

# Signature Capture

## Reference Guide





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## Revision History

Changes to the original manual are listed below:

Change	Date	Description
-01 Rev A	11/2006	Initial Release. (Hypercom Rev. A)



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## Introduction

This guide includes information about signature capture formats and resolution.



**NOTE** Screens and windows pictured in this guide are samples and can differ from actual screens.



**IMPORTANT** Any references in this guide to Hypercom Corporation, Hypercom logo, Hypercom file names and file paths, Hypercom software and terminals reflect hardware and software manufactured by Hypercom Corporation for Symbol Technologies, Inc.

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## Notational Conventions

The following conventions are used in this document:

- *Italics* are used to highlight the following:
  - Chapters and sections in this and related documents
  - Drop-down list and list box names
  - Check box and radio button names
  - Icons on a screen.
- **Bold** text is used to highlight the following:
  - Names of windows
  - Dialog box components.
- bullets (•) indicate:
  - Action items
  - Lists of alternatives
  - Lists of required steps that are not necessarily sequential
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

- Special icons:



**NOTE** Notes contain neutral or positive information supplementing the main text. It is often information that applies only to special cases.



**IMPORTANT** Important statements draw attention to information crucial to using the product successfully. Pay special attention to Important statements.



**CAUTION** Cautions advise that a negative result, such as a loss of data, may occur.



**WARNING!** Warnings provide information that is essential to the safety of the user, the equipment, or both. Failure to do as instructed may result in physical damage.

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## Related Documents

For the latest version of this and all payment solution guides go to: <http://www.symbol.com/manuals>.

## Service Information

For service information, warranty information, technical assistance or problems with the equipment, contact the regional Symbol Global Customer Interaction Center. Before calling, have the model number, serial number and several bar code symbols at hand.

Call the Global Customer Interaction Center from a phone near the scanning equipment so that the service person can try to troubleshoot the problem. If the equipment is found to be working properly and the problem is reading bar codes, the Support Center will request samples of the bar codes for analysis at our plant.

If the problem cannot be solved over the phone, it may be necessary to return the equipment for servicing. If that is necessary, the Global Customer Interaction Center will provide specific directions.

- ✓ **NOTE** Symbol Technologies is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty. If the original shipping container was not kept, contact Symbol to have another sent.

If the Symbol product was purchased from a Symbol Business Partner, contact that Business Partner for service.

## Global Customer Interaction Center

The addresses and telephone numbers below are provided for you convenience. However, this information can change due to telephone provider updates. For the most up-to-date contact number information, visit: [www.symbol.com/contactsupport](http://www.symbol.com/contactsupport) for a Customer Interaction Center in your area.

Country/Region	Address	Telephone
United States	Symbol Technologies, Inc. One Symbol Plaza Holtsville, New York 11742-1300	1-800-653-5350
Canada	Symbol Technologies Canada, Inc. 5180 Orbitor Drive Mississauga, Ontario, Canada L4W 5L9	1-866-416-8545 (Inside Canada) 905-629-7226 (Outside Canada)
United Kingdom	Symbol Technologies Symbol Place Winnersh Triangle, Berkshire RG41 5TP United Kingdom	0800 328 2424 (Inside UK) +44 118 945 7529 (Outside UK)
Asia/Pacific	Symbol Technologies Asia, Inc. (Singapore Branch) 230 Victoria Street #12-06/10 Bugis Junction Office Tower Singapore 188024	Tel: +65-6796-9600 Fax: +65-6337-6488
Australia	Symbol Technologies Pty. Ltd. 432 St. Kilda Road Melbourne, Victoria 3004	1-800-672-906 (Inside Australia) +61-3-9866-6044 (Outside Australia)

