Smart Coin System User Manual

GA02033

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1 DOCUMENT INTRODUCTION

1.1 Document Issue

Rev.	Date	Amendment Details	Issued by
--	19/02/15	First Issue	JB
1.1	4/May/2015	Added safety warning	IJ
1.2	21/Jul/2015	Added Managing the coins…	IJ

1.2 Copyright

1.3 Limited Warranty

Innovative Technology Ltd warrants each of its hardware products to be free from defects in workmanship and materials under normal use and service for a period commencing on the date of purchase from Innovative Technology Ltd or its Authorized Reseller, and extending for the length of time stipulated by Innovative Technology Ltd.

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1.4 Product Safety Information

Throughout this manual set, we may draw your attention to key safety points that you should be aware of when using or maintaining the product.

These safety points will be highlighted in a box, like this:

Caution!

Mains voltage is present on these terminals

This manual set and the information it contains is only applicable to the model stated on the front cover, and must not be used with any other make or model.

Read before using product!

1) Do not put a hand into the Smart Coin System while power is applied. Danger of injury!

2) It is possible for a static charge to be transferred onto the coins during normal operation. The coins should be discharged to earth before they are accessible to the user.

3) The base plate should always be connected to earth.

2 PRODUCT INTRODUCTION

2.1 General Description

The SMART Coin System (SCS) is a state of the art bulk coin validator, mixed coin hopper and recycler in one.

The unit validates, discriminates and stores mixed coins, eliminating coin starvation & the need for multiple hoppers.

With a market leading coin hopper capacity and fully audited, efficient refills the SMART Coin System is designed to eliminate coin starvation and significantly reduce operator collection costs. Operating at a market leading 12 coins per second the SMART Coin System improves operator cash flow, significantly reducing collection costs.

2.2 Key Features

- State of the art bulk coin validator, hopper & recycler
- Eliminates coin starvation
- Market leading coin capacity, acceptance and payout speed
- Lowest cost of ownership

- Floating function
  - When the SCS receives the command to float to a required level, coins are sent to the cash box until the requested float level remains in the hopper
- No need for additional sorters, hoppers or tubing
  - All coins validated by the coin feeder before entering the hopper. The hopper will then send all unrequired coins (not needed for future payments) to the cash box.
- Built in security
  - Modulated coin exit sensor; 128 bit AES Encrypted SSP communications (eSSP); locking option.
- The SMART Hopper can be used to control a coin acceptor making machine wiring and software implementation simpler. There is no need to have a separate ccTalk bus to control the coin acceptor. Only 1 SSP bus is required, the hopper then communicates with the coin acceptor using a ccTalk connection.

2.3 Typical Applications

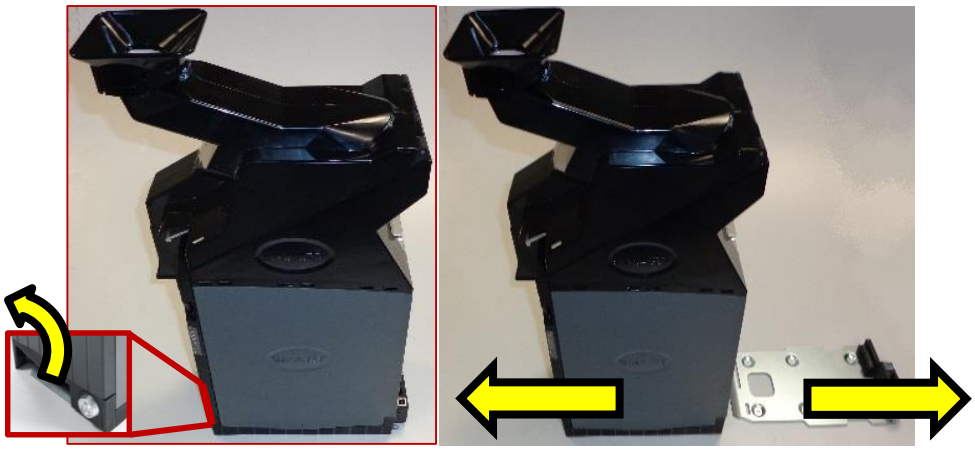
The SMART Coin System can be used in a variety of situations where coin acceptance, validation and recycling are needed. Some typical applications are:

- Automated change transactions
- AWP and SWP applications
- Self-Serve and Retail
- Kiosks
- Casinos
- Parking and Ticketing
- Vending

