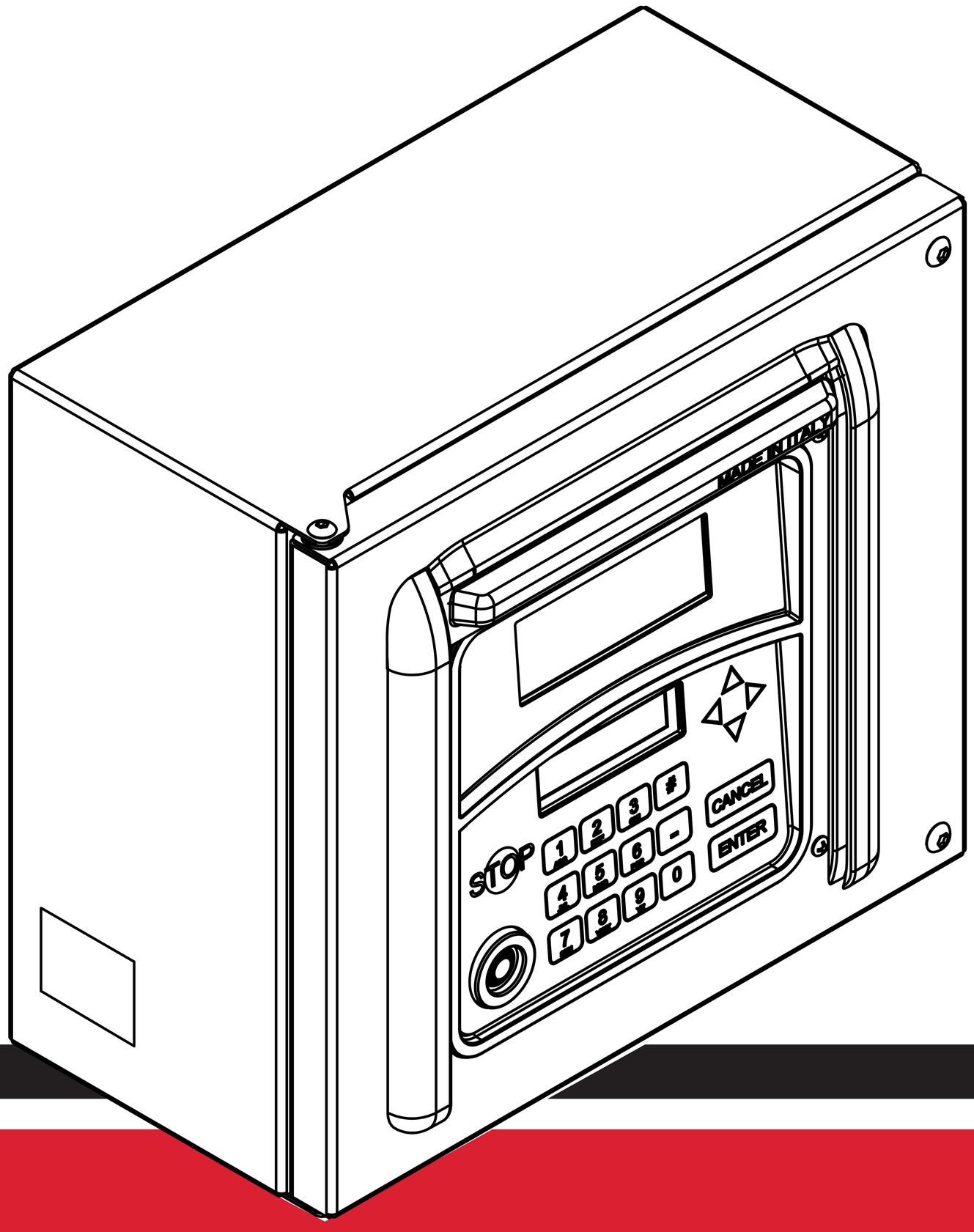
PIUSI

Fluid Handling Innovation

MC BOXdc KEYPAD

B.SMART



MADE IN ITALY

Installation, use and maintenance Manual EN

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ENGLISH

Bulletin M0715

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1 GENERAL PRECAUTIONS

In order to protect workers' safety and to avoid the risk of any damage, before performing any operation, please read and become familiar with the contents of the instruction manual.

1.1 SYMBOLS USED IN THE MANUAL

In order to signal particularly important instructions or warnings, the following symbols are used:

	ELECTRICAL HAZARD This symbol identifies the risk of electric shock from equipment powered by voltages potentially dangerous for humans.
	CAUTION This symbol indicates accident prevention regulations addressed to operators and other exposed persons.
	WARNING This symbol indicates that there is a possibility of damaging the units and/or their components.
	NOTE This symbol indicates useful information.
	Read the instruction manual carefully.

1.2 MANUAL STORAGE

This manual must be intact and completely readable. The final users, as well as the qualified technicians authorised to installation and maintenance must be able to view it at any time.

1.3 RIGHTS FOR REPRODUCTION

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2 DECLARATION OF CONFORMITY

2.1 FACSIMILE OF THE EU DECLARATION OF CONFORMITY

The undersigned: PIUSI S.p.A
Via Pacinotti 16/A z.i. Rangavino
46029 Suzzara - Mantua - Italy

DECLARES on its own responsibility, that the equipment described below:

Description:	Dispenser for diesel fuel
Model:	MC BOX B.SMART KEYPAD
Serial number:	see the Lot Number on the plate affixed to the product
Year of construction:	See the production year on the plate stamped on the product.

Complies with the following legislation:

- **Machinery Directive**
- **Electromagnetic Compatibility Directive**
- **Restriction of Hazardous Substances Directive (RoHS)**
- **Radio Equipment Directive (RED)**

The technical file is at the disposal of the competent authorities in response to a motivated request made to PIUSI S.p.A. PRODUCT or further to a request sent by e-mail to: **doc_tec@piusi.com.**

THE ORIGINAL DECLARATION OF CONFORMITY IS SUPPLIED SEPARATELY IN CONJUNCTION WITH THE PRODUCT

2.2 ETL DECLARATION OF CONFORMITY

This product is ETL listed for Canada and United States under the UL1238 , CSA C22.2#61010-1-12:2012 Ed.3+U1;U2;A1 and CSA C22.2#61010-2-201:2018 Ed.2 standards.

3 INSTRUCTIONS AND SAFETY NORMS

	FIRE HAZARD If there are flammable liquids in the working area, flammable vapours may be present and may cause fire or explosion during use.
	EXPLOSION HAZARDS To eliminate fire and explosion hazards use the dispenser only in well ventilated places. Keep work area free of debris, including rags and spilled or open containers of solvent and gasoline. Do not plug or unplug power cords or turn lights on or off when flammable fumes are present. Keep a working fire extinguisher in the work area.
	RISK OF FIRE AND EXPLOSION **This product is NOT SUITABLE for use in Classified Areas subject to the presence of potentially explosive atmospheres.** The PIUSI B.SMART product is designed for use with the user's mobile phone only and exclusively for connection and authentication operations and to link the user's device to the dispenser in order to perform certain operations in remote mode as described in this manual. Mobile phone use when refilling vehicles, also with other non-flammable liquids is in any case strongly discouraged as it can cause distractions that may prove hazardous. PIUSI shall not be held liable in the event of damage to persons or property of the user or third parties resulting from failure to comply with the above warnings and / or any other negligent, reckless or inept behaviour of the user.
	This equipment must have a protective earth connection between metal masses and for electrical components that require grounding. Improper installation or use of the equipment may result in danger of electric shock. All electrical equipment in the work area must have a protective earth connection. Stop operation immediately if static sparking occurs or if you feel a shock. Do not use the dispenser until you have identified and rectified the issue.
	You must avoid any contact between the electrical power supply and the fluid that needs to be pumped. Install the equipment in a sheltered location. Do not expose to rain. Do not switch on the fluid dispensing equipment with damaged electrical parts, such as cables, or damaged hydraulic parts, such as the suction/delivery pipe or the delivery nozzle. Call the maintenance technicians immediately and replace all damaged parts before using the equipment.
	DANGER OF BURNS To avoid severe burns, do not touch liquids or equipment.
	NO SMOKING Do not smoke near the fuel transfer pump and do not use the pump near naked flames.

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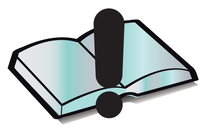
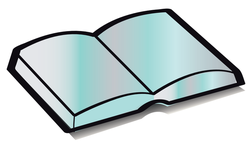
PRECAUTIONS FOR USE	
	**PERSONAL PROTECTION EQUIPMENT FEATURES** Wear personal protection equipment that is: - suitable to the operations to be performed; - resistant to the various cleaning products used.
PERSONAL PROTECTIVE EQUIPMENT TO BE WORN	
	Safety shoes
	Close-fitting clothes
	Protective gloves
	Safety glasses

OTHER SAFETY DEVICES	
	**INSTRUCTION MANUAL** - Do not operate the unit when fatigued or under the influence of drugs or alcohol. - Do not leave the work area while equipment is energised or in operation. - Turn off the equipment when not in use. - Do not alter or modify the equipment. Alterations or modifications may void agency approvals and create safety hazards. - Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. - Do not twist the hose or use a stronger hose. - Keep children and animals away from the working area. - Respect all safety norms in force. - 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 MC 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 Dealer for more information. - Keep hoses and cables away from transit areas, edges, moving parts and hot surfaces. - Do not bend hoses excessively or use them to pull the unit.
	TOXIC FLUID OR FUMES HAZARD For issues arising from the treated product with eyes, skin, inhalation and ingestion refer to the safety data sheet of the fluid used Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines. Prolonged contact with the product may cause skin irritation; during delivery phases, always wear protective gloves.
	EQUIPMENT MISUSE Do not use the equipment for uses other than those for which it is designed and built. All different uses may be hazardous for property, animals, or persons.

4 FIRST AID MEASURES

PERSONS WHO HAVE SUFFERED ELECTRIC SHOCK

Disconnect the power source, or use a dry insulator to protect yourself while you move the injured person away from any electrical conductor. Avoid touching the injured person with your bare hands until he is far away from any conductor. Immediately call for help from qualified and trained personnel. Do not operate switches with wet hands.

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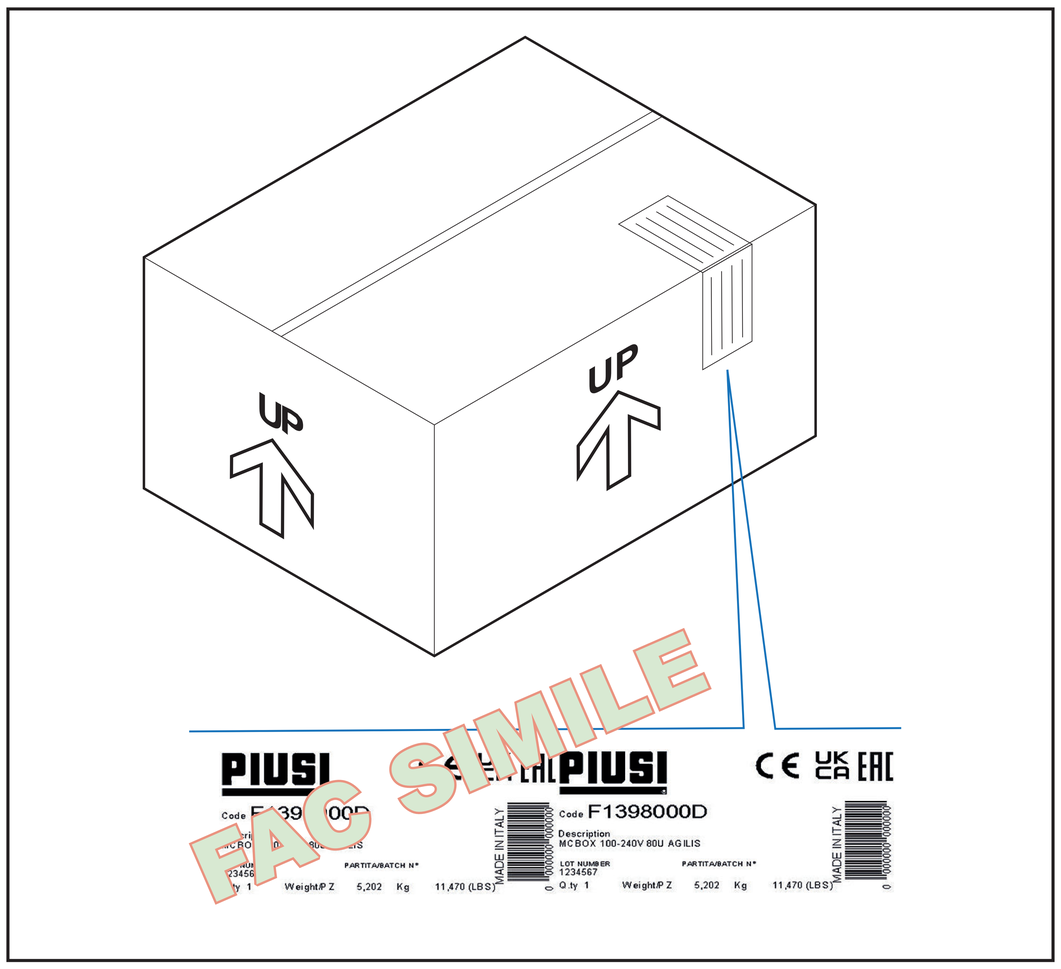
5 TRANSPORT, HANDLING AND UNPACKING

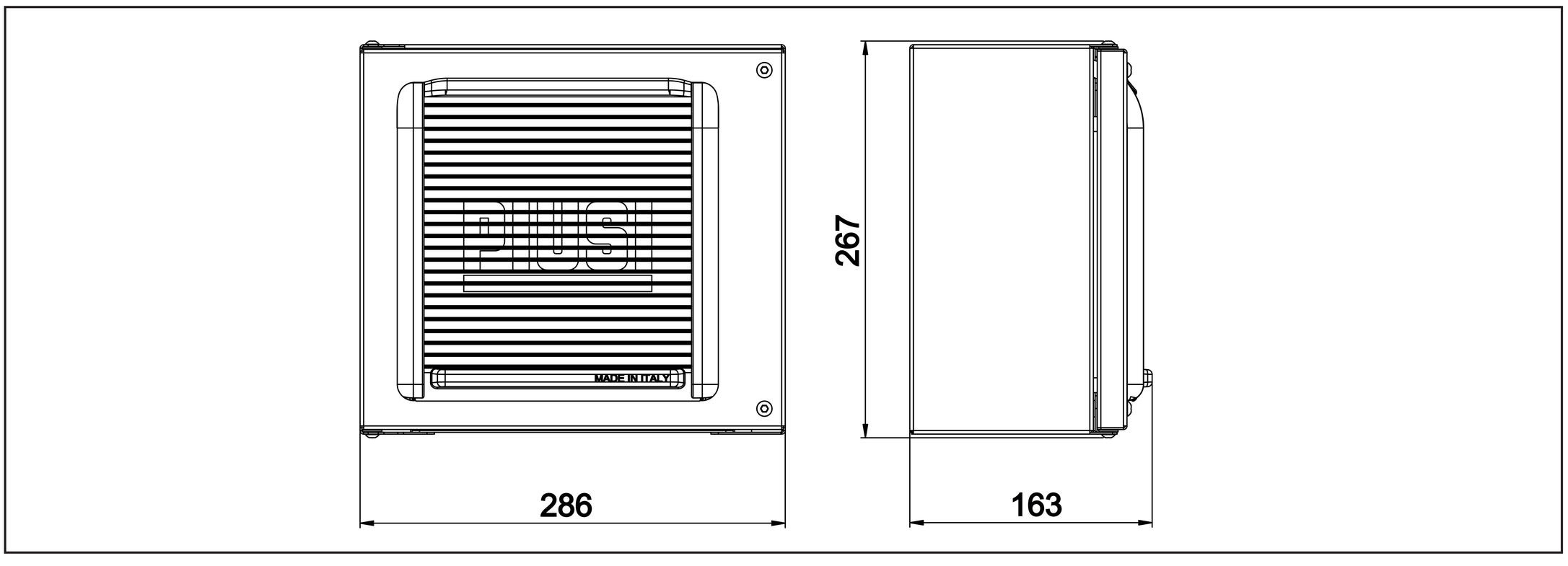
MC BOX B.SMART KEYPAD is shipped packaged in a non-stackable cardboard box. During storage the machine must be kept in an upright position as indicated by the graphic symbols printed on the box showing the direction of handling.

Whenever the machine needs lifting, make sure all the hoisting gear and accessories (such as the rigging belts) have an adequate load bearing capacity. Mechanical handling and lifting gear must only be used by authorised and suitably trained staff.
During periods of non-use, the machine, be it packed or unpacked, must be stored in an area protected against the elements (e.g. rain, humidity, direct sunlight, etc.) and dust.
The packaging carries the following indications:
- 'THIS WAY UP' arrow;
- label with all the information relating to the equipment (model, weight, etc.).



5.1 DIMENSIONS AND WEIGHTS

MODEL	OVERALL WEIGHT (kg)	PACKAGING DIMENSIONS (mm)
MC BOXdc B.SMART	5.3	480 x 370 x 265



6 MACHINE AND MANUFACTURER IDENTIFICATION

MC BOX B.SMART KEYPAD stations are equipped with an identification plate attached to the frame:
- Model.
- Serial number / year of manufacture.
- Technical data.
- CE marking.
- Manual code.

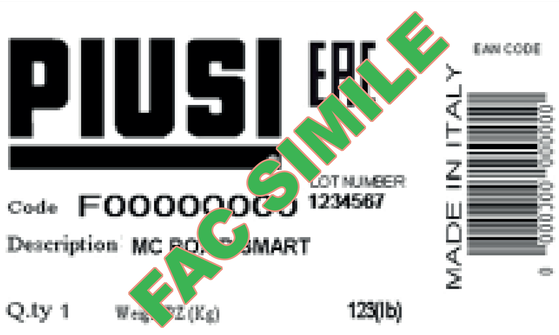
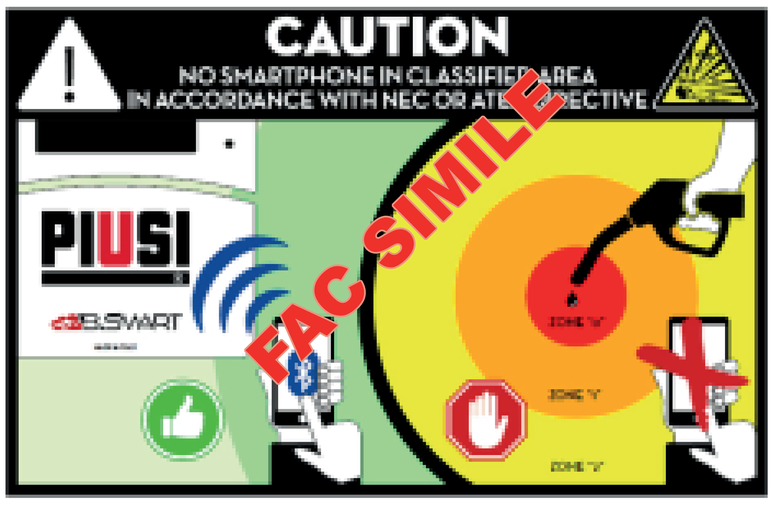
CAUTION: before installing, always make sure the type of dispensing system is correct and suitable for the available power supply (Voltage/Frequency).

6.1 PLATES POSITIONS

The dispensing system is equipped with adhesive decals containing key information for the operator. Make sure the decals do not deteriorate or become detached from the equipment over time.

NOTE: should this occur, please contact customer service and request replacements for any damaged or missing decals, then affix the new decals in their designated positions.

Decals are the following ones:

	CE plate with technical data:
	**Corner label plate applied on the box**
	**Warning decal prohibiting smartphone use near the transfer pump when dispensing is under way** After dispensing has been activated, during refuelling operations, do not use your smartphone at a distance of less than 30 cm from the pump. TO BE APPLIED BY THE INSTALLER To be applied if MC BOX B.SMART is installed near a classified area.
	Product warranty label

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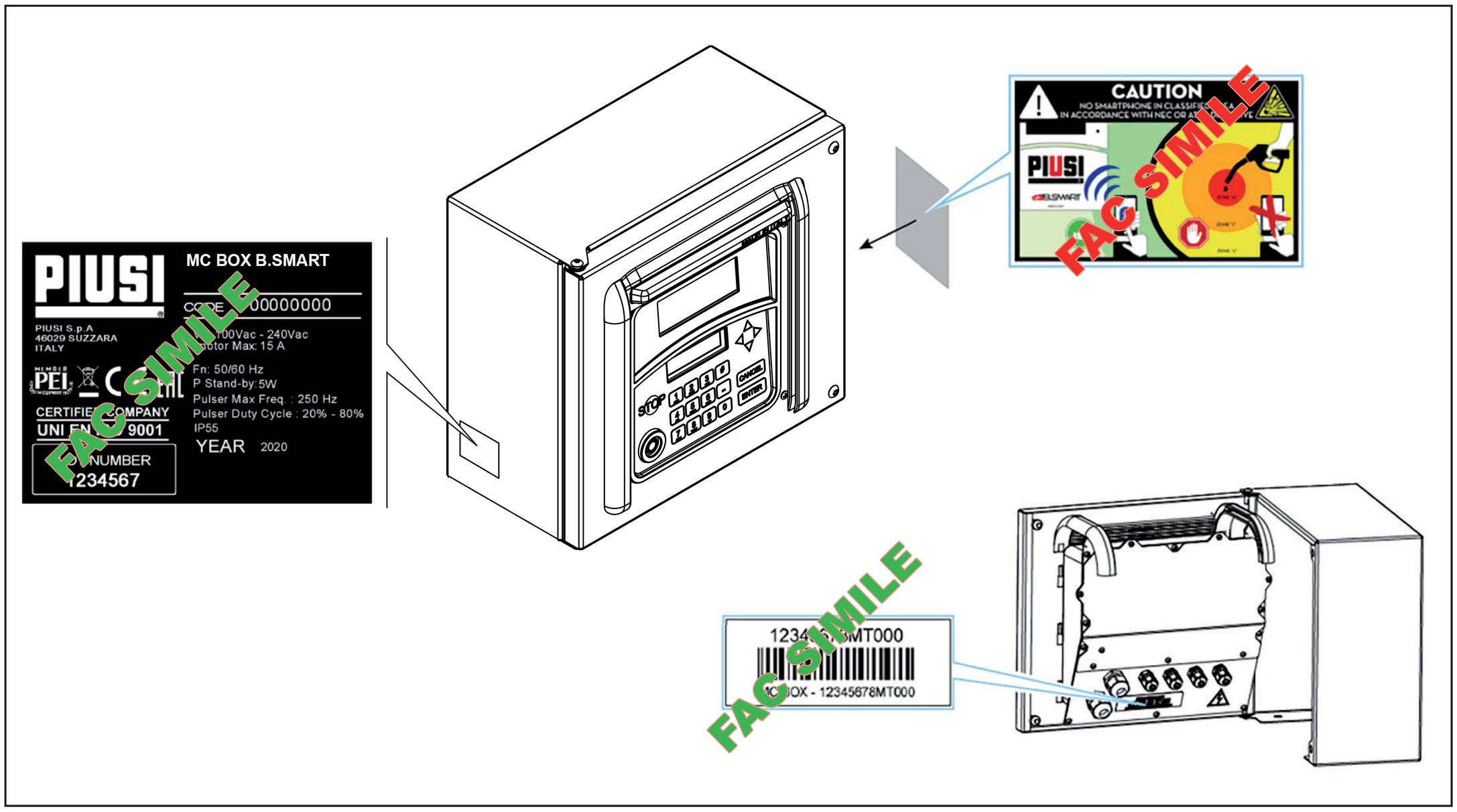
MC BOX B.SMART
PIUSI S.p.A
46029 SUZZARA
ITALY
Fn: 50/60 Hz
P Stand-by: 5W
Pulser Max Freq. : 250 Hz
Pulser Duty Cycle : 20% - 80%
IP55
YEAR 2020
1234567
CAUTION
FAC SIMILE
FAC SIMILE
FAC SIMILE

7 DESCRIPTION OF MAIN PARTS

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

1. An electronic controller
Equipped with Bluetooth interface (BLE 4.0 and later), 2 displays, a keypad, and 2 interface LEDs, controlling 1 dispensing pump and capable of receiving level readings for 1 tank via RS485 digital communications or 0-10 V or 4-20 mA analog communications thanks to the optional Tank Watchdog package.

2. A smartphone app
Installed on a smartphone equipped with an Android operating system or Apple iOS.

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

ELECTRONIC CONTROLLER – USER INTERFACE

The electronic controller user interface has the following components:
2 displays, of which:
- one 4-digit numerical display showing:
  - dispensing value:
  - hour HH . MM (optional parameter settable via web app);
  - warning and alarm codes.
- One 16x2 character alphanumeric display for various user interface messages.
  - 2 LEDs, one Blue for Bluetooth and one Red to show the presence of warnings or alarms.
  - A numerical/alphanumeric keypad and several function keys.
  - i-Button reader

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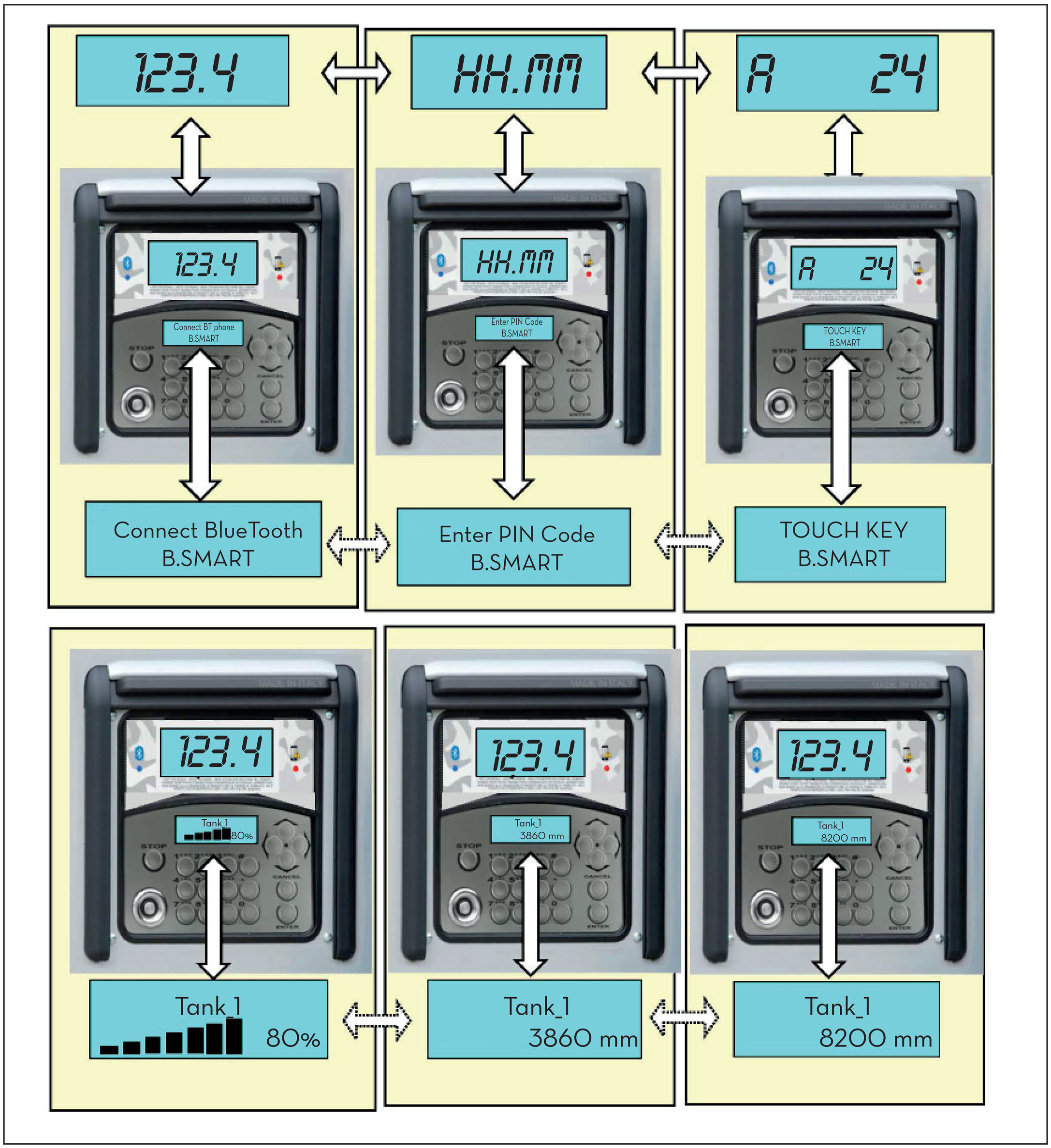
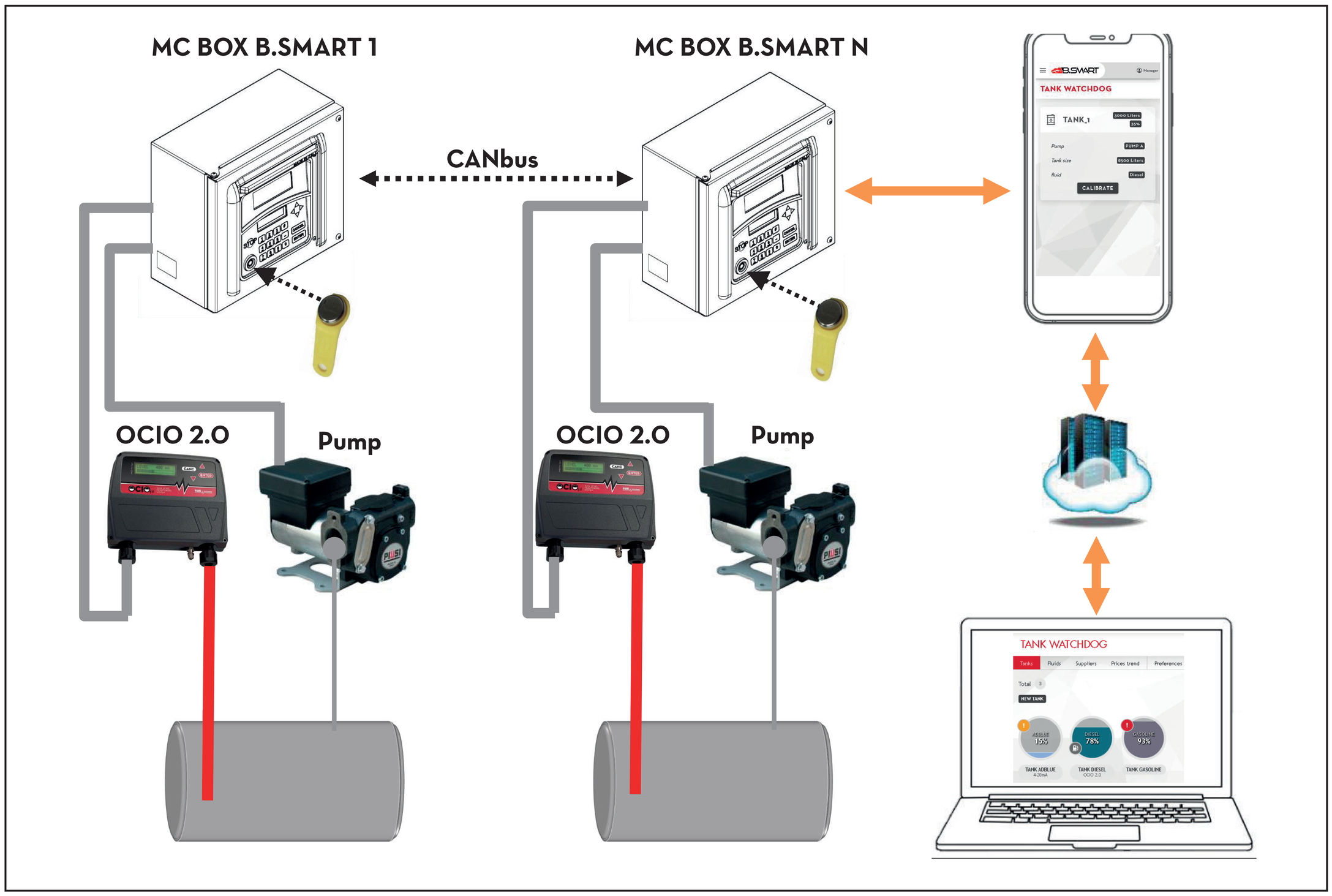
DISPLAY MODE IN STAND-BY



"TYPICAL SITE" LAYOUT

The figure shows an example of one of the most complex site layouts that can be managed by the system



There are numerous system configurations when using one or more controller.

An example of the basic system structure is provided showing the possibility to:

- Monitor fuel tank levels.
- Manage multiple distributors, within the same plant.

For more specific details on modes of connection and communication between dispensers, refer to the site management manual available in the WEBAPP.

SYSTEM FUNCTIONS

- Site configuration, acquisition and management of filling operations, management of filling dispensers, management of drivers, vehicles and detailed reporting of dispensing operations on the WEBAPP accessible from any PC/Tablet, using your credentials
- Fuel dispensing using the dedicated app: PIUSI app, downloadable for smartphones only from the Play Store and App Store, which connects to the dispenser / controller via a BLE (Bluetooth Low Energy) link.
- Fuel dispensing using the dedicated APP also in areas without 3/4G coverage and Wi-Fi.
- Dispensing via i-Button associated with the individual driver.
- Dispensing by means of a pin code entered via the keypad.
- Facility for interface with systems for tank level measurement in digital mode via RS485 port with PIUSI Ocio 2.0 with 0-10V or 4-20 mA analog interfaces.
- Possibility to remotely manage sites far from the company headquarters.

