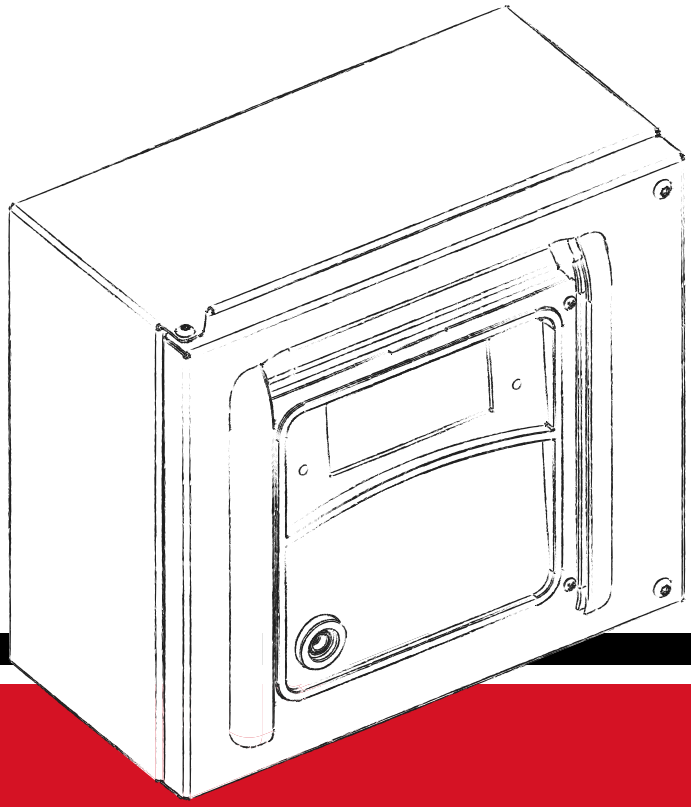
PIUSI

Fluid Handling Innovation

B.SMART

FULL PACK MC BOX ETL



MADE IN ITALY

Installation, use and maintenance

EN

BULLETIN M0583 EN_01

ENGLISH

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1 CONFORMITY DECLARATION

1.1 ETL DECLARATION OF CONFORMITY

This product is ETL listed for Canada and United States under the UL1238 and CSA 222#142 standards.

1.2 EU CONFORMITY DECLARATION

The undersigned: PIUSI S.p.A.
Via Pacinotti 16/A - Z.I. Rangavino
46029 Suzzara - (MN) - Italy
DECLARES under its own responsibility, that the unit described below:
Description: **AUTOMATIC FLUID DISPENSING MANAGEMENT SYSTEM**
Model: MC BOX B.SMART
Serial number: refer to the Lot Number indicated on the CE plate affixed to the product
Year of manufacture: refer to the year of production indicated on the CE plate affixed to the product.
conforms to the legal regulations that transpose the following directives:
- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility Directive 2014/30/EU
- ROHS II Directive 2011/65/EU
- RED Directive 2014/53/EU
The documentation is at the disposal of the relevant authority upon justified request at PIUSI S.p.A. or request via e-mail: doc_tec@piusi.com The party authorised to compose the technical file and draw up the declaration is Otto Varini in his capacity as legal representative.

Suzzara, 01/07/2020

Otto Varini
legal representative.

2 GENERAL WARNINGS

IMPORTANT INFORMATION

For operators' safety and to prevent any damage, the instruction manual must be fully read and understood before carrying out any operation.

Symbols used in the manual

The following symbols will be used in the manual to highlight particularly important instructions, warnings and information.

WARNING
This symbol indicates safety regulations for the operators and/or any persons at risk.

ATTENTION
This symbol indicates the possibility of damage to the unit and/or its components.

NOTE
This symbol indicates useful information.

Storage of the manual

This manual must be whole and legible in its entirety. The end user and specialist technicians authorised for installation and maintenance must be able to read it at any time.

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3 SAFETY INSTRUCTIONS

WARNING Electrical supply - preliminary checks for the installation		**Completely avoid contact between the electrical supply and the liquid to be pumped.**
Inspection and maintenance operations		**Before any inspection or maintenance, cut off the POWER SUPPLY**
FIRE AND EXPLOSION When flammable liquids are present in the work area, flammable vapours may be present and may cause fire or explosion during station use.		**To prevent fire and explosion risks:** Use the station only in ventilated areas Keep the work area free of scraps, including scraps and solvent or petrol tanks. Do not plug or unplug or operate the switch in the presence of flammable vapours. All devices in the work area must be grounded. Interrupt immediately any action if there are sparks or shocks. Do not use the station until you have identified and resolved the problem. Keep a fire-extinguisher in good working order close to the working area.
ELECTRICAL SHOCK **Electrocution or death**		This station must be grounded. Improper installation or use of the station may result in danger of electric shock. Switch off and unplug the power cord after use. Connect only to grounded sockets. Use only grounded cables in accordance with the applicable regulations. Unsuitable extension leads may be dangerous. Make sure that the plug and socket of the extension cords are intact. Unsuitable extension leads may be dangerous. In outdoor use, use only extensions suitable for the specific use, according to the regulations in force. The plug and socket must be connected far from water. Do not expose to rain. Install in a sheltered location. Never touch the plug or the socket with wet hands. Do not turn the dispensing system on if the supply connection cable, WARNING parts of the unit, e.g. the suction/delivery pipe, the nozzle or the safety devices are damaged. Replace the damaged pipe immediately before use. Before each use, check that the mains connection cable and the plug are not damaged. If damaged, have the cable and plug replaced by qualified personnel. The plug and socket must be connected far from water. Outdoors, use only authorised extension leads for which this use is envisaged with an adequate wire diameter in accordance with the regulations in force. As a general rule of electrical safety it is always recommended to power the device by protecting the line with: - circuit breaker/disconnector with a current rating suitable for the power line - 30 mA residual current device The electrical connection must have a ground fault current interrupter (GFCI). Installation operations are carried out with the box open and the electrical contacts accessible. All these operations must be carried out with the unit isolated from the mains in order to avoid hazards of electrocution!

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IMPROPER USE OF THE UNIT Improper use of the device can cause serious damage or death.		Do not operate the unit when tired or under the influence of drugs or alcohol.
		Do not leave the work area while the unit is on and operating.
		Turn off the unit when not in use.
		Do not alter or modify the unit. Alterations or modifications to the unit may invalidate its type-approval and result in dangers to safety.
		Arrange the hose and the power cables always far from transit areas, sharp edges, moving parts and hot surfaces.
		Do not twist the hose or use a stronger hose.
		Keep children and animals far from the work area
		Observe all applicable safety regulations.
		Do not exceed the maximum working pressure or temperature of the component with the lowest system rating. See the technical specifications in all machine manuals.
		Use liquids and solvents that are compatible with the wet parts of the unit. See the technical specifications in all machine manuals. Read the manufacturer's warnings for liquids and solvents. To obtain more information about the material, request the Safety Data Sheet (MSDS) from your distributor or dealer.
		Check the unit every day. Repair or replace worn or damaged parts immediately with original manufacturer's spare parts only.
		Make sure that the unit is classified and approved in accordance with the regulations for the environment in which it is used.
		Use only the unit for its intended purpose. Contact your distributor for more information.
		Keep hoses and cables away from transit areas, edges, moving parts and hot surfaces.
		Do not bend or bend the hoses too much or use the hoses to pull the unit.
DANGER OF BURNS		To avoid severe burns, do not touch liquids or equipment
Danger of smoke and toxic fluids.		For problems deriving from the product handled with eyes, skin, inhalation and ingestion, refer to the safety data sheet of the fluid used.
		Store treated liquids in suitable containers and in compliance with applicable regulations.
		Prolonged contact with the product handled may cause skin irritation; always use protective gloves when dispensing.

FIRE AND EXPLOSION

If it is necessary to dispense in areas classified as hazardous for explosion, it is forbidden to use the smartphone less than 30 cm away from the fluid at the time of dispensing.

The PIUSI B-SMART product has been conceived to be used together with the user's mobile phone only and exclusively for the operations of connection, authentication and connection of the user's device to the fuel dispenser in order to perform remotely certain operations described in this manual.
If the PIUSI B-SMART product is used to refill petrol or other fuel or liquid that emits flammable vapours or in any case creates potentially explosive atmospheres according to the current ATEX regulations (Directive 2014/34/EU and relative applicable national implementing provisions, including any later amendment or additions), the use of the mobile phone while dispensing and in any case within any zone classified for ATEX purposes in accordance with the regulations in force is strictly prohibited, except in the case where the unit is regularly ATEX certified and authorised for use in the relevant area. The mobile phone must therefore remain outside this area or be switched off.
The use of the mobile phone by the user when refilling the vehicle with other non-flammable liquids is in any case strongly discouraged as it can cause distractions that can be dangerous.
PIUSI disclaims any and all liability in the event of damage to the person or property of the user or third parties resulting from failure to comply with the above warnings and / or any other negligent, reckless or imperishable behaviour of the user.

4 FIRST AID REGULATIONS

Persons subjected to electrical discharge

Disconnect the supply, or use a dry insulator for protection when moving the victim far away from any lead. Avoid touching the victim with bare hands until they are far away from any lead. Request the assistance of trained, qualified staff immediately. Never operate switches with wet hands.

NO SMOKING

Do not smoke near the dispenser and do not use the pump near open flames.

5 SAFETY NORMS

BASIC CHARACTERISTICS OF THE PROTECTIVE EQUIPMENT

Wear protective equipment that is:
- suitable for the operations to be carried out
- resistant to the products used for cleaning.

PERSONAL PROTECTIVE EQUIPMENT TO BE WORN

Safety shoes;

Close-fitting clothing;

Protective gloves;

Safety goggles;

OTHER EQUIPMENT

Instruction manual.

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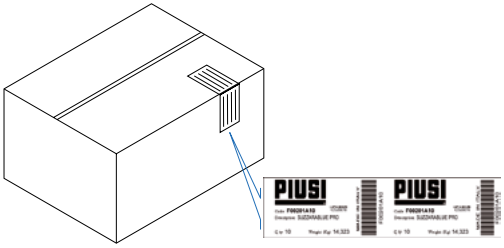
6 TRANSPORT, HANDLING AND UNPACKING

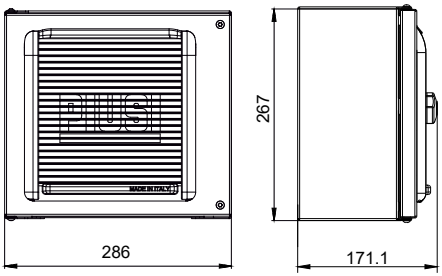
During machine inactivity, both packed or unpacked, it should be stored in an area protected against weather agents (rain, moisture, sun, etc...) and dust.
To open the cardboard packaging, use scissors or a cutter, taking care not to damage the system. Fully open the packaging and grasp the MC BOX B.SMART so that it can be positioned afterwards.
The packaging elements (cardboard, wood, cellophane, etc...) must be placed in the suitable containers and not left in the environment or within children easy reach as they are potentially harmful. Disposal should be performed in compliance with the standards in force in the utilisation country.
Make sure the unit is integer controlling all parts for possible damage that could hinder safety and functionality. In case of doubt, do not start up and contact the manufacturer's technical service.

