LaserLite® Pro and LaserLite Mx
Hardware Manual

GCO# 927 MN-DTL-05

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LaserLite Pro is covered by one or more of the following U.S. Patents:
U.S. Patent No. 4,360,798; 4,369,361; 4,387,297; 4,460,120; 4,496,831; 4,593,186; 4,603,262; 4,607,156; 4,652,750; 4,673,805; 4,736,095; 4,758,717; 4,816,660; 4,845,350; 4,896,026; 4,897,532; 4,923,281; 4,933,538; 4,992,717; 5,015,833; 5,017,765; 5,021,765; 5,021,641; 5,029,183; 5,047,617; 5,103,461; 5,113,445; 5,130,520; 5,140,144; 5,142,550; 5,149,950; 5,157,687; 5,168,148; 5,168,149; 5,180,904; 5,229,591, 5,230,088; 5,235,167; 5,243,655; 5,247,162; 5,250,791; 5,250,792; 5,262,627; 5,262,628; 5,280,163; 5,280,164; 5,280,498; 5,304,786; 5,304,788; 5,321,246; 5,377,361; 5,367,151; 5,373,148; 5,378,882; 5,396,053; 5,396,055; 5,399,846; 5,408,081; 5,410,139; 5,410,140; 5,412,198; 5,418,812; 5,420,411; 5,436,440; 5,444,231; 5,449,891; 5,449,893; 5,468,949; 5,479,000; 5,479,002; 5,479,441; 5,504,322; 5,528,621; 5,532,469; 5,543,610; 5,545,889; 5,552,592; 5,578,810; 5,589,680; 5,608,202; 5,612,531; 5,619,028.

Federal Communications Commission Statement: This equipment is a Class A computing device under the U.S. FCC rules and this warning is required.

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

If this equipment is operated from the same electrical wall circuit as other pieces of equipment and erratic operation of the unit occurs, it may be necessary to shut off other equipment or power the unit from a dedicated electrical circuit.

If this equipment has an FCC ID number affixed to the equipment, then the unit meets the limits for a U.S. Federal Communications Commission Class B computing device and the following information applies.

FCC Notice: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by disconnecting and reconnecting the equipment, the user is encouraged to try to correct the interference by one or more of the following measures.
Reorient the receiving antenna.
Relocate the computer with respect to the receiver.
Move the computer away from the receiver.
Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: “How to Identify and Resolve Radio-TV Interference Problems.”
This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Table of Contents

Introduction

This manual contains information on the LaserLite Pro and the LaserLite Mx portable data collectors. This manual consists of two chapters and six appendixes.

Chapter 1 contains information on using the LaserLite Pro and the LaserLite Mx, including information on:

- the hardware,
- replacing the batteries,
- scanning bar codes,
- reading Dallas Semiconductor iButtons™ (also known as Touch Memory buttons),
- communicating with the computer.

Chapter 2 contains information on using a LaserLite Mx with a memory card, including information on:

- installing the memory card,
- removing the memory card,
- formatting the memory card,
- and notes on using the memory card.

Chapter 2 will refer you to the *Developer's Reference Manual* and the *Videx BASIC Manual* (included in this software package) for information on the commands necessary to communicate with memory cards.

The six appendixes contain information on:

- bar codes,
- hardware specifications,
- a glossary,
- cable diagrams,
- using multiple data collectors and Base Stations,
- and resetting a LaserLite Pro or LaserLite Mx.

Chapter 1

LaserLite Pro and LaserLite Mx Portable Data Collectors

This chapter contains:

- Introduction to LaserLite Pro and LaserLite Mx
- Basic instructions on LaserLite Pro and LaserLite Mx operations

LaserLite Pro and LaserLite Mx

LaserLite Pro and LaserLite Mx are exceptional high-performance portable data collectors manufactured by Videx. They combine laser bar code scanning and iButton technology in one easy-to-use package. LaserLite Pro and LaserLite Mx are housed in cast and extruded aluminum cases that protect the unit and provide superior durability.

Figure 1-1 LaserLite Pro

LaserLite Pro (Figure 1-1) is shipped with application software installed, so the unit is ready to use straight out of the box. To power up the LaserLite Pro, slide the lock switch (located at the bottom of the keypad) ON (away from the lock icon). You can then enter data by keypad (see pages 9–11), by scanning bar codes (see page 17), or by touching iButtons (see page 19). To turn the LaserLite Pro off, slide the lock switch OFF (towards the lock icon).

LaserLite Mx (Figure 1-2) is an enhanced version of the LaserLite Pro; it uses 3.3-volt SmartMedia memory cards (Figure 1-3) to provide additional memory to the LaserLite Mx.

Figure 1-2 LaserLite Mx

SmartMedia cards can add 2 MB, 4 MB, or 8 MB of flash ROM memory to the LaserLite Mx. A SmartMedia card is commonly referred to as a memory card or as an SSFDC (which is an abbreviation for **S**olid **S**tate **F**loppy **D**isk **C**ard). We will use the term “memory card” in this manual.

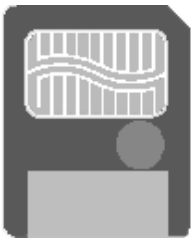


Figure 1-3 SmartMedia Memory Card (3.3 volt)

LaserLite Mx is shipped with application software installed. To power up a LaserLite Mx, insert the memory card into the LaserLite Mx memory card slot, and slide the lock switch ON (away from the lock icon). (Inserting the memory card is described on page 30.) Once the memory card is inserted and the unit is turned on, the LaserLite Mx can collect data by keypad (see pages 9–11), by scanning bar codes (see page 17), or by touching iButtons (see page 19).

To turn the LaserLite Mx off, slide the lock switch OFF (switch towards the lock icon).

Figure 1-4 is a diagram of the LaserLite Pro and the LaserLite Mx system components.

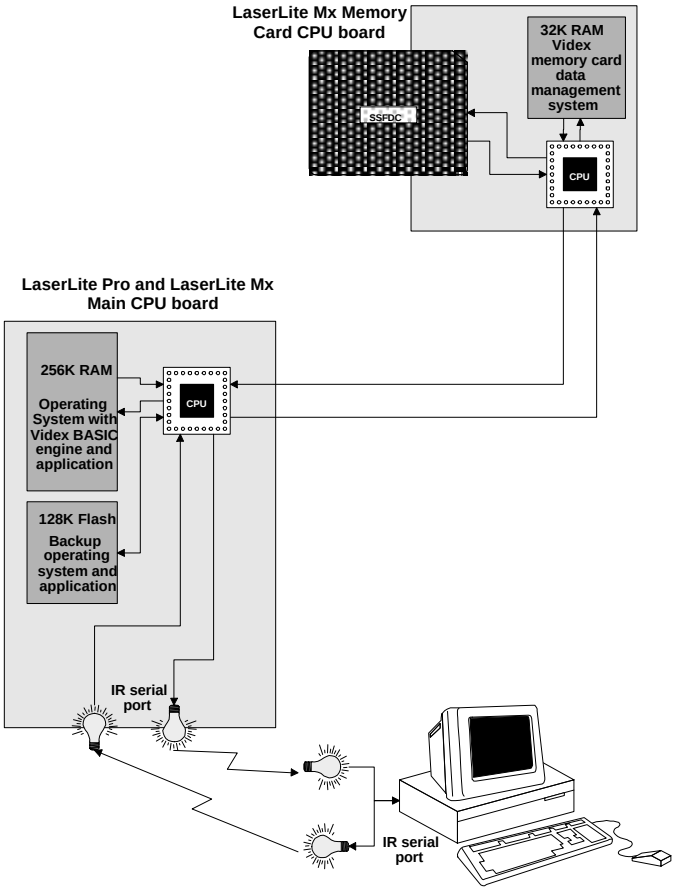


Figure 1-4 LaserLite Pro and LaserLite Mx System Components

Both the LaserLite Pro and the LaserLite Mx have a main board with a central processing unit (CPU), 256K of random-access memory (RAM), 128K of flash read-only memory (ROM), and an infrared communication (IR) serial port. In addition, the LaserLite Mx has a memory card circuit board with a CPU, 32K of RAM for program execution, and an SSFDC connector. The memory card is inserted into the SSFDC connector. The dual microprocessors and enhanced memory of the LaserLite Mx allow for extensive searches, match inquiries, large cross-reference files, and multi-tasking capabilities. See Chapter 2 for information on using LaserLite Mx memory cards.

LaserLite Pro and LaserLite Mx share the following features:

- Visible-light laser for reading bar codes.
- Read data from and write data to iButtons (also known as Touch Memory buttons).
- Scan all popular bar code symbologies.
- Operate on four replaceable AA batteries; either alkaline or rechargeable (NiCad or NiMH).
- Rechargeable lithium back-up battery for RAM memory.
- Alphanumeric keypad.
- Five user-definable function keys.
- IR communication to host computer or printers.
- Strong metal case.
- Internally cushioned laser.
- 32-character display.
- Display scrolling capability.
- 128K flash ROM; 256K battery-backed RAM.
- Real-time clock.

Additionally the LaserLite Mx supports:

- 2 MB, 4 MB, or 8 MB 3.3-volt SmartMedia memory cards.
- Multiple files on one memory card.
- Memory card operating software that provides a set of commands for data management, including record indexing and key field searching.

Case

LaserLite Pro and LaserLite Mx are constructed with a sturdy metal case. The case body is made of extruded and cast aluminum, providing strength and durability in a lightweight package. The case is powder coated for a lasting, protective finish. The combination of the case design and powder coating provides resistance to dust and moisture.

LaserLite Pro and LaserLite Mx each measure a compact 7.61 x 1.75 (handle)/1.95 (laser) x 2.19 inches and weigh less than 14 ounces.

Memory

LaserLite Pro and LaserLite Mx have internal memories of 128K (K = 1024 characters) flash ROM and 256K battery-backed RAM. This is enough storage capacity for over 8,000 5-digit bar code scans (with time and date stamp) to be kept in memory before it is necessary to transfer the data to a computer. More data can be stored by eliminating the time and date stamp from the application. Additional memory is available to the LaserLite Mx with SmartMedia memory cards. See Chapter 2 for information on using LaserLite Mx and memory cards.

Application Builder or one of the communications programs is used to transfer the data from the data collector to the computer. (Consult the *Application Builder Manual* and the *Developer's Reference Manual* for specific instructions.) The data is transferred to the computer and stored as an ASCII text file. See pages 21–25 for more information on communications between a LaserLite Pro or LaserLite Mx and a computer.

Pressing the **MEM** key (bottom left key on keypad) displays the current available memory status.

Display and Keypad

LaserLite Pro and LaserLite Mx each have a 2-line by 16-character LCD display and a 32-key alphanumeric keypad. The keys are divided into three sections: the five keys at the top of the keypad are yellow, the number keys are white, and the remaining keys are gray.

The yellow keys include:

- the **SHFT** key is the Shift key; it toggles the **Key Mode** LED on or off and allows access to the keypad's alpha characters,
- the **ENT** key is the Enter key; it accepts keypad input,
- the **ESC** key is the Escape key; it is used to exit events,
- the **BSP** key is the backspace key; it is used to correct keypad entries,
- and a scan button (large yellow key); it is pressed and held while scanning a bar code.

The gray keys consist of five symbol keys: dash (-), period (.), plus sign (+), asterisk (*), and slash (/); four scroll keys, five function keys (f1–f5), a **MEM** key that displays the available memory, a **BAT** key that displays the current battery level, and a **SP** key which is the space key. Pressing the **<f4>** function key displays the version of the operating system. Pressing the **<f5>** function key allows you to delete the last entry. The unit will display "Delete data?"; press the **Y** or scroll up ( ) key to delete the last entry.

Located above the keys are three indicator LEDs: **Key Mode**, **Valid SCAN**, and **Laser ON**.

The **Key Mode** LED lights when the **SHFT** key is pressed and the unit is placed in alpha mode. Pressing and releasing the **SHFT** key toggles the **Key Mode** LED off and on. When the **Key Mode** LED is lit and a key is pressed, the key's alpha character is entered.

The **Valid SCAN** LED lights when a bar code is scanned, a button is touched, or the **ENT** key is pressed. The **Valid SCAN** LED flashes to indicate that the data was entered successfully.

The **Laser ON** LED lights when the scan button is pushed and the laser is activated. The **Laser ON** LED remains on until a bar code is scanned or the scan button is released.

Lock Switch

Located below the keypad is a lock switch. The lock switch turns the data collector OFF and ON. The data collector is OFF when the lock switch is towards the lock icon, and ON when the lock switch is away from the lock icon. The lock switch must be ON before you can use the LaserLite Pro or LaserLite Mx. However, it is a good idea to turn the lock switch OFF while the data collector is being stored, transported, or not being used for a while; this will prevent unintentional keypresses and unnecessary draining of the batteries, while still retaining the program and data.

