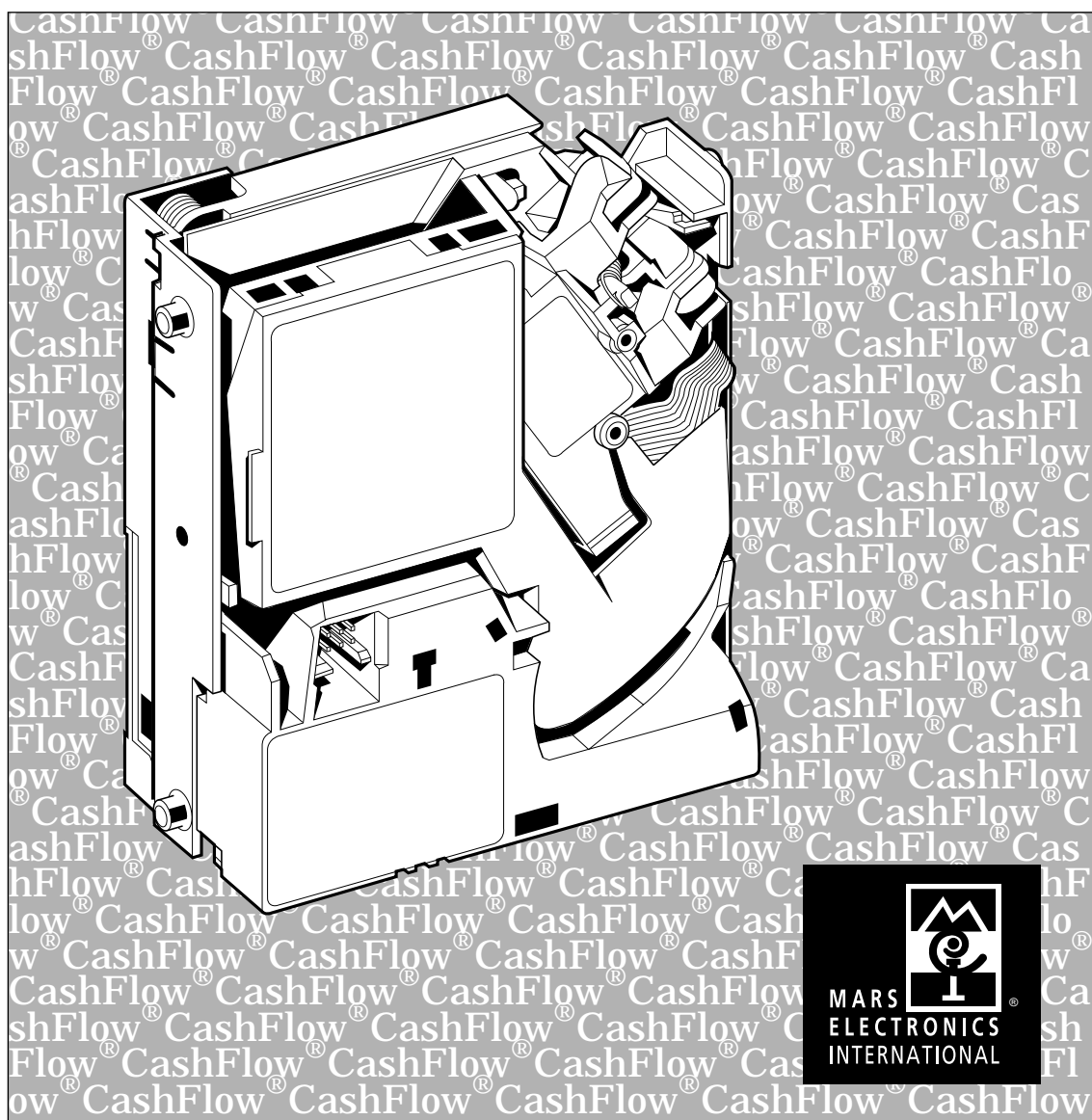


The  
**CASHFLOW® 330**  
REFERENCE SERIES  
**ACCEPTOR**  
**APPLICATIONS DESIGN**  
**GUIDE**





# CashFlow<sup>®</sup> 330 acceptor Applications Design Guide

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## **SAFETY AND EMC**

### **International & National Standards Conformance**

When installed and operated according to the instructions for the particular unit, CashFlow® 330 products are designed to meet the applicable Safety and Electro Magnetic Compatibility standards for any country in which they are used.

### **Maximum Operating Voltages**

Do not apply more than the indicated voltage.

### **Dangerous Environments**

Do not operate in the presence of flammable gases, fumes or water.

### **Disposal of Product**

Do not dispose of this product by incineration.

**Warning:** Before removing or replacing modules  
**SWITCH OFF or ISOLATE the ELECTRICITY SUPPLY** to the host machine.

**THIS MANUAL IS PROVIDED FOR USE ONLY BY PERSONNEL  
TRAINED TO UNDERTAKE ELECTRICAL INSTALLATION.**



## GLOSSARY

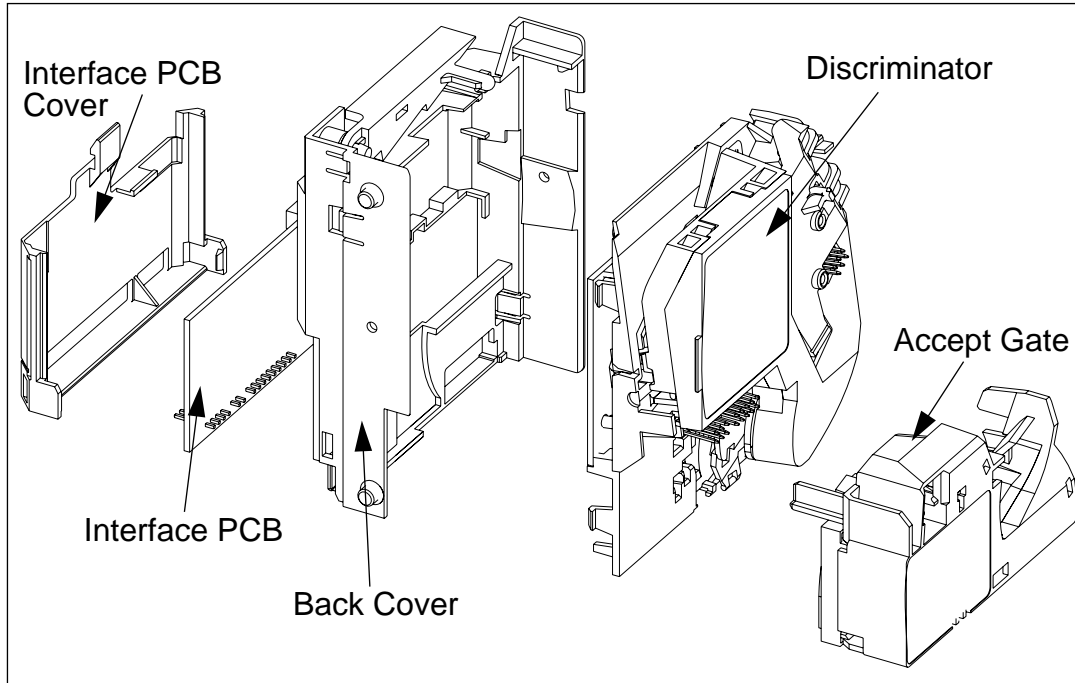
<b>Acceptor</b>	The unit which accepts and validates coins. Made up of various modules.
<b>Accept Gate</b>	A control module that routes coins. Forms part of the Acceptor
<b>Adaptor</b>	Plastic moulding to house the Acceptor and replicate 5" product envelope.
<b>Back Cover</b>	Plastic moulding which houses the discriminator. Forms part of the Acceptor.
<b>Channel</b>	A mounting assembly generally fitted in the host machine.
<b>Coin Entry</b>	The opening where coins enter the Acceptor.
<b>Discriminator</b>	The module which discriminates coins using the sensors on both the flight deck and the flight deck lid. Forms part of the Acceptor.
<b>Dual Polarity Interface</b>	A specific customer interface that provides a single output circuit to work with both positive and negative common customer interfaces
<b>Front Plate</b>	Accessory which is available for providing Front entry coin option.
<b>Interface</b>	The electrical or mechanical boundary between the validator and the host machine.
<b>0V Common Interface</b>	A specific customer interface that uses open collector outputs referenced to 0V
<b>SELV</b>	Safety Extra Low Voltage supply. Applicable only where the Acceptor is used as a stand alone product.



## OVERVIEW

The CashFlow<sup>®</sup> 330 acceptor is made up of five basic modules, each of which is available in a number of options:

- Accept Gate
- Discriminator
- Back Cover
- Interface PCB
- Interface PCB Cover



The acceptor is compact at only 4" and can be used as a stand alone or, if fitted with the appropriate accessories, can be adapted for use as a standard 5" front or top entry unit.

MEI have also designed a range of front plates and channels all of which, when combined with a CashFlow<sup>®</sup> 330 acceptor, are suitable for most applications.

The acceptors are provided, as standard, with a serial interface which is known as the HI<sup>2</sup> interface. Optional interfaces are available which, when fitted to an acceptor, provide compatibility with earlier products. These interfaces simply plug into the discriminator.

Although a number of variants of acceptor are available the basic operational principles are the same. The following pages describe the way in which the product works, under the headings of Mechanical, Electrical, and Operational.