3 INSTALLATION

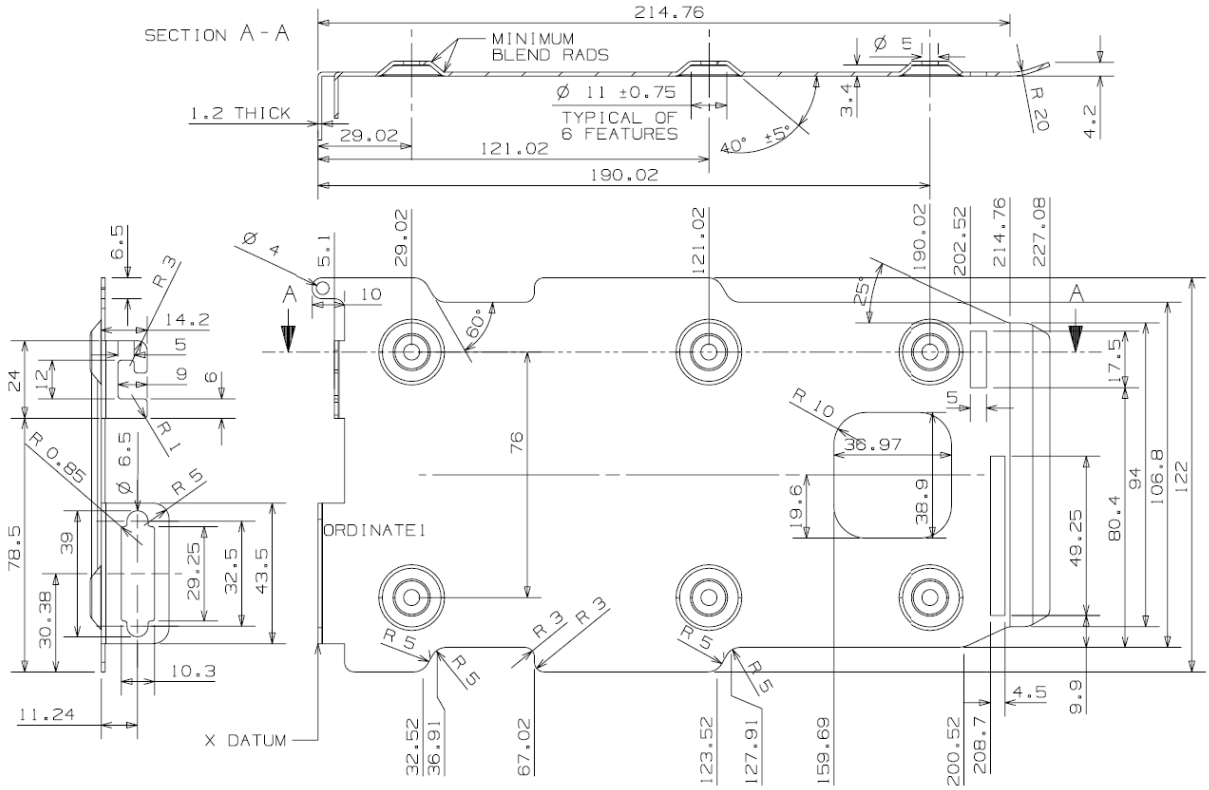
3.1 Preparation

If you received your Smart Coin System already mounted on the baseplate, remove it.



3.2 Baseplate Mounting Requirements

Ensure that the mounting position and note exit hole meets the dimensional requirements as shown below (all dimensions are in millimetres mm):



The coins fall from the cashbox exit chute and are intended to be caught in the host machine cashbox.

The maximum thickness of the shelf (on to which the baseplate is mounted) is 10mm – including any items which protrude below it (such as nuts, washers, screws etc.).

WARNING!

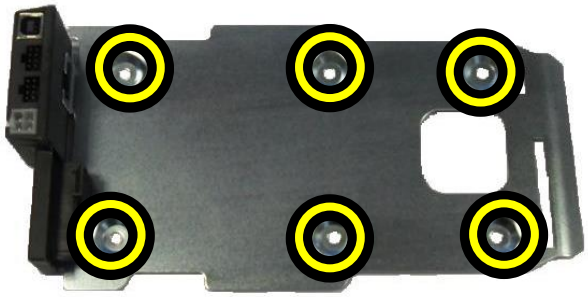
Ensure there is space for coins to fall clear.

Ensure that there is space below the **exit chute** to allow the coins to fall clear of the coin exit.

WARNING!

Always ensure the bottom cash box exit on the underside of the SMART Hopper is clear to allow coins to exit. Failure to do so can result in permanent damage to the internal mechanisms

Secure the baseplate in position using the screw holes provided.



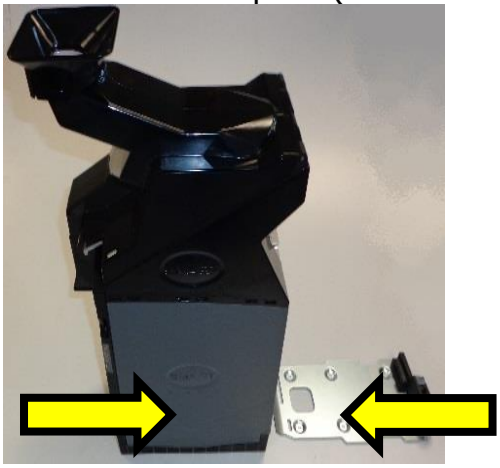
WARNING!

Ensure baseplate mounting screws are flush with the surface of the baseplate.

Do not allow screw heads to foul the SMART Coin System.

3.3 Mounting the Smart Coin System

Slide the Smart Coin System on to the baseplate (reverse of removal).



3.4 Connect the unit

Connect the cable from the host machine to the connector on the rear of the mounting plate. See Mechanical & Electrical Documentation for connection details.

Apply power to the unit (host machine).

3.5 Configuration

The SMART Coin System does not use DIP switches to configure the unit – configuration and setting is carried out by use of a Configuration Button on the front of the SMART Coin System body (below/left of the Led cluster):

There are several functions available when using the Configuration Button, and these are listed in the next table:

WARNING!

Risk of unit damage

When in programming mode, do not turn off the power before the operation is complete as this will make the unit unusable.

3.5.1 Configuration Button Functions

Action	Power Status	Function
Press the button, then press the button again within 5 seconds (do not double click a pause in press is required)	Powered ON	Switches interface between SSP and CC2.
Press and hold for longer than 5 seconds	Powered ON	Switch between USB mode (CDE & HID)

3.5.2 Flash Counts (Interface Type)

Flash Count 🔴	Flash Count 🟢	Interface
1 (Flashing Slow)		SSP
1 (Flashing Slow together)	1 (Flashing Slow together)	CC2
1 (Flashing Alternately)	1 (Flashing Alternately)	DES Trusted Mode

The SMART Coin System leaves the factory pre-set to at least one currency and one interface so that it is ready for immediate installation. The dataset and interface used are shown on the label fixed to the back of the SMART Coin System.

3.5.3 DES Trusted Mode

When set to CC2 with DES enabled. DES trusted mode can be entered by resetting all denomination levels to 0. On a power cycle the SMART Coin System will automatically enter DES trusted mode for 2min to allow for pairing to the host. The easiest way to set all levels to zero is to run an empty cycle.

3.5.4 Programming and Dataset loading

For programming and loading a new dataset in some cases it may be possible to connect to the unit using the USB connectors on the SMART Coin System.

These connections are NOT for operational use. The 8 way connector should be used at all times.

3.5.5 SD Card Update

Updating the SMART Coin System with a SD Card is a very quick and simple process.

You require a Class 4 SD Card.

A computer with a SD Card Reader

The card needs to be blank formatted in the FAT32 format.

Simply copy the Dataset/Firmware file on to the SD Card with the file renamed as update.cf1.

Then place the SD Card in to the SD slot on the front of the Smart Coin System. During the update the LED lights will pulse at high speed. Once the update is completed the SMART coin System will reset.

3.6 Basic Operation

The SMART Coin System is a device that can validate, store and later dispense a large number of mixed denomination coins.

The SMART Coin System has two Light Emitting Diode (LED) indicators that are used to show the status of the unit (one Red, one Green) – these can be found on the front of the unit. If the SMART Hopper unit is operating normally, only the Green LED should be lit: when operating normally this LED will flash once every second.

The SMART Coin System has inbuilt fault detection. If there is a configuration or other error, the Status Indicator LEDs will flash in a particular sequence.