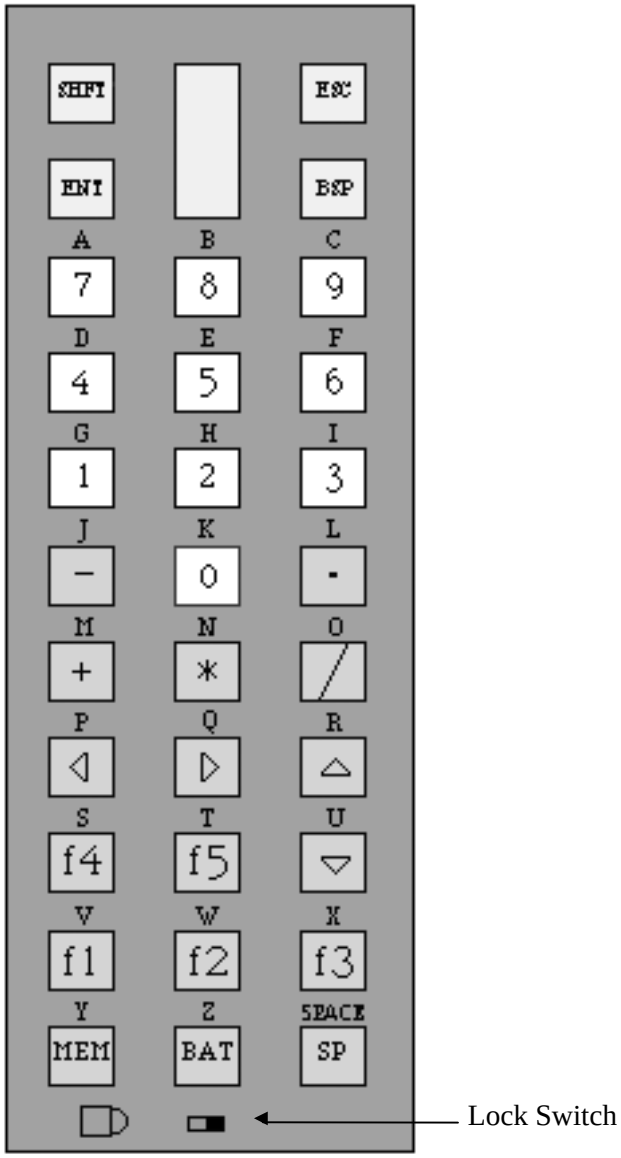


Figure 1-5 Keypad

Clock

LaserLite Pro and LaserLite Mx contain a built-in clock that is set to match the computer's clock each time the unit is programmed or its data is transferred. For the data collector's clock to be correct, the date and time on the computer must be correct before communicating with the LaserLite Pro or LaserLite Mx.

When a bar code is scanned, or an iButton is read, the date and time may be recorded along with the entered data. This timekeeping feature makes it possible to use a database, spreadsheet, or other program to calculate beginning, ending, and intervals of time from the data transferred from the LaserLite Pro or LaserLite Mx.

Batteries

LaserLite Pro and LaserLite Mx ship with 4 AA alkaline batteries installed. LaserLite Pro and LaserLite Mx use AA batteries, either alkaline, nickel-cadmium (NiCad), or nickel-metal hydride (NiMH).

Figure 1-6 LaserLite Pro with AA Batteries

The following table shows the current draw of a LaserLite Pro and LaserLite Mx during operations:

Operation	**Approximate Current Draw**	
	LaserLite Pro	LaserLite Mx
Sleep	1 mA	1.5 mA
Idle (Display on)	10 mA	15 mA
Processing	20 mA	34 mA
Button read	21 mA	35 mA
Laser on	100 mA	105 mA

Pressing the **BAT** key (bottom center key on keypad) displays the current battery charge status.

Alkaline batteries require no recharging and typically provide several weeks of use between battery replacements. Exact battery life depends upon actual use; a fresh set of alkaline batteries will provide approximately 2,000 milliampere hours (mAh) capacity. You can expect to make 100,000 or more scans from one set of alkaline batteries.

The LaserLite Pro/Mx Base Station can recharge NiCad and NiMH batteries. The LaserLite Pro/Mx Base Station has a charge switch located along its side that turns the charge feature ON or OFF. With the charge switch ON, the LaserLite Pro/Mx Base Station can recharge NiCad and NiMH batteries. ***If you are using alkaline batteries, the Base Station's charge switch must be OFF***.

WARNING!
DO NOT attempt to charge rechargeable alkaline batteries in the LaserLite Pro/Mx Base Station; it is designed to recharge NiCad and NiMH batteries only. We do not recommend using rechargeable alkaline batteries in the LaserLite Pro or LaserLite Mx.

The following tables can help you determine which AA batteries would be best for your situation. The first table assumes 5,000 scans during an 8-hour workday; the second table assumes 500 scans during an 8-hour workday.

5,000 Scans – 8-Hour Workday				
AA Battery Type	**Charge Switch**	**Battery Life per Charge**	**Recharge Time**	**Recharge Cycle Recommended**
Alkaline (2400 mAh)	OFF	10 days	N/A	N/A
NiCad (500 mAh)	ON	2 days	12–14 hr.	Daily
NiMH (1200 mAh)	ON	5 days	35–37 hr.	Twice a week; one charge must be 35–37 hours.

500 Scans – 8-Hour Workday				
AA Battery Type	**Charge Switch**	**Battery Life per Charge**	**Recharge Time**	**Recharge Cycle Recommended**
Alkaline (2400 mAh)	OFF	30 days	N/A	N/A
NiCad (500 mAh)	ON	5 days	12–14 hr.	Twice a week
NiMH (1200 mAh)	ON	10 days	35–37 hr.	Weekly

Both LaserLite Pro and LaserLite Mx have a rechargeable lithium back-up battery that maintains the programs and data while the AA batteries are being replaced. The AA battery cutoff voltage is approximately 4.0 volts. If the AA batteries drop below 4.0 volts, the unit will stop operating until the batteries are replaced. If you do not immediately replace the AA batteries, the lithium back-up battery will maintain the program and data for up to five days. The unit's AA batteries recharge the lithium back-up battery. To keep the lithium back-up battery at full charge, always store the LaserLite Pro and LaserLite Mx with the AA batteries installed.

Replacing the Batteries

You will need four (4) new AA batteries (either alkaline, NiCad, or NiMH).

The following steps guide you through replacing the batteries:

1. Turn the data collector's lock switch OFF (towards lock icon).

2. Remove the battery end cap.

   To remove a standard end cap:
   a) Use a flatblade screwdriver to loosen the screw until you can remove the end cap from the unit.
   b) Remove the battery end cap. Place the end cap and screw in a safe place for later reassembly.

   To remove a key ring end cap:
   a) Push in the key ring's locking latch to remove the key ring.
   b) Use a flat object (such as a penny or a flatblade screwdriver) to loosen the key ring base until you can remove the end cap from the unit.
   c) Remove the battery end cap. Place the end cap and key ring in a safe place for later reassembly.

3. Remove the four old batteries and replace with four new AA batteries. Be sure the batteries are installed correctly. (Note: The correct battery polarity is etched on the data collector's case.)

4. Reinstall the end cap and tighten it firmly into place. If using a key ring end cap, reattach the key ring to the key ring base.

5. Turn the data collector's lock switch back ON and it is ready to use.

Battery Information and Warnings

Videx recommends using high-quality AA batteries, either alkaline, nickel-metal hydride (NiMH) or nickel-cadmium (NiCad). Substitution of batteries other than those recommended by Videx could alter the operating life of your unit.

Note: The following warnings are important:

- **DO** keep AA batteries installed in the LaserLite Pro and LaserLite Mx. This will keep the back-up battery fully charged.
- **DO** install the batteries correctly.
- **DO NOT** mix different battery types (i.e., NiCad and alkaline).
- **DO NOT** mix new and used batteries. Replace all batteries for optimum battery performance.
- **DO NOT** use rechargeable alkaline batteries.
- **DO NOT** dispose of batteries in fire.
- **Remember** alkaline batteries cannot be recharged by the Base Station; only NiCad and NiMH batteries can be recharged by the Base Station.

Laser Scanner

LaserLite Pro and LaserLite Mx use a visible-light laser scan engine to scan bar codes. The laser scan engine is internally cushioned to protect it from damage.

LaserLite Pro and LaserLite Mx can scan Code 3 of 9, Interleaved 2 of 5, Codabar, UPC, EAN, and Code 128 bar code symbologies. They can scan bar codes printed by a variety of printers, including direct thermal and ink-jet printers.

Scanning Bar Codes

(Note: A LaserLite Mx with factory installed software requires that a properly formatted memory card be inserted before it can scan bar codes.)

To scan a bar code with the LaserLite Mx or LaserLite Pro:

1. Verify the unit is ON (lock switch away from lock icon).
2. Press the scan button while pointing the laser head towards a bar code. The **Laser ON** LED will light and the data collector will emit a red laser beam.
3. Align the laser beam until the bar code is centered and the beam crosses the entire bar code.
4. Move the data collector towards or away from the bar code until the bar code takes up approximately two-thirds the width of the beam.
5. When the bar code is successfully scanned, the data collector beeps, flashes the **Valid SCAN** LED, and writes the bar code data to memory. The laser automatically turns off after scanning a bar code.
6. Press the scan button and the laser is ready to scan again.

Key Points on Scanning

- Keep the scan button pressed during the scan.
- The laser beam must cross the entire bar code.
- Align the laser beam so the bar code is centered.

Laser Warnings

These products incorporate a Class II laser. The visible laser diode has a maximum output of one milliwatt. Laser light can be dangerous to you or others nearby if it is improperly used. Be sure to observe the caution label on the LaserLite Pro and LaserLite Mx along with the following cautions:

- Do not stare directly into the laser beam.
- Do not remove the laser caution labels from the unit.
- The laser is certified for use with the LaserLite Pro and the LaserLite Mx only. Do not connect the laser to any other device.

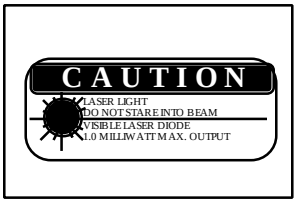


Figure 1-7 Laser Caution Label

Button Reader

The LaserLite Pro and LaserLite Mx button reader can communicate with Dallas Semiconductor iButtons (also known as Touch Memory buttons).

Reading Buttons

(Note: A LaserLite Mx with factory installed software requires that a properly formatted memory card be inserted before it can communicate with buttons.)

To read a button:

1. Verify the lock switch is ON (switch away from lock icon).
2. Place the LaserLite Pro's or LaserLite Mx's button reader over a button—the round rim of the button helps align the button reader. With a momentary touch, the unit reads the button and stores the serial number in memory.
3. LaserLite Pro and LaserLite Mx emit an audible beep and flash the **Valid SCAN** LED with each successful read.

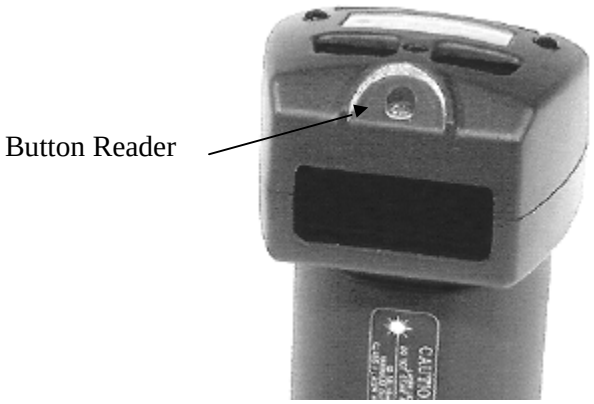


Figure 1-8 LaserLite Pro/LaserLite Mx Button Reader

iButtons

An iButton is a memory chip housed in a stainless steel container. The stainless steel container protects the memory chip and also provides an electrical path for communication. The top of the button is connected to the enclosed memory chip circuit, and the bottom and sides of the button provide a signal ground. When the data collector's button reader touches a button, the top and the sides of the button are connected and an electrical path is established. Through this path, data is transferred at up to 16,000 bits per second.

Read-only iButtons contain a serial number that is programmed into the button at the factory. The serial number is unalterable and along with the family code, uniquely identifies each button.

Read/write iButtons contain the above mentioned serial number feature, plus a non-volatile memory chip for writing data to the button. Specifications for iButtons are located in Appendix B.