<b>Country/Region</b>	<b>Address</b>	<b>Telephone</b>
Österreich/Austria	Symbol Technologies Austria GmbH Prinz-Eugen Strasse 70 / 2.Haus 1040 Vienna, Austria 01-5055794-0 (Inside Austria)	+43-1-5055794-0 (Outside Austria)
Danmark/Denmark	Symbol Technologies AS Dr. Neergaardsvej 3 2970 Hørsholm	7020-1718 (Inside Denmark) +45-7020-1718 (Outside Denmark)
Europe/Mid-East Distributor Operations		Contact your local distributor or call +44 118 945 7360
Suomi/Finland	Oy Symbol Technologies Kaupintie 8 A 6 FIN-00440 Helsinki, Finland	9 5407 580 (Inside Finland) +358 9 5407 580 (Outside Finland)
France	Symbol Technologies France Centre d’Affaire d’Antony 3 Rue de la Renaissance 92184 Antony Cedex, France	01-40-96-52-21 (Inside France) +33-1-40-96-52-50 (Outside France)
Deutschland/ Germany	Symbol Technologies GmbH Waldstrasse 66 D-63128 Dietzenbach, Germany	6074-49020 (Inside Germany) +49-6074-49020 (Outside Germany)
Italia/Italy	Symbol Technologies Italia S.R.L. Via Cristoforo Columbo, 49 20090 Trezzano S/N Naviglio Milano, Italy	2-484441 (Inside Italy) +39-02-484441 (Outside Italy)
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México/Mexico	Symbol Technologies Mexico Ltd. Torre Picasso Boulevard Manuel Avila Camacho No 88 Lomas de Chapultepec CP 11000 Mexico City, DF, Mexico	5-520-1835 (Inside Mexico) +52-5-520-1835 (Outside Mexico)
Nederland/ Netherlands	Symbol Technologies Kerkplein 2, 7051 CX Postbus 24 7050 AA Varsseveld, Netherlands	315-271700 (Inside Netherlands) +31-315-271700 (Outside Netherlands)

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Norge/Norway	Symbol's registered and mailing address: Symbol Technologies Norway Hoybratenveien 35 C N-1055 OSLO, Norway Symbol's repair depot and shipping address: Symbol Technologies Norway Enebakkveien 123 N-0680 OSLO, Norway	+47 2232 4375
South Africa	Symbol Technologies Africa Inc. Block B2 Rutherford Estate 1 Scott Street Waverly 2090 Johannesburg Republic of South Africa	11-809 5311 (Inside South Africa) +27-11-809 5311 (Outside South Africa)
España/Spain	Symbol Technologies S.L. Avenida de Bruselas, 22 Edificio Sauce Alcobendas, Madrid 28108 Spain	91 324 40 00 (Inside Spain) +34 91 324 40 00 (Outside Spain) Fax: +34.91.324.4010
Sverige/Sweden	"Letter" address: Symbol Technologies AB Box 1354 S-171 26 SOLNA Sweden  Visit/shipping address: Symbol Technologies AB Solna Strandväg 78 S-171 54 SOLNA Sweden	Switchboard: 08 445 29 00 (domestic) Call Center: +46 8 445 29 29 (international) Support E-Mail: Sweden.Support@se.symbol.com



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## Introduction

Symbol signature capture products record the graphical signature data in a vector graphics format. The signature consists of a series of lines, each with a starting point and a destination point. The details of the format are shown below.

Symbol's legacy signature capture products all scale the signature the same way. This causes reproduction problems when moving from one capture device to another because of differences in scaling and aspect ratio. This legacy format also has resolution problems on some pads.

Symbol's current signature capture products have an enhanced mode that solves both the reproduction problems and the resolution problems.

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## Legacy Format

The legacy signature capture products scale the signature with a horizontal range of 640 corresponding to the full width of the pad and 128 corresponding to the full height of the pad. Any application attempting to reproduce the signature needs to know the dimensions of the pad in order to properly scale the signature on the output device.

For the ICE 4000 product, the vertical range of 128 includes the fixed-button portion of the screen. A typical signature on the ICE 4000 uses a vertical range of about 10. Because of the shorter height on the ICE 5500 pad, the typical signature uses a vertical range of about 20. This scaling discrepancy causes problems when reproducing the signature.

