![MEI logo]

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CASHFLOW SC/SCL SERIES
CUSTOMER INTERFACE MANUAL

TITLE   : MEI Cashflow SC series customer interface manual

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AUTHORS   : WCR

Change History

Issue	Date	Description	Author
G5	03/28/06	- Updated for USB Interface - Added MW Upstacker Full Face BEG - Add 24VDC Power Requirement Chart - Updated BEG LED Supply Values - Added External Inhibit Feature - Updated SCL Description	D Blasko
G6	08/14/07	Updated Power Requirements for Cashflow SC	P Wesel
G7	09/26/08	- Updated Mounting Information - Added BNF Information - Added BNF Tray Options - Added Retail Harness Options - EBDS document change - Updated lock information	C Vasquez D Blasko

1   General Description:

The CASHFLOW SC Series Note/Bar Code Acceptors are a family of high security acceptors that process currency and bar code documents over a wide range of electrical and environmental conditions. The CASHFLOW SC series is intended for use in indoor or protected outdoor environments. The CASHFLOW SC series Note/Bar Code Acceptors are designed for a high rate of genuine note acceptance and standard bar code decoding while maintaining security (resistance to a variety of frauds)*. Additional features include improved human interface, and a variety of entry guide options. The note combination can either be selected externally via the electronic interface or via a programming coupon. The CASHFLOW SC series Note/Bar Code Acceptors process bank notes four ways with the option to process two ways and one way. The CASHFLOW SC series Note/Bar Code Acceptors can decode bar code documents two ways. The CASHFLOW SC series application software can be designed for various countries' currencies.

*The retail model bill acceptors SCXXX27R and SCXXX28R do not support barcode coupon acceptance.

1.1   Definitions:

Acceptor Module
The main part of the note acceptor that contains the electronics, sensors, and motors necessary for the acceptor to operate.

Chassis
The metal framework used to hold the entire note acceptor (acceptor, cashbox, interface board) within the host machine.

Cashbox
The removable container used to accept and store currency. There may also be a lock attached used for securing the currency.

Interface Board
A customized PCB used to connect to specific interface hardware for host machines.

Recognition Sensor Array
The recognition sensor array has a dual purpose. First, it is used to identify the note and second it is used as a position sensor to mark the Escrow position. Notes are normally stopped, in Escrow, right after the sensor array.

Barcode sensor
A specialized sensor used to obtain the barcode pattern off of the barcode substrate.

Bunch Note Feeder (BNF)
Optional module supports bulk feed. Contact MEI to for supported countries.

1.2   Communication Interfaces:

The interfaces described in section 4 are hardware capable now and can be enabled by a software upgrade:

Enhanced Bi-Directional Serial Interface (EBDS) 9600 BAUD with physical hardware of: isolated open collector or RS232 levels

Bally® Slot Data System (proprietary to JCM®/Bally®)[1]

The following IGT® interfaces are fully supported:

IGT®: Netplex (proprietary to IGT®)[1]

Note 1:

IGT interfaces are proprietary interfaces and are not documented in this manual. Please refer to the appropriate reference documents listed in section

1.3   Kits Available:

Contact your MEI sales representative for kit part numbers.

Available Kits:
-   Mounting Kits
-   Entry Guide Kits
-   Harness Kits
-   Acceptor guide

Other kits shall be defined as required to service and support the Cashflow[tm] SC product.

1.4   Reference Documents:

-   IGT® Netplex Protocol version 1.07
-   IGT® Bill Validator Protocol Version 2.5
-   Bally Systems Coupon Cashless Protocol - "SDS" (4/9/97)
-   ANSI X3.182-1990 Bar Code Print Quality Guideline
-   AIM USA Uniform Symbology Specification - Interleaved 2-of-5

2 Mechanical Interface

2.1 Product Modules
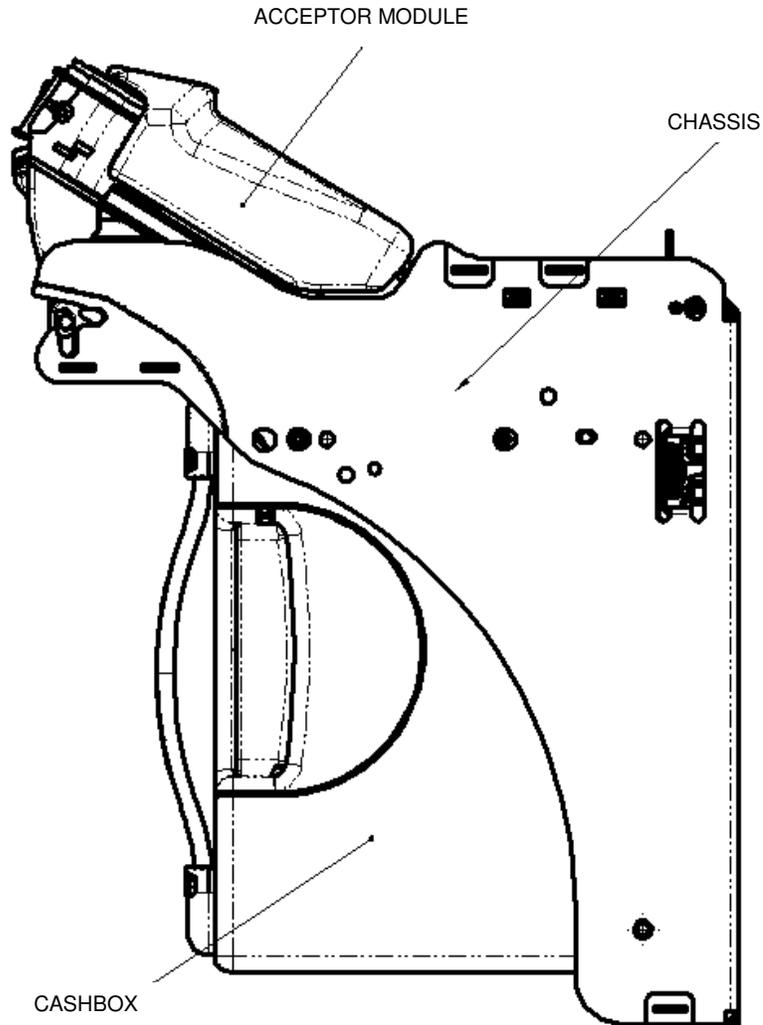
2.2   Mechanical Dimensions

The following Cashflow SC **series CAD files are available:**

2D Drawings

252053001.pdf is a 2D drawing which shows detailed dimensions of the Cashflow sc66/sc83 series
Note Acceptors.
252053001.dxf is a 2D drawing which shows detailed dimensions of the Cashflow sc66/sc83 series
Note Acceptors.

The 2D drawing is also available in the following formats upon request:

DWG   (AutoCAD® Native Drawing Format)
TIFF   (2D Drawing Fax Format)

3D CAD Files

Cashflow SC66 is a 3D CAD Solid model in IGES format
Cashflow SC66 E-Drawing is a 3D file with self executing embedded viewer

Cashflow SC83 is a 3D CAD Solid model in IGES format
Cashflow SC83 E-Drawing is a 3D file with self executing embedded viewer

The 3D CAD files are also available in the following formats upon request:

SolidWorks   (Native)
IGES   (Surface data)
ParaSolid   Unigraphics® / IronCad®
STEP   (AP203)
SAT   ACIS® (AutoDesk® - Mechanical Desktop®)
VDA   VDAFS
ProE   ProEngineer® (Version 19 or higher)
STL   Stereolithography (Caution facetted data is approximate)

In addition to the physical space requirements of the unit, additional clearance is required for removal of the cashbox and acceptor module. These clearance envelopes are also specified in the above drawing.

MEI reserves the right to update the drawings and specifications without notice. Please check with MEI for the latest version of these documents before using this data.

The following Cashflow SCM **series CAD files are available:**

2D Drawings

252300008.pdf REF is a 2D drawing which shows detailed dimensions of the Cashflow BNF SCM66/SCM83 series Note Acceptors.
252300008.dxf is a 2D drawing which shows detailed dimensions of the Cashflow BNF SCM66/SCM83 series Note Acceptors.

The 2D drawing is also available in the following formats upon request:

DWG   (AutoCAD® Native Drawing Format)
TIFF   (2D Drawing Fax Format)

3D CAD Files

Cashflow SCM66/SCM83 is a 3D CAD Solid model in IGES format
Cashflow SCL66/SCM83 E-Drawing is a 3D file with self executing embedded viewer

The 3D CAD files are also available in the following formats upon request:

SolidWorks   (Native)
IGES   (Surface data)
ParaSolid   Unigraphics® / IronCad®
STEP   (AP203)
SAT   ACIS® (AutoDesk® - Mechanical Desktop®)
VDA   VDAFS
ProE   ProEngineer® (Version 19 or higher)
STL   Stereolithography (Caution facetted data is approximate)

In addition to the physical space requirements of the unit, additional clearance is required for removal of the cashbox and acceptor module. These clearance envelopes are also specified in the above drawing.

MEI reserves the right to update the drawings and specifications without notice. Please check with MEI for the latest version of these documents before using this data.

The following Cashflow SCL **series CAD files are available:**

2D Drawings

252202001.pdf is an 2D drawing which shows detailed dimensions of the Cashflow SCL66/ SCL83
                series Note Acceptors.
252202001.dxf is an 2D drawing which shows detailed dimensions of the Cashflow SCL66/SCL83
                series Note Acceptors.

The 2D drawing is also available in the following formats upon request:

DWG   (AutoCAD® Native Drawing Format)
TIFF   (2D Drawing Fax Format)

3D CAD Files

Cashflow SCL66 is a 3D CAD Solid model in IGES format
Cashflow SCL66 E-Drawing is a 3D file with self executing embedded viewer

Cashflow SCL83 is a 3D CAD Solid model in IGES format
Cashflow SCL83 E-Drawing is a 3D file with self executing embedded viewer

The 3D CAD files are also available in the following formats upon request:

SolidWorks   (Native)
IGES   (Surface data)
ParaSolid   Unigraphics® / IronCad®
STEP   (AP203)
SAT   ACIS® (AutoDesk® - Mechanical Desktop®)
VDA   VDAFS
ProE   ProEngineer® (Version 19 or higher)
STL   Stereolithography (Caution facetted data is approximate)

In addition to the physical space requirements of the unit additional clearance is required for removal of the cashbox and acceptor module. These clearance envelopes are also specified in the above drawing.

MEI reserves the right to update the drawings and specifications without notice. Please check with MEI for the latest version of these documents before using this data.