An iButton can be attached to virtually anything by using an adhesive backing, a mounting bracket, or a key fob.

Figure 1-9 iButtons

Communication to the Computer

LaserLite Pro and LaserLite Mx communicate with the computer through an IR link, utilizing IrDA® technology. The IR link for the LaserLite Pro and the LaserLite Mx is the IR transmitter on the end cap. The IR link for the computer can be either a LaserLite Pro/Mx Base Station, an external JetEye® PC IR station attached to the computer's serial port, or a built-in IrDA transceiver addressable as a serial port. LaserLite Pro and LaserLite Mx establish two-way communication to the host computer using this IR link.

To communicate with a data collector, use the Application Builder software or one of the communication programs. The communication programs are **Vxcom** (Windows 95/98/NT), **Download.exe** (DOS), or **Videx Download** (Macintosh). (Note: The LaserLite Mx is not Macintosh compatible.) See the *Application Builder Software Manual* for information on Application Builder; see Chapter 1 of the *Developer's Reference Manual* for information on the communication programs.

IR Port

To communicate with a computer using either a JetEye external IR station connected to the computer's serial port or a built-in IrDA transceiver, point the data collector's IR transmitter (located in the end cap) towards the computer's IR station. Space the data collector approximately four inches from the IR device during communication. (The optimum range for communication is approximately 3–12 inches. The range varies depending upon the type of IR station and the ambient light conditions.)

LaserLite Pro/Mx Base Station

To communicate with a computer using a LaserLite Pro/Mx Base Station, insert the LaserLite Pro or LaserLite Mx into the Base Station's slot (Figure 1-10). The Base Station must be connected to the computer's serial port with a Videx serial port cable. See pages 24–25 for instructions on connecting the Base Station to the computer. (Note: If the Base Station fails to communicate, reset it by unplugging it from the electric outlet and plugging it back in.)

Figure 1-10 LaserLite Pro/Mx Base Station

The Base Station has four LEDs: **Charge**, **Receive**, **Transmit**, and **Power**. The **Charge** LED will illuminate when the data collector is inserted into the Base Station if the charge switch is ON. The **Receive** LED will illuminate when the computer is sending information to the data collector. The **Transmit** LED will illuminate when the data collector is sending information to the computer. The **Power** LED will illuminate when the Base Station is plugged into an electric power outlet.

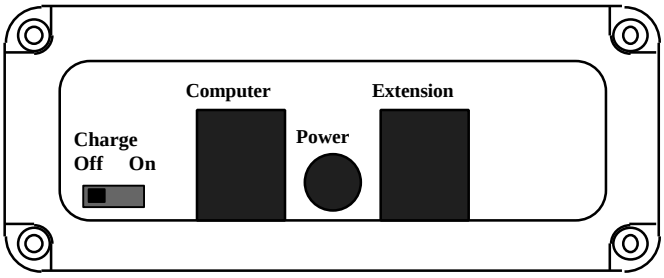


Figure 1-11 LaserLite Pro/Mx Base Station - Side View

The charge switch, **Computer** port, **Power** connection, and **Extension** port are located on the left side of the Base Station (Figure 1-11). The **Computer** port is for the computer's serial port cable connection to the Base Station. The Base Station's power transformer plugs into the **Power** connection. The **Extension** port allows you to connect up to ten Base Stations to a single computer serial port, for transferring data from more than one data collector during a single transfer process. (See Appendix E for information on using multiple Base Stations.)

Besides providing an IR link for communication, the LaserLite Pro/Mx Base Station can also trickle-charge nickel-metal hydride (NiMH) and nickel-cadmium (NiCad) batteries, but not rechargeable alkaline batteries.

The charge switch on the side of the Base Station controls the charging function. The charge switch turns the battery recharging function ON or OFF. The Base Station's charge switch is shipped in the OFF position. The switch must remain OFF if the data collector has alkaline batteries. The charge switch should only be turned ON if NiCad or NiMH batteries are being used; otherwise you could cause damage to the data collector.

If you have installed NiMH or NiCad batteries in the data collector, turn the Base Station's charge switch ON to recharge the batteries while the data collector is in the Base Station.

Connecting the Base Station to a Computer

The following steps describe how to connect a LaserLite Pro/Mx Base Station to the computer's serial port. You will need a computer, a LaserLite Pro/Mx Base Station, and a Videx serial port cable.

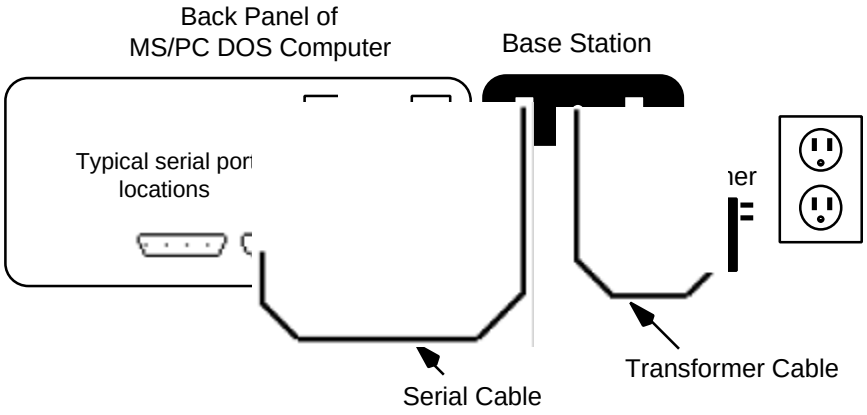


Figure 1-12 Base Station Connections

To connect the Base Station:

1. Shut down the computer.

2. Plug the Base Station's power transformer (Output: 12 VDC 300 mA) into an electric outlet.

3. Plug the other end of the transformer cable into the **Power** socket on the side of the Base Station (see Figures 1-11 and 1-12).

4. Verify that the Base Station's **Power** light is on.

5. Connect the serial port cable's connector (9-pin, 25-pin, or DIN 8) to the computer's serial port. If you are using a DOS or Windows computer, you can use serial ports 1, 2, 3, or 4. If you are using Macintosh (*LaserLite Pro only*), you can use either the Modem or Printer port; the Modem port is recommended since it is designed for two-way communication. (Note: The serial ports on a DOS/Windows computer will always be a male connector. Pin-outs for the Videx serial port cables are provided in Appendix D.)

6. Connect the serial port cable's RJ-11 plug to the **Computer** port of the Base Station.

7. The Base Station must be placed *at least* three inches away from the computer and monitor to prevent the possibility of high levels of electromagnetic interference hindering communications.

Recharging a LaserLite Pro or LaserLite Mx with NiCad or NiMH Batteries

Note: Only NiCad and NiMH batteries can be recharged. **DO NOT** attempt to recharge alkaline batteries (including rechargeable alkaline) or you could damage the data collector.

1. Slide the Base Station's charge switch ON.

2. Insert the LaserLite Pro or LaserLite Mx into the Base Station.

3. Make sure that both the **Power** and **Charge** lights on the Base Station are lit.

4. Let the data collector's batteries recharge. The length of time needed to fully recharge the batteries will depend on the milliampere-hour (mAh) rating of the batteries and how much of their charge is depleted. Use the following table to determine the length of recharge time needed.

Battery Type	Rating (mAh)	Charge Time (Empty to Full)
NiCad	500	12–14 Hr.
NiCad	700	20–22 Hr.
NiMH	1200	35–37 Hr.

Notes:

Chapter 2

LaserLite Mx Memory Cards

This chapter contains:

- Information on using LaserLite Mx memory cards

Memory Cards

The LaserLite Mx uses 3.3-volt SmartMedia cards. A SmartMedia card is commonly referred to as a memory card or an SSFDC (abbreviation for **S**olid **S**tate **F**loppy **D**isk **C**ard).

Up to sixty individual files can be stored on one memory card. Special operating system commands are provided for managing the memory card files, including record indexing and key field searching. See Chapters 1 and 5 of the *Developer's Reference Manual* for complete information on communicating with memory cards.

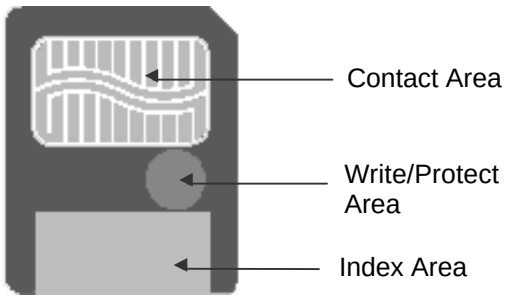


Figure 2-1 SmartMedia Memory Card (3.3 volt)

The memory card (Figure 2-1) has a **contact area**, a **write/protect area**, and an **index area**.

The **contact area** provides the communications path between the memory card and the LaserLite Mx. It is important to keep the contact area clean. Be careful—do not touch the contact area with your fingers.

The **write/protect area** is for "locking the card." Placing a write/protect adhesive seal over the write/protect area prevents any changes to the card or its files. (Note: For most LaserLite Mx applications, you should not write/protect the memory card.)

The **index area** is similar to a "disk label" in that it provides an area that can be written on for identifying the memory card.

Memory cards purchased from Videx are already formatted and ready to use, but if you need to format a memory card, use the **MXFORMAT** utility program described on pages 34–38.

To communicate with a memory card, use the **Vxcom** or **Download** communications programs described in the *Developer's Reference Manual*. New commands for communicating with the memory card have been provided for the **Vxcom** and **Download** communications programs commands file. Complete information on these commands, **Vxcom**, **Download**, and the commands file are provided in Chapter 1 and Chapter 5 of the *Developer's Reference Manual*.

Installing a Memory Card

A memory card is inserted into the LaserLite Mx's memory card slot that is located above the LCD display.

To install the memory card:

1. IMPORTANT: Be sure the LaserLite Mx's lock switch is OFF (towards lock icon) before installing the memory card.
2. Install the memory card (Figure 2-2) by inserting the end of the card (with the diagonal corner) with the contact area down (towards the display). NOTE: Do not touch the memory card's contact area.

Figure 2-2 Installing Memory Card

3. Push the memory card in as far as it will go; the edge of the memory card will protrude slightly from the memory card slot.
4. Slide the LaserLite Mx's lock switch ON. If the memory card has been formatted, the LaserLite Mx is now ready to use. (If you need to format the memory card, follow the steps on pages 34–38.)

Removing a Memory Card

To remove a memory card:

1. IMPORTANT: Be sure the LaserLite Mx's lock switch is OFF (switch towards lock icon) before removing the memory card.
2. Remove the memory card by pulling it straight out of the unit.

Memory Card Capabilities

The following operations can be performed with a LaserLite Mx and a memory card:

- Create, open, close, and delete files. Four different types of files are supported: *indexed* (**I** or **H**), *sequential* (**S**), *boot* (**B**), and *identification* (**D**).
- Add, delete, and change records.
- Search records based on the key field.
- Move a pointer within a file.
- Seek information based on a given string.
- Reorganize space.
- List memory card file information and status report.
- Boot main CPU.

Common Precautions

It is important to be aware of the following notes and precautions when using a memory card:

- Do not remove the memory card from the LaserLite Mx unless the lock switch is OFF (towards the lock icon).
- Do not remove the memory card or turn off the LaserLite Mx during operations such as file transfer, card formatting, or file deletion. This could damage the memory card.

Doing either of the above could interrupt writing important data management information to the memory card and render some data irretrievable.

Note: Removing a memory card from a LaserLite Mx that has not been turned off automatically places the memory card module processor in 'halt' mode. This prevents any undesirable writing to the memory card. To restart the memory card module processor, the LaserLite Mx must restart from the 'sleep' mode. This happens when the unit is turned off or when it times out. 'Sleep' mode is indicated by a blank display.

The memory card is a precision electronic device; the following cautions are important:

- Do not apply pressure or shock.
- Do not bend or drop.
- Do not use or store the memory card in an environment subject to strong static electricity or electrical noise interference.
- Do not use the memory card in a hot, humid, or corrosive environment.
- Make sure no dirt or foreign particles are on the contact area. Do not touch the contact area with your fingers.
- Clean the memory card with a soft anti-static cloth (available at electronic stores).
- Do not carry the memory card in your pants pocket where it may be bent and damaged by pressure when sitting or moving.

Protecting the Data

- Transferring files to and from the memory card is prevented when a write/protect adhesive seal is applied to the write/protect area. To enable file transfer, remove the write/protect adhesive seal.
- Apply the write/protect adhesive seal properly. Make sure that the write/protect adhesive seal is applied securely in its place.
- Data can be written to the memory card at least 250,000 times. For example, if data is written to the memory card 30 times a day, the card should last at least 20 years.
- Data can be lost or destroyed in the following situations:
    - Improper handling and use of a memory card by the user or third party.
    - Exposure to static electricity or EMI (electronic magnetic interference).
    - Removing the memory card or turning off the LaserLite Mx lock switch during an operation.
    - The memory card can be used reliably over many years, but eventually it loses its ability to store and transfer data. At this point, replace it with a new card.
- Back up important data onto another medium such as a floppy disk or hard disk.

