SR3 Type 2 Technical Manual

Contents

Tables

Figures

1. Diary of Changes

Issue 3.0 .... 26th April 2002
- Added Figure 9: SR3 Parallel Connector
- Added Figure 11: SR3 Parallel Connector
- Added Figure 14: SR3 Parallel Connector
- Changed the notation in Table 5: Game Price Selection – Mode 3
- Changed the notation in Table 7: Timer Selection – Mode 3

Issue 3.1 .... 18th November 2002
- Added mode
- Amended 1st page disclaimer.

Issue 4.0 .... 10th January 2003
- Added mode 6 details.
- Applied TMWP 3.2
- Changed the 'high' voltage of Inhibit All.
- Corrected the typo's re:- Reject pin from pin 6 to pin 5.
- Removed Reference to Figure 14: SR3 Parallel Connector
- Removed Reference to Figure 11: SR3 Parallel Connector

Issue 5.0 .... 2nd April 2003
- Added Mode 7 details.
- Changed the spares part numbers in Table 37.
- Added Appendix B – Parallel Interface Pin-outs.
- Standardised the terminology used in the pin-out tables.
- Added Mode 8 details.
- Added reference to Mode 9.
- Added Mode 10 details.
- Removed Mode 6 MechTool™ details (now in TSP022).
- Added warning to section 20.
- Removed reference to 12V from Figure 44.

Issue 5.1 .... 4th April 2003
- Changed the default credit codes in section 0 to match actual product manufactured.

Issue 5.2 .... 7th July 2003
- Changed Mode 5 pin 5 description in Table 9.
- Changed Mode 5 pin 5 description in Section 39.
- Updated section 29 Label Details Explained.
- Updated section 26 Sorter Option **(NOT Modes 6, 7, 14, 15 or 20)**.
- Added Table 29: Sort Outputs v Sorter Paths.

Issue 6.0 .... 18th August 2003
- Changed ccTalk® to ccTalk throughout the document.
- Updated ccTalk commands to match those in TSP072.
- Added Italian "ITY" ccTalk details.
- Updated section 24, Alarms.
- Added Mode 14 and Mode 15 details.
- Ammended section 36 Specified EMC Performance.
- Ammended Appendix B – Parallel Interface Pin-outs.

Issue 6.1 .... 17th September 2003
- Corrected information in
- Figure 28 and Table 25.

Issue 6.2 .... 16th December 2003
- Added Figure 26.

Issue 6.4 .... 2nd February 2004
- Added Figure 25 and Figure 30 3 way sorter details.
- Added Figure 7 MFP Cut-out details.

Issue 6.5 .... 25th February 2004
- Added Table 23 Mode 14 Sorter v Coin Dimensions
- Added Table 26 Mode 15 Sorter v Coin Dimensions

Issue 6.6 .... 23rd March 2004
- Added Figure 29: Recommended Routing of Sorter Cable – Mode 15

Issue 6.7 .... 30th June 2004
- Changed footer

Issue 7.0 .... 13th Jan 2005
- Improved section 27 "Sorter Drivers".

Issue 8.0 .... 5th Jun 2007
- Added Mode 20 details
- Added 12V only where applicable

2. Introduction

The SR3 series of coin acceptors has been designed to be compatible with the standard 3.5" mechanical and electronic acceptors currently used throughout the vending, amusement and leisure industries.

Through the development of Series Resonance Technology, the SR3 incorporates the highest levels of discrimination and functionality. Each acceptor within the series will accept up to 12 different coins from 15mm – 31mm in diameter.

The SR3 can be programmed on site without the use of coins via a hand held "ccProgrammer", or using a Win9x programmer but for total flexibility, if a new coin/token is required, the **Teach and Run™** function can be used (not available on Modes 3, 8, 14 or 15).

The SR3 Type 2 is a development of the Type 1 which is now compatible with the previous range of C120 acceptors including the C120R, C122, C123 as well as incorporating an in-built totaliser feature and much more.

3. SR3 Type 2 Modes

- Mode 1 Enhanced C120.
- Mode 2 C122 compatible. Each accept line doubles as an Inhibit line.
- Mode 3 Totaliser interface.
- Mode 5 C123 compatible. Host controlled sorter.
- Mode 6 Totaliser output and direct sorter drive.
- Mode 7 40V Mode 1 or 2 Price Stepper (Italian vending compatible).
- Mode 8 Accumulator totaliser.
- Mode 9 To be released.
- Mode 10 Mode 1 (no sleep – MechTool entry at any time).
- Mode 14 Italian AWP ccTalk compatible with direct sorter drive – 12V only.
- Mode 15 Front Plate version of Mode 14 – 12V only.
- Mode 20 Mode 1 & Direct Power sorter drivers – 12V only.

