Telemetry KIT MPYV2
User Manual and Maintenance

Rev.	Date	Edited:	Controlled:	Approved:
1.1	24/06/2020	A. De Gregorio	F. De Palma	F. Liuzzi

History of Revisions

Rev.	Date	Description	Edited:
1.1	24/06/2020	Para 5.1 added additional statement, Para 5.2 entirely added	A. De Gregorio
1.0	21/05/2020	First Issue	A. De Gregorio

Annexes

Document Code	Rev.	Date	Document Title
WI9250PM1_H04	0.1	26/02/2020	MOD_MPYV2_SPAY_C1 (MOUNTING TEMPLATE) (print in A3 format)

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1 Introduction

1.1 Applicable Documents

[App.1] ARG.CE.RCH «Analisi di Rischio Modulo Telemetrico MOD_HWT», rev. 0.2, 11/07/2016

[App.2] MPYV2.HL.HA.010 «Analisi dei Rischi (Safety)- Modulo di Pagamento», rev. 1.0, 10/02/2020

[App.3] MPYV2.HL.AP.005 «Albero di Prodotto», rev. 1.0, 29/01/2020

1.2 Acronyms

In the following table are listed and explained the recurring acronyms that have been used in this document.

Acronyms	Description
VM	Vending Machines
VMC	Vending Machine Controller
NFC	Near Field Communication
HW	Hardware
FW	Firmware
SW	Software
BLE	Bluetooth Low Energy
DUT	Device Under Test
LVD	Low Voltage Directive
EMC	Electromagnetic Compatibility
RED	Radio Equipment Directive

Table 1 – Acronyms

1.3 Scope

This document is the user manual containing the information for the correct use of the modules MOD_HWT_INT, having P/N WI9152PMX and MOD_MPYV2_SPAY_C1 having P/N WI9250PM1, which constitute the Telemetry KIT MPYV2.

1.4 Field of Application

This document applies to the commissioning, use and maintenance and decommissioning phase of the following modules:

- Module MOD_HWT_INT, P/N WI9152PMX, Baseline 2.0
- Module MOD_MPYV2_SPAY_C1, P/N WI9250PM1, Baseline 1.0.

which constitute the Telemetry KIT MPYV2 defined in [App.3], and, hereafter in the following pages, indicated as KIT.

2 Introduction

This manual contains the description of the operations and the instructions necessary to correctly carry out the main operations of use, ordinary and periodic maintenance of the modules defined in §1.4 (henceforth simply referred to as modules).

For a practical consultation, this manual is divided into easily identifiable chapters.

The instructions given in this manual are intended for specialized personnel with specific knowledge and skilling.

Such personnel must be authorized, trained and adequately instructed about dangerousness of voltages and electric currents.

This manual, in the event of sale or selling, must always be delivered together with the KIT.

2.1 Information on this Manual

This manual is to be considered an integral part of the SmartCheck Module and must accompany it in the event of resale and up to its disposal.

In case of loss or damage to the present manual, please request a copy to the manufacturer (Matipay S.r.l.).

This manual is made up of forty-third (43) pages and during its editing it was decided to use a few but obvious symbolic images in order to make the consultation easier and more immediate.

The presence of this symbol indicates to pay maximum attention to the subject matter.

The presence of this symbol indicates additional information or advice to optimize the use of the product.

The EU Declarations of Conformity of the modules are available by forwarding the request to:

info@matipay.com

2.1.1 Obligations for employer

The employer is responsible for the disclosure of this document to all personnel who will interact with the modules.

2.1.2 Obligations for operators

In addition to the duty to strictly follow the instructions contained in this manual, operators are obliged to report to their direct supervisors any deficiency or potentially dangerous situation that may occur.

3 General Description

The modules are designed for use in Vending Machine (called hereafter as VM).

In Figure 1 is shown, for an illustrative purpose, the application context diagram of the MOD_HWT_INT and MOD_MPYV2_SPAY_C1 modules of the KIT, which allows communication between smartphones and VMs for the purchase of products, using wireless technologies such as NFC and Bluetooth LE.

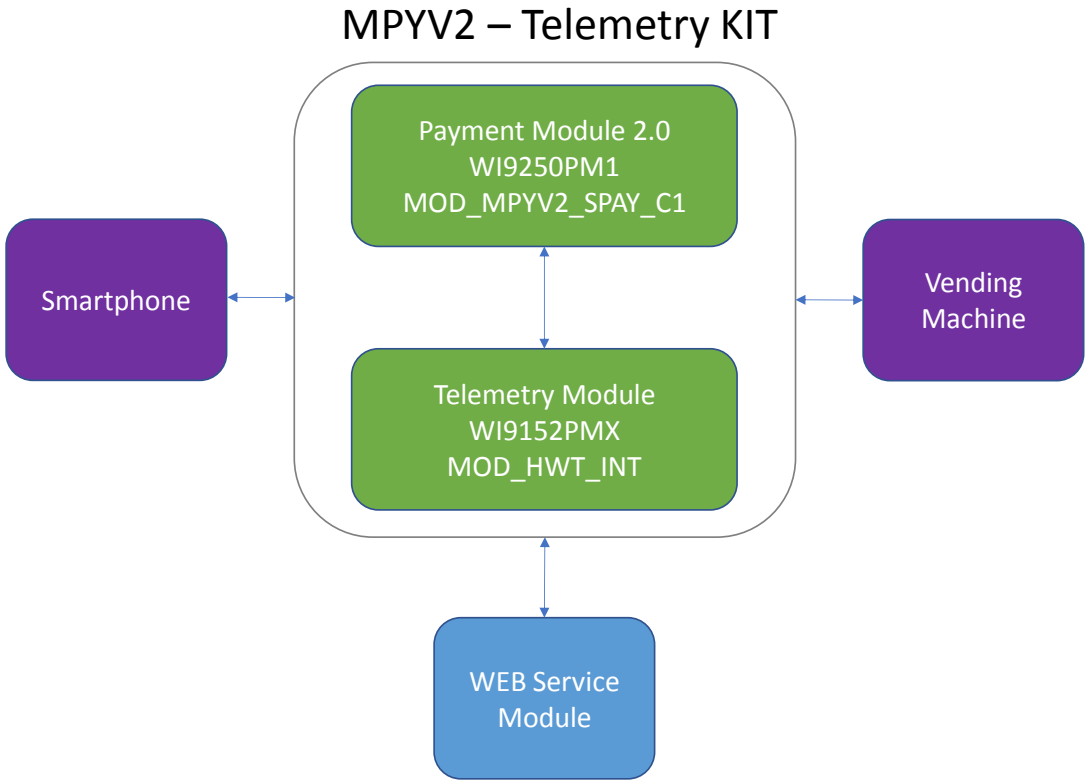


Figure 1 – Application Context

Any different use of the Telemetry KIT from those indicated in this document is to be considered unauthorized and dangerous.

The device must be used by authorized, instructed and trained personnel.

Any arbitrary modification made to this device raises Matipay S.r.l. from any liability for damage or injury that may result to operators, third parties or property.
Correct use of the device, scrupulous observance of the standards listed here and the rigorous application of all precautions to prevent any dangerous situations, will avoid the possibility of accidents or injuries, will make the device work better and longer and will minimize the failures.

Matipay S.r.l. declines any objective and subjective responsibility if the behavioral rules referred to in this manual are not applied and respected.

4 MOD_HWT_INT Description

The MATIPAY WI9152PMX MOD_HWT_INT module, hereinafter also referred to as the Telemetry Module, consists of an electronic card placed inside a plastic container with external dimensions 140x100x22mm and overall weight less than 200g.

Inside the plastic container there is also a rechargeable LI-ION battery that provides power to the board in case of power failure.

The Telemetry module is responsible for providing system connectivity to a remote Server via GSM / GPRS modem installed on the electronic board inside the module itself.

In Figure 3 the MOD_HWT_INT is shown, while in Table 2 the connectors (internal / external) and the slots of the module itself are described. The Table 3 describes the correspondences between ports / interfaces and the external connectors of the module

