

Technical Manual

Color Lab



ORIGINAL INSTRUCTION

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Table of contents

0. FOREWORD	6
0.1. HOW TO USE THE MANUAL	6
0.1.1. IMPORTANCE OF THE MANUAL	6
0.1.2. HOW TO KEEP THE MANUAL	6
0.1.3. HOW TO CONSULT THE MANUAL	6
0.1.4. SYMBOLS USED IN THE MANUAL	7
0.1.5. PROCEDURE FOR UPDATING THE MANUAL IN CASE OF MODIFICATIONS TO MACHINE	7
0.2. INSTRUCTIONS FOR ORIGINAL SPARE PART AND CONSUMABLE ORDER	7
0.3. SAFETY INFORMATION.....	8
0.3.1. PRECAUTIONS AND USAGE REGULATIONS	8
0.3.2. GENERAL SAFETY WARNINGS.....	8
0.3.3. USERS AND ACCESS LEVELS	9
0.3.4. RESIDUAL RISKS AND DANGEROUS AREAS.....	9
0.3.5. CONTACT WITH COLORANTS OR BASES	10
0.3.5.1. GENERAL FIRST AID MEASURES	10
0.4. TECHNICAL SPECIFICATIONS	10
0.4.1. ELECTRICAL SPECIFICATIONS	10
0.4.2. EQUIPMENT CLASSIFICATION AND REFERENCE STANDARDS	10
0.4.3. OPERATING CONDITIONS.....	10
1. DESCRIPTION OF THE MACHINE	11
1.1. MAIN COMPONENTS	11
1.1.1. DYE UNITS.....	11
1.1.2. ELECTRICAL CONTROL PANEL	11
1.1.3. CAN SUPPORT ARM.....	12
1.1.4. SUPPORT CABINET (OPTIONAL)	12
1.1.5. SEMI-FINISHED PRODUCTS OR BASE TANK PULL-OUT TRAY	12
1.1.6. SEMI-FINISHED PRODUCTS OR BASE TANK.....	13
1.1.7. AUTOCAP	13
2. PARTS REMOVAL AND REPLACEMENT	14
2.0. SAFETY REGULATIONS ON MAINTENANCE	14
2.0.1. AUTHORISED PERSONNEL.....	14
2.0.2. MACHINE SWITCHING OFF	14
2.0.3. ACCESS TO THE REPAIR AND MAINTENANCE OPERATIONS	14
2.0.4. MACHINE RESTORATION AND START AFTER THE INTERVENTION	14
2.0.5. PRODUCT DISPOSAL	14
2.1. EXTERNAL COVER REMOVAL	15
2.1.1. UPPER PANELS	15
2.1.2. SIDE PANELS	15
2.1.2.1. POWER SUPPLY PANEL REMOVAL	15
2.1.2.2. ACCESS TO THE ELECTRICAL PARTS	16
2.1.2.3. REAR COVER REMOVAL	16
2.2.1. STRAINER CLEANING	17
2.3. REMOVAL OF BASE OR SEMI-FINISHED PRODUCT TRAY.....	17
2.3.1. DISASSEMBLY OF BASE OR SEMI-FINISHED PRODUCT TRAY.....	18
2.4. BASE OR SEMI-FINISHED PRODUCT GROUP REPLACEMENT.....	19
2.5. BASE OR SEMI-FINISHED PUMP REPLACEMENT	20
2.6. REPLACEMENT OF BASE CIRCUIT ELECTROVALVES	21
2.7. CLEANING OF BASE OR SEMI-FINISHED PRODUCT CIRCUIT FILTERS.....	23
2.8. AUTOCAP GROUP REPLACEMENT	24
2.9. REPLACEMENT OF HUMIDIFIER PARTS (ULTRASONIC ATOMIZER KIT)	25
2.9.1. ATOMIZER	25
2.9.2. ATOMIZER CONTROL BOARD.....	25
2.9.3. AIR PUMP	25

3. ELECTRIC REPAIRING OPERATIONS.....	26
3.1. DIAGNOSIS AND ELECTRONIC PART DESCRIPTION	26
3.1.1. PC LINUX BOARD	26
3.1.2. MAIN AUTOMATION BOARD (MAB)	26
3.1.3. SCCB BOARD	27
3.2. CHECKING AND REPLACING THE NETWORK FUSES	28
3.3. REPLACING THE POWER SUPPLY UNITS	28
3.4. REPLACING THE LINUX/MAB BOARD	29
3.5. REPLACING THE SCCB BOARD BASE CIRCUIT	29
3.6. REPLACING THE CAN PRESENCE PHOTOCCELL/REFLECTIVE PANEL	30
3.6.1. REPLACING THE REFLECTIVE PANEL	30
3.6.2. REPLACING THE PHOTOCCELL.....	30
3.7. LTE ROUTER SETTINGS.....	31
3.7.1. CONNECTION VIA VPN CLIENT ON WINDOWS 7 AND 10.....	31
3.7.2. CONNECTION VIA VPN CLIENT FROM ANDROID DEVICES.....	33
4. PROGRAMMING THE ELECTRONIC BOARDS	37
4.1. PROGRAMMING OF BOARDS WITH NO BOOTLOADER	37
4.1.1. PROGRAMMING DEVICES.....	37
4.1.2. INSTALLING THE MPLAB IDE SOFTWARE	37
4.1.3. PROGRAMMING WORKSPACE	37
4.1.4. PROGRAMMING THE BOARDS	38
4.2. PROGRAMMING OF BOARDS WITH BOOTLOADER	40
4.2.1. SOFTWARE “BOOTLOADERAPP”	40
4.2.2. INSTALLATION OF “BOOTLOADERAPP”	41
4.2.3. STARTING THE BOOTLOADER	42
4.2.4. MAB FIRMWARE UPDATE	42
4.2.5. ACTUATOR FIRMWARE UPDATE (SCCB BOARDS).....	43
4.2.6. SETTING ADDRESSES.....	44
4.3. BOOTLOADER 2.0.....	44
5. HANDLING THE MACHINE.....	45
5.1. MOVING THE MACHINE	45
6. ACCESS TO THE DIAGNOSTIC FUNCTIONS.....	46
6.1. ADMIN CONTROL AND DIAGNOSTIC INTERFACE.....	46
7. CONNECTION DIAGRAMS.....	47
8. TROUBLE SHOOTING	60

0. FOREWORD

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 ordinary maintenance operations, such as canister and tank filling, nozzle cleaning and autocalibration. Access to the dedicated software area is protected by a first level password;
- **TECHNICIAN:** an expert operator authorised to access the machine's special diagnostic, calibration, 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 and to perform ordinary maintenance operations;
- **MAINTENANCE AREA:** the area inside the machine, which can be accessed with a key, where ordinary maintenance operations are usually performed (on Color Lab such operations are performed by the MAINTENANCE OPERATOR); extraordinary maintenance operations require the access to the SERVICE AREA and are performed by the TECHNICIAN (replacement of dispensing units, circuits, electric parts);
- **SERVICE AREA (FOR USE BY TECHNICIANS):** the internal areas of the machine that can not be accessed using a single key, but with other tools (circuits electrical cabinets);

0.3.4. RESIDUAL RISKS AND DANGEROUS AREAS

USER AND MAINTENANCE OPERATOR


The potentially dangerous areas associated with mechanical moving parts are described below:

- **autocalibration system:** risk of entrapment for the hands, fingers, hair and/or clothing due to autocalibration opening/closing movement.
- **Movement of the loading arm;** its movement in manual configuration does not pose any risks that are not already obvious; its movement in "automatic arm" configuration poses a slight risk of crushing between the arm and the tunnel vertical right wall.
- **paint tanks:** risk of squeezing arms, hands or fingers due to the movement of stirring blade. The stirring cycle activation is timed by the software and may occur unexpectedly. Do not insert your hands into the base or colorant tanks. Always shut off the machine prior to performing any necessary interventions.

TECHNICIAN: The authorised technician can remove the machine fixed protections and access the internal parts containing live electrical components.

- **Electrical panel area:** risk of electric shock.

Any interventions that require the operator to access zones where risks of electrical 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	3.0÷1.7A
Absorbed power	400W max
Fuses 5X20 mm	T3.15A-250V Q.ty 2pcs
Working noise (*)	Lower than 70 dB (A)

(*) A-weighted sound pressure level determined during normal use 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 61010-1 IEC EN 61326-1
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

OVERVIEW OF MAIN ELEMENTS

1. Dye units
2. Electrical control panel
3. Colour sample support arm
4. Support cabinet (optional)
5. Semi-finished products or base circuits
6. Autocap



Machine with cabinet and rails

1.1.1. DYE UNITS

The machine can house up to 16 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.

Each unit contains a 1.5 litre tank, and is equipped with its own colorant reserve alarm system.



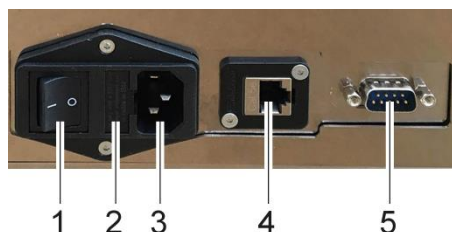
External view of the Colorant Circuits

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

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.

7. On/off Switch
8. Fuse holder 5x20mm T4A 250Vac
9. Standard CT-120 Power Socket 100-240Vac
10. Ethernet Port RJ45
11. Port RS-232 (for scale)



Electrical connections

The compartment behind the removable panel contains the AC/DC converters, the secondary circuit protection fuses, the Linux and MAB boards and the Autocap control SCCB board (see para. 2.1.2.2).

1.1.3. CAN SUPPORT ARM

The machine produces colour samples in volumes ranging from 100cc to 1 litre.

The support arm (1) can be positioned at different heights in order to accommodate cans of appropriate volumes, based on the quantity to be dispensed.

The handle facilitates the extraction and the correct positioning of the can in the dispensing position.



1.1.4. SUPPORT CABINET (OPTIONAL)

The machine can be supplied on a cabinet equipped with two front doors. The cabinet can contain two trays for base and Titanium and filler semi-finished products.

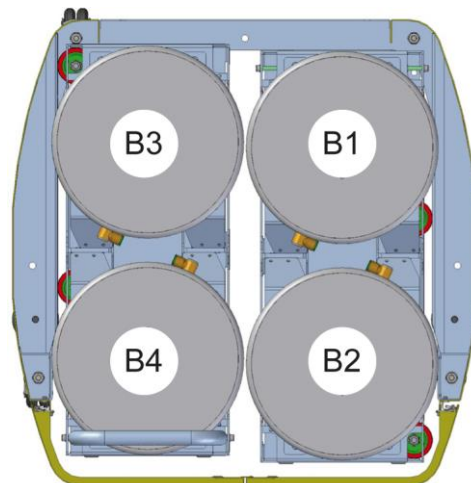
1.1.5. SEMI-FINISHED PRODUCTS OR BASE TANK PULL-OUT TRAY

The cabinet can contain 2 trays capable of accommodating up to 4 stainless steel tanks of 22 litres each (1), which are suitable for containing bases or semi-finished products.

The trays are equipped with wheels and handles (2) in order to facilitate their extraction from the cabinet and circuit refilling.



The figure to the side shows the circuit layout.



To replace, remove or clean a tray, refer to paragraph 2.3.

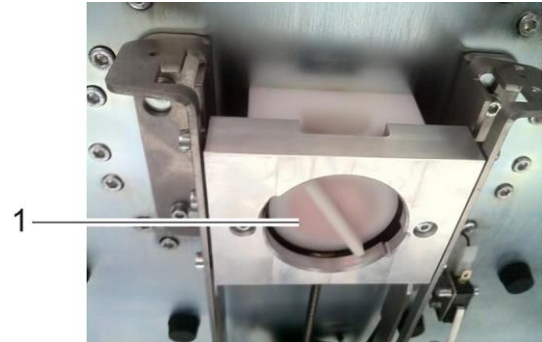
1.1.6. SEMI-FINISHED PRODUCTS OR BASE TANK

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 or semi-finished products, 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.

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. 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.