The following Cashflow Bunch Note Feeder (BNF) SCL **series CAD files are available:**

2D Drawings

252459002.pdf is a 2D drawing which shows detailed dimensions of the Cashflow BNF SCL66/SCL83 series Note Acceptors.
252459002_G1.DXF is a 2D drawing which shows detailed dimensions of the Cashflow BNF SCL66/SCL83 series Note Acceptors.

The 2D drawing is also available in the following formats upon request:

DWG   (AutoCAD® Native Drawing Format)
TIFF   (2D Drawing Fax Format)

3D CAD Files

Cashflow BNF SCL66/SCL83 is a 3D CAD Solid model in IGES format
Cashflow BNF SCL66/83 E-Drawing is a 3D file with self executing embedded viewer

The 3D CAD files are also available in the following formats upon request:

SolidWorks   (Native)
IGES   (Surface data)
ParaSolid   Unigraphics® / IronCad®
STEP   (AP203)
SAT   ACIS® (AutoDesk® - Mechanical Desktop®)
VDA   VDAFS
ProE   ProEngineer® (Version 19 or higher)
STL   Stereolithography (Caution facetted data is approximate)

In addition to the physical space requirements of the unit, additional clearance is required for removal of the cashbox and acceptor module. These clearance envelopes are also specified in the above drawing.

MEI reserves the right to update the drawings and specifications without notice. Please check with MEI for the latest version of these documents before using this data.

2.3 Mounting options

⚠️ **IMPORTANT! – The unit is not to be used as a standalone peripheral. Proper mounting of the chassis is required for normal operation. Inadequate/improper mounting may result in a degradation of performance. The following section describes the proper mounting requirements. Contact MEI technical support regarding these mounting guidelines.**

<u>Chassis Mounting Considerations</u>

When using the two side planes (A and B) to mount the unit, be careful to ensure that they are aligned so the chassis width dimension is not spread, separated, flexed or bowed. Refer to figures 1 and 2. The chassis width dimension should be 114mm +/- 0.4 mm. Extending the chassis width dimension past the tolerance can cause error conditions such as cashbox ejection or lowered cashbox capacity.
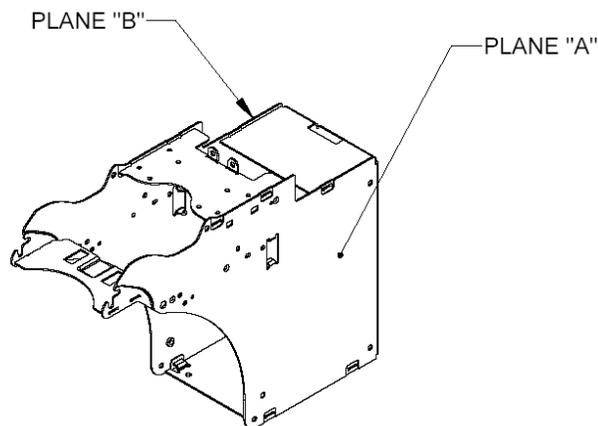

Figure 1. SCL Side Mounting Planes
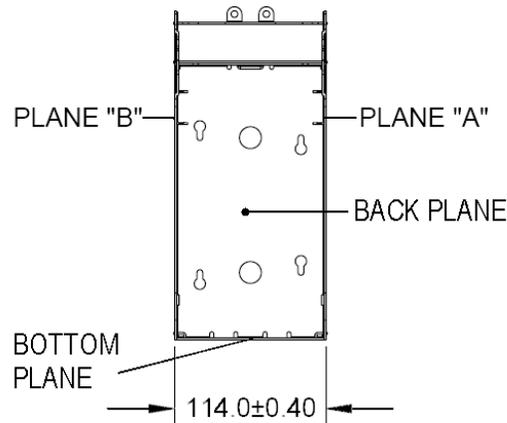
Figure 2. Rear View of Chassis Width Dimension

Cashflow SC series (500 note capacity)

A total of 12 mounting holes and two grounding points are offered. The side mounting holes and chassis ground points are highlighted in Figure 3. These mounting locations are compatible with the MEI® ZT series note acceptors. In general use of 3 mounting holes, including at least two separate planes, will be sufficient to mount the unit. Care should be taken not to distort the chassis if it is mounted on surfaces that are not exactly aligned. Dimensions to the centerline of the note path are given on drawing 252053001.pdf to assist in alignment with the entry guide. Note the thread depth on the M4 mounting holes should be no greater than 6mm and no less than 4mm. Longer screws will interfere with the removable cashbox. Shorter screws may not have enough thread engagement. If mounting to the back plane of the chassis, care should be given not to use hardware that will interfere with the complete insertion of the cashbox.
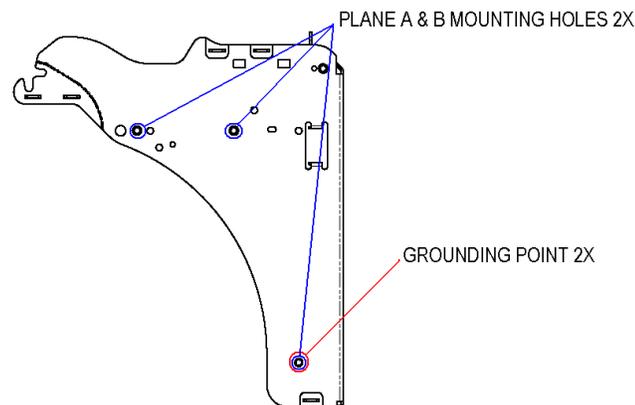
Figure 3. SC model side mounting and chassis ground locations

Cashflow SCM (900 note capacity) and SCL (1,200 note capacity) models

It is important that the chassis be supported rigidly on both sides and bottom to prevent any spread, separation, flex or bowing from occurring. A total of 12 mounting holes and 2 chassis ground points are offered. The side mounting holes and chassis ground points are highlighted in Figure 4.
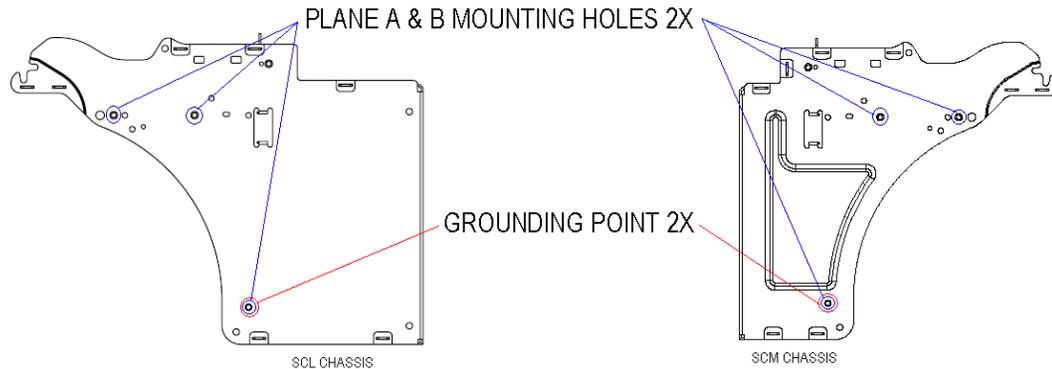
Figure 4. SCL & SCM model side mounting and chassis ground locations respectively

The use of 6 mounting holes, including a minimum of three separate planes (the bottom surface and both side surfaces) are required to mount the unit. Sheet 3 of the 252202001.pdf drawing shows the recommended procedure for mounting to the bottom of the unit. Care should be taken not to distort the chassis if it is mounted on surfaces that are not exactly aligned. Dimensions to the centerline of the note path are given on the drawing to assist in alignment with the entry guide. Note the thread depth on the M4 mounting holes should be no greater than 6mm and no less than 4mm. Longer screws will interfere with the removable cashbox. Shorter screws may not have enough thread engagement. If mounting to the back plane of the chassis, care should be given not to use hardware that will interfere with the complete insertion of the cashbox. Use the checklist below to check that your installation meets MEI guidelines.

SCM/SCL Mounting Checklist

- ☑ Minimum, 3 planes of chassis supported (both sides and bottom)
- ☑ Minimum, 6 mounting holes
- ☑ Side mounts are rigid and prevent outward spread, separation, flex or bow of chassis walls
- ☑ Chassis not distorted due to misalignment during tightening of mounting fasteners
- ☑ Threaded mounting locations screws are 4mm – 6mm long
- ☑ No mounting fasteners touch or rub the cashbox
- ☑ Chassis grounding used and linked to adequate enclosure grounding location.
- ☑ Contact MEI Technical Support for installation review

Chassis to Chassis Mounting

Chassis to Chassis mounting is an option available only on the Cashflow SCL series. There are 4 holes in each side of the chassis that permit mounting multiple units side by side. Four plastic rivets available from Richco can be used to hold the chassis's together and are assembled as shown below. The following Richco Rivets can be used SR-5055B, SRV0-5055B, SRV0-5055W, SR-5055W.
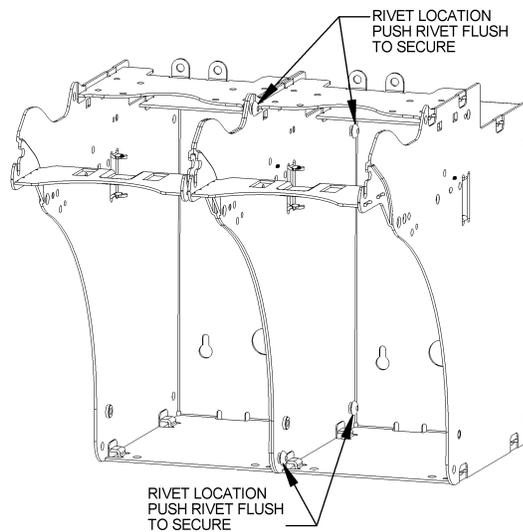
2.4   Entry Guides

MEI offers the following entry guides as standard offerings. Additional versions are available for specific OEM's. In general the entry guides are available in two widths. One for notes up to 66mm wide and another for notes up to 83mm wide. Note the entry guide throat dimension is larger.