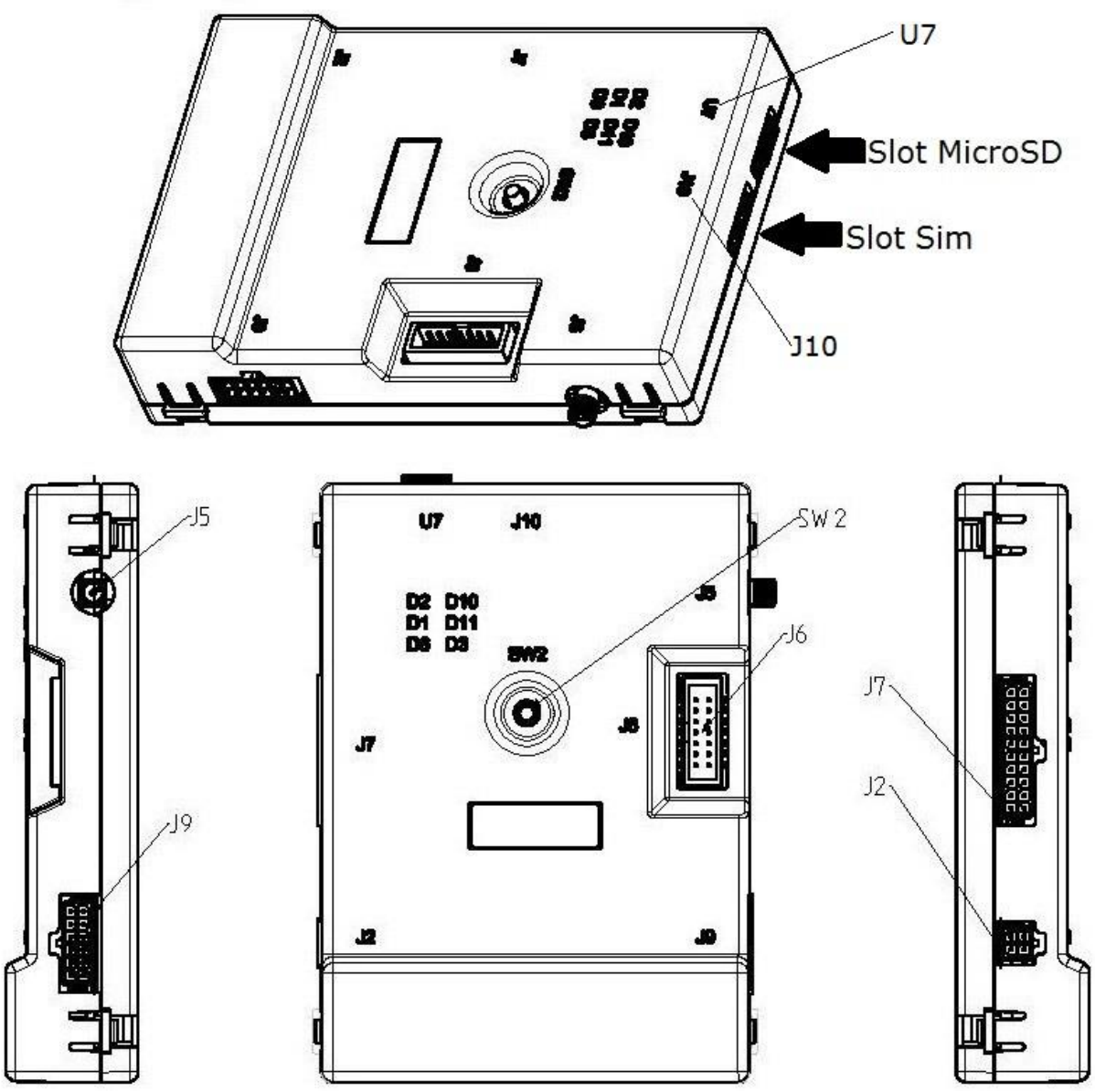


Figure 2 – MOD_HWT_INT, views, slots and connectors.

Item	Connector/Slot/Switch	Description
1	J2	External Connector for power supply input from VM
2	J3	Internal Connector for backup battery
3	J5	External Connector for GSM/GPRS antenna
4	J6	External Connector for MOD_MPYV2_SPAY_C1 connection
5	J7	External Connector for Future Use (I/O and Communication)
6	J9	External Connector for MDB/EVA DTS to VM connection
7	J10	External Slot for MicroSD HC insertion
8	SW2	External Switch for data upload from EVA DTS and module reset
9	U7	External Slot for SIM Card insertion

Table 2 – MOD_HWT_INT, connectors description, slots e switches.

The SW2 switch, available on MOD_HWT_INT, has a double functionality depending on the pressure time:

- pressing from 2 to 9 seconds: EVA DTS data upload
- pressing more than 10 seconds: MOD_HWT_INT reboot

Item	Port/Interface	Q.ty	Conn.	Electrical Characteristics	Connected to
1	Power Supply Input Voltage	1	J2	10Vdc - 40Vdc	VM
2	Power Supply Input Power	1	J2	<6W	VM
3	Antenna Interface	1	J5	COAX 50Ω	GSM/GPRS Antenna
4	Communication Interface to MOD_MPYV2_SPAY_C1	1	J6	RS232	MOD_MPYV2_SPAY_C1
5	Power Supply Interface to MOD_MPYV2_SPAY_C1	1	J6	5Vdc	MOD_MPYV2_SPAY_C1
6	I/O Interface	1	J7	Digital	Temperature Sensor and auxiliary Relay available inside VM
7	Communication Interface	2	J7	CAN	Future Use
8	Communication Interface	2	J9	EVA-DTS/MDB	Bus MDB/EVA DTS to VM

Table 3 – MOD_HWT_INT, ports/interfaces correspondence and connectors

5 MOD_MPYV2_SPAY_C1 Description

The MATIPAY WI9250PM1 MOD_MPYV2_SPAY_C1 module, hereinafter also referred to as the Payment Module, consists of an electronic card placed inside a plastic container with external dimensions 105x84x19mm and overall weight less than 70g.

This module is mounted on the front panel of the VM and communicates with the MOD_HWT_INT unit from which it also receives the supply voltage. Its task is to provide NFC connectivity (with Smartphones and NFC cards like Mifare, Felica and Legic)[1] and Bluetooth LE to external devices (such as Smartphones).

Only in the case of operation without the MOD_HWT_INT unit, the module can be equipped with a CR2032 button battery to power the internal clock of the board in the event of a power failure. This battery is not present in the Module in the basic configuration, but its use is intended for a future application called "Standalone".

In Figure 3 the MOD_MPYV2_SPAY_C1 module is shown and in Table 4 the connector module is described. In Table 5 the correspondence between ports/interfaces and connectors are detailed.

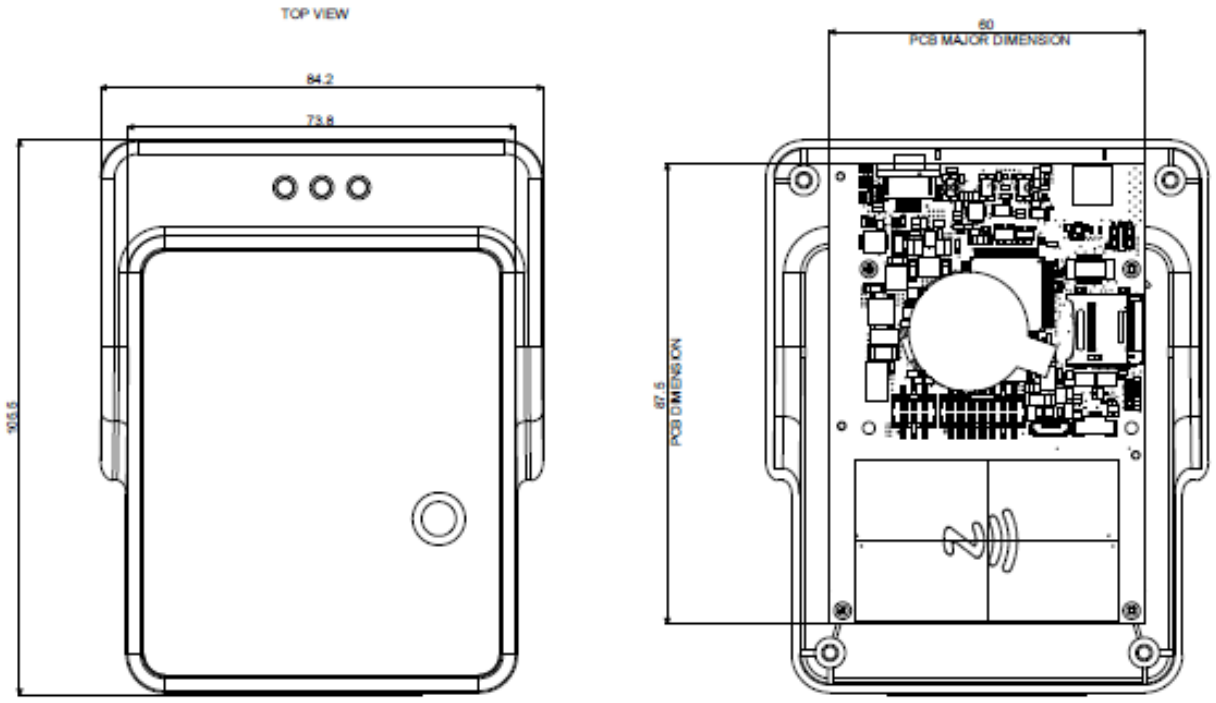


Figure 3 - MOD_MPYV2_SPAY_C1, front and rear view.

[1] Compatibility with Mifare, Felica and Legic supports is strictly linked to the type of application loaded on the device. Physical supports are always supported but could be tied to an application linked to the specific customer.

Item	Connector	Description
1	J4	Power Supply Input Connector and Communication to MOD_HWT_INT
2	J11 (Future Use)	Power Supply Input Connector from VM (Future Use)
3	BT1 (Future Use)	Internal Connector for CR2032 button battery

Table 4 –MOD_MPYV2_SPAY_C, connectors.

Item	Port/Interface	Q.ty	Conn.	Electrical Characteristics	Connected to
1	Connection interface to MOD_HWT_INT module	1	J4	RS232	MOD_HWT_INT Module
2	Power Supply Interface from MOD_HWT_INT	1	J4	5Vdc - 40Vdc	MOD_HWT_INT Module
3	Input Power	1	J4	<6W	MOD_HWT_INT Module
4	Input Power Supply Interface from VM (Future Use)	1	J11	10Vdc - 40Vdc	VM
5	Wireless Interface	1	Enclosure	NFC	External wireless device
6	Wireless Interface	1	Enclosure	BLE	External wireless device

Table 5 – MOD_MPYV2_SPAY_C1, correspondence of connectors/interfaces.

5.1 FCC Statements

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

This device model WI9250PM1 (WI9250PM1 - MPYV2 SPAY):

FCC ID: 2AVPV-MPYV2SPAY

Matipay Srl

Model: WI9250PM1

FCC ID: 2AVPV-MPYV2SPAY

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.

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

5.2 RF Radiation Exposure Statement

This product complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 cm between the radiator and your body.

6 Wiring and accessories

This chapter lists and describes both the wirings supplied with the MOD_HWT_INT and MOD_MPYV2_SPAY_C1 modules and any optional wiring.

6.1 Wiring supplied

The wirings described in Table 6 are supplied together with modules.

The length of all supplied wirings is less than 3 meters.

