Condor Plus Technical Manual

Money Controls

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1. Diary of Changes

Issue 1.0 ..... August 2001
Issue 2.0 ..... February 2002

- Updated Figure 1
- Updated Table 2
- Money Controls logo added.
- Amended section 18 Service.

Issue 3.0 ..... 1st March 2002

- Applied TMWP V3.0.
- Amended Figure 1.
- Added guide to Condor Plus LED status.
- All drawings changed to .jpg's.
- Changed spacer references to 3.3mm and 3.75mm.
- Ammended **ccTalk** drawings.
- Added VACS +6V output cct.
- Added section – Theory of Operation
- Added T&R and window narrowing limitation

Issue 3.1 ..... 6th September 2002

- Modification to disclaimer.

Issue 4.0 ..... 30th March 2003

- Applied TMWP V3.2.
- Added Appendix 1 – Divertor.
- Changed the divert details in Figure 13.
- Added CPx1xG timer details to Figure 4 and Table 7.

Issue 4.1 ..... 28th August 2003

- Changed ccTalk® to ccTalk throughout the document.
- Changed the title of section 20 to Product Compliance.
- Updated the details of section 20.
- Updated the ccTalk error and fault commands.
- Added details of the new CPx1x connector in Figure 4.

Issue 4.2 ..... 10th March 2004

- Updated the VACS timer in Table 7.
- Updated Figure 4.

Issue 4.3 ..... 30th June 2004

- Changed footer

Issue 4.4 ..... 16th June 2005

- Changed Credit gap timer from 20ms to 28ms.

2. Introduction

The Condor Plus range of electronic coin acceptors has been designed specifically for the international gaming machine industry, accepting up to 10 coins per second. Whilst conforming to the industry standard space envelope, Condor Plus brings advanced coin handling technology and sets a new standard in discrimination, reliability and servicing.

2.1 Theory of operation

When a coin enters the Condor Plus, the coins material – conductivity, and volume, affect the magnetic fields generated by the 2 inductive coils. Two magnetic fields are generated – one with the fields in-phase (Sensor 1), the second with the fields out-of-phase (Sensor 2). The coin / token has a different affect on each on both the amplitude and frequency.

Sensor 3 is a reflective sensor. An infra-red beam is emitted from the Condor Plus and a measurement of the beam reflected back is taken.

Sensor 4 is a diameter sensor consisting of three linear optical devices, A, B and C, whose beams travel horizontally across the coin path. As the coin / token breaks the beams in turn, the time taken is measured and the diameter can be calculated.

Sensor 5 is a Frequency Modulation sensor (FM Max). Sensor 1 and Sensor 2 measure the change in amplitude, Sensor 5 measures the change in frequency on Sensor 2 caused by the coin / token.

Sensor 6 Not used.

Sensor 7 is a combination sensor whose output is a linear equation based on three out of the first five sensors. The detail is determined during the coin specification and is fixed for a nominated currency

When a Condor Plus is pre-programmed by Money Controls or taught using **Teach and Run™**, values from true coin readings are stored in memory. When a coin is entered the readings generated are compared to those windows programmed into EPROM. If a match is **NOT** found on ALL the programmed sensors then the coin will be rejected.

If the readings from the coin entered fall within ALL those programmed in memory, then a VACS (see section 8.1) signal will be generated. Shortly afterwards the accept gate will be activated, the coin will pass the credit opto's and a credit pulse (see section 8.2) will be issued. - **This is only generated on models CPx3x.**

The accept gate will stay open for a short time after the coin passes the credit opto's. If another **true** coin, is closely following the 1st coin, then the accept gate will remain OPEN.
If the following coin is deemed **false,** then the accept gate will close immediately a window is not matched and the coin will be rejected.

2.2 Condor Plus v Condor

MechTool™ inbuilt.

(The requirement for external programming equipment has been virtually eliminated).
See the Condor Plus **MechTool™** manual for more details.

ccTalk serial communication protocol.

(Data including credits, coin throughput and faults can now be obtained serially).
See section 16 for more details.

Improved Teach and Run™.

(An improved algorithm now requires a minimum of 8 coins).

More sensor readings.

(Condor Plus takes a Maximum of 7 coin readings against 4 on Condor).

Divertor driver connector.

(See section 9. for more details).

Improved accept solenoid design including 'anti-beering'.

(The accept flap will now not stick to the body if a sticky substance is poured in).

No ZA (South Africa specific) model.

(All models now have identical electronics).

Increased mounting stud thread length.

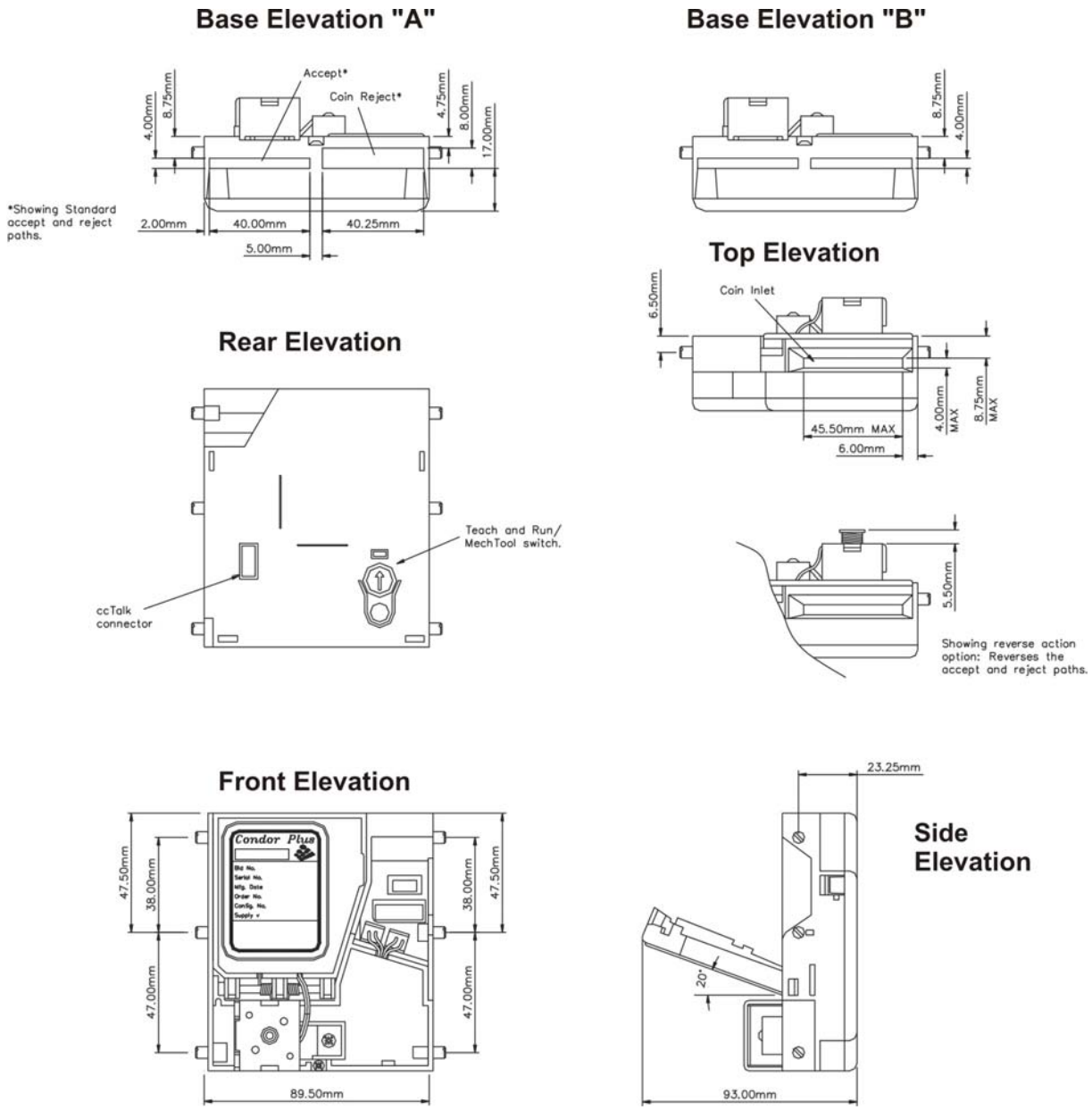
(Condor Plus = 5mm, Condor = 3mm).

Customer selectable timers.

(VACS, Credit, Credit Gap and Alarm – CP43x model ONLY,
VACS only, on all other CP4xx models)

3. Mechanical Configurations

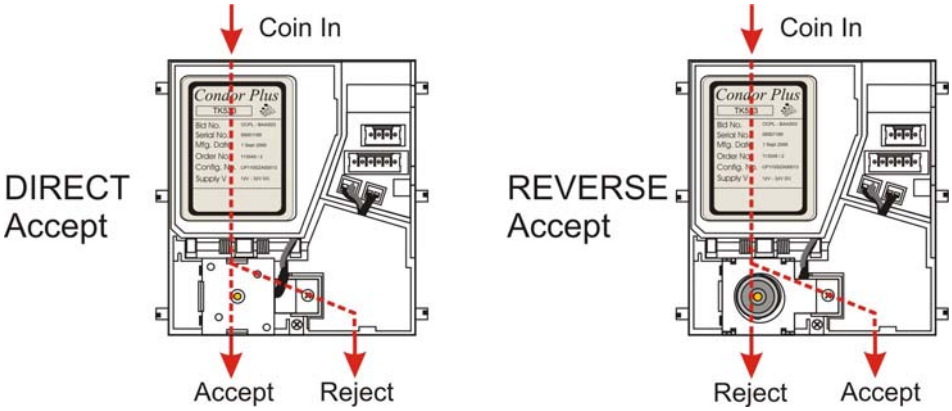
Figure 1: Condor Plus External Dimensions



Notes:- All Direct (EXCEPT US $1 TKN) builds use Divertor "A". (Anti-beering divertor).
All Reverse action builds use Divertor "B".
For further details see Table 2.

Continued:

Figure 2: Direct and Reverse Accept Paths



4. Coin Dimensions

The accepted range of coin sizes are shown below:

Table 1: Coin Dimensions

Diameter	15mm to 44.5mm (0.59” to 1.75“)
Thickness	1.5mm to 3.75mm (0.059” to 0.148”).

Condor plus is designed to accept coins within the diameter range 15mm to 44.5mm and thickness range 1.5mm to 3.75mm.
For coins larger than 38.5mm sections of the divertor assembly are removed. For coins thicker than 2.85mm a selection of spacers are available. The spacers open the debris flap wider than standard. However, when a Condor Plus is built to accept larger coins / tokens, its performance in discriminating smaller coins may be reduced due to the increased space, allowing the coins to rattle or bounce through the acceptor.