## Signature Capture Resolution

A captured signature has a resolution of 640 X 128 pixels. The signature coordinate limits are:

(0,0)	(639,0)
(0,127)	(639,127)

**Figure 1-1** *Figure 1. Signature Coordinate Limits (Legacy Format)*

## Signature Data Format

A signature is stored as a stream of bits. Within the bit stream there are two types of bit sequences: Move and Draw. The initial bit of a sequence indicates which type of sequence it is. Signature data always starts with a Move, thus the first bit (the most significant bit of the first byte) is always a “1” and this information can be used to identify the legacy format.

### Move

A Move sequence is processed by moving the graphics cursor to the absolute X,Y position specified by the sequence data. The first sequence in a compressed signature will always be a Move sequence. A Move sequence is 18-bits long.

**Table 1-1** Move Sequence (Legacy Format)

<b>1xxxxxxxxxyyyyyy</b>	
1	Move sequence indicator.
Xxxxxxxxx	10-bit absolute X coordinate (0 to 639).
Yyyyyyy	7-bit absolute Y coordinate (0 to 127).

### Draw

A Draw sequence is processed by adding the X and Y change values to the previous graphics cursor position to determine the new cursor position. A Draw sequence is 13-bits long.

**Table 1-2** Draw Sequence (Legacy Format)

<b>0sxxxxsyyyyy</b>	
0	Draw sequence indicator.
Sxxxxx	Signed change in the X coordinate (-31 to +31).
Syyyyyy	Signed change in the Y coordinate (-31 to +31).

Since the signature bit stream is transmitted a byte at a time, there may be as many as seven extra bits at the end of a signature. These extra bits should be discarded.

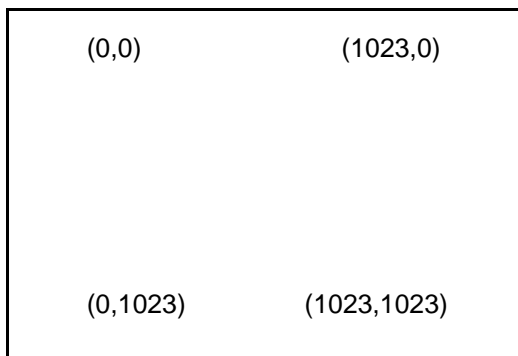


## Enhanced Format

The current versions of the ICE 4000, ICE 5500, ICE 6000, and ICE 6500 products have an enhanced resolution mode allowing for a range of up to 1024 for both horizontal and vertical coordinates. More importantly, this enhanced mode now includes a header documenting the scaled resolution and the size of the pad. With this new enhanced mode, we cannot only capture better signatures, but we can also reproduce them more accurately.

### Signature Capture Resolution

A captured signature has a resolution of up to 1024 X 1024 pixels. The actual resolution will depend upon the value specified in the application. Assuming maximum resolution, the signature coordinate limits are:



**Figure 1-2** *Figure 2. Signature Coordinate Limits (Enhanced Format)*

### Signature Data Format

A signature is stored as a ten-byte header followed by binary data.

#### Signature Header

The signature header consists of the following data.

**Table 1-3** *Signature Header Data*

Size	Description
8 bits	ID (all bits 0)
8 bits	Header Data Length to follow in bytes (MSB first, =8)
16 bits	X-Axis Scaled Resolution (horizontal full-scale range up to 1024, MSB first)

**Table 1-3** Signature Header Data (Continued)

Size	Description
16 bits	Y-Axis Scaled Resolution (vertical full-scale range up to 1024, MSB first)
16 bits	X-Axis Physical Size (width of pad in .01 mm units, for the ICE 5500 this is 6717 corresponding to 67.17 mm, MSB first)
16 bits	Y-Axis Physical Size (height of pad in .01 mm units, MSB first)

Since the first bit of the signature data (the MSB of the first byte) is always a “0”, this key can be used to identify whether the signature data is in the legacy format or the enhanced format.

### Signature Binary Data

The signature binary data is a stream of bits. Within the bit stream there are two types of bit sequences: Move and Draw. The initial bit of a sequence indicates what type it is.

#### **Move**

A Move sequence is processed by moving the graphics cursor to the absolute X,Y position specified by the sequence data. The first sequence in a compressed signature will always be a Move sequence. A Move sequence is 21-bits long.

