



Value through Innovation

USER MANUAL

SPECTRUM™ III MOIR

FULL INSERT MAGNETIC STRIPE READER

Standard & Compact chassis



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SPECTRUM III Mag Only Insert Reader (MOIR)

FCC WARNING STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his expense.

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This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following conditions: this device may not cause harmful interference and this device must accept any interference received, including interference that may cause undesired operation.

CE STANDARDS

An independent laboratory performed testing for compliance to CE requirements. The unit under test was found compliant to Class B.

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SPECTRUM III Mag Only Insert Reader (MOIR)

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INTRODUCTION

The ID TECH Spectrum III Magnetic Stripe Insert Reader can be configured to read 1, 2, or 3 tracks of magnetic stripe data from cards conforming to ISO 7810 and 7811 standards. All reader configuration communication is accomplished using one of the standard reader interfaces: Key Board, RS232, or USB.

Two chassis types are available for the Spectrum III MOIR Insert Readers.

One type is the standard, full size, chassis; the other is the Compact chassis. The compact chassis is smaller, fitted with a single small sized bezel, and is used typically in applications where a smaller profile is wanted.

Both chassis are molded from a glass and lubricant-filled engineering plastic that supports the magnetic head and electronics, and serves as a guide for the card. The head is spring-loaded for good contact with warped or bowed cards. The compact chassis does not provide the card latch, front switch, and debris gate options. The same PCA circuit design and features are identical on both chassis types.

The reader has an open internal design that allows foreign matter entering through the bezel (up to half a card) to fall away and not clog or otherwise obstruct the card path. The reader has several options for mounting. The reader can be securely mounted in any position; however, mounting with the debris opening down is suggested. A separate molded bezel attaches to the chassis to guide the card, and serves as a mount for a tri-colored LED.

Environmentally, the reader is designed to function at temperatures ranging from 32° to 131°F (0° to 55° C) in humidity up to 95% non-condensing. It can be stored or shipped at temperatures ranging from -40° to 158° F (-40° to 70° C).

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SPECIFICATION

Electrical

Power Requirements: RS-232: +5 VDC/45mA (power adapter regulated 5 VDC/250mA or equivalent)

USB & Keyboard: +5 VDC/45mA power supplied by the host computer

Operating Current: 45 mA maximum for three tracks of magnetic data

Environmental

Operating Temperature: 32° F to 131° F (0° C to 55° C)

Storage Temperature: -40° F to 158° F (-40° C to 70 ° C)

Humidity: Maximum 95% non-condensing

Reliability

Operating Life: Magnetic Head: 1,000,000 cycles minimum*

Chassis and Bezel: 1,000,000 card cycles minimum*

Warranty: One year, parts and labor

Mechanical

Media Thickness: 0.025 to 0.035 inches. Maximum card thickness 0.035 inches

Media Formats: ISO 7811, AAMVA driver license format, coercivity of 300 to 4,200 Oe

Reading Speed: 3 to 50 inches per second.

Dimensions(L)x(W)x(H): 4.64 inches (117 mm) x 3.97 inches (101 mm) x 0.389 inches (9.88 mm)

Options: Standard, Flush, & Metal Bezels. Gate, LED Indicator, "Card Seated" Sensor, "Card Present" Sensor.

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INSTALLATION

Keyboard Interface

The MOIR Keyboard Interface reader is connected between the keyboard input port of the host computer and keyboard itself using a “Y” cable. The “Y” cable has a 6-pin mini-KIN female on one end, and a 6-pin mini-DIN male on the other end.

To connect the reader to the host, turn the power off and disconnect the keyboard from the computer. Connect the keyboard to the female end of the “Y” cable. Then insert the male end of the “Y” cable into the keyboard port.

Manually entered data from the keyboard passes through the unit to the host, leaving the keyboard fully functional at all times.

Data from either of the input heads is transmitted to the host keyboard port, where it appears to the host as coming directly from the keyboard. This makes the reader, as a data source, completely transparent to the host’s application software. In other words, if it is expecting data from the keyboard, that same data can be entered via the MOIR KB reader and make no different to the host.

Since the host computer’s application software is expecting data to be input in a particular order and format, the reader’s output can be configured to simulate the keyboard-entered data stream by adding terminating characters and special preamble and/or postamble character strings to scanned data.

RS232 Interface

As with a standard serial interface, the host must be configured to accept the data and perform the appropriate processing. For the RS232 interface device, the end user needs care that the host application's RS-232 parameters (baud rate, data bits, Start/Stop characters, parity, and handshaking method) match those expected by the reader. The magnetic reader's output can be formatted with terminating characters and special preamble and/or postamble character strings to match the data format expected by the host.

USB HID KB Interface

For the USB_HID_KB reader, the end user does not need a special driver. When the reader connects to the host through the USB cable, the OS will install the new device automatically. There will be two new items in the OS device manager window. One is “Human Interface Devices -> USB Human Interface Device”, another is “Keyboards -> HID Keyboard Device”. The USB_HID_KB reader is fully functional on a USB-equipped IBM PC or PC-compatible running Windows 98, Me, 2000 or XP.

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USB CDC Interface

The ID TECH Magnetic Stripe Insert Reader uses a special software driver to simulate a virtual COM port on the Windows operating system, thereby enabling the reader to be connected via the USB port of the host computer. The reader is fully functional on a USB-equipped IBM PC or PC-compatible running Windows 2000 or XP.

Since USB devices are designed to be "plug and play," the host will search for a device driver when the reader is first connected. If one cannot be found, it will prompt you to make a selection. At this point, insert the ID TECH USB CDC Driver disk. The Wizard will require that you choose the .inf file. This file (MOIR_USB_CDC.inf) is on the disk or available from the ID TECH website at www.idtechproducts.com. The driver appears to the system as an extra virtual COM port. Application software accesses the USB reader in the same way it would access a standard Windows COM port using the Windows VCOMM API calls, or by using a com port library.

Go to Start — Settings — Control Panel — System — Hardware — Device Manager — Ports (COM & LPT). There should be one item: ID TECH Magnetic Stripe Insert USB CDC Reader (COMX). The "X" can be a number between 1 and 127.

You may change the port to a number your software can support (like COM3) by highlighting ID TECH Magnetic Stripe Insert USB CDC Reader (COMX) and clicking on PROPERTIES. Click on PORT SETTINGS, then ADVANCED, then COM PORT NUMBER and use the down arrow to scroll to the number you desire. Close out by clicking OK in all the windows.

As with a standard serial interface, the host must be configured to accept the data and perform the appropriate processing. For the USB CDC interface device, the end user need not care that the host application's RS-232 parameters (baud rate, data bits, Start/Stop characters, parity, and handshaking method) match those expected by the reader. The magnetic reader's output can be formatted with terminating characters and special preamble and/or postamble character strings to match the data format expected by the host.

Interface Connector

See Appendix D (Page 49) for Pinout information. All of the interfaces use the same connector.

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DEFINITIONS

The following are definitions of common terms and abbreviations used throughout this manual.

ACK	Acknowledge
BPI	Bits Per Inch
CDC	Communication Device Class
ESD	Electro-Static Discharge
ETX	End of Transmission
Hex	Hexadecimal
HID	Human Interface Devices
ISO	International Standards Organization
IPS	Inches Per Second
LRC	Longitudinal Redundancy Check
NACK	Non-acknowledge
TLP-224	A protocol used for communication between the reader and the host
USB	Universal Serial Bus

Related Documents

ISO 7810	Identification Cards - Physical Characteristics (1995)
ISO 7811	Identification Cards -Recording Technique (1995)
AAMVA	Best Practices Guidelines for the Use of Magnetic Stripes

Related Links

AAMVA	http://www.aamva.org
ID TECH	http://www.idtechproducts.com

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OPERATION

Operating Procedure

The Spectrum III Magnetic Stripe Insert Reader is easy to operate. Make sure the reader is properly connected and receiving sufficient power. The green LED will indicate that it is ready to read.

LED INDICATION	MEANING (LED controlled by reader)
Amber	Reader is sending or receiving data from the host.
Green	Reader is ready to read a magnetic stripe, or is idle.
Red	Bad magnetic stripe read.
Off	Reader is reading magnetic stripe data (but is not communicating with the host).

By default, the LED is under the control of the reader. The LED can also be under the control of the host application. (Please see page XX for the specific HOST LED CONTROL commands.) If the LED is under the control of the host, the following settings are available:

- Turn the LED off
- Turn the LED green
- Turn the LED red
- Turn the LED amber

To read a Magnetic Stripe Card, just follow these simple steps:

1. Insert the card, magnetic stripe down, into the reader until it hits a hard stop. As soon as the reader detects the magnetic stripe, the green LED indicator will go off.
2. When the card has been inserted all the way, the green LED will light again.
3. Withdraw the card in one continuous motion. The green LED will go off again. (The reader is capable of reading a magnetic stripe on both insertion and withdrawal, but a more reliable read is achieved on withdrawal.)
4. When the card has been fully withdrawn, the LED turns amber to indicate processing. The LED will turn red (to indicate a bad read) or return to green (to indicate a good read).

Buffer Mode

When the unit is armed to read in the buffer mode, decoded data will be retained in memory and an optional notice will be sent to the host to indicate its presence. Data will be held in memory until the reader receives the next ARM TO READ or MSR RESET command, at which point all data in memory will be erased. Please refer for the specific ARM TO READ IN BUFFER MODE, MSR RESET IN BUFFER MODE, and READ MSR DATA IN BUFFER MODE commands.