4. Mechanical Configurations

Figure 1: Accept and Reject Paths

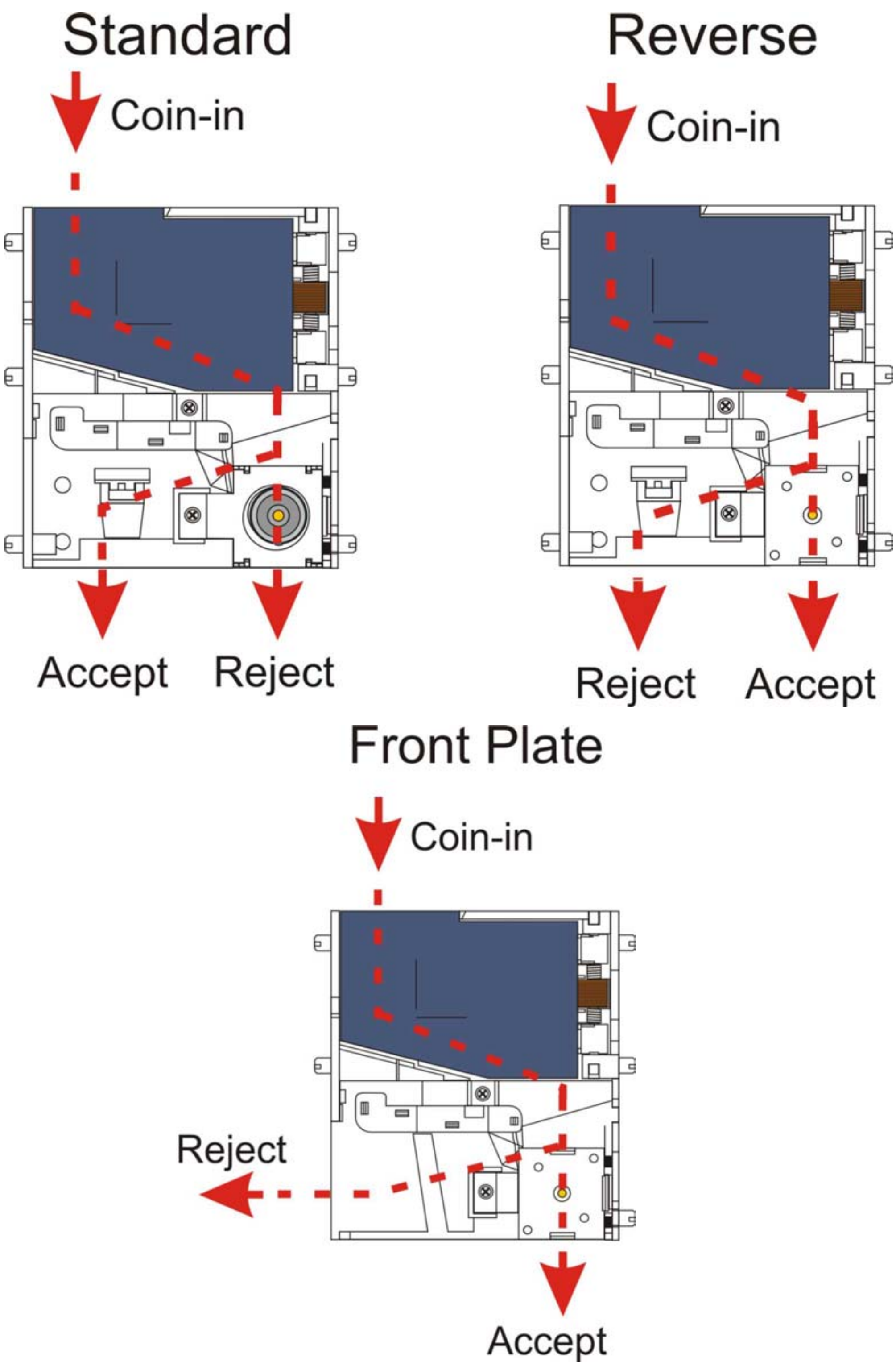


Figure 2: Front Plate Model Details

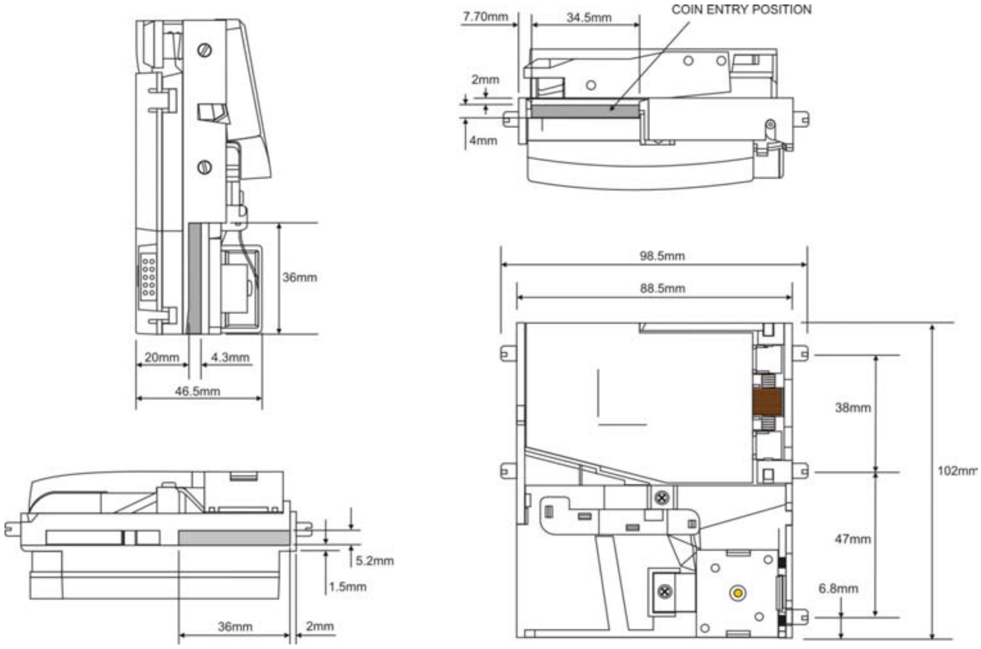


Figure 3: Front Plate Cut-out Details

Cut-out Details - viewed from front

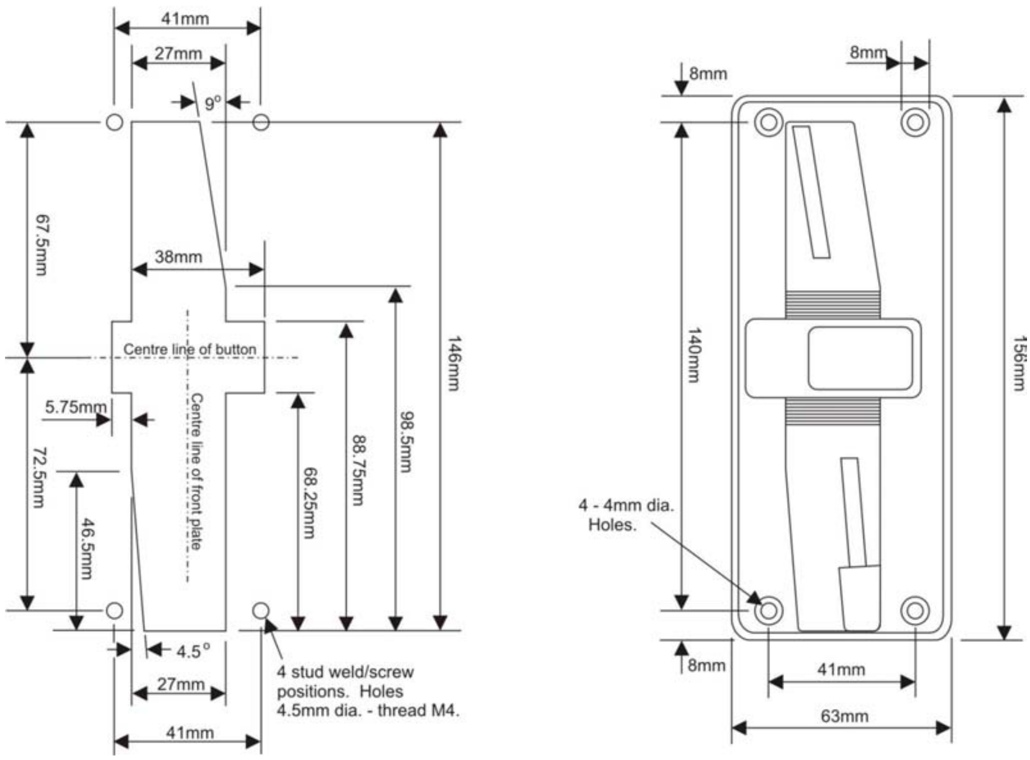


Figure 4: Standard Model Details

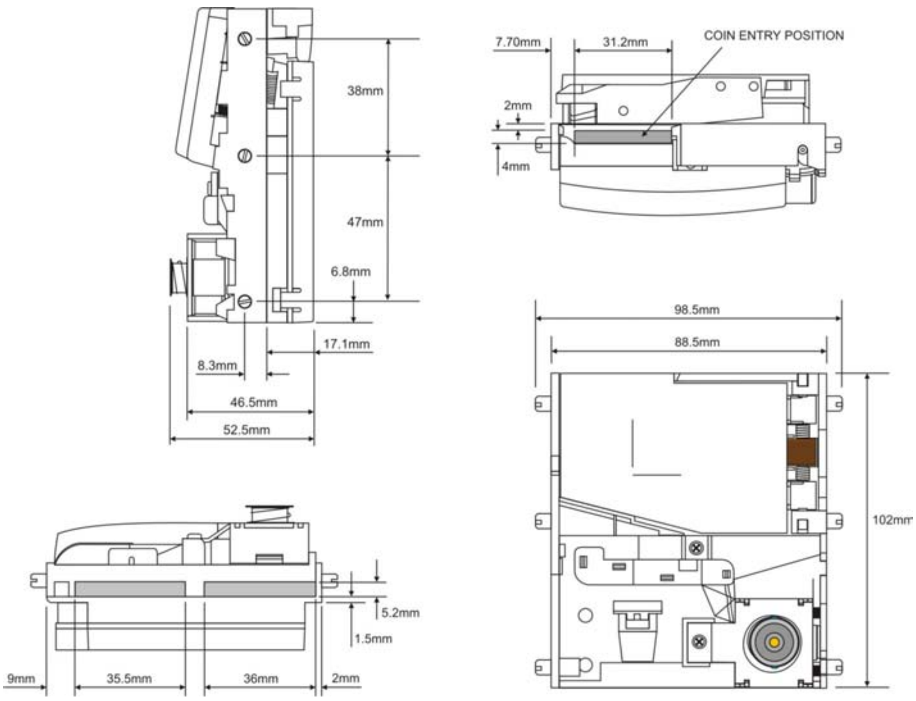


Figure 5: Reverse Model Details

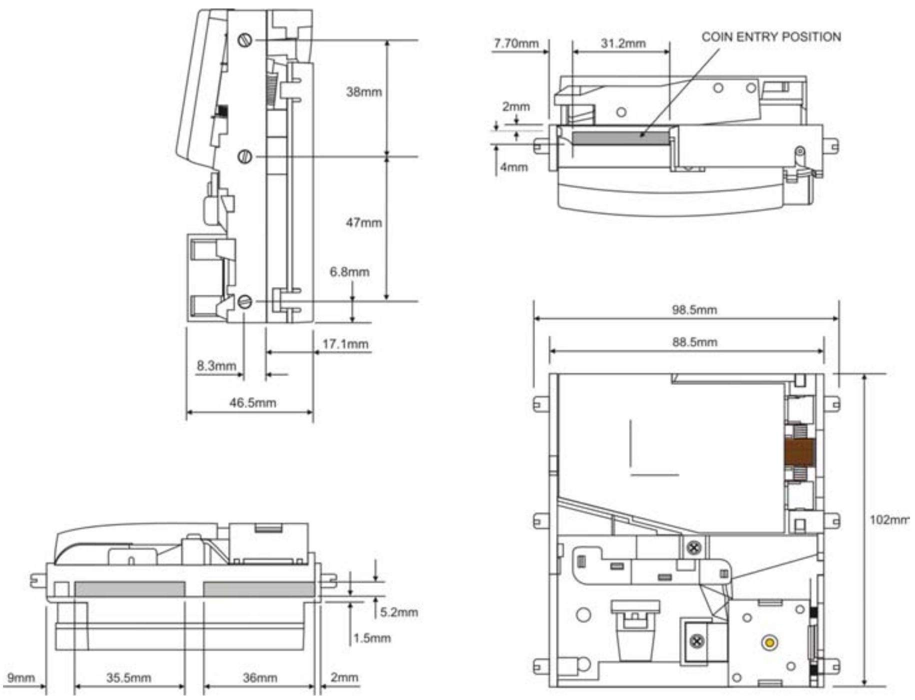


Figure 6: Mini Front Plate Dimensions

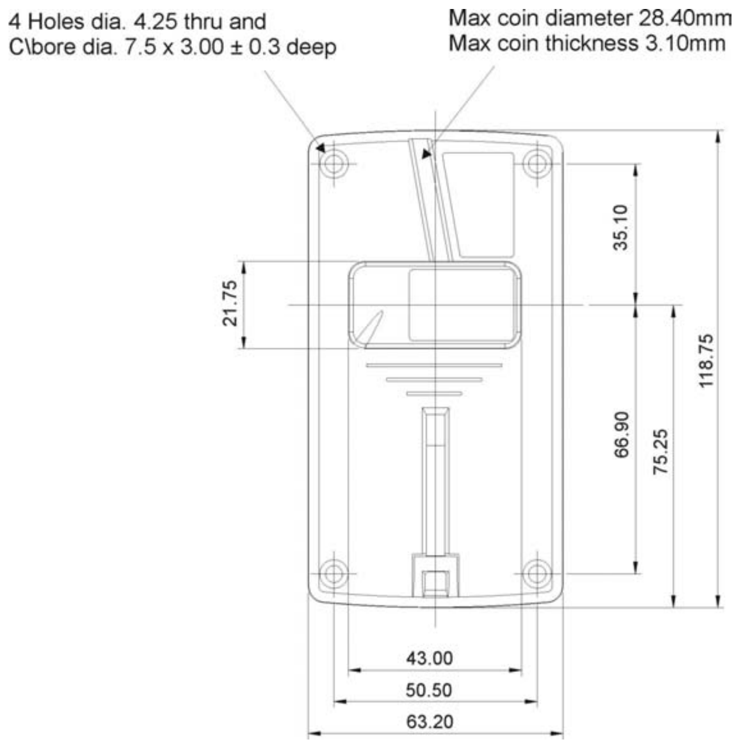
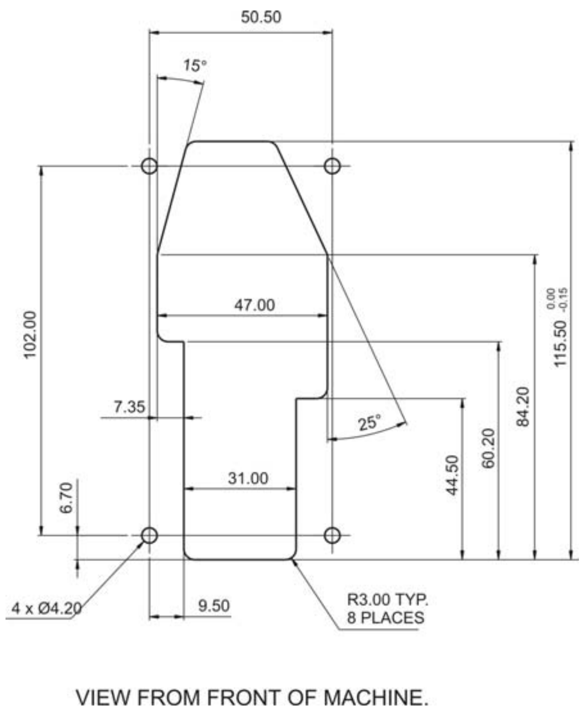


Figure 7: Mini Front Plate Cut-out Details



5. Rear Cover Details

Figure 8: SR3 Connector Side

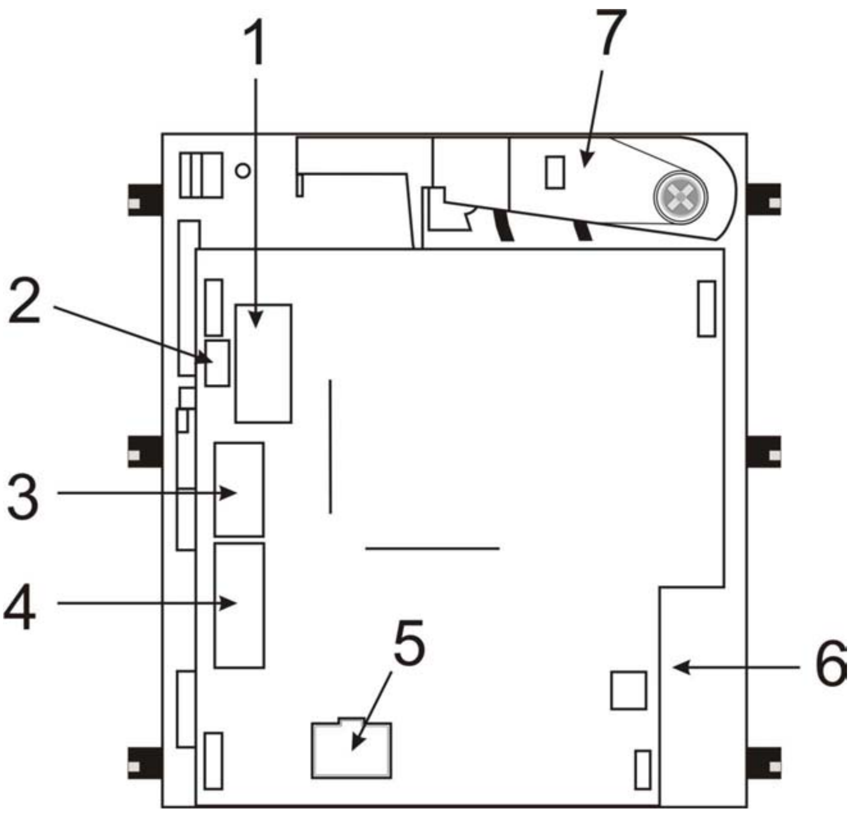


Table 1: SR3 Type2 Rear Cover Details.

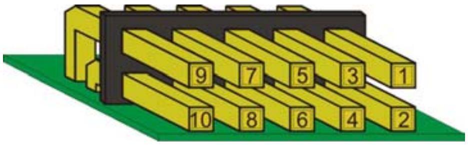
Number	Feature / Function
1	Option / Totaliser Switches
2	LED
3	Serial Interface – **ccTalk** (see section 30)
4	Sorter Driver (see section 26)
5	Inhibit and Bank Select Switches
6	Parallel Connector
7	Reject Lever

6. Mode 1

6.1 Parallel Interface – Mode 1

Figure 9: SR3 Parallel Connector

Industry standard interface.
Connector type: 10 pin DIL



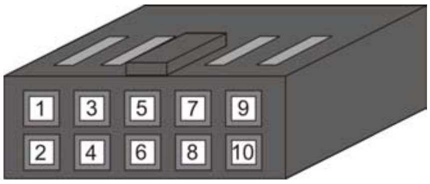


Table 2: Parallel Interface – Mode 1

PIN	FUNCTION	ACTIVE
1	0 VOLTS	
2	+ SUPPLY	
3	Accept 5	Low
4	Accept 6	Low
5	Reject operated	Low
6	Inhibit All (Default Accept)	High
7	Accept 1	Low
8	Accept 2	Low
9	Accept 3	Low
10	Accept 4	Low

6.2 Inhibit All

When the input on pin 6 on the 10 way connector is high (>1.2 volts), all the coins will be rejected.

The Inhibit All pin HAS to be low (<1.2 volts) or not connected, in order for those coins not individually inhibited on the 8 way DIL switch or in EEPROM, determined by the programmed settings (See Accept and Inhibit Configuration in the **MechTool™** Manual TSP022), to be accepted.

If no coins are individually inhibited and both banks are enabled, then ALL coins will be accepted.

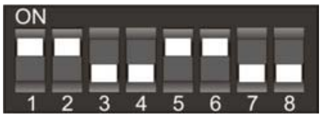
6.3 Inhibit Coins – Mode 1

A flag setting in EEPROM (selected when the product is ordered), determines how coins are inhibited. To change this flag on receipt of the product ccProgrammer will be required.

6.3.1 INHIBIT MODE 0:-

Coins are inhibited via **MechTool™** (please refer to the SR3 Type2 **MechTool™** Manual TSP022). Inhibit switches 1 to 6 are ignored.

6.3.2 INHIBIT MODE 1:-



Coins are inhibited using the 8 way DIL switch shown below:-

Switches 1 to 6 control the acceptance of programmed coins.

ON = coins inhibited.
OFF = coins accepted.

Switch 1 controls coins 1 and 7,
Switch 2 controls coins 2 and 8,
Switch 3 controls coins 3 and 9,
Switch 4 controls coins 4 and 10,
Switch 5 controls coins 5 and 11,
Switch 6 controls coins 6 and 12.

Based on the above switch settings coins 3, 9, 4 and 10 will be accepted all the others are inhibited.

Switch 7 enables / disables Bank 1, ON = disable – OFF = enable.
Switch 8 enables / disables Bank 2, ON = disable – OFF = enable.

Note:- The inhibit and Bank select inputs are ANDED. Therefore a coin will only be accepted if both the relevant bank AND the individual coin is enabled.

6.3.3 SERIAL INHIBIT {CREDIT-POLL}

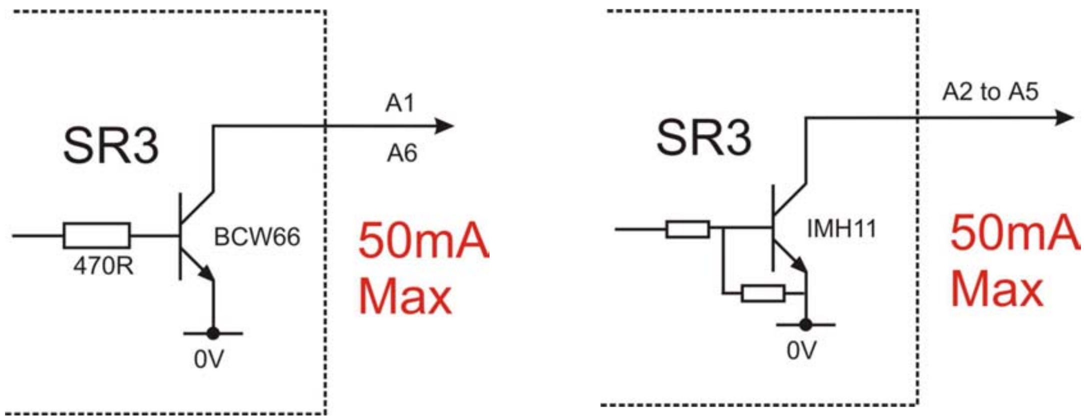
SERIAL OPERATION ONLY.

As an added security feature, an option can be set by MCL when the product is ordered [Credit-Poll Set]. If selected, this requires the host machine to poll the SR3 every 1 second.
If the SR3 fails to see a poll within the 1 second time period, ALL the coins will be inhibited.
When the SR3 receives the next poll all the coins previously enabled, will be re-enabled.

6.4 Coin Accept Outputs – Mode 1

Each coin accept output consists of an open collector NPN transistor. On acceptance of a true coin the transistor is turned on for a period of 100ms (+/- 20%) to less than 0.7 volts at a Max. 50mA. The host machine must look for valid credit pulses NOT LESS THAN 50ms. It is not sufficient to merely detect the edges of credit pulses. This 'debounce' 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.

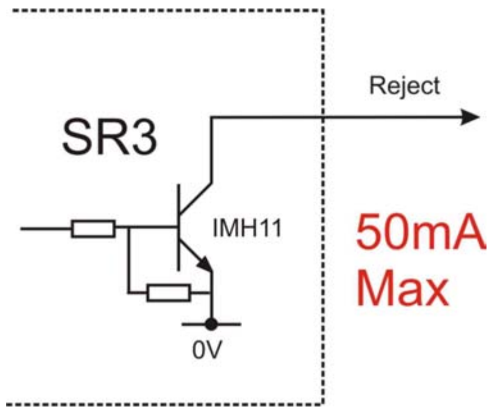
Figure 10: Coin Accept Outputs – Mode 1



6.5 Reject Signal

Each time the Reject Lever is pressed, the gate displacement is detected and an output signal is sent to pin 5 (reject operated) on the parallel connector.
This output will remain active for as long as the Reject Lever is pressed.

Figure 11: Reject Output – Mode 1



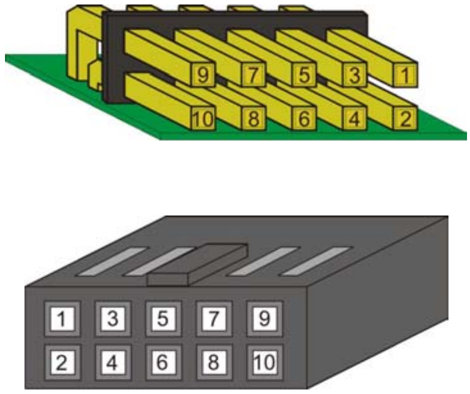
7. Mode 2

7.1 Parallel Interface – Mode 2

C122 standard interface.
Connector type: 10 pin DIL

Table 3: Parallel Interface – Mode 2

PIN	FUNCTION	ACTIVE
1	0 VOLTS	
2	+ SUPPLY	
3	Accept 5 / Inhibit 5	Low
4	Accept 6 / Inhibit 6	Low
5	Reject operated	Low
6	Inhibit All (Default Accept)	High
7	Accept 1 / Inhibit 1	Low
8	Accept 2 / Inhibit 2	Low
9	Accept 3 / Inhibit 3	Low
10	Accept 4 / Inhibit 4	Low



7.2 Inhibit All

When the input on pin 6 on the 10 way connector is high (>1.2 volts), all the coins will be rejected.

The Inhibit All pin HAS to be low (<1.2 volts) or not connected, in order for those coins not individually inhibited on the 8 way DIL switch or in EEPROM, determined by the programmed settings (See Accept and Inhibit Configuration in the **MechTool**™ Manual TSP022), to be accepted.

If no coins are individually inhibited and both banks are enabled, then ALL coins will be accepted.

7.3 Inhibit Coins – Mode 2

A flag setting in EEPROM (selected when the product is ordered), determines how coins are inhibited.

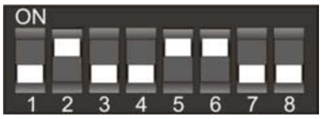
7.3.1 INHIBIT MODE 0:-

NOT AVAILABLE.

7.3.2 INHIBIT MODE 1:-

Coins are inhibited using the 8 way DIL switch shown below or via the accept lines (see Figure 12):-

NOTE:- Both Inputs have to be the same for a coin to accept. (Accept line high and Inhibit OFF)



Switches 1 to 6 control the acceptance of programmed coins.

ON = coins inhibited.
OFF = coins accepted.

Switch 1 controls coins 1 and 7,
Switch 2 controls coins 2 and 8,
Switch 3 controls coins 3 and 9,
Switch 4 controls coins 4 and 10,
Switch 5 controls coins 5 and 11,
Switch 6 controls coins 6 and 12.

Based on the above switch settings coins 1, 3, 4, 7, 9 and 10 will be accepted all the others are inhibited.

Switch 7 enables / disables Bank 1, ON = disable – OFF = enable.
Switch 8 enables / disables Bank 2, ON = disable – OFF = enable.

Note:- The inhibit and Bank select inputs are ANDED. Therefore a coin will only be accepted if both the relevant bank AND the individual coin is enabled.

7.3.3 SERIAL INHIBIT {CREDIT-POLL}

SERIAL OPERATION ONLY.

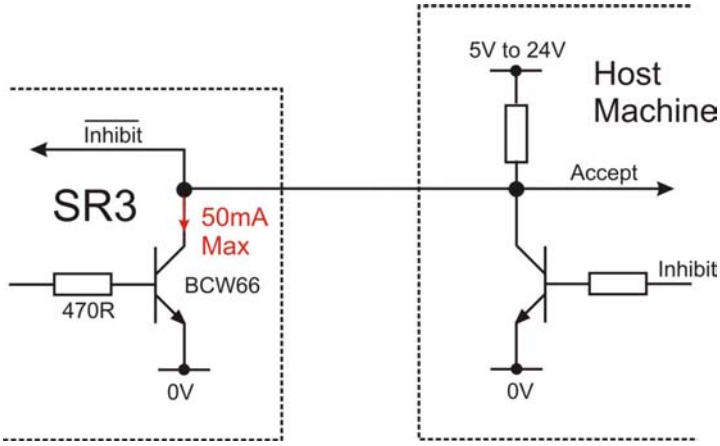
As an added security feature, an option can be set by MCL when the product is ordered [Credit-Poll Set]. If selected, this requires the host machine to poll the SR3 every 1 second.
If the SR3 fails to see a poll within the 1 second time period, ALL the coins will be inhibited.
When the SR3 receives the next poll ALL the coins will be re-enabled.