A summary of the Flash Codes are shown below:

🔴	Flashing Fast	- In Bootloader
	Flashing Fast at Power up	- Calibrating
	Flashes x 2	- Calibration Error
	Flashes x 3	- Fraud Attempt
	Flashing Slow	- Idle & not enabled (SSP)
🔴 🟢	Flashing Slow	- Idle & not enabled (CC2)
	Alternating Slow	- DES Trusted mode (CC2 DES enabled)
🟢	Flashing Slow	- Enabled

4 MANAGING THE COINS – OPTIMUM USE

In order to get the best from the SMART Coin System, please observe the following:

a) Minimum hopper coin levels: the recommended minimum is 20 pieces of each denomination, the absolute minimum is 10 pieces of each denomination or 50 coins, whichever is less. Less than this will result in extended search times for the correct coin or even time-outs.
b) Maximum hopper coin levels: the maximum is determined by the physical level (height) of the coins held. This is observed and reported by the 'Full Sensor' (optical) in the hopper bowl. It reports using the 'Device Full' 0xCF SSP event. The actual number of coins to reach this level varies with coin sizes and mix. Typical values are approximately 1500 coins.
The host should use the Coin Level Control commands to ensure that the maximum is not exceeded.

4.1 Coin Level Control commands

Coin levels can be controlled using one or more of the following commands:

Float Amount 0x3D:

This will float the unit to leave the requested value in the unit. Its benefits are:

a) Overall Value Control
b) Calculations are done for you by the SCS

Float by Denomination 0x44:

This will float the unit on an individual coin by coin basis to ensure the actual coin levels remain. Its benefits are:

a) Exact coin levels
b) The absolute maximum of the coins is not exceeded (see above)
c) A good mix of coins at all times to meet the payout values required.

Set Cashbox Payout Limit 0x4E

Allows the host to specify a maximum level of each coin, by denomination, to be left in the hopper. Its benefits are:

a) Floating (paying to cashbox) is done 'invisibly'
b) Levels are reached automatically
c) No out-of-service time while floating takes place

4.2 Small Coins

Coins below 18mm diameter require special considerations.

€0.01 (EUR 1 cent)

During normal operation (payout or stir) the number of €0.01 in the hopper should not exceed 20 or 15% of the total coins – whichever is greater.

If the €0.01 coins exceed this level the SCS will automatically try to dump the excess to cashbox during any payout operation.

If the €0.01 coins exceed this level they should be reduced, as quickly as possible, using the Coin Level Controls commands.

4.3 Large Coins

Large coins (coins larger than the largest in the dataset) can block the recesses in the Coin Feeder disk. In the worst cases this would mean that the normal coins cannot be fed into the hopper.

It is extremely unlikely that this would happen in normal operation. Even so, the SCS monitors for this and if this happens, after a coin feeder activation zero coins are seen in the validation area then the unit will issue a Maintenance Required SSP message (0xC0). This is a warning that the host machine can use to call the site operator to check the unit.

4.4 Filling the unit

When filling with a roll of coins put only one roll of coins into the feeder at one time. Wait for the coins to be completely processed before introducing more coins.

If filling with rolls of different denominations, if possible use the rolls in a mixed order i.e. do not put all the same denomination in at the same time. This will help mix the coins from the start.

When filling with mixed coins, insert 150 coins maximum at one time. Wait for these to be processed before introducing more coins.

Note: During refill some coins may be rejected in the normal way. These should be re-entered once the previous lot have been processed.

Stirring

Stirring is the way of mixing the coins without actually paying any coins out.

After filling the SCS it is recommended that the Coin Stir command is issued (0x5D) with a duration of at least 30 seconds. This will help to ensure optimum payout times for the customer.

5 FIELD MAINTENANCE

This section contains the essential information that the field engineer needs to clean, maintain and fault find a SMART Coin System that is installed in a host machine.

The SMART Coin System has been designed to minimise any problems or performance variations over time. This has been achieved by careful hardware and software design; this attention to the design means there is very little user maintenance required.

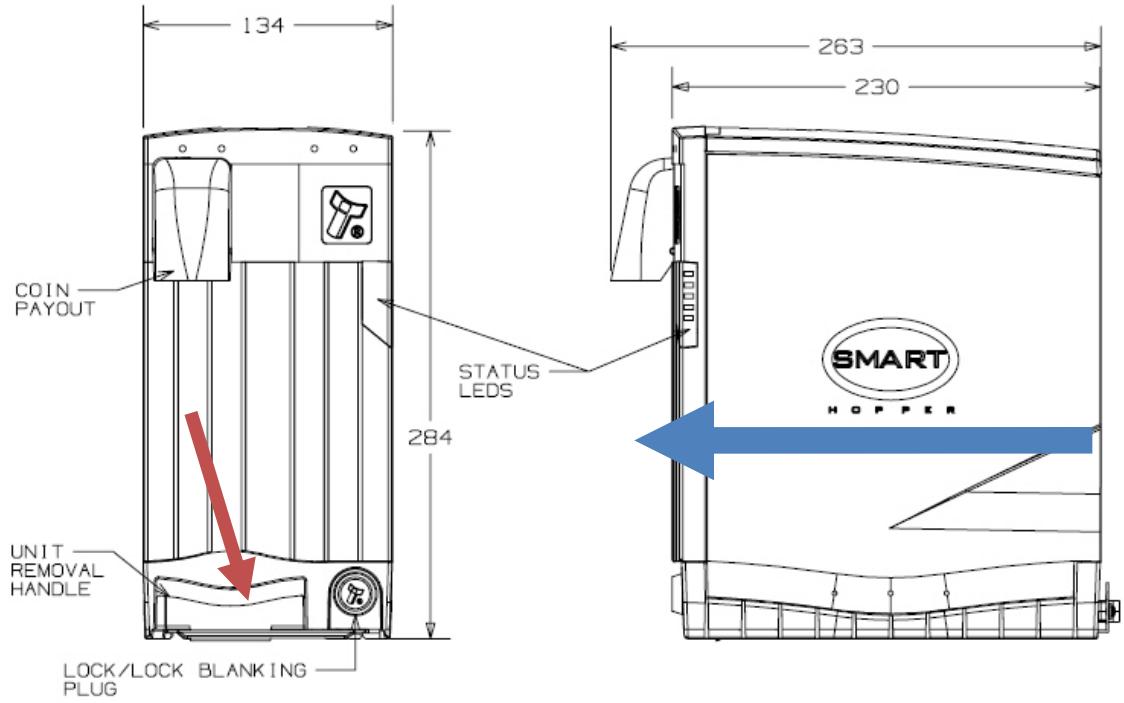
5.1 Detaching SMART Coin Feeder

The below pictures highlight the button location to detaching the different parts.

