8 Coin CMM Technical Manual

Money Controls

Contents

Tables

Figures

1. Diary of changes

Issue 1.0……..February 2002

Issue 1.1……6th Sept 2002

- Modification to disclaimer.

Issue 1.2……4th Nov 2002

- Section 11.3 amended to add idle and coin return current details.

Issue 1.3……7th Aug 2003

- Applied TMWP V3.2.
- Converted the spares list into Table 1.

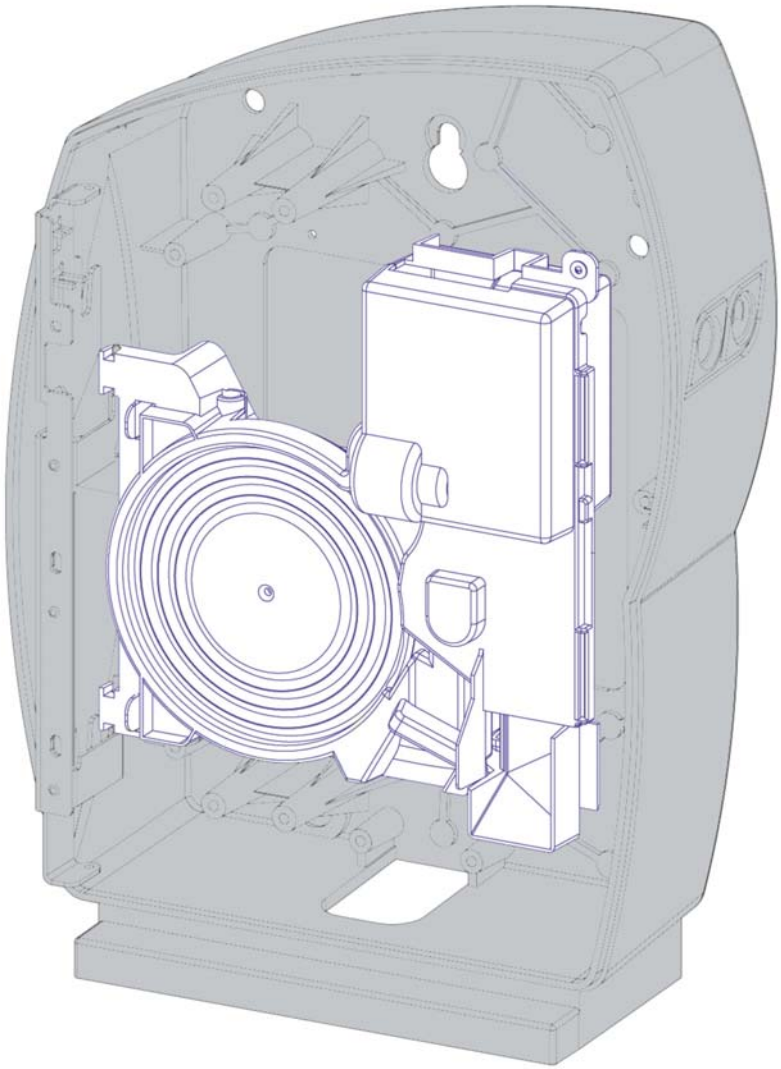
Issue 1.4……30th June 2004

- Changed footer

2. Introduction and Scope

This Technical Manual describes the functionality of a self contained, low power Coin Management Module (CMM). The manual also provides a guide to the installation and subsequent maintenance of the module.
The Coin Management Module acts as an intelligent slave to a Host, such as a payphone (Figure 1), communicating via a serial communication link. It has been specifically designed to handle the majority of the world's coinage without mechanical modification.
The Module manages all the required coin handling functions, including coin discrimination, storage and the cash/refund operations.
The Coin Set to be accepted can be pre-programmed on manufacture, or is capable of being remotely programmed from a Management System. The module can accept up to 12 different coin or token types.

Figure 1: CMM in Payphone



3. General Arrangement

An exploded view of the Coin Management Module is shown in Figure 2.
The CMM incorporates many new features as well as an advanced coin discrimination technology to meet current and future demands for coin recognition. The coin paths have been optimised to reduce the incidence of jams within the mechanism due to slow or damp coins.
The Module is contained by an enclosure, which provides a means of attaching the module to the host. The enclosure also provides protection for the module during transit and storage.
The Coin Management Module consists of five main sub-assemblies; the main chassis, the coin acceptor, the coin store, the control PCB, and the cover.

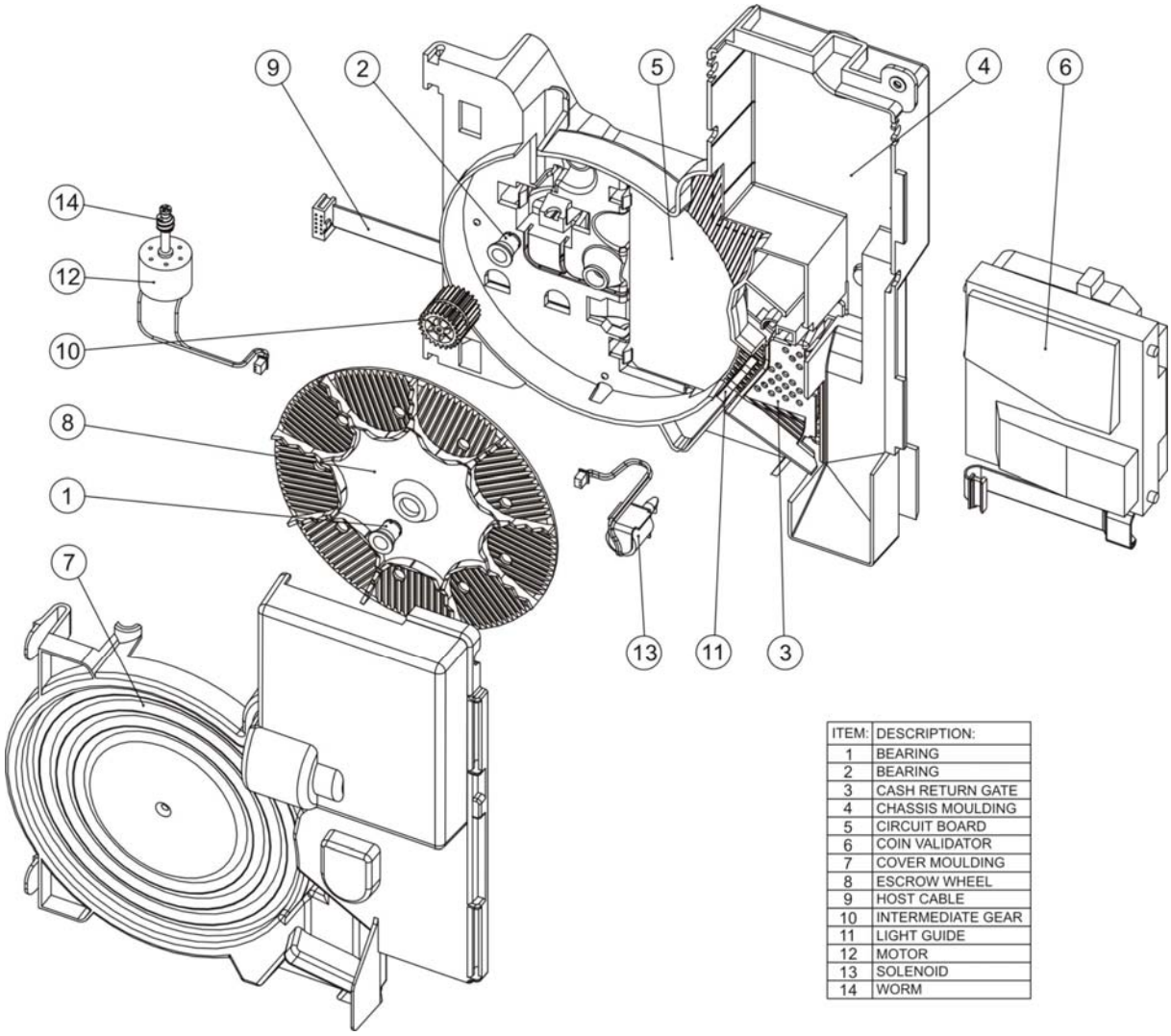
3.1 The Main Chassis

The main chassis is designed, in conjunction with the cover, to hold the coin acceptor, the coin store and the control board in their correct relative positions, and to provide a means to attach the module to the host assembly. The chassis also incorporates clip features to secure the motor and solenoid assemblies. The bearing points for the coin store, the intermediate gear, the cash/refund gate are also features of this moulding.
The cover is retained onto the chassis by an integral hinge and two quick release clips. These clips can be easily released using a thumb and finger and provide a quick release feature should it be necessary to access the inside of the CMM in the field or during service.