2.0.3. ACCESS TO THE REPAIR AND MAINTENANCE OPERATIONS



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.

2.0.4. 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**
- **PERFORM A FUNCTIONAL CHECK (SEE PARAGRAPH 3.4 AND CHAPTER 4 OF THE OPERATOR MANUAL)**

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.

2.0.5. 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.

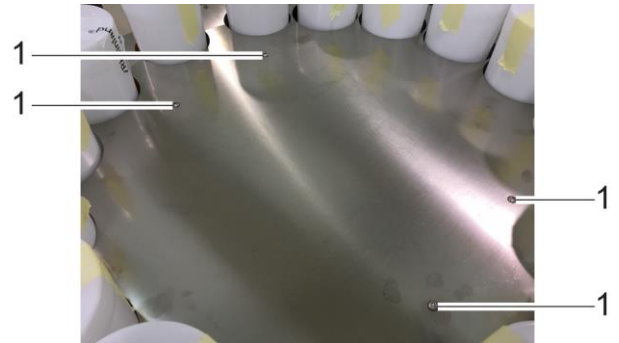
2.1. EXTERNAL COVER REMOVAL

To reach the colorant groups, the nozzle and the electrovalves of the circuits it is 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)

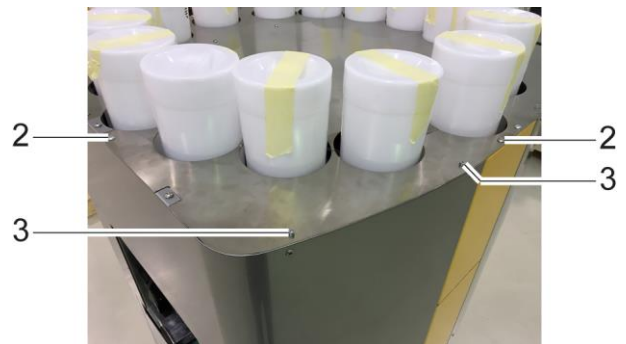
2.1.1. UPPER PANELS

Remove the upper panel in the middle of the colorant canisters by loosening the 4 retaining screws (1) with an Allen wrench of 3 mm.



Remove the 4 panels in the corners by loosening 2 M5 retaining button head screws (2) with an Allen wrench of 3 mm.

Do NOT remove the M4 cylindrical-head screws (3)!



2.1.2. SIDE PANELS

2.1.2.1. POWER SUPPLY PANEL REMOVAL

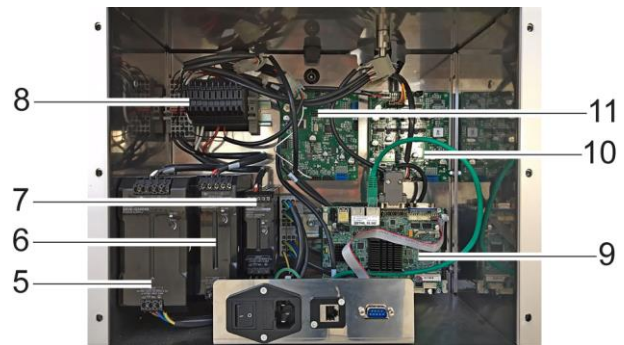
To remove the rear panel and reach the supply area, loosen the 6 M5 retaining button head screws (4) with an Allen wrench of 3 mm.



2.1.2.2.ACCESS TO THE ELECTRICAL PARTS

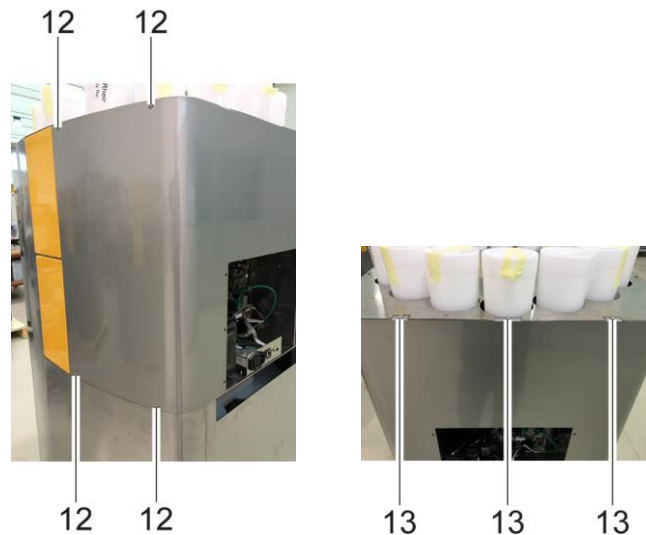
Behind the rear removable panel of the machine there is an electric compartment at mains voltage with:

- 12. power supply unit, 100-240Vac, 48Vdc
- 13. power supply unit, 100-240Vac, 24Vdc
- 14. power supply unit, 100-240Vac, 12Vdc
- 15. circuit protection fuses
- 16. PC Linux board
- 17. MAB board
- 18. Autocap circuit SCCB board



2.1.2.3.REAR COVER REMOVAL

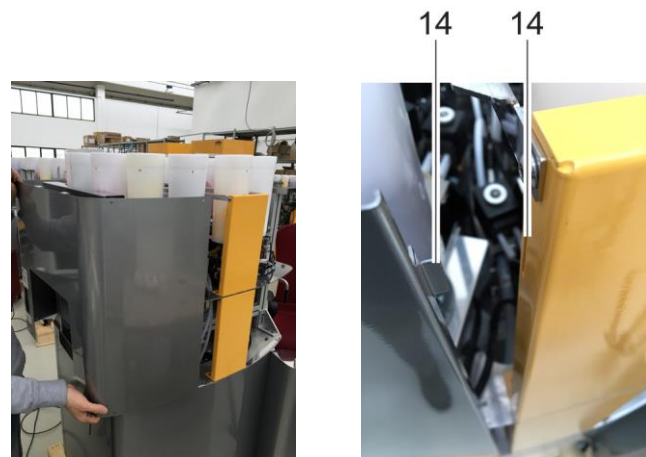
Remove the 4 side screws on each side of the machine (12) and the 3 upper screws (13) using an Allen wrench of 3 mm.



Slide out the panel from the frame paying attention not to damage the engagement points on the central uprights (14).

The base or semi-finished circuit SCCB boards are inside the rear side panel (see para. 3.5).

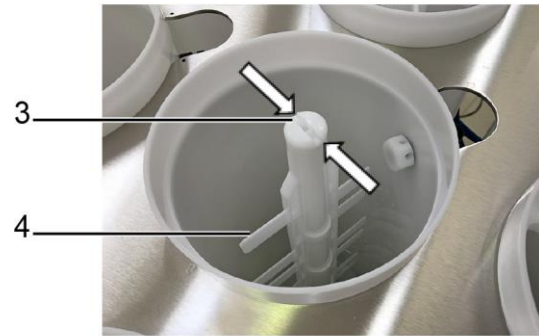
WARNING: Collect the any toothed washer under the screws! When reassembling the panels, fit said washers to their original position.



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.

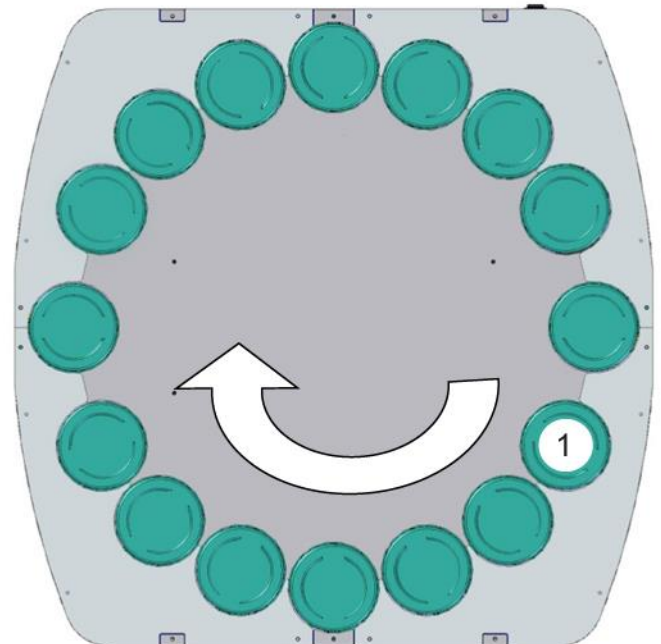
2.3. REMOVAL OF BASE OR SEMI-FINISHED PRODUCT TRAY

To replace the colorant group proceed as follows:

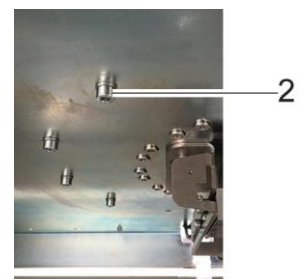
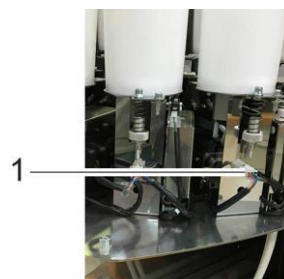
- make sure the machine is disconnected from the power supply as described in para. 2.0.3.

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.

- Identify the colorant group to be replaced, referring to the numbering indicated in the figure.



- 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.



Replacing the groups no. 8 and 16 could be more difficult due to the presence of the vertical fixed walls (3) located behind the groups. In this case, proceed as follows.

- First remove the group retaining knob on the lower side of the surface (2).
- Gently lift the rear side of the group until it is possible to reach the electric connector (1).
- Disconnect the connector and remove the group having care not to damage the dispensing knob.



2.3.1. DISASSEMBLY OF BASE OR SEMI-FINISHED PRODUCT TRAY

To pull out the tray and disconnect it from the machine, proceed as follows:

- make sure the machine is disconnected from the power supply as described in para. 2.0.3.
- Open the doors and pull the trays out completely.



- Disconnect the electric circuits by disconnecting the electric 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.



- Release the carabiner (1) that connects the tray to the grounding braid (2).



- Close the valves of the delivery and recirculation circuits.
- Disconnect the machine delivery and recirculation pipes using the quick-release couplings and paying attention to possible paint leaks.

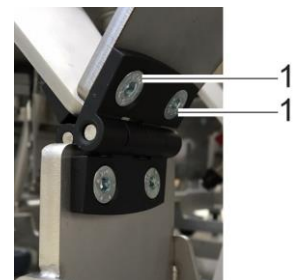


2.4. BASE OR SEMI-FINISHED PRODUCT GROUP REPLACEMENT

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.

- Separate the tray from the machine as described in paragraph 2.3.
- If the new group is not wired, use the wiring of the group to be replaced; in this case, disconnect the wirings on the pump (stepper motor and photocell) and on the tank (stirring motor and base or semi-finished reserve micro-switch).
- Loosen the 2 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.

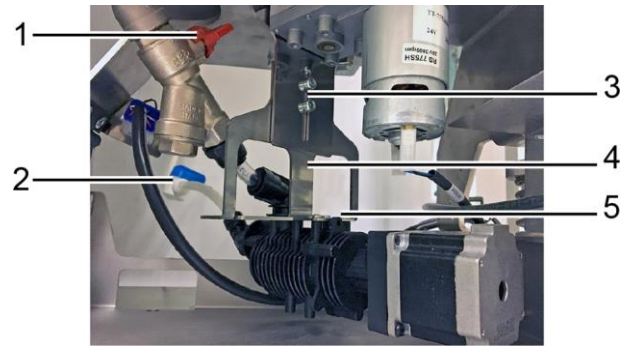
Performing such operations with machine on could seriously damage the electronic components.