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COMPATIBILITY WITH SMARTPHONE OPERATING SYSTEMS

The system is compatible with the following iOS versions:

iOS	Android
iOS10	5.0 - 5.1
iOS11	6.0
iOS12	7.0 - 7.1
iOS13	8.0
iOS14	9.0
iOS15	10
iOS16 and subsequent versions	11
	12
	13 and subsequent versions

CLOUD

Space on dedicated Servers that hold the database for storing the configurations of the site and the dispenser, drivers, vehicle license plates and all dispensed fuel data.

WEBAPP

WEB interface used by the site manager. It has various functions: it monitors the dispensing cycles (who carried them out, when, from which controller), creates/deletes users from the site, adds/removes controllers/dispensers from the site. The only external device the WEBAPP connects to is a USB reader for i-Button.

APP

It makes several operations:

- It manages two types of users: driver and manager.
- It sends commands to the controller and receives responses. The commands are used to perform: dispensing, calibration, updating of the controller firmware, downloading of updates to controller configuration, management of drivers or uploading to the CLOUD of the dispensing cycles performed by the controller.

8 TECHNICAL CHARACTERISTICS

INTENDED USE

Implementation of a fluid delivery and control system for private use and not subject to special regulations such as ATEX standards for potentially explosive atmospheres.

⚠ CAUTION: do not install MC BOX B.SMART in potentially explosive locations according to Atex directive.

MAXIMUM ELECTRICAL PARAMETER VARIATIONS

The electrical motors installed in the dispensers can handle the following maximum variations:

- +/- 5% of power voltage;

SEE THE TECHNICAL DATA TABLE BELOW

⚠ CAUTION: before installing, always make sure the type of dispensing system is correct and suitable for the available power supply.

Technical data	Standard conditions	Limits	Note
Power supply input	12 - 24 Vdc	Maximum power absorbed in stand-by: 5W	
Motor piloting output	12 - 24 Vdc	Imax = 50 A (a 12 Vdc) Imax = 25 A (a 24 Vdc)	
Electronic Key Interface	YELLOW key (i-button): Enabling input from PIUSI electronic key.	The yellow key can only be registered in the controller and the user key is authorised only for the controller itself	It is possible to configure the presence or not of said key.
Nozzle contact input (only for versions where available)	Clean contact or Open Collector electronic signal (NPN).	Approximately 250 µA at 5 Vdc will be supplied to the clean contact (or open collector).	It is possible to configure the presence or not of this contact, furthermore it is possible to configure the type of signal (normally open or normally closed).
Pulser IN input	Free contact or Open Collector electronic signal (NPN)	Approximately 250 µA at 5Vdc will be supplied to the clean contact (or open collector). The input signal may have a maximum frequency of 300 Hz with a Duty Cycle between 20% - 80%.	The input signal may have a maximum frequency of 300 Hz with a Duty Cycle between 20% - 80%.
Level 1 and 2 contact input (only for versions where available)	Clean contact or Open Collector electronic signal (NPN) The terminal also outputs 24VDC power	Approximately 250 µA at 5 VDC will be supplied to the clean contact (or open collector).	It is possible to configure the presence or not of this signal, furthermore it is possible to configure the type of signal (normally open or normally closed for those versions where envisaged). Finally, it is possible to select the action which the main controller must perform when it receives this signal: it may simply generate an alarm on the display or completely inhibit further dispensing if Block Pump is set.
Auxiliary power supply output 24 Vdc	Auxiliary 24 Vdc power supply output to power external electronic devices.	Imax = 25 mA.	The device being powered must not absorb more than 25 mA with a 24 Vdc power supply. Typically it could be a level sensor.
Fuses	F1 (Vdc power supply input) 1A T (delayed). F2 60 A T (delayed) motor fuse.		
Enclosure protection rating	Rainproof		
Working temperature	From -10° C to +40°C		
Storage temperature	From -20° C to +60°C		
Humidity	< 90%		
Maximum altitude	2000 m		
Pollution degree	2		
Wiring distances	Max pulser distance	15 m	
	Max level sensors distance	100 m	

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Technical data	Standard conditions	Limits	Note
Display and counting limits	Floating decimal point sequence: 0.00 --> 9.999 --> 99.99 --> 999.9 --> 9999 The maximum quantity which can be dispensed is 9999 units, regardless of the unit of measure set, be it litres, gallons or pints. 0.00 → 9.999 → 99.99 → 999.9 → 9999		
	PRESET: Maximum preset quantity	9999 litres/gallons/ pints	
Memory storage	The Electronic Controller can store: - Up to 500 Users - Up to 500 dispensing cycles		

9 USE

9.1 INTENDED USE

The MC BOX B.SMART dispenser is designed as a diesel filling station for private use.
A dedicated smartphone APP and WEBAPP make it easy to use, returning a summary of all dispensing operations.

CAUTION: **ambient conditions for use**
Ambient temperature: min. -10°C / max. +40°C
Relative humidity: max 90%.

9.2 IMPROPER USE

CAUTION: **flammable liquids and explosive atmospheres**
MC BOX B.SMART has not been designed to comply with the ATEX directive or to operate in potentially explosive atmospheres.
Do not install the MC BOX B.SMART in a potentially explosive location.
The system was not designed for dispensing of petrol, flammable liquids with flash point <55°C/131°F, or for operation in environments with potentially explosive atmosphere.
The use in the above mentioned conditions is forbidden.

CAUTION: **improper use**
It is strictly forbidden to use the system for purposes other than the ones indicated. Any other use different from the one for which the system has been conceived and described in this manual is considered “MISUSE”. Therefore, PIUSI S.p.A. shall not be held responsible for any damage caused to people, animals or to the system itself.

9.3 REASONABLY FORESEEABLE MISUSE

The smartphone is an indispensable tool for MC BOX B.SMART to set up and record the dispensing cycles managed by the system, but it is forbidden to use your mobile phone near the transfer pump when refuelling operations are under way.

CAUTION: Use your smartphone only and exclusively to connect, authenticate and link 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.

10 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 when refilling in bad weather. Installation of the transfer pump must be carried out by specialised personnel and carried out according to the instructions provided in this chapter.
If MC BOX B.SMART is not sheltered under a canopy, a “display cover” is provided as protection for the display and keypad.

NOTE: it is also suitable for use in wet locations.

WARNING: **Personnel authorised to install the device**

All installation procedures must be performed exclusively by qualified and authorised staff. They must:

Install the system in a dry and well ventilated place;

Properly install all the components necessary for the equipment to function properly;

Only use accessories that have been supplied with the system.

CAUTION: use of unsuitable accessories not supplied with the system is strictly prohibited. PIUSI S.p.A. shall not be held responsible for damages caused to people, things or to the environment deriving from failure to meet such instructions.

THE UNIT IS FOR PROFESSIONAL USE ONLY.

The equipment must be installed in a well lit place, in compliance with the norms in force.

The equipment has been designed to be used in a dry environment. If it is installed outdoors, provide adequate protective covering.

The motors are not explosion-proof. Do NOT install in places with explosion hazard.

MC BOX B.SMART can be mounted to a wall or on a pedestal.
To install the equipment on a wall you will need 4 x M8 screws.
To install it on a pedestal you will need 4 x M6 screws.
Diagrams showing the distance between holes for precise installation are provided below.
The pedestal is a Piusi accessory supplied separately from the MC BOX B.SMART .

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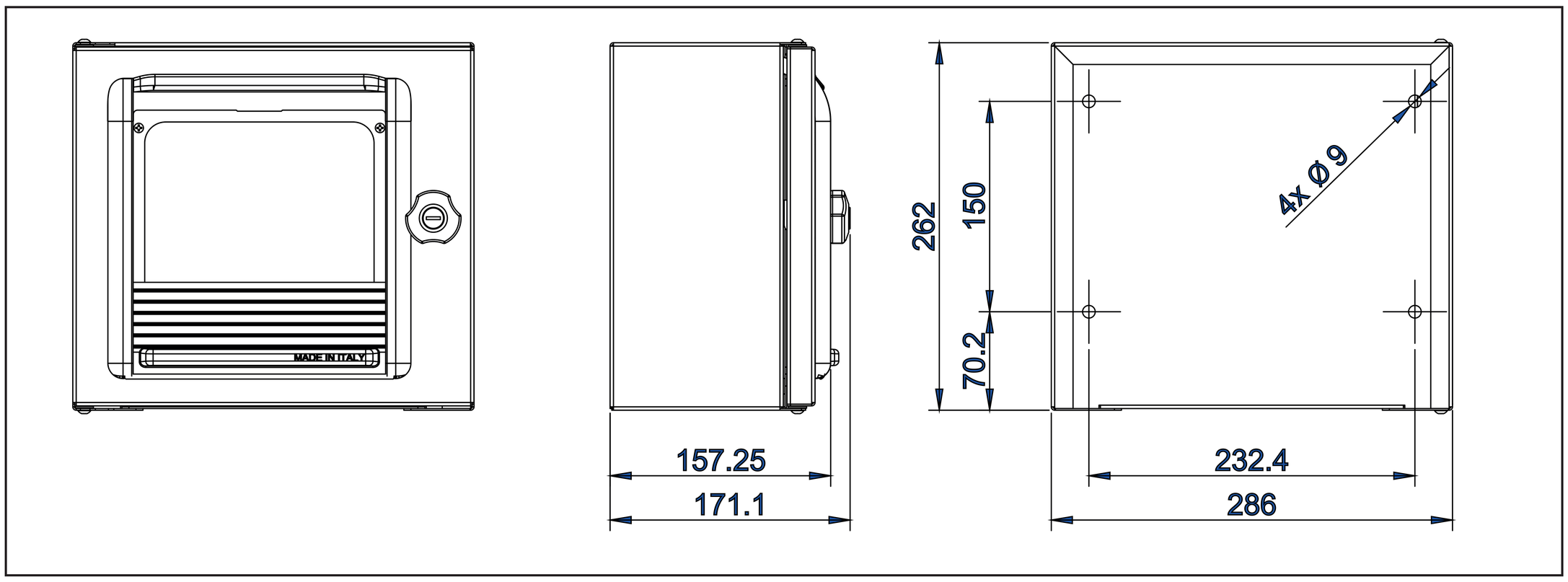
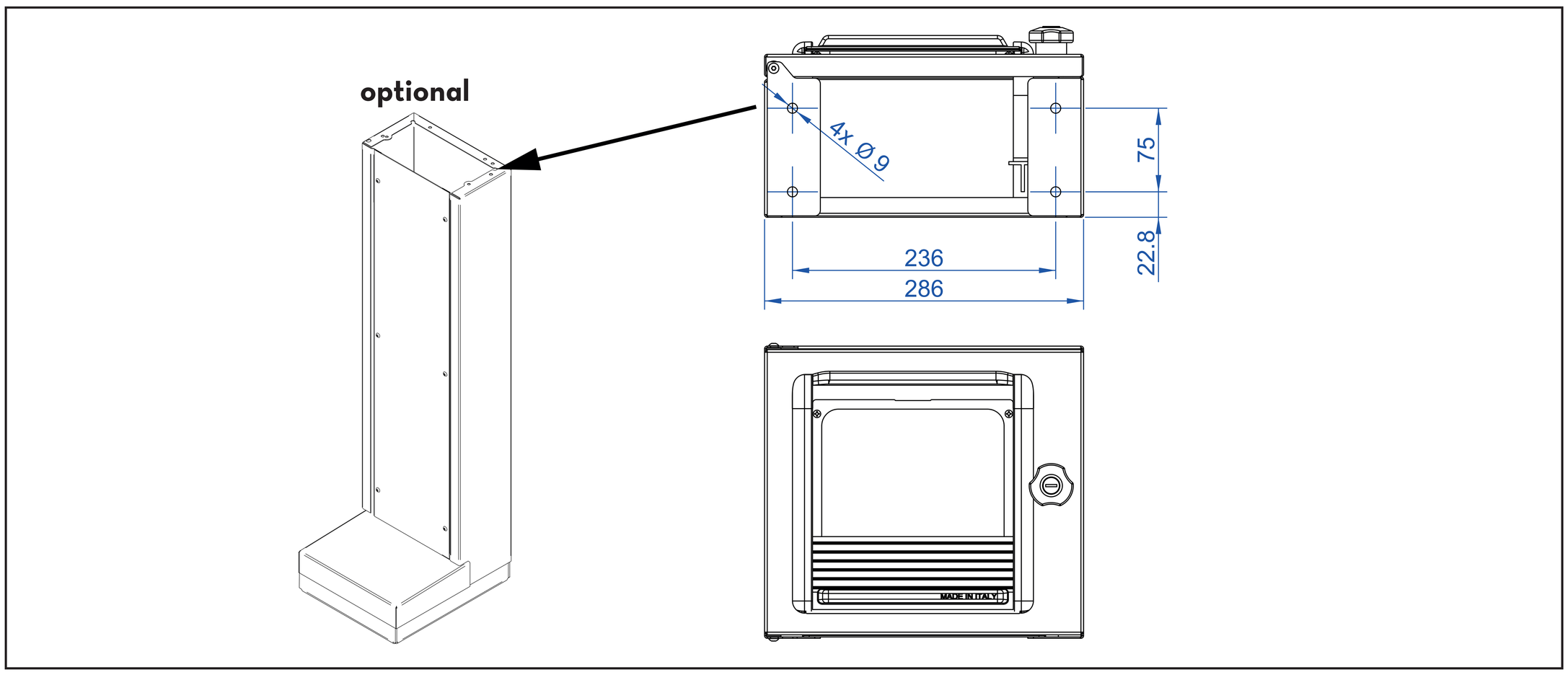
WALL MOUNTING

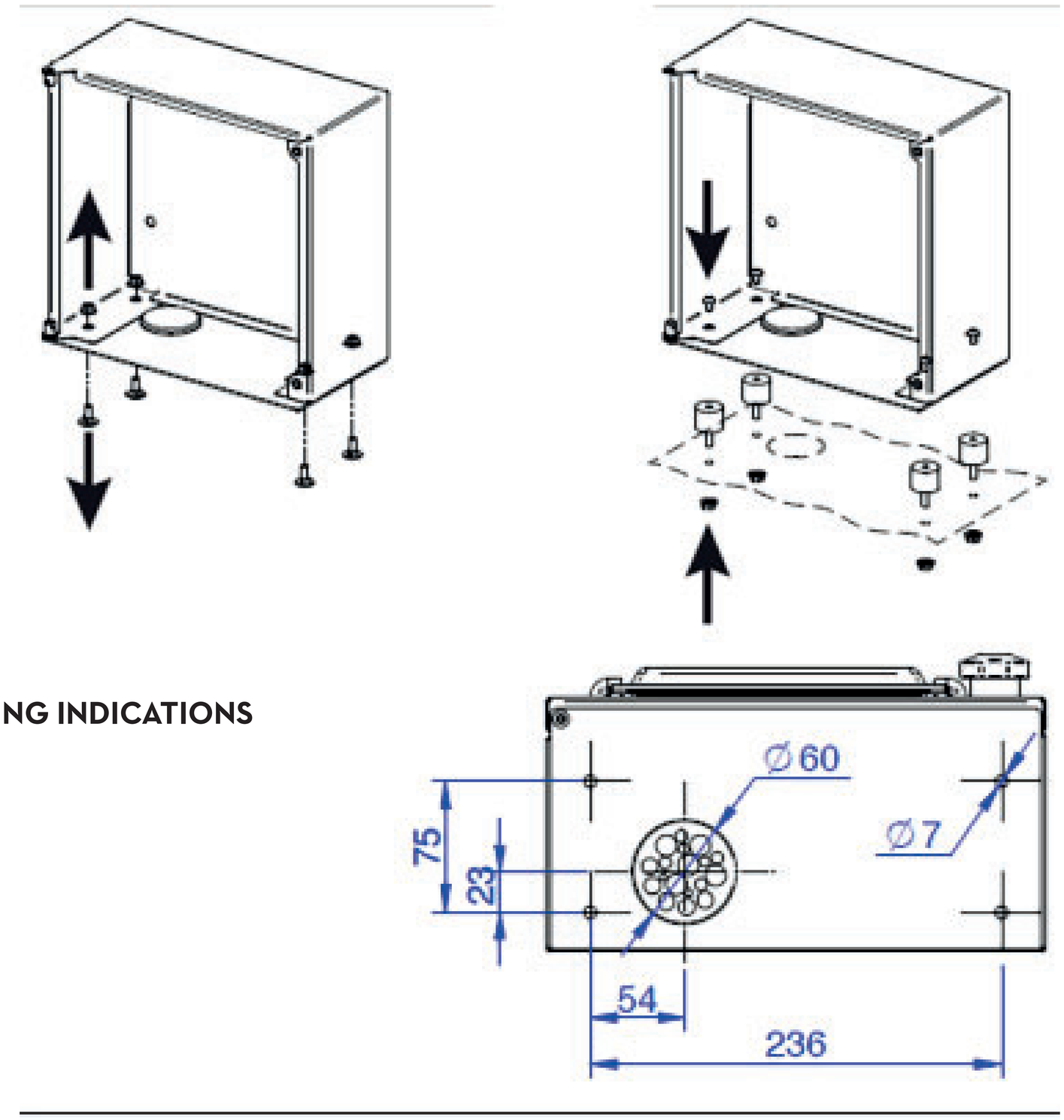


PEDESTAL MOUNTING



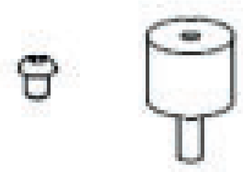
CAUTION: BE SURE TO INSTALL THE MCBOX B-SMART ONLY IN AN AREA WHERE THERE IS NO RISK OF EXPLOSION

INSTALLATON TO VEHICLES WITH VIBRATION DAMPERS

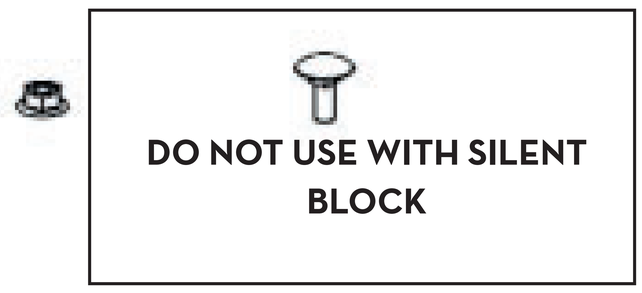


DRILLING INDICATIONS

4 x Silent block Kit



4 x Supplied with the bodywork



10.1 DANGEROUS AREA

Any fuel dispenser is considered a danger zone as defined in the National Electrical Code. Installation must be performed in compliance with the following standards:

- National Electrical Code (NFPA No. 70).
- Code for motor fuel dispensing facilities and repair garages (NFPA No. 30A).

WARNING: the installer is responsible for gaining familiarity with and observing all the relevant local codes.

The Product is designed for use in unclassified areas.

All the equipment must be installed outside the danger zones.

NOTE: local codes may impose specific installation requirements. Installation is subject to approval of the local authorities having jurisdiction for the site.

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11 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.

CAUTION: 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 switch or circuit breaker with a current rating suitable for the electrical line and a differential switch suitable for the type of electrical load.

It is specified in detail that:
- a switch or circuit-breaker must be included in the installation;
- it must be suitably located and easily reached;
- it must be marked as the disconnecting device for the equipment.

CAUTION: The power supply panel equipped with switch or circuit breaker must be near the equipment and the disconnecting means shall disconnect all current-carrying conductors.

CAUTION: before accessing the electrical parts, make sure that you have disconnected all the main switches that energise the unit.

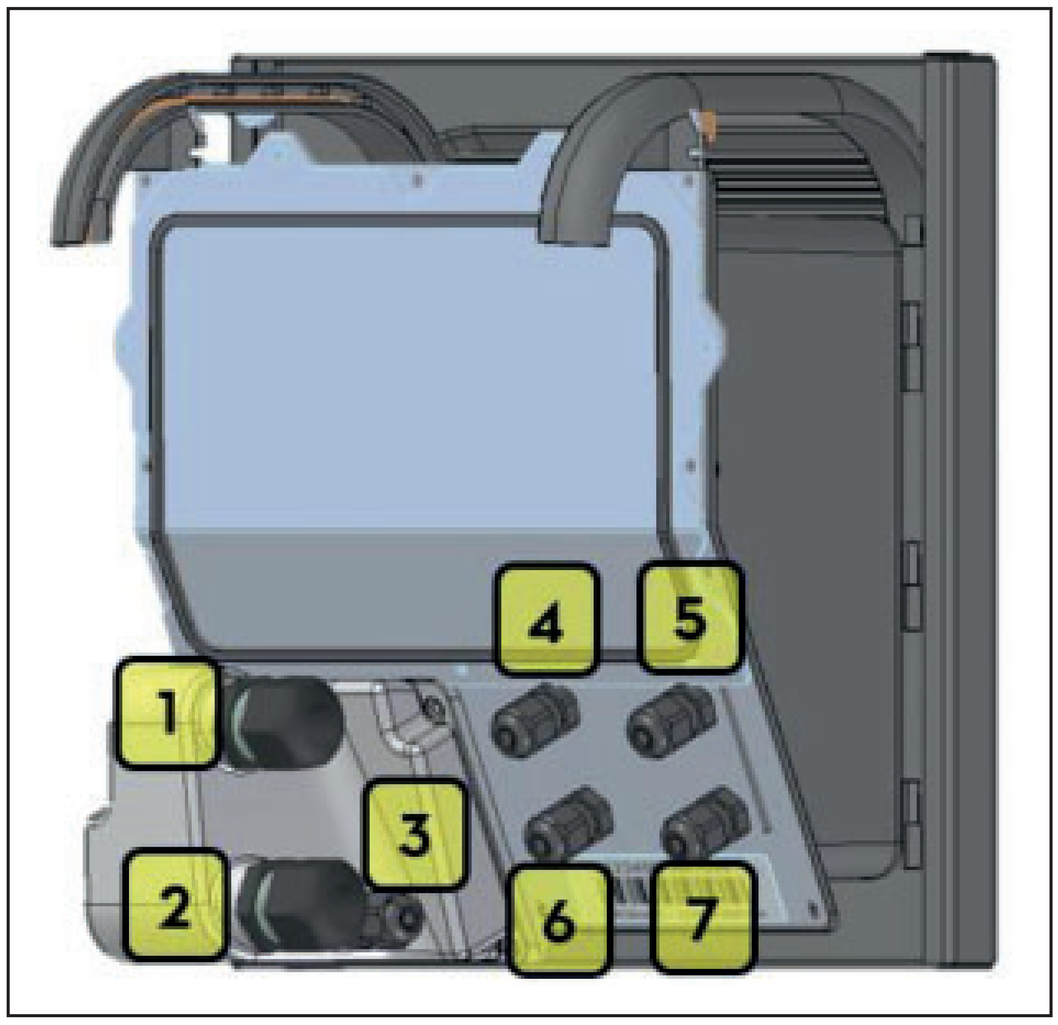
The operations required for correct wiring are described below:
- Controller PG connection.
- Power input (pump motor and board) and motor output cabling.
- Connector for: 24 Vdc service power supply, nozzle contact, level contact.
- OCIO connection on RS485 (if used).
- Connection for interfacing with other controllers via CANbus.

CABLE GLAND CONNECTION

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

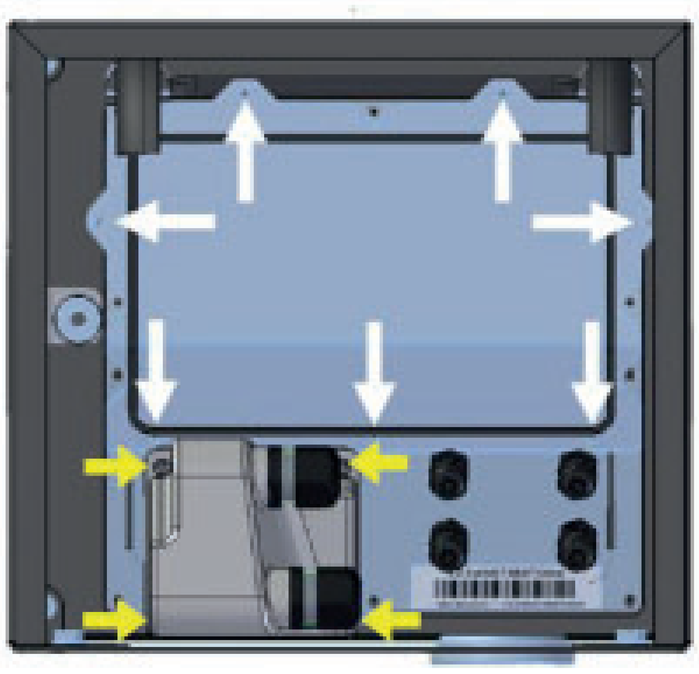
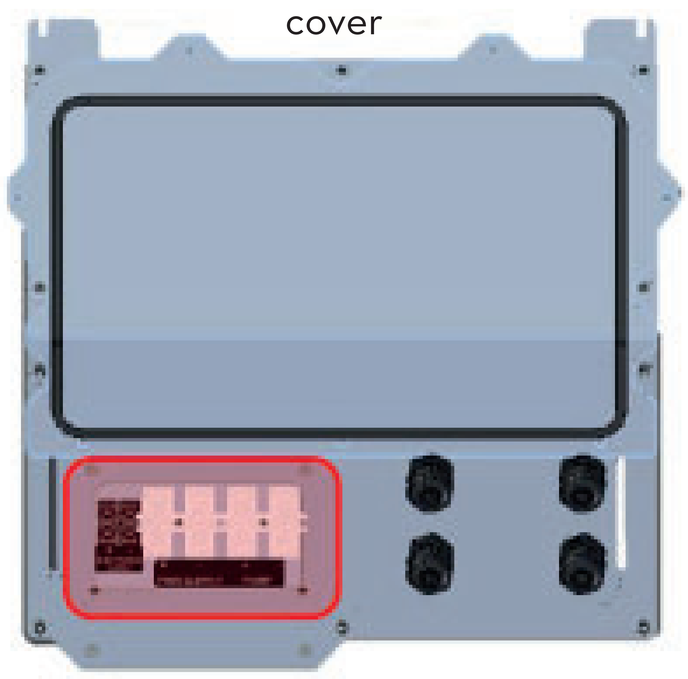
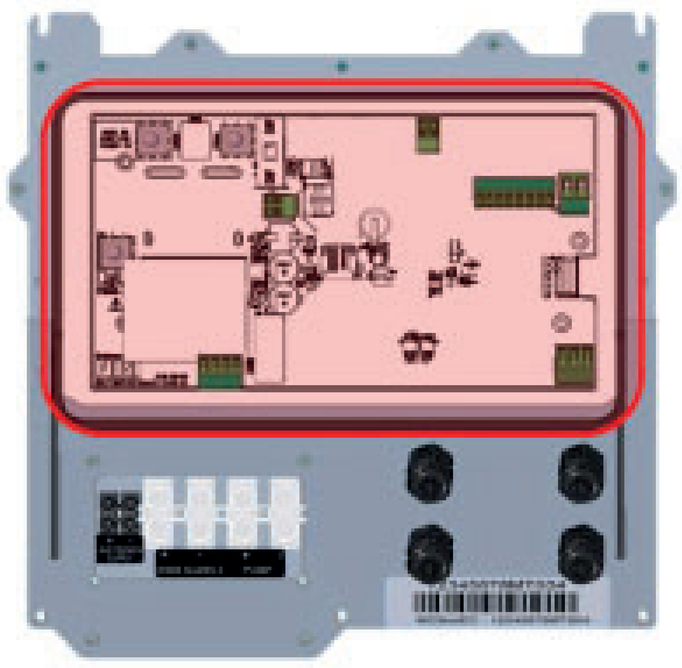
1. Motor output.
2. Pump power supply input.
3. Board power supply input.
4. Pulser input.
5. Level contact.
6. Nozzle contact.
7. RS485 data line / CANbus line.

CAUTION: use copper conductors only for wiring.



OPENING THE REAR COVER OF THE CONTROLLER AND REMOVING THE TERMINAL BLOCK COVER

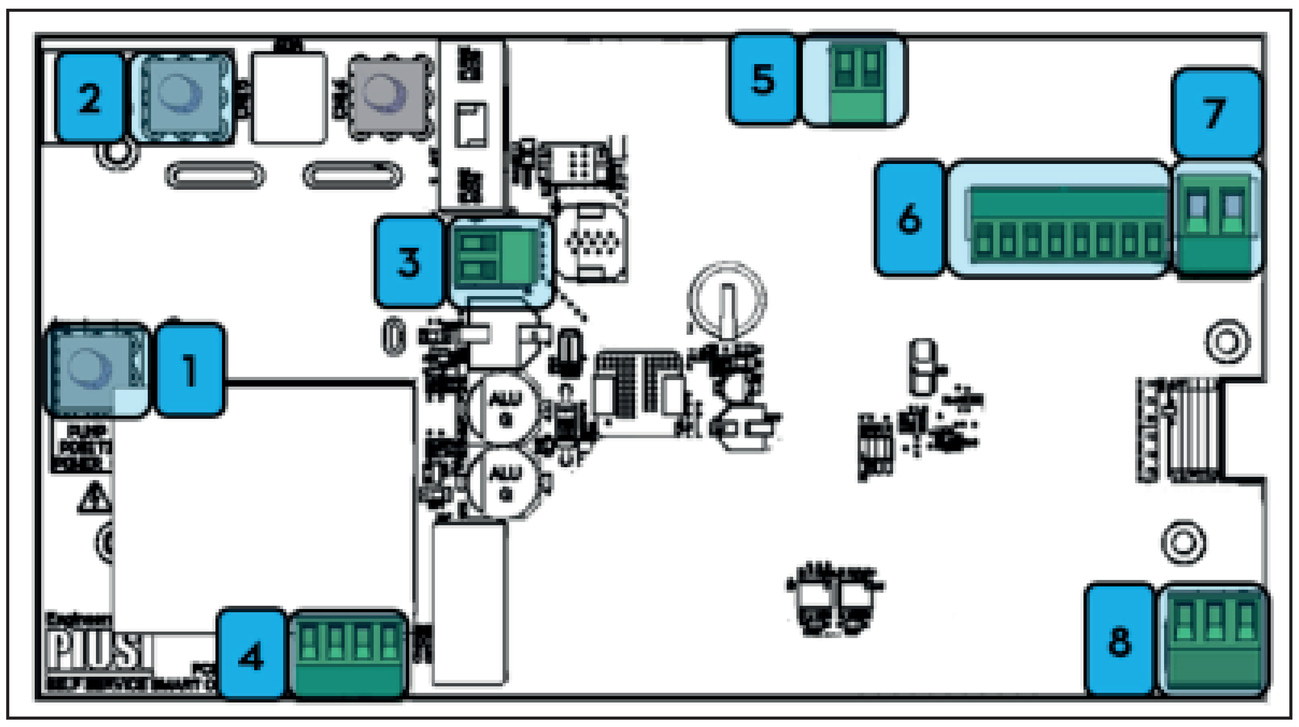
Loosen all 7 screws of the rear cover of the controller to access the compartment of the electronic boards, then undo the 4 screws to remove the terminal block cover.

Screw positions	Removing the terminal block cover	Rear cover opening
		

DETAILED VIEW OF ELECTRONIC BOARD

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

1. Motor output.
2. Pump power supply input;
3. Board power supply input.
4. RS485 Data line.
5. Key contact.
6. 8-signal connector.
7. Nozzle contact.
8. CANbus line.

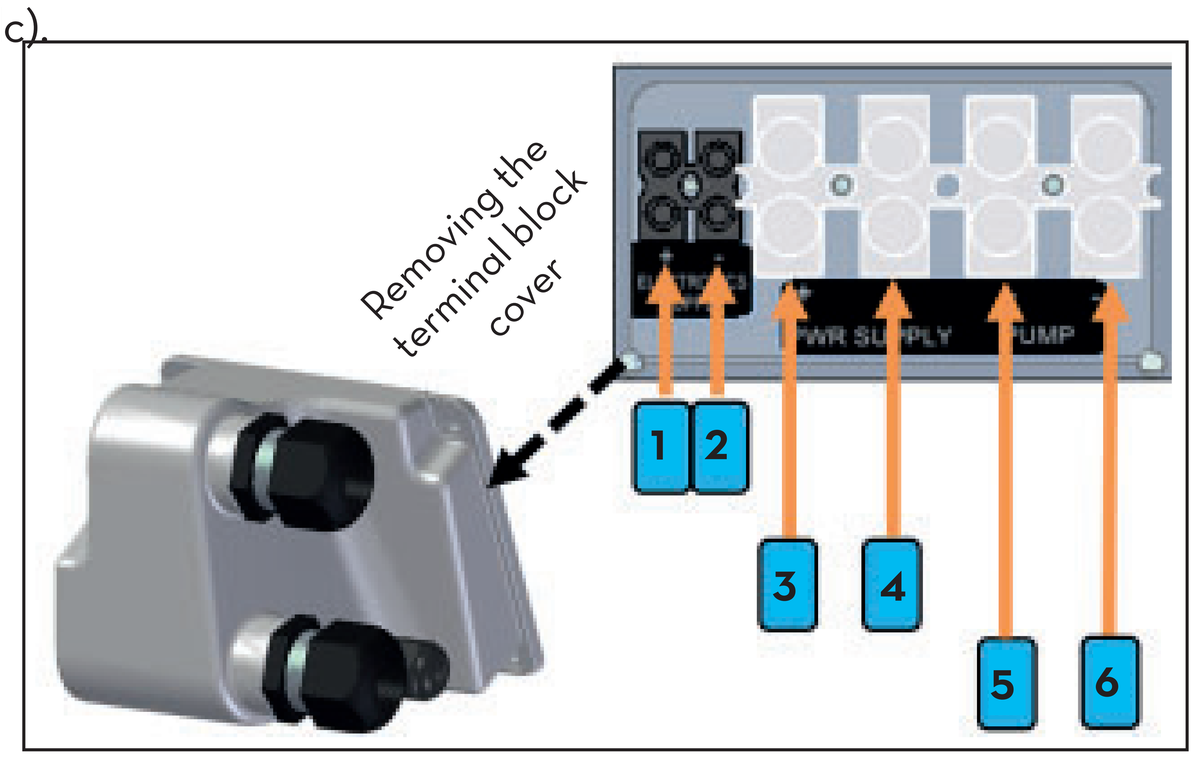


11.1 POWER AND MOTOR OUTPUT CABLING ON THE TERMINAL BLOCK

The power and motor output cables can be hooked up once the terminal block cover has been removed. The following connections must be made at the bottom of the terminal block:

1. Board power supply | Positive (+12Vdc/+24dc).
2. Board power supply | Negative (GND).
3. Pump power supply | Positive (+12Vdc/+24dc).
4. Pump power supply | Negative (GND).
5. Pump output | Positive (+12Vdc/+24dc).
6. Pump output | Negative (GND).