MEI Universal Entry Guide:
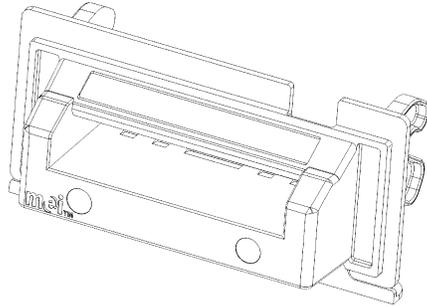
Note Width	Box of 1	Box of 24	3D IGES FILES
66 mm (USA+)	252067014P1	252067014	66mm MEI Universal Entry Guide
66 mm (USA+)	252024322P1		66mm MEI Universal Entry Guide Upstacker
83 mm (International)		252063153P24	83mm MEI Universal Entry Guide Upstacker
83 mm (International)	252065015P1	252065015	83mm MEI Universal Entry Guide

MEI Platform Entry Guide:
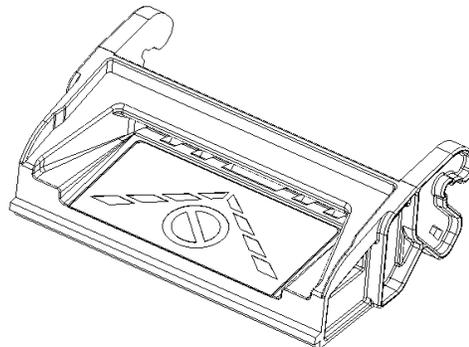
Note Width	Box of 1	Box of 24	3D IGES FILES
66 mm (USA+)	252063016P1	252063016	66mm MEI Platform Entry Guide
83 mm (International)	252060065P1	252060065	83mm MEI Platform Entry Guide

MEI Coin Resistant Entry Guide:
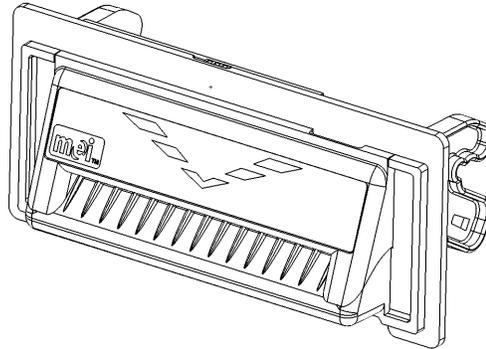
Bill Width	Box of 1	Box of 24	3D IGES FILES
66 mm (USA+) Unlit, No USB Cutout	252067053P1	252067053	SC66 CRB, Unlit, No USB
66 mm (USA+) Lit, No USB Cutout	252069052P1	252069052	SC66 CRB, Lit, No USB
66 mm (USA+) Unlit, w/ USB Cutout	252063055P1	252063055	SC66 CRB, Unlit, w/ USB
66 mm (USA+)Lit, w/ USB Cutout	252065054P1	252065054	SC66 CRB Lit w/ USB
83 mm (International) Unlit, No USB Cutout	252069057P1	252069057	SC83 CRB, Unlit, No USB
83 mm (International) Lit, No USB Cutout	252061056P1	252061056	SC83 CRB, Lit, No USB
83 mm (International) Unlit, w/ USB Cutout	252065059P1	252065059	SC83 CRB, Unlit, w/ USB
83 mm (International) Lit, w/ USB Cutout	252067058P1	252067058	SC83 CRB, Lit, w/ USB

Note: The USB Cutout option is only offered with the MEI Coin Resistant Entry Guide. The diagram above illustrates an entry guide without the USB Cutout.

MEI 83mm Upstacker Full Face Entry Guide:
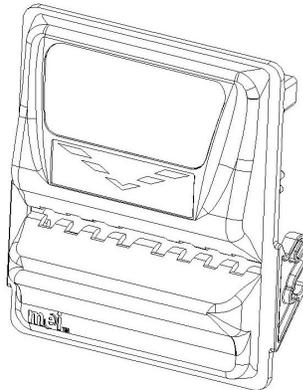
Note Width	Box of 1	Box of 24	3D IGES FILES
83 mm (International)	252019105	N/a	83mm Upstacker Full Face BEG

MEI Bunch Note Feeder (BNF) Universal Note Tray:
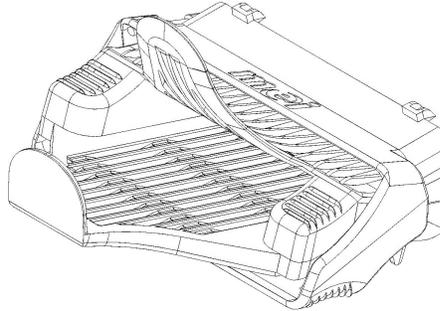
Note Width	Box of 1	Box of 24	3D IGES FILES
66 mm	252464006P1	N/a	MEI BNF Tray Univ 66mm
85 mm (International)	252065015P1	N/a	MEI BNF Tray Univ 85mm

MEI Bunch Note Feeder (BNF) Note Tray Mounting Bracket:
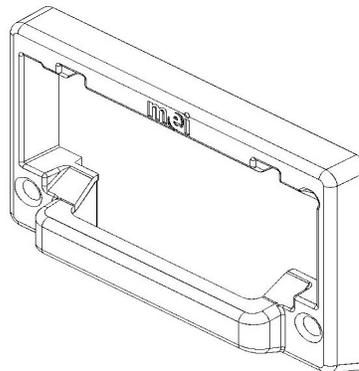
Note Width	Box of 1	Box of 24	3D IGES FILES
66 mm and 83mm	252468009P1	N/a	BNF_Mounting_Plate_Tray

Custom Entry Guide Info:
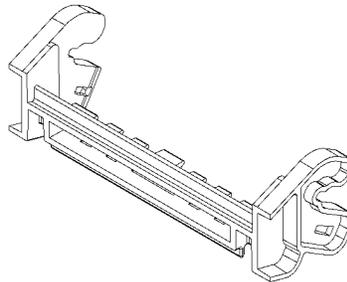
For customers who prefer to tool their own entry guides, MEI drawings 252057026 (sc66) and 252053045 (sc83) are available for the Cashflow interface. These drawings show the geometry of the interface teeth and mounting tabs. 3D CAD models of the required geometry are also available upon request.

Design of the entry guide has a strong impact on the ergonomics, reliability, and performance of the transaction system. It is strongly recommended that customers consult with MEI engineering before finalizing any new entry guide design.
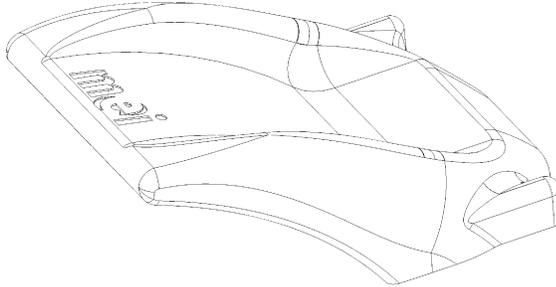
2.5 Acceptor Guide:

An acceptor guide is available to help guide the acceptor into the chassis in applications where visibility is poor or an upstacker application is required. The acceptor guide mounts to the top of the chassis using 4 screws as shown below and will fit both the SC and SCL Cashflow units. The acceptor guide is pre-assembled with the SCXX07R and SCLXX07R retail units.
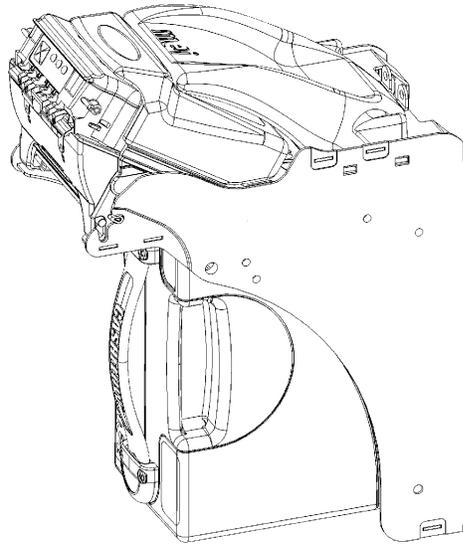
2.6   Cashbox Lock Specification

The cashbox may be fitted with either one or two security locks. The product is designed to accept locks from a range of manufacturers including: -

        Medeco
        Kaba
        Abloy
        VSR
        Miwa
        Duo
        ILCO

Standard 5/8" and 1 1/8" formats are supported. There is a significant variety of lock designs and spacer washers may be required for some lock types. The MEI drawing 252050011 shows the critical mechanical dimensions for the locks. Locking hasps are not shipped with most cash boxes. The hasp part number is MEI part # 252035002. A special hasp is required on the SC cash box. The hasp dictates what type of cam lock can be used. The standard hasp is MEI part # 252035002. A hasp with a larger locking hole is also available MEI part # 252036076. Use hyperlinks to view dimensional drawings of the hasp. Lists of constraints that limit cam lock selection are shown in the following table.

Locks vary greatly in price, security, keying policies etc. The customer is responsible for selecting a lock with performance that is fit for the intended purpose. MEI does not test or endorse any specific brand of lock for security characteristics. For applications requiring NO locks, a "slam" latch is available: MEI Part Number 252260001P1/P12 NLC CASHBOX LATCH.

When only one lock is used the remaining blank hole does not give access to the contents of the cashbox. Some regulatory authorities however may require a blanking plug be fitted. Contact MEI for assistance in obtaining a suitable plug.

Lock Rotation Direction

When two locks are installed they must rotate in opposite directions. See the figure below.
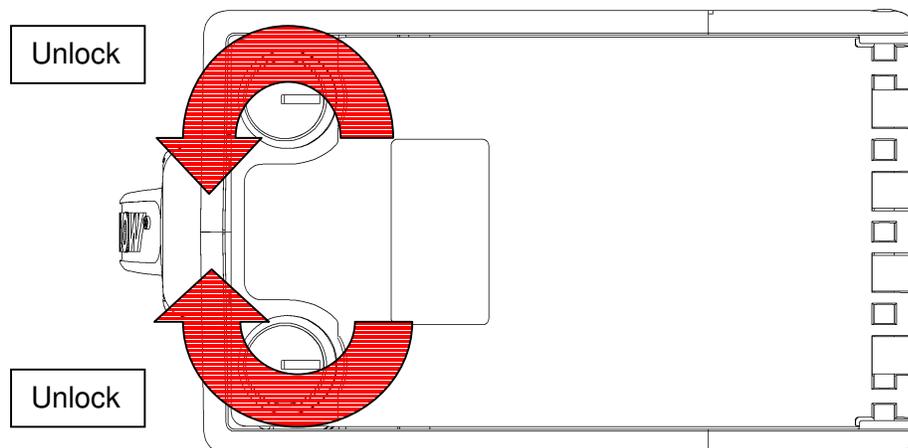
Lock Installation

The following figures show a SC cash box with installed cam lock and MEI hasp. The figures also show the diversity of locks that can be used with the SC/SCL cash box.

unlocked

locked

Non-Locking Cashbox
For situations that call for no locks on the cashbox (i.e. cash stripping) a latch kit P/N 252260001P1/P12 is available. See MEI drawing 252260001 for installation instructions.