Table 2 shows the various available builds and a conversion from Condor to Condor Plus builds.

5. Build Variations

Table 2: Condor Plus v Condor Builds:

Condor Build Number	Condor Build Number	CONDOR PLUS Build	GATE SIZE	SPACER	Deflector	ACCEPT Path	Divider plate profile
R.O.W.	**ZA**						
1 = 13	17 = 29	**AA**	33mm	3mm	YES	DIRECT	"A"
2 = 14	18 = 30	**AB**	40mm	3mm	NO	DIRECT	"A"
3 = 15	19 = 31	**AC**	45mm	3mm	NO	DIRECT	"A"
4 = 16	20 = 32	**AD**	33mm	4mm	YES	DIRECT	"A"
5	21	**AE**	40mm	4mm	NO	DIRECT	"A"
6	22	**AF**	45mm	4mm	NO	DIRECT	"A"
7	23	**AG**	33mm	3mm	YES	REVERSE	"B"
8	24	**AH**	40mm	3mm	NO	REVERSE	"B"
9	25	**AI**	45mm	3mm	NO	REVERSE	"B"
10	26	**AJ**	33mm	4mm	YES	REVERSE	"B"
11	27	**AK**	40mm	4mm	NO	REVERSE	"B"
12	28	**AL**	45mm	4mm	NO	REVERSE	"B"
33		**AM**	25mm	3mm	YES	DIRECT	"A"
34		**AN**	25mm	4mm	YES	DIRECT	"A"
35		**AP**	25mm	3mm	YES	REVERSE	"B"
	36*	**AX**	45mm	3mm	NO	REVERSE	"B"
	37*	**AY**	45mm	3mm	NO	DIRECT	"A"
38		**AQ**	25mm	3.5mm	YES	DIRECT	"A"
39		**AR**	33mm	3.5mm	YES	DIRECT	"A"
40		**AS**	40mm	3.5mm	NO	DIRECT	"B"
41		**AT**	45mm	3.5mm	NO	DIRECT	"A"
42		**AU**	33mm	3.5mm	YES	REVERSE	"B"
43		**AV**	40mm	3.5mm	NO	REVERSE	"B"
44		**AW**	45mm	3.5mm	NO	REVERSE	"B"

33mm Gate - Max diameter = 32.5mm
40mm Gate - Max diameter = 37.9mm
45mm Gate - Max diameter = 44.7mm

Black 3mm spacer - Max thickness = 2.85mm
Blue 3.5mm spacer - Max thickness = 3.1mm
Grey 4mm spacer - Max thickness = 3.4mm

BUILDS 1 TO 16 = R.O.W. (Rest Of World)….first row
BUILDS 17 TO 32 = ZA (South Africa) only….second row
BUILD 33 Au (Australia) only
*Build 36 uses 45mm gate, but standard divertor plate = R100 MCS token
*Build 37 is a Direct version of B36

Condor plus….there is no 'ZA' build.

Note: The reason some Condors have 2 builds is historical. Initially the Condor was designed to replace the CC16 (CN10x) which had a 6 way connector. In order to supply a CC62 version (CN13x) which had a 7 way connector, the body had to be machined to accommodate the extra pin. This caused the 2 different builds. E.g. build 1 would have been for CN10x & build 13 was the same build but for the CN13x version.
The body has now been tooled to accept both types of connectors.

6. Model Numbers Explained

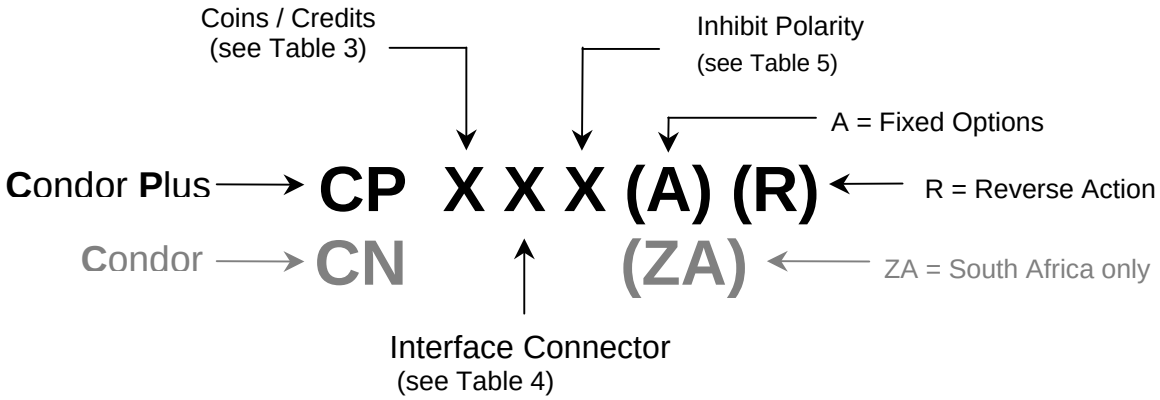


Table 3: Coins / Credits

Model				Description
CP	**1**	X	X	Single / multi* coin - single credit pulse.
CP	**3**	X	X	Multi coin - Fixed credit pulses.
CP	**4**	X	X	Multi coin - Customer specific credit pulses.

* Can be used for Old/New coinage or for multiple windows of the same coin to increase security, i.e. multiple small windows as opposed to 1 large window. (Specific to **Teach & Run**™).

Table 4: Interface Connector

Model				Connector type	Part No.	Description
CP	X	**0**	X	JST	B6B-XH-A	6 Way
CP	X	**1**	X	AMP	640456-6	6 Way (IGT Only)
CP	X	**3**	X	AMP	640456-7	7 Way - pin 5 removed

Table 5: Inhibit Polarity

Model				Inhibit line status (High > 4V, Low < 1V)	Inhibit line not connected
CP	X	X	**0**	HIGH = COIN INHIBITED	COIN INHIBITED
CP	X	X	**1**	HIGH = COIN INHIBITED	COIN ACCEPTED
CP	X	X	**2**	LOW = COIN INHIBITED	COIN INHIBITED
CP	X	X	**3**	LOW = COIN INHIBITED	COIN ACCEPTED

7. Condor Plus Connectors

Figure 3: Connector Positions

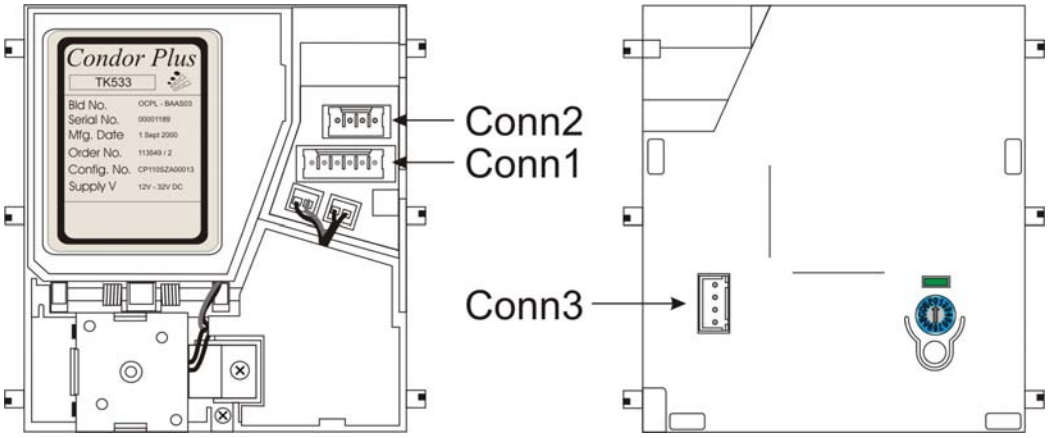


Table 6: Connector Descriptions

Conn1	Parallel Interface	See Figure 4
Conn2	Divertor Driver	See Figure 13
Conn3	**ccTalk** Interface	See Figure 14

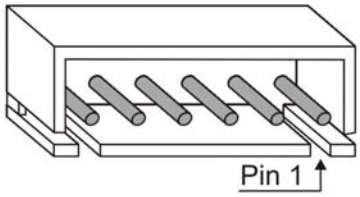
8. Parallel Interface

Figure 4: Parallel Interface - Connector 1

CONDOR PLUS
CPx0x, CPx2x

CONDOR
CNx0x, CNx2x

Connector type:-
JST Part No:- B6B-XH-A



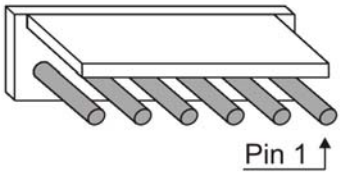
Pin 1	Inhibit All	High/Low@
Pin 2	VACS +6V	12ms (35ms*)
Pin 3	Vsupply	12 to 32V dc
Pin 4	Vsupply	12 to 32V dc
Pin 5	Vsupply	12 to 32V dc
Pin 6	0V	

@ Depends on Model
* Reverse Action

CONDOR PLUS
CPx1x

CONDOR
CNx1x

Connector type:-
(NEW) MOLEX Part No:- 22-27-2061
(OLD) AMP Part No:- 640454-6



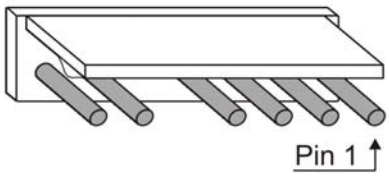
Pin 1	Inhibit All	High/Low@
Pin 2	VACS o/c	17ms (35ms*)
		17ms%
Pin 3	Vsupply	12 to 32V dc
Pin 4	Vsupply	12 to 32V dc
Pin 5	Vsupply	12 to 32V dc
Pin 6	0V	

@ Depends on Model
% On model CPx1xG
* Reverse Action

CONDOR PLUS
CPx3x

CONDOR
CNx3x

Connector type:-
AMP Part No:- 640456-7



Pin 1	0V	
Pin 2	VACS o/c	17ms (35ms*)
Pin 3	Alarm o/c	12ms
Pin 4	Credit o/c	12ms
Pin 5	Key	
Pin 6	Vsupply	12 to 32V dc
Pin 7	Inhibit All	High/Low@

@ Depends on Model
* Reverse Action

8.1 VACS Signal

VACS is an acronym for Valid Advanced Credit Signal.
When the Condor Plus decides that a coin is true, before the accept gate is opened, the VACS signal is issued.
On models CPx0x, CPx1x and CPx2x, the VACS may be used to switch on coin optics which sit below the Condor Plus which in turn generate a credit signal.
On model CPx3x the VACS can be used to confirm the Credit signal is true. i.e. a VACS signal issued before a Credit signal = valid coin condition. Any other condition = invalid.

The length and polarity of the VACS signal is model dependent. (see Table 7)

See Figure 4 for the pin-outs of each model.

