

Technical Manual

Color Tester



ORIGINAL INSTRUCTION

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0.1. HOW TO USE THE MANUAL

0.1.1. IMPORTANCE OF THE MANUAL

This manual provides instructions on the ordinary and extraordinary maintenance of Color Tester.

Further ordinary maintenance instructions are provided in the Operator Manual.

Before carrying out any repair or extraordinary maintenance operation, carefully read this manual in all its parts, paying more attention to the paragraphs related to precautions and safety alerts.

In case problems or difficulties should arise, the TECHNICAL SERVICE SUPPORT of Alfa Srl is always available to provide the right support, advice, explanation and assistance.

Alfa Srl reserves the right to make modifications for improving its own products without prior notification.

The incorrect use of the system can lead to loss of warranty in all its forms and terms.

0.1.2. HOW TO KEEP THE MANUAL

Do not remove, modify, rewrite contents of this manual for any reason.

Keep the manual in a safe place, protected from heat and humidity.

0.1.3. HOW TO CONSULT THE MANUAL

This manual comprises:

- COVER PAGE IDENTIFYING THE TYPE OF PRODUCT
- TABLE OF CONTENTS
- INSTRUCTIONS AND/OR NOTES ON THE PRODUCT

The COVER PAGE identifies the product described in this manual.

Use the CONTENTS to find the list of CHAPTERS and PARAGRAPHS contained in the manual and their subjects.






The INSTRUCTIONS AND/OR NOTES ON THE PRODUCT define the safe working practices and advice on the correct procedures and the skills required to correctly operate and maintain the system.

Some images of this manual having been enclosed for easier identification of the described parts may not be exactly the same as the ones in your System.

0.1.4. SYMBOLS USED IN THE MANUAL

The safety and advice symbols used in this manual are used to draw the reader’s attention to warnings concerning safety or indicating good working practices. The same symbols are also placed on the machine to indicate dangerous areas and refer to the relevant safety notes in the manual.

MEANING OF THE SYMBOLS

	WARNING! GENERAL DANGER
	WARNING! HIGH VOLTAGE
	WARNING! RISK OF CRUSHING.
	WARNING! LASER RADIATION DANGER
	GROUND CABLES THIS SYMBOL INDICATES GROUND REFERENCE POINT.

0.1.5. PROCEDURE FOR UPDATING THE MANUAL IN CASE OF MODIFICATIONS TO MACHINE

If the MACHINE or MANUAL is MODIFIED in any way, an UPDATE could be sent for insertion into the printed Manual.

0.2. INSTRUCTIONS FOR ORIGINAL SPARE PART AND CONSUMABLE ORDER




To provide a fast and efficient service, always specify the following information when ordering replacement and consumable parts:

- **Machine type:** as indicated on nameplate.
- **Serial number:** as indicated on nameplate.
- **Quantity** of each item required.
- **Code** of required part.
- **Description** of required part.








0.3. SAFETY INFORMATION


0.3.1. PRECAUTIONS AND USAGE REGULATIONS

The machine must be positioned in an enclosed area that complies with the environmental requirements set out in the relevant paragraph.

	<p>Do not install the machine in a dusty environment. Do not expose the machine to sources of heat, excessive cold, water, electromagnetic energy, or sources of smoke. The machine must be positioned on perfectly level flooring.</p>
	<p>Always make sure that the power cable is intact and free of any cuts or cracks. In case of cable damage, renew the cable using genuine spare parts.</p>
	<p>The noise level generated by the machine is less than 70 DB (measured at a distance of 1 m and at a height of 1.60 m from the floor). This value can be exceeded in certain work environments. If the noise to which the operator is exposed on a daily basis is presumably greater than 85 DB, effective hearing protections must be used, as required by the 86/188/EEC regulations.</p>

0.3.2. GENERAL SAFETY WARNINGS

	<p>Color Tester is compliant with all the safety requirements of the main European and extra-European Standards and Institutions. Despite that, it is suggested to read carefully the information contained in this chapter and in the next pages since they show the possible dangerous situations and the necessary precautions to take.</p>
	<p>The machine is provided with doors and guards that prevent the operator from getting in contact with mechanical and electrical hazardous parts. A periodical check on the safety devices must be performed according to the instructions provided by this manual. If the safety protection systems are damaged, turn off the machine and call the technical service.</p>
	<p>High voltage parts - Risk of electric shock No high voltage part is accessible from the User area. All the high voltage circuits are contained into enclosed areas and protected by fixed guards. The high-voltage internal parts are accessible to the maintenance operator and are protected against direct contact with dangerous parts by means of IP 2X or higher class protection. Dangerous parts are marked by the symbol indicated on the side.</p>
	<p>Dangerous mechanical parts - Risk of crushing or trapping. Internal moving parts are accessible only to technical personnel. Do not put your hands into the machine working areas. Tie hair to avoid the risk that it can be trapped in the machine. For the same reason, keep away of the machine or avoid wearing any hanging objects such as ties, necklaces, pendants or other similar items.</p>
	<p>High-temperature parts - Risk of scalds The machine includes no components or areas that may reach so high temperature as to become dangerous for the user, the maintenance operator or the technician. The areas where this risk can occur, under faulty conditions, are marked by the symbol indicated on the side.</p>
	<p>Flammable parts - Risk of fire The machine is made from materials which do not propagate fire in order to minimise fire risk. Nevertheless, the machine must be installed in a duly ventilated room, complying with the manufacturer's installation requirements. Never leave materials, fluid or foreign objects that might increase the risk and spread of a fire inside the machine.</p>
	<p>It is forbidden to modify the machine's internal an external protections. Contact Alfa's Technical Support Service if necessary. Alfa Srl shall bear no responsibility for any damage that may arise due to the failure to comply with the above instructions. In the event of a malfunction, contact the manufacturer's technical support service.</p>

	<p>GROUND CONNECTION Ground wire connection point.</p> <p>Always ensure that yellow-green ground leads are duly fastened to the ground point indicated by the symbol on the side. DO NOT REMOVE GROUND CONNECTIONS.</p> <p>In case of lead damage, switch machine off and immediately contact the technical service support.</p>
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IF THE EQUIPMENT HAS BEEN USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED

0.3.3. USERS AND ACCESS LEVELS

The machine has three different user interfaces:

- **USER:** an operator who uses the machine for the purpose of producing a colour sample;
- **MAINTENANCE OPERATOR:** user in charge of performing routine maintenance operations, such as loading the colorant groups, the magazines, and the printer roll. Access on the part of these operators is protected by a first level password;
- **TECHNICIAN:** an expert operator authorised to access the machine's special diagnostic, initialisation, configuration, troubleshooting, and extraordinary maintenance functions. Access on the part of these operators is protected by a second level password.
- **ADMINISTRATOR:** a superuser who's authorised to access the machine's software in order to add or delete users, change user rights, reset passwords, etc.

In order to identify the various areas of intervention, the following definitions must be taken into account:

- **USER AREA:** the area outside the machine that the user accesses in order to produce a colour sample (colour charts, display, payment system, label printing; sample output tray);
- **MAINTENANCE AREA:** the area inside the machine, which can be accessed with a key, where routine maintenance operations can be performed (tank and magazine filling, label printer roll change, unloading bin replacement, nozzle cleaning); ordinary maintenance operations on Color Testers are performed by the MAINTENANCE OPERATOR. Extraordinary maintenance operations require access to SERVICE AREA and are performed by the TECHNICIAN;
- **SERVICE AREA (FOR USE BY TECHNICIANS):** the internal areas of the machine that can not be accessed using a single key, but whose access also requires the use of other tools (electrical cabinets);

0.3.4. RESIDUAL RISKS AND DANGEROUS AREAS

USER: The machine does not present any risk for the operator.

MAINTENANCE OPERATOR: The doors allowing access to machine internal parts are protected by safety interlock micro-switches, which stop any movement if doors are opened during machine operation.


In case of door opening, potentially dangerous areas are as follows:

- electrical panel area: risk of electric shock.

TECHNICIAN: Authorised technicians can access special diagnostic functions and can work in “service” mode, i.e. with disabled protections. In this mode, the safety interlock micro-switches are disabled and it is possible to touch dangerous moving parts:

- Cartesian axes and autocap system: risk of snagging arms, hands, fingers, hair or clothes due to the movement of the drive axes.
- Capping area: risk of squeezing arms, hands or fingers due to can pusher and drive organs.
- paint tanks: risk of squeezing arms, hands or fingers due to the movement of stirring blade.

Any intervention that requires the operator to access zones where risks of electric shock are present must be performed with the machine off.

	<p>REMOTE SERVICE: The machine may also be remotely activated via Personal Computer or Smart device. Pay maximum attention during access to dangerous areas.</p>
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0.3.5. CONTACT WITH COLORANTS OR BASES

Always beware of any product leaks from the machine or circuits during production, as well as during cleaning and maintenance operations.

Contact with the products (colorants or bases) can cause irritations or injuries if not properly treated.

In case of need always refer to the safety sheet of the concerned liquid, available at the colorant manufacturer.

0.3.5.1. GENERAL FIRST AID MEASURES

In the event of eye contact: remove contact lenses, if present. Immediately rinse the eyes with running water for at least 15 minutes, holding the eyelids open. Consult a physician immediately.

In the case of skin contact: remove the contaminated garments. Wash the skin thoroughly with soap and water.

Ingestion: immediately consult a physician and show them the can, label or material safety data sheet. Keep the person warm and relaxed. Do not induce vomiting.

0.4. TECHNICAL SPECIFICATIONS

0.4.1. ELECTRICAL SPECIFICATIONS

Power supply	100-240Vac 50-60Hz
Max current	2.5÷1.7A
Absorbed power	400W max
Fuses 5X20 mm	T2.5A-250V Q.ty 2 pcs
Working noise (*)	Lower than 70 dB (A)
Colour Display TFT-LCD	12.1" 1024x768 16.2M Colour capacitive Touch screen

(*) A-weighted sound pressure level determined in accordance with annex ZBB of 60335-2-75 standard during a normal working cycle to 1 m distance far from the surface of the machinery and to 1,60 m height from the floor.

0.4.2. EQUIPMENT CLASSIFICATION AND REFERENCE STANDARDS

Overvoltage category	II See note (1)
Protection classification	IP 20
Class of equipment	I
Reference standards	IEC EN 55022 IEC EN 55024 IEC EN 61000-3-2 IEC EN 61000-3-3 IEC EN 60335-1 IEC EN 60335-2-75 IEC EN 60204-1
Airborne noise (*)	Lower than 70 dB (A)

Note (1):

The equipment is protected for overvoltage up to 1500V. For power lines subjected to transients with peaks of voltage greater than 1500V, the use of external suitable protection devices is recommended.

0.4.3. OPERATING CONDITIONS

Operating temperature (*)	+5 ÷ +35°C
Relative humidity	30% ÷ 90% without condensate
Storage temperature	-25 ÷ +55°C
Altitude	2000 m

(*) The products (colorants and semi-finished products) lose their rheological characteristics outside the temperature range of 15÷ +35°C.

1. DESCRIPTION OF THE MACHINE

This paragraph shows the main external and internal components of the Color Tester and describes the replacement modes.

1.1. MAIN COMPONENTS



Color Tester components

1.	Empty 100 ml cans storages	2.	Colorant groups
3.	100 ml can lids storages	4.	Can unloading chute
5.	Control electronic panel	6.	Label printer
7.	Negative unloading bag support	8.	Base tank pull-out tray
9.	Base tanks (white and transparent)	10.	Tank tray fastener
11.	Corner door retainer	12.	Coin slot (optional)
13.	Storage and colorants support base	14.	Grippers and Cartesian axes level

1.1.1. DYE UNITS

The machine can house up to 12 colorant groups.
The circuits are all the same, fastened to colorant support base through one knob, bolted below the surface, and are facing toward a single dispensing point (dispensing nozzle). From the electrical point of view, they are connected to the machine by means of a single connector located on the rear side of the group.



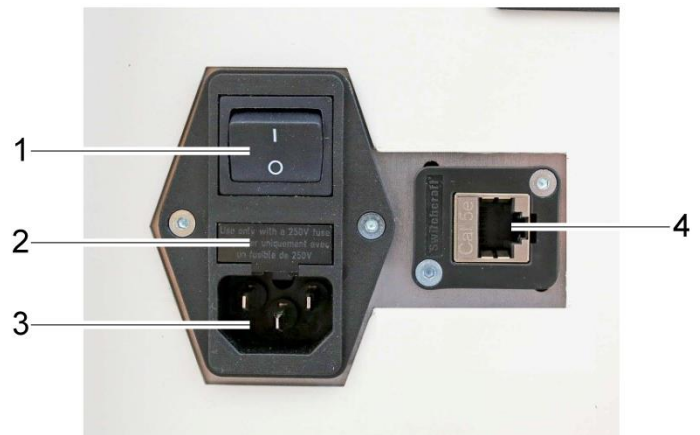
To reach the colorant groups and replace a circuit, refer to paragraphs 2.1 and 2.2.

1.1.2. ELECTRICAL CONTROL PANEL

It is located on the rear side of the machine and provides the main electrical connections of the system.

1. On/off Switch
2. Fuse holder 5x20mm T4A 250Vac
3. Standard CT-120 Power Socket 100-240Vac
4. Ethernet Port RJ45

The compartment inside the removable panel of the machine contains the AC/DC converters, the secondary circuit protection fuses, the MAB board and the unit control SCCB boards (see para. 2.1.2).



1.1.3. PICK-UP GROUPS AND CAN STORAGE

The machine produces 100-cc colour samples, dispensed inside approved cans that are pre-loaded in the machine in suitable internal storages.

The machine features 4 independent storages, each provided with a dedicated pick-up system.



1.1.4. CAPPING GROUPS AND LID STORAGE

The machine left side hosts two lid storages with two independent capping units.



1.1.5. PULL-OUT BASE TANK

In the lower part there is a tank with the base stainless steel tanks.



To replace a complete base group, refer to paragraph 2.3.

1.1.6. BASE TANKS

Each tank is fastened to a swivelling mount equipped with a warning level detection. Under the tank, fixed onto it, there is a shut-off tap with built-in strainer and pumping unit, which is equipped with a delivery tap. Extractable, low profile dripping trays can be housed underneath the tanks.

To replace a circuit for bases, refer to paragraph 2.4.

1.1.7. AUTOCAP

Autocap (1) is located in the lower side of the colorant support base.



To replace the autocap, refer to chapter 2- AUTOCAP GROUP REPLACEMENT.

1.1.8. CARTESIAN SYSTEM

A Cartesian axes system allows movement of passive grippers under the colorant support base.

Grippers (1) are driven by means of the Cartesian axes system, in which axes are conventionally called Y (2) and X (3).



Gripper features a motor-driven lever (4) used to lift can during dispensing. This system ensures that no product drops can be accidentally dispensed outside the can.



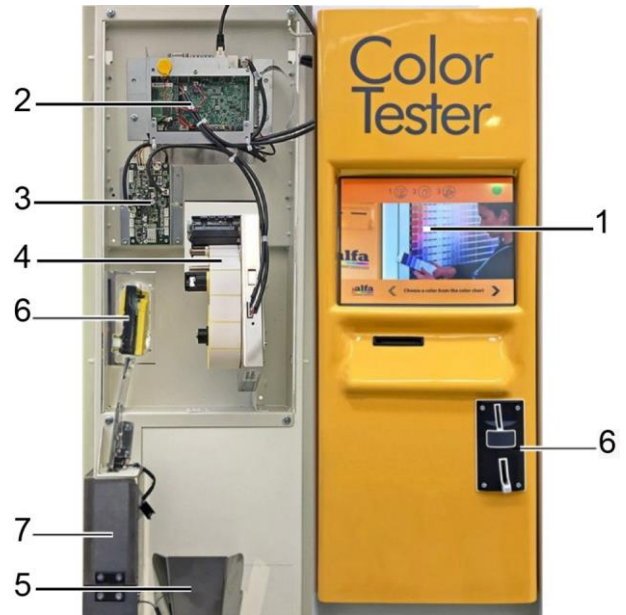
1.1.9. PRINTER AND PAYMENT SYSTEM

The picture at the side shows the inner part (on the left) and the outer part (on the right) of the Color Tester door, which houses:

1. Touch screen display
2. PC Linux board
3. SPB board (Power Board) + Buffer battery
4. Label printer
5. Unloading

Payment system (optional) consisting of:

6. Coin slot
7. Drawer for coin collection



2. PARTS REMOVAL AND REPLACEMENT

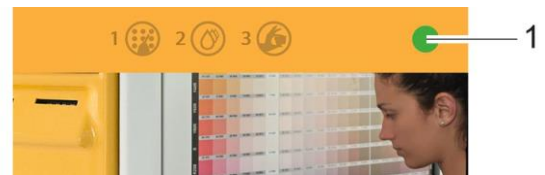
2.0. SAFETY REGULATIONS ON MAINTENANCE

2.0.1. AUTHORISED PERSONNEL

The operations described in this chapter must be carried out in dangerous service areas **RESERVED TO TRAINED AND AUTHORISED TECHNICAL PERSONNEL.**

2.0.2. "SERVICE" MODE

- Only specialised and trained technicians are authorised to operate in "Service" mode.
- In "Service" mode, the safety devices are disabled. All movements are active only after login and after user presses the safety deadman button.
- To access the Service mode it is necessary to go to the service window by pressing the button on top right (1) and enter the requested access password (see 2.0.6).
- Take all necessary precautions to ensure that the password remains confidential and is periodically updated by authorised staff.
- Alfa declines any liability for loss or damage to persons or properties due to the non-compliance with the above-described precautions and particularly to the use of the machine with disabled safety protections.




2.0.3. MACHINE SWITCHING OFF

In order to switch off the machine, turn the main switch to its "O" position and disconnect the power cable from the socket.

NOTE: in order to disconnect the machine, the operator must not rely exclusively upon the power switch, but must also unplug the machine power cable.

2.0.4. ACCESS TO THE REPAIR OPERATIONS

	<p>THE MACHINE POWER CABLE MUST BE UNPLUGGED FROM THE MAINS BEFORE ACCESSING THE SERVICE AREA AND BEFORE PERFORMING ANY REPLACEMENT/REPAIR OPERATIONS. IT IS ALSO RECOMMENDED TO POSITION THE CABLE SO THAT THE PLUG IS ALWAYS VISIBLE TO THE OPERATOR DURING THE COURSE OF THE MAINTENANCE INTERVENTION.</p>
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2.0.5. MACHINE RESTORATION AND START AFTER THE INTERVENTION

Once the repair intervention has been completed:

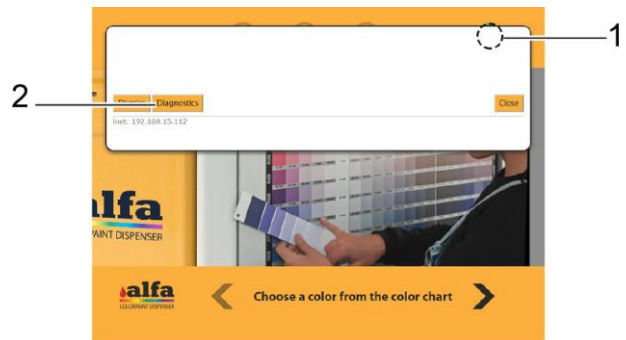
- **RESTORE ALL THE ELECTRICAL CONNECTIONS**
- **RESTORE ALL THE GROUNDING CONNECTIONS**
- **REINSTALL ALL THE REMOVED PROTECTION DEVICES**
- **PLUG THE MACHINE TO THE MAINS**
- **CLOSE THE DOORS AND PERFORM A FUNCTIONAL CHECK (SEE PARAGRAPH 3.4 AND CHAPTER 4 OF THE OPERATOR MANUAL).**
- **PERFORM A FUNCTIONAL CHECK OF THE SAFETY DEVICES (PARA. 2.0.8)**

ALFA SHALL BEAR NO RESPONSIBILITY FOR ANY MACHINE MALFUNCTIONS OR PROBLEMS THAT MAY ARISE DUE TO THE OMISSION OR INCORRECT EXECUTION OF THE MAINTENANCE OPERATIONS.

2.0.6. SETTING THE PASSWORD FOR TECHNICIANS

Access to maintenance and diagnostic functions is only allowed to TECHNICAL OPERATORS after entering the relevant password.

- Press status indicator on the display (1) and hold it depressed for a few seconds, then release it;
- Press “Diagnostics” (2) to continue.



- Factory settings are password = "OMEGA". The password can be changed at any time by system administrator.
- As soon as maintenance is completed, it is recommended to remember to log out.
- A time-out forces automatic logout after 6 minutes of inactivity (value can be edited through the administrator's interface – See Software Manual).



2.0.7. OPERATION WITH TEMPORARILY DISABLED PROTECTIONS

After the authentication with the password, the authorised technical personnel can use a specific jog command to control movements and visually check the machine operation, or to perform the necessary adjustments.

To enable the movements with open doors, connect the control button available to the technician to the suitable connector, then keep the button pressed to allow the mechanical parts movement. When pressing the acknowledgement button, the machine executes and completes a single command.

By keeping the button pressed, the machine performs a continuous movement cycle, as if it were working with closed doors.

The control button is usually on the surface above the color tester left door.



	<p>THE ACKNOWLEDGEMENT BUTTON MUST BE PRESSED MANUALLY. DO NOT USE OTHER SYSTEMS TO KEEP THE BUTTON PRESSED REMOVE THE CABLE WITH THE ACKNOWLEDGEMENT CONTROL WHEN THE OPERATION IS COMPLETED</p>
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2.0.8. CHECKING THE OPERATION OF THE SAFETY DEVICES

In order to ensure trouble-free operation in maximum safety conditions, it is necessary that door interlock switches operate properly.

At the end of the ordinary maintenance operations, open the doors using the provided key and ensure that the relevant alarm is displayed.

If the machine does not show the alarm, the interlock switch may be faulty. In this case, solve the problem and repeat the check.

If the problem persists, switch off the machine and contact the technical service.

2.0.9. WORK EQUIPMENT

Allen wrench, 2.5 – 3 – 4 – 5 mm



Open adjustable wrench, 13 mm



Open adjustable wrench, 22 mm



Ratchet wrench + socket, 13 mm



PH1 cross head screwdriver



PH1 flat head screwdriver



Cutting nippers



Plastic tie, 3.6 mm



2.0.10. PRODUCT DISPOSAL

During the maintenance or repair interventions it may be necessary to empty canisters and tanks from the paints contained in the circuits.

Colorants and base must be disposed of in suitable collector tanks to be treated and disposed of in a suitable way.

It is forbidden to release the products in the environment or in the public sewers.

2.1. EXTERNAL PANEL REMOVAL

To reach the groups (colorants and bases), the nozzle, the Cartesian axis and the storages, usually it is sufficient to open the machine front doors. Nevertheless, to better reach the other components such as the electrovalves of the base circuits or the machine on-board electronic devices it may be necessary to remove the covers of the machine as described in this paragraph.

Before starting the removal procedure, switch off the machine (see para. 2.0.3)

2.1.1. REAR PANELS

Loosen the 12 M6 retaining screws with an Allen wrench of 4 mm to remove the upper panel (1).

This operation must be performed by two operators as the panel does not have a support system.

WARNING: when removing the second last screw, the panel could lose balance and swivel. Leave the top central screw as the last one to be removed.

By removing the last screw, the panel could fall. Hold it from the suitable handles!

If necessary, it is possible to remove also the rear lower panel.

Loosen the 8 M6 retaining screws with an Allen wrench of 4 mm to remove the lower panel (2).

Collect the toothed washers that will have to be reinstalled upon reassembly.



2.1.2. ELECTRIC PART PROTECTIONS

2.1.2.1. ACCESS TO THE POWER SUPPLY PANEL

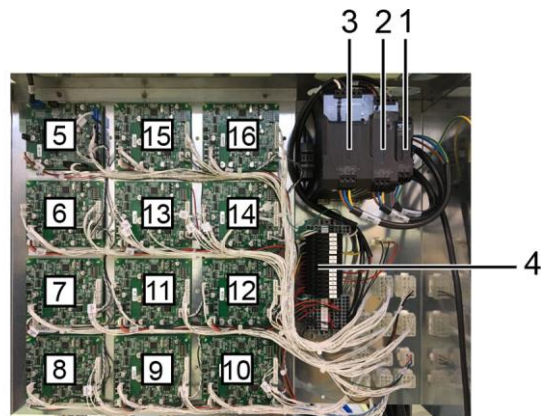
To access the power supply units and the unit control electronic circuits, remove the 6 screws (1) fixing the machine right side panel, behind which the machine on-board electric panel is located.