7.4 Coin Accept Outputs / Inhibits 1 to 6 – Mode 2

Each coin accept output consists of an open collector NPN transistor. On acceptance of a true coin the transistor is turned on for a period of 100ms (+/- 20%) to less than 0.7 volts at a Max. 50mA. The host machine must look for valid credit pulses NOT LESS THAN 50ms. It is not sufficient to merely detect the edges of credit pulses. This 'debounce' 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.
As well as being outputs these also double up as inputs. After a coin has been discriminated – but not accepted – the inhibit lines are read by the microprocessor. If the inhibit corresponding to the discriminated coin is low (<1.2V) the coin will be rejected. Otherwise the coin will be accepted.

<u>Note:- This can reduce accept rates of closely following coins of the same denomination. This is because when the first coins accept line is activated, this then inhibits the second coin.</u>

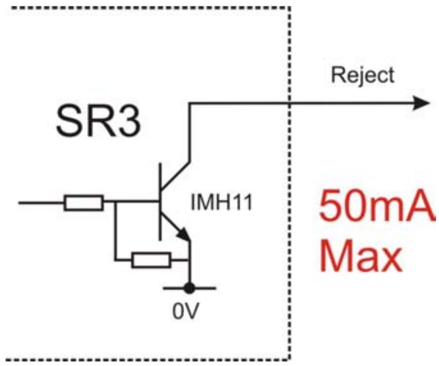
Figure 12: Coin Accept Outputs / Inhibits 1 to 6 – Mode 2



7.5 Reject Signal

Each time the Reject Lever is pressed, the gate displacement is detected and an output signal is sent to pin 5 (reject operated) on the parallel connector.
This output will remain active for as long as the Reject Lever is pressed.

Figure 13: Reject Output – Mode 2



8. Mode 3 (Totaliser)

Important Notice:

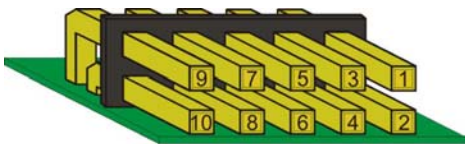
SR3 MechTool^{TM} FUNCTIONS ARE NOT AVAILABLE IN THIS MODE.

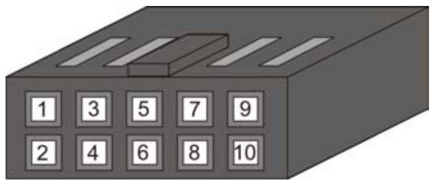
8.1 Parallel Interface – Mode 3

Connector type: 10 pin DIL

Table 4: Parallel Interface – Mode 3

PIN	FUNCTION	ACTIVE
1	+ SUPPLY	
2	0V	
3	Not Used	
4	Counter	Low
5	Not Used	
6	Inhibit All (Default Accept)	High
7	Credit Output	Low
8	Not Used	
9	Not Used	
10	Not Used	





8.2 Inhibit All

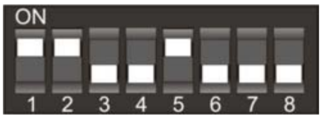
When the input on pin 6 on the 10 way connector is high (>1.2 volts), all the coins will be rejected.

The Inhibit All pin HAS to be low (<1.2 volts) or not connected in order for those coins not individually inhibited by the 8 way DIL switches, to be accepted.

If no coins are individually inhibited and both banks are enabled, then ALL coins will be accepted.

8.3 Inhibit Coins – Mode 3

Coins can ONLY be individually inhibited by using the 8 way DIL switch shown below



Switches 1 to 6 control the acceptance of programmed coins.

ON = coins inhibited.
OFF = coins accepted.

Switch 1 controls coins 1 and 7,
Switch 2 controls coins 2 and 8,
Switch 3 controls coins 3 and 9,
Switch 4 controls coins 4 and 10,
Switch 5 controls coins 5 and 11,
Switch 6 controls coins 6 and 12.

Based on the above switch settings coins 3, 4, 6, 9, 10 and 12 will be accepted all the others are inhibited.

Switch 7 enables / disables Bank 1, ON = disable – OFF = enable.
Switch 8 enables / disables Bank 2, ON = disable – OFF = enable.

Note:- The inhibit and Bank select inputs are ANDED. Therefore a coin will only be accepted if both the relevant bank AND the individual coin is enabled.

8.4 Totaliser – (Mode 3 ONLY)

MechTool™ functions, **Teach and Run™** and coin security tuning are not available, because the 6 way DIL switches are used to set the game price, bonus option and credit pulse mark-space ratio.

The totaliser has two outputs, counter and credit, which provide the credit (which includes bonus information) to the host machine. The lowest coin value (also known as "counter step") must be specified at time of order, this is used to calculate the number of counter pulses.

8.5 Counter Output

number of pulses = coin values inserted / lowest coin value.

The SR3 transmits a pulse every time the lowest coin value is achieved.
BONUSES are Ignored.

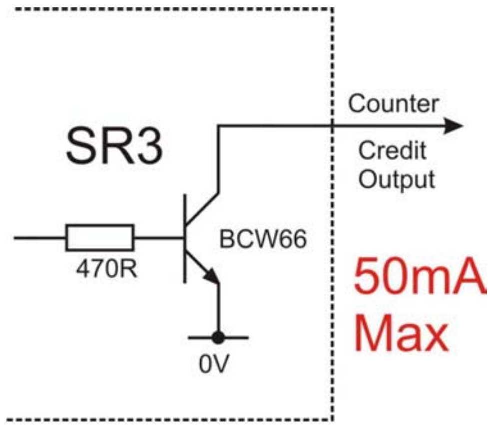
8.6 Credit Output

number of pulses = (V / GP) + B.

The SR3 transmits credit pulses on a single output line. The number of pulses transmitted depends on the game price and the bonuses awarded.

- **V** = value of coins inserted
- **GP** = game price
- **B** = bonus award for coin inserted

Figure 14: Counter and Credit Outputs – Mode 3



8.7 Game Price

The Game price can be selected, 1 from 8, via the **6** way DIL switch. Game Prices must be pre-set by Money Controls at the time of ordering.

Switches 1 to 3 are used to select the Game Price.

Table 5: Game Price Selection – Mode 3

Game Price (GP)	SW1	SW2	SW3
GP1	off	off	off
GP2	**ON**	off	off
GP3	off	**ON**	off
GP4	**ON**	**ON**	off
GP5	off	off	**ON**
GP6	**ON**	off	**ON**
GP7	off	**ON**	**ON**
GP8	**ON**	**ON**	**ON**

8.8 Bonus Selection

SW4 OFF disables the bonus function.
SW4 ON enable the bonus function.

Table 6: Bonus Selection – Mode 3

Game Price (GP)	Bonuses awarded for coins programmed.											
	W1 10p	W2 20p	W3 50p	W4 £1	W5 £2	W6	W7	W8	W9	W10	W11	W12
GP1	0	0	1	2	5	0	0	0	0	0	0	0
GP2	0	1	2	3	5	0	0	0	0	0	0	0
GP3	0	0	0	1	3	0	0	0	0	0	0	0
GP4	0	0	0	0	0	0	0	0	0	0	0	0
GP5	0	0	0	0	0	0	0	0	0	0	0	0
GP6	0	0	0	0	0	0	0	0	0	0	0	0
GP7	0	0	0	0	0	0	0	0	0	0	0	0
GP8	0	0	0	0	0	0	0	0	0	0	0	0

This 8 x 12 matrix is programmed to customer requirements, by Money Controls at set-up.

8.9 Credit / Counter Pulse Selection

The Credit / Counter output timers can be selected from 4 pre-set values, via the 6 way DIL switch.

Switches 5 and 6 are used to select the Credit / Counter output timers.

Table 7: Timer Selection – Mode 3

Pulse mark-space timers	SW5	SW6
20ms ON – 80ms OFF	off	off
50ms ON – 200ms OFF	**ON**	off
100ms ON – 400ms OFF	off	**ON**
200ms ON – 800ms OFF	**ON**	**ON**

8.10 Totaliser Example

Lowest Coin Value: € 0.10.
Price of Credit / Game: € 0.50.

Bonus Option: € 1.00 1 bonus game
€ 2.00 3 bonus games

Table 8: Totaliser Example – Mode 3

Coins inserted	Credit pulses given	Counter pulses given	Comments
5 x 10c	1	5	If only 4 coins are inserted the SR3 will remember the coins until power is switched off.
3 x 20c	1	6	If further coins are not inserted then the 10c is remembered until power is switched off.
€ 1.00	3	10	
€ 2.00	7	20	

Note: APPLIES TO THE COUNTER OUTPUT ONLY.

If the lowest coin value was set to 15c, then inserting a 20c coin will give 1 counter pulse and 5c will be lost. Inserting 50c will give 3 counter pulses and 5c will be lost.

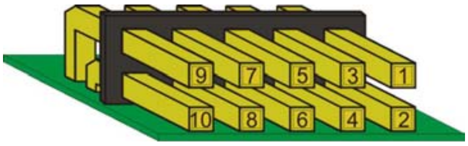
9. Mode 5

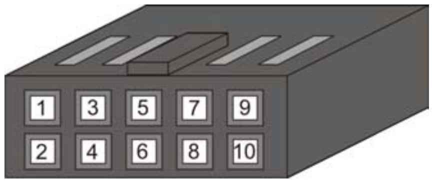
9.1 Parallel Interface – Mode 5

Connector type: 10 pin DIL

Table 9: Parallel Interface – Mode 5

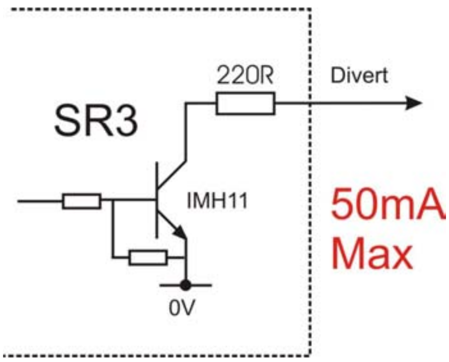
PIN	FUNCTION	ACTIVE
1	0 VOLTS	
2	+ SUPPLY	
3	Accept 5	Low
4	Accept 6	Low
5	Divert Signal	Low
6	Inhibit All (Default Accept)	High
7	Accept 1	Low
8	Accept 2	Low
9	Accept 3	Low
10	Accept 4	Low





Although this is a custom PCB, its functionality is, except for Pin 5 'Divert Signal', identical to Mode 1. A coin is selected by the customer to divert. This information is stored in EEPROM and when the 'diverted' coin is accepted, a pulse, of 500ms duration, is output from pin 5. At the same time as the 'divert' signal is output, the SR3 is inhibited for the same time. This stops any more coins being accepted and possibly diverted, when they shouldn't be. The host machine uses this signal to drive an external divertor, (see Figure 15)

Figure 15: Divert Signal Output – Mode 5



10. Mode 6

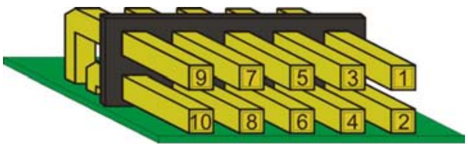
SR3 mode 6 is a product with totaliser capability and the facility to directly drive a specified four way sorter. There is no front plate option with this product.
Limited MechTool[TM] functions are available in this mode. Coin security tuning and limited Teach & Run (windows 1 and 3 only) is allowed using both the 6 and 8 way DIL switches.
The 6 way DIL switches are also used for the totaliser functions, and the 8 way DIL switches are also used for enabling/disabling coins.

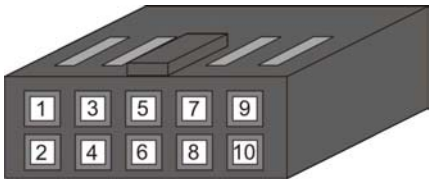
10.1 Parallel Interface – Mode 6

The SR3 T2 Mode 6 uses an industry standard 10-way connector as shown below.

Table 10: Parallel Interface – Mode 6

Pin	Mode 6	Active
1	GND	
2	+ Supply	
3	Sort B	Low
4	Sort A	Low
5	NC	
6	Inhibit All (Default Accept)	High
7	NC	
8	Counter	Low
9	Credit	Low
10	NC	





10.2 Inhibit All

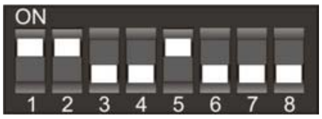
When the input on pin 6 on the 10 way connector is high (>1.2 volts), all the coins will be rejected.

The Inhibit All pin HAS to be low (<1.2 volts) or not connected in order for those coins not individually inhibited by the 8 way DIL switches, to be accepted.

If no coins are individually inhibited and both banks are enabled, then ALL coins will be accepted.

10.3 Inhibit Coins – Mode 6

Coins are inhibited using the 8 way DIL switch shown below



Switches 1 to 6 control the acceptance of programmed coins.

ON = coins inhibited.
OFF = coins accepted.

Switch 1 controls coins 1 and 7,
Switch 2 controls coins 2 and 8,
Switch 3 controls coins 3 and 9,
Switch 4 controls coins 4 and 10,
Switch 5 controls coins 5 and 11,
Switch 6 controls coins 6 and 12.

Based on the above switch settings coins 3, 4, 6, 9, 10 and 12 will be accepted all the others are inhibited.

Switch 7 enables / disables Bank 1, ON = disable – OFF = enable.
Switch 8 enables / disables Bank 2, ON = disable – OFF = enable.

Note:- The inhibit and Bank select inputs are ANDED. Therefore a coin will only be accepted if both the relevant bank AND the individual coin is enabled.

Note:- When both bank switches are up [all coins inhibited] , this activates the teach function. Please refer to the current SR3 Type2 *MechTool*™ ***manual (TSP022) for more information.***

10.4 Totaliser (Mode 6 ONLY)

The totaliser has two outputs, counter and credit, which provide the credit (which includes bonus information) to the host machine. The lowest coin value (also known as "counter step") must be specified at time of order, this is used to calculate the number of counter pulses.
The pulse duty cycle is 50% and the pulse duration is nominally 100ms, though can be preset to any value between 10ms and 2.5seconds.
The Counter and Credit timers cannot be adjusted separately.

10.5 Counter Output

number of pulses = coin values inserted / lowest coin value.

The SR3 transmits a pulse every time the lowest coin value is achieved, BONUSES are ignored.

Table 11: Counter Output Examples – Mode 6

	Coin 1	Coin 2	Coin 3	Coin 4	Coin 5
Denomination	Token 1	€ 0.50	Token 2	€ 1.00	€ 2.00
Coin Value	50	50	500	100	200
Lowest Coin Value	50	50	50	50	50
Counter Output	1	1	10	2	4

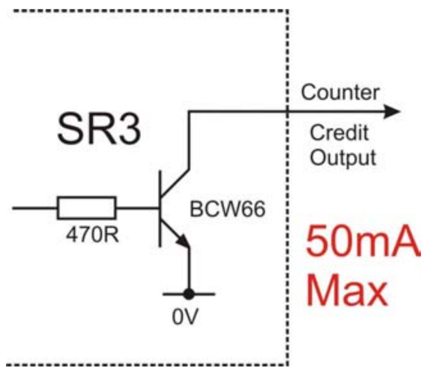
10.6 Credit Output

number of pulses = (V / GP) + B.

The SR3 transmits credit pulses on a single output line. The number of pulses transmitted depends on the game price and the bonuses awarded.

- **V** = value of coins inserted
- **GP** = game price
- **B** = bonus award for coin inserted

Figure 16: Counter and Credit Outputs Cct. – Mode 6



10.7 Game Price

The Game price can be selected, 1 from 8, via the 6 way DIL switch. Game Prices must be pre-set by Money Controls at the time of ordering but can be changed later by using ccProgrammer.

Switches 1 to 3 are used to select the Game Price.

Table 12: Game Price Selection – Mode 6

Game Price (GP)	SW1	SW2	SW3	Example
GP1	0	0	0	€ 0.50
GP2	1	0	0	€ 0.50
GP3	0	1	0	€ 1.00
GP4	1	1	0	€ 1.00
GP5	0	0	1	€ 0.20
GP6	1	0	1	€ 0.20
GP7	0	1	1	€ 0.50
GP8	1	1	1	€ 0.10

Note:- 0 = Switch OFF

10.8 Bonus Selection

SW4 OFF disables the bonus function.
SW4 ON enable the bonus function.
When bonus is active, the bonus awarded depends on DIL switch positions 5 and 6, and the coin value inserted. Valid values for Bonuses are form 0 to 15 inclusive.
This table below shows an example, which the customer determines when ordering.

Table 13: Bonus Selection – Mode 6

		Bonuses awarded for coins programmed.											
SW5	SW6	W1 Token 1	W2 €0.50	W3 Token 2	W4 €1.00	W5 €2.00	W6	W7	W8	W9	W10	W11	W12
OFF	OFF	0	1	5	2	3	0	0	0	0	0	0	0
ON	OFF	0	0	5	1	2	0	0	0	0	0	0	0
OFF	ON	0	0	2	0	1	0	0	0	0	0	0	0
ON	ON	0	0	0	0	0	0	0	0	0	0	0	0

This 12 x 4 matrix is programmed to customer requirements, by Money Controls at set-up or can be changed using ccProgrammer.