Table 7: VACS timers.

Model	Output Polarity	Standard	Reverse
CPx0x and CPx2x	+6V (high)	12ms	35ms
CPx1x	Open Collector (low)	17ms	35ms
CPx1xG	Open Collector (low)	17ms	35ms
CPx3x	Open Collector (low)	17ms	35ms

Figure 5: VACS Open Collector Output Cct.

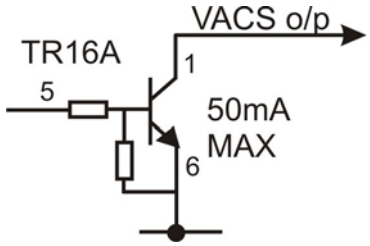
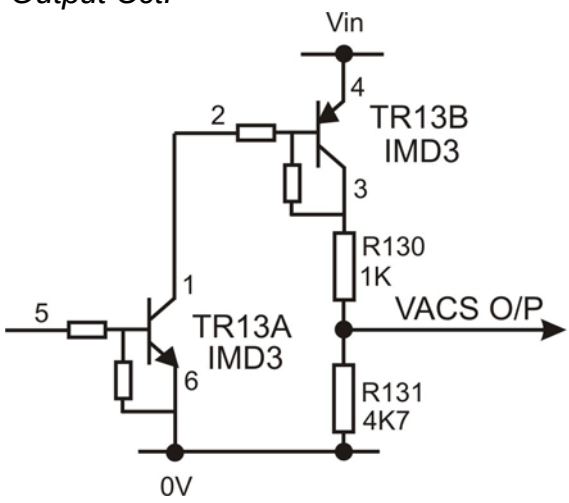


Figure 6: VACS +6V Output Cct.



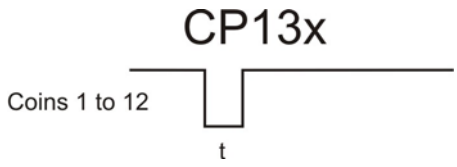
8.2 Credit Signals

The Credit output consists of an open collector NPN transistor. On acceptance of a true coin the transistor is turned on for a period of *t* ms (+/- 10%) to less than 0.7 volts at a Max. 50mA. The host machine must look for valid credit pulse of NOT LESS THAN *t* – 50%. It is not sufficient to merely detect the edges of a credit pulse. This 'de-bounce' will prevent credits being registered by the host machine as a result of any noise or false credit pulses being induced on the output lines.

8.21 CP13X CREDITS

t = 12ms, minimum time between output credits = 80ms.

Figure 7: CP13x Credit Output Pulse

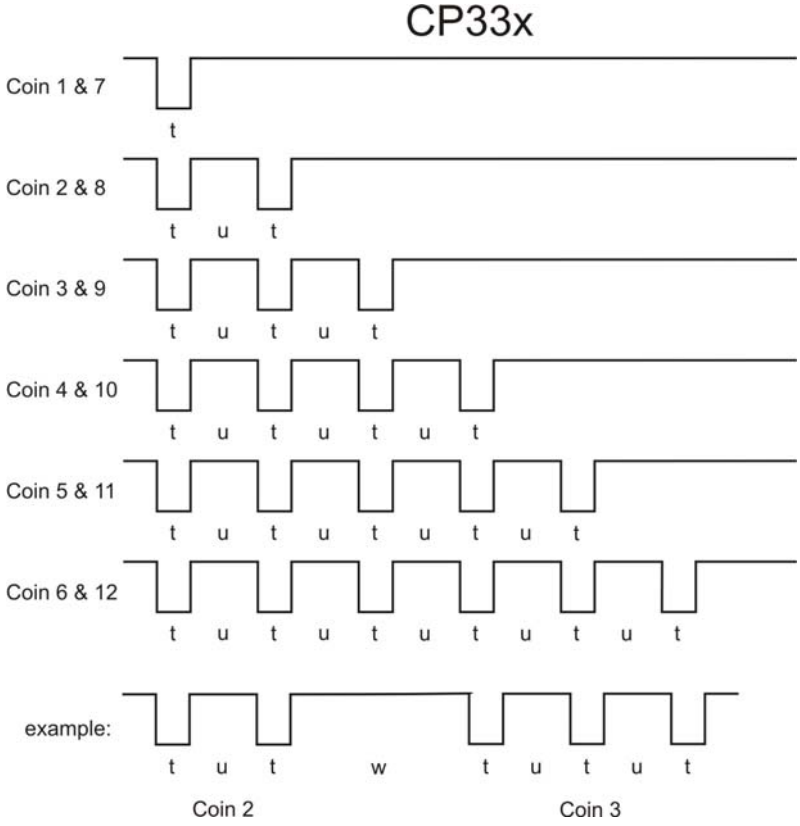


8.22 CP33X CREDITS

t = 12ms, u = 28ms, w = 112ms (4 x 28ms).

Number of pulses are FIXED.

Figure 8: CP33x Credit Output Pulses



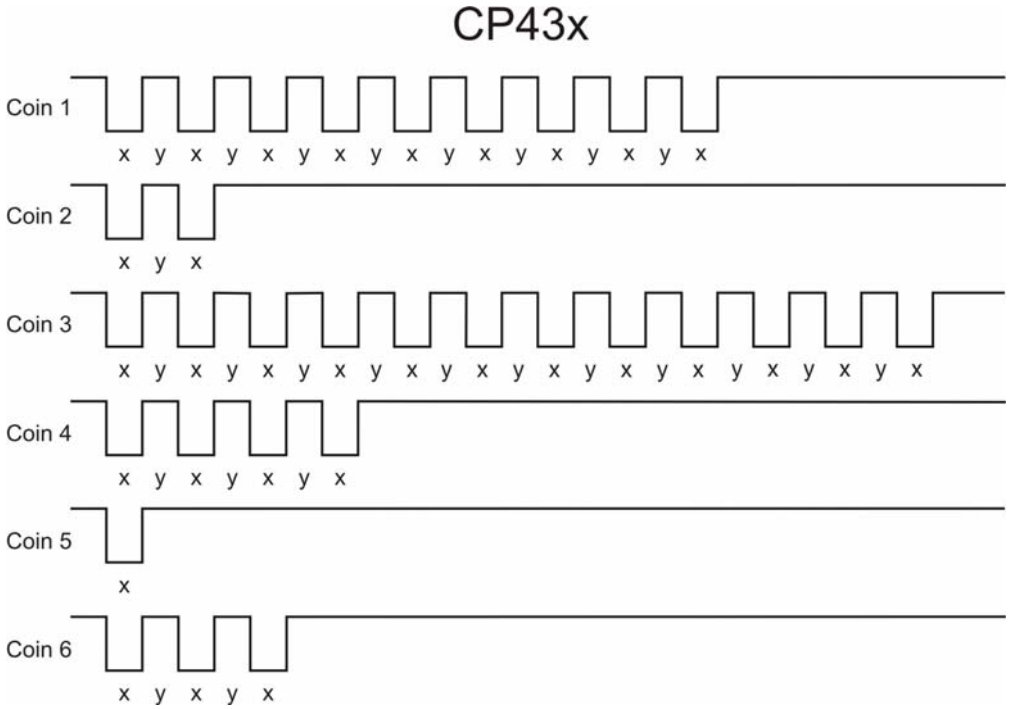
8.23 CP43X CREDITS

x , y = CUSTOMER SELECTABLE.

Minimum time between output credits = 4 x gap timer (y) = 4 x 28ms = 112ms.

Number of pulses are CUSTOMER SELECTABLE.

Figure 9: CP43x Credit Output Pulses

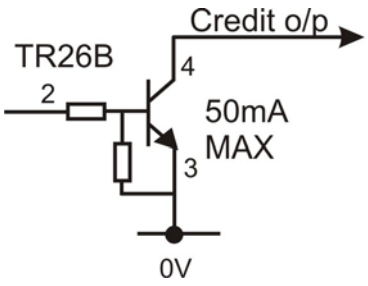


Credit pulse (x), selectable between 1ms and 250ms in 1ms steps.
Gap timer (y), selectable between 10ms and 60ms in 10ms steps.

Note: Condor Plus will stack credits in a buffer. However, care should be taken in specifying the number of pulses per coin, the length of credit pulse and the gap timer, especially in fast feed applications because of the time required to actually send the pulses to the host machine.

e.g. 10 pulses x 100ms (credit timer (x)) + 9 x 50ms (gap timer (y)) + 4 x 50ms (y) (minimum time between credits) = 1,650ms (1.65secs).

Figure 10: Credit Output Cct.



8.3 Inhibit All

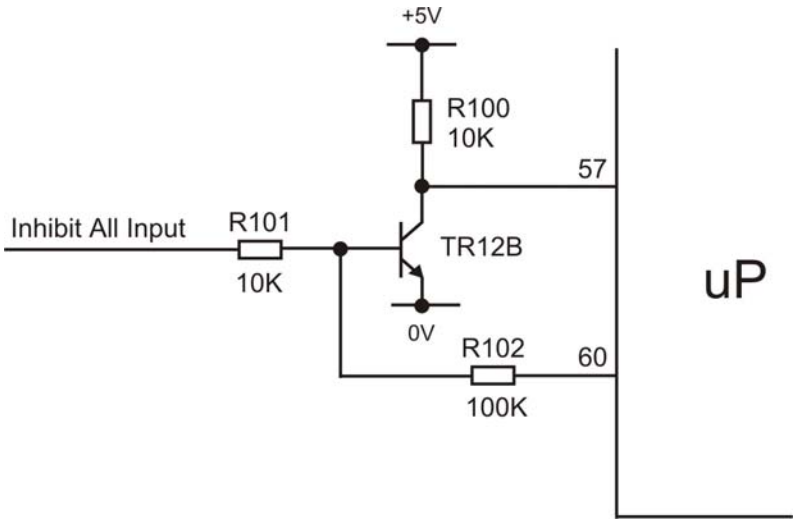
As its name suggests this pin Inhibits the acceptance of all the coins programmed.
4 options are available when ordering. These can also be changed, depending on the application, if **MechTool™** is on.

0	Inhibit High	Default Inhibit
1	Inhibit High	Default Accept
2	Inhibit Low	Default Inhibit
3	Inhibit Low	Default Accept

Inhibit High requires an active drive >4V
Inhibit Low requires an active drive <0.5V

The Default condition determines whether a coin accepts or rejects if the Inhibit All pin is not connected.

Figure 11: Inhibit All cct.



Note: In some applications, although the Inhibit is driven High/Low, it is not necessarily driven High/Low to enable the coins, i.e. it is left floating.
In this instance a model which is 'Default Accept' should be used.