2.1.2.2. ELECTRIC PANEL

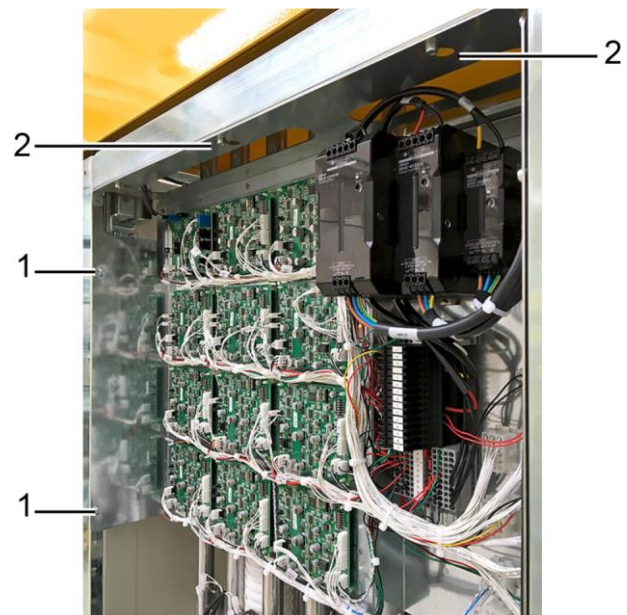
Behind the rear removable panel of the machine there is an electric compartment at mains voltage with:

1. power supply unit 100-240Vac, 12Vdc (optional)
2. power supply unit, 100-240Vac, 24Vdc
3. power supply unit, 100-240Vac, 48Vdc
4. terminals and circuit protection fuses
5. MAB board
6. Autocap circuit SCCB board
7. Can 1 pick-up circuit SCCB board
8. Can 2 pick-up circuit SCCB board
9. Can 3 pick-up circuit SCCB board
10. Can 4 pick-up circuit SCCB board
11. Capping 1 circuit SCCB board
12. Capping 2 circuit SCCB board
13. Base 1 circuit SCCB board
14. Base 2 circuit SCCB board
15. Y-Axis circuit SCCB board
16. X-Axis circuit SCCB board



To remove the whole electric panel:

- disconnect all electric connectors;
- remove side screws (1);
- loosen upper screws (2);
- lift the panel and slide it out through the relevant slots.

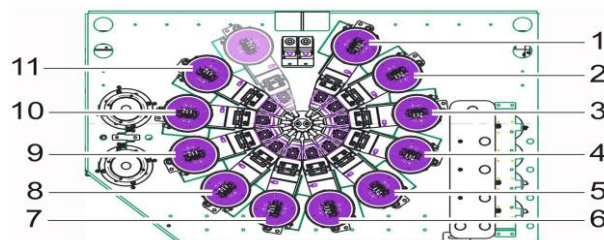


2.2. COLORANT CIRCUIT REMOVAL

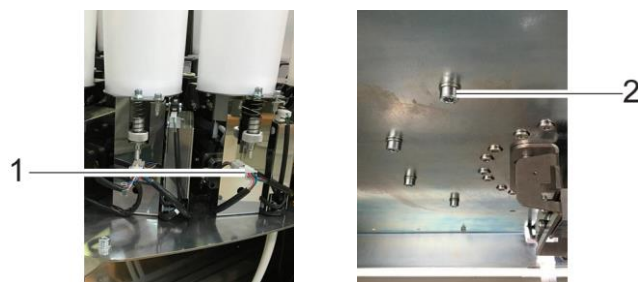
To replace the colorant group proceed as follows:

- make sure the machine is disconnected from the power supply as described in para. 2.0.3.
- Identify the colorant group to be replaced, referring to the numbering indicated in the figure.

Note: the electric connection and disconnection of the colorant groups must be performed with machine off. Performing such operations with machine on could seriously damage the electronic components.



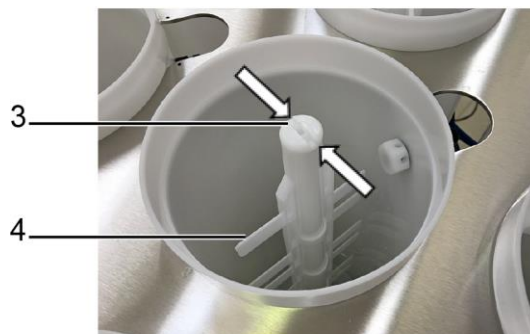
- Disconnect the electric connector of the colorant group to be replaced (1).
- Remove the M6x16 retaining screw (2) of the colorant group to be replaced using an Allen wrench of 4 mm. The screws are on the lower side of the surface (note: after the installation it is possible to replace them with more convenient knobs).
- Gently lift the colorant group to be replaced having care not to damage the colorant outlet nozzle.
- Insert the new colorant group paying attention not to damage the group nozzle.
- Fix the colorant group to the support base by means of the just removed knob.
- Reconnect the wiring.



2.2.1. STRAINER CLEANING

Clean the colorant filters as described below:

- Remove the lid of the colorant group with the filter to be cleaned.
- Lift the cross element located inside the colorant tank and release the filter by pressing the tabs (3) indicated in the figure.
- Lift the stirring blade (4), with the filter fixed on its bottom.
- Remove the filter and rinse it with running water paying attention not to damage it.
- Engage the filter back to the end part of the stirring blade and reinsert the components inside the tank by pressing on the central rod to engage the tabs.



Reposition the cross element and the colorant tank lid.

2.3. REPLACING THE BASE PULL-OUT TANK

2.3.1. REMOVING THE BASE TANK

In general it is not necessary to remove or replace the tank or the relevant sliding guides; nevertheless, if necessary proceed as follows:

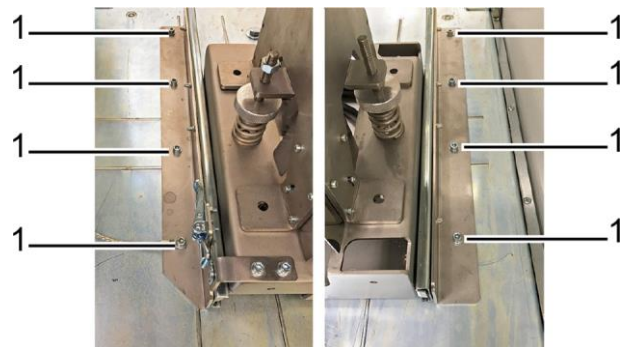
- make sure the machine is disconnected from the power supply as described in para. 2.0.3.
- Open the front doors to reach the base tank.



- Disconnect the electric and hydraulic circuits as described in the next para. 2.4, by separating all connectors.

Note: the electric connection and disconnection of the groups must be performed with machine off. Performing such operations with machine on could seriously damage the electronic components.

- Loosen the 4 M8 screws (1) on each side of the tank that retain the relevant L-shaped supports to the machine base;
- Pull out the tank with the relevant guides and containers. Have a second operator to help you or use a suitable lifting mean (forklift or alike), especially if the containers are not empty.
- Pay attention not to cause container overturning.
- If necessary, instead of removing the complete tank, first remove the single containers proceeding as described in paragraph 2.4.



2.4. BASE GROUP REPLACEMENT

Warning: the group removal could require the involvement of more operators as the weight of the group that contains paint could exceed 25 kg.

To replace the entire base group proceed as follows.

- make sure the machine is disconnected from the power supply as described in para. 2.0.3.
- Open the front doors and pull the tank out completely.
- Close the valve of the delivery circuit (1);
- Disconnect the electric connector (2)
- Disconnect the machine delivery (3) and recirculation (4) pipes using the quick-release couplings and paying attention to possible paint leaks.



- Loosen the 2 pairs of M5x16 hexagon flat head screws (1) that fix the group hinge to the support.
- Gently lift the entire group with the aid of a second operator if the tank is not empty and its weight is too high for just one person.
- Empty the stainless steel tank and collect the paint residues in a suitable collection and disposal system.
- Position the new pre-assembled group on the tray.
- Tighten the screws of the two hinges to fix the new group to the tray.
- Reconnect the previously disconnected pipes and the electric connections.



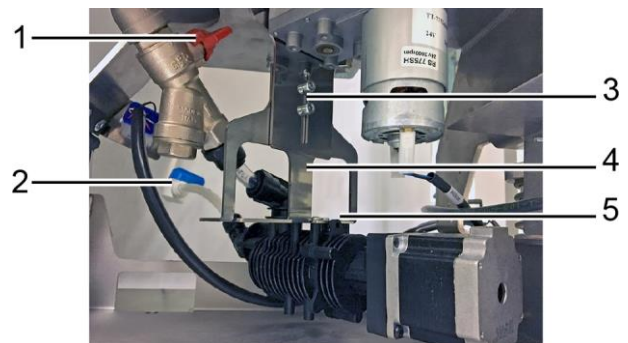
Note: the electric connection of the groups must be performed with machine off. Performing such operations with machine on could seriously damage the electronic components.

If necessary, repeat the adjusting procedure of the base group reserve (see Operator manual, para. 5.4.2).

2.5. BASE PUMP REPLACEMENT

To replace the pump of a base circuit proceed as follows.

- make sure the machine is disconnected from the power supply as described in para. 2.0.3.
- Close the two taps on the inlet pipe (1) and the delivery pipe (2) of the group on which to perform maintenance.
- Loosen the 2 M5X12 socket head screws (3) on the pump support.
- Disconnect all electric wirings of the pump.
- Disconnect the quick-release coupling from the D10 3/8" intake fitting downstream tap (1).
- Disconnect the pump outlet circuit using the delivery quick-release coupling before the tap (2).
- Remove the pump and the relevant "L"-shaped support (4) from the group.
- Disconnect the pump outlet circuit using the delivery quick-release coupling before the valve.
- Then remove the metallic support from the old pump and screw it to the new pump, having care to position it correctly.
- Insert the new 0.2 l/min pump in the group by connecting the inlet quick-release coupling to the tank valve.
- Tighten the retaining screws of the pump support to the pump integral with the tank (5).
- If necessary, thoroughly clean the residues of the delivery pipes.
- Reconnect the delivery circuit and the previously removed wirings following the previously performed operations in the reverse order (always refer to the labels on the wirings and the pipes).
- Open the system delivery and recirculation taps before restarting the machine.



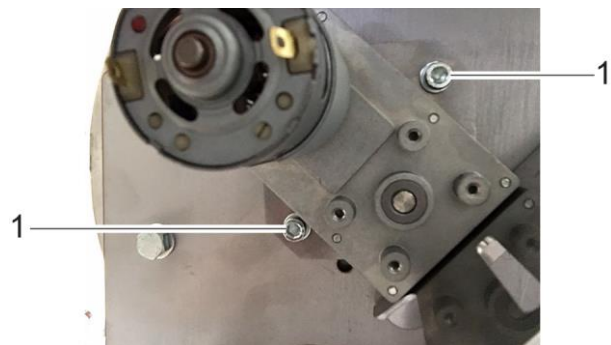
2.6. REPLACEMENT OF BASE TANK STIRRING MOTOR

To replace the stirring motor of the base circuits proceed as follows:

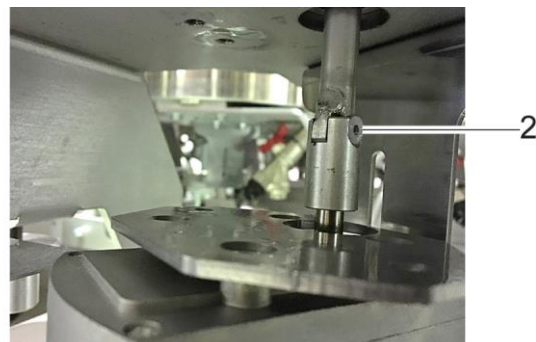
- use a small cross head screwdriver to remove the screw that fixes the stirring blade to the internal driving rod.



- Use a 5-mm Allen wrench to loosen the two M5 screws (1) that fix the motor flange to the tank and then slide down the motor with flange.

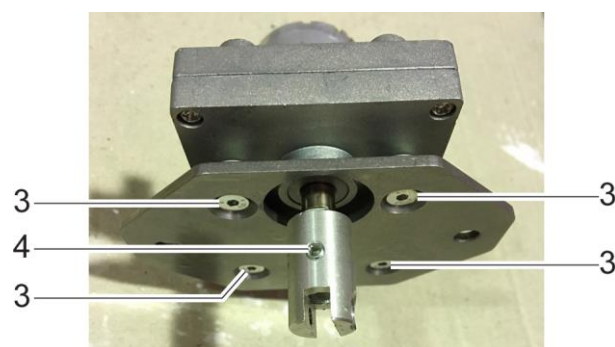


- Once the motor coupling can be reached, use a 2.5-mm Allen wrench to loosen the countersunk head screw (2) that fixes the coupling to the internal rod.

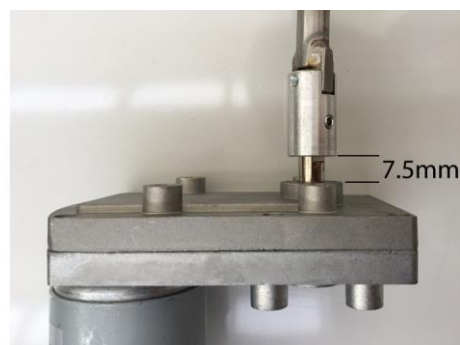


- Once the motor is removed from the group, loosen the 4 M5 countersunk head screws (3) and the M4 dowel (4) to separate the plate and the motor coupling.
- Check the coupling status to check if it needs to be replaced or if it can still be used on the new motor.

NOTE: if necessary, in this phase it is possible to remove the stirring blade by sliding it upward to clean and/or replace it.



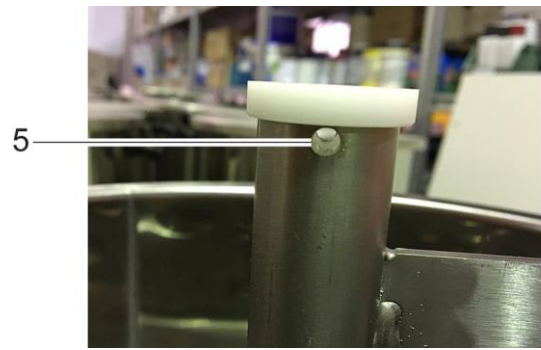
- Then refit the plate and the coupling on the new motor paying attention to tighten the dowel on the shaft flattened face and at the correct height (approx. 7.5 mm from the reference shown in the figure). Use medium strength threadlocker to block the dowel and prevent loosening during the use.



- Follow the removal operation in the reverse order to reconnect the coupling to the rod with the previously removed countersunk head screw (2), and the motor to the tank with the retaining screws (1).

To refit the stirring blade, proceed as follows:

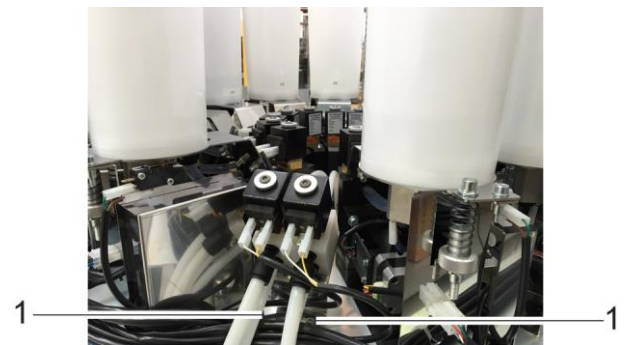
- Lift the blade as required and press down the plastic bushing firmly until it engages in the pipe top part. In this way, the pipe and the bushing holes (5) will be perfectly aligned.
- Lower the blade until locking the drive central rod into the bushing, checking that the holes remain aligned.
- Tighten the previously removed screw.



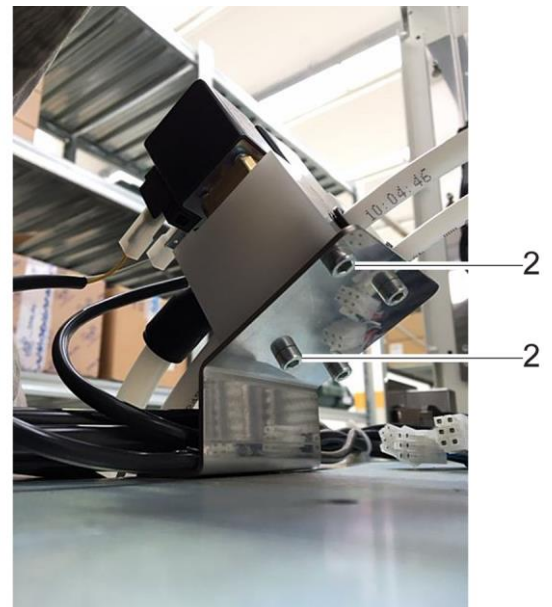
2.7. REPLACEMENT OF BASE CIRCUIT ELECTROVALVES

The electrovalves of the base circuits are located on the colorant support base. To replace the single electrovalve, remove the side panels as described in paragraphs 2.1.2.3 and 2.1.2.5, and then proceed as follows:

- identify the circuit electrovalve to be replaced (EVB1, EVB2).
- Close the circuit delivery and recirculation taps connected to the electrovalve to be replaced (see also paragraph 2.4).
- Loosen 2 M5X16 screws + D5 washer (1) that fix the electrovalves support bracket to the colorant support base and remove the electrovalves support.



- Gently remove the electrovalve support without disconnecting pipes and electric wiring.
- Loosen the M5X16 screws + D5 washers (2) that retain the electrovalves on the support lower side.
- Disconnect the electrovalve inlet and outlet pipes having care to avoid paint spillage.
- Disconnect the electric connections and gently remove the electrovalve to be replaced.



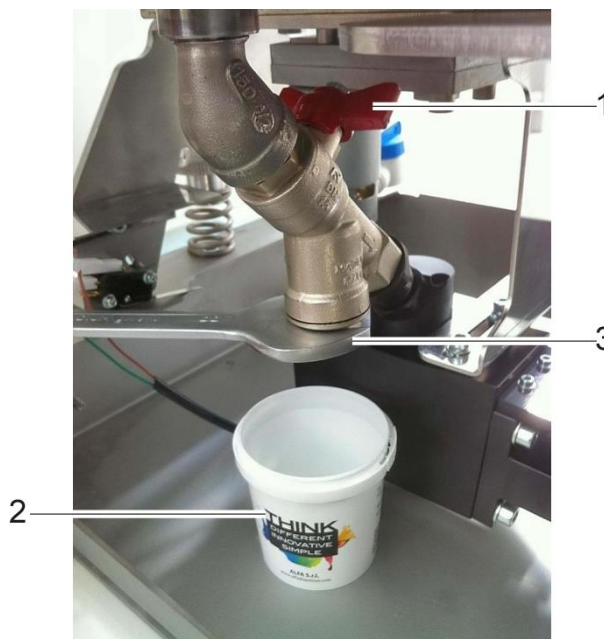
- Connect the duly cleaned pipes to the new electrovalves.
- Tighten the rear screws (M5X16 + D5 washer) of the electrovalve to the relevant support.
- Screw the electrovalve support again to the colorant support base.
- Reconnect the electric connection according to the wiring diagram.
- Open the taps of the circuit tank on which the maintenance operations have been performed.
- Use the previously removed M5X16 socket head screws + D5 washers to fix the two rear panels of the cabinet.
- Reconnect the network cable and the Ethernet cable to restart the machine.

2.8. CLEANING OF BASE CIRCUIT FILTERS

Upstream of the base circuit dispensing pump, at tank outlet, is a combined valve including a tap and a filter. It is recommended to periodically clean the filter, since during use it tends to hold all impurities of the paint.

To clean the base or semi-finished product circuit filter proceed as follows:

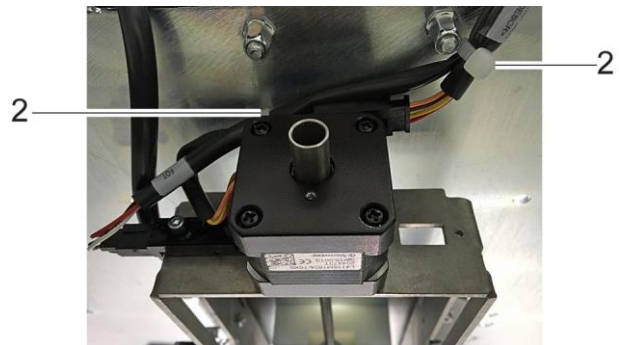
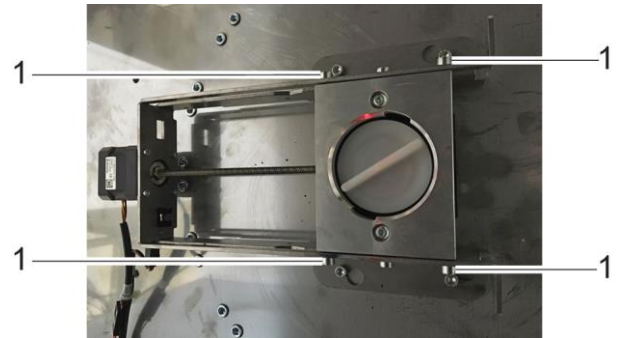
- Close tap upstream of filter (1).
- Set a can under the filter bottom end (2).
- Loosen the filter holder cap using a 22 mm wrench (3).
- Remove filter and flush with running water to clean it.
- Refit filter and its screw cap, then work on tap to open the circuit.
- At the end of the cleaning procedure, restart the machine by performing the necessary tank recirculation.



2.9. AUTOCAP GROUP REPLACEMENT

To replace the Autocap group proceed as follows:

- Remove the ties that retain the Autocap group wirings.
- Disconnect the electric connectors that connect the group to the machine.
- Loosen the 4 M5X16 socket head screws + D5 washers (1) that keep the Autocap group in position and fixed to the machine central plate.
- Rotate the block clockwise and remove it from the machine.
- Position the new Autocap group by inserting it from the bottom to the top and rotating it counter-clockwise to block it on the screw heads.
- Tighten the 4 M5X16 socket head screws.
- Reconnect the previously disconnected wirings by fixing them with plastic ties (2) as shown in the figure.



2.10. REPLACING THE AXIS MOVEMENT COMPONENTS (MOTOR, LIMIT SWITCH SENSORS, PINION)

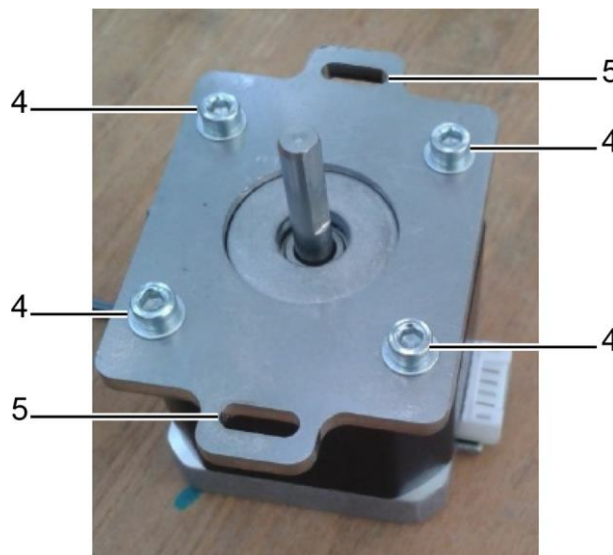
In case of a fault in the X and Y axes movement and thus in the passive gripper, it is necessary to replace one or more components that form this machine's group.

To replace the Y axis motor, or the relevant toothed gear, proceed as follows:

- Bring the motor to the end of its stroke on front door side.
- Disconnect the electric connection by removing any wire ties.
- Loosen the two hex. socket head cap M3x12 screws (1) securing the motor support to the Y axis.

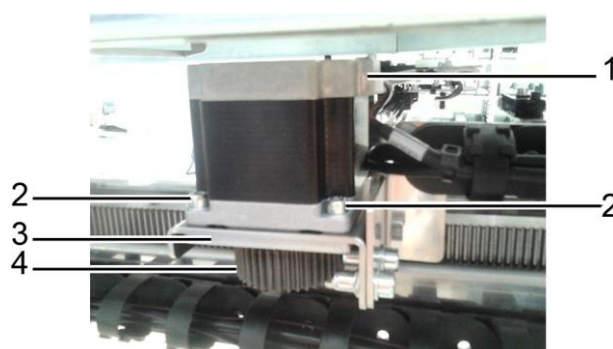


- Remove the toothed gear (2) by loosening bushing M5x6 retaining dowels (3).
- Remove the 4 hex. head socket head cap M3x8 screws (4) to release motor from support.
- Remove the motor and install the new one, by refitting the motor support and toothed gear in their positions.
- Refit the support in its original position using screws (1), previously removed. In this phase, adjust the support position using the slotted holes (5) so that the sliding along the rack is neither too hard nor too smooth.
- Restore the electric connections and fix the cables to the axes structure by means of ties.



To replace the X axis motor, or the relevant toothed gear, proceed as follows:

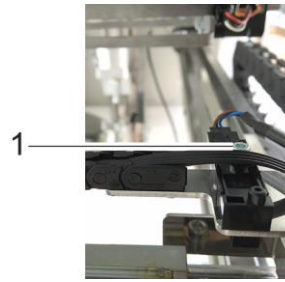
- Remove the rear lower panel to reach the structure of the X axis.
- Disconnect the electric connections (1) of the motor to be replaced.
- Loosen the 4 M4X12 socket head screws + D4 washers (2) that fix the motor to the structure.
- Remove the X-axis motor removing at the same time the threaded plate (3) from the lower side of the Y axis.
- Remove the toothed gear (4) by loosening bushing M5x6 retaining dowels.
- If necessary, replace the toothed gear, or refit it on the new motor.
- Fit the new motor by re-positioning the previously removed threaded plate using the no.4 M4x12 socket head screws + D4 washers.
- Before tightening screws, adjust motor position using the slots on the support so that the sliding along the rack is neither too hard nor too smooth.
- Restore motor electric connections and fix the cables with ties.
- Fit the rear lower panel of the machine with 9 M6X12 screws + split washers.



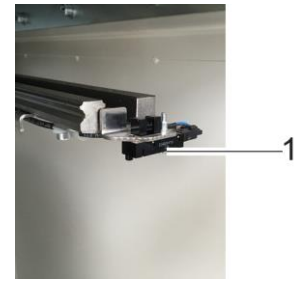
In case of malfunction of the optical sensors on the axes moving components, it is necessary to replace one or more of said sensors.