The packaging shall bear the following indications:
- label showing the information for the equipment (model, weight, etc.).



6.1 DIMENSIONS AND WEIGHTS

MODEL	TOTAL WEIGHT (kg)	PACKAGING DIMENSIONS (mm)
MC BOX B.SMART	5.3	480 x 370 x 265
PEDESTAL KIT	15	-



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7 MACHINE AND MANUFACTURER IDENTIFICATION

The MC BOX B.SMART stations are equipped with an identification plate attached to the frame:

- Model	- Technical data
- Serial number / Year of manufacture	- CE marking
	- Manual code

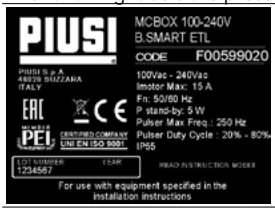
WARNING **Before installation, always check that the dispensing system model is correct and suitable for the supply currently available (Voltage / Frequency).**

7.1 POSITION OF THE PLATES

Some stickers and/or plates are applied to the MC BOX B.SMART to indicate the most relevant information to the operator. It is necessary to check that these do not deteriorate or detach over time.

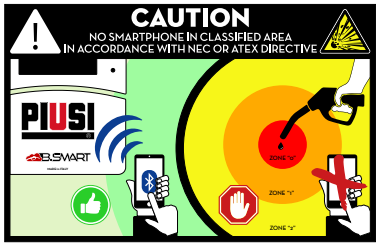
NOTE **Should this occur, please contact our customer assistance office so that we can send you copies of the spoilt or missing plates/labels for reapplication where originally provided.**

The following labels are present:



1 CE plate with technical data

2 Corner label plate applied on the box

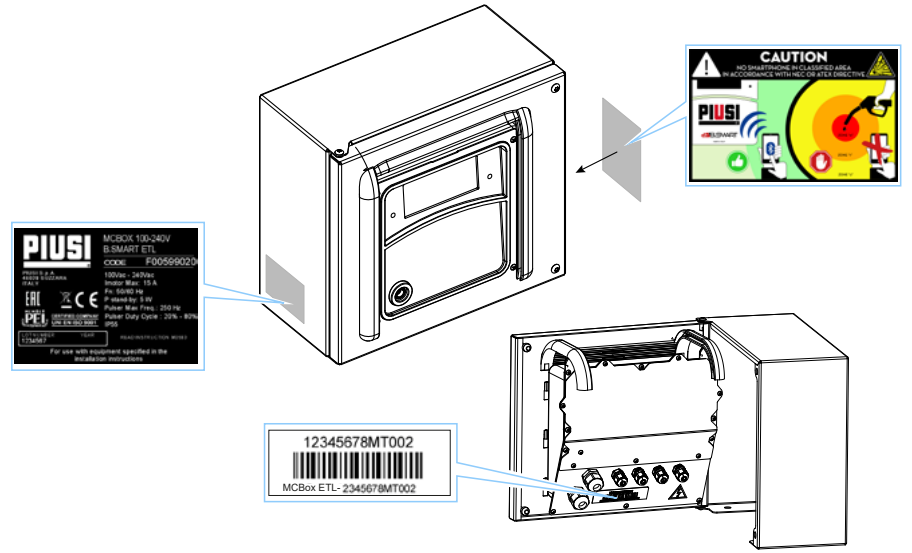


3 Adhesive for prohibiting the use of smartphones in the vicinity of the dispenser during dispensing

After activation of the dispensing, during refilling operations, do not use your smartphone less than 30 cm from the dispenser.

APPLICATION CHARGED TO THE INSTALLER
To be applied in case MC BOX B.SMART is installed near a classified area

4 - Product warranty label



8 DESCRIPTION OF THE MAIN PARTS

FOREWORD

B.SMART is an electronic system for controlling the dispensing of fluids via smartphone.
The control system consists of:

An electronic controller
equipped with a BlueTooth interface (BLE 4.0 and later), a display and an interface LED that controls a dispensing pump

An APP
installed on a smartphone equipped with an Android operating system or Apple IoS

A WebAPP
namely an internet portal accessible from any PC or Tablet connected to the internet from which the entire site can be monitored

SYSTEM FUNCTIONS

- site configuration, acquisition and management of refillings, management of refilling fuel dispensers, management of drivers, vehicles and detailed reporting of the dispensings via WebAPP accessible from any PC/Tablet, using your credentials
- Fuel dispensing using the dedicated APP: PIUSI APP, downloadable only for smartphones from Play Store and App Store, which connects to the fuel dispenser / controller via BLE connection
- Fuel dispensing using the dedicated APP also in areas without 3/4G coverage and Wi-Fi
- Dispensing via iButton associated with the individual driver
- Possibility to remotely manage sites far from the company headquarters

	As can be seen from the descriptive diagram on page 12, an example of the basic structure of the system is shown, which shows the possibility of: • manage an engine output • monitor the level of 1 tank as needed, even if a tank is shared by pumps connected to different control units • manage multiple control units simultaneously, within the same system For more specific details on how to connect and communicate between the control units, please refer to the manual contained in the WebApp of plant management.
COMPATIBILITY WITH OPERATING SYSTEMS	The system is compatible with the following iOS versions: • iOS10 • iOS11 • iOS12 and the following
	The system is compatible with the following Android versions: • 5.0 - 5.1 • 6.0 • 7.0 - 7.1 • 8.0 • 9.0 and the following
EQUIPMENT AND CHARACTERISTICS	The system consists of several devices:
BOX	composed of an electronic controller to manage fuel dispensing, equipped with: • Numeric display • Reader for iButton • BLE 4.0 connection (or following) • Status sensors for: level alarms, flow meters, positioning of the dispensing nozzle • Pump on/off control
CLOUD	Where there is the database to store the configurations of the site and the dispenser, the drivers, the license plates of the vehicles and all the dispensings
WebApp	Web interface used by the site manager. It has various functions: it monitors the dispensings (from whom they were made, when, in which controller), creates/eliminates users from the site, adds/removes controllers/fuel dispensers from the site. The only external device the WebApp connects to is a USB reader for iButton
APP	It makes several operations: • It manages two types of users: driver and manager • It sends commands to the controller and receive answers, the commands are used to perform: dispensing, calibration, updating the firmware of the controller, downloading updates of the controller configuration, managing the drivers or loading in the cloud the dispensings in the controller

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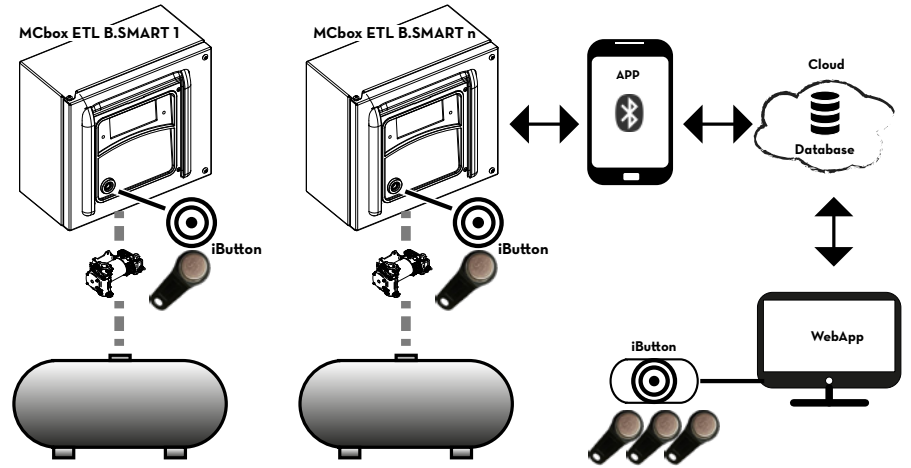
MCbox ETL B.SMART 1
iButton
MCbox ETL B.SMART n
iButton
APP
Cloud
Database
WebApp
iButton

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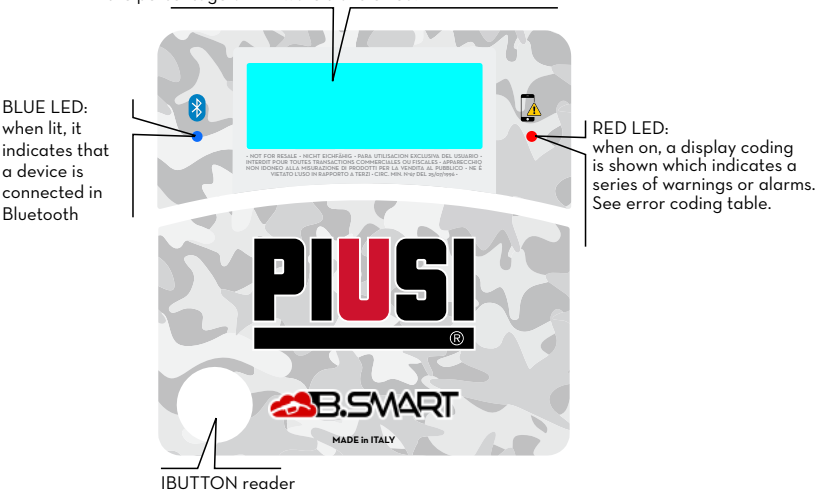
9 OPERATION

The controller is powered by 100/240 V ac, it drives a motor that can absorb a maximum current of 15 A. It has a 4-character backlit display, iButton reader, blue led for Bluetooth connection and red led for warning/alarm:

DISPLAY
Backlighting on:
the driver or manager has been authenticated via smartphone or the driver has been authenticated via iButton.
The display shows:

- the version of the installed firmware,
- the value of the dispensing,
- the time,
- warning or alarm code when the red LED is on,
- the boot status for the firmware update,
- the percentage of firmware transferred.



NOTE Red LED on - It switches on due to several factors, each time the LED lights up the display shows a code indicated by a letter A and by an incremental number. Whenever the led is on, it is not possible to dispense.

Below are the possible coded errors, with their respective resolution methods:

Coding	Description	Explanation/Solution
C 1	WARNING_MASTER_PUMP_GROUPA_LEVEL1_CONTACT	Contact 1 associated with pump A of the main controller is active: red LED flashing.
C2	WARNING_MASTER_PUMP_GROUPA_LEVEL2_CONTACT	Contact 2 associated with pump A of the main controller is active: red LED flashing.
C3	WARNING_MASTER_PUMP_GROUPA_THR1	The tank associated with pump A of the main controller has reached the level 1 threshold: red LED flashing.
C4	WARNING_MASTER_PUMP_GROUPA_THR2	The tank associated with pump A of the main controller has reached the level 2 threshold: red LED flashing.
C9	WARNING_SLAVE_PUMP_GROUPA_LEVEL1_CONTACT	Contact 1 associated with pump A of the secondary controller is active: red LED flashing.
C 10	WARNING_SLAVE_PUMP_GROUPA_LEVEL2_CONTACT	Contact 2 associated with pump A of the secondary controller is active: red LED flashing.
C 11	WARNING_SLAVE_PUMP_GROUPA_THR1	The tank associated with pump A of the main controller has reached the level 1 threshold: red LED flashing.
C 12	WARNING_SLAVE_PUMP_GROUPA_THR2	The tank associated with pump A of the secondary controller has reached the level 2 threshold: red LED flashing.

