



Condor Plus

Technical

Manual

This document is the private unpublished property of Money Controls Ltd and may not be reproduced in part or in total by any means, electronic or otherwise, without the written permission of Money Controls Ltd. Money Controls Ltd does not accept liability for any errors or omissions contained within this document. Money Controls Ltd shall not incur any penalties arising out of the adherence to, interpretation of, or reliance on, this standard. Money Controls Ltd. reserves the right to amend, improve or change the product referred to within this document or the document itself at any time.



Contents

1) Diary of Changes..... 4

2) Introduction..... 5

 ◆ Condor Plus v Condor 5

3) Mechanical Configurations 6

4) Coin Dimensions 7

5) Build Variations 8

6) Model Numbers Explained 9

7) Condor Plus Connectors 10

8) Parallel Interface 11

 ◆ VACS Signal 12

 ◆ Credit Signal (CPx3x only)..... 13

 ◆ Inhibit All 15

 ◆ Alarm (CPx3x only)..... 16

 ◆ Diagnostics (power-up)..... 16

9) Divertor Driver 17

 ◆ Description..... 18

 ◆ Operation 18

10) Serial Interface -cctalk™ 19

11) *Teach and Run™ 20

 ◆ Teach and Run™ Method..... 21

12) Coin Security – Window Adjustment 22

13) Order Entry Form – *Crib Sheet*..... 24

14) Label Details 26

15) cctalk Serial Messages 27

16) cctalk Interface Circuits..... 30

 ◆ Circuit 1 – cctalk Standard Interface..... 30

 ◆ Circuit 2 – cctalk Low Cost Interface 31

 ◆ Circuit 3 – cctalk Direct Interface 32

 ◆ Circuit 4 – cctalk PC Interface 33

17) Service..... 34

18) Electrical Interface Requirements..... 35

19) Specified EMC Performance 36

 ◆ Emissions 36

 ◆ Immunity 36

 ◆ Shock / Vibration Immunity..... 36



Tables

Table 1: Coin Dimensions 7
 Table 2: Condor Plus v Condor Builds: 8
 Table 3: Coins / Credits 9
 Table 4: Interface Connector 9
 Table 5: Inhibit Polarity 9
 Table 6: Connector Descriptions 10
 Table 7: VACS timers. 12
 Table 8: Coin Security Options..... 22
 Table 9: cctalk Serial Commands..... 27
 Table 10: Error Codes 29
 Table 11: Fault Codes 29
 Table 12: Status Codes 29
 Table 13: Power Supply 35
 Table 14: Current Consumption 35
 Table 15: Environmental Ranges 35

Figures

Figure 1: Condor Plus External Dimensions 6
 Figure 2: Direct and Reverse Accept Paths 7
 Figure 3: Connector Positions 10
 Figure 4: Parallel Interface - Connector 1 11
 Figure 5: VACS output cct. 12
 Figure 6: CP13x Credit Output Pulse 13
 Figure 7: CP33x Credit Output Pulses 13
 Figure 8: CP43x Credit Output Pulses 14
 Figure 9: Credit output cct. 14
 Figure 10: Inhibit All cct. 15
 Figure 11: Alarm output cct. 16
 Figure 12: Divertor Driver - Connector 2 17
 Figure 13: cctalk Interface - Connector 3 19
 Figure 14: Teach and Run™ Controls 20
 Figure 15: Coin Security – Rotary Switch..... 23
 Figure 16: Circuit 1, cctalk Standard Interface 30
 Figure 17: Circuit 2, cctalk Low Cost Interface..... 31
 Figure 18: Circuit 3, cctalk Direct Interface 32
 Figure 19: Circuit 4, cctalk PC Interface 33
 Figure 20: Coin Path Access 34

1) Diary of Changes

- Issue 1.0.....August 2001
- Issue 2.0.....February 2002
 - Updated Fig 1.
 - Updated Table 2.
 - Added MCL Logo's.
 - Amended section 17 – “Service”

2) Introduction

The Condor Plus range of electronic coin acceptors has been designed specifically for the international gaming machine industry, validating 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.

◆ 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 15) 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 8 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.**

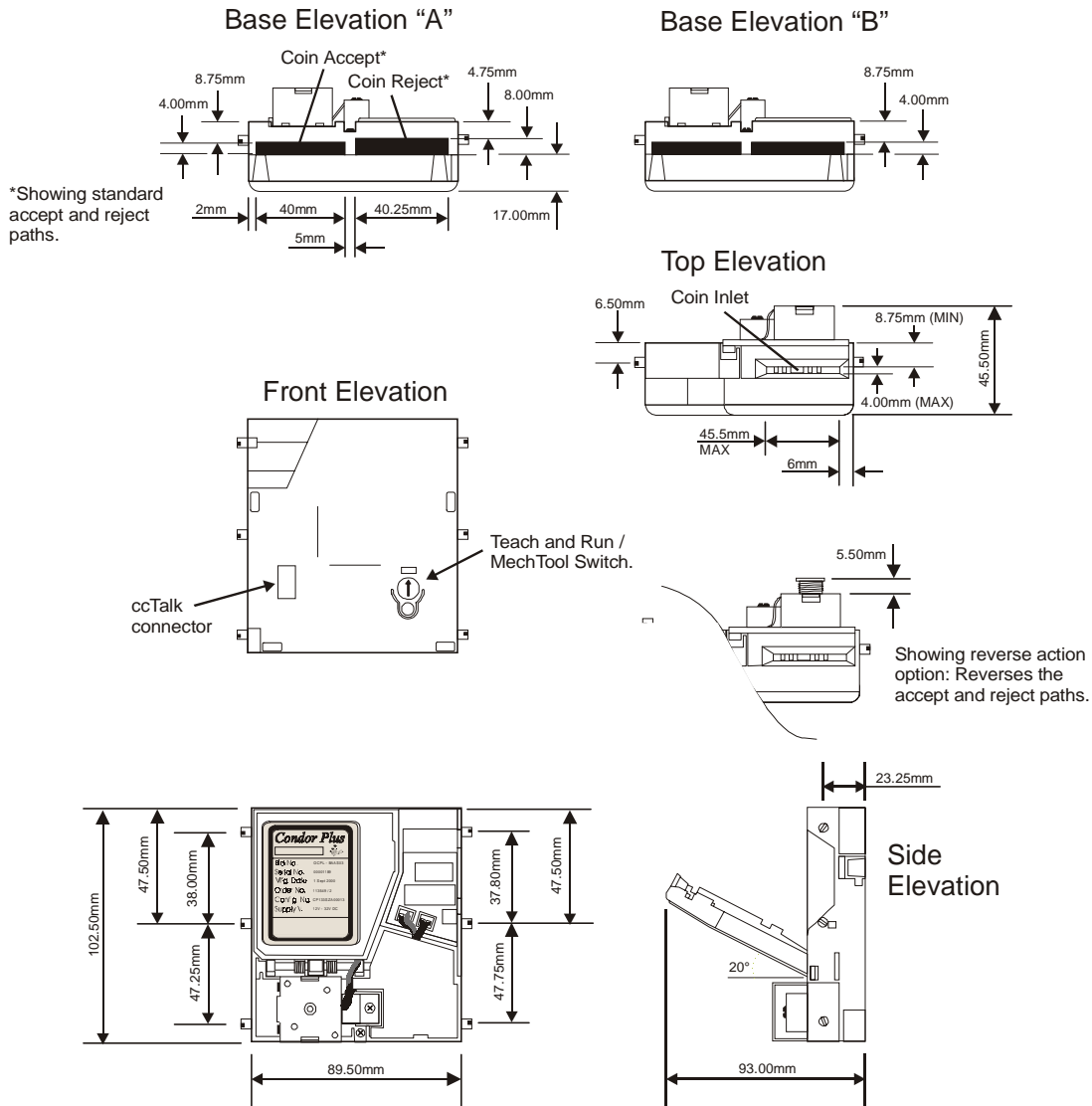
(Condor Plus = 5mm, Condor = 3mm).

