

Bus Ticketing System(B400C)

Manual

(TVM)

Ver 1.0

Korea Smart Card Co., Ltd

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1. TVM

1.1 Introduction

This manual provides information on the use and the spec of the machine for the users.

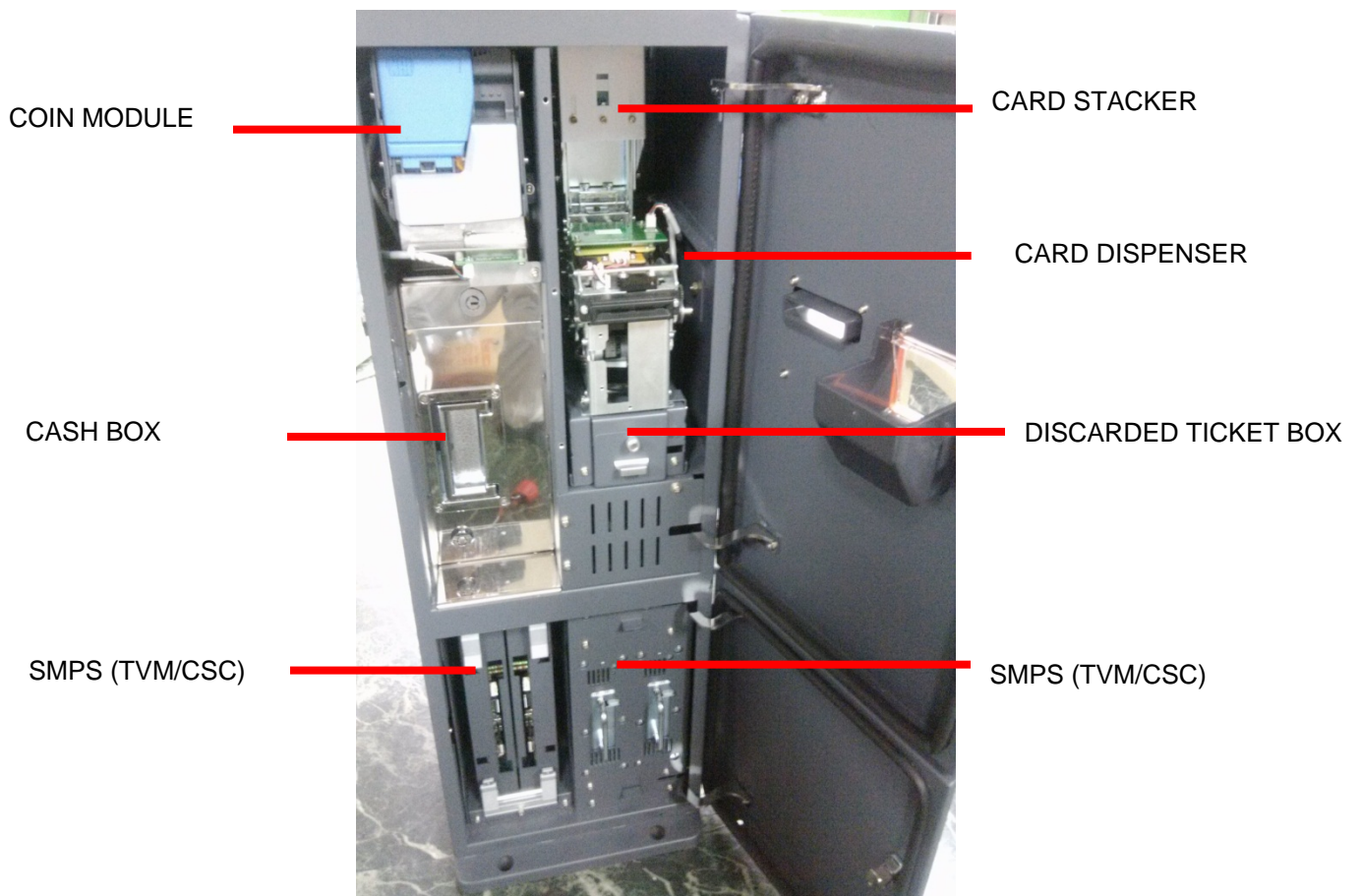
1.2 Caution

1. Please read the manual carefully for safe use.
2. The machine must be kept in a cool area.
3. Use the proper devices or tools to disassemble the machine to prevent damage.
4. Be sure the power is off before disassembling the machine.
5. BEWARE: electric shock or other safety related accidents.