Transferring Files Between the Memory Card and Computer

Use either the **Vxcom** *(Windows)* or **Download** *(DOS)* communications program's commands file to transfer files to and from the memory card. Refer to the *Developer's Reference Manual* for information on communicating with a LaserLite Mx memory card. Chapter 1 of the *Developer's Reference Manual* contains information on using **Vxcom** or **Download**, including information on the commands file. Chapter 5 of the *Developer's Reference Manual* contains information on communicating with a LaserLite Mx memory card.

Formatting a Memory Card

The **MXFORMAT** utility program formats a memory card in a LaserLite Mx and prepares the memory card for operation by installing the Videx Data Management System (DMS) file. (Note: Memory cards purchased from Videx are already formatted and contain the Videx Data Management System software.)

To use the MXFORMAT program to format a memory card:

1. Insert the memory card into the LaserLite Mx and turn the lock switch ON (switch away from lock icon).

2. Click **Browse** at the **Run** window.

3. Locate and open the **MXFORMAT** program. **MXFORMAT** uses the following syntax:

   MXFORMAT -p*n* **-d***n [file.img] file.crd*

4. Click at the end of the path name and add the **MXFORMAT** parameters. (Note: The format parameters only need to be entered the first time **MXFORMAT** is run. You do not need to enter these parameters again, unless the settings or files are changed.)

   The first parameter is the serial port (**-p**); you can use serial ports 1, 2, 3, or 4 (the program uses 1 by default). If you use serial port 1, you do not need to enter this parameter. If you use serial ports 2, 3, or 4, you must enter a **-p** followed by the serial port number.

The second parameter is the IR device (**-d**). Use 0 for a Base Station or a built-in IR transceiver; use 1 for a JetEye. The program uses 0 by default. If you use a Base Station or a built-in IR transceiver, you do not need to enter this parameter. If you use a JetEye, you must enter a **-d1**.

The following table shows the parameters to enter for the serial port and IR device being used:

Serial Port	IR Device	Parameters to Enter	Actual Parameters the Software Uses
1	Base Station or Built-in IR		-p1 -d0 (default)
2	Base Station or Built-in IR	-p2	-p2 -d0
3	Base Station or Built-in IR	-p3	-p3 -d0
4	Base Station or Built-in IR	-p4	-p4 -d0
1	JetEye	-d1	-p1 -d1
2	JetEye	-p2 -d1	-p2 -d1
3	JetEye	-p3 -d1	-p3 -d1
4	JetEye	-p4 -d1	-p4 -d1

Table 2-1 Serial Port and IR Device Parameters

The next parameter is the image file (**file.img**). This parameter is optional. As of this release, an image file for the LaserLite Mx is a combination of the operating system and application program; the image file must have a **.IMG** extension. The image file is written to the memory card after formatting is complete. The file is transferred as an operating system boot file. *(Note: See Chapter 1 of the Developer's Reference Manual for information on using the communications programs (**Vxcom** or **Download**) to create an image file.)*

The final parameter is the **file.crd** parameter. This parameter is required. This file is the executable Data Management System (DMS) for the memory card. The DMS filename is in the form **VTDMS*xxx*.CRD**, where ***xxx*** represents the version number of the file (for example, **VTDMS122.CRD**). The version number will change as new versions of the software are released. The filename will always begin with **VTDMS** and end with a **.CRD** extension.

Example MXFORMAT Command Lines:

The following command line would format a card using serial port 2 and a JetEye IR device:

```
MXFORMAT -p2 -d1 vtdms122.crd
```

The following command line would format a card using serial port 1 and a JetEye IR device, and send an image file named **security.img** to the memory card:

```
MXFORMAT -d1 security.img vtdms122.crd
```

The following command line would format a card using serial port 1 and a Base Station:

```
MXFORMAT vtdms122.crd
```

5. After entering the correct parameters, insert the LaserLite Mx into the Base Station, or point its IR transmitter (located in the end cap) towards the JetEye or the computer's built-in IR transceiver.

6. Click **OK** at the **Run** window to format the memory card.

7. The **MXFORMAT** program displays the **Format Warning** dialog box (Figure 2-3). Click **Continue** to proceed with the memory card format process. (Clicking **Cancel** would quit the **MXFORMAT** program.)

Figure 2-3 Format Warning Dialog Box

7. The **Format a Card** dialog box appears (Figure 2-4).

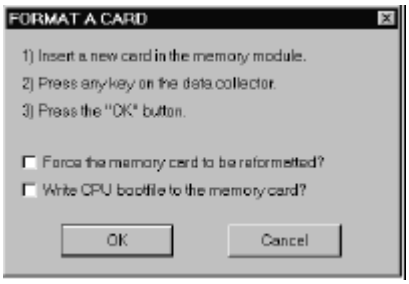


Figure 2-4 Format a Card Dialog Box

If the memory card is already formatted, you can force it to reformat (erasing the current files on the card) by clicking the top checkbox. If the box is not checked and the card is already formatted, only the files specified on the **MXFORMAT** command line are written to the card.

If an image file (*.**IMG**) is listed on the command line, then it can be written to the memory card to make it bootable. Click the lower checkbox to write the image file to the memory card after formatting. If the lower box is not checked, the image file is not written to the memory card. If a *.**IMG** file is not listed on the command line, the checkbox is grayed out and is not selectable.

Click **OK** to begin the formatting process.

8. The **Progress** dialog box appears (Figure 2-5).

Figure 2-5 Progress Dialog Box

The progress bar sweeps from left to right, to indicate that formatting is in progress. Pressing **Cancel** exits the **MXFORMAT** program, but does not stop the formatting process of the memory card.

9. When the memory card completes formatting, the **Formatting in Progress** dialog box is replaced by the **Format Another Card?** dialog box.

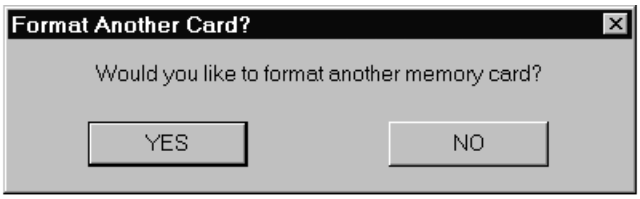


Figure 2-6 Format Another Card Dialog Box

Click **Yes** to format another card; click **No** to close the dialog box and quit the **MXFORMAT** program.

Memory cards can also be formatted by explicitly loading the Data Management System (DMS) software; see Appendix B of the *Developer's Reference Manual* for information.

Appendixes

Notes:

Appendix A Bar Code Reference

Contents

Bar Code Symbologies

There are many different bar code symbologies. The following chart shows some of the more commonly used symbologies.

Bar Code	Uses	Description
Code 3 of 9	Auto parts, labels for sorting, Dept. of Defense, purchasing, and supply control.	Most popular industrial and government bar code symbology. Reliable. Variable length, uses numeric and uppercase letters.
Interleaved 2 of 5	Industry, cartons of food, labels for sorting, and supply control.	A popular industrial bar code symbology. This is a numbers only code and requires an even number of digits to make a legal code.
EAN	European product code.	European retail bar code symbology.
UPC	Universal Product Code; grocery, drug, and medical goods.	A food and drug retail market symbology. This is a variable length code.
Codabar	Medical sample control, photo processing, and libraries.	Used for Red Cross blood banks. This is a variable length code.
Code 128	Shipping/receiving, inventory.	A popular high-density bar code symbology. Variable length with upper and lowercase letters, all ASCII control characters, and all numeric entries.

Figure A-1 Bar Code Symbologies

LaserLite Pro and LaserLite Mx scan Code 3 of 9, Interleaved 2 of 5, EAN, UPC, Codabar, and Code 128 bar code symbologies.

Where to Get Bar Codes

You can print your own bar codes with a bar code printing program or you can purchase printed sheets of bar code labels. The bar codes can be organized in many different ways to meet the requirements of numerous applications. For the best scanning results, it is important to use good quality bar code labels. Contact the Videx Technical Support department if you need a list of vendors that produce high quality bar code labels.

Bar Code Optimum Size

Bar code size is specified by the width of the narrow bars and spaces, which should be equal to each other. Videx recommends using bar codes with a narrow element width (or X-dimension) equal to 15 thousandths of an inch. This size corresponds to about 5 bar code characters per inch. Be sure to include the start and stop characters when calculating characters per inch. Good scanning performance cannot be guaranteed with a narrow element width less than 10 thousandths of an inch. However, the LaserLite Pro and LaserLite Mx with a standard range laser scan engine will usually scan good quality, high-contrast Code 3 of 9 symbology bar codes with narrow elements of 7.5 thousandths of an inch (9 characters per inch). If you are reading higher density bar codes, you may need a LaserLite Pro or LaserLite Mx with a high-density scan engine.

Bar Code Quality

Bar codes of poor quality reduce the scan rate or in extreme cases are not scannable. Quality includes such elements as good contrast, clean printing, and correct dimensions.

The printing must be clean and have the correct dimensional relationships. Ragged edges, white specks in the bars, and black specks in the spaces or quiet zones at the beginning and end of the bar code reduce the scanning performance. The narrow bars should be the same width as the narrow spaces, and likewise for the larger elements. The ratios between bars of different widths should be the values specified by the appropriate standard. Although the LaserLite Pro and LaserLite Mx laser scan engines can compensate for a certain amount of deviation from nominal values, extreme deviation from the standards may produce unscannable bar codes.

A worn impact printer ribbon can cause loss of contrast. Any inked ribbons used to print bar codes must be renewed promptly when bar code darkness begins to diminish.

Be sure to test the bar codes with the LaserLite Pro or LaserLite Mx before implementing them into your system.

Appendix B Product Specifications

Contents

LaserLite Pro and LaserLite Mx Specifications

Physical:	Extruded and cast-aluminum case
Weight:	13.5 oz (383.0 g)
Dimensions:	Width 1.95"/1.75" (49.5/44.4 mm) Depth 2.19" (55.6 mm) Length 7.61" (193.3 mm)
Memory:	128K flash ROM, 256K battery-backed RAM
Extended memory:	LaserLite Mx memory card slot for SSFDC 2 MB, 4 MB, or 8 MB memory cards
Processor:	8051
Internal clock:	Real-time and date, 12/24 hour
Power:	4 AA batteries (alkaline, nickel-metal hydride (NiMH), or nickel-cadmium (NiCad))
Battery life:	Alkaline: Approximately 300,000 button reads or 100,000 scans, or 3 months use
Battery monitor:	8-bit ADC; digitized battery voltage
Back-up battery:	Rechargeable lithium, 10 year useful life; backs up RAM and clock for up to five days without AA batteries; 20 hour charge time
Display:	2-line x 16-character LCD
Keypad:	32 keys include: alphanumeric, scan, scroll up, scroll down, shift, enter, escape, backspace, free memory, battery voltage, space, and 5 function keys
Lock switch:	Locked position (OFF) disables keys, turns off the display, and puts the unit to sleep
Input:	Laser bar code, iButton, keypad

Bar code scanner:	Laser scan engine
Light source:	Visible laser diode, 670nm ± 10nm
Scan rate:	36 (± 3) scans per second
Optical resolutions:	Element width: min. 0.0055" (0.14 mm); max. 0.2" (5.08 mm)
Indicators:	**Key Mode** LED, **Valid SCAN** LED, **Laser ON** LED
Audio:	Beeper
Symbologies:	Code 3 of 9, Codabar, I-2 of 5, UPC, EAN, Code 128
Buttons:	Dallas Semiconductor iButtons (also known as Touch Memory buttons)
Data storage:	Bar code data Origin/family code Date and time
Output:	ASCII text file
Communications:	IR; 0–6" (0–152 mm); 9600 bps
Environment:	Water and dust resistant
Humidity:	0 to 95% noncondensing
Temperature:	Storage: -4° to 140° F (-20° to 60° C) Operating: 32° to 122° F (0° to 50° C)
Regulatory compliance:	FCC, CE, FDA
Warranty:	One year

LaserLite Mx Memory Card Specifications

Product type:	3 volt SSFDC
Memory type:	NAND-type flash memory
Weight:	Approximately 1.8 g (0.065 oz)
Dimensions:	37 mm x 45 mm x 0.76 mm (1.5" x 1.8" x .03")
Operating conditions:	Temperature: 0°C to +40°C (+32°F to +104°F) Humidity: 80% maximum