❖ **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



Note:-

All Direct (EXCEPT US \$1 TKN) builds use Divertor "A". (Anti-beering divertor).

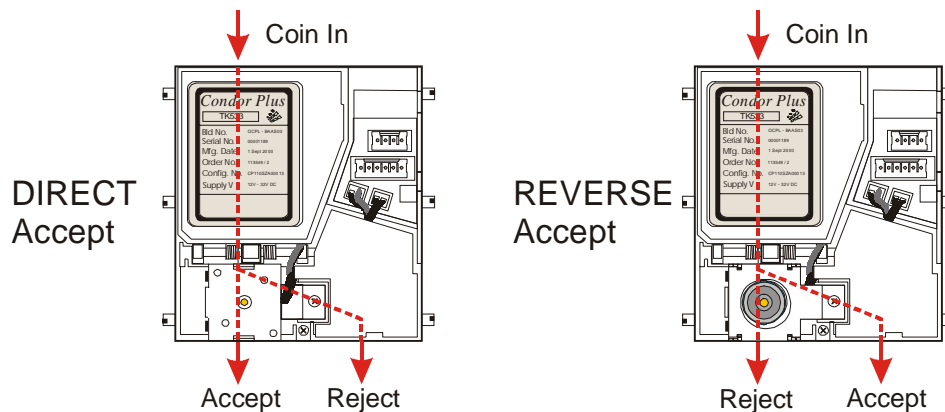
All Reverse action builds use Divertor "B".

For further details see Table 2.

CONFIDENTIAL

Not to be disclosed without prior written permission from Money Controls

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 a sections of the divortor assembly are removed. For coins thicker than 2.85mm a selection of spacers are also available. These open the debris flap wider than standard. However, when Condor Plus is built to accept larger coins / tokens its performance in discriminating smaller coins may be reduced due to the increased space, allowing them 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.	Divertor
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

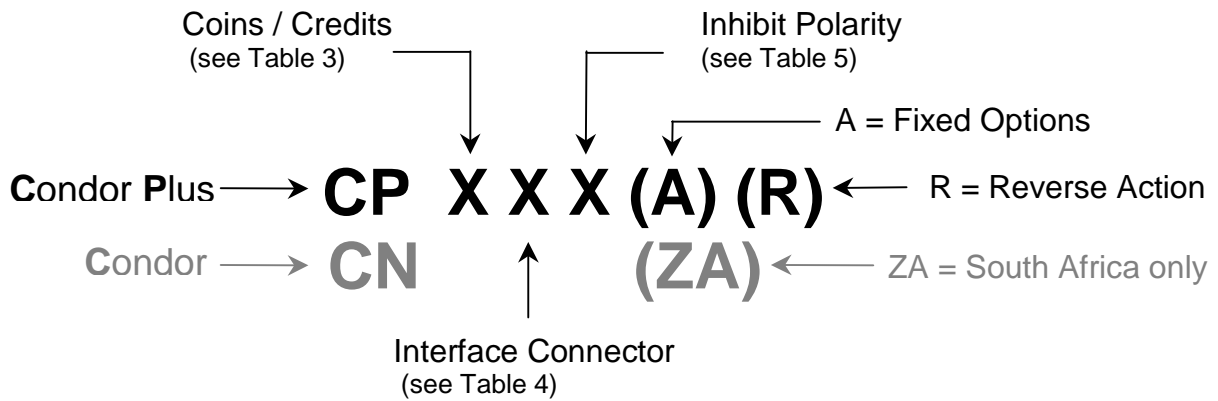


Table 3: Coins / Credits

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

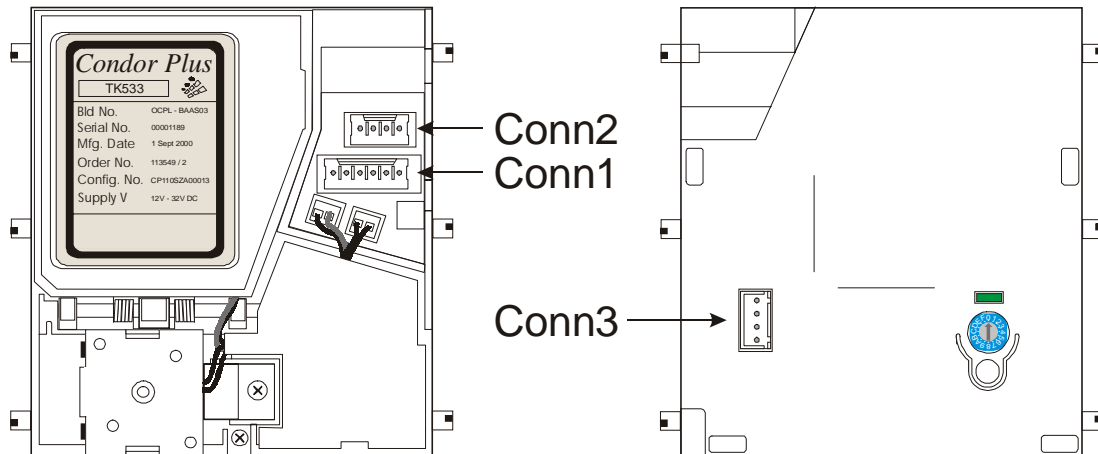


Table 6: Connector Descriptions

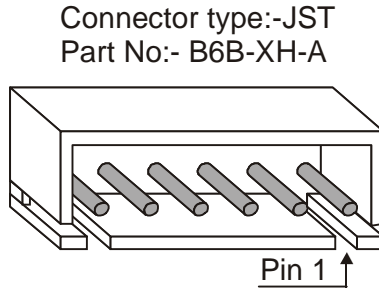
Conn1	Parallel Interface	See Figure 4
Conn2	Divertor Driver	See Figure 12
Conn3	cctalk Interface	See Figure 13