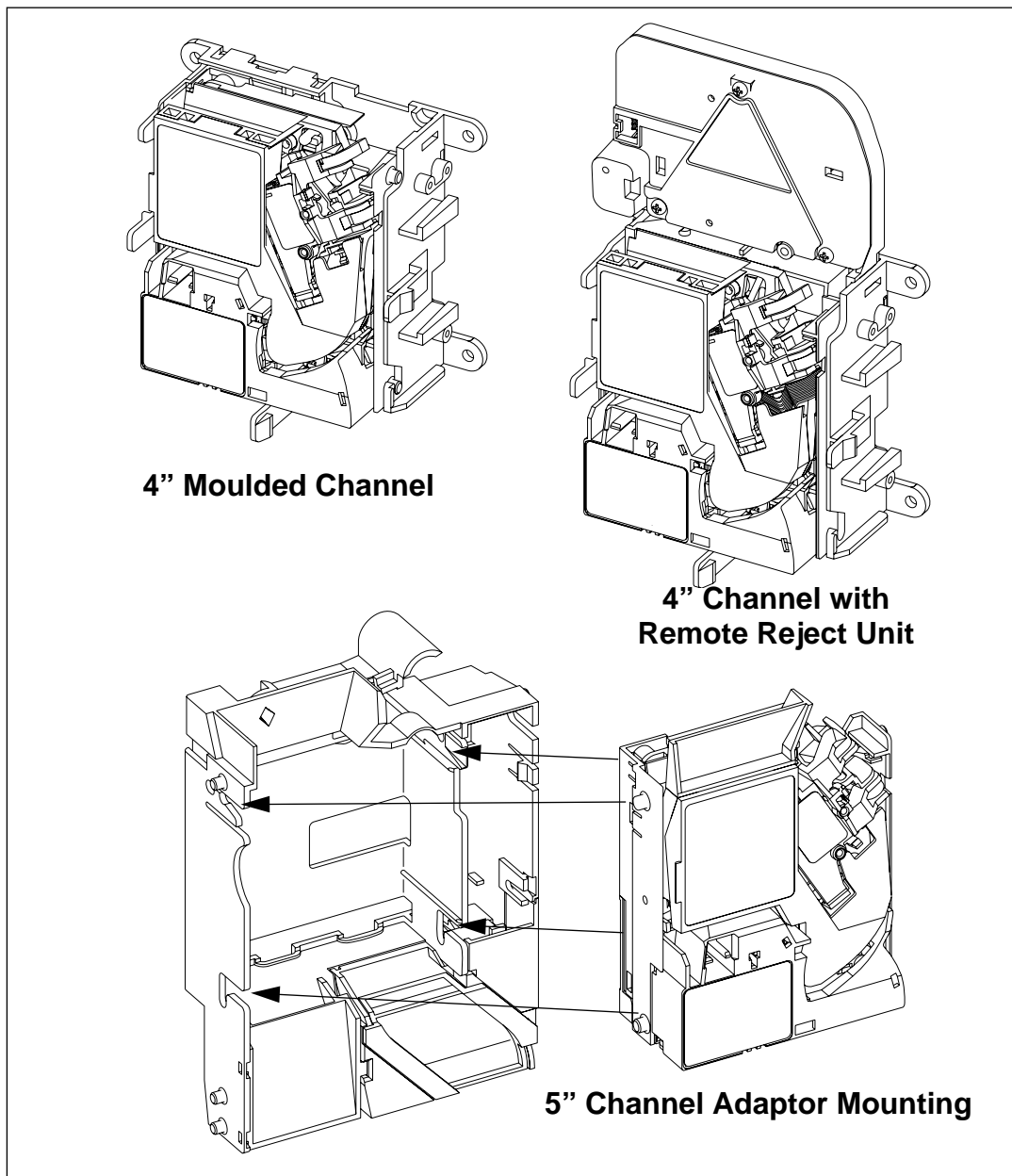


## PRODUCT VARIANTS

### TOP ENTRY

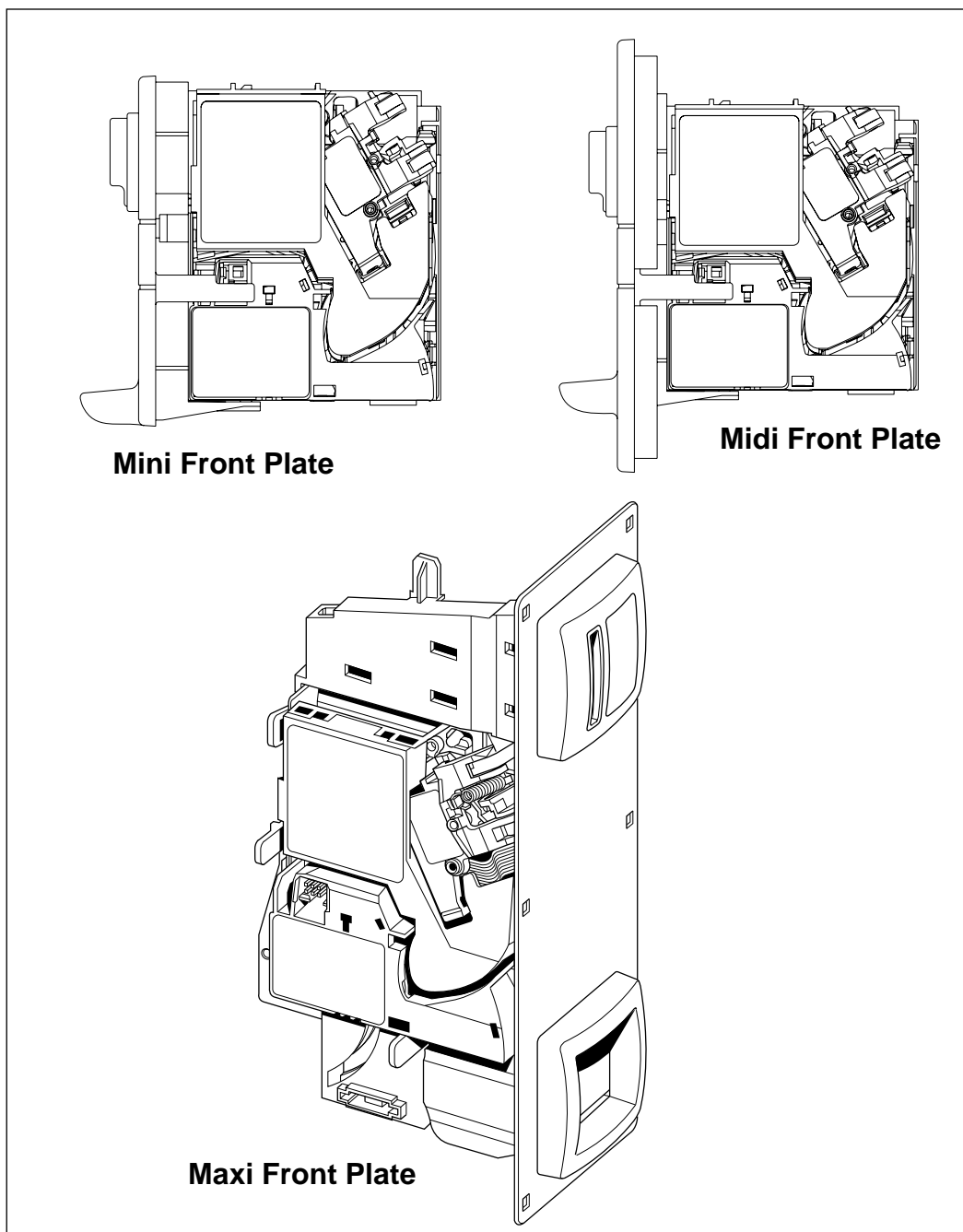
For top entry applications the acceptor can be mounted in a 4" moulded channel, a 5" metal channel or an industry standard channel, forming part of the host machine. The channel applications require the use of an adaptor.

In addition to this a motorised reject unit can be mounted onto the 4" channel so as to enhance the coin entry and reject functions, particularly where these are not adjacent to the fixture point in the host machine. For connection details see the appendix.





## **FRONT ENTRY**



For front entry applications MEI have designed three new front plates for use with CashFlow<sup>®</sup> 330 acceptors, these are called the Mini, Midi, and Maxi front plates.

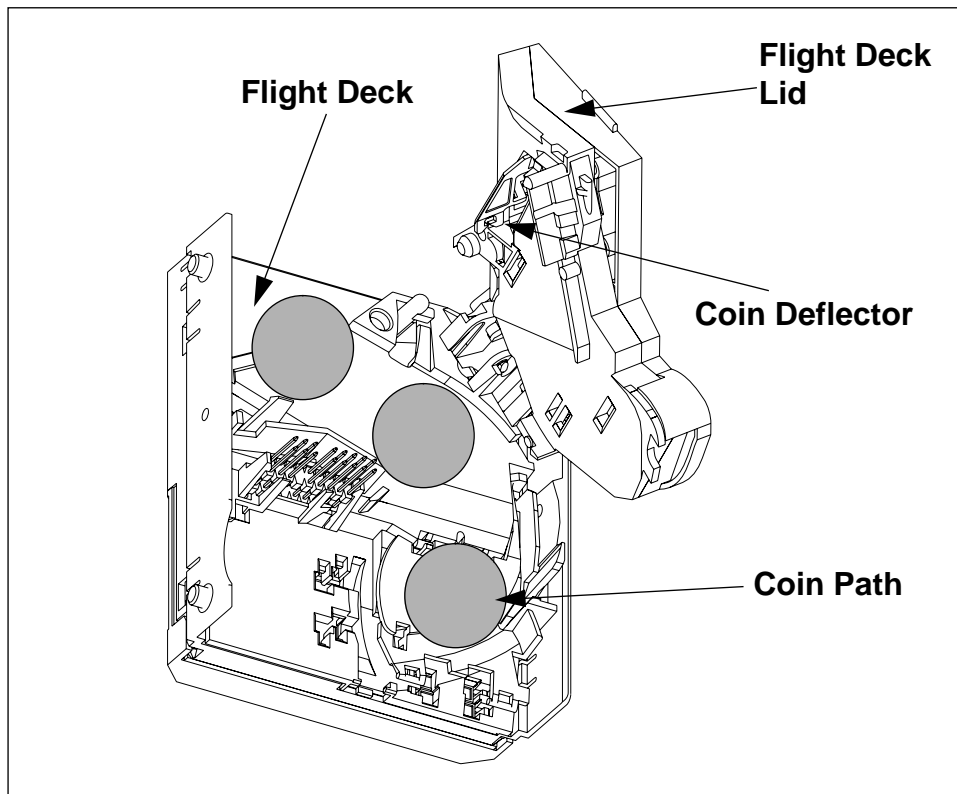
For detailed information on use of these please refer to the Front Plate Applications Guide, Mars part number 143512044, or contact your MEI distributor, who is listed at the end of this book.



## PRODUCT OPERATION

### MECHANICAL

The discriminator comprises a flight deck and lid which together form the coin control and flight path. On the inside of the flight deck lid there is a mechanical device incorporated near the coin entry point. This device is known as the coin deflector and brings coins under control by either removing or dampens their inherent kinetic energy. It also acts as a cotton catcher.



There is a hinge at the top right hand side of the flight deck which allows coupling of the lid via an intermediate component, known as the flight deck lid arm. This allows the lid to locate accurately to the flight deck independently of the hinge. The lid also maintains a parallel coin throat by being spaced from the deck on three bosses which locate the lid to the deck.

The design of the lid arm hinge area allows the lid to open to 180 deg. relative to the deck. The opening is restricted to just over 100 deg. by the back cover to prevent the lid fouling other parts such as front plates etc.

The action of the hinge spring allows the lid to remain open when past about 100 deg. and will snap shut when closed to about 60 deg.



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although the lid will need to be pressed to ensure that it is correctly seated against the deck.

Clearance of any debris or jammed coins from the acceptor is carried out by opening the lid. This is done by pressing the reject lever which is located behind the coin entry.

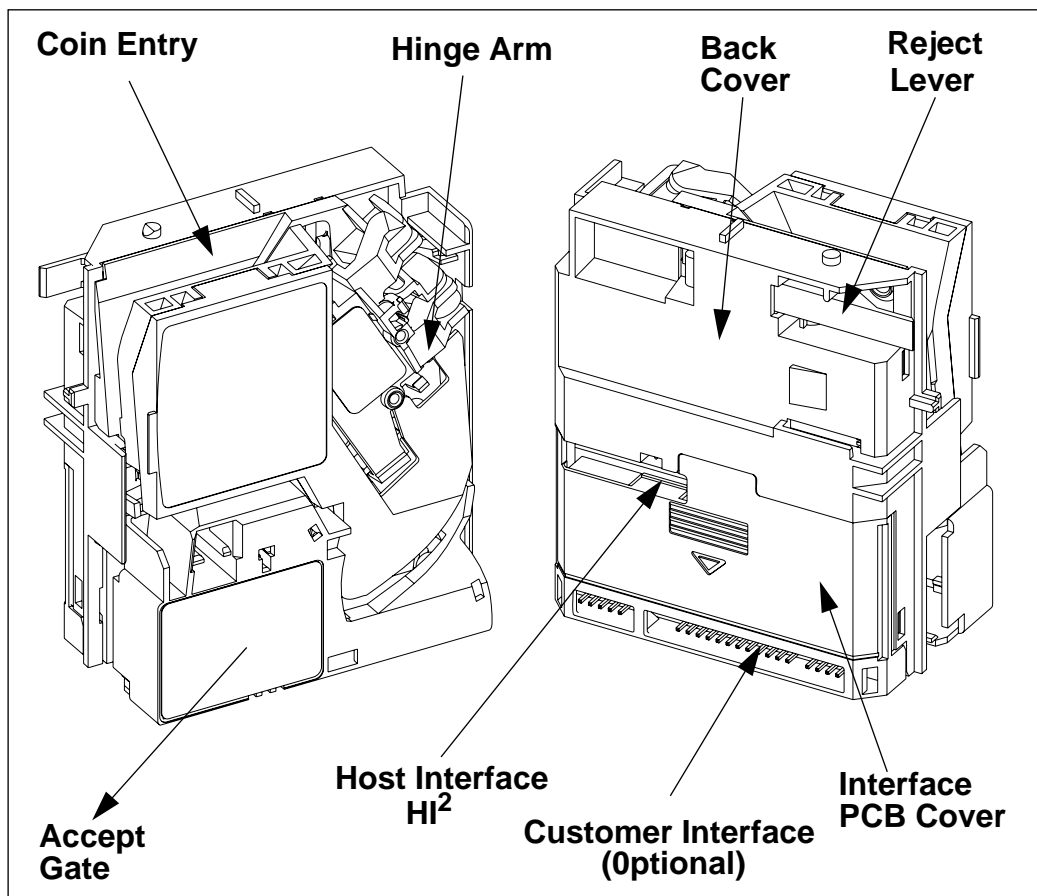
The reject lever assembly forms part of the back cover assembly and there are versions available for front and top entry mounted acceptors. They both clip on to the discrimination module.

For front plate mounted acceptors the reject lever assembly is located on the back of the back cover.

For channel mounted acceptors the reject lever assembly is located on the top of the back cover.

The lid opening is articulated so as to remain essentially parallel to the flight deck as the gap between them is increased. This means that the acceptor can be defined within a smaller total volume envelope while offering the best coin jam clearance. This means that the edge of the lid furthest from the hinge does not have to open more to give greater clearance at the hinge end.

The discriminator also provides the mounting for the PCB.





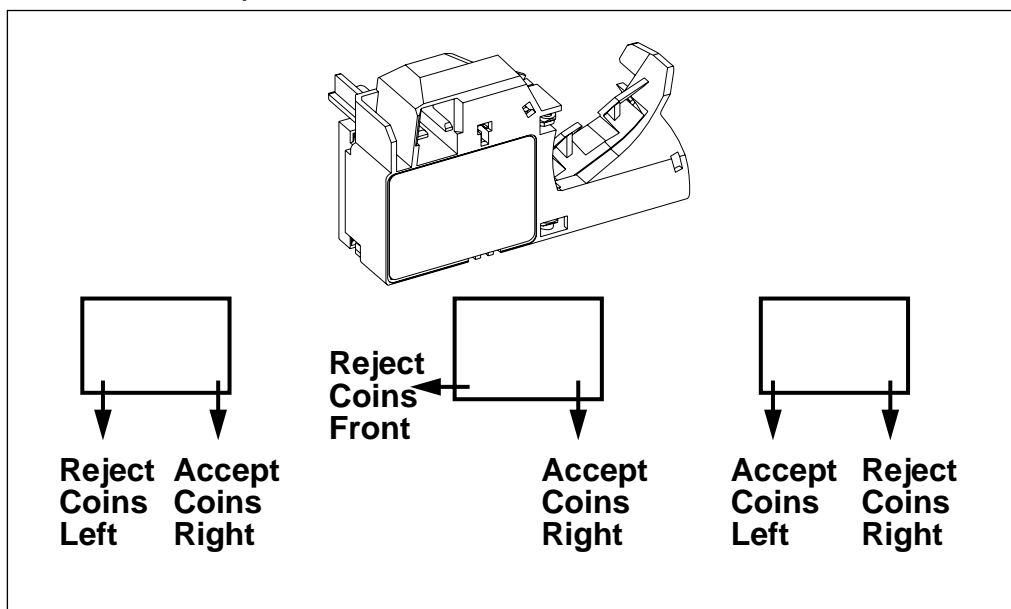
### **ELECTRICAL**

The CashFlow<sup>®</sup> 330 acceptor products are based on a 12V serial interface. The electrical circuitry is contained in a PCB which is mounted on the rear of the flight deck behind the back cover.

All internal connections to this PCB are via flexible loom which is soldered directly to the PCB. This connects to the sensors on the flight deck, lid, accept gate solenoid and optical coin strobes. Any external connections to the discrimination PCB are via 0.1" staked pins accessible through apertures in the back cover. Additional staked pins on the discrimination PCB are provided to allow optional interface PCB's to be fitted.

The base acceptors provide an asynchronous serial interface to the host machine and CashFlow<sup>®</sup> terminal products. A parallel interface product can be provided by fitting one of the optional interface PCB's which are plugged directly onto the discrimination PCB. The base acceptor operates from a 12V supply but can also be configured for 24V operation by using the correct interface PCB option.

Coins that are correctly discriminated are routed to the accept exit by energising the accept gate. Coins that are rejected are routed to the reject exit. Accepted coins generate a coin output signal if they pass correctly through the coin strobes in the accept gate module. The accept exit can be either on the right or left as viewed from the front of the acceptor.



### **Coin Exit Options**



The accept gate module contains a solenoid operated gate, optical coin strobes and coin routing components. There are three variants available and the module clips and plugs onto the flight deck. The coin exits for both accepted and rejected coins are defined by the type of accept gate fitted.

The electronics on the discrimination PCB operate from 5V generated by an on-board regulator from the 12V customer supply. If an optional interface PCB is fitted then the 12V supply comes from this PCB.

### **OPERATIONAL**

There are some functions of the acceptor which are common across the whole CashFlow<sup>®</sup> product range. These include coin discrimination, control and communication.

When a coin is put through the acceptor it's validity is determined by measuring certain parameters. It also looks at the coin type status to define whether the payment is a valid coin or token, or an invalid coin. Finally, the inhibit status is checked. If the coin is not inhibited, then it will be accepted and the accept gate opened. Acceptors fitted with customer interfaces will now activate the coin output lines.

If a coin or token is rejected the accept gate will not open and any further coins will be inhibited for a period of 500ms. If the following coin is also rejected then this time period will be restarted.

If the reject lever is operated an Escrow Return (ER) message will be generated and, if a 0V common interface is fitted, the ER output will be activated.



## ELECTRICAL INTERFACES

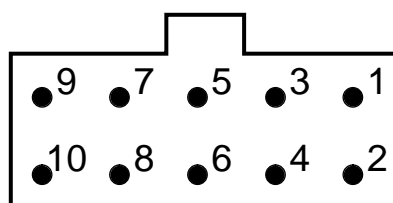
### HOST INTELLIGENT INTERFACE (HI<sup>2</sup>)

The HI<sup>2</sup> interface offers serial control of the following functions:

- Inhibiting Coins
- Enabling Coins

The connections to the 10 way connector of the HI<sup>2</sup> are shown below.