1.3 Tool &Equipment

1. Screwdriver, WrenchDriver(M8), Hexagon Wrench Driver(M5), L-Wrench Driver(M6)
, Torx WrenchDriver(M3)
2. USB (TVM version / CSC version)
3. SAM (TVM / CSC)

1.4 Descriptions



FRONT

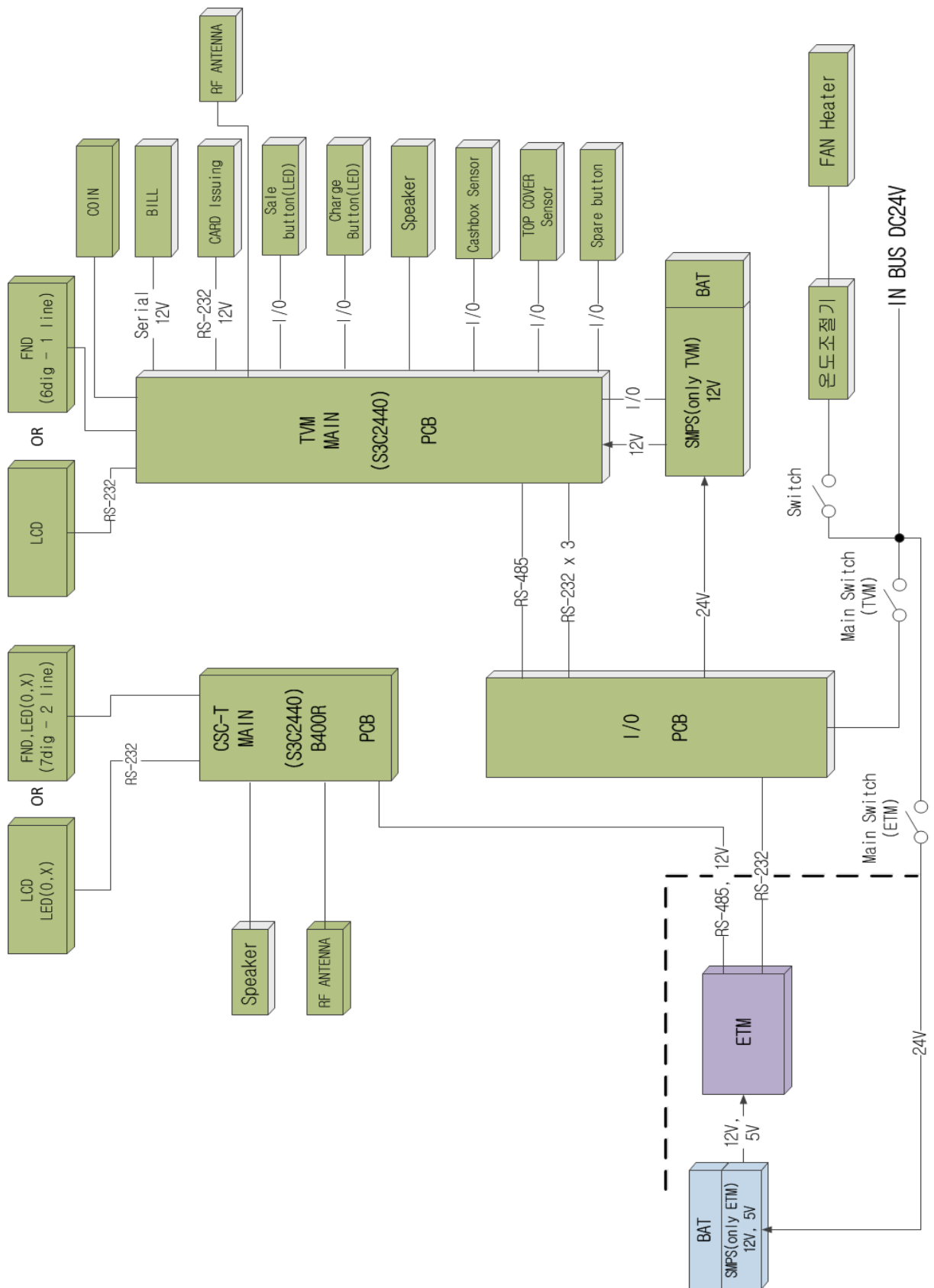


POWER SWITCH

EXTERNAL
INPUT/OUTPUT

REAR

1.5 Block Diagram



1.6 Specifications

1.6.1 Specifications

No.	Category	Detail	Remarks
1	TVM Main PCB	Samsung ARM9 core 32bit : S3C2440 400Mhz Audio Codec 1x USB(host Ver 1.1) 4x SIMM slots Volume S/W	
2	O.S.(Version)	Embedded Linux 2.6.2.1	
3	Display PCB -TVM-	DFSTN Negative Graphic LCD Water Proof Button (2ea) Buzzer	
4	Display PCB -CSC-	DFSTN Negative Graphic LCD Buzzer	
5	CSC-T main PCB	Samsung ARM9 core 32bit : S3C2440 400Mhz Audio Codec 1x USB(host Ver 1.1) 8x SIMM slots Volume S/W	
5	Card Dispenser	200pcs(incase of 0.8mm only, flat card) ISO 14443 AType / mifare RS-232C Discarded ticket processing DC12V ±5% 850mA (Max 2.5A) 280mm(D) x 105mm(W) x 200mm(H)	