3 Power Requirements:

CASHFLOW SCXX Acceptors require a regulated DC input voltage ranging from 12.0 $V_{PEAK-MIN}$ (-5%) to 27.3 $V_{PEAK-MAX}$ (+5%). Note: that PEAK readings are specified at the unit so that represented voltages are inclusive of any ripple, surge, or sag that may exist on the power lines.

Power consumption is defined by the following table:

Stand-by (Watts max peak)	Note Transporting (Watts max peak)	Note Stacking (Watts max peak)	Continuous Feed (Watts typical average)
10	30	70	24

One can convert to current by using the formula:
Power = Current x Voltage   or   Current = Power / Voltage

Here are some examples assuming voltage is constant:

Input Voltage (Volts)	Stand-by (Amps max peak)	Note Transporting (Amps max peak)	Note Stacking (Amps max peak)	Continuous Feed (Amps typical average)
24	0.42	1.25	2.92	1.0
13.5	0.74	2.22	5.19	1.8

The graph below shows a typical curve running from a 13V/20W power supply.

CASHFLOW SC/SCL series
Applied Voltage and Current while Transporting and Stacking into a Full Cassette
(Typical readings measured at 2 pin interlocking power connector @ room temp) Rev B

CALCULATIONS:
Average Current: 1.6 Amps
(from -0.5 to 5.5 seconds)

STACKER- PUSH

TRANSPORT

TRANSPORT

ESCROW

STACKER- STALLED

Current
Voltage
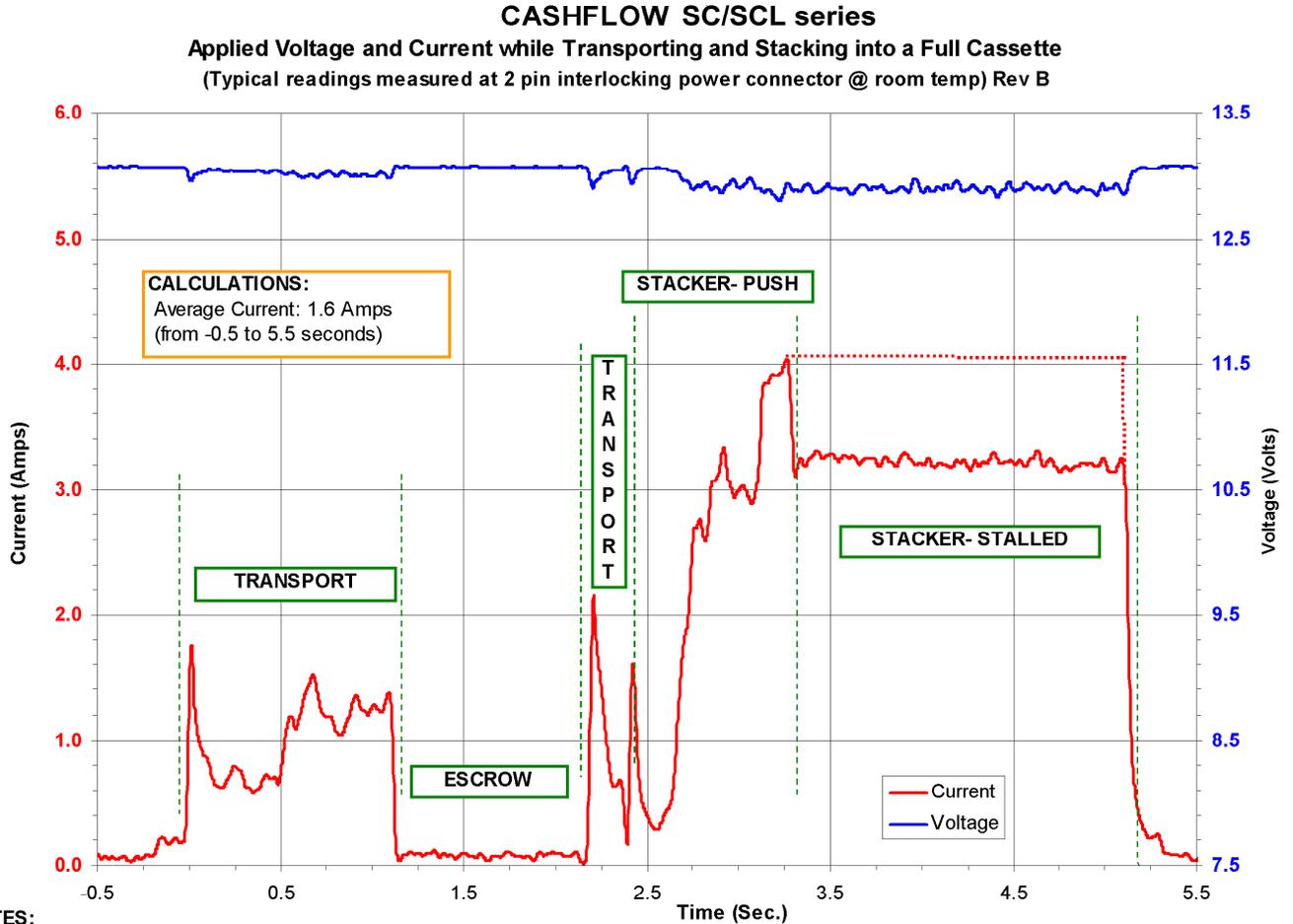
NOTES:
"ESCROW" and "STACKER- STALLED" times are preliminary.
Power budget: Vin peak is 12 Volts MIN, 28 Volts MAX. Power Peak is 70 Watts MAX.

FIGURE 3

The graph below shows a typical curve running from a 24V/70W power supply.

Cashflow SC/SCL series - Applied Voltage and Current Near Full Stack at 24 V
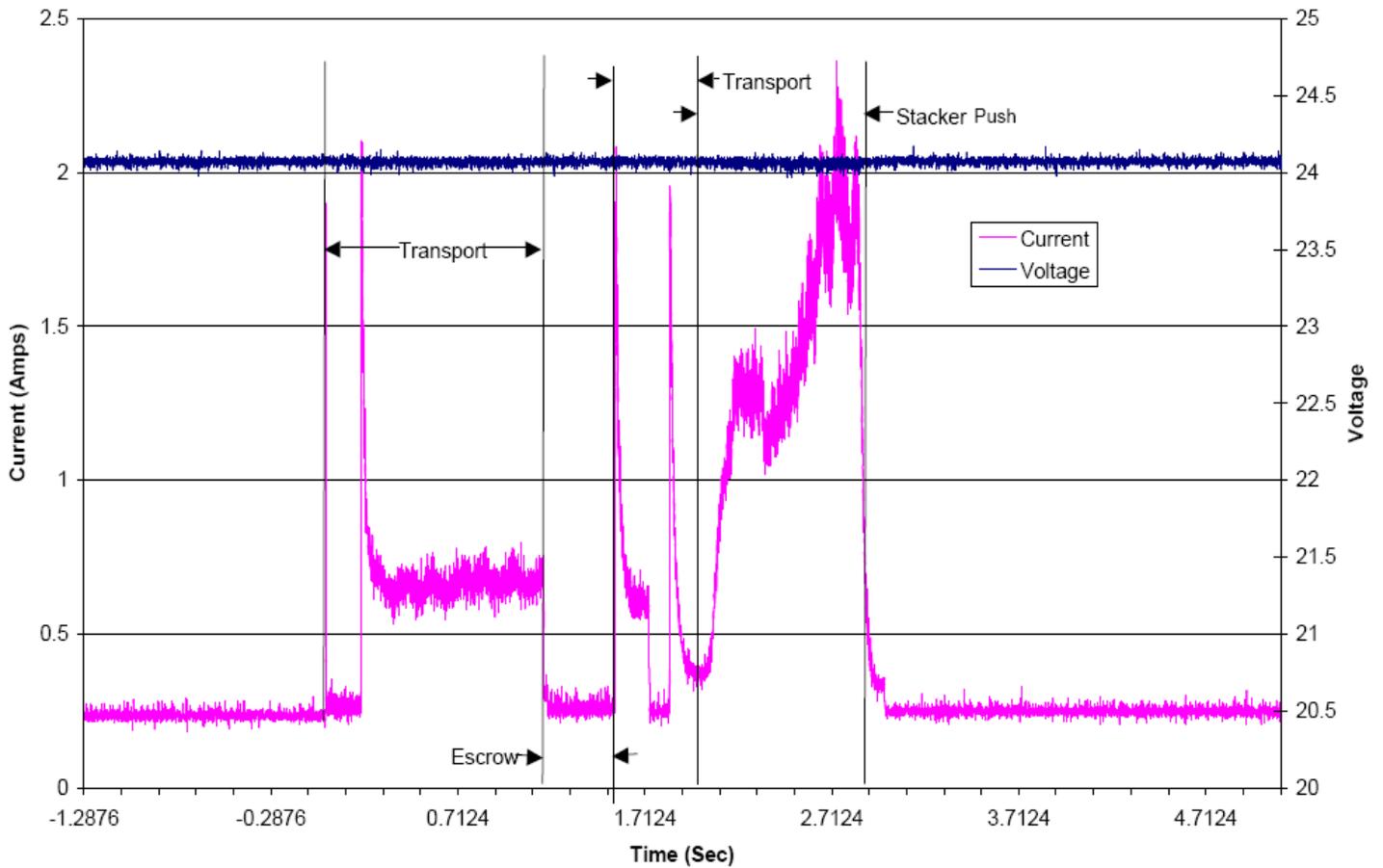
4 Interface Connections:

All connections refer to the host connector P2 located on the Interface PCB. This connector is a 34-pin double-sided card edge type. The top side has 17 contacts numbered "1" to "17" starting from the right. The bottom side has 17 contacts numbered "A" to "U" starting also from the right . Note the following letters are skipped: "G", "I", "O", and "Q". Refer to Figure 4 below. Note the black column represents the Keying Feature.

17	16	15	14	13	12		11	10	9	8	7	6	5	4	3	2	1
U	T	S	R	P	N		M	L	K	J	H	F	E	D	C	B	A

Figure 4.