3.2 The Coin Acceptor

The C120P coin acceptor mechanism manufactured by Money Controls contains an integral microprocessor controller and associated electronics.
The acceptor's function is to accept pre-programmed coins or tokens and to reject non programmed coins and forgeries (slugs). The processor also controls an integral solenoid operated gate, which directs coins either to the coin store or the reject chute.
The coins to be accepted can be programmed from a remote management system via the host, or locally from a hand held programming device.
The electrical parameters of inserted coins are measured in the flight deck area of the acceptor, the sensing coils being well protected by the body moulding. The flight deck cover is hinged by means of a spring-loaded arm and can be opened to clear debris or jammed coins. The cover may also be opened further manually in order to carry out cleaning etc.
The exit path for rejected coins is vertically below the right hand side of the device, while the accept path is at the left-hand corner. An optical sensor checks that coins have been correctly routed, any error detected being posted to the host by means of a serial data link.
The electronic control board is situated at the rear of the unit and is protected by a removable cover. A polarised 10 way socket at the rear provides power and the connections required for communication with the CMM host controller.

Figure 2: CMM Exploded View



ITEM:	DESCRIPTION:
1	BEARING
2	BEARING
3	CASH RETURN GATE
4	CHASSIS MOULDING
5	CIRCUIT BOARD
6	COIN VALIDATOR
7	COVER MOULDING
8	ESCROW WHEEL
9	HOST CABLE
10	INTERMEDIATE GEAR
11	LIGHT GUIDE
12	MOTOR
13	SOLENOID
14	WORM

3.3 The Coin Store

The coin store consists of a wheel having nine individual pockets, each capable of accepting any coin within the specified range. The wheel can be rotated, allowing accepted coins to be stored sequentially in the pockets as each is aligned with the exit of the coin acceptor. Up to eight coins can be stored in this way.
Further rotation of the wheel allows stored coins to be released from the store by gravity. The coins can then be individually routed to either the cash box or a refund area, depending on the setting of a solenoid controlled cash/refund gate.
An electric motor and a reduction gearbox drive the coin wheel. The motor is controlled by the control PCB, using feedback signals derived from optical sensors monitoring the wheel position.
Two optical sensors, one for each direction of rotation, determine the store position by detecting holes positioned in each pocket. The sensors can also detect the presence of a coin in the pocket.
A further sensor detects coins leaving the store during the cash/refund cycle. In addition, the position of the cash/refund gate is also monitored optically, enabling the detection of any jammed or incorrectly routed coins.
Surfaces of the mouldings, which may come into contact with the faces of coins, feature specially designed ribs. These help to prevent coins sticking to the surfaces in wet or damp conditions. Drainage channels are also provided to assist in the removal of any liquids that may be introduced into the mechanism.

3.4 The Control PCB

The control PCB is located behind the coin store and contains a further microprocessor and associated memory, together with the drive circuits required for controlling the coin store and the cashing solenoid. The optical devices that monitor the store position and the coin routing paths are also mounted directly on the board.
Pre-programmed coin characteristics, together with the unit's fault history are stored in a non-volatile memory, which is supported by a small battery. The capacity of the battery is rated to last for the life of the module.
The interface circuitry to enable communication with the coin acceptor and with the host is also included on this PCB.
The detailed operation of this board is described in the appropriate diagram notes.

3.5 The Cover

The module cover, in conjunction with the main chassis is designed to hold the coin acceptor, the coin store and the control board in their correct relative positions, and to allow the module to be attached to the host. The two parts are snapped together to enclose the module.
Surfaces that may come into contact with coin faces are ribbed to avoid sticking problems in wet or damp conditions. Drain holes are provided to release any liquids that may be introduced.
No adjustments to the module are required or provided for either during factory assembly or during service and maintenance.

4. Principle of Operation

4.1 Coin Acceptance

The coin acceptor contains a dedicated microprocessor, which monitors and controls the acceptance process. In order to save power, the acceptor is normally set in a minimum power configuration. A coin insertion detector remains active.
Coins entering the field of the coin insertion detector cause the acceptor to power up and begin to measure electrical parameters during the coin's flight through a sensing field. The microprocessor analyses this data and compares it with previously programmed coin parameters.
If a match is found, and that particular coin is not inhibited, the in-built accept gate is energised by a processor-controlled solenoid and the coin is routed to the first pocket of the coin store.
If a match is not found, or if the coin is an inhibited type, then the accept gate is not operated and the coin is routed to the reject chute.
An optical sensor checks that an accepted coin has left the acceptor correctly. In the event of an incorrect routing, an appropriate error message is generated. This sensor also gives some protection against certain types of fraud attempt.
A micro-switch on the flight deck provides indication that the deck is open, either because of the presence of debris or because of a possible fraud attempt. Such errors are communicated to the CMM controller via the serial data link.
Up to twelve coin types may be programmed into the acceptor and any or all of these can be selectively inhibited if required. New or modified coin set data may be remotely downloaded to the acceptor from a management system, via a telephone line, or by means of a dedicated terminal.

4.2 Coin Storage

The coin store consists of a wheel having nine individual pockets, each capable of accepting any coin within the specified range. An electric motor and a reduction gearbox are provided to rotate the coin store under the control of a microprocessor fitted to the control PCB.
The motion of the store is controlled by feedback signals, derived from optical sensors, which monitor the store position by means of holes located in each pocket.
During the initialisation process, one of the store pockets is automatically aligned with the acceptor coin exit path, using these sensors.
The first coin to be accepted drops into this pocket and is detected by the optical sensor. After a suitable de-bounce period, the processor will start the drive motor and begin rotate the store in an anti-clockwise direction.
The store will continue to rotate until the next in line pocket is detected, whereupon the motor will be stopped, leaving the second pocket aligned with the acceptor, ready for a further coin to be accepted.
During store rotation, the acceptor is inhibited so that there is no danger of a second coin being accepted and possibly causing a jam condition while the first coin is still being moved.
As subsequent coins are accepted, the store continues to rotate, coins being stored sequentially in the pockets as each is aligned with the exit of the coin acceptor. After the eighth coin has been accepted, the store is not rotated further and the acceptor is turned off, preventing any further coin acceptance.
Although there are nine pockets, only eight coins can be stored, the ninth pocket now being aligned with the store exit path.
If the store becomes full, as it might be during a high value call, the last coin in the store can be automatically cashed when its' value has been used, leaving an empty pocket available for a further coin to be inserted. The acceptor is turned back on to enable this to happen. This process can be repeated for as often as required in order to complete the call.

4.3 Coin Collection

The Module is capable of selectively cashing and refunding any of the coins from the store, so that a "best change" algorithm may be implemented. Best change means that any wholly unused coins in the store are routed to the refund area at the end of the call, whereas used or partially used coins are routed to the cash box.