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MAGNETIC STRIPE READER COMMANDS

Processing a command may take a while. During command processing, the reader will not respond to a new command. Caution must be taken to maintain at least 250 ms between the start of two commands if no response has been received.

Once communication between the host and the reader has been established, sending the appropriate setup commands to the reader from the host application can enter changes to the reader's settings.

Following are explanations and examples of the proper format and command content to send commands to the reader. All commands and characters are expressed in hex format and contained in brackets:

Structure

Every command follows the same basic structure:

HEADER	DATA	TRAILER
--------	------	---------

The HEADER consists of <60> followed by <Command Length> The DATA consists of Function ID, Function Length, and Function Data The TRAILER consists of <LRC> followed by <ETX>

Example of LRC

The Longitudinal Redundancy Check (LRC) is calculated by taking "Exclusive OR" (Modulus 2) of all characters preceding it. The total, with LRC, is equal to zero. For example, the following command means "Set <Send Option> to 0x30 value".

<60><00><04><53><19><01><30><1F><03>

<1F> is the LRC character.

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It is derived from the following:

Characters	#1	#2
<60>	0110	0000
<00>	0000	0000
<04>	0000	0100
<53>	0101	0011
<19>	0001	1001
<01>	0000	0001
<30>	0011	0000

<1F> 0001 1111 <Result of Exclusive OR>

When sending a setup command:

<60><CommandLength><53>[<FuncID><Len><FuncData>...]<LRC><ETX>

When sending a review command: <60><00><02><52><XX><LRC><ETX>

... where <53> and <52> are the key codes for their respective commands.

In this example:

<Command Length> is a two-byte counter from <53> to the end of <FuncData>.

<FuncID> is the total of contents, a respective command, and one byte that identifies the particular function affected.

<Len> is a one byte length count for the <FuncData> block.

<FuncData> is the data block for the function.

<ETX> = 03h

The overall <LRC> (Modulus 2 = Exclusive OR) checksum (from <60> to <LRC>) should be zero.

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GENERAL COMMANDS

The following table is a summary of the general commands described in this section:

HEAD <60><Command	DATA	NAME	USAGE
60 00 01	24	Get Reader Status	To get reader status in the form of a single byte
60 00 01	39	Get Version	To get the version of the reader's firmware
60 00 01	49	Reset the Reader	To reset the reader to its default state
60 00 03	50 01 30	Arm to Read in Buffer Mode	To enable reading in the buffer mode
60 00 03	50 01 32	MSR Reset in Buffer Mode	To return the reader to its default settings when buffer mode is enabled
60 00 03	51 01 xx	Read MSR Data in Buffer Mode	To set the tracks on the magnetic stripe to be read while in the buffer mode
60 00 02	52 1F	Review All Settings	To retrieve all current settings
60 00 02	52 <FunctionID>	Get Setting	Getting various reader optional settings
60 00 02	53 18	Default All	Setting reader optional functions to
60 00 xx	53[<FuncID> <Len><Func Data>]...	Send Setting	Setting various reader optional functions
60 00 04	53 10 01 xx	Set Terminal Type	Set terminal type of the reader
60 00 04	53 11 01 xx	Set Reader Option	Set the switch notifications, LED control, Data Envelope and Raw Data Decoding
60 00 04	53 2F 01 xx	Set Reader Option 2	Set the notification of no data, media detect, card in slot and incomplete insertion
60 00 02	6C	LED Control	To set the LED to be controlled by

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GET READER STATUS

<60><00><01><24><LRC><ETX>

The response will be: <60><00><01><Reader Status><LRC><ETX>

For all readers (RS232, KB or USB interface), a single-byte reader status will be returned.

Bit Position	0	1
0	Others	No data in a reader*
1	Card not seated*	Card seated*
2	Others	Media detected*
3	Card not present*	Card present*
4	No magnetic data*	Magnetic data present*
5	All other conditions	Card in Slot*
6	All other conditions	Incomplete Insertion*
7	Unused	

* Note: Flags are available only when optional features are supported by the reader. The flag will always be 0 if an option is not supported.

GET FIRMWARE VERSION

<60><00><01><39><LRC><ETX>

The response will be: <60><00><Version String Length><Version><LRC><ETX>

For this reader, <Version> will be a string greater than 50 bytes, and less than 60 bytes.

RESET THE READER

This command allows the host to return the reader to its default state (no armed to read, no magnetic data stored, etc.).

<60><00><01><49><LRC><ETX>

The response will be: <60><00><02><90><00><LRC><03>

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BUFFER MODE COMMANDS

<60><00><03><50><01><30><LRC><ETX>
<60><00><03><50><01><32><LRC><ETX>
<60><00><03><51><01><Track Select Byte><LRC><ETX>

These commands are executed only when the MSR READING SETTING is in <32> MSR Reading Buffered mode. If the host sends these commands to the reader in MSR Auto-Transmission mode, the reader will send back an "E0 00" response package.

For more specific information, please refer to the descriptions under the ARM TO READ IN BUFFER MODE, MSR RESET IN BUFFER MODE, and READ MSR DATA IN BUFFER MODE commands.

REVIEW ALL SETTINGS

<60><00><02><52><1F><LRC><ETX>

This command retrieves all current settings. The reader sends back an acknowledgement <ACK> and a response that is a collection of many function-setting blocks. Each function-setting block has the following format:

<FuncID><Len><FuncData>

<FuncID> is the total of contents, a respective command, and one byte that identifies the setting(s) for the function.

<Len> is a one-byte length count for the block that follows.

<FuncData> is the actual setting.

GET SETTING

<60><00><02><52><FuncID><LRC><ETX>

This command get various reader optional setting. The reader sends back an acknowledgement <ACK> and a response that is a setting block. The function-setting block has the following format:

<FuncID><Len><Funcdata>

<FuncID> is the total of contents, a respective command, and one byte that identifies the setting(s) for the function.

<Len> is a one-byte length count for the block that follows.

<FuncData> is the actual setting.

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RESTORE TO DEFAULT

<60><00><02><53><18><LRC><ETX>

This command does not have any <FuncData>. It restores all settings to the default value.

(Please see Appendix A: Default Settings for a chart of all default settings.)

The response will be: <60><00><02><90><00><F2><03>

SEND SETTING

<60><CommandLength><53><FuncID><Len><FuncData><LRC><ETX>

<CommandLength> is a two bytes counter, which indicates length of data from <53> to end of <Func Data>.

<FuncID> is the total of contents, a respective command, and one byte that identifies the setting(s) for the function.

<Len> is a one-byte length count for the block that follows.

<FuncData> is the actual setting.

The response will be: <60><00><02><90><00><F2><03>

HOST LED CONTROL

The reader or the host can control the LED. (Setting a bit in the Reader Option setting can make the choice between reader and host control of the LED.)

This command sets the LED only when it is to be controlled by the host. Otherwise, the reader will send back an "E0 00" to the host.

<60><00><02><6C><LED Status><LRC><ETX>

The LED status can be set as follows:

<30> Set LED to off

<31> Set LED to green

<32> Set LED to red

<33> Set LED to amber

The response will be: <60><00><02><90><00><LRC><03>

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SET TERMINAL TYPE

This command sets terminal type for the reader.

<60><00><04><53><10><01 ><Terminal Type setting><LRC><ETX>

A terminal type setting is defined as follows:

- <30> PC_AT keyboard interface reader
- <31> RS232 interface reader
- <32> USB_HID/ USB_HID_KB interface reader
- <33> USB_CDC interface reader

The response will be: <60><00><02><90><00><LRC><ETX>

For RS232 interface reader, the default setting is RS232 <31>

For KB interface reader, the default setting is PC_AT <30>

For USB_HID/ USB_HID_KB interface reader, the default setting is U_HID_KB <32>

For USB_CDC interface reader, the default setting is U_CDC <33>

SET READER OPTION

<60><00><04><53><11><01 ><Setting><LRC><ETX>

A single-byte setting is defined as follows:

Bit Position	0	1
0	Card Seated Off	Card Seated On
1	Card Removed Off	Card Removed On
2	Card In Off	Card In On
3	MSR Data Envelope Off	MSR Data Envelope On
4	LED Controlled by Reader	LED Controlled by Host
5	Magnetic Data Present Off	Magnetic Data Present On
6	Standard Decoder	Raw Data Decoder
7	Card Out Off	Card Out On

The response will be: <60><00><02><90><00><LRC><ETX>

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For RS232 and USB_CDC reader, the default value is 0x8F. For KB and USB_HID_KB reader, the default value is 0x03.

The Raw Data Decoder enables raw data to be sent to the host for further processing. Two ASCII characters represent each raw data byte: The first ASCII character is for the high nibble of the hex code. The second ASCII character is for the low nibble of the hex code. For example, the characters "4" and "B" represent raw data "4Bh" (01001011).

If "Raw Data Decoder" has been set, all data will be treated as a bit string and will be sent out in hex format. Leading or trailing zeros (depending on whether the reader reads on insertion or withdrawal) will not be sent. All the read tracks data is sent with no regard to track designation or separation. No error checking is performed.

The "Magnetic Data Present" option is only available when the unit has been set to buffered mode.