8) Parallel Interface

Figure 4: Parallel Interface - Connector 1

CONDOR PLUS
CPx0x, CPx2x

CONDOR
CNx0x, CNx2x

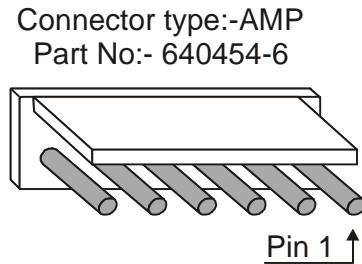


Pin 1	Inhibit All	High/Low [®]
Pin 2	VACS +6V	12ms (35ms*)
Pin 3	Vsupply	12 to 32V dc
Pin 4	Vsupply	12 to 32V dc
Pin 5	Vsupply	12 to 32V dc
Pin 6	0V	

[®] Depends on Model
* Reverse Action

CONDOR PLUS
CPx1x

CONDOR
CNx1x

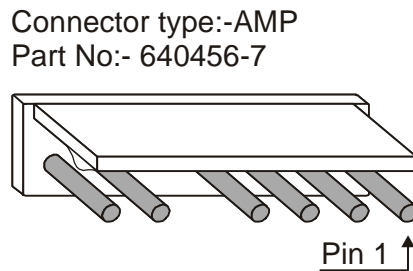


Pin 1	Inhibit All	High/Low [®]
Pin 2	VACS o/c	35ms
Pin 3	Vsupply	12 to 32V dc
Pin 4	Vsupply	12 to 32V dc
Pin 5	Vsupply	12 to 32V dc
Pin 6	0V	

[®] Depends on Model

CONDOR PLUS
CPx3x

CONDOR
CNx3x



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

◆ **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)

Table 7: VACS timers.

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

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

Figure 5: VACS output cct.

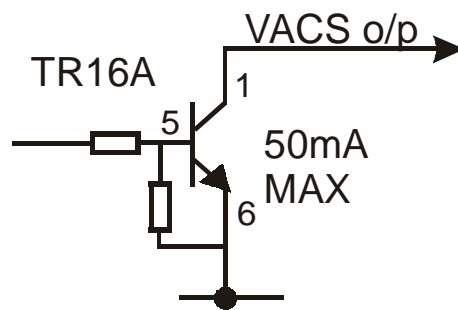
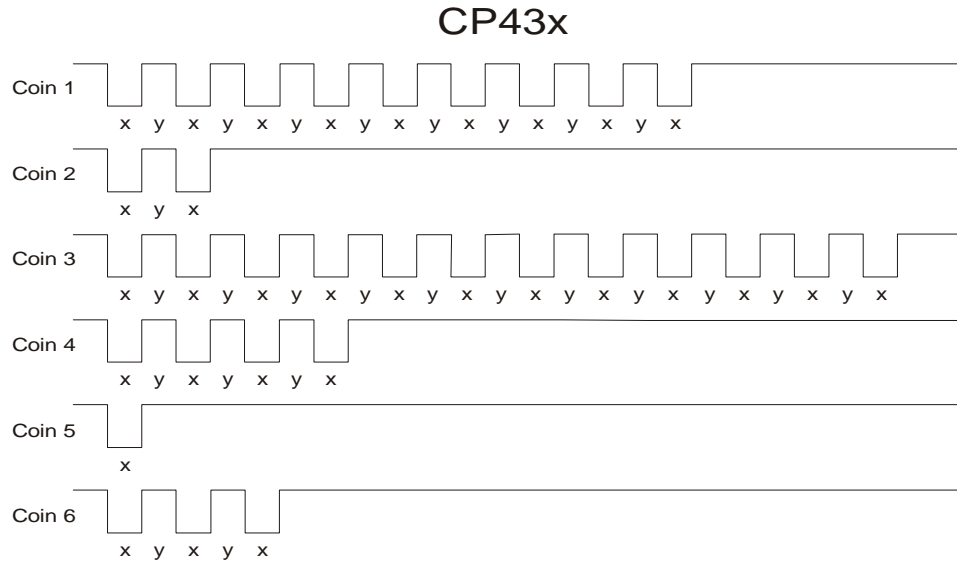


Figure 8: CP43x Credit Output Pulses

x, y = CUSTOMER SELECTABLE.

Minimum time between output credits = 4 x gap timer (y)

Number of pulses are CUSTOMER SELECTABLE.

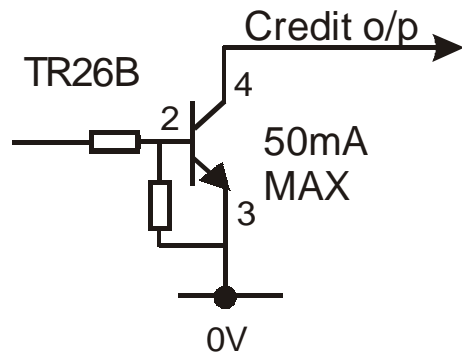


Credit pulse (x), selectable between 1ms and 250ms in 1ms steps.
 Gap timer (y), selectable between 10ms and 60ms in 10ms steps.

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 9: Credit output cct.



◆ **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.

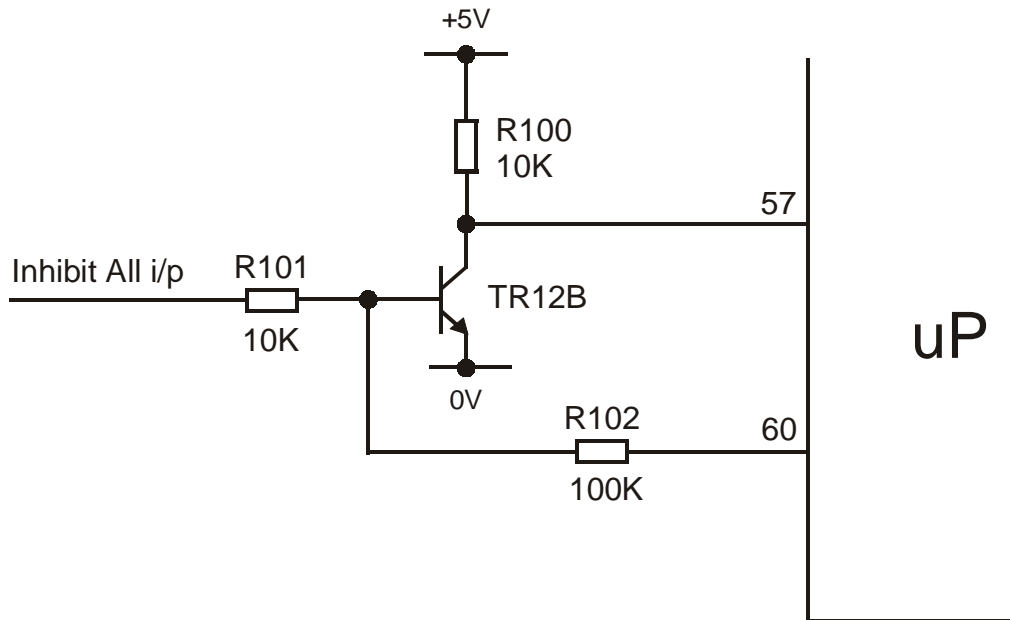
0	Inhibit High	Default Inhibit
1	Inhibit High	Default Accept
2	Inhibit Low	Default Inhibit
3	Inhibit Low	Default Accept