The stored coins can be selectively cashed or refunded at the end of the call by continued rotation of the store. As each pocket is aligned with the store exit path, the coin stored in that pocket is released from the store by gravity. The coin can then be individually routed to either the cash box or the refund area, depending on the setting of a solenoid operated cash/refund gate controlled by the microprocessor.

The direction in which the store is rotated to perform this operation is determined by power management considerations, the processor choosing the most economical direction dependent on how many coins are present in the store.

An optical sensor array monitors the exit of the store, while a further sensor monitors the position of the gate. Hence incorrect routing or a failure to release a coin from the store can be detected and reported to the host.

The module cashes the minimum number of coins possible to pay for the time used, i.e. large value coins are cashed in preference to low value. This process makes maximum use of the available capacity of the cash container.

The cashing gate is normally set to refund coins when not energised and route coins to the cash box when energised. Hence a failure of the gate to operate for whatever reason will result in all coins being refunded to the customer. This is considered by most administrations to be the fairest option in the case of failure.

If a pre-set threshold of such faults is recorded, a fatal fault message will be sent to the administration centre and the module will be put out of service pending a service visit.

5. Communications

5.1 CMM to Host

Communication between the Coin Management Module and the Host is via a simple asynchronous serial bus, running at 4800 baud.
Messages are broken down into packets of 8 bytes. The 8-byte message frame consists of a message number, an instruction code, up to five bytes of data and a check sum. If more than 5 bytes of data are required, continuation messages are sent sequentially until the data transmission is complete.
The hardware and software interfaces are described in detail in the relevant specifications (refer to Section 13: Relevant documents). This document also fully defines the messages and their format.

5.2 CMM to Acceptor

The serial communication link between the acceptor and the CMM controller conforms to the Money Controls ccTalk protocol. This is also a 4800-baud asynchronous serial bus conforming to RS232. Full details of this protocol are described in the appropriate specification.
Message packets can be a minimum of 5 bytes, for a message with no data, up to a maximum of 255 bytes, 252 of which can be data.
The first byte contains the destination address; the second byte defines the number of bytes to follow in the message. The packet also includes the source address, the message header and a checksum.
Details specific to this application are described in the appropriate C120P specification (see related documents).

5.3 The Coin Download Process

The coin acceptor is usually supplied pre-programmed with either the customer's specified coin set or more usually, with a factory default coin set (usually UK). This simplifies factory testing. Most customers will have the coin download facility provided via a management system, which ensures that the target coin set will be downloaded automatically on installation, overwriting whatever data is resident in the acceptor.
Whenever the CMM module is powered up, the CMM processor enters a routine that checks the identity of both the host and the coin acceptor. This is done using the unique serial number in the case of the acceptor, and the host ID (e.g. telephone number) in the case of the host.
If either of these numbers is different from the numbers previously stored in the CMM's memory, then one or the other of the units has been changed and new data is required.
If the acceptor has been changed for one of the same calibration standard, then the CMM can download the relevant data from its' own memory. If the calibration standard is different, the CMM will have to request new data from the host.
If the host identity is different, then the CMM has been changed. Hence, new data will need to be downloaded, including the new host identity. This process is fully automatic, but will take some time, typically 30 – 60 seconds especially if a full download is required.
The information that is downloaded from the management system during this procedure also includes information that is used by the CMM to manage other coin handling functions.
Data relating to the volume of the coins enables the remaining cash box capacity to be calculated. Other data includes the coin inhibit map, information concerning operator tone frequencies and the fault thresholds.
The CMM Software Interface document describes the download process and the data in detail, see related documents.

6. Power Management

The CMM is designed to operate in applications where the available power is limited, for instance in telephone line powered equipment.
Hence, wherever possible, the processors on both the CMM and the acceptor are put into the lowest power mode possible while not actually performing a coin-handling task.

The acceptor is powered up by either a coin entering the sensor field or, if the CMM wishes communicate with the acceptor, by activation of the bi-directional 'ready' line from the CMM. As soon as the requested task is completed, the acceptor returns to the low power state.

The CMM is powered up either by the acceptor raising of the 'ready' line, or by the host activating the 'wake up' line.

The acceptor will raise the 'ready' line if there is a serial credit available. The CMM wakes up and polls the acceptor for the credit message and takes appropriate action to handle the expected coin. After completion of the required task, the CMM returns to a low power state.

The CMM will raise the 'ready' line if it wishes to obtain data from the acceptor, such as test or diagnostic results, or if it is required to download revised coin data. When the current task is complete, both units return to a low power state.

The communications between the host and the CMM are carried out in a similar manner, with the 'wake up' line providing the handshake function.

Power for the optical sensors is reduced to a minimum by using pulsing techniques. The duty cycle is chosen to give the optimum balance between discrimination and power loss.

The solenoids are driven in two stages, a high power pull-in pulse, followed by a low power holding period. This is possible because the current needed to hold in the solenoids is considerably less than that required to initially pull-in.

The cash/refund operation is optimised by the CMM controller so that the store motor is energised for the minimum length of time. This can result in the store rotating in either direction during the cash/refund cycle, depending on how many coins are in the store.

7. Routine and Preventative Maintenance

The CMM is designed such that no regular maintenance is required, the components being selected to last the life of the module. However, by the nature of the environment in which the module will operate, it is inevitable that over a period of time, coin dust, dirt and other debris may accumulate in the coin paths.

It is also possible that objects may have been introduced, either accidentally or deliberately as part of a fraud attempt, which may require the module to be stripped and cleaned. A damp cloth and mild detergent is recommended. On no account must any solvent or foam type cleaner be used.

WARNING 1. Coin dust may accumulate in the mechanism during use. Inhalation of the dust should be avoided during maintenance operations. Ensure that power is removed before any maintenance operations are attempted.

WARNING 2. The module contains static sensitive components and may be damaged by exposure to high voltages. Approved anti-static precautions, such as earthed wrist straps should be used, especially when handling the electronic PCB.

If an ESD workstation is not available, do not work in a carpeted area and do not handle materials that produce or hold static electricity, such as cellophane wrappers etc.