8.4 Alarm (CPx3x only)

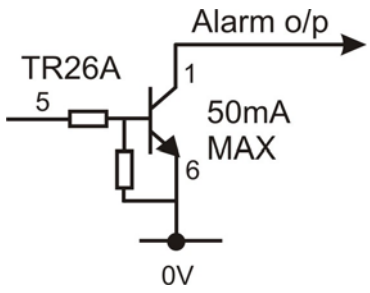
The alarm signal is activated when as the acceptor is in use, a coin or coins are seen to travel in the wrong direction i.e. upwards towards the coin entry, or if the credit opto's are obscured or an event occurs out of sequence.

The LED on Condor Plus will change from the normal operating green to yellow.

During an alarm condition Condor Plus will not accept coins.

When an alarm condition occurs a single pulse of 12ms is output, unless the credit opto's are blocked, in which case the Alarm is active for the duration of the blockage. Once the blockage is removed, the Alarm pin will reset.

Figure 12: Alarm Output Cct.



8.5 Diagnostics (power-up)

Diagnostics is a customer option. It can be enabled or disabled according to customer requirements. The diagnostics routines performed at power-up cover the following areas:-

- **Inductive coils**
- **Reflective sensor**
- **Diameter opto's**
- **Credit opto**

If all is clear the acceptor will be ready to accept coins within 60ms of power-up. If a fault is found the following will occur:-

- **The LED will flash red**
- **No coins will be accepted and**
- **On Models CPx3x the Alarm pin will activate as per normal alarm conditions**

9. Condor Plus LED Status Guide

The LED should NEVER turn RED during normal operation.

9.1 Continuous GREEN

Normal operation. Coin / token should accept.

Note: If Power-Up Diagnostics is OFF it is possible that there is a fault which cannot be indicated. See section 9.2

9.2 Flashing RED

Critical fault detected at power-up.

- EEPROM checksum error.

- Possible causes are:-
- Fault on inductive coils.
- Fault on reflective sensor.
- Fault on diameter opto's.
- Fault on credit sensor.
- Fault on reject sensor.

} **Only if Power-Up Diagnostics is ON.**

9.3 Continuous RED

Condor Plus in Teach mode.

9.4 Flashing Green

Teach mode completed.

9.5 Continuous Yellow

This colour is used twice

9.51 POWER-UP DISCRIMINATION SENSOR CALIBRATION.

When the Condor Plus powers-up the LED turns yellow while the mech. is calibrating the discrimination sensors. This is normally very fast, but if the mech. is unable to calibrate the sensors then the LED will stay YELLOW permanently. The Condor Plus will not accept any coins / tokens.

9.52 ALARM CONDITION

All coins are inhibited while the alarm is active.
Possible causes are:-

- Coin-on-string detected (out of sequence opto beams B, C or credit / reject sensor).
- True coin did not reach the credit sensor.
- True coin blocked the credit sensor for too long.
- Coin halted in credit / reject sensor area.

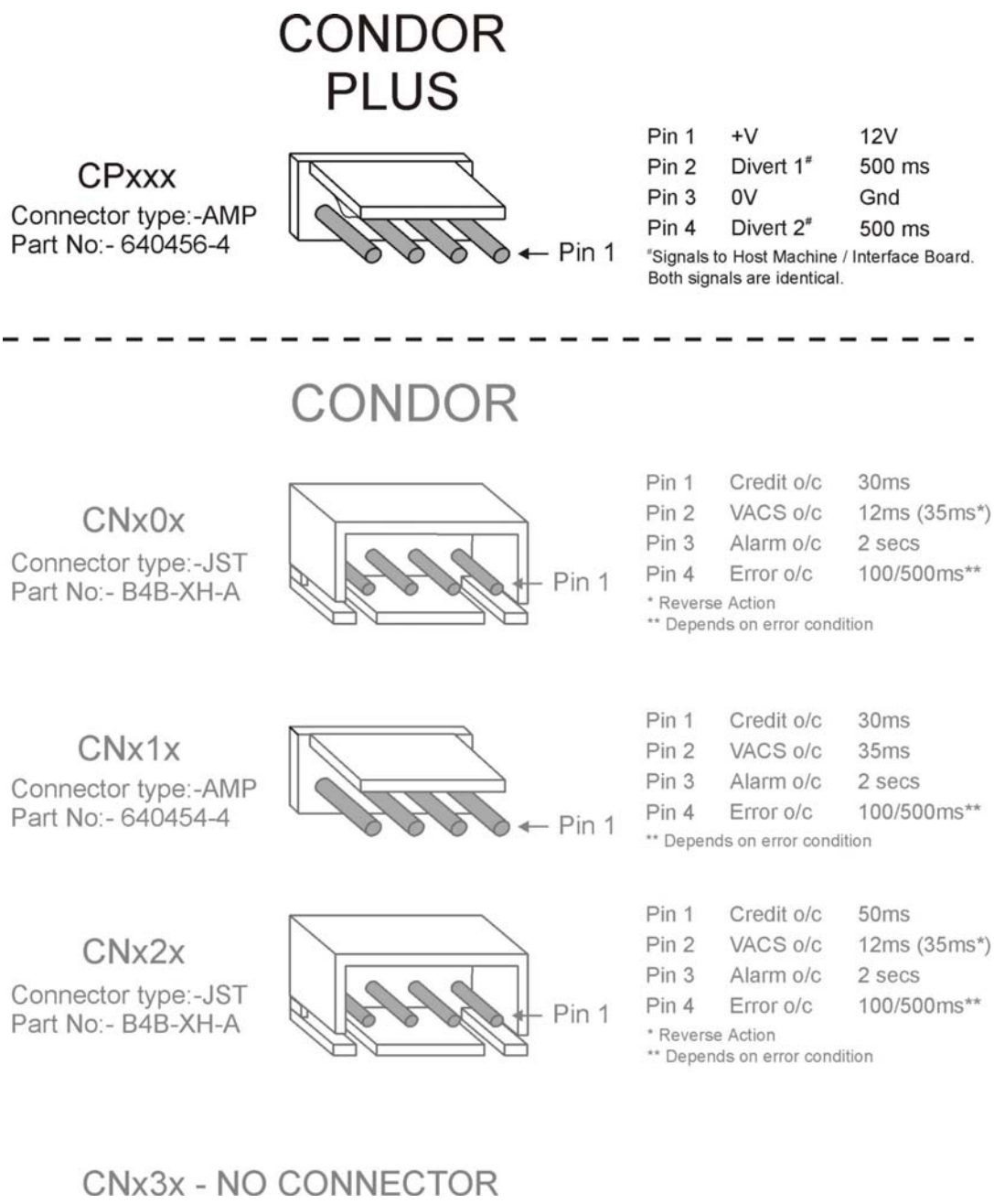
See section 8.4 for more details on the Alarm output

10. Divertor Driver

The Divertor connector **REPLACES** the 4 way connector on the old Condor models CNx0x, CNx1x and CNx2x.

This is an additional feature on the CPx3x model.

Figure 13: Divertor Driver - Connector 2



10.1 Description

There is an option to drive an active 2-way divertor, which fits below the Condor Plus acceptor. The function of the active divertor is to direct coins down one of two paths according to the 'divert' details held within acceptor EEPROM for each programmed coin. It may, for example direct a single coin type to a hopper for payout purposes and direct all other coins/tokens to a cashbox.

The sorter module contains a PCB that interfaces with the mech. and host machine.

10.2 Operation

The Condor Plus supplies a logic signal to the divertor, generated co-incidentally with the VACS signals. The divertor signal is dependent on both the coin 'divert' information stored in EEPROM and the timing gap between inserted coins. The typical coin throughput on Condor Plus can exceed 10 coins per second. It is not possible to actively divert coins at this level of throughput.

The divertor drive signal operates according to the following:-

a) Where the timing gap between any two adjacent coins in a stream of coins is greater than 300ms, each coin is diverted according to its programmed 'divert' path. Adjacent coins can have identical or different 'divert' paths.

b) Where the timing gap between any two adjacent coins in a stream of coins is less than 300ms, the operation depends upon the coin's divert paths.

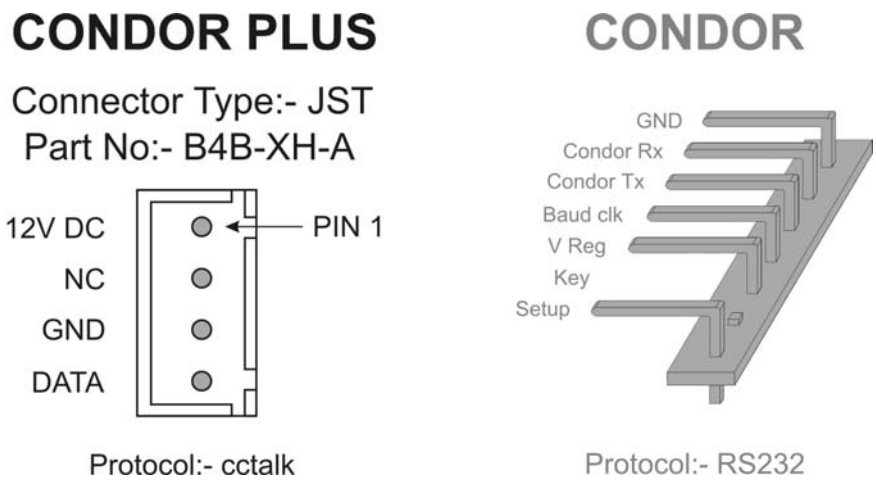
   i. Where the coin divert paths are the same, all will accept and divert according to their divert path.

   ii. Where the coin divert paths are different, the first will accept and be diverted according to its divert path. The second coin will reject. Coin acceptance is inhibited until the Condor Plus detects a timing gap between coins sufficient to resume normal operation. This is coin size dependent, but typically 0.5 seconds.

11. Serial Interface - ccTalk

Protocol: **ccTalk** compliant implementation.

*Figure 14: **ccTalk** Interface - Connector 3*



For available **ccTalk** commands see section 16.

12. Teach and Run™.

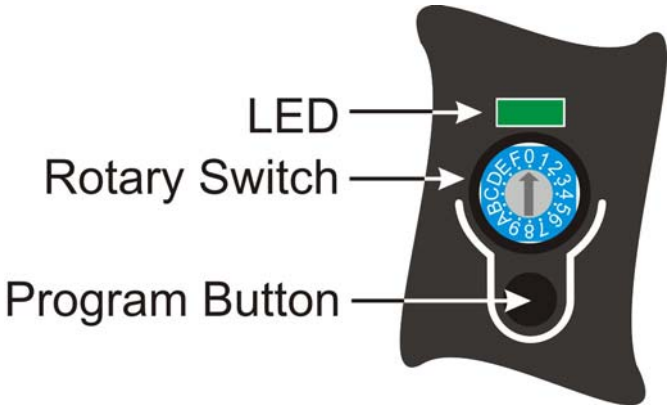
Condor Plus is equipped with the same unique programming system as Condor **- Teach and Run™**. **Teach and Run™** is a method of programming the acceptor to accept a coin / token by inserting a sample of a given coin / token, generally 8 to 10 coins, to allow it to calibrate itself. The procedure itself is very simple and involves using the rotary switch and the programming button both located on the rear of the acceptor (see Figure 15).