10.9 Totaliser Examples

SW1	SW2	SW3	SW4	SW5	SW6
ON	OFF	OFF	OFF	OFF	OFF
Game Price 2			No Bonus	Bonus 1 See Table 13	

	Coin 1	Coin 2	Coin 3	Coin 4	Coin 5
Denomination	Token 1	€ 0.50	Token 2	€ 1.00	€ 2.00
Coin Value	50	50	500	100	200
Lowest Coin Value	50	50	50	50	50
Counter Output	1	1	10	2	4
Credit Output	1	1	10	2	4

SW1	SW2	SW3	SW4	SW5	SW6
ON	OFF	OFF	ON	OFF	OFF
Game Price 2 (€0.50)			Bonus ON	Bonus 1 See Table 13	

	Coin 1	Coin 2	Coin 3	Coin 4	Coin 5
Denomination	Token 1	€ 0.50	Token 2	€ 1.00	€ 2.00
Coin Value	50	50	500	100	200
Lowest Coin Value	50	50	50	50	50
Counter Output	1	1	10	2	4
Credit Output	1	1 + 1 = 2	10 + 5 = 15	2 + 2 = 4	4 + 3 = 7

SW1	SW2	SW3	SW4	SW5	SW6
OFF	ON	OFF	ON	OFF	ON
Game Price 3 (€1.00)			Bonus ON	Bonus 3 See Table 13	

	Coin 1	Coin 2	Coin 3	Coin 4	Coin 5
Denomination	Token 1	€ 0.50	Token 2	€ 1.00	€ 2.00
Coin Value	50	50	500	100	200
Lowest Coin Value	50	50	50	50	50
Counter Output	1	1	10	2	4
Credit Output	1(2 coins)	1(2 coins)	5 + 2 = 7	1	2 + 1 = 3

10.10 Alarm – (Mode 6 ONLY)

When enabled, an alarm condition will activate the output (shown below) for 100ms, except for condition iii below.

Conditions which will indicate an alarm condition include:

- i. A sequence of events occur which indicate a 'Coin-on-string' fraud is being attempted. There are a number of events that might lead to this condition.
- ii. If the credit / reject sensor is blocked for more than 1.5 seconds, the alarm signal will remain active, for the duration of the blockage.
- iii. During power-up diagnostics – if enabled.

Under condition iii please refer to section 25 Diagnostics (power-up).

Figure 17: Alarm Output Connector – Mode 6

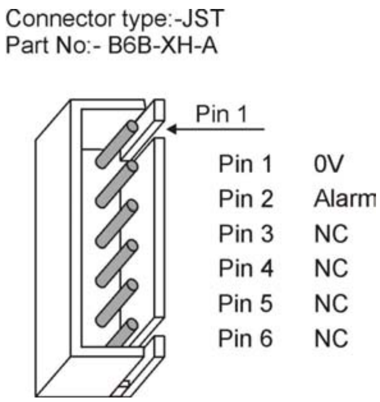
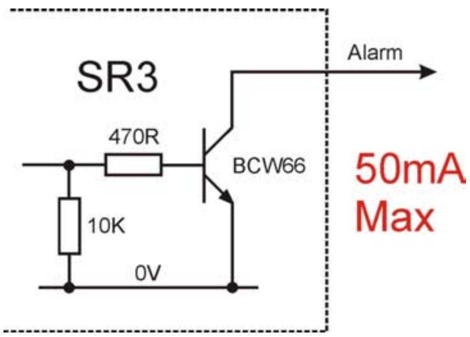


Figure 18: Alarm Output Cct.– Mode 6



10.11 Sorter Option – (Mode 6)

The SR3 Mode 6 is capable of directly driving a specified external sorter.
This SR3 Mode 6 only supports sorter mode 1.

10.11.1 SORTER MODE 1

The SR3 drives the sorter solenoids for a preset time after a coin is discriminated. While the sorter is active, an inhibit is placed on a second close coin if its sorter path is different.
Where a second coin is to be sorted down the same path as the first coin, it is allowed to accept even if the sorter solenoid(s) are active for the first coin. See Table 14 for information on sorter paths.

There is no feedback from the sorter to the SR3.

10.11.2 SORTER OUTPUT (MODE 6)

Figure 19: Sorter Output Cct. – Mode 6

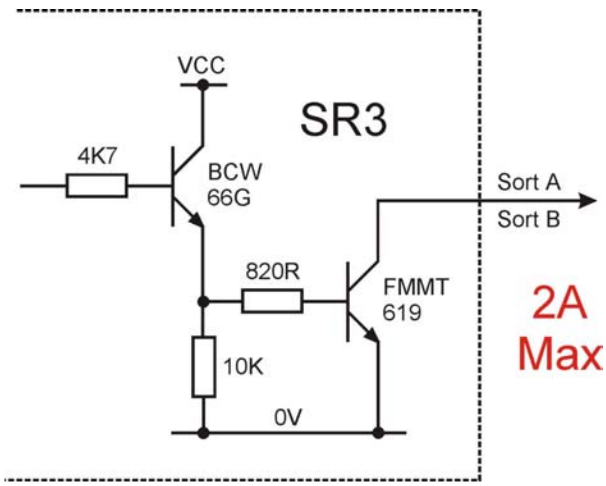


Figure 20: Sorter Path Outputs – Mode 6

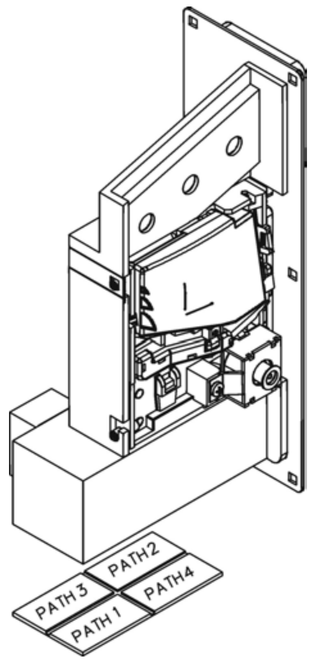


Table 14: Sorter Path Programming – Mode 6

	Path 1	Path 2	Path 3	Path 4
Sort A	1	0	0	1
Sort B	0	1	0	1

10.12 TK Replication (Mode 6 ONLY)

'TK Replication' software allows the copying of the coins/tokens 'taught' in windows 1 and 3 to be copied to other SR3 T2 Mode 6 acceptors. This ultimately saves time in not having to 'Teach' each SR3 individually.

11. Mode 7

Mode 7 has two operating modes which can be selected at the time of ordering or using ccProgrammer. In one of the modes it simulates the Dual price stepper and the other mode it works as a standard SR3 Type 2 Mode 1.
This mode has a custom PCB which has 10 pin and 16 pin DIL connectors (see Table 15 and Table 16 for interface details).
The 6 way DIL switches are used for the MechTool™ functions, coin security tuning and Teach & Run.
The 8 way DIL switches are used for enabling/disabling coins.

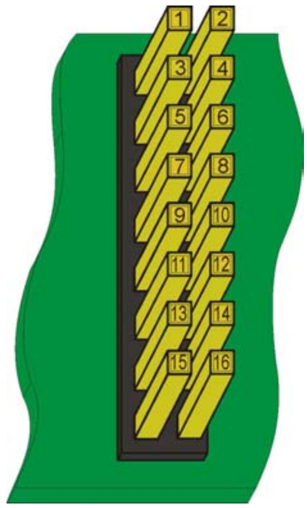
11.1 Mode 7 (Std Mode)

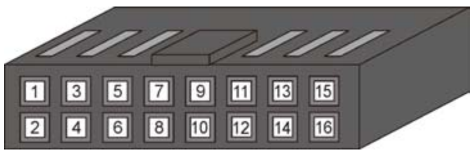
Please refer to section 6 Mode 1.

Connector type: 16 pin DIL

Table 15: 16 Pin Parallel Interface

PIN	FUNCTION	ACTIVE
1	NC	
2	NC	
3	NC	
4	NC	
5	NC	
6	Inhibit All (Default Accept)	High
7	Accept 3	Low
8	GND	
9	Accept 4	Low
10	Accept 5	Low
11	Accept 6	Low
12	Accept 2	Low
13	Accept 1	Low
14	Accept 6	Low
15	Accept 6	Low
16	+40V DC	



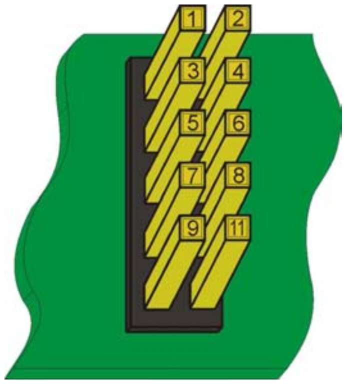


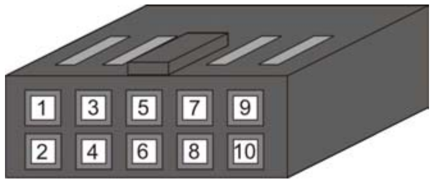
11.2 Parallel Interface – Mode 7 (Stepper Mode)

Connector type: 10 pin DIL

Table 16: Parallel Interface – Mode 7

PIN	FUNCTION	ACTIVE
1	0 VOLTS	
2	+40V	
3	NC	
4	NC	
5	Reject operated	Low
6	Inhibit All (Default Accept) / Reset	High
7	NC	
8	Price 1	Low
9	Price 2	Low
10	NC	





11.3 Inhibit All

When the input on pin 6 on the 10 way connector is high (>1.2 volts), all the coins will be rejected.

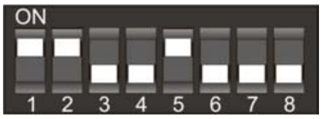
The Inhibit All pin HAS to be low (<1.2 volts) or not connected in order for those coins not individually inhibited by the 8 way DIL switches, to be accepted.

If no coins are individually inhibited and both banks are enabled, then ALL coins will be accepted.

WARNING: Should the Inhibit All / Reset Line be held High for more than 50ms before Price 1 is reached, then the accumulated credit will be LOST.

11.4 Inhibit Coins – Mode 7

Coins can ONLY be individually inhibited by using the 8 way DIL switch shown below



Switches 1 to 6 control the acceptance of programmed coins.

ON = coins inhibited.
OFF = coins accepted.

Switch 1 controls coins 1 and 7,
Switch 2 controls coins 2 and 8,
Switch 3 controls coins 3 and 9,
Switch 4 controls coins 4 and 10,
Switch 5 controls coins 5 and 11,
Switch 6 controls coins 6 and 12.

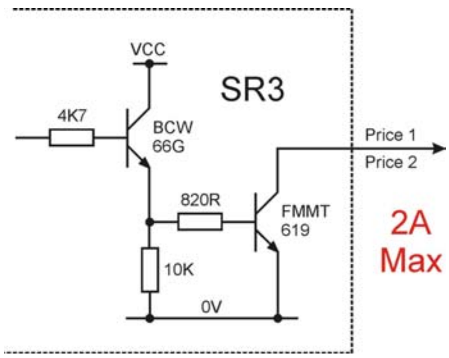
Based on the above switch settings coins 3, 4, 6, 9, 10 and 12 will be accepted all the others are inhibited.

Switch 7 enables / disables Bank 1, ON = disable – OFF = enable.
Switch 8 enables / disables Bank 2, ON = disable – OFF = enable.

Note:- The inhibit and Bank select inputs are ANDED. Therefore a coin will only be accepted if both the relevant bank AND the individual coin is enabled.

11.5 Price Outputs

Figure 21: Price 1 and 2 Output Ccts. – Mode 7



11.6 Stepper Mode Operation

Price 1 and Price 2 can be programmed by Money Controls at the time of ordering, via MechTool™ - by entering coins (please refer to TSP022) or ccProgrammer.

The Mode 7 accumulates the coin values. When Price 1 is reached the SR3 activates the Price 1 output on the parallel connector. Price 1 output stays active until the Inhibit All / Reset line is held High for more than 50ms by the host machine.

If more coins are inserted and Price 2 is reached then both Price 1 and Price 2 outputs will be activated. Both outputs will stay active until the Inhibit All / Reset line is held High for more than 50ms by the host.

WARNING: Should the Inhibit All / Reset Line be held High for more than 50ms before Price 1 is reached, then the accumulated credit will be LOST.

If one of the two Prices is set to 0* the corresponding Price line is permanently on. This is the **Free Sales Mode**.

Price 1 and Price 2 are set initially by the factory as specified on the order, these values can be changed later to match new requirements using MechTool™ or ccProgrammer. Coin values will be set during production to known coin or token values. Teach and Run is available through MechTool™, but coin value changes are NOT supported.

If more money is entered than either Price 1 or 2 then there are three modes concerning the remaining credit. These modes are set initially by the factory as specified in the order, and can only later be changed using ccProgrammer.

11.6.1 TWO PRICE STEPPER

The excess credit is lost when the host toggles the Inhibit All / Reset line to indicate that the credit has been accepted. Both prices can be used.
Acceptance is blocked as soon as the higher Price is reached i.e. the coin acceptor inhibits all coins until the Inhibit All / Reset line is toggled for 50ms by the host, or power is lost to the acceptor.

11.6.2 MULTIPLE SALES – TYPE 1

The excess credit remains valid after the first Price has been reset by the host. Only the first Price can be used - Price 1. The second Price is set to the free sales mode - Price 2 is permanently ON.

11.6.3 MULTIPLE SALES – TYPE 2

The remaining credit is erased after 2 minutes from the last coin being entered. i.e. entering more coins will reset the time delay. Only the first Price can be used - Price 1. The second Price is set to the free sales mode - Price 2 is permanently ON.

12. Mode 8 (Totaliser)

Important Notice:

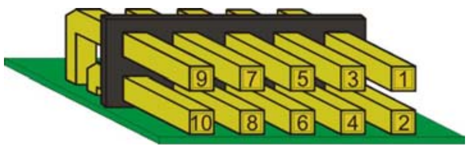
SR3 MechTool™ FUNCTIONS ARE NOT AVAILABLE IN THIS MODE.

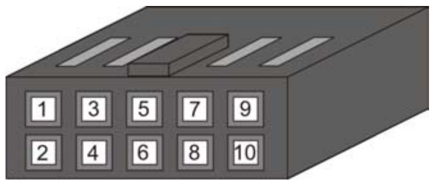
12.1 Parallel Interface – Mode 8

Connector type: 10 pin DIL

Table 17: Parallel Interface – Mode 8

PIN	FUNCTION	ACTIVE
1	0V	
2	+ SUPPLY	
3	Not Used	
4	Counter	Low
5	Not Used	
6	Inhibit All (Default Accept)	High
7	Credit Output	Low
8	Not Used	
9	Not Used	
10	Not Used	





12.2 Inhibit All

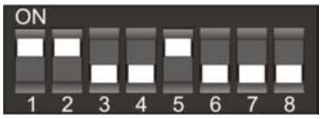
When the input on pin 6 on the 10 way connector is high (>1.2 volts), all the coins will be rejected.

The Inhibit All pin HAS to be low (<1.2 volts) or not connected in order for those coins not individually inhibited by the 8 way DIL switches, to be accepted.

If no coins are individually inhibited and both banks are enabled, then ALL coins will be accepted.

12.3 Inhibit Coins – Mode 8

Coins can ONLY be individually inhibited by using the 8 way DIL switch shown below



Switches 1 to 6 control the acceptance of programmed coins.

ON = coins inhibited.
OFF = coins accepted.

Switch 1 controls coins 1 and 7,
Switch 2 controls coins 2 and 8,
Switch 3 controls coins 3 and 9,
Switch 4 controls coins 4 and 10,
Switch 5 controls coins 5 and 11,
Switch 6 controls coins 6 and 12.

Based on the above switch settings coins 3, 4, 6, 9, 10 and 12 will be accepted all the others are inhibited.

Switch 7 enables / disables Bank 1, ON = disable – OFF = enable.
Switch 8 enables / disables Bank 2, ON = disable – OFF = enable.

Note:- The inhibit and Bank select inputs are ANDED. Therefore a coin will only be accepted if both the relevant bank AND the individual coin is enabled.

12.4 Totaliser – (Mode 8 ONLY)

This totaliser mode is similar to SR3 Type 2 Mode 3 in operation except the bonuses are given on the accumulated coin value rather than on the coins inserted. When the bonus is given the bonus price is subtracted from the accumulated credits. After a 30 second delay, any previous coins are ignored. A coin insertion restarts the 30 second delay.

MechTool™ functions, **Teach and Run**™ and coin security tuning are **NOT** available, because the 6 way DIL switches are used to set the game price and bonus options.

The 8 way DIL switches are used for enabling/disabling coins.

The totaliser has two outputs, counter and credit, which provide the credit (which includes bonus information) to the host machine. The lowest coin value (also known as "counter step") must be specified at time of order, this is used to calculate the number of counter pulses.