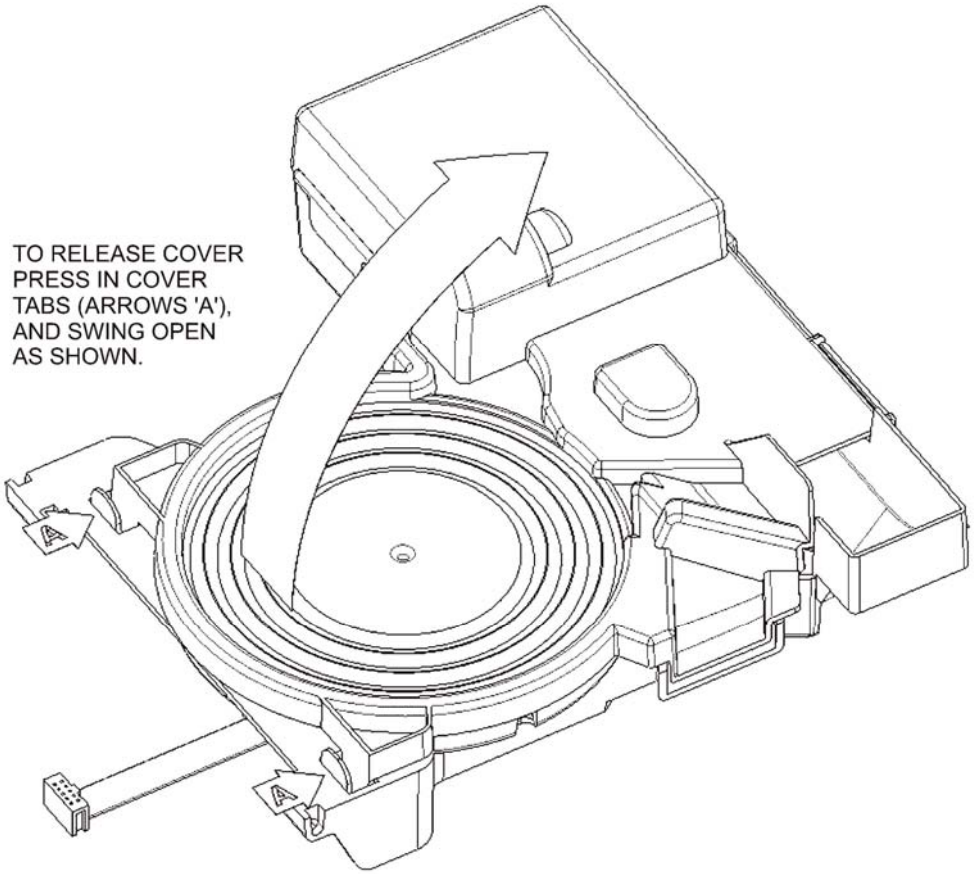
7.1 The Cover

The module should be laid flat on the work surface with the cover uppermost and the flexible lead to the left. The cover can be removed by gently pressing the location lugs (see Figure 3) to the left, and lifting the left-hand side of the cover. The cover can now be swung vertically about the right hand edge and the hinges disengaged. The coin store and acceptor are now accessible.

If required, the cover may be cleaned with a soft cloth and a warm mild detergent, followed by a rinse in clean water, ensuring that all traces of water are removed before replacement. Mechanical damage, especially in areas that come into contact with coins, will render the cover unserviceable.

To replace the cover, engage the hinges at the right of the unit and close, until both clips on the left snap fully home.

Figure 3: Cover Removal



7.2 The Acceptor

The acceptor may be removed by disengaging the top two locating pins from the main chassis and lifting the unit away, disengaging the flexible cable from the connector at the rear of the unit. (See Figure 4 and Figure 5) Do not pull the connector out by the cable as this may cause damage.

The acceptor is a non-serviceable part and must not be further dismantled, as performance will be impaired. The unit must be replaced if there is significant damage to the coin flight path, as performance will almost certainly be degraded. Maintenance must be limited to light cleaning.

The flight deck of the acceptor may be examined by lifting the lid, which is hinged about the right hand side of the unit. Remove any debris or foreign objects. The flight deck may be cleaned by application of a soft bristled brush to remove debris followed by wiping gently with a cloth and mild detergent. Ensure that the acceptor is completely dry before refitting in the module.

To replace, reconnect the flexible cable connector at the rear of the unit, ensuring correct polarity, and re-seat the acceptor into its' positioning lugs, ensuring the top clips snap home.

Figure 4: Acceptor Retaining Clips

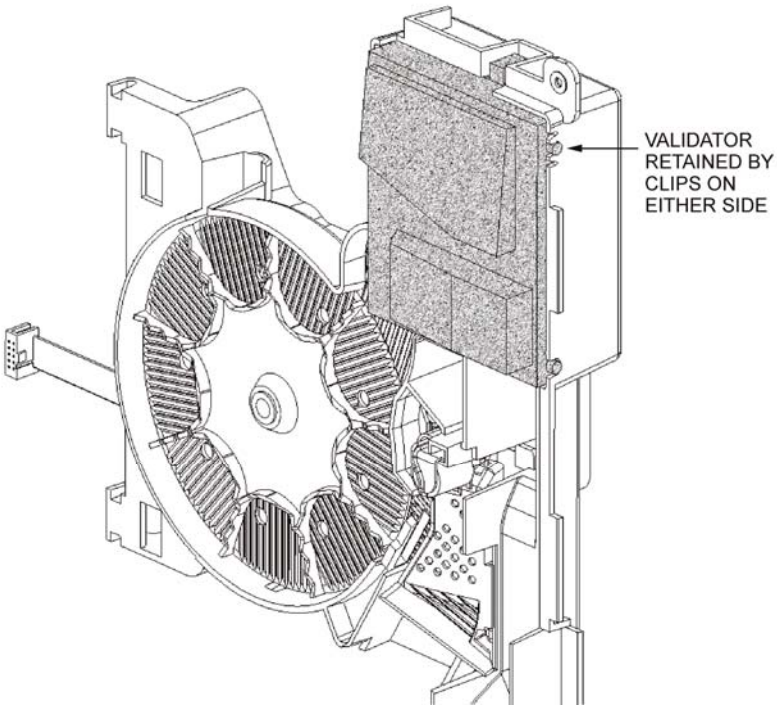
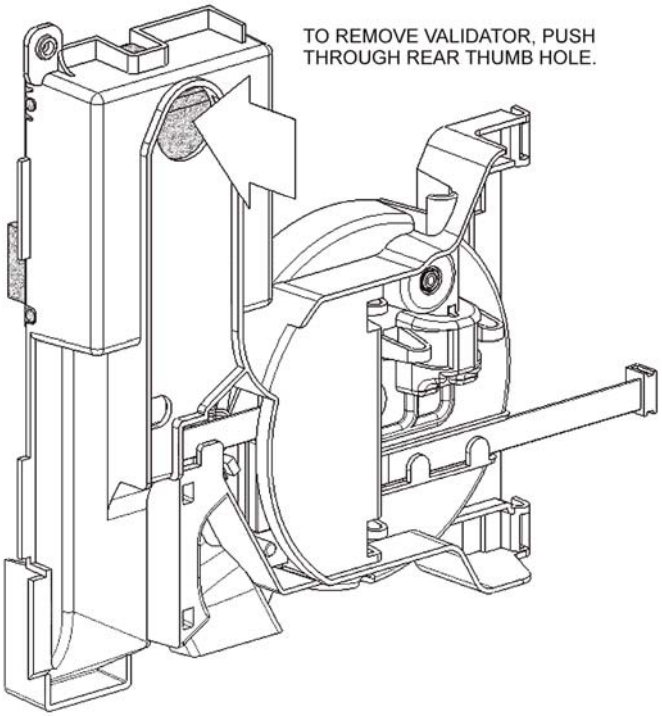


Figure 5: Acceptor Removal



7.3 Coin Store

The coin store can be removed simply by lifting the store away from its' bearing. Remove any debris or foreign objects. The store may be cleaned by application of a soft bristled brush followed by wiping gently with a mild detergent solution and a cloth, followed by a rinse in clean water. Ensure that the sensing and drainage holes are not obscured and are free from foreign objects.

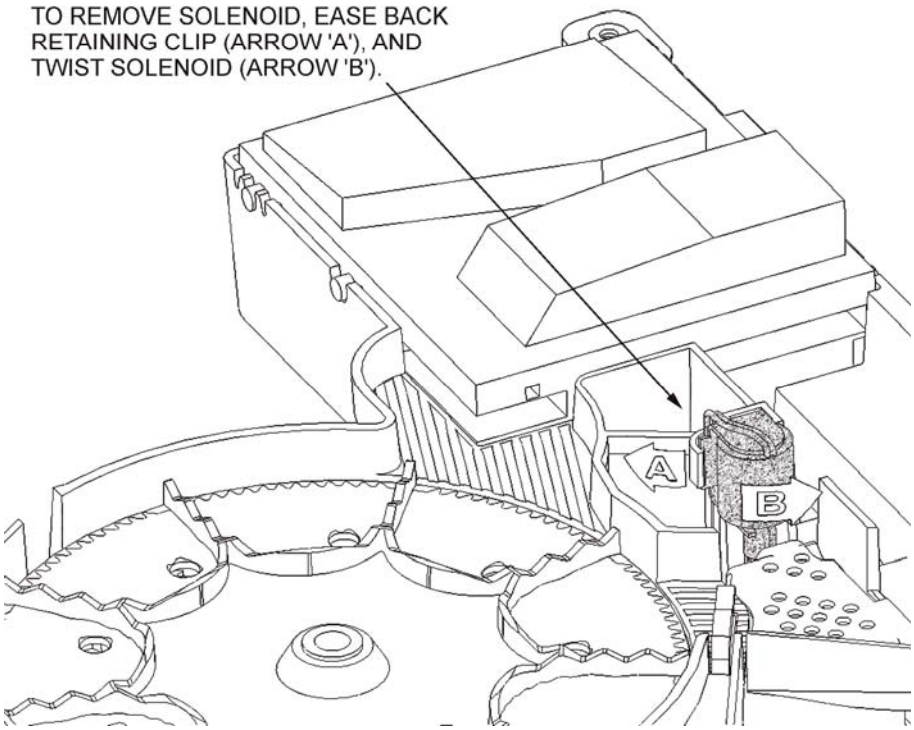
Ensure that the store is completely dry before refitting in the module, replacement being a reversal of removal. The position of the store is not critical, as it will be automatically reset at the next power up.