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C 17	**WARNING_MASTER_PUMP_GROUPA_PROBE_OCIO**	Fault detected on the level sensors connection line. (The system allows manual dispensing).
C 19	**WARNING_MASTER_SLAVE_GROUPA_PROBE_OCIO**	Fault detected on the level sensors connection line. (The system allows manual dispensing).
C25	**WARNING_CANBUS_COM**	Fault detected on the connection line between controllers. The system behaves as for probe alarms, allowing manual dispensing.
A 1	**ALARM_MASTER_PUMP_GROUPA_LEVEL1_CONTACT**	Contact 1 associated with pump A of the main controller is active: red LED on (not flashing). Dispensing not possible.
A2	**ALARM_MASTER_PUMP_GROUPA_LEVEL2_CONTACT**	Contact 2 associated with pump A of the main controller is active: red LED on (not flashing). Dispensing not possible.
A3	**ALARM_MASTER_PUMP_GROUPA_THR1**	The tank associated with pump A of the main controller has reached the level 1 threshold: red LED on (not flashing). Dispensing not possible.
A4	**ALARM_MASTER_PUMP_GROUPA_THR2**	The tank associated with pump A of the main controller has reached the level 2 threshold: red LED on (not flashing). Dispensing not possible.
A9	**ALARM_SLAVE_PUMP_GROUPA_LEVEL1_CONTACT**	Contact 1 associated with pump A of the secondary controller is active: red LED on (not flashing). Dispensing not possible.
A 10	**ALARM_SLAVE_PUMP_GROUPA_LEVEL2_CONTACT**	Contact 2 associated with pump A of the secondary controller is active: red LED on (not flashing). Dispensing not possible.
A 11	**ALARM_SLAVE_PUMP_GROUPA_LEVEL1_THR1**	The tank associated with pump A of the main controller has reached the level 1 threshold: red LED on (not flashing). Dispensing not possible.
A 12	**ALARM_SLAVE_PUMP_GROUPA_LEVEL1_THR2**	The tank associated with pump A of the secondary controller has reached the level 2 threshold: red LED on (not flashing). Dispensing not possible.
A28	**ALARM_BUFFER_FULL**	The dispensing buffer is full. All the dispensing operations stored in the controller must be uploaded to the cloud.
A29	**ALARM_INACTIVE_PUMP**	No pumps are active. (Check system configuration on WebApp)
A30	**ALARM_RTC_RESET**	The time has been lost. The current time must be uploaded to the controller via a smartphone.
A31	**ALARM_RTC_FAULT**	Time synchronization not possible. (Contact the Service Department).
A32	**ALARM_SOFT_MEMORY_DATA_FAULT(Cumulative)**	Corrupted memory (data can be reset from WebApp backup).
A33	**ALARM_HARD_MEMORY_DATA_FAULT(Cumulative)**	Corrupted memory (data can be reset from WebApp backup).
A34	**ALARM_VERY_HARD_MEMORY_DATA_FAULT(Cumulative)**	Damaged memory (contact the Service Department).

With regard to the warning/alarm logics, it should be noted that one or more pump units can be connected to the same tank, or share common level contacts as outlined in the paragraph describing the system.
In these situations, warnings and alarms from one controller will be propagated to the other controllers sharing the same resource.
For more specific details on modes of connection and communication between controllers, please refer to the manual found in the system management WebApp.

10 TECHNICAL SPECIFICATIONS

INTENDED USE Implementation of a system for the dispensing and control of fluids for private use not subject to special regulations such as ATEX for potentially explosive environments.

WARNING **DO NOT INSTALL MC BOX B.SMART IN ENVIRONMENTS CLASSIFIED AS POTENTIALLY EXPLOSIVE IN ACCORDANCE WITH ATEX REGULATIONS.**

MAXIMUM VARIATIONS IN ELECTRICAL PARAMETERS The motors in the dispensers accept maximum variations:
of supply voltage by +/- 5%
and maximum frequency variations of +/- 2%
SEE TECHNICAL SPECIFICATIONS TABLE BELOW

WARNING **BEFORE INSTALLATION, ALWAYS CHECK THAT your MODEL IS CORRECT AND SUITABLE FOR THE SUPPLY EFFECTIVELY AVAILABLE (VOLTAGE / FREQUENCY).**

Signal	Standard conditions	Limits	Notes
Power supply input	100-240 V ac	Maximum power absorbed in stand-by of 5W	The electronic board is equipped with a switching technology power supply that allows a wide range of voltages and frequencies and therefore makes the equipment robust for the high fluctuations of voltage or frequency present on the power distribution mains in many areas of the world
Motor piloting output	100-240 V ac	Imax 15 A	
Electronic key interface	YELLOW key (iButton): Enabling input by PIUSI electronic key	Through a software procedure, the yellow keys of the drivers are registered on the PC and then these drivers are enabled on one or more dispensing stations	You can configure whether or not such a key is present
Nozzle contact input (only for versions where available)	Clean contact or Open Collector (NPN) electronic signal	About 250 uA at 5 V dc will be supplied on the clean contact (or on the open collector)	It is possible to configure whether or not this contact is present, and it is also possible to configure the type of signal (normally open or normally closed)
Pulser IN input	Free contact or Open Collector (NPN) electronic signal	About 250 uA at 5 V dc will be supplied on the clean contact (or on the open collector) The input signal can have a maximum frequency of 300 Hz with a Duty Cycle between 20% and 80%	The input signal can have a maximum frequency of 300 Hz with a Duty Cycle between 20% and 80%

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Level 1 contact input **(only for versions where available)**	Clean contact or Open Collector (NPN) electronic signal If it is necessary to supply a level sensor, 24 V dc are also available on the terminal. The maximum current available to the sensor for its power supply is 25 mA	About 1 mA at 5 V dc will be supplied on the clean contact (or on the open collector)	It is possible to configure whether or not this signal is present, and it is also possible to configure the type of signal (normally open or normally closed for versions where provided) Finally, it is possible to choose the action to be taken by the controller when it receives this signal: it can only give an alarm on the display or it can totally inhibit other dispensings if the Pump Block is set
Level 2 contact input **(only for versions where available)**	Clean contact or Open Collector (NPN) electronic signal If it is necessary to supply a level sensor, 24 V dc are also available on the terminal. The maximum current available to the sensor for its power supply is 25 mA	About 250 uA at 5 V dc will be supplied on the clean contact (or on the open collector)	It is possible to configure whether or not this signal is present, and it is also possible to configure the type of signal (normally open or normally closed for versions where provided) Finally, it is possible to choose the action to be taken by the controller when it receives this signal: it can only give an alarm on the display or it can totally inhibit other dispensings if the Pump Block is set
24 V dc auxiliary power supply output	24 V dc auxiliary output to supply external electronic devices	Imax = 25 mA	The device to be supplied must not absorb more than 25 mA with 24 V dc power supply. Typically it could be a level sensor
Fuses	F1 (V ac power input) 800 mA T (delayed) F2 (motor output) 20 A T (delayed) F3 (AC/DC output) 800 mA T (delayed)		
IP protection degree	IP 55		
Operating temperature	From -10° C to +40°C		
Storage temperature	From -20° C to +60°C		
Humidity	< 90%		
Wiring distances	Max. pulser distance	15 m	
	Max. level sensor distance	100 m	
Counting and display limits	The floating point sequence: 0.00 -> 99.99 -> 999.9 -> 9999 The maximum quantity that can be dispensed is 9999 units regardless of the unit of measurement set litres/gallons/pints **0.00** → **9,999** → **99.99** → **999.9** → **9999**		
	PRESET: Presettable maximum quantity	9999 litres/gallons/ pints	
Memories	The electronic controller can store: - Up to 500 users - Up to 500 dispensings		

EN

11 USE

11.1 INTENDED USE

MC BOX B.SMART IS DESIGNED TO MANAGE DISPENSING FOR SEVERAL REFILLING STATIONS FOR PRIVATE USE.
DEDICATED APP AND WEB APP MAKE IT EASY TO USE, BY RETURNING A SUMMARY OF ALL DISPENSINGS.

WARNING
Use ambient conditions

Ambient temperature: min. -20°C / max. +60°C
Relative humidity: max. 90%
The limit temperatures indicated apply to the pump components and must be observed to avoid possible damage or malfunction.

11.2 NOT INTENDED USE

WARNING
Flammable liquids and explosive atmospheres

MC BOX B.SMART HAS NOT BEEN DESIGNED IN ACCORDANCE WITH ATEX REGULATIONS OR TO OPERATE IN ENVIRONMENTS WITH A POTENTIALLY EXPLOSIVE ATMOSPHERE.
DO NOT INSTALL MC BOX B.SMART IN POTENTIALLY EXPLOSIVE LOCATIONS.

The system was not designed for the dispensing of diesel, petrol, flammable liquids with flash point <55°C/131°F, or for operation in environments with a potentially explosive atmosphere.
Use in the conditions indicated above is therefore prohibited.

WARNING
Not intended use

Use of the system for purposes other than those intended is strictly prohibited. Any use other than that for which the system was designed and described in this manual is considered "IMPROPER USE", for which Piusi S.p.A. accepts no responsibility in case of damage to property, persons, animals or the system itself.

11.3 REASONABLY FORESEEABLE MISUSE

The smartphone is an indispensable tool for MCbox B.SMART to set up and record the dispensings managed by the system, but it is forbidden to use it when dispensing near the dispenser.

WARNING

It is absolutely forbidden to use the mobile phone when dispensing petrol or other fuel or liquid that emits flammable vapours or in any case creates potentially explosive atmospheres; in any case within any area classified for ATEX purposes in accordance with the regulations in force, except in the case where the device is regularly ATEX-certified and authorised for use in the relevant area. The mobile phone must therefore remain outside this area or be switched off.

WARNING

Use your smartphone only and exclusively to connect, authenticate and pair from your device to the dispenser. When refilling the vehicle, even with non-flammable liquids, the use of the telephone is in any case strongly discouraged as it can cause distractions that can be dangerous.

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12 INSTALLATION

12.1 BOX INSTALLATION

FOREWORD

MC BOX B.SMART can be installed outdoors However, it is advisable to shelter it under a canopy to ensure a longer life and provide more comfort during use in bad weather.
The installation must be carried out by specialised personnel according to the instructions in this chapter.

ATTENTION Staff authorised for installation

All installation operations must be performed only by competent and authorised staff, who must:
- Install the system in a dry, well-ventilated place;
- Properly install the accessories necessary for the correct operation of the unit.
- Use solely the accessories provided with the system.

WARNING

THE UNIT IS FOR PROFESSIONAL USE ONLY.