PIN	SIGNAL NAME	PIN	SIGNAL NAME
1	DATA	2	GND
3	BUSY	4	GND
5	RESET	6	POWER FAIL
7	VIN	8	VNEG
9	RESERVED	10	VSOL



Viewed from loom end

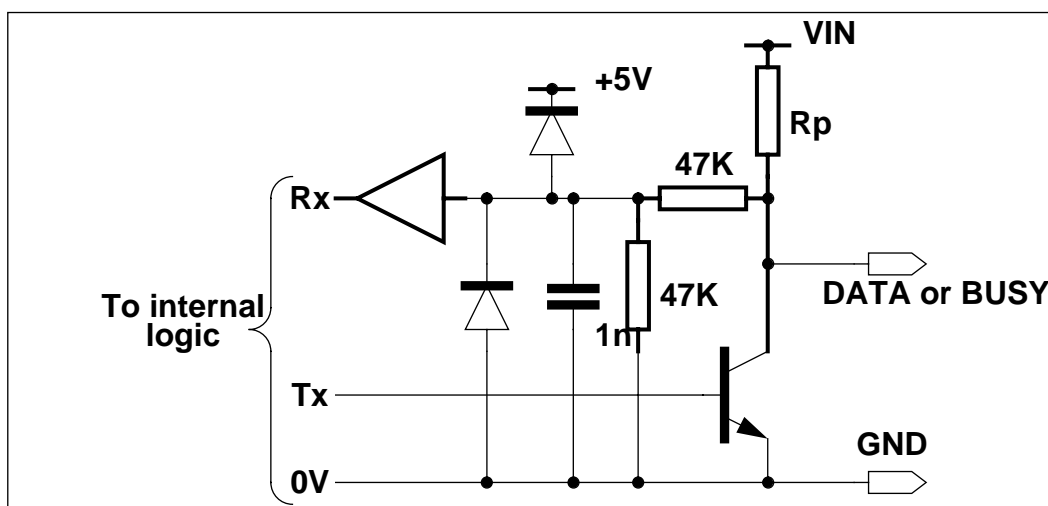
### Electrical Specifications

#### I/O Ports

##### Data and Busy

Input high voltage	V <sub>ih</sub>	8.0V min.	VIN + 1.5V max
Input low voltage	V <sub>il</sub>	GND - 1.5V min	1.3V max.
Input impedance	R <sub>p</sub>	4.7KΩ nom.	to VIN
Output high voltage	V <sub>oh</sub>	9.0Vmin.	VIN max.
Output low voltage	V <sub>ol</sub>	GND min.	0.5V max.
Output sink current	I <sub>ol</sub>	-----	25mA max.





## Data and Busy line equivalent circuit

The Data and Busy lines are active low signals and are designed to be wire-ORed with other HI<sup>2</sup> nodes. The selector represents an HI<sup>2</sup> system load of 3 units.

### Reset

Input high voltage	V <sub>ih</sub>	Open circuit or > 3.5V (5.5V max.)
Input low voltage	V <sub>il</sub>	(GND - 0.5V) min. 0.9Vmax.
Input impedance	R <sub>p</sub>	47kΩ nom. to + 5V
Input capacitance	C <sub>in</sub>	1.5μF nom.
Input series resist.	R <sub>serl</sub>	56Ω nom.

In addition to the on-board power-on reset circuit, an external device may reset the system by pulling RESET low. The RESET line is active low and is intended to be driven by an open collector transistor referenced to 0V. A series resistor is provided to limit the peak current drawn when the on-board reset capacitor is discharged by an external device.



## CashFlow<sup>®</sup> 330 acceptor Applications Design Guide

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### PF (Power Fail)

Input high voltage	V <sub>ih</sub>	3.7V min.	5.5V max.
Input low voltage	V <sub>il</sub>	(GND - 0.5V) min. 0.9Vmax.	
Input impedance	R <sub>p</sub>	4.7k $\Omega$ nom. to + 5V	

In addition to the on-board power fail circuit, there is an input on the host connector to allow an external device to warn of an impending power failure. The power fail input is active low and is intended to be driven by an open collector transistor referenced to 0V.

### VIN (Power)

Input supply voltage	V <sub>in</sub>	10V min.	15V max. (Abs.max. not operational 20V)
Supply voltage ripple	V <sub>rip</sub>	Within V <sub>in</sub> min. to max. up to 100Hz 250mV pk-pk frequencies > 100Hz	
Supply rise time	T <sub>rise</sub>	75ms max.	
Input current	I <sub>in</sub>	500mA max.	

**VIN** is the input supply voltage referenced to the supply return, VNEG.

**VNEG** is connected to GND on the acceptor.

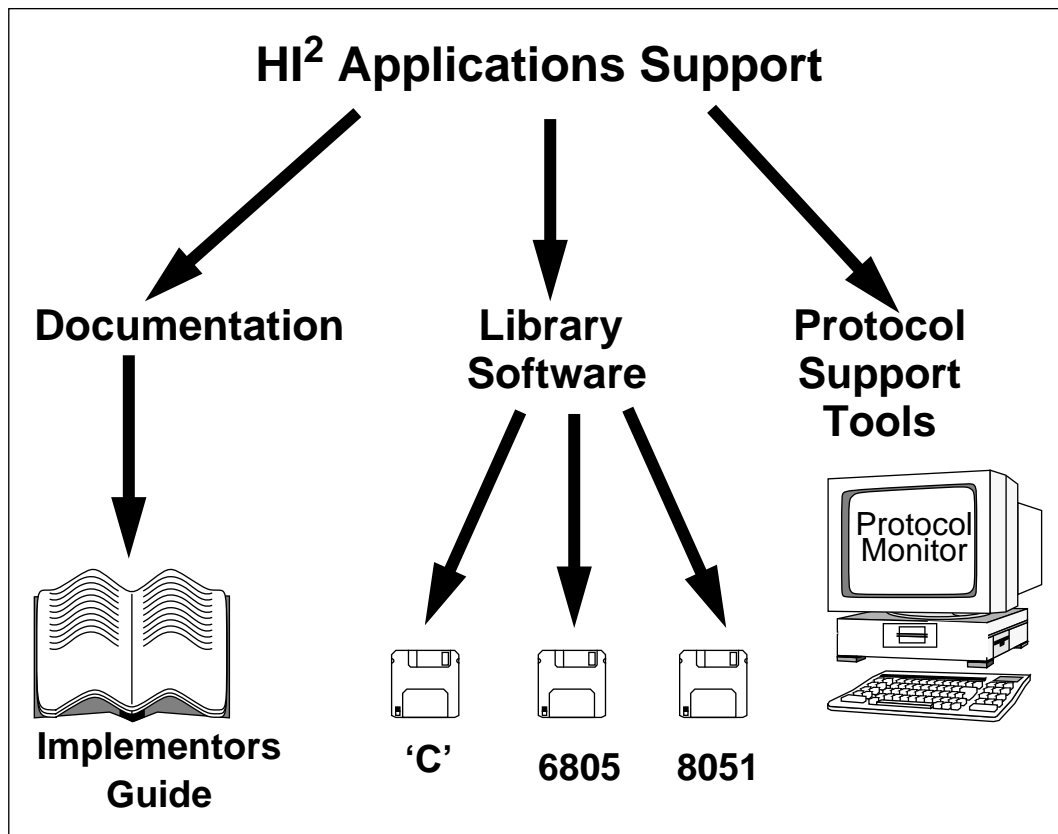


## **APPLICATIONS SUPPORT**

The Host Intelligent Interface (HI<sup>2</sup>) is a high functionality interface for point to point or multi node systems.

It is currently only available under licence and confidentiality agreements.

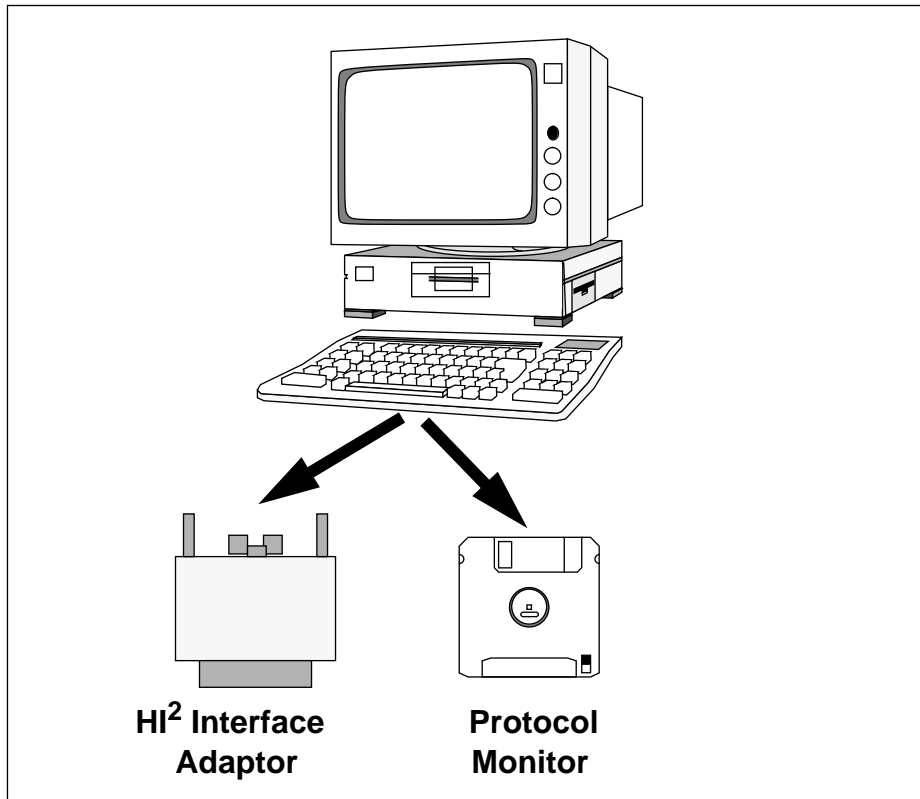
Applications support for HI<sup>2</sup> is in the form of documentation and support. These are all intended to make it straightforward to design-in the interface.



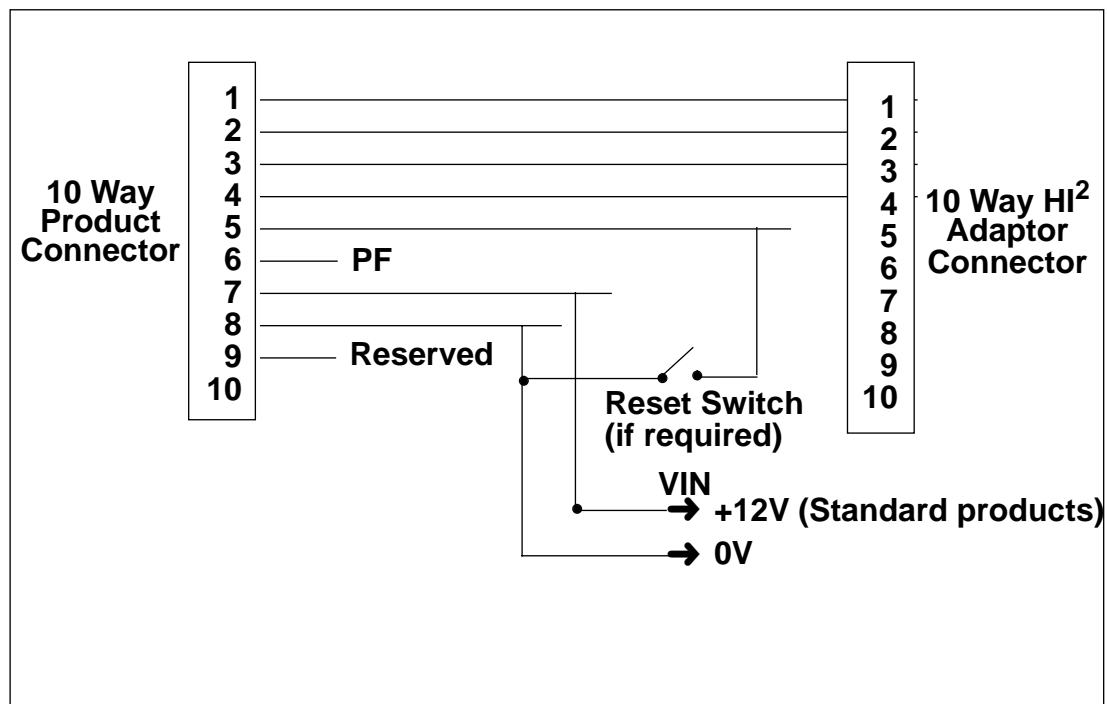


## SUPPORT TOOLS

With the use of a HI<sup>2</sup> interface adaptor and with the aid of the special “Protocol Monitor” software application it is possible to connect a PC serial port to the HI<sup>2</sup> signals.



The adaptor should be plugged into the PC serial port and wired to the HI<sup>2</sup> bus as shown below.





## MACHINE INTERFACE PCB's

All CashFlow® coin products incorporate a serial machine interface called HI<sup>2</sup> which offers maximum communication flexibility and security.

Machine interface PCB's are used to provide compatibility to industry standard interfaces. There are five different types available, these are:

- Standard version 112, (0V Common 12V)
- Standard version 124, (0V Common 24V)
- Standard version 212 (0V Common 12V)
- Standard version 312 (0V Common 12V)
- Dual Polarity (12V)

**Please note:** Not all interfaces are available for all product configurations. Please contact your Mars Electronics International representative for guidance.

The interface PCB's are attached directly to the discrimination PCB and are enclosed within the back cover of the acceptor.

All of the PCB's contain a four-bit DIL switch known as the Man Machine Interface (MMI). This switch can be used to configure certain aspects of the product.

### **COMPATIBILITY**

Standard versions 112 and 124 are compatible with the following:

MS130, MS135, MS130B1, MS135B1, MS180 and MS185.

Standard version 212 is compatible with:

NRI G13.

Standard version 312 is compatible with:

Azkoyen L60.

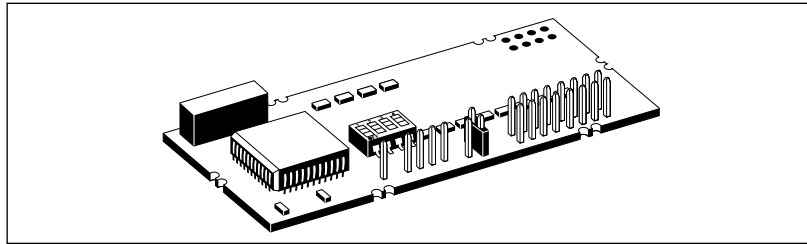
Dual Polarity version is compatible with:

MS111, MS111B1, MS115, ME111.