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

2.5. BASE OR SEMI-FINISHED PUMP REPLACEMENT

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

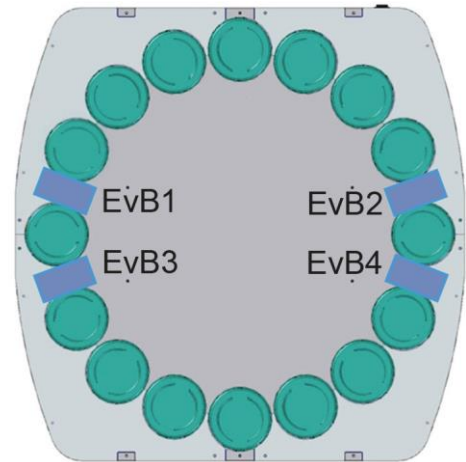
- make sure the machine is disconnected from the power supply as described in para. 2.0.3.
- Close the two taps on the inlet pipe (1) and the delivery pipe (2) of the group on which to perform maintenance.
- Loosen the 2 M5X12 socket head screws (3) on the pump support.
- Disconnect all electric wirings 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 CIRCUIT ELECTROVALVES

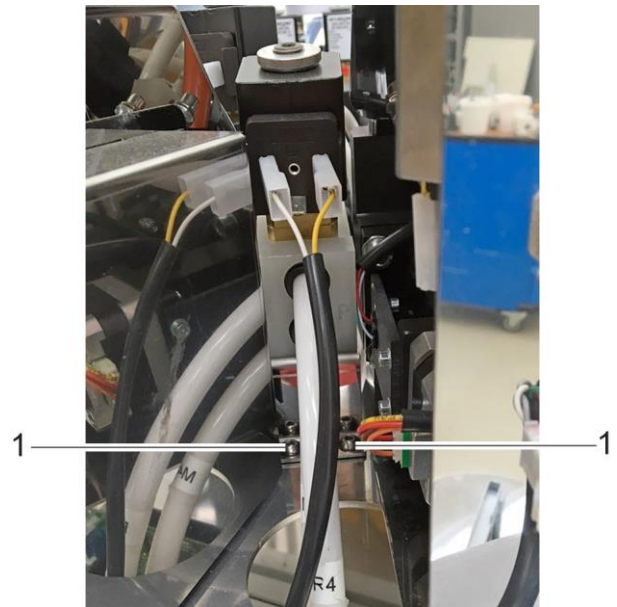
The electrovalves of the base and semi-finished product circuits are located on the colorant support base. To replace the single electrovalve, remove the side panels as described in paragraphs 2.1.2.3 and 2.1.2.5, and then proceed as follows:

- identify the circuit electrovalve to be replaced (EVB1, EVB2, EVB3, EVB4).
- Close the circuit delivery and recirculation taps connected to the electrovalve to be replaced (see also paragraph 2.3.1).



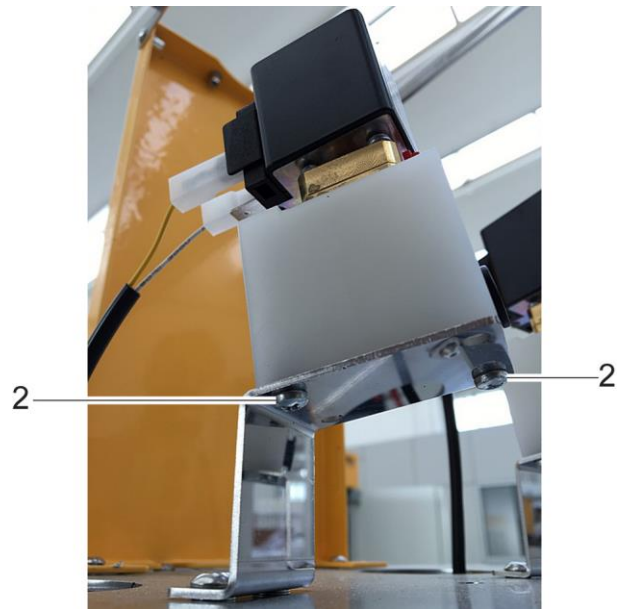
Front

- Loosen 2 M5X16 screws + D5 washer (1) that fix the electrovalve support bracket to the colorant support base and remove the electrovalve support.
- If necessary, to better reach the valve, temporarily remove the adjacent colorant group as described in paragraph 2.2.



Technical Manual – Color Lab

- 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.



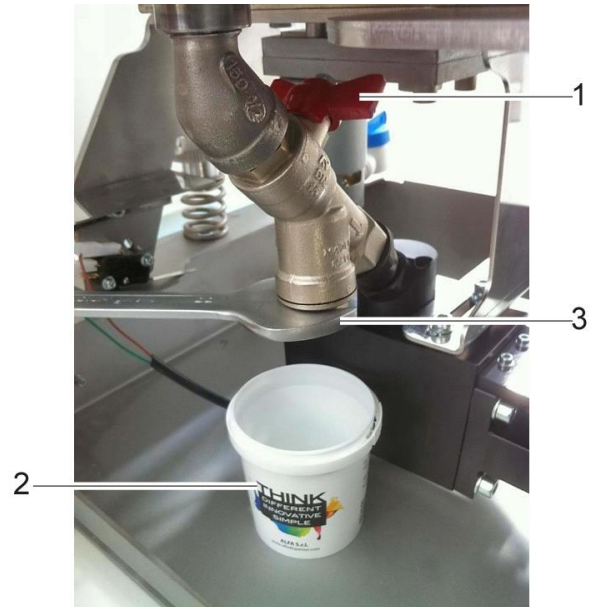
- Connect the duly cleaned pipes to the new electrovalves.
- Tighten the rear screws (M5X16 + D5 washer) of the electrovalve to the relevant support.
- Screw the electrovalve support again to the colorant support base.
- Reconnect the electric connection according to the wiring diagram.
- Open the taps 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.

2.7. CLEANING OF BASE OR SEMI-FINISHED PRODUCT CIRCUIT FILTERS

Upstream of the master 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:

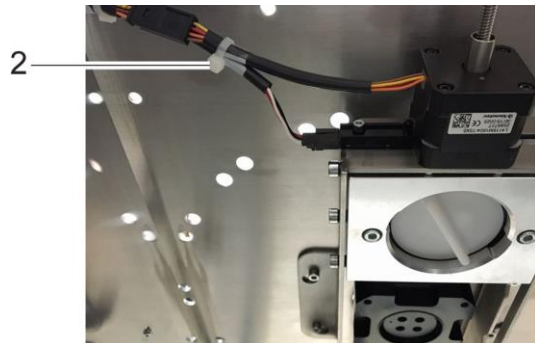
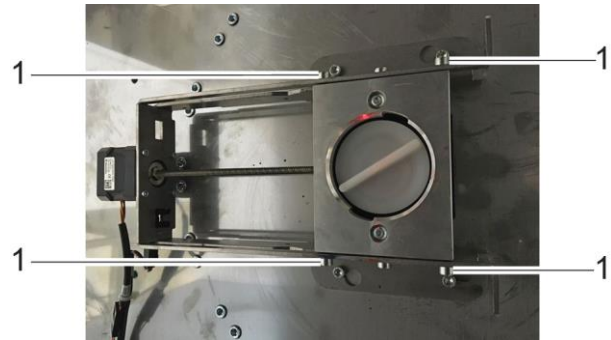
- Close tap upstream of filter (1).
- Set a can under the filter bottom end (2).
- Loosen the filter holder cap using a 22 mm wrench (3).
- Remove filter and flush with running water to clean it.
- Refit filter and its screw cap, then work on tap to open the circuit.
- At the end of the cleaning procedure,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



2.8. 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.



2.9. REPLACEMENT OF HUMIDIFIER PARTS (ULTRASONIC ATOMIZER KIT)

2.9.1. ATOMIZER

The humidifier uses an ultrasonic atomizer to spray the water from the tank. To change the transducer:

- Remove the mobile safety protection under the dispensing head by loosening 4 M4x10 supporting countersunk head screws, as described in par. 2.7;
- Disconnect the wiring connector;
- Loosen the two cross-slotted screws (1) and remove the transducer.

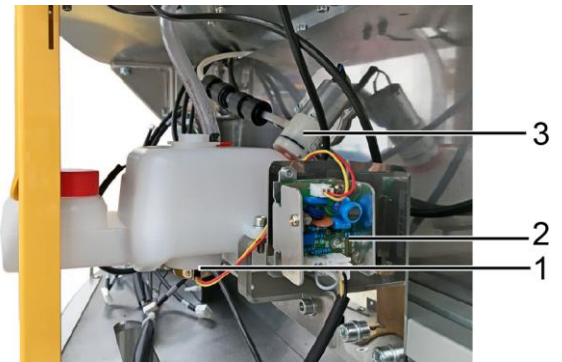
WARNING: THERE MUST BE WATER IN THE TANK WHEN YOU TURN THE ATOMIZER ON.

2.9.2. ATOMIZER CONTROL BOARD

The atomizer is controlled by a board located inside the electric box.

To change the board, remove the rear panel to reach the switchboard, as described in chapter 2 - ACCESS TO THE ELECTRIC PARTS, then:

- Disconnect the connectors from the board;
- Loosen the two M3x10 retaining screws with an Allen wrench of 2.5 mm to remove the board (2).



2.9.3. AIR PUMP

The air pump (3) is located near the humidifier tank. The pipes are interference-fit.

Disconnect the pipes and the electrical connector to disconnect the pump.

3. ELECTRIC REPAIRING OPERATIONS

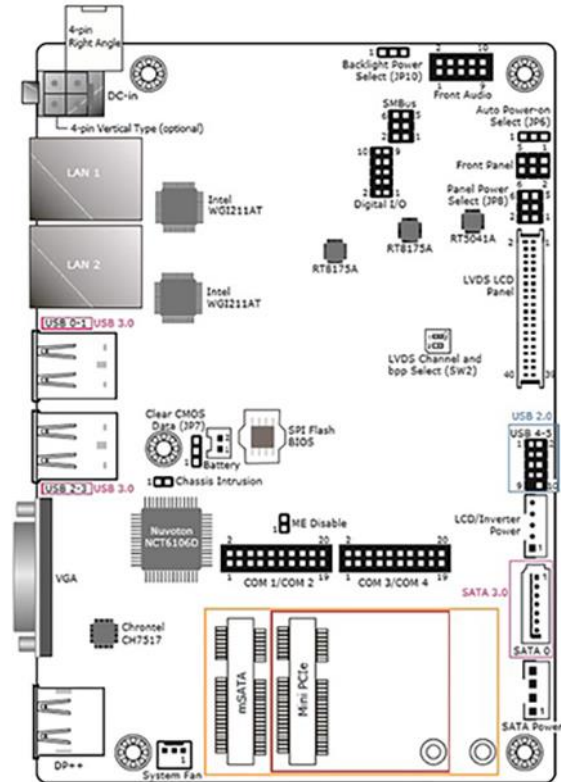
3.1. DIAGNOSIS AND ELECTRONIC PART DESCRIPTION

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)

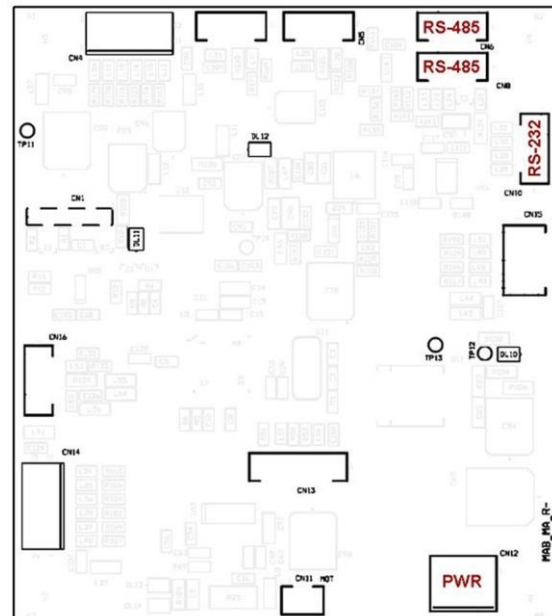
The machine management firmware MAB board is saved on the MAB board. The orders sent by the high-level software are managed at MAB level. This board organises the machine cycle by interrogating and sending orders via RS-485 to the slave boards of the single circuits.

The MAB board is supplied with 24Vdc.

The MAB board controls directly:

- the status lamp and the stop button
- hole beam locator lasers
- the can presence photocell

CN13 is used for programming the firmware via bootloader (see chapter 4 – PROGRAMMING THE ELECTRONIC BOARDS).