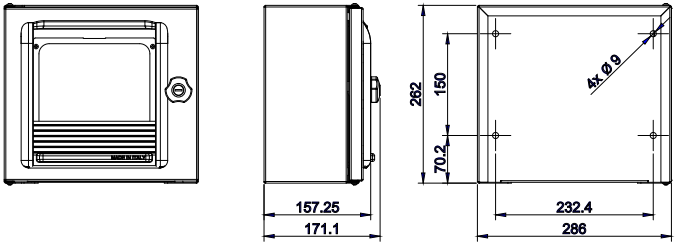
The use of unsuitable accessories not provided with the system is strictly prohibited. Piusi S.p.A. accepts no responsibility for harm to persons, property or the environment due to failure to observe this instruction.

MC BOX B.SMART must be installed in an adequately lit location, in compliance with the regulations in force.

MC BOX B.SMART has been designed to be used in a dry place. If it is installed outdoors, provide adequate protective covering.

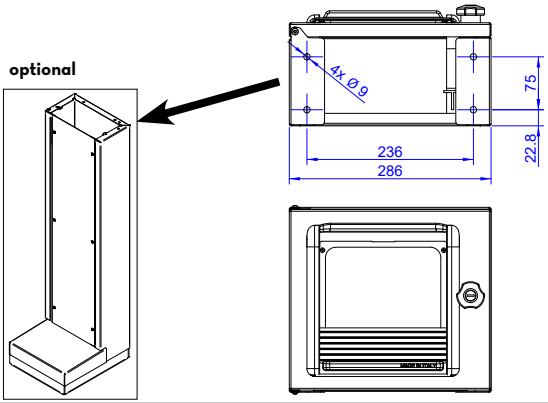
MCbox B-SMART can be installed on the wall or on a pedestal.
For wall mounting, it will be necessary to have a nr. 4 M8 screws.
For pedestal mounting, use no. 4 M6 screws.
Below are the diagrams with the center distances of the holes for a precise installation.
The pedestal is a Piusi accessory not included in the MCbox B-SMART supply.

WALL MOUNTING



EN

MOUNTING ON A PEDESTAL



WARNING

PROVIDE FOR THE INSTALLATION OF MCBOX B-SMART IN AREAS WHERE THERE IS NO RISK OF EXPLOSION

12.2 HAZARDOUS AREA

Any fuel dispenser is a hazardous area as defined in the National Electrical Code. Installation must be in accordance with the following:
· National Electrical Code (NFPA No. 70);
· Automotive and Marine Service Station Code (NFPA No. 30A).

WARNING

The installer is responsible to investigate and follow any local codes. MC BOX Bsmart ETL is listed for use in a non-classified area. All of the equipment must be installed outside of the hazardous areas.

NOTE

Local codes may dictate specific installation requirements. Installation is subject to approval by the local authority having jurisdiction at the site.

12.3 ELECTRICAL CONNECTIONS

ELECTRICAL CONNECTIONS

The electrical connections must be carried out in a workmanlike manner by specialised personnel, in full compliance with the regulations in force in the country of installation and with the instructions in the electrical diagrams in this manual.

WARNING

The MC BOX B.SMART Electronic Panel is NOT equipped with circuit breakers; it is therefore essential to install upstream MC BOX B.SMART an electrical power supply panel equipped with a circuit breaker / disconnector with a current rating suitable for the electrical line and a differential switch suitable for the type of electrical load.
Otherwise, provide for a quick disconnection system such as a socket/plug connection to be used in the event of faults.

WARNING

Before accessing the electrical parts, make sure that you have disconnected all the main switches that energize the unit.

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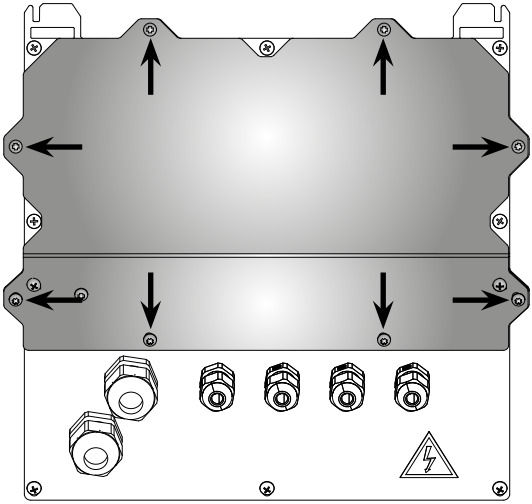
The operations required for a correct wiring are described below:

- Opening the rear cover of the controller
- Power supply connector
- Pump connector
- Connector for: 24 V dc service power supply, nozzle contact, pulser, level 1 and 2 contact
- Controller PG connection
- Closing the rear cover of the controller
- ocio connection on RS485 (if used)
- interface connection with other canbus control units

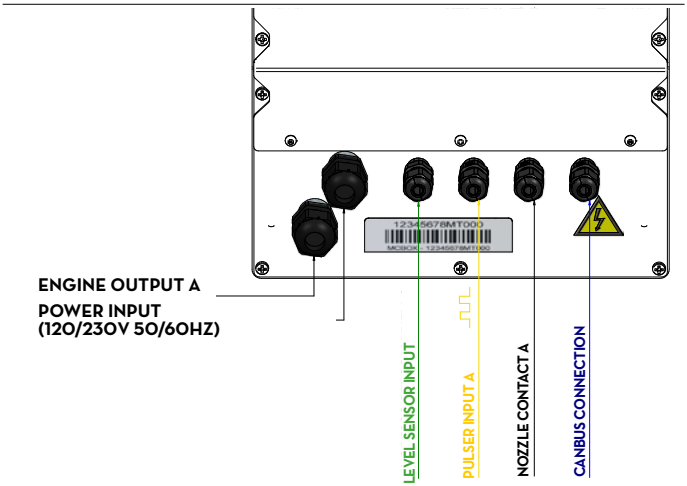
OPENING THE REAR COVER OF THE CONTROLLER

Loosen all 8 screws of the rear cover of the controller to access the compartment of the electronic boards



CABLE GLAND CONNECTION

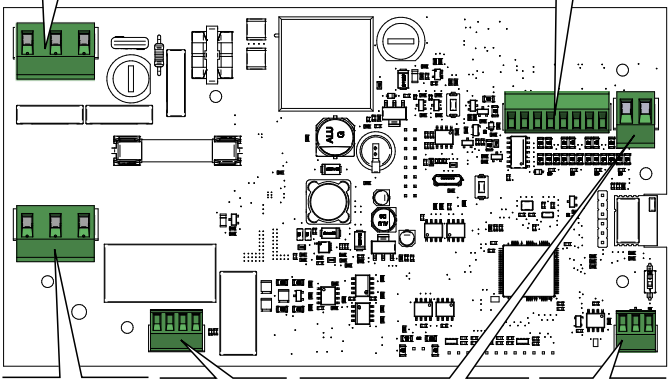
The cable glands to be used for the various signals are indicated in order to obtain an optimised cable route inside the controller



Once the cover has been opened, the electronic board and its connectors are accessed:

POWER CONNECTOR
Power supply INPUT 100/240 V ac depending on the motor models - 50/60 Hz. The line must be disconnected by an electrical panel or by a plug-socket

SIGNAL CONNECTOR
Connector for: level 1 and 2 contact, pulser input, GND and 24 V dc and 25 mA power supply output



CONNECTOR MOTOR OUTPUT 100-240 V ac 50/60 Hz (the same input voltage and frequency)

CONNECTOR RS485

CONNECTOR NOZZLE CONTACT
Nozzle contact (used on Self Service model, optional on MCBOX and not used on CUBE model)

CONNECTOR CANBUS

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IN DETAIL:

1
Power supply cable:

Power supply cable:
Insert the grounding wire (yellow/green sheath) into the central hole of the terminal, then phase and neutral respectively on the left and right and tighten the wire fixing screws

Voltage values:

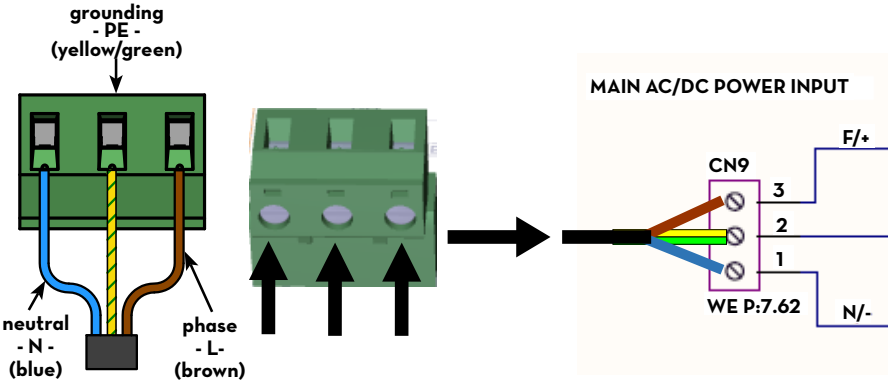
The electronic controller must be supplied with voltages and frequencies compatible with the motor to be driven:
- If the motor is 230 V ac 50 Hz, the controller must be supplied at the same voltage and frequency
- If the motor is 120 V ac 60 Hz, the controller must be supplied at the same voltage and frequency

WARNING

The cable cross-section must be chosen according to the electrical current absorbed by the motor, which is the device in which almost all the current flows.
Pay attention to the cable specifications:
- SIGNAL AND POWER SUPPLY WIRING CONNECTED IN THIS BOX MUST BE RATED AT LEAST 300V
- POWER SUPPLY AND MOTOR OUTPUT WIRING CROSS-SECTIONS MUST BE BIGGER OR EQUAL THAN AWG16

NOTE

The maximum current that the motor can absorb is 15 A



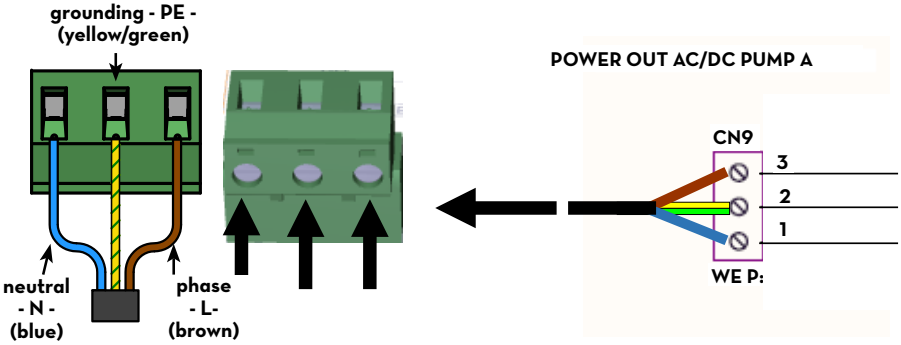
2
MOTOR cable:

Insert the grounding wire (yellow/green sheath) into the central hole of the terminal, then phase and neutral respectively on the left and right and tighten the wire fixing screws.
On the motor terminal, when active, there are the same voltage and the same frequency as the input from the power supply line

WARNING

The CABLE SECTION of the MOTOR must be chosen according to the electric current absorbed by the motor

EN



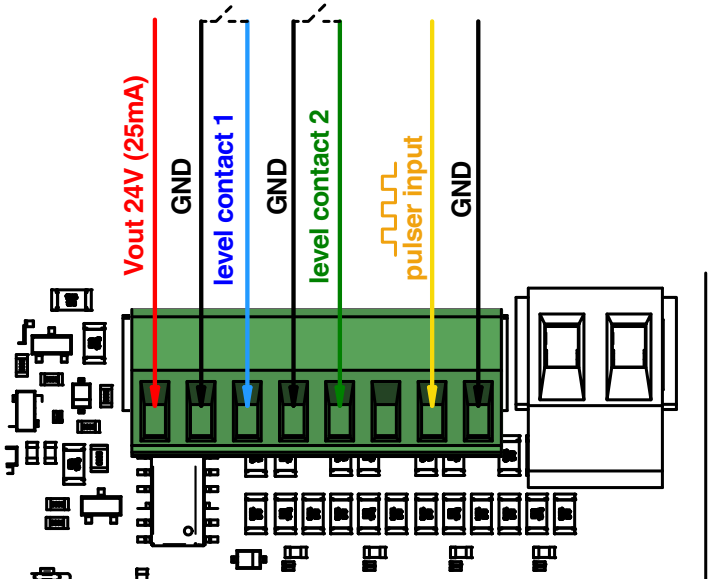
3 SIGNALS connector:

Output 24 V dc, pulser, level 1 and 2 contact.
Tighten the screws on the top of the 8-hole terminal:
Level 1 contact, level 2 contact and pulser.