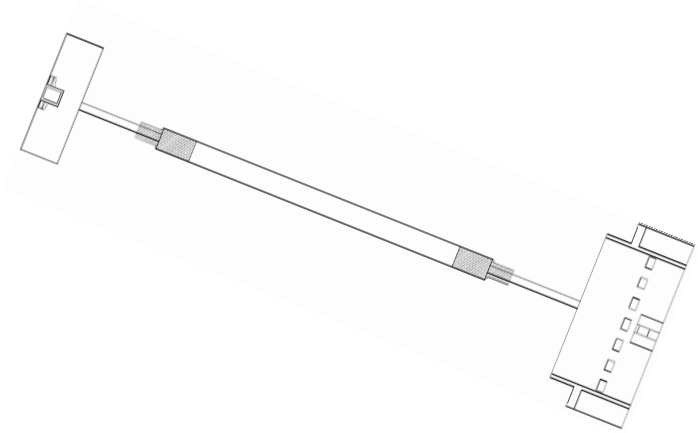
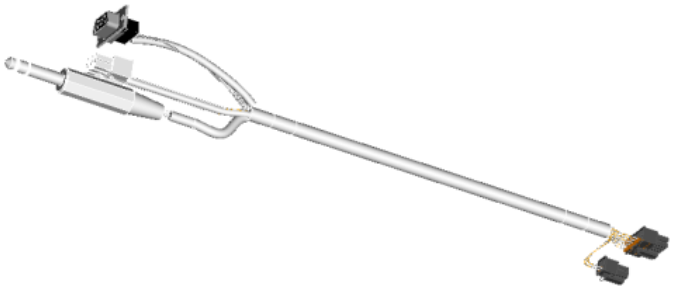
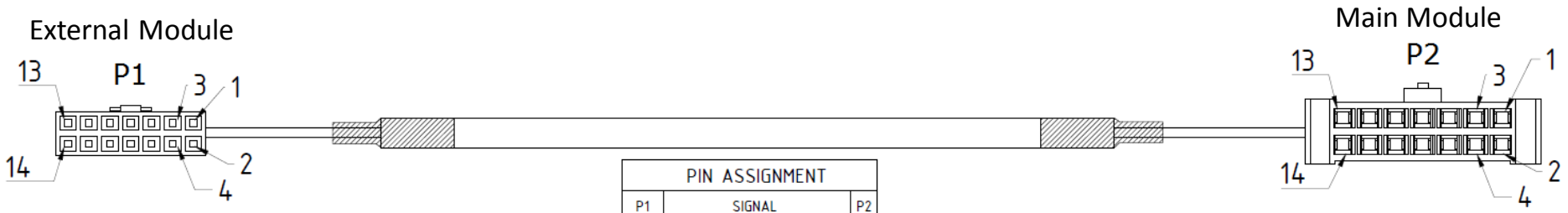
WIRING	NAME	PART NUMBER
	CABLE_CUSTOM_ MAIN_SLAVE_CABLE	CAVI9240PM1AA
	CABLE_CUSTOM_ MDB/EVA-DTS_ POWERSUPPLY	CAVI9168PMXAD

Table 6 – Supplied Wirings

Cable for Telemetry Module to Payment Module 2.0 connection and pinout:



PIN ASSIGNMENT		
P1	SIGNAL	P2
1	VCC	2
2	GND	1
3	n.c.	6
4	n.c.	8
5	n.c.	10
6	n.c.	12
7	RESET_SLAVE	3
8	IRQ_SLAVE	5
9	n.c.	14
10	GND	4
11	RS232_CTS_SLAVE	9
12	RS232_RX_SLAVE	11
13	RS232_RTS_SLAVE	7
14	RS232_TX_SLAVE	13

Figure 4 - CABLE_CUSTOM_MAIN/SLAVE_BOARD

Cable for Telemetry Module to Vending Machine connection and pinout:

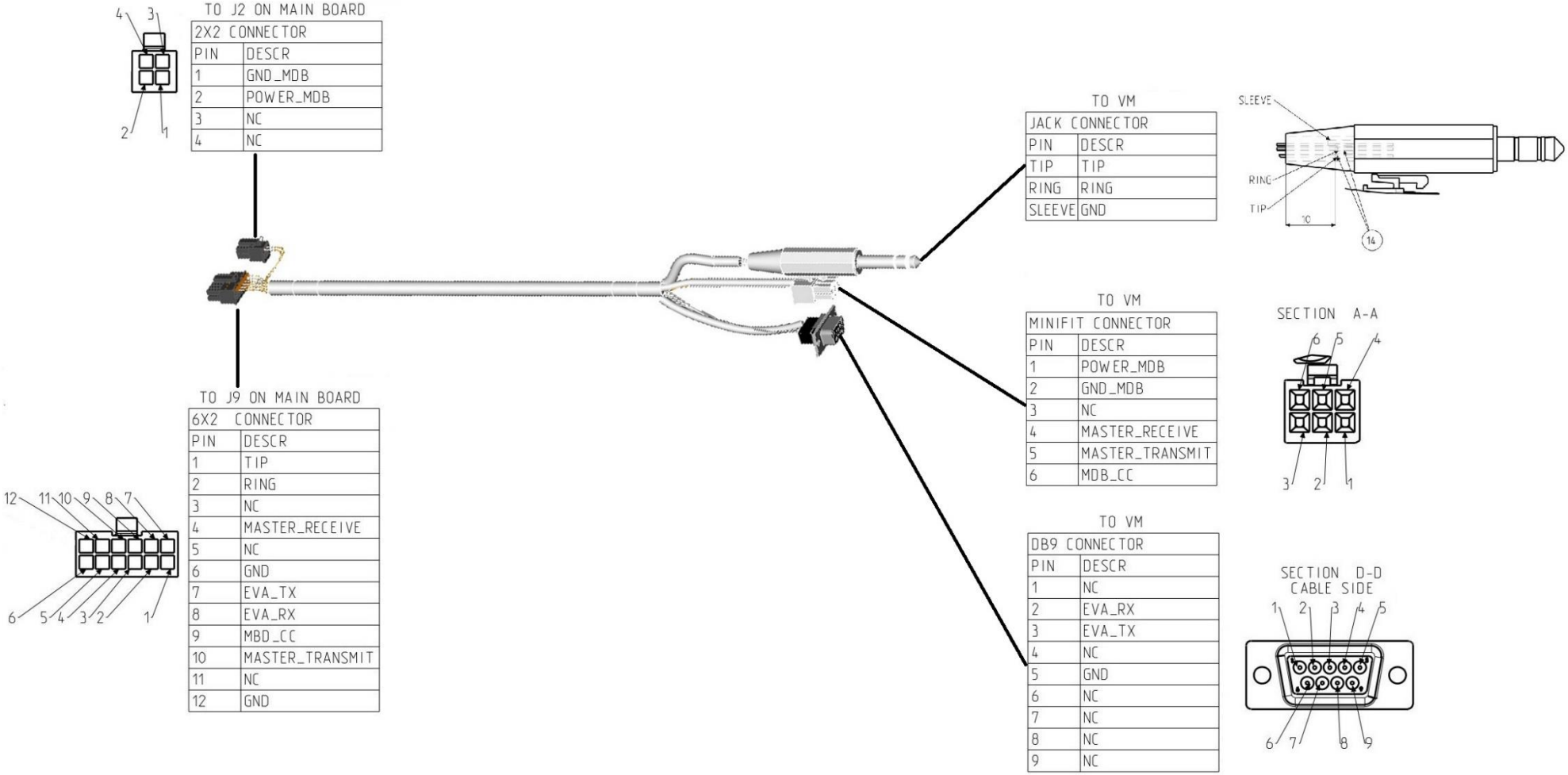


Figure 5 - CABLE_CUSTOM_MDB/EVA-DTS_POWERSUPPLY

6.2 Accessories and optional wirings

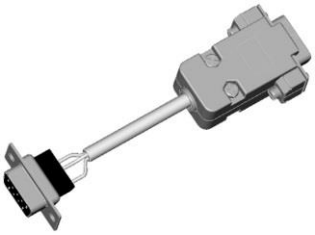
ACCESSORIES/WIRINGS	NAME	PART NUMBER
	GSM/GPRS ANTENNA	VARBM02812XXXAA
	CABLE_CUSTOM_ TX RX DB9 FAS INVERSION	CAVI9168PMXAG
	MicroSD HC Class 10 (pre-formatted with FAT32 file system)	

Table 7 – Accessories and optional wirings

The GSM / GPRS antenna is supplied, on request, as an optional accessory. It is already equipped with cables and connectors.

If it is necessary to invert the EVA-DTS serial communication signals, the use of an adapter cable such as the one shown in Figure 6 is required.

SIDE 1
CONNECTED PINs: 2-3-5
OTHER PINs: NOT CONNECTED

SIDE 2
CONNECTED PINs: 2-3-5
OTHER PINs: NOT CONNECTED

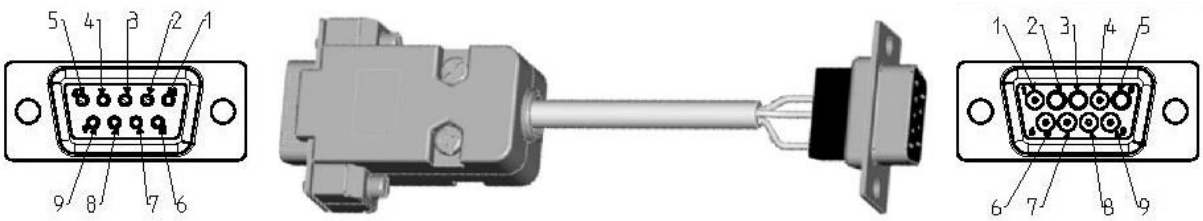


Figure 6 - CABLE_CUSTOM_ TX RX DB9 FAS INVERSION

7 Preliminary operations and maintenance

7.1 Modules installation

The modules are intended exclusively for installation on Vending Machines equipped with an MDB and EVA-DTS communication port. The MOD_HWT_INT Telemetry Module is installed inside the VM while the Payment Module 2.0 MOD_MPYV2_SPAY_C1 is installed on the front of the VM. Below are reported the mounting methods for each unit.

The modules can operate in a temperature range between -20°C to +50°C.

Before installing the modules, make sure that the main power source of VM is disconnected.

7.1.1 MOD_HWT_INT Installation

In order to prevent damage to the module, precautions must be observed before proceeding with installation to avoid the possibility of electrostatic discharge (ESD).

For the first installation of MOD_HWT_INT module (see Figure 7) it is necessary to connect the backup battery available inside the enclosure of MOD_HWT_INT module.