6	Bill Acceptor	Escrow = 1 Bill Serial(RS232-based) /CCNET DC12V / stand by:200mA,(Max: 2A)	
7	Coin Acceptor	Fast coin Acceptance up to 10 coin per seconds Parallel, ccTalk, SGI 12V (standby 200mA , Coin acceptance 500mA)	
8	SMPS(TVM)	IN : DC24V (DC20V - DC30V) OUT : DC12V/7A 1x Battery DC12V Power Fail signal	
9	SMPS(ETM)	IN : DC24V (DC20V - DC30V) OUT : DC12V/7A 1x Battery DC12V Power Fail signal	
10	Space Heater Unit	DC 24V / 3.7A (90W) 180x60x60	
11	Speaker	2x 3W, 4Ω	

1.6.2 Temperature

Operating: 0°C - +55°C

Humidity: 45% - 70%

1.6.3 Power Supply Requirements

Supply Voltage: DC24V (DC20V - DC30V)

Current Consumption

Stand-by: 1.1A

Operational: 1.7A (Max : 7A / Full load & Heater Unit)

1.6.4 Weight

Base Unit: 50Kg

1.6.5 Mating Connector

1. RS232-1

Pin No.	Signal Description
1	DC12V(OUT)
2	UART_TX
3	UART_RX
4	GND
5	NC

2. RS232-2

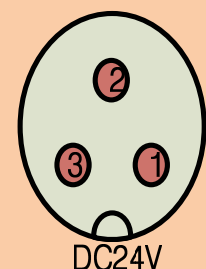
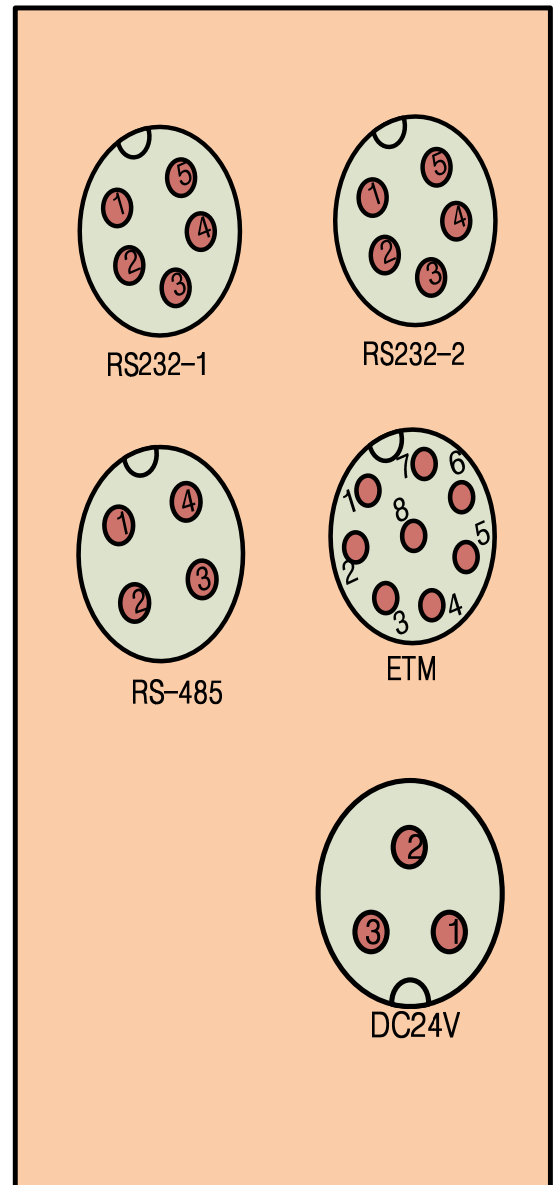
Pin No.	Signal Description
1	DC12V(OUT)
2	UART_TX
3	UART_RX
4	GND
5	NC