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 10: 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.

◆ Alarm (CPx3x only)

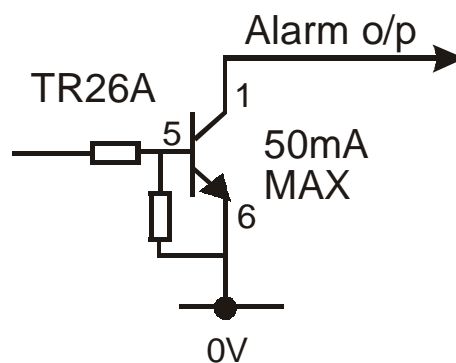
The alarm signal is activated when as the acceptor is in use, a coin or coins are seen to travel in the wrong direction i.e. upwards towards the coin entry, or if the credit opto's are obscured or an event occurs out of sequence.

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 11: Alarm output cct.



◆ 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:-

1. Inductive coils
2. Reflective sensor
3. Diameter opto's
4. 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:-

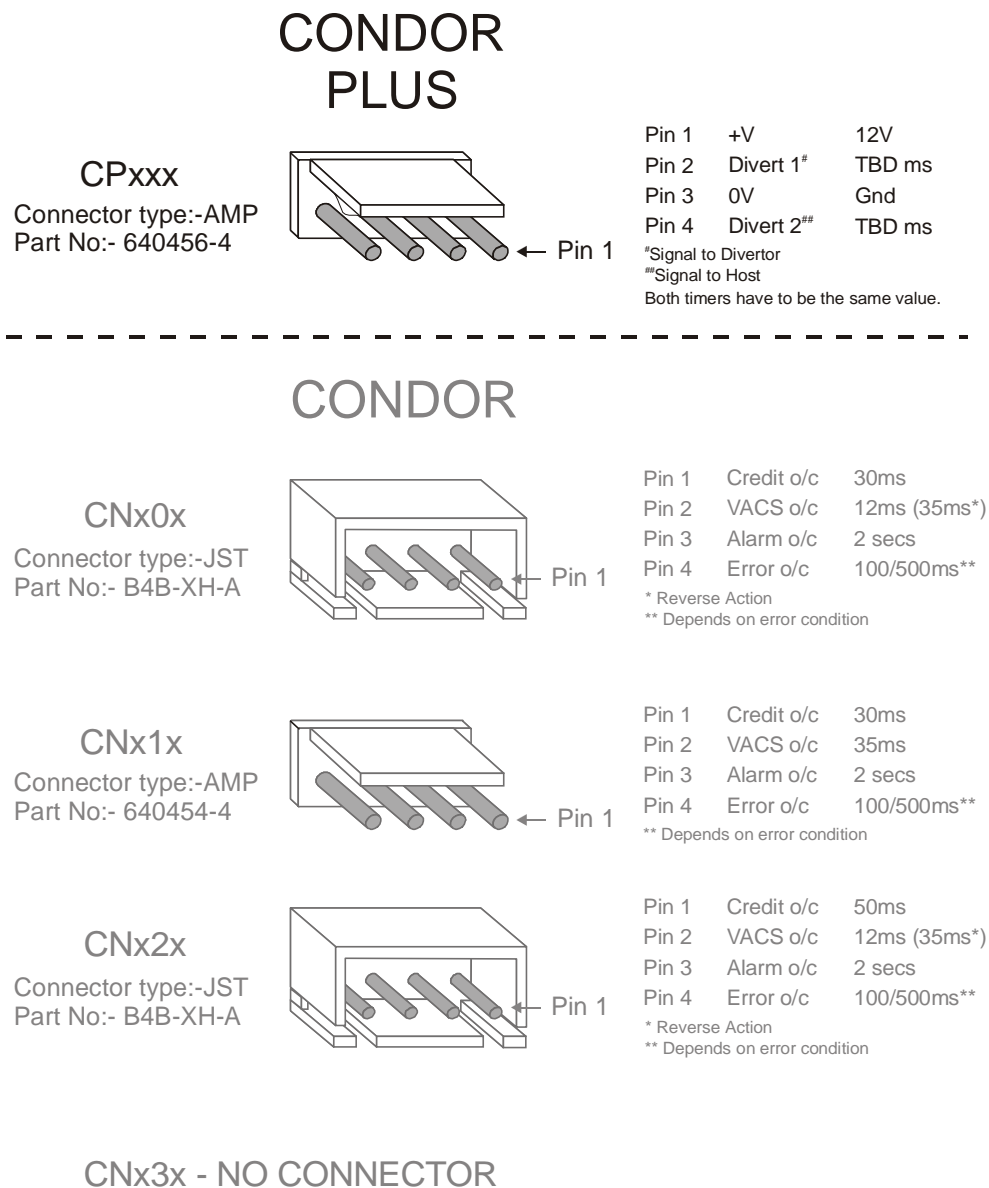
1. The LED will flash red.
2. No coins will be accepted and
3. On Models CPx3x the Alarm pin will activate as per normal alarm conditions.

9) 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 12: Divertor Driver - Connector 2



◆ Description

There is an option to drive an active 2-way diverter, which fits below the Condor Plus acceptor. The function of the active diverter 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.

◆ Operation

The Condor Plus supplies a logic signal to the diverter, generated coincidentally with the VACS signals. The diverter 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 diverter drive signal operates according to the following:-

- I. 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.
- II. 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.

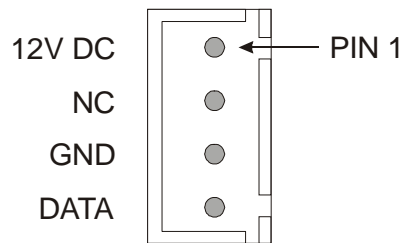
10) Serial Interface -cctalk™

Protocol: cctalk compliant implementation.