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

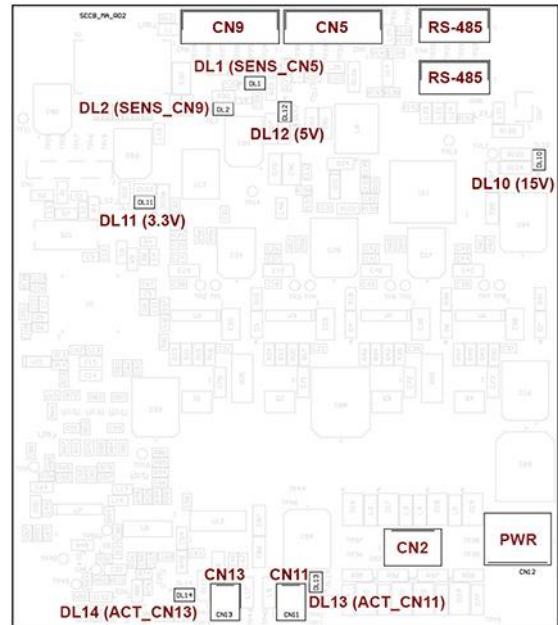
DL10 = 15V

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
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
COL 13	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 14	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 15	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
COL 16	STEPPER	HOME PHOT.	RS485	RS485	RESERVE	ELECTROVALVE	PWR	STIR MOT
AUTOCAP	STEPPER	HOME PHOT.	RS485	RS485			PWR	

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. 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 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:

- To reach the power supply unit compartment, remove the rear panel as described in chapter 2 - EXTERNAL COVER REMOVAL.
- 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.



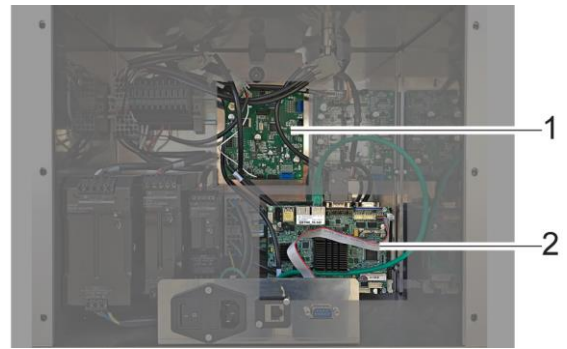
- Fit the new power supply unit manually on the DIN bar.
- Reconnect the power supply unit to the wiring according to the attached wiring diagram.
- Reposition the previously removed protection panel.

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

3.4. REPLACING THE LINUX/MAB BOARD

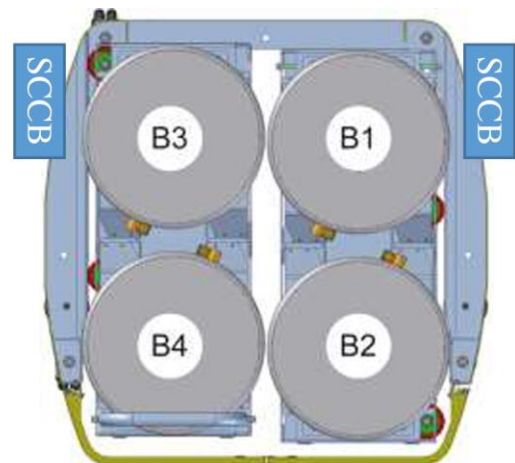
To replace the Linux PC or MAB boards, proceed as follows:

- Remove the rear power supply panel as described in chapter 2 - EXTERNAL COVER REMOVAL.
- Disconnect the power supply and signal cables from the board to be replaced.
- Removed the MAB (1) or Linux PC (2) board to be replaced from the supports on its corners (pressure-fit plastic supports for the MAB board and M3 retaining screws to the Linux board).
- 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 software/firmware. To reprogramme the boards refer to chapter 4.
- Restore the electric connections.



3.5. REPLACING THE SCCB BOARD BASE CIRCUIT

- To reach the SCCB boards of the base or semi-finished circuits (if any), remove the lateral panels as described in paragraphs 2.1.2.3 and 2.1.2.5, then proceed as described below.



- Find the position of the group board to be replaced.
- Disconnect the power supply and signal cables from the board.
- Remove the board by releasing it from the supports 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 boards refer to chapter 4.
- Restore the previously disconnected connections according to the wiring diagram.



Left side boards:
B3 (bottom) and B4 circuits



Right side boards:
B1 (bottom) and B2 circuits

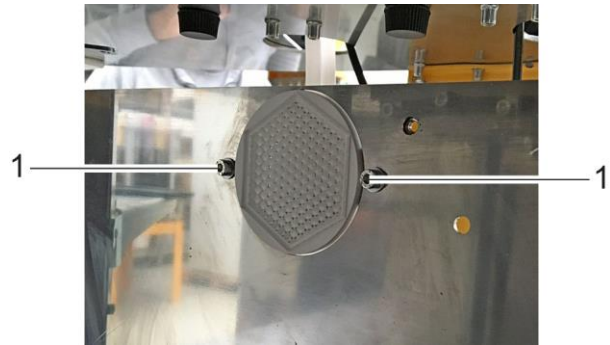
3.6. REPLACING THE CAN PRESENCE PHOTOCELL/REFLECTIVE PANEL

The reflective panel is not a part usually subject to damages and most of the problems connected to it can be solved with a suitable cleaning.

Nevertheless, to replace the photocell or the relevant reflective panel proceed as described below.

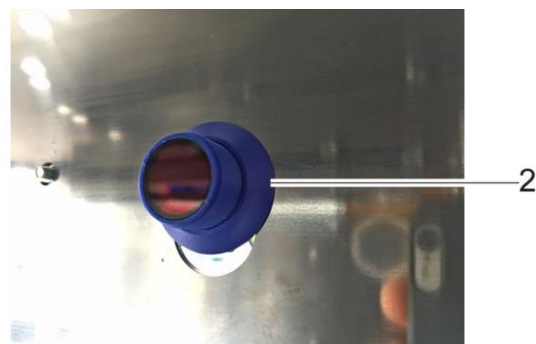
3.6.1. REPLACING THE REFLECTIVE PANEL

- Remove the rear cover as described in para. 2.1.2.3 or the front cover as described in para. 2.1.2.4.
- Inside the tunnel loosen the two M4 retaining screws (1) using an Allen wrench of 2.5 mm.
- To loosen the screws keep the nuts on the other side of the panel with a 7-mm wrench.
- Remove the component, position the new reflective panel and fix it with the previously removed screws.



3.6.2. REPLACING THE PHOTOCELL

- Remove the rear cover as described in para. 2.1.2.3 or the front cover as described in para. 2.1.2.4.
- Loosen the photocell retaining plastic ring nut (1) by hand or using a wrench.
- Then loosen the front round ring nut (2) until removing it from the photocell.
- Slide the component out of the wall.
- Disconnect the photocell screw connector and connect the new photocell.
- Fix the new photocell to the wall using the supplied ring nuts.
- Adjust the height in order to obtain an optimal detection of the can presence. We recommend in most of the cases to fix the photocell to the slot top part.



3.7. 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.

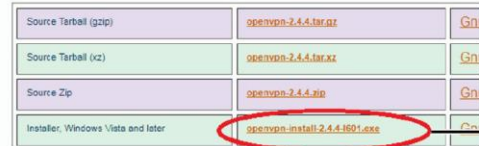
3.7.1. CONNECTION VIA VPN CLIENT ON WINDOWS 7 AND 10

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](#), [irc.freenode.net](#)).



NOTE: the GPG key used to sign the release files has been changed since OpenVPN 2.4.4. The old GPG signatures, 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 [this page](#).

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

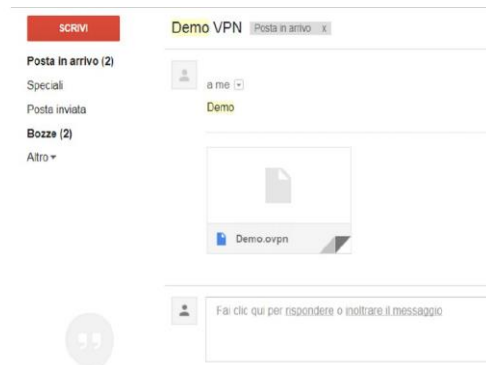


- Check the boxes indicated in the figure on the side, then press “Next”.

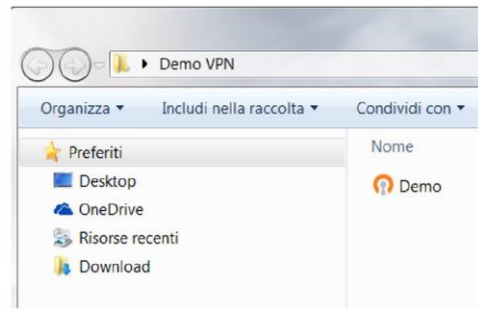


To connect to the machine via the VPN Client, proceed as described below:

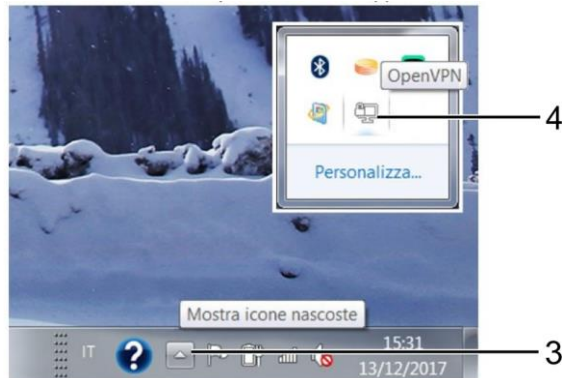
- Download the file containing the login credentials sent by Alfa via email.



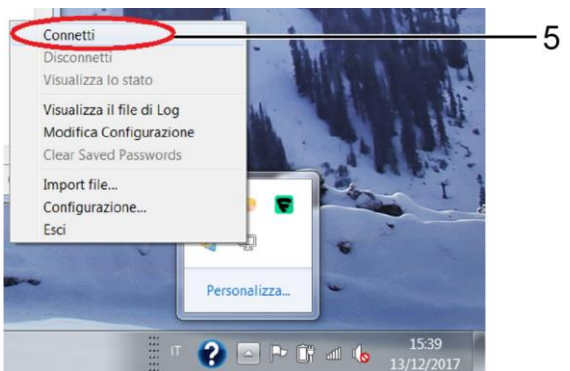
- Save the file containing the credentials in C:/programs/OpenVPN/Config
- Make sure you save it as an “.opvn” file.



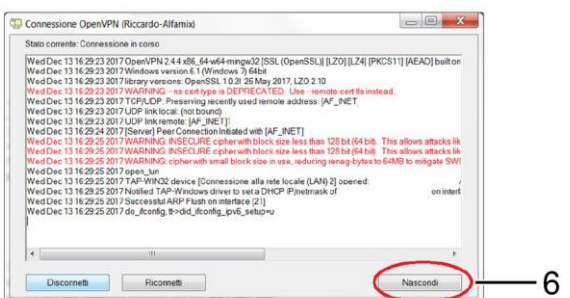
- On Windows Toolbar, click the arrow icon “show hidden icons” (3) then find the icon “OpenVPN” (4) in the pop-up.



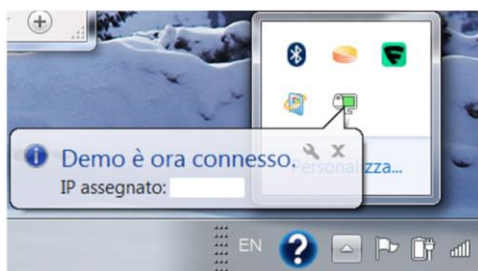
- Right click on the icon and select “Connect” (5);



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



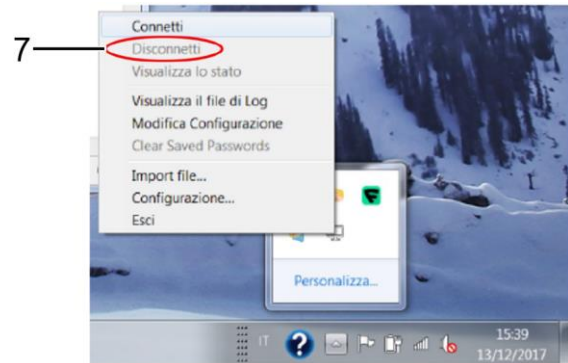
- After a few seconds a new pop-up will open on the toolbar, near the clock indicating that the PC is connected. This window could close automatically, while the OpenVPN icon will become green.