4.1 Connection Pin-Out Table for EBDS Interface:

PIN	NAME	DESCRIPTION	TYPE
1	Power Input	From positive terminal of power supply.	Power
2	Power Return	From negative terminal of power supply.	Power
3	Isolated Return	Return/common of the opto-isolated interface.	Return/Common
4	$\overline{\text{Isolated TXD}}$	Opto-isolated serial data output from acceptor.	Open collector output. Active low.
5	$\overline{\text{Isolated RXD}}$	Opto-isolated serial data input to note acceptor.	Opto-LED with 2.2K series resistor. Active low.
6	$\overline{\text{Isolated RESET}}$	Opto-isolated RESET input to note acceptor.	Opto-LED with 2.2K series resistor. Active low.
7	Isolated Vopt	Isolated power for opto-isolated interface.	Power (typical: 13.5V at 25mA)
8	Bezel Power	Power for opto-couplers on entry guide PCBs.	Power Input (pin 1) with 600 ohm, 2W series resistor.
9	LED Supply	Power for LEDs i.e. O.O.S. LED.	5V with 180 ohm, 0.125W series resistor.
10	$\overline{\text{External Inhibit}}$	Host driven disable signal	Quasi-bidirectional input w/ weak pull-up. Active low.
11	Reserved (OOS)		
12	$\overline{\text{Bezel LED Drive}}$	Drive signal for Entry Guide LEDs	Open collector output. Active low.
13	EARTH	EARTH ground connection to support EMC	EARTH
14	OEM BEZEL 0	Entry guide line reserved for OEMs	Uncommitted Lines[2] to P3-1
15	OEM BEZEL 1	Entry guide line reserved for OEMs	Uncommitted Lines[2] to P3-2
16	OEM BEZEL 2	Entry guide line reserved for OEMs	Uncommitted Lines[2] to P3-3
17	OEM BEZEL 3	Entry guide line reserved for OEMs	Uncommitted Lines[2] to P3-4
A	Power Input	Same as pin1	Power
B	Power Return	Same as pin 2	Power
C	RS232 A RXD	RS232 data input for Auxiliary Interface	RS232 levels
D	Ground	Signal ground	Signal ground
E	USB Data(+)	STS (Service Tool)/IGT USB Data (+)	USB Positive data line
F	USB Data(-)	STS (Service Tool)/IGT USB Data (-)	USB Negative data line
H	Ground	Signal ground	Signal ground
J	RS232 A TXD	RS232 data output for Auxiliary Interface	RS232 levels
K	RS232 H TXD	RS232 data output for Host Interface	RS232 levels
L	RS232 H RXD	RS232 data input for Host Interface	RS232 levels
M	Ground	Signal ground	
N	OEM SW1 COM.	Cashbox present mechanical switch	Uncommitted Lines[2]
P	OEM SW1 N.O.	Cashbox present mechanical switch	Uncommitted Lines[2]
R	OEM SW1 N.C.	Cashbox present mechanical switch	Uncommitted Lines[2]
S	OEM SW2 COM.	Cashbox present mechanical switch	Uncommitted Lines[2]
T	OEM SW2 N.O.	Cashbox present mechanical switch	Uncommitted Lines[2]
U	OEM SW2 N.C.	Cashbox present mechanical switch	Uncommitted Lines[2]

Notes: [2] OEM Line power maximum: 30VAC, 42 Volts peak, 2 Amps max.

4.2 Connection Pin-Out Table for EBDS USB Interface:

PIN	NAME	DESCRIPTION	TYPE
1	Power Input	From positive terminal of power supply.	Power
2	Power Return	From negative terminal of power supply.	Power
3	Isolated Return	Return/common of the opto-isolated interface.	Return/Common
4	$\overline{\text{Isolated TXD}}$	Opto-isolated serial data output from acceptor.	Open collector output. Active low.
5	$\overline{\text{Isolated RXD}}$	Opto-isolated serial data input to note acceptor.	Opto-LED with 2.2K series resistor. Active low.
6	$\overline{\text{Isolated RESET}}$	Opto-isolated RESET input to note acceptor.	Opto-LED with 2.2K series resistor. Active low.
7	Isolated Vopt	Isolated power for opto-isolated interface.	Power (typical: 13.5V at 25mA)
8	Bezel Power	Power for opto-couplers on entry guide PCBs.	Power Input (pin 1) with 600 ohm, 2W series resistor.
9	LED Supply	Power for LEDs i.e. O.O.S. LED.	5V with 180 ohm, 0.125W series resistor.
10	$\overline{\text{External Inhibit}}$	Host driven disable signal	Quasi-bidirectional input w/ weak pull-up. Active low.
11	Reserved (OOS)		
12	$\overline{\text{Bezel LED Drive}}$	Drive signal for Entry Guide LEDs	Open collector output. Active low.
13	EARTH	EARTH ground connection to support EMC	EARTH
14	OEM BEZEL 0	Entry guide line reserved for OEMs	Uncommitted Lines[2] to P3-1
15	OEM BEZEL 1	Entry guide line reserved for OEMs	Uncommitted Lines[2] to P3-2
16	OEM BEZEL 2	Entry guide line reserved for OEMs	Uncommitted Lines[2] to P3-3
17	OEM BEZEL 3	Entry guide line reserved for OEMs	Uncommitted Lines[2] to P3-4
A	Power Input	Same as pin1	Power
B	Power Return	Same as pin 2	Power
C	RS232 A RXD	RS232 data input for Auxiliary Interface	RS232 levels
D	Ground	Signal ground	Signal ground
E	USB D1(+)	STS (Service Tool)/IGT USB, Data1(+)	USB Positive data line
F	USB D2(-)	STS (Service Tool)/IGT USB, Data1(-)	USB Negative data line
H	Ground	Signal ground	Signal ground
J	RS232 A TXD	RS232 data output for Auxiliary Interface	RS232 levels
K	RS232 H TXD	RS232 data output for Host Interface	RS232 levels
L	RS232 H RXD	RS232 data input for Host Interface	RS232 levels
M	Ground	Signal ground	
N	OEM SW1 COM.	Cashbox present mechanical switch	Uncommitted Lines[2]
P	OEM SW1 N.O.	Cashbox present mechanical switch	Uncommitted Lines[2]
R	OEM SW1 N.C.	Cashbox present mechanical switch	Uncommitted Lines[2]
S	Vbus	+5VDC from USB host	USB power
T	USB D2(+)	EBDS over USB, Data2 (+)	Differential USB signal
U	USB D2(-)	EBDS over USB, Data2 (-)	Differential USB signal

Notes: [2] OEM Line power maximum: 30VAC, 42 Volts peak, 2 Amps max.

4.3 Connection Pin-Out Table for EBDS Interface BNF SCL:

PIN	NAME	DESCRIPTION	TYPE
1	Power Input	From positive terminal of power supply. (POWER +)	Power
2	Power Return	From negative terminal of power supply. (GROUND)	Power
3			
4			
5			
6			
7			
8			
9	LED Supply	Power for LEDs i.e. O.O.S. LED. (LED SUPPLY)	5V with 180 ohm, 0.125W series resistor.
10	External Inhibit	Host driven disable signal (RESERVED)	Quasi-bidirectional input w/ weak pull-up. Active low.
11	Reserved (OOS)	OUT OF SERVICE	
12	Bezel LED Drive	Drive signal for Entry Guide LEDs (BEZEL LED DRIVE)	Open collector output. Active low.
13			
14	OEM BEZEL 0	Entry guide line reserved for OEMs (OEM_BEZEL_0)	Uncommitted Lines[2] to P3-1
15	OEM BEZEL 1	Entry guide line reserved for OEMs (OEM_BEZEL_1)	Uncommitted Lines[2] to P3-2
16	OEM BEZEL 2	Entry guide line reserved for OEMs (OEM_BEZEL_2)	Uncommitted Lines[2] to P3-3
17	OEM BEZEL 3	Entry guide line reserved for OEMs (OEM_BEZEL_3)	Uncommitted Lines[2] to P3-4
A	Power Input	Same as pin1 (POWER +)	Power
B	Power Return	Same as pin 2 (GROUND)	Power
C	RS232 A RXD	RS232 data input for Auxiliary Interface(OEM_BEZEL 2)	RS232 levels
D			
E			
F			
H			
J	RS232 A TXD	RS232 data output for Auxiliary Interface (OEM_BEZEL_3)	RS232 levels
K	RS232 H TXD	RS232 data output for Host Interface (RS232 EBDS TXD)	RS232 levels
L	RS232 H RXD	RS232 data input for Host Interface (RS232 EBDS RXD)	RS232 levels
M			
N			
P			
R			
S			
T			
U			

Notes: [2] OEM Line power maximum: 30VAC, 42 Volts peak, 2 Amps max.

4.4 Connection Pin-Out Table for EBDS USB Interface BNF SCL:

PIN	NAME	DESCRIPTION	TYPE
1	Power Input	From positive terminal of power supply. (POWER +)	Power
2	Power Return	From negative terminal of power supply. (GROUND)	Power
3			
4			
5			
6			
7			
8			
9	LED Supply	Power for LEDs i.e. O.O.S. LED. (LED SUPPLY)	5V with 180 ohm, 0.125W series resistor.
10	$\overline{\text{External Inhibit}}$	Host driven disable signal (RESERVED)	Quasi-bidirectional input w/ weak pull-up. Active low.
11	Reserved (OOS)	(OUT OF SERVICE)	
12	$\overline{\text{Bezel LED Drive}}$	Drive signal for Entry Guide LEDs (BEZEL LED DRIVE)	Open collector output. Active low.
13			
14	OEM BEZEL 0	Entry guide line reserved for OEMs (OEM_BEZEL_0)	Uncommitted Lines[2] to P3-1
15	OEM BEZEL 1	Entry guide line reserved for OEMs (OEM_BEZEL_1)	Uncommitted Lines[2] to P3-2
16	OEM BEZEL 2	Entry guide line reserved for OEMs (OEM_BEZEL_2)	Uncommitted Lines[2] to P3-3
17	OEM BEZEL 3	Entry guide line reserved for OEMs (OEM_BEZEL_3)	Uncommitted Lines[2] to P3-4
A	Power Input	Same as pin1 (POWER +)	Power
B	Power Return	Same as pin 2 (GROUND)	Power
C	RS232 A RXD	RS232 data input for Auxiliary Interface(OEM_BEZEL 2)	RS232 levels
D			
E			
F			
H	Ground	Signal ground	Signal ground
J	RS232 A TXD	RS232 data output for Auxiliary Interface (OEM_BEZEL_3)	RS232 levels
K	RS232 H TXD	RS232 data output for Host Interface (RS232 EBDS TXD)	RS232 levels
L	RS232 H RXD	RS232 data input for Host Interface (RS232 EBDS RXD)	RS232 levels
M			
N			
P			
R			
S	Vbus	(V BUS (+5VDC))	USB power
T	USB D2(+)	(DATA 2 + (PLUS))	Differential USB signal
U	USB D2(-)	(DATA 2 - (MINUS))	Differential USB signal

Notes: [2] OEM Line power maximum: 30VAC, 42 Volts peak, 2 Amps max.