Figure 13: cctalk Interface - Connector 3

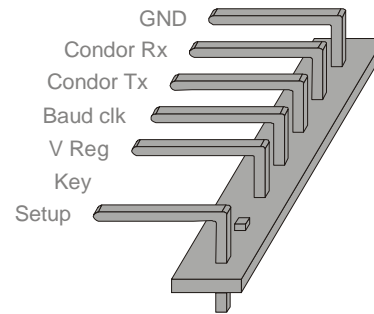
CONDOR PLUS

Connector Type:- JST
Part No:- B4B-XH-A



Protocol:- cctalk

CONDOR



Protocol:- RS232

For available cctalk commands see section 15)

11) *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 14).

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.

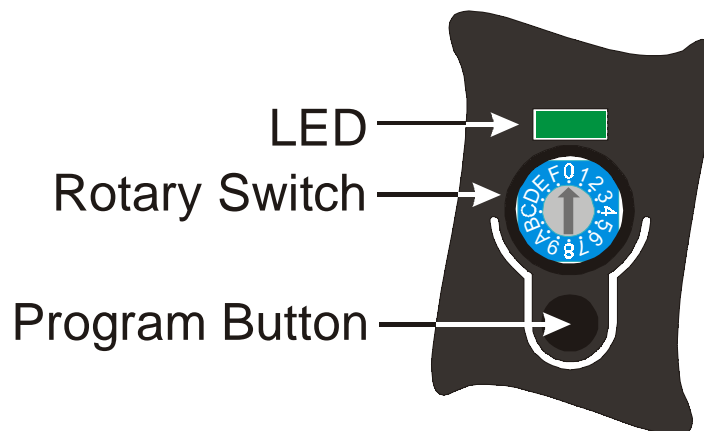
***NOTE:**

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 14: 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.

◆ **Teach and Run™ Method**

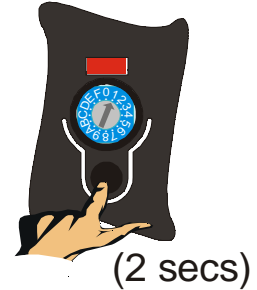
Set the Rotary Switch to the desired window position to be programmed (e.g.1).

*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.*



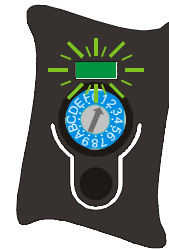
Press the Program Button.

*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.*



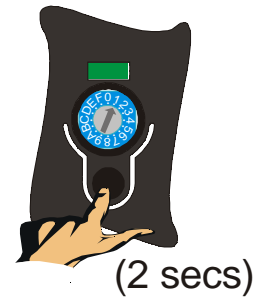
Enter the required numbers of coins / tokens (typically 8).

The LED will flash Green.

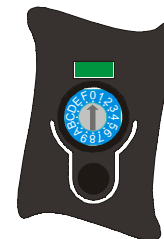


Press the Program Button.

The LED will be continuous Green



Turn the Rotary Switch back to 0.



Select the level of security required. (see section 12)

12) 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.

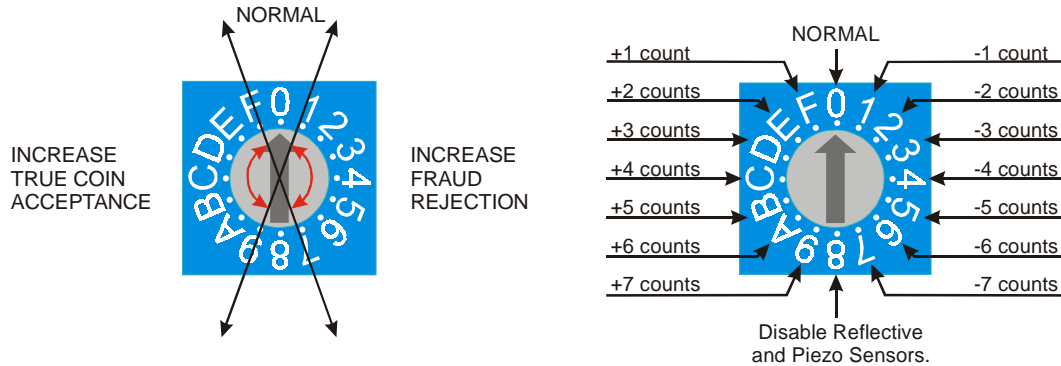
Figure 15 shows the operation of the rotary switch. The operation of the switch will be dependant on the tuning options selected below.

(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	<i>Standard Tuning</i> ¹ on all windows which can be widened or narrowed – (Condor).
ON	OFF	ON	Both <i>Standard Tuning</i> 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	<i>Standard Tuning</i> ¹ performed on ALL windows, but only to narrow programmed windows.
ON	ON	ON	Both <i>Standard Tuning</i> ¹ and individual window tweaks are possible on all windows which can be narrowed only. Their cumulative ⁴ effect on the window is used.

Figure 15: 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 Eeprom. 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.

13) 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.

Should always be selected except maybe for CP43x.

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

Spacer:
Select from 3 sizes.
1. 3mm accepts coins up to 2.85mm thick.
2. 3.5mm accepts coins up to 3.1mm thick. (reserved primarily for US\$1 gaming token).
3. 4mm accepts coins up to 3.4mm thick.

Timers: Default:

Credit Gap Timer	<input checked="" type="checkbox"/>
Credit Timer	<input checked="" type="checkbox"/>
VACS Timer	<input checked="" type="checkbox"/>
Alarm Timer	<input checked="" type="checkbox"/>

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.

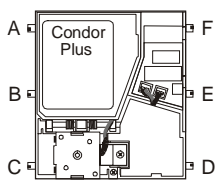
MECHTOOL:, TEACH PERMITTED:, TEACH:
 If MechTool™ is OFF, then Teach Permitted AND Teach MUST be OFF.
 This will allow no modifications to the Condor Plus without a ccProgrammer.
 If MechTool™ is ON and Teach Permitted is OFF Teach MUST be OFF.
 If MechTool™ is ON and Teach Permitted is ON, Teach can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

MECHTOOL:	ON <input type="checkbox"/> OFF <input type="checkbox"/>	Coinage CP1xx = Single CP3xx or CP4xx = Multi All Coins Tweak See Table 8 Independent Coin Tweak See Table 8 Secure Tuning See Table 8 Alarm Enabled See Page 16 Diagnostics See Page 16 24V AC Module IGT ONLY.	Default:	Single <input type="checkbox"/>	Multi <input type="checkbox"/>
TEACH PERMITTED:	ON <input type="checkbox"/> OFF <input type="checkbox"/>		YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	
TEACH:	ON <input type="checkbox"/> OFF <input type="checkbox"/>		YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Teach Coin Size:			NO <input checked="" type="checkbox"/>	YES <input type="checkbox"/>	

