools dialog box appears.



Command Line: E:\MSVC\BIN\APSTUDIO.EXE
Menu Text: &App Studio
Arguments: $RC
Initial Directory:

2 Click **Add**. The Add Tool dialog box appears.

3 Select the IMCV.BAT file and click **OK** to return to the Tools dialog box. The default location for this file is C:\INTERMEC\IMT24\SIM.

4 Replace the contents of the **Menu Text** field with:

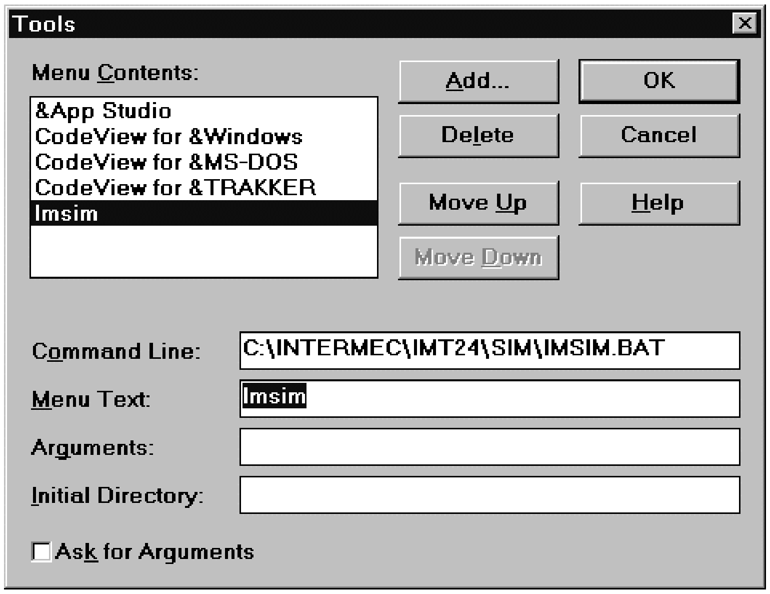
```
CodeView for &Trakker
```

Also, enter this information to the **Arguments** field:

```
$Target
```

5 Click **Add** to add a new item to the **Tools** menu. The Add Tool dialog box appears.

6 Select the IMSIM.BAT file and click **OK** to return to the Tools dialog box. The default location for this file is C:\INTERMEC\IMT24\SIM.



Command Line: C:\INTERMEC\IMT24\SIM\IMSIM.BAT
Menu Text: Imsim
Arguments:
Initial Directory:
☐ Ask for Arguments

7 Replace the contents of the **Menu Text** field with:

```
&Simulation for Trakker
```

Also, enter this information to the **Arguments** field:

```
$Target
```

8 Click **OK**.

9 From the main menu, choose **Tools**. The two new options appear on the menu.

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Trakker Antares Application Development Tools System Manual

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