7.4 The Cash / Refund Solenoid

The cash/refund solenoid may be removed by disengaging the connector to the PCB, then gently releasing the left hand-retaining clip holding the solenoid into the chassis moulding (see Figure 6). Do not overstrain the clip. Ensure that the solenoid plunger and spring are not lost. Maintenance is limited to cleaning the plunger and bore with a soft cloth. Under no circumstances should abrasives or metal polish be used to clean the plunger. If there is any sign of corrosion on the plunger, the complete solenoid must be replaced by a new assembly.

On replacement, ensure that the solenoid is fully seated in position in the chassis, with the retaining clip engaged and that the plunger actuator is engaged in the hole in the cash/refund gate. Reconnect the solenoid to the PCB, routing the cable as shown in Figure 8, Figure 9, and Figure 10.

Figure 6: Cash / Refund Solenoid Removal



7.5 The Cash / Refund Gate

It should not normally be necessary to remove the cash/refund gate unless the unit has been damaged or severely contaminated. Normal cleaning can be carried out with the gate in place using a soft bristled brush or a cloth and a mild detergent solution.

In the unlikely event that the gate needs to be removed, remove the solenoid as above, and disengage the gate pivots from the chassis by moving the gate sharply upwards. Lift the gate away from the chassis.

To replace, re-engage the pivots and replace the solenoid, checking that the gate operates freely, with no hint of sticking.

7.6 The Printed Circuit Board

The PCB assembly is a non-serviceable part. Suspected failures must result in substitution, ensuring that anti static precautions are observed as above.

To remove the PCB, gently disengage the two retaining lugs at the left-hand edge of the board and lift away from the chassis. Do not overstrain the retaining lugs. Disconnect the solenoid, motor and two ribbon cable connectors.

To replace the PCB, reconnect the solenoid, motor and two ribbon cable connectors, taking care not to strain the cables. Slide the right-hand edge of the PCB under the exit sensor, offer up to the retaining lugs and press gently home, ensuring that the lugs correctly engage.

Ensure that all the cables are correctly routed as shown in Figure 8, Figure 9, Figure 10, Figure 11, Figure 12, and Figure 13.

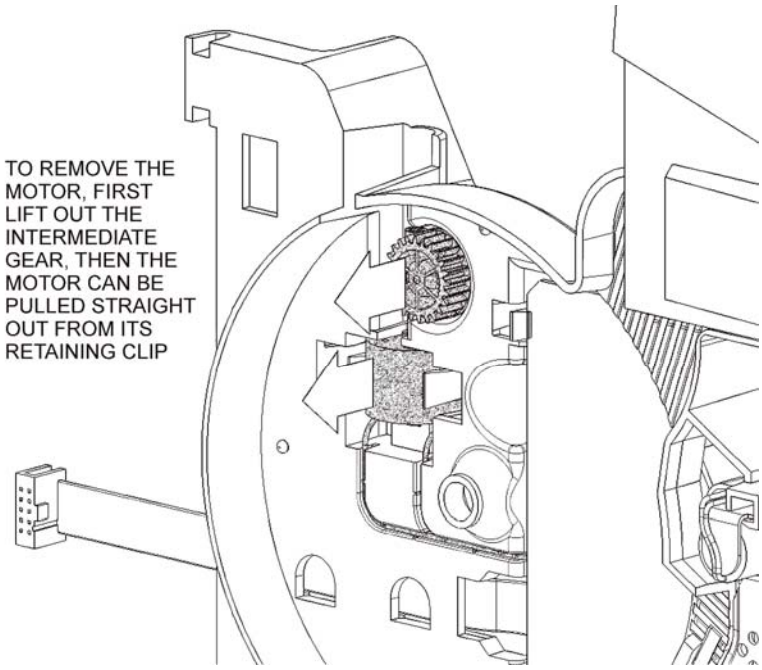
7.7 The Drive Motor and Gearbox

This assembly is a non-serviceable part; maintenance is limited to replacement. No attempt should be made to lubricate the mechanism as this may result in permanent damage.

The sub assembly may be removed following disconnection of the motor connector from the PCB. Lift the intermediate gear from it's bearing, noting its' orientation. Lift the motor clear of the chassis retaining lugs (refer to Figure 7). Dust or debris may be removed using a dry soft bristled brush.

Replacement follows the reverse of removal, replacing the motor first ensuring that the unit is correctly located in the retaining clips. Replace the intermediate gear with the bearing boss downward. Plug the motor connector into the PCB. Route the wires as shown in Figure 8, Figure 9, and Figure 10.

Figure 7: Drive Motor and Gear Removal



7.8 The Main Chassis

Breakage of any of the chassis fixing lugs or the sub assembly retaining lugs, or mechanical damage to areas that come into contact with coins, will render the chassis unserviceable.

The chassis may be cleaned following removal of all components, with a soft cloth and a warm mild detergent, followed by a rinse in clean water. Ensure that all traces of water are removed before rebuilding.

7.9 Coin Exit Sensor Lightguide

The coin exit sensor lightguide may be removed for cleaning or replacement by lifting from the retaining clips. Great care must be taken not to scratch the optical surfaces of this device. If in doubt, replace with a new lightguide.