4.5 INPUTS

Power Input
Main DC power to the note acceptor (host edge card connector pins 1 and A). See section 3 for power requirements.

Power Return
Ground connection to the main DC power to the note acceptor (host edge card connector pins 2 and B).

Isolated RXD
Active low optically isolated input line (host edge card connector pin 5). This line should be driven by an open collector output capable of switching a voltage equal to that of 24 VDC and sinking 20 mA. This input is used as an RXD line in this interface.

RS232 H RXD
RS232 level non-isolated input signal (host edge card connector pin L). This line is used for host BDS communications only.

RS232 A RXD
RS232 level non-isolated input signal (host edge card connector pin C). This line is used for auxiliary communications (i.e. SDS).

Isolated Vopt
Positive supply pin (host edge card connector pin 7) for the opto-isolated interface components. Supply can be from 12 VDC (-5%) to 24 VDC (+5%) and must be capable of sourcing 50 mA of current.

Isolated Return
Negative supply pin (host edge card connector pin 3) for the opto-isolated interface components.

Isolated Reset
Active low opto-isolated input pin (host edge card connector pin 6) that will reset the acceptor when connected to Vret. The output driving this pin should be capable of sinking 20 mA of current.

External Inhibit
Active low input pin (host edge card connector pin 10) that will cause the unit to become disabled when asserted. The output driving this pin should be capable of sinking 20 mA of current.

4.6 OUTPUTS

Isolated TXD
Open collector output line (host edge card connector pin 4) capable of sinking a maximum of 50 mA with a maximum collector voltage of 40 volts. This line is used as a TXD line in BDS.

Bezel LED Drive
Active low output line (host edge card connector pin 12). This line is an open collector output . Max voltage is 28V. This line indicates the Acceptor is enabled and ready to take notes. Conditions under which the Acceptor is disabled include:

- The Controller has disabled the Acceptor.
- The cashbox is not present.
- During transportation and processing of a note.

In addition, the Bezel LED Drive line will toggle between states if the Acceptor module requires service due to an unrecoverable jam

RS232 H TXD
RS232 output line (host edge card connector pin K). This line is used for host BDS communication only. The same message content appears at both this pin and the Isolated TXD line.

RS232 A TXD
RS232 output line (host edge card connector pin J). This line is used for auxiliary communication (i.e. SDS).

LED SUPPLY Output
This line provides +5 VDC through a 180 ohm, 1/8 W resistor (host edge card connector pin 9). It can be used to provide power to an external LED indicator connected to the Out of Service line. Out of service is only active in the NISR interface.

Bezel Power
This line supplies the main DC power to the entry guide LEDs through a 600 ohm, 2W resistor (host edge card connector pin 8). The entry guide LED assembly should draw no more than 30 mA of current from the acceptor.

4.7 Optional Harnesses:

12 pin (RS232 EBDS) compatible harnesses: SC, SCL
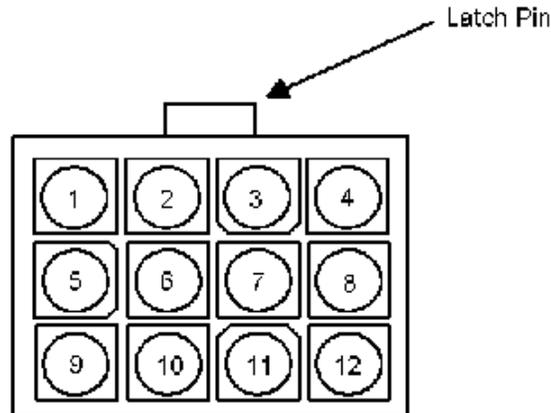
Mating Connector: Housing - Amp #172333-1
Pins - Amp #170360-1 or #170364-1

**Table 4.7.1 CASHFLOW SCXX 12 Pin Block Connector Pin-out for RS232 EBDS version**

Connector Pin #	Wire Color	Signal	P2 pin See 0
1	White	Reserved	10
2	Gray	$\overline{\text{Bezel LED Drive}}$	12
3	Not Populated	——	——
4	Yellow	$\overline{\text{Out of Service}}$	11
5	Blue	Ground[2]	2,B
6	Pink	RS232 EBDS RXD[1]	L
7	Blue	Power -[2]	2,B
8	Purple	Led Supply	9
9	Not Populated	——	——
10	Not Populated	——	——
11	Green	Power +	1 & A
12	Tan	RS232 EBDS TXD[1]	K

NOTES: [1] RXD refers to input to Note Acceptor. TXD is an output.
[2] Pins 7 and 5 are tied with a loop of wire in back of the 12pin connector (black in color).

12 pin ZT1204 (Opto Isolated EBDS) compatible harnesses:

Latch Pin
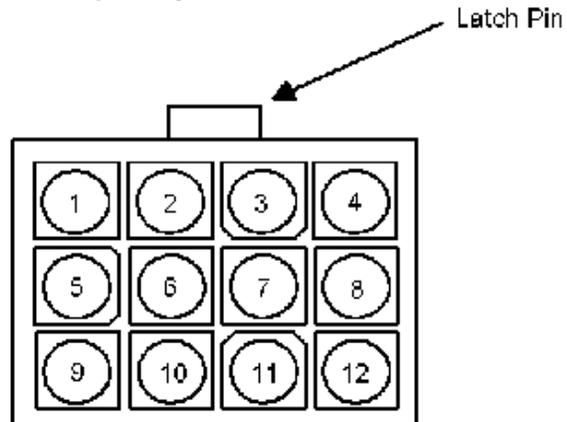
Mating Connector: Housing - Amp #172333-1
Pins - Amp #170360-1 or #170364-1

Table 4.7.2: CASHFLOW SCXX 12 Pin Block Connector Pin-out for Opto Isolated EBDS version

Connector Pin #	Wire Color	Signal	P2 pin See 0
1	White	Aux A	14
2	Gray	Led -	12
3	Red	V opt	7
4	Yellow	V ret	3
5	Blue	Ground[2]	2 & B
6	Pink	Isolated Reset	6
7	Black	Aux B	15
8	Purple	Led +	8
9	Brown	Isolated TXD[1]	4
10	Orange	Isolated RXD[1]	5
11	Green	Power +	1 & A
12	Not Populated	———	———

NOTES: [1] RXD refers to input to Note Acceptor. TXD is an output.
[2] Pins 12 and 5 are tied with a loop of wire in back of the 12-pin connector.

12 pin and "B" connector (EBDS over USB) compatible harness SC/SCL
The USB harness consists of two parts:
• A 12 pin latching AMP connector used primarily to deliver power to the unit.
• A 4 contact USB "B" peripheral connector used to communicate with the host system.
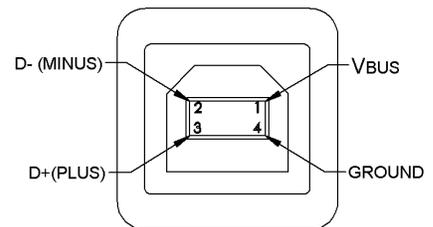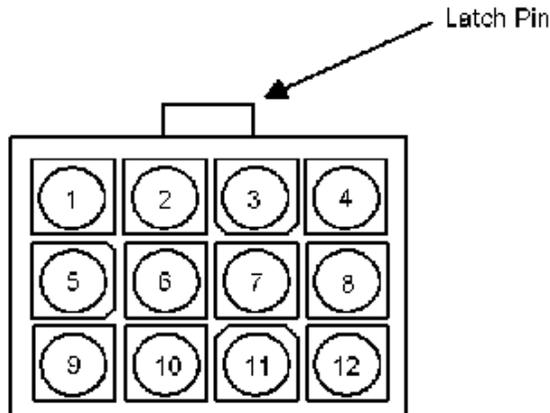
Mating Connector: Housing - Amp #172333-1
Pins - Amp #170360-1 or #170364-1

USB "B" Peripheral Connector

Table 4.7.3: CASHFLOW SCXX 12 Pin Block Connector Pin-out for EBDS over USB version

Connector Pin #	Wire Color	Signal	P2 pin See 0
1	White	**Reserved**	10
2	Gray	$\overline{\text{Bezel LED Drive}}$	12
3	Not Populated	——	——
4	Yellow	$\overline{\text{Out of Service}}$	11
5	Blue	OEM_Bezel_1,Ground^2	2
6	Pink	RS232 EBDS RXD[1]	L
7	Blue	Power - [2]	B
8	Purple	Led Supply	9
9	Not Populated	——	——
10	Not Populated	——	——
11	Green	Power +, OEM_BEZEL_0	1 & A
12	Tan	RS232 EBDS TXD[1]	K

NOTES: [1] RXD refers to input to Note Acceptor. TXD is an output.
[2] Pins 7 and 5 are tied with a loop of wire in back of the 12pin connector.

Connection to a USB host is via a standard, full speed (shielded) "A to B" cable not exceeding 6 feet in length.

12 pin and "B" connector (EBDS over USB) compatible harness: SCL BNF USB
The USB harness consists of two parts:
• A 12 pin latching AMP connector used primarily to deliver power to the unit.
• A 4 contact USB "B" peripheral connector used to communicate with the host system.
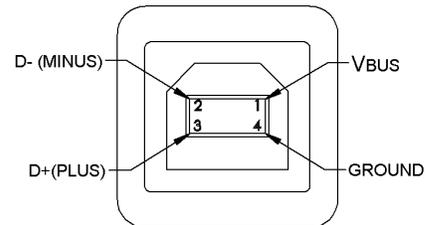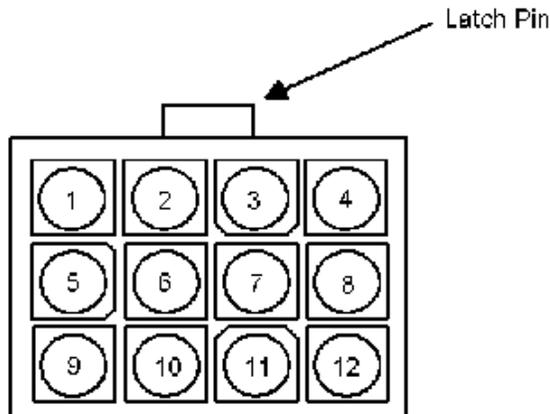
Mating Connector: Housing - Amp #172333-1
Pins - Amp #170360-1 or #170364-1

USB "B" Peripheral Connector

Table 4.7.4: CASHFLOW SCXX 12 Pin Block Connector Pin-out for EBDS over USB version

Connector Pin #	Wire Color	Signal	P2 pin See 0
1	White	Reserved	10
2	Gray	$\overline{\text{Bezel LED Drive}}$	12
3	Not Populated	————	————
4	Yellow	$\overline{\text{Out of Service}}$	11
5	Blue	Ground[2]	2
6	Pink	RS232 EBDS RXD[1]	L
7	Blue	Power - [2]	B
8	Purple	Led Supply	9
9	Not Populated	————	————
10	Not Populated	————	————
11	Green	Power +	1 & A
12	Tan	RS232 EBDS TXD[1]	K

NOTES: [1] RXD refers to input to Note Acceptor. TXD is an output.
[2] Pins 7 and 5 are tied with a loop of wire in back of the 12pin connector.