3. RS-485

Pin No.	Signal Description
1	DC12V(OUT)
2	TVM 485+
3	TVM 485-
4	GND

4. ETM

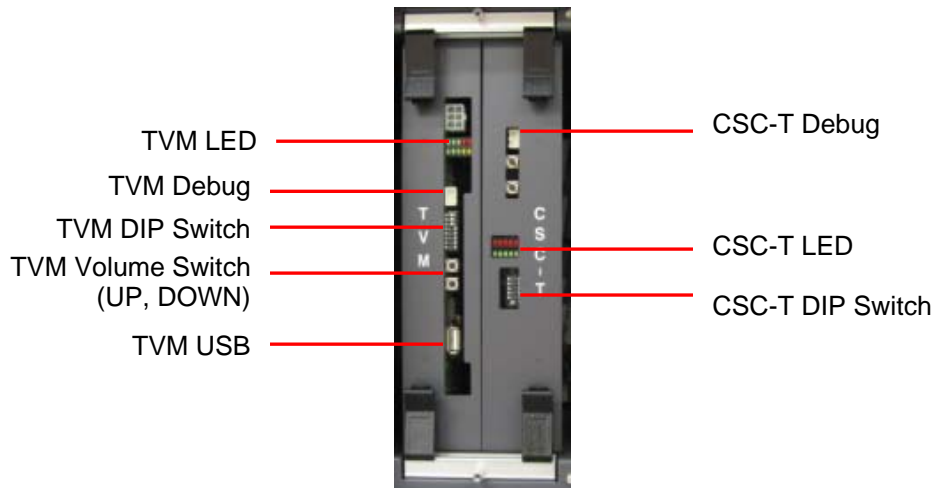
Pin No.	Signal Description
1	DC12V(OUT)
2	DC5V(OUT)
3	UART_TX
4	UART_RX
5	ETM_12V
6	CSC 485+
7	CSC 485-
8	GND