LaserLite Pro Base Station Specifications

Weight:	7.4 oz (210 g)
Dimensions:	4.0" x 4.0" x 1.8" (102 x 102 x 46 mm)
Power supply adapters:	120 V (60 Hz) Input: 120 VAC, 60 Hz, 7 W Output: 12 VDC, 300 mA Plug Polarity:  220 V (50 Hz) Input: 220 VAC, 50 Hz, 9 W Output: 12 VDC, 300 mA, 3.6 VA Plug Polarity: 
Indicator lights:	Charge, Receive, Transmit, and Power
Connection ports:	Computer, Power, Extension
Switches:	Charge OFF/ON switch; switch ON to recharge NiCad and NiMH batteries; switch OFF when using alkaline batteries
Series connections:	Up to 10 Base Stations can be connected to single serial port (Exception: If using only one power transformer and Charge ON, only a maximum of 3 Base Stations can be connected to a single serial port)
Current:	100 mA with charging 40 mA with charging disabled
Charge current:	Trickle current: 42 mA
Serial communications:	Infrared to data collector; RS-232 to computer (via RJ-11 serial port cable)
Baud rate:	9600 bps
Temperature:	Storage: -4° to 140° F (-20° to 60° C) Operating: 32° to 122° F (0° to 50° C)
Regulatory compliance:	FCC, CE

iButton Specifications

Read-Only iButton Specifications

Button type:	DS1990
Physical:	Memory chip stored inside button-shaped, water-resistant, stainless steel case
Weight:	3 mil button: 0.057 oz (1.6 g) 5 mil button: 0.08 oz (2.3 g)
Dimensions:	3 mil button: 0.642" diameter x 0.126" height (16.3 x 3.2 mm) 0.682" diameter mounting flange (17.3 mm) 5 mil button: 0.642" diameter x 0.23" height (16.3 x 5.9 mm) 0.682" diameter mounting flange (17.3 mm)
Operating temperature:	-40° to 185° F (-40° to 85° C)
Battery:	None
Data storage:	Unique 12-character serial number (read only)

Read/Write iButton Specifications

Button types:	DS1991, DS1992, DS1993, DS1994
Physical:	Non-volatile memory chip stored inside button-shaped, water-resistant, stainless steel case
Weight:	0.12 oz (3.4 g)
Dimensions:	0.642" diameter x 0.23" height (16.3 x 5.9 mm) 0.682" diameter mounting flange (17.3 mm)
Operating temperature:	-4° to 158° F (-20° to 70° C)
Battery:	Lithium
Data storage:	Up to 4 Kbit read/write memory plus unique 12-character serial number (read only)
Clock:	Real-time
Life span:	10 years of data retention

Appendix C Glossary

ASCII: Abbreviation for **A**merican **S**tandard **C**ode for **I**nformation **I**nterchange. A standard code for representing characters as binary numbers, used on most computers and printers.

ASCII text file: A computer file containing only ASCII characters.

Base Station: Device manufactured by Videx, that connects to computer's serial port and provides IR communication to the LaserLite Mx or LaserLite Pro, and also recharges NiCad or NiMH batteries.

data file: A computer file containing data stored on a computer disk.

download: To transfer the data from a LaserLite Pro or a LaserLite Mx to the computer using the IR link (Base Station, JetEye, or internal IR transceiver).

flash memory: Non-volatile memory that can be erased and reprogrammed.

hard disk: A rigid magnetic storage medium that can store large amounts of text. May be either internal or external to the computer.

hexadecimal: A number system with a base of 16. An iButton serial number is hexadecimal.

iButton: Dallas Semiconductor data button that contains unique serial number; also known as Touch Memory buttons.

ID: A number assigned to a LaserLite Pro or LaserLite Mx to identify it to the computer (Default: 0000000000). If using multiple Base Stations attached to a single computer, you will need to assign a unique ID to each data collector.

IR: Abbreviation for infrared communication. Infrared communication provides wireless transfer of data between two IR devices.

IrDA: Abbreviation for the **I**nfra**r**ed **D**ata **A**ssociation (IrDA). IrDA is an independent organization whose charter is to create interoperable, low cost IR data interconnection standards. Setting standards for IR communication is key to effortless communication between brands and type of equipment.

JetEye: Device that connects to computer's serial port and provides IR communication.

LCD: Abbreviation for **L**iquid **C**rystal **D**isplay. The display on the LaserLite Pro and LaserLite Mx is a LCD device.

LED: Abbreviation for **L**ight **E**mitting **D**iode. An LED device lights up when the proper current passes through it. The **Key Mode**, **Valid SCAN**, and **Laser ON** indicators are LED devices.

memory card: A data storage card for the LaserLite Mx; also known as a SmartMedia card or an SSFDC.

program: To give instructions to the LaserLite Pro or LaserLite Mx from the computer using the IR link, so that the unit operates in a particular way.

RAM: Abbreviation for **R**andom-**A**ccess **M**emory. This memory stores information temporarily; the information stored in RAM can be changed.

ROM: Abbreviation for **R**ead-**O**nly **M**emory. This memory's contents can only be read, but not changed. Information is placed into ROM once (during manufacturing) and remains there permanently, even when the power is turned off.

SSFDC: Abbreviation for LaserLite Mx memory card (also known as SmartMedia cards); stands for **S**olid **S**tate **F**loppy **D**isk **C**ard.

serial number: Unique 12-digit hexadecimal number programmed into an iButton at the factory.

serial port: A connector or port on the computer that allows connecting an external device to the computer, so that the computer and the device can communicate. A Base Station or a JetEye IR station is connected to the computer's serial port.

text editor: An editing program which allows you to edit ASCII text files.

Touch Memory Button: Dallas Semiconductor data button that contains a unique serial number; also known as iButtons.

transfer: Send data from the LaserLite Pro or LaserLite Mx to the computer by using the IR link. Also called *download*.

Notes:

Appendix D Cable Pin Out Configurations

Contents

Note on Signal Direction Convention:
RS-232 signal wires are given names that stay with the same wire as it goes between the two devices being connected. Signals that imply a direction, such as “Receive Data,” are named from the perspective of the “Terminal” (DTE) device and may therefore appear to be backward in terms of signal direction when applied to the “Modem” (DCE) device on the other end of the cable. In the lists of pin assignments in this section, an indication of signal direction from the point of view of the device to which the connector is attached has been included in addition to the signal name.

25-Pin Serial Port Cable — DOS/Windows Computer to Base Station (TWC-001)

The cable used to connect the 25-pin serial port of a DOS/Windows computer to the Base Station is shown in Figure D-1.

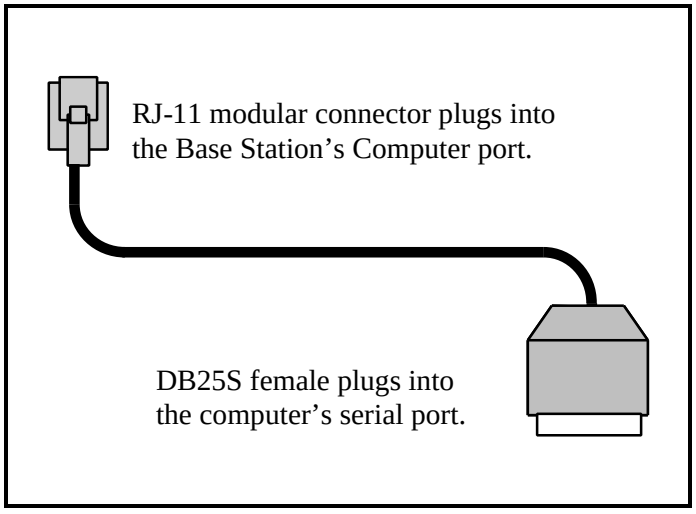


Figure D-1 25-Pin Serial Port Cable

Figure D-2 on the following page shows the pin configuration for the DB25S connector in relation to the RJ-11 modular connector.

25-Pin Serial Port Cable — DOS/Windows Computer to Base Station (TWC-001)

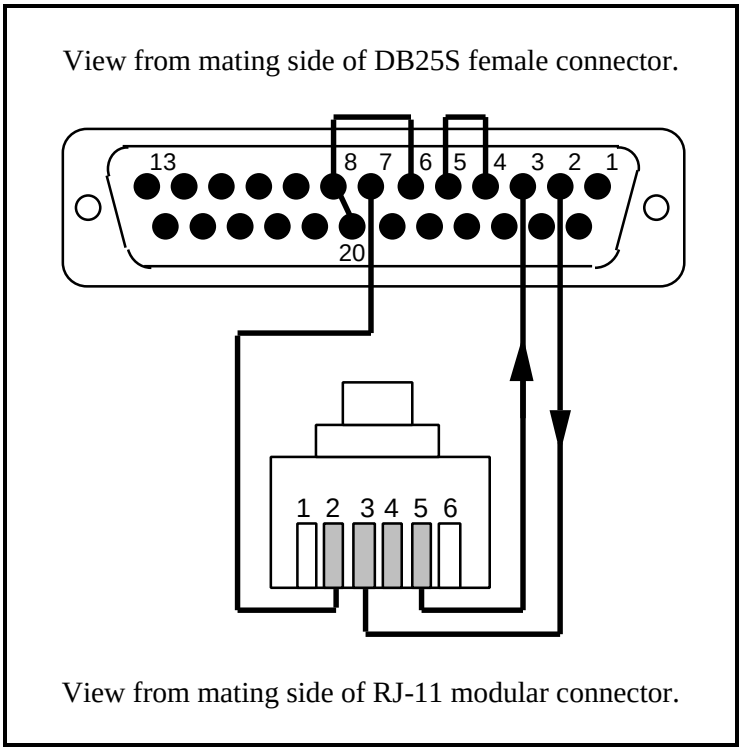


Figure D-2 25-Pin Serial Port Cable Configuration

25-Pin Assignment		Modular Connector Pin Assignment	
2	TXD Transmit Data (Out)		
3	RXD Receive Data (In)	2	Ground
4	RTS Request to Send (Out)	3	TXD (In)
5	CTS Clear to Send (In)	5	RXD (Out)
6	DSR Dataset Ready (In)		
7	Ground		
8	DCD Carrier Detect (In)		
20	DTR Data Terminal Ready (Out)		

9-Pin Serial Port Cable — DOS/Windows Computer to Base Station (TWC-008)

The cable used to connect the 9-pin serial port of a DOS/Windows computer to the Base Station is shown in Figure D-3.

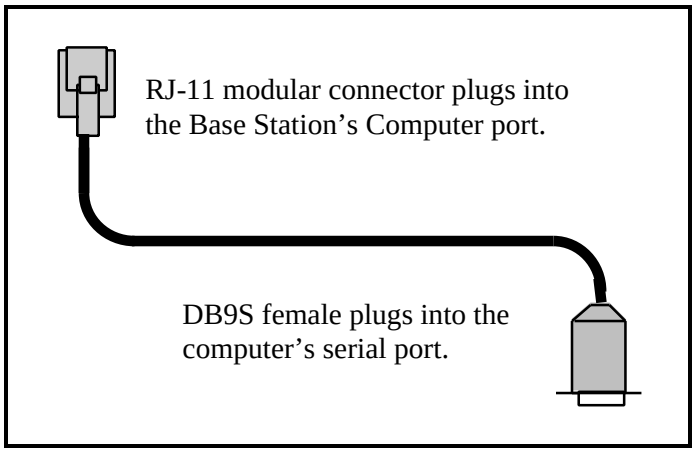
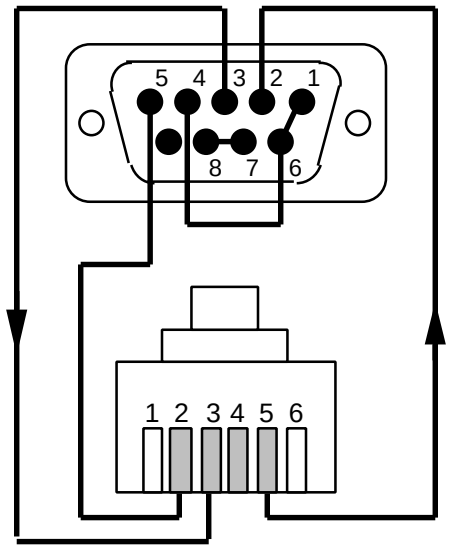


Figure D-3 9-Pin Serial Port Cable

Figure D-4 on the following page shows the pin configuration for the DB9S connector in relation to the RJ-11 modular connector.