To replace the 4 limit switch sensors on the axes moving components proceed as follows:

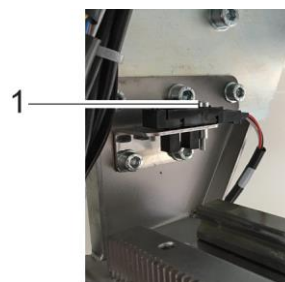
- remove the rear lower panel of the machine as described in paragraph 2.1.1. (operation not necessary if the area where you want to work can be accessed through the front doors).
- Find the sensor to be removed: Y_Home, Y_End, X_Home, X_End.
- Remove any tie that retains the wiring of the sensor to be replaced to the relevant support structure.
- Disconnect the wiring connector and loosen the M3X20 socket head screw + D3 washer (1) to release the sensor from the relevant support structure.
- Remove the faulty sensor and replace it with a new equivalent one.
- Use the previously removed M3x20 socket head screw to fix the new sensor to the support and restore the electric connections. Use ties to properly fix the wiring to the moving component structure so as to prevent it from interfering with the component's movement.
- Reposition the rear lower panel and fix using 9 M6X12 socket head screws with the previously removed toothed washers in their original position.



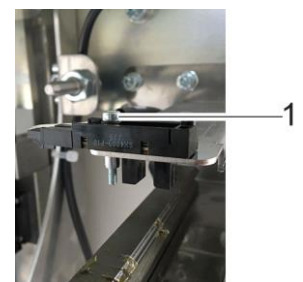
Y Home



Y End



X Home

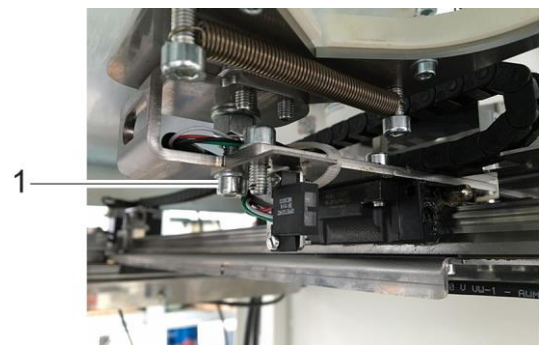


X End

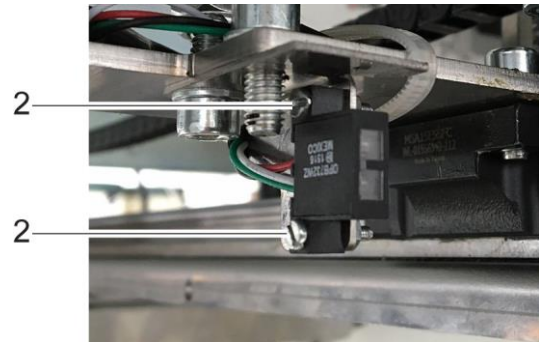
In case of malfunction in the can detection it is necessary to replace the reflective sensor on the machine's passive gripper.

To replace this sensor proceed as follows:

- open both front doors to access the area to work in.
- Manually move the machine's gripper to the front side of the machine.
- Disconnect the connector on the reflective sensor and remove the ties that retain the sensor wiring.
- Loosen the M5X12 socket head screw + D5 washer (1) and remove the supporting bracket of the reflective sensor.

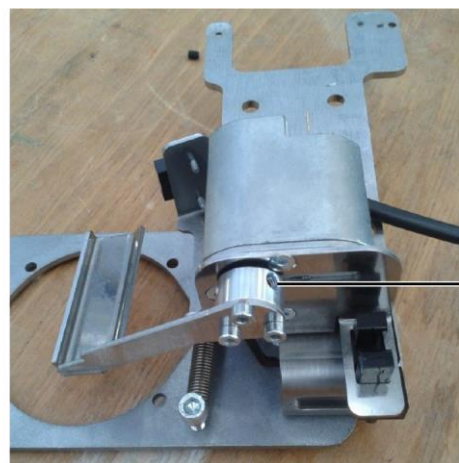


- Remove the support and the reflective sensor to be replaced by loosening 2 M2X10 screws + M2 nuts (2), then replace the sensor and fit the support back in its seat.
- Fix the supporting bracket with the previously removed M5x12 screw to the gripper structure.
- Reconnect the connector to the previously disconnected wiring.
- Fix the wiring with plastic ties to prevent it from interfering with the axes moving components.
- Close the front doors to restart the machine.



2.10.1. REPLACING THE CAN LIFTING DC MOTOR

- Disconnect motor electrical connections.
- Remove blade from DC crankshaft, loosening the three M4x5 dowels (1).



- Loosen the three M3x10 hexagon socket countersunk head cap screws (2) to remove DC motor from its support.



- Replace the motor with a Alfa genuine spare part, securing it to support using the previously removed screws, then refit blade in its original position, tightening crankshaft dowels.

2.11. REPLACING THE CAN PICK-UP UNIT (MOTOR AND SENSORS)

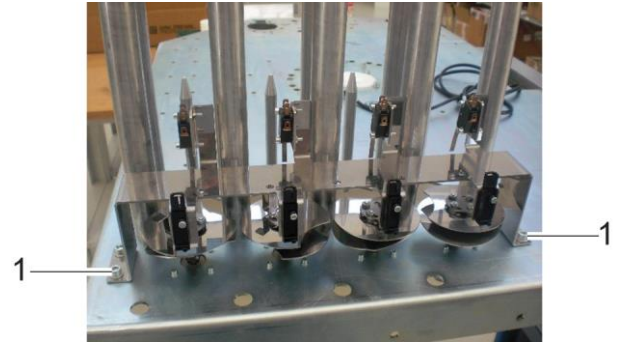
To replace the sensors of the can pick-up unit proceed as follows:

- switch the machine off (see paragraph 2.0.3) and open the front RH and LH doors.
- Remove the rear upper panel as described in paragraph 2.1.1 to better reach the working area.

2.11.1. REMOVING THE SENSOR SUPPORTING GROUP

If necessary, remove the entire sensor support as described below:

- disconnect the connectors of all sensor wirings of the can pick-up units and storages.
- Loosen the 4 M6X16 socket head screws (1) of the can pick-up unit support.
- Gently pull out the metallic support of the photocell sensors and micro-switches.



2.11.2. REPLACING THE SENSORS

- Remove the M3X20 socket head screws (2) to release the sensors to be replaced.
- Then install new equivalent sensors.

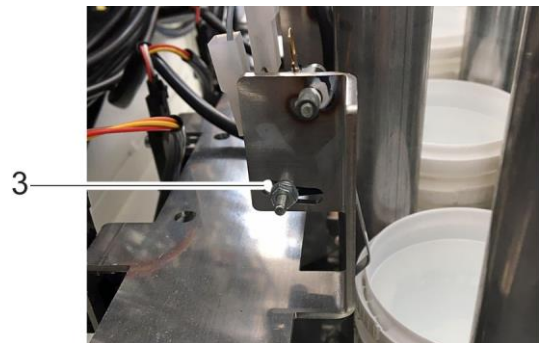
Pay attention to restore the micro-switches connections correctly (common contact and normally open contact). When the replacement is completed, refit the support and restore the electric connections by performing the removal operations described in paragraph 2.11.1 in the reverse order.

Fix the cables to the structure so that they do not interfere with the mobile component movement.



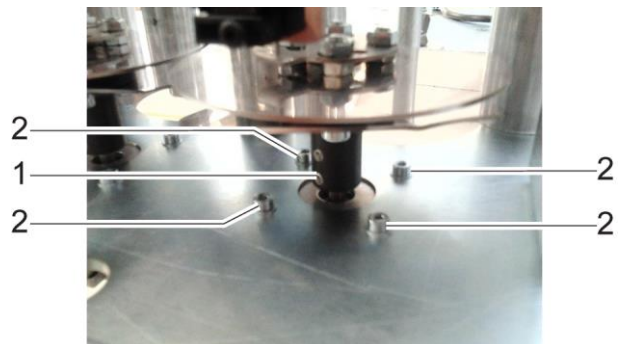
Note: the support of the reserve sensor of the cans storage has a slot (3) that allows recording the sensor inclination. To perform the adjustment, fix the sensor with an M3 screw – and an M3 nut on the support, then tighten them when you reach the position that allows the desired operation.

Note: the lever of the reserve sensor must be suitably bent.



To replace the motors of the can pick-up unit proceed as follows:

- remove the sensor support group as described in paragraph 2.11.1.
- Remove the can selector by loosening 3 M3x5 dowels on the motor shaft (1) and lifting upwards the pick-up unit consisting of two circular blades and the connection coupling.
- Then loosen 4 M3X8 socket head screws + M3 washers (2) of the motor to replace and support the motor on the lower side of the fixing surface.
- Fit the new motor and the previously removed components following the removal operations in the reverse order.



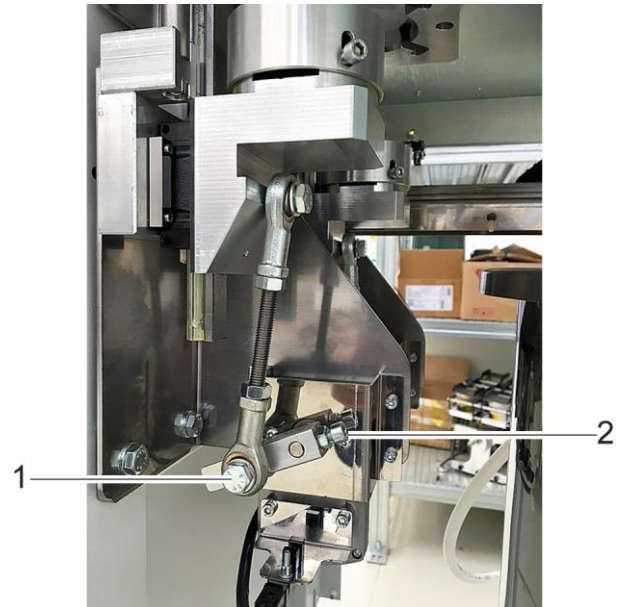
2.12.REPLACING THE CAPPING UNIT AND ITS COMPONENTS

To replace one or more motors of the can capping unit proceed as follows:

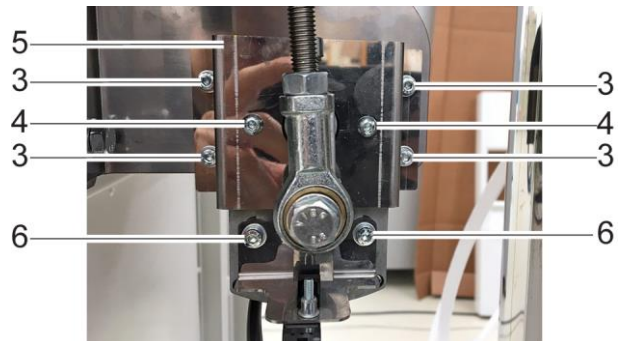
- switch the machine off (see paragraph 2.0.3) and open the front RH and LH doors.
- Remove the rear lower panel as described in paragraph 2.1.1 to better reach the working area.

2.12.1. REPLACING THE CAPPING MOTOR

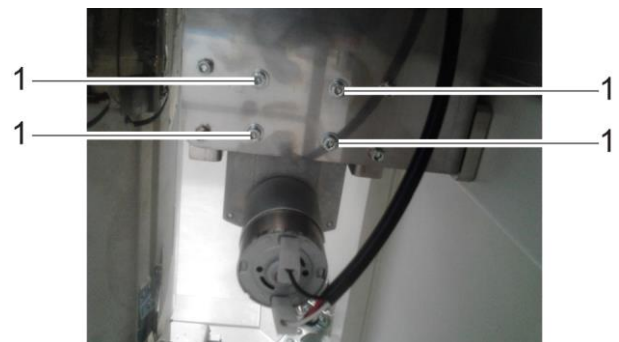
- To replace the motor, first disconnect the wirings.
- Loosen the M8X25 bolt (1) that retains the connecting rod of the capping unit to the motor, using a 13-mm wrench.
- Then loosen also the M5 (2) screw that retains the motor shaft to the rotary motion driving arm.
- Push the capping unit upwards and move the connecting rod to the side until it is possible to slide the arm out of the motor.



- Loosen the 4 M4X6 screws + D4 washer (3) and the two button head screws (4), then remove the metallic protection underneath (5).
- Loosen 2 M5 screws that fix the sensor support (6) to the motor.



- Proceeding from the rear side of the capping unit, loosen the 4 M4X6 screws + D4 washer (1) to release the motor to be replaced.
- Gently remove the motor and fit the new one in its seat.

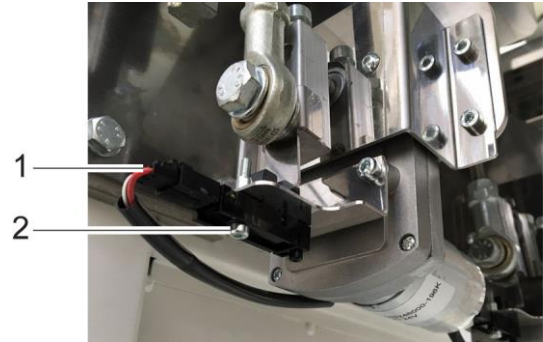


Perform the removal operations in the reverse order to restore the unit and machine operation.

To replace the sensors of the can capping unit proceed as follows:

2.12.2. REPLACE THE CAPPING HOME PHOTOCELL

- To replace the capping home sensor, disconnect the wiring connector (1) and loosen the M3X20 socket head screw + D3 washer (2) to release the sensor from the relevant support structure.
- Use the previously removed M3x20 socket head screw to fix the new sensor to the support and restore the electric connections.
- Use ties to properly fix the wiring to the moving component structure so as to prevent it from interfering with the component's movement.



2.12.3. REPLACING THE STORAGE RESERVE SENSOR

- To replace the lids storage reserve sensor, disconnect the wirings and remove the M3x20 socket head screws (2) to release the sensors to be replaced.
- Then install new equivalent sensors.

Pay attention to restore the connections in the correct contacts (common contact and normally open contact). Fix the cables to the structure so that they do not interfere with the mobile component movement.



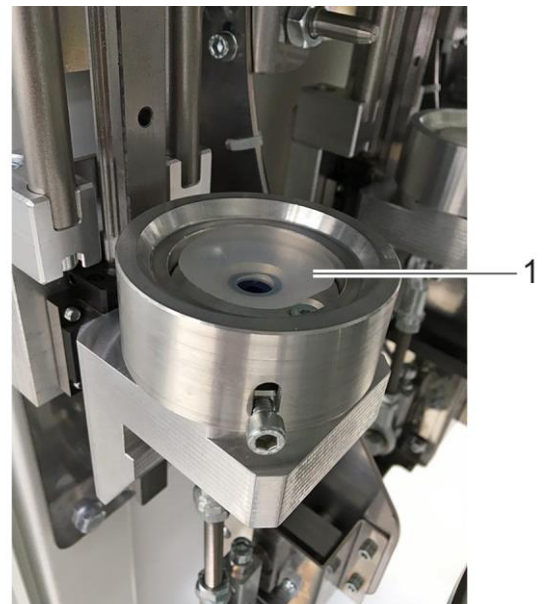
2.12.4. REPLACING THE CAPPING SUCTION CUP

Another component that may need a preventive replacement or a replacement in case of malfunction is the capping suction cup. Proceed with the replacement as described below:

- switch the machine off (see paragraph 2.0.3) and open the front RH and LH doors.
- Remove the damaged suction cup (1) by slightly pulling it upwards until removing it from its seat.
- Fit the new suction cup in the relevant seat by gently pressing it downwards.
- Check the correct operation of the can suction cup.

To simulate the capping operation, use the “Diagnostic” software (see chapter 5).

Use the hold-to-run push-button to enable the movements with open doors (see paragraph 2.0.7).



3. ELECTRIC REPAIRING OPERATIONS

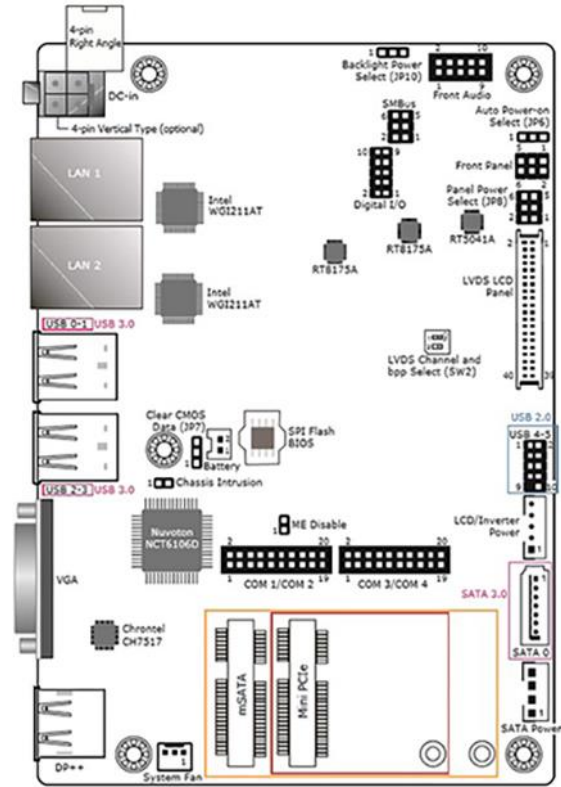
3.1. DIAGNOSIS AND ELECTRONIC PART DESCRIPTION

3.1.1. PC LINUX BOARD

The machine is provided with a Linux PC board on which the high-level machine software is memorised.

The Linux PC board receives the Ethernet connection from the LAN1 port and is internally connected to the MAB board via RS-232. The Linux board has RS-232 and USB ports necessary to connect some accessories like the scale.

The Linux PC board is powered with 12V.



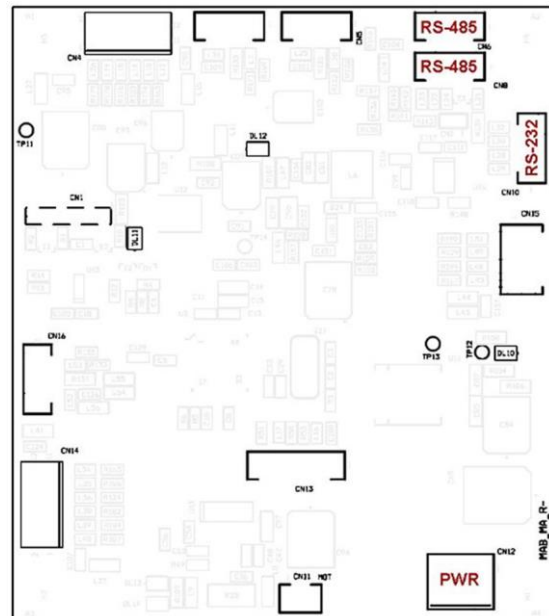
3.1.2. MAIN AUTOMATION BOARD (MAB)

The machine management firmware MAB board is saved on the MAB board. The orders sent by the high-level software are managed at MAB level. This board organises the machine cycle by interrogating and sending orders via RS-485 to the slave boards of the single circuits.

The MAB board is supplied with 24Vdc.

The MAB board controls directly:

- the can presence reflective photocell



3.1.3. SCCB BOARD

Each circuit (colorants, bases, storages, Cartesian axes and autocap) is managed by a dedicated SCCB board addressed according to the machine configuration set in the software.

Each board is powered with 24 V (two separate lines for logics and power) and 48V, controls the digital sensor inputs and integrates the control drivers of two DC 24V peripheral units (DC motor stirring and/or electrovalves) and of one stepper motor.

The board generates the necessary on-board service voltage. To facilitate the diagnosis, each power supply features a status LED (on = power connected):

DL11 = 3.3V

DL12 = 5V

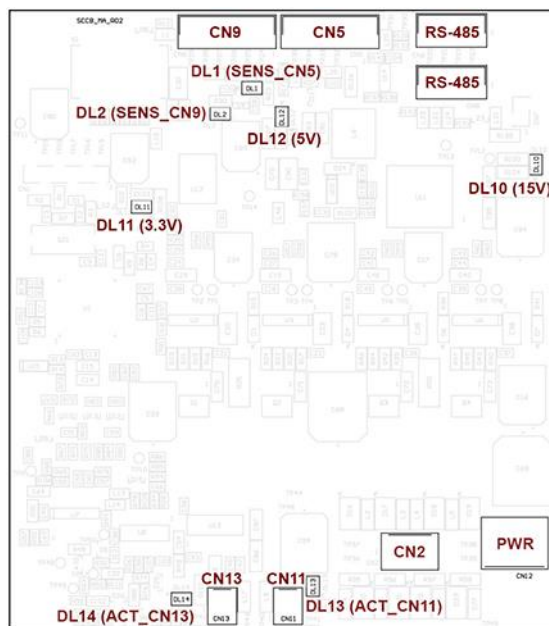
DL10 = 15V

In case one or more power supply LEDs is OFF, check the fuse relevant status (see para. 3.2).

Likewise, the DC MOT (CN13) and EV (CN11) outputs have a status LED that indicates when they are powered.

Following is a list of the controls of each SCCB board:

CN1 connector is always used for programming and updating the firmware via PICKIT (see chapter 4 – PROGRAMMING THE ELECTRONIC BOARDS).



CIRCUIT	CN2	CN5	CN6	CN8	CN9	CN11	CN12	CN13
BASE 1	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
BASE 2	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 1	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 2	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 3	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 4	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 5	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 6	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 7	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 8	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 9	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 10	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 11	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 12	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
X	STEPPER	HOME PHOT.	RS485	RS485	TOT.PHOT.		PWR	
Y	STEPPER	HOME PHOT.	RS485	RS485	TOT.PHOT.		PWR	
CAN STORAGE 1	STEPPER	HOME PHOT.	RS485	RS485	RESERVE		PWR	
CAN STORAGE 2	STEPPER	HOME PHOT.	RS485	RS485	RESERVE		PWR	
CAN STORAGE 3	STEPPER	HOME PHOT.	RS485	RS485	RESERVE		PWR	
CAN STORAGE 4	STEPPER	HOME PHOT.	RS485	RS485	RESERVE		PWR	
LIDS STORAGE 1		HOME PHOT.	RS485	RS485	RESERVE		PWR	DC CAP
LIDS STORAGE 2		HOME PHOT.	RS485	RS485	RESERVE		PWR	DC CAP
AUTOCAP	STEPPER	HOME PHOT.	RS485	RS485			PWR	

3.1.4. SPB BOARD

The SPB board is powered with 24V and produces a 12Vdc on-board voltage, these values are necessary for Linux board, printer and payment system (if any) operation (see figure at the side).

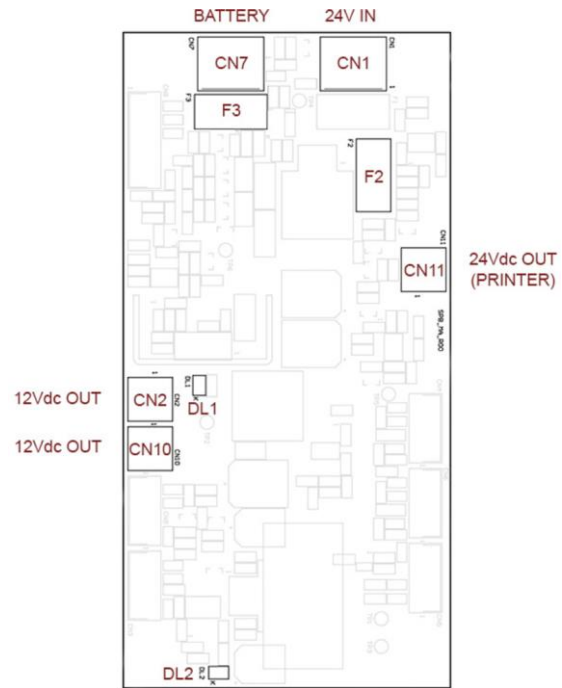
In case of machine switching off or problems to the electric mains (interruptions or voltage dips), the SPB board keeps the Linux board powered at 12V for the time required for the operating system controlled shut-down.

A NI-MH, 16.8V - 1800mAh battery, featuring an internal safety PTC and connected to the board on CN7, is used for the 12V voltage storage function.

The board features two inner fuses:

- F2=0.5A on the charge branch (protection against a charge current above the maximum value tolerated by the battery);
- F3=2.5A on the battery (protection in case of excessive absorption).

DL1 and DL2 LEDs indicate the presence of 12V and 5V, respectively.



3.2. CHECKING AND REPLACING THE NETWORK FUSES

In case of mains malfunction or problems, the safety fuses could blow and cut power.

Fuses are located in the fuse holder built in the plug with switch on the back panel (see para. 1.1.2).

To replace the interrupted fuse open fuse holder using a flat screwdriver to prise it open.

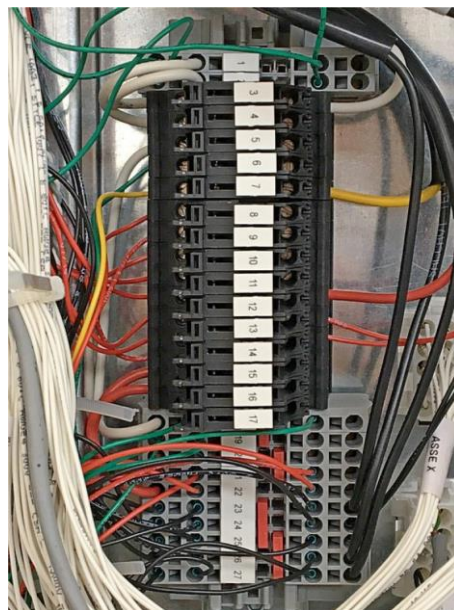
Remove the fuse and its holder and install a new fuse.