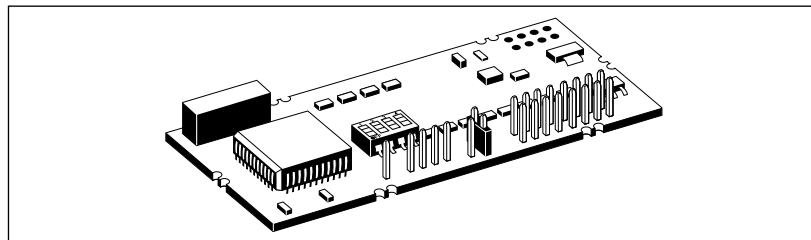


**STANDARD VERSIONS 112 and 124, (0V COMMON 12V & 24V)**

These PCB's provide for 6 coin output lines and 6 individual inhibit inputs, an all-inhibit input, a flight deck open (ER) output and four route inhibit inputs.



**Standard version 112 (0V Common 12V) interface PCB**



**Standard version 124 (0V Common 24V) interface PCB**

**PCB Connectors - versions 112 and 124**

The coin outputs are defined as outputs OPA to OPF, and the inhibit inputs are defined as inputs INHA to INHF. The all-inhibit input is defined as input ALLINHB, with the flight deck open output being ER. The route inhibits are defined as inputs INHR1 to INHR4.

The 6 coin outputs consist of open collector transistors referenced to 0V. The appropriate output becomes active for between 80ms to 120ms to indicate that a particular coin has been accepted.

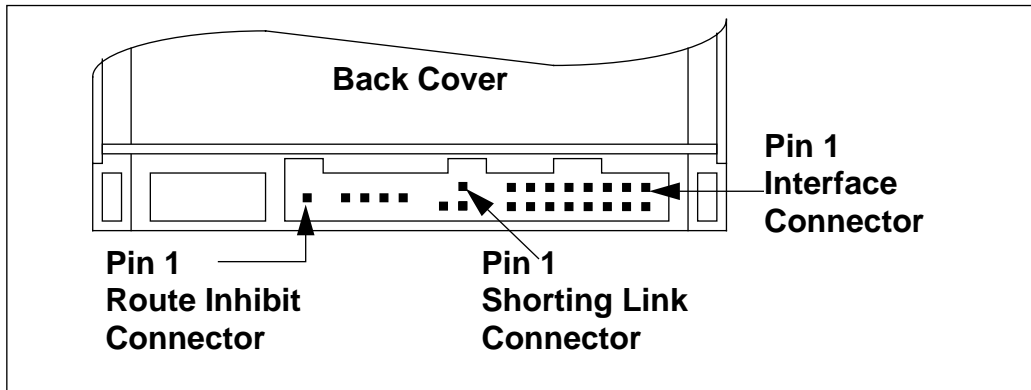
The 6 individual coin inhibit inputs consist of CMOS inputs with input protection and pull-down resistors. The inputs are active high to inhibit coins and if left open circuit will default to accepting coins.

The all-inhibit input consists of a CMOS input with input protection and pull-up resistor. The input is active low to inhibit coins and if left open circuit will default to accepting coins.

The flight deck open output consists of an open collector transistor referenced to 0V. The output is active low to indicate that the flight



deck is open and will remain active for a maximum of 500ms.



## Connector locations - versions 112 and 124

The four route inhibit inputs consist of CMOS inputs with input protection and pull-up resistors. The inputs are active low to inhibit a route and if left open circuit will default to route enabled. A shorting link is required between pins 1 and 2 of the shorting link connector to enable this mode of operation.

Conn. Pin	Signal Name	Signal Name	Conn. Pin
1	INHC	INHE	2
3	INHD	INHF	4
5	ER	ALLINHB	6
7	OPC	GND	8
9	OPF	OPD	10
11	OPE	OPB	12
13	OPA	INHB	14
15	INHA	VSUPPLY	16

## Interface connector - versions 112 and 124

Conn. Pin	Signal Name	Signal Name	Conn. Pin
		INHF	1
3	RESERVED	IF	2

## Shorting Link Connector - version 112 and 124



Conn. Pin	Signal Name
1	GND
2	POLARISED
3	INHR4
4	INHR3
5	INHR2
6	INHR1

(Loom To Have  
Blanked Receptacle)

### **Route Inhibit Connector - versions 112 and 124**

### **Electrical Interfaces - versions 112 and 124**

#### **Power**

For 12V operation, VSUPPLY (pin 16) referenced to GND (pin 8):

Input supply voltage	Vin	10V min.                      15V max. (Abs.max. not operational 20V)
Supply voltage ripple	Vrip	Within Vin min. to max. up to 100Hz  250mV pk-pk frequencies >100Hz
Supply rise time	Trise	75ms max.
Input current	Iin	500mA max. Acceptor only

#### **Outputs**

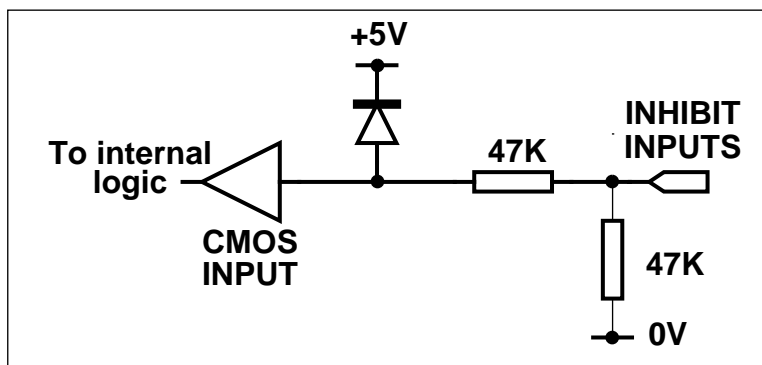
Off State voltage	Voff	+30V max.
Leakage current	Lin	5 $\mu$ A
On state voltage	Vcesat	0.5V max.
On state current	Ic	30mA max.



## Inputs (INHA - INHF)

Individual coin inhibit inputs - (INHA-INHF) Pins 1,2,3,4,14 and 15

Inhibit coins	V <sub>in</sub>	> + 4V (+30V max)
Accept coins	V <sub>in</sub>	between 0V and +1V or input open circuit
Input impedance	47k $\Omega$ nom. to 0V	



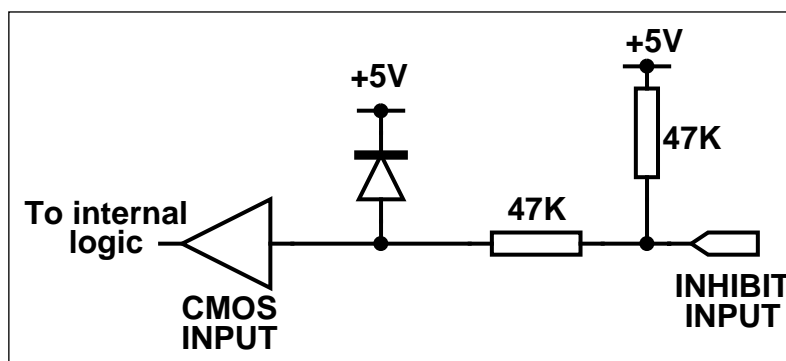
**INHA-F Input Equivalent Circuit**

All-Inhibit Input: (ALLINHB) Pin 6

Accept coins	V <sub>in</sub>	> + 4V (+ 30V max.) or input open circuit
Inhibit coins	V <sub>in</sub>	between 0V and + 1V
Input impedance	47k $\Omega$ nom. to + 5V	

Route Inhibit inputs: (INHR 1-4) Pins 3, 4,5,6

Route enabled	V <sub>in</sub>	> + 4V (30V max.) or input open circuit
Route inhibited	V <sub>in</sub>	Between 0V and +1V
Input impedance:	47k $\Omega$ nom. to + 5V	



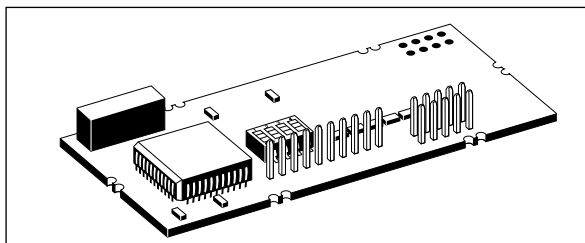
**All-inhibit and Route inhibit input equivalent circuit**



### **STANDARD VERSIONS 212 and 312, (0V COMMON 12V)**

This PCB provides two quite separate interfaces. Version 212 has 6 coin output lines, an all-inhibit input and a flight deck open (ER) output. This interface operates from a +12V supply.

Version 312 has 4 coin outputs, an alarm output or inhibit input and an all-inhibit input. This interface operates from a +12V supply. Provision has also been made for two route inhibit inputs.

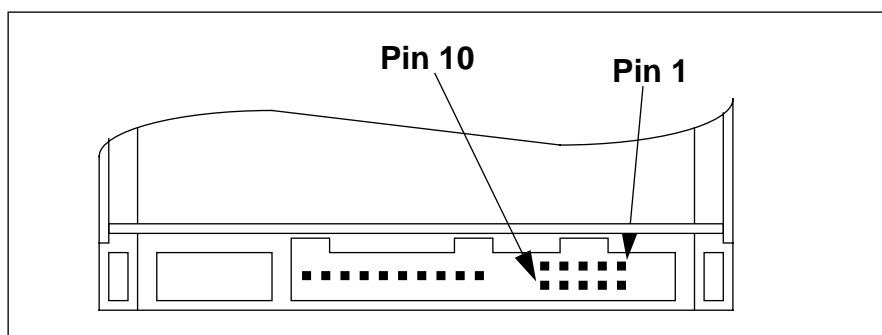


### **Versions 212 and 312 (0V Common 12V) Interface PCB**

#### **PCB Connectors - version Standard 212**

The six coin outputs consist of open collector transistors referenced to 0V. The appropriate output becomes active for between 80ms to 120ms to indicate that a particular coin has been accepted.

The coin outputs are defined as outputs OPA to OPF.



#### **Connector locations - Version 212**

Connector Pin	Signal Name	Signal Name	Connector Pin
1	GND	VSUPPLY	2
3	OPE	OPF	4
5	ER	ALLINH	6
7	OPA	OPB	8
9	OPC	OPD	10



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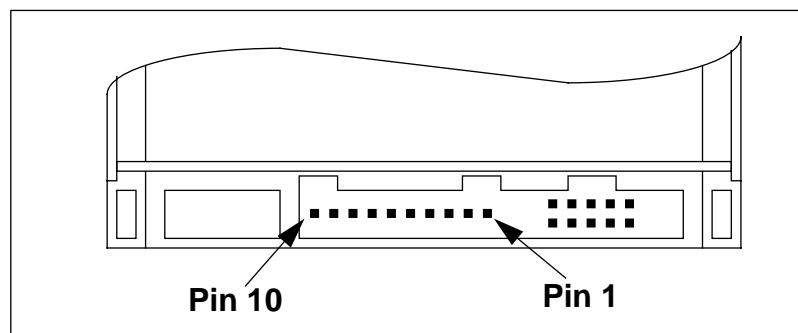
The all-inhibit input consists of a CMOS input with input protection and pull-down resistor. The input is active high to inhibit coins and if left open circuit will default to accepting coins. The all-inhibit input is defined as input ALLINH

The flight deck open output consists of an open collector transistor referenced to 0V. The output is active low to indicate that the flight deck is open and will remain active for a maximum period of 500ms. The flight deck open output is defined as output ER.

### **PCB Connectors - version Standard 312**

The four coin outputs consist of open collector transistors referenced to 0V. The appropriate output becomes active for between 80ms to 120ms to indicate that a particular coin has been accepted. The coin outputs are defined as outputs OPA to OPD.

The alarm output consist of an open collector transistor referenced to 0V. The output becomes active, if enabled, when the acceptor detects a fraud condition. The alarm output is defined as output ALARM /INH.



**Connector locations - Version 312**

Connector Pin	1	2	3	4	5	6	7	8	9	10
Signal Name	VSUPPLY	GND	OPA	OPB	OPC	ALLINH	OPD	INHR1	INHR2	ALARM/INH

The same interface pin is also used for an inhibit input which consists of a CMOS input with input protection and pull-up resistor. The input is active high to inhibit coins and if left open circuit will default to inhibiting coins. The input may be configured via the acceptor inhibit map, to inhibit some or all of the coins in the coin set.



## CashFlow® 330 acceptor Applications Design Guide

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The inhibit input is defined as input ALARM/INH. The all-inhibit input consists of a CMOS input with input protection and pull-up resistor. The input is active high to inhibit coins and if left open circuit will default to inhibiting coins. The input may be configured via the acceptor inhibit map, to inhibit some or all of the coins in the coin set. The all-inhibit input is defined as input ALLINH.

### Electrical Interfaces

#### Power

Standard 2 interface; VSUPPLY (pin 2) referenced to GND (pin1):

Standard 3 interface; VSUPPLY (pin 1) referenced to GND (pin2):

Input supply voltage	Vin	10V min.                      15V max. (Abs. max. not operational 20V)
Supply voltage ripple	Vrip	Within Vin min. to max. up to 100Hz 250mV pk-pk frequencies > 100Hz
Supply rise time	Trise	75ms max.
Input current.	Iin	500mA max. Acceptor only

#### Outputs

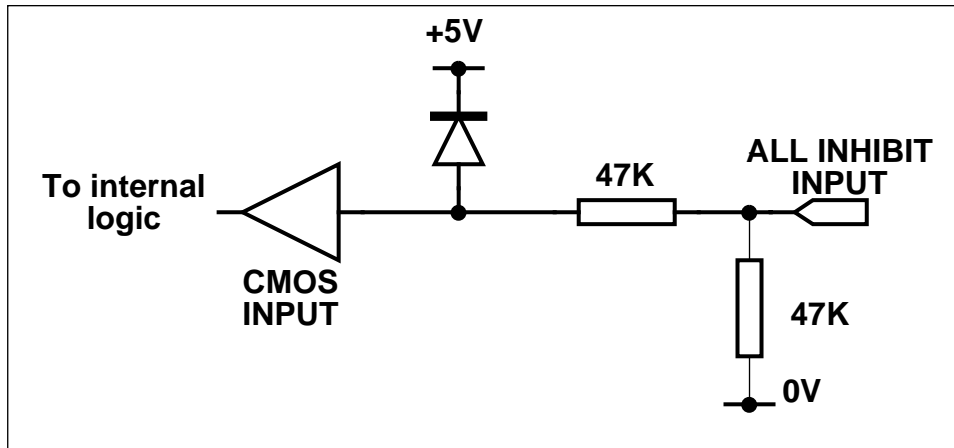
All outputs:

Off state voltage	Voff	+30V max.
Leakage current	Iin	5 $\mu$ A
On state voltage	Vcesat	0.5V max.
On state current	Ic	30mA max.