Within the SR3 is a set of bonus price multipliers and bonus awards. The customer can select the bonus price, the bonus price multipliers and the number of bonuses given, at time of order or these can be changed using ccProgrammer. The desired bonus price and award can then be selected using the 6 way DIL bonus switches.

The actual bonus award is selected by specifying a multiple of the bonus price.

The pulse duty cycle is 50% and the pulse duration is nominally 100ms, though can be preset to any value between 10ms and 2.5seconds.
The Counter and Credit timers cannot be adjusted separately.

12.5 Counter Output

number of pulses = coin values inserted / lowest coin value.

The SR3 transmits a pulse every time the lowest coin value is achieved.
BONUSES are ignored.

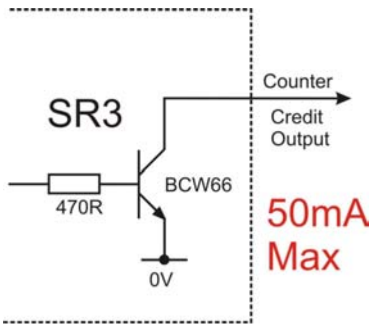
12.6 Credit Output

number of pulses = (V / GP) + B.

The SR3 transmits credit pulses on a single output line. The number of pulses transmitted depends on the game price and the bonuses awarded.

- **V** = accumulated value of coins inserted
- **GP** = game price
- **B** = accumulated bonus award for the accumulated value of coins inserted

Figure 22: Counter and Credit Outputs – Mode 8



12.7 Game Price

The Game price can be selected, 1 from 8, via the **6** way DIL switch. Game Prices must be pre-set by Money Controls at the time of ordering.

- Switches 1 to 3 allow up to 8 game prices to be set.
- Switch 4 enables/disables the bonus.
- Switches 5 and 6 control the credit output pulse mark/space times.

Table 18: Game Price Selection – Mode 8

Game Price (GP)	SW1	SW2	SW3
GP1	off	off	off
GP2	**ON**	off	off
GP3	off	**ON**	off
GP4	**ON**	**ON**	off
GP5	off	off	**ON**
GP6	**ON**	off	**ON**
GP7	off	**ON**	**ON**
GP8	**ON**	**ON**	**ON**

12.8 Bonus Selection

SW4 OFF disables the bonus function.
SW4 ON enable the bonus function.

When the bonus is enabled, the bonus awarded depends on DIL switch positions 5 and 6, and the values of the coins inserted. This table below shows an example, which the customer determines when ordering.

Table 19: Bonus Selection – Mode 8

SW5	SW6	Bonuses awarded	
		Bonus Multiplier	**Bonus Award**
off	off	2	1
ON	off	5	2
off	**ON**	10	5
ON	**ON**	5	2

* With a bonus price of 10 the following table shows the accumulator price at which the bonus credits are awarded.

SW5	SW6	Bonuses awarded	
		Accumulat or Price	**Bonus Award**
off	off	2*10=20	1
ON	off	5*10=50	2
off	**ON**	10*10=100	5
ON	**ON**	5*10=50	2

12.8.1 BONUS EXAMPLES

Lowest coin value: 25 units.
Price of credit/game: 100 units.

Bonus option: Accumulated coin value of 300 = 2 bonus,
(Only one price allowed)

Table 20: Credit and counter pulses given for different coin insertions

Coins inserted (Units)	Accumulated Value	Credit pulses given	Counter pulses given	Comments
3 * 50	150	1	6	If further coins are not inserted then the 50 units are lost after 30 seconds.
3 * 100	300 0 remainder	5	12	Credit pulses = 3 games plus 2 bonus. 300 subtracted from accumulated value when bonus given.
200	200	2	8	Accumulated value cleared after 30 seconds.
2 * 200 + 100	300 200 remainder	7	20	Credit pulses = 5 games plus 2 bonuses 300 subtracted from accumulated value when bonus given. Remaining accumulated value (200) cleared after 30 seconds.
3 * 200	300 300 0 remainder	10	24	Credit pulses = 6 games plus 4 bonuses 300 subtracted from accumulated value when bonus given first time. 300 subtracted from accumulated value when bonus given second time.

NOTE: This mode always clears the Accumulated Value 30 seconds after the last coin insertion.

NOTE: If the lowest coin value was set to 20 units, then inserting 25 unit coin will give 1 counter pulse and 5 units will be lost. Inserting 50 unit coin will give 2 counter pulses and 10 units will be lost. THIS ONLY APPLIES TO COUNTER OUTPUT.

13. Mode 9

To be released.

14. Mode 10

This mode is functionally the same as Mode 1 except MechTool^{TM} can be accessed at any time, rather than within the first 20 seconds after power up.

Also, should the reject lever be pressed within the first 20 seconds after power-up, the SR3 will **NOT** enter 'standby' mode.

15. Mode 14

Important Notice:

SR3 MechTool™ FUNCTIONS ARE NOT AVAILABLE IN THIS MODE.

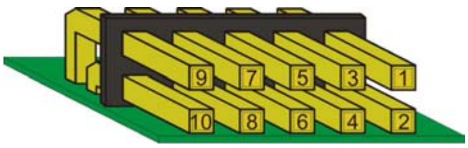
SR3 mode 14 has been developed for the Italian AWP market to be used in serial ccTalk mode only. Mode 14 also has the capability to directly drive a specified four way sorter. Mode 14 is available in a Std Body version only. For a frontplate version please refer to Mode 15.

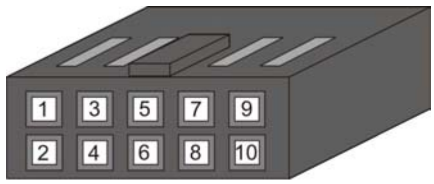
15.1 Parallel Interface – Mode 14

The SR3 T2 Mode 14 uses an industry standard 10-way connector as shown below.

Table 21: Parallel Interface – Mode 14

Pin	Mode 14	Active
1	GND	
2	+ Supply	
3	Sort B	Low
4	Sort A	Low
5	NC	
6	Inhibit All (Default Accept)	High
7	NC	
8	Not used	
9	Not used	
10	NC	





15.2 Inhibit All

When the input on pin 6 on the 10 way connector is high (>1.2 volts), all the coins will be rejected.

The Inhibit All pin HAS to be low (<1.2 volts) or not connected in order for coins to be accepted.

15.3 Inhibit Coins – Mode 14

Coin Accept / Inhibit information is stored in Eeprom. These can then only be changed using ccTalk commands. See ccTalk Serial Messages and TSP072 for more information.

15.4 Sorter Option – (Mode 14)

The SR3 Mode 14 is capable of directly driving a specified external sorter.
This SR3 Mode 14 only supports sorter mode 1.

15.4.1 SORTER MODE 1

The SR3 drives the sorter solenoids for a preset time after a coin is discriminated. While the sorter is active, an inhibit is placed on a second close coin if its sorter path is different.
Where a second coin is to be sorted down the same path as the first coin, it is allowed to accept even if the sorter solenoid(s) are active for the first coin. See Figure 24 for information on sorter paths.

There is no feedback from the sorter to the SR3.

15.4.2 SORTER OUTPUT (MODE 14)

Figure 23: Sorter Output Cct. – Mode 14

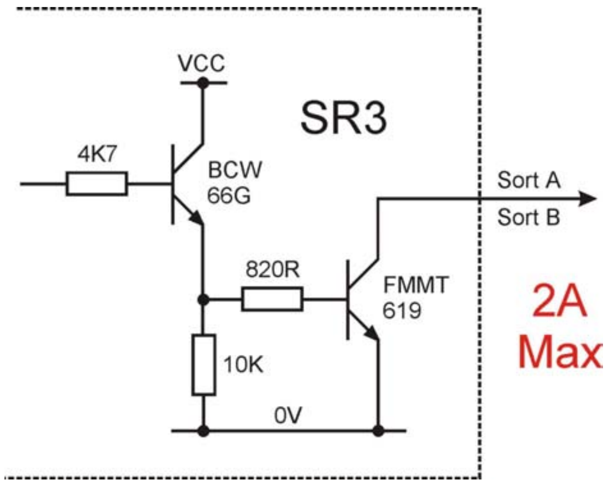


Figure 24: 4 way Sorter Path Outputs – Mode 14

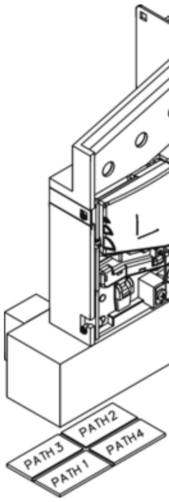


Table 22: Sorter Path Programming – Mode 14

	Path 1	Path 2	Path 3	Path 4
Sort A	1	0	0	1
Sort B	0	1	0	1

Figure 25: 3 way In-Line Sorter Path Outputs – Mode 14

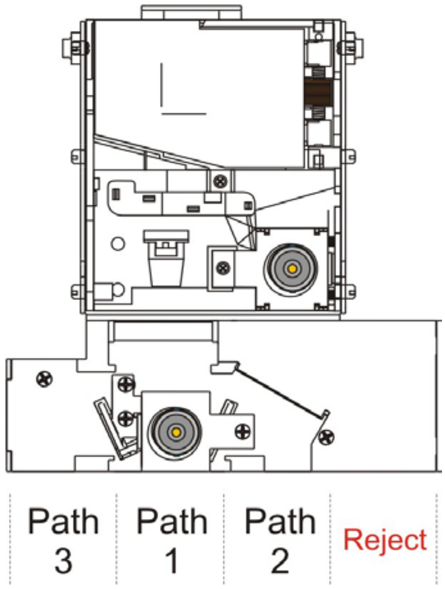
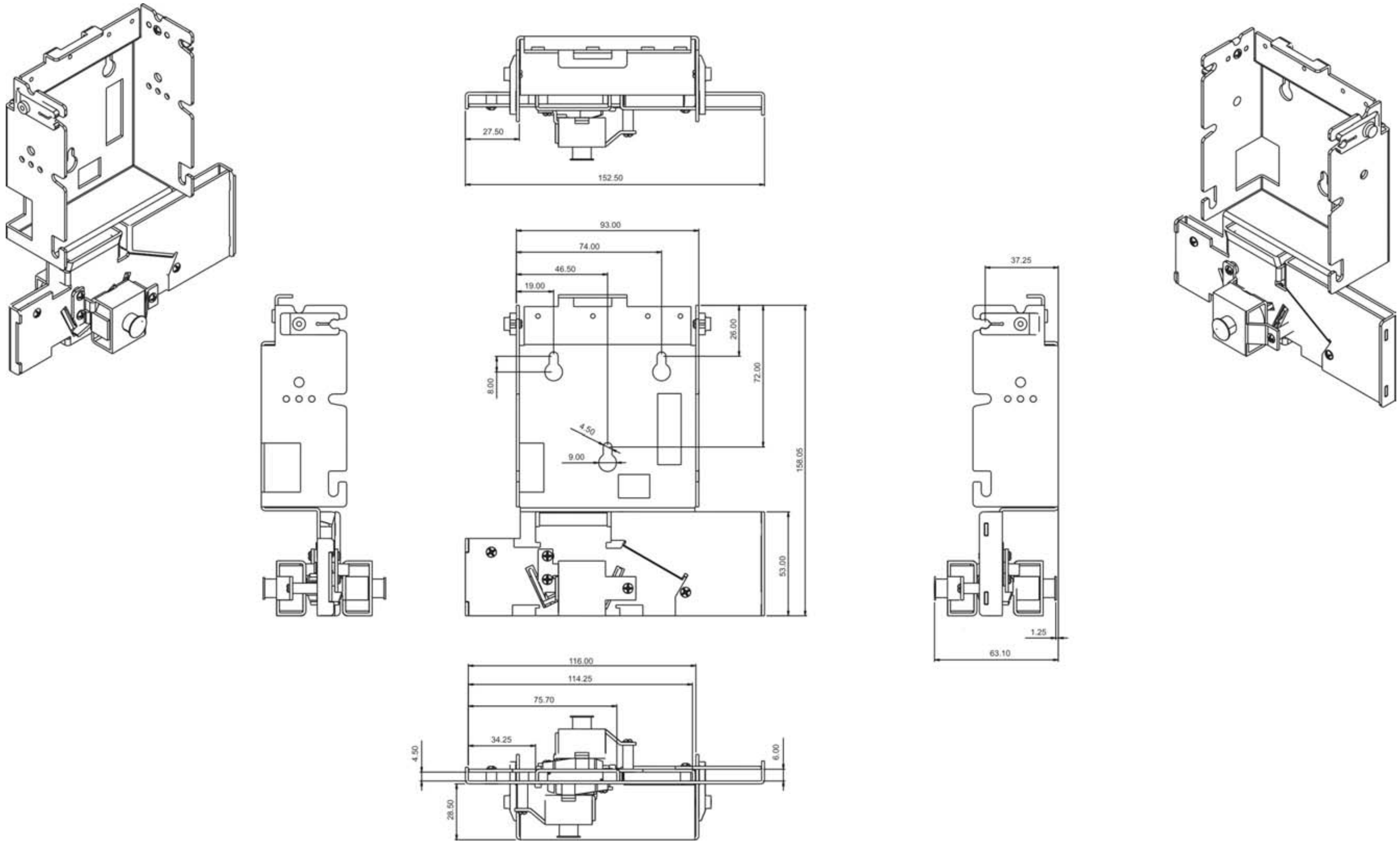


Table 23: Min / Max Coin Diameters v Coin Path – Mode 14

	Path 3	Path 1	Path 2	Reject
Min Dia	18.5mm	15.75mm	18.75mm	13.0mm
Max Dia	28.0mm	29.0mm	27.4mm	33.0mm

Figure 26: 3 way In-Line Sorter Dimensions – Mode 14



16. Mode 15

Important Notice:

SR3 MechTool™ FUNCTIONS ARE NOT AVAILABLE IN THIS MODE.

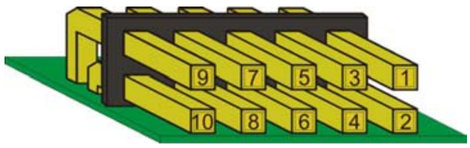
SR3 mode 15 has been developed for the Italian AWP market to be used in serial ccTalk mode only. Mode 15 also has the capability to directly drive a specified four way sorter. Mode 15 is available in a frontplate version only. For a Standard Body version please refer to Mode 14.

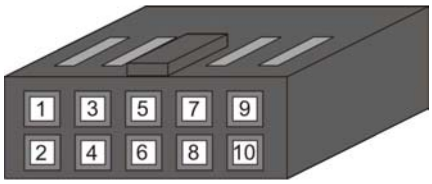
16.1 Parallel Interface – Mode 15

The SR3 T2 Mode 15 uses an industry standard 10-way connector as shown below.

Table 24: Parallel Interface – Mode 15

Pin	Mode 14	Active
1	GND	
2	+ Supply	
3	Sort B	Low
4	Sort A	Low
5	NC	
6	Inhibit All (Default Accept)	High
7	NC	
8	Not used	
9	Not used	
10	NC	





16.2 Inhibit All

When the input on pin 6 on the 10 way connector is high (>1.2 volts), all the coins will be rejected.

The Inhibit All pin HAS to be low (<1.2 volts) or not connected in order for coins to be accepted.

16.3 Inhibit Coins – Mode 15

Coin Accept / Inhibit information is stored in Eeprom. These can then only be changed using ccTalk commands. See ccTalk Serial Messages and TSP072 for more information.

16.4 Sorter Option – (Mode 15)

The SR3 Mode 15 is capable of directly driving a specified external sorter.
This SR3 Mode 15 only supports sorter mode 1.

16.4.1 SORTER MODE 1

The SR3 drives the sorter solenoids for a preset time after a coin is discriminated. While the sorter is active, an inhibit is placed on a second close coin if its sorter path is different.
Where a second coin is to be sorted down the same path as the first coin, it is allowed to accept even if the sorter solenoid(s) are active for the first coin. See Figure 28 for information on sorter paths.

There is no feedback from the sorter to the SR3.