After a good read, the magnetic stripe data will be sent out with an envelope (<60> <Len_H> <Len_L> <Card data indication 1 > <Card indication 2> <Magstripe data> <LRC> <ETX>), if "MSR Data Envelope" is ON. Otherwise, magnetic stripe data will be sent out without an envelope (<Magstripe Data>).

<Card data indication 1 > (<Cx>) is an ID to indicate magnetic data.

Bit Position	Value
0-3	Unused
4	'0'
5	'0'
6	'1'
7	'1'

<Card Data Indication 2> flags the current read.

Bit Position	'0'	'1'
0	Track 1 decode fail	Track 1 decode success
1	Track 2 decode fail	Track 2 decode success
2	Track 3 decode fail	Track 3 decode success
3	No Track 1 data	Track 1 data exists
4	No Track 2 data	Track 2 data exists
5	No Track 3 data	Track 3 data exists
6-7	Unused	

Note: Track x decode flag available only when track x data exist.

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For RS232 and USB_CDC interface reader, after an insertion or withdrawal, a Magnetic Data Present Notification (<60><00><02><B0><Card Status><LRC><ETX>) will be issued if the "Magnetic Data Present" bit has been set to ON and magnetic data in current read direction enabled by reader. And a "Card Switch Change" notification (<60><00><02><B0><Card Status><LRC><ETX>) will be issued by the reader if "Card Seated On", "Card Removed On", "Card In On", or "Card Out On" has been set to ON and the card switch have changed.

For KB and USB_HID_KB interface reader, a Magnetic Data String will be issued if the "Magnetic Data Present" bit has been set to ON and magnetic data in current read direction enabled by reader. The default string is "[Tab]Magnetic Data[Tab]". And a card notification string (Card Seated String, Card Removed String, Card Present String or Card Out String) will be issued by the reader if "Card Seated On", "Card Removed On", "Card In On", or "Card Out On" has been set to ON and the card switch was changed.

SET READER OPTION 2

<60><00><04><53><2F><01 ><Setting><LRC><ETX>

A single-byte setting is defined as follows:

Bit Position	0	1
0	Media Detected Off	Media Detected On
1	No Data Off	No Data On
2	No Card in Slot	Card in Slot On
3	No Incomplete Insertion	Incomplete Insertion
4-7	Reserved	

The response will be: <60><00><02><90><00><LRC><ETX>

For RS232 and USB_CDC reader, the default value is 0x00. For KB and USB_HID_KB reader, the default value is 0x03.

After an insertion or withdrawal, a NO DATA notification will be issued if its setting is ON. That means no data on selected tracks (if Read Direction is enabled) and no magnetic data after an insertion or withdrawal time out.

After an insertion or withdrawal, a MEDIA DETECTED notification will be issued if its setting is ON and magnetic data in the current read direction is disabled by reader.

After a withdrawal, a CARD IN SLOT notification will be issued if CARD PRESENT is still ON 2 seconds after withdrawal.

After an insertion, an INCOMPLETE INSERTION notification will be issued if CARD SEATED is still OFF 2 seconds after insertion.

SPECTRUM III Mag Only Insert Reader (MOIR)

For RS232 and USB-CDC interface reader, a STATUS CHANGE notification (<60><00><02><B0><Card Status><LRC><ETX>) will be issued by the reader if "Media Detected", "No Data", "Card In Slot", or "Incomplete Insertion" has been set to ON and the according status was changed.

For KB and USB-HID-KB interface reader, a notification string (No Data String, Media Detected String, Card In Slot String or Incomplete Insertion String) will be issued by the reader if "Media Detected", "No Data", "Card In Slot", or "Incomplete Insertion" has been set to ON and the according status was changed.

SPECTRUM III Mag Only Insert Reader (MOIR)

RS232 Reader Special Commands

The following table is a RS232 Reader Special commands summary described in this section:

HEAD <60><Command Length>	DATA	NAME	USAGE
60 00 04 53	41 01 xx	Set Baud Rate	To set baud rate for RS232 interface reader
60 00 04 53	42 01 xx	Set Bata Bits	To set Data Bits for input character frame
60 00 04 53	43 01 xx	Set Data Parity	To set Data Parity for input character frame
60 00 04 53	44 01 xx	Set Hand Shake Method	To set handshake method
60 00 04 53	45 01 xx	Set Stop Bits	To set Stop Bits for input character frame
60 00 04 53	47 01 xx	Set Xon Character	To set Xon Character
60 00 04 53	48 01 xx	Set Xoff Character	To set Xoff Character

SET BAUD RATE

The default baud rate is 38400 bits/sec. Reader will turn to the setting baud rate after send back a response for this setting command. Application should turn to the setting baud rate after receiving the response to ensure the communication between application and hybrid reader.

Set Baud Rate Command

<60><00><04><S><41><01><Baud Rate Setting ><LRC> <ETX>

The command is used to set the baud rate of serial communication between application and hybrid reader, where:

Baud Rate Setting:

'3': 2400 bits/sec

'4': 4800 bits/sec

'5': 9600 bits/sec

'6': 19200 bits/sec

'7': 38400 bits/sec

The response will be: <60><00><02><90><00><F2><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

SET DATA BITS

Directly following the start bit, the data bits are sent. The least significant bit is always the first bit sent. This command is used to set the number of data bits in a character frame.

Set Data Bits Command

<60><00><04><S><42><01><Data Bits Setting ><LRC> <ETX>

The default Data Bits value is 8 bits.

Data Bits Setting:

'0': 8 Bits

'1': 7 Bits

The response will be: <60><00><02><90><00><F2><03>

SET DATA PARITY

An optional parity bit follows the data bits in the character frame. This parity bit is included as a simple means of error handling. This command is used to set the data parity method of the transmission.

Set Data Parity Command

<60><00><04><S><43><01><Data Parity Setting ><LRC> <ETX>

The default Data Parity value is None.

Data Parity Setting:

'0': None

'1': Even

'2': Odd

'3': Mark

'4': Space

The response will be: <60><00><02><90><00><F2><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

SET HANDSHAKE METHOD

<60><00><04><S><44><01><Handshake Setting ><LRC> <ETX>

The command is used to set the Handshake (Flow Control) of serial communication between application and Magnetic Stripe Insert reader, where:

Handshake Setting:

'0': No Handshake

'1': Hardware Handshake

'2': Software Xon/Xoff Handshake

The response will be: <60><00><02><90><00><F2><03>

SET STOP BITS

The stop bit identifying the end of a data frame can have two different numbers: 1 or 2 bits. This command is used to set the number of stop bits in a character frame.

Set Stop Bits Command

<60><00><04><S><45><01><Stop Bits Setting ><LRC> <ETX>

The default Stop Bits value is 1 bit.

Stop Bits Setting:

'0': 1 Bit

'1': 2 Bits

The response will be: <60><00><02><90><00><F2><03>

XON ID SETTING

This setting allows the user to select any single character to be used as the XOn ID character.

<60><00><04><53><47><01 ><XOn ID Character><LRC><ETX>

The XOn ID can be any single ASCII character desired. The default value is 0x11.

The response will be: <60><00><02><90><00><F2><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

XOFF ID SETTING

This setting allows the user to select any single character to be used as the XOff ID character.

<60><00><04><53><48><01 ><XOff ID Character><LRC><ETX>

The XOff ID can be any single ASCII character desired. The default value is 0x13.

The response will be: <60><00><02><90><00><F2><03>

KB or USB_HID_KB Reader Special Commands

The following table is a special command only for keyboard interface reader:

HEAD <60><Command Length>	DATA	NAME	USAGE
60 00 04 53	12 01 xx	Set Character Delay	Set inter-character delay time for KB reader

SET CHARACTER DELAY

<60><00><04><S><12><01><Character delay setting ><LRC> <ETX>

This command sets inter character delay time for keyboard interface reader.

Character delay setting:

- '0': 2 ms inter character delay
- '1': 5 ms inter character delay
- '2': 10 ms inter character delay
- '3': 20 ms inter character delay
- '4': 50 ms inter character delay
- '5': 100 ms inter character delay

The response will be: <60><00><02><90><00><F2><03>

The default value is 2 ms inter character delay.

SPECTRUM III Mag Only Insert Reader (MOIR)

The following table is a KB or USB/HID/KB Reader Special commands summary described in this section:

HEAD <60><Command Length>	DATA	NAME	USAGE
60 00 xx 53	26 xx	Set Card Seated String	To edit the string for the optional notification
60 00 xx 53	27 xx	Set Card Removed String	To edit the string for the optional notification
60 00 xx 53	28 xx	Set Card Present String	To edit the string for the optional notification
60 00 xx 53	29 xx	Set Card Out String	To edit the string for the optional notification
60 00 xx 53	2A xx	Set No Data String	To edit the string for the optional notification
60 00 xx 53	2B xx	Set Media Detected String	To edit the string for the optional notification
60 00 xx 53	2C xx	Set Magnetic Data String	To edit the string for the optional notification
60 00 xx 53	2D xx	Set Card In Slot String	To edit the string for the optional notification
60 00 xx 53	2E xx	Set Partial In String	To edit the string for the optional notification

SPECTRUM III Mag Only Insert Reader (MOIR)

SET CARD SEATED STRING

This setting allows the user to select a character string to be output as card-seated notification. When the card seated switch changes from off to on, this string will be sent out if "Card Seated On and Off" bit in ReaderOptID is set.