Connection to a USB host is via a standard, full speed (shielded) "A to B" cable not exceeding 6 feet in length.

4.8   MEI External Inhibit Feature

Overview

This feature provides an alternative means of inhibiting Cashflow SC Note Acceptors from drawing notes in. Once the additional connections are made simply "shorting" the input to ground (taking the input low) will inhibit the Cashflow SC Note Acceptor. The Cashflow SC Note Acceptor automatically enables once the ground is removed, assuming the interface has the BA enabled. This is a 3Volt low current input.

Feature Installation Procedure

Orientation Note: Make sure the six spade connectors are on the left-hand side when viewed from the rear on the unit. Note: The harness on retail model bill acceptors SCXXX27R and SCXXX28R do not support have the spade connectors.
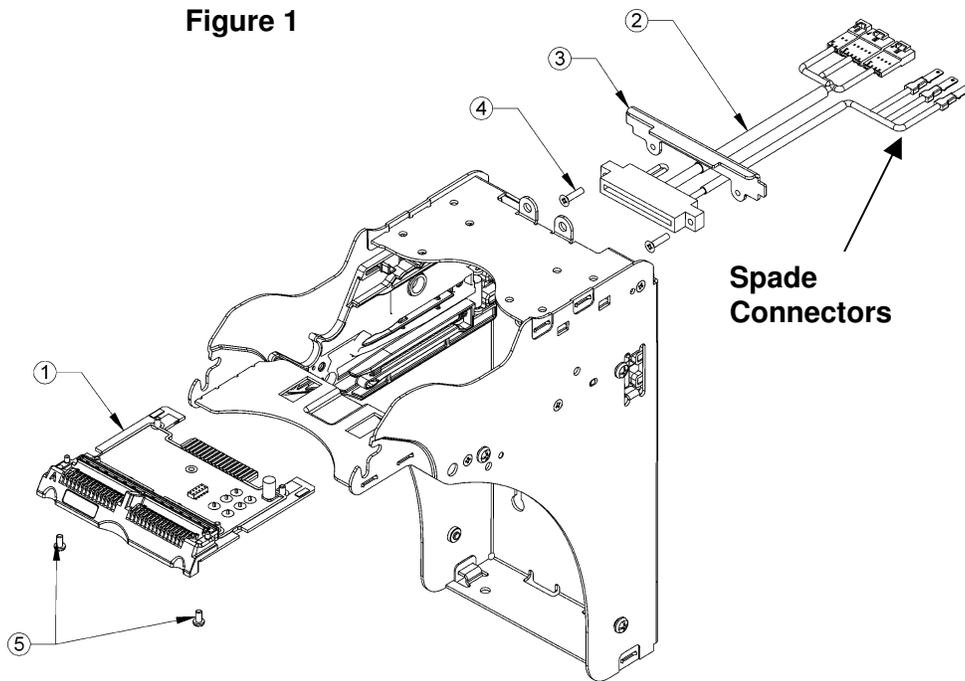
Figure 1

Spade Connectors

1. With power disconnected remove the acceptor head, and cashbox and Interface Card (#5).
2. Remove the two screws (#4) that secure the interface harness to the mounting plate (#3). See fig.1
3. Install the lockout harness (#2) to the mounting plate (#3) with the two screws (#4) in same fashion that they were removed. See fig.1
4. Connect the external inhibit output harness (kit .# 252065071) to the interface harness via connectors.
5. Reinstall the SC acceptor head.

6. Reinstall the SC Cashbox.

7. If a new Interface Card was installed configure the interface card to the proper machine interface using the MEI STS program.

Description/kit #'s   Picture
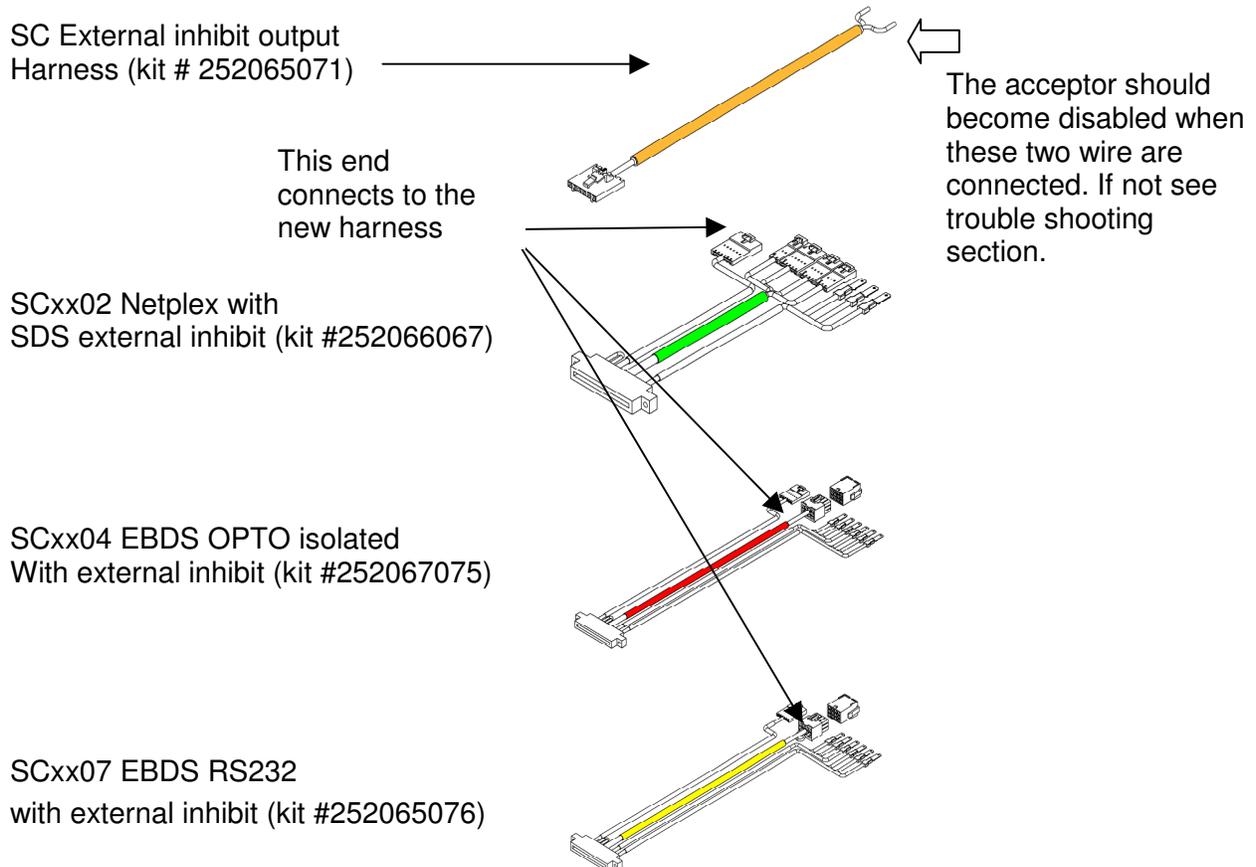
SC External inhibit output
Harness (kit # 252065071)

The acceptor should become disabled when these two wire are connected. If not see trouble shooting section.

This end connects to the new harness

SCxx02 Netplex with
SDS external inhibit (kit #252066067)

SCxx04 EBDS OPTO isolated
With external inhibit (kit #252067075)

SCxx07 EBDS RS232
with external inhibit (kit #252065076)

Trouble Shooting:

1. Make sure the harness is oriented correctly.
2. Make sure the host has enabled the Cashflow SC Note Acceptor. Green MMI - LED on Solid. Short the two new External inhibits output wires together. The Cashflow SC Note Acceptor should disable and the Green MMI should begin to Blink.
3. If the Cashflow SC Note Acceptor does not disable check the following:
➢ Verify the software version. Contact MEI.
➢ Verify the Interface Card revision. Contact MEI.

4.9   Optional Harness

Pictured below are various harness options available with the retail model bill acceptors (SCXXX27R, and SCXXX28R). Note that the retail models do not have the six spade connectors.

SCLxx27R EBDS RS232 with
 BNF support (kit #252460020P1)
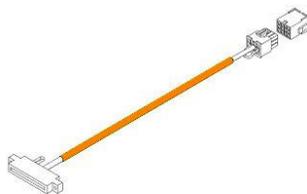
SCxx28R EBDS USB
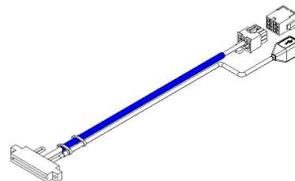
SCLxx28R EBDS USB BNF
with BNF support
(kit # 252416050P1)
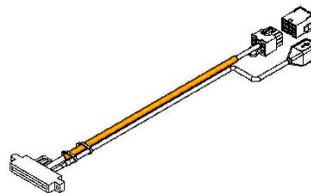
SCxx27R EBDS RS232
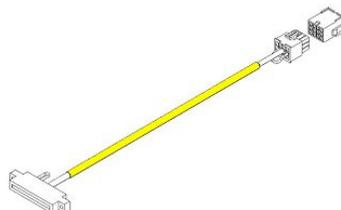
5   EBDS Definition

The Extended Bi-Directional Serial Protocol is described in documents: RETAIL EBDS PROTOCOL SPECIFICATION with MPOST and Generic EBDS Interface Specification 20105-002850110. The first document was written to guide retail software integrators and the second is meant for gaming OEMs respectively.

6   Barcode Overview

This document specifies the Bar Code requirement for MEI Note Acceptors. The type of bar code, coupon size, position of bar code, printing ink quality, and paper quality of the coupons are specified

Note:The retail model bill acceptors SCXXX27R and SCXXX28R do not support barcode coupon acceptance.