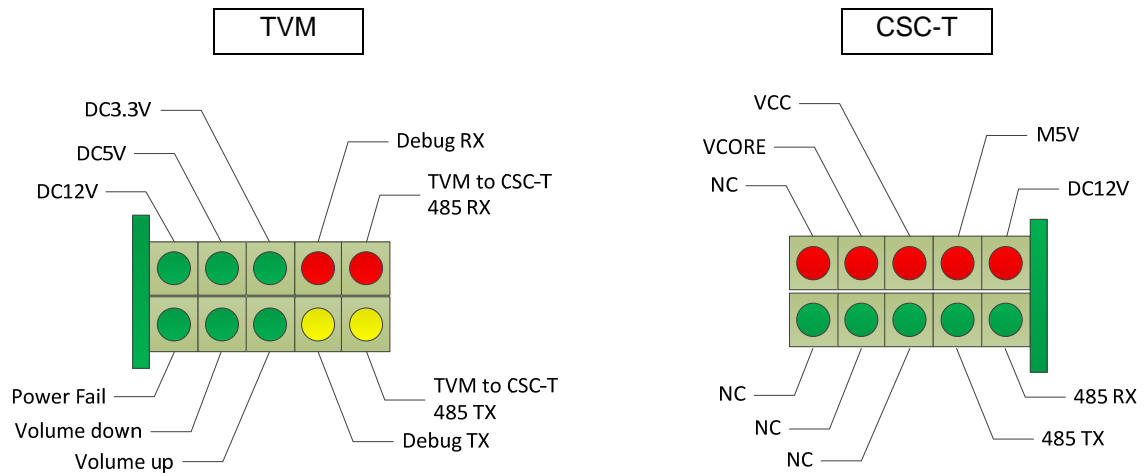
5. DC24V

Pin No.	Signal Description
1	DC24V(OUT)
2	GND
3	EARTH

1.6.6 TVM, CSC-T main PCB Names



LED Indicator



1.7 Main Modules

1.7.1 Cash Box

Specifications

Size: 183mm(w) x 201mm(h) x 230mm(d)

Capacity: 400 (Free fall type)

Material: Stainless Steel

Key lock

3Keys

Caution: Be sure not to lose or misplace your cashbox key.
The cashbox may be damaged at shock or drop.
Be sure to understand the manual before installing
or removing the cashbox (refer to Cashbox Installation and Removal).



1.7.2 Switching Mode Power Supply (SMPS)

Specifications

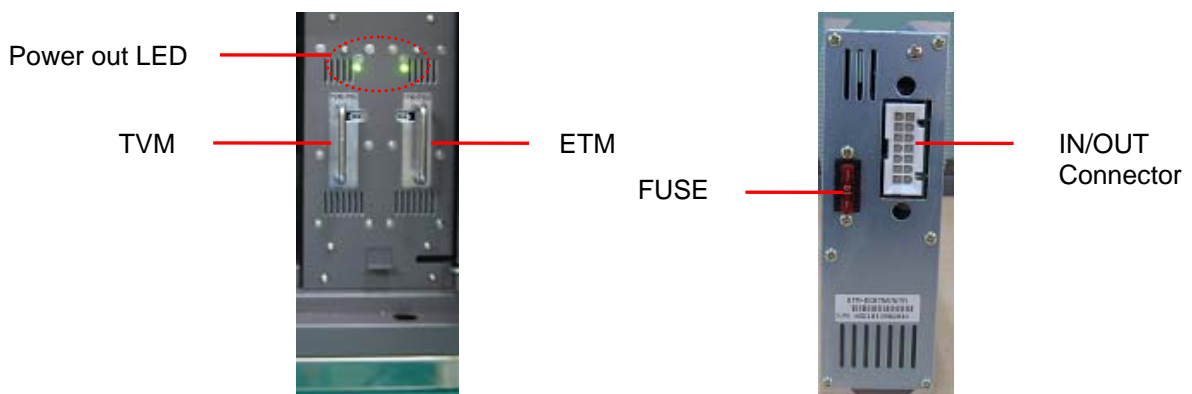
No.	Function	TVM	ETM
1	Power IN	DC24V (DC20V - DC30V)	DC24V (DC20V - DC30V)
2	Power OUT	DC12V/7A	DC12V/7A
3	Battery #2	1x DC12V	1x DC12V
4	LED(Green)	O	O
5	FUSE	10A	10A
6	Power Fail signal	O	O
7	Protection	Over Current Over Voltage	Over Current Over Voltage

#1.Do not share the power for TVM and ETM; make sure they are plugged in separately.

#2.When the input power is shut off, UPS kicks in by the backup battery.With the fully charged battery, the system will be powered for about 5 minutes (However, it may be shorter depending on the battery life or obsolete battery).

To prevent any damage or significantly lowered battery life from over-discharge, the battery output power is automatically cut off when the power is not supplied within a certain period of time after the input power is shut off.

#3.Be sure that the battery case is not worn off to facilitate the battery installation and removal.