<60><Command Length><53><26><Len><Card Seated

String><LRC><ETX> In this example:

<Command Length> is a two-byte length from <53> to <Card Seated String>

<Len> is the number of bytes of the Card Seated String, but no greater than 24

<Card Seated String> is {string length}{string} (String length is one byte,

maximum 23.) The response will be: <60><00><02><90><00><F2><03>

SET CARD REMOVED STRING

This setting allows the user to select a character string to be output as card removed notification. When the card-seated switch changes from on to off, this string will be sent out if "Card Removed On and Off" bit in ReaderOptID is set.

<60><Command Length><53><27><Len><Card Removed

String><LRC><ETX> In this example:

<Command Length> is a two-byte length from <53> to <Card Removed String>

<Len> is the number of bytes of the Card Removed String, but no greater than 24

<Card Removed String> is {string length}{string} (String length is one byte,

maximum

23.)

The response will be: <60><00><02><90><00><F2><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

SET CARD PRESENT STRING

This setting allows the user to select a character string to be output as card present notification. When the card front switch changes from off to on, this string will be sent out if "Card In On and Off" bit in ReaderOptID is set.

<60><Command Length><53><28><Len><Card Present String><LRC><ETX>

In this example:

<Command Length> is a two-byte length from <53> to <Card Present String>

<Len> is the number of bytes of the Card Present String, but no greater than 24

<Card Present String> is {string length}{string} (String length is one byte, maximum 23.)

The response will be: <60><00><02><90><00><F2><03>

SET CARD OUT STRING

This setting allows the user to select a character string to be output as card out notification. When the card front switch changes from on to off, this string will be sent out if "Card Out On and Off" bit in ReaderOptID is set.

<60><Command Length><53><29><Len><Card Out String><LRC><ETX>

In this example:

<Command Length> is a two-byte length from <53> to <Card Out String>

<Len> is the number of bytes of the Card Out String, but no greater than 24

<Card Out String> is {string length}{string} (String length is one byte, maximum 23.)

The response will be: <60><00><02><90><00><F2><03>

SET NO DATA STRING

This setting allows the user to select a character string to be output as no data notification. When mismatch of data edit formula, no data on selected tracks, no magnetic data after an insertion or withdraw time out, this string will be sent out if "No Data On and Off" bit in ReaderOpt2ID is set.

<60><Command Length><53><2A><Len><No Data String><LRC><ETX>

In this example:

<Command Length> is a two-byte length from <53> to <No Data String>

<Len> is the number of bytes of the No Data String, but no greater than 24

<No Data String> is {string length}{string} (String length is one byte, maximum 23.)

The response will be: <60><00><02><90><00><F2><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

SET MEDIA DETECTED STRING

This setting allows the user to select a character string to be output as media detected notification. When magnetic data in current read direction disabled by reader, this string will be sent out if "Media Detected On and Off" bit in ReaderOpt2ID is set.

<60><Command Length><53><2B><Len><Media Detected String><LRC><ETX>

In this example:

<Command Length> is a two-byte length from <53> to <Media Detected String>

<Len> is the number of bytes of the Media Detected String, but no greater than 24

<Media Detected String> is {string length}{string} (String length is one byte, maximum 23.)

The response will be: <60><00><02><90><00><F2><03>

SET CARD IN SLOT STRING

This setting allows the user to select a character string to be output as card in slot notification. When the card withdraws from the card seated switch and the card front switch is still on after 2s, this string will be sent out if "Card In Slot On and Off" bit in ReaderOpt2ID is set.

<60><Command Length><53><2D><Len><Card In Slot String><LRC><ETX>

In this example:

<Command Length> is a two-byte length from <53> to <Card In Slot String>

<Len> is the number of bytes of the Card In Slot String, but no greater than 24

<Card In slot String> is {string length}{string} (String length is one byte, maximum 23.)

The response will be: <60><00><02><90><00><F2><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

SET PARTIAL IN STRING

This setting allows the user to select a character string to be output as partial in notification. When the card insert through the card front switch and the card-seated switch is still off after 2s, this string will be sent out if "Incomplete Insertion On and Off" bit in ReaderOpt2ID is set.

<60><Command Length><53><2E><Len><Incomplete Insertion String><LRC><ETX>

In this example:

<Command Length> is a two-byte length from <53> to < Incomplete Insertion String>
<Len> is the number of bytes of the Incomplete Insertion String, but no greater than 24
< Incomplete Insertion String> is {string length}{string} (String length is one byte, maximum 23.)

The response will be: <60><00><02><90><00><F2><03>

SET MAGNETIC DATA STRING

This setting allows the user to select a character string to be output as magnetic data notification. After an insertion or withdrawal if in buffer mode, the magnetic data in current read direction was enabled by reader, this string will be sent out if "Magnetic Data On and Off" bit in ReaderOptID is set.

<60><Command Length><53><2C><Len><Magnetic Data String><LRC><ETX>

In this example:

<Command Length> is a two-byte length from <53> to < Magnetic Data String>
<Len> is the number of bytes of the Magnetic Data String, but no greater than 24
< Magnetic Data String> is {string length}{string} (String length is one byte, maximum 23.)

The response will be: <60><00><02><90><00><F2><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

MAGNETIC STRIPE READER CONFIGURATION

The Spectrum III MagStripe Reader has a number of configuration options. Default settings, which are programmed into the reader at the factory, are printed in boldface.

For sending Setup Commands from the application program to the reader, there are no special serial communication parameters for a CDC device. For RS232 device, the serial communication parameter default setting is 38400, None, 8, 1.

Setup Commands include the Sending Commands that change the MSR configuration settings, and Receiving Commands that retrieve the current MSR configuration settings to the application program.

COMMAND STRUCTURE

Every command follows the same basic structure:

HEADER	DATA	TRAILER
--------	------	---------

The **HEADER** consists of <60> followed by <Command Length>

The **DATA** consists of Function ID, Function Length, and Function Data

The **TRAILER** consists of <LRC> followed by <ETX>

A simple Turbo TLP-224 protocol with a one-byte "check sum" is used when sending setup commands to reader. When sending a command:

<60><CommandLength><53>[<FuncID><Len><FuncData>]<LRC><ETX>

The response confirming the command structure will be:

<60><00><02><90><00><LRC><ETX>

In this example:

<Command Length> is a two-byte counter from <53> to the end of <FuncData>.

<FuncID> is the total of contents, a respective command, and one byte that identifies the particular function affected.

<Len> is a one-byte length count for the <FuncData> block.

<FuncData> is the data block for the function.

<ETX> = 03h

Overall <LRC> (Modulus 2 = Exclusive OR) checksum (from <60> to <LRC>) is zero.

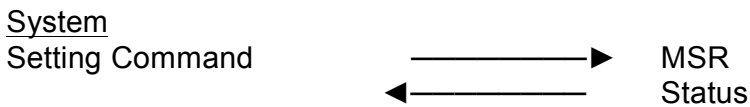
SPECTRUM III Mag Only Insert Reader (MOIR)

COMMUNICATION TIMING

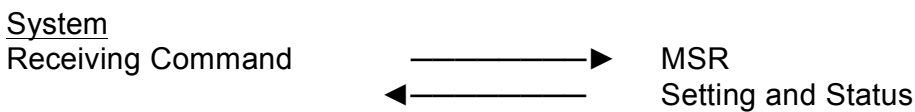
During command processing or the reading of a magnetic stripe, the reader will not respond to a new command. Caution must be taken to maintain a minimum delay (250 ms) between two commands. The typical delay for the reader to respond to a setting command is less than 200 ms.

Before issuing a new command, always wait for a response to the last command. Make sure the inter-command delay is more than 250 ms.

Sending Command Protocol



Receiving Command Protocol



SPECTRUM III Mag Only Insert Reader (MOIR)

COMMANDS

The following table is a magnetic stripe reader commands summary described in this section:

HEAD <60><Command Length>	DATA <XX><XX>	NAME	USAGE
60 00 04	53 13 01 xx	Track Selection Setting	To select the tracks on the magnetic stripe to be read
60 00 04	5317 01 xx	Track Separator Setting	To format the data read from the card
60 00 04	5319 01 xx	Send Option	To enable or disable the sentinel or account number on Track 2 only or sending error notification
60 00 04	53 1A 01 xx	MSR Reading	To turn the magnetic stripe reading function off or on in either auto-transmit or buffer mode
60 00 04	53 1D 01 xx	Decoding Method	To read a card in a selected direction
60 00 04	53 60 01	LRC Option	To enable or disable sending out the LRC character
60 00 04	53 61 01	Track1 7bit start sentinel	To set the track1 start sentinel character
60 00 04	53 62 01	Track1 6bit start sentinel	To set the track1 start sentinel character
60 00 04	53 63 01	Track1 5bit start sentinel	To set the track1 start sentinel character
60 00 04	53 64 01	Track2 7bit start sentinel	To set the track2 start sentinel character
60 00 04	53 65 01	Track2 5bit start sentinel	To set the track2 start sentinel character
60 00 04	53 66 01	Track3 7bit start sentinel	To set the track3 start sentinel character
60 00 04	53 67 01	Track3 6bit start sentinel	To set the track3 start sentinel character
60 00 04	53 68 01	Track3 5bit start sentinel	To set the track3 start sentinel character
60 00 04	53 69 01	Track end sentinel	To set the track end sentinel character
60 00 04	53 21 01 xx	Terminator Setting	To format the data read from the card
60 00 04	53 3X 01 xx	Track 1,2, 3 ID Setting	To edit the data read from the card
60 00 xx	53 Dx xx	Preamble and Postamble Settings	To edit the data read from the card
60 00 03	50 01 30	Arm to Read in Buffer Mode	To enable reading in the buffer mode
60 00 03	50 01 32	MSR Reset in Buffer Mode	To return the reader to its default settings when buffer mode is enabled
60 00 03	51 01 xx	Read MSR Data in Buffer Mode	To set the tracks on the magnetic stripe to be read while in the buffer mode

SPECTRUM III Mag Only Insert Reader (MOIR)

TRACK SELECTION SETTING

There are up to three tracks of encoded data on a magnetic stripe. This setting selects the tracks to be read. The command responses given below indicate successfully entered commands. If an error message is returned instead of an indicated response, please refer to Appendix B: Status Code Table for an explanation.

```
<60><00><04><53><13><01 ><Track_Selection Settings><LRC><ETX>
```

Track Selection Settings:

```
<30> Any Track  
<31 > Track 1 Only  
<32> Track 2 Only  
<33> Track 1 & Track 2  
<34> Track 3 Only  
<35> Track 1 & Track 3  
<36> Track 2 & Track 3  
<37> All Three Tracks
```

Note: The default setting, "Any Track," permits the reader to read any track on which data is present. The setting "All Three Tracks" will instruct the reader to read data from all three tracks. If any of the three tracks fails to read for any reason, no data will be sent from any of the tracks.