4 ELECTRICAL CONNECTION LEVEL CONTACTS

With reference to level 1 contact and level 2 contact, it is necessary to specify that they are configurable contacts, which allow to connect:

- 4-20mA level sensor
- level sensor 0-10V
- clean contact (switch not necessarily connected to the internal levels of the tank)



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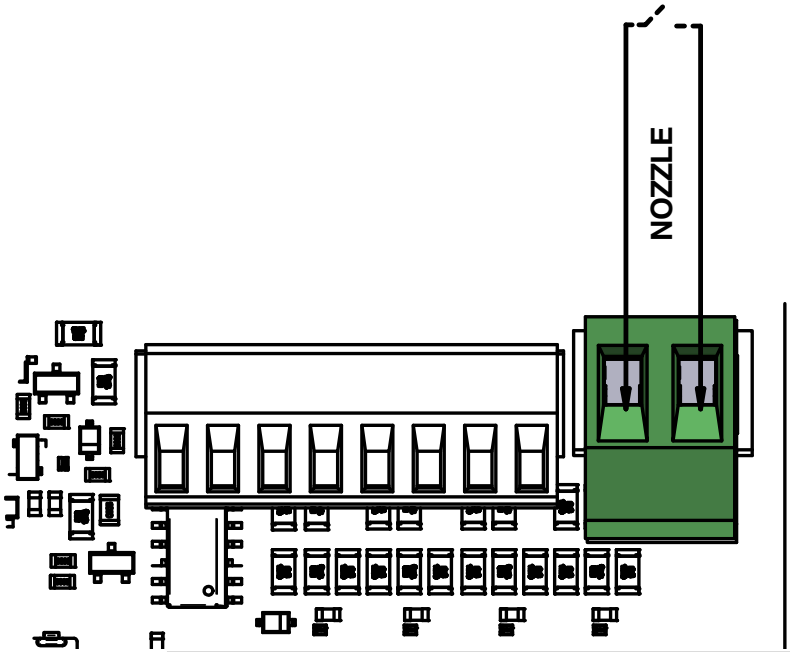
5
Nozzle contact:

On MC BOX B.SMART this signal is optional.

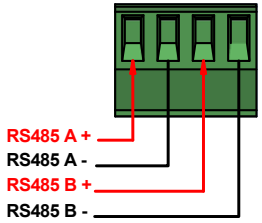


6
Serial connection:

The B.Smart board has two RS485 serial communication channels.
As well as the level contacts on the signals terminal board, it is possible to connect the OCIO detection system to the B.Smart board.

NOTE

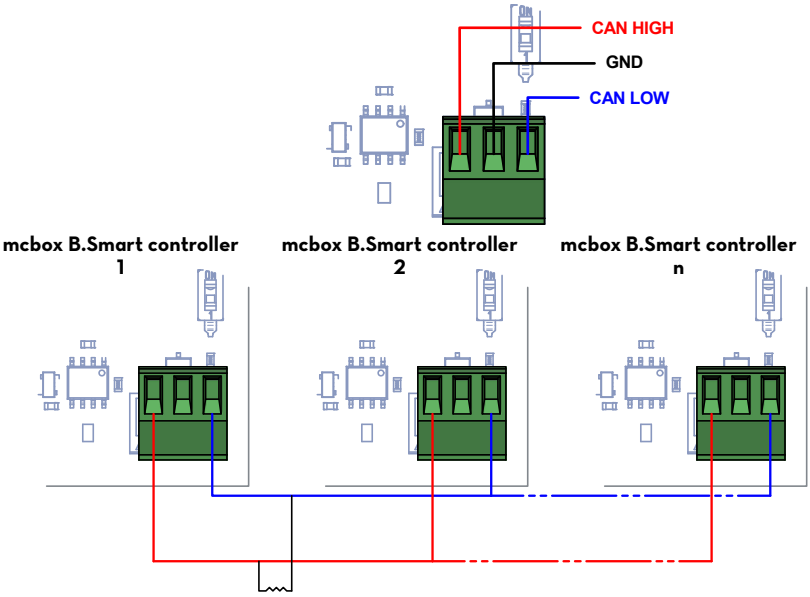
If OCIO 2.0 is used on the RS485 connector, DO NOT connect the level 1 and 2 contacts on the signal connector



7
CANBUS connection:

The controllers can be connected to each other, via CANBUS connection. The figure shows the connector on each individual board and a small diagram showing the connection between x number of controllers.

EN



Insert the 120 ohm resistor provided between CAN HIGH - CAN LOW and connect the resistor output wires to the terminal boards, as shown in the figure.

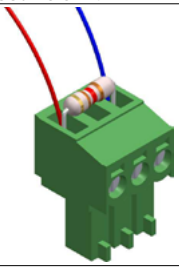
CAUTION

The 120 ohm resistor must be inserted in the CANBUS line ONCE ONLY, as shown in the connection diagram.

NOTE

For the CANBUS connection, it is recommended to:

- **Use a cable with a characteristic impedance of 120 ohms**
- **The length of the connection between the various MCBOX B.SMARTs must not exceed 100 m.**



8 Closing the rear cover of the controller

Replace the cover and tighten the 8 screws

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13 INITIAL CONFIGURATION

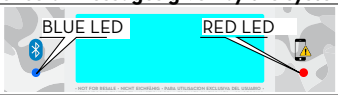
Before use, you must set up your system by connecting your MCbox B-SMART to the Smartphone App and the dedicated WebApp. This section explains all the steps required for a correct configuration.

To configure the system you need to:

- **Switch the controller on**
- **Configure the controller via APP**
- **Configure the controller via WebApp**

13.1 SWITCHING-ON

The following is the sequence of messages given by the system during the switching-on phase

1		**Display, BLUE and RED LEDs light up**
2		**All segments ON**
		All segments OFF
3		**The first part of the firmware revision index is shown (in this example r.1.00)**
4		**The last part of the firmware revision index (i = internal) is shown: i.00**
5		**The backlighting of the display and the LEDs turn off and 0.00 appears on the display**

EN

13.2 CONFIGURATION VIA APP AND WEBAPP

FOREWORD

Initially it is necessary to assign the purchased SYSTEM CODE to the control unit. To do this it is necessary that the smartphone is connected to the 3 / 4G or Wi-Fi network, to check this check the status on the bottom left of the screen:

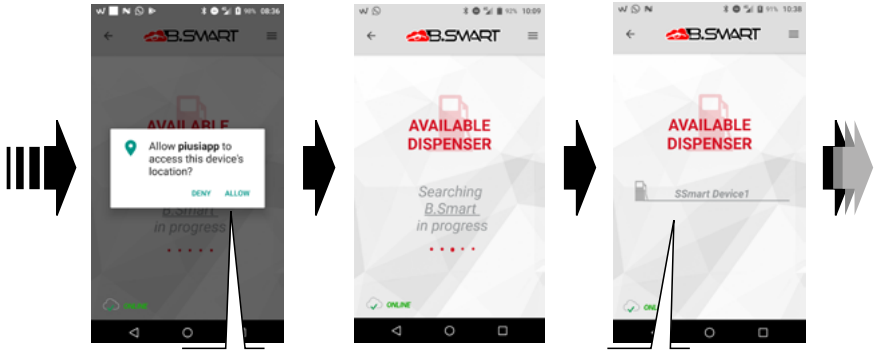
OFFLINE: APP/smartphone non connessa a 3/4G o Wi-Fi

ONLINE: APP / smartphone connected to 3 / 4G or Wi-Fi

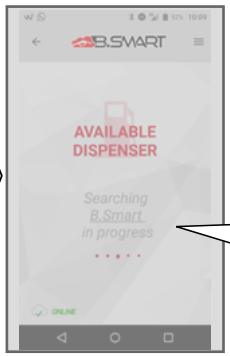
1 Access your Play Store or App Store from your smartphone and search for PIUSI APP.

The icon is: Download and install the application.

2 Activate your smartphone's Bluetooth and GPS and open the APP.
Then follow the steps described below:



DURING THE SEARCH, THE FOLLOWING ERRORS MAY OCCUR



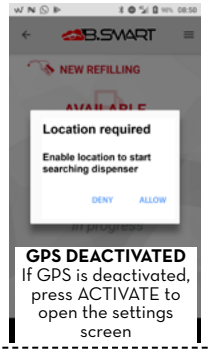
DISPENSER SEARCH IN PROGRESS...