1.7.3 CARD DISPENSER

Specifications

1.	Card Type	ISO 14443 A Type / Mifare
2	Card Stack Capability	200pcs (incase of 0.8mm only, flat card)
3	Function	Discarded ticket processing
4	Interface	RS-232C
5	Power	DC12V \pm 5% 850mA (Max 2.5A)
6	Size	280mm (D) x 105mm (W) x 200mm (H)

Pin Connections

Pin Number	Signal Description	Note
1	DC12V	
2	RS232 TX	
3	RS232 RX	
4	GND	
5	GND	
6	NC	
7	NC	
8	NC	
9	NC	



PC SUB-9pin (male)

1.7.4 BILLMODULE



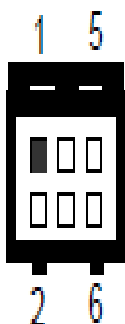
Specifications

1	Acceptable CashCode	Length: 92.5 mm Width: 132 mm Height : 100.6 mm
2	Insertion Direction	4-way
3	Validation Method	Optical/Transparency/Reflection/MAG
4	Interface	Serial
5	Escrow	1 banknote
6	LED	LED lamp (upper position of faceplate) Full-color lightning (gradation/solid)
7	Power Supply Voltage	12V DC $\pm 5\%$
8	Rated Power Consumption	Standby: Approx. 0.1 A Operation: Approx. 0.8 A Max: Approx. 1.4 A (Max. 300 ms)

Connector

The following diagram is the interface connector as viewed from the acceptor side or from a relay board.

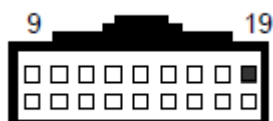
1) Power Connector



Signal descriptions:

TERMINAL	SIGNAL	FUNCTION	ACTIVITY
1	+ 12 V DC Power	Power Supply (+)	-
2	Ground	Power Supply (-)	-
3	Pulse Output 1	Pulse Signal	Current Presence
4	Pulse Output 2	Pulse Signal	
5	Inhibit Line (+)	Enable/Disable Accept Bill	Current Presence is Enable Accept Bill
6	Inhibit Line (-)		

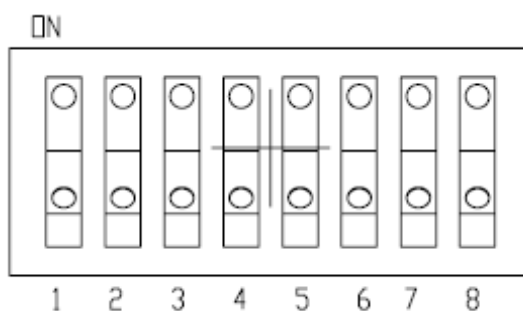
2) Data Connector



Signal descriptions:

TERMINAL	SIGNAL	FUNCTION	ACTIVITY
1	Credit Pulse	Pulse Signal NIP Interface (output)	Low
2	Interrupt	Availability to transfer a status message (output)	Low
3	Serial/Pulse Select	Interface type (input)	High/Low
4	Ground	Signal Ground	-----
5	Serial Data Output	An eight bit status message (output)	High/Low
6	Not connected	-----	-----
7	Not connected	-----	-----
8	Not connected	-----	-----
9	Not connected	-----	-----
10	Out of Service	The information on that cassette is full or jam has occurred (output)	Low
11	TXD-TTL	Transmitted data (TTL level)	High/Low
12	Accept Enable	Enable accept bill (input)	Low
13	LED Power Source	200 ohm to 5 VDC (output)	High
14	Send	Control system signal initiating transfer a status message (input)	Low
15	TXD-RS	Transmitted data (RS level)	High/Low
16	RXD-TTL	Received Data (TTL level)	High/Low
17	RXD-RS	Received Data (RS level)	High/Low
18	Not connected	-----	-----

DIP Switch Settings



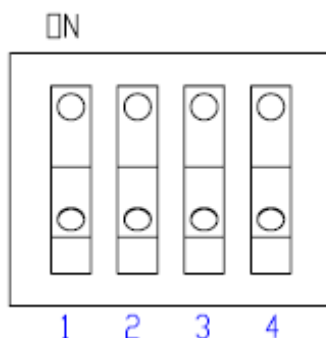
The switches are located at the CPU board.

The VU(MVU) bill Validator operates in two basic modes: Validation Mode and Service Mode.

Validation Mode: This is the mode for normal operation.

Service Mode: This is the mode for programming and testing.

A set of 8 DIP switches (SW1) defines the settings and programs the Bill Validator to recognize and validate different denominations or define other parameters.