- 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).



3.7.2. 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.

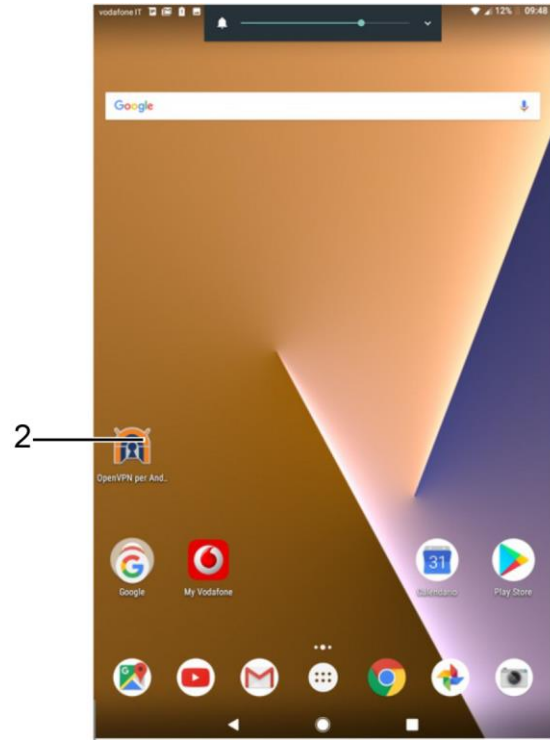


To connect to the machine via the VPN Client, proceed as described below:

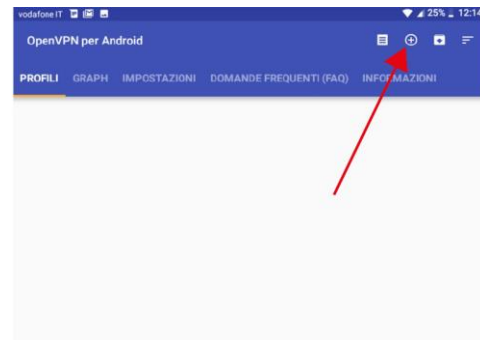
- Download the file containing the login credentials sent by Alfa via email.



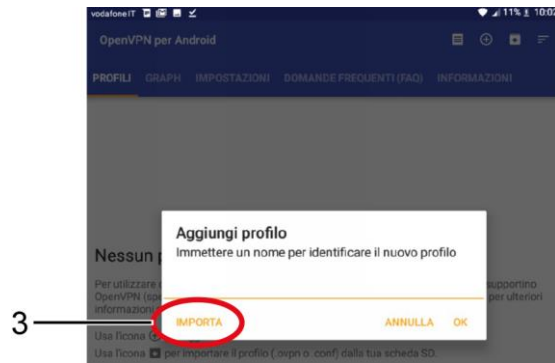
- Run the app OpenVPN (2) previously installed.



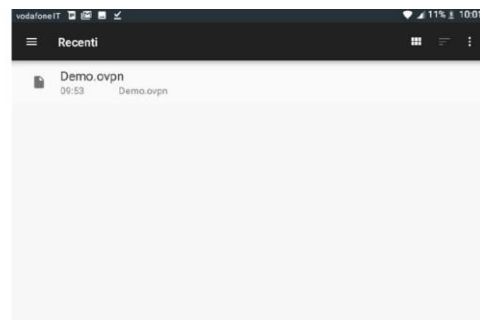
- Press symbol “+” present on the bar at top right of the app screen.



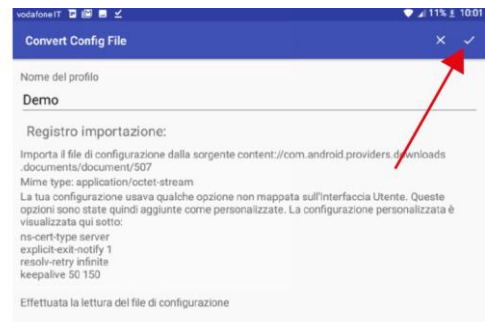
- Press “Import” (3).



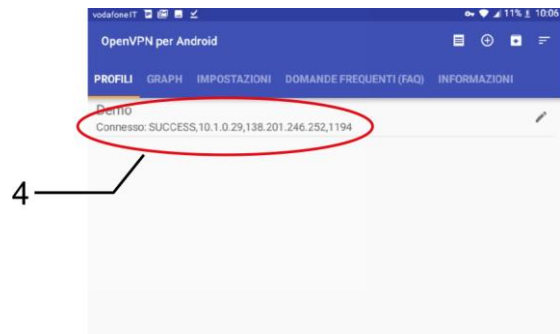
- Select the “.ovpn” file previously downloaded;



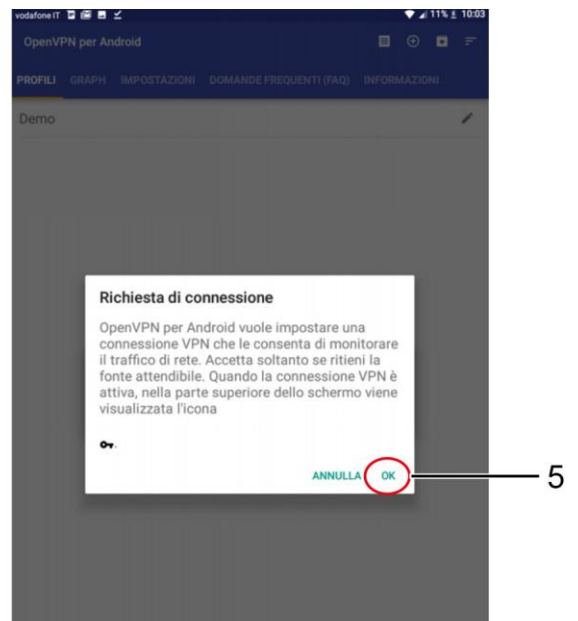
- Press on the check mark in the top right corner;



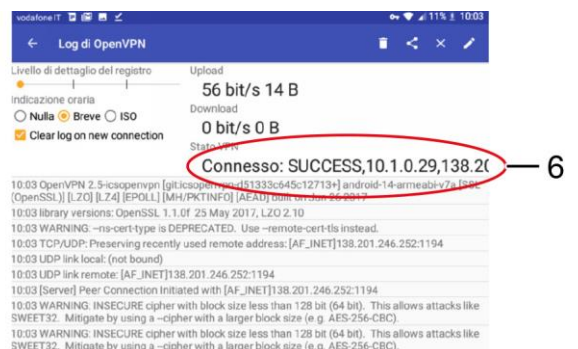
- Press on the just-added file (4).



- Press OK (5) on the next window.



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

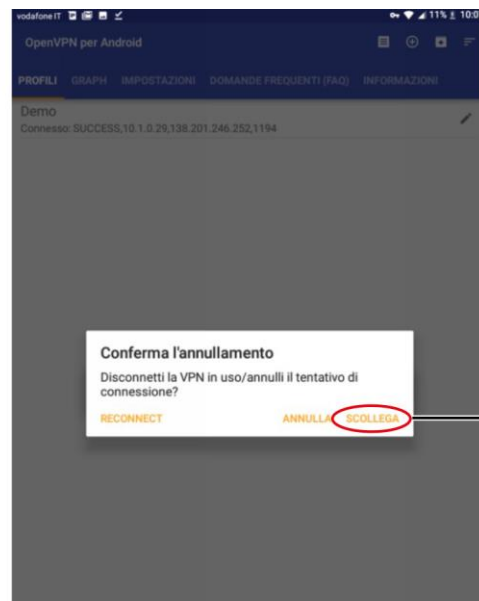


Technical Manual – Color Lab

- 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.

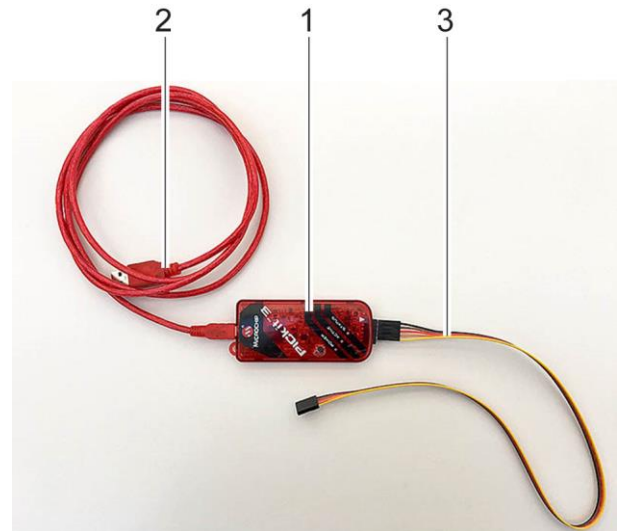
To programme the boards, use a suitable USB programmer (1) and the MPLAB IDE programming software.

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.

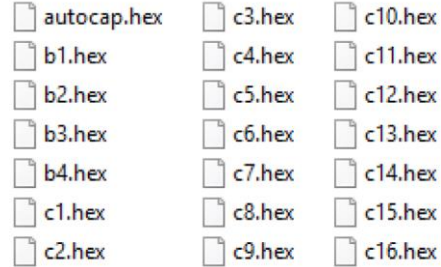
	Actuators_release_PICKIT3.mcw	4
	MABrd_Release_PcKit3.mcw	5

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:

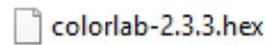
- up to 24 firmware versions (from c1 to c24) that can be used on colorant groups of the machine*;
- up to 8 firmware versions (from b1 to b8) that can be used on base groups or semi-finished products of the machine*;
- Autocap group firmware;



*: 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 Lab firmware;
- SGBRDB board firmware (if present);
- Firmware of other optional boards (HUTBRD, SPB, etc.)



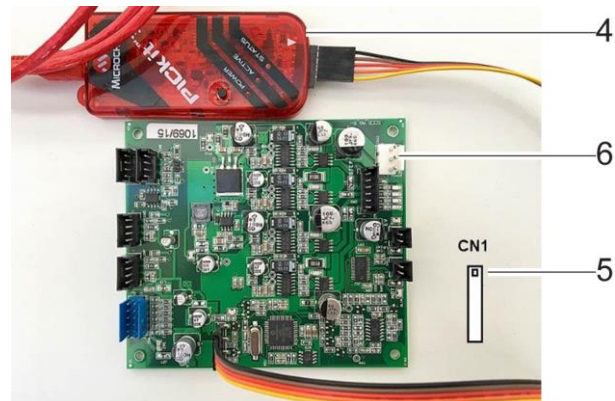
WARNING: CAREFULLY READ THE RELEASE NOTE TO CHECK THE FIRMWARE VERSION COMPATIBILITY

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.

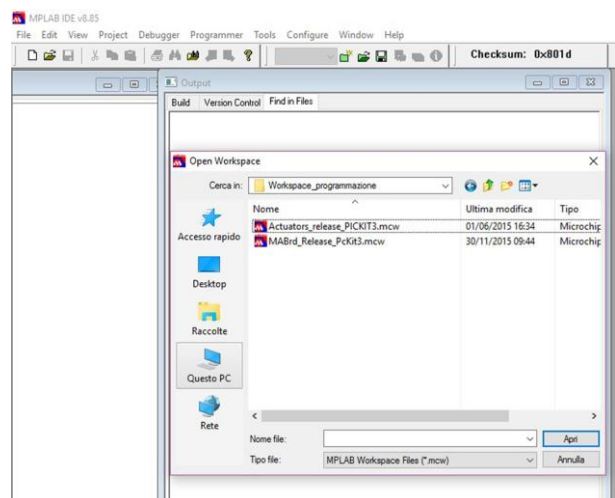


Launch the MPLAB IDE software

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).