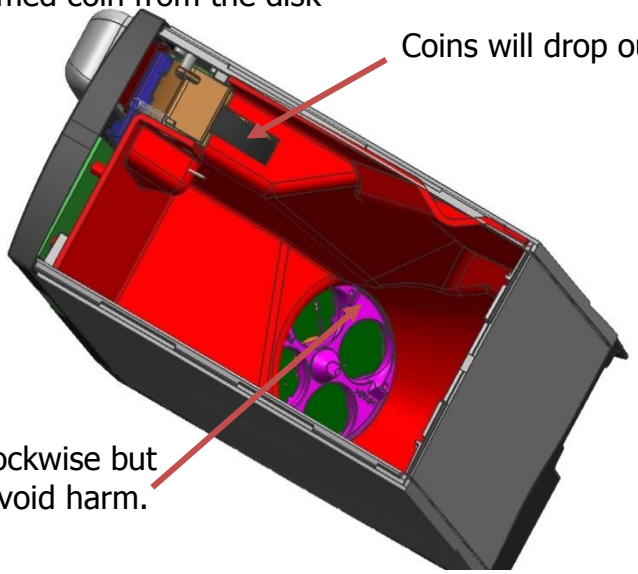
1. The Feeder can be detached from the Hopper pulling up the button.
2. Then Lift the lid of the feeder by lifting the front tab.
3. The feeder should now slide off the hopper as shown below.
4. Push the Feeder back until it stops and lift the Feed from the Hopper.

5.2 Clearing a Jam from the Hopper

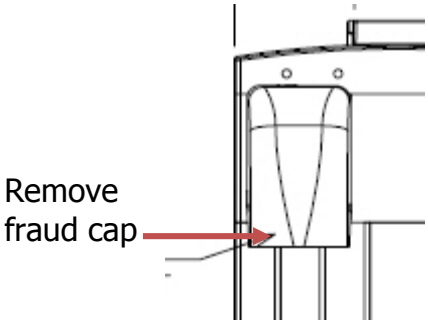
1. Power off the SCS and remove 24volt 4 way power cable.
2. Remove the hopper from the mounting plate



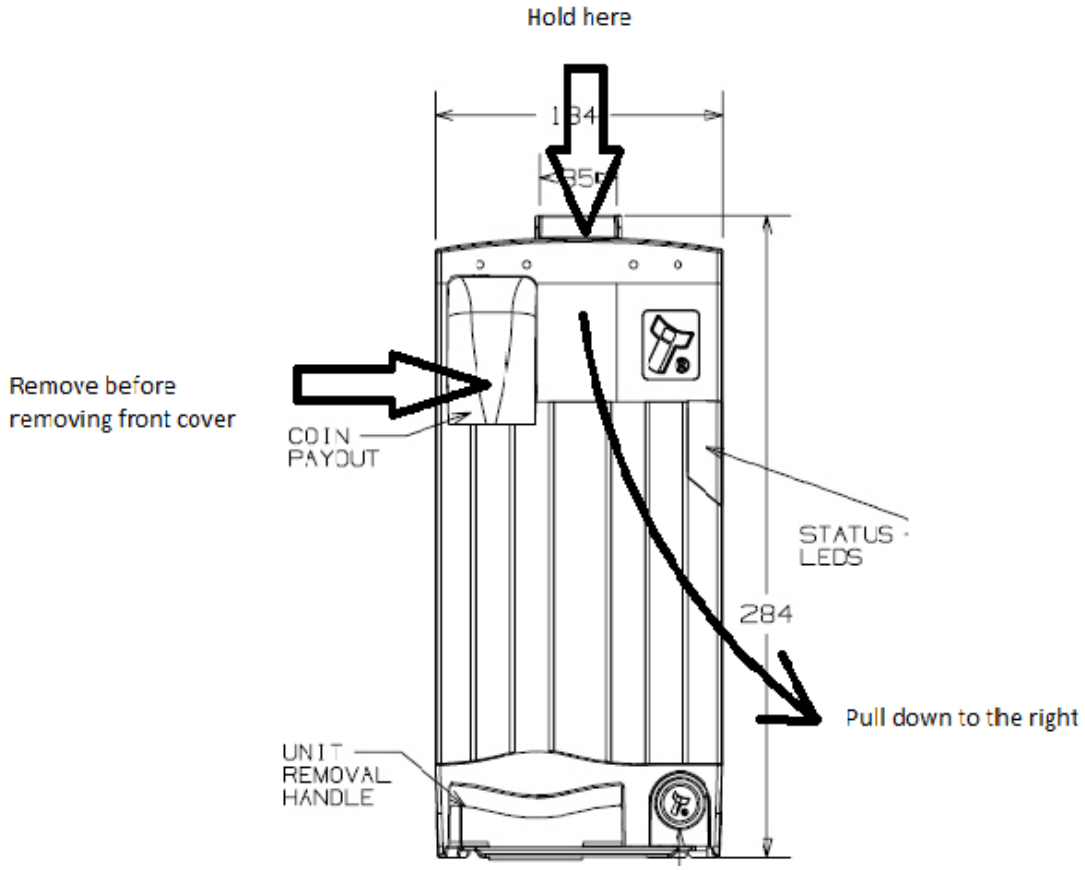
3. Empty all coins from the coin bowl
4. Clear the jammed coin from the disk



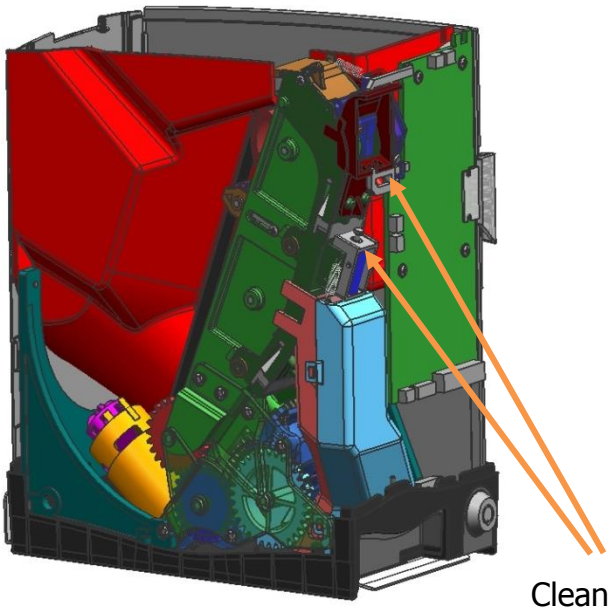
5. Remove coin cover (fraud cover)