The increase in coin insertions over Condor, is because a new algorithm has been developed for Condor Plus, which aims to improve the accuracy of the taught coin / token window by eliminating spurious coin readings.

NOTE:- To make use of the Teach and Run™ function, MechTool™, 'Teach Permitted' AND Teach and Run™ MUST be selected, i.e. ON, when ordering.
Condor Plus also allows Teach and Run™ (if selected when ordered) to be enabled and disabled via the MechTool™ feature. (Refer to the Condor Plus MechTool™ Manual for further details)

(The rotary switch has no functional effect in **CPxxxA** applications).

*Figure 15: **Teach and Run™** Controls*



TIP: If after entering 20 coins **Teach and Run™** doesn't work, this means the coin/token readings are too far apart to program successfully. Start again using 1 of the coin/token sample and repeat **Teach and Run™**. Put the Condor Plus into run mode and check how many of the sample coins/tokens accept.
Using one of the coins that reject, program the next window in the same way as the first.
Repeat until all coins/tokens accept.
If the coin/token programs successfully but then doesn't accept, you may have to enable more windows. This is explained in the Condor Plus **MechTool™** manual.

12.1 Teach and Run™ Method

Set the Rotary Switch to the desired window position to be programmed (e.g.1).

If only 1 coin has been enabled then you can only program window 1.
If 6 coins have been enabled then you program windows 1 to 6.
If 12 coins have been enabled then you program windows 1 to C.
Credit codes CANNOT be changed.
*Please refer to the Condor Plus **Mechtool™** Manual for further details.*

Press the Program Button.

The LED will turn RED.
*If the LED returns to Green, **Teach and Run™** has not been enabled.*
*Refer to the Condor Plus **MechTool™** Manual for further details.*

Enter the required numbers of coins / tokens (typically 8).

The LED will flash Green.

Press the Program Button.

The LED will be continuous Green

Turn the Rotary Switch back to 0.

Select the level of security required. (see section 13**)**

Please see the warning on page 25

13. Coin Security – Window Adjustment

Condor Plus now offers different levels of security depending on your requirements (see Table 8 below).

If **MechTool™** is ON, then these security options can be changed to suit the application. Otherwise they must be selected at the time of ordering.

*Please refer to the Condor Plus **MechTool™** Manual for further details.*

Figure 16 shows the operation of the rotary switch. The operation of the switch will be dependant on the tuning options selected below.

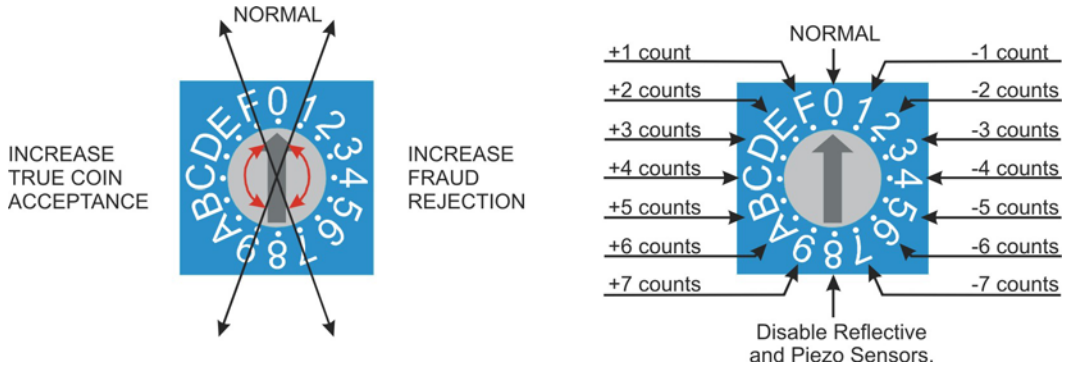
(The rotary switch has no functional effect in **CPxxxA** applications).

Table 8: Coin Security Options

Window Tuning [1]	Secure Tuning [2]	Individual Tuning [3]	Coin Security Level
OFF	OFF	OFF	No coin window modification is possible. (Condor – Security Switch OFF).
OFF	OFF	ON	Individual window tweaks possible. Windows can be widened or narrowed.
OFF	ON	OFF	No coin window modification is possible. (Condor – Security Switch OFF).
OFF	ON	ON	Individual window tweaks possible, but tweaks can only narrow programmed windows.
ON	OFF	OFF	*Standard Tuning*[1] on all windows which can be widened or narrowed – (Condor).
ON	OFF	ON	Both *Standard Tuning*[1] and individual window tweaks are possible on all windows which can be widened or narrowed. Their cumulative[4] effect on the window is used.
ON	ON	OFF	*Standard Tuning*[1] performed on ALL windows, but only to narrow programmed windows.
ON	ON	ON	Both *Standard Tuning*[1] and individual window tweaks are possible on all windows which can be narrowed only. Their cumulative[4] effect on the window is used.

13.1 Coin Security – Rotary Switch

Figure 16: Coin Security – Rotary Switch



Each count is added/subtracted to/from the upper and lower limits of the programmed windows, therefore, each count represents an **actual** increase/reduction of 2 counts.

[1] Window Tuning (*Standard Tuning)*, when enabled, allows window tweaks during 'normal' operation of the Condor Plus.

[2] Secure Tuning, when enabled, only allows windows to be narrowed – NOT widened.

Note: Enabling Secure Tuning will IGNORE previously programmed window WIDENING values.

[3] Individual Tuning, when enabled, allows individual window tweaks to be programmed into Eeprom.

Note: Disabling Individual Tuning will IGNORE previously programmed Individual Tuning values.

[4] Cumulative effect. Any *Standard Tuning* tweaks are added to tweaks programmed in EPROM. e.g. Individual tweak = 2 (-2 counts), standard tuning tweak = D (+3 counts), total effect on the programmed window = +1 count top and bottom of each sensor window.

Warning - Teach and Run™ ONLY

Depending on the coin taught, window narrowing may cause a 50% drop in true coin acceptance simply by turning the rotary switch to position 1.

This is because Teach and Run™ programs Sensor 6. Some coins give readings of 0. Therefore when the window is reduced by 1 count, the coins which give a 0 reading will be rejected.

Coins programmed by MCL or using ccProgrammer are not affected.

14. Order Entry Form – Crib Sheet

RED text is REQUIRED **BLUE text is OPTIONAL** **GREEN text is INFORMATION**

Customer Part Number: To be filled in by the customer.	**Rev:** Enter the next Revision Level.	**Initiator:** Enter your Initials here. If up-issuing enter your initials if different from previous issue.
Customer: Enter Customer Name.	**Config Number:** Will be issued by Money Controls.	**Original Issue Date:** Enter Original Issue Date.
Description: Please enter a brief description of the product		**Revision Date**: Enter New Revision Date.
Special Instructions: Please enter any special instructions.		

Coin	COIN/COUNTRY/YEAR (If required by customer, or N/A)	No. of Pulses	Prog'd Y/N	Coin Sorted Y/N	Coin	COIN/COUNTRY/YEAR (If required by customer, or N/A)	No. of Pulses	Prog'd Y/N	Coin Sorted Y/N
1					7				
2					8				
3					9				
4					10				
5					11				
6					12				

Coin window number.

Coin/Country/Year. If a coin/token is to be programmed, enter as much information about the coin/token as possible, in each of the windows to be programmed.

No of pulses. This is only used for model CP43x. All other models have fixed credits. CP40x & CP41x don't have a Credit output pin.

Prog'd Y/N. If the coin/token details are filled in and the coin/token requires programming, enter Y. If T & R then enter N.

Coin Sorted Y/N. If the coin / token is to activate a divertor then enter Y.

Gate Size:
Select from 4 sizes.
1. 25mm gate – Australian $1 ONLY.
2. 33mm accepts coins up to 32.5mm diameter.
3. 40mm accepts coins up to 37.9mm diameter.
4. 45mm accepts coins up to 44.7mm diameter.

Spacer:
Select from 3 sizes.
1. 3mm accepts coins up to 2.85mm thick.
2. 3.5mm accepts coins up to 3.3mm thick. (reserved primarily for US$1 gaming token).
3. 4mm accepts coins up to 3.75mm thick.

Should always be selected except maybe for CP43x.

Timers:	**Default:**
Credit Gap Timer	☒
Credit Timer	☒
VACS Timer	☒
Alarm Timer	☒

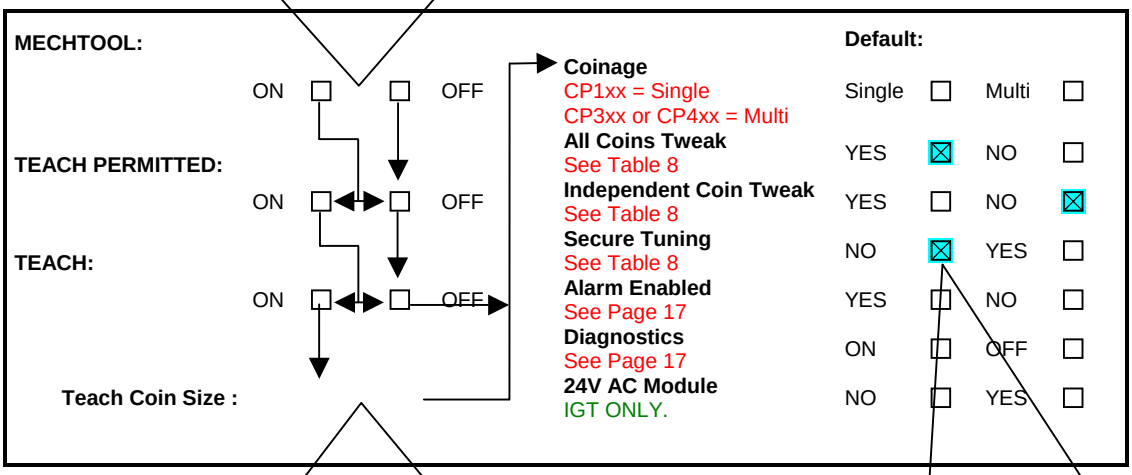
If the model selected is a CP43x then a customer can select any timers in the steps stated below.

Other – Please state:		
10…100	10ms steps	ms
1…250	1ms steps	ms
1…250	1ms steps	ms
1…2000	1ms steps	ms

Inhibit Polarity:
Select from 4 options.
0 – Inhibit High, Default Inhibit.
1 – Inhibit High, Default Accept.
2 – Inhibit Low, Default Inhibit.
3 – Inhibit Low, Default Accept.