TRACK SEPARATOR SETTING

This setting allows the user to select the character to be used to separate data decoded by a multi-track reader.

```
<60><00><04><53><17><01 ><Track_Separator><LRC><ETX>
```

The Track Separator can be any one ASCII Character. The default value is **CR** (Hex 0D).

SPECTRUM III Mag Only Insert Reader (MOIR)

SEND OPTION

This setting allows the application program to disable or enable the start/end sentinel, to disable or enable the account number for Track 2 only, and to disable or enable the error notification (“%E?” for Track 1, “;E?” for Track 2, and “+E?” for Track 3).

<60><00><04><53><19><01><Send Option Setting><LRC><ETX>

Send Option Setting:

<30> Do not send Start/End sentinel, do send all data on all tracks. No error notification.

<31> Send Start/End sentinel and all data on all tracks. No error notification.

<32> Do not send Start/End sentinel for any track, but do send account number on Track 2 only. No error notification.

<33> Send Start/End sentinel on Track 1 & only account number on Track 2 for a credit card, or Send Start/End sentinel on Tracks 1 and 3 for a standard card. No error notification.

<34> Do not send Start/End sentinel, but do send all data on all tracks. Send the error notification.

<35> Send Start/End sentinel and all data on all tracks. Send the error notification.

<36> Do not send Start/End sentinel for any track, but do send account number on Track 2 only. Send the error notification.

<37> Send Start/End sentinel on Track 1, and account number on Track 2 only for a credit card, or Send Start/End sentinel on Tracks 1 and 3 for a standard card. Send the error notification.

The default setting for RS232 and USB_CDC reader is 0x31, the default setting for KB and USB_HID_KB reader is 0x35.

The response will be: <60><00><02><90><00><F2><03>

MSR READING

Turns the magnetic stripe reading function ON or OFF or initiates reading with the buffer mode. If the reading function is disabled, no data will be sent to the host.

<60><00><04><53><1A><01 ><MSR Reading Setting><LRC><ETX>

MSR Reading Setting:

<30> MSR reading disable

<31> **MSR reading enable**

<32> MSR reading buffered mode

The response will be: <60><00><02><90><00><LRC><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

DECODING METHOD

To ensure optimal reading performance, the reader is set at the factory to read magnetic stripe cards on withdrawal. Card velocity must be consistent to yield the best read rate, and a consistent speed of the card across the magnetic head is easier to achieve on withdrawal rather than insertion. However, the reader can be configured to read on both insertion and withdrawal or on insertion alone, if desired.

<60><00><04><53><1D><01 ><Decoding Method Setting><LRC><ETX>

Decoding Method Setting:

- <31> Two Directions
- <32> Read on insertion only
- <33> Read on withdrawal only

The response will be: <60><00><02><90><00><F2><03>

TERMINATOR SETTING

This setting allows the user to select the character to be used as the magnetic card data terminator. Simple message formatting can be accomplished by using the Terminator, the Preamble, and the Postamble.

<60><00><04><53><21><01 ><Terminator Settings><LRC><ETX>

Terminator Settings can be any single ASCII character desired.

The response will be: <60><00><02><90><00><F2><03>

TRACK 1 ID SETTING

This setting allows the user to select any single character to be used as the Track1 ID. If this character is not 0x00, it will be sent out before the Track 1 start sentinel.

<60><00><04><53><31><01 ><Track 1 ID><LRC><ETX>

<Track 1 ID> ASCII code set as Track 1 ID.

The Track 1 ID can be any single ASCII character desired. No Track 1 ID is expressed as NULL (0x00).

The response will be: <60><00><02><90><00><F2><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

TRACK 2 ID SETTING

This setting allows the user to select any single character to be used as the Track 2 ID. If this character is not 0x00, it will be sent out before the Track 2 start sentinel.

<60><00><04><53><32><01 ><Track2 ID><LRC><ETX>

<Track 2 ID> ASCII code set as Track 2 ID.

The Track 2 ID can be any single ASCII character desired. No Track 2 ID is expressed as NULL (0x00).

The response will be: <60><00><02><90><00><F2><03>

TRACK 3 ID SETTING

This setting allows the user to select any single character to be used as the Track 3 ID. If this character is not 0x00, it will be sent out before the track 3 start sentinel.

<60><00><04><53><33><01 ><Track 3 ID><LRC><ETX>

<Track 3 ID> ASCII code set as Track 3 ID.

The Track 3 ID can be any single ASCII character desired. No Track 3 ID is expressed as NULL (0x00).

The response will be: <60><00><02><90><00><F2><03>

LRC OPTION

This setting allows the user to determine whether or not to send the LRC character for each track of data.

<60><00><04><53><60><01 ><LRC Option><LRC><ETX>

LRC Option:

<30> Send track data without LRC character

<31> Send track data with LRC character

The response will be: <60><00><02><90><00><F2><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

TRACK 1 7-BIT START SENTINEL SETTING

This setting allows the user to select any single character to be output as the Track 1 start sentinel if the magnetic card's Track 1 data is 7-bit encoded.

<60><00><04><53><61><01 ><Track1 7Bit Start Sentinel ><LRC><ETX>

The response will be: <60><00><02><90><00><F2><03>

TRACK 1 6-BIT START SENTINEL SETTING

This setting allows the user to select any single character to be output as the Track 1 start sentinel if the magnetic card's Track 1 data is 6-bit encoded.

<60><00><04><53><62><01 ><Track1 6Bit Start Sentinel ><LRC><ETX>

The response will be: <60><00><02><90><00><F2><03>

TRACK 1 5-BIT START SENTINEL SETTING

This setting allows the user to select any single character to be output as the Track 1 start sentinel if the magnetic card's Track 1 data is 5-bit encoded.

<60><00><04><53><63><01 ><Track1 5Bit Start Sentinel ><LRC><ETX>

The response will be: <60><00><02><90><00><F2><03>

TRACK 2 7-BIT START SENTINEL SETTING

This setting allows the user to select any single character to be output as the Track 2 start sentinel if the magnetic card's Track 2 data is 7-bit encoded.

<60><00><04><53><64><01 ><Track2 7Bit Start Sentinel ><LRC><ETX>

The response will be: <60><00><02><90><00><F2><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

TRACK 2 5-BIT START SENTINEL SETTING

This setting allows the user to select any single character to be output as the Track 2 start sentinel if the magnetic card's Track 2 data is 5-bit encoded.

<60><00><04><53><65><01 ><Track2 5Bit Start Sentinel ><LRC><ETX>

The response will be: <60><00><02><90><00><F2><03>

TRACK 3 7-BIT START SENTINEL SETTING

This setting allows the user to select any single character to be output as the Track 3 start sentinel if the magnetic card's Track 3 data is 7-bit encoded.

<60><00><04><53><66><01 ><Track3 7Bit Start Sentinel ><LRC><ETX>

The response will be: <60><00><02><90><00><F2><03>

TRACK 3 6-BIT START SENTINEL SETTING

This setting allows the user to select any single character to be output as the Track 3 start sentinel if the magnetic card's Track 3 data is 6-bit encoded.

<60><00><04><53><67><01 ><Track3 6Bit Start Sentinel ><LRC><ETX>

The response will be: <60><00><02><90><00><F2><03>

TRACK 3 5-BIT START SENTINEL SETTING

This setting allows the user to select any single character to be output as the Track 3 start sentinel if the magnetic card's Track 3 data is 5-bit encoded.

<60><00><04><53><68><01 ><Track3 5Bit Start Sentinel ><LRC><ETX>

The response will be: <60><00><02><90><00><F2><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

TRACK END SENTINEL SETTING

This setting allows the user to select any single character to be output as the track end sentinel.

<60><00><04><53><69><01 ><Track End Sentinel ><LRC><ETX>

The response will be: <60><00><02><90><00><F2><03>

PREAMBLE SETTING

This setting allows the user to select a character string to be output at the beginning of magnetic stripe data. If a character string is defined, it will be sent out before any track ID or start sentinel. If no character string is defined, nothing will be sent out ahead of the track ID or start sentinel.