DISPENSER FOUND

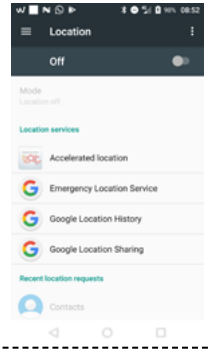
BLUETOOTH DEACTIVATED
activate Bluetooth from your smartphone settings

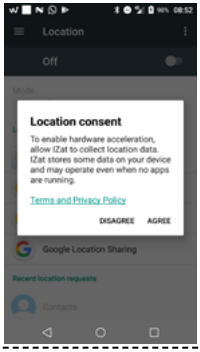
Activate the GPS, using the button in the upper right and choose the type of service, from those in the list

Press I ACCEPT, to accept the consent to the position, then return to the APP, which will show the list of fuel dispensers

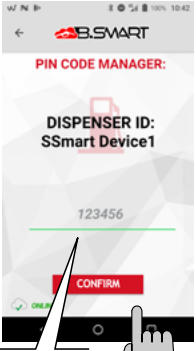


GPS DEACTIVATED
If GPS is deactivated, press ACTIVATE to open the settings screen



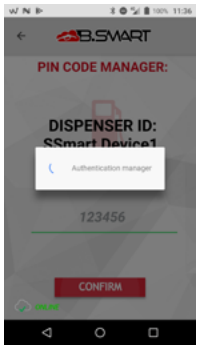


THE PIN MUST BE ENTERED

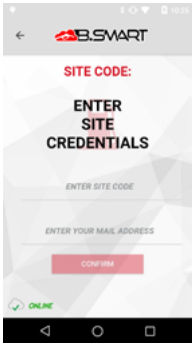


The manager PIN to be entered at the first installation is **123456**

press **CONFIRM** to continue

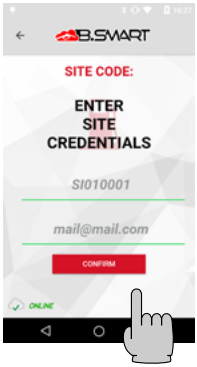


Wait for authentication to finish



The inclusion of the **SYSTEM CODE (site CODE)** and the EMAIL address of the portal user who activated the site

IMPORTANT: SEE REGISTRATION GUIDE (MO548)



Enter the **SYSTEM CODE** purchased in the license and the EMAIL address of the portal user who registered the column on the PIUSI portal ". For this example it is:

Ute00004

SITE CODE detected. Press **NEXT** to continue. The site data is displayed

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The dispenser is uploaded in the cloud

Other operations by the manager are shown (in addition to the discovery of the dispenser and registration in the cloud)

The operations are:

1 - Meter calibration

2 - Forced synchronization of data in addition to all automatic synchronizations

3 - Firmware updates of the electronic controller

Press HOME to return to the APP HOME

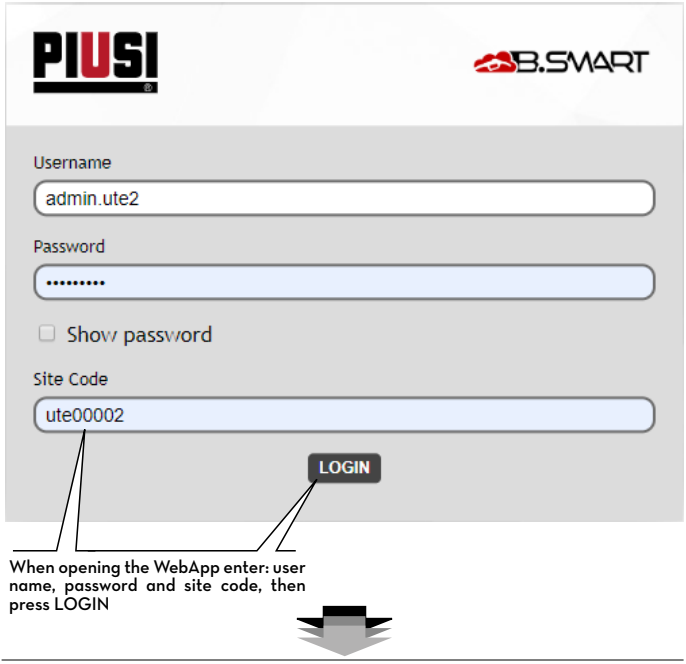
HOME page of the APP

13.3 CONTROLLER CONFIGURATION VIA WEBAPP

FOREWORD

For detailed account registration instructions, see the Registration Guide (MO548)

After assigning the SYSTEM CODE to the controller, you must check if the controller is present in the cloud. the connect from your browser: Google Chrome, Microsoft Edge or Mozilla Firefox to the following link: https://bsmart.piusi.com/
The WebApp login screen opens:



When opening the WebApp enter: user name, password and site code, then press LOGIN

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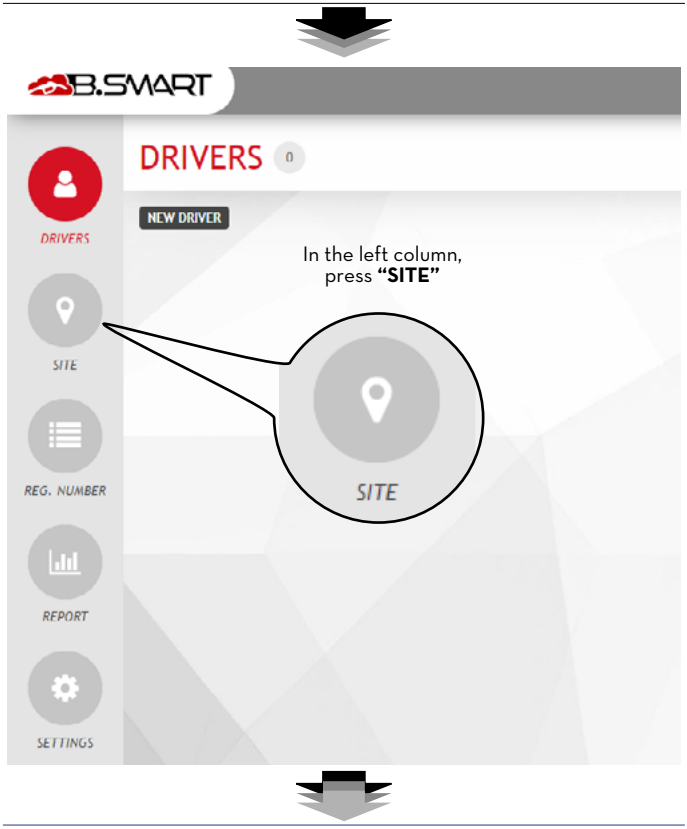
B.SMART
DRIVERS
0
NEW DRIVER
DRIVERS
SITE
REG. NUMBER
REPORT
SETTINGS
In the left column,
press **“SITE”**
SITE

Full details of the WebApp functions (such as managing drivers, registration numbers, dispensing reports and configurations) can be found in the dedicated manual, loaded in the dedicated area of the WebApp.

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14 DRIVER ACCESS

14.1 FIRST DRIVER ACCESS FROM APP

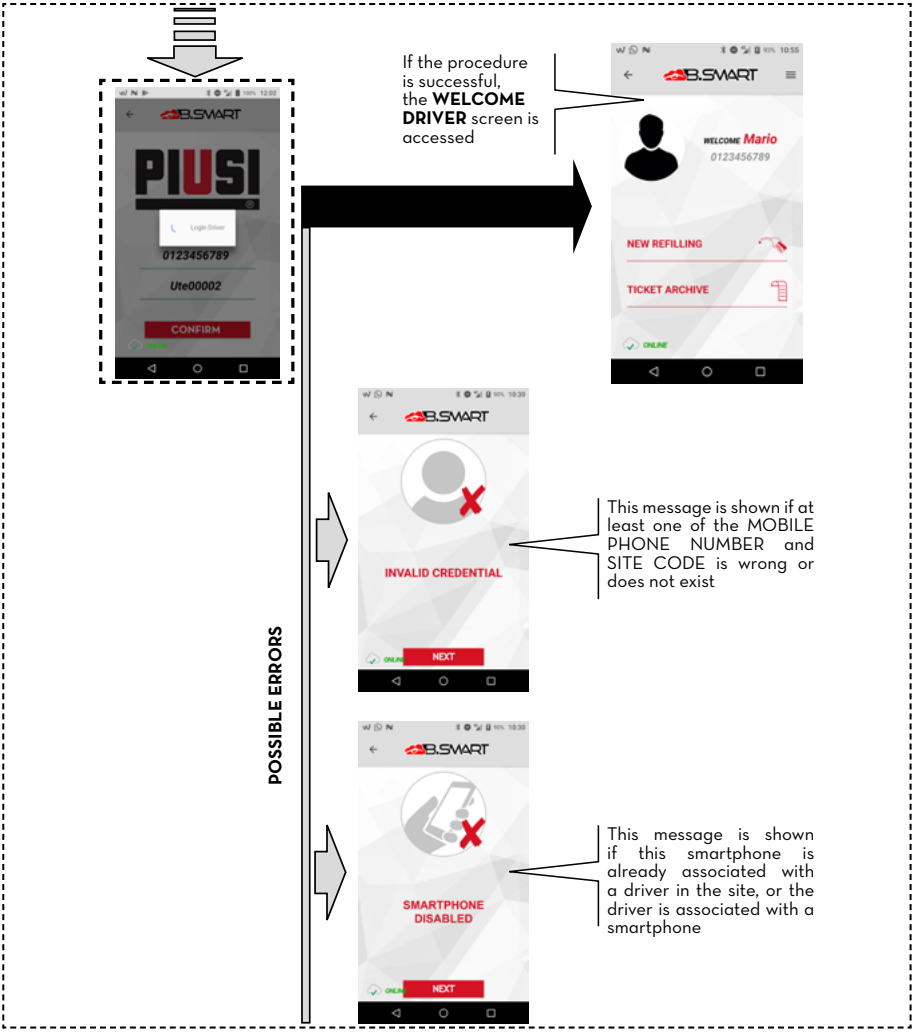
PREMESSA

To use the APP as a driver, the manager must have created the driver profile via WebAPP (see WebAPP manual, chapter 1, section 1.1 - ADDING NEW DRIVER).
Also to do this the smartphone must be connected to the 3 / 4G or Wi-Fi network, to check this check the status in the lower left of the screen:

OFFLINE: APP / smartphone not connected to 3 / 4G or Wi-Fi

49/5000
ONLINE: APP / smartphone connected to 3 / 4G or Wi-Fi

Subsequently the driver can authenticate himself in the APP:



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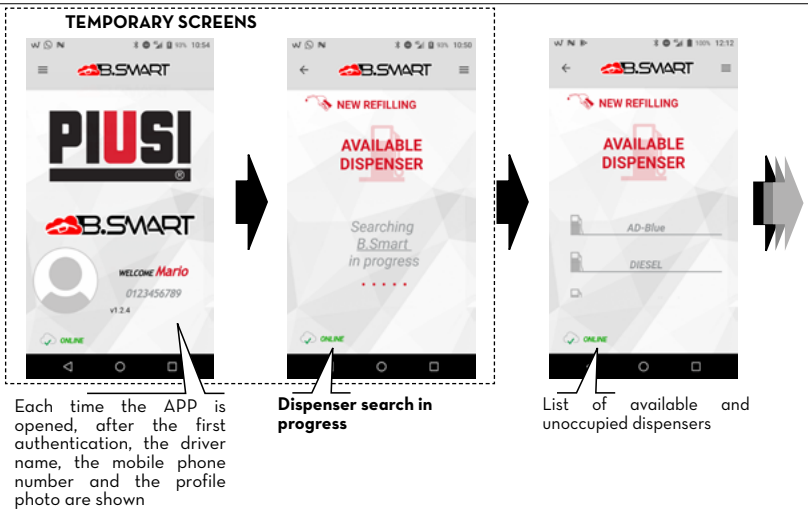
14.2 DRIVER - DISPENSING VIA APP



Each time the APP is opened, after the first authentication, the driver name, the mobile phone number and the profile photo are shown