CAUTION: for supply connection, use wires rated for at least 80 °C (176°F).



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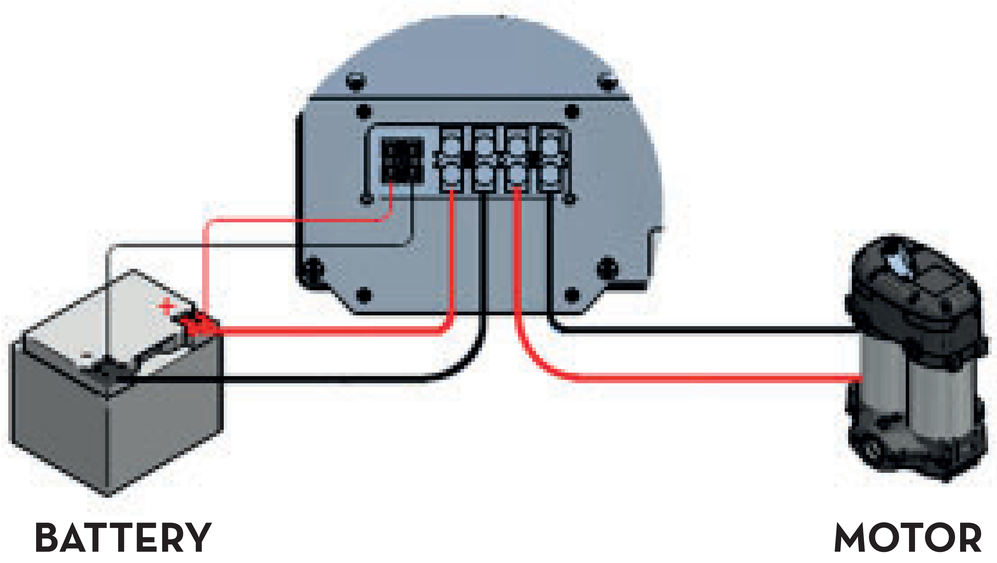
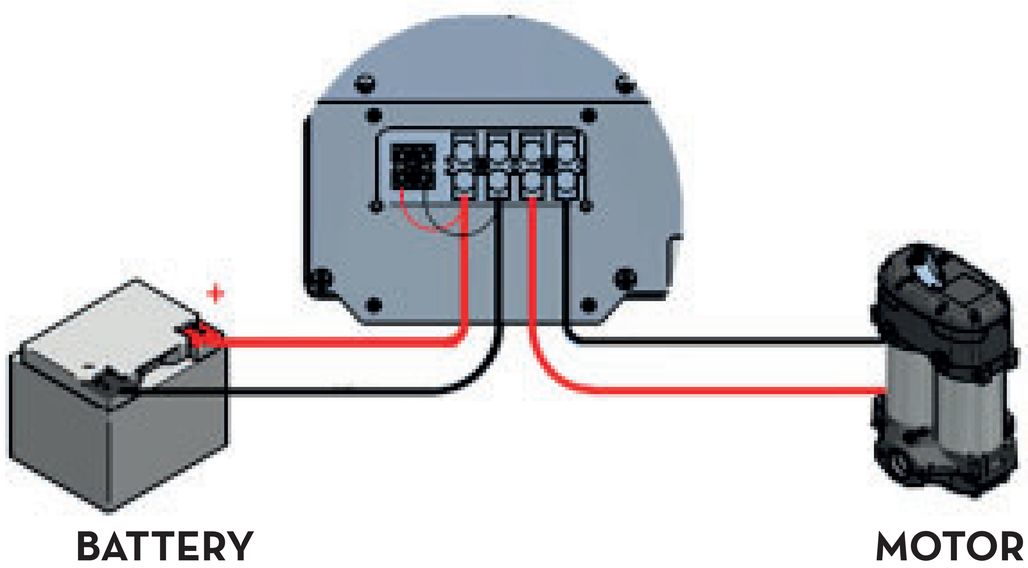
11.2 POSSIBLE ELECTRONIC BOARD AND PUMP MOTOR POWER CABLING

We show two possible configurations below. Where possible, follow the scheme of configuration 1 (diagram on the left):

Configuration 1
Separate electronic board and pump power cables



Configuration 2
Jumper on the terminal block for delivering power to the electronic board



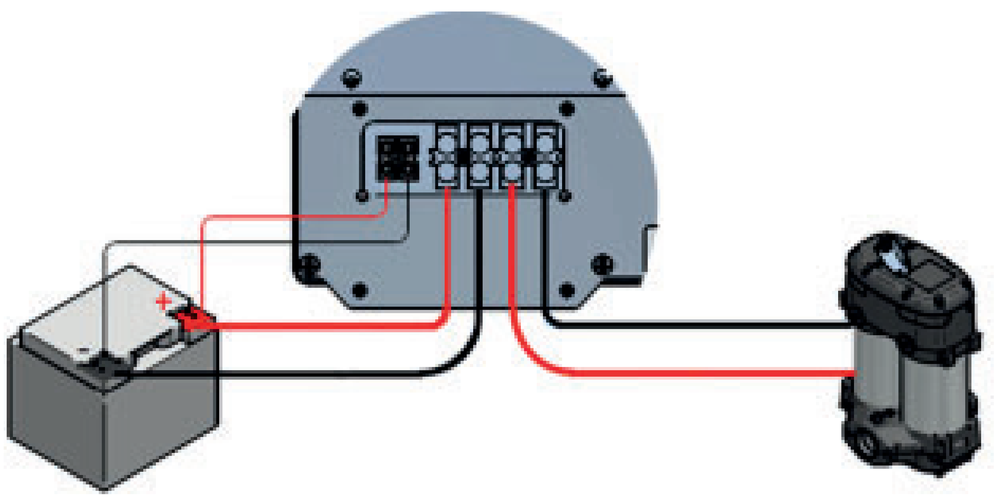
11.3 PUMP POWER CABLE SPECIFICATIONS

11.3.1 CONFIGURATION 1: SEPARATE ELECTRONIC BOARD AND PUMP POWER CABLES

CAUTION: the cross section of the cables must be chosen in relation to the maximum current absorbed by the motor in its most critical bypass operation condition.

Maximum pump current [A]	Nominal cross section of pump power cable	
	[mm²]	[AWG]
10	2.5	13
15	2.5	13
20	4	11
25	4	11
30	6	9
35	6	9
40	6	9
45	10	7
50	10	7

Configuration 1
Separate electronic board and pump power cables

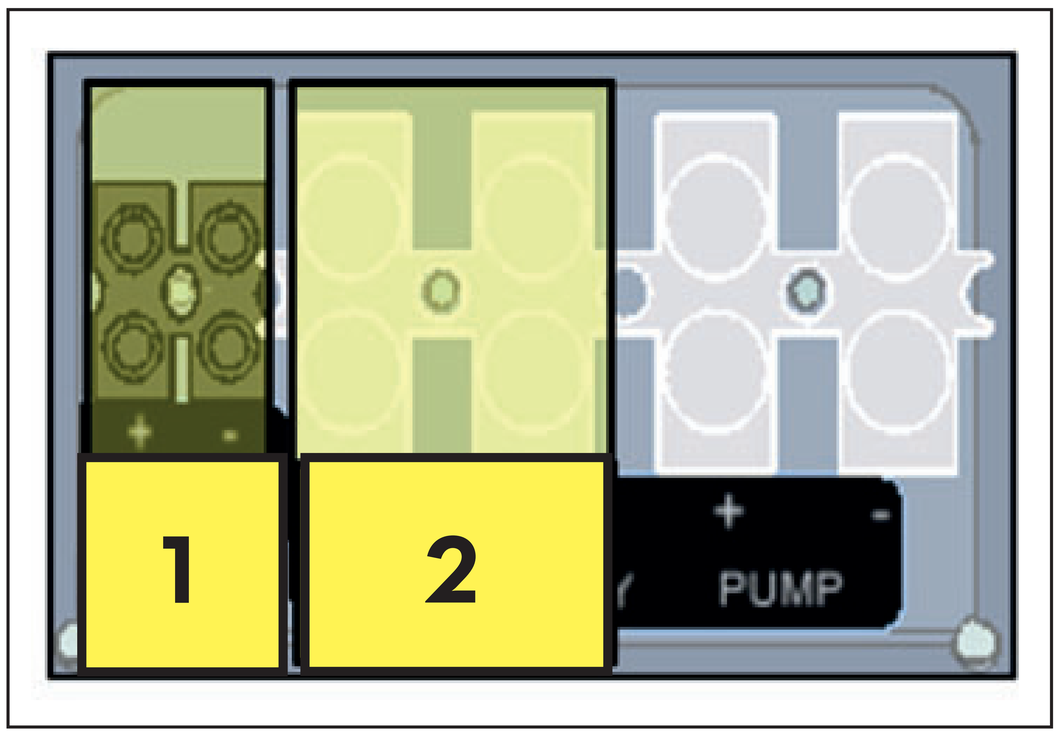


CAUTION: the values in the table are minimum cross sections for the pump power cable.

CAUTION: if you are using a pump running on 24 VDC power, consider only the values for up to 25 A maximum current draw.

The figure shows the terminals for hooking up:

1. the electronic board power supply.
2. the pump motor power supply.



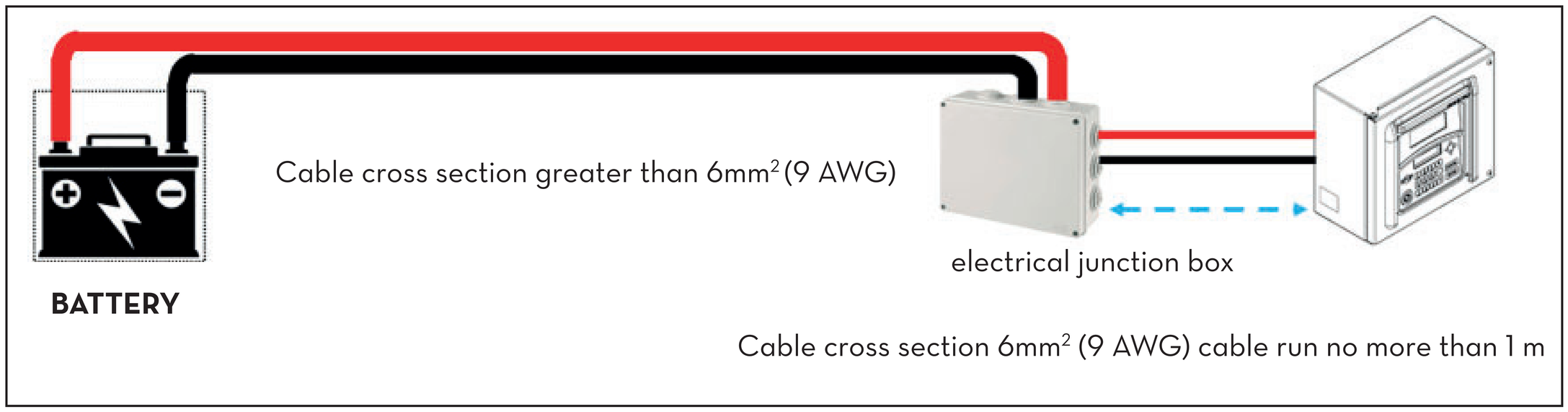
NOTE: if the electronic board has a separate power cable, its cross section must be at least 1 mm2 (17 AWG).

NOTE: Make sure to use a motor compatible with the controller:
- If the controller is powered with 12V, the motor must have an operating voltage of 12V. If the controller runs on 24V power, the motor must have a voltage of 24V.

CAUTION: the controller's pump power terminal block is designed for cables with a cross section of no more than 6 mm^2 (9 AWG).

If the cable has a large cross section according to the values in the table, it must be reduced to 6 mm^2 (9 AWG).

The 6 mm^2 (9 AWG) cable run must be less than 1 m from the MC BOX B.SMART and the point of reduction.



11.3.2 CONFIGURATION 2: JUMPER ON THE TERMINAL BLOCK FOR DELIVERING POWER TO THE ELECTRONIC BOARD

This configuration should be used if it is not possible to separate the electronic board and pump power cables.

CAUTION: the cross section of the cables must be chosen in relation to the maximum current absorbed by the motor in its most critical bypass operation condition, and the length of the power cable itself.

CAUTION: the values given in the table are the minimum pump power cable cross sections required to prevent voltage drops compromising the operation of the MC BOX B.SMART.

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Configuration 2 - jumper on the terminal block for delivering power to the electronic board

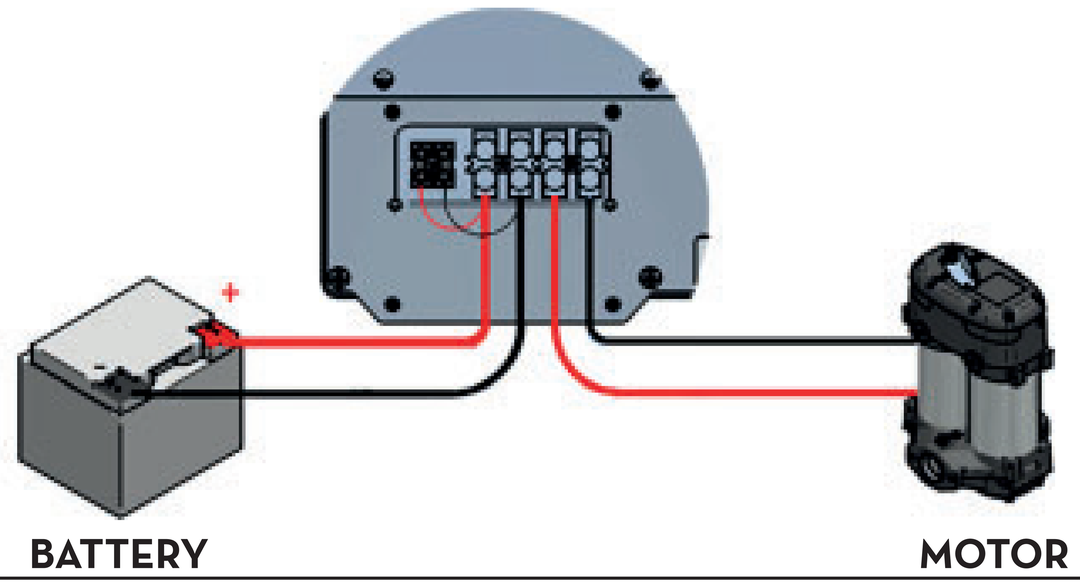


TABLE OF CABLE SIZES FOR A 12 VDC PUMP

Cable length [m]	Nominal cross section of pump power cable																	
	[mm²]	[AWG]	[mm²]	[AWG]	[mm²]	[AWG]	[mm²]	[AWG]	[mm²]	[AWG]	[mm²]	[AWG]	[mm²]	[AWG]	[mm²]	[AWG]	[mm²]	[AWG]
Up to 2	2.5	13	2.5	13	4	11	4	11	6	9	6	9	6	9	10	7	10	7
3	2.5	13	4	11	4	11	6	9	6	9	10	7	10	7	10	7	10	7
4	2.5	13	4	11	6	9	10	7	10	7	10	7	10	7	16	5	16	5
5	4	11	6	9	10	7	10	7	10	7	16	5	16	5	16	5	16	5
6	4	11	6	9	10	7	10	7	16	5	16	5	16	5	25	3	25	3
7	6	9	10	7	10	7	16	5	16	5	16	5	25	3	25	3	25	3
8	6	9	10	7	10	7	16	5	16	5	25	3	25	3	25	3	25	3
9	6	9	10	7	16	5	16	5	25	3	25	3	25	3	35	1	35	1
10	10	7	10	7	16	5	16	5	25	3	25	3	25	3	35	1	35	1
	10		**15**		**20**		**25**		**30**		**35**		**40**		**45**		**50**	
	Maximum pump current [A]																	

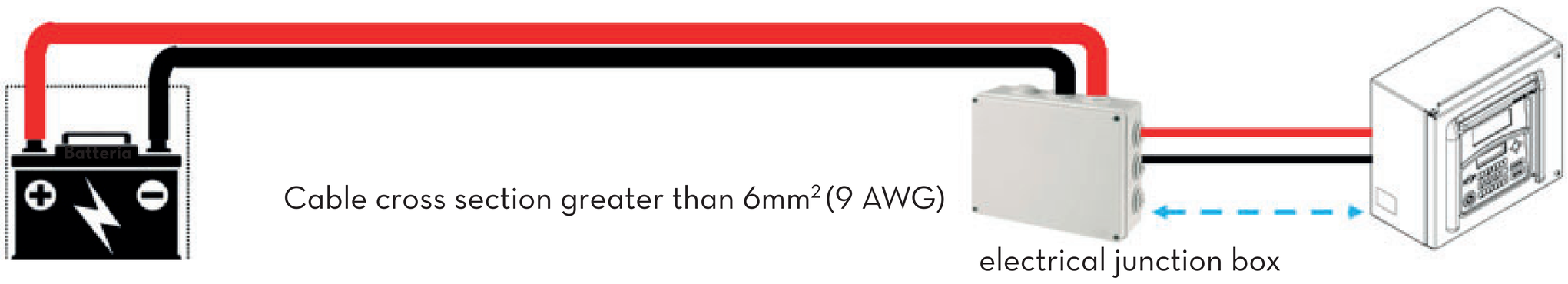
NOTE: the cross section of the cable used to make the bridge to deliver power to the electronic board must be at least 1 mm² (17 AWG)

NOTE: Make sure to use a motor compatible with the controller:
- If the controller is a 12V model, the motor must also have a 12V operating voltage.

CAUTION: the controller's pump power terminal block is designed for cables with a cross section of no more than 6 mm² (9 AWG).

If the cable has a large cross section using the values in the table, it must be reduced to 6 mm² (9 AWG), at a distance of no more than 1 m from the MC BOX B.SMART.

The 6 mm² (9 AWG) cable run must be less than 1 m from the MC BOX B.SMART and the point of reduction.



Cable cross section 6mm² (9 AWG) cable run no more than 1 m

TABLE OF CABLE SIZES FOR A 24 VDC PUMP

Maximum pump current [A]	Nominal cross section of pump power cable	
	[mm²]	[AWG]
10	2.5	13
15	2.5	13
20	4	11
25	4	11

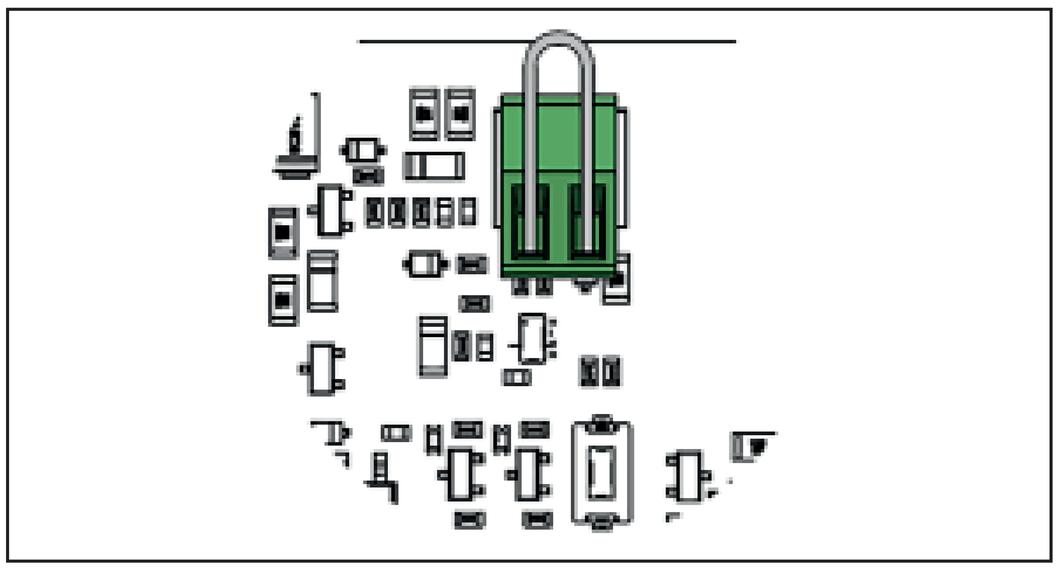
NOTE: if the electronic board has a separate power cable, its cross section must be at least 1 mm2 (17 AWG).

NOTE: Make sure to use a motor compatible with the controller:
- If the controller is a 24V model, the motor must also have a 24V operating voltage.

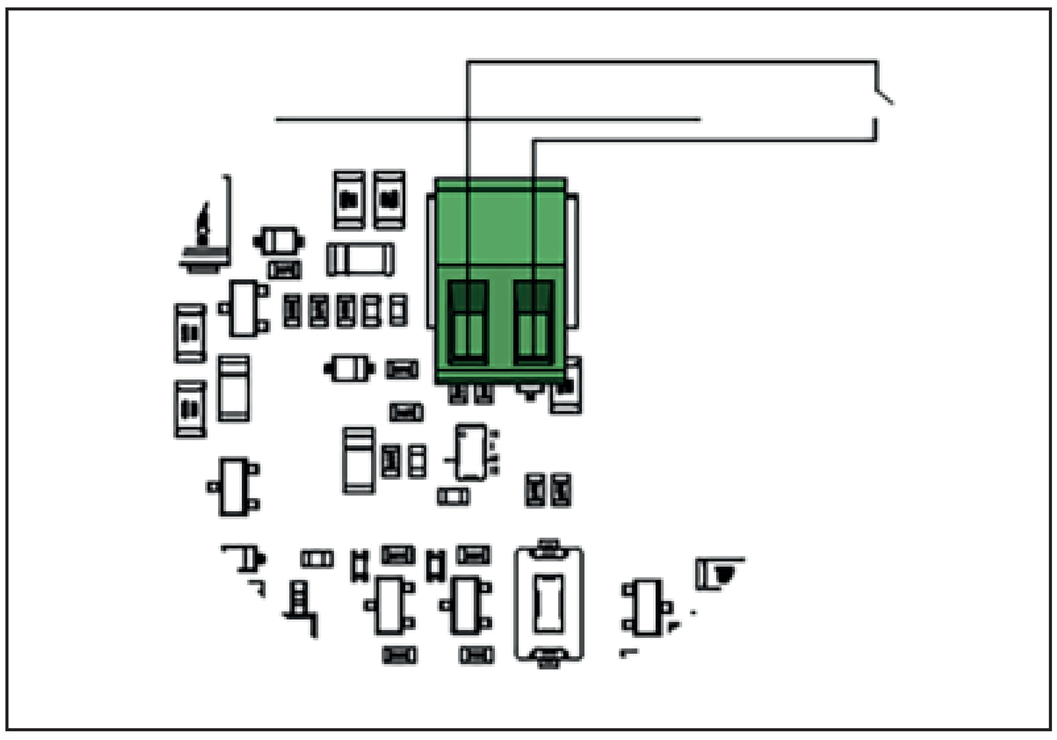
11.4 KEY CONTACT

The key contact is used to zero the current draw when the vehicle is powered off, to avoid draining its battery.
The key contact can be used in three different ways:

1. Jumper, always active (configuration as sold)



2. No voltage contact (switch)



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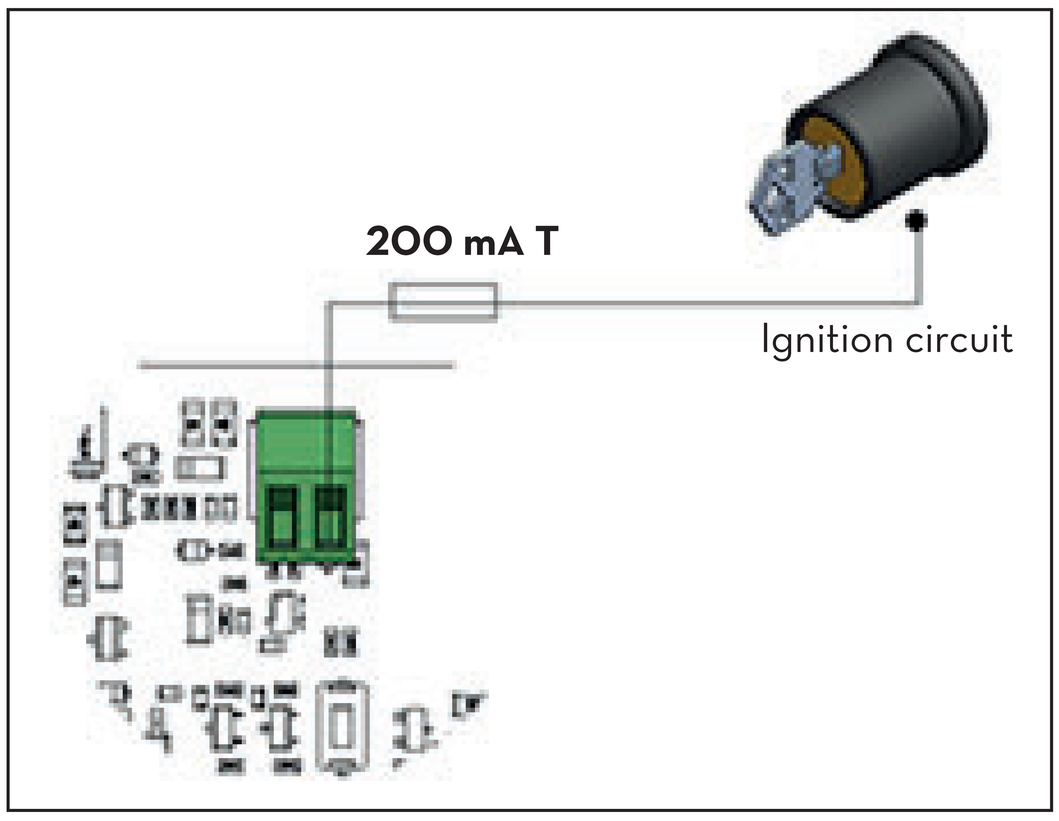
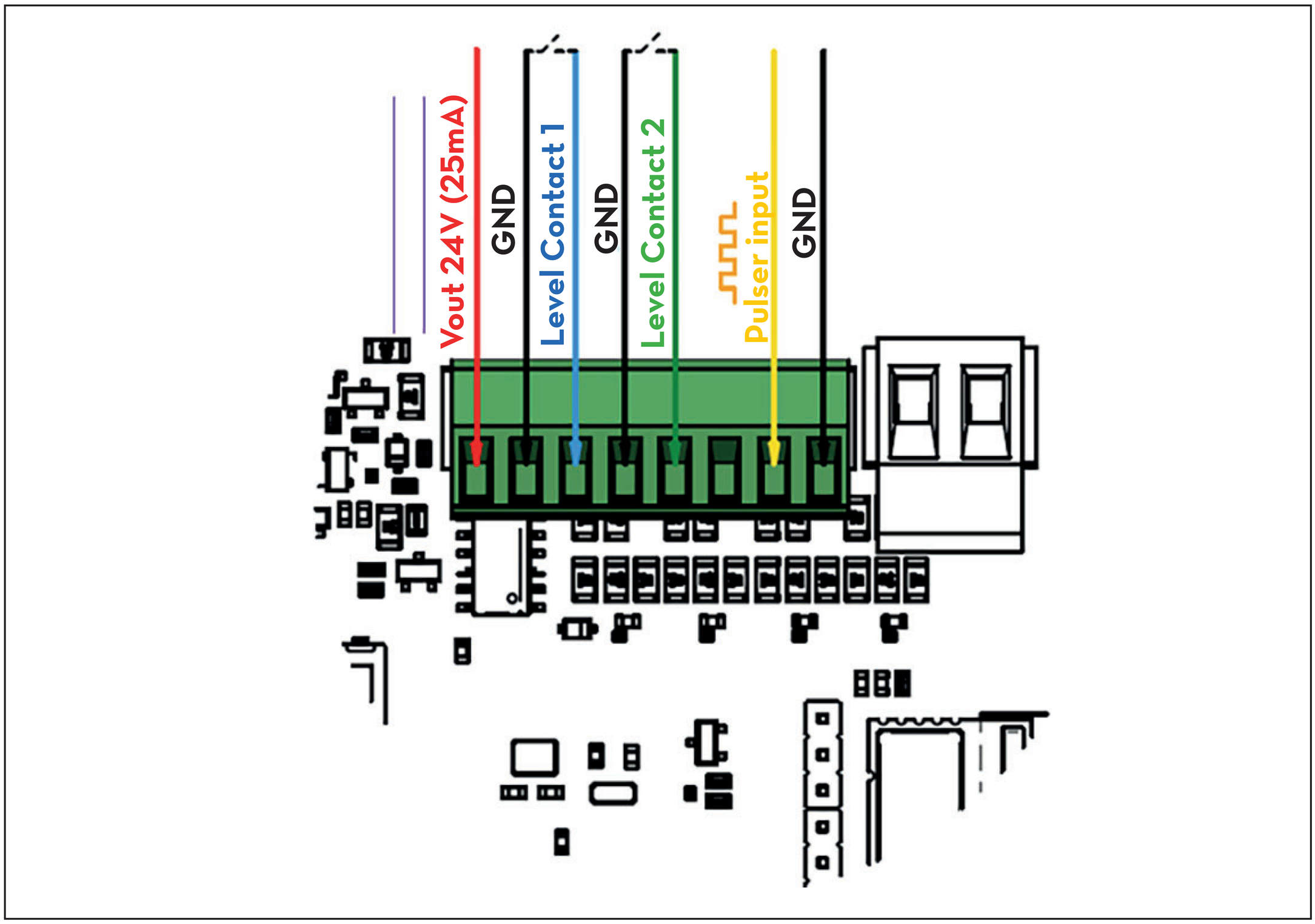
3. The battery voltage supplied by the ignition circuit can be used with an appropriate switch. We recommend using a 200mA T fuse.



11.5 SIGNALS CONNECTOR

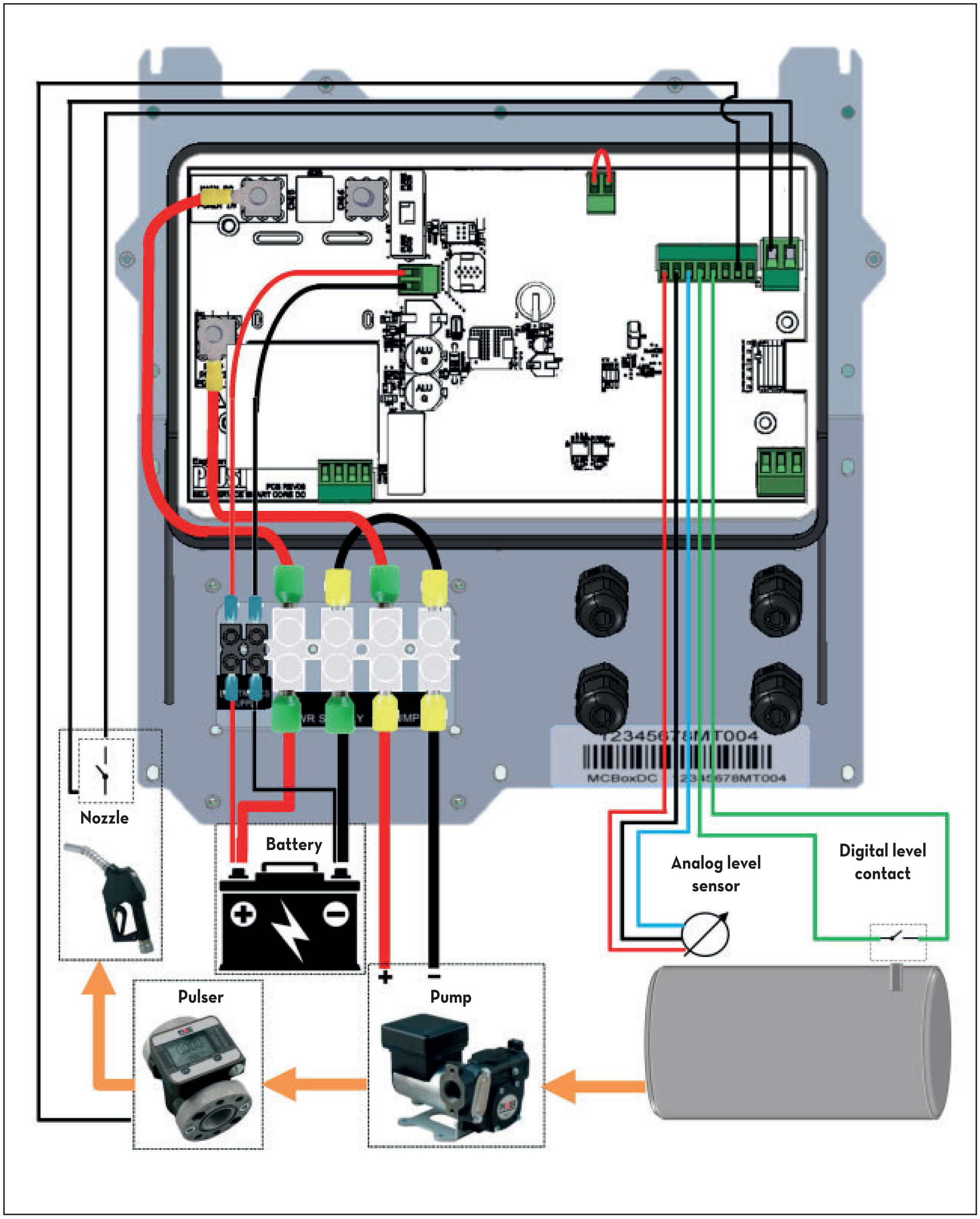
The 8 position signal connector provides:

- 24 Vdc output.
- Level 1 contact (analog / digital).
- Level 2 contact (digital).
- Pulser input.