<60><Command Length><53><D2><Len><Preamble String><LRC><ETX>

In this example:

<Command Length> is a two-byte length from <53> to <Preamble String>

<Len> is the number of bytes of the Preamble String, but no greater than 0x10

<Preamble String> is {string length}{string} (String length is one byte, maximum 15.)

The response will be: <60><00><02><90><00><F2><03>

SPECTRUM III Mag Only Insert Reader (MOIR)

POSTAMBLE SETTING

This setting allows the user to select a character string to be output at the end of magnetic stripe data. If a character string is defined, it will be sent out after the terminator ID. If no character string is defined, nothing will be sent out after the terminator ID.

<60><Command Length><53><D3><Len><Postamble String><LRC><ETX>

In this example:

<Command Length> is a two-byte length from <53> to <Postamble String>

<Len> is the number of bytes of Postamble String, but no greater than 0x10

<Postamble String> is {string length}{string} (String length is one byte, maximum 15.)

The response will be: <60><00><02><90><00><F2><03>

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ENVELOPE FOR MAGNETIC STRIPE DATA

This command adds the ID TECH envelope to magnetic stripe data before it is sent to the host.

<60><Len_H><Len_L><card data indication 1><card data indication 2>[Track 1 data][Track2 data][Track 3 data]<LRC><ETX>

<card data indication 1 >(<Cx>) is an ID to indicate magnetic data.

Bit Position

0-3	Unused (set to 0)
4	'0'
5	'0'
6	'1'
7	'1'

<card data indication 2> is to indicate reading status.

Bit Position	'0'	'1'
0	Track 1 decode fail	Track 1 decode success
1	Track 2 decode fail	Track 2 decode success
2	Track 3 decode fail	Track 3 decode success
3	No Track 1 data	Track 1 data exists
4	No Track 2 data	Track 2 data exists
5	No Track 3 data	Track 3 data exists
6-7	Unused (set to 0)	

Note: The Track x decode flag will be 0 if Track x data does not exist.

Note: The order of magnetic data and switch change notification depends on the order in which they come to the microcontroller. This is not fixed.

ARM TO READ IN BUFFER MODE

This command sets the reader to read magnetic stripe data and store it in memory.

<60> <00> <03> <50> <01 > <30> <LRC> <ETX>

The response will be: <60> <00> <02> <90> <00> <LRC> <03>

If the reader controls the LED, the LED will turn green and the reader will send an ACK response to the host. Previously read data will be erased, and the reader will wait for the next card insertion or withdraw, depend on decoding method command. If an MSR RESET command is received, all data will be erased from memory.

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When a card is inserted and withdrawn, the decoded data will be saved in memory and not sent to the host. If the reader controls the LED, the LED will turn green. (If there was no data to read, the LED will briefly turn red and then go green.) A notification will be sent to the host to indicate the presence of magnetic data. Data will be held until receiving the next ARM TO READ or MSR RESET command.

While in Buffer Mode, the reader will continue to allow the normal commands (e. g. status, LED commands).

MSR RESET IN BUFFER MODE

This command will disable MSR reading and clear any magnetic data stored in the buffer. The reader will enter a disarmed state and ignore MSR data.

<60> <00> <03><50> <01><32> <LRC> <ETX>

The response will be: <60> <00> <02> <90><00> <LRC> <03>

Any stored magnetic data will be erased. The reader will send an ACK response to the host.

If the reader is configured automatically to transmit magnetic data, the reader will respond that the command is not supported.

READ MSR DATA IN BUFFER MODE

There are up to three tracks of encoded data on a magnetic stripe. This setting selects the tracks to be read in Buffer Mode.

<60> <00> <03> <51 > <01 > <Track Select Byte> <LRC> <ETX>

Track Selection Settings:

<30> Any Track

<31> Track 1

<32> Track 2

<33> Track 1 & Track 2

<34> Track 3

<35> Track 1 & Track 3

<36> Track 2 & Track 3

<37> All Three Tracks

The data on the selected track(s) will be sent to the host either in envelope format or not, according to the Card Notification Setting, or in RAW format. The data will not be erased after this command.

SPECTRUM III Mag Only Insert Reader (MOIR)

TROUBLESHOOTING

The Spectrum III Magnetic Stripe Insert Reader is easy to install and use. Most problems encountered can be attributed to:

- Incorrect Interface Cabling
- Incorrect Driver Installation
- Incorrect Configuration Setup
- Bad Magnetic Stripe Quality

General Procedures

The troubleshooting process can be simplified by following these simple diagnostic procedures.

1. Once the Magnetic Insert Reader is correctly powered, the LED of the reader should be green.
2. For USB CDC reader, if this is a first-time installation, the OS will ask for the .inf file. Choose MOIR_USB_CDC.inf file. After the installation, there should be a new USB CDC device shown in the OS device manager window -> ports "ID TECH Magnetic Stripe Insert USB CDC reader (COMx)".
3. For USB_HID_KB reader, the OS will install the device automatically. There will be two new items in the OS device manager window. One is "Human Interface Devices -> USB Human Interface Device", another is "Keyboards -> HID Keyboard Device".
4. For RS232 and USB CDC readers, open a communication application (such as HyperTerminal) and select the correct Com port. Set the RS232 parameters.
5. For KB and USB_HID_KB readers, open an application (such as Notepad) to receive the card data.
6. Inserting and withdraw a credit card. The LED will turn amber while processing, then green or red, as appropriate.
7. Once the reader has indicated a "good read," the card data should be shown in the communication application.

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Appendix A - DEFAULT SETTINGS

Default Settings for Magnetic Stripes

The Spectrum III Magnetic Stripe Insert Reader is shipped from the factory with the following default settings already programmed:

Magnetic Track Basic Data Format

```
<SS1 ><T1_DATA><ES><CR>  
<SS2><T2_DATA><ES><CR>  
<SS3><T3_DATA><ES><CR>
```

Where:

SS1 (start sentinel track 1) = % (7 or 6 bit encoding) or; (5 bit encoding)

SS2(start sentinel track 2) = ; (5 bit encoding) or % (7 bit encoding)

SS3(start sentinel track 3) = % (7 bit encoding) or ! (6 bit encoding) or; (5 bit encoding)

ES(end sentinel all tracks) = ? DEFINITIONS FOR MAGNETIC STRIPES

Start or End Sentinel: Characters in encoding format which come before the first data character (start) and after the last data character (end), indicating the beginning and end, respectively, of data. The Start Sentinel always begins with a "1" (one) bit to signal the start of data.

Track Separator: A designated character, which separates data tracks.

Terminator: A designated character that comes at the end of the last track of data, to separate card reads.

LRC: Check character, following end sentinel. CDL: Old California Drivers License format.

* Note: The <CR> commands shown above for Tracks 1 &2 and Tracks 2&3 denote the default character for this position, the Track Separator position. The <CR> command shown for Track 3 denotes the default character for this position, the Terminator position.

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DEFAULT SETTINGS TABLE

Setting	Default
MSR Reading	Enable Auto Transmit Mode (0x31)
Magnetic Decoding Method	Withdraw Only (0x33)
Track 1 ID	None (0x00)
Track 2 ID	None (0x00)
Track 3 ID	None (0x00)
T1 7 bit Start ID	'%' (0x25)
T1 6 bit Start ID	'%' (0x25)
T1 5 bit Start ID	',' (0x3B)
T2 7 bit Start ID	'%' (0x25)
T2 5 bit Start ID	',' (0x3B)
T3 7 bit Start ID	'%' (0x25)
T3 6 bit Start ID	'!' (0x21)
T3 5 bit Start ID	',' (0x3B)
Track End ID	'?' (0x3F)
Terminator Setting	CR (0x0D)
CardSeatedStr ID *	[tab]Card Seated[tab]
CardRemovedStrID *	[tab]Card Removed[tab]
CardInStrID *	[tab]Card Present[tab]
CardOutStrID *	[tab]Card Out[tab]
NoDataStrID *	[tab]No Data[tab]
MediaDetectedStrID *	[tab]Media Detected[tab]
MagDataStrID *	[tab]Magnetic Data[tab]
CardInSlotStrID *	[tab]Card In Slot[tab]
PartialInStrID *	[tab]Incomplete Insertion[tab]
BaudID **	38400bps (0x37)
DataID **	8 Bits (0x30) ParityID
**	None Parity (0x30)
HandShakeID **	No HandShake (0x30)
StopID **	1 Bit (0x30)
XOnID **	0x11
XOffID **	0x13
Character Delay***	2 ms inter-character delay (0x30)
Preamble Setting	None (0x00)
Postamble Setting	None (0x00)
Track Selection Setting	Any Track (0x30)
Track Separator Setting	CR (0x0D)
LRC Option	Without LRC in output (0x30)

* Only for KB and USB_HID_KB reader

** Only for RS232 reader

***Only for KB reader

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Terminal Type	For RS232 reader: RS232 (0x31) For KB reader: PC_AT (0x30) For USB_HID_KB reader: U_HID_KB (0x33) For USB_CDC reader: U_CDC (0x34)
Send Option	For RS232 and CDC reader: Send Sentinel and all data/No error notification (0x31) For KB and USB_HID_KB reader: Send Sentinel, all data and error notification (0x35)
Reader Operation	For RS232 and CDC reader: Card Seated On, Card Removed On, Card In On, Card Out On, MSR Data Envelope On, LED Controlled by Reader, Magnetic Data Present Off, Standard Decoder (0x8F) For KB and USB_HID_KB reader: Card Seated On, Card Removed On, Card In Off, Card Out Off, MSR Data Envelope Off, LED Controlled by Reader, Magnetic Data Present Off, Standard Decoder (0x03)
Reader Operation 2	For RS232 and CDC reader: Media Detected Off, No Data Off, Card in Slot Off, Incomplete Insertion Off (0x00) For KB and USB_HID_KB reader: Media Detected On, No Data On, Card in Slot Off, Incomplete Insertion Off (0x03)