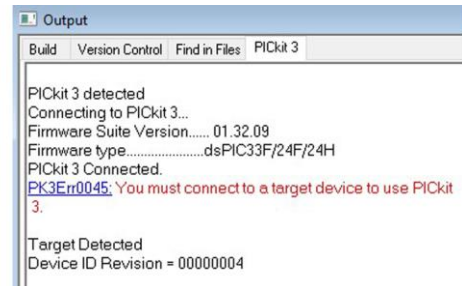
If message “No PICkit 3 Connected” is displayed, it means that the programmer is not connected correctly.



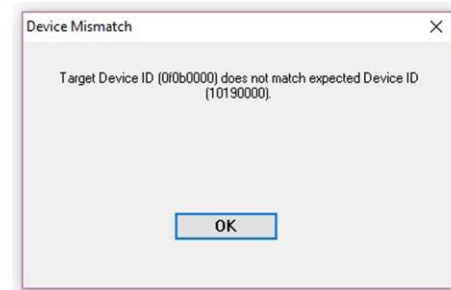
When the programmer is correctly connected and detected, the software will show the message “PICkit 3 detected”.



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.

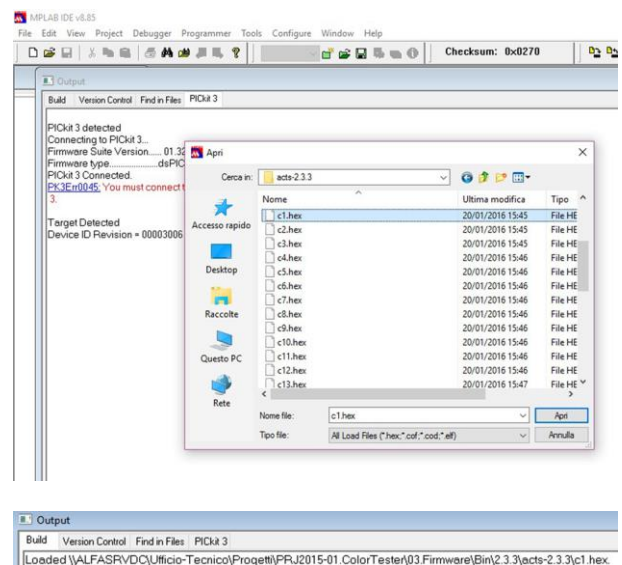


WARNING: If you upload a MAB Workspace and connect an SCCB board (or vice versa), the software will show the error “Target device ID does not match expected Device ID”.



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

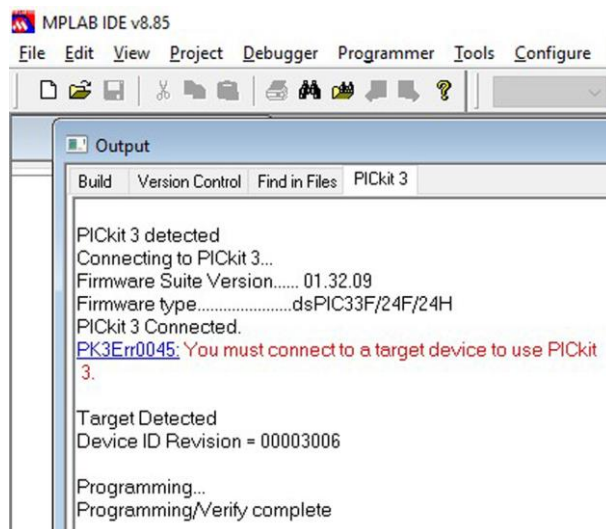
Select the suitable firmware version and select “Open”.



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.

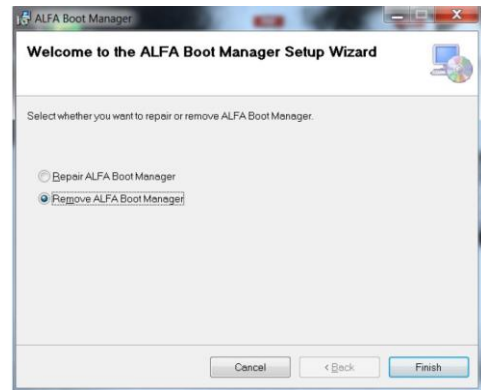
4.2.2. INSTALLATION OF “BOOTLOADERAPP”

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”.

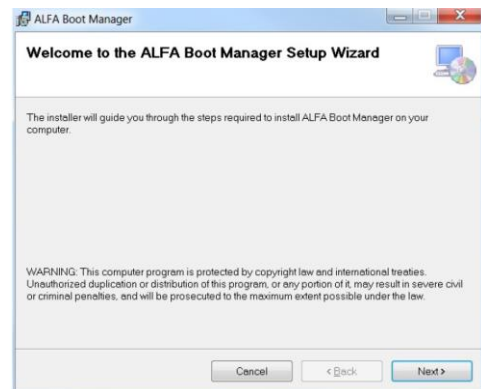
Wait until uninstall is completed and press “Close”.



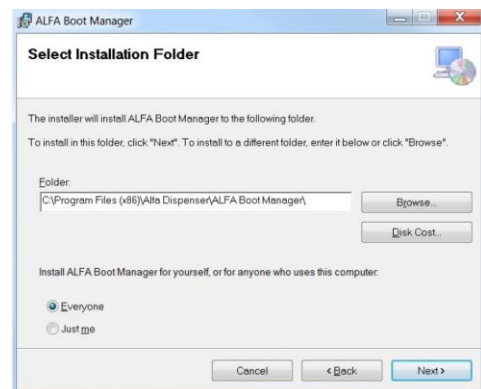
To install the application:

1. Run the installation file  ALFA Boot Manager .

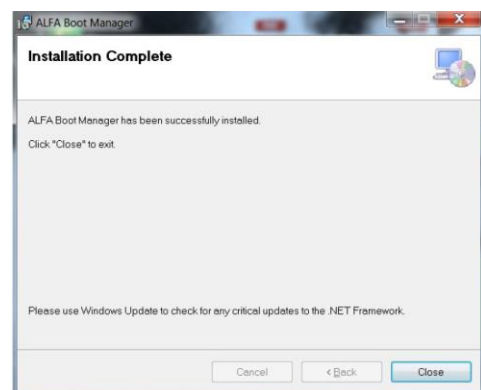
The page on the side will open.



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

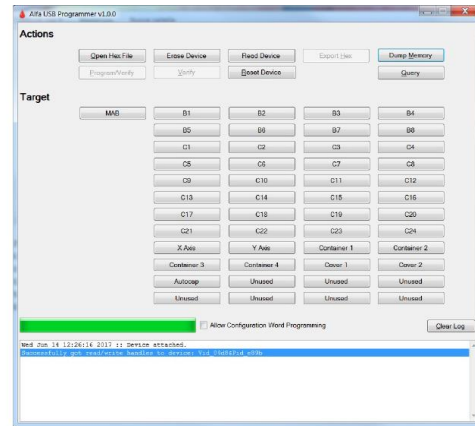


3. When prompted, press “Next >” until completing the installation procedure, then press “Close” to end the installation procedure.



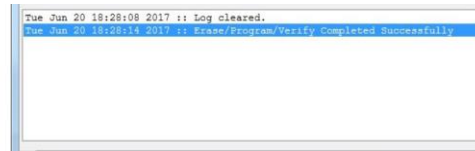
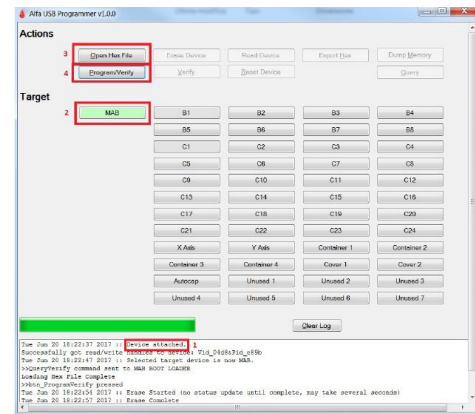
4.2.3. STARTING THE BOOTLOADER

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



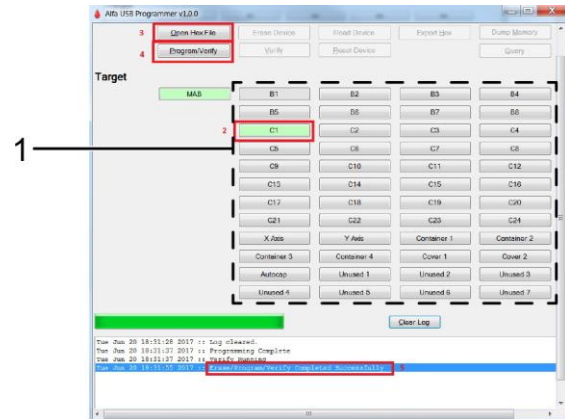
4.2.4. MAB FIRMWARE UPDATE

- 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. HANDLING THE MACHINE

5.1. MOVING THE MACHINE

Color Lab must only be handled in safe conditions.

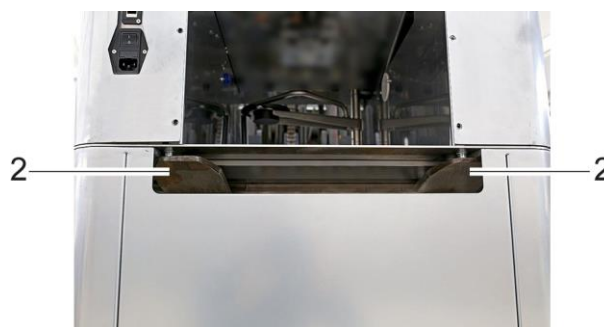
For small movements of the machine with the cabinet, it is possible to raise the support feet and use the dedicated wheels.

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 bigger movements, it is necessary to use a suitable lifting mean. In this case, proceed as follows:

- Switch the machine off and disconnect all electric connections (power supply, ethernet, serial).
- Open the cabinet doors to reach the trays of the base or semi-finished circuits and then pull them out.
- Disconnect the trays hydraulic and electrical circuits described in paragraph 2.3.1., and make sure that the hydraulic valves are closed in order to avoid leaking of the paint inside the pipes;
- Disconnect the tray ground connections using suitable carabiner (see para. 2.3).
- Extract the trays from the cabinet;
- Using a lift truck with tilting forks, insert the forks into the cabinet and lift the machine. The position of the forks is illustrated in the adjacent image (2), shown from the back of the machine.
- Be careful not to damage the pipes and cables present in the lower compartment!



LIFT THE MACHINE CAREFULLY, TAKING CARE TO MAKE SURE THAT IT IS GRIPPED PROPERLY AND IS NOT AT RISK OF TIPPING OVER

- Handle the machine using the fork lift truck and position it in the required installation space.

Place the machine on a surface suitable for sustaining its weight or on perfectly smooth and level flooring.



Once the movement has been completed, lower the support feet to stabilise the machine and reconnect the circuits. Use a spirit-level to level the machine.