	<p>USE ONLY FUSES OF THE SAME TYPE AND THE NOMINAL RATING SHOWN IN THE PRODUCT LABEL.</p> <p>Fuse requirements: EU - IEC 60127 Approval US - UL248-1 and UL248-14 Approval</p>
--	--

3.3. REPLACING THE SECONDARY CIRCUIT FUSES (INTERNAL TERMINAL BOARDS)

In case of malfunction or faults, the safety fuses could interrupt the output power supply of the terminal boards. The fuses are located on the terminal boards located inside the electric panel (see para. 2.1.2.2).

- In order to replace the fuses, proceed as follows:
- make sure the machine is disconnected from the power supply as described in para. 2.0.3.
- Remove the side panel as shown in paragraph 2.1.2 and find the fuse-holding terminal boards.



- Find the circuit of the interrupted power supply line and take a fuse with a correct rating according to the diagram to the side.

1			48V X-Y
2			48V B1-B2
3	5x20mm F2,5A 250Vac		48V B1-B2
4	5x20mm F2,5A 250Vac		48V X-Y
5	5x20mm F2A 250Vac		48V CONTAINERS
6	5x20mm F4A 250Vac		48V COLORANTS
7	5x20mm F2A 250Vac		12V LINUX
8	5x20mm F1,5A 250Vac		24V PRINTER
9	5x20mm F4A 250Vac		24V COLORANTS
10	5x20mm F150mA 250Vac		24V MAB
11	5x20mm F1A 250Vac		24V X
12	5x20mm F1A 250Vac		24V Y
13	5x20mm F1A 250Vac		24V B1
14	5x20mm F1A 250Vac		24V B2
15	5x20mm F1,5A 250Vac		24V AUTOCAP
16	5x20mm F1,5A 250Vac		24V T1-T2
17	5x20mm F1A 250Vac		48V CONTAINERS
18			48V CONTAINERS
19			24V CONTAINERS
20			24V CONTAINERS
21			24V T1-T2
22			24V T1-T2
23			GND
24			
25			
26			
27			

- Lift the fuse holder until it is possible to manually remove the damaged fuse.
- Insert the new fuse in the fuse holder.
- Close the fuse holder by slightly pressing on it.
- Reposition and fix the machine rear panel using the previously removed screws.

WARNING: use only fuse of the same type and with the same nominal rating specified by the manufacturer.

3.4. REPLACING THE POWER SUPPLY UNITS

In case of an electric fault in one or more power supply units of the machine, proceed as follows to replace them:

- make sure the machine is disconnected from the power supply as described in para. 2.0.3.
- To reach the power supply unit compartment remove the rear panel as described in paragraph 2.1.1. to reach the electric panels, then remove the internal protections as described in paragraph 2.1.2.
- Disconnect the wiring between the power supply unit to be replaced and the rest of the machine.
- Remove the power supply unit by fitting a small flat screwdriver in the suitable retaining tab and remove the unit from the DIN bar.
- Fit the new power supply unit manually on the DIN bar.
- Reconnect the power supply unit to the wiring according to the attached wiring diagram.
- Reposition the previously removed protection panel.

WARNING: use only genuine spare parts supplied by the manufacturer.



3.5. REPLACING THE MAX BOARD

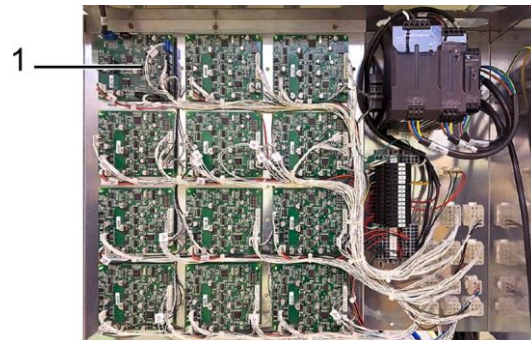
To replace the MAB boards, proceed as follows:

- make sure the machine is disconnected from the power supply as described in para. 2.0.3.
- Remove the rear panel as described in paragraph 2.1.1. to reach the electric panels, then remove the internal protections as described in paragraph 2.1.2.
- Disconnect the power supply and signal cables from the board (1) to be replaced.
- Remove the board by releasing it from the plastic supports on its corners.
- Insert a new board on the supports having care not to damage its components.

WARNING: Use an already programmed board or the suitable programmer to install the correct firmware. To reprogramme the boards refer to chapter 4.

- Restore the electric connections.

MAKE SURE THAT THE TERMINATION JUMPER ON CN7 (2) IS PRESENT ON THE NEW BOARD.



3.6. REPLACING THE SCCB BOARD

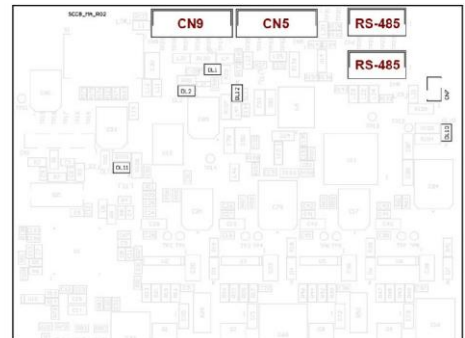
- make sure the machine is disconnected from the power supply as described in para. 2.0.3.
- Remove the rear panel as described in paragraph 2.1.1. to reach the electric panels, then remove the internal protections as described in paragraph 2.1.2.

Find the SCCB board to be replaced by referring to what is indicated in paragraphs 2.1.2.2 and 2.1.2.3, then proceed as follows.

- Disconnect the power supply and signal cables from the board.
- Remove the board by releasing it from the supports (1) on its corners.
- Insert a new board on the supports having care not to damage its components.

WARNING: Use a board already programmed with the function of the replaced board. To reprogramme the board refer to chapter 4.

- Restore the previously disconnected connections according to the wiring diagram.



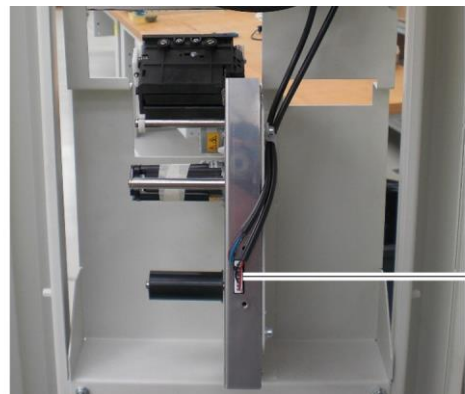
MAKE SURE THAT THE TERMINATION JUMPER ON CN7 (2) IS NOT PRESENT ON THE NEW BOARD.

3.7. REPLACING THE PRINTER

If the problems of label printing can not be solved with the ordinary maintenance operations, it is necessary to replace the printer.

To replace the printer proceed as follows:

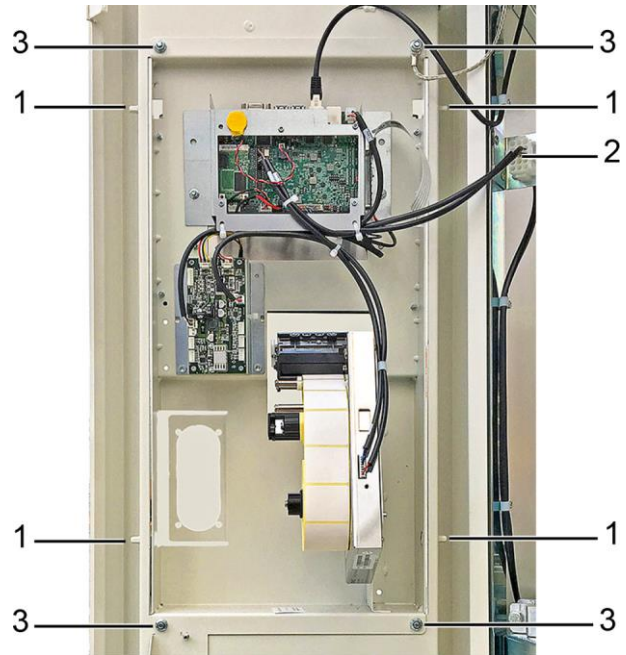
- disconnect connector (1) located between the PC unit and the printer. It is easy to see it on the machine left side door.
- Loosen the 4 M4X12 socket head screws + D4 washer + D5 washer for screw (1), having care not to damage the wiring fixed to the upper left screw of the printer support.
- Position the new printer on the relevant support using the just removed 4 M4X12 socket head screws + D4 and D5 washers.
- Pay attention to reposition the wiring in the suitable retainer on the support upper left corner.
- Reconnect all connectors of the wirings between printer and PC unit.



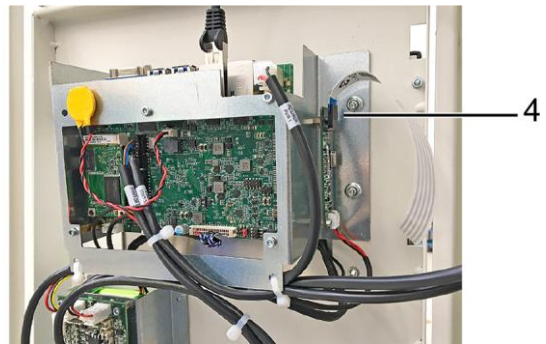
3.8. REPLACING THE LINUX PC BOARD/DISPLAY UNIT

In case of malfunction replace the PC – display unit as follows:

- open both doors (left and right) of the machine.
- Remove the external cover of the LH door by loosening the 4 M5X16 socket head screws + D5 washers (1) on the panel external corners.



- Disconnect the connector between PC and display (4), as shown in the figure and the power supply wiring of display (5).



- Remove the display by loosening the 4 M3X12 socket head screws + D3 washers and the relevant nuts (6) located on the corners of the display. Take care not to pull the wirings at the back!
- Disconnect the connectors located on display rear side.



- To remove the PC board, use a 2.5mm Allen wrench to loosen the M3x6 screws (7) securing the stud bolts (integral with the board) to the metal support (8).



Reassembly:

- Replace the damaged components and refit the display and the PC board using the previously removed screws and nuts; then restore all the electric connections.

3.9. REPLACING THE SPB BOARD AND THE BATTERY

If any repair operation is required, replace the parts as follows:

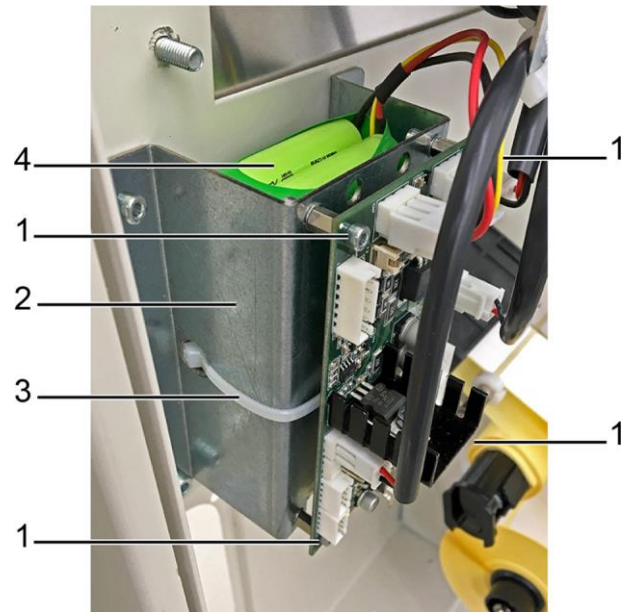
Board replacement

- Loosen the 4 M3x6 retaining screws (1) to release board from support (2), then disconnect wirings and proceed to replacement.

Battery replacement

- Use a cutter to cut tie (3) securing battery (4) inside support;
- Disconnect battery and replace it with the spare one;
- Secure battery to support using a new tie.

NOTE: FOR REPLACEMENT, USE ONLY GENUINE SPARE PARTS SUPPLIED BY THE MANUFACTURER



3.10. REPLACING THE PAYMENT SYSTEM

In case of any problems to the payment system (optional), contact the Alfa technical service and request the replacement with a genuine spare part.

3.11.LTE ROUTER SETTINGS

When a hard-wired ethernet network is not available, it is still possible to obtain a remote connection to the machine via an LTE Router.

A VPN client - duly installed and set up - is necessary to connect to the machine.

3.11.1. CONNECTION VIA VPN CLIENT ON WINDOWS 7 AND 10

To install the VPN Client, proceed as described below:

- Open an internet browser at <https://openvpn.net/index.php/open-source/downloads.html>
- Click “openvpn-install-2.4.4-l601.exe” (1) and download the file.

Please note that OpenVPN 2.4 installers *will not* work on Windows XP.

If you find a bug in this release, please file a bug report to our [Trac bug tracker](#) first, either using the [openvpn-devel mailinglist](#) or the developer IRC channel (help take a look at our official [documentation](#), [wiki](#), [forums](#), [openvpn-users mailing list](#) or [irc.freenode.net](#)).

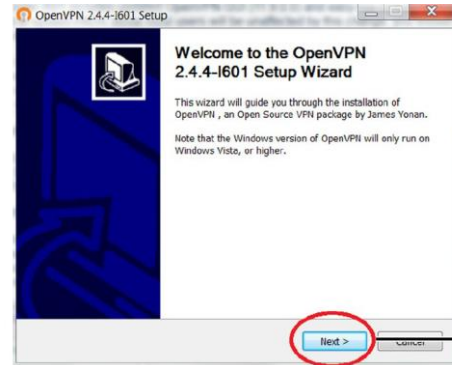
Source Tarball (gzip)	openvpn-2.4.4.tar.gz	Gn
Source Tarball (xz)	openvpn-2.4.4.tar.xz	Gn
Source Zip	openvpn-2.4.4.zip	Gn
Installer, Windows Vista and later	openvpn-install-2.4.4-l601.exe	Gn

1

NOTE: the GPG key used to sign the release files has been changed since OpenVPN 2.3.13, as well as the new GPG public key are available [here](#).

We also provide static URLs pointing to latest releases to ease automation. For more information see [here](#).

- Open the downloaded file, then press “Next” (2) on the following screen page.



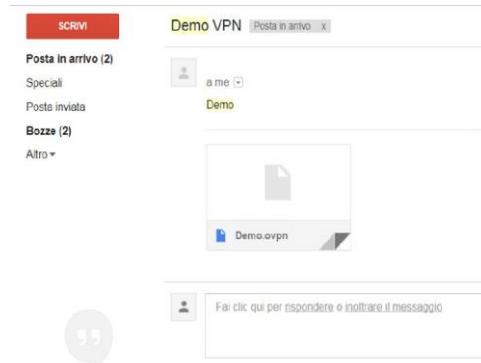
2

- Check the boxes indicated in the figure on the side, then press “Next”.

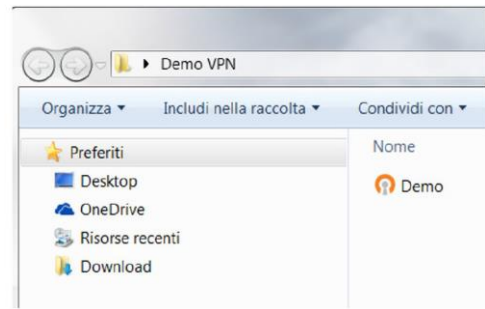


To connect to the machine via the VPN Client, proceed as described below:

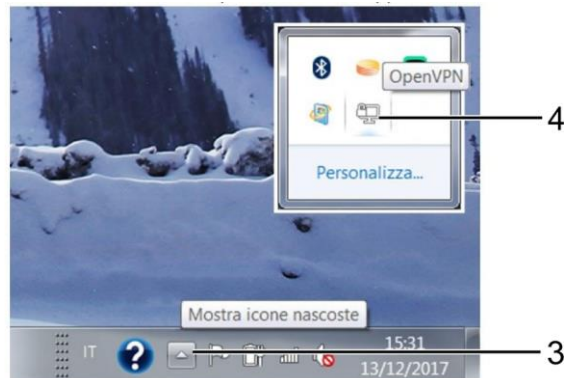
- Download the file containing the login credentials sent by Alfa via email.



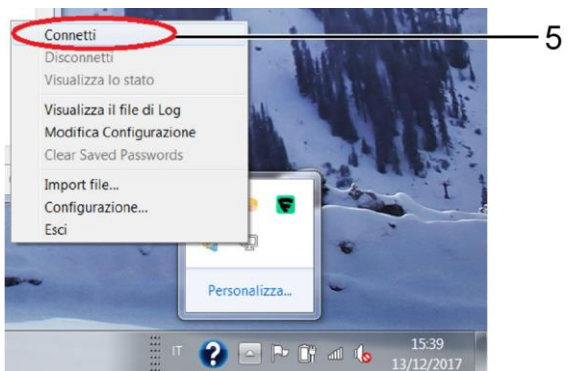
- Save the file containing the credentials in C:/programs/OpenVPN/Config
- Make sure you save it as an “.opvn” file.



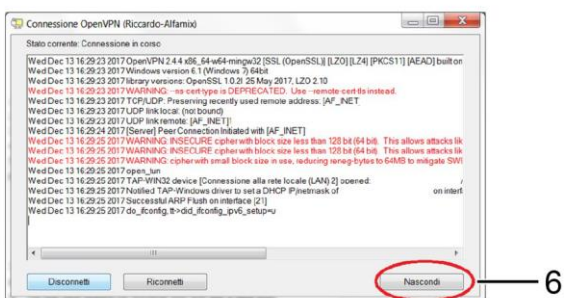
- On Windows Toolbar, click the arrow icon “show hidden icons” (3) then find the icon “OpenVPN” (4) in the pop-up.



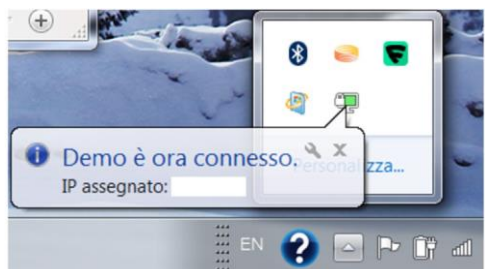
- Right click on the icon and select “Connect” (5);



- Press “Hide” (6) to close the following page;



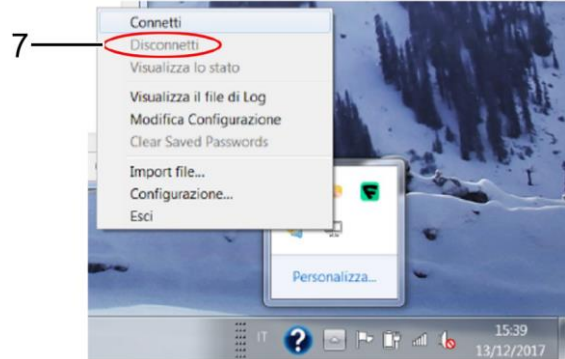
- After a few seconds a new pop-up will open on the toolbar, near the clock indicating that the PC is connected. This window could close automatically, while the OpenVPN icon will become green.



- To connect to the machine, open your internet browser.
- In the address bar, enter the IP address of the machine you wish to establish connection with, usually indicated on the LTE router.
- Enter the login credentials given by Alfa.



To disconnect from the machine, right click on OpenVPN icon and select “Disconnect” (7).



3.11.2. CONNECTION VIA VPN CLIENT FROM ANDROID DEVICES

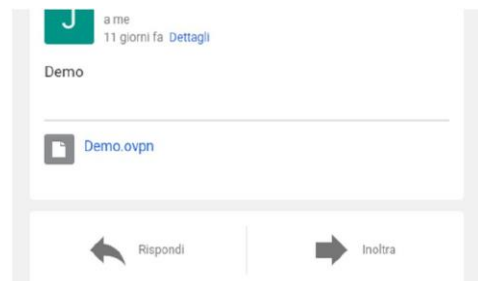
To install the VPN Client, proceed as described below:

- From the Home screen of your device, open Play Store.
- In the search bar, type “openvpn for android”.
- Click the green button (1) to install the application.

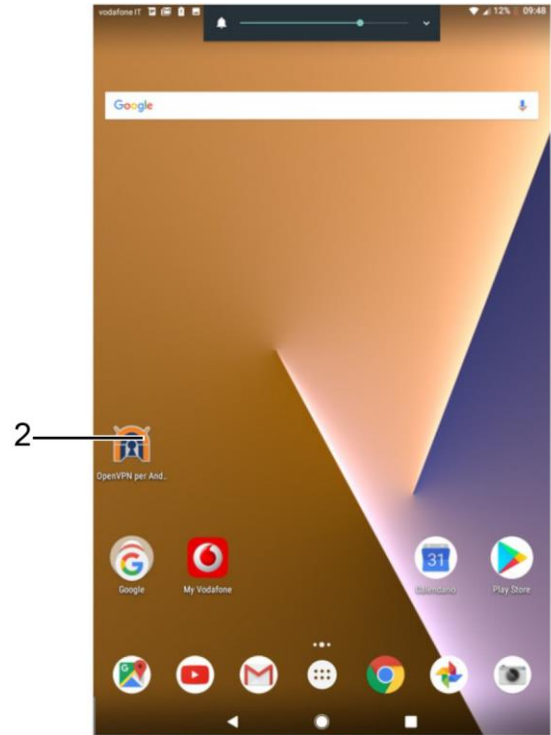


To connect to the machine via the VPN Client, proceed as described below:

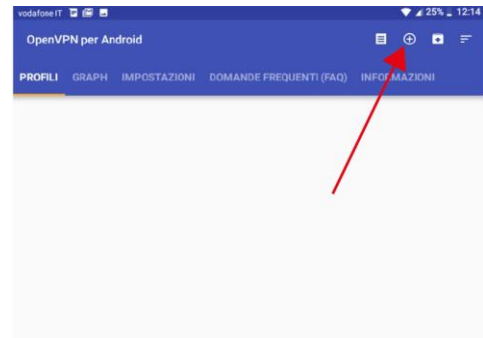
- Download the file containing the login credentials sent by Alfa via email.



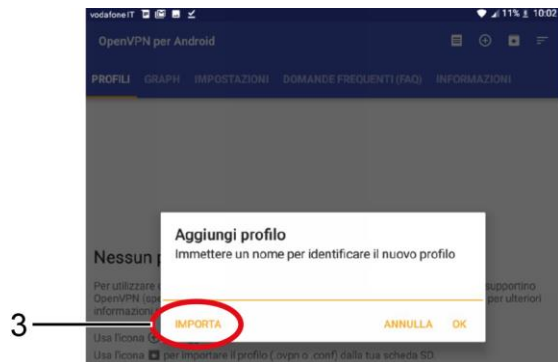
- Run the app OpenVPN (2) previously installed.



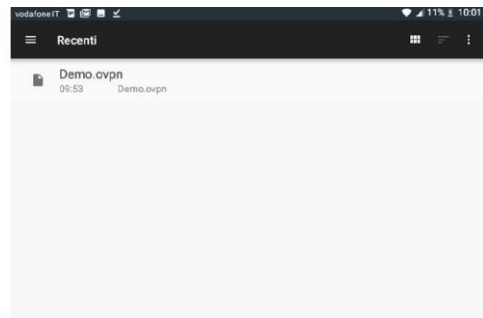
- Press symbol “+” present on the bar at top right of the app screen.



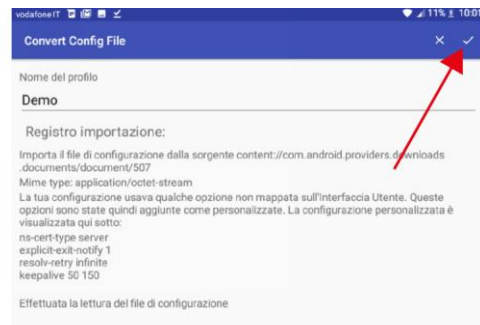
- Press “Import” (3).



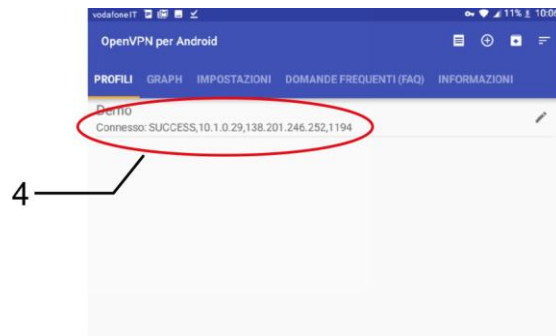
- Select the “.ovpn” file previously downloaded;



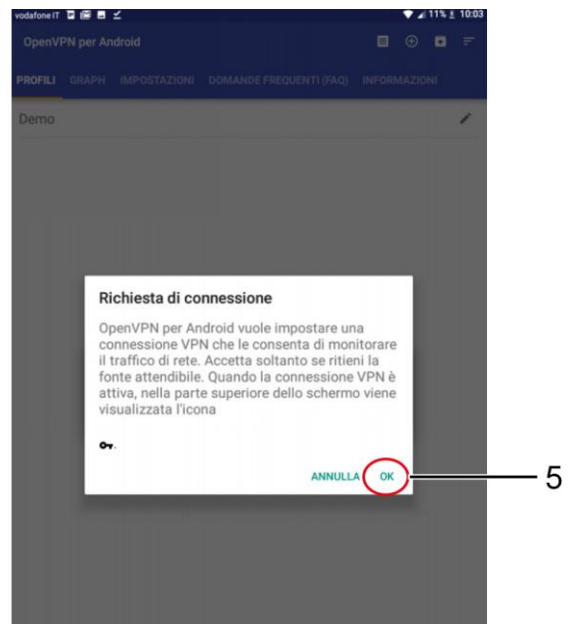
- Press on the check mark in the top right corner;



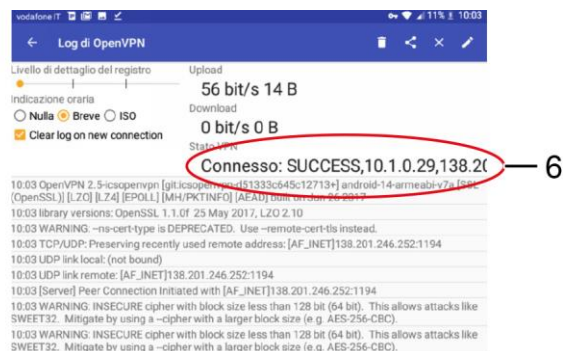
- Press on the just-added file (4).