9-Pin Serial Port Cable — DOS/Windows Computer to Base Station (TWC-008)

View from mating side of DB9S female connector.



View from mating side of RJ-11 modular connector.

Figure D-4 9-Pin Serial Port Cable Configuration

9-Pin Assignment		Modular Connector Pin Assignment	
1	DCD Carrier Detect (In)		
2	RXD Receive Data (In)	2	Ground
3	TXD Transmit Data (Out)	3	TXD (In)
4	DTR Data Terminal Ready (Out)	5	RXD (Out)
5	Ground		
6	DSR Dataset Ready (In)		
7	RTS Request to Send (Out)		
8	CTS Clear to Send (In)		

DIN 8 Serial Port Cable — Macintosh Computer to Base Station (TWC-009) (LaserLite Pro only)

The cable used to connect the Base Station to the serial port of a Macintosh computer is shown in Figure D-5.

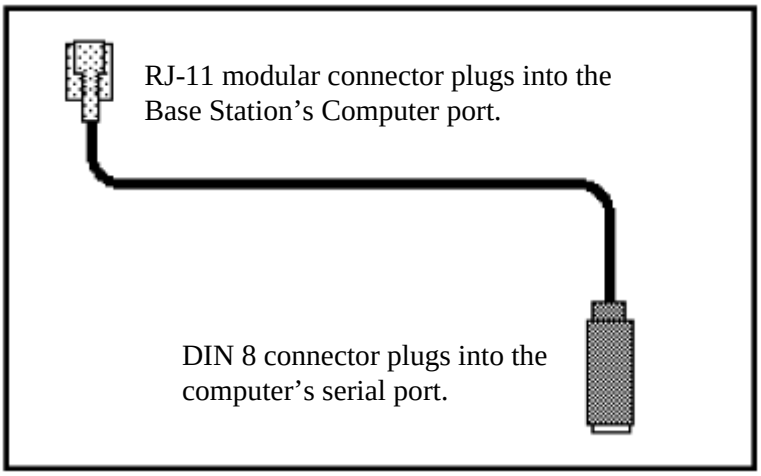


Figure D-5 DIN 8 Serial Port Cable

Figure D-6 on the following page shows the pin configuration for the DIN 8 connector in relation to the RJ-11 modular connector.

DIN 8 Serial Port Cable — Macintosh (LaserLite Pro only)

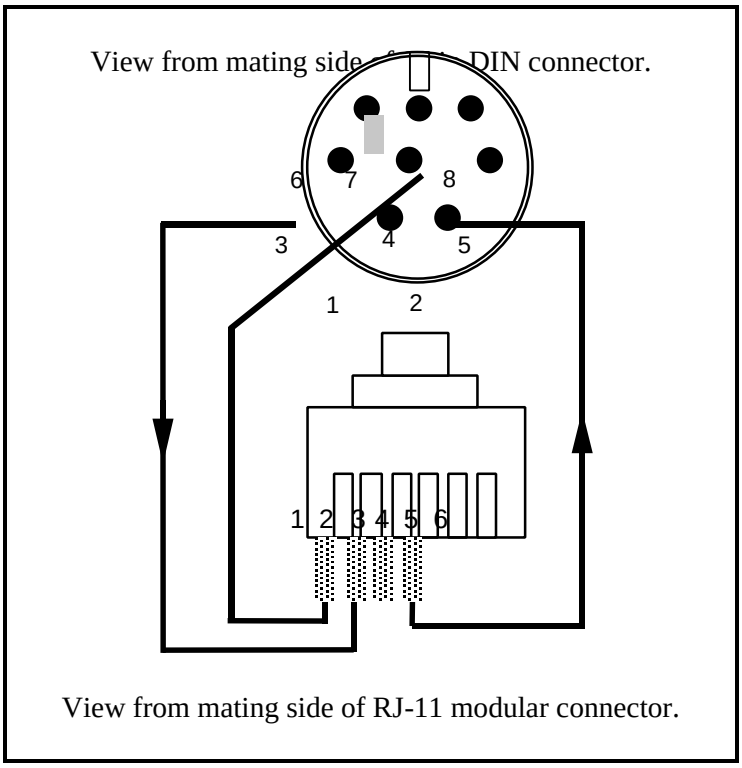


Figure D-6 DIN 8 Serial Port Cable Pin Configuration

DIN 8 Assignment		Modular Connector Pin Assignment	
3	TXD - Transmit Data (Out)		
4	Ground	2	Ground
5	RXD - Receive Data (In)	3	Data In
8	RXD + Receive Data*	5	Data Out

*Positive differential input of RS-422 grounded for noise immunity.

Base Station Interconnect Cable (TWC-006)

This is the cable used to connect multiple Base Stations in series. (See page 64 for information on connecting multiple Base Stations.)

The cable is a standard telephone extension cable. The TWC-006 interconnect cable from Videx is about eight inches long. The recommended maximum length for an interconnect cable is fifty feet.

Figure D-7 shows the pin configuration for the RJ-11 modular connectors at both ends of this cable.

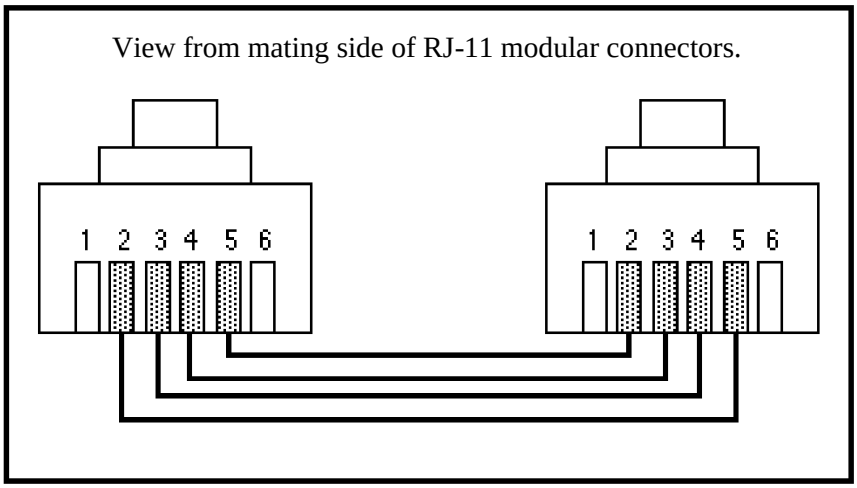


Figure D-7 Interconnect Cable

Appendix E Using Multiple Data Collectors and Base Stations

Contents

Connecting the Base Stations

Videx Base Stations can be connected in series; this allows the user to transfer data from up to ten data collectors in a single transfer process.

To connect multiple Base Stations:

1) Connect the first Base Station to the computer's serial port:
   a) Plug the Base Station's transformer into an electric outlet and connect the other end into the Base Station's **Power** connection.
   b) Use the serial port cable to connect the computer's serial port to the Base Station's **Computer** port.
   c) The Base Station should be placed at least three inches away from the computer and monitor.

2) To add additional Base Stations:
   a) Use an interconnect cable (TWC-006) to connect the **Extension** port of the first Base Station to the **Computer** port on the second Base Station. See Figure E-1.
   b) Continue the same pattern of connection for each additional unit.

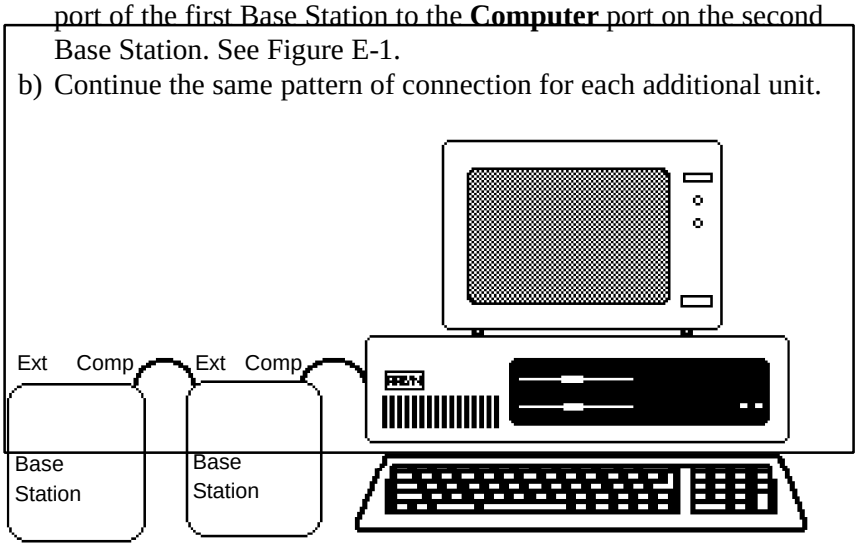


Figure E-1 Base Stations in Series

You can connect up to ten Base Stations to a single serial port.
Exception: If using the charge feature on the LaserLite Pro/Mx Base Station, you can only connect up to three Base Stations to a single power transformer; or you can connect up to ten if each Base Station is plugged into its own power transformer.

To avoid problems when using multiple Base Stations, you need to be aware of the following cautions:

- Each LaserLite Pro or LaserLite Mx used in a multiple Base Station arrangement must have a unique ID.

- When the data transfer process begins, do not remove the data collector from the Base Stations, quit the program, or shut down the computer until the transfer process is complete.

Caution:
When sending an operating system and/or application to a LaserLite Pro or LaserLite Mx, you must have only one LaserLite Pro or LaserLite Mx at a time in the multiple Base Station set up. If there is more than one, the data collector will not be damaged, but it will not be properly programmed.
When transferring data from a LaserLite Pro or LaserLite Mx, do not interrupt the process by removing the unit from its Base Station or aborting the program. The system is designed to avoid data loss, but observing this caution provides added protection.

If you remove a LaserLite Pro or LaserLite Mx while it is in the process of transferring data, the software displays a message that it was unable to communicate with the unit and then continues to try to transfer the data from all of the other units. The data in the interrupted unit will not clear and can be transferred after the others have completed their data transfer.

Changing a Data Collector's ID with a Windows Computer

When using multiple Base Stations, each data collector must be given a unique ID; this allows the computer to access each data collector and verify that it has transferred the data from each one. To assign an ID, you must first create a commands text file, then click and drag the file onto the **Vxcom** icon. **Vxcom** then uses the commands file to unlock the unit and change the ID. (For complete information on **Vxcom** and using a commands text file, see Chapter 1 of the *Developer's Reference Manual*.)

Note: The original **Vxcom** filename was **Vxcomm.exe**; newer versions of **Vxcom** have names in the form **Vxcom*xxx*.exe**, where ***xxx*** corresponds to the version number (for example, **Vxcom138.exe**). The **Vxcom** file is accompanied by a DLL with a name in the form **Vxcom*xxx*.dll**. The original DLL file (**Vxcomm.dll**) is also included because the Application Builder program (**Appbuild.exe**) requires **Vxcomm.dll** to communicate with the unit.

During normal operation, a unit is given an ID of ten zeros. To change the ID, create a text file consisting of the following three command lines:

1) an **I** command, followed by a space, followed by ten zeros to unlock the unit;

2) a **C** command, followed by a space, followed by the new ID for the unit;

3) and an **L** command to relock the unit.

I 0000000000 Sends an unlock command to the data collector. (Note: Ten zeros will unlock any data collector.)

C *new ID#* Changes the unit's ID to the given ID. The ID can be any alphanumeric combination of up to ten characters in length. For example, if you want an ID of 1, this line should be **C 1**; if you want an ID of BuildingD, this line should be **C BuildingD**; if you want an ID of 123#_AB, this line should be **C 123#_AB**, and so on.

L Sends a **LOCK** command and puts the data collector to sleep. When the unit is awakened with a keypress, it immediately runs the current application.

For example, to change a unit's ID to **12345**:

1. Use a word processing program to create a text file containing the following three lines:

```
I 0000000000
C 12345
L
```

2. Save the file as a text file with a **.txt**, **.vdx**, or no extension and quit the program.

3. Place a data collector into the Base Station slot.

IMPORTANT: When sending a file to a data collector, it must be the ONLY data collector attached to the computer.

4. Click and drag the text file you created onto the **Vxcom** icon.

5. **Vxcom** executes the commands listed in the text file: it unlocks the unit, changes the ID to what is listed after the **C** command (in this case, 12345), and then relocks the unit.

6. Remove the data collector from the Base Station slot; it is ready to use.

To continue changing other data collector's IDs:

1. Reopen the text file.

2. Change the ID listed after the **C** command by selecting **12345** and typing in a new ID. (Note: There must be a space character between the **C** and the ID.)