Please follows the here below procedure:

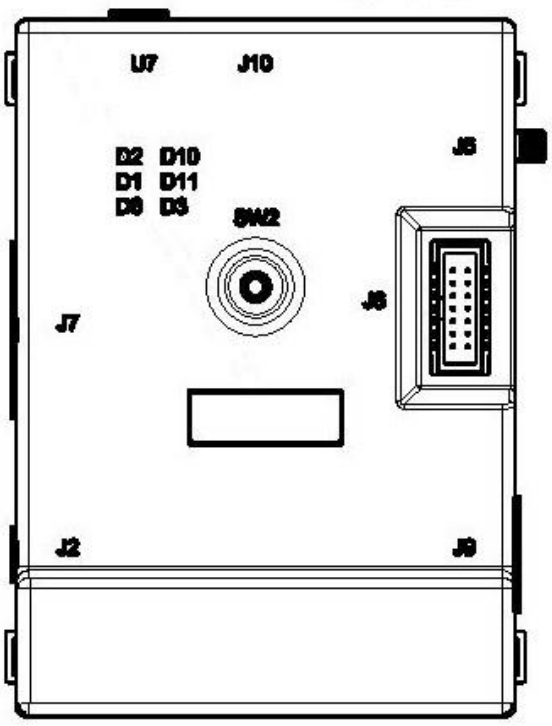


Figure 7 –MOD_HWT_INT Module

Apply a slight pressure on the tabs 1 and 3 indicated in Figure 8 and at the same time act to release the upper part of the module casing. Then repeat the procedure on the tabs marked with 2 and 4 in Figure 8. At this point the upper part of the casing will be released from the lower one as illustrated in Figure 9.

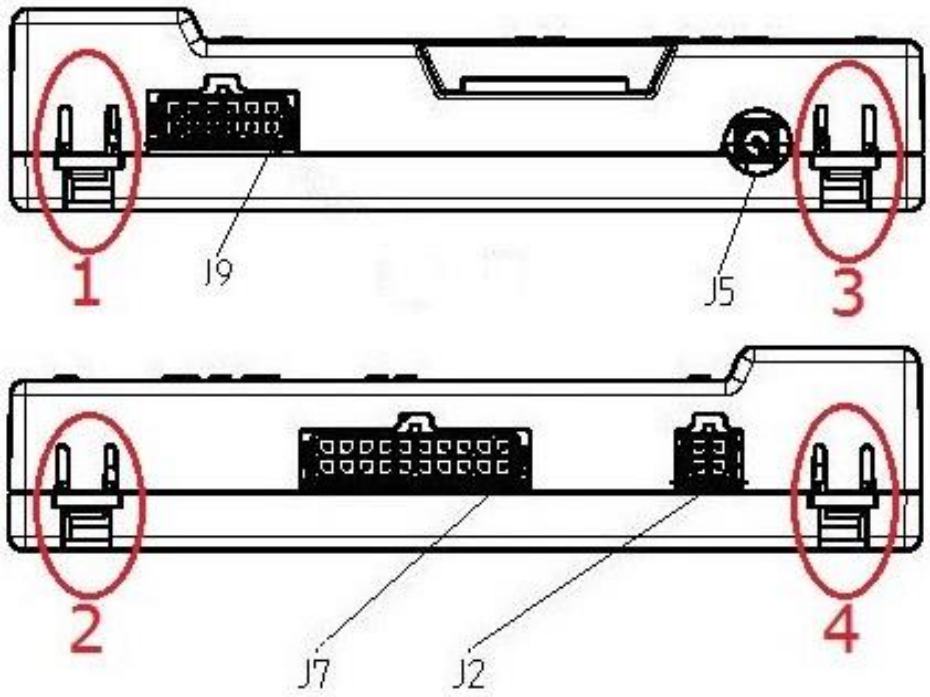


Figure 8 – MOD_HWT_INT, details of opening tabs

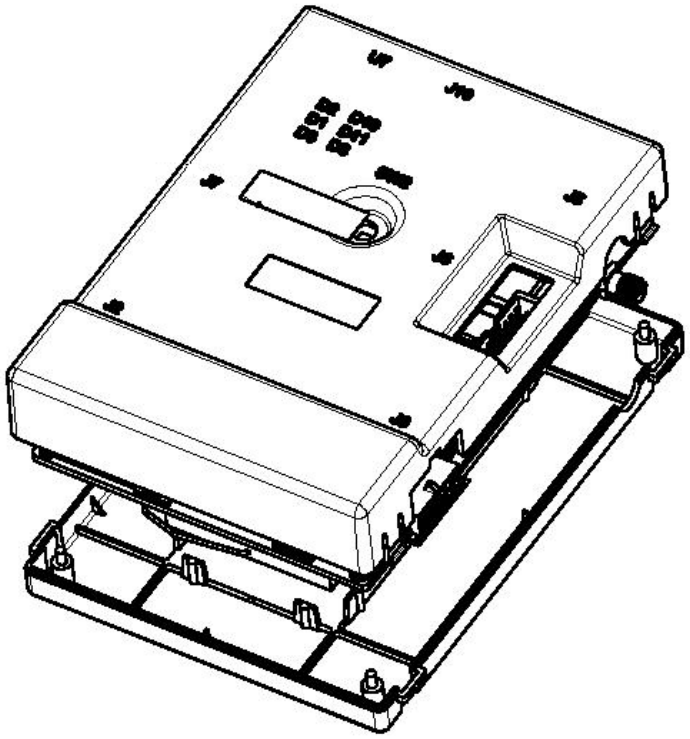


Figure 9 – MOD_HWT INT, enclosure disassembly

Once the upper part of the module casing has been removed, a situation like the one shown in Figure 10 is presented.

At this point, connect the backup battery connector to connector J3 indicated by the red arrow in Figure 10.

For the correct use and disposal of the backup battery, refer to the procedure indicated in §8.

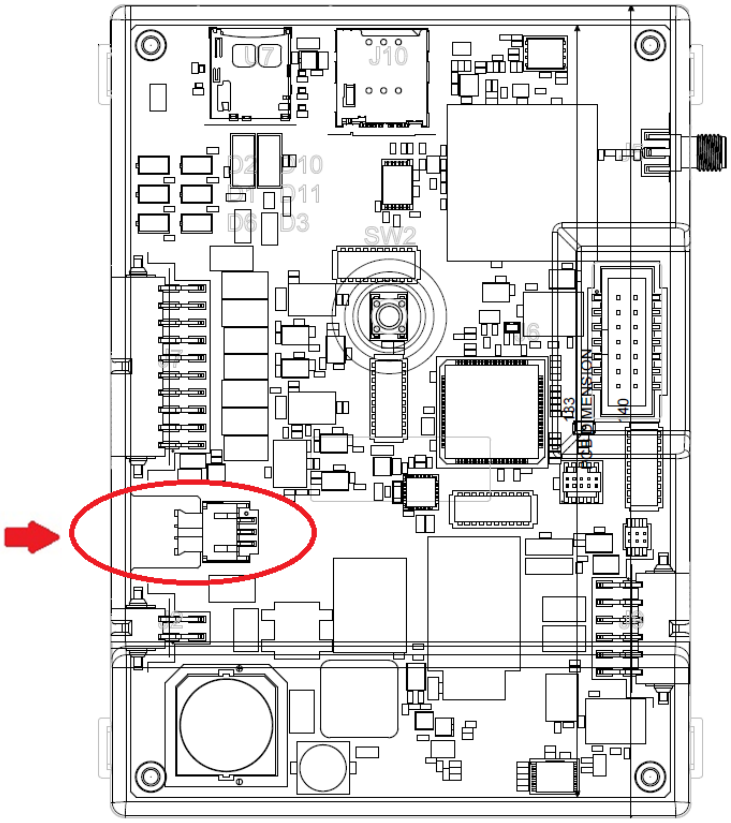


Figure 10 – MOD_HWT_INT, backup battery connector detail

Close again the MOD_HWT_INT module by hooking the lugs on the upper part of the casing.

At the first connection, the backup battery may be totally discharged, therefore it is recommended not to disconnect the power supply to the MOD_HWT_INT module for at least 24 hours after the first start.

It is recommended to replace the backup battery inside the MOD_HWT_INT module at least every 36 months.

The MOD_HWT_INT module now must be fixed inside the VM and its positioning is at the discretion of the installer, bearing in mind that the length of the CABLE_CUSTOM_MDB / EVA-DTS_POWERSUPPLY (see Figure 5) is 95 cm while the CABLE_CUSTOM_MAIN / SLAVE_BOARD (see Figure 4) is 85 cm.

The method of MOD_HWT_INT module fixing is at the discretion of the installer. For this purpose, the use of cable ties is recommended.
It is strongly advised against the use of double-sided tape or products that may lose adhesive capacity over time or due to temperature changes.

7.1.2 MOD_MPYV2_SPAY_C1 Installation

The Payment Module 2.0 MOD_MPYV2_SPAY_C1 is fixed to the VM front panel by using the screws (code *MVITEATFLAAD*) supplied, according to the diagram shown in Figure 11.

The mounting height of the Payment Module with respect to the ground must be less than 2 meters.

Since that the Payment module 2.0 MOD_MPYV2_SPAY_C1 is fixed to the front panel of the VM, considering that it is not a "Mobile" type device, considering how it is used, it is implied that the minimum distance of 20 cm between the module and the end user is intrinsically respected.