Figure 8: Solenoid Cable Position

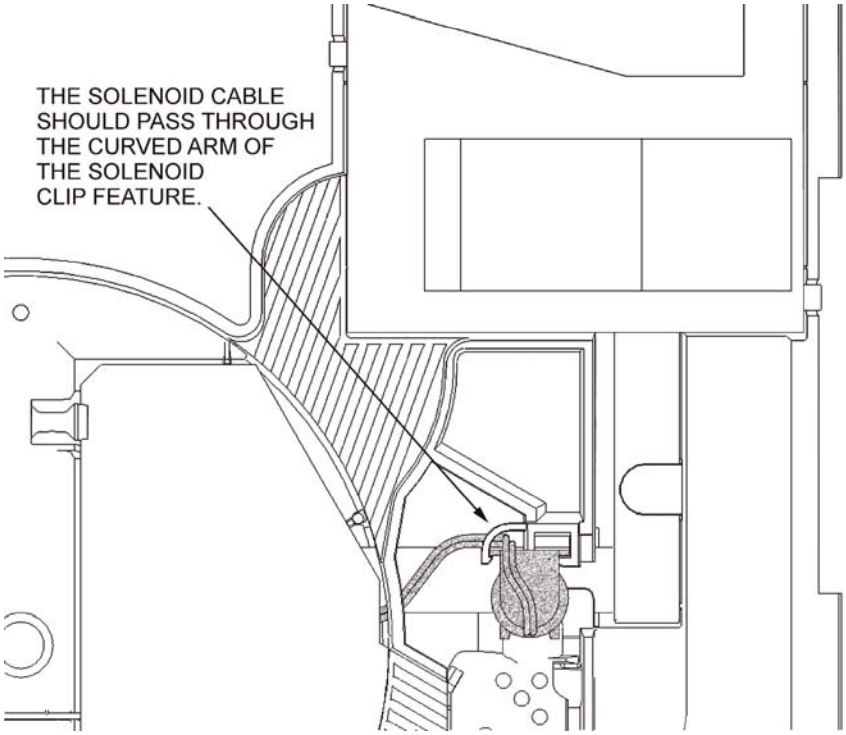


Figure 9: Motor Cable Position

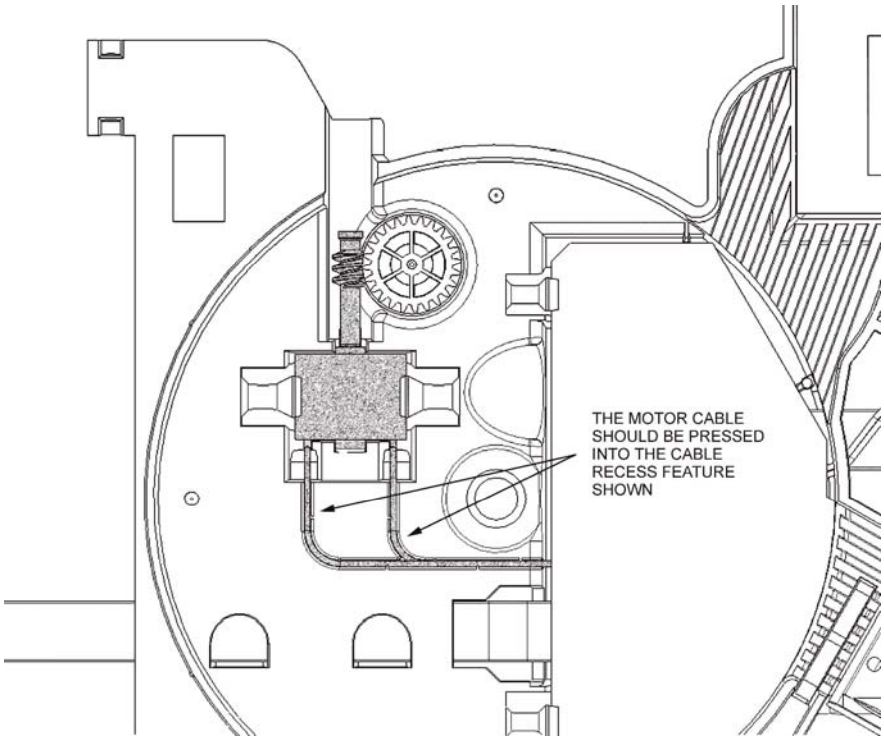


Figure 10: Solenoid and Motor PCB Connections

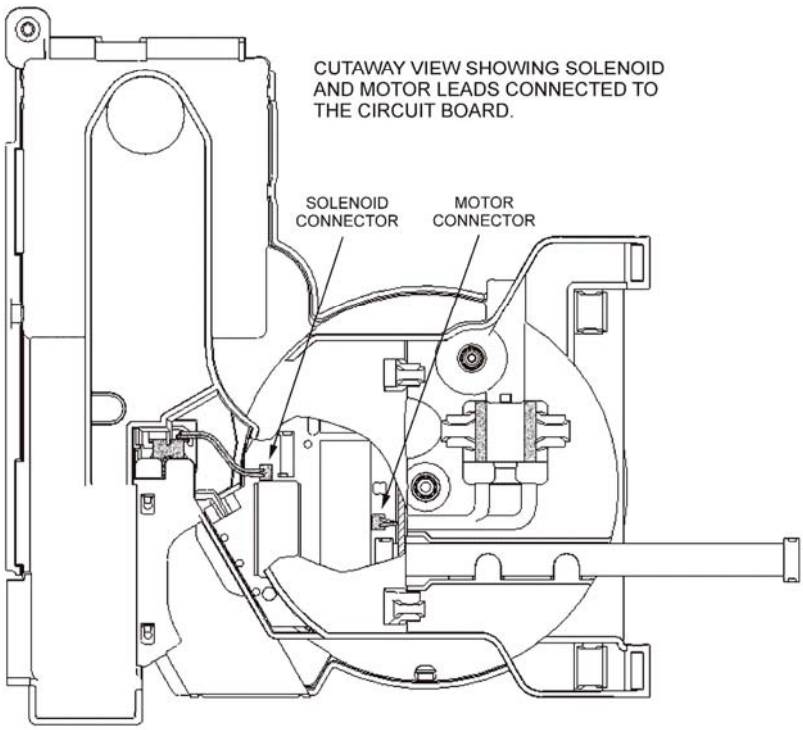


Figure 11: Acceptor and Host Cables PCB Connections

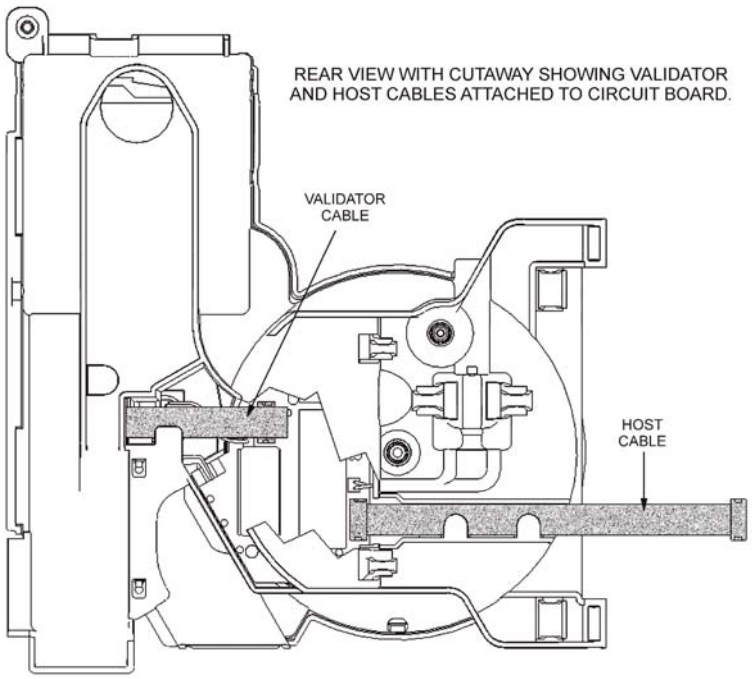


Figure 12: Acceptor Cable Routing (Front View)