EXAMPLE OF USING THE 8 SIGNAL CONNECTOR

The signal connector has a large number of Input or Output functions.
The following image shows how to use two different level contacts to manage a tank.



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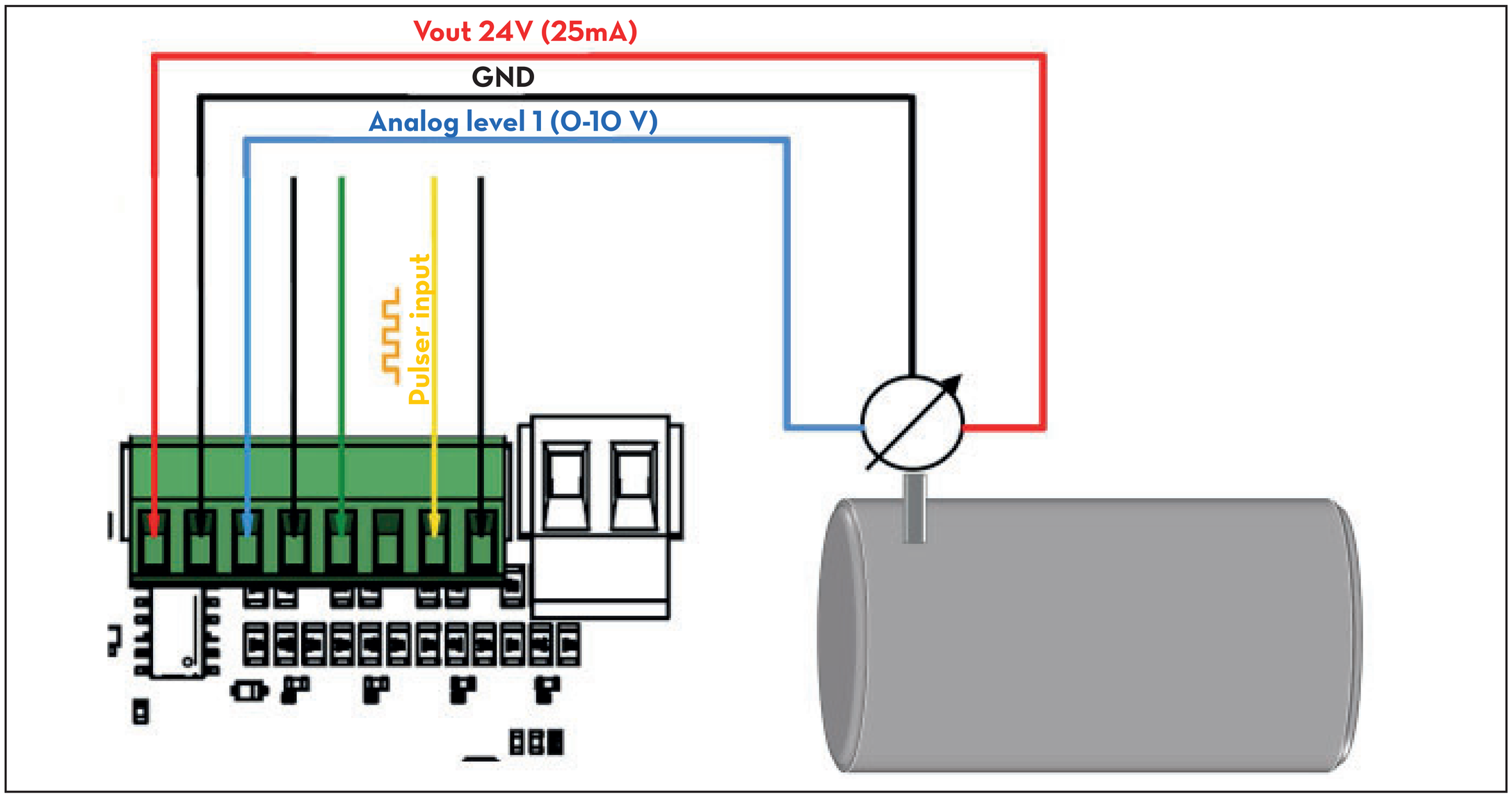
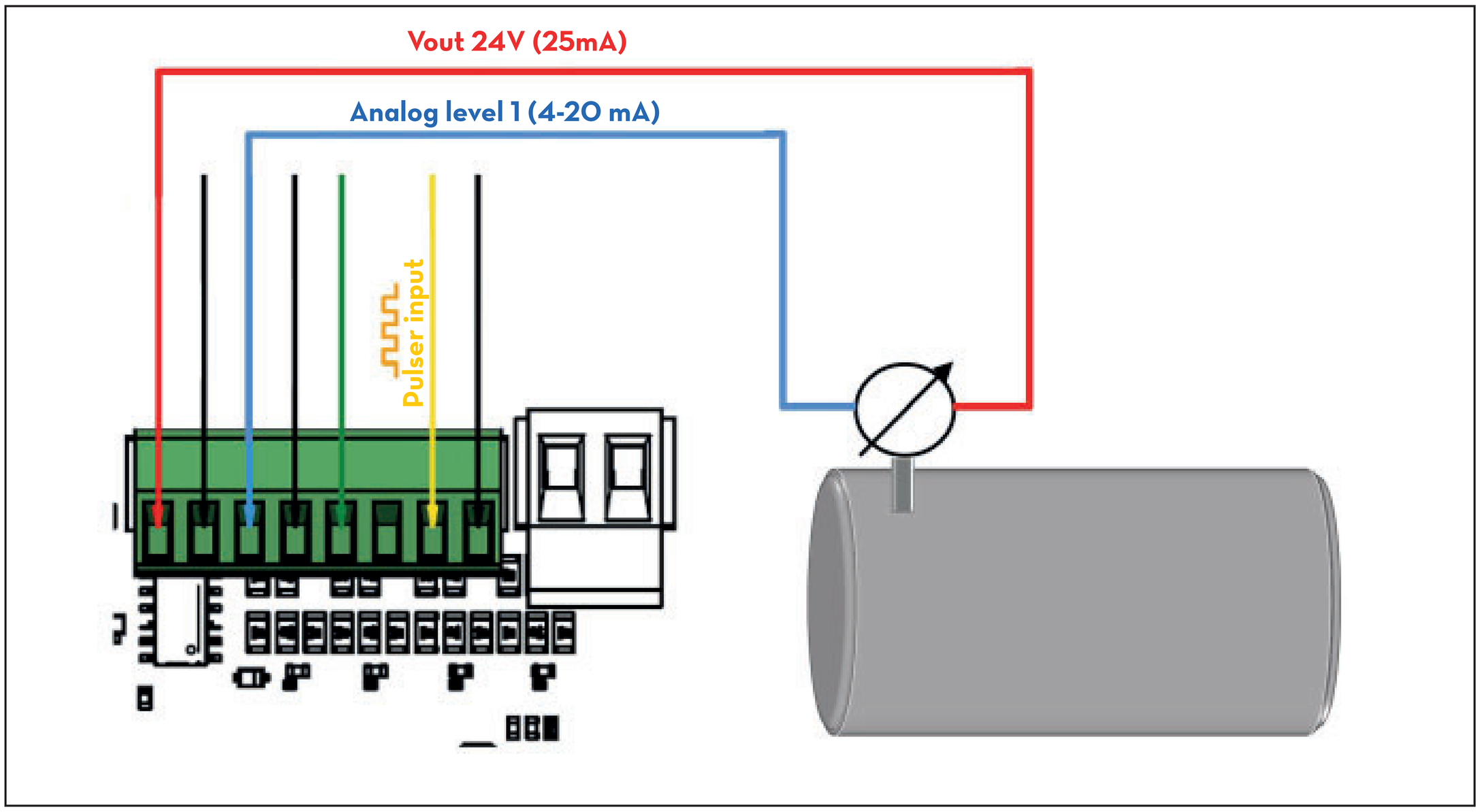
DETAIL:
With reference to the Level 1 and 2 inputs, note that they are different from one another
Level input 1 can be used as an analog input (0-10V or 4-20 mA level sensor) or as a voltage free contact (e.g. float switch) while level input 2 is a pure voltage free contact (digital input).

A) CONNECTION OF ANALOG LEVEL SENSORS

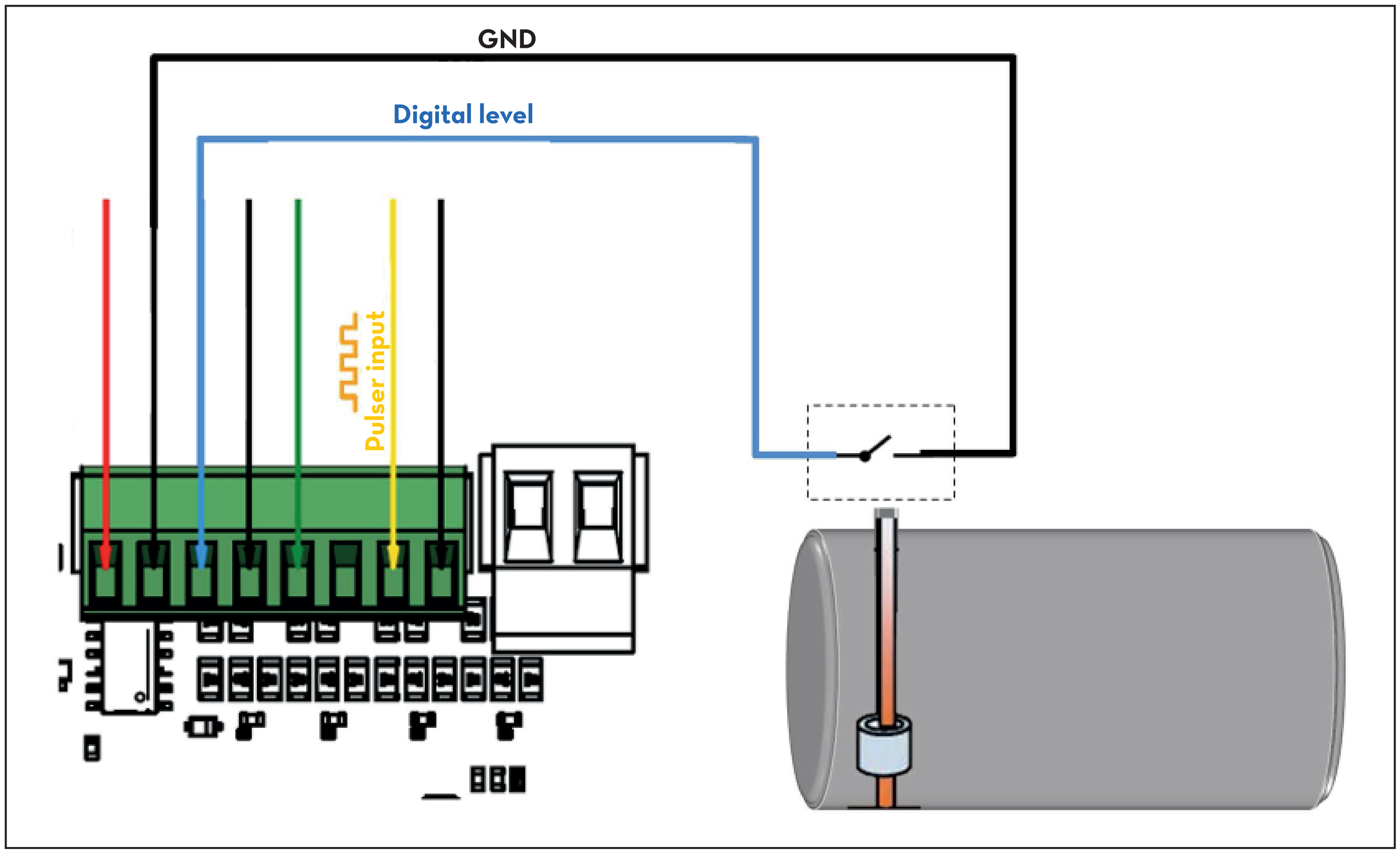
0-10 V Analog Sensor.



4-20 mA Analog Sensor.



B) CONNECTION OF LEVEL CONTACTS (E.G. FLOAT SWITCH)



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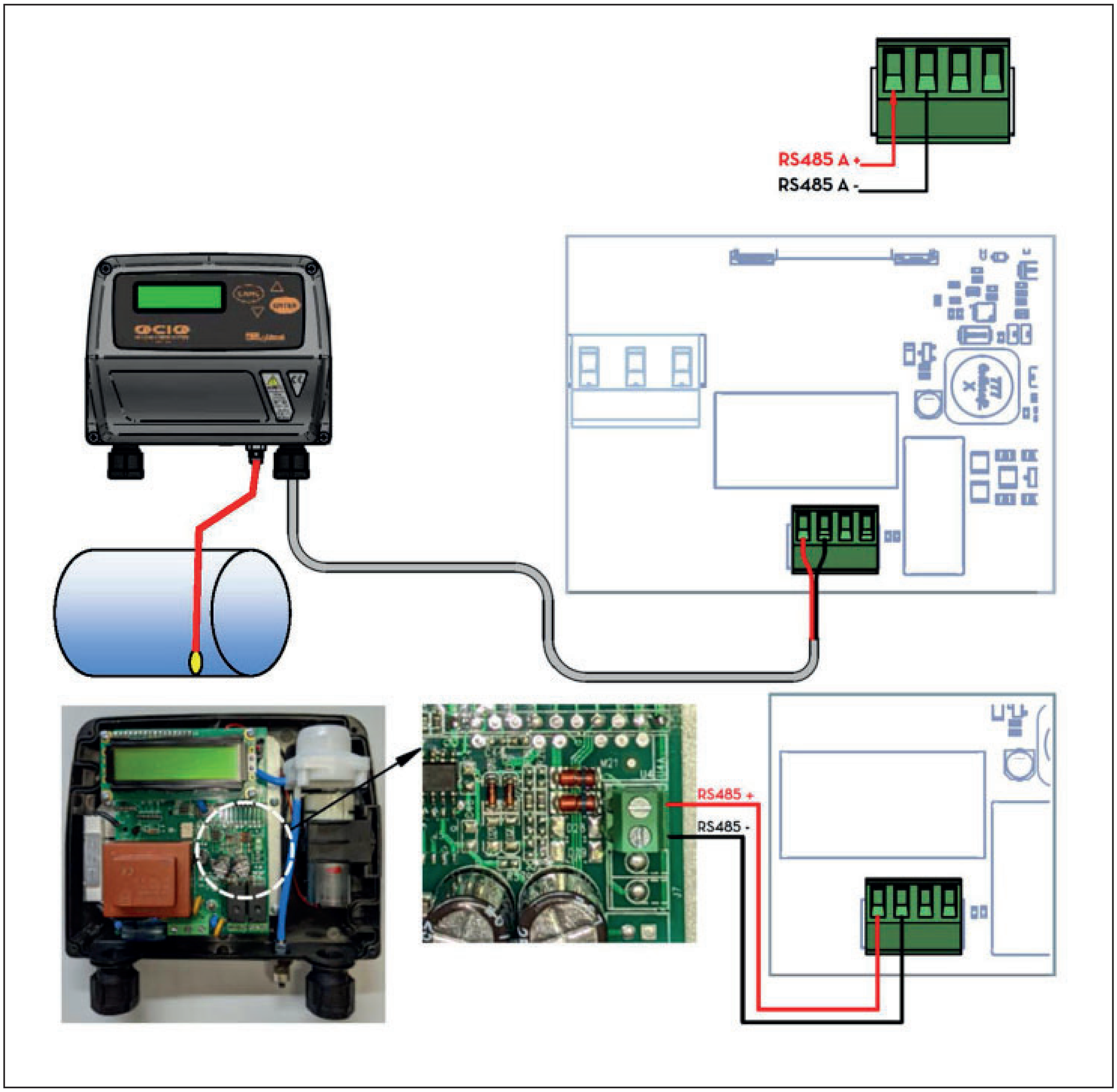
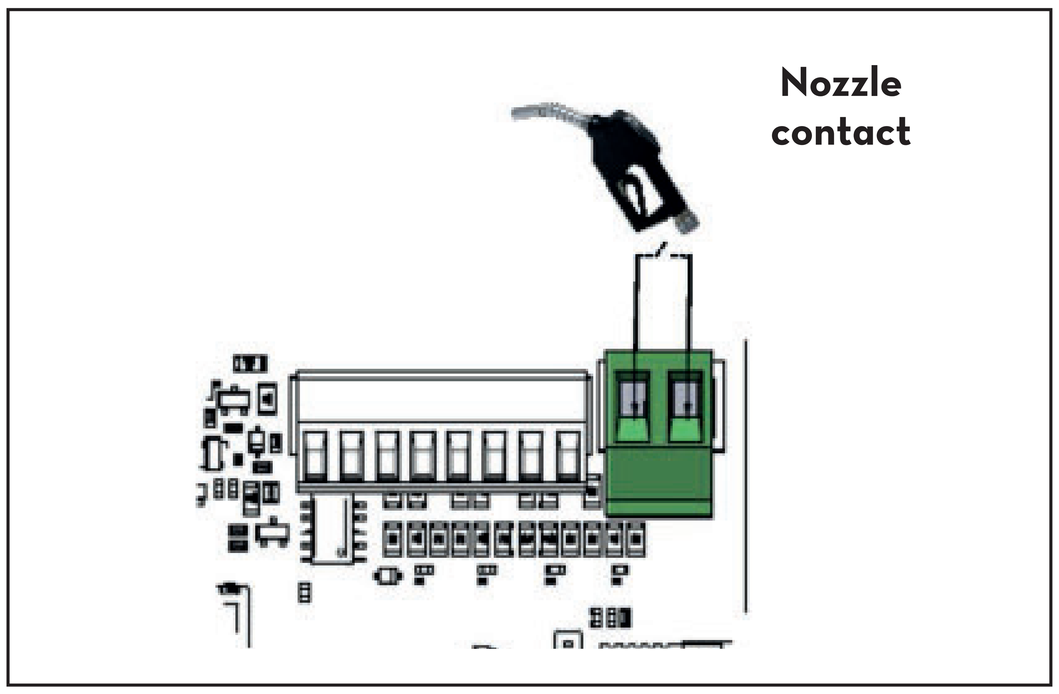
11.6 TANK LEVEL MANAGEMENT WITH OCIO 2.0 VIA RS485 SERIAL PORT

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 2.0 detection system to the B.SMART board.



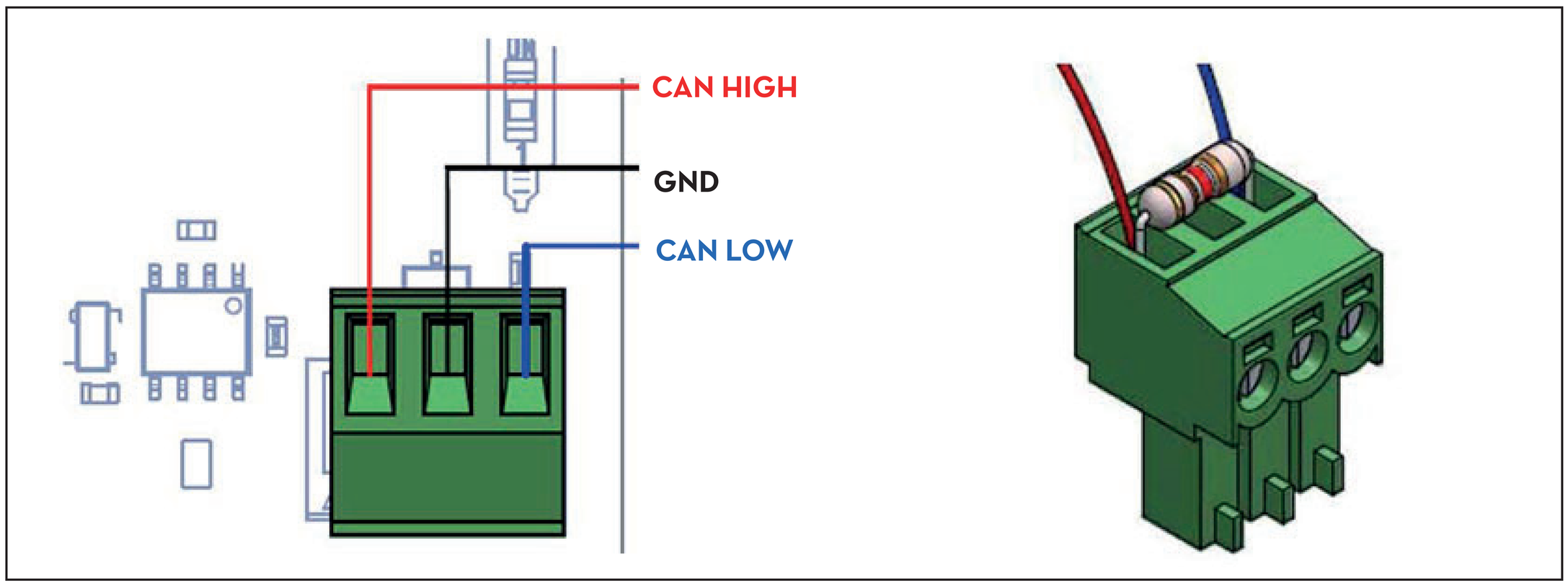
WARNING: if tank level management is provided by Ocio 2.0 the level contacts on the B.SMART controller will not be managed (so even if electrically connected they would not be considered by the controller logic).

11.7 NOZZLE CONTACT

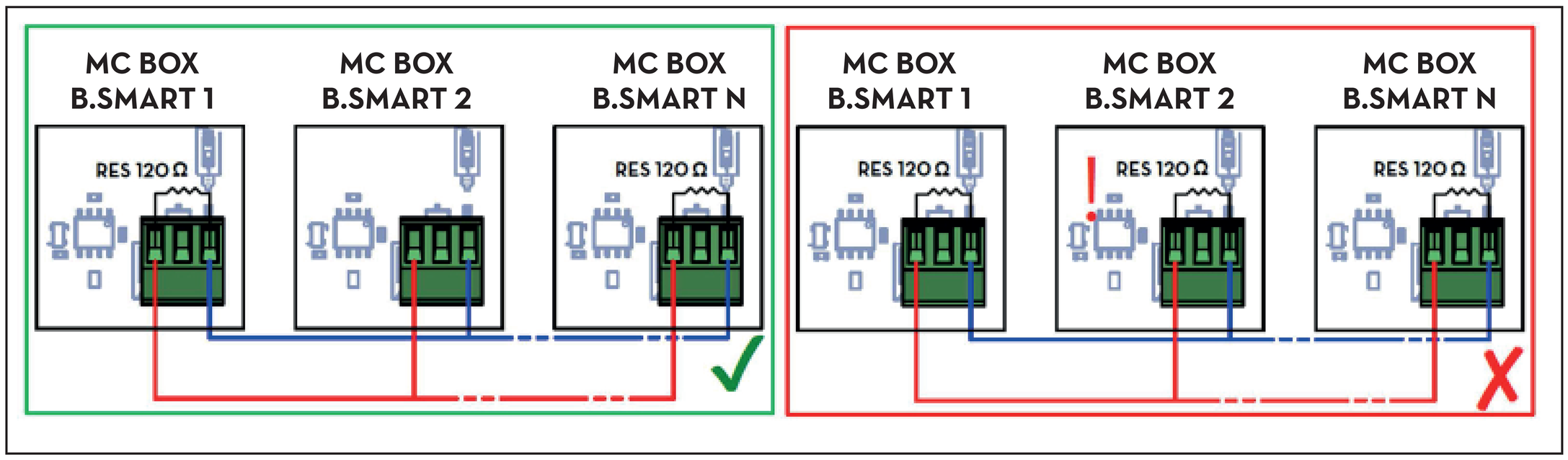


11.8 CANBUS CONNECTION

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. 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.



Example connection of the CANbus line (correct hookup on the left, incorrect on the right):



CAUTION: the 120 ohm resistor must be inside the CANBUS line as shown in the connection diagram.

NOTE: for CANBUS connection it is advisable to:

- Use a cable with a characteristic impedance of 120 ohms.
- Do not exceed 100 m in length for the connection between the various MC BOX B.SMART stations.

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12 INITIAL CONFIGURATION

Before use, you must set up your system by connecting your MC BOX B.SMART to the smartphone app and the dedicated web app. This section explains all the steps required for a correct configuration.
To configure the system you need to:

- Switch on the controller.
- Configure the controller via the app.
- Configure the controller via the WEBAPP.

12.1 START-UP

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.OO)**
4		**The last part of the firmware revision index (i = internal) is shown: i.OO**
5		**The display backlighting and LEDs turn off and O.OO appears on the display**

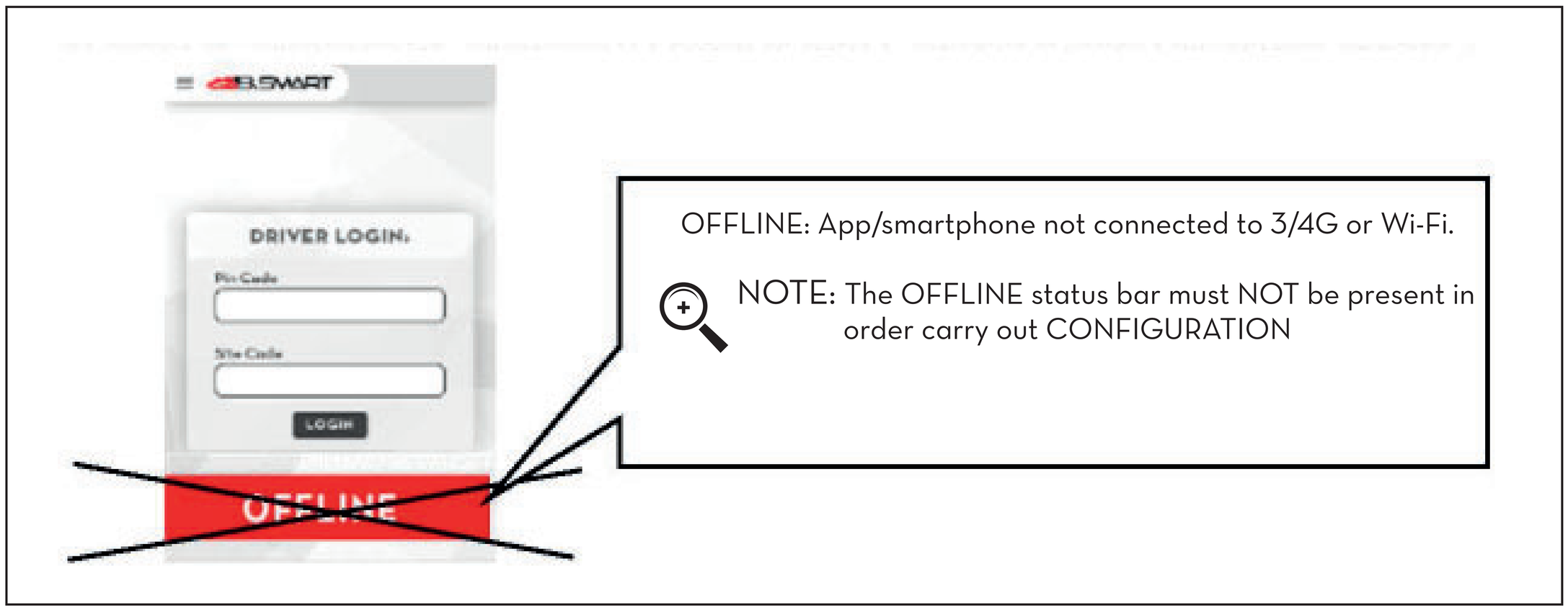
12.2 CONFIGURATION VIA APP

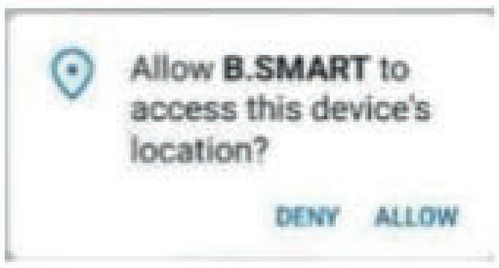
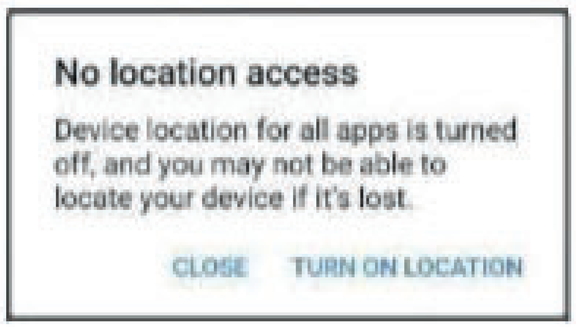
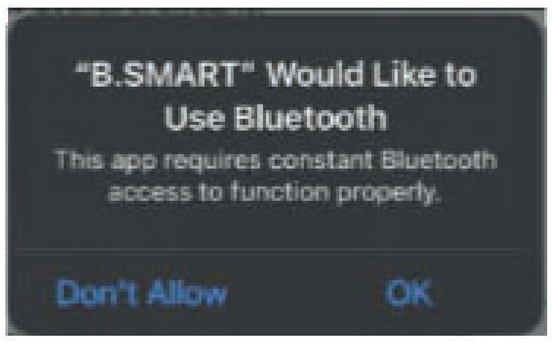
FOREWORD
Initially it is necessary to assign the purchased SYSTEM CODE to the controller.
From your smartphone, go to the Play Store or APP Store and search for PIUSI APP.

The icon is:
Download and install the application

For CONFIGURATION purposes the smartphone must be ONLINE or connected to the 3/4/5 G or Wi-Fi network,

To check connection status refer to the icon at the bottom left on the app screen.



Activate Bluetooth on the smartphone	
(Android Only) Allow access to the position	
(Android Only) Activate geolocation service	
(IOS Only) Allow the application to use the phone Bluetooth functions	

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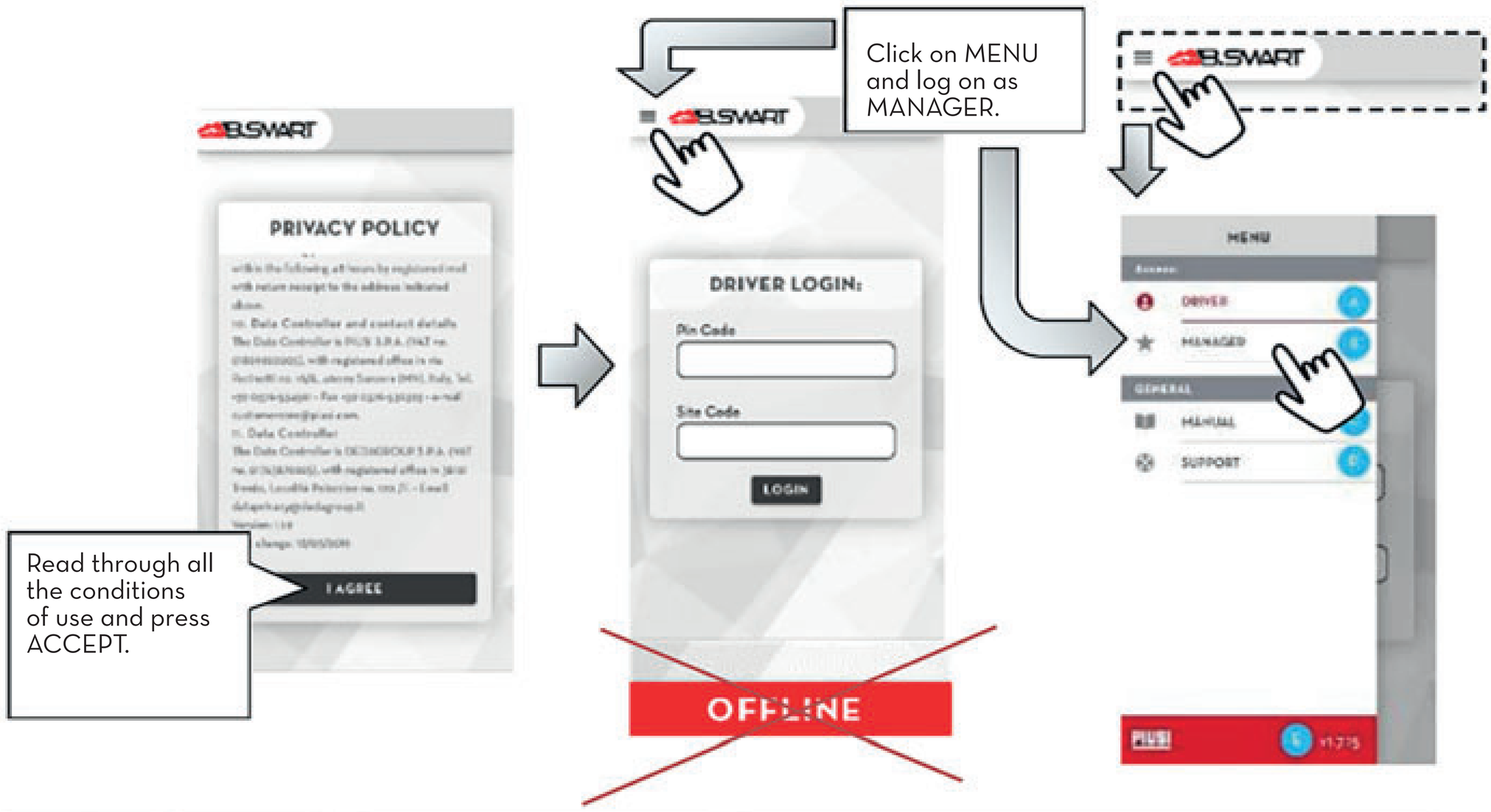
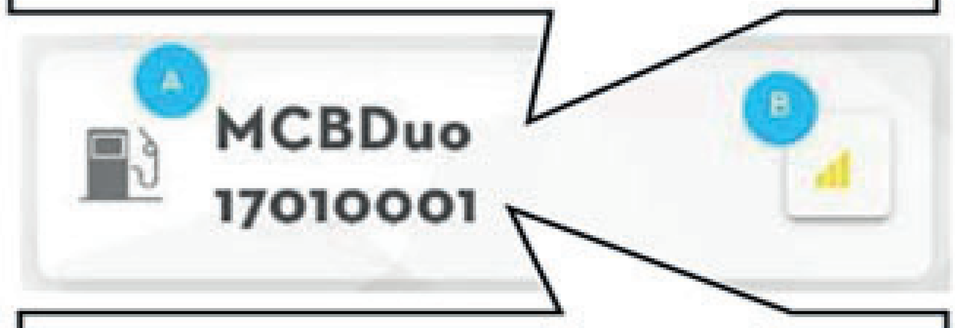
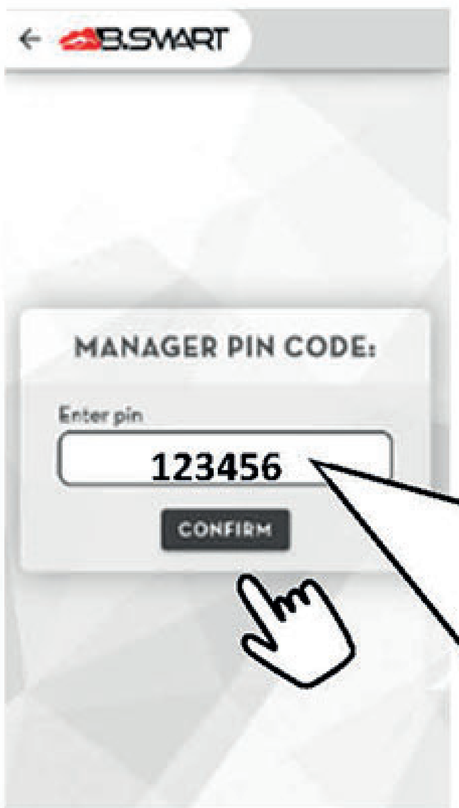


...scanning.
If scanning continues for several minutes, this means there is no controller in the vicinity.