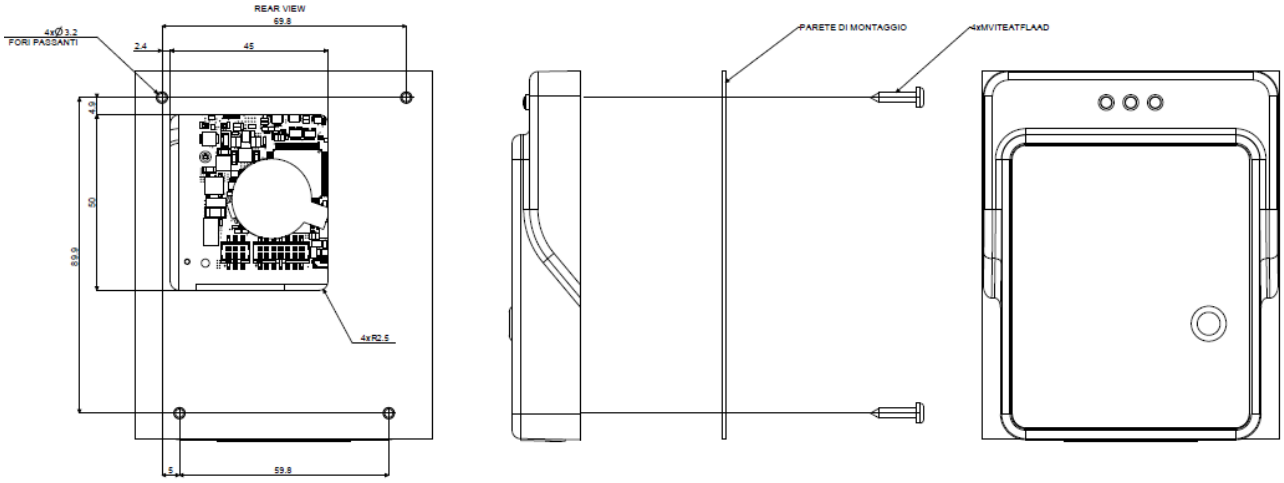


Figure 11 – MOD_MPYV2_SPAY_C1, mounting scheme.

Only if the MOD_MPYV2_SPAY_C1 module is used without the MOD_HWT_INT module, before being installed, the CR2032 button battery must be inserted in the appropriate BT1 battery holder, shown in Figure 1.

For the correct use and disposal of the CR2032 lithium battery, refer to the procedure indicated in §8.

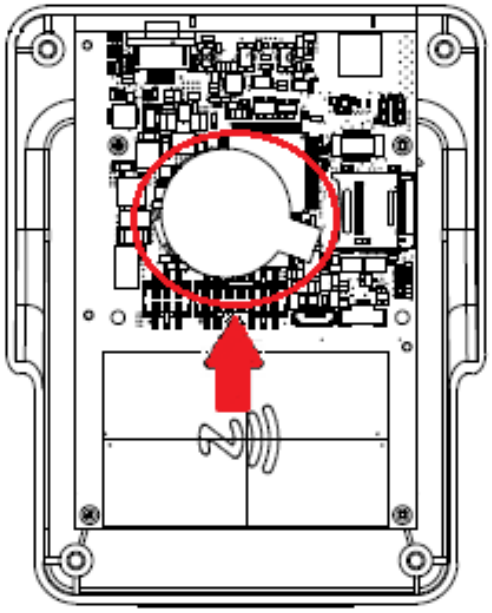


Figure 1 – MOD_MPYV2_SPAY_C1, battery holder.

7.1.3 Modules connection

Carry out the following steps in sequence.

Connect the modules to each other by means of the CABLE_CUSTOM_MAIN/SLAVE_BOARD (see Figure 4), as shown in Figure 12.

This cable has a length less than 3 meters.

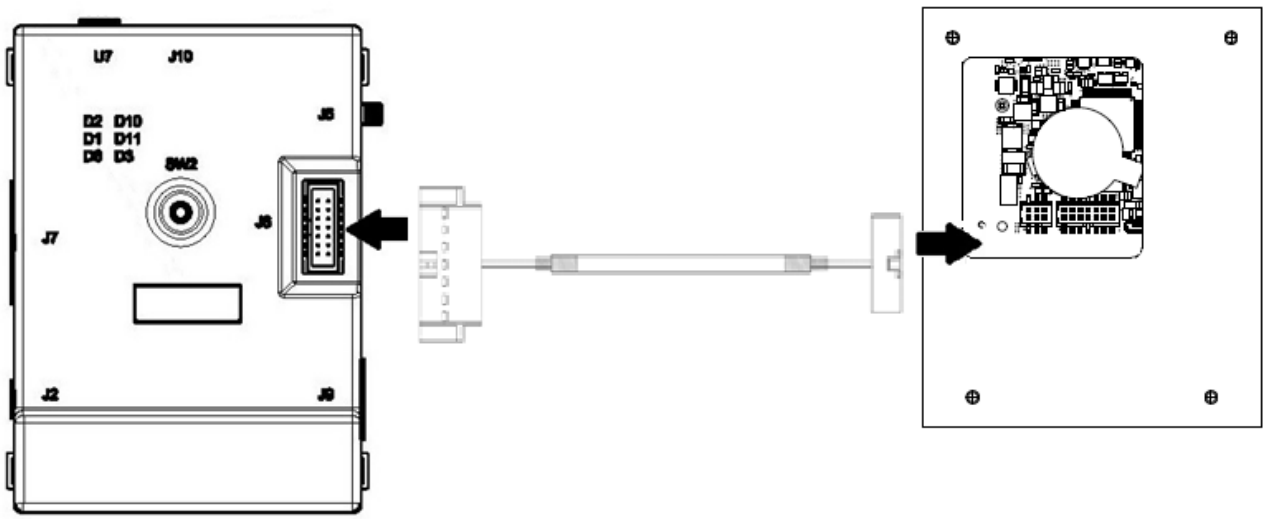


Figure 12 – Connection with CABLE_CUSTOM_MAIN/SLAVE_BOARD

Connect the Telemetry Module MOD_HWT_INT to the VM internal devices by means of CABLE_CUSTOM_MDB/EVA-DTS_POWERSUPPLY (see Figure 5), as shown in Figure 13.

This cable has a length less than 3 meters.

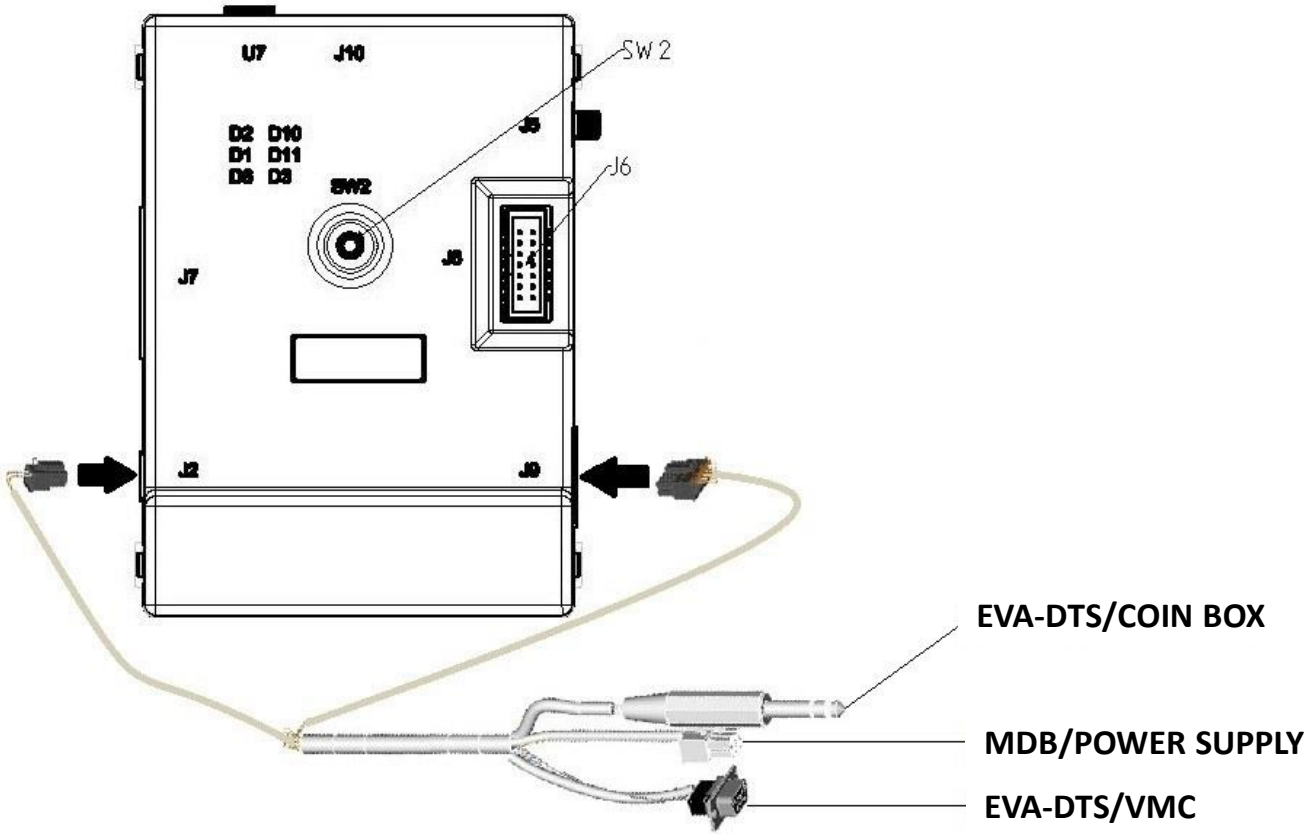


Figure 13 – Connection of CABLE_CUSTOM_MDB/EVA-DTS_POWERSUPPLY to the Telemetry Unit

During the installation of the Telemetry Unit, pay attention to the cable routing path. If not positioned correctly, it could be damaged during the opening or closing phases of the VM.

Screw the connector of the GPRS antenna to connector J5 on the MOD_HWT_INT module, as shown in Figure 14.

If possible, it is recommended to position the GSM / GPRS antenna outside the VM.