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:



<input type="checkbox"/> ACFD (Top & Bottom)	<input type="checkbox"/> BCED (Middle & Bottom)
<input type="checkbox"/> ABFE (Top & Middle)	<input type="checkbox"/> 6 STUDS
<input type="checkbox"/> AC__ (Back Only – Amusement Doors)	

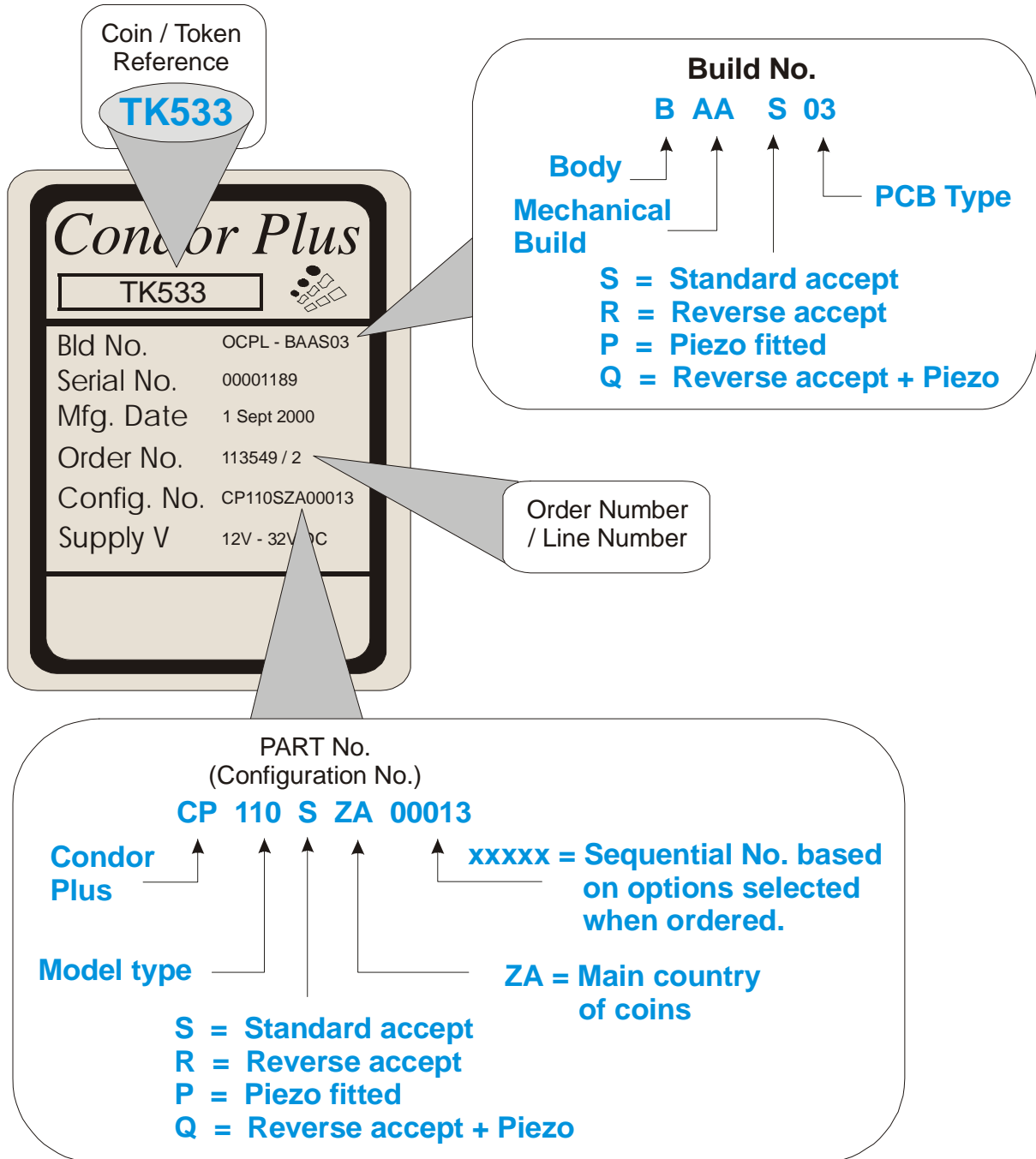
Select the required stud positions for the application.

QA NOTES: Please enter any Quality relevant information

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

MCL INTERNAL USE ONLY:	PIEZO:
-------------------------------	---------------

14) Label Details



15) cctalk Serial Messages

Table 9: cctalk Serial Commands

Header	Function
254	Simple poll
253	Address poll
252	Address clash
251	Address change
250	Address random
249	Request polling priority
248	Request status
247	Request variable set
246	Request manufacturer id
245	Request equipment category id
244	Request product code
242	Request serial number
241	Request software revision
240	Test solenoids
238	Test output lines
237	Read input lines
236	Read opto states
233	Latch output lines
232	Perform self-test
231	Modify inhibit status
230	Request inhibit status
229	Read buffered credit or error codes
227	Request master inhibit status
226	Request insertion counter
225	Request accept counter
216	Request data storage availability
213	Request option flags
212	Request coin position
210	Modify sorter paths

CONFIDENTIAL

Not to be disclosed without prior written permission from Money Controls

cctalk Serial Commands (cont).

Header	Function
209	Request sorter paths
202	Teach mode control
201	Request teach status
197	Calculate ROM checksum
196	Request creation date
195	Request last modification date
194	Request reject counter
193	Request fraud counter
192	Request build code
185	Modify coin id
184	Request coin id
170	Request base year
169	Request address mode
4	Request comms revision
3	Clear comms status variables
2	Request comms status variables
1	Reset device

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

The following error codes are supported.

Table 10: Error Codes

Code	Error
1	Reject coin
2	Inhibited coin
3	Multiple window (ambiguous coin type)
6	Accept sensor timeout
8	2nd close coin error (coin insertion rate too high)
14	Accept sensor blocked
15	Sorter opto blocked
17	Coin going backwards
23	Credit sensor reached too early
24	Reject coin (repeated sequential trip)
25	Reject slug
35	Number of coin meter pulses overloaded
36	Games overloaded
254	Coin return mechanism activated (flight deck open)

The following fault codes will be supported.

Table 11: Fault Codes

Code	Fault
1	EEPROM checksum corrupted
2	Fault on inductive coils
3	Fault on credit sensor
4	Fault on piezo sensor
8	Fault on sorter exit sensors
22	Fault on thermistor
34	Temperature outside operating limits

The following status codes will be supported.