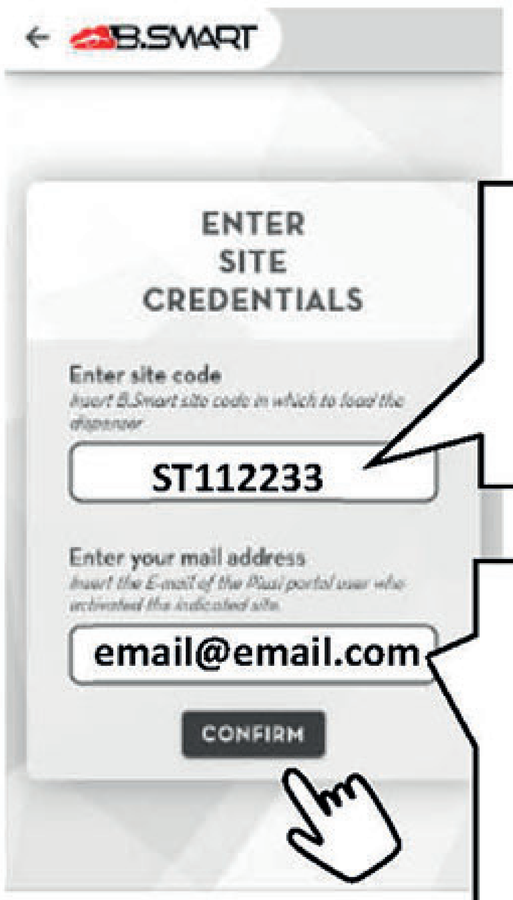
The controllers detected during scanning are added to the list and appear as shown below:
A. Controller name.
B. Signal quality.



NOTE
• a dispenser cannot be detected if it is already connected to a smartphone at the time.



The site manager connects to the controllers using a special pin code for authentication (can be different for each controller and is configured from web app; default code is 123456) and by means of advanced privileges he/she can carry out site management operations.



Enter the code of the destination site in which the controller will be used.

Enter the e-mail address of the portal user who recorded the code produced by the controller on the PIUSI portal.

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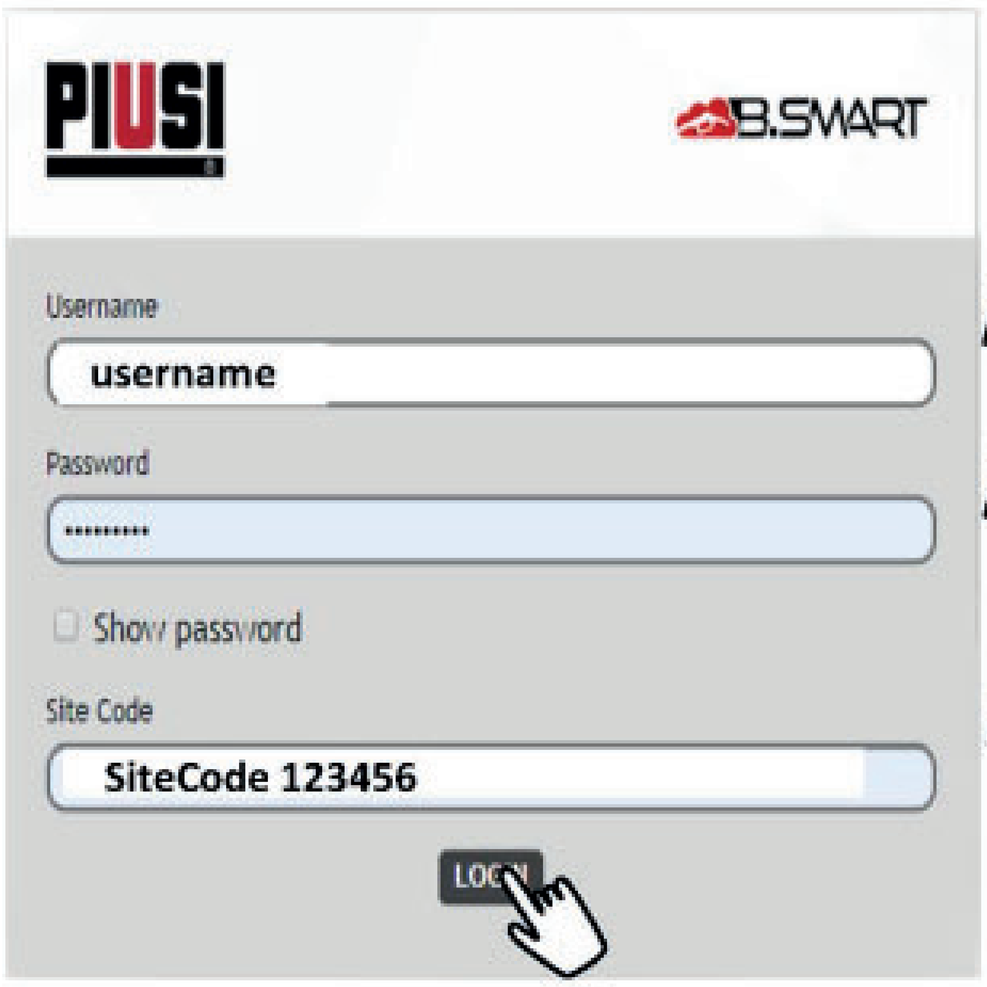
12.3 CONFIGURATION VIA WEB-APP

FOREWORD

For detailed account registration instructions, see the Registration Guide (MO548)
After assigning the SITE CODE to the controller, you must check if the controller is present in the CLOUD.
Then connect by pointing your browser: Google Chrome, Microsoft Edge or Mozilla Firefox to the following link: https://B.SMART.piusi.com/
The WEBAPP login screen opens:
Full details of the WEBAPP functions (such as managing drivers, registration numbers, dispensing reports and configurations) can be found in the dedicated manual available on the WEBAPP.



Check for the presence of the dispenser just installed on the cloud via the app.

If this is the case, the controller has been correctly assigned to the site.

In the field below the controller the assigned default name and serial number are displayed, e.g.:
MCBOX_ AC2P_0004 and 18120004

13 DRIVER ACCESS

13.1 FIRST DRIVER ACCESS FROM APP AND FIRST FILLING

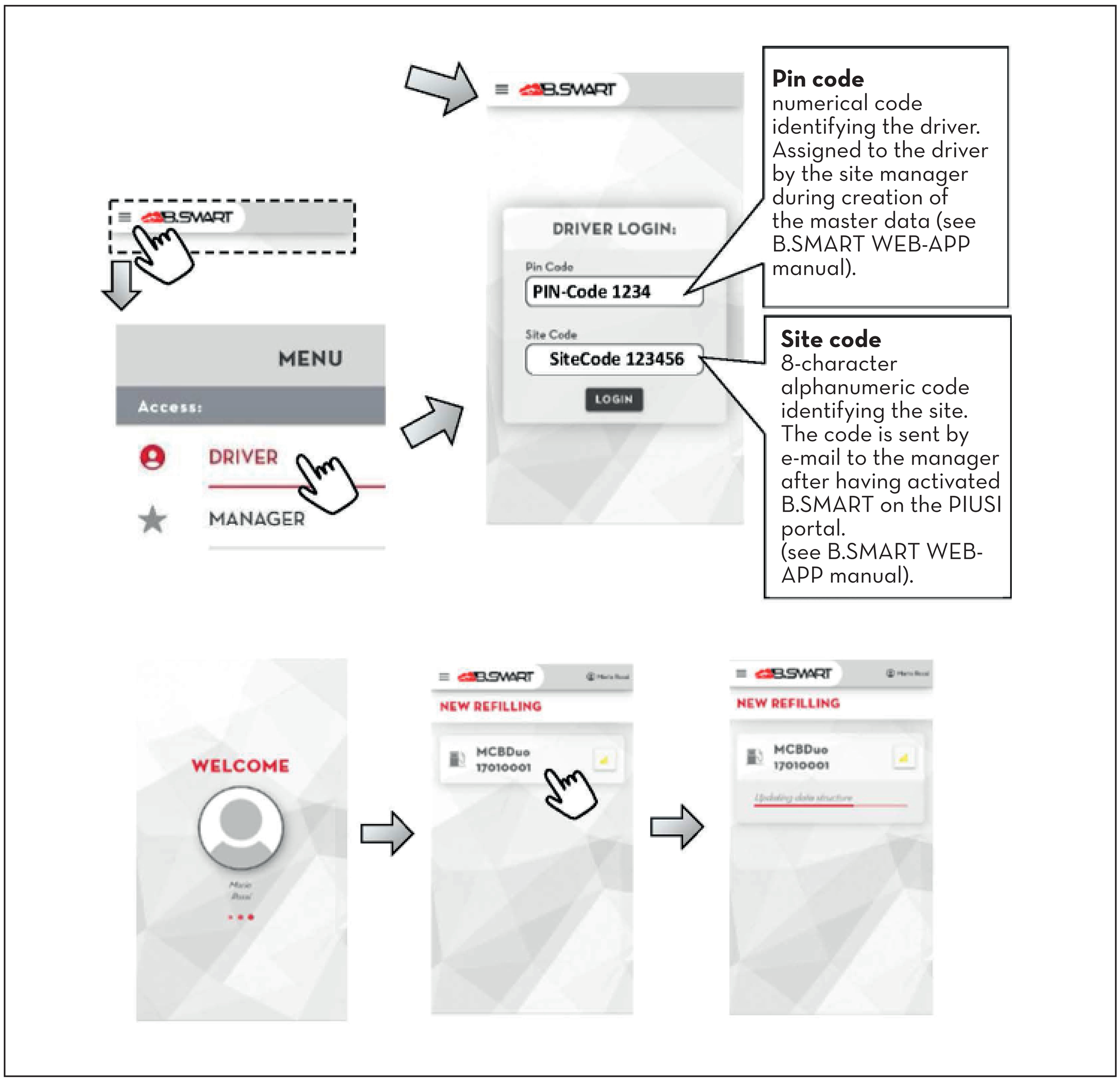
FOREWORD

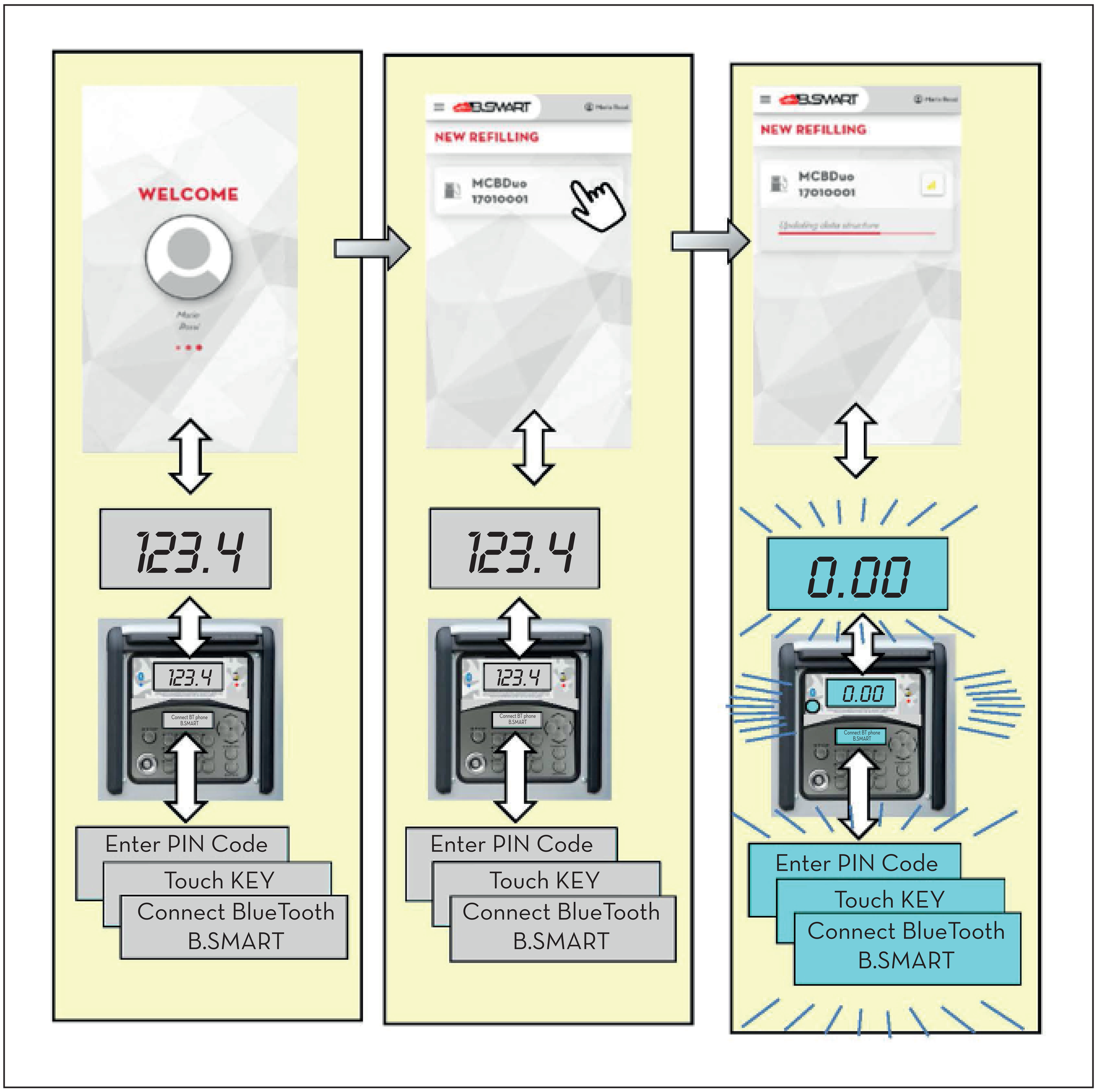
To use the APP as a driver, the manager must have created the driver profile via WEBAPP (see WEBAPP manual, section – ADD NEW DRIVER).
The DRIVER section of the app is accessed:

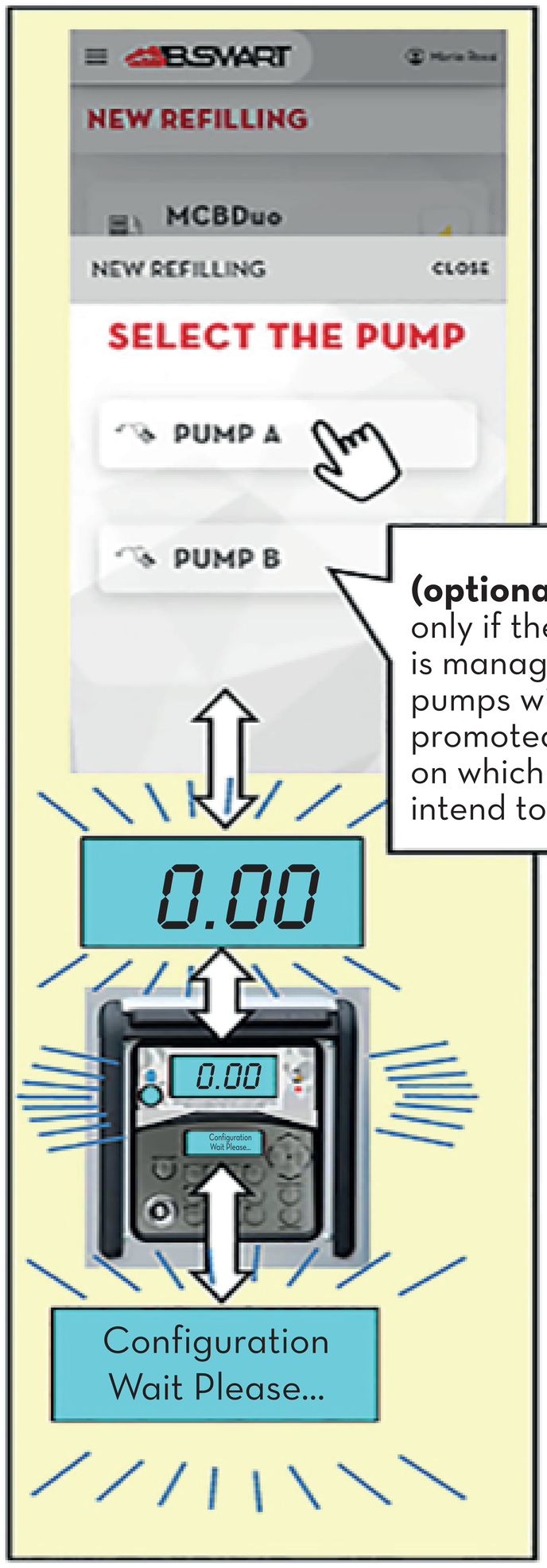
- automatically when the app is opened,

or

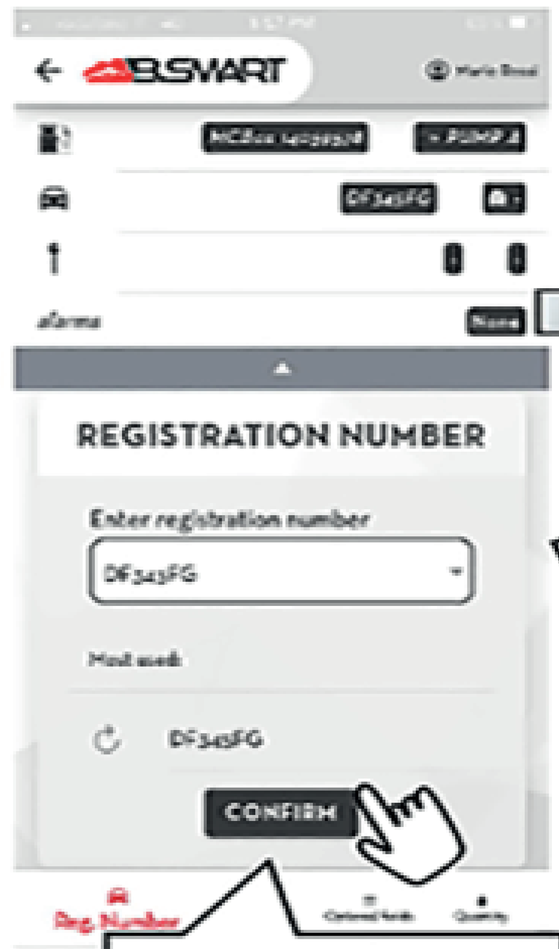
- from the main MENU.




WELCOME
123.4
Connect BT phone B.SMART
Enter PIN Code
Touch KEY
Connect BlueTooth B.SMART
B.SMART
NEW REFILLING
MCBDuo 17010001
123.4
Connect BT phone B.SMART
Enter PIN Code
Touch KEY
Connect BlueTooth B.SMART
B.SMART
NEW REFILLING
MCBDuo 17010001
0.00
Connect BT phone B.SMART
Enter PIN Code
Touch KEY
Connect BlueTooth B.SMART



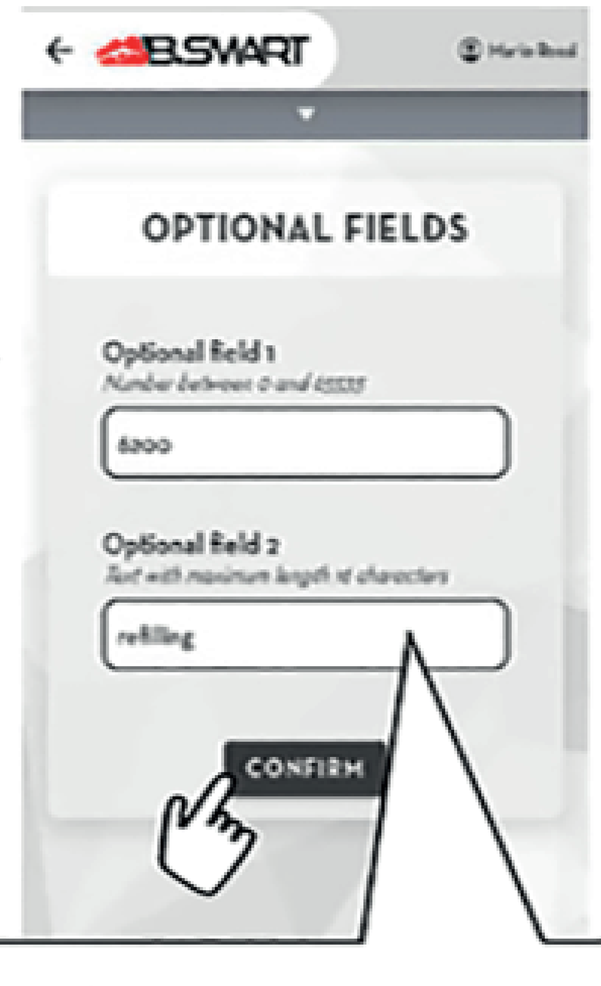
(optional)
only if the controller is managing 2 pumps will you be promoted to specify on which pump you intend to dispense.



OPTIONAL request
This page is displayed if the manager has enabled the 'Use registration number' option on the controller. You must select a reg. number from the list to continue.

The new filling cycle creation page opens.

OPTIONAL request
Odometer input, this page appears only if the manager has enabled use of the odometer in the WEBAPP.



OPTIONAL request
This page is shown if the site manager has enabled the "Optional fields" option from the web app. Two additional optional fields are activated in which to enter further information concerning the dispensing operation.

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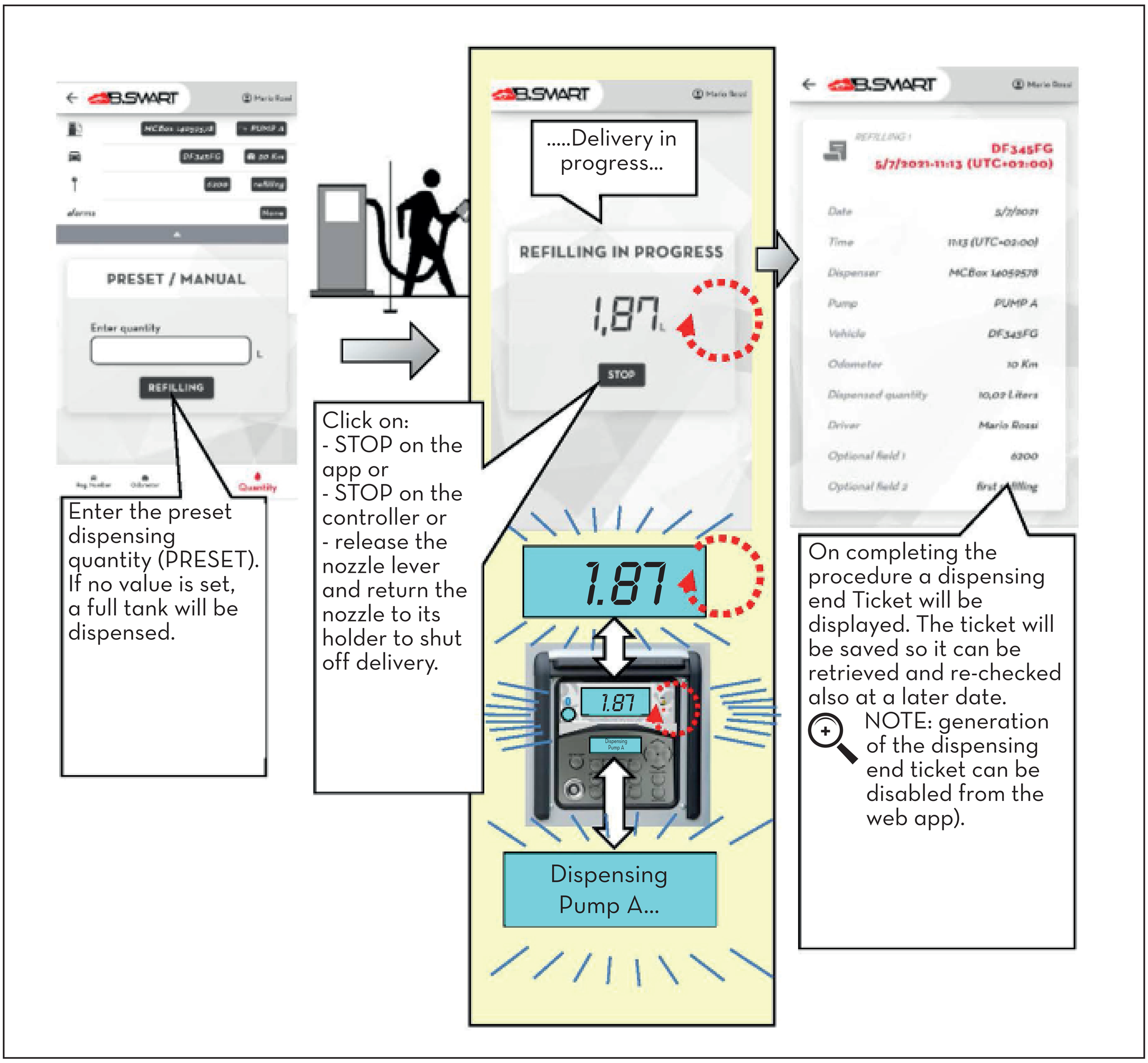


CAUTION

- Do not move away from the controller during the new filling creation procedure to avoid losing the Bluetooth connection
- If the smartphone loses Bluetooth connectivity and disconnects from the controller before the end of the delivery the ticket will not be generated, but the value is normally recorded and will be sent to the cloud at the time of the next connection
- To unload and use the 'registration numbers' uploaded to the system, the telephone must be connected to the Internet while it is connected to the controller.

13.2 DISPENSING VIA USER KEY (I-BUTTON)

When the manager creates the driver he/she can add an electronic key (i-Button) 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 driver file in the WEBAPP
(see WEBAPP manual, “ADD NEW DRIVER” section).

The I-Button is used as a means of authentication in place of a smartphone or PIN CODE entered via the keypad. To proceed with dispensing:
- place the i-Button on the reader on the controller;
- authentication will take place;
- at this point, dispensing can begin.

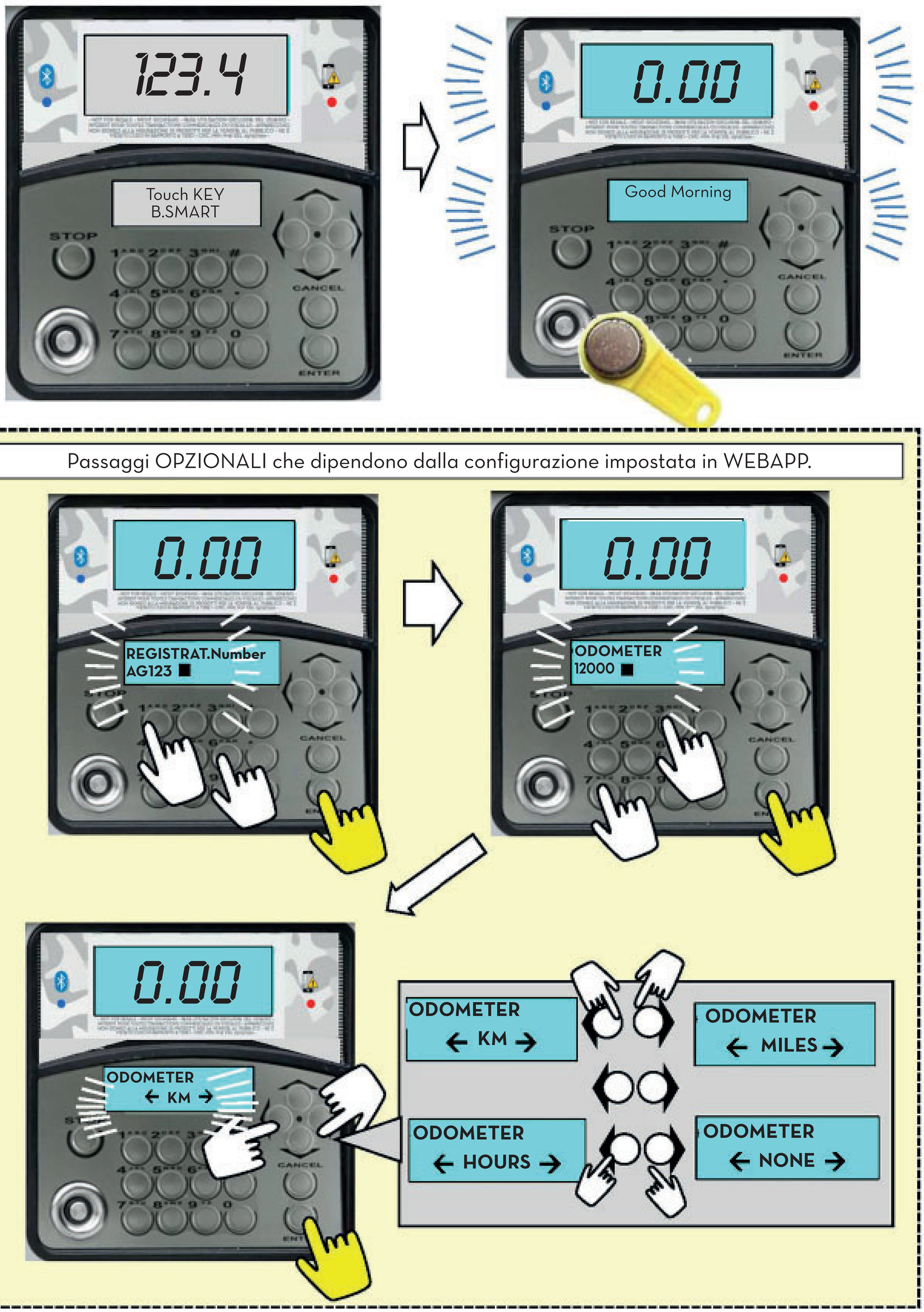
Dispensing operations are uploaded to the cloud as soon as a smartphone with an active data connection connects to the controller.

WARNING: dispensing via the i-Button is allowed only when the system configuration procedures have been completed successfully using a smartphone and the web app.

These procedures are fundamental, as they allow the Manager to configure the system and manage its controllers while at the same time ENABLING THE DRIVER TO DISPENSE VIA A SPECIFIC CONTROLLER.

NOTE: dispensing via i-Button is recommended only when strictly necessary in cases when it is impossible to dispense via a smartphone.

This is because dispensing with the i-Button does not allow for direct cloud updating, thus limiting the potential of the system.