A set of 4 DIP switches (SW1) defines the settings of interface type.
For a complete explanation of switch description, please see the software User's Guide (enclosed to each bill validator and available at www.cashcode.com).

1.7.5 COIN MODULE

Specifications

1	Function	Fast coin Acceptance up to 10 coin per seconds
2	Interface	Parallel, ccTalk, SGI
3	Power	12V (standby 200mA , Coin acceptance 500mA)
4	Operating range	0°C to 60°C ,
5	Coin acceptance	32 coin types max. in 2 x 16 or 1 x 32 channels Coin diameter:15–32.5mm Coin thickness:1.5–3.3mm Speed:10 coins/sec.
6	Mounting position	Vertical, max. deviation: $\pm 2^\circ$
7	Size	102mm (D) x 89mm (W) x 52mm (H)
8	Mark of conformity	CE

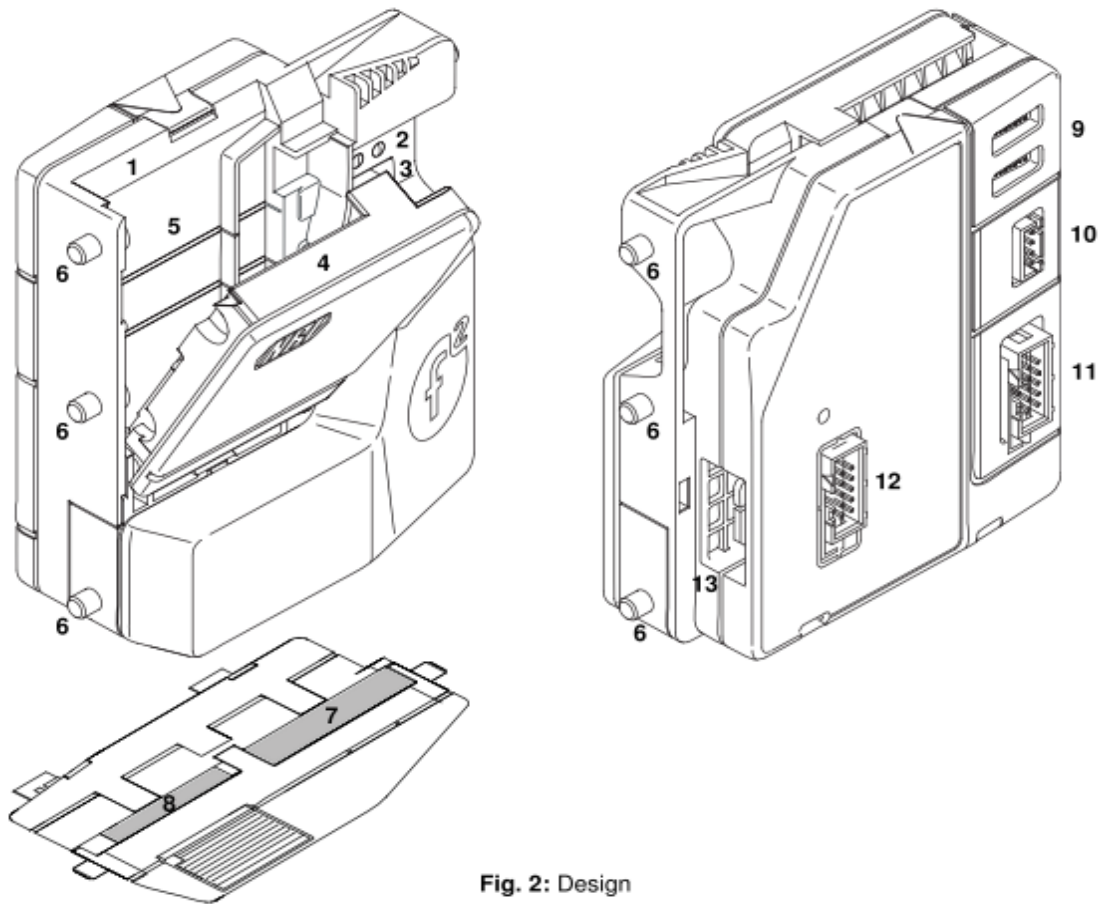


Fig. 2: Design

- | | |
|---|--|
| 1 Coin insert funnel | 9 Switching blocks |
| 2 Pilot lights | 10 Machine interface – serial ccTalk mode |
| 3 Machine interface – parallel SGI mode (3-7 pole) | 11 Sorting interface |
| 4 Flight deck | 12 Machine interface – parallel standard mode/
Machine interface – parallel SGI mode (3-10 pole) |
| 5 Coin runway/Measurement and validation area | 13 PC interface – WinEMP configuration software |
| 6 Mounting studs | |
| 7 Coin outlet – return area | |
| 8 Coin outlet – cash-box | |