3. Save and close the file.

4. Insert a data collector into the Base Station slot.

5. Click and drag the edited text file to the **Vxcom** icon.

6. **Vxcom** executes the commands listed in the text file: it unlocks the unit, changes its ID to what is listed after the **C** command, and then relocks the unit.

7. Continue these same steps until a unique ID is assigned to each unit.

Note: Keep a list of the IDs; you will need this list in the section "Transferring Data from Multiple Data Collectors."

Changing a Data Collector's ID with a DOS Computer

To assign a unique ID when using a DOS computer, create a commands file, and then enter the name of the commands file on the **Download.exe** command line. **Download.exe** then uses the commands file to unlock the unit and change the ID. (For complete information on **Download.exe** and using a commands file, see Chapter 1 of the *Developer's Reference Manual*.)

During normal operation, a unit is given an ID of ten zeros. To change the ID, you must create a commands file consisting of the following three command lines:

1) an **I** command, followed by a space, followed by ten zeros to unlock the unit;

2) a **C** command, followed by a space, followed by the new ID for the unit;

3) and an **L** command to relock the unit.

I 0000000000	Sends an unlock command to the data collector. (Note: Ten zeros will unlock any data collector.)
C *new ID#*	Changes the unit's ID to the given ID. The ID can be any alphanumeric combination of up to ten characters in length. For example, if you want an ID of 1, this line should be **C 1**; if you want an ID of BuildingD, this line should be **C BuildingD**; if you want an ID of 123#_AB, this line should be **C 123#_AB**, and so on.
L	Sends a **LOCK** command and puts the data collector to sleep. When the unit is awakened with a keypress, it immediately runs the current application.

For example, to change a unit's ID to **12345**:

1. Use a word processing program to create a commands file containing the following three lines:

```
I 0000000000
C 12345
L
```

2. Save the file as a text file with a **.txt** or no extension and quit the program.

3. Place a data collector into the Base Station slot.

IMPORTANT: When you are sending a file to a data collector, it must be the ONLY data collector attached to the computer.

4. Enter the name of the commands file on the **Download.exe** command line.

5. **Download.exe** executes the commands listed in the file: it unlocks the unit, changes the ID as instructed by the **C** command (in this case, 12345), and then relocks the unit.

6. Remove the data collector from the Base Station slot and it is ready to use.

To continue changing other data collector's IDs:

1. Reopen the commands file.

2. Change the ID listed after the **C** command by selecting **12345** and typing in a new ID. (Note: There must be a space character between the **C** and the ID.)

3. Save and close the file.

4. Insert a data collector into the Base Station slot.

5. Reactivate the **Download.exe** command line containing the name of the commands file.

6. **Download.exe** executes the commands listed in the file: it unlocks the unit, changes its ID as instructed by the **C** command, and then relocks the unit.

7. Continue these same steps until you have assigned a unique ID to each of your units.

Note: Keep a list of the IDs you are using; you will use this list in the section "Transferring Data from Multiple Data Collectors."

Changing a LaserLite Pro's ID with a Macintosh Computer

To assign a unique ID to a LaserLite Pro when using a Macintosh computer, you must first create a commands file, then click and drag the file onto the **Videx Download** icon. **Videx Download** then uses the commands file to unlock the unit and change the ID. (For complete information on **Videx Download** and using a commands file, see Chapter 1 of the *Developer's Reference Manual*.) (Note: LaserLite Mx is not Macintosh compatible.)

During normal operation, a LaserLite Pro is given an ID of ten zeros. To change the ID, create a commands file consisting of the following three command lines:

1) an **I** command, followed by a space, followed by ten zeros to unlock the LaserLite Pro;

2) a **C** command, followed by a space, followed by the new ID for the unit;

3) and an **L** command to relock the LaserLite Pro

For example, to change a LaserLite Pro's ID to **12345**:

1. Use a word processing program to create a file containing the following three lines:

```
I 0000000000
C 12345
L
```

2. Save the file as a text file with a **.txt**, **.vdx**, or no extension and quit the program.

3. Place a LaserLite Pro into the Base Station slot.

IMPORTANT: When you are sending a file to a data collector, it must be the ONLY data collector attached to the computer.

4. Click and drag the commands file onto the **Videx Download** icon.

5. **Videx Download** executes the commands listed in the text file: it unlocks the unit, changes the ID to what is listed after the **C** command (in this case, 12345), and then relocks the unit.

6. Remove the LaserLite Pro from the Base Station slot; it is now ready to use.

To continue changing other LaserLite Pro's IDs:

1. Reopen the commands file.

2. Change the ID listed after the **C** command by selecting **12345** and typing in a new ID. (Note: There must be a space character between the **C** and the ID.)

3. Save and close the file.

4. Insert another LaserLite Pro into the Base Station slot.

5. Click and drag the edited commands file to the **Videx Download** icon.

6. **Videx Download** executes the commands in the commands file: it unlocks the unit, changes its ID as instructed by the **C** command, and then relocks the unit.

7. Continue these same steps until you have assigned a unique ID to each LaserLite Pro.

Note: Keep a list of the IDs; you will use this list in the next section "Transferring Data from Multiple Data Collectors."

Transferring Data from Multiple Data Collectors

To transfer data from a group of data collectors in one transfer process, you must:

1. Create a commands text file that uses the **FOREVER**, **FOREACH**, or **FORALL** looping commands to transfer the data from the data collectors.
2. Insert all of the data collectors into their Base Stations.
3. If using Windows, click and drag the commands text file onto the **Vxcom** icon; if using DOS, enter the name of the commands text file on the **Download.exe** command line; or if using Macintosh (LaserLite Pro only), click and drag the commands text file onto the **Videx Download** icon.

The three looping commands provide transfer methods for three different situations. The **FOREVER** loop is useful if you have a computer dedicated to transferring the data from the data collectors. The **FOREACH** loop is useful if you are transferring data from only a portion of the data collectors. The **FORALL** loop is useful if all of the data collectors are required to be transferred during the process.

The following table describes the looping commands:

FOREVER	For use with a computer that is dedicated to transferring data. This loop will transfer the data from any data collector it locates. This loop attempts to execute commands within a loop indefinitely.
FOREACH	This loop will search for each data collector in the list of IDs. If it locates the data collector with the ID, it executes the commands within the loop once; if it does not locate the data collector with the ID, it goes on to the next ID. This loop attempts to execute commands within a loop once for each ID listed.
FORALL	This loop will look for each listed data collector's ID until it has located and transferred the data from each ID in the list. This loop attempts to execute commands within a loop indefinitely, until all listed IDs have been located.

Table E-1 Looping Commands

FOREVER Looping Command

The following example shows how the **FOREVER** loop is used in a commands text file to continually look for data collectors to transfer.

Example FOREVER Commands File:

```
FOREVER                 'Begin the loop.
    I 0000000000
    'Unlock any unit.
    M1 Transferring Data     'Put message on display.
    S                   'Transfer data from unit.
    Z                   'Clear data from unit.
    T                   'Set time by computer's time.
    G                   'Restart the application.
END             'End loop, begin re-executing at top.
```

Note on the Unlock command (I id): No additional characters should be included on the same line as the **Unlock** command. Any characters after the unit ID (for example, space characters or comments) will cause this command to fail. In the above example, the comment associated with the **Unlock** command is on a separate line.

FOREACH Looping Command

The following example shows how the **FOREACH** loop is used in a commands text file to attempt to transfer the data from each data collector in the list once.

Example FOREACH Commands File:

You can either list the IDs individually as in the first line of Example 1, or you can make a text file of the IDs and use the filename in quotes as on the first line of Example 2.

Example 1 Commands Text File for Transferring Data from Multiple Data Collectors (IDs listed on command line):

```
FOREACH ID1, ID2, ID3   'Begin the loop. All IDs
                        'listed on line.
   I loop_id
'Unlock the unit using the special identifier. This
'identifier substitutes for all the units listed on
'the first line.
   M1 Transferring Data 'Put message on display.
   S                    'Transfer data from unit.
   Z                    'Clear data from unit.
   T                    'Set time by computer's time.
   L                    'Lock unit and put to sleep.
END             'End loop, begin re-executing at top.
```

Note on the loop_id argument: When the argument of the **Unlock** command is a specific ID (as in the previous **FOREVER** example), the program attempts to unlock the unit 8 times at 5-second intervals. This ensures that a unit is unlocked regardless of its sleep cycle (a unit sleeps for 25 seconds, then wakes for 5 seconds). If the program does not unlock a unit, the program returns an error and aborts. On the other hand, when the argument of the **Unlock** command is **loop_id** (as in the **FOREACH** example), the program only makes one attempt to unlock the unit. If it is successful, it performs the remaining commands in the loop; if not successful, it moves on to the next value for loop_id without aborting the program. Given the unit's sleep cycle, it is unlikely that one attempt will successfully unlock a unit. Therefore, it would generally not be reasonable to use a **FOREACH** loop by itself as in the above

example. For examples showing appropriate use of a **FOREACH** loop, refer to the discussions of Scenarios 3 and 4 on pages 80–81.

Example 2 Commands Text File for Transferring Data from Multiple Data Collectors (IDs listed in **IDs.txt** file):

```
FOREACH "IDs.txt"       'Begins the loop. All IDs
                        'listed in the IDs.txt file.
   I loop_id
'Unlock the unit using the special identifier. This
'identifier substitutes for all the units listed on
'the first line.
   M1 Transferring Data 'Put message on display.
   S                    'Transfer data from unit.
   Z                    'Clear data from unit.
   T                    'Set time by computer's time.
   L                    'Lock unit and put to sleep.
END                     'End loop, begin re-executing
                        'at top.
```

The **IDs.txt** file must contain a list of the IDs. The IDs in the text file must be separated by commas or spaces.

FORALL Looping Command

The following two examples show how the **FORALL** loop is used in a commands text file to transfer the data from each data collector in the list.

Example FORALL Commands File:

You can either list the IDs individually as in the first line of Example 1, or you can make a text file of the IDs and use the filename in quotes as on the first line of Example 2.

Example 1 Commands Text File for Transferring Data from Multiple Data Collectors (IDs listed on command line):

```
FORALL ID1, ID2, ..., IDN     'Begins loop. All IDs
                              'listed on this line.
   I loop_id
'Unlock the unit using the special identifier. This
'identifier substitutes for all the units in the
'IDs.txt file.
   M1 Transferring Data 'Put message on display.
   S                    'Transfer data from unit.
   Z                    'Clear data from unit.
   T                    'Set time by computer's time.
   L                 'Lock unit and put it to sleep.
END              'End loop, begin re-executing at top.
```

Example 2 Commands Text File for Transferring Data from Multiple Data Collectors (IDs listed in **IDs.txt** file):

```
FORALL "IDs.txt"  'Begin the loop.
   I loop_id
'Unlock the unit using the special identifier. This
'identifier substitutes for all the units in the
'IDs.txt file.
   M1 Transferring Data 'Put message on display.
   S                    'Transfer data from unit.
   Z                    'Clear data from unit.
   T                    'Set time by computer's time.
   L              'Lock the unit and put it to sleep.
END            'End loop, begin re-executing at top.
```

The **IDs.txt** file must contain a list of the IDs. The IDs in the list must be separated by commas or spaces.

In order to clarify the functioning of these different looping structures, it is helpful to consider four different scenarios for transferring data from multiple units.

Scenario #1: The user has multiple data collectors to transfer, but only one at a time will be put in the Base Station or in front of the JetEye. A computer is dedicated to transferring data collectors as they become available. In this situation, the units do not need to be assigned individual IDs and a **FOREVER** loop can be used:

```
FOREVER
I 0000000000
M1 Transferring Data
S
Z
T
L
END
```

This loop will continue indefinitely, unlocking any data collector that is available. It is important that only one unit at a time be in the Base Station or in front of the JetEye when using this looping structure. This loop will unlock any data collector; if more than one data collector is unlocked at a time, communications will fail.

Scenario #2: The user has multiple data collectors to transfer. Some or all of them may be in the Base Station at any time. Each of the units must be transferred exactly one time. A computer is dedicated to transferring the units as they become available. In this situation, each unit must be assigned a unique ID and the **FORALL** loop can be used:

```
FORALL "IDs.txt"
      I loop_id
      M1 Transferring Data
      S
      Z
      T
      L
END
```

This loop will continue until the data from each unit in the **IDs.txt** file has been transferred once. Multiple units can be in the Base Station at one time because only one unit will be unlocked at a time.