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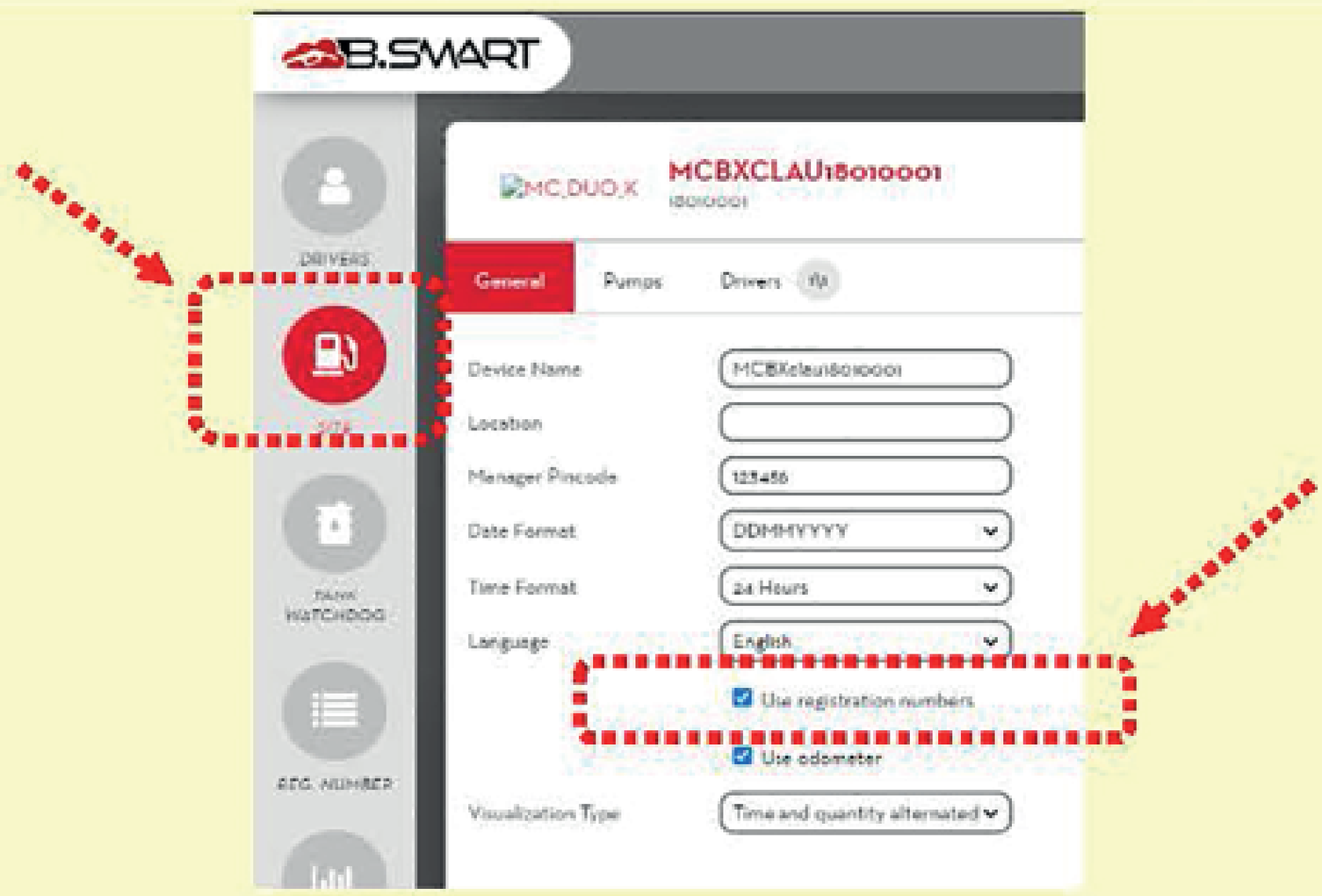
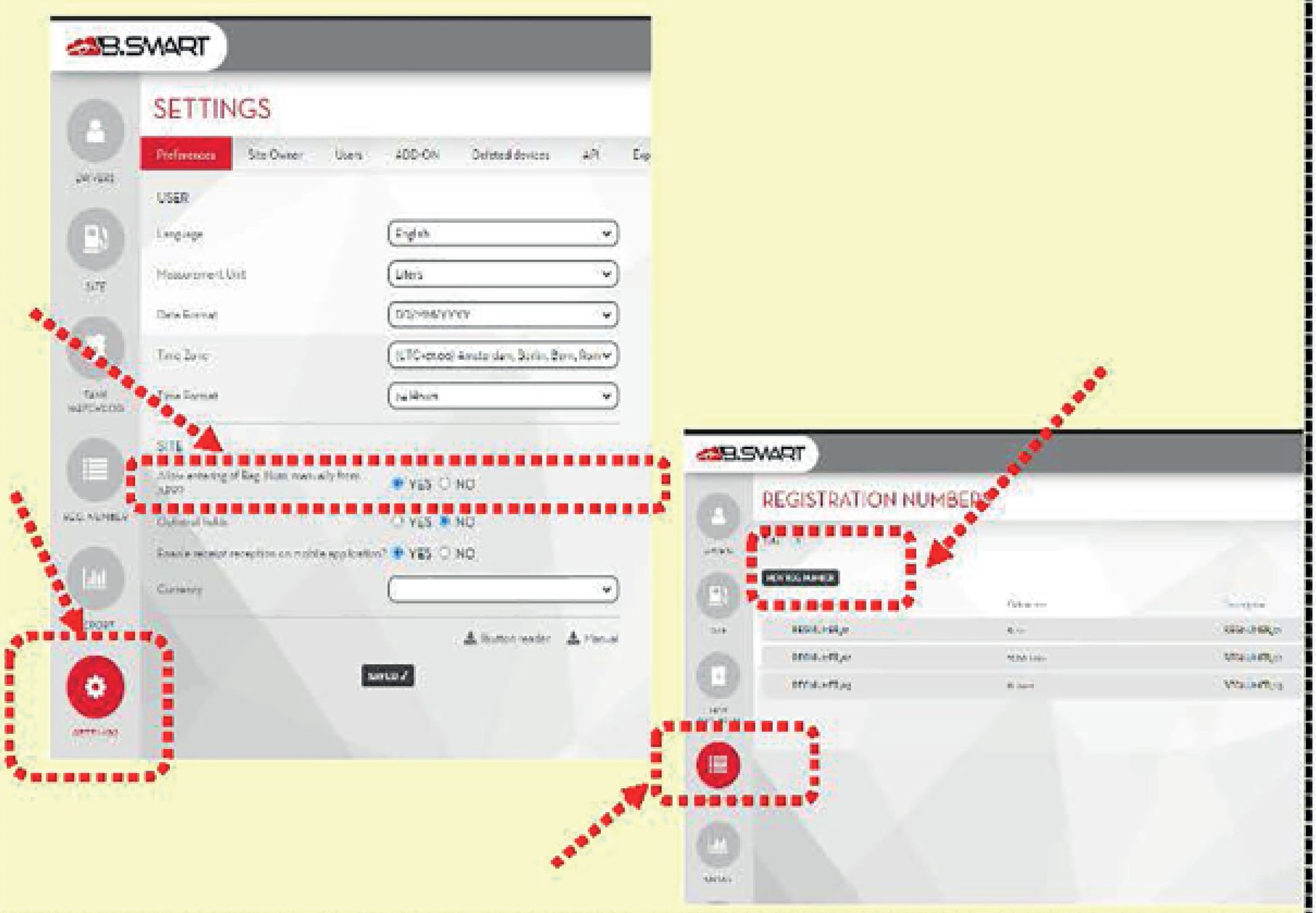
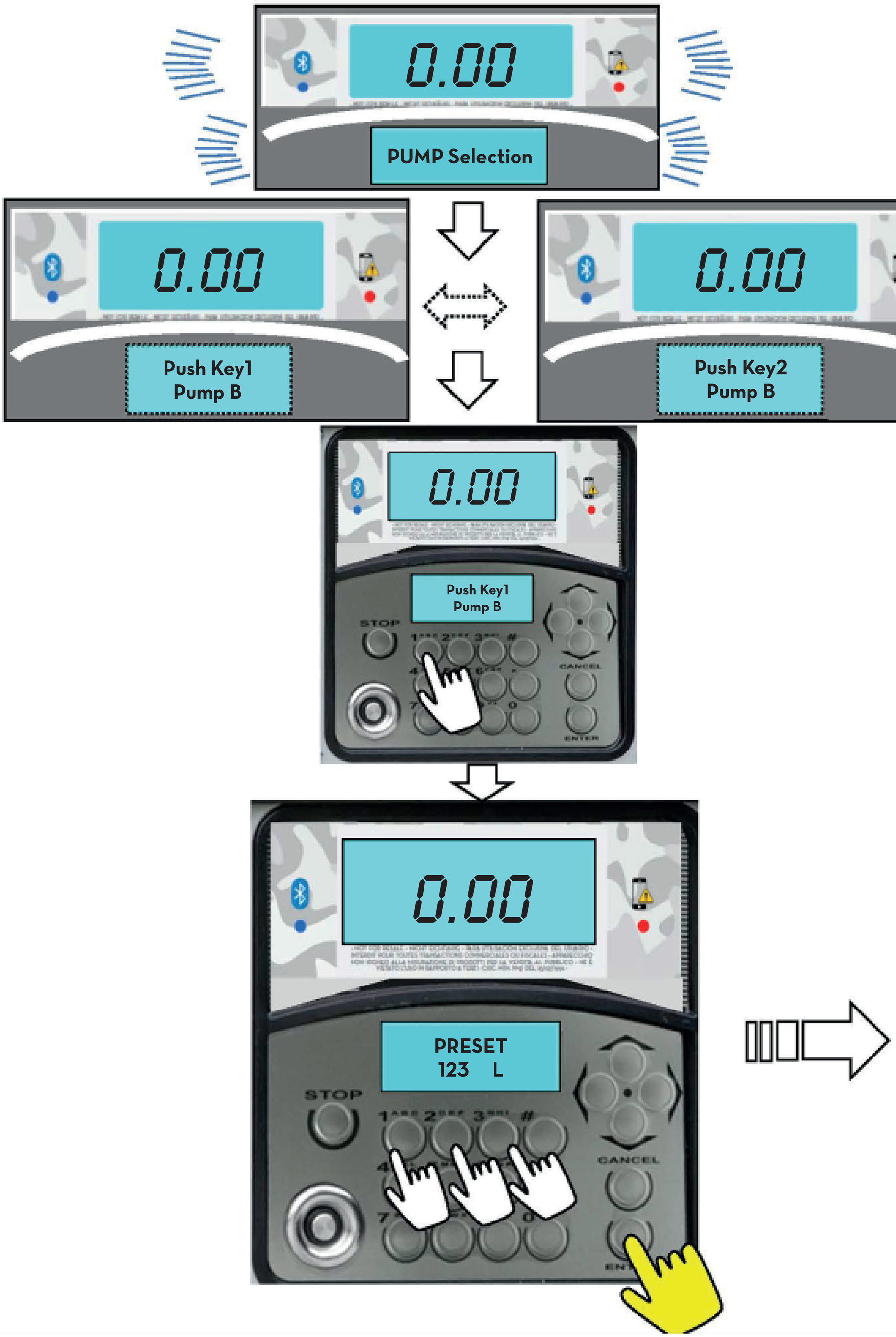
OPTIONAL steps depending on the web app configuration.







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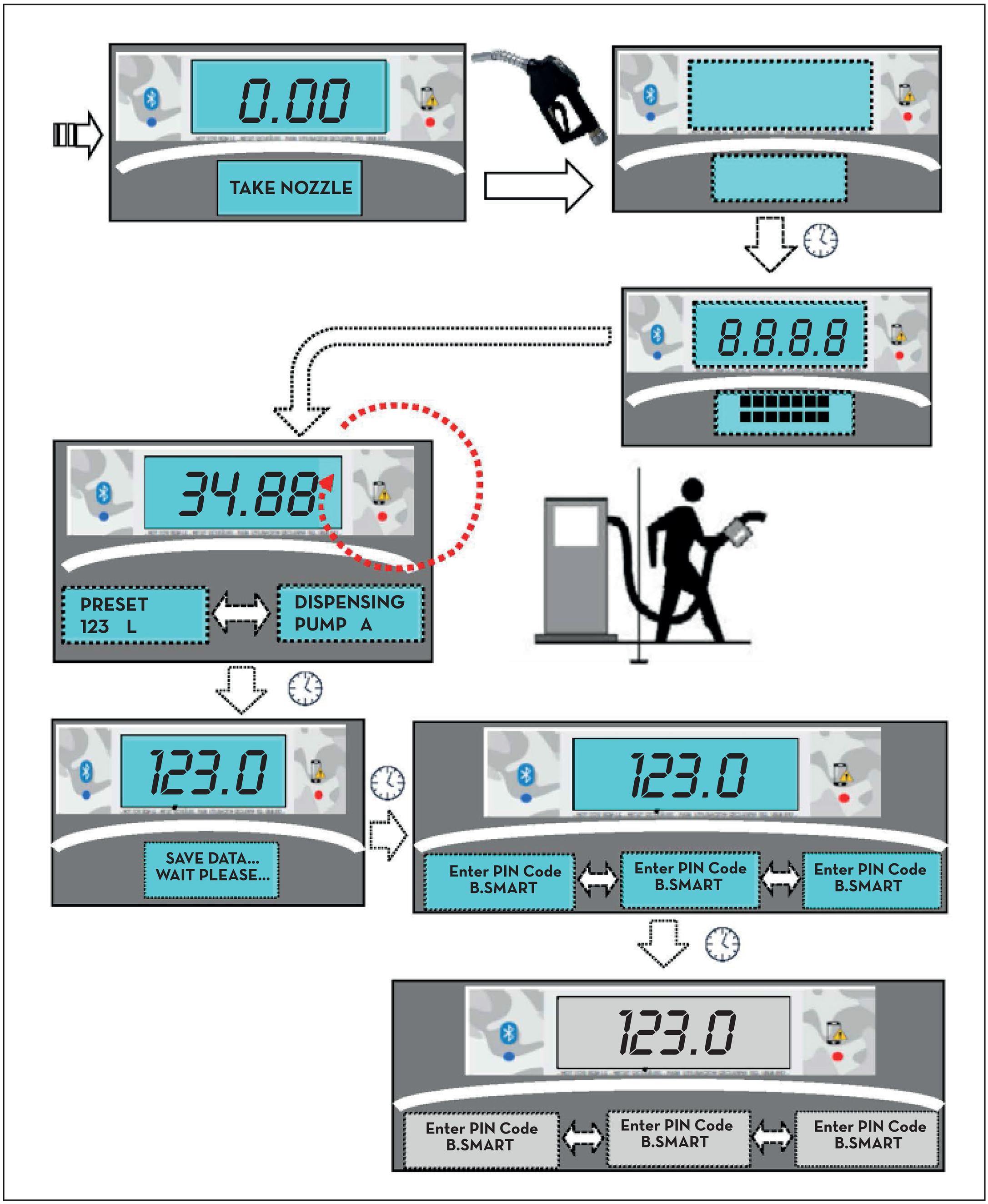

0.00
TAKE NOZZLE
8.8.8.8
34.88
PRESET
123 L
DISPENSING
PUMP A
123.0
SAVE DATA...
WAIT PLEASE...
123.0
Enter PIN Code
B.SMART
Enter PIN Code
B.SMART
Enter PIN Code
B.SMART
123.0
Enter PIN Code
B.SMART
Enter PIN Code
B.SMART
Enter PIN Code
B.SMART

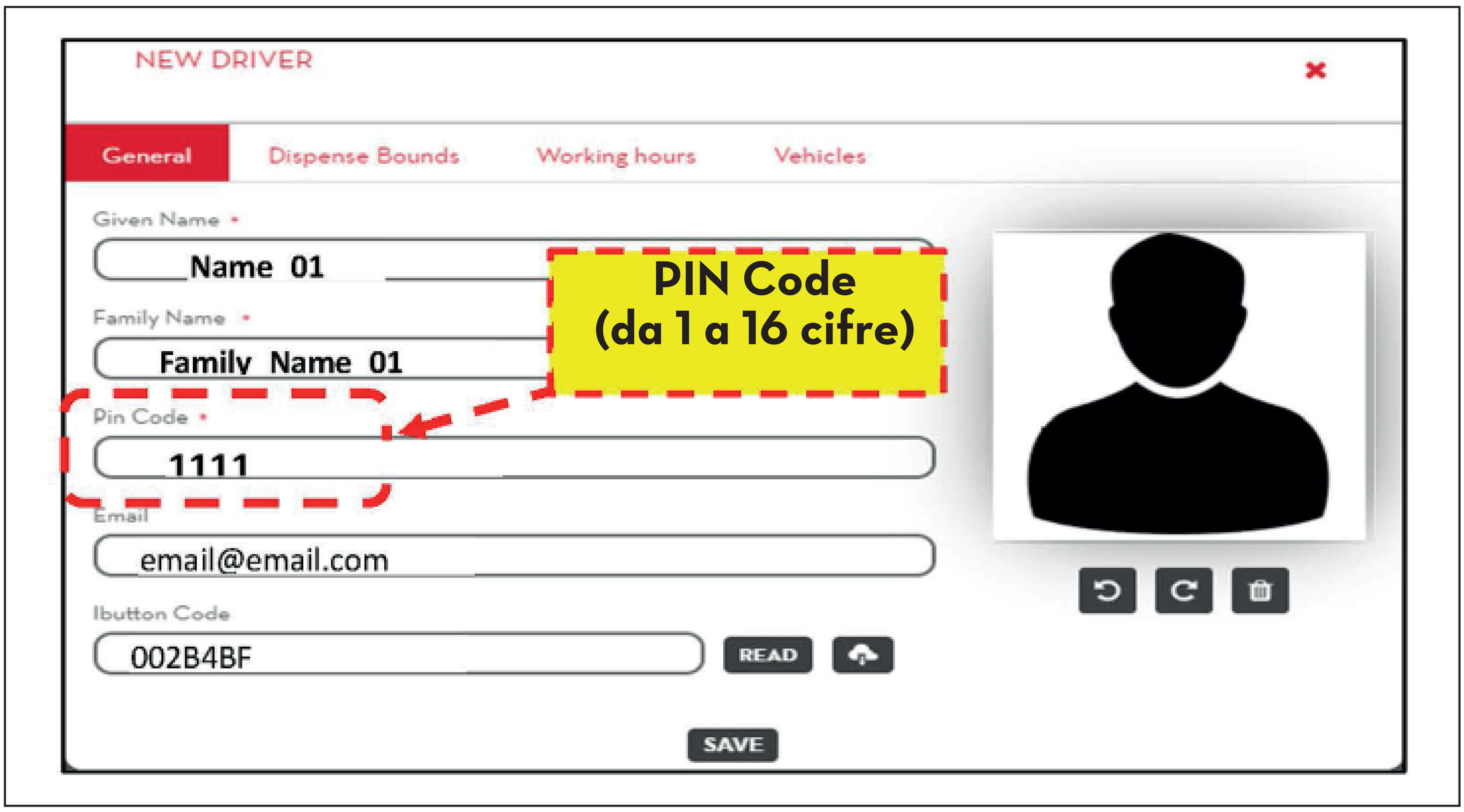
13.3 DISPENSING BY PIN CODE ENTERED ON THE KEYPAD

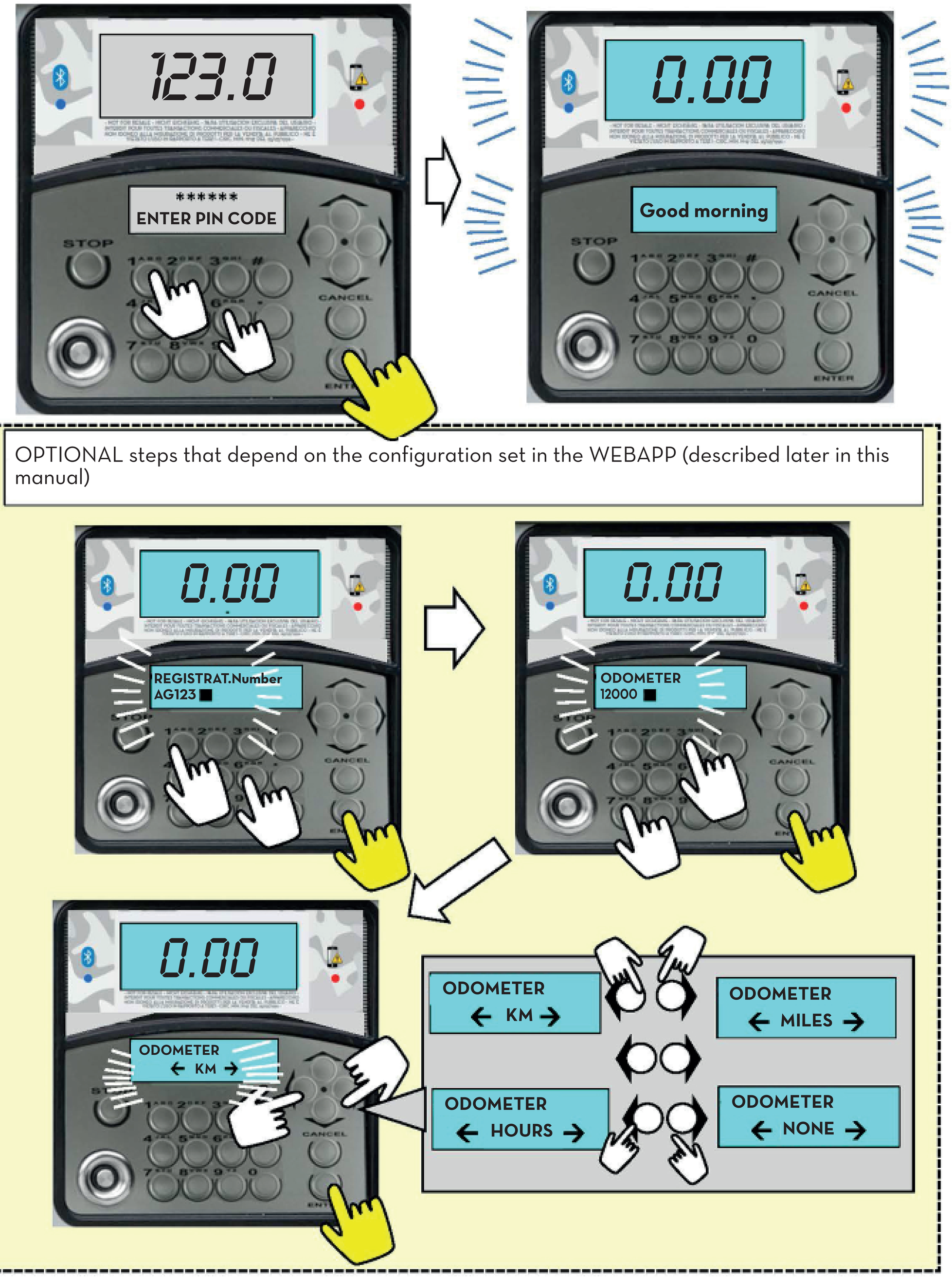
When the manager creates a driver he/she can add a personal PIN CODE as the third alternative to allow the driver to access the unit.
The personal PIN CODE can be a variable number with from 1 to 16 digits chosen by the Manager and, if required, of a different number of digits for each driver
When the Manager creates the driver master data on in the cloud on the web app, (see "ADD NEW DRIVER") he/she must assign a PIN code (which can be from 1 to 16 digits)
This Pin CODE, after appropriate synchronisations between the cloud and the electronic controller can be entered by the driver on the electronic controller, alternatively on the smartphone app or on the i-Button to access the dispenser and perform the dispensing cycle

WARNING: dispensing via PIN CODE is allowed only when the system configuration procedures have been completed successfully using a smartphone and the web app.

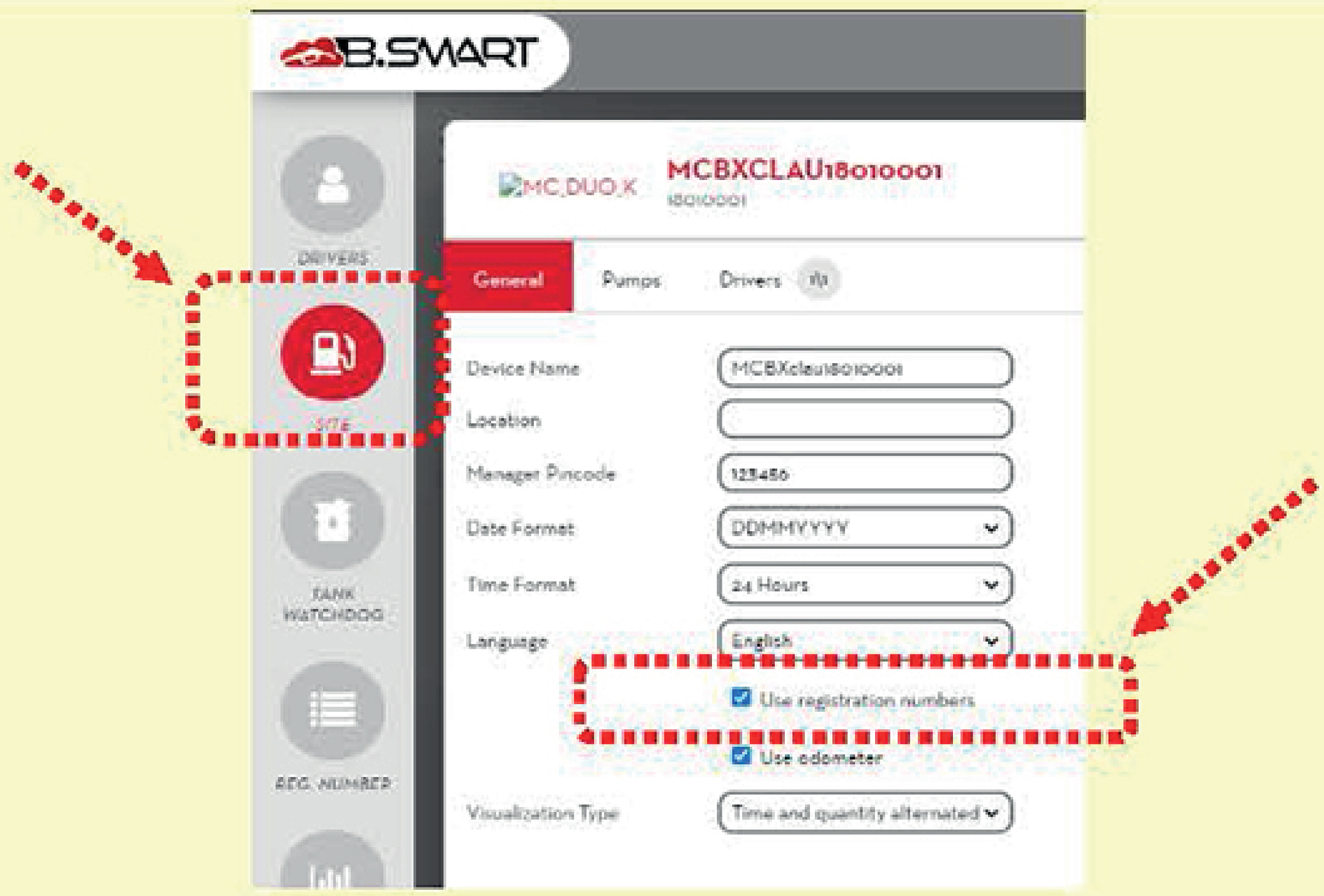
These procedures are fundamental, as they allow the Manager to configure the system and manage its controllers while at the same time ENABLING THE DRIVER TO DISPENSE VIA A SPECIFIC CONTROLLER.

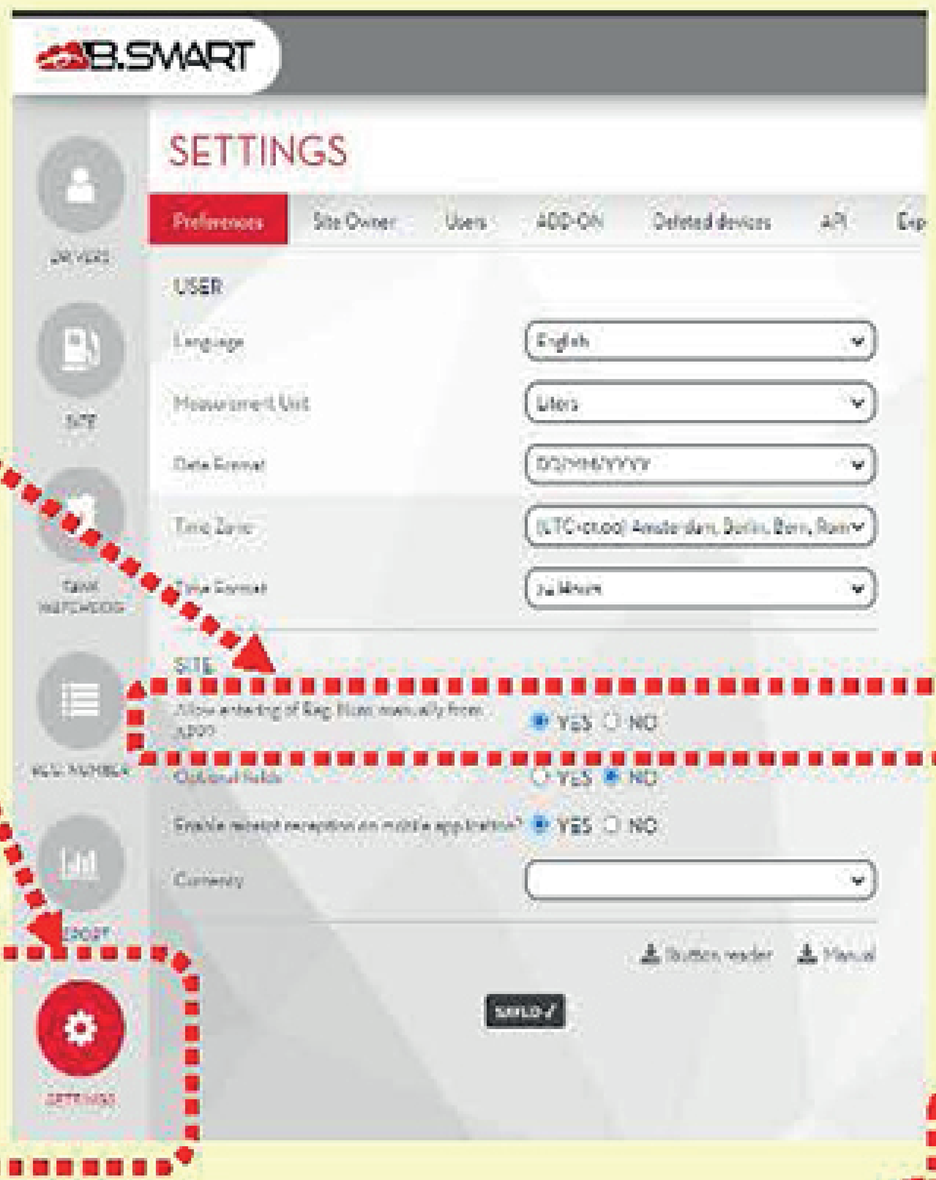
NOTE: dispensing via PIN CODE is recommended only when strictly necessary in those case where it is impossible to dispense via a smartphone.
This is because dispensing with the PIN CODE does not allow for direct updating on the cloud, thus limiting the potential of the system.