Dispenser search in progress

List of available and unoccupied dispensers

Dispenser selection- DIESEL dispenser

Smart-phone-con-troller connection in progress + Data synchroni-zation between cloud and fuel dispenser

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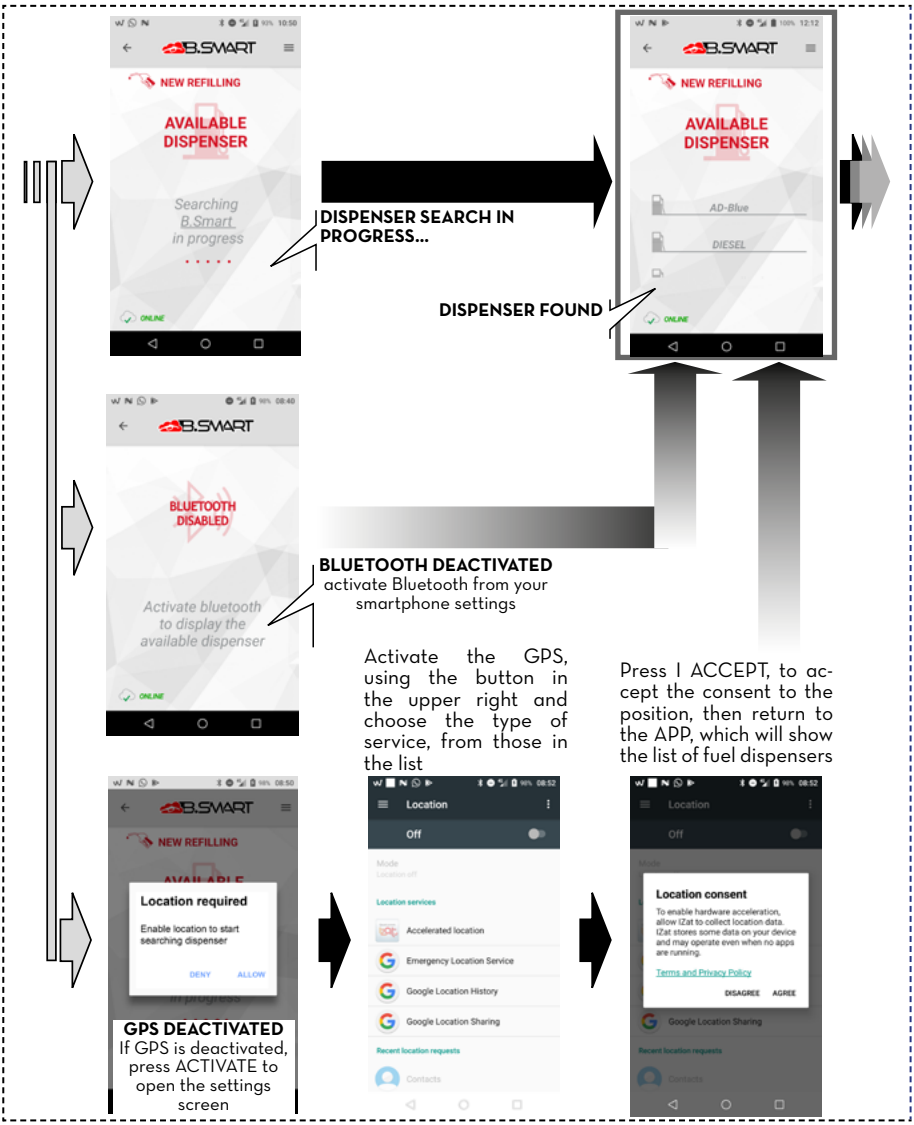

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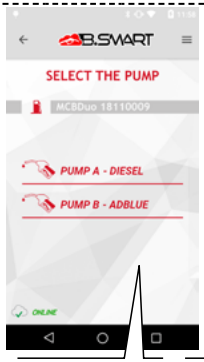


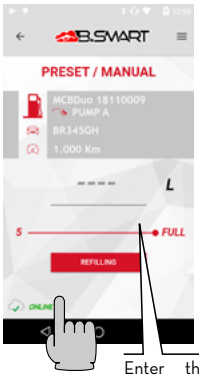
Select the pumping group to deliver from

OPTIONAL request decided by the manager based on how he configures in webAPP: if he wants this request to be made to the user or not
"Registration Number" entry (which could be the license plate of the vehicle to be refilled or another reference useful for the System Manager)
In this example, **ab123cd** is entered

Click **CONFIRM** to continue

OPTIONAL request Odometer insertion, this page is shown only if the manager has enabled the use of the odometer from WebApp.
In this example, **1000** is entered

Click **CONFIRM** to continue



Click **REFILL** to continue

Enter the quantity to be dispensed as default (PRESET) or, if no value is set, the full tank is dispensed.

Dispensing in progress:
If you have set a PRESET quantity in the meter, the pre-selected quantity is present

It is not present when the FULL TANK is set.

Click on **STOP** to close the dispensing

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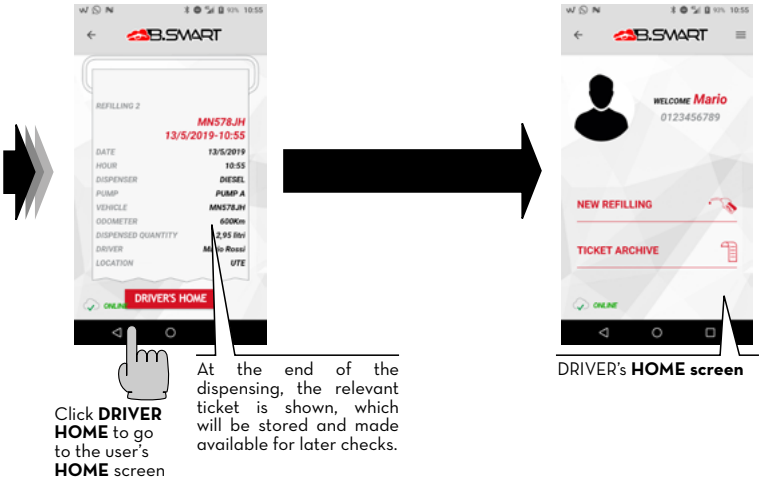

Click **DRIVER HOME** to go to the user's **HOME** screen

At the end of the dispensing, the relevant ticket is shown, which will be stored and made available for later checks.

DRIVER's **HOME screen**

NOTE

You can also perform the NEW REFILLING procedure offline, i.e. from a smartphone not connected to the 3/4G or Wi-Fi network.
In this case, the dispensings will be uploaded to the cloud as soon as the smartphone has the APP open in an area with 3/4G signal, or as soon as a new smartphone connected to the 3/4G network or Wi-Fi will connect to the controller.

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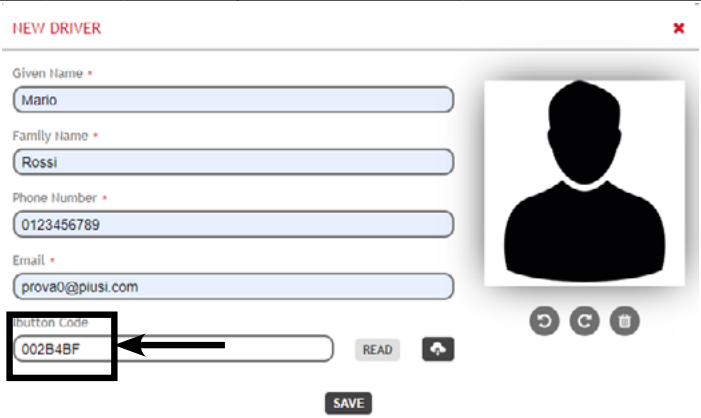
14.3 DISPENSING VIA USER KEY (I-BUTTON)

When the manager creates the driver he can add an electronic key (iButton) which is used to perform the access.
To do this, just add the last 7 digits of the hexadecimal code associated with the key to the input of the driver's card in WebAPP (see WebApp manual, chapter "ADD NEW DRIVER").



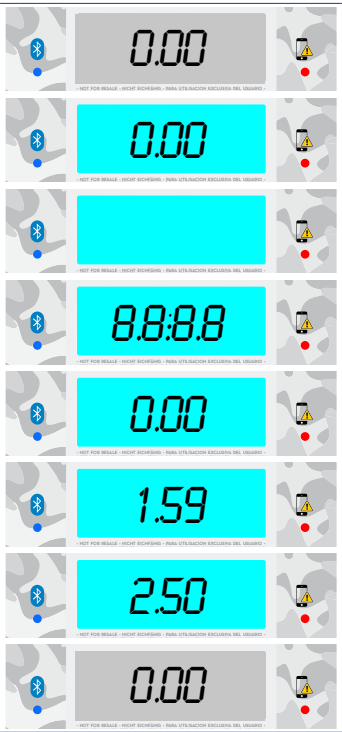
The i-Button serves as a means of authentication to replace the smartphone. For the dispensing, simply place the iButton on the reader in the controller: authentication takes place, then you can start dispensing.
Dispensings are uploaded to the cloud as soon as a smartphone with an active data connection connects to the controller.

ATTENTION

The delivery via the iButton key is allowed only when the procedures indicated in paragraphs 13.2, 13.3 and 14.1 have been successfully completed, through the use of a smartphone and the WebApp.
These procedures are essential, as they allow the operator to configure the system and manage the control units inside it, and in the same way they ENABLE THE AUTHORIST TO DISPENSE ON A SPECIFIC CONTROL UNIT.

NOTE

Dispensing via iButton is recommended only in cases of extreme necessity related to the lack of possibility to dispense with smartphones.
This is because a delivery with iButton does not allow you to update the cloud directly, thus jeopardizing the real potential of the system.



Driver authentication via i-Button

Dispensing start

Dispensing end

15 MAINTENANCE

15.1 ROUTINE MAINTENANCE

MC BOX B.SMART does not NORMALLY require any ROUTINE maintenance.

15.2 EXTRAORDINARY MAINTENANCE

WARNING

Maintenance of electrical parts may only be carried out by qualified electrical or electronic personnel.

Before performing any maintenance, make sure to disconnect the device from the power line to switch it off and isolate it from the power mains.

If the device is sold without cable, periodically check the grounding circuit in accordance with the regulations in force.