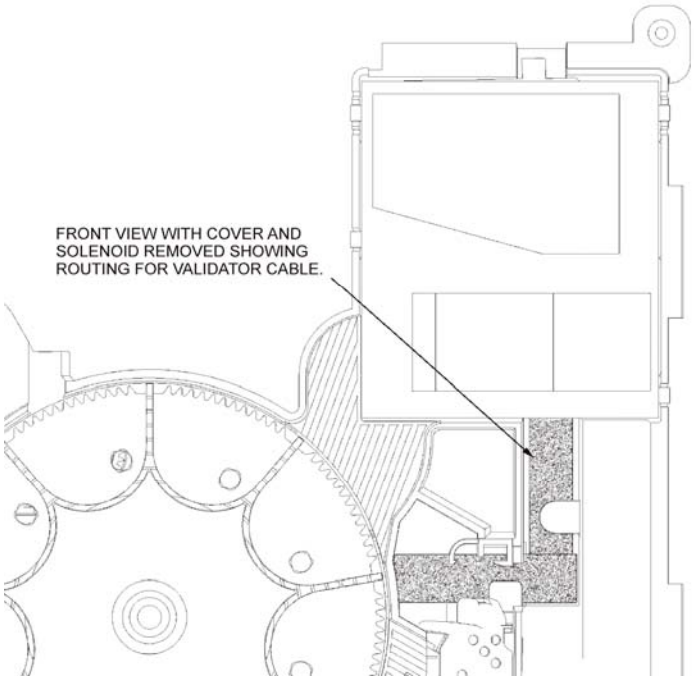
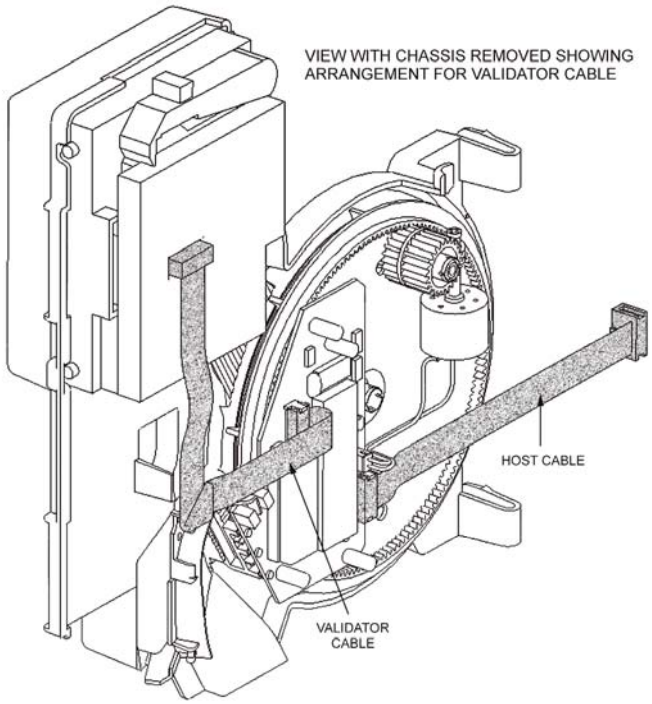


Figure 13: Acceptor and Host Cable Arrangement (Rear View)



8. Test

Following strip and rebuild the module must be tested to verify that all functions are operating correctly. This may be done using a slave host.

8.1 Slave Test

Testing using a slave host should follow the normal installation procedure (see section 12). On successful completion, a selection of typical operations should be performed, ensuring that as many of the module's functions are exercised. These should include, as a minimum, insertion of at least one of each of the programmed coins, insertion of the full eight coin capacity, and a full cash and refund cycle from the store.

If no faults are observed or reported, the unit is fit for return to the field. If any faults are detected, the cause must be determined before returning to service.

9. Spare Parts

The following parts are available as service replacement parts: -

Table 1: Spare Parts List

Part Description	Spares Number
CMM (excluding coin acceptor)	Contact MC Sales
Coin acceptor (C120P-7)	Contact MC Sales
Downloadable coinspec files	Contact MC Sales
Main chassis	SORBITXX00001
Cover	SORBITXX00002
Escrow Wheel	SORBITXX00003
Intermediate gear	SORBITXX00004
Bearing	SORBITXX00005
Coin exit sensor lightguide	SORBITXX00006
Cash/refund gate	SORBITXX00007
Solenoid and plunger assembly	SORBITXX00008
Motor assembly	SORBITXX00009
PCB assembly (used with C120P-7)	SORBITXX00010
Acceptor ribbon cable	SORBITXX00011
Host ribbon cable	SORBITXX00012
Fastener	SORBITXX00013

10. Trouble Shooting

A possible cause of coin jams is the presence of bent or damaged coins in the coin path areas. Under no circumstances must force be used to remove the jammed coins, as this could cause damage to the coin path geometry or mechanism. Do not return damaged coins to the mechanism.

If necessary, remove the acceptor and coin store from the chassis as described above and remove all loose coins before attempting to remove jammed coins. Jammed coins can usually be removes either by inverting the unit or by gently pushing the coin free by means of the edge of another coin.

It is advisable to clean the unit every 20,000 coins or every three months using a slightly moist cloth and mild detergent. On no account should any solvent, abrasive or foam cleaner be used.

The following lists possible problems and suggested remedies.

Table 2: Trouble Shooting Guide

Problem:	Possible Cause:
No Power To CMM	Faulty host. Check Host to CMM ribbon cable. Check connectors.
All Coins Rejected	No power available from host. All coin inhibits set ON - download new inhibit map. Coin download required – download data. Faulty acceptor – replace.
Low Accept Rate	Dirt or debris in coin rundown area – clean. Damaged coin path – replace unit. Module not level.
One Type Of Coin Rejected	Coin inhibited – download new inhibit map. Bent or damaged coin inserted.
Incorrect Routing	Cash/refund solenoid not operating – check connections. Cash/refund solenoid not operating – clean or replace. Cash/refund gate jammed – clean or replace.
Coin Jam In System	Coin path blocked – strip and clear. Badly bent coin – strip and clear. Coin outside specified size – discard.
Motor Fails To Run	Store jammed – strip and clear. Motor faulty – check connections or replace. PCB fault – replace.
No Response	No power available – check connections to host. Ribbon cable faulty – replace. Electronics faulty – replace.

11. Specifications

11.1 Dimensions

Please refer to Figure 14 and Figure 15.

11.2 Mechanical

Height:	275.4mm
Width:	247.0mm
Depth:	79.6mm
Weight:	0.81kg

11.3 Power

Input voltage:	Vbat +5.5 to +8.0 volts dc (Vbat typical 6.5 volts dc)
	Vcc +5.0 ± 0.25 volts dc
Max current (accepting):	80 mA (for 300ms)
Idle current	3mA
Coin return	13mA

11.4 Coin data

Diameter	15.00 – 31.00mm
Thickness	1.20 – 3.30mm
Weight	1.5 gram's min
Coin acceptance	2 coins per second (maximum)

11.5 Environment

Operating Temperature:	-25° C - +55°C
Storage Temperature:	-40°C - +70°C
Humidity:	up to 95% non-condensing