Table 12: Status Codes

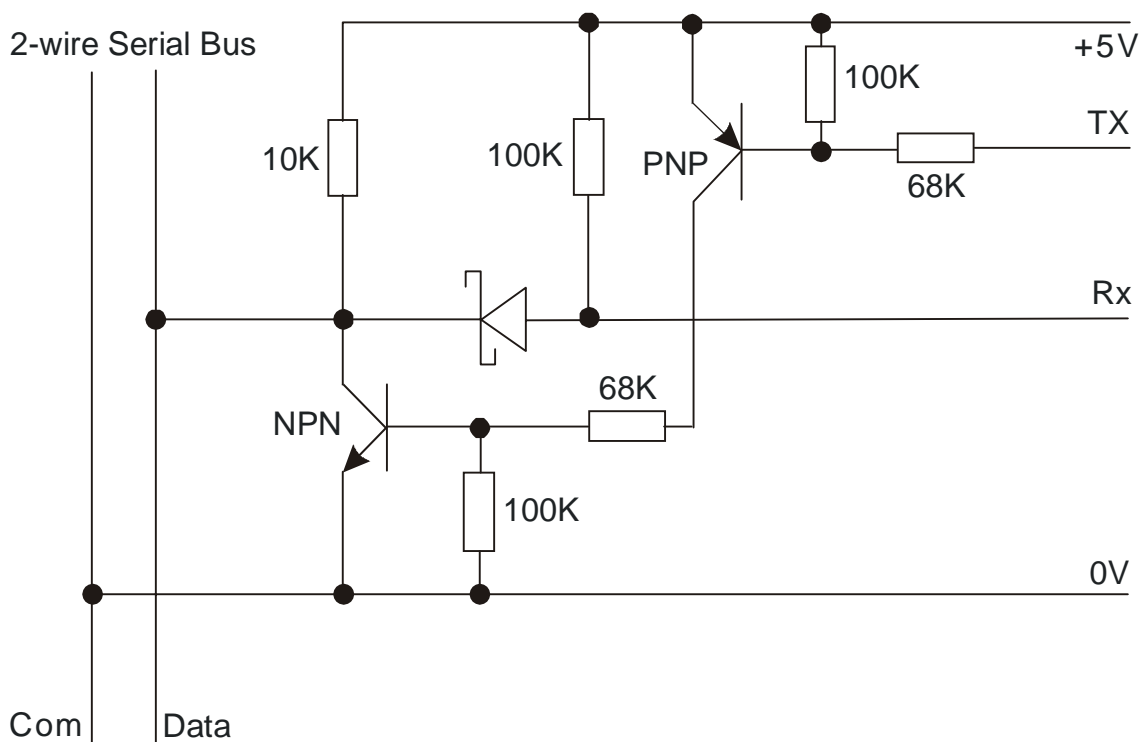
Code	Status
1	Coin return mechanism activated (flight deck open)

16) cctalk Interface Circuits

◆ Circuit 1 – cctalk Standard Interface

Figure 16: Circuit 1, cctalk Standard Interface

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



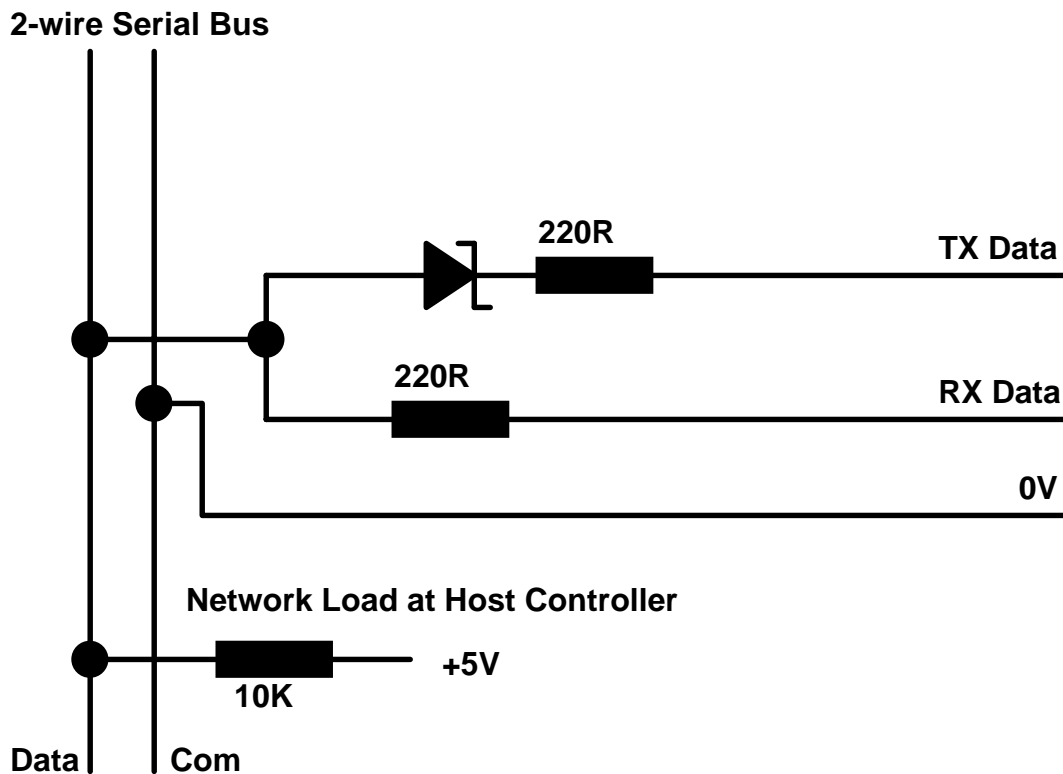
Typical Components

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

◆ **Circuit 2 – cctalk Low Cost Interface**

Figure 17: 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.