6. Re-move the front panel. From the top pull down and right (twist) and the panel clips off.



7. Once the cover is removed check the pistol is not sticking and that the sensor is clean, see picture below.



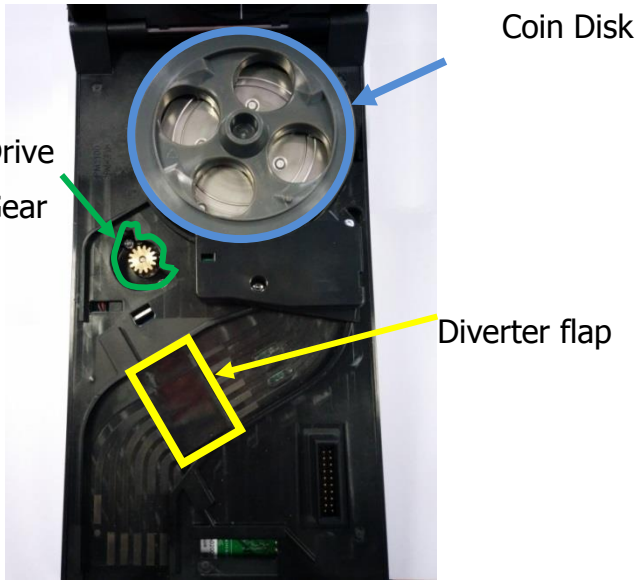
Clean Sensor and pistol.

8. Re-fit all parts
9. Re-attach the hopper to the mounting base plate and the feeder
10. Re-fill the hopper and apply levels to host.
11. Apply power
12. Test operation

5.3 Clearing a Jam from the Feeder

Before attempting to clear the jam you must ensure the power has been removed.

1. Empty all coins from the funnel.
2. Lift the catch on the front of the feeder and lift the lid back.
3. Clear the jammed coin from the disk and ensure it is free to rotate.
4. Wipe the track of any coin dust.
5. Ensure the diverter flap is able to move, the flap should be capable of opening onto the coin path.
6. Once all of the coins have been cleared ensure the drive gear isn't impeded.
7. Close the lid of the feeder and reapply power.
8. Check for normal operation.



5.4 Fault Finding - Flash Codes

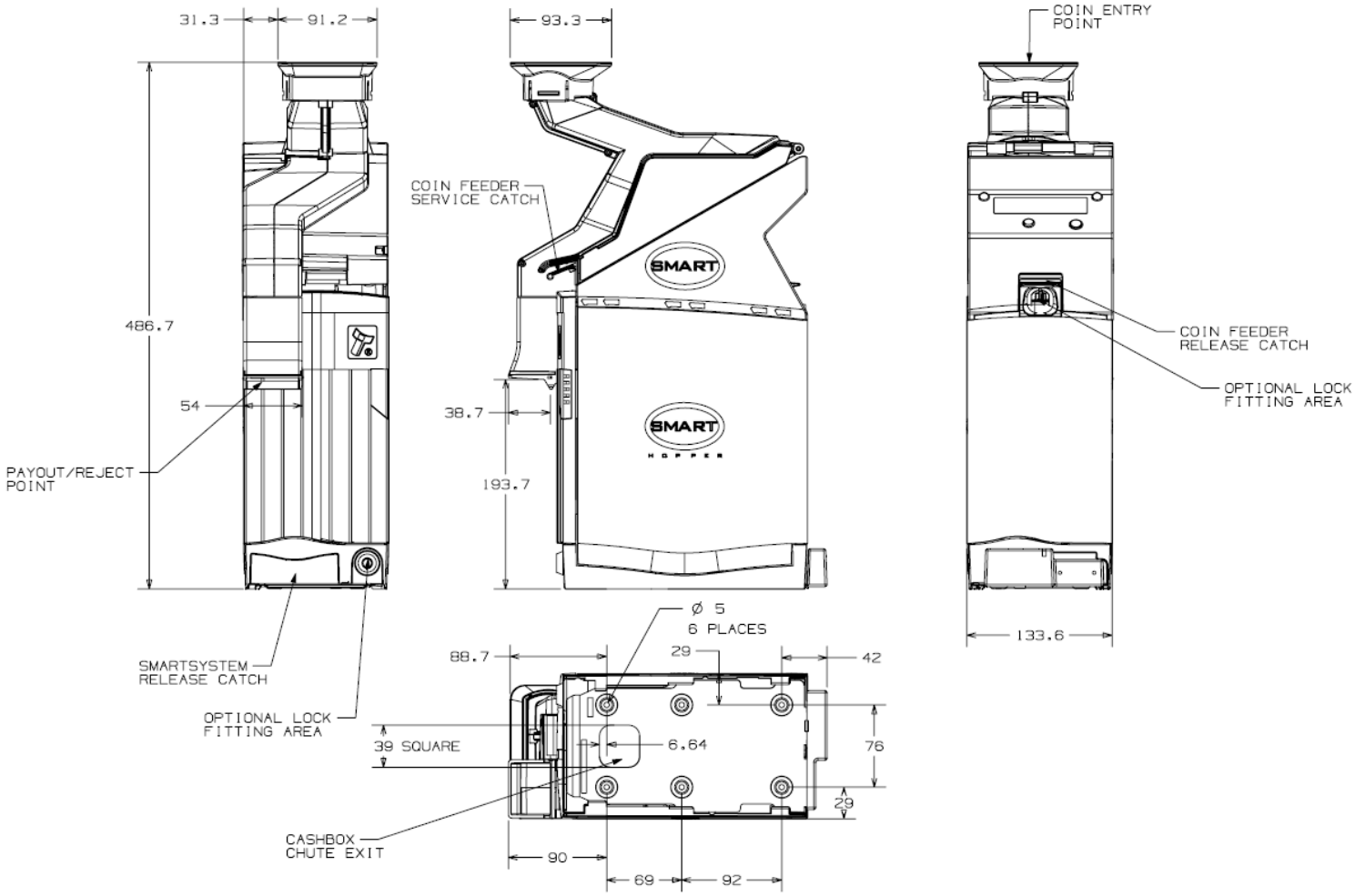
The Smart Hopper module has inbuilt fault detection. If there is a configuration or other error, the Smart Hopper module LED's well indicates will flash in a particular sequence. The Smart Hopper module status indicators are on the front of the Smart Hopper module, seen below:

A summary of the Status Indicator Flash Codes for the payout module are shown here:

Led Colour	Status	Description	Action
Green	Flashing 1Hz	Enabled and ready to dispense	
Red	1 Flash	Hopper disabled	Host system to send enables command.
Red	2 Flashes	Calibration Fault	Optical sensor contaminated. Operator to clean exit sensor light pipe. If fault persists, return to ITL for service.
Red	3 Flashes	No Encryption key set	Host system to negotiate key.
Red	4 Flashes	Coin jammed	Remove power, manually empty coins from bowl and check hopper base for stuck coins. Try manually turning the disc. Persistent jam may require returning to ITL for service.
Red	5 Flashes	Fraud Attempt detected.	Reset hopper. If this persists it indicates a problem with the top pay-out flap, light guide or exit sensor.
Red	6 Flashes	Legacy, no longer used. (Hopper empty)	
Red	7 Flashes	Memory checksum error	Re-download hopper firmware. If this persists return to ITL for service.
Red	8 Flashes	Hopper sensors not initialised	Return to ITL for service.
Red	9 Flashes	Legacy, no longer used. (Lid removed).	

6 MECHANICAL & ELECTRICAL DOCUMENTATION

6.1 Dimensions



6.2 Technical Specifications

Power Requirements		Performance & Reliability	
Recommended Voltage	24V	Weight Empty	4kg
		Full	18kg (approx)
Minimum Voltage	21.6V	MCBF (cycle)	150,000[1]
Maximum Voltage	26.4V	MCBI (cycles)	50,000[1]
Standby Supply Current	200mA	Acceptance[4]	95%
Running Supply Current	3A	Acceptance (3rd time)[4]	97.00%
Peak Supply Current	6.5A	Duty Cycle	
Recommended PSU	7A	Cycle Time	
Warranty	12 Months	Maintainable Life	1,000,000 cycles

Media Specifications				
	Min	Max	Capacity	1500 x €1
Diameter	18mm	28.5mm		1200 x £1
Thickness	1.65mm	3.2mm		

Environmental Specifications		Supported Interfaces
Maximum Temperature	+ 50°C	(e)SSP over ~TTL, cctalk (CC2)
Minimum Temperature	+ 3°C	~TTL levels:
Maximum Humidity	95% NC	Inputs: 0.5V max = 0, 3.7V min = High internal pullup
Minimum Humidity	5%	Outputs: o/collector 0.6V min = Low Max current sink 50mA

Preventative Maintenance Schedule:	- Every 10,000 cycles check belt to ensure it is in good condition. Clean optical level switch on the inside. - Every 50,000 cycles clean coin dust.
Standards & Approvals:	IEC 61249-2-21 Materials for PCBs. [2] CE/RoHS/WEEE IEC/UL 60950 Safety (CB Scheme)

Notes:

[1] To be confirmed by testing
[2] In progress - not yet certified
[3] Street grade true notes (GBP)

Please ensure suitable cable is used for power and communication connections.

6.3 Earth Bonding

It is **very** important that the base plate is bonded to earth, as lack of proper bonding can cause communication issues and failures with the SMART Coin System.

The earth bond should be made to any of the 6 holes in the bottom of the base plate and be bonded to mains earth, typically through the Power Supply Unit.

Information

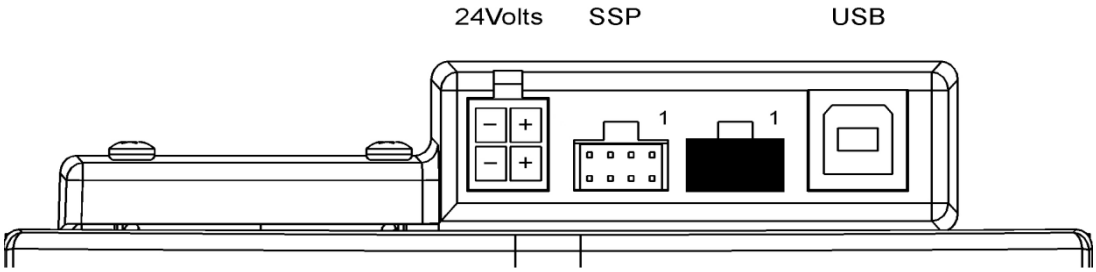
Earth resistance.

The resistance between the base plate and the Earth pin on the mains plug should be less than 0.7 ohms.

6.4 Electrical Interfaces

SMART Hopper

All the connectors needed to set up the SMART Coin System are easily accessible on the bottom base: there are two connectors that are used to allow interfacing and programming:

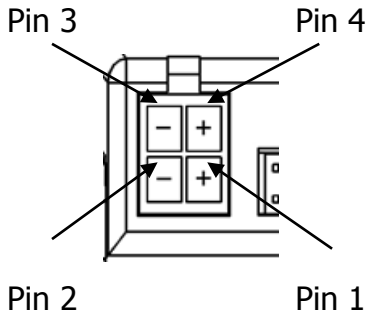


Information

Power always required regardless of connection type.

Power is always required on pins 3 and 4 of the 4 way connector.

The first connector is a 4 pin socket used to power up the SMART Hopper.

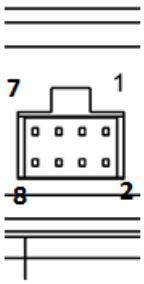


Pin	Description
1	+24V DC
2	0V / Ground Connection
3	N/C
4	N/C

Interface communication from the SMART Hopper unit to the host machine can communicate via SSP or CCT.

The SSP pin numbering of the socket is shown below, as well as an overview of the socket connections:

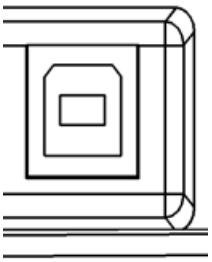
SSP



Pin	Description
1,3&4	N/C
2	0V / Ground Connection
7	Serial Data Out (Tx)
8	Serial Data In (Rx)

The USB connector is a standard Type B USB socket. The USB socket can be used for programming the SMART Hopper unit and also bench testing – a USB 2.0 compliant Type 'A' to 'B' lead can be used to do this. USB cables should be electrically shielded and less than 5 metres long. **Please note:** Direct USB should **NOT** be used for Host communications. If USB is required than our IF17 (TTL to USB) should be used.