**Table 1-4** Move Sequence (Enhanced Format)

<b>1xxxxxxxxxyyyyyyy</b>	
1	Move sequence indicator.
Xxxxxxxxxx	10-bit absolute X coordinate (0 to 1023).
Yyyyyyyyyy	10-bit absolute Y coordinate (0 to 1023).

#### **Draw**

A Draw sequence is processed by adding the X and Y change values to the previous graphics cursor position to determine the new cursor position. The Draw sequence is 13-bits long.

**Table 1-5** Draw Sequence (Enhanced Format)

<b>0sxxxxxyyyyy</b>	
0	Draw sequence indicator.
Sxxxxx	Signed change in the X coordinate (-31 to +31).
Syyyyy	Signed change in the Y coordinate (-31 to +31).

Since the signature bit stream is transmitted a byte at a time, there may be as many as seven extra bits at the end of a signature. These extra bits should be discarded.

## Symbol SigCapDisplay ActiveX Control Object

Symbol SigCapDisplay ActiveX Control Object exposes methods and properties to POS applications to display signature data received from the Symbol touch screen PIN pad devices like the Symbol PD8700 terminal. Symbol SigCapDisplay ActiveX Control Object also provides API to convert the raw signature data into a bitmap image.

The SigCapDisplay Control Object can be added to a Form/Dialog at design time and after that it will be visible on the Form/Dialog not only in design mode, but also in run-time. Please see the description of the methods below to work with the Symbol SigCapDisplay ActiveX Control Object.

**Table 1-6** *SigCapDisplay Methods*

Method	Syntax	Remarks
ResetSignature	void ResetSignature (void);	Requests the Control Object to reset or blank out any existing signature displayed and initialize internal variables.
SetSigCapData	void SetSigCapData (VARIANT VectorData);	Transfers the signature data to the Control Object. The VectorData is of VARIANT type and must be of type unsigned char combined with array.  For information on VARIANT type, see: <a href="http://msdn.microsoft.com/library/default.asp?url=/library/en-us/automat/html/chap6_7zdz.asp">http://msdn.microsoft.com/library/default.asp?url=/library/en-us/automat/html/chap6_7zdz.asp</a> .  For sample code to convert binary data to VARIANT type data and vice versa, see: <a href="http://msdn.microsoft.com/library/default.asp?url=/library/en-us/vcsample/html/vcsmpvariantuse demonstratesuseofvariants.asp">http://msdn.microsoft.com/library/default.asp?url=/library/en-us/vcsample/html/vcsmpvariantuse demonstratesuseofvariants.asp</a> .
Display Signature	void DisplaySignature (void);	Requests the Control Object to display the signature. This method must be called after calling SetOPOSSigCapRawData or SetSigCapData.

**Table 1-6** *SigCapDisplay Methods (Continued)*

<b>Method</b>	<b>Syntax</b>	<b>Remarks</b>
SetOPOSSigCapRawData	void SetOPOSSigCapRawData (String RawData, LONG BinaryConversion);	<p>Transfers the signature data to the Control Object. This method is equivalent to the SetSigCapData method, but more suited for applications that are using Symbol OPOS Service Objects to communicate with the Symbol terminal.</p> <p>The BinaryConversion parameter must be set to OPOS_BC_NIBBLE or OPOS_BC_DECIMAL so that data does not get translated or misinterpreted if different development platforms were used for the POS application and ActiveX control.</p> <p>For more information on the BinaryDataConversion property, see the "UnifiedPOS Retail Peripheral Architecture" specification at <a href="http://www.nrf-arts.org">http://www.nrf-arts.org</a>.</p>
GenerateBMPFile	void GenerateBMPFile (String FileName);	Creates a bitmap file with the name specified in FileName after the signature is displayed inside the Control Object. The DisplaySignature method must be called before invoking this method.
ConvertIntoBmp	void ConvertIntoBmp (VARIANT VectorData, String FileName);	Creates a bitmap file with the name specified FileName. This function does not have any condition and can be used solely to pass in the binary signature data in the Symbol vector format and generate a bitmap file.



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