- Press OK (5) on the next window.



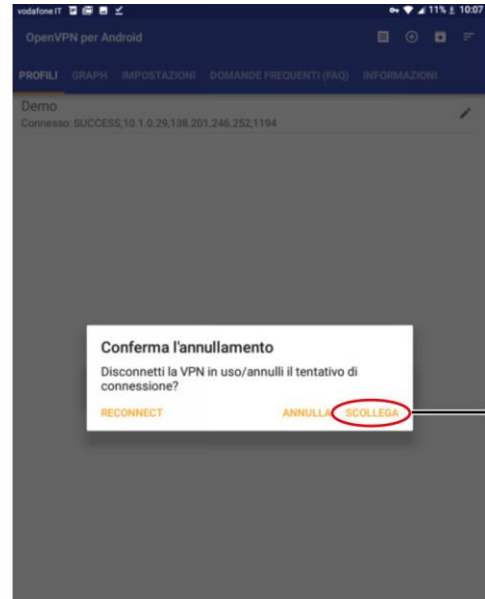
- Now the VPN status must be “Connected” (6).



- To connect to the machine, open your internet browser.
- In the address bar, enter the IP address of the machine you wish to establish connection with, usually indicated on the LTE router.

Enter the login credentials given by Alfa.

- To disconnect from the machine, open the app OpenVPN, then select the “Profiles” menu and press “Disconnect” (7).



4. PROGRAMMING THE ELECTRONIC BOARDS

Depending on board version, programming can be carried out in either of two different methods:

- Boards with no bootloader (programming via PICKit): see paragraph 4.1
- Board with bootloader: see paragraph 4.2.

4.1. PROGRAMMING OF BOARDS WITH NO BOOTLOADER

4.1.1. PROGRAMMING DEVICES

Each SCCB board must have the dedicated firmware. For the SCCB boards, the firmware depends on the group to control.

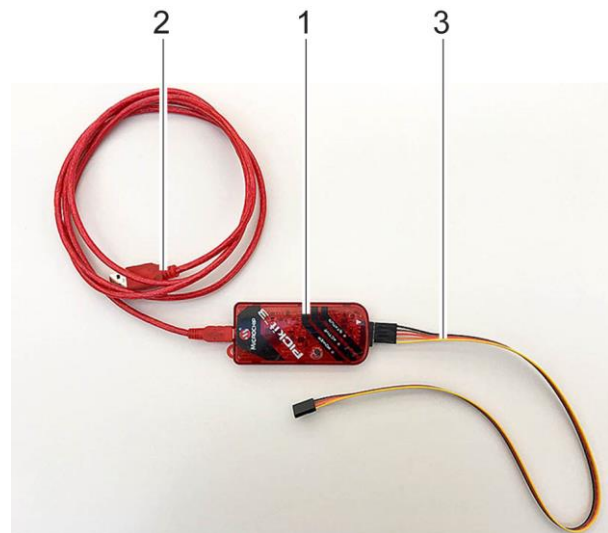
To programme the boards, use a suitable USB programmer (1) and the MPLAB IDE programming software.

If you do not have the suitable programmer, contact the Alfa technical service.

The programmer uses a USB cable (2) for the connection to the PC.

It could be useful to use an extension (3) to connect the programmer to the boards positioned in points that are hard to reach.

NOTE: The boards can be programmed both on the machine and on the bench. To programme the boards they must be powered by means of CN12 connector. If you use the previously programmed boards for other functions it is recommendable to disconnect the RS-485 serial connectors before powering the machine.





4.1.2. INSTALLING THE MPLAB IDE SOFTWARE

The MPLAB IDE programming software can be downloaded from the reserved area of the website www.alfadispenser.com or from the download area of the website <http://www.microchip.com>. The software can be installed on a Windows, Linux or Mac PC.

4.1.3. PROGRAMMING WORKSPACE

To write the firmware it is necessary have a programming workspace to upload in the MPLAB IDE software as better described below.

The programming workspaces are different for the SCCB (4) boards and the MAB (5) board.

-  Actuators_release_PICKIT3.mcw ——— 4
-  MABrd_Release_PcKit3.mcw ——— 5

4.1.4. PROGRAMMING THE BOARDS

Download the workspace and the last available firmware version from the Alfa website reserved area, or contact the Alfa technical service to receive the firmware. If you do not have the credentials to access the reserved area, contact the Alfa technical service.

SCCB: according to the group to which the board must be connected, the following firmware is available:

- up to 24 firmware versions (from c1 to c24) that can be used on max. 12 colorant groups of the machine*;
- up to 8 firmware versions (from b1 to b8) that can be used on max. 2 base groups of the machine*;
- Autocap group firmware;
- can container firmware (from container 1 to 4);
- lid can firmware (from cover 1 to 2);
- X-axis firmware;
- Y-axis firmware.

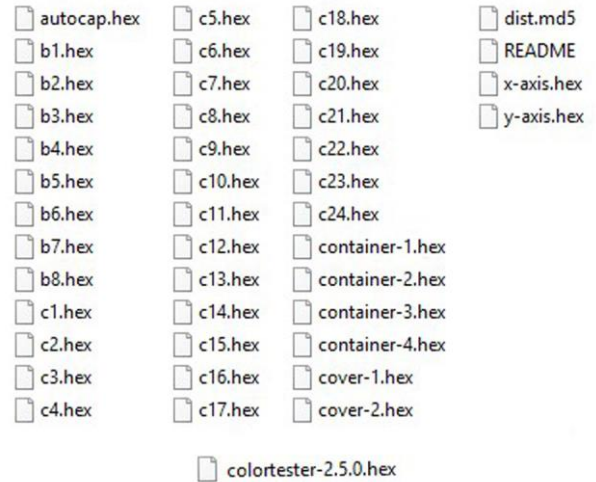
*: see the circuits enabled in the “Slave configuration” of the “Device-Machine” menu of the Admin interface. For further information consult the Software manual.

MABs and OTHER BOARDS:

MAB board Color Tester firmware;

SGBRDB board firmware (if present);

- Firmware of other optional boards (HUTBRD, SPB, etc.)



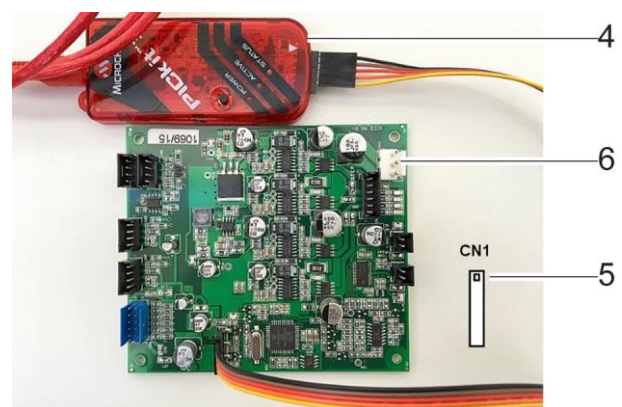
WARNING: CAREFULLY READ THE RELEASE NOTE TO CHECK THE FIRMWARE VERSION COMPATIBILITY

Connect the USB programmer, if necessary use an extension, to CN1 connector of the board to be programmed.

WARNING: Check that pin 1 of the programmer (4) is connected to pin 1 of CN1 connector (5)!

Power the board by connecting the CN12 connector (6) to the machine.

WARNING: do not connect the CN6 and CN8 connectors of the RS-485 communication to avoid problems linked with possible address conflicts.

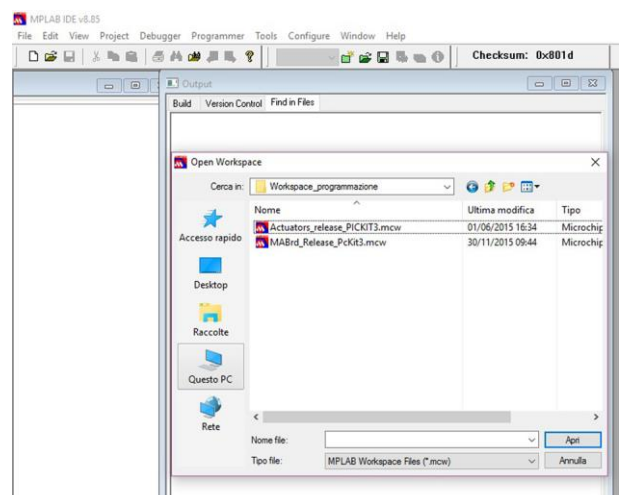


Launch the MPLAB IDE software

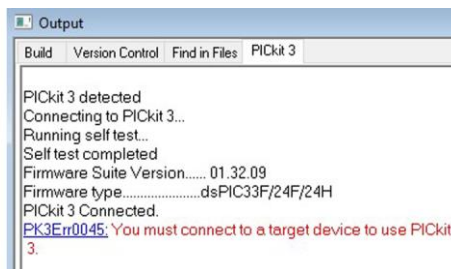
Access to “File – Open workspace...” and select the workspace of the board to programme (MAB or SCCB), then select Open. For the SGBRD board, use SCCB workspace.

WARNING: if you have connected a MAB board, upload the “MABrd” workspace, whereas if you have connected an SCCB board, upload the “Actuators” workspace (see para. 4.3).

If message “No PICkit 3 Connected” is displayed, it means that the programmer is not connected correctly.



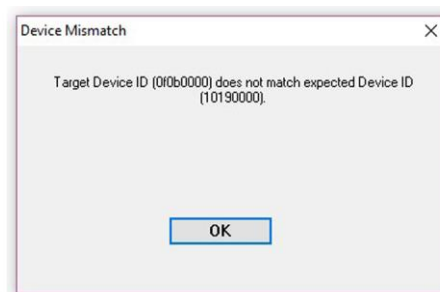
When the programmer is correctly connected and detected, the software will show the message “PICkit 3 detected”.



When connecting the board to the programmer and powering it, the software shows the message “Target Detected” besides the DEVICE ID of the connected board.

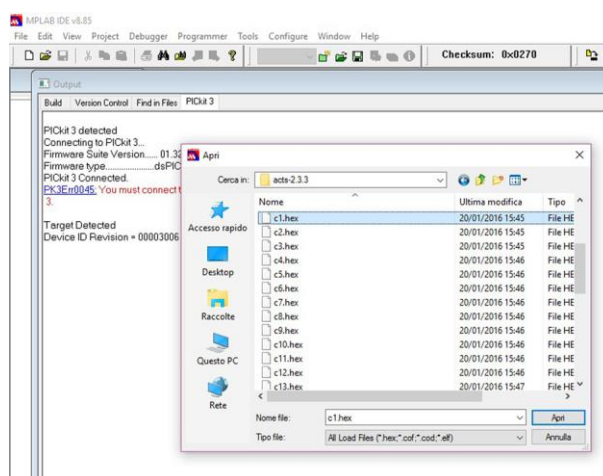


WARNING: If you upload a MAB Workspace and connect an SCCB board (or vice versa), the software will show the error “Target device ID does not match expected Device ID”.



When everything is ready, programme the board in “File – Import...” and select the suitable firmware version.

Select the suitable firmware version and select “Open”.

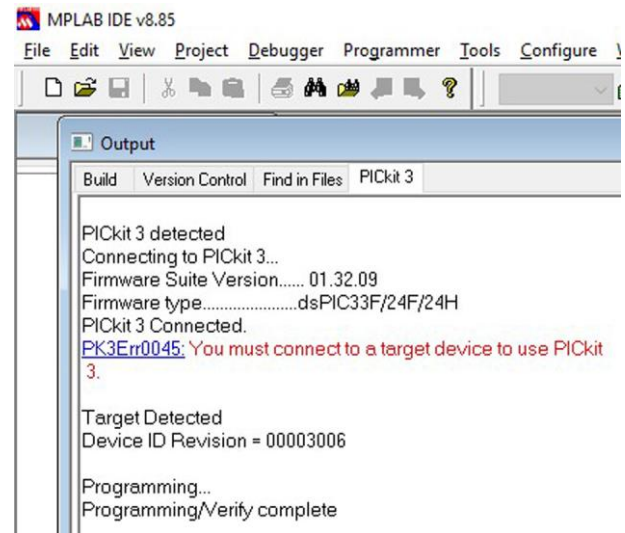


If the operation is completed successfully, the display will show the message “Loaded....”



Select “Program” in the “Programmer” menu to start the board programming.

At the end of the operation, the display will show the message “Programming/Verify complete”.



Now it is possible to disconnect the power supply and the programmer.

The board is ready to be used on the machine.

WARNING: Before programming a new board, make sure the loaded Workspace is the correct one. If this is not the case, go back to the “File – Open workspace...” menu and upload the new workspace.

4.2. PROGRAMMING OF BOARDS WITH BOOTLOADER

4.2.1. SOFTWARE “BOOTLOADERAPP”

The most recent boards are preloaded with BOOT firmware for the management of the BootLoader, i.e. the application that allows the updating of the machine control firmware.

NOTE: To program a board that does not feature preloaded BOOT, please contact Alfa technical service.

To program a hard-wired board via BootLoaderAPP, it is necessary to follow this procedure:


1. Shut off the machine;
2. connect the special cable Alfa USB BOOT LOADER (code 305001893) across CN13 connector of the MAB board and a USB port of the PC/LAPTOP on which the application BootloaderAPP.exe is installed;
3. run BootloaderAPP;
4. switch the machine on.

TO USE A MACHINE IN BOOT MODE, YOU MUST FIRST CONNECT THE USB CABLE FROM MAB TO PC / LAPTOP AND THEN SWITCH MACHINE ON.

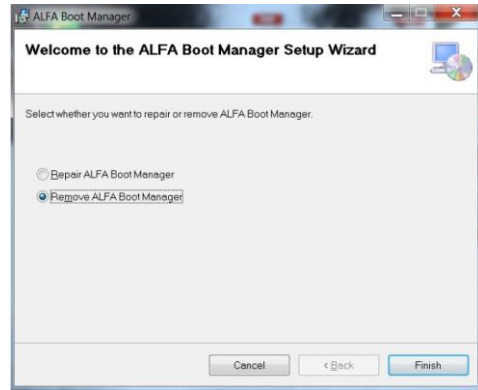
BootLoaderAPP installation procedure is described in the following paragraph. If the software is already installed on the PC, go directly to the following paragraph explaining software use for programming boards.

4.2.2. INSTALLATION OF “BOOTLOADERAPP”


If a version of the application is already present on the PC, you must first remove it before installing a new version.

In this case, run the installation software  ALFA Boot Manager and select option “Remove ALFA Boot Manager”, then press “Finish”.

Wait until uninstall is completed and press “Close”.



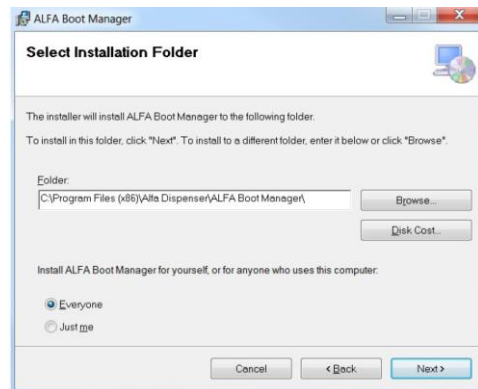
To install the application:

1. Run the installation file  ALFA Boot Manager .

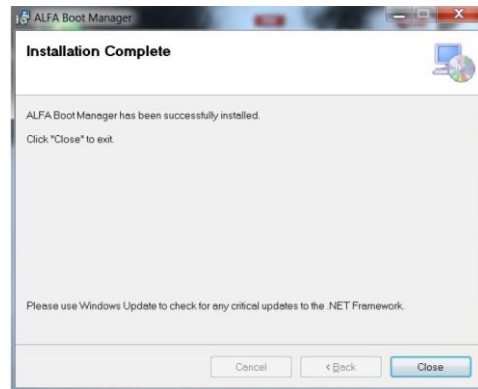
The page on the side will open.



2. In the following window, select the software installation path and select option “Everyone”, then press “Next >”.

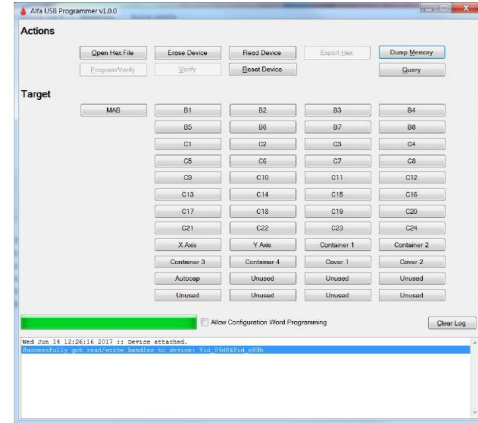


3. When prompted, press “Next >” until completing the installation procedure, then press “Close” to end the installation procedure.



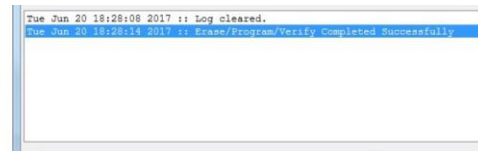
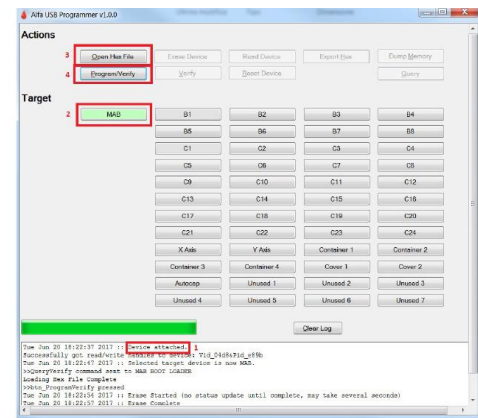
4.2.3. STARTING THE BOOTLOADER

Run BootloaderApp on the PC (the application is in the folder selected in step 2 of the installation procedure).
The following window will open.



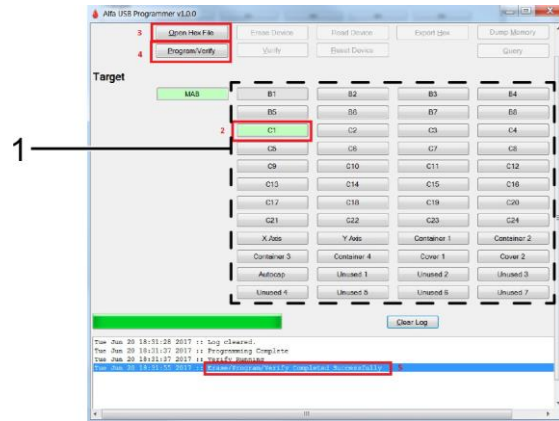
4.2.4. MAB FIRMWARE UPDATE

- Check that the software detected the presence of a MAB 'Device attached' (1)
- Select the MAB board to be used by pressing the MAB button (2) 'Selected target device is now MAB' + 'QueryVerify command sent to MAB BOOT LOADER'
- Select the Intel HEX file to be programmed, and press 'Open Hex File' (3) 'HEX File Complete'
- Proceed with Programming and Verification, by pressing 'Program/Verify' (4) "": wait for the final message 'Erase/Program/Verify Completed Successfully'
- If programming is successful, the 'MAB' button becomes GREEN.



4.2.5. ACTUATOR FIRMWARE UPDATE (SCCB BOARDS)

- Connect the special cable Alfa USB BOOT LOADER (code 305001893) across CN13 connector of the MAB board and a USB port of the PC for programming;
- Switch the machine on (or the board when programming it on a bench);
- Check that the software detected the presence of a MAB 'Device attached';
- Select actuator board (1) to be programmed by pressing the corresponding button (Fig. C1) (2) 'Selected target device is now C1' + 'QueryVerify command sent to MAB BOOT LOADER';
- Check that the address set in the actuator board to be programmed is consistent with the selected device (please refer to the following paragraph "SETTING ADDRESSES");
- Select the Intel HEX file to be programmed, and press 'Open Hex File' (3) 'HEX File Complete';
- Proceed with Programming and Verification, by pressing 'Program/Verify' (4), then wait for the final message 'Erase/Program/Verify Completed Successfully' (5);
- If programming is successful, the 'C1' button becomes GREEN.



4.2.6. SETTING ADDRESSES

For programming an SCCB actuator board, the address set via the dip-switches must be consistent with the Target selected via the programming software (see previous paragraph).

Before programming a board, set the corresponding dip-switches accordingly.

Dip-switch addressing is a binary code.

The least significant bit is the leftmost one. A dip-switch set to ON corresponds to a bit value of '1'.

SCCB must have a fixed addressing, as follows:

GROUP OR CIRCUIT	DIP-SWITCH
BASE or MASTER B1-B8 (or M1-M8): ADDRESS 1...8	
COLORANTS C1-C24: ADDRESS 9...32	
X-AXIS: ADDRESS 33	
Y-AXIS: ADDRESS 34	
CAN SELECTOR 1-4: ADDRESS 35...38	
CAPPING 1-2: ADDRESS 39...40	
AUTOCAP: ADDRESS 41	
CAN LIFTER: ADDRESS 42	
HUMIDIFIER: ADDRESS 43	

Each address must be unique in the machine.

After programming, board address can be changed but only into addresses belonging to the same group of circuits (colorants, bases, etc.).

4.3. BOOTLOADER 2.0

Boot Loader 2.0 generation will include the possibility to remotely update the Firmware of ALFA machines, only by means of ALFA Software, with no need of any USB cable and without physically switching the machine off and back on.

If newer Firmware versions are found, a message will warn the operator, specify the name and type of the Firmware versions available, and propose the update with a new Firmware version. The operator shall then select which versions to install.

5. SOFTWARE CONTROL UTILITY

5.1. “DIAGNOSTIC” INTERFACE

In service mode (see para. 2.0.6) it is possible to use different controls to check the correct operation of the single units inside the machine.

From the first diagnostic window, press the forward arrow symbol on the touch screen to access the advanced functions.

Following are the available functions:

from the first window it is possible to monitor the circuit status. It is furthermore possible to:

- start a machine reset;
- open the autocap;
- close the autocap;
- start an automatic purge cycle;
- start the movement of the label roll;

Note:

when you need to start some movements, remember to open the autocap from the current window before passing to the next one.

From the first window, press on the “forward arrow” to access a set of machine's advanced functions that allow to:

- start a machine reset;
- Open and close the autocap (OPEN AUTOCLAP/CLOSE AUTOCLAP);
- position the gripper under a cans storage (WITHDRAWAL);
- control the pick-up of a can (LOAD);
- position the gripper under the dispensing nozzle (FILLING);
- Extend and retract can lifting blade (EXTEND LIFTER / RETRACT LIFTER); Control a capping cycle (CAP);
- perform a cycle of negative unloading;
- perform a cycle of positive unloading;
- move the gripper to the home position (HOME).

From the first window, by pressing on the identification of a canister or a base, you access the circuit management menu that allows to:

- Display product level;
- enter the refill quantity;
- start a circuit purge cycle;
- start/stop the recirculation;
- Start/stop the stirring;

*NOTE:

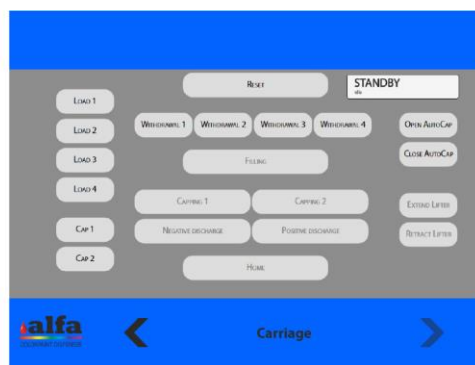
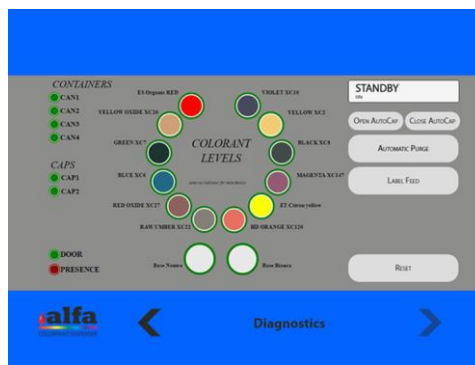
Before starting a Purge cycle it is necessary to:

- open the autocap;
- position a can under the dispensing nozzle.

All functions are enabled also with open doors, provided that you press the authorisation button for technical use (see paragraph 2.0.7).

When the operation is completed, remember to disconnect the button and reposition it in the seat on the left door, log out and wait for the machine to complete the reset before resuming its operation.

At the end of the service or repair operation, close the doors and perform a functional test cycle (see paragraph 2.0.5).



6. HANDLING THE MACHINE

6.1. MOVING THE MACHINE

Color Tester must only be handled in safe conditions.



WARNING:
HANDLE WITH A DOUBLE FORK-LIFT TRUCK, TRANSPALLET OR SIMILAR DEVICE WITH A CAPACITY OF AT LEAST 500KG.