Accept Path:
Select from 2 options.
1. Direct Accept.
2. Reverse Accept.

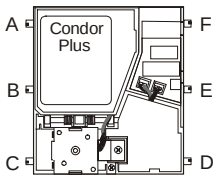
MECHTOOL:, TEACH PERMITTED:, TEACH:
If **MechTool™** is OFF, then **Teach Permitted** AND **Teach** MUST be OFF.
This will allow no modifications to the Condor Plus without a ccProgrammer.
If **MechTool™** is ON and **Teach Permitted** is OFF **Teach** MUST be OFF.
If **MechTool™** is ON and **Teach Permitted** is ON, **Teach** can be turned ON and OFF via **MechTool™.**



Teach Coin Size:
3 Options are available.
1. Small – only selected for the size of a US10c coin.
2. Standard – All other coin sizes.
3. Large – 40mm tokens and above.

All Coins Tweak:
Independent Coin Tweak:
YES will have NO effect if MechTool™ is OFF.
Secure Tuning:
Highlighted boxes indicate Standard Condor window security.

Stud Position:



☐ ACFD (Top & Bottom) ☐ BCED (Middle & Bottom)

☐ ABFE (Top & Middle) ☐ 6 STUDS

☐ AC__ (Back Only – Amusement Doors)

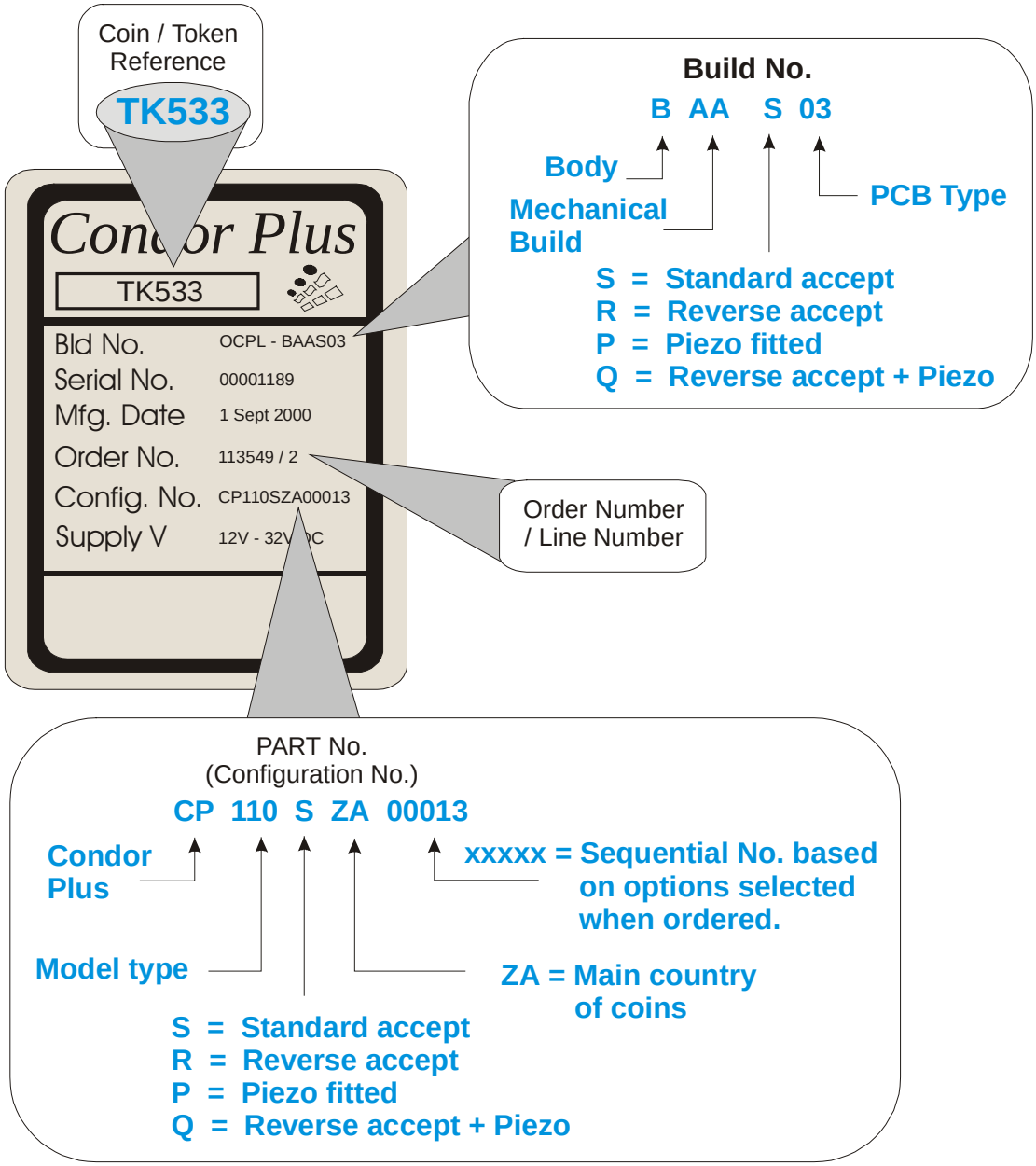
Select the required stud positions for the application.

QA NOTES: Please enter any Quality relevant information

MC SALES APPROVAL:	**CUSTOMER APPROVAL:**
To be signed either by the Sales Executive or a Technical Services Engineer.	**To be signed by the customer.**

MCL INTERNAL USE ONLY: PIEZO: BUILD:

15. Label Details



16. ccTalk Serial Messages

*Table 9: **ccTalk** Serial Commands*

Header	Function	Header	Function
255	Factory set-up and test	226	Request insertion counter
254	Simple poll	225	Request accept counter
253	Address poll	216	Request data storage availability
252	Address clash	213	Request option flags
251	Address change	212	Request coin position
250	Address random	210	Modify sorter paths
249	Request polling priority	209	Request sorter paths
248	Request status	202	Teach mode control
247	Request variable set	201	Request teach status
246	Request manufacturer id	197	Calculate ROM checksum
245	Request equipment category id	196	Request creation date
244	Request product code	195	Request last modification date
242	Request serial number	194	Request reject counter
241	Request software revision	193	Request fraud counter
240	Test solenoids	192	Request build code
238	Test output lines	185	Modify coin id
237	Read input lines	184	Request coin id
236	Read opto states	183	Upload window data
233	Latch output lines		
232	Perform self-test	4	Request comms revision
231	Modify inhibit status	3	Clear comms status variables
230	Request inhibit status	2	Request comms status variables
229	Read buffered credit or error codes	1	Reset device

For further details on this section please refer to the current **ccTalk** generic standard or contact Money Controls Technical Services Department.

16.1 ccTalk error codes.

Table 10: Error Codes

Code	Error	Code	Error
0	Null Event (no error)	14	Credit opto blocked
1	Reject coin	17	Coin going backwards
2	Inhibited coin	19	Coin too slow (over credit sensor)
3	Multiple window (ambiguous coin type)	24	Reject coin (repeated sequential trip)
5	Discrimination timeout	25	Reject slug
6	Accept sensor timeout	26	Reject opto's blocked
10	Credit sensor not ready	128	Inhibit coin (Type 1)
11	Divertor not ready	…	Inhibit coin (Type n)
12	Reject coin not cleared	139	Inhibit coin (Type 12)
13	Discrimination sensors not ready		

16.2 ccTalk fault codes.

Table 11: Fault Codes

Code	Fault	Code	Fault
0	OK (no fault detected)	4	Fault on piezo sensor
1	EEPROM checksum corrupted	5	Fault on reflective sensor
2	Fault on inductive coils	6	Fault on diameter sensor
3	Fault on credit sensor	18	Fault on reject sensor

16.3 ccTalk status codes.

Table 12: Status Codes

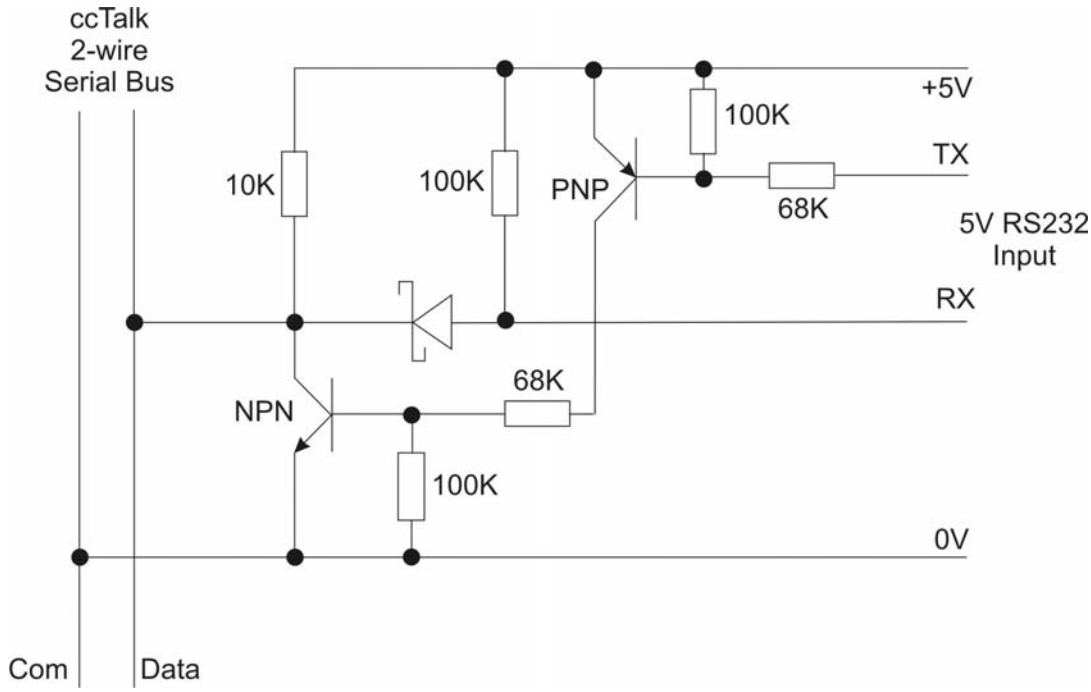
Code	Status
0	OK
1	Coin return mechanism activated (flight deck open)
2	C.O.S. mechanism activated (coin-on-string)

17. ccTalk Interface Circuits

17.1 Circuit 1 – ccTalk Standard Interface

This circuit uses an open-collector transistor to drive the data line and a diode protected straight-through receiver.