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Appendix B - STATUS CODE TABLE

Return Status and Explanations

<u>Code</u>	<u>Definition</u>
<B0><XX>*	Card status (switch, no data, media detect...) change notification
<90><00>	Operation completed successfully (all operations)
<81><00>	Time out
<69><00>	Command not supported
<29><00>	Unknown ID warning
<2A><00>	Command received correctly, but could not be completed
<C0><XX>*	Magnetic card data with envelope

*Note: XX is the reader status byte

SPECTRUM III Mag Only Insert Reader (MOIR)

Appendix C - FUNCTION ID TABLE

Function Description	Function ID	Function Value
Terminal Type	10	'0'-'6'
Reader Option	11	Any Value (One byte)
Character Delay ***	12	'0'-'5'
Track Selected Settings	13	'0'-'7'
Track Separator Settings	17	Any ASCII Code
Send Option	19	'0'-'7'
MSR Reading	1A	'0'-'2'
Magnetic Decoding Method	1D	'1'-'3'
Terminator Settings	21	Any ASCII Code
CardSeatedStrID *	26	String (no more than 24 bytes)
CardRemovedStrID *	27	String (no more than 24 bytes)
CardInStrID *	28	String (no more than 24 bytes)
CardOutStrID *	29	String (no more than 24 bytes)
NoDataStrID *	2A	String (no more than 24 bytes)
MediaDetectedStrID *	2B	String (no more than 24 bytes)
MagDataStrID *	2C	String (no more than 24 bytes)
CardInSlotStrID *	2D	String (no more than 24 bytes)
PartialInStrID *	2E	String (no more than 24 bytes)
Reader Option 2	2F	Any Value (One byte)
Track 1 ID	31	Any ASCII Code
Track 2 ID	32	Any ASCII Code
Track 3 ID	33	Any ASCII Code
BaudID **	41	'3'-'7'
DataID **	42	'0'-'1'
ParityID **	43	'0'-'4'
HandShakeID **	44	'0'-'2'
StopID **	45	'0'-'1'
XOnID **	47	Any ASCII Code
XOffID **	48	Any ASCII Code
LRC Option	60	'0' - '1'
T17BStartID	61	Any ASCII Code
T16BStartID	62	Any ASCII Code
T15BStartID	63	Any ASCII Code
T27BStartID	64	Any ASCII Code
T25BStartID	65	Any ASCII Code
T37BStartID	66	Any ASCII Code
T36BStartID	67	Any ASCII Code
T35BStartID	68	Any ASCII Code
TEndID	69	Any ASCII Code
Preamble Setting	D2	String (no more than 15 bytes)
Postamble Setting	D3	String (no more than 15 bytes)