16.4.2 SORTER OUTPUT (MODE 15)

Figure 27: Sorter Output Cct. – Mode 15

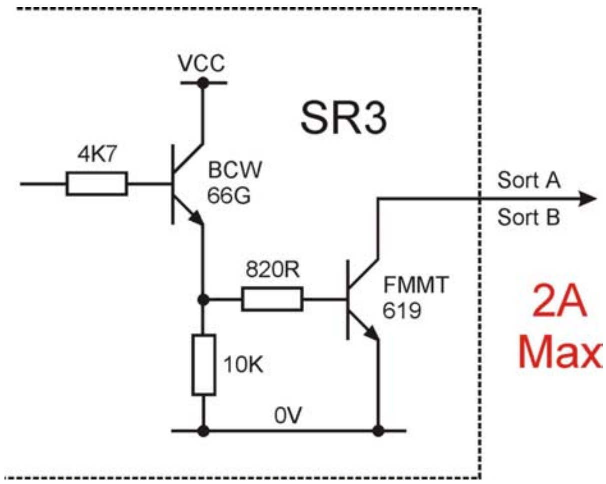


Figure 28: 3 way In-Line Sorter Path Outputs – Mode 15

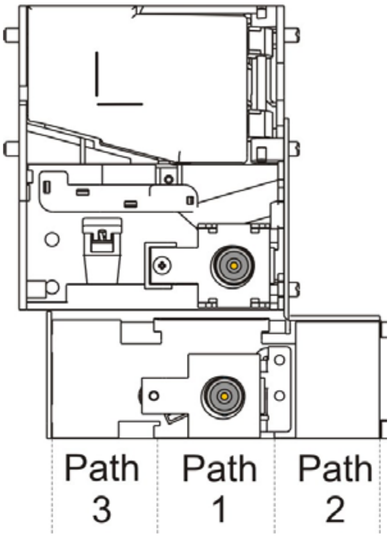


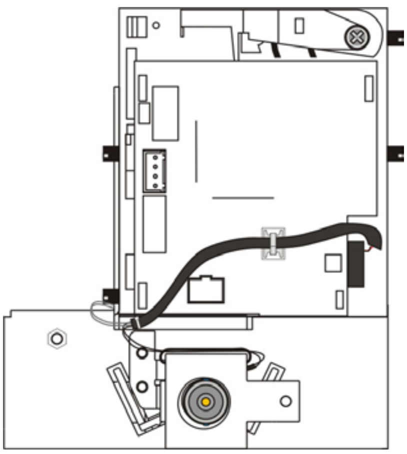
Table 25: Sorter Path Programming – Mode 15

	Path 1	Path 2	Path 3
Sort A	0	0	1
Sort B	0	1	0

Table 26: Min / Max Coin Diameters v Coin Path – Mode 15

	Path 3	Path 1	Path 2
Min Dia	18.0mm	16.0mm	16.0mm
Max Dia	26.75mm	31.0mm	31.0mm

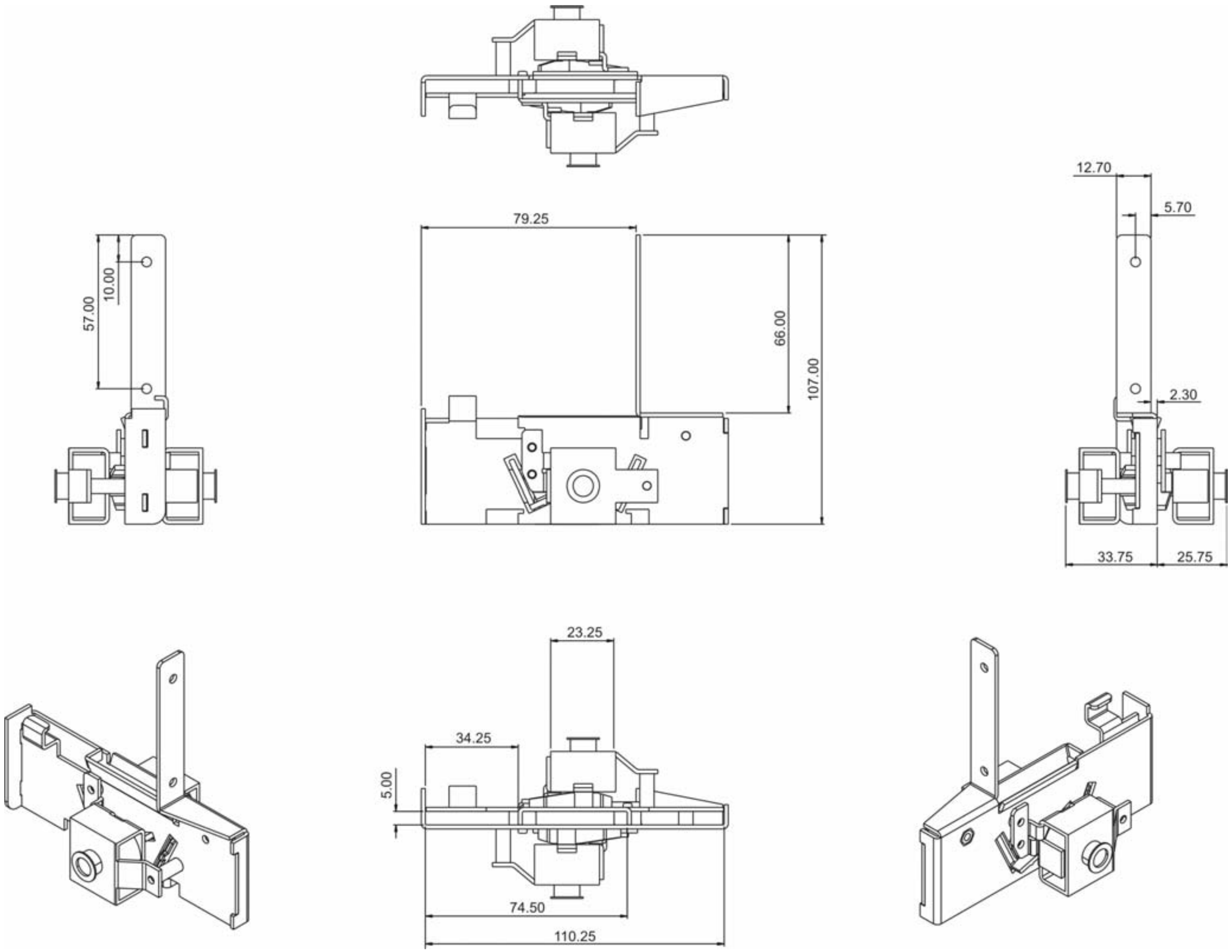
Figure 29: Recommended Routing of Sorter Cable – Mode 15



IMPORTANT:

**The sleeved cable MUST be kept away from the solenoid plunger and the solenoid diverter flaps.
Failure to adhere to this could cause coins to mis-route.**

Figure 30: 3 way In-Line Sorter Dimensions – Mode 15



17. Mode 20

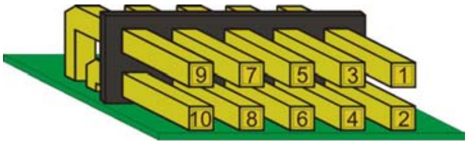
IMPORTANT:

When used with a sorter, the MAX voltage that can be applied is +12V.

17.1 Parallel Interface – Mode 20

Figure 31: SR3 Parallel Connector

Industry standard interface.
Connector type: 10 pin DIL



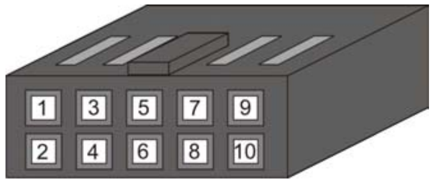


Table 27: Parallel Interface – Mode 20

PIN	FUNCTION	ACTIVE
1	0 VOLTS	
2	+ SUPPLY	
3	Accept 5	Low
4	Accept 6	Low
5	Reject operated	Low
6	Inhibit All (Default Accept)	High
7	Accept 1	Low
8	Accept 2	Low
9	Accept 3	Low
10	Accept 4	Low

17.2 Inhibit All

When the input on pin 6 on the 10 way connector is high (>1.2 volts), all the coins will be rejected.

The Inhibit All pin HAS to be low (<1.2 volts) or not connected, in order for those coins not individually inhibited on the 8 way DIL switch or in EEPROM, determined by the programmed settings (See Accept and Inhibit Configuration in the **MechTool**™ Manual TSP022), to be accepted.

If no coins are individually inhibited and both banks are enabled, then ALL coins will be accepted.

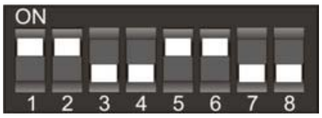
17.3 Inhibit Coins – Mode 20

A flag setting in EEPROM (selected when the product is ordered), determines how coins are inhibited. To change this flag on receipt of the product ccProgrammer will be required.

17.3.1 INHIBIT MODE 0:-

Coins are inhibited via **MechTool**^{TM} (please refer to the SR3 Type2 **MechTool**^{TM} Manual TSP022). Inhibit switches 1 to 6 are ignored.

17.3.2 INHIBIT MODE 1:-



Coins are inhibited using the 8 way DIL switch shown below:-

Switches 1 to 6 control the acceptance of programmed coins.

ON = coins inhibited.
OFF = coins accepted.

Switch 1 controls coins 1 and 7,
Switch 2 controls coins 2 and 8,
Switch 3 controls coins 3 and 9,
Switch 4 controls coins 4 and 10,
Switch 5 controls coins 5 and 11,
Switch 6 controls coins 6 and 12.

Based on the above switch settings coins 3, 9, 4 and 10 will be accepted all the others are inhibited.

Switch 7 enables / disables Bank 1, ON = disable – OFF = enable.
Switch 8 enables / disables Bank 2, ON = disable – OFF = enable.

Note:- The inhibit and Bank select inputs are ANDED. Therefore a coin will only be accepted if both the relevant bank AND the individual coin is enabled.

17.3.3 SERIAL INHIBIT {CREDIT-POLL}

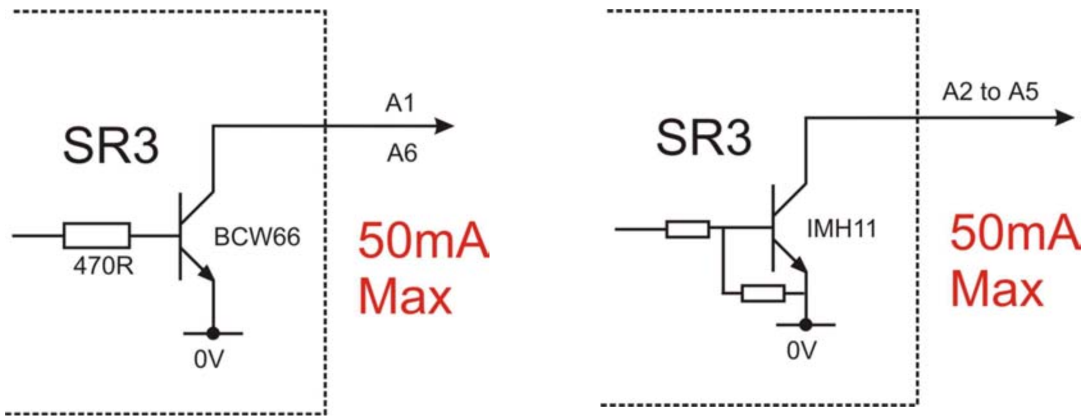
SERIAL OPERATION ONLY.

As an added security feature, an option can be set by MCL when the product is ordered [Credit-Poll Set]. If selected, this requires the host machine to poll the SR3 every 1 second.
If the SR3 fails to see a poll within the 1 second time period, ALL the coins will be inhibited.
When the SR3 receives the next poll all the coins previously enabled, will be re-enabled.

17.4 Coin Accept Outputs – Mode 20

Each coin accept output consists of an open collector NPN transistor. On acceptance of a true coin the transistor is turned on for a period of 100ms (+/- 20%) to less than 0.7 volts at a Max. 50mA. The host machine must look for valid credit pulses NOT LESS THAN 50ms. It is not sufficient to merely detect the edges of credit pulses. This 'debounce' 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.

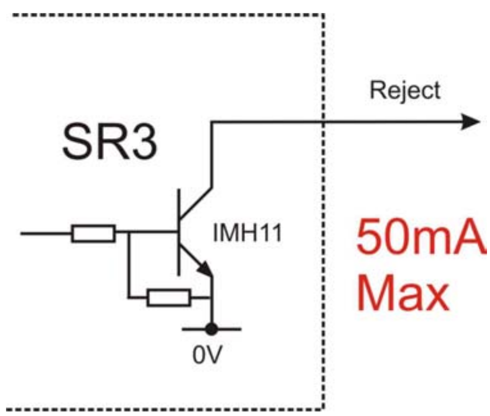
Figure 32: Coin Accept Outputs – Mode 20



17.5 Reject Signal

Each time the Reject Lever is pressed, the gate displacement is detected and an output signal is sent to pin 5 (reject operated) on the parallel connector.
This output will remain active for as long as the Reject Lever is pressed.

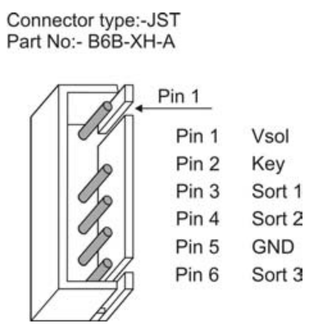
Figure 33: Reject Output – Mode 20



17.6 Sorter Option.

The SR3 mode 20 provides power drive to directly activate a Money Controls sorter. The drive is active for 500ms and generated at the same time as the accept gate is activated. There is no feedback from the sorter. For Sorter Paths see Figure 25 and Figure 28.

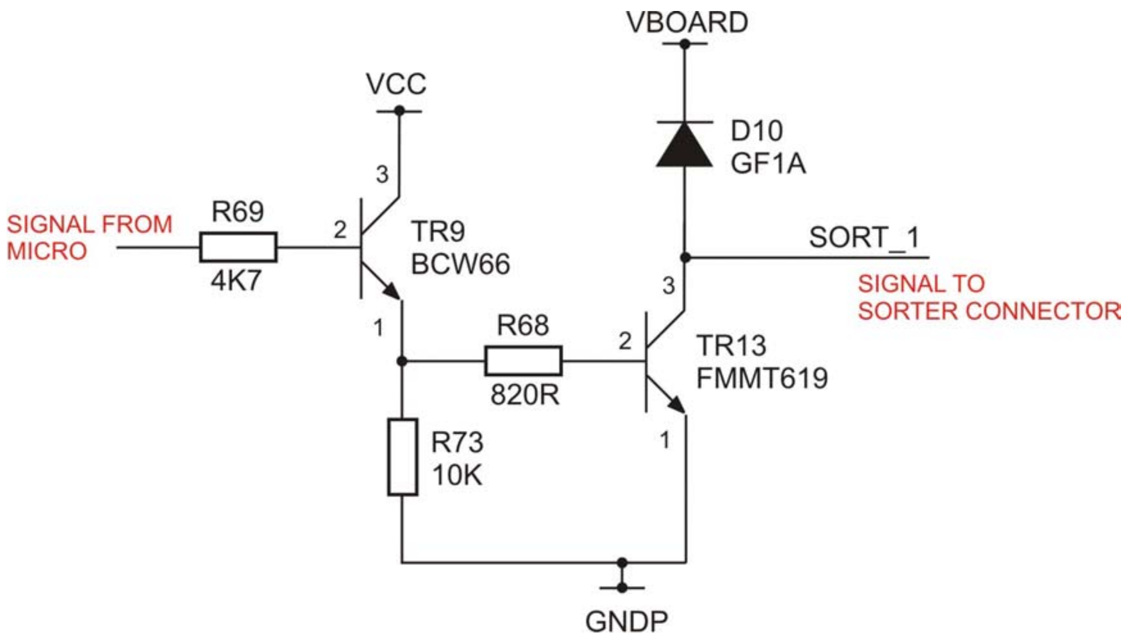
Figure 34: Sort Output Connector Details



17.6.1 SORTER DRIVE CIRCUIT

The sorter output on the SR3 Mode 20, is a high current drive capable of driving a Money Controls front plate or standard sorter. See Figure 26 and Figure 30 for details.

Figure 35: Sorter Drive Output Circuit



18. Credit Codes (NOT Modes 3, 6, 7-7, 8, 14 or 15)

18.1 Standard Parallel Credit Codes

This is the basic 6 coin pattern, one output is active per coin for 100ms and the output corresponds to the coin position. Coins 7 to 12 are the same codes as coins 1 to 6.

Coin No.	A6	A5	A4	A3	A2	A1
Coin 1, 7	0	0	0	0	0	1
Coin 2, 8	0	0	0	0	1	0
Coin 3, 9	0	0	0	1	0	0
Coin 4, 10	0	0	1	0	0	0
Coin 5, 11	0	1	0	0	0	0
Coin 6, 12	1	0	0	0	0	0

18.2 Default 12 Coin Mode Credit Codes

This pattern shows A4 as a strobe. This can be used as a check whereby the credit codes are only looked at **and valid** when A4 is active. The outputs are active for 100ms.

Coin No.	A6	A5	A4	A3	A2	A1
Coin 1	0	0	0	0	0	1
Coin 2	0	0	0	0	1	0
Coin 3	0	0	0	0	1	1
Coin 4	0	0	0	1	0	0
Coin 5	0	0	0	1	0	1
Coin 6	0	0	0	1	1	0
Coin 7	0	0	0	1	1	1
Coin 8	0	0	1	0	0	0
Coin 9	0	0	1	0	0	1
Coin 10	0	0	1	0	1	0
Coin 11	0	0	1	0	1	1
Coin 12	0	0	1	1	0	0

Please Note: Either Parallel or Binary must be selected when ordering.
You **CANNOT** switch between Binary and Parallel on the SR3 without re-programming.

Also, these are the standard available codes.
You can select different combinations of credits to suit your application.