Scenario #3: The user has multiple data collectors to transfer. Some or all of them may be in the Base Station at any time. Each unit is to be transferred when it is placed in the Base Station; some of the units may be transferred more than one time. A computer is dedicated to transferring the units as they become available. In this situation, each unit must be assigned a unique ID and a **FOREACH** loop nested inside a **FOREVER** loop can be used:

```
FOREVER
      FOREACH "IDs.txt"
            I loop_id
            M1 Transferring Data
            S
            Z
            T
            L
      END
END
```

This loop will continue indefinitely, continually attempting to unlock any units whose IDs are contained in the **IDs.txt** file. Unlike the **FORALL** loop in Scenario #2, this loop will continue attempting to transfer the data from a data collector even after it has been successfully transferred one time.

Scenario #4: The user has multiple data collectors to transfer; all of the units to be transferred are in their Base Stations. However, some of the units (listed in the **IDs.txt** file) are not available to transfer. If the computer is unable to unlock a particular unit, the computer will stop trying to unlock that unit. In this situation, each unit must have a unique ID and a **FOREACH** loop can be used:

```
FOREACH "IDs.txt"
      I loop_id
      M1 Transferring Data
      S
      Z
      T
      L
END
```

As was explained in the earlier discussion of the **FOREACH** loop, when the argument of the **Unlock** command is **loop_id**, the program only makes one attempt to unlock the unit. Given the unit's sleep cycle, it is unlikely that one attempt will successfully unlock a unit. However, it is possible to ensure that each unit is awake when the program attempts to unlock it. This is done by placing six unused IDs at the beginning of the **IDs.txt** file (Figure E-2).

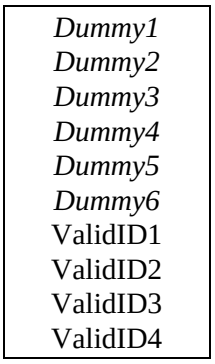


Figure E-2 Sample IDs.txt File

If a unit is awake and receives an **Unlock** command with the wrong ID, it will stay awake as long as it detects activity on the serial port. By placing six unused IDs at the beginning of the **IDs.txt** file, it is possible to ensure that each unit receives at least one **Unlock** command with an invalid ID and then stays awake. Then each unit is awake when the **FOREACH** loop attempts to unlock it and the data from the unit is transferred. The program only attempts to unlock each unit one time; if a unit is not present, the program moves on to the next ID. The program quits after attempting one time to unlock and transfer each unit.

For complete information on using the commands file, see Chapter 1 of the *Developer's Reference Manual*.

Notes on Using Multiple Data Collectors

To avoid problems when using multiple data collectors and Base Stations, you need to be aware of the following cautions:

- Each LaserLite Pro and LaserLite Mx used in a multiple Base Station arrangement must have a unique ID. See the preceding section in this appendix for information on changing the ID of a LaserLite Pro or LaserLite Mx.
- When the data transfer process begins do not remove a LaserLite Pro or LaserLite Mx from its Base Station, quit the program, or shut down the computer until the transfer process is completed.

Caution:
When sending an operating system and/or application to a LaserLite Pro or LaserLite Mx, you must have only one LaserLite Pro or LaserLite Mx at a time in the multiple Base Station set up. If there is more than one, the data collectors will not be damaged, but they will not be properly programmed.
When transferring data, do not interrupt the process by removing the unit from its Base Station or aborting the program. The system is designed to avoid data loss, but observing this caution provides added protection.

If you remove a LaserLite Pro or LaserLite Mx while it is in the process of transferring data, the software displays a message that it was unable to communicate with the unit and then continues to try to transfer the data from all of the other data collectors. The data in the interrupted unit will not be cleared and can be transferred after the others have completed their data transfer.

Key Points on Using Multiple Data Collectors

- Each LaserLite Pro and LaserLite Mx must have a unique ID.
- When sending files to a LaserLite Pro or LaserLite Mx, it must be the only unit in a Base Station.
- Do not interrupt the data transfer process.
- Data is not cleared from a LaserLite Pro or LaserLite Mx until all of the data is correctly transferred to the computer.

Appendix F Resetting the LaserLite Pro and LaserLite Mx

In the unlikely event that a LaserLite Pro or LaserLite Mx locks up and does not correct itself after sitting for 2 to 3 minutes, you will need to manually reset the unit to Monitor mode and resend the operating system software to the data collector.

To manually reset the unit to Monitor mode:

1) Remove the battery end cap.

2) Hold the scan button down while replacing the battery end cap.

3) The unit will beep three times, indicating a successful reset.

4) The LaserLite Pro will show **VX1 Monitor 1.11** or **VX1 Monitor 1.34** on the first line, and **Ready, bps=9600** on the second line of the display. The LaserLite Mx will show **VX1 Monitor 1.33** or **VX1 Monitor 1.34** on the first line, and **Ready, bps=9600** on the second line of the display.

5) Verify that the computer's IR station (Base Station, JetEye, or internal IR transceiver) is attached to the computer and ready to use.

6) Prepare the LaserLite Pro or LaserLite Mx to communicate with the computer, by either inserting the unit into the Base Station or pointing its IR transmitter (located in the end cap) towards the JetEye or built-in IR transceiver.

The next steps guide you through resending the operating system software to the LaserLite Pro or LaserLite Mx. (Note: The LaserLite Mx is not Macintosh compatible.)

- If you are using Windows 95/98/NT, go to Step 7 on page 84.
- If you are using DOS, go to Step 7 on page 87.
- If you are using a Macintosh computer (LaserLite Pro only), go to Step 7 on page 88.

For Windows users *(from page 83):*

If you have previously used **Vxcom**, proceed to Step 9. If you have not used **Vxcom**, complete Steps 7 and 8 before proceeding to Step 9. Note: The original **Vxcom** filename was **Vxcomm.exe**; newer versions of **Vxcom** have names of the form **Vxcom*xxx*.exe**, where ***xxx*** corresponds to the version number (such as, **Vxcom138.exe**).

7) Choose the **Run** command from the Windows **Start** menu and click **Browse** (Figure F-1).

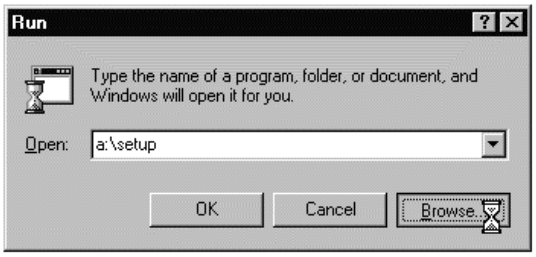


Figure F-1 Run Window - Click Browse

8) Locate and open the **Vxcom** program. Click at the end of the path name to add the parameters (Figure F-2).

   The syntax is: [-p<port number>] [-d<IR device>]. Spaces are used to separate the parameters from each other.

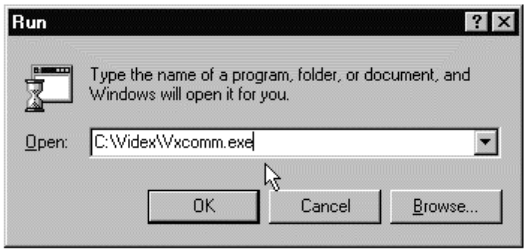


Figure F-2 Add Vxcom Parameters

   The first parameter is the serial port (**-p**); the program uses 1 by default. If you are using serial port 1, you do not need to enter

this parameter. If you are using serial ports 2, 3, or 4, you must enter a **-p** followed by the serial port number (that is, **-p2** for serial port 2, **-p3** for serial port 3, **-p4** for serial port 4).

The next parameter is the IR device (**-d**); the program uses 0 by default. If using a Base Station or a built-in IR transceiver, you do not need to enter this parameter; if using a JetEye, you must enter a **-d1**.

Enter the appropriate parameters and click **OK** to close the **Run** window and save the entry. Table F-1 on the page 86 summarizes the serial port and IR device transfer parameters.

(Note: The transfer parameters only need to be entered the first time you use **Vxcom**; you do not need to enter these parameters again unless the parameters change.)

9) Resend the operating system and application to the LaserLite Pro or LaserLite Mx by dragging the operating system file icon (***Pro122a.OS*** for LaserLite Pro, ***Lmx123.OS*** for LaserLite Mx), along with an application icon (**Default.s** for the LaserLite Pro, **Mx-Demo.s** for the LaserLite Mx, or use your own application) to the **Vxcom** icon (Figure F-3).

(Note: The actual filename of the operating system files ***(Pro122a.OS, Lmx123.OS)*** supplied with this software may be different, because the last characters of the name will change as new versions of the software are released. However, the operating system filename for a LaserLite Pro will always begin with **Pro**, and the filename for the LaserLite Mx will always begin with **Lmx**. The filename will always have a **.OS** extension.)

Figure F-3 Vxcom Icon

10) **Vxcom** begins looking for the LaserLite Pro or LaserLite Mx. Press any key on the data collector to begin the transfer. A window opens (Figure F-4) and reports the progress of the transfer.

Figure F-4 Vxcom Progress Window

(See Chapter 1 of the *Developer's Reference Manual* for complete information on **Vxcom**.)

The following table summarizes the parameters for **Vxcom** and **DOWNLOAD.exe**:

Serial Port	**IR Device**	**Parameters to Enter**	**Actual Parameters the Software Uses**
1	Base Station or Built-in IR		-p1 -d0 (default)
2	Base Station or Built-in IR	-p2	-p2 -d0
3	Base Station or Built-in IR	-p3	-p3 -d0
4	Base Station or Built-in IR	-p4	-p4 -d0
1	JetEye	-d1	-p1 -d1
2	JetEye	-p2 -d1	-p2 -d1
3	JetEye	-p3 -d1	-p3 -d1
4	JetEye	-p4 -d1	-p4 -d1

Table F-1 Serial Port and IR Device Transfer Parameters

For DOS users *(from page 83):*

7) To resend the operating system software to the LaserLite Pro or LaserLite Mx with **DOWNLOAD.exe**, use the following syntax:

   DOWNLOAD sys.os app.s -p*n* -d*n*

   Where **sys.os** is the name of the operating system file, **app.s** is the name of the application file, **-p*n*** specifies the serial port (default is 1), and **-d*n*** specifies the configuration (0 for Base Station or built-in IR transceiver (default), 1 for JetEye). Table F-1 on page 86 summarizes the serial port and IR device transfer parameters.

   The actual filename of the operating system files (***Pro122a.OS*** for LaserLite Pro, ***Lmx123.OS*** for LaserLite Mx) may be different, because the last characters of the name will change as new versions of the software are released. However, the operating system filename for a LaserLite Pro will always begin with **Pro**, and the operating system filename for the LaserLite Mx will always begin with **Lmx**, and they will always have a **.OS** extension.

   The factory installed application file for the LaserLite Pro is **Default.s** and for the LaserLite Mx it is **Mx-Demo.s**, or use your own application if desired.

   For example, to send the operating system file and the default application to a LaserLite Pro using serial port 2 and a JetEye, type the following at the DOS prompt:

   DOWNLOAD Pro122a.OS default.s -p2 -d1

   To send the operating system file and default application to a LaserLite Mx using serial port 1 and a Base Station, type the following at the DOS prompt:

   DOWNLOAD Lmx123.OS mx-demo.s

   To send the operating system file and an application to a LaserLite Pro using serial port 3 and a Base Station, type the following at the DOS prompt:

   DOWNLOAD Pro122a.OS security.s -p3

   (See Chapter 1 of the *Developer's Reference Manual* for complete information on **DOWNLOAD.exe**.)

For Macintosh users (LaserLite Pro only) *(from page 83):*

When loading the operating system with a Macintosh computer, you must also load an application file (**.S** extension) along with the operating system software. In the following example, we load the default application (**Default.s**) with the operating system.

7) Resend the operating system software to the LaserLite Pro, by selecting the operating system file (**Pro122a.OS**) and an application file (**Default.s**) (Figure F-5).

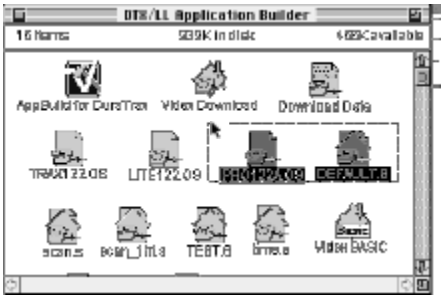


Figure F-5 Operating System and Application Files Selected

8) Click and drag the two files to the **Videx Download** icon (Figure F-6). This starts the **Videx Download** program that transfers the files to the LaserLite Pro.

Figure F-6 Videx Download Icon

(Note: The actual filename of the operating system file may be different, because the last characters of the name will change as new versions of the software are released. However, the operating system filename for a LaserLite Pro will always begin with **Pro** and have a **.OS** extension.)

(See Chapter 1 of the *Developer's Reference Manual* for complete information on **Videx Download**.)

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