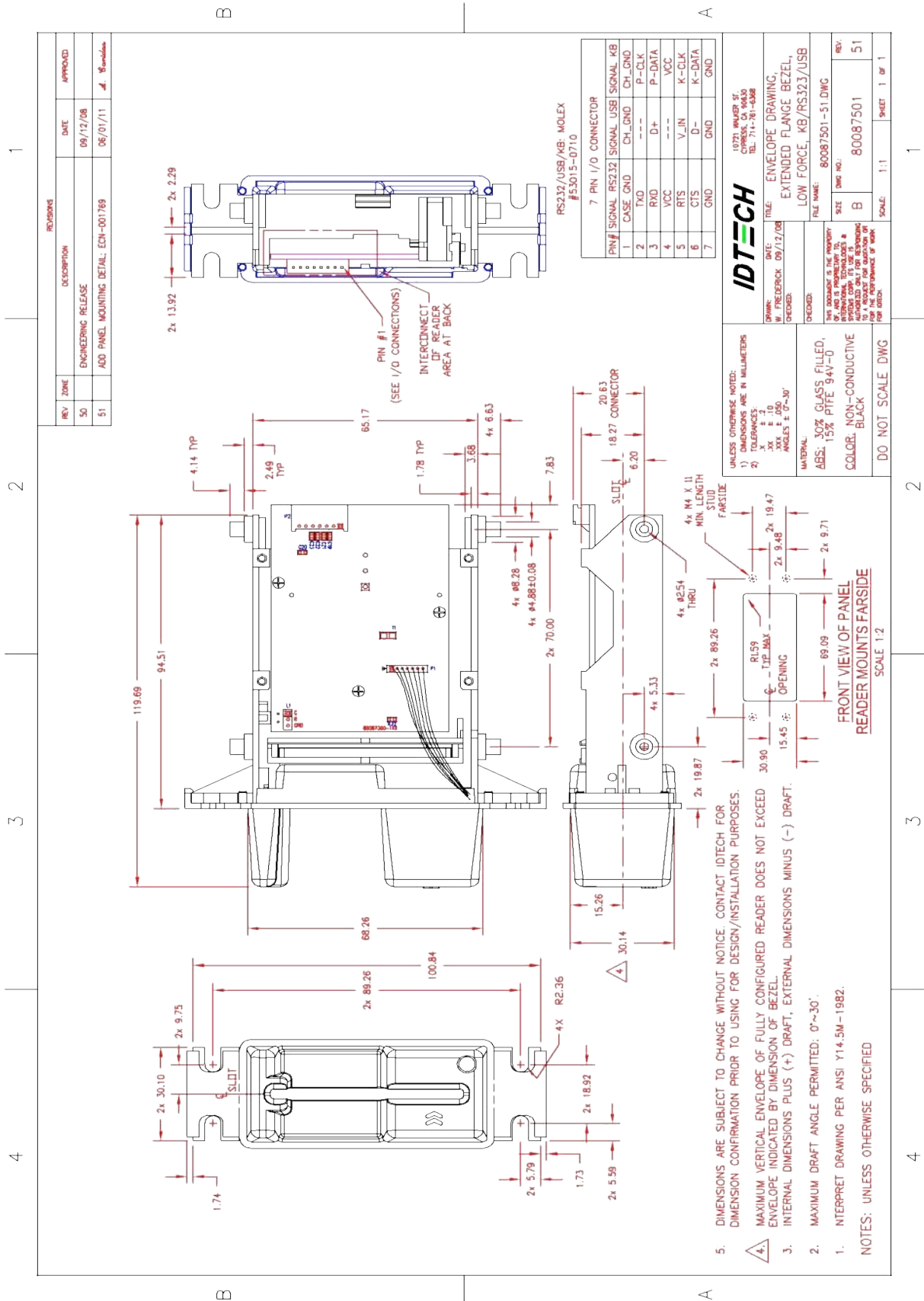
* Only for KB and USB_HID_KB reader

** Only for RS232 reader

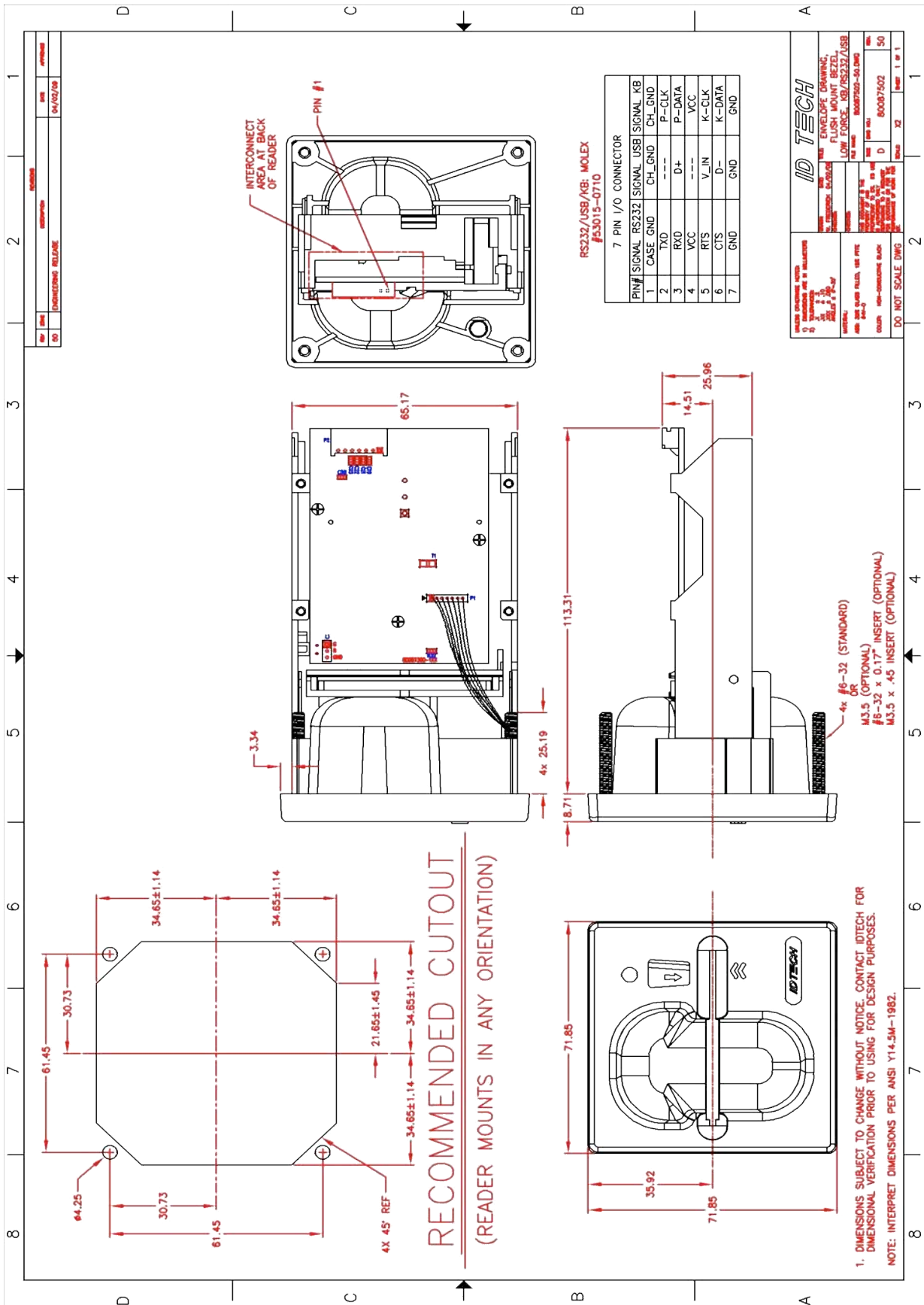
*** Only for KB reader

Appendix D – Outline Drawing

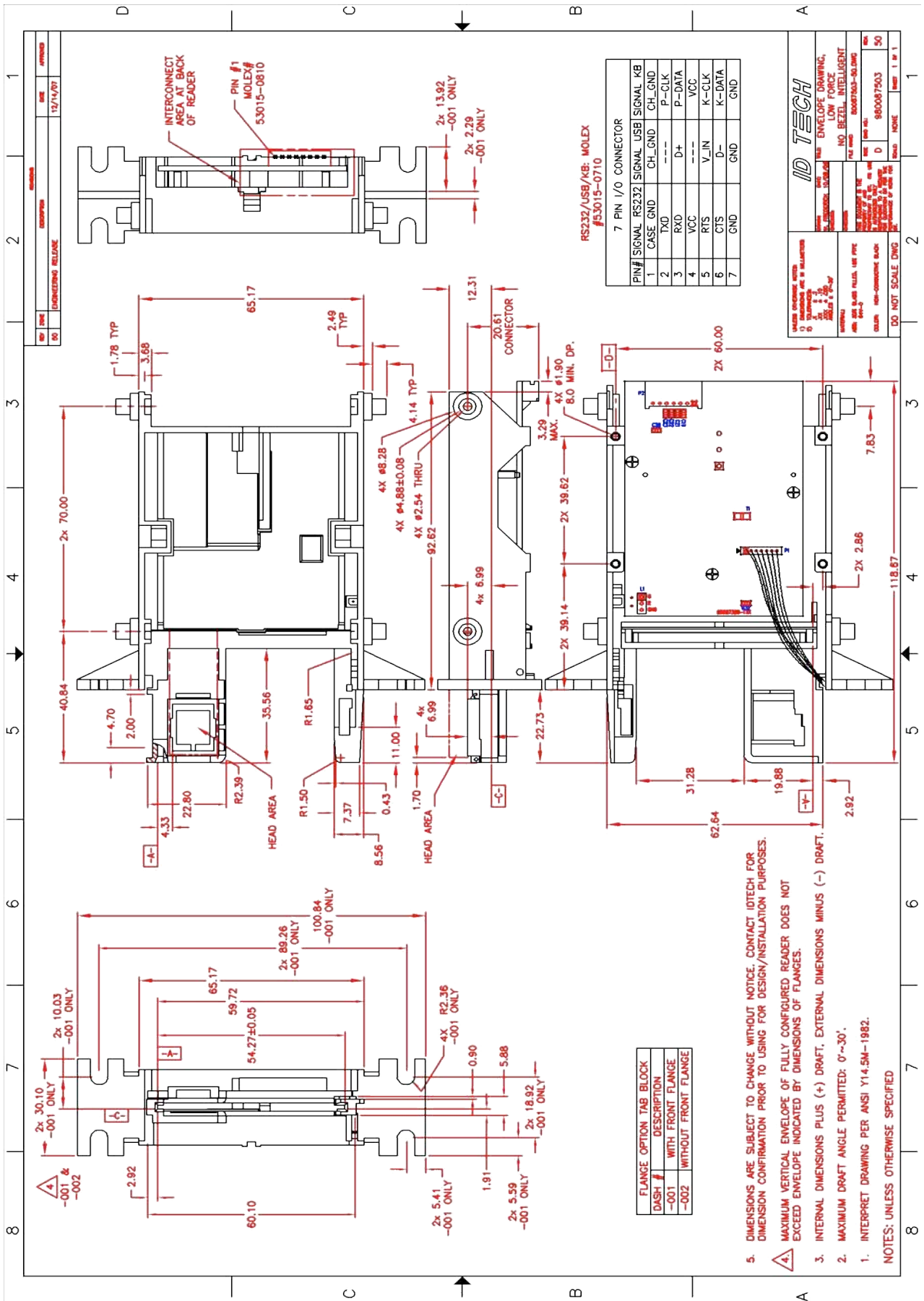
Standard Bezel



Flush Bezel

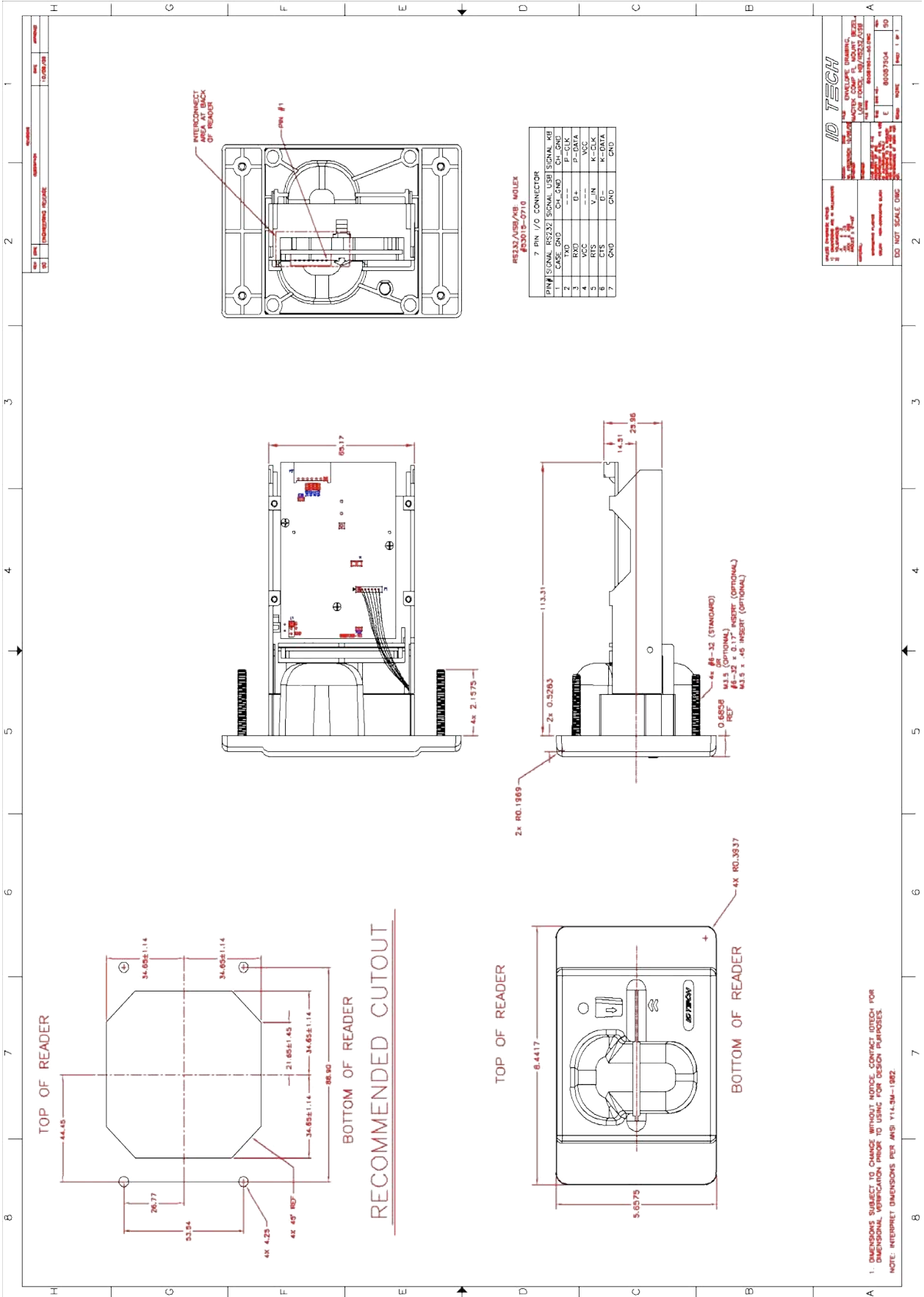


No Bezel



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Metal Flush Bezel



Metal Bezel