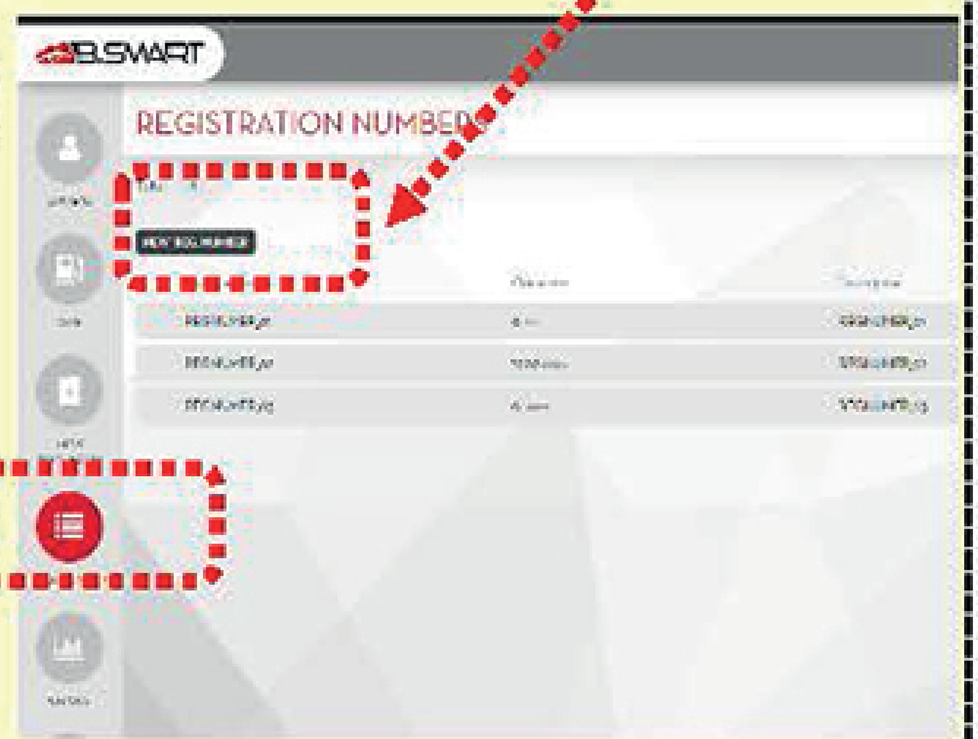


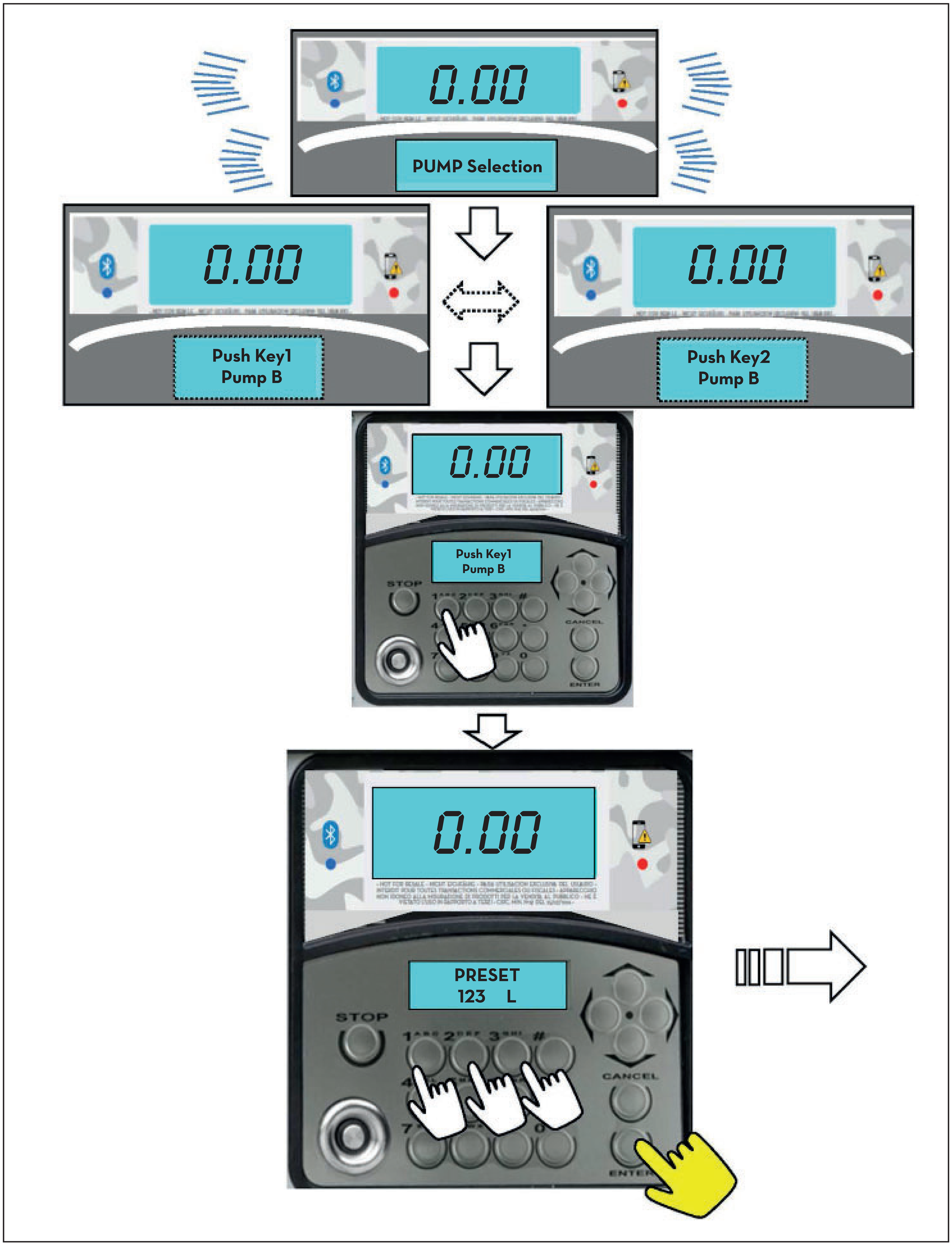

123.0
******
ENTER PIN CODE
STOP
CANCEL
0.00
Good morning
OPTIONAL steps that depend on the configuration set in the WEBAPP (described later in this manual)
0.00
REGISTRAT.Number
AG123
0.00
ODOMETER
12000
0.00
ODOMETER
← KM →
ODOMETER
← KM →
ODOMETER
← MILES →
ODOMETER
← HOURS →
ODOMETER
← NONE →

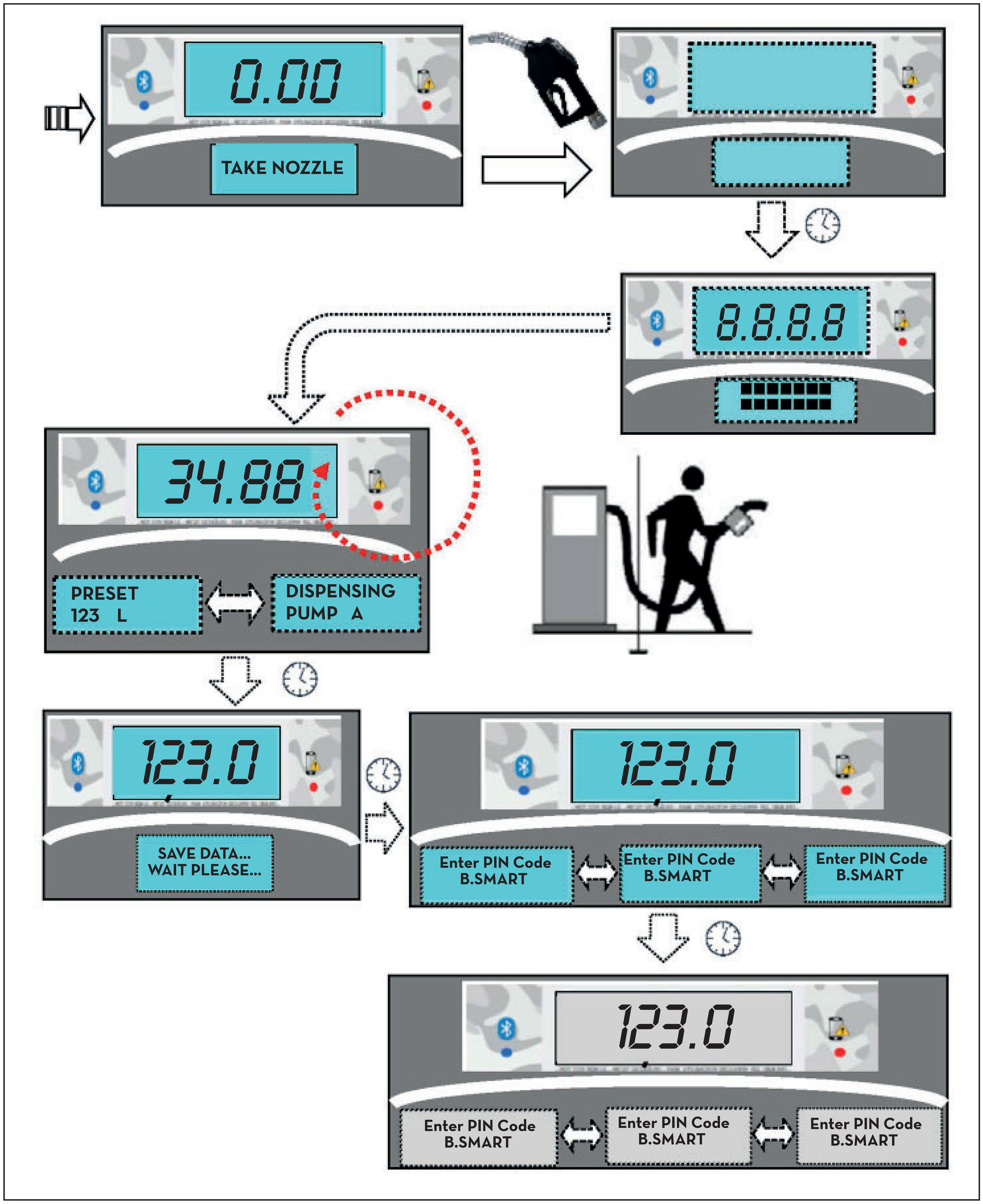
Settings on web app for entry of Vehicle Reg.Number and Odometer reading








0.00
PUMP Selection
0.00
Push Key1
Pump B
0.00
Push Key2
Pump B
0.00
Push Key1
Pump B
STOP
CANCEL
ENTER
0.00
PRESET
123 L
STOP
CANCEL
ENTER



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14 METER CALIBRATION

Before using the MC BOX B.SMART station, METERING ACCURACY should be checked.
Proceed as follows:

- Enter a previously enabled USER PIN.
- Dispense in a calibrated container.
- Compare the quantity of diesel delivered with a calibrated container.

CAUTION: For a correct accuracy it is essential to observe the following indications:

- Use a precision sample vessel with a graduated scale with capacity indication of not less than 20 litres.
- Before checking, be sure to remove all air from the system, dispensing until a full and regular flow is obtained.
- Continuously dispense at the maximum flow rate of MC BOX B.SMART.
- Stop the flow by quickly closing the dispensing nozzle.
- Reach the graduated area of the sample vessel avoiding prolonged low flow rate deliveries, rather making short dispensings at maximum flow rate.
- Compare the indication provided by the container with the indication provided by MC BOX B.SMART, after waiting for any foam to disappear.

If the accuracy is NOT satisfactory, proceed with a CALIBRATION OF THE FUEL METER as indicated in the specific manual.

CAUTION: differences of up to 1/10 litre on a 20-litre dispensing cycle are within the guaranteed accuracy of +/- 0.5%.

CAUTION: For dispensing cycles of 2 litres or less, the manufacturer does not guarantee the same metering accuracy.

15 TANK LEVELS MONITORING

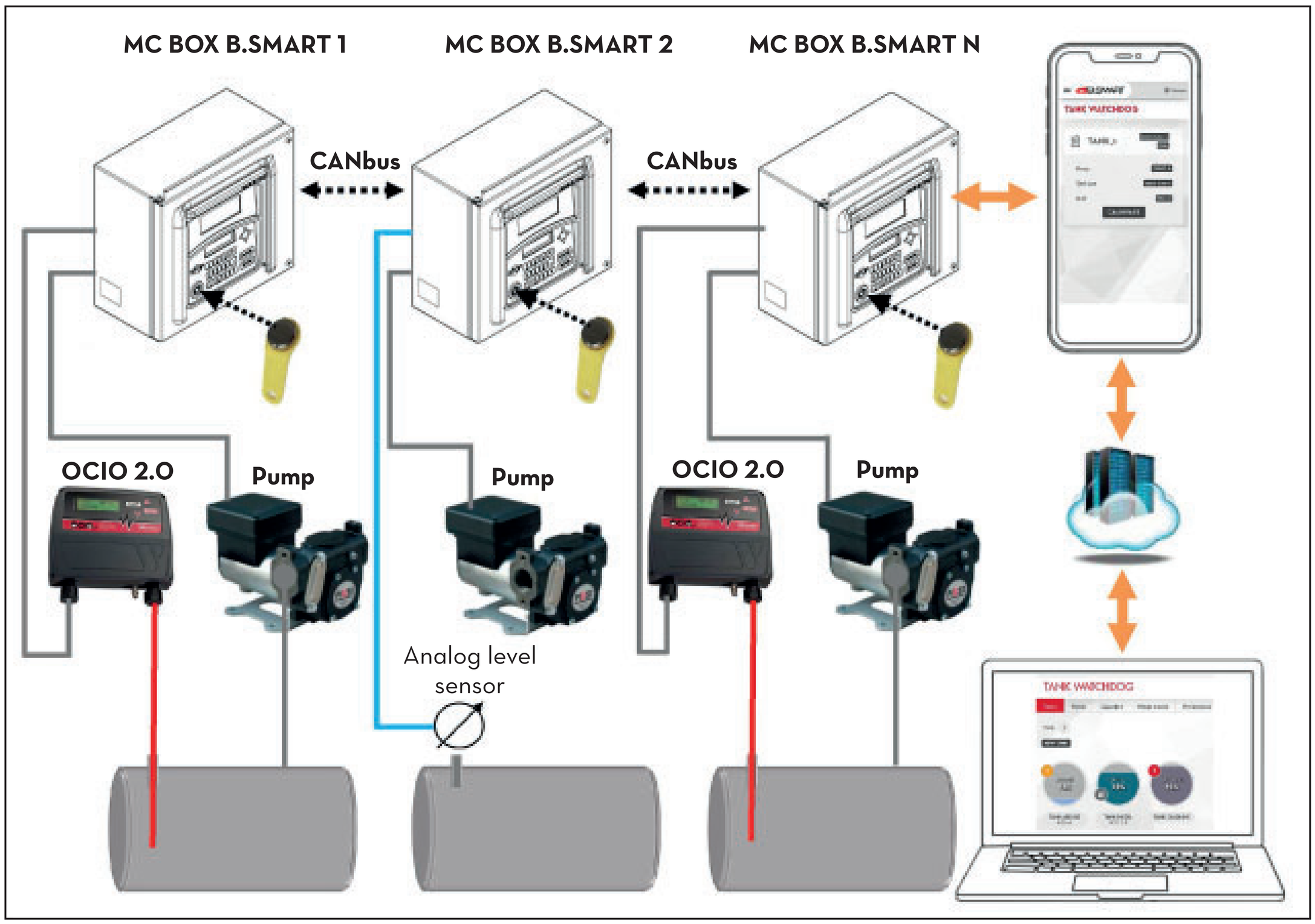
B.SMART allows the tanks to be monitored after activating the TANK WATCHDOG add-on in the WEB application.
This integration makes it possible to monitor the liquid level in the tanks and manage different types of level probe connected to the controller.
The tank types and shapes that can be monitored are:

- Parallelepiped.
- Horizontal cylinder.
- Vertical cylinder.
- Customised.

If you have selected a custom shape, you can define the geometrical representation of the tank by filling in a SCALING TABLE.

The operations required for system installation and configuration are as follows:

1. Choose the level sensors, which may be of different types:
   - OCIO 2.0.
   - 4-20mA analog sensor.
   - 0-10V analog sensor.
   - None (mathematically calculated tank monitoring).
2. Connect the sensors in accordance with the electrical schematics.
3. Connect the CAN BUS if there are level sensors to be shared among several B.SMART controllers.
4. In the web app, configure and assign the tanks to their respective pumps (see web app manual).
5. Connect to the site controller and check you are connected to the Internet to download and apply the new configurations from the web app.



CAUTION:

- The data concerning product levels and alarms for the monitored tanks are synchronised in the cloud only when a telephone connects to the controller (driver or manager user). Given that synchronisation in real time cannot be guaranteed, the data shown on the web app may not correspond to the real situation.
- It is not possible to configure the tank parameters or perform product loading and unloading transactions via a phone connection (system configurations are centralised and managed from the web app).

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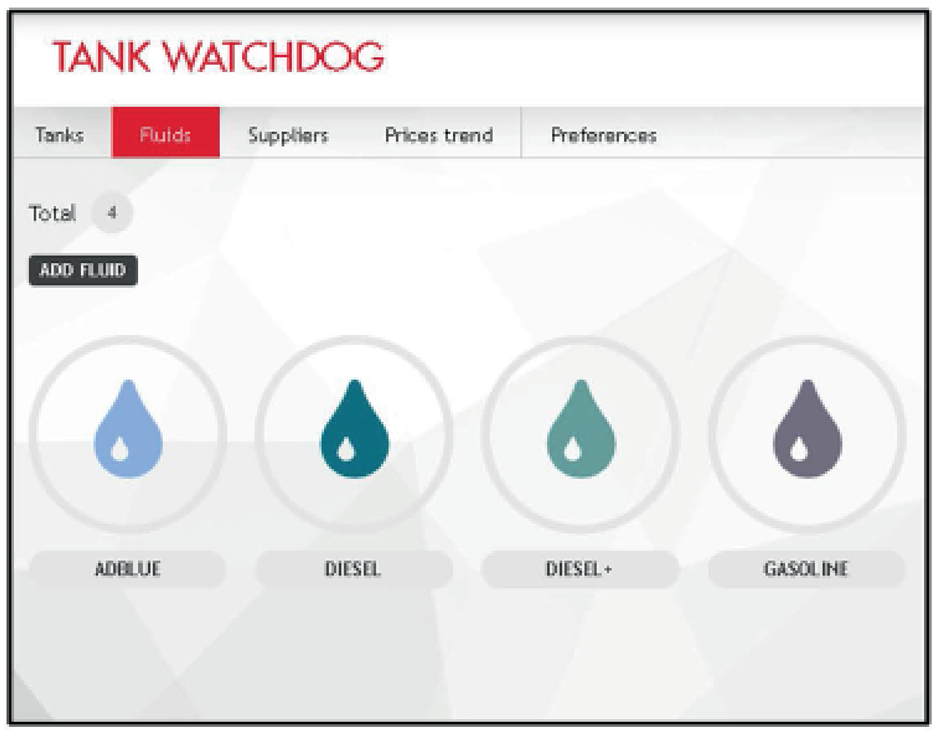
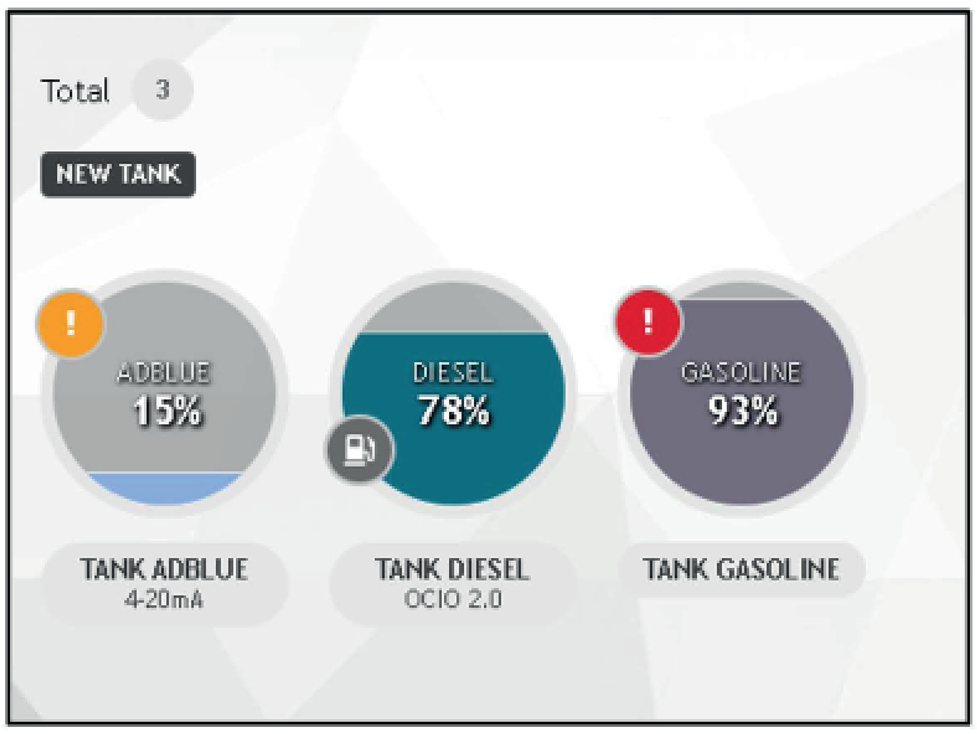
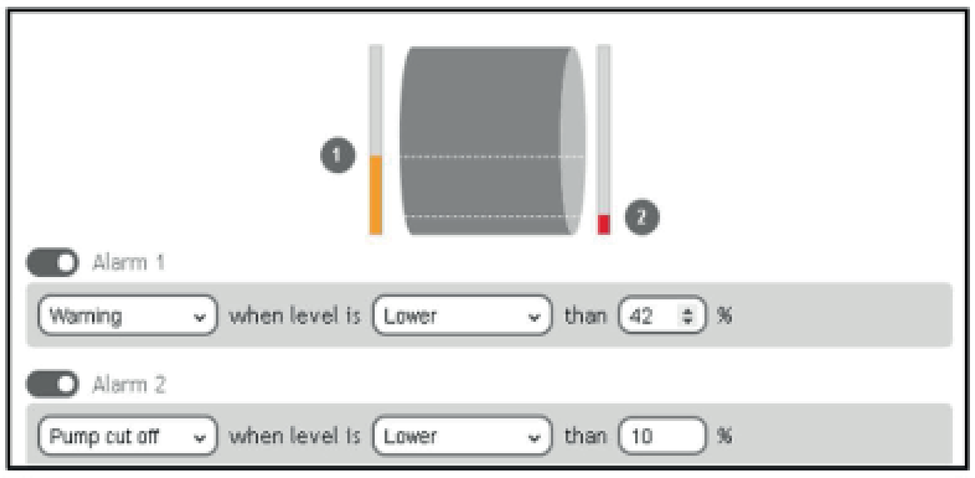
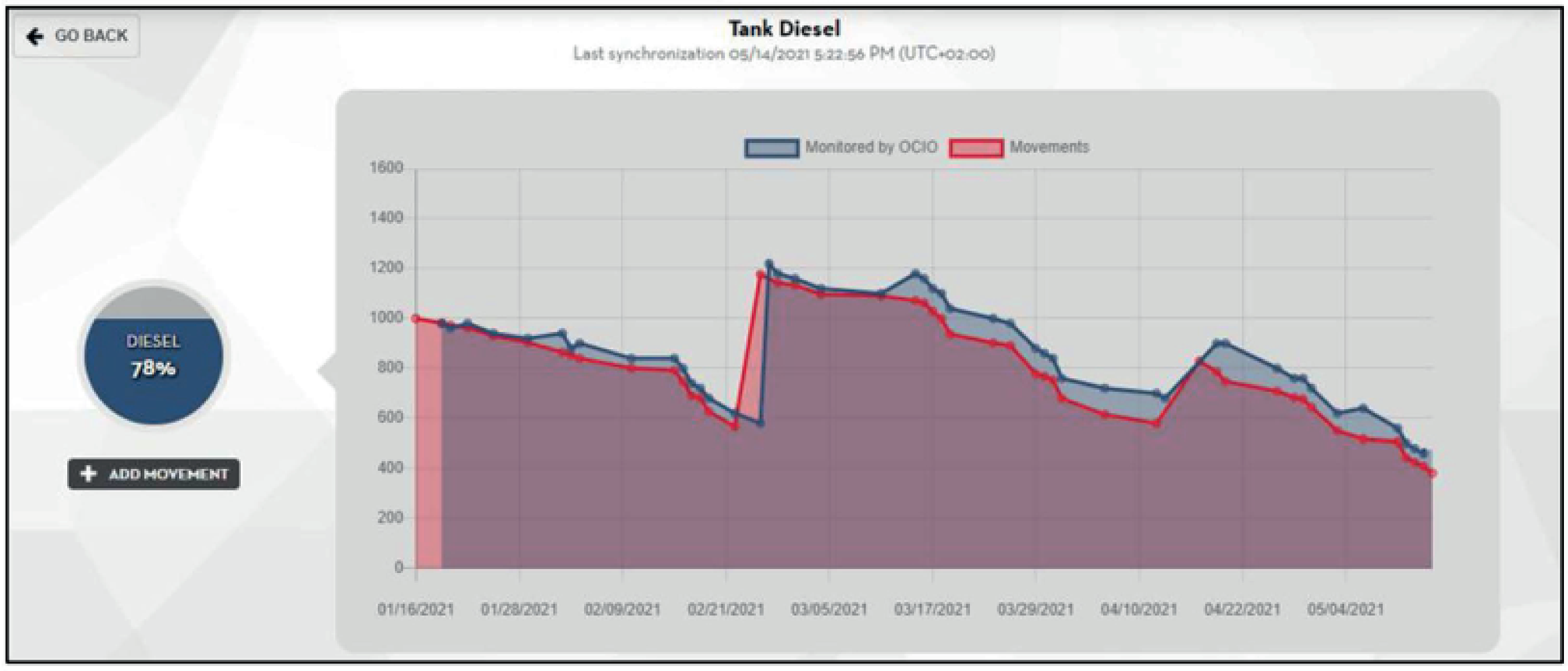
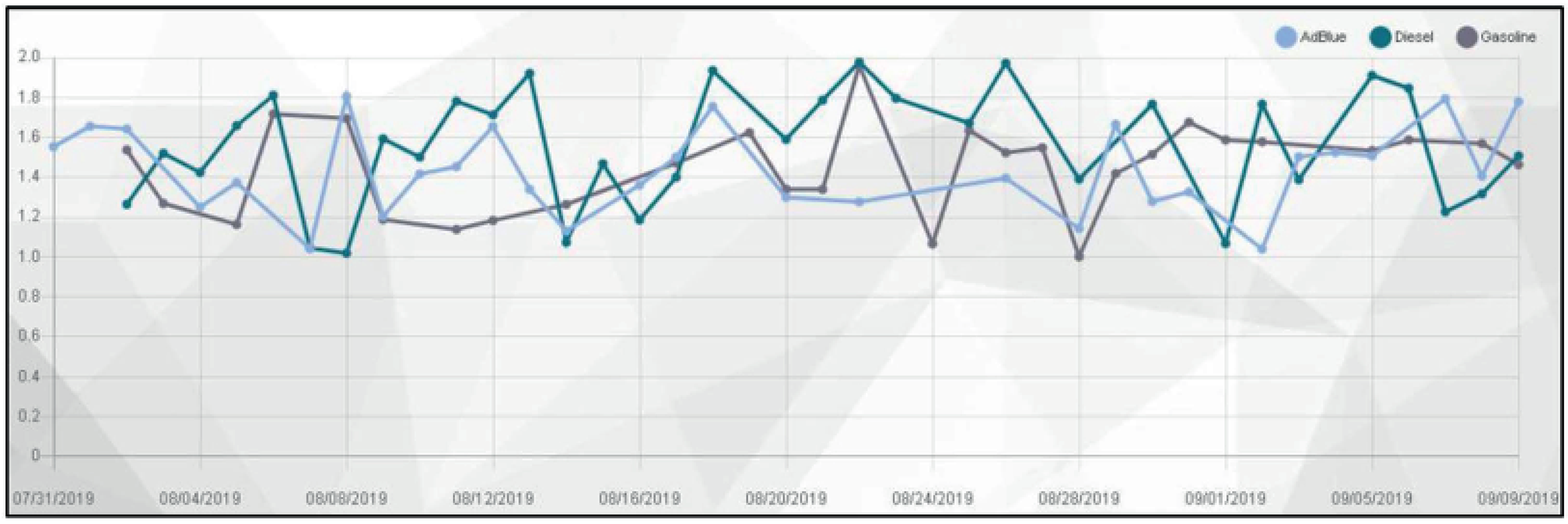
Some web app screenshots are shown here by way of example.
Refer to the specific manual for further details.



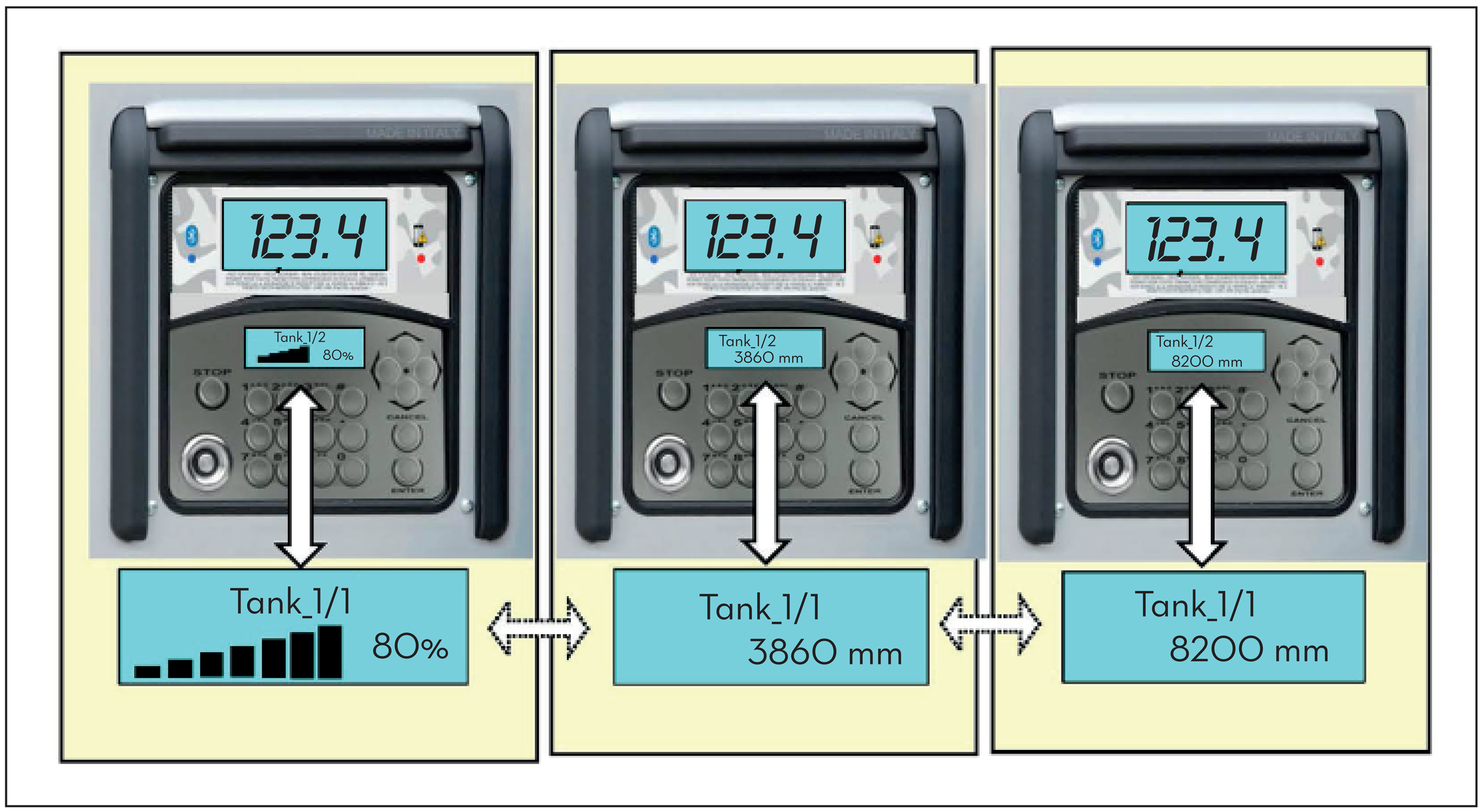








The status of the tanks is shown concisely also on the electronic controller 2x16 display as shown below.



CAUTION:

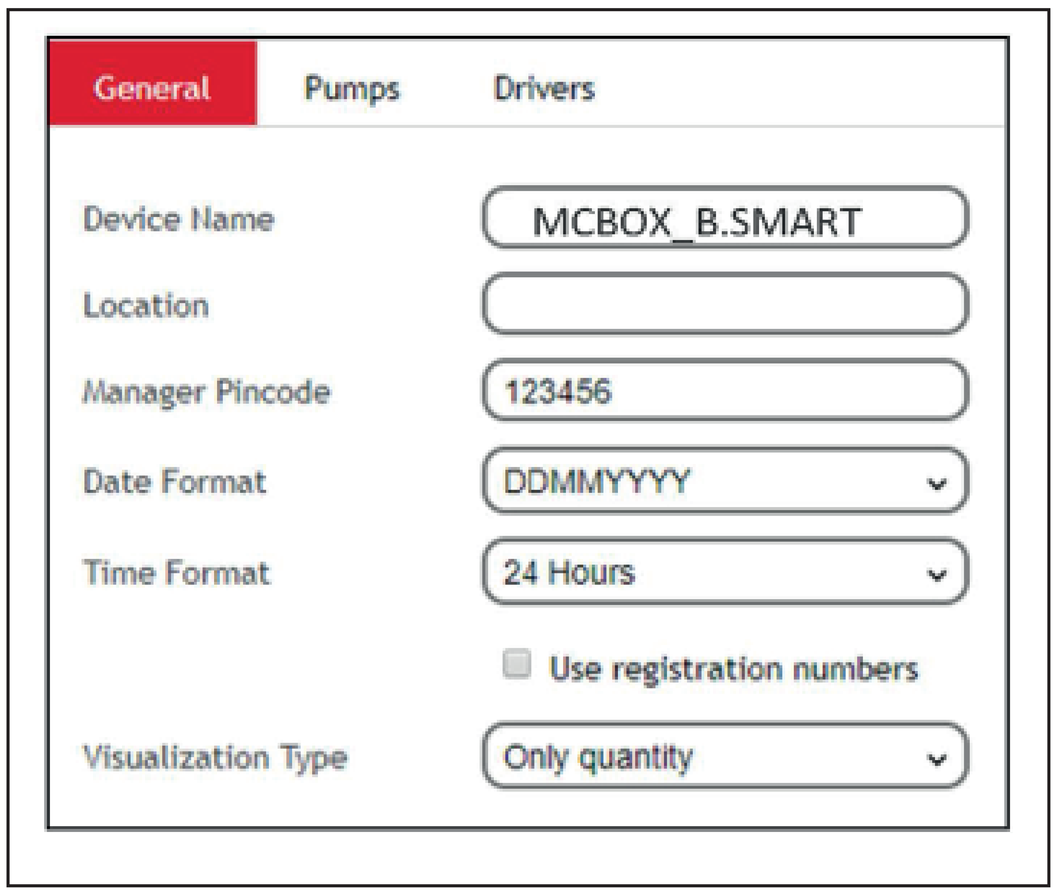
- For correct operation, it is good practice to repeat sensor calibration or tanks correction periodically;
- It is not possible to calibrate the sensors or perform corrections if, in a network of dispensers the current dispenser is pumping fuel from a tank under the management of another dispenser on the site (the sensor is not physically connected to a pump of the current dispenser but the measurement is managed and transmitted over the CANBUS network by another dispenser on the site).
- Whenever changing the configuration of a tank shared by multiple dispensers in the same network, go to each dispenser to apply the new configuration.

16 DISPLAY CONFIGURATION in STAND-BY

B.SMART makes it possible to configure the electronic controller display in stand-by mode
In Stand-By the large display may show:

- Only the last dispensing operation.
- Only the time in HH:MM format.
- Latest dispensing operation alternating with current time.

Configuration is carried out on the web app in the section dedicated to the controller in question, as indicated alongside, and then sent to the controller by means of a smartphone and the B.SMART app.