#### Standard 2; All-inhibit input (ALLINH)

Inhibit coins	Vin	> +4 V (+30V max)
Accept coins	Vin	between 0V and +1V or input open circuit
Input Impedance:	47k $\Omega$ nom. to 0V	

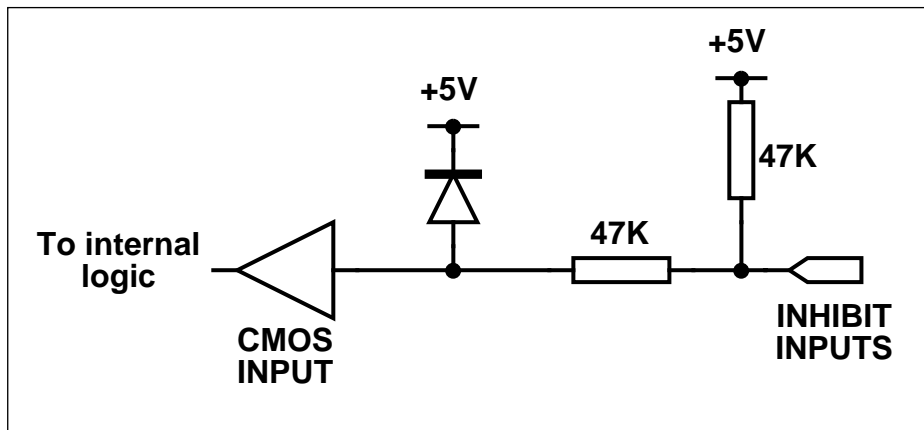




**Standard 212 ALLINH input equivalent circuit**

**Standard 3; Inhibit inputs (ALLINH, ALARM/INH and INHR1-7)**

Accept coins	V <sub>in</sub>	> +4 V (+30V max) or input open circuit
Inhibit coins	V <sub>in</sub>	between 0V and +1V
Input Impedance:	47kΩ nom. to +5V	

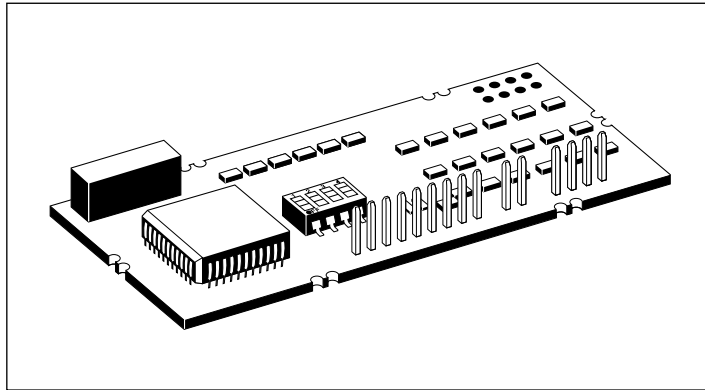


**Standard 312 - Inhibit inputs equivalent circuit**



### DUAL POLARITY

This interface operates from a nominal 12V supply and self configures to either positive or negative common operation. In either mode of operation this interface offers 6 coin output lines, an output common, 6 individual inhibit inputs and power connections.



**Dual Polarity Interface PCB**

#### **Coin outputs - positive common**

For positive common operation the OPCOM line must be positive with respect to GND and the coin output lines should be connected through a load to a voltage more negative than the OPCOM line.

#### **Coin outputs - negative common**

For negative common operation the OPCOM line must be negative with respect to GND or connected to GND. The coin output lines should be connected through a load to a voltage more positive than the OPCOM line.

With either of these options it is possible to operate in a pulsed mode by allowing the OPCOM line to float until it is polled by the host machine.

When a coin is accepted one of the coin output lines becomes active.



**PCB Connector - Dual Polarity**

The coin outputs are defined as OPA to OPF, and the inhibit inputs as INHA-INHF.

<b>Conn. Pin</b>	<b>Signal Name</b>
1	OPA
2	OPB
3	OPCOM
4	OPF
5	POLARISING
6	OPE
7	OPD
8	POLARISING
9	OPC
10	INHC
11	VSUP
12	GND
13	INHD
14	INHE
15	INHF
16	INHB
17	INHA

**Electrical Specifications****Power**

VSUP (pin 11) referenced to GND (pin 12):

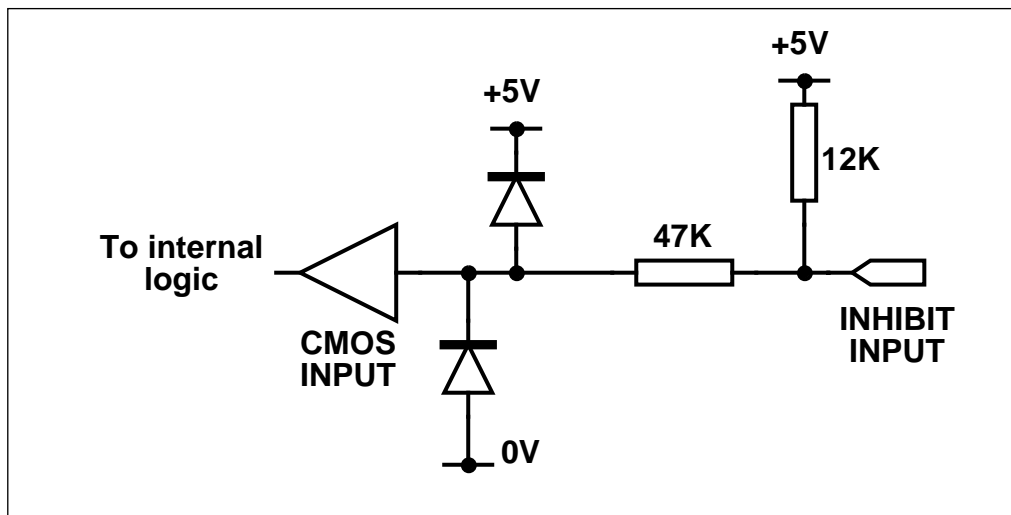
Input supply voltage	Vin	10V min.	15V max. (Abs. max. not operational 20V)
Supply voltage ripple	Vrip	Within Vin min. to max. up to 100Hz 250mV pk-pk frequencies > 100Hz	
Supply rise time	Trise	75ms max.	
Input current	Iin	1440mA max.	



## Inputs

### Individual coin inhibit inputs:

Inhibit coins	V <sub>in</sub>	> + 4V (+20Vmax) or input open circuit
Accept coins	V <sub>in</sub>	between 0V and + 1V
Input impedance	12k $\Omega$ nom.	to + 5V



### Inhibit input equivalent circuit

## Outputs - Positive Common

OPCOM (pin3) referenced to GND (pin12):

Input voltage	V <sub>in</sub>	5V min	26V max.
		(4.5V min	5V max.
	I <sub>c</sub>		max =10mA)

### All outputs:

Off state voltage	V <sub>off</sub>	(OPCOM - 27V) min.
Leakage current	I <sub>in</sub>	5 $\mu$ A
On state voltage	V <sub>cesat</sub>	(OPCOM - 1.5V) min.
On state current	I <sub>c</sub>	40mA max.



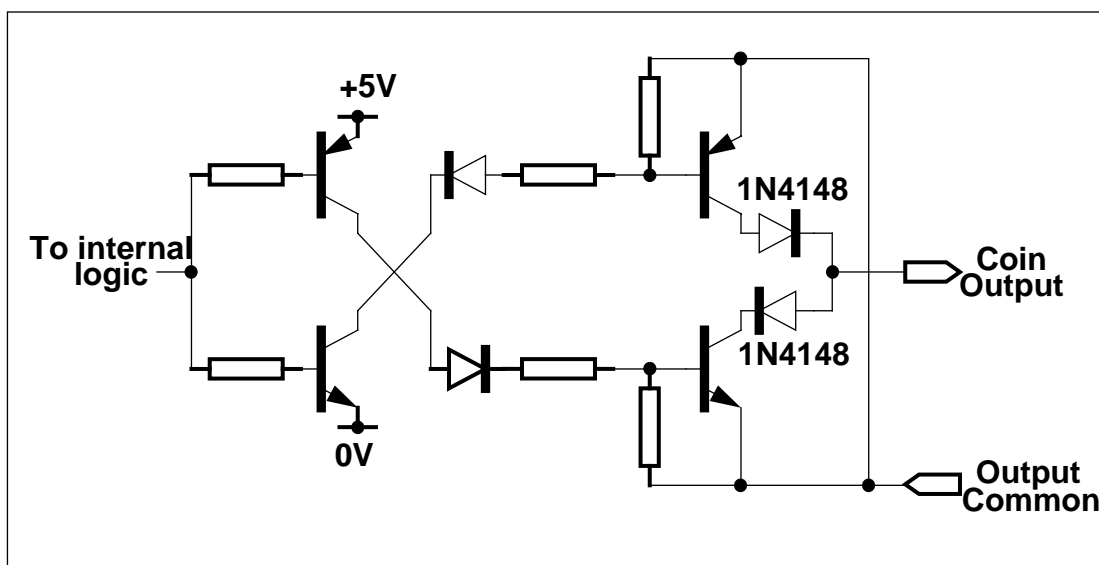
### Outputs -Negative Common

OPCOM (pin3) referenced to GND (pin12):

Input voltage	$V_{in}$	-22V min.	0V max.
		(0V min.	0.5V max. $I_c$
		max=10mA)	

#### All outputs:

Off state voltage	$V_{off}$	(OPCOM + 27V) min.
Leakage current	$I_{in}$	5 $\mu$ A
On state voltage	$V_{cesat}$	(OPCOM + 1.5V) min.
On state current	$I_c$	40mA max



Coin output equivalent circuit



## **CONFIGURATION**

### **FACTORY CONFIGURATION**

The CashFlow® 330 acceptor is configured for:

- Serial interface  
and / or
- Parallel interface

The accept gate modules are factory configured for specific product types. It is therefore essential that if you need to change the accept gate you change like for like.

### **Specific Coinsets**

The acceptor is pre-programmed to accept a specific range of coins and/or tokens from the following countries.

This list does not preclude any other coinsets not specifically listed.

Australia	Hungary	Singapore
Austria	India	South Africa
Bahrain	Israel	South Korea
Belgium	Italy	Spain
Canada	Japan	Sweden
Colombia	Kuwait	Switzerland
Cyprus	Malta	Taiwan
Denmark	Mexico	Turkey
Eire	Netherlands	UAE
Finland	New Zealand	UK
France	Norway	USA
Germany	Portugal	
Greece	Saudi Arabia	



### **FIELD CONFIGURATION**

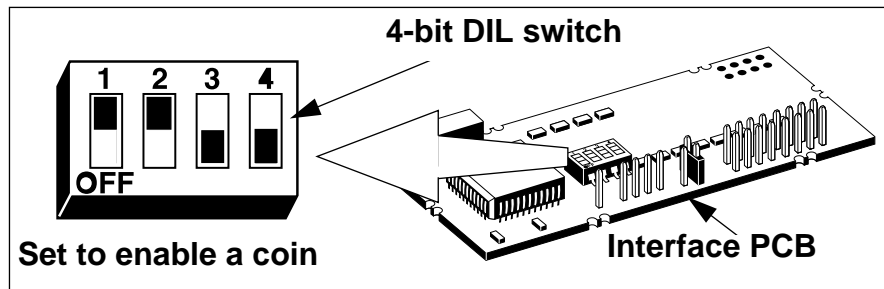
The CashFlow<sup>®</sup> 330 acceptor product offers various field configuration options. There are two methods available: via an interface PCB (MMI) or by use of a Mars<sup>®</sup> Route Alpha 250 hand held terminal.

#### **VIA MAN MACHINE INTERFACE (MMI)**

The Man Machine Interface is designed to provide a simple stand-alone interface which allows frequently used functions to be accessed and varied by an operator or route person.

The actual interface consists of a 4-bit DIL switch on the machine interface PCB. The following functions are available:

- Inhibit an individual coin
- Enable an individual coin



To change the function of the product there is a sequence of events that must be followed **in order**:

- 1 Switch off power and remove the acceptor module from the machine.
- 2 Disconnect the loom(s).
- 3 Remove the interface PCB cover by pressing downwards in the direction of the arrow on the cover.
- 4 Re-connect the loom(s).
- 5 Switch on power to the acceptor module.
- 6 Adjust the switch positions on the 4-bit DIL switch.
- 7 Replace the acceptor module back into machine.
- 8 Press the reject lever within a 4 minute time-out period.
- 9 Insert coins until desired function has been achieved.
- 10 Press the reject lever.



### **Important points to remember**

- The acceptor module must be powered up before changing the switch positions.
- The reject lever must be pressed within the 4 minute timeout period to return to the normal operational mode.

Care should be taken while the acceptor is not mounted in the machine.

### **To Inhibit a Coin**

- 1 Adjust slide switches to: 1=ON, 2=ON, 3=OFF, 4=ON.
- 2 Press the reject lever.
- 3 Insert coins to be inhibited until they are accepted.
- 4 Press the reject lever to return to operational mode.

### **To Enable a Coin**

- 1 Adjust slide switches to: 1=ON, 2=ON, 3=OFF, 4=OFF.
- 2 Press the reject lever.
- 3 Insert coins to be enabled until they are accepted.
- 4 Press the reject lever to return to operational mode.