IN ORDER TO AVOID THE RISK OF PAINTING SPILLS INSIDE THE MACHINE, NEVER MOVE THE MACHINE WITH THE COLORANT CIRCUITS FULL.

BEWARE OF ANY STEPS OR IRREGULARITIES IN THE FLOORING/TERRAIN THAT COULD RESULT IN SUDDEN STOPPAGES, AS THESE COULD CAUSE MACHINE TO BECOME UNBALANCED. ALWAYS PROCEED AT A LOW SPEED WITH TWO PEOPLE HANDLING THE MACHINE AT ALL TIMES.

For further information on the packing, unpacking and handling of the machine, refer to chap. 2 of the Color Tester Operator Manual.

6.2. DIMENSIONS OF THE PACKAGE

Height on pallet	2110 mm (± 15 mm)
Pallet width	1150 mm
Depth pallet	900 mm
Weight (empty)	350 Kg

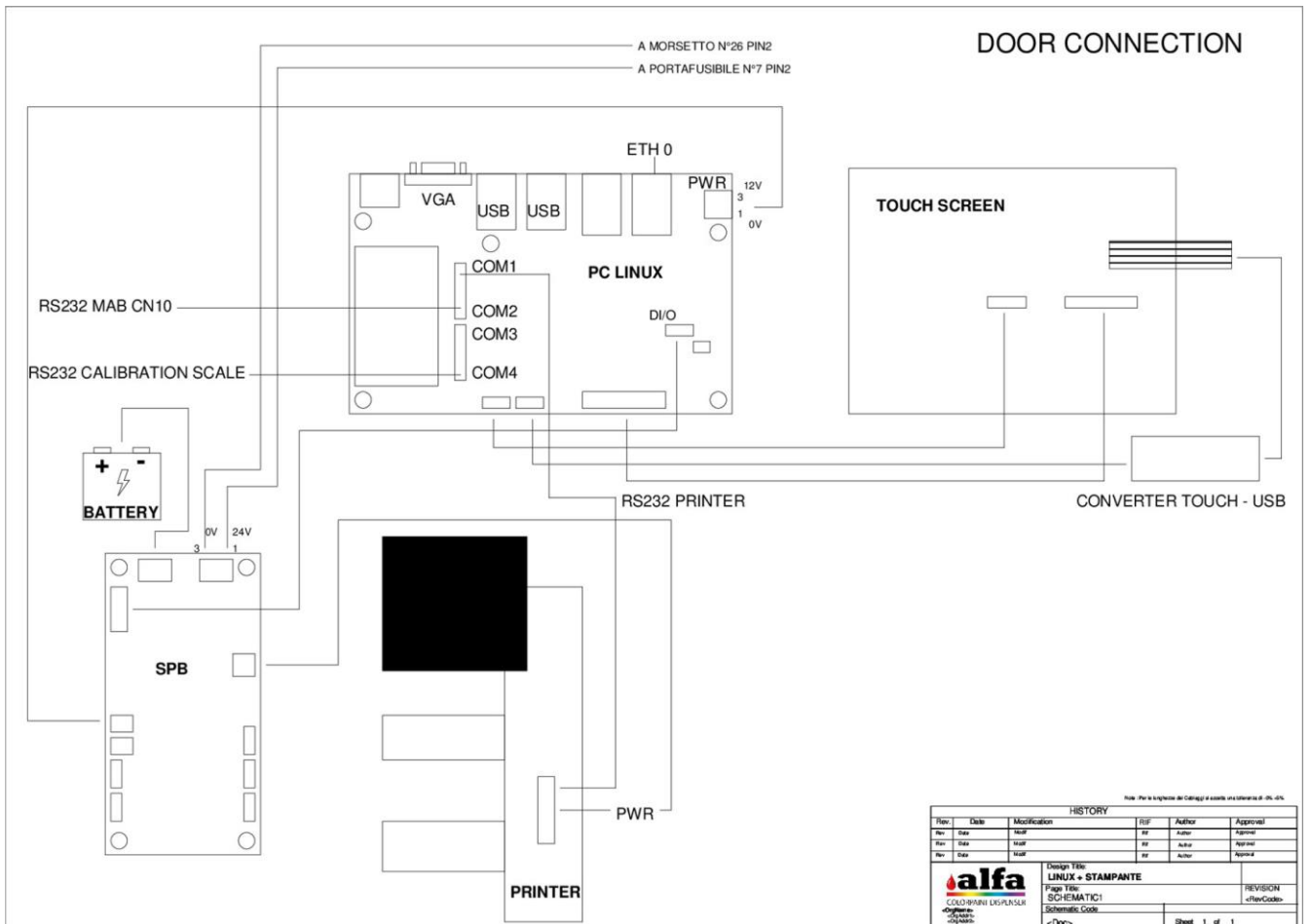
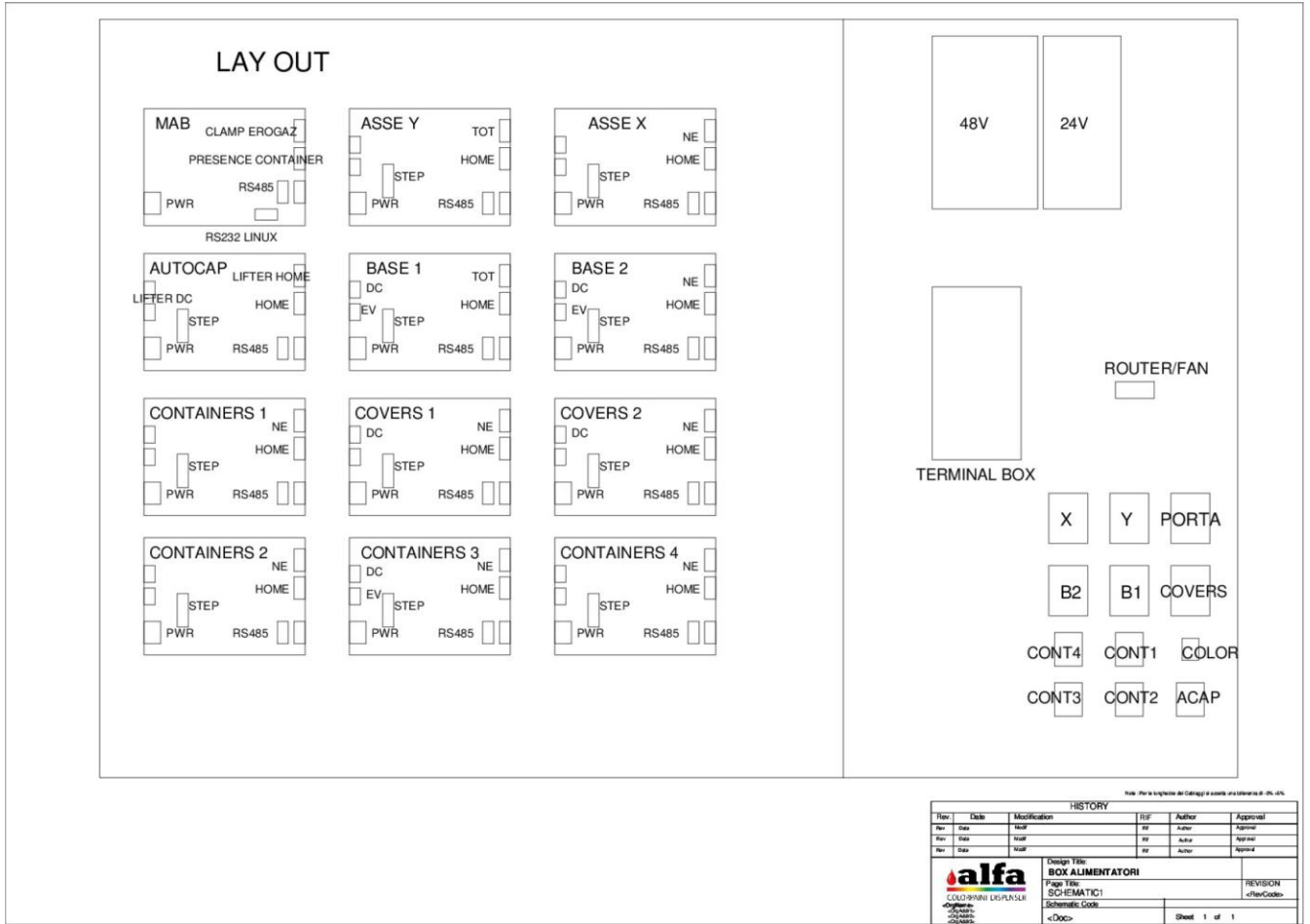
7. ACCESS TO THE DIAGNOSTIC FUNCTIONS

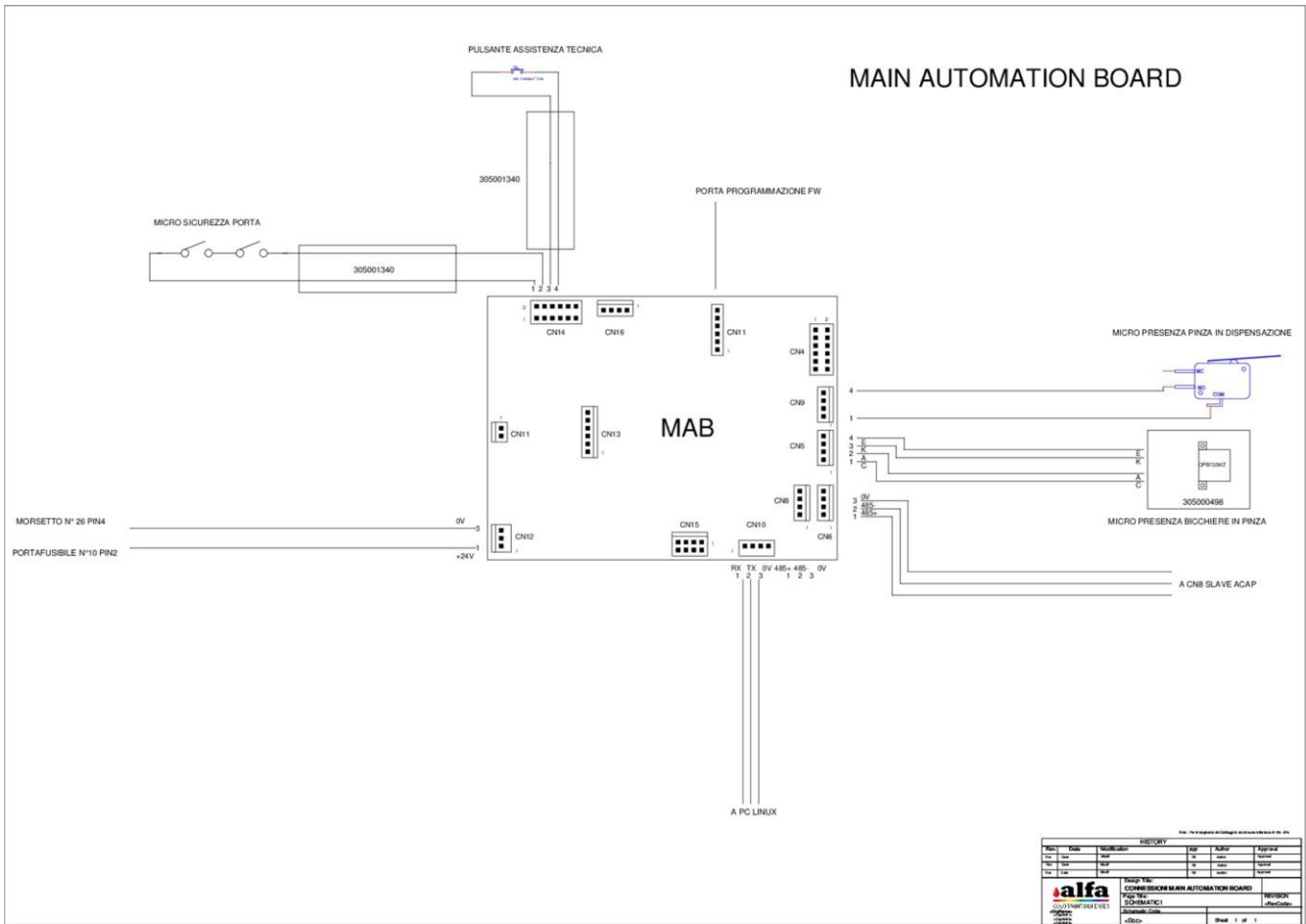
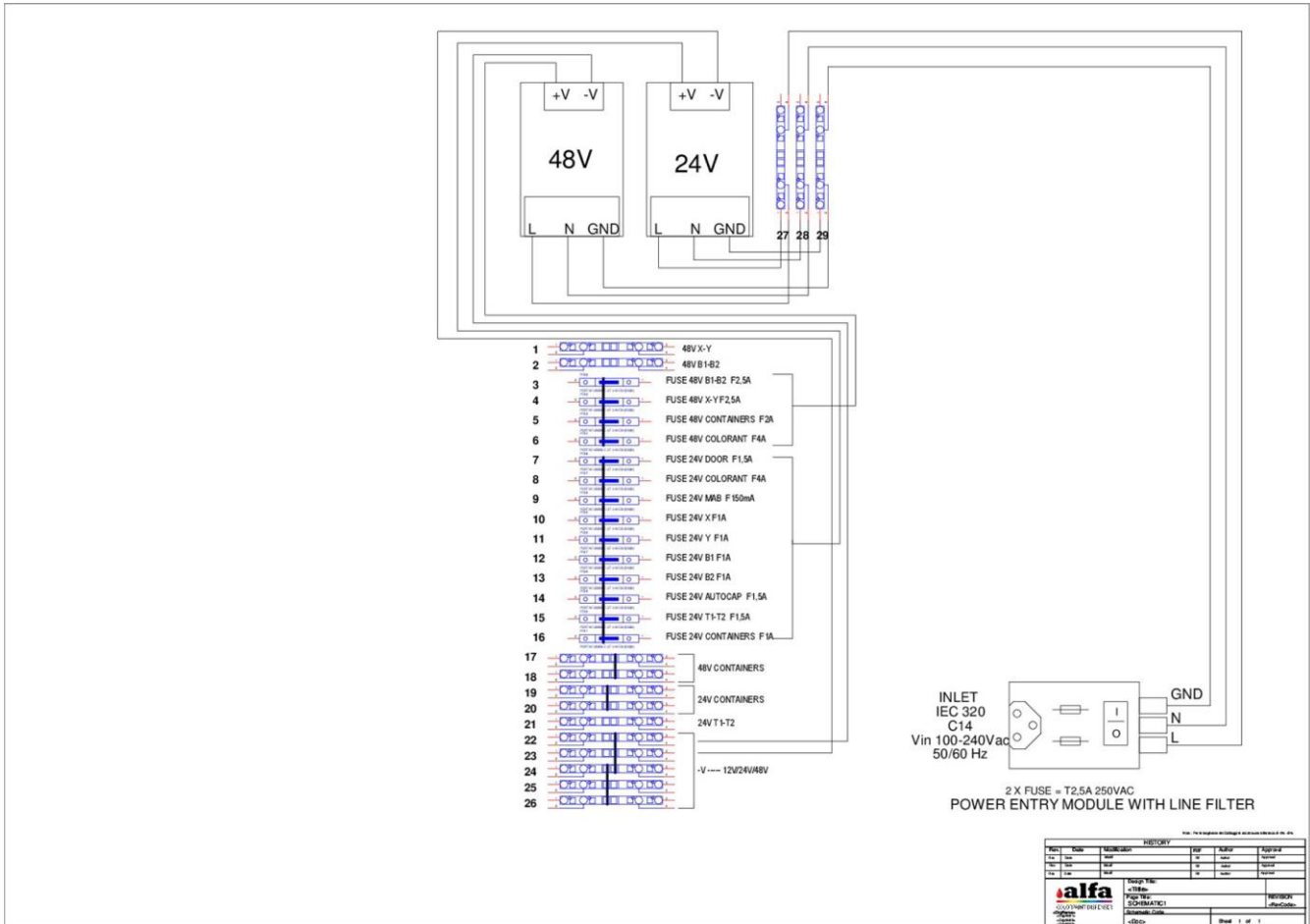
7.1. ADMIN CONTROL AND DIAGNOSTIC INTERFACE

The web control browser Admin interface has diagnostic functions that indicate the status of the machine and of the relevant circuits, as well as specific controls to activate and test each single circuit or the valve and motor functions.

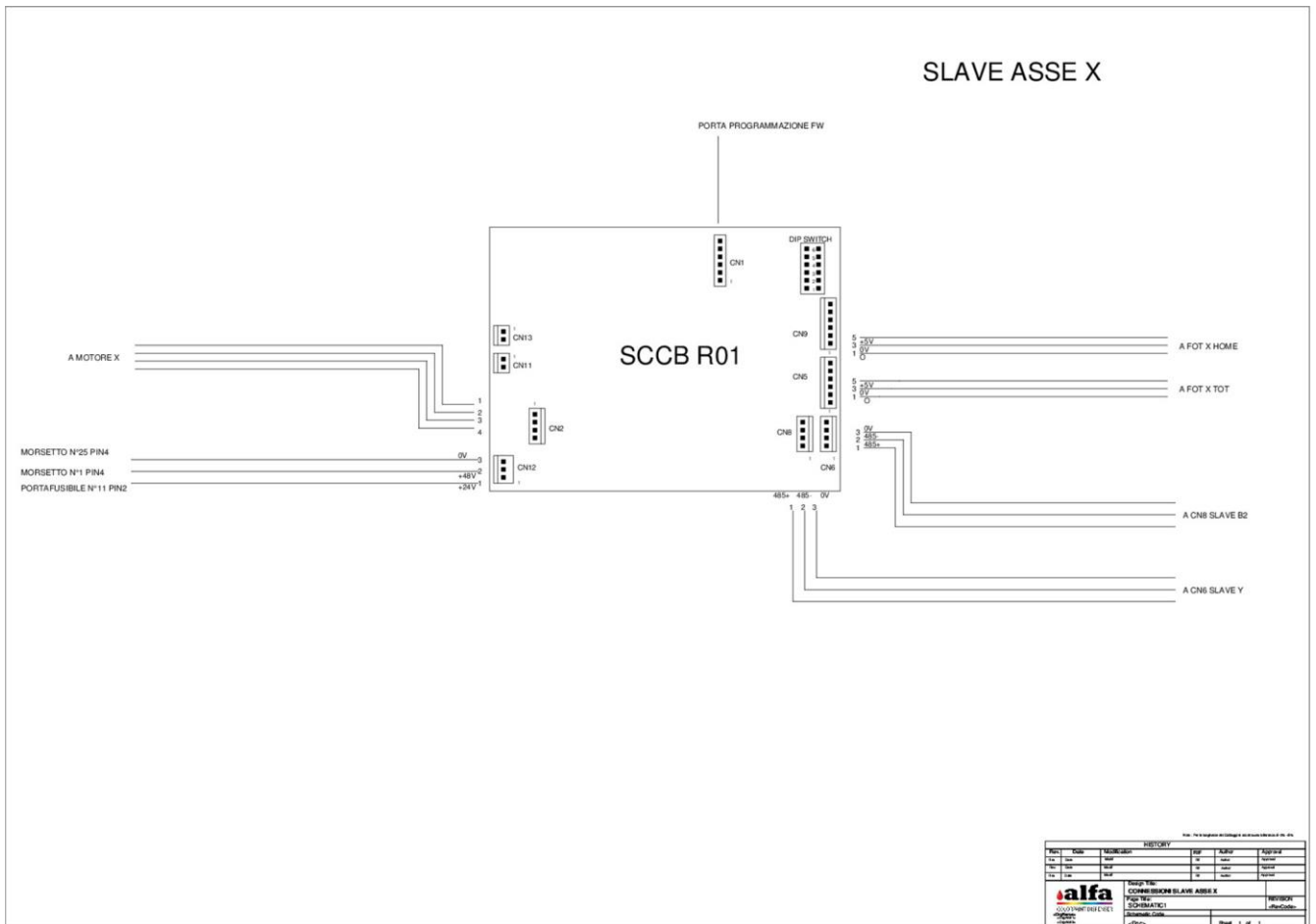
For information about the interface access modes and the function description refer to the software manual.