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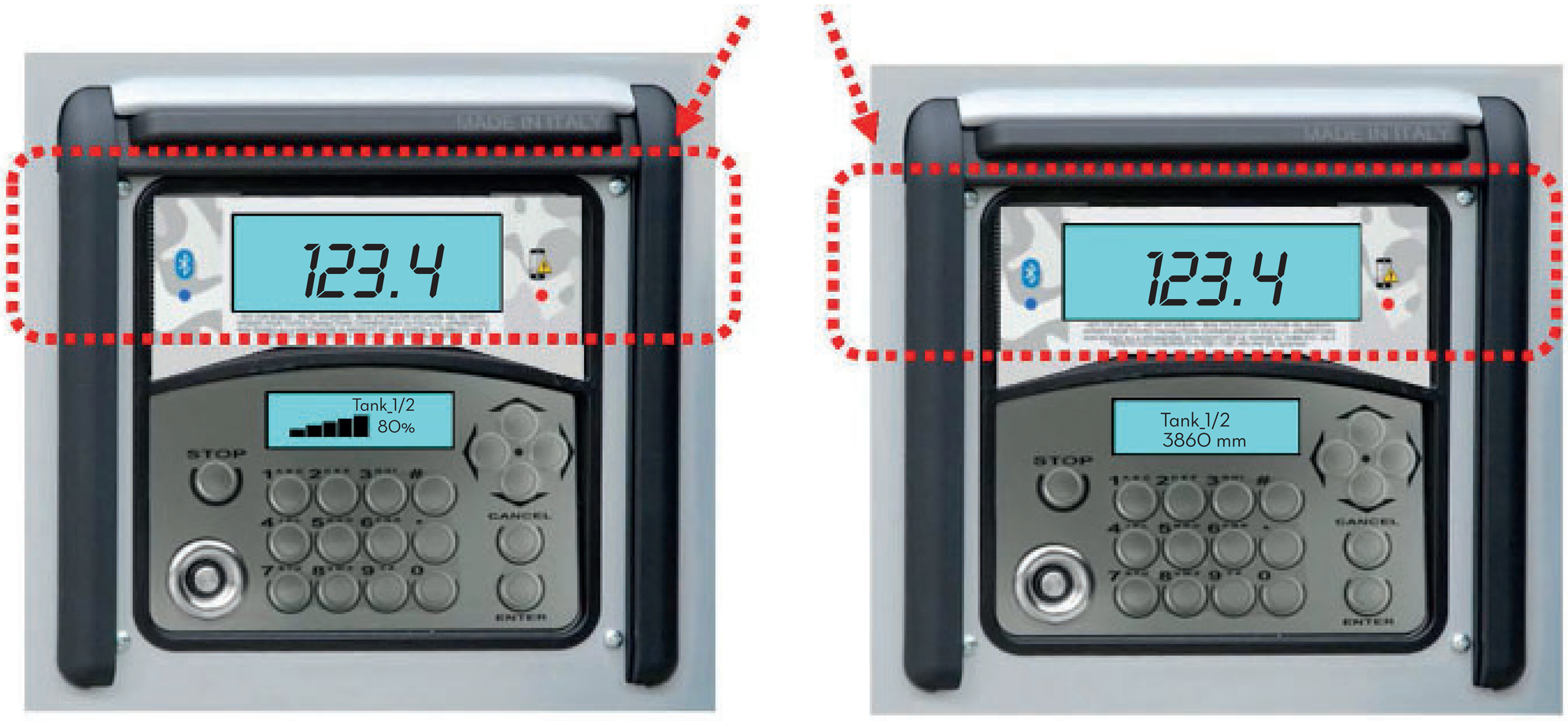
123.4
Tank_1/2
80%
STOP
CANCEL
ENTER
09.0
Tank_1/2
3860 mm
STOP
CANCEL
ENTER


123.4
Tank_1/2
80%
STOP
CANCEL
ENTER
123.4
Tank_1/2
3860 mm
STOP
CANCEL
ENTER

17 ALARM AND WARNING STATES

Flashing or steady on of the RED LED is due to various factors.
Whenever the LED switches on the display presents a code indicated by a letter A (Alarm) or C (Caution), and a number.
Whenever the LED lights steady on, dispensing is NOT possible.
Examples:

Coding	Description	Explanation/Solution	RED LED status
WARNING STATES (CAUTION / WARNING)			
C1	**WARNING_MASTER_PUMP_GROUPA_LEVEL1_CONTACT**	Contact 1 associated with pump A of the main controller is active.	
C2	**WARNING_MASTER_PUMP_GROUPA_LEVEL2_CONTACT**	Contact 2 associated with pump A of the main controller is active.	
C3	**WARNING_MASTER_PUMP_GROUPA_THR1**	The tank associated with pump A of the main controller has reached the level 1 threshold.	
C4	**WARNING_MASTER_PUMP_GROUPA_THR2**	The tank associated with pump A of the main controller has reached the level 2 threshold.	
C5	**WARNING_MASTER_PUMP_GROUPB_LEVEL1_CONTACT**	Contact 1 associated with pump B of the main controller is active.	
C6	**WARNING_MASTER_PUMP_GROUPB_LEVEL2_CONTACT**	Contact 2 associated with pump B of the main controller is active.	
C7	**WARNING_MASTER_PUMP_GROUPB_THR1**	The tank associated with pump B of the main controller has reached the level 1 threshold.	
C8	**WARNING_MASTER_PUMP_GROUPB_THR2**	The tank associated with pump B of the main controller has reached the level 2 threshold.	
C9	**WARNING_SLAVE_PUMP_GROUPA_LEVEL1_CONTACT**	Contact 1 associated with pump A of the secondary controller is active: red LED flashing.	
C10	**WARNING_SLAVE_PUMP_GROUPA_LEVEL2_CONTACT**	Contact 2 associated with pump A of the secondary controller is active: red LED flashing.	
C11	**WARNING_SLAVE_PUMP_GROUPA_THR1**	The tank associated with pump A of the main controller has reached the level 1 threshold: red LED flashing.	

EN

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Coding	Description	Explanation/Solution	RED LED status
C12	**WARNING_SLAVE_PUMP_ GROUPA_THR2**	The tank associated with pump A of the secondary controller has reached the level 2 threshold.	
C13	**WARNING_SLAVE_PUMP_ GROUPB_LEVEL1_CONTACT**	Contact 1 associated with pump B of the secondary controller is active.	
C14	**WARNING_SLAVE_PUMP_ GROUPB_LEVEL2_CONTACT**	Contact 2 associated with pump B of the secondary controller is active.	
C15	**WARNING_SLAVE_PUMP_ GROUPB_THR1**	The tank associated with pump B of the secondary controller has reached the level 1 threshold.	
C16	**WARNING_SLAVE_PUMP_ GROUPB_THR2**	The tank associated with pump B of the secondary controller has reached the level 2 threshold.	
C17	**WARNING_MASTER_PUMP_ GROUPA_PROBE_OCIO**	Fault detected on the level sensors connection line. (The system allows manual dispensing).	
C18	**WARNING_MASTER_PUMP_ GROUPB_PROBE_OCIO**	Fault detected on the level sensors connection line. (The system allows manual dispensing).	
C19	**WARNING_MASTER_SLAVE_ GROUPA_PROBE_OCIO**	Fault detected on the level sensors connection line. (The system allows manual dispensing).	
C20	**WARNING_MASTER_SLAVE_ GROUPB_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.	
ALARM STATES			
A1	**ALARM_MASTER_PUMP_ GROUPA_LEVEL1_CONTACT**	Contact 1 associated with pump A of the main controller is active. Dispensing not possible.	
A2	**ALARM_MASTER_PUMP_ GROUPA_LEVEL2_CONTACT**	Contact 2 associated with pump A of the main controller is active. Dispensing not possible.	

Coding	Description	Explanation/Solution	RED LED status
A3	**ALARM_MASTER_PUMP_ GROUPA_THR1**	The tank associated with pump A of the main controller has reached the level 1 threshold. 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. Dispensing not possible.	
A5	**ALARM_MASTER_PUMP_ GROUPB_LEVEL1_CONTACT**	Contact 1 associated with pump B of the main controller is active. Dispensing not possible.	
A6	**ALARM_MASTER_PUMP_ GROUPB_LEVEL2_CONTACT**	Contact 2 associated with pump B of the main controller is active. Dispensing not possible.	
A7	**ALARM_MASTER_PUMP_ GROUPB_THR1**	The tank associated with pump B of the main controller has reached the level 1 threshold. Dispensing not possible.	
A8	**ALARM_MASTER_PUMP_ GROUPB_THR2**	The tank associated with pump B of the main controller has reached the level 2 threshold. Dispensing not possible.	
A9	**ALARM_SLAVE_PUMP_ GROUPA_LEVEL1_CONTACT**	Contact 1 associated with pump A of the secondary controller is active. Dispensing not possible.	
A10	**ALARM_SLAVE_PUMP_ GROUPA_LEVEL2_CONTACT**	Contact 2 associated with pump A of the secondary controller is active. Dispensing not possible.	
A11	**ALARM_SLAVE_PUMP_ GROUPA_LEVEL1_THR1**	The tank associated with pump A of the main controller has reached the level 1 threshold. Dispensing not possible.	
A12	**ALARM_SLAVE_PUMP_ GROUPA_LEVEL1_THR2**	The tank associated with pump A of the secondary controller has reached the level 2 threshold. Dispensing not possible.	
A13	**ALARM_SLAVE_PUMP_ GROUPB_LEVEL1_CONTACT**	Contact 1 associated with pump B of the secondary controller is active. Dispensing not possible.	
A14	**ALARM_SLAVE_PUMP_ GROUPB_LEVEL2_CONTACT**	Contact 2 associated with pump B of the secondary controller is active. Dispensing not possible.	

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Coding	Description	Explanation/Solution	RED LED status
A15	**ALARM_SLAVE_PUMP_ GROUPB_LEVEL1_THR1**	The tank associated with pump B of the secondary controller has reached the level 1 threshold. Dispensing not possible.	
A16	**ALARM_SLAVE_PUMP_ GROUPB_LEVEL1_THR2**	The tank associated with pump B of the secondary controller has reached the level 2 threshold, impossible to dispense.	
A28	**ALARM_BUFFER_FULL**	The dispensing buffer is full. All dispensing operations stored in the controller must be uploaded to the cloud.	
A29	**ALARM_INACTIVE_PUMP**	No pumps are active. (Check system configuration from the web app).	
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 synchronisation not possible. (Contact the Service Department).	
A32	**ALARM_SOFT_MEMORY_ DATA_FAULT(Cumulative)**	Corrupted memory (data can be reset from the backup in the web app).	
A33	**ALARM_HARD_MEMORY_ DATA_FAULT(Cumulative)**	Corrupted memory (data can be reset from the backup in the web app).	
A34	**ALARM_VERY_HARD_ MEMORY_DATA_ FAULT(Cumulative)**	Damaged memory (contact the Service Department).	

NOTE: 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, refer to the manual found in the site management web app.

18 SPECIAL KEY COMBINATIONS

Pressing a combination of keys provides access to certain information:

# + 7	Board Code 123456789	Circuit Board Code
# + 8	FW Release 1.2.3	Firmware Release
# + 9	Serial Number 87654321	Electronic Board Serial Number

18.1 KEYPAD

The membrane keypad is used for entering data. It features:

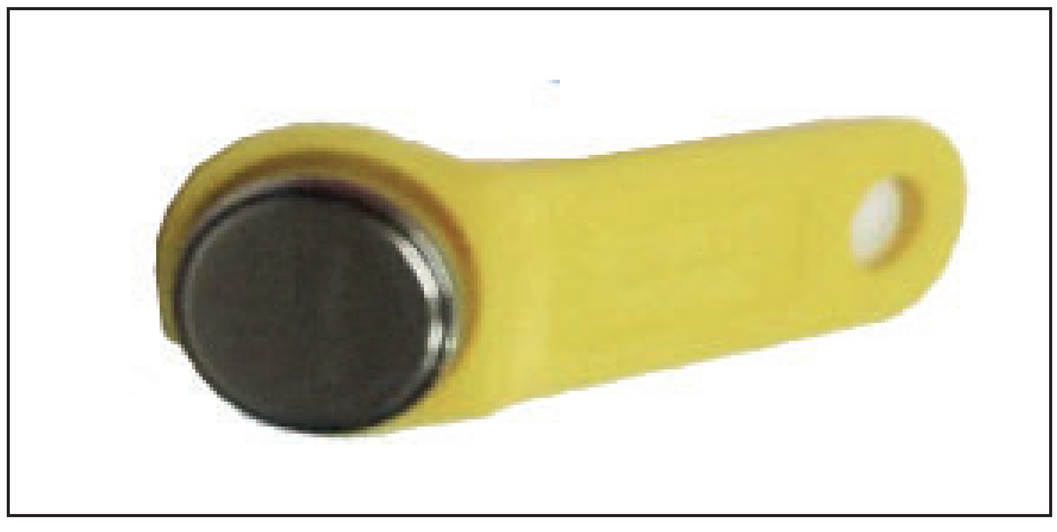
- 10 alphanumeric keys;
- 8 special keys, as follows.

STOP	STOP stops the pump / quits any configuration menu.	∧ ∨	UP / DOWN for scrolling through menus
#	NUMBER used in combination with other keys for particular functions	< >	RIGHT / LEFT for selecting options (flashing)
ENTER	ENTER for confirming selections and entered values	CANCEL	CANCEL for deleting entries or returning to previous steps

18.2 ELECTRONIC KEYS AND THE READER

USER KEYS (YELLOW)

The manager assigns each user his own key, which is used only for dispensing fuel. These keys have an ID code which is automatically scanned when the user touches his key to the unit.



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19 MAINTENANCE

19.1 ROUTINE MAINTENANCE

The MC BOX does not USUALLY require any ROUTINE maintenance.

19.2 EXTRAORDINARY MAINTENANCE

CAUTION: maintenance of the electrical parts can be performed only by a qualified electrician or electronics engineer.

Before performing any maintenance make sure to unplug the device from the power supply to turn it off and isolate it from the mains.

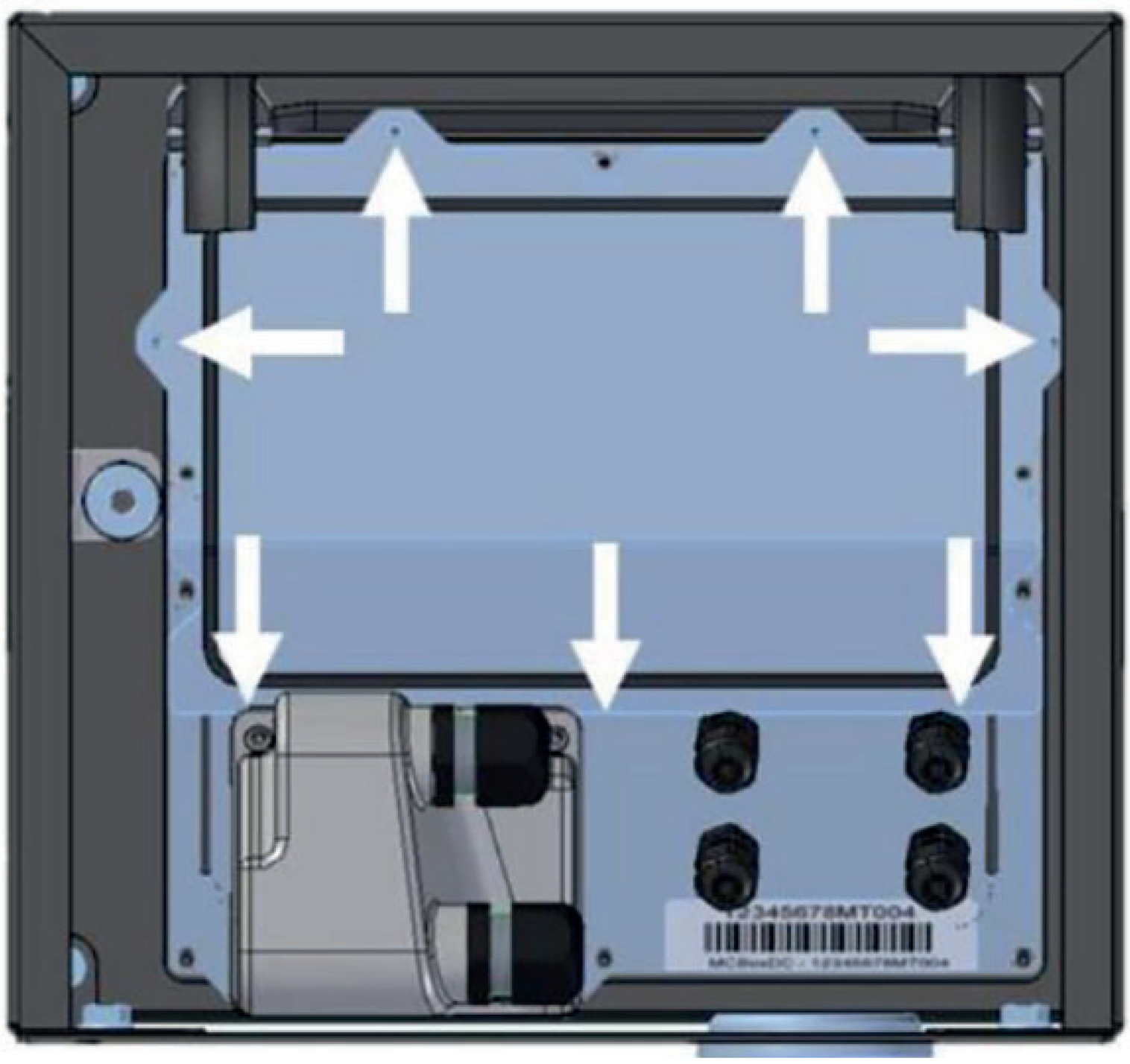
If the device is sold without cable to provide periodic verification of the circuit grounding in accordance with current regulations.

- Checking the fuses: to access the fuses, open the unit and access the components that are live during normal use. Disconnect the unit from the mains power supply to allow this to be done safely.

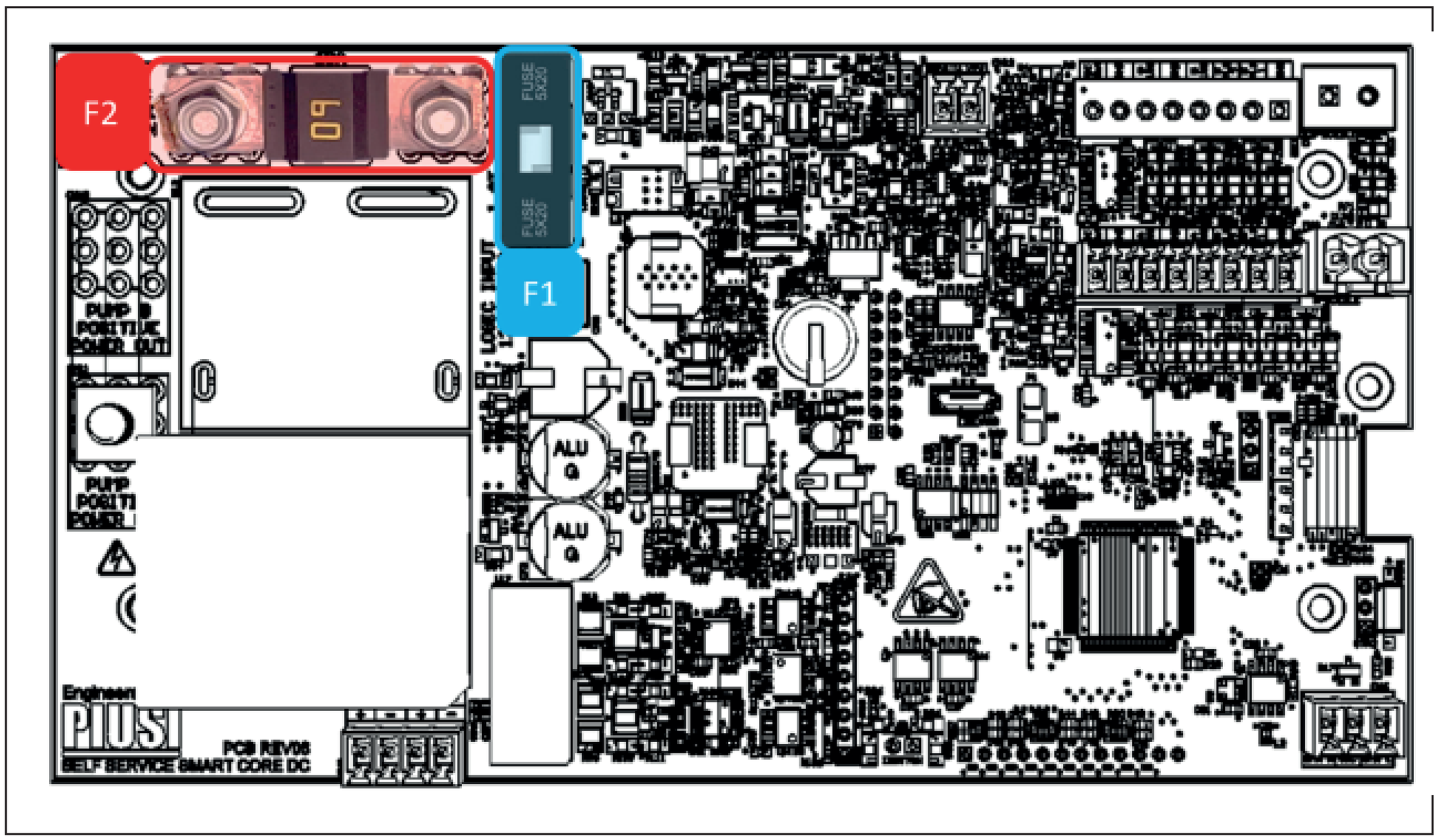
19.3 CHECK AND REPLACEMENT OF FUSES

For checking and replacing fuses on electronic boards:

1. Disconnect the unit's main power supply.
2. Open the MC BOXdc B.SMART door to access the controller.
3. Loosen the screws of the metal rear panel to access the circuit boards compartment.



4. Check the condition of the 2 fuses and replace them if necessary.



F1 1A T (time delay) power supply fuse on DC supply input.
F2 60 A T (time delay) motor fuse.

5. Tighten the screws of the metal rear panel to close the circuit boards compartment and reconnect the power supply.

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20 TROUBLESHOOTING

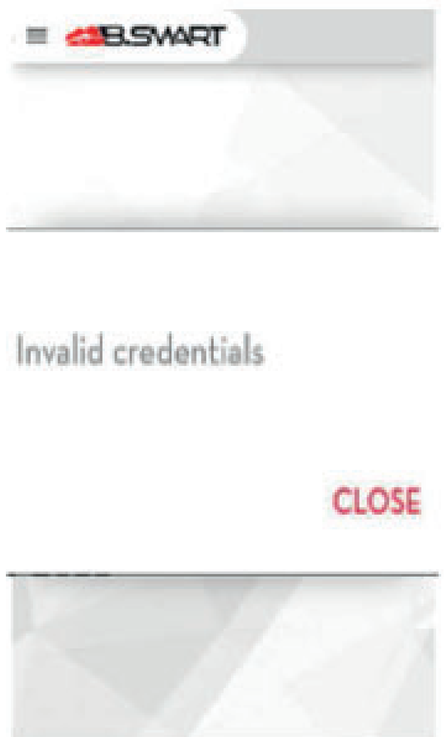
20.1 ELECTRICAL/ELECTRONIC PROBLEMS

PROBLEM	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
MC BOX B.SMART does not switch on	Lack of power due to: • Incorrect connections. • Upstream circuit breaker set to OFF. • Power supply fuse blown.	• Check connections • Set the circuit breaker to ON • Check fuse
A driver with an electronic key is not recognised	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 recognised by the system.	Change the electronic key, the system MANAGER will also have to delete the code of the old key and link the new key to the driver via the web app.
The motor does not start	Has not been connected correctly to the terminals.	Check connections, or (if present) check that the motor switch is set to the ON position.
Does not count during dispensing	The Pulser that emits the counting signals is incorrectly connected.	Check connections
	The Pulser that emits the counting signals is NOT compatible with the electronics.	The electronics are designed to receive a “voltage free contact” or “Open Collector” signal at 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	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 outside the ranges compatible with the electronics.	The pulser signal must have a frequency of at most 300 Hz and Duty Cycle from 10% to 90%. Beyond these ranges, the system does not process the received data correctly. The system must be set within the correct ranges, interposing appropriate electronic interfacing equipment if needed (contact the Technical Assistance service for these options).

20.2 PROBLEMS WITH THE SMARTPHONE APP

PROBLEM	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
The APP says the driver is not enabled	The manager has not enabled the driver to use the dispenser.	The manager must enable the driver to use the dispenser via the web app in the section dedicated to drivers.
Dispensing cycle from smartphone is not present in the cloud	Dispensing carried out with the smartphone with data connection disabled or in an area with poor 2G/3G/4G coverage.	The dispensing operation will be present on the cloud as soon as the app is opened in an area with 2G/3G/4G coverage. In the meantime it will be stored in the smartphone memory and also in the dispenser memory.
App unable to find the controller even though Bluetooth is active	Bluetooth module on the smartphone is not compatible with the Bluetooth module in the dispenser.	The dispenser Bluetooth module is compatible with all smartphones equipped with Bluetooth version 4.0 or later (smartphones from 2011 onwards).
	Dispenser is being used by another driver.	The dispenser will become visible on the smartphone only when the driver currently using it has finished operations.

21 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/she must disclose this information. CAUTION: 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 gain access with the old smartphone, you must first access using a new smartphone, then have the account reset and finally enter with the initial smartphone.
2	**What to do if a driver loses his/her smartphone?**	If the driver loses his/her smartphone, 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 web app manual, “DRIVER DETAILS” chapter).

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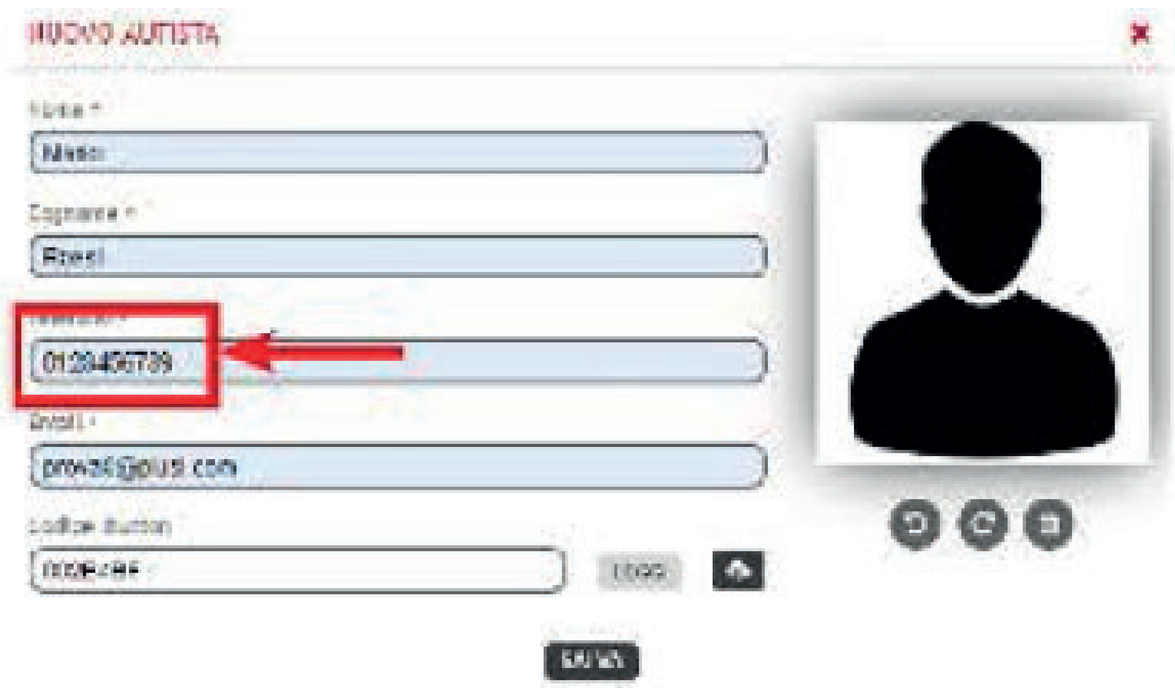
4	**When will dispensing cycles carried out via i-Button or a smartphone without an internet connection be uploaded to the cloud?**	There are 4 cases in which dispensing cycles are uploaded to the cloud: • Each time the app is opened, if the data connection is active. • App open in background and data connection active. • Data synchronisation by the manager by pressing the SYNC key. • Every time a driver connects to the controller and the internet connection of the smartphone is active. • As can be seen from the list, dispensing operations can be uploaded to the cloud even if the smartphone is not connected to the controller.
5	**What to do if I can't dispense with authentication carried out with the i-Button?**	There are a few possible cases: • Dispensing memory full. • Tank empty. • Button not associated with any drivers. 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 clear the dispensing memory, perform a cloud synchronisation operation. If this fails to solve the problem, reset the controller.
		i-Button not associated with any drivers When the i-Button 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 this must be disclosed to the manager, who will change it from the driver's file in the web app (see also the web app manual, "DRIVER DETAILS" chapter).  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.

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22 SCRAPPING AND DISPOSAL

FOREWORD

In case the system should be demolished, its parts must be given to companies specialised in industrial waste disposal and recycling; in particular:

PACKAGING DISPOSAL

The package is made of biodegradable cardboard that can be consigned for sorted waste collection.

DISPOSAL OF METAL PARTS

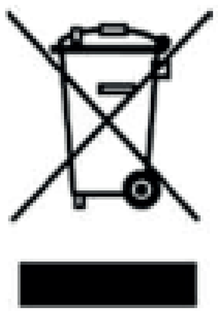
The metal components, both painted and in stainless steel, are usually recycled by companies that are specialised in the metal-scrapping industry.

DISPOSAL OF ELECTRICAL AND ELECTRONIC EQUIPMENT

Disposal of waste electrical and electronic equipment must be handled by specialised recycling and disposal companies in compliance with the provisions of directive 2012/19/EU.
It is strictly prohibited to discard waste electrical and electronic equipment (WEEE) as household waste. Such wastes must be disposed of separately.
Any hazardous substances in the electrical and electronic appliances and/or the misuse of such appliances can have potentially serious consequences for the environment and human health.
Unlawful disposal of WEEE may result in application of the penalties provided for in law.

ENVIRONMENTAL INFORMATION FOR CUSTOMERS RESIDENT IN THE EUROPEAN UNION

European Directive 2012/19/EU requires that equipment bearing this symbol on the product and/or its packaging must not be disposed of with unsorted municipal waste.

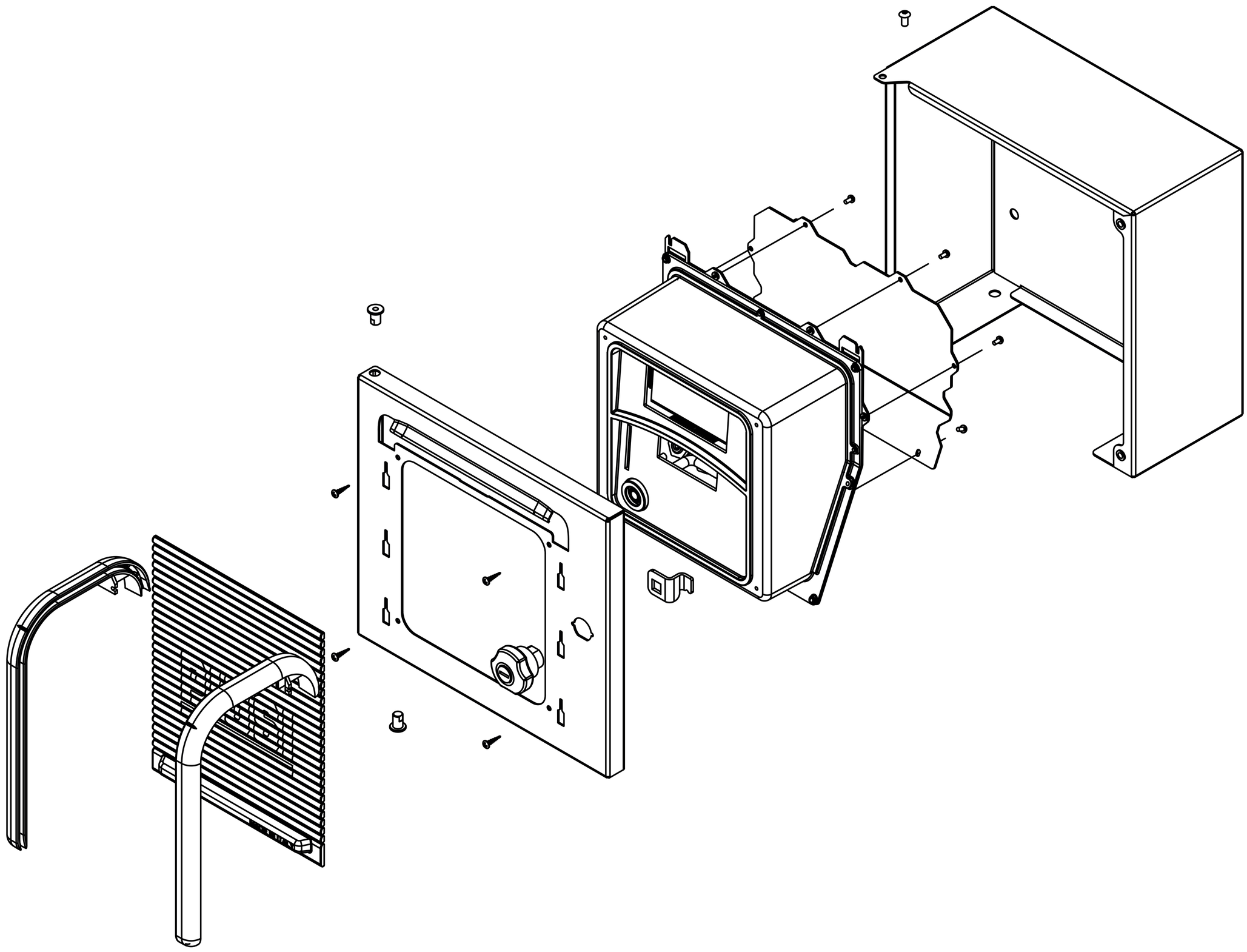


The symbol indicates that this product must not be disposed of as household waste. It is your responsibility to dispose of this and other electric and electronic equipment via designated collection facilities appointed by the government or local authorities.

DISPOSAL OF OTHER PARTS

The disposal of other parts such as pipes, rubber seals, plastic components and cables should be entrusted to companies specialised in the disposal of industrial wastes.

23 REPLACEMENT PARTS TABLE



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