Connector

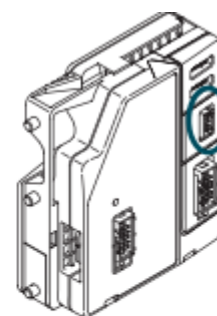
currenza f² ccTalk – machine

Pin assignment

1	Pin 1	12V DC supply
	Pin 2	nc
4	Pin 3	GND
	Pin 4	Data



You will find a detailed description of the serial ccTalk interface with various connection diagrams in the specification "ccTalk Serial Communication Protocol, Generic Specification", which is available on the internet at "www.cctalk.org". The following pages list a summary of implemented ccTalk commands, status and error messages.



1.7.6 Space heater

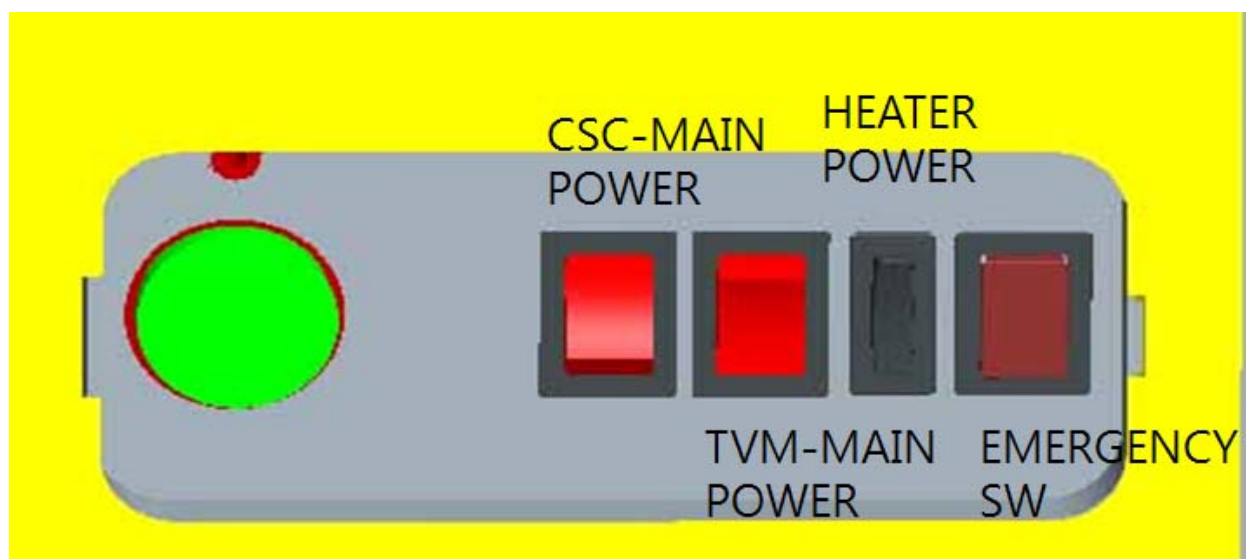
Specifications

1	Function	Space Heating
3	Power	24V / 3.7A (90W)
4	Operating range	Analog SW : -20°C to 50°C ,
5	Surface Temp	Arround : 23°C , End of heater 50°C ,



1.7.7 Others

Power S/W



GENERAL (Subpart A)

Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

UNINTENTIONAL RADIATORS (Part15, Subpart B, 15.105)

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ① Reorient or relocate the receiving antenna.
- ② Increase the separation between the equipment and receiver.
- ③ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ④ Consult the dealer or an experienced radio/TV technician for help.

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference. and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications (including the antenna) made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
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