Figure 14: CMM External Dimensions

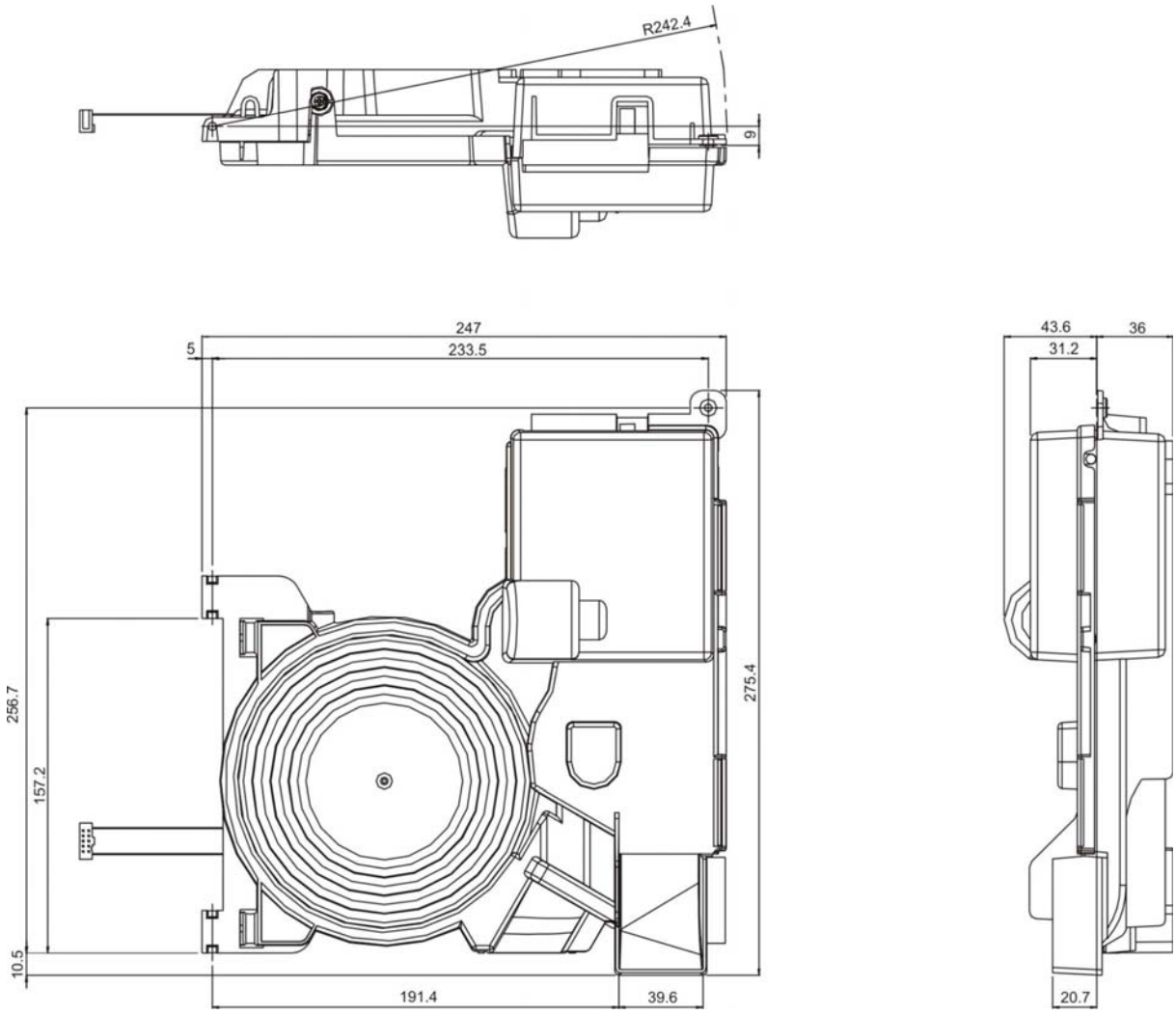
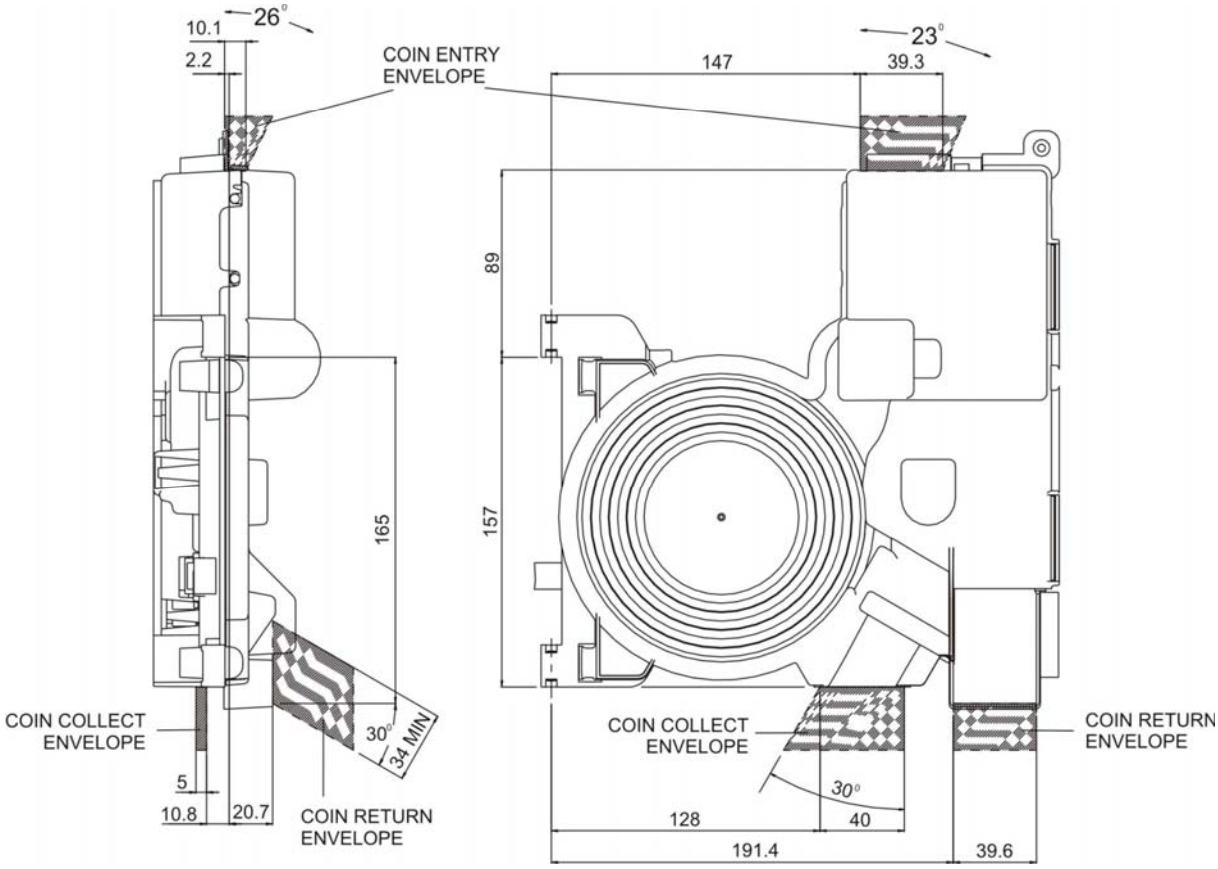


Figure 15: Coin Entry/Exit Positions



12. Installation

The method of installation may vary slightly dependent on the host. This description assumes that the host is a payphone. Ensure that the host is powered down before installation.

Offer the module upto the host with the two mounting lugs and ribbon cable to the left. Engage the two mounting lugs onto the mounting pins. To facilitate this, the lower pin is slightly longer than the top.

Close the right hand edge of the module against the top right fixing lug and engage the thumbscrew. Use only finger pressure and do not over-tighten.

Insert the ribbon cable connector into the designated socket on the host ensuring that the locking ears fully engage. Note that the connector is polarised.

The host may now be powered up, in the case of a payphone, by taking the handset off hook. If the CMM has not been fitted to the host previously, the CMM will begin the initialisation process automatically.

The store will be heard to rotate for about 10 seconds and the cash/refund solenoid will be heard to operate. This process self-checks the mechanism and initialises the position of the store wheel.

A download of the relevant coin data from the host will then follow. If the host has the appropriate data in memory already, this will be complete in about 30 seconds. If the host has to contact a management system to obtain the data, there may be a delay of some minutes. Do not attempt to insert coins until this process is complete.

In the case of a payphone, the host will power down at the completion of this routine, signifying that that the system is now programmed. The payphone handset may now be placed on hook.

Lifting the handset should now allow coins to be inserted and accepted into store. At least one of each programmed denomination should be inserted, up to a maximum of eight coins. If the handset is now replaced, the coins should all be refunded.

Repeat, dialling a chargeable call and check that the correct cost is cashed at the end of the call.

If all is well, the module can be left in service. If any fault messages are generated, the cause must be investigated before returning to service.

13. Relevant Documents

TSP039.doc 8 coin CMM - Host to CMM Interface Specification.

ccTalk Serial Communication Protocol - Generic Specification – Parts 1-3
- ccTalk42-1.doc Issue 4.2 Part 1
- ccTalk42-2.doc Issue 4.2 Part 2
- ccTalk42-3.doc Issue 4.2 Part 3

C120P Serial Communication Protocol – Interface & Command Specification
- CcTalk-p.doc Issue 3.2

617/SA/31464/000 Neptune Coin Management Module Requirements.

TP/ENG/017 GPT Payphone Systems Environmental Specification.

13.1 Statutory

EN41003: 1993 Particular Safety requirements for equipment to be connected to telecommunication networks.

EN60950: 1992 Specification for Safety of Information technology equipment, including electrical business equipment.

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