When you have completed configuring the acceptor module the interface PCB cover needs to be replaced. To do this follow the instructions below:

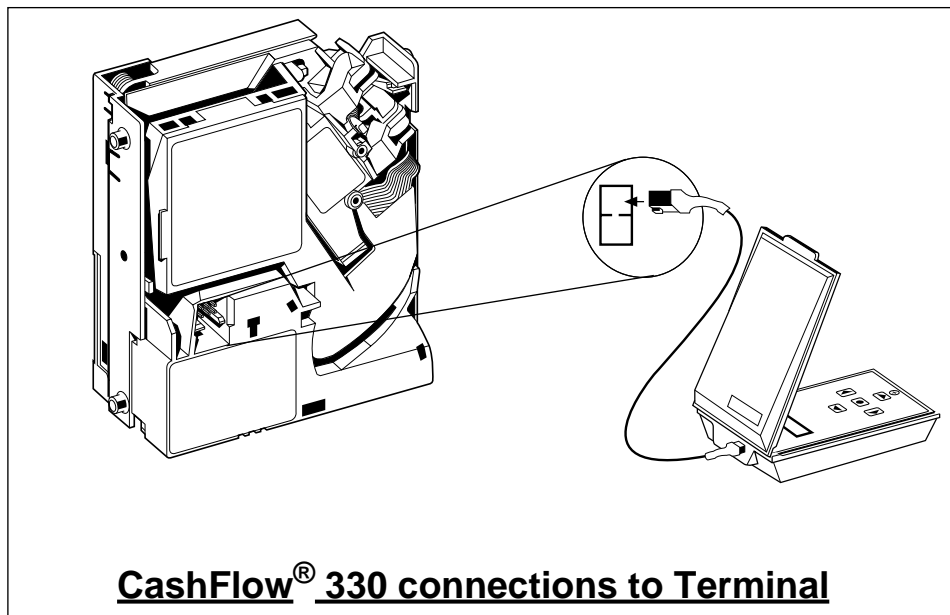
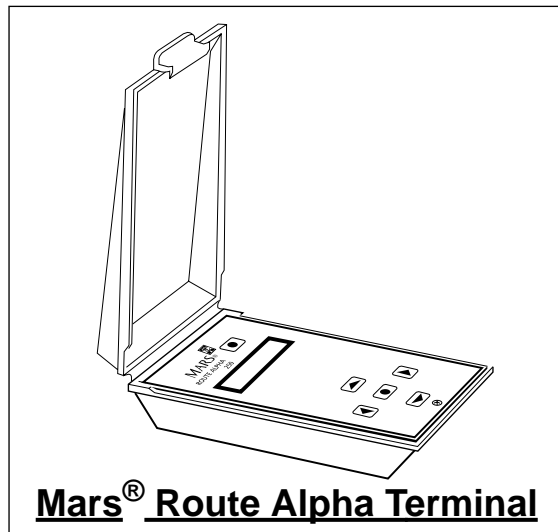
- 1 Switch off power and remove the acceptor module from the machine.
- 2 Disconnect the loom(s). When disconnecting hold down the interface PCB before pulling on the loom.
- 3 Replace the interface PCB cover.
- 4 Re-connect the loom(s).
- 5 Place the acceptor module back into the machine.
- 6 Switch on power.
- 7 Test the unit to ensure it is working correctly.



## CashFlow<sup>®</sup> 330 acceptor Applications Design Guide

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### VIA MARS<sup>®</sup> ROUTE ALPHA 250 TERMINAL



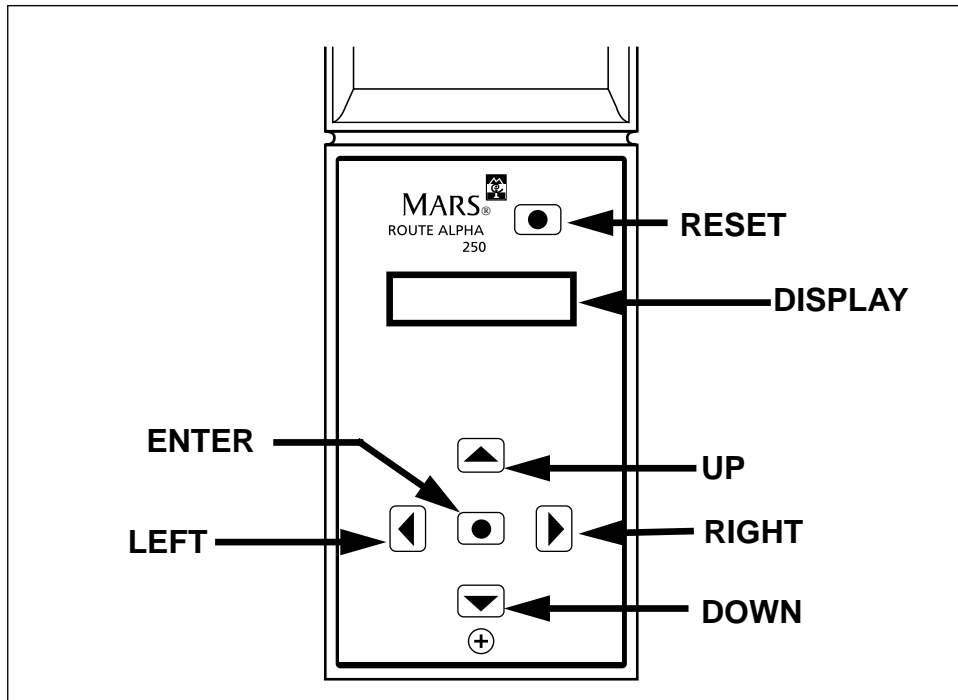
The Mars<sup>®</sup> Route Alpha 250 terminal is used to check or change certain data held at addresses which affect the way the acceptor operates. Each address has a unique number which identifies the feature you wish to read or change.

The following pages will explain how to access and change the data in certain addresses. At the end of this section there is a list of addresses and the allowed values.

The terminal is connected via a six way terminal connector at the front of the acceptor module as shown in the above diagram.



## Key Functions



**Reset Key:** used to reset all modes and to initialise any settings that you have changed. If the reset key is pressed while an address is being updated then the address may not be updated. The reset key must be pressed to activate the changes that you have made.

**Up Key:** used to increase the value displayed on the screen.

**Down Key:** used to decrease the value displayed on the screen.

**Left Key:** used to scroll the display to the left when a large number is being accessed that cannot be fully displayed on the screen.

**Right Key:** used to scroll the display to the right when a large number is being accessed that cannot be fully displayed on the screen.

**Enter Key:** used to change between the address and data displays.

## Other Facilities Of The Terminal

The terminal has built-in features to speed up its use, including the ability to scan at a higher speed with the keys auto repeating, to automatically roll over from its highest to lowest address and to inform the operator should a communication error occur.

### Auto Repeating Keys

If either the UP or DOWN keys are kept pressed they automatically repeat. The repeat speed of the key increases the longer the key is held down.



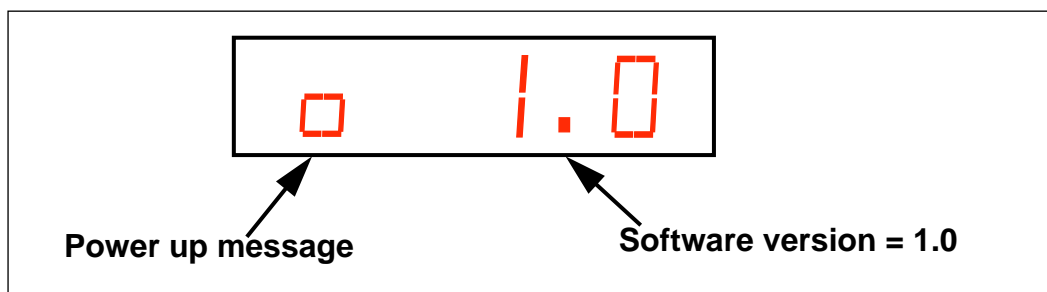
### Double Click Hotkeying

If a key is doubled clicked (pressed twice in quick succession) then this causes the address number to increment by a larger amount. e.g. if the user starts at address number 1 then double clicks the UP key, the address will jump to 40, double click again the address will jump to address 100 etc. You can also double click the DOWN key to decrement by larger amounts.

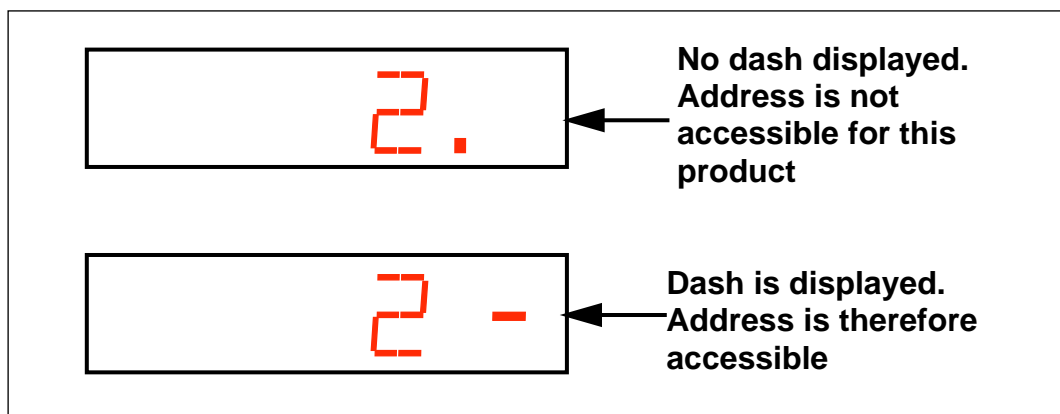
### Using The Terminal

As soon as the terminal is connected to an acceptor it powers up and interrogates the product.

The terminal display will clear and briefly show a message that indicates the version of software in the terminal. A display of [0 1.0] means software with a version number of 1.0 is fitted in the terminal.



After a few seconds the display will show the number [1.] or [1.-]. Not all configuration items are applicable to every product but all the address values are shown on the display. If the value for the address is applicable to the product a dash will be present at the far right position on the display. The value can then be accessed and changed if required





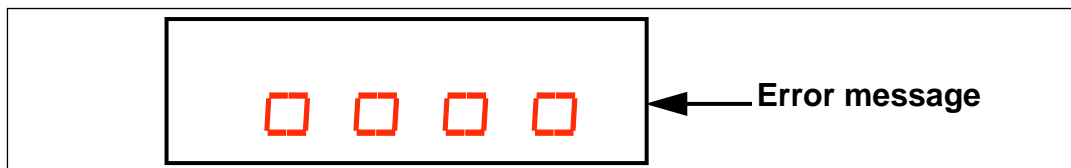
## CashFlow<sup>®</sup> 330 acceptor Applications Design Guide

The basic operation to alter the information held in an address is:

- 1 Connect the terminal to the CashFlow<sup>®</sup> acceptor module.
- 2 Wait for the terminal to power up correctly.
- 3 Select the address by using the UP and DOWN keys.
- 4 Examine the data by pressing the ENTER key.
- 5 Alter the data value by pressing the UP or DOWN keys until the new value has been reached.
- 6 Press the ENTER key to return to displaying addresses.
- 7 Press the RESET key to initialise the new value.

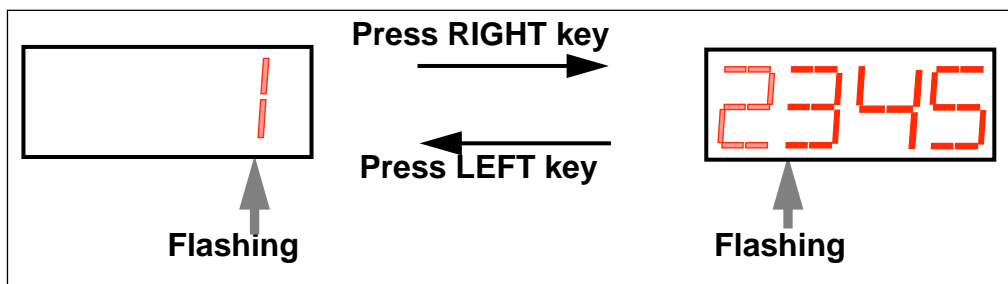
When the terminal is displaying values stored at addresses, no decimal point will be displayed.

If an error occurs with the communication between the terminal and the acceptor the display will show an error message of four half height zeroes.



This message will stay on the display. Pressing the ENTER key will then revert the display to showing the current address. If the error occurred while updating an address then the value of that address should be checked as it may not have been updated correctly.

As the screen is capable of only displaying four digits at any one time the number displayed on the screen can be scrolled if it is greater than 9999 by using the LEFT and RIGHT keys. The left or rightmost digit will flash indicating an extra digit can be examined by use of the scrolling keys e.g. Value is 12345





## CashFlow<sup>®</sup> 330 acceptor Applications Design Guide

The tables below show you how the addresses can be reconfigured and their possible values.

Address	Parameter	Range	Meaning
1	Coin 1 inhibit	0-1	0 = coin allowed, 1 = inhibited
2	Coin 2 inhibit	0-1	0 = coin allowed, 1 = inhibited
3	Coin 3 inhibit	0-1	0 = coin allowed, 1 = inhibited
4	Coin 4 inhibit	0-1	0 = coin allowed, 1 = inhibited
5	Coin 5 inhibit	0-1	0 = coin allowed, 1 = inhibited
6	Coin 6 inhibit	0-1	0 = coin allowed, 1 = inhibited
7	Coin 7 inhibit	0-1	0 = coin allowed, 1 = inhibited
8	Coin 8 inhibit	0-1	0 = coin allowed, 1 = inhibited
9	Coin 9 inhibit	0-1	0 = coin allowed, 1 = inhibited
10	Coin 10 inhibit	0-1	0 = coin allowed, 1 = inhibited
11	Coin11 inhibit	0-1	0 = coin allowed, 1 = inhibited
12	Coin12 inhibit	0-1	0 = coin allowed, 1 = inhibited
13	Coin13 inhibit (Serial acceptor only)	0-1	0 = coin allowed, 1 = inhibited
14	Coin14 inhibit (Serial acceptor only)	0-1	0 = coin allowed, 1 = inhibited
15	Accept direction	0-1	0 = left, 1 = right
16	Strobes	1/2/4/8	Value = sum of codes 1 = direction strobe left 2 = direction strobe right 4 = post gate left, 8 = post gate right
21	Coin 1 type	0-2	0 = coin 1 = value token 2 = vend token
22	Coin 2 type	0-2	0 = coin 1 = value token 2 = vend token



## CashFlow<sup>®</sup> 330 acceptor Applications Design Guide

Address	Parameter	Range	Meaning
23	Coin 3 type	0-2	0 = coin 1 = value token 2 = vend token
24	Coin 4 type	0-2	0 = coin 1 = value token 2 = vend token
25	Coin 5 type	0-2	0 = coin 1 = value token 2 = vend token
26	Coin 6 type	0-2	0 = coin 1 = value token 2 = vend token
27	Coin 7 type	0-2	0 = coin 1 = value token 2 = vend token
28	Coin 8 type	0-2	0 = coin 1 = value token 2 = vend token
29	Coin 9 type	0-2	0 = coin 1 = value token 2 = vend token
30	Coin 10 type	0-2	0 = coin 1 = value token 2 = vend token
31	Coin11 type	0-2	0 = coin 1 = value token 2 = vend token
32	Coin 12 type	0-2	0 = coin 1 = value token 2 = vend token
33	Coin 13 type (Serial acceptor only)	0-2	0 = coin 1 = value token 2 = vend token
34	Coin 14 type (Serial acceptor only)	0-2	0 = coin 1 = value token 2 = vend token