A1 to A6 ALL ON is NOT available – this is the ALARM code.

19. Debug Features

Debug features are used to determine reasons for coin reject, and are output on the coin acceptor LED by a number of red pulses (see Table 28 below).

The coin acceptor LED under normal operation should be GREEN.

The LED is situated to the left of the 6 way DIL switch on the connector side on the acceptor (See Figure 8).

Table 28: Debug Features

1 RED pulse	Coin accepted / Reject Lever pressed
2 RED pulses	Coin outside programmed sensor windows
3 RED pulses	Coin valid, but inhibited
4 RED pulses	Master Inhibit from host machine

Debug features will not be buffered and assume a single coin insertion. The insertion of several coins would cause an overflow and no useful information.

The debug features operate in normal acceptor operation.

The LED cannot be seen if the machine door is closed.

20. MechTool™ - 6 Way DIL Switch Options. (NOT Modes 3,8,14 &15)

There are a number of options which can be selected via the 6 way DIL switch.
Please refer to the current SR3 Type2 **MechTool™** manual (TSP022).

Warning:

Pressing the reject lever within 20 seconds of power up, with the 6 DIL switches set to OFF, will set the SR3 into standby mode, the LED will flash RED and no coins will be accepted for approx. 3 mins.

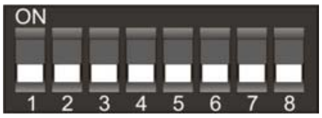
This does NOT apply to SR3 Type 2 Mode 10

21. Bank Select (NOT Modes 14 & 15)

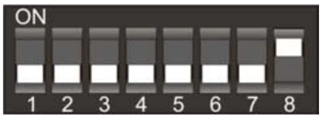
This function allows you to enable both or individually select banks of coins via switches 7 and 8 on the 8 way DIL switch.
This enables the selection of 2 different currencies, one in each bank, or 12 coins/tokens in both banks from the same country.

To enable/disable the banks set the switches as shown below.

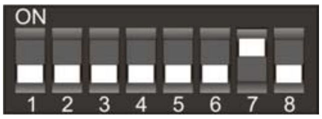
21.1 Both Banks ON



21.2 Bank 1 ON Bank 2 OFF



21.3 Bank 1 OFF Bank 2 ON



22. Teach and Run™ Option (NOT Modes 3, 8, 14 & 15)

Please refer to the current **MechTool**™ Manual (TSP022) for detailed explanation.

23. Adjustable Coin Security (NOT Modes 3, 8, 14 & 15)

The security of an individual coin/token can be adjusted using the 6 way DIL switches.
Please refer to the current **MechTool**™ Manual (TSP022) for detailed explanation.

24. Alarms (NOT Modes 3, 6, 7-7, 8, 14 or 15)

For mode 6 please refer to section 10.10.
When enabled, an alarm condition will activate all the outputs (A1 to A6) for 100ms, except for condition iii below.

Conditions which will indicate an alarm condition include:

- i. A sequence of events occur which indicate a 'Coin-on-string' fraud is being attempted. There are a number of events that might lead to this condition.
- ii. If the credit / reject sensor is blocked for more than 1.5 seconds, the alarm signal will remain active, for the duration of the blockage.
- iii. During power-up diagnostics – if enabled.

Please refer to the current **MechTool**™ Manual (TSP022) for further information.

25. Diagnostics (power-up)

The SR3 performs a self-test at power-up. If a fault condition is detected and diagnostics is enabled, an Alarm is activated and the SR3 is inhibited. If the fault condition clears, say a coin blockage of the credit sensor, the inhibit will be lifted and the SR3 is then ready for normal operation. A diagnostics test failure is indicated in parallel mode in exactly the same way as an alarm.

The faults which are detected at power up are:-

- Credit sensor blocked.
- EEPROM checksum error.
- Blockage in the discrimination area.
- Sensor faulty.

26. Sorter Option (NOT Modes 6, 7, 14, 15 or 20)

For Mode 6, 7, 14, 15 and 20 details, please refer to their respective sections.
The SR3 has 'Sort' outputs which are capable of switching on and off, external sorter drive transistors. The coin exit positions from the sorter are identical to an industry standard OEM product. There are three operating modes for use with sorters. One mode is selected during the set-up process.

26.1 Sorter Mode 1 *(default)*

The SR3 provides a logic signal to enable the sorter solenoids to be driven. The signal is active for 500ms and generated at the same time as the accept gate is activated. There is no feedback from the sorter.

26.2 Sorter Mode 2

As soon as a coin is discriminated as true, its corresponding credit code is output for 1ms, after which the accept gate and sorter solenoids are activated. [provided master inhibit is inactive].
If the Master Inhibit Line is active (i.e. all coins inhibited), then the credit code is output for 10ms. No accept gate solenoid activity occurs and the coin is rejected. If during the first 9ms of the 10ms credit pulse, the Master Inhibit Line changes to inactive (i.e. accept), then the coin will be accepted. The accept gate then operates and the coin accepts. A 100ms credit is issued as the coin passes the credit sensor.
The host machine drives the sorter solenoids in this application.

26.3 Sorter Mode 3

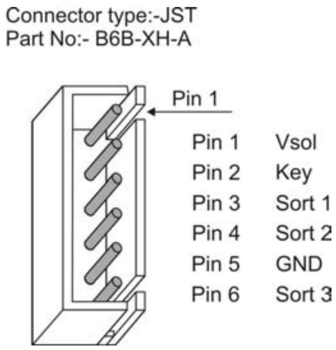
The issue of the 'early' 1ms credit is delayed by a fixed time from completion of coin discrimination **(TBD).** Provided the master inhibit line is inactive when the coin completes discrimination, the coin accepts. The early credit pulse is issued after the fixed delay, followed by the standard credit pulse of 100ms duration as the coin passes the credit sensor.

Note: Sorter modes 1, 2 & 3 are mutually exclusive. One must be selected when ordering.

27. Sorter Drivers (NOT Modes 6, 7, 14, 15 & 20)

For Mode 6 please see section 10.11.
Mode 7 does NOT have this feature.
For Mode 14 please see section 15.4.
For Mode 15 please see section 16.4.
For Mode 20 please see section 17.6

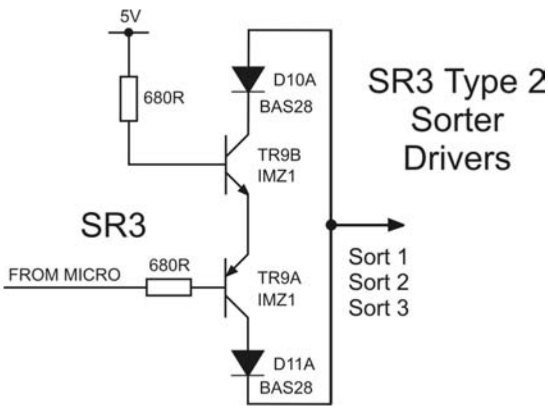
Figure 36: Sort Output Connector Details



27.1 Sorter Drive Circuit

The sorter output on SR3 is just a low current drive and will not drive a solenoid directly. It was designed to source or sink a limited current and so it can be connected directly to the base of the transistor being used to drive the solenoid.

Figure 37: Sorter Drive Output Circuit

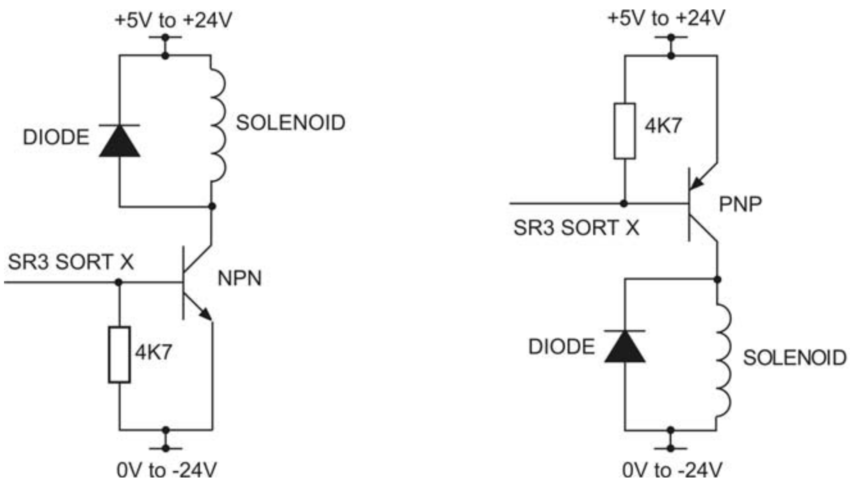


27.1.1 THEORY OF OPERATION

If SORT 1 / 2 / 3 is connected to +5V or above, D11A is reverse biased and D10A forward biased. To turn on the drive, the micro takes it's output to 0V, enabling TR9B to sink current which flows through R83 until the voltage on the base of TR9A reaches about 3.8V. At this point the voltage on the base of TR9B will be approaching 5V so it will start to turn off. The current sink is therefore limited to about 5mA (as the micro output is at around 0.4V, the current through R83 is (3.8-0.4)/680). If SORT 1 / 2 / 3 is connected to 0V or below, D10A is reverse biased and D11A forward biased. The circuit works in a similar way and TR9B sources current until the voltage across R82 has dropped to nearly 1.2V, so again the output current source is limited to 5mA.

27.2 Sorter Drive Examples

Figure 38: Sorter Drive Examples



These two circuits show how you could use the SR3 output to drive a solenoid. The transistors used depend on how much current your solenoid requires. The above voltages show the maximum range you can apply to the SR3 output and you will need to set the actual voltage to match your solenoid.

27.3 Sort Outputs v Sorter Paths

Table 29: Sort Outputs v Sorter Paths

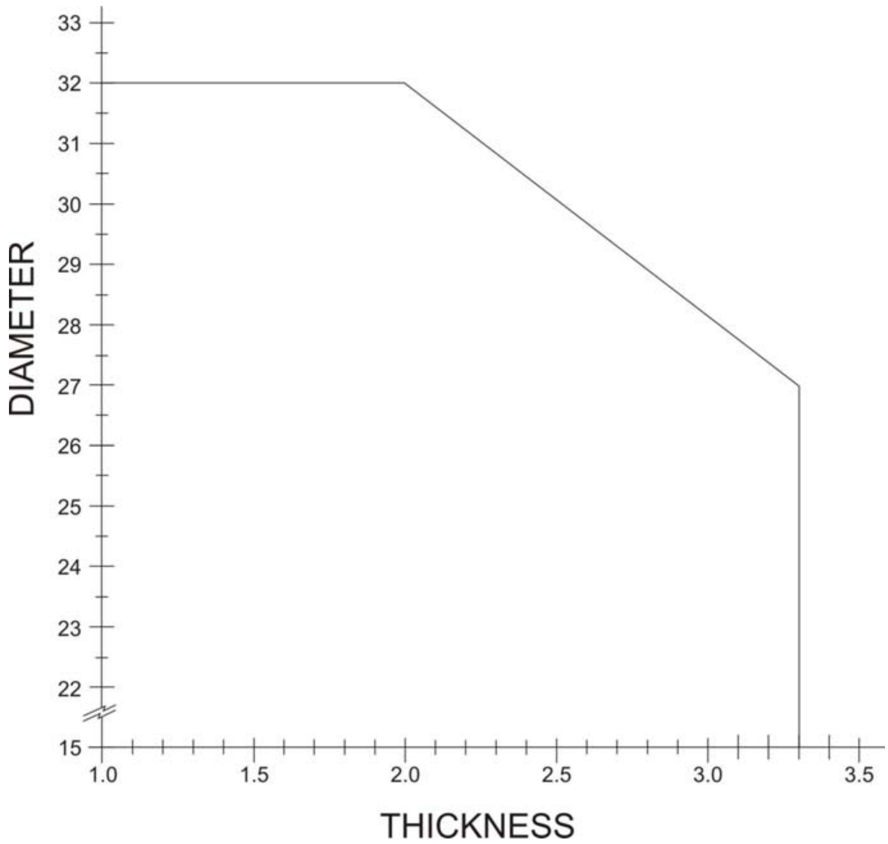
Sorter Path	Sort 1	Sort 2	Sort 3
1	1	0	0
2	0	1	0
3	0	0	0
4	1	1	0
5	1	0	1
6	0	1	1
7	0	0	1
8	1	1	1

1 = Active

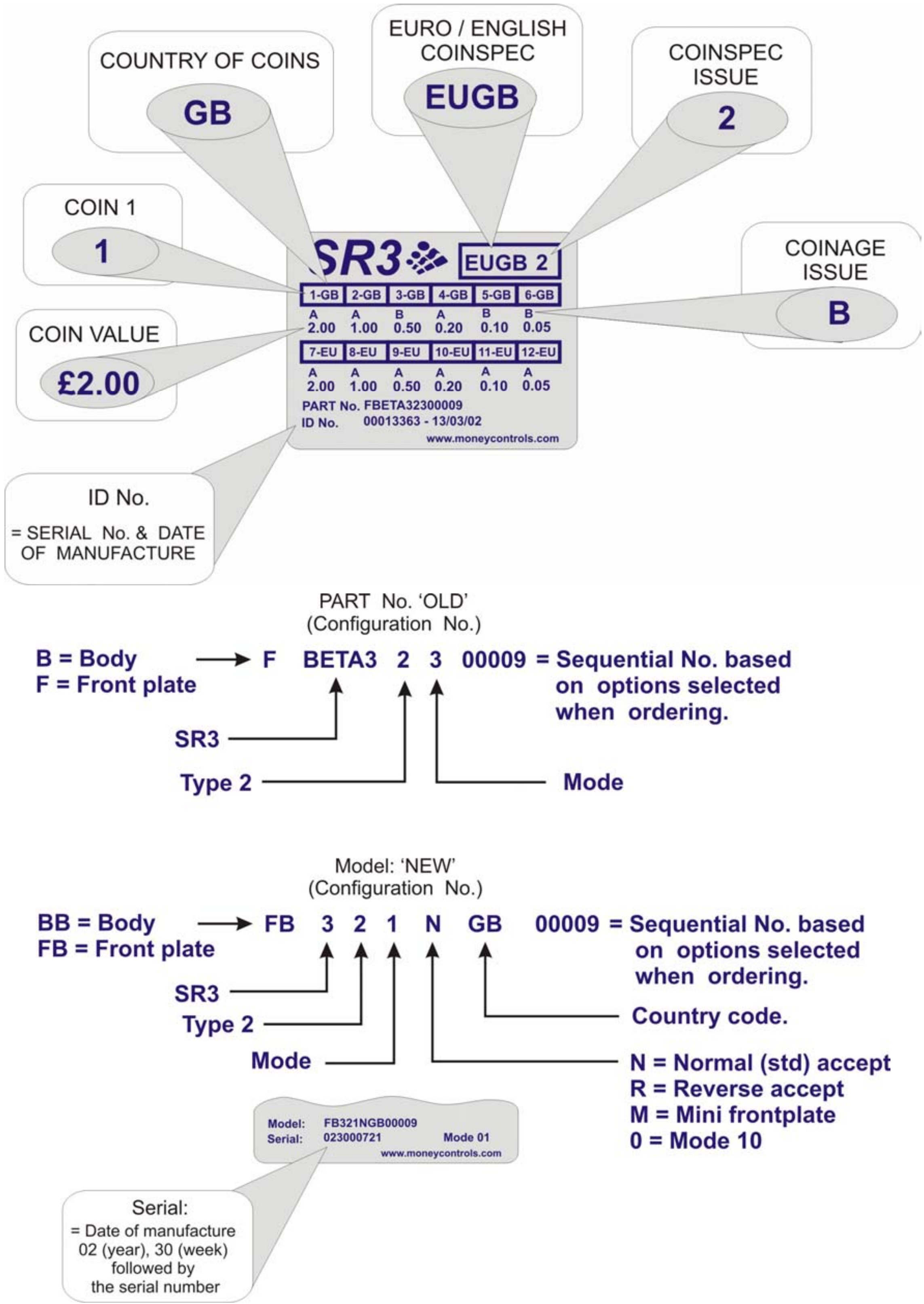
28. Coin Dimensions

The accepted range of coin sizes are shown below:
This Graph is only intended as a guide. If a coin is required that is close to the limits shown, please check with Money Controls Technical Services department first.

Figure 39: SR3 Accepted Coin Dimensions Graph



29. Label Details Explained

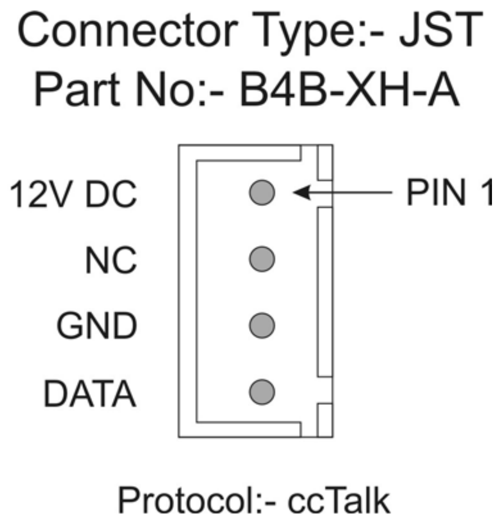


30. Protocol

30.1 Serial Interface

Protocol: **ccTalk** compliant implementation. For further details on this section please refer to the current **ccTalk** generic standard.