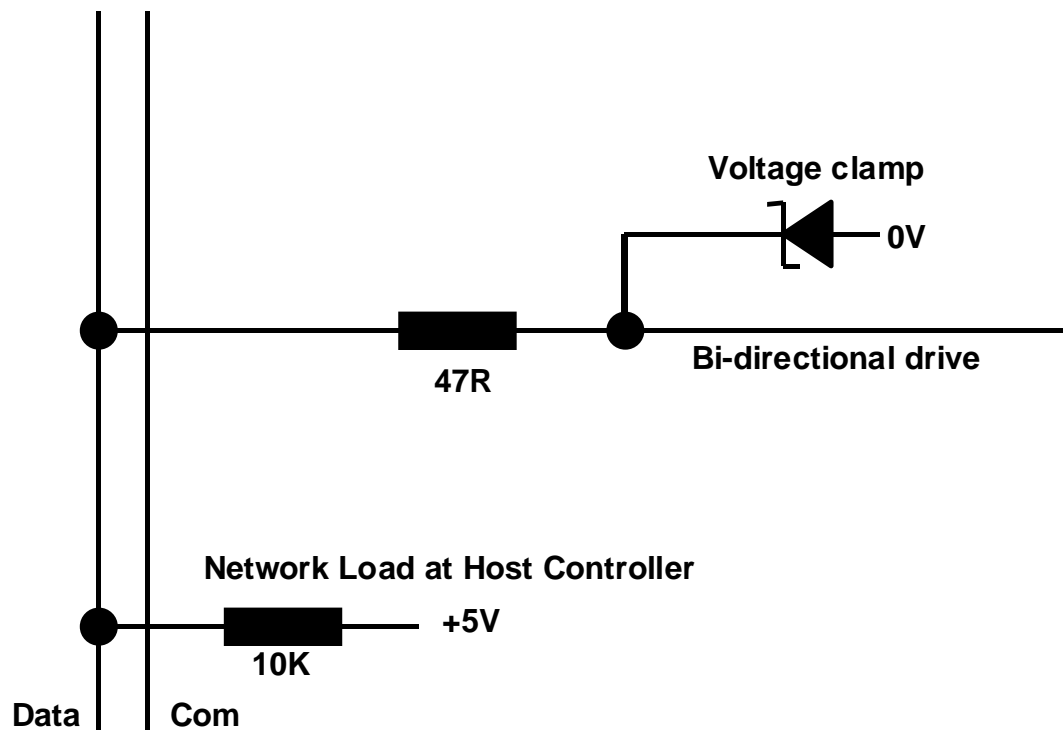


◆ **Circuit 3 – cctalk Direct Interface**

Figure 18: 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.

2-wire Serial Bus

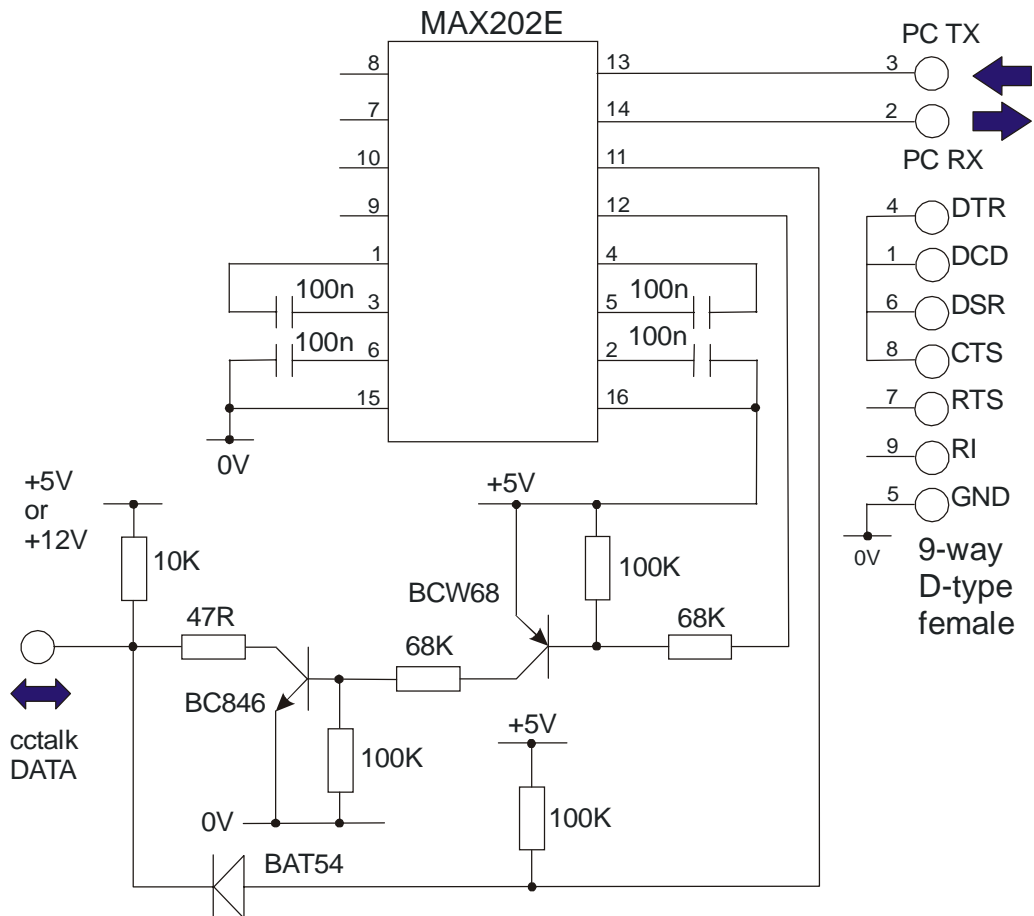


◆ **Circuit 4 – cctalk PC Interface**

Figure 19: 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.

PC Interface Circuit



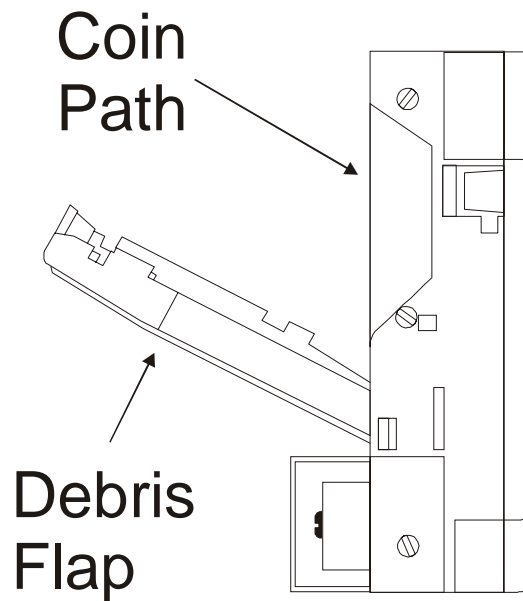
17) Service

The coin path area should be cleaned regularly, every 100,000 coins or 3 months, whichever is the sooner, to ensure accurate validation 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 20: Coin Path Access



18) 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.)		

19) Specified EMC Performance

◆ Emissions

This product is compliant with EMC test specification EN55022 : 1994 [CISPR22]

◆ Immunity

This product is compliant with EMC test specification EN50082-1 : 1994 [CISPR14]

◆ Shock / Vibration Immunity

This product is compliant with BS 2011 part 2.1 [IEC 68-2-27]

This manual is intended only to assist the reader in the use of this product and therefore Money Controls shall not be liable for any loss or damage whatsoever arising from the use of any information or particulars in, or any incorrect use of the product. Money Controls reserve the right to change product specifications on any item without prior notice