8. CONNECTION DIAGRAMS

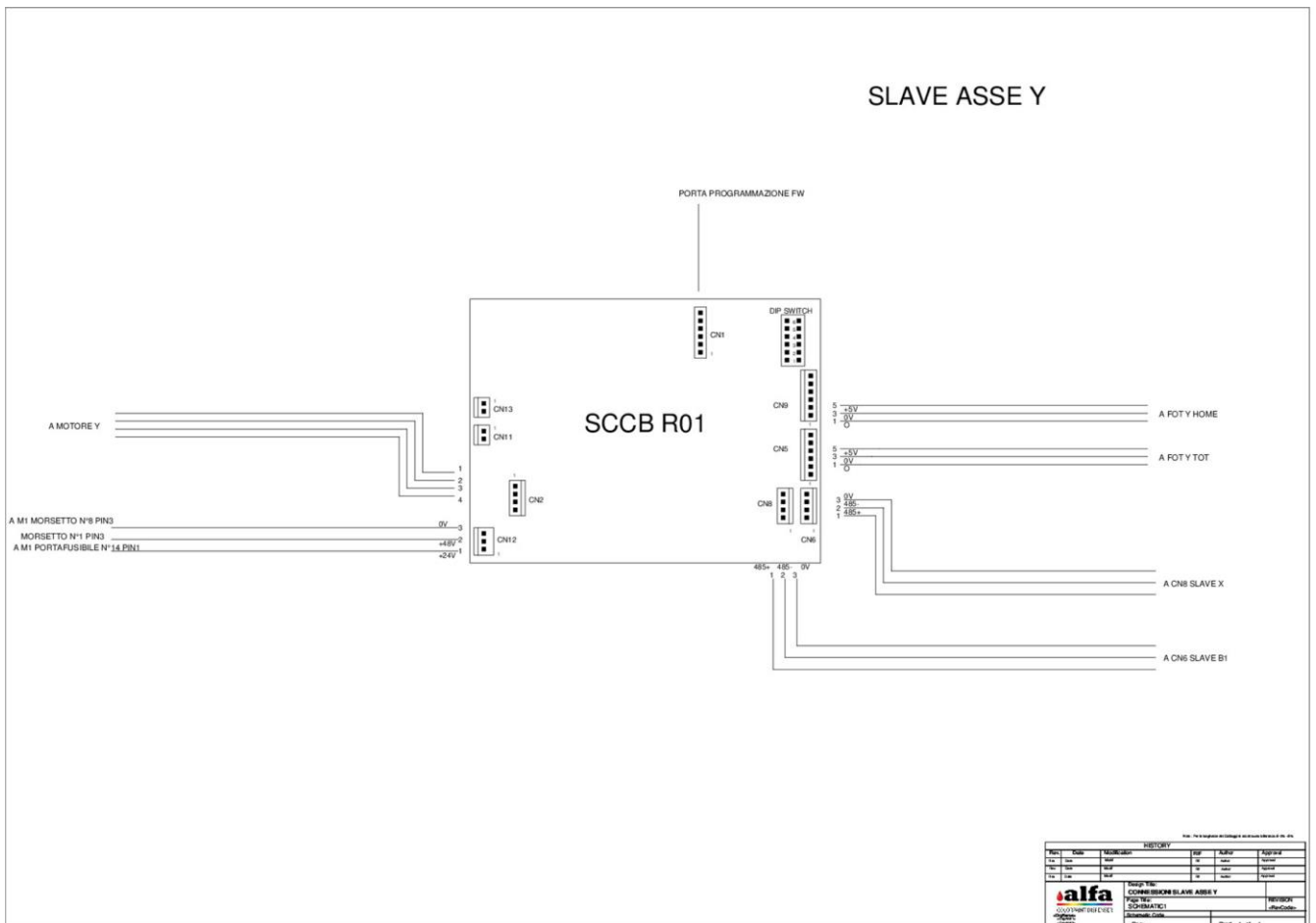




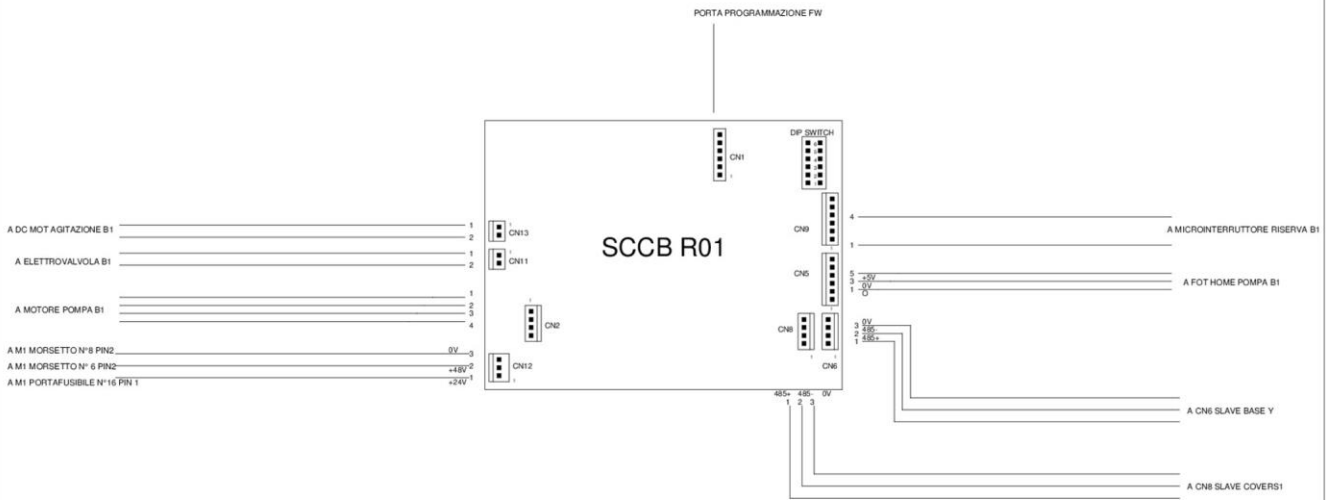
SLAVE ASSE X



SLAVE ASSE Y



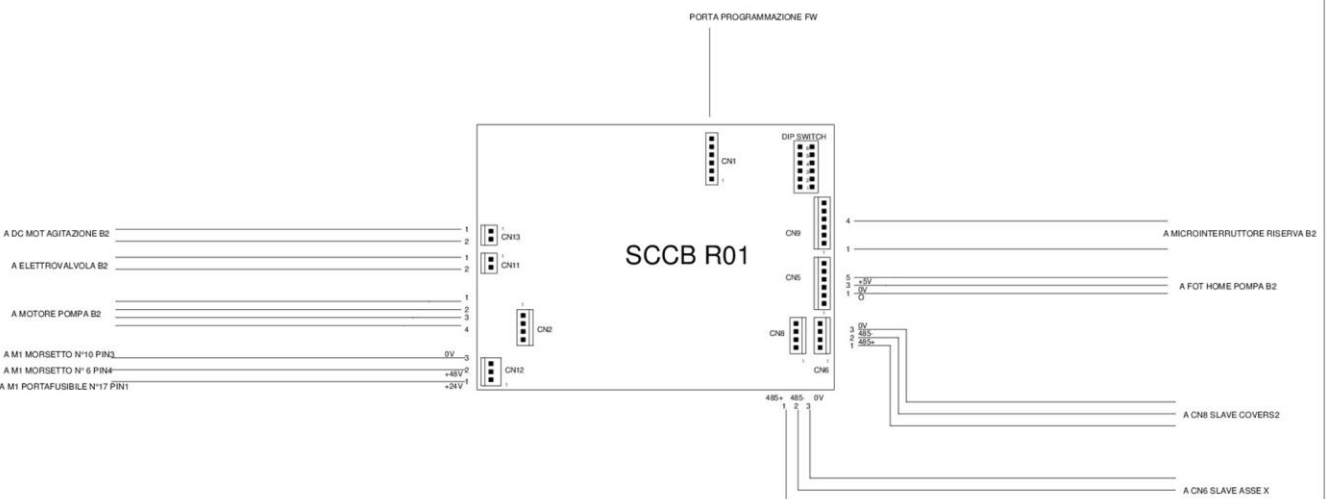
SLAVE BASE 1



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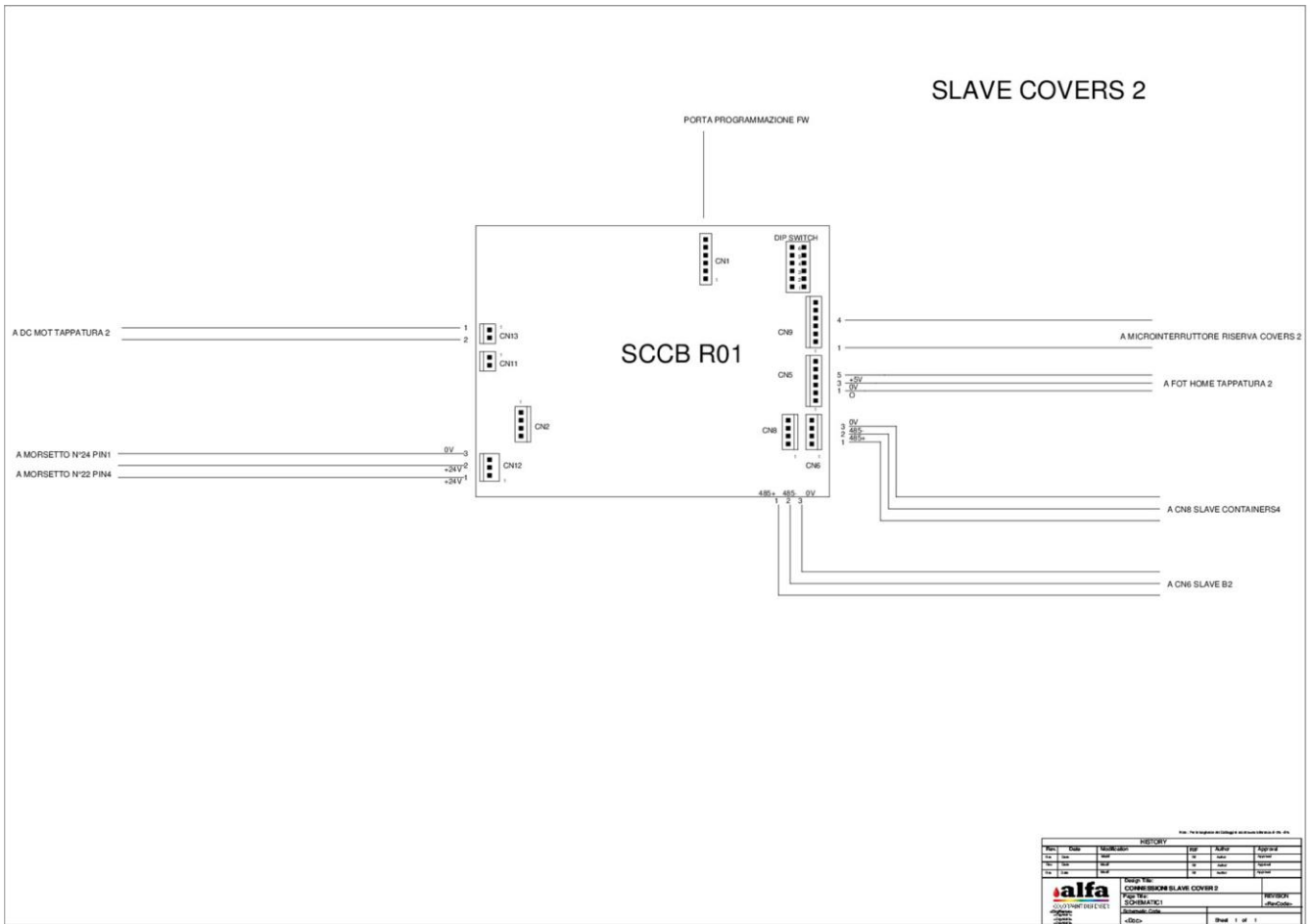
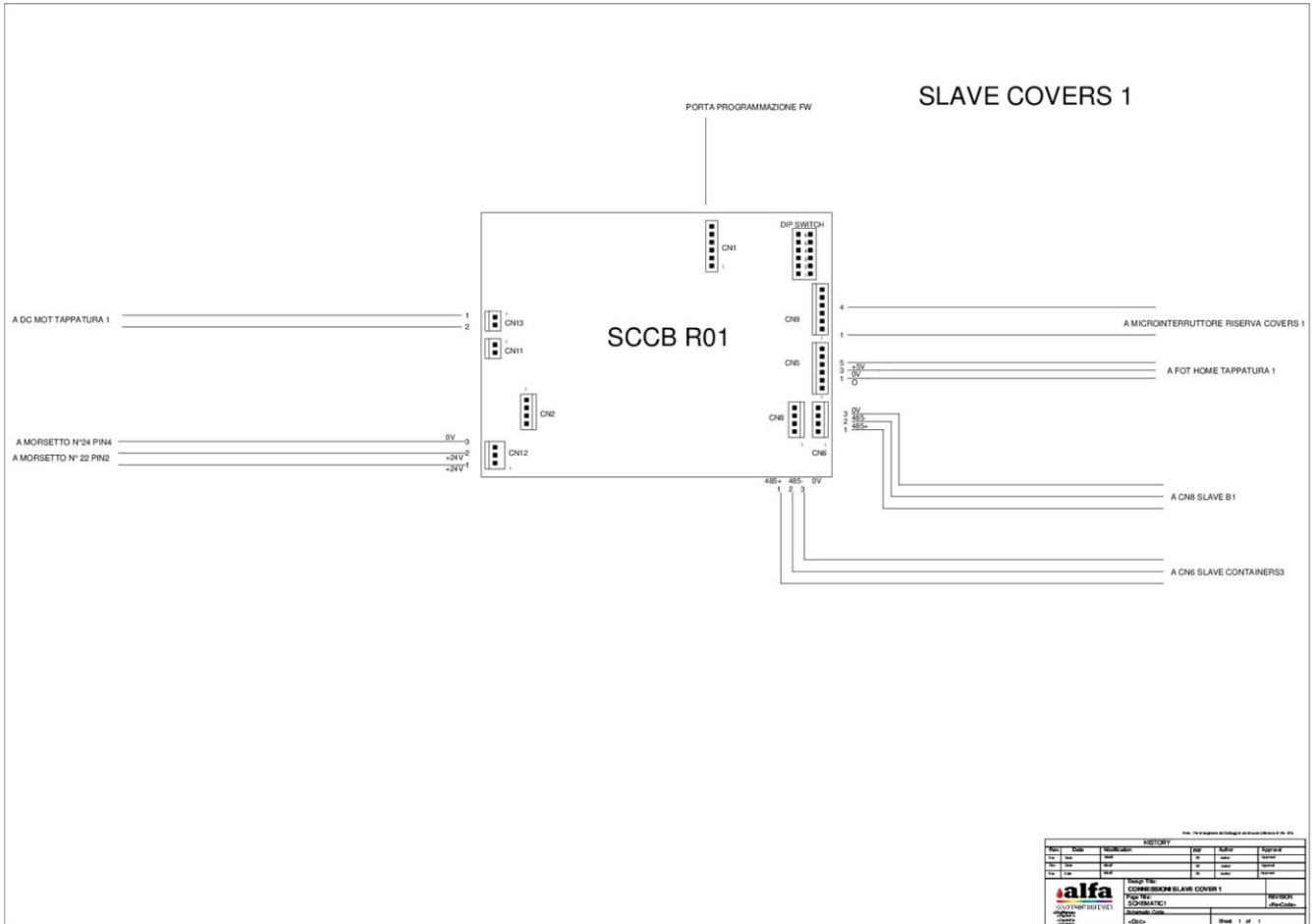
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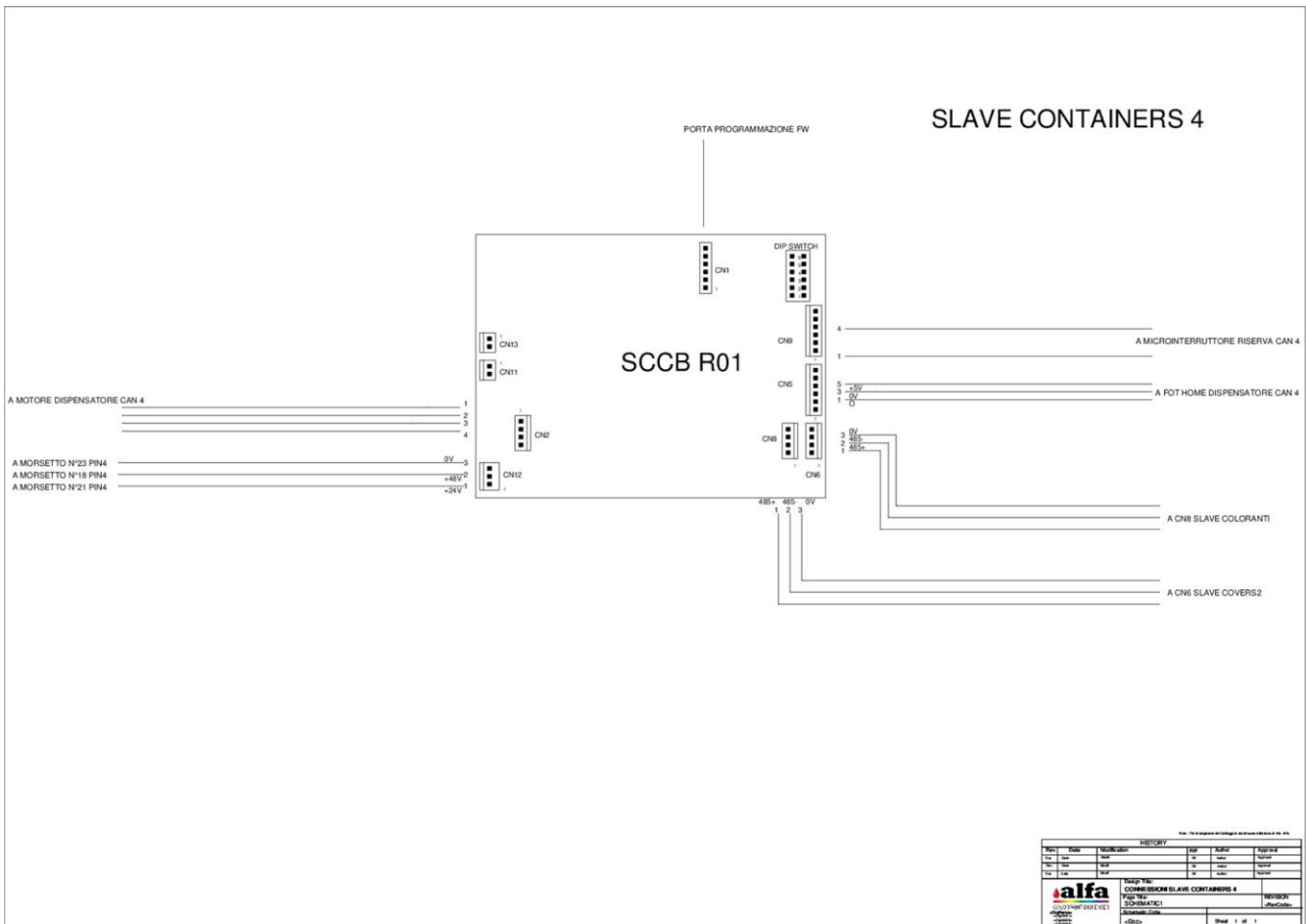
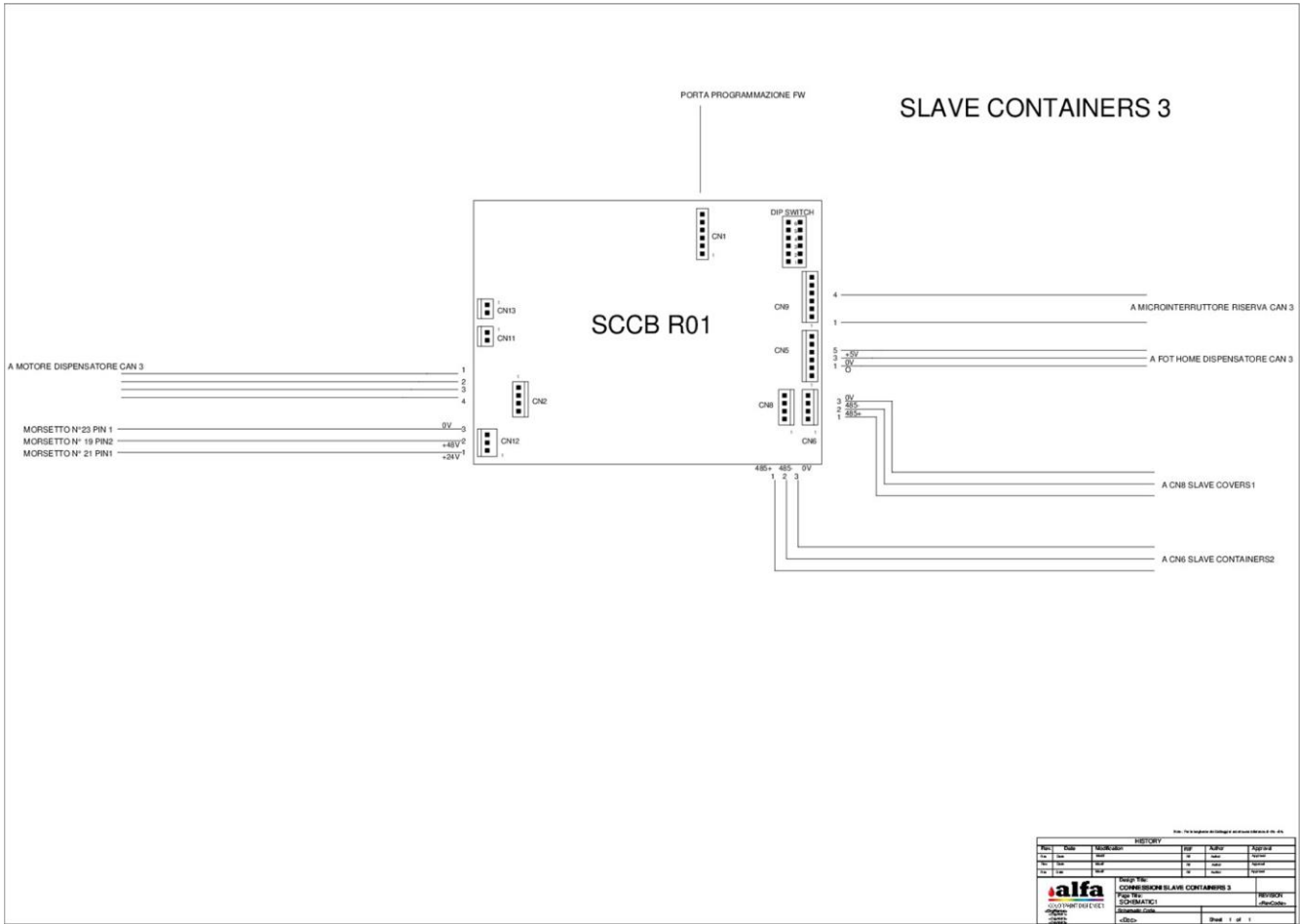
SLAVE BASE 2

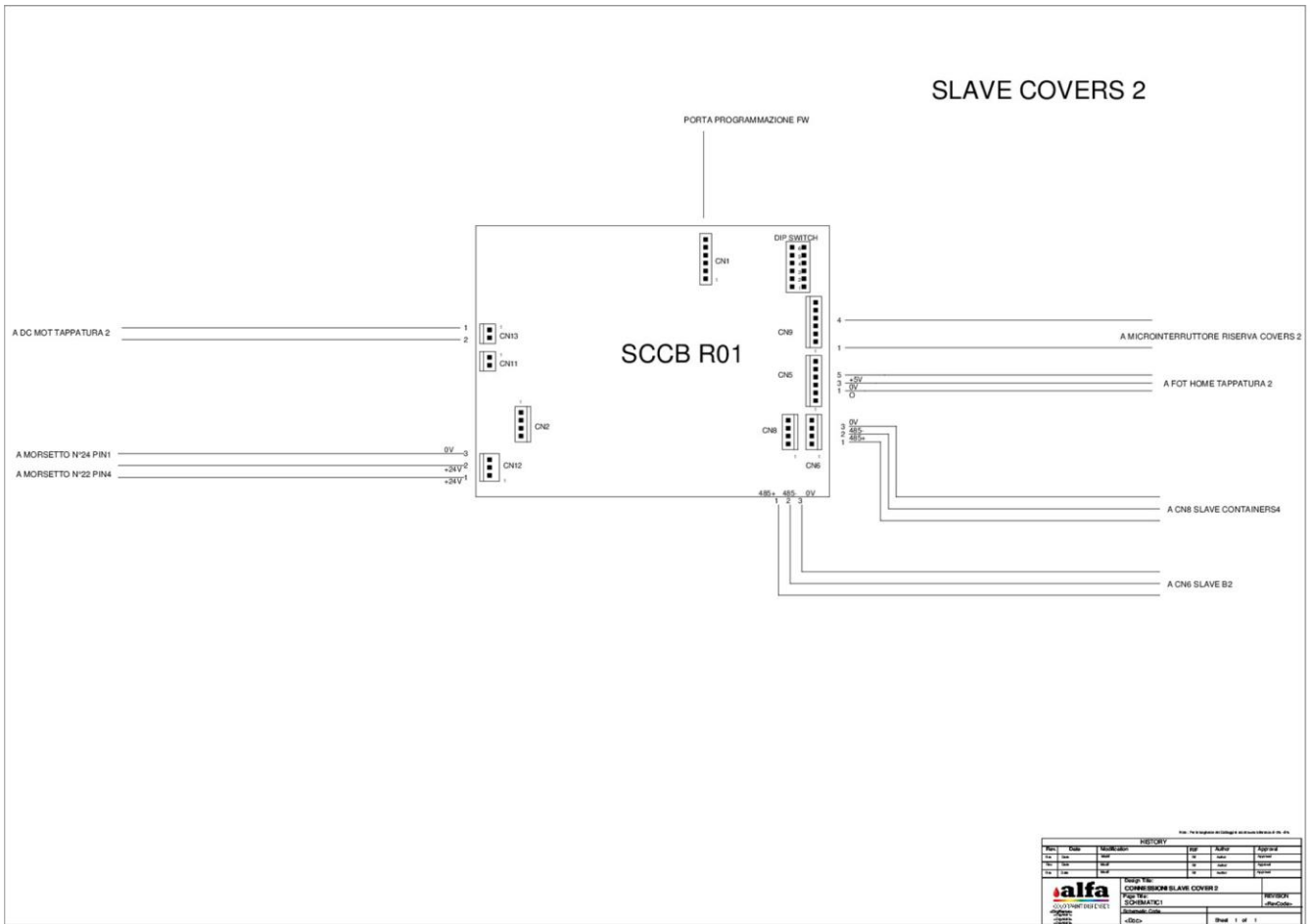
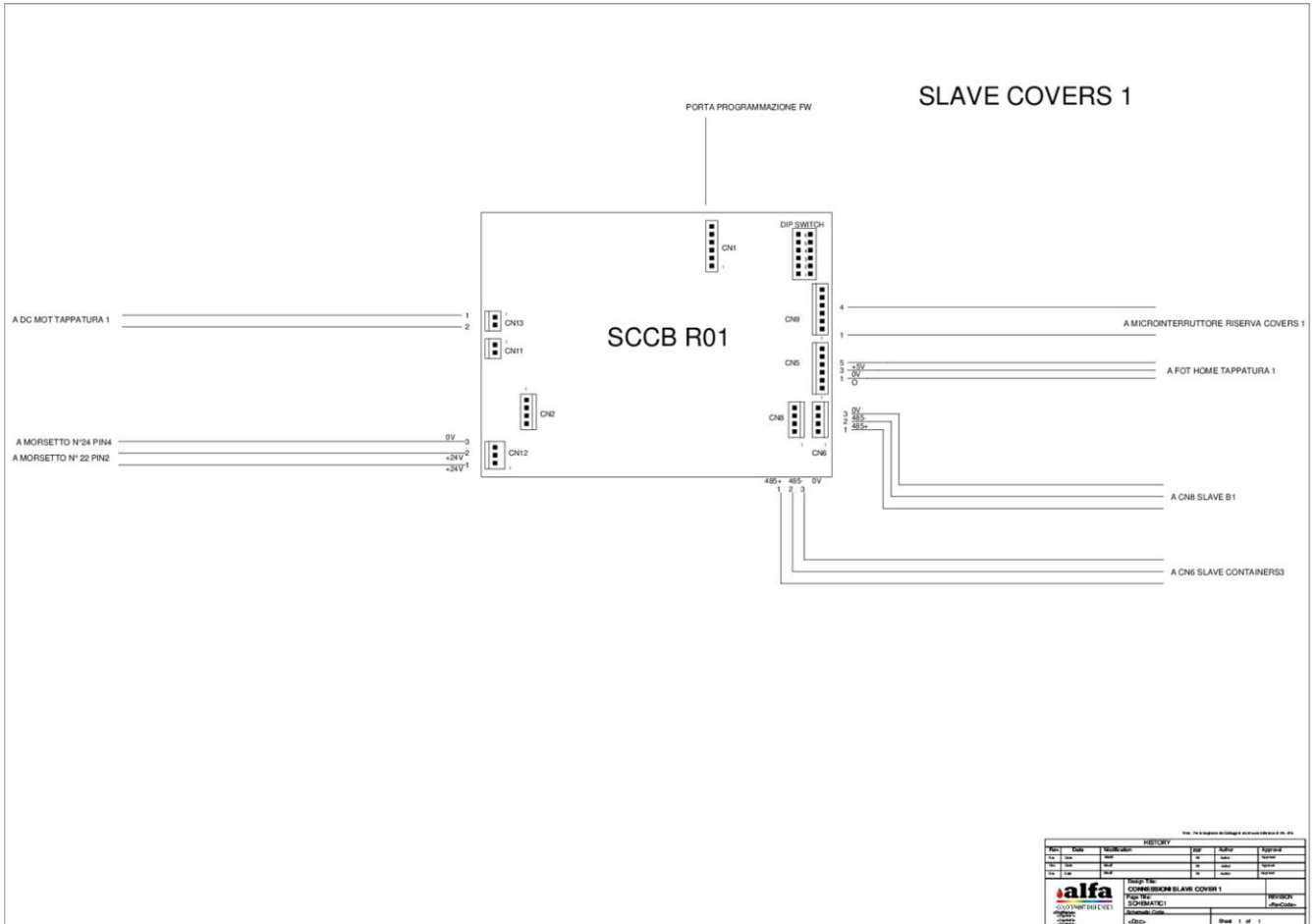