USB



7 GLOSSARY OF TERMS

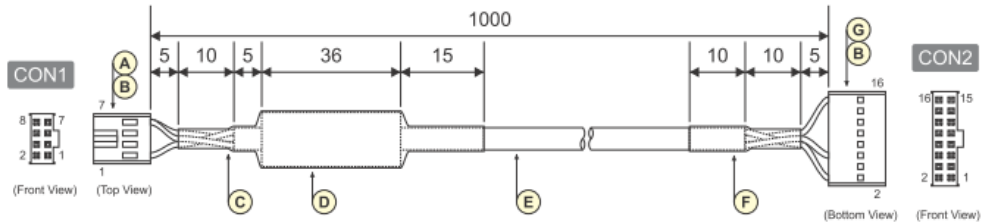
Term	Meaning
A	Ampere
AC	Alternating Current
ACK	Acknowledge
AES	Advanced Encryption Standard
ASSY	Assembly
AV	Average
AWG	American Wire Gauge
AWP	Amusement With Prizes
BNV	Bank Note Validator
ccTalk	Coin Controls Talk
COMMS	Communications
CRC	Cyclic Redundancy Check
DC	Direct Current
DIA	Diameter
DIP	Dual Inline Package
ECB	Electronic Code Book
EEPROM	Electrically Erasable Programmable Read Only Memory
eSSP	Encrypted Smiley® Secure Protocol
FAQ	Frequently Asked Questions
GA	General Assembly
GND	Ground
Hz	Hertz

ITL	Innovative Technology Ltd
LED	Light Emitting Diode
mA	milliampere
max	maximum
MDB	Multi Drop Bus
min	minimum
mm	millimetre
ms	millisecond
MOD	Modified (or Modification)
NV	Note Validator
PCB	Printed Circuit Board
PDF	Portable Document Format
PiPS	Pay-in Pay-out System
PROM	Programmable Read Only Memory
PSU	Power Supply Unit
QTY	Quantity
RAM	Random Access Memory
ROM	Read Only Memory
Rx	Receive
RoHS	Restriction of the use of certain Hazardous Substances
SIO	Serial Input Output
SSP	Smiley® Secure Protocol
SWG	Standard Wire Gauge
SWP	Skill With Prizes
SYNC	Synchronize

TTL	Transistor Transistor Logic
Tx	Transmit
USB	Universal Serial Bus
V	Volt
V_In	Voltage In
WEEE	Waste Electrical and Electronic Equipment

8 CABLE DRAWINGS

DRAWING NO. CN385 ISSUE 1



Parts List

Item	QTY	Description	Vendor
A	1	90142-0008 housing (2x4way 2.54mm pitch with key)	Molex
B	8	9733272 tin plated crimp	Molex
C	1	66mm long, black heat shrink sleeve	-
D	1	K5A RH 14.2x6.35x36 sleeve core (Single turn)	Paddiford Electronics/Z.Shen Enterprise
E	1	4-core AWM style 2462 24AWG cable	-
F	1	20mm long, black heat shrink sleeve	-
G	1	90142-0016 housing (2x8way 2.54mm pitch with key)	Molex

Connectivity

CON1 Pin	CON2 Pin	Gauge (AWG)	Colour	Comments
2	16	24	Black	Comms_GND
7	1	24	Orange	Vend_1 (SSP_TX)
8	5	24	Brown	Inhibit_1 (SSP_RX)

Note:
Pin 1 (CON1) and Pin15 (CON2) are fitted with crimps but not connected.
All other pins are unloaded

ISSUE NO.	MOD NO.	DATE	MOD BY
1	-	04/01/10	A Lunsong

All parts must be rated to at least UL94-VW1
All connector housings must be rated to UL94-V0

INNOVATIVE TECHNOLOGY LIMITED
DERKER ST. OLDHAM ENGLAND, OL1 4EQ UNITED KINGDOM
TEL: +44(0)161 626 9888 FAX: +44(0)161 620 2890

3rd ANGLE PROJECTION

NOT TO SCALE
All dimensions in mm ±2mm

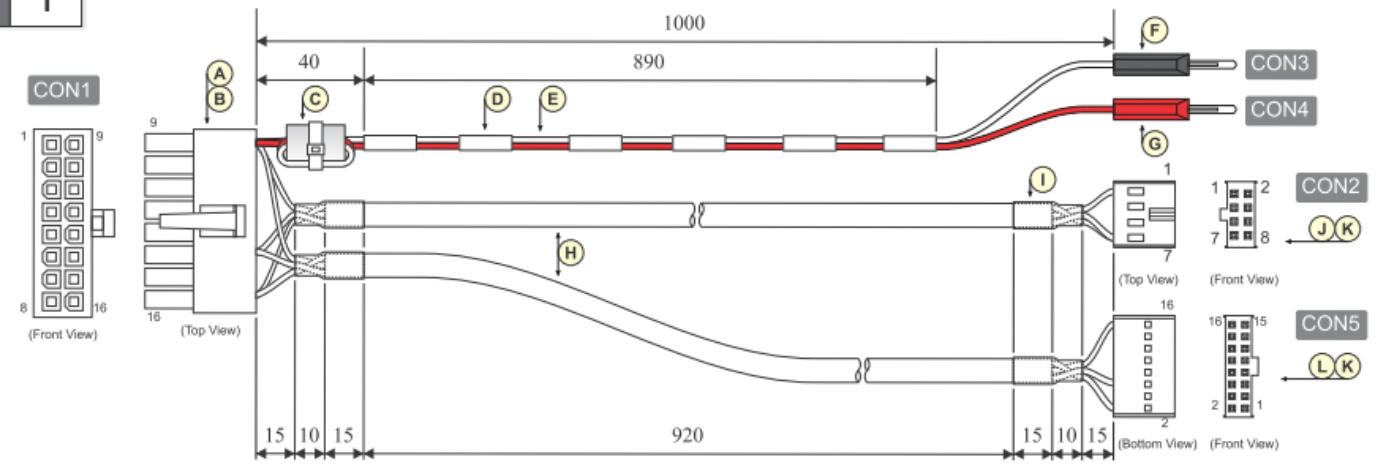
TITLE: SSP Smart Hopper User interface cable assembly (discrete wires)