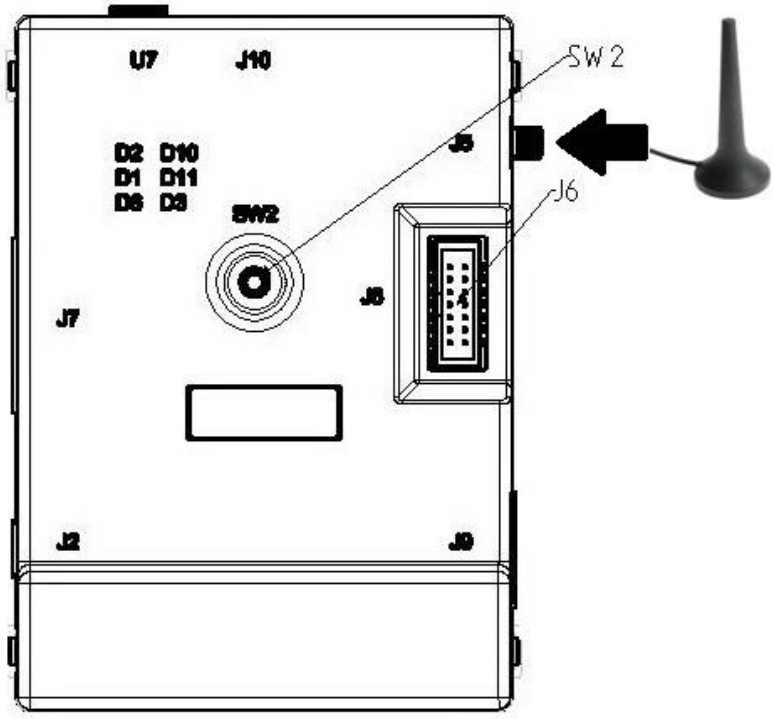


Figure 14 – MOD_HWT_INT, GPRS antenna connection

7.1.4 Maintenance

The only scheduled ordinary maintenance operations are limited to the visual inspection and external cleaning of the devices and the replacement of the backup battery (procedure indicated in the §8).

Before each maintenance operation it is necessary to disconnect the power supply.

8 Battery replacement and disposal

The backup battery of the Telemetry Module must be replaced with a HOWELL type model HW484594 3.7V, or equivalent, under penalty of warranty void and the risk of any damage, even serious, to things or people

The CR2032 button battery of the Payment Module 2.0 must be replaced with a Panasonic type CR2032 3V 220mAh, or equivalent, under penalty of warranty void and the risk of any damage, even serious, to things or people.

Before replacing any of the backup batteries that are part of the Telemetry KIT, make sure to disconnect the main power supply of Vending Machine.

In order to prevent damage to the MOD_HWT_INT and MOD_MPYV2_SPAY_C1 modules, precautions must be observed before replacing the batteries to avoid the possibility of electrostatic discharge (ESD).

8.1 Battery replacement and disposal of MOD_HWT_INT

To replace the backup battery, follow the steps described below.

Disconnect all the connectors from the MOD_HWT_INT module, until you are in the condition of Figure 15.

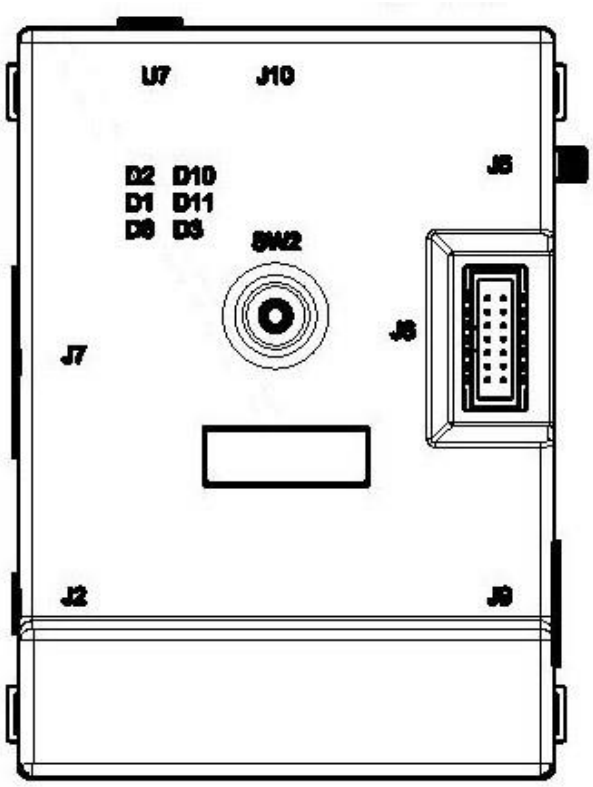


Figure 15 –MOD_HWT_INT Module

Extract the MOD_HWT_INT module from the VM.

It is necessary to remove the MOD_HWT_INT module from the VM in order to avoid damaging the module during the battery replacement phase.

Apply a slight pressure on the tabs 1 and 3 indicated in Figure 16 and at the same time act to release the upper part of the module casing. Then repeat the procedure on the tabs marked with 2 and 4 in Figure 16. At this point the upper part of the casing will be released from the lower one as illustrated in Figure 17.

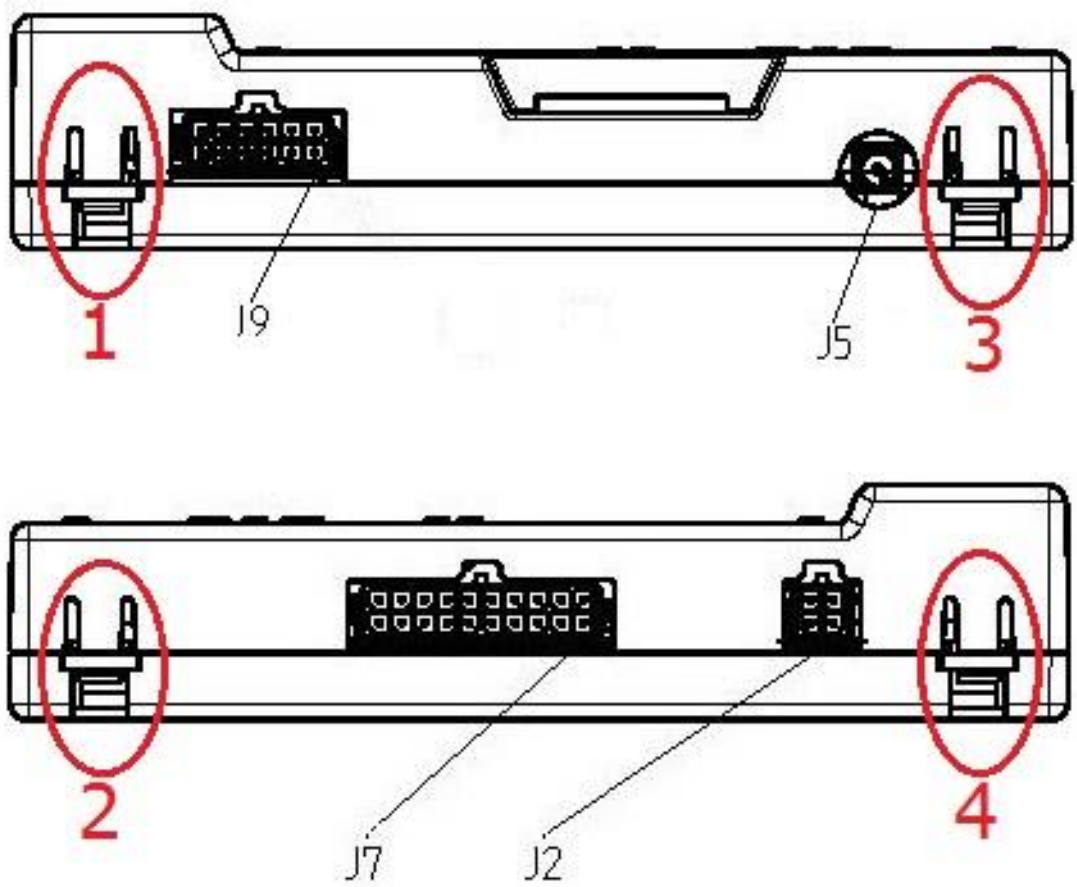


Figure 16 – MOD_HWT_INT, details of opening tabs

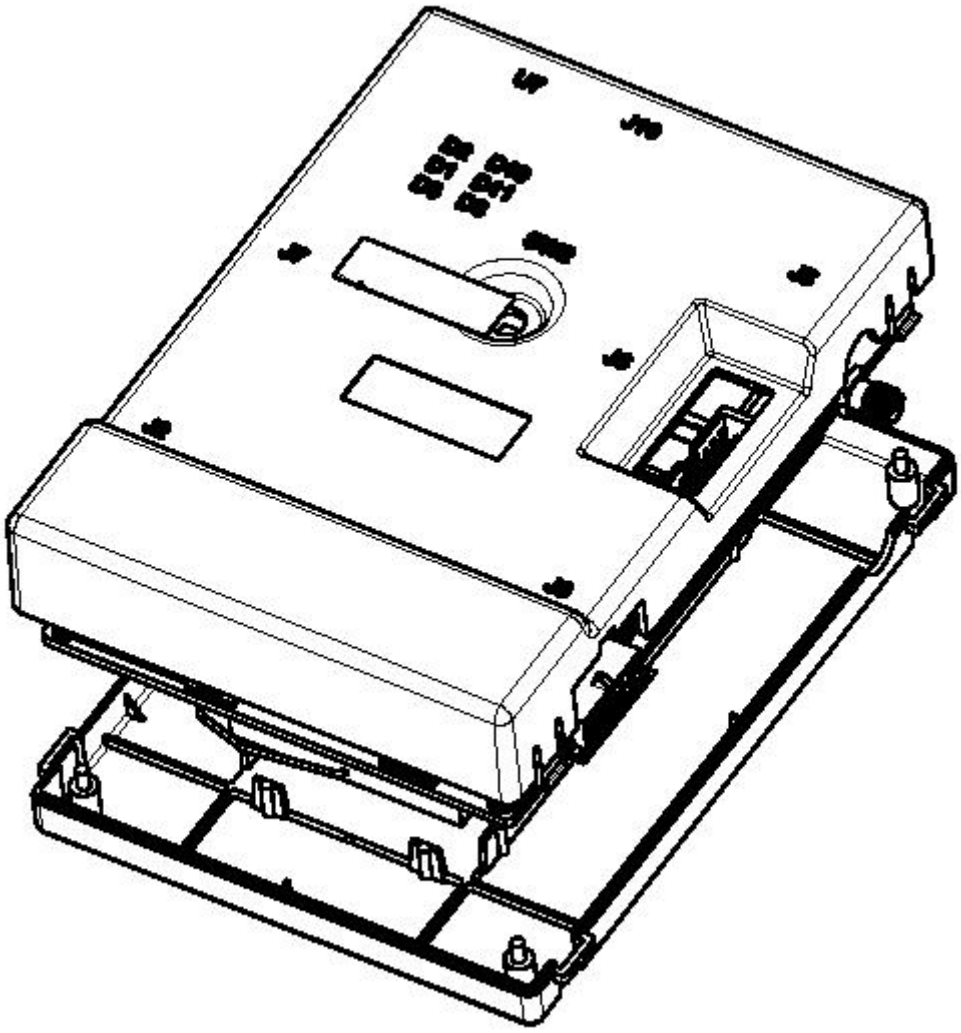


Figure 17 – MOD_HWT INT, enclosure disassembly

Once the upper part of the module casing has been removed, a situation like the one shown in Figure 18 is presented.