*Figure 17: Circuit 1, **ccTalk** Standard Interface*



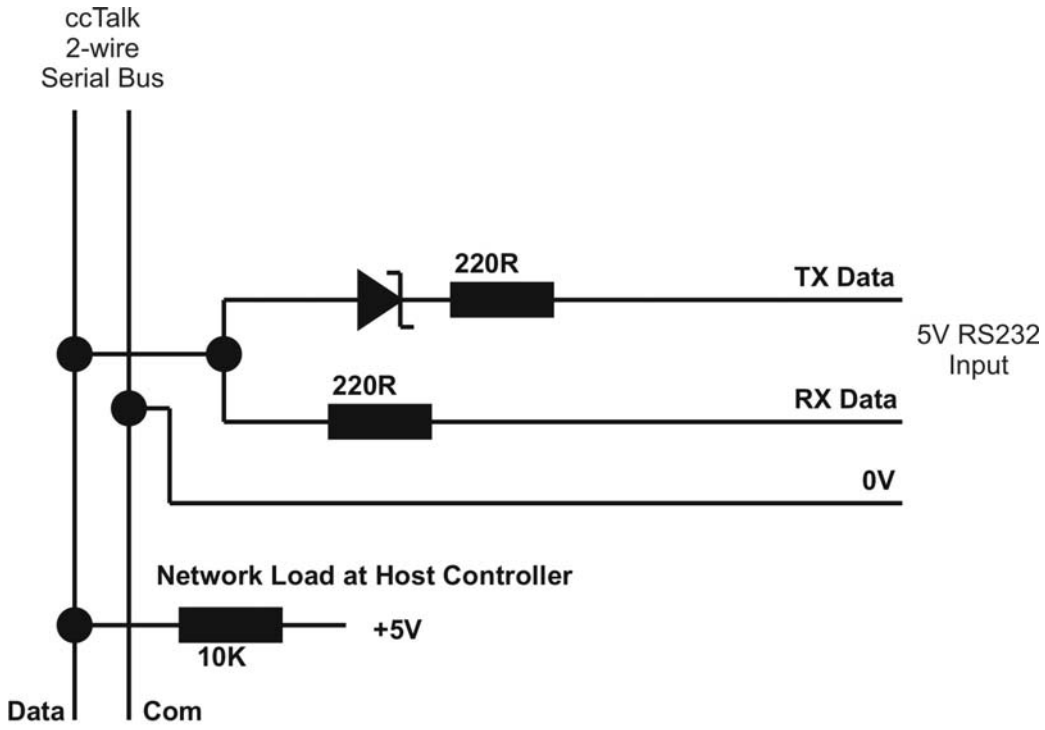
Typical Components

Diode	BAT54	Schottky Diode, low forward voltage drop
NPN	BC846B	High gain, medium signal, NPN transistor
PNP	BCW68	High gain, medium signal, PNP transistor

17.2 Circuit 2 – ccTalk Low Cost Interface

Assuming that the transmitting device is capable of sinking a reasonable amount of current, a direct diode interface can be used rather than a full transistor interface. Although cheaper to implement, this circuit does not have the drive capability or the robustness of other designs.

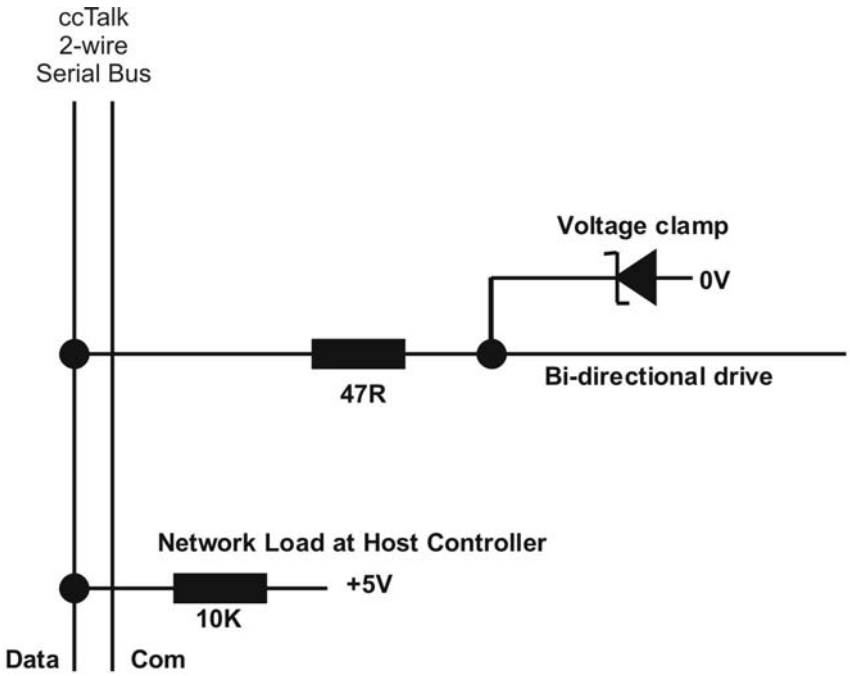
*Figure 18: Circuit 2, **ccTalk** Low Cost Interface*



17.3 Circuit 3 – ccTalk Direct Interface

A very low cost solution is to interface a single pin on a microcontroller directly onto the **ccTalk** data line. The pin can be switched between active-low for transmitting and high-impedance tri-state for receiving.

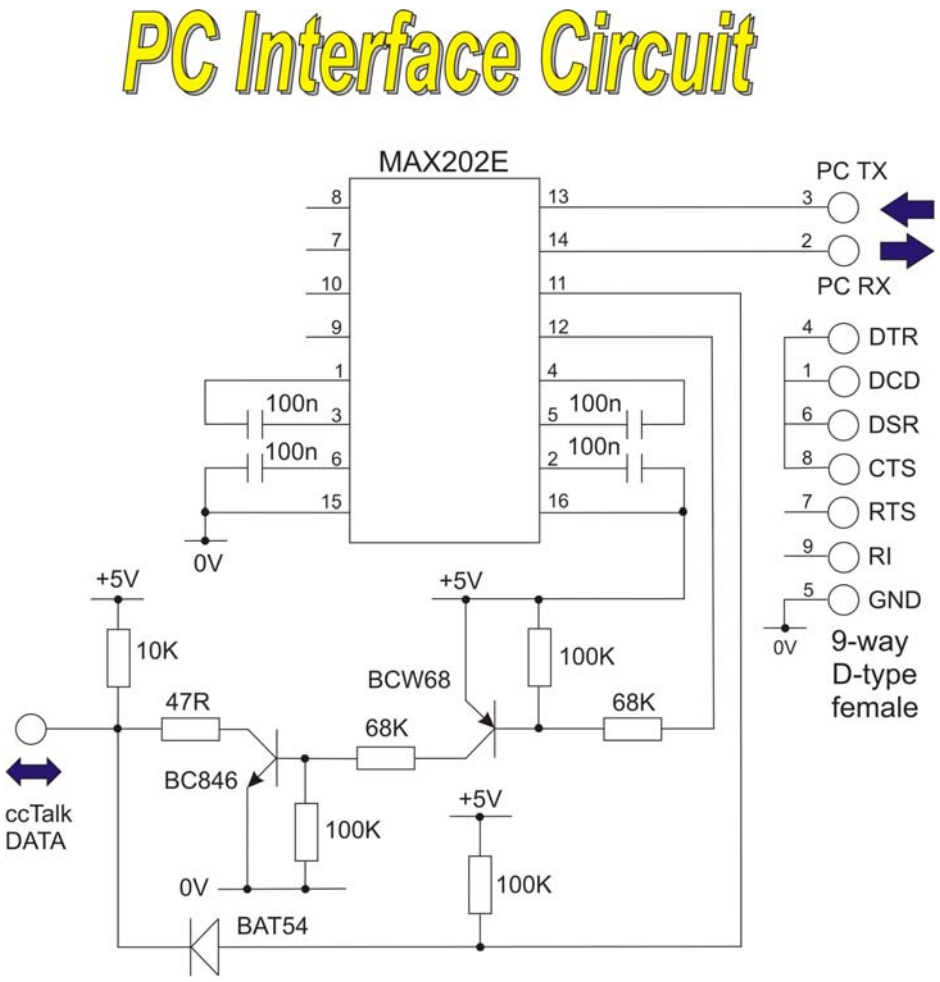
*Figure 19: Circuit 3, **ccTalk** Direct Interface*



17.4 Circuit 4 – ccTalk PC Interface

The circuit below shows how to connect the 9-pin serial port of a PC to the **ccTalk** data bus. The only integrated circuit required is a Maxim level-shifter which operates off a single +5V supply. Any small-signal diodes and transistors can be used.

*Figure 20: Circuit 4, **ccTalk** PC Interface*



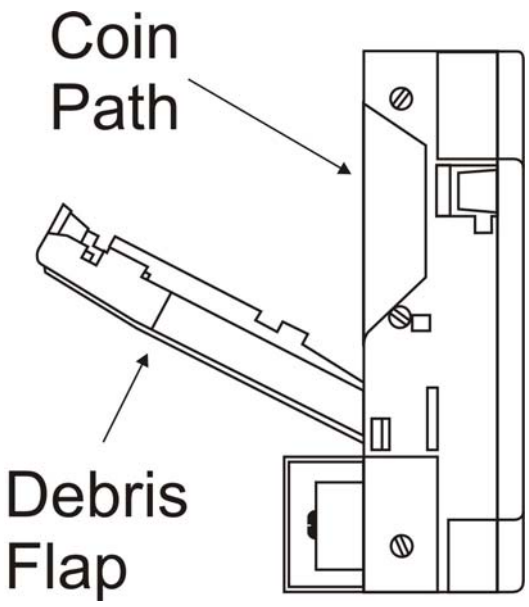
18. Service

The coin path area should be cleaned regularly, every 100,000 coins or 3 months, whichever is the sooner, to ensure accurate acceptance of coins and tokens. Only a damp cloth should be used.

Under NO circumstances should any solvent or foam type cleaner be used.

Access to the coin path is gained by opening the Debris Flap (see below).

Figure 21: Coin Path Access



19. Electrical Interface Requirements

Table 13: Power Supply

Voltage:	12V – 24V dc
Absolute:	Min 11V Max 32V
Min / Max rise time:	5ms / 500ms (From 0V to within supply range)
Min / Max fall time:	5ms / 500ms (From within supply range to 0V)
Acceptor Power up time:	60ms from the application of a valid voltage supply. A valid supply must be between the limits specified above.
Ripple voltage [< 120Hz]:	< 1 Volt
Ripple voltage [> 120Hz]:	< 100mV
Ripple voltage [> 1KHz]:	< 20mV

Table 14: Current Consumption

Typically:	70mA
Maximum:	500mA

Table 15: Environmental Ranges

Operating temperature range:	0°C to 60°C 10% to 75% RH non-condensing
Storage temperature range:	-25°C to 70°C 5% to 95% RH non-condensing
(Recovery time by the acceptor after a temperature step change is 1 hour per 20°C. Maximum operating rate of change 20°C per hour.)	