MATERIAL: All Materials used must be RoHS Compliant

FINISH: -

DRAWN BY	DATE	CHECKED BY	DATE	TOOL NO.
P.Newton	09/04/09	-	-	-

DRAWING NO. CN398 ISSUE 1



Parts List

Item	QTY	Description	Vendor
A	1	0039012165 housing (2x8way 4.2mm pitch Mini-Fit receptacle)	Molex
B	4	0039000038 tin plated, female crimp	Molex
C	1	10-13-165082160-0 (K5A T 16.5x8.2x16 toroidal core) (2 turns (1 loop); cable tie to secure in place)	Paddiford Electronics/ Z.Shen Enterprise
D	10	15mm long, black heat shrink sleeve (spread along the length of harness with typical separation of 82mm)	-
E	2	Standard 22AWG wire	-
F	1	553-0100-01 stackable black 4mm banana plug	Deltron
G	1	553-0500-01 stackable red 4mm banana plug	Deltron
H	2	4-core AWM style 2462 24AWG cable	-
I	4	25mm long, black heat shrink sleeve	-
J	1	90142-0008 housing (2x4way 2.54mm pitch with key)	Molex
K	8	9733272 tin plated crimp	Molex
L	1	90142-0016 housing (2x8way 2.54mm pitch with key)	Molex

Comments

CON1 mates with 6745-2160 straight header (on Smart Payout)
CON2 connects to SSP Hopper Interface Port
CON3 connects to V- (GND) of power supply
CON4 connects to V+ (12V) of power supply
CON5 connects to Host Machine

Connectivity

CON1 Pin	CON2 Pin	CON3 Pin	CON4 Pin	CON5 Pin	Gauge (AWG)	Colour	Comments
16	7	-	-	1	24	Orange	SSP TX (Vend1)
14	8	-	-	5	24	Brown	SSP RX (Inhibit1)
9	-	-	1	-	22	Red	V_IN (12V)
1	2	1	-	16	24/22	Black	GND

Note:
Pin 14 and 16 (CON1) each has two wires crimped together.
Pin 1 (CON1) has three wires crimped together. If crimp is unable to hold three wires together please use AWG 26 for the 4-core PVC cable.
Pin 1 (CON2) is fitted with crimp but not connected.
Pin 15 (CON5) is fitted with crimp but not connected.
All other pins are unloaded.
For the unused wire in the 4-core PVC cable, please trim excess or, if possible, please use a 3-core PVC cable.
Length for both PVC cable is the same

Host machine (via CON5) controls both Hopper and Payout through different SSP addresses. Hence, SSP_TXD_(Vend1) on Payout and SSP TX on Hopper are both linked to pin 1 (Vend1) on CON5.

ISSUE NO.	MOD NO.	DATE	MOD BY
1	-	04/01/10	A Lunsong

All parts must be rated to at least UL94-VW1
All connector housings must be rated to UL94-V0

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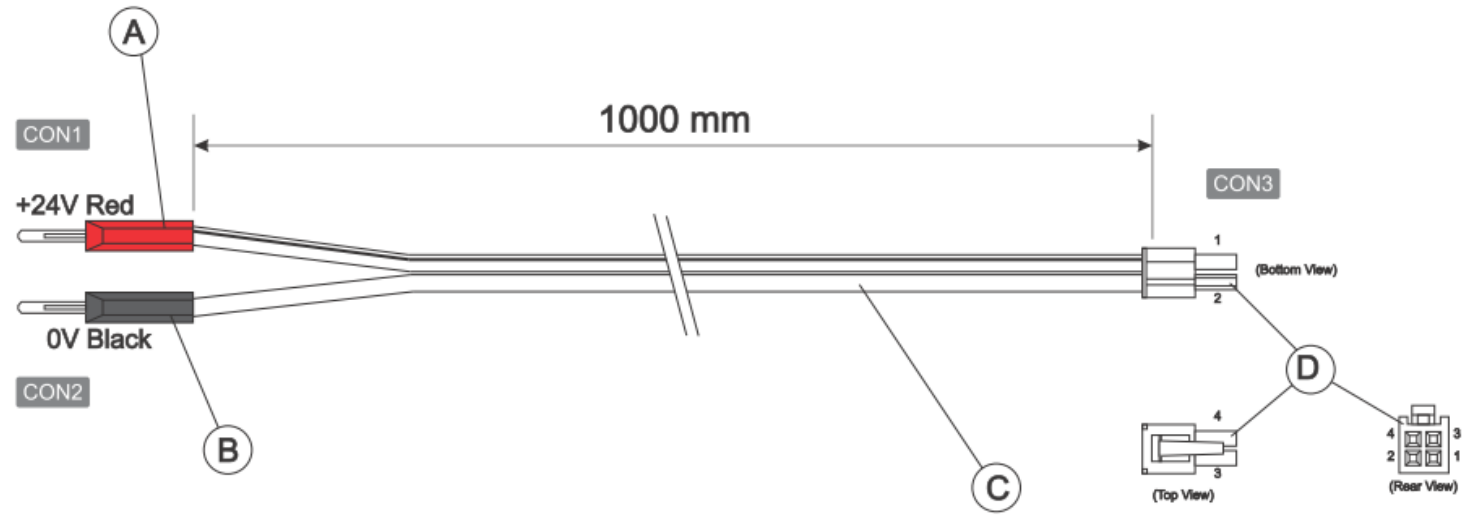
3rd ANGLE PROJECTION

NOT TO SCALE
All dimensions in mm ±2mm

TITLE: Dual eSSP interface to both Smart Payout and Hopper assembly
MATERIAL: -
FINISH: -
DRAWN BY: A Lunsong
DATE: 15/09/09
CHECKED BY: -
DATE: -
TOOL NO.: -

DRAWING NO. CN389 ISSUE 2



Parts List

Item	QTY	Description	Part Number	Vendor
A	1	4mm Stackable Plug, Red	553-0500-01	Deltron
B	1	4mm Stackable Plug, Black	553-0100-01	Deltron
C	1	Polarised Audio Wire, 2 x 0.5mm^2 AWG 20-18	-	-
D	1	4 Circuit Receptacle Housing, 4.2mm PE Series UL94V-2	794954-4	Tyco
E	2	4..2mm PE Series Crimp Socket (Not Shown)	1586315-1	Tyco

Connectivity

CON1 Pin	CON2 Pin	CON3 Pin	Colour	Comments
1	-	1	Black/Red	24V (Hopper Power)
-	1	2	Black	0V (Hopper GND)

Note:
All other pin locations are empty.
Audio wire colour is not important but polarisation marking is required.

ISSUE NO.	MOD NO.	DATE	MOD BY
2	-	28/02/2011	P.Newton
1	-	04/01/10	P.Newton

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All parts must be rated to at least UL94-VW1

3rd ANGLE PROJECTION

NOT TO SCALE
All dimensions in mm ±2mm

TITLE: Hopper Interface Power Cable

MATERIAL: All Materials used must be RoHS Compliant

FINISH: -

DRAWN BY: P. Newton DATE: 14/05/2009

CHECKED BY: - DATE: -

TOOL NO. -

9 CONTACT

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