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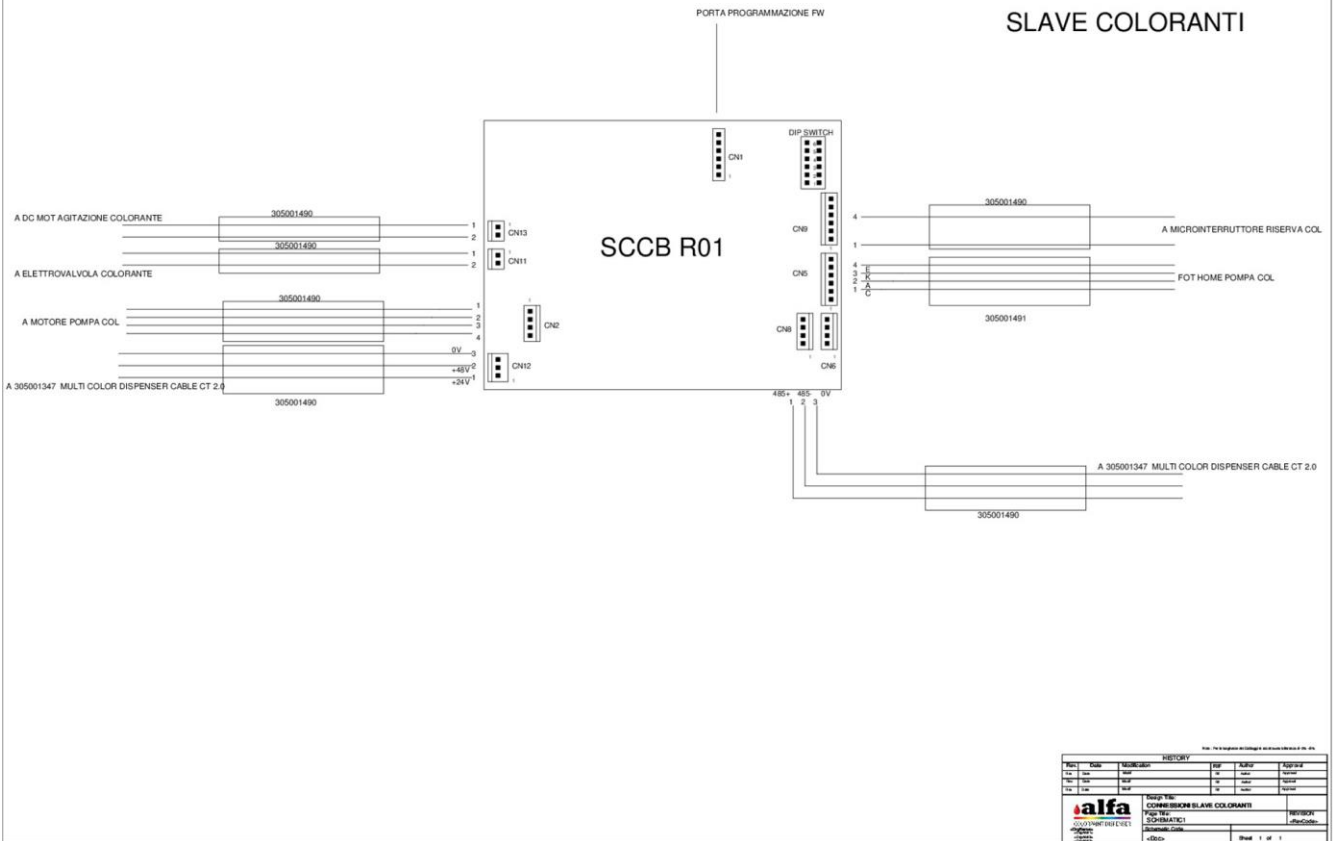






CONNESSIONI GRUPPO COLORANTE VALIDO PER CIASCUN GRUPPO PRESENTE IN MACCHINA

SLAVE COLORANTI



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	GRUPPO: SLAVE COLORANTI FIG. N°: SCHEMATICO	REVISIONI: _____
	Gruppo: SLAVE COLORANTI FIG. N°: SCHEMATICO	REVISIONI: _____

Pag. 1 di 1

9. TROUBLE SHOOTING

ERROR CODES	ERROR DETECTED	ERROR DESCRIPTION	TROUBLESHOOTING
1	TIMERMG_TEST_FAILED	Timer operation test failure	Test failure means that the program on the MAB board has stopped working. Restart the program
2	EEPROM_COLOR_CIRC_PARAM_CRC_FAULT	Circuit parameter CRC fault	Check for the absence of parameters in the case of MAB replacement. Load the master/colorant circuit parameters onto the new MAB board
3	EEPROM_CALIB_CURVES_PARAM_CRC_FAULT	Calibration curve parameter CRC fault	Check for the absence of parameters in the case of MAB replacement. Load the calibration parameters onto the new MAB board
4	EEPROM_XY_OFFSET_PARAM_CRC_FAULT	Failure of x and y coordinates, Cartesian positions, offset CRC	Check for the absence of parameters in the case of MAB replacement. Load x and y offset parameters onto the new MAB board
5	EEPROM_SLAVES_EN_PARAM_CRC_FAULT	Slave configuration CRC fault	Check for the absence of parameters in the case of MAB replacement. Load the SLAVE configurations onto the new MAB board
10	USER_INTERRUPT	Machine operation Software interruption	HALT has been pressed
11-18	TIMEOUT_COM_MAB_ACT "X", where "X" = 1..8	"X" BASE slave communication time-out (detected on the MAB side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the "X" BASE slave board
19-42	TIMEOUT_COM_MAB_ACT "X", where "X" = 1..24	"X" COLORANT slave communication time-out (detected on the MAB side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the "X" COLORANT Slave board
43	MOVE_X_AXIS_IDX	Slave X AXIS communication time-out (detected on the MAB side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the X AXIS board
44	MOVE_Y_AXIS_IDX	Slave Y AXIS communication time-out (detected on the MAB side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the Y AXIS board
45-48	STORAGE_CONTAINER "X" _IDX where "X"=1..4	"X" CAN slave communication time-out (detected on the MAB side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the "X" CAN Slave board

ERROR CODES	ERROR DETECTED	ERROR DESCRIPTION	TROUBLESHOOTING
49-50	PLUG_COVER_"X"_IDX, where "X"=1..2	Slave "X" CAPPING STATION communication time-out (detected on the MAB side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the "X" CAPPING board
51	AUTOCAP_IDX	Slave AUTOCAP communication time-out (detected on the MAB side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the AUTOCAP slave board
59	TIMEOUT_COM_MAB_MGB	MAB-MGB Communication time-out	Check MAB and MGB power supply wiring and replace it if damaged. Check the SERIAL communication connectors, and visually check the hardware of the 2 boards
61-68	B"X"_BASE_TOUT_ERROR, where "X" = 1..8	"X" BASE slave communication time-out (detected on the SLAVE side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the "X" BASE slave board
69-92	C"X"_COLOR_TOUT_ERROR, where "X" = 1..24	"X" COLORANT slave communication time-out (detected on the SLAVE side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the "X" COLORANT Slave board
93	MOVE_X_AXIS_TOUT_ERROR	X AXIS slave communication time-out (detected on the SLAVE side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the X AXIS board
94	MOVE_Y_AXIS_TOUT_ERROR	Y AXIS slave communication time-out (detected on the SLAVE side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the Y AXIS board
95-98	STORAGE_CONTAINER"X"_TOUT_ERROR, where "X"=1..4	"X" CAN SELECTION slave communication time-out (detected on the SLAVE side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the "X" CAN Slave board
99-100	PLUG_COVER"X"_TOUT_ERROR, where "X"=1..2	"X" CAPPING STATION slave communication time-out (detected on the SLAVE side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the "X" CAPPING slave board
101	AUTOCAP_TOUT_ERROR	AUTOCAP slave communication time-out (detected on the SLAVE side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the AUTOCAP slave board

ERROR CODES	ERROR DETECTED	ERROR DESCRIPTION	TROUBLESHOOTING
201	RESET_TIMEOUT	RESET process time-out	The RESET process is not completed within the maximum set time. Check for a mechanical jam in the dispenser and eliminate it if possible
202	TIMEOUT_SUPPLY_START	Time-out at Dispensing start	Dispensing did NOT start within the maximum set time. Check for a mechanical jam in the dispenser and eliminate it if possible
203	TIMEOUT_SUPPLY_FAILED	Dispensing duration time-out	Dispensing did not end within the maximum set time. The formula is too long, or check for a mechanical jam in the dispenser and eliminate it if possible
210	DOOR_OPEN	Door open	Door open during Process. Check the actual opening of the door, sensor operation and close, if necessary
211	COVERS_NOT_AVAILABLE	Covers NOT available	Check if Covers are missing and, if necessary, fill the station
212	CONTAINERS_NOT_AVAILABLE	Cans NOT available	Check if Cans are missing and, if necessary, fill the station
213	WITHDRAWAL_FAILED	Failed can withdrawal	Check for the presence of cans, or check for a mechanical jamming
214	TIMEOUT_CLAMP_POS_DETECTION	Time-out of lift positioning at dispensing start	Check that the lift is not in the dispensing position. If this is the case, check the operation of the stepper motor that controls it and check the board. Check that there is no mechanical jamming
215	SENSOR_X_AXIS_ERROR	X AXIS positioning error	During X axis movement the Start or End photocell, where requested, has not been engaged. Check for the presence of a mechanical jamming of damaged or dirty mechanical parts of the Cartesian axis. Clean or replace the concerned mechanical parts. Check photocell operation
216	SENSOR_Y_AXIS_ERROR	Y AXIS positioning error	During Y axis movement the Start or End photocell, where requested, has not been engaged. Check for the presence of a mechanical jamming of damaged or dirty mechanical parts of the Cartesian axis. Clean or replace the concerned mechanical parts. Check photocell operation
217	SENSOR_CLAMP_ERROR	No cup lift in filling position error	Check if the lift is not in that position. If this is the case, check the operation of the stepper motor that controls it. Check that there is no mechanical jamming
218	DISCARD_FAILED	Can still present after negative unloading due to cup presence at the end of Reset or at the beginning of dispensing, before pick-up	The reflective photocell on the passive gripper might be dirty, damaged, or positioned incorrectly. Clean the sensor and position it properly, or replace it if damaged. Remove the cup if present and stuck in the mechanical parts.

ERROR CODES	ERROR DETECTED	ERROR DESCRIPTION	TROUBLESHOOTING
219	TIMEOUT_PLUG_COVER1	Capping Station 1 MAB communication time-out (detected on the MAB side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the CAPPING 1 Slave board
220	TIMEOUT_PLUG_COVER2	Capping Station 2 MBA communication time-out (detected on the MAB side)	Check the SCCB power supply wiring and replace it if damaged. Check the RS485 communication connector, and visually check the board hardware. If damaged, replace the CAPPING 2 Slave board
221	NO_CONTAINER_AFTER_CAPPING	No can after Capping at the end of Dispensing (Photocell NOT engaged)	Check that the can is NOT jammed in Capping position
222	MOVE_X_AXIS_HOME_POS_ERROR	Loss of steps: deviation upon the detection of X AXIS slave HOME position	Verify the cleanliness of rack, splicing device and sensors, and remove any residues if necessary. Verify the integrity of the motor and replace it if deterioration is encountered. If any mechanical parts are damaged or jammed on rack teeth and splicing device, remove or change the mechanical parts in question. Verify the electrical connections and change them if damaged. Check the photocell sensors and reposition them or change them if damaged.
223	MOVE_Y_AXIS_HOME_POS_ERROR	Loss of steps: deviation upon the detection of Y AXIS slave HOME position	Verify the cleanliness of rack, splicing device and sensors, and remove any residues if necessary. Verify the integrity of the motor and replace it if deterioration is encountered. If any mechanical parts are damaged or jammed on rack teeth and splicing device, remove or change the mechanical parts in question. Verify the electrical connections and change them if damaged. Check the photocell sensors and reposition them or change them if damaged.
224	MOVE_X_AXIS_OVER_POS_LIMIT_ERROR	Maximum number of steps carried out by the X AXIS slave without encountering the END photocell	Check the correct operation of the END photocell, any folding of the flag, or the presence of an obstacle along the path of the X axis SLAVE
225	MOVE_Y_AXIS_OVER_POS_LIMIT_ERROR	Maximum number of steps carried out by the Y AXIS slave without encountering the END photocell	Check the correct operation of the END photocell, any folding of the flag, or the presence of an obstacle along the path of the Y axis SLAVE

ERROR CODES	ERROR DETECTED	ERROR DESCRIPTION	TROUBLESHOOTING
226-229	STORAGE_CONTAINER"X"_HOME_POS_ERROR, where "X"=1..4	Loss of steps: deviation upon the detection of "X" CAN SELECTION slave HOME position	Verify the cleanliness of the mechanical parts and sensors, and remove any residues if necessary. Verify the integrity of the motor and replace it if deterioration is encountered. If any mechanical parts are damaged or jammed, remove or change the mechanical parts in question. Verify the electrical connections and change them if damaged. Check the photocell sensors and reposition them or change them if damaged.
230	AUTOCAP_HOME_POS_ERROR	Loss of steps: deviation upon the detection of slave AUTOCAP HOME position	Verify the cleanliness of the mechanical parts and sensors, and remove any residues if necessary. Verify the integrity of the motor and replace it if deterioration is encountered. If any mechanical parts are damaged or jammed, remove or change the mechanical parts in question. Verify the electrical connections and change them if damaged. Check the photocell sensors and reposition them or change them if damaged.
231	AUTOCAP_PACK_POS_ERROR	Cup Lift Homing procedure upon RESET was NOT carried out successfully	At least 1 of the transitions did not take place: Covered-Uncovered, Uncovered-Covered during lift Reset. Check the operation of the photocell, the lift motor and any obstacle that hinders the movement
232	PLUG_COVER1_PHOTOC_ERROR	Error on the photocell controlling Capping station 1 position	During Reset, or at the end of Dispensing the Capping 1 correct positioning photocell has not been engaged. Check for obstacles and check correct photocell operation
233	PLUG_COVER2_PHOTOC_ERROR	Error on the photocell controlling Capping station 2 position	During Reset, or at the end of Dispensing the Capping 1 correct positioning photocell has not been engaged. Check for obstacles and check correct photocell operation
234	CLAMP_POSITION_ERROR	Can in filling position error	When the machine is in STANDBY the microswitch detecting can presence in filling area is engaged: check the actual presence and remove if necessary.
235	CAN_LIFTER_STUCKED	Can badly positioned at the end of lifting before dispensing Start	Before dispensing start, when the lift has completed its movement, can presence is detected. Check can correct positioning in the lift, and the operation of the photocell detecting the can
236	X_AXIS_NOT_AVAILABLE	X axis NOT enabled	Change machine configuration in the EEPROM of MAB enabling X axis
237	Y_AXIS_NOT_AVAILABLE	Y axis NOT enabled	Change machine configuration in the EEPROM of MAB enabling Y axis

ERROR CODES	ERROR DETECTED	ERROR DESCRIPTION	TROUBLESHOOTING
240	MANUAL_INTERVENTION_REQUEST0	At the end of X Axis movement in Capping the photocell is NOT engaged	Operator's intervention required
241	MANUAL_INTERVENTION_REQUEST1	Can not detected at the end of Dispensing, or at the beginning of Capping, or at the end of Capping	Operator's intervention required
242	MANUAL_INTERVENTION_REQUEST2	Can not detected at the end of Capping	Operator's intervention required
301-308	B"X"_BASE_RESET_ERROR, where "X" = 1..8	"X" BASE slave reset procedure duration time-out	Verify the cleanliness and positioning of the photocell mounted on the "X" BASE, then clean or reattach the sensor. Verify the integrity of the "flag", the pusher, the motor, and the connectors, and replace the parts or the entire unit if any mechanical wear or damage is found. If the communication is present but an electronic type problem remains, replace the SCCB board.
309-332	C"X"_COLOR_RESET_ERROR, where "X"=1..24	"X" COLORANT slave reset procedure duration time-out	Verify the cleanliness and positioning of the photocell mounted on the "X" COLORANT, then clean or reattach the sensor. Verify the integrity of the "flag", the pusher, the motor, and the connectors, and replace the parts or the entire unit if any mechanical wear or damage is found. If the communication is present but an electronic type problem remains, replace the SCCB board.
333	MOVE_X_AXIS_RESET_ERROR	Slave X AXIS reset procedure duration time-out	Verify the cleanliness and positioning of the photocells of X axis, then clean or refix the sensor. Verify the integrity of the motor and the connectors, and replace the parts or the entire unit if any mechanical wear or damage is found. If the communication is present but a problem of an electronic type remains, replace the SCCB board.
334	MOVE_Y_AXIS_RESET_ERROR	Slave Y AXIS reset procedure duration time-out	Verify the cleanliness and positioning of the photocells of Y axis, then clean or refix the sensor. Verify the integrity of the motor and the connectors, and replace the parts or the entire unit if any mechanical wear or damage is found. If the communication is present but a problem of an electronic type remains, replace the SCCB board.

ERROR CODES	ERROR DETECTED	ERROR DESCRIPTION	TROUBLESHOOTING
335-338	STORAGE_CONTAINER"X"_RESET_ERROR, where "X"=1..4	Slave "X" CAN SELECTION reset procedure duration time-out	Verify the cleanliness and positioning of the photocells of the "X" CAN unit, then clean or refix the sensor. Verify the integrity of the motors and the connectors, and replace the parts or the entire unit if any mechanical wear or damage is found. If the communication is present but a problem of an electronic type remains, replace the SCCB board.
339-340	PLUG_COVER"X"_RESET_ERROR, where "X" = 1..2	Slave "X" CAPPING STATION reset procedure duration time-out	Verify the cleanliness and positioning of the photocells of the "X" CAPPING unit, then clean or refix the sensor. Verify the integrity of the motors and the connectors, and replace the parts or the entire unit if any mechanical wear or damage is found. If the communication is present but a problem of an electronic type remains, replace the SCCB board.
341	AUTOCAP_PACKING_ERROR	Autocap has NOT reached the packaging position within the set TIME-OUT	Verify the cleanliness of the mechanical parts and sensors, and remove any residues if necessary. Verify the integrity of the motor and replace it if deterioration is encountered. If any mechanical parts are damaged or jammed, remove or change the mechanical parts in question. Verify the electrical connections and change them if damaged. Check the photocell sensors and reposition them or change them if damaged.
342	AUTOCAP_HOMING_ERROR	Loss of steps: deviation upon the detection of slave AUTOCAP HOME position	Verify the cleanliness of the mechanical parts and sensors, and remove any residues if necessary. Verify the integrity of the motor and replace it if deterioration is encountered. If any mechanical parts are damaged or jammed, remove or change the mechanical parts in question. Verify the electrical connections and change them if damaged. Check the photocell sensors and reposition them or change them if damaged.
351-358	B"X"_DATA_SUPPLY_FAILED, where "X" = 1..8	Invalid table parameters	Check for consistency errors between the tables and the circuit installed on the machine. Verify the proper installation of the calibration tables in the Machine menu.
359-382	C"X"_DATA_SUPPLY_FAILED, where "X" = 1..24	Invalid table parameters	Check for consistency errors between the tables and the circuit installed on the machine. Verify the proper installation of the calibration tables in the Machine menu.

ERROR CODES	ERROR DETECTED	ERROR DESCRIPTION	TROUBLESHOOTING
401-408	B"X"_SUPPLY_CALC_ERROR, where "X" = 1..8	In CONTINUOUS dispensing the Number of steps of the "X" BASE to carry out is NOT a multiple of a whole stroke	Check for consistency errors between the tables and the circuit installed on the machine. Verify the proper installation of the calibration tables in the Machine menu.
409-432	C"X"_SUPPLY_CALC_ERROR, where "X" = 1..24	In CONTINUOUS dispensing the Number of steps of the "X" COLORANT to carry out is NOT a multiple of a whole stroke	Check for consistency errors between the tables and the circuit installed on the machine. Verify the proper installation of the calibration tables in the Machine menu.
451-482	DISABLED_REQUIRED_CIRCUIT_"X"_ERROR, where "X" = 0..31	"X" Slave must dispense but is erroneously Disabled	Load the Slave configurations onto the new MAB board.
501-508	B"X"_COLOR_HOME_POS_ERROR, where "X"=1..8	Error in the HOMING procedure of the "X" BASE	Check the correct operation of the photocell and the correct movement of the "X" BASE stepper
509-532	C"X"_COLOR_HOME_POS_ERROR, where "X"=1..24	Error in the HOMING procedure of the "X" COLORANT	Check the correct operation of the photocell and the correct movement of the "X" COLORANT stepper
551-558	B"X"_COLOR_HOME_BACK_ERROR, where "X" = 1..8	Loss of steps error in "X" BASE Dispensing	Decrease the dispensing speed
559-582	C"X"_COLOR_HOME_BACK_ERROR, where "X" = 1..24	Loss of steps error in "X" COLORANT Dispensing	Decrease the dispensing speed
601-608	B"X"_COLOR_POS0_READ_LIGHT_ERROR, where "X" = 1..8	At the end of the movement from HOME position to POS0 the photocell is NOT engaged in the "X" BASE	Check photocell and stepper operation
609-632	C"X"_COLOR_POS0_READ_LIGHT_ERROR, where "X" = 1..24	At the end of the movement from HOME position to POS0 the photocell is NOT engaged in the "X" COLORANT	Check photocell and stepper operation
651-658	B"X"_COLOR_END_STROKE_READ_DARK_ERROR, where "X" = 1..8	At the end of the dosing stroke the photocell is engaged in "X" BASE	Check photocell and stepper operation
659-682	C"X"_COLOR_END_STROKE_READ_DARK_ERROR, where "X" = 1..24	At the end of the dosing stroke the photocell is engaged in "X" COLORANT	Check photocell and stepper operation
701-708	B_"X"_OVERCURRENT_ERROR, where "X" = 1..8	"X" BASE stepper motor overcurrent	Check wirings, stepper operation
709-732	C_"X"_OVERCURRENT_ERROR, where "X" = 1..24	"X" COLORANT stepper motor overcurrent	Check wirings, stepper operation
751-758	B"X"_SOFTWARE_ERROR, where "X" = 1..8	Logic error in the process statuses on "X" BASE	Replace electronic board, if the problem persists request a Firmware update
759-782	C"X"_SOFTWARE_ERROR, where "X" = 1..24	Logic error in the process statuses on "X" COLORANT	Replace electronic board, if the problem persists request a Firmware update
783	MOVE_X_AXIS_SOFTWARE_ERROR	Logic error in the process statuses on X AXIS	Replace electronic board, if the problem persists request a Firmware update
784	MOVE_Y_AXIS_SOFTWARE_ERROR	Logic error in the process statuses on Y AXIS	Replace electronic board, if the problem persists request a Firmware update
785-788	STORAGE_CONTAINER"X"_SOFTWARE_ERROR where "X" = 1..4	Logic error in the process statuses on "X" CONTAINER	Replace electronic board, if the problem persists request a Firmware update
789-790	PLUG_COVER"X"_SOFTWARE_ERROR where "X" = 1..2	Logic error in the process statuses on "X" CAPPING	Replace electronic board, if the problem persists request a Firmware update

ERROR CODES	ERROR DETECTED	ERROR DESCRIPTION	TROUBLESHOOTING
791	AUTOCAP_SOFTWARE_ERROR	Logic error in the process statuses on AUTOCAP	Replace electronic board, if the problem persists request a Firmware update
801-808	B"X_COLOR_DRV_OVER_CURR_TEMP_ERROR, where "X" = 1..8	"X" BASE Stepper motor overtemperature	Check wirings, stepper operation
809-832	C"X_COLOR_DRV_OVER_CURR_TEMP_ERROR, where "X" = 1..24	"X" COLORANT Stepper motor overtemperature	Check wirings, stepper operation
833	MOTION_X_DRV_OVER_CURR_TEMP_ERROR	X AXIS Stepper motor overtemperature	Check wirings, stepper operation
834	MOTION_Y_DRV_OVER_CURR_TEMP_ERROR	Y AXIS Stepper motor overtemperature	Check wirings, stepper operation
835-838	STORAGE_CONTAINER"X"_DRV_OVER_CURR_TEMP_ERR where "X" = 1..4	"X" CONTAINER Stepper motor overtemperature	Check wirings, stepper operation
839-840	PLUG_COVER"X"_DRV_OVER_CURR_TEMP_ERR where "X" = 1..2	"X" CAPPING Stepper motor overtemperature	Check wirings, stepper operation
841	AUTOCAP_DRV_OVER_CURR_TEMP_ERROR	AUTOCAP Stepper motor overtemperature	Check wirings, stepper operation
851-858	B"X_COLOR_OPEN_LOAD_ERROR, where "X" = 1..8	Load missing in "X" BASE Stepper	Check wirings, stepper operation
859-882	C"X_COLOR_OPEN_LOAD_ERROR, where "X" = 1..24	Load missing in "X" COLORANT Stepper	Check wirings, stepper operation
883	MOTION_X_OPEN_LOAD_ERROR	Load missing in X AXIS Stepper	Check wirings, stepper operation
884	MOTION_Y_OPEN_LOAD_ERROR	Load missing in Y AXIS Stepper	Check wirings, stepper operation
885-888	STORAGE_CONTAINER"X"_OPEN_LOAD_ERROR where "X" = 1..4	Load missing in "X" CONTAINER Stepper	Check wirings, stepper operation
889-890	PLUG_COVER"X"_OPEN_LOAD_ERROR	Load missing in "X" CAPPING Stepper	Check wirings, stepper operation
891	AUTOCAP_OPEN_LOAD_ERROR	Load missing in AUTOCAP Stepper	Check wirings, stepper operation

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