*Figure 40: **ccTalk** Serial Connector*



31. ccTalk Serial Messages

*Table 30: Supported **ccTalk** Serial Commands*

Refer to Table 1 of the current '**ccTalk** Serial Communication Protocol - Generic Specification'.

Header	Function	Header	Function
254	Simple poll	**222**	Modify sorter override status
253	Address poll	**221**	Request sorter override status
252	Address clash	**216#**	Request data storage availability
251	Address change	**213**	Request option flags
250	Address random	**212**	Request coin position
249	Request polling priority	**210**	Modify sorter paths
248	Request status	**209**	Request sorter paths
247	Request variable set	**202#**	Teach mode control
246	Request manufacturer id	**201#**	Request teach status
245	Request equipment category id	**197**	Calculate ROM checksum
244	Request product code	**196**	Request creation date
243	Request database version	**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	**182#**	Download calibration information
232	Perform self-test	**173**	Request thermistor reading
231	Modify inhibit status	**170**	Request base year
230	Request inhibit status	**169**	Request address mode
229	Read buffered credit or error codes	**4**	Request comms revision
227	Request master inhibit status	**3**	Clear comms status variables
226	Request insertion counter	**2**	Request comms status variables
225	Request accept counter	**1**	Reset device

 # Not supported on the Italian "ITY" Version, Modes 14 and 15.

The following error codes are supported.

Table 31: Supported Error Codes

Refer to Table 3 of the current '**ccTalk** Serial Communication Protocol - Generic Specification'.

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
17	Coin going backwards
23	Credit sensor reached too early
24	Reject coin (repeated sequential trip)
25	Reject slug
27	Games overload
28	Max coin meter pulses exceeded
254	Coin return mechanism activated (flight deck open)

The following fault codes will be supported.

Table 32: Supported Fault Codes

Refer to Table 4 of the current '**ccTalk** Serial Communication Protocol - Generic Specification'.

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

The following status codes will be supported.

Table 33: Supported Status Codes

Refer to Table 5 of the current '**ccTalk** Serial Communication Protocol - Generic Specification'.

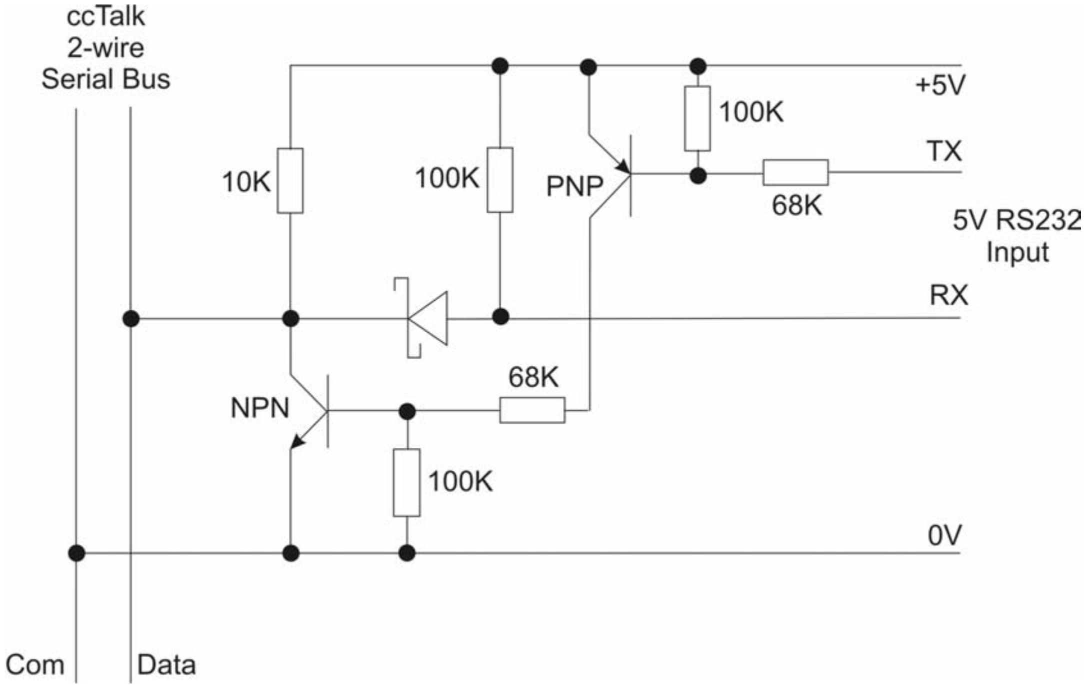
Code	Status
1	Coin return mechanism activated (flight deck open)

32. ccTalk Interface Circuits

32.1 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 41: Circuit 1, **ccTalk** Standard Interface*



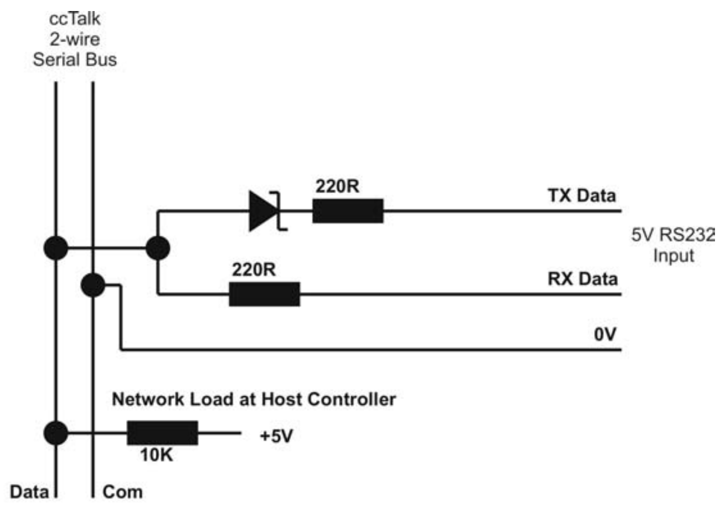
Typical Components

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

32.2 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.

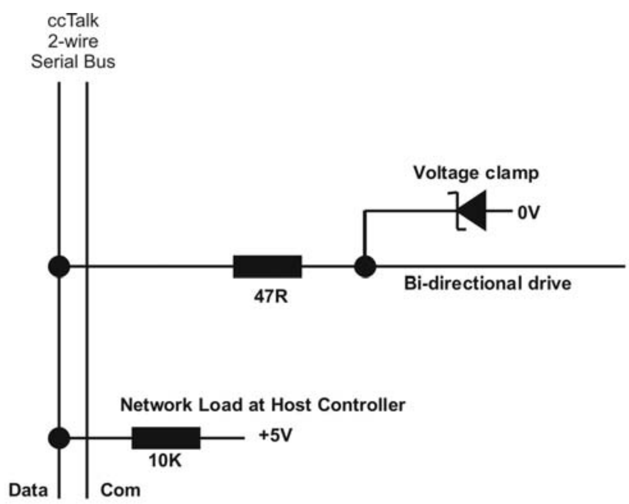
*Figure 42: Circuit 2, **ccTalk** Low Cost Interface*



32.3 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.

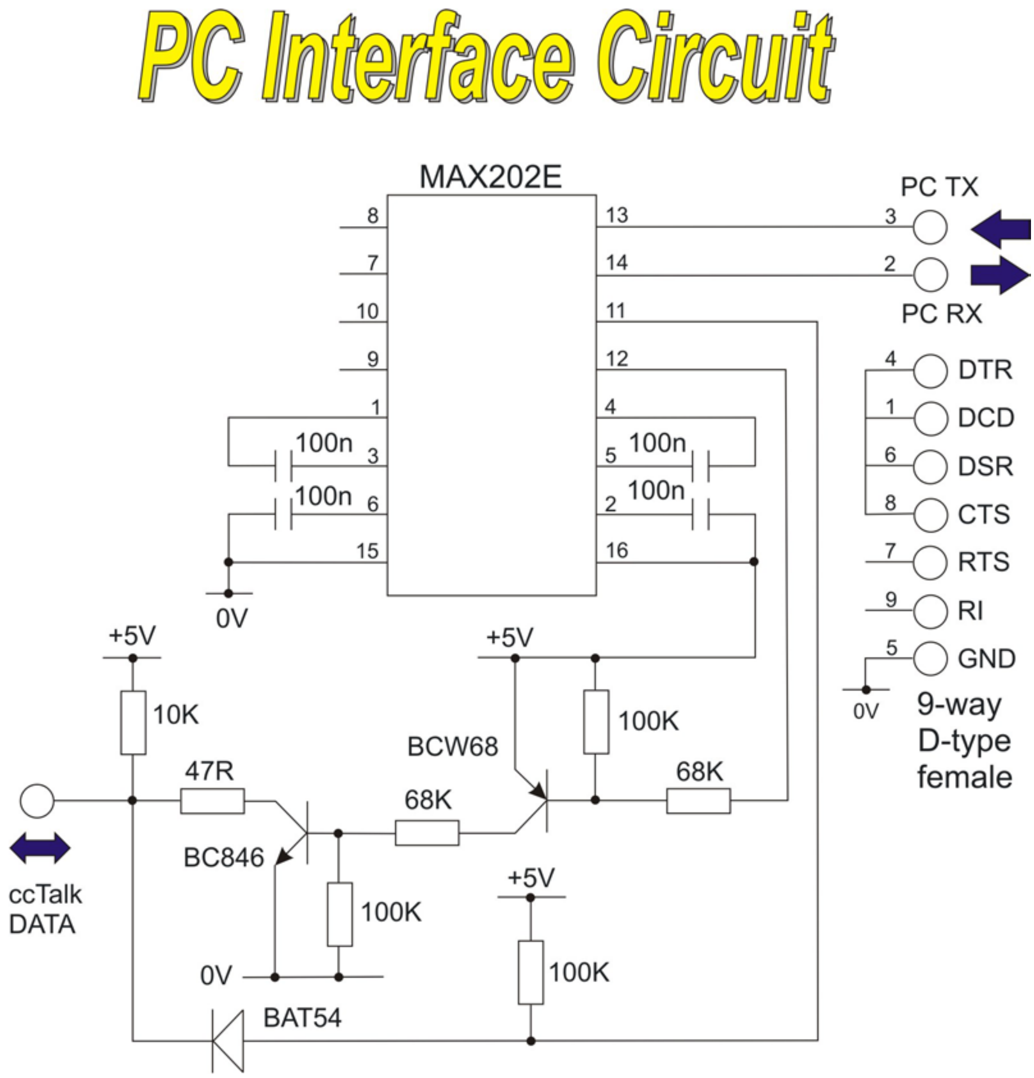
*Figure 43: Circuit 3, **ccTalk** Direct Interface*



32.4 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 44: Circuit 4, **ccTalk** PC Interface*



33. Fault Finding

The following information is presented for customers' guidance in rectifying a fault but does not cover all possible causes.
All acceptors with electronic faults should be returned to Money Controls Ltd. or to an approved service centre for repair.

Symptom	Investigate	Possible Cause
Acceptor does not work (all coins reject).	Connector.	Poor contact. Loose wire.
	Power supply.	Not switched on. Incorrect voltage. Inadequate current. Rise time too slow.
	Inhibit All input.	Acceptor inhibited.
	Accept gate.	Gate not free or dislocated.
	Accept channel.	Obstructed.
	Reject gate.	Not fully closed.
	LED on rear cover is RED.	EEPROM checksum error[6]. SR Sensor faulty[7,8]. Credit opto's faulty[7,8]. Credit sensor blocked[7]. Reject Lever pressed[9]
	LED on rear cover is YELLOW.	Remove the power and re-apply. LED should be green.
Poor acceptance of true coins.	Power supply	Voltage less than 10V. (NB voltage drops when solenoid is activated).
	Accept gate.	Gate not free or dislocated.
	Connector.	Loose.
	Coin rundown.	Dirty.
	Bank select.	Both banks are enabled and programmed with the same coins[10].
Coins stick or jam in acceptor.	Accept channel. Accept gate. Reject gate.	Dirty or mechanical damage.
One of the true coin types always rejects.	Label.	Coin not programmed.
No accept signal.	Connector.	Loose or broken wire.
	Accept channel.	Dirty or obstructed. (acceptor time-out)

[6] This condition requires the SR3 to be reprogrammed.
[7] These faults will only be seen if 'Power-up Diagnostics' is ON.
[8] These faults require to SR3 to be returned for repair.
[9] The SR3 will time out after 20 sec's. Alternatively, switch the power off then on.
[10] Refer to page 61.

34. Service

The coin rundown area should be cleaned regularly to ensure accurate discrimination 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 rundown is gained by opening the reject gate.

35. Electrical Interface Requirements

Table 34: Power Supply

	Mode 7	Modes 14/15 & 20	All Other Modes
Voltage:	40V	12V	12V – 24V dc +/- 10%
Absolute:	Min 10V Max 42V	Min 10V Max 16V	Min 10V Max 28V
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:	200 ms 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 35: Current Consumption

Typical:	70mA
Maximum:	450mA

Table 36: Environmental Ranges

Operating temperature range:	0°C to 60°C	10% to 75% RH non-condensing
Storage temperature range:	-30°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.)		

36. Specified EMC Performance

36.1 Emissions

This product is compliant with EMC test specification EN55014-1; 1997

36.2 Immunity

This product is compliant with EMC test specification EN55014-2; 1997

37. Material Flammability Rating

Major plastic part of the SR3 (the body) is rated at:-	UL94-V0
The other parts are rated at:-	UL94-HB
The PCB is rated at:-	UL94-V0

38. Appendix A – Available Parallel Interface Looms

Table 37: Available Parallel Interface Looms

Loom Length	Spares Part Number
SR3 loom assembly 220mm	SSR3NNXX00042
SR3 loom assembly 250mm	SSR3NNXX00039
SR3 loom assembly 400mm	SSR3NNXX00040
SR3 loom assembly 500mm	SSR3NNXX00041
SR3 loom assembly 520mm	SSR3NNXX00043
SR3 loom assembly 550mm	SSR3NNXX00045
SR3 loom assembly 650mm	SSR3NNXX00046
SR3 loom assembly 850mm	SSR3NNXX00044
SR3 loom assembly 3000mm	SSR3NNXX00047

39. Appendix B – Parallel Interface Pin-outs

Pin	Mode 1	Mode 2	Mode 3	Mode 5	Mode 6	Mode 7			Mode 8	Mode 9 Low power	Mode 10	Modes 14 & 15	Mode 20
						Mode 1 10 pin Conn	Mode 7 Stepper mode	Mode 1 16 pin Conn					
1	GND	GND	+12V	GND	GND	GND	GND	NC	GND	GND	GND	GND	GND
2	+12V	+12V	GND	+12V	+12V	+40V	+40V	NC	+12V	+12V	+12V	+12V	+12V
3	Accept 5	Accept 5 / Inhibit 5	NC	Accept 5	Sort B	Accept 5	NC	NC	NC	Accept 5	Accept 5	Sort B	Accept 5
4	Accept 6	Accept 6 / Inhibit 6	Counter	Accept 6	Sort A	Accept 6	NC	NC	Counter	Accept 6	Accept 6	Sort A	Accept 6
5	Reject	Reject	NC	Divert Signal	NC	Reject	Reject	NC	NC	Reject	Reject	NC	Reject
6	Inhibit All	Inhibit All	Inhibit All	Inhibit All	Inhibit All	Inhibit All	Inhibit All	Inhibit All	Inhibit All	Inhibit All	Inhibit All	Inhibit All	Inhibit All
7	Accept 1	Accept 1 / Inhibit 1	Credit	Accept 1	NC	Accept 1	NC	Accept 3	Credit	Accept 1	Accept 1	NC	Accept 1
8	Accept 2	Accept 2 / Inhibit 2	NC	Accept 2	Counter	Accept 2	Price 1	GND	NC	Accept 2	Accept 2	Not used	Accept 2
9	Accept 3	Accept 3 / Inhibit 3	NC	Accept 3	Credit	Accept 3	Price 2	Accept 4	NC	Accept 3	Accept 3	Not used	Accept 3
10	Accept 4	Accept 4 / Inhibit 4	NC	Accept 4	NC	Accept 4	NC	Accept 5	NC	Accept 4	Accept 4	NC	Accept 4
11	-	-	-	-	-	-	-	Accept 6	-	-	-	-	-
12	-	-	-	-	-	-	-	Accept 2	-	-	-	-	-
13	-	-	-	-	-	-	-	Accept 1	-	-	-	-	-
14	-	-	-	-	-	-	-	Accept 6	-	-	-	-	-
15	-	-	-	-	-	-	-	Accept 6	-	-	-	-	-
16	-	-	-	-	-	-	-	+40VDC	-	-	-	-	-
PCB type	1	1	1	1	2	3	3	3	1	-	4	2	5
Cover type	1	1	1	1	1	2	2	2	1	-	2	1	1

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