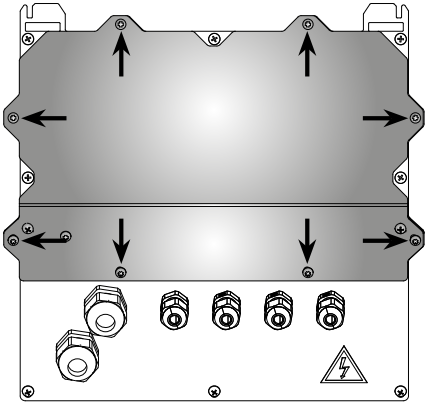
1 - Firmware update via smartphone, see dedicated section in the APP manual

2 - Fuse control: to access the fuses it is necessary to open the unit and access the parts that are live during normal use, to operate safely disconnect the general power supply from the unit

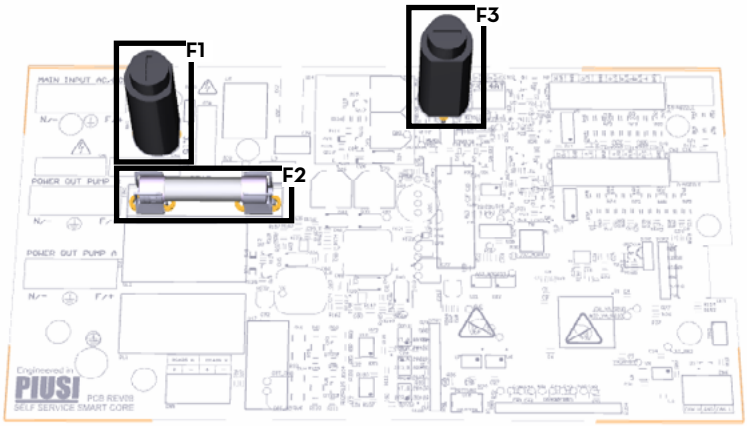
15.3 CHECK AND REPLACEMENT OF FUSES

For checking and replacing fuses on electronic boards:

1	Cut the unit off the power supply;
2	Open the door of MC BOX B.SMART with the appropriate key;
3	Loosen the screws of the metal rear cover to access the compartment of the electronic boards



4	Check the condition of the 3 fuses and replace them if necessary



F1 • Power supply fuse at AC power supply input 800 mA T (delayed)
F2 • Motor fuse 20 A T (delayed)
F3 • Power supply fuse at AC/DC converter output 800 mA T (delayed)

5	Tighten the screws of the metal rear cover to close the compartment of the electronic boards and power

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16 TROUBLESHOOTING

16.1 ELECTRICAL/ELECTRONIC CONNECTIONS

PROBLEM	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
MC BOX B.SMART does not switch on	Lack of power DUE TO: • Incorrect connections • Upstream circuit breaker in OFF position • Fuse on power supply interrupted	Check connections Set circuit breaker to ON position Check fuse
A driver with an electronic key is not recognized	The electronic key has not been associated by the MANAGER	The system MANAGER associates the key to the driver
	The electronic key has been damaged and is no longer recognized by the system	Change the electronic key, the system MANAGER will also have to delete the code of the old key and associate the new key to the driver via WebAPP
The motor does not start	It has not been connected correctly to the terminals provided	Check connections, or (if present) check that the position of the motor switch is in the ON position
No counting while dispensing	The Pulser that emits the counting signals is not correctly connected	Check connections
	The Pulser that emits the counting signals is NOT compatible with the electronics	The electronics are designed to receive a "clean contact" or "Open Collector" signal as input. If the input signal is an incompatible voltage signal, in addition to the malfunction the electronic board is likely to be damaged
	Pulser board damaged	Replace Pulser board
The counting is not accurate	The system is NOT calibrated	Calibrate the system according to the procedure
The counting is not accurate even after calibration or is only accurate at low flow rates	The signal coming from the Pulser is out of the ranges acceptable by the electronics	The signal received by the pulser must be with max. frequency 300 Hz and Duty Cycle between 10% and 90%. Beyond these ranges, the system does not process the received data correctly. The system must fall within the correct ranges by interposing other electronic interface devices (contact the Technical Assistance for these particular options)

16.2 PROBLEMS WITH THE SMARTPHONE APP

PROBLEM	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
APP signals that the driver is not enabled	The manager didn't enable the driver to the dispenser	The MANAGER enables the driver to the dispenser via WebAPP in the section dedicated to drivers
Dispensing from smartphone is not present in the cloud	Dispensing was made with the smartphone with data connection disabled or in an area with poor 2G/3G/4G coverage	Dispensing will be in the cloud as soon as the APP is opened in an area with 2G/3G/4G coverage. In the meantime it will be stored on the memory of the smartphone and also in the memory of the dispenser
APP does not see the controller, but Bluetooth is active	Bluetooth module on the smartphone is not compatible with the Bluetooth module of the dispenser	The Bluetooth module of the dispenser is compatible with all smartphones that feature the Bluetooth version 4.0 or later (smartphones from 2011 onwards)
	Dispenser occupied by another driver	The dispenser will be visible from the smartphone only when the driver who is using it has finished operations

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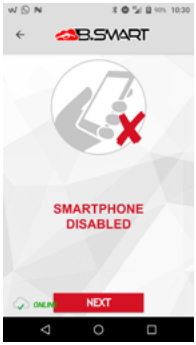
17 FAQ

1	**If a driver changes smartphone, is it necessary to create a new account for that driver or can he continue to use what he already had?**	If the driver changes smartphone, he must notify the site manager, who will delete / reset the smartphone - driver association in the WebApp (procedure described in the manual of the WebApp, chapter "DRIVER DETAIL"). The driver can then log in from the APP installed on the new smartphone.
	WARNING	**After the manager has deleted the smartphone - driver association, the driver is obliged to access with a smartphone other than the previous one, because access with his credentials is prevented on the old device. To be able to access with the old smartphone, you must first access with a new smartphone, then be reset as user and finally enter with the initial smartphone**
2	**What if a driver loses his smartphone?**	If the driver loses his smartphone, it is necessary to notify the site manager, who will immediately remove the smartphone - driver association. The procedure to be followed is the same as that indicated in question 1.
3	**What if the APP reports that the smartphone is not recognized?**	 Generally it is an error shown when the driver has changed smartphone but has kept the same phone number and the site manager has not reset the user. In this case the driver must contact the manager and inform him of the error shown by the APP. The manager will remove the smartphone - driver association to allow the driver to login from the new smartphone. The procedure to be followed by the manager is the same as that indicated in question 1 (see also the WebApp manual, chapter "DRIVER DETAIL")
4	**When are dispensings made via iButton or smartphones without an internet connection uploaded to the cloud?**	There are 4 cases in which the dispensings are uploaded to the cloud: • Each time the APP is opened, if the data connection is active • APP open in the background and data connection active • Data synchronization by the manager by pressing the SYNCHRONIZATION key • Every time a driver connects to the controller and the internet connection of the smartphone is active As you can see from the list, the dispensings can be uploaded to the cloud even if your smartphone is not connected to the controller.

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5 What if I can't dispense via authentication with iButton?

There are a few possible cases:
- Dispensing memory full
- Tank empty
- iButton not associated with any driver

In detail:

Dispensing memory full and tank empty

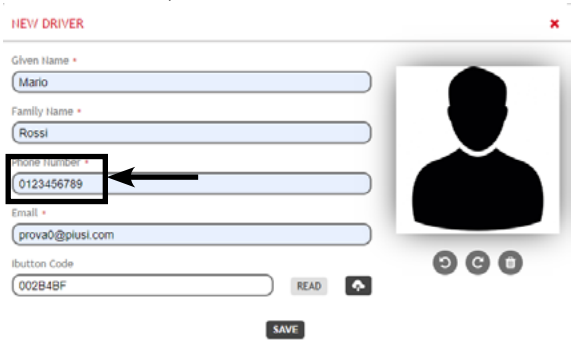
The red LED to the right of the controller display is on. This may indicate problems in the memory (dispensing memory full) or tank empty.
To empty the dispensing memory, synchronize with the cloud. If the problem is not solved, reset the controller

iButton not associated with any driver

When the iButton is placed on the reader the display does not light up

6 What if a driver changes his phone number and keeps the same smartphone?

If a driver changes number it is necessary to inform the manager, who will change it from the driver's card in the WebApp (see also the manual of the WebApp, chapter "DRIVER DETAIL").

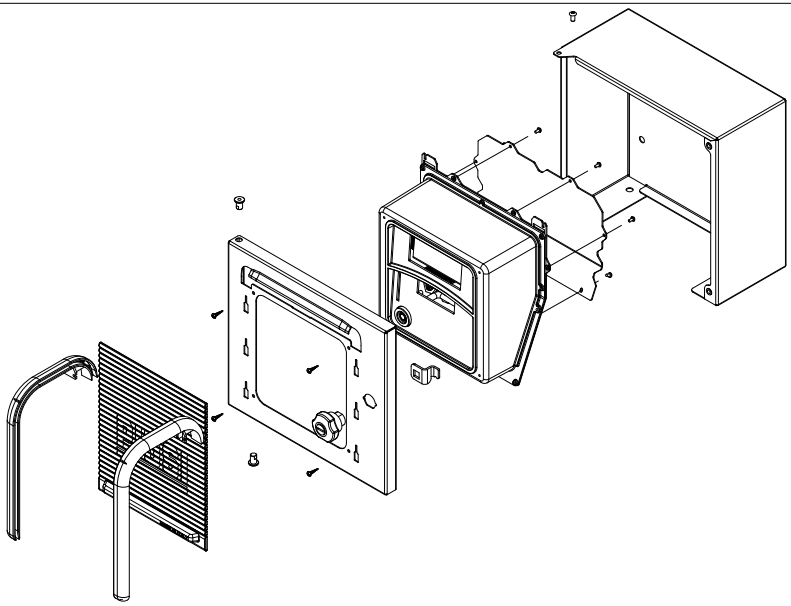


In the APP, the number is automatically updated the first time you connect to the cloud. From now on the mobile phone number will be the one to be used to access the APP.
In addition, in the case of mobile number portability between different mobile operators, it is likely that for a few days the mobile number will be the temporary one, and then the mobile number will be the same again as soon as portability is complete. In this case, during the transition period, there is no need to notify the site manager of the temporary number, you can continue to use your original telephone number.

18 SCRAPPING AND DISPOSAL

Foreword	If the system is scrapped, its components must be consigned to companies specialised in the disposal and recycling of industrial waste and, in particular:
Disposal of the packaging	The packaging is made of biodegradable cardboard that can be handed over to companies for the normal recycling of cellulose.
Disposal of metal parts	The metal parts, both painted and stainless steel, can normally be recycled by companies specialised in the metal scrapping sector.
Disposal of electrical and electronic components	These must of necessity be disposed of by companies specialised in the disposal of electronic components, in compliance with the indications of the directive 2012/19/EU (see directive text below).
Environmental information for customers resident in the European Union	European Directive 2012/19/EU requires equipment marked with this symbol on the product and/or packaging not to be disposed of together with mixed municipal waste. The symbol indicates that this product must not be disposed of together with normal domestic waste. It is the responsibility of the owner to dispose of both these products and other electrical and electronic equipment through the specific collection facilities indicated by the government or local public authorities.
	The disposal of Waste Electrical and Electronic Equipment (WEEE) as domestic waste is strictly prohibited. This type of waste must be disposed of separately.
	Any dangerous substances that may be present in the electrical and electronic equipment and/or incorrect use of such equipment may potentially have serious consequences for the environment and human health.
	In the case of unlawful disposal of such waste, the sanctions envisaged by the regulations in force may be applied.
Disposal of further parts	Further product parts, such as hoses, rubber seals, plastic parts and wiring should be handled by companies specialising in industrial waste disposal.

19 EXPLODED VIEW



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