At this point, release the battery connector from connector J3 indicated by the red arrow in Figure 18.

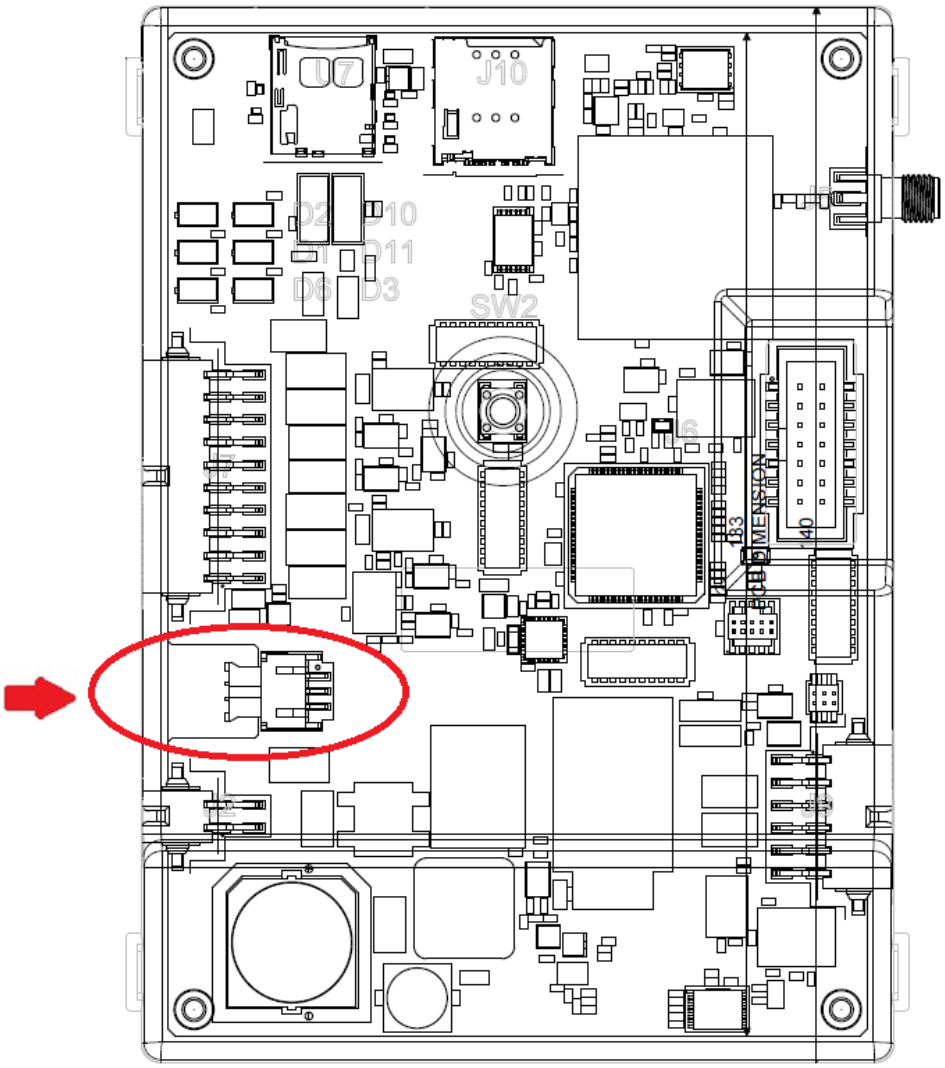


Figure 18 – MOD_HWT_INT, backup battery connector detail

Separate the internal electronic card (having P/N BI9150PMX, see [App.3]) from the back of the casing; a situation like the one shown in Figure 19 is presented, with the backup battery to be replaced in its seat. Remove it and replace it with the new backup battery.

At this point, reposition the electronic board inside the back shell of the casing, connect the power cable of the new backup battery to connector J3 of the card and completely close the MOD_HWT_INT module by hooking the tabs of the upper part of the casing.

Place the module inside the VM again and reconnect all the connectors. After making sure that all the cables have been connected correctly, power the VM again.

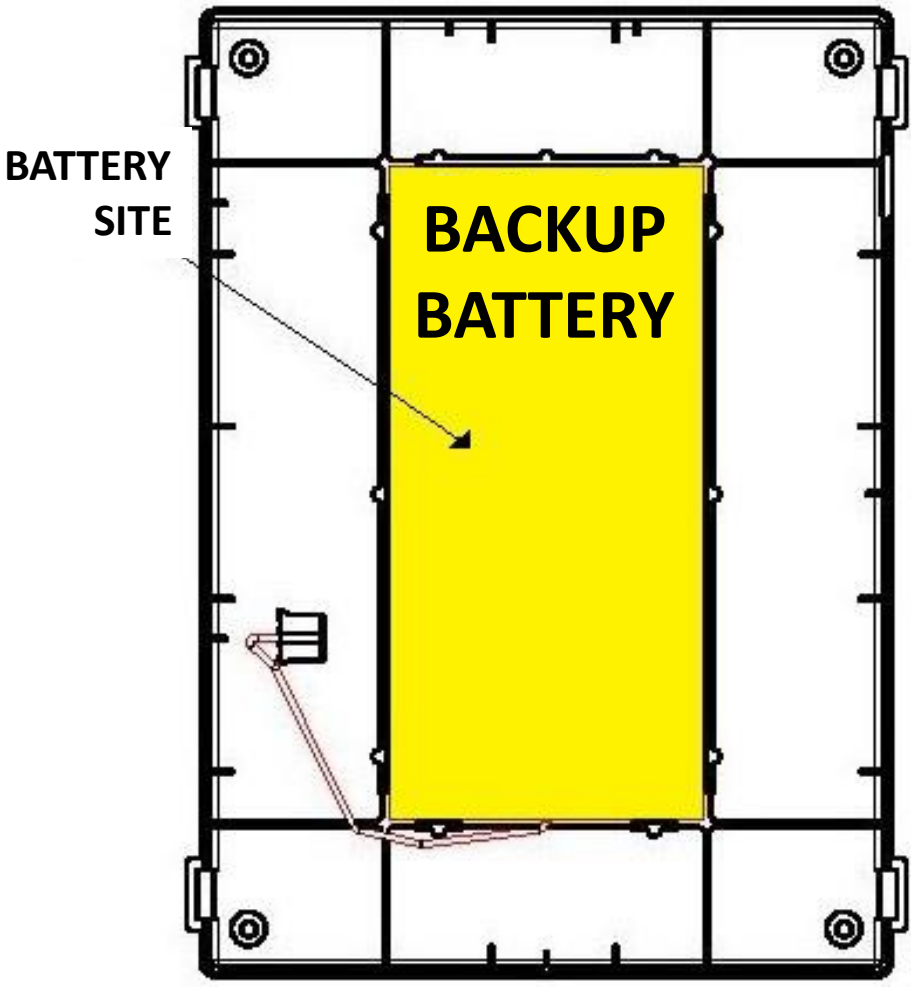


Figure 19 – Backup Battery of MOD_HWT INT Module

Li-ion

The correct disposal of the exhausted battery helps to avoid any negative consequences on the environment and health. For any additional information relating to the recycling of the product, contact the municipality, the ecological center office or the manufacturer.

8.2 Battery replacement and disposal of MOD_MPYV2_SPAY_C

The indications provided in this paragraph are to be considered when the use of this battery is foreseen by the manufacturer. The CR2032 battery is intended for "**FUTURE USE**".

To insert or replace the CR2032 button battery, follow the steps described below.

Disconnect all the connectors from the MOD_MPYV2_SPAY_C1 module, extract the MOD_MPYV2_SPAY_C1 module until you are in the condition of Figure 20.

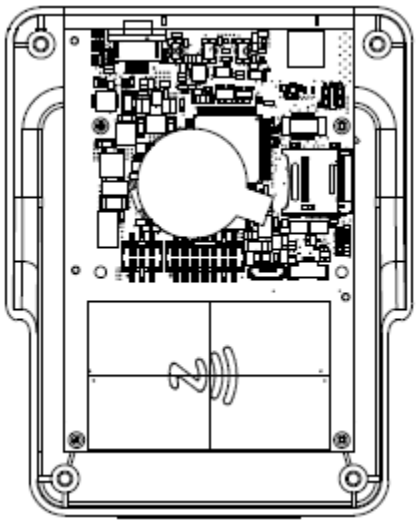


Figure 20 – MOD_MPYV2_SPAY_C1 Module

It is necessary to remove the MOD_MPYV2_SPAY_C1 module from the VM in order to avoid damaging the module during the battery replacement phase.

Insert the button battery between the upper contact tab and the lower contact (Figure 21), making sure that the negative pole of the battery is facing the lower contact and the positive pole is facing the upper contact of the housing.

To remove the button battery, slightly lift the upper tab contact (Figure 21) and remove the button battery.

During the phase of insertion or extraction of the button battery DO NOT use metal objects, or in general, electrical conductors.