## CashFlow<sup>®</sup> 330 acceptor Applications Design Guide

Address	Parameter	Range	Meaning
140,143, 146,149, 152,155, 158,161,	Inhibit lines 1 - 8, inhibits map part i	0 -15	Value = sum of codes where 1/2/4/8 = coins 1/2/3/4
141,144, 147,150, 153,156, 159,162.	Inhibit lines 1 - 8, inhibits map part ii	0 -15	Value = sum of codes where 1/2/4/8 = coins 5/6/7/8
142,145, 148,151, 154,157, 160,163.	Inhibit lines 1 - 8, inhibits map part iii	0-15	Value = sum of codes where 1/2/4/8 = coins 9/10/11/12
164,166, 168,170, 172,174, 176,178, 180,182, 184,186	Coins 1-12 output map part i	0-15	Value = sum of codes where 1/2/4/8 = outputs a/b/c/d
165,167, 169,171, 173,175, 177,179, 181,183, 185,187	Coins 1-12 output map part ii	0-15	Value = sum of codes where 1/2/4/8 = outputs e/f/g/h
188	Inhibit pull up polarity	0-1	0 = pull down 1 = pull up
189	Master inhibit polarity	0-1	0 = active high 1 = active low
190	External inhibit enable	0-1	0 = disabled 1 = enabled
191	FIB enable	0-1	0 = disabled 1 = enabled



## ENVIRONMENTAL PERFORMANCE

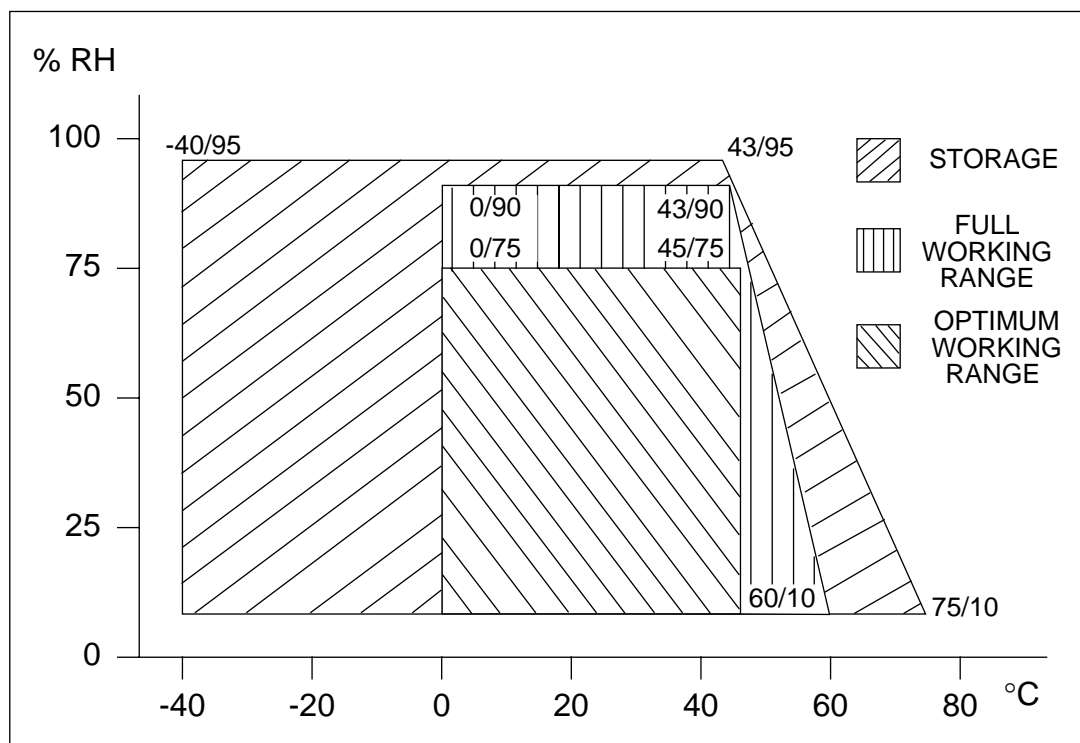
Products will meet the following environmental specification:

### TEMPERATURE RANGE

Working ambient	0° to 60°C
Max rate of change	15°C/hr. non condensing
Storage	-40° to +75°C
Recovery	1 hour per 10°C to working ambient temperature range
Solar radiation	Max. working ambient applies

### HUMIDITY

Operational	10% to 90% RH
Storage	10% to 95% RH
Recovery	1 hour per 10% RH to working ambient humidity range



Temperature / Humidity specification



## **VIBRATION**

Operational - units will not be damaged by these conditions:

Vibration (Coin acceptance <b>will not</b> be seriously affected.)	0.25g at 5 to 500 Hz. Intermittent over the unit's life. Refer to BS2011: part 2.1 Fc:1983 / IEC 68-2-6
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## **TRANSPORTATION**

Units in the packed state will not sustain any physical damage under these conditions:

Shock	Half sine, 30g shock, 18ms dur. Refer to BS 2011: part 2.1 Ea: 1988 / IEC 68-2-27
Bump	1000 bumps 6ms duration at 25g. Refer to BS 2011: part 2.1 Eb: 198 7/ IEC 68-2-29
Free Fall	1000mm fall onto packing faces. Refer to BS 2011: part 2.1 Ed: 1992 / IEC 68-2-32:1975
Crush	Neatly stacked units of the same type may be stacked to a height of 2 metres.



## **LIQUIDS**

### **Water**

The units inclusive of PCBs will be splash protected.

The coin entry encourages excess water towards the reject path on an accept right product, and the front of the product out of the coin path. Coin stall under these conditions will be minimised.

### **Salt water**

Prolonged exposure in a salt laden atmosphere will lead to PCB corrosion damage. Suitable packaging will be required when shipped by sea.

### **Other Liquids**

Exposure to these will cause impairment of function. To include: dilute carbonic acid, dilute citric acid, carbonated drinks, beer, tea, coffee, chocolate, soup, syrup and sugar residue, uric acid.

### **Comments:**

- Certain beverages and the dilute acids may cause similar effects to salt water if they contact the PCB's.
- Performance when wet will be similar to that described for water.
- Liquids which leave a residue on drying which affects the passage of coins will cause malfunction
-



## **SAFETY AND SUBMISSIONS**

### **CLASSIFICATION**

The defined product will satisfy the requirements of a class II (un-earthed) appliance as defined in IEC 335.

The products will comply with:

- UL 756 "Coin and currency changers and actuators"
- IEC 335, 3rd Edition "Safety of Household and similar Electrical Appliances"

### **FLAMMABILITY**

All major plastic parts will be moulded in materials with a flammability rating of UL 94 V-2/IEC 707 FV2 or better. Some small parts are moulded in materials with a minimum flammability rating of 94 -HB/IEC 707 FH2.

### **POWER SUPPLY INPUT PROTECTION**

Overcurrent protection is not included in the product and should be provided as part of the host machine.

Recommended fuse ratings are:

- 12V: 2.0A

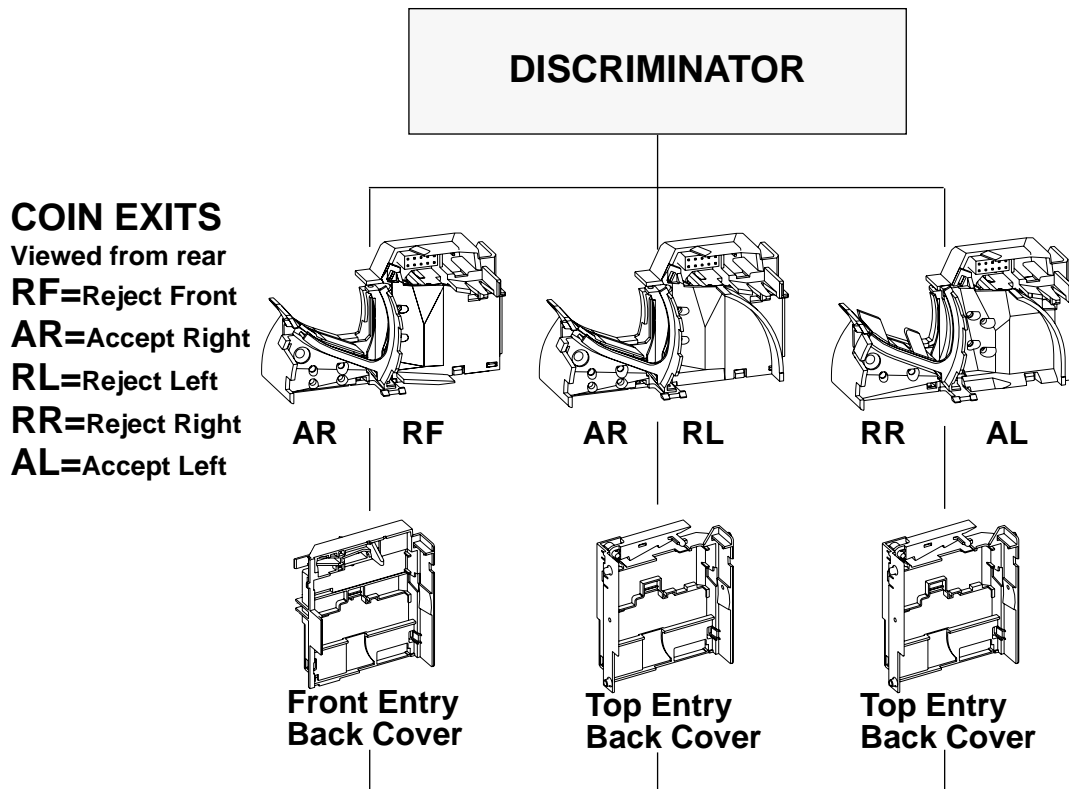
Other protection methods may be used providing the overall protection envelope remains within that defined by the fuse characteristics.

### **MECHANICAL PARTS**

The CashFlow® products will not contain mechanically moving parts, or sharp edges, which can present a hazard in normal use.



## CASHFLOW® MODULES COMPATIBILITY



0V Common I/F 12v	✓	✓	✓
0V Common I/F 24v	✓	✓	✓
Dual Polarity I/F 12v	✓	✓	✓
4" Channel	x	✓	✓
5" Top Entry Adaptor	x	✓	x
Mini F/P	✓	x	x
Midi F/P	✓	x	x
Maxi F/P	x	x	✓



## COMPATIBILITY with EARLIER PRODUCTS

If you are currently using the MS/ME100 product range then the table below will help you identify the acceptor and accessory required for compatibility. The typical applications shown are a guide only to the options available.

	NEW		NEW	NEW	
Available Options	4" Acceptor Stand Alone	4" Acceptor +Top Entry Adaptor	4" Acceptor +Mini Front Plate	4" Acceptor +Midi FrontPlate	4" Acceptor +Maxi Front Plate
Typical Application	Juke Boxes, Cigarette M/c Channel Mounted		Video Games, Table Top Vending		Pin Ball M/c's
Replaces MS111		✓			✓
Replaces ME111		✓			✓
Replaces ME115		✓			✓
Replaces MS130		✓			✓



## MARS ELECTRONICS INTERNATIONAL OFFICES

AUSTRALIA	ITALY
MARS ELECTRONICS INTERNATIONAL 302 PARRAMATTA ROAD AUBURN NEW SOUTH WALES, 2144 TELEPHONE: 2 - 7375390 FACSIMILE: 2 - 7375399	MARS ELECTRONICS INTERNATIONAL 27011 BELGIOIOSO (PV) VIALE DANTE, 40 TELEPHONE: 0382 - 979313 FACSIMILE: 0382 - 970790
CANADA	JAPAN
MARS ELECTRONICS INTERNATIONAL 37, HOLLAND DRIVE BOLTON ONTARIO, L7E 5S4 TELEPHONE: 416 - 239 - 2782 FACSIMILE: 416 - 239 - 3322	MARS ELECTRONICS INTERNATIONAL A DIVISION OF MASTER FOODS LTD. 3F MUSASHI-KOSUGI TOWER PLACE 403 KOSUGIMACHI 1-CHOME NAKAHARA-KU KAWASAKI-SHI KANAGAWA-KEN 211 TELEPHONE: 44 - 712 - 1315 FACSIMILE: 44 - 712 - 1439
FRANCE	SPAIN
MARS ELECTRONICS INTERNATIONAL BOULEVARD DES CHANATS BP 7 45550 ST. DENIS DE L'HOTEL TELEPHONE: 38 - 59 - 6161 FACSIMILE: 38 - 59 - 6172	MARS ELECTRONICS INTERNATIONAL M. <sup>a</sup> DE MOLINA, 40-3 <sup>a</sup> 28006 MADRID TELEPHONE: 9 - 3379182 FACSIMILE: 91- 5635517
GERMANY	SWITZERLAND
MARS ELECTRONICS INTERNATIONAL INDUSTRIERING 17 A 41751 VIERSEN TELEPHONE: 02162 - 9560 FACSIMILE: 02162 - 41544	MARS ELECTRONICS INTERNATIONAL CH. PONT-DU-CENTENAIRE 109 PLAN-LES-OUATES P.O. BOX 2650 1211 GENEVA 2 TELEPHONE: 22 - 8840505 FACSIMILE: 22 - 8840504
GREAT BRITAIN	UNITED STATES
MARS ELECTRONICS INTERNATIONAL ESKDALE ROAD WINNERSH TRIANGLE WOKINGHAM BERKSHIRE, RG41 5AQ TELEPHONE: 01734 - 697700 FACSIMILE: 01734 - 446412	MARS ELECTRONICS INTERNATIONAL 1301 WILSON DRIVE WEST CHESTER PA 19380 TELEPHONE: 610 - 4302500 FACSIMILE: 610 - 4302694