6. ACCESS TO THE DIAGNOSTIC FUNCTIONS

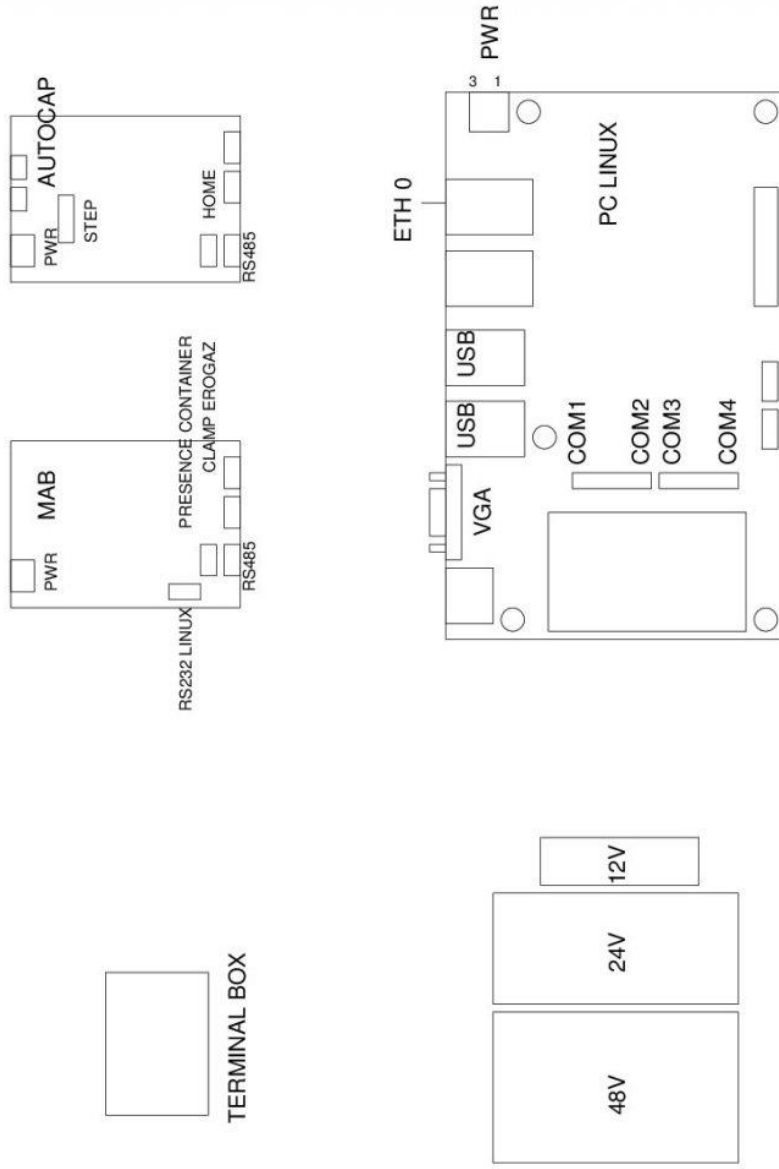
6.1. ADMIN CONTROL AND DIAGNOSTIC INTERFACE

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.

7. CONNECTION DIAGRAMS

ELECTRICAL LAY OUT



Nota: Per i programmi e i collegi il vedere i manuali di riferimento di Alfa.

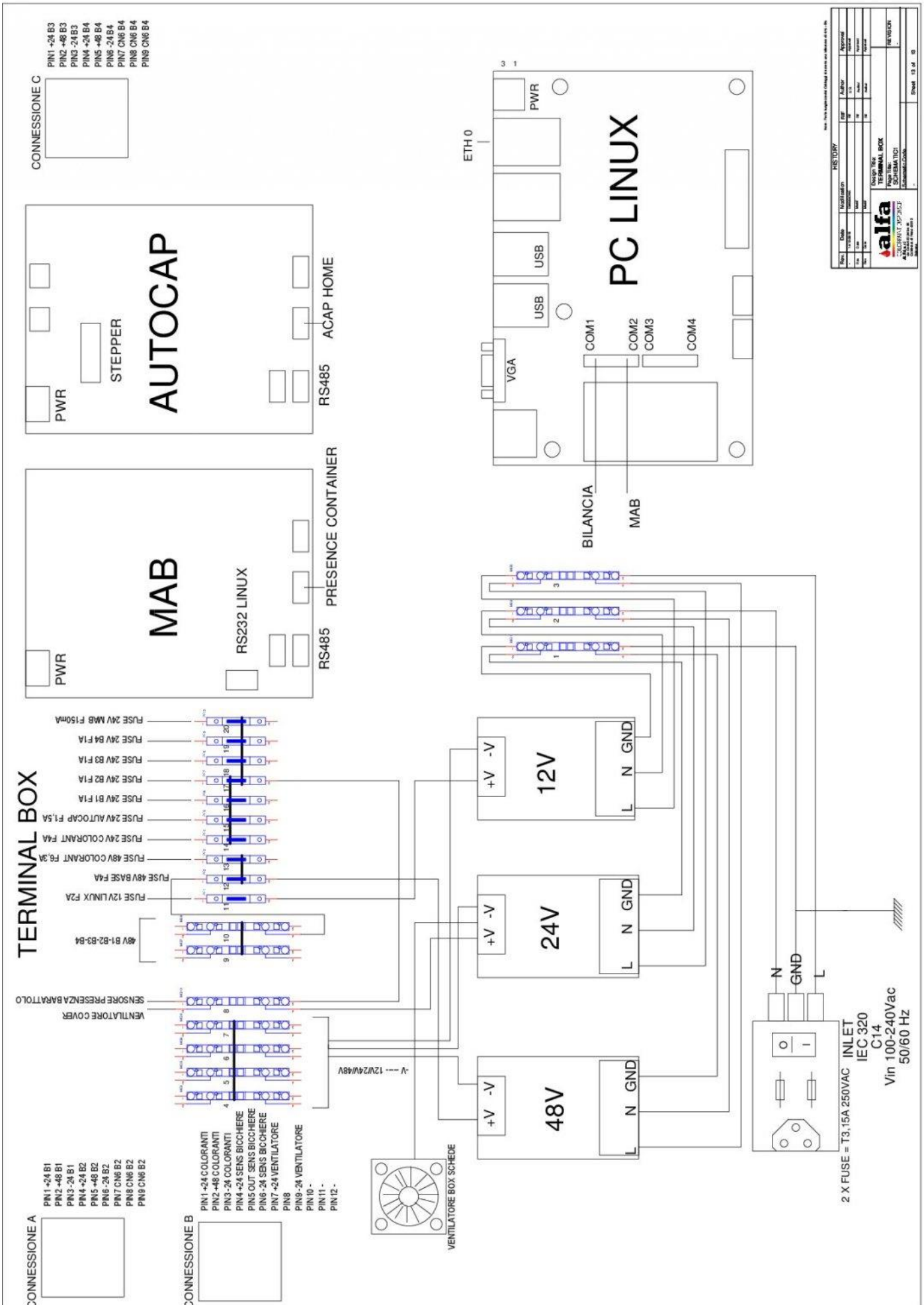
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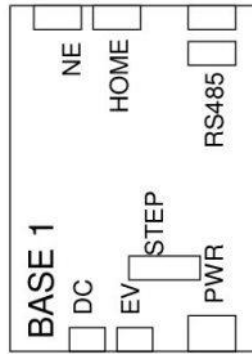
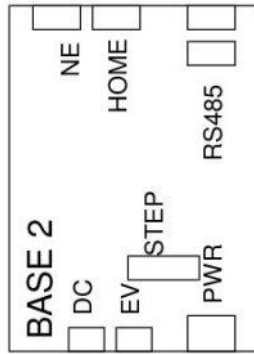
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Page Title: SCHEMATIC 1
Schematic Code: -

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00197 Roma - Italy
Tel. +39 06 574911

REVISION


Sheet 10 of 13

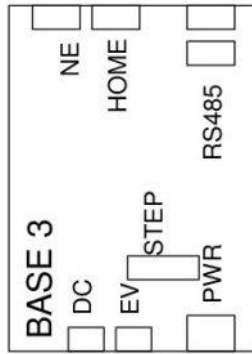
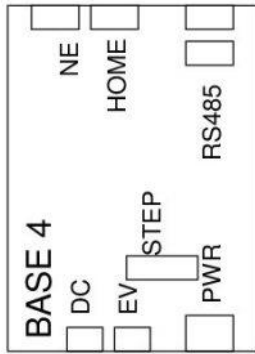




Note : Per le lunghezze dei Cablaggi si accetta una tolleranza di 0% -5%

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-	14/12/2015	EMISSIONE	RIF	U.S.	Approval
Rev	Date	Modif	RIF	Author	Approval
Rev	Date	Modif	RIF	Author	Approval

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-			Sheet 12 of 13



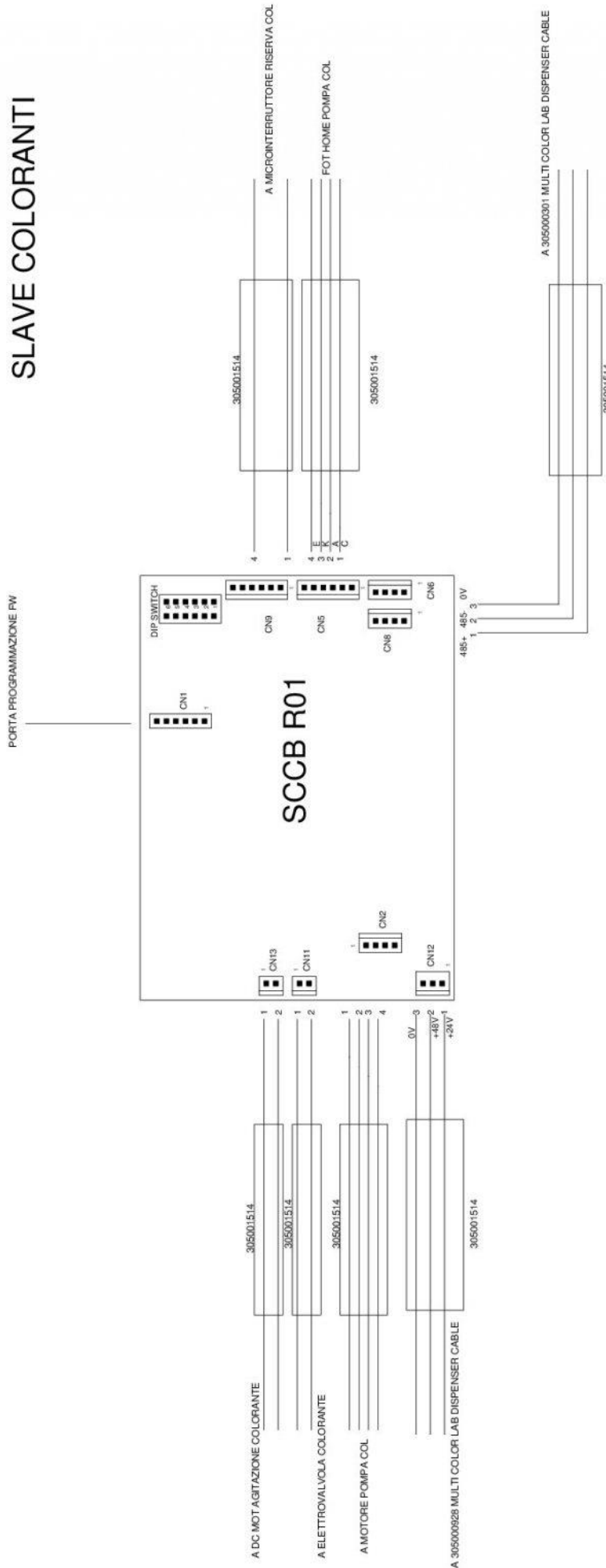
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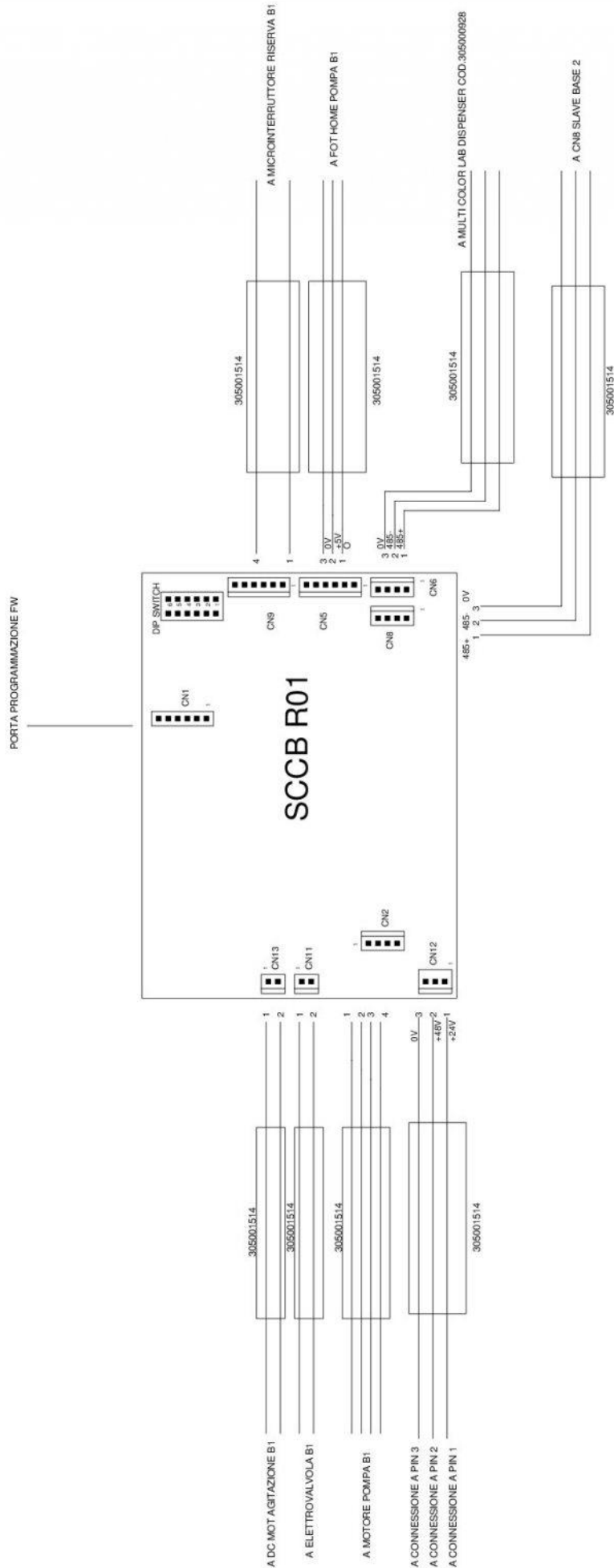
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SLAVE COLORANTI