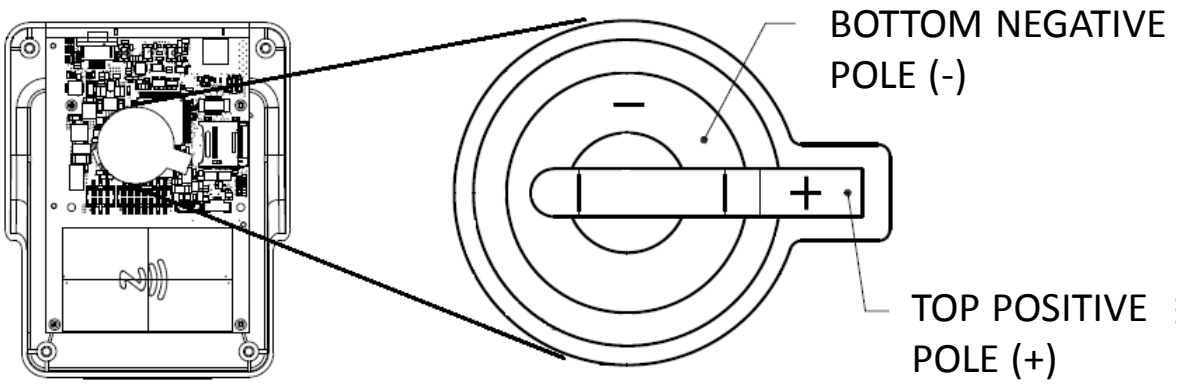


Figure 21 – MOD_MPYV2_SPAY_C1, backup battery holder detail

Place the module on the VM again and reconnect all the connectors. After making sure that all the cables have been connected correctly, power the VM again

Li-ion

The correct disposal of the exhausted battery helps to avoid any negative consequences on the environment and health. For any additional information relating to the recycling of the product, contact the municipality, the ecological center office or the manufacturer.

9 FAQ – Troubleshooting

Before contacting the technical assistance service, carry out the simple checks listed in the following Troubleshooting Table.

Problem	Possible Causes	Solution
The MOD_HWT_INT module does not turn on	• The connector of the power supply cable CABLE_CUSTOM_MDB / EVA-DTS_POWERSUPPLY (Figure 5) is not correctly inserted in the socket inside the VM • The CABLE_CUSTOM_MDB / EVA-DTS_POWERSUPPLY (Figure 5) is well connected inside the VM, but the VM is not connected to the power outlet	• Correctly connect the connector of CABLE_CUSTOM_MDB / EVA-DTS_POWERSUPPLY (Figure 5) to the socket inside the VM • Connect the VM to the power outlet
The MOD_MPYV2_SPAY_C1 module does not turn on	• The connectors of the CABLE_CUSTOM_MAIN / SLAVE_BOARD (Figure 4) are not correctly inserted in the appropriate seats on the MOD_HWT_INT or on the MOD_MPYV2_SPAY_C1	• Check that the connectors of the CABLE_CUSTOM_MAIN / SLAVE_BOARD (Figure 4) are correctly inserted in the appropriate seats on the MOD_HWT_INT and on the MOD_MPYV2_SPAY_C1
The red LED remains on during the start-up phase	• An error occurred during the module startup phase	• Restart the VM. If the error persists, contact technical support
During normal use, the red LED lights up for 5 seconds (or remains on)	• Problems occurred during the VM operation phases. The red LED lights up for 5 seconds and then goes off if the problem has been solved, otherwise it remains on as long as the problem has not been solved. • Another cashless device is in use	• If the red LED stays on for more than 5 seconds, restart the VM. If the error persists, contact technical support • Disconnect the key or other cashless device present on the VM

Table 8 – Troubleshooting table

10 Long Term Storage

For long term inactivity periods it is necessary to store the modules in a dry place protected from atmospheric agents, making sure to protect them to avoid damage.

Before storage it is recommended to clean the products.

Both the backup battery of the MOD_HWT_INT module, and the CR2032 button battery of the MOD_MPYV2_SPAY_C1 module, must be disconnected from the respective modules.

Table 9 shows the temperature limits allowed in case of storage for the modules and the respective batteries

Device	Storage Temperature Range
MOD_HWT_INT Module	-20°C / +70°C
MOD_MPYV2_SPAY_C1 Module	-20°C / +70°C
Battery HOWELL Model HW484594	-20°C / +45°C
Button Battery Model Panasonic CR2032 3V 220mAh	-30°C / +60°C

Table 9 – Storage Temperature Range – Long Term.

It is also recommended for the backup battery present inside the MOD_HWT_INT module, to check every 3 months that the voltage present at its ends is within the range of values 3,6V-3,9V.

If the aforementioned check notifies a voltage value outside those indicated, we strongly recommend that you restore the temperature conditions declared in the previous paragraph.

11 Return to service

After a long period of inactivity, before using the modules, it is necessary to check that they do not show any visible damage.

In case of anomalies, check the interconnection cables between the modules and the VM and between the two modules.

12 Proper product disposal

(Disposal of electrical and electronic equipment at the end of useful life) (Applicable in European Union countries and other countries with separate waste collection system). The mark on the product, on the accessories or on the documentation indicates that the product and its electronic accessories must not be disposed with other household waste at the end of its life cycle.

To avoid any damage to the environment or health caused by inappropriate waste disposal, the user is invited to separate the product and the aforementioned accessories from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

Business users are invited to contact their supplier and check the terms and conditions of the purchase contract. This product and its electronic accessories must not be disposed of together with other commercial waste.

Proper disposal of the product avoids potential harmful effects on the environment and health. Recycling materials helps to preserve natural resources.

13 Radio Modules Data

13.1 Radio Modules Data

13.1.1 GSM/GPRS Modem

The MOD_HWT_INT module is equipped with GSM/GPRS Radio interface.

In the product it performs the function of GPRS data transmission / reception. It does not fulfill GSM voice functionality in any way.

The GSM / GPRS module radio data are as follows:

Feature	Description
Output Power	2 W (33 dBm ± 2dB) – Class 4 @ GSM 900 1 W (30 dBm ± 2dB) – Class 1 @ DCS 1800 0.5 W (27 dBm ± 3 dB) – Class E2 @ EDGE 900 0.4 W (26 dBm +3/-4 dB) – Class E2 @ EDGE 1800
Modulation	GMSK, 8PSK
Interface	Antenna
GPRS	Quad-band GSM 850/E-GSM 900/DCS 1800/PCS 1900 GPRS Multi-slot class 10 R99 support PBCCH support Coding schemes: CS1 to CS4

RF Band	Transmit Band (Tx)	Receive Band (Rx)
GSM 850	824 to 849 MHz	869 to 894 MHz
E-GSM 900	880 to 915 MHz	925 to 960 MHz
DCS 1800	1710 to 1785 MHz	1805 to 1880 MHz
PCS 1900	1850 to 1910 MHz	1930 to 1990 MHz

RF Signal	Impedance	VSWR Rx (max)	VSWR Tx (max)
RF_MAIN	50Ω	3:1	3:1

RF performances are compliant with the ETSI recommendation GSM 05.05:

Frequency Band	Typical Sensitivity (dBm)
GSM 850	-109
E-GSM 900	-109
DCS 1800	-108
PCS 1900	-108

Table 10 – GSM/GPRS Radio Data

13.1.2 Bluetooth LE

The MOD_MPYV2_SPAY_C1 module is equipped with Bluetooth Low Energy (BLE) Radio interface.

The Bluetooth LE module radio data are as follows:

Parameter	Mode and Conditions	Min.	Typ.	Max.	Unit
Frequency range	-	2402	-	2480	MHz
Modulation	GFSK				
Interface	Antenna embedded in Bluetooth chip				
RX sensitivity (standard)	Packets: 200 Payload: PRBS 9 Length: 37 Bytes Dirty Transmitter: off. PER: 30.8%	-	-94	-	dBm
Maximum input	-	-10	-	-	dBm

Parameter	Min.	Typ.	Max.	Unit
Transmitter				
Frequency range[a]	2402	-	2480	MHz
Output power adjustment range	-20	-	4	dBm
Output power	-	2	-	dBm
Output power variation	-	2.5	-	dB
LO Performance				
Initial carrier frequency tolerance	-	-	±150	KHz
Frequency Drift				
Frequency drift	-	-	±50	KHz
Drift rate	-	-	20	KHz/50us
Frequency Deviation				
Average deviation in payload (sequence: 00001111)	225	-	275	KHz
Average deviation in payload (sequence: 10101010)	225	-	-	KHz
Channel spacing	-	2	-	MHz

[a.] This parameter is taken from the Bluetooth 4.0 specification

Table 11 – Bluetooth Radio Data

13.1.3 NFC

The MOD_MPYV2_SPAY_C1 module is equipped with Near Field Communication (NFC) interface.

The NFC module radio data are as follows:

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
fo	External RF signal frequency		-	13.56	-	MHz
DR	Data Rate		106	-	848	kbit/s
Po	Maximum Power	@ 10m			42	dBµA/m
Mod	Modulation Type		ASK			
Interface	Antenna Loop on PCB					

Table 12 – NFC Radio Data

14 Dispositions

Carefully check the device before each operation. Matipay S.r.l. cannot provide for any reasonably unforeseeable misuse which could lead to a potential danger.

The modules are made up of plastic casings specifically designed for installation on a VM.

Improper use could cause damage or malfunction of the modules.

The modules do not have openings for internal ventilation. However, be careful to avoid spilling liquids that could cause damage to internal equipment.

Avoid using liquids near the device.

14.1 Personnel qualification

The personnel in charge of maintenance and use of the device must have consulted the Chapter 7 - Preliminary operations and maintenance. This is imperative for all staff who work with modules only sporadically.

Establish the responsibility of the device operator and authorize it to refuse disposition by third parties that are contrary to the safety rules.

Personnel in the training phase may only perform their work if they are constantly supervised by a skilled person.

15 Warranty

The warranty period of the MOD_HWT_INT module, the MOD_MPYV2_SPAY_C1 module, and the accessories supplied is 12 months.

The warranty period of the button battery is 6 months.

The use of spare parts not approved by the manufacturer invalidates any warranty and relieves the manufacturer of any responsibility for malfunctions or accidents.

Removal or modification of seals and protections relieves the manufacturer of any liability for damage caused to things and / or persons.