20. Product Compliance

20.1 Emissions

This product has been self assessed to EMC test specification EN55022: 1995 Electromagnetic compatibility – Radiated Emissions Class B.

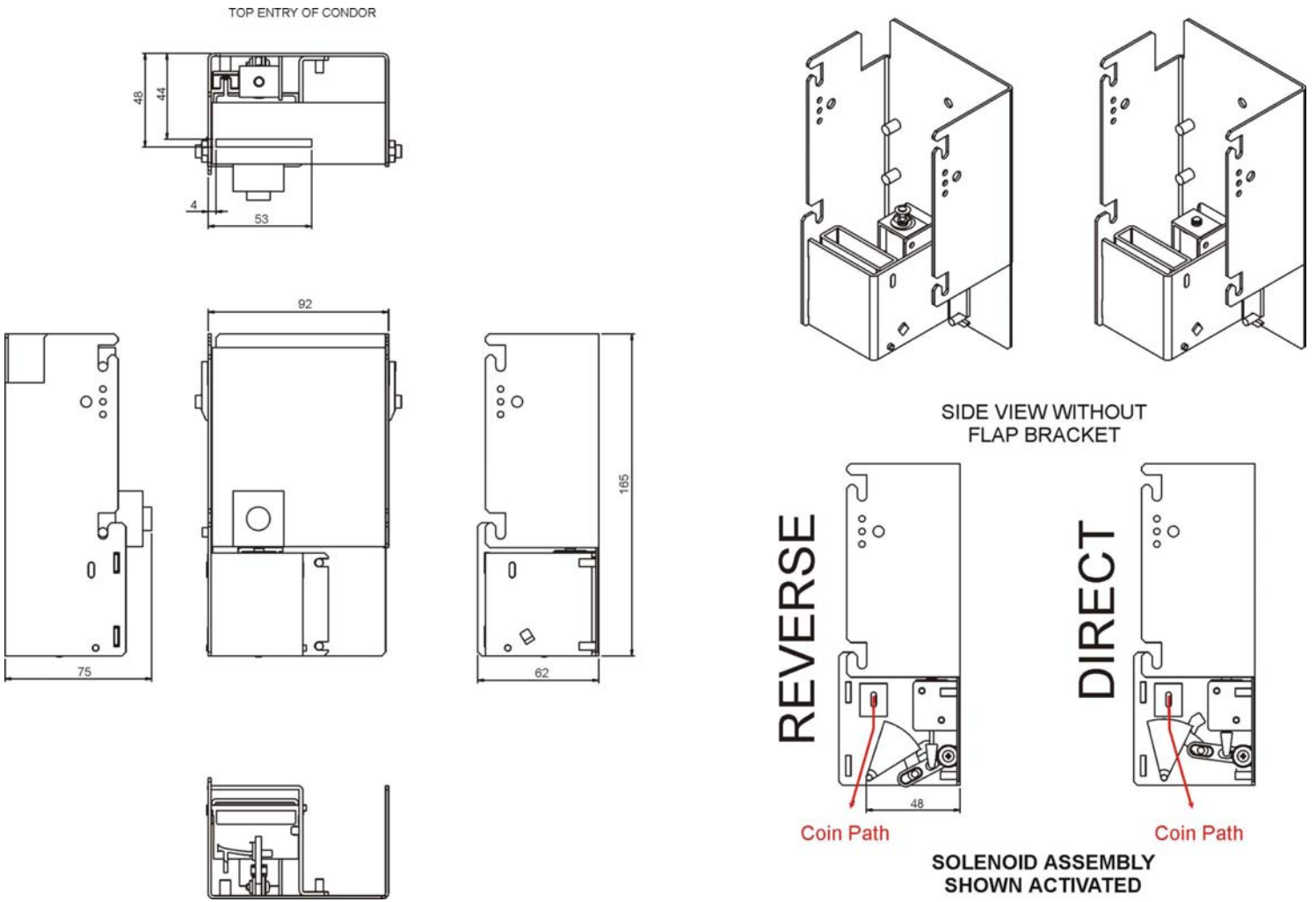
This product has been self assessed to EMC test specification EN55022: 1995 Electromagnetic compatibility – Conducted Emissions Class A.

20.2 Immunity

This product has been self assessed to EMC test specification EN50082-1: 1992 Electromagnetic compatibility – Immunity.

21. Appendix 1 – Divertor

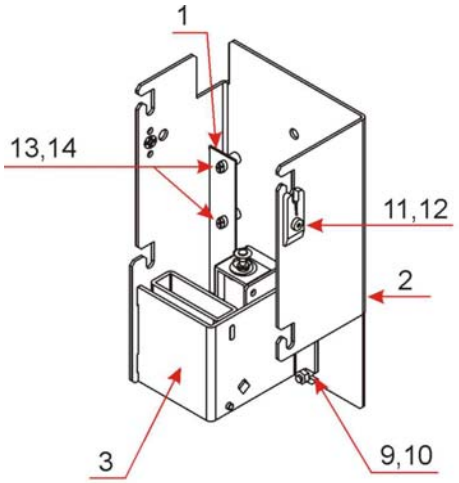
Figure 22: Divertor Dimensions

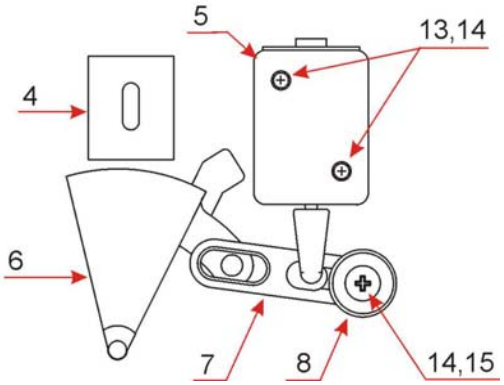


21.1 Divertor Spares

Table 16: Divertor Spares

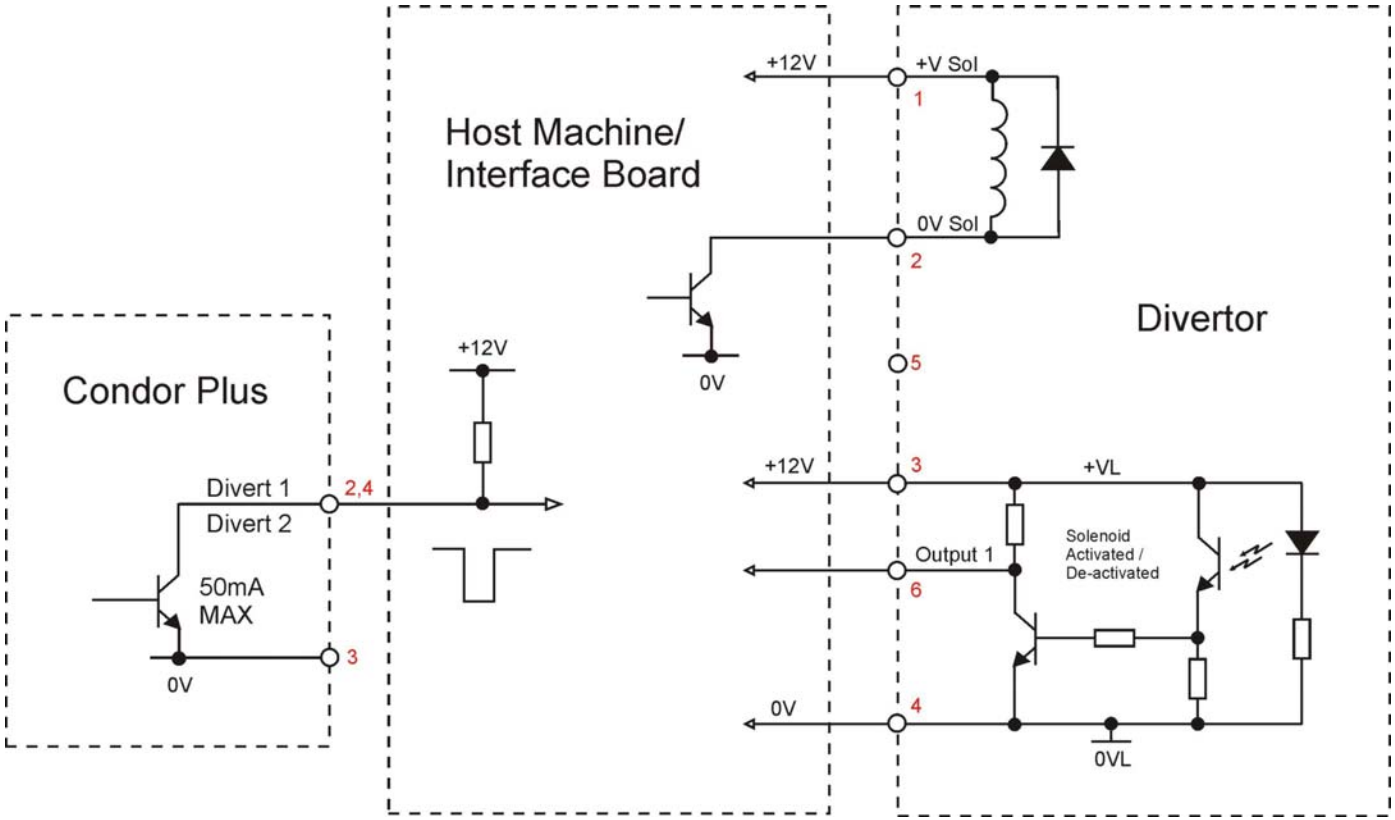
Item	Description	Part Number
1	PCB	SCNDORXX00060
2	Main Bracket	SCNDORXX00107
3	Divertor Flap Bracket	SCNDORXX00099
4	Coin Guide	SCNDORXX00092
5	Direct Solenoid (complete)	SCNDORXX00090
5	Reverse Solenoid (complete)	SCNDORXX00091
6	Divertor Flap	SCNDORXX00095
7	Pivot Link	SCNDORXX00093
8	Spacer Bush	SCNDORXX00096
9	M4 Full Nut	SCNDORXX00100
10	M4 Shakeproof Washer	SCNDORXX00101
11	Mounting Bracket Clip	SCNDORXX00097
12	Self Tapping c/sunk Screw	SCNDORXX00106
13	M3 x 5 Pozi Pan M/C Screw	SCNDORXX00102
14	M3 Internal Shakeproof Washer	SCNDORXX00103
15	M3 x 10 Pozi Pan M/C Screw	SCNDORXX00104





21.2 Divertor Application Example

Figure 23: Divertor Interface Example



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