6.1   Size And Structure Of Bar Code Coupons

Printing
For reliable processing the bar code image must be printed according to the ANSI X3.182-1990 Bar Code Print Quality Guideline. The absolute bar code position on the document must conform to the following parameter limits measured in millimeters:
**Position of Bar Code Printing**

6.1.1.1   Vertical
The bar code is printed equally to the left and right of the centerline. A blank space of minimum 10mm to be provided before and after the bar code printed area.

6.1.1.2   Horizontal
The bar code is printed equally from the top to the bottom of the centerline.
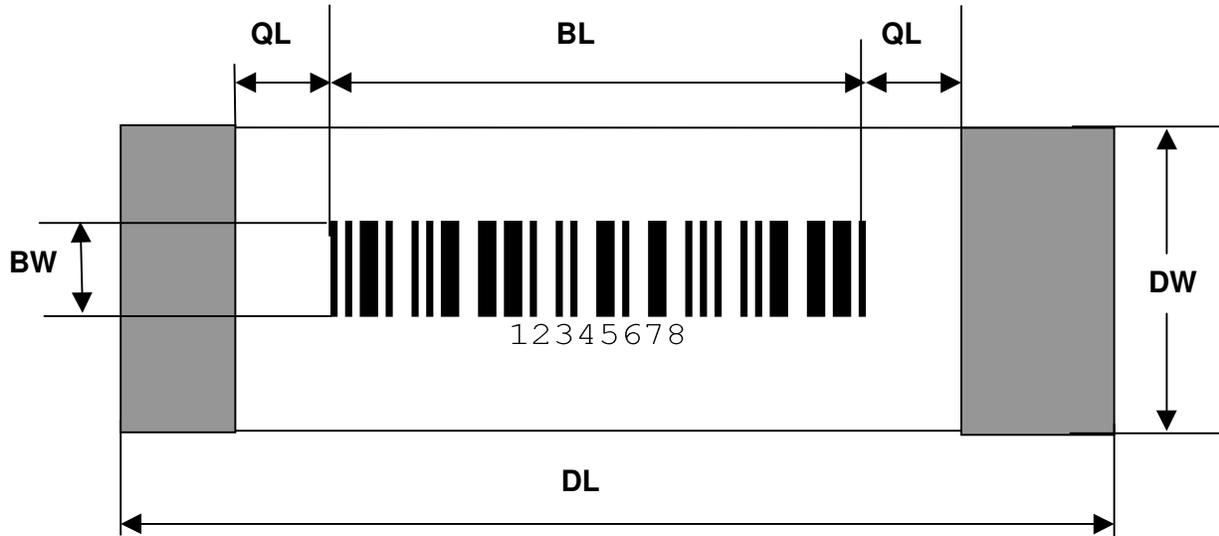
Parameter	Min (mm) 2:1	Max (mm) 3:1
BW	9 (SC66 Fixed Width) 26 (SC83 Multi Width)	N/A
QL	10	N/A
BL	68 (18 characters.) 89.5 (24 Characters)	86 (18 characters.) 114 (24 Characters)
DW	65	67
DL	155 (18 and 24 Characters) 119 (18 Characters Only)	157 (18 and 24 Characters) 121 (18 and 24 Characters)
Thickness	0.1	0.1778

6.2 Bar Code Specification

Symbology	Interleaved 2 of 5
Bar Width	Min. 0.5 mm. Max. 0.6mm
Wide to Narrow Ratio	2:1 - 3:1
Number of Characters	18 or 24
Printing Ink	Color: Black Characteristic: Visible light absorption at 600~700 nm.
Quality of Printing	Passes ANSI x3.182-1990 for a 5 mil aperture @ 660 nm Print Contrast Signal (PCS) value: Min. 0.9 Quality of Printing: The bar code print quality shall conform to ANSI INCITS 182-1990 (R2002), "Guideline for Bar Code Print Quality". This guideline is available from: The American National Standards Institute 11 West 42nd Street, 13th Floor New York, NY 10036 212.642.4900 http://webstore.ansi.org/ansidocstore/find.asp
Paper Thickness	0.0039" to 0.007" (0.1 mm to 0.1778 mm)
Paper Density	Equivalent to 20 pound paper
Color of Paper	White in area of bar code printing
Condition of Paper	Paper of uniform quality with minimum of mottle to be used

6.3　General Printing:

Below is the front view of the Bar Code. The Back of the coupon is not specified, there are no printing restrictions.
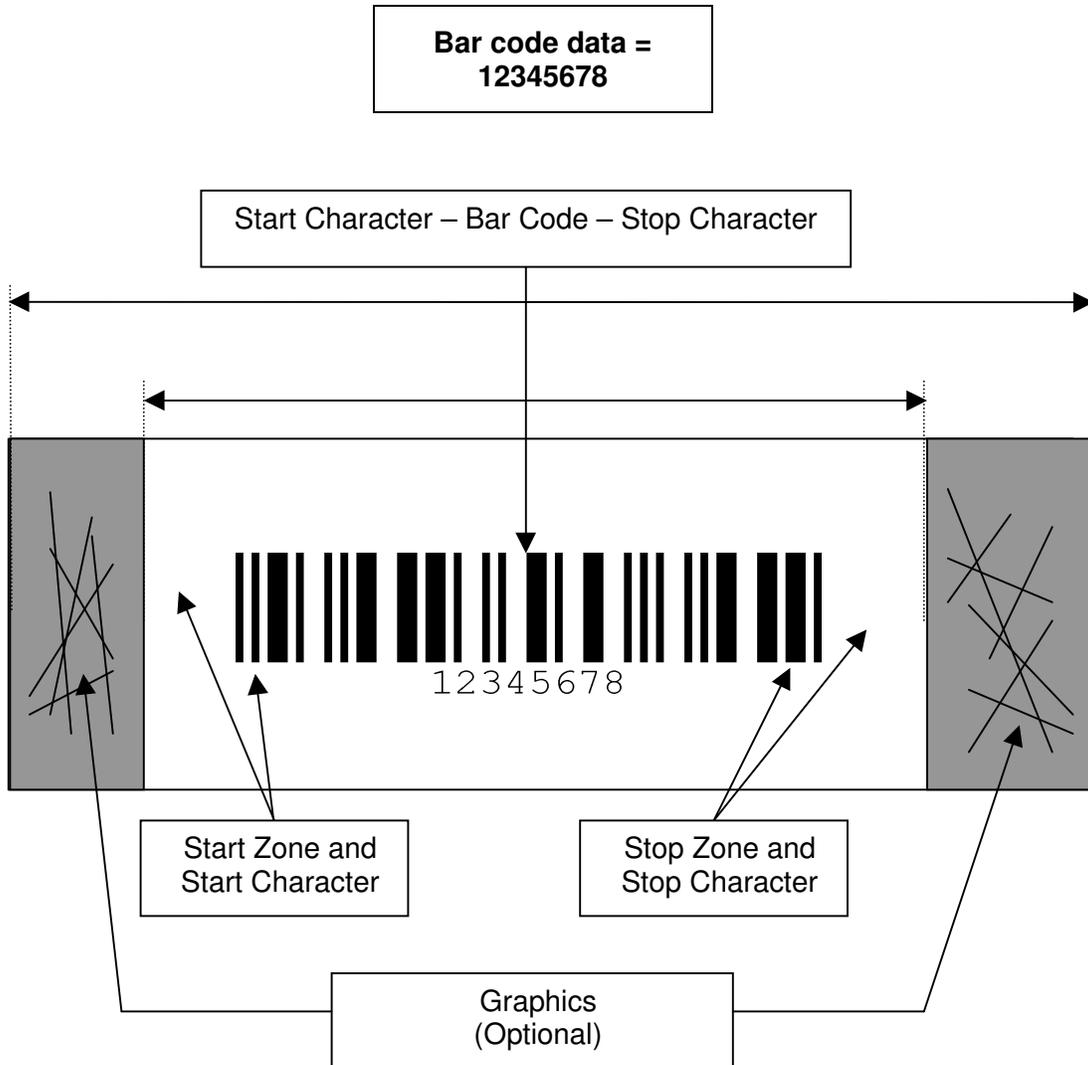
6.4   Special 24 character consideration

All bar codes must be either 18 or 24 characters. When 24 characters are detected the Note Acceptor will insert the two "EZ-pay" (IGT™) leading zeros 0,0, followed the first 16 characters of the 24 character bar code. The last 8 characters are discarded.

Example:
The 24 character value of "123456789111111112222" will be translated to "00123456789111111111"
The first 16 characters are saved (**1234567891111111**~~2222~~).
Two leading zeros are inserted (**00**123456789111111111)
The coupon is then reported as if it was 18 characters. In effect, there are 16 characters for the monetary value and 24 for the final processing outside of the Note Acceptor.

7   Configuration Coupon

7.1   Configuration Coupon Instructions

Note: The configuration coupon can ONLY be used with the SC66. There is no configuration coupon for the SC83.

Paper copies of this Manual have a usable coupon (see below). Electronic copies of the coupon are usable if your printer does not distort any areas of the coupon. Copies of the coupon are usable if cut to match the size of the coupon on the next page.

The coupon should be filled out using a #2 pencil, filling in the circles for the desired options. For correct operation, all 10 lines must be completed. Only one circle should be filled per line. The back of the coupon should not be marked.

Lines 1 through 7 shall be filled out to enable the desired banknote denominations.

Line 8, voucher, enables/disables the acceptance of vouchers (also know as bar code tickets).

Line 9, Aux, enable/disables the use of the second serial port (Certain applications use the second serial port to communicate to the gaming player tracking systems).

Line 10 to enable desired note direction. Enable 1 or 2-way face up, or 4-way acceptance (which allows acceptance in all directions).

To configure the unit using the configuration coupon, the MMI button will be pressed and held for 1 second. Upon release of the button, the Green and Yellow LEDs will flash.   At this point the unit is ready to accept the Configuration Coupon.

MMI Button

ACCEPTED: Upon coupon acceptance, the Green LED will flash rapidly.

REJECTED: Upon rejection, the Red LED will flash rapidly. Retry coupon or try new coupon.

Upon completion of the configuration cycle, the unit will return to normal operation whether the coupon was accepted or rejected.

7.2 Format and Form Factor

SC66 Configuration Coupon:

Note: The configuration coupon can ONLY be used with the SC66. There is no configuration coupon for the SC83.

SC66 Configuration Coupon for all currencies not compatible with the above coupon. Contact your technical support representative for currency tables.

Note The configuration coupon can ONLY be used with the SC66. There is no configuration coupon for the SC83.