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## **APPENDIX**

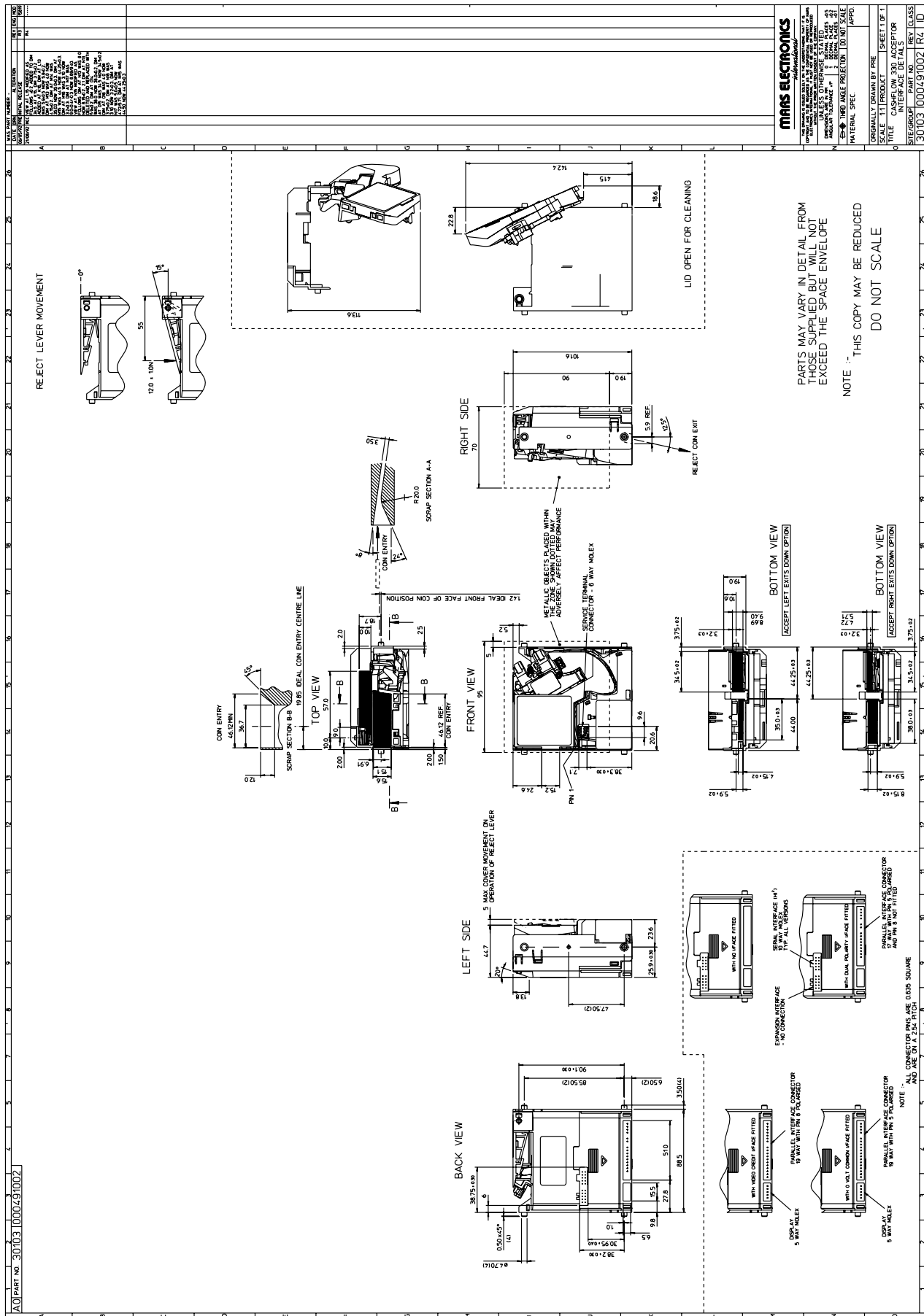
### **INTERFACE DRAWINGS**

The following mechanical interface drawings are included in this section.

	<b>Drawing Number</b>
<b>4" ACCEPTOR</b>	000491002
<b>5" TOP ENTRY ADAPTOR</b>	148895001
<b>MINI FRONT PLATE</b>	149278001
<b>MIDI FRONT PLATE</b>	149281001
<b>MAXI FRONT PLATE</b>	149265001
<b>4" CHANNEL</b>	149498001
<b>REMOTE REJECT UNIT</b>	001347001

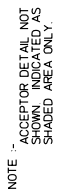


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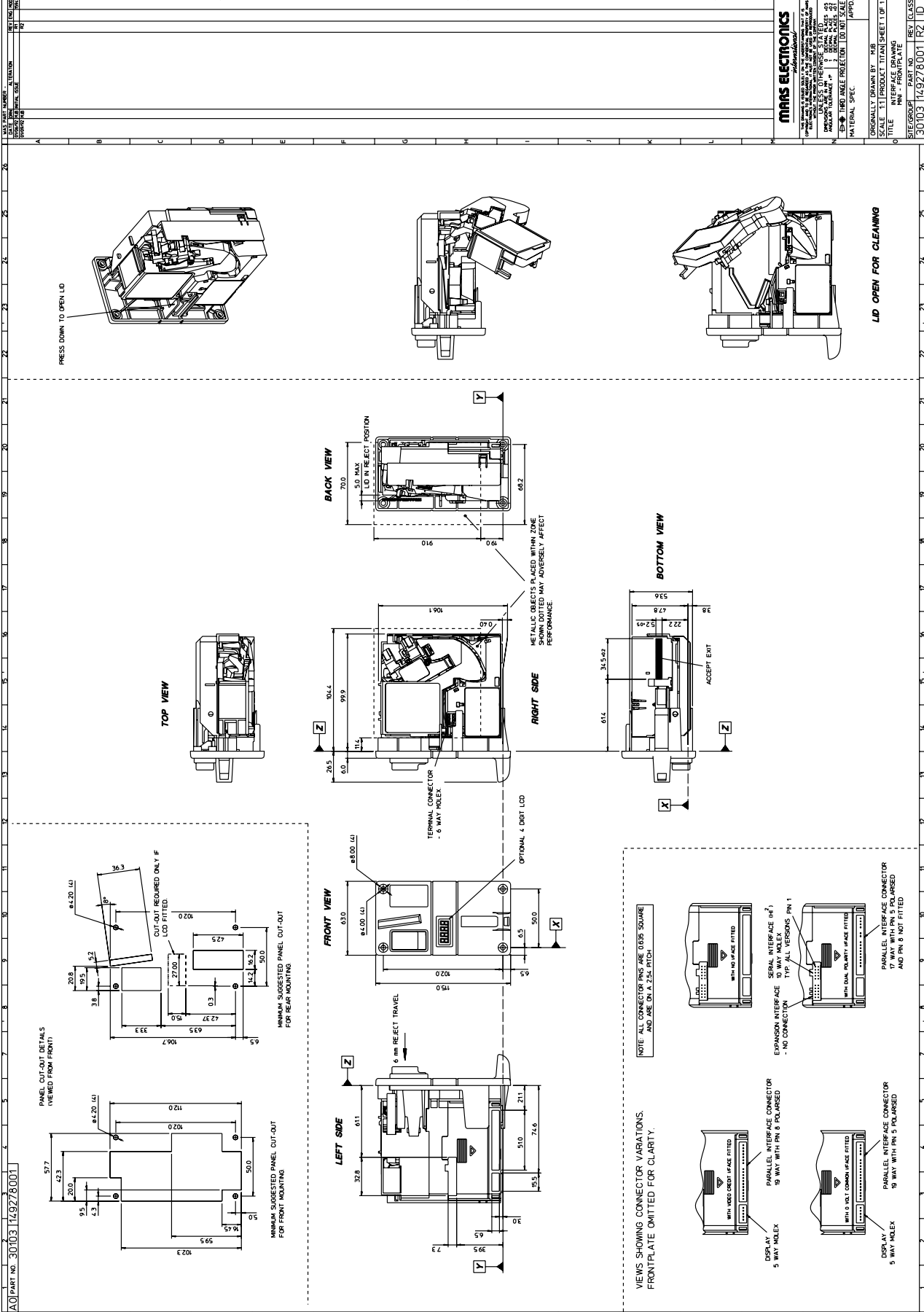




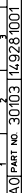
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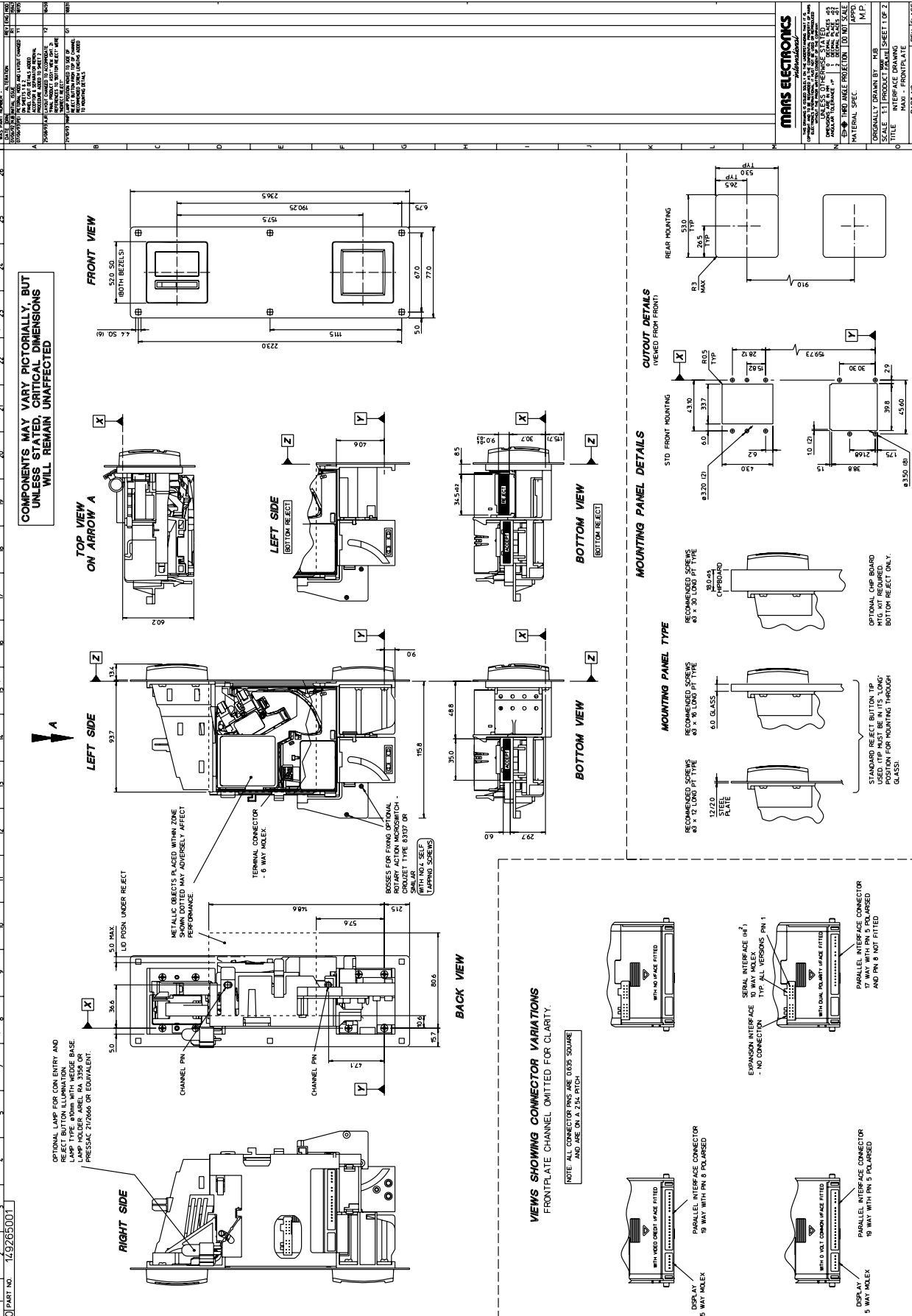






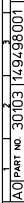






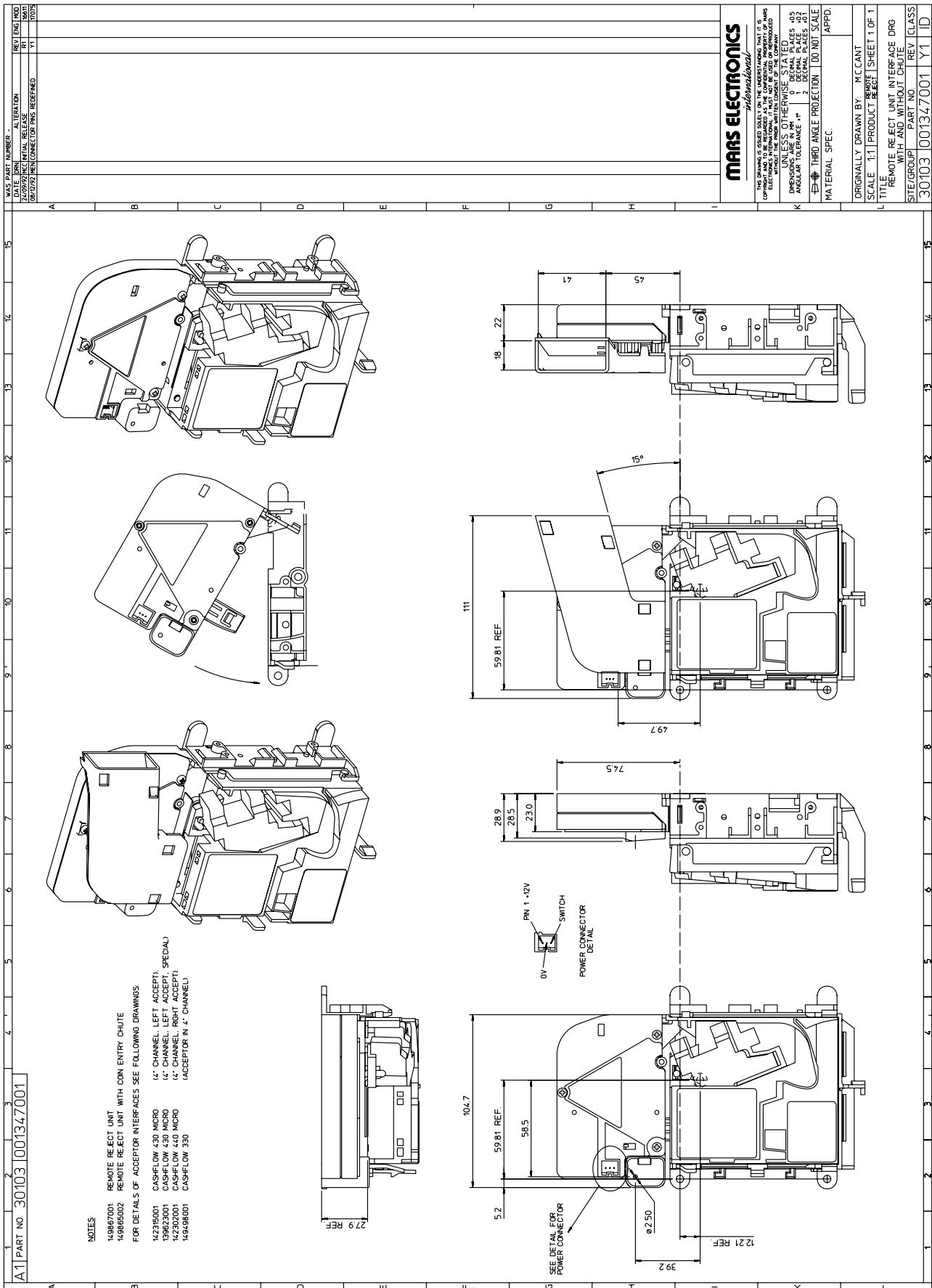


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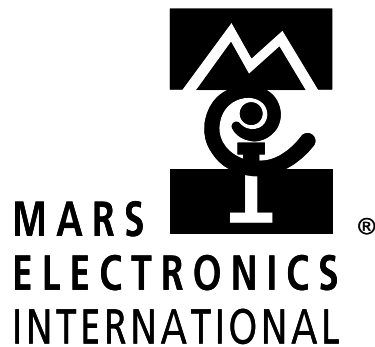




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