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SLAVE BASE 1



View the legend and design rules and address at the link

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CHECKER					
APPROVED					

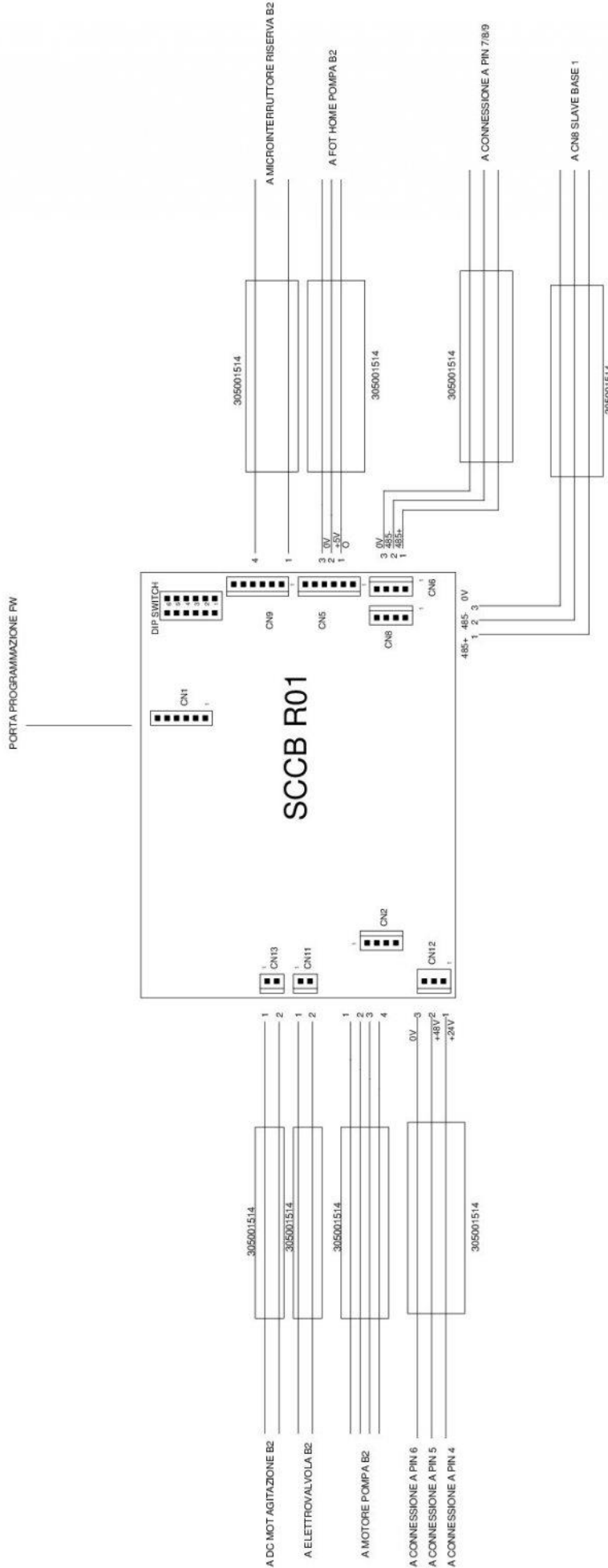
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 ALFA PAINT SYSTEMS S.p.A.
 Via S. Felice 4, 37060, S. Felice del Bianco (Verona)

Design File:
 CONNESSION SLAVE BASE 1
 PROJECT:
 305001514 (305001514)
 305001514

Revision:
 CONNESSION SLAVE BASE 1
 1.0

Sheet 5 of 13

SLAVE BASE 2



Nota: Per le segnalazioni di errori o per altre informazioni, scrivere a: Alfa S.p.A.

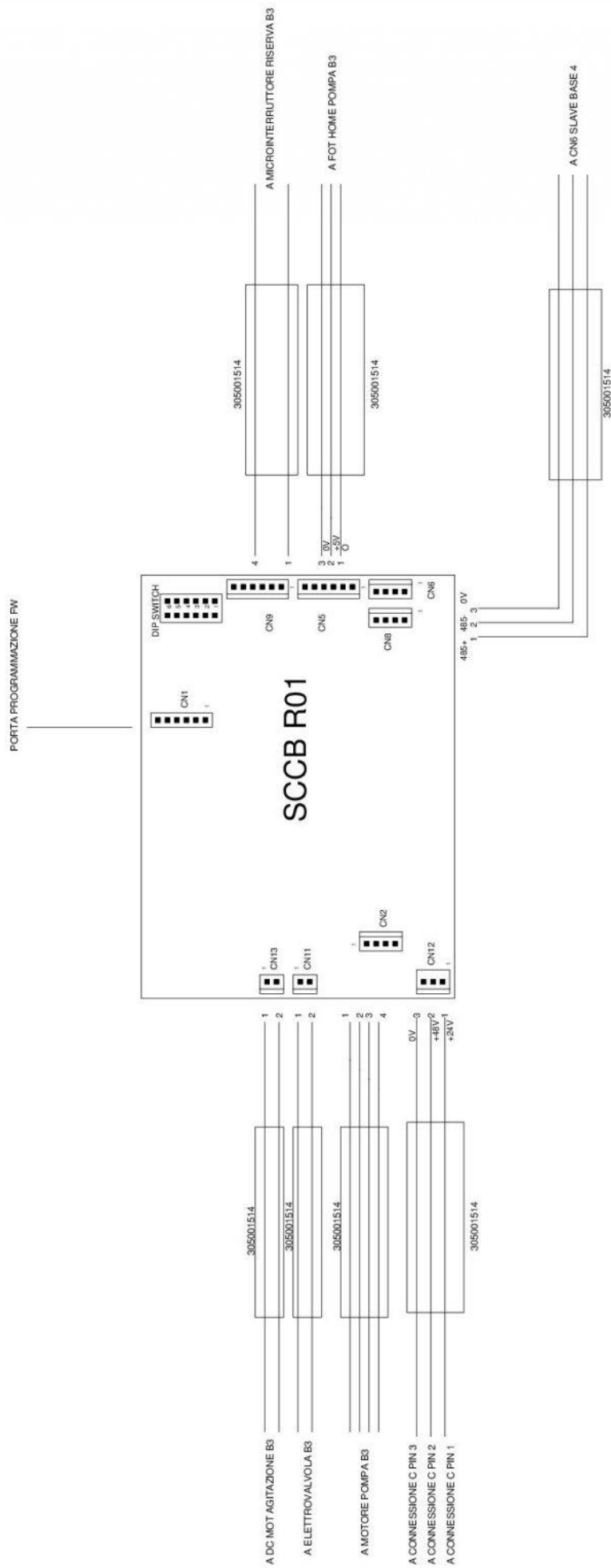
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Titolo: CONNESSION SLAVE BASE 2
 Pagina: SCHEMATICO
 Revisione: 10

Foglio: 9 di 10

SLAVE BASE 3



Rev. The information and design is subject to change without notice. © Alfa S.p.A.

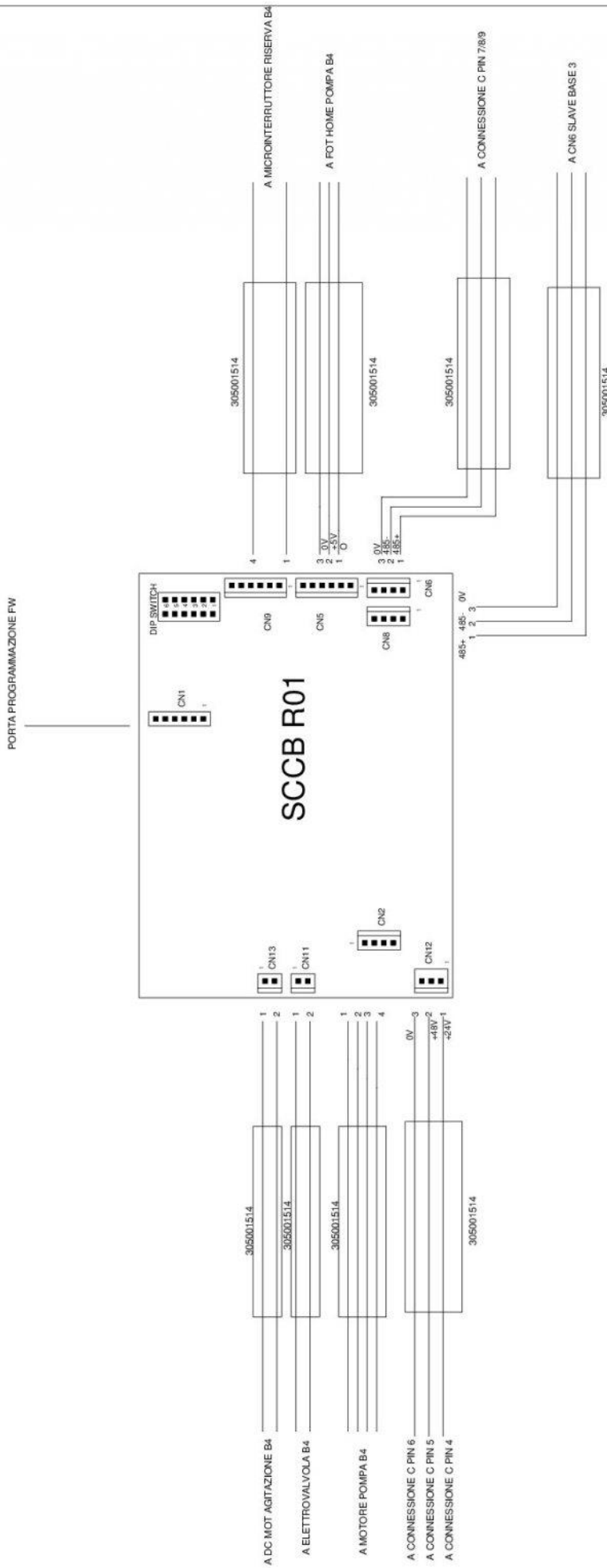
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05	15/08/2011	5th Issue		
06	15/08/2011	6th Issue		
07	15/08/2011	7th Issue		
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09	15/08/2011	9th Issue		
10	15/08/2011	10th Issue		

Design Title: CONNESSION SLAVE BASE 3
 Project No: 305001514
 Revision: 01

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Sheet 7 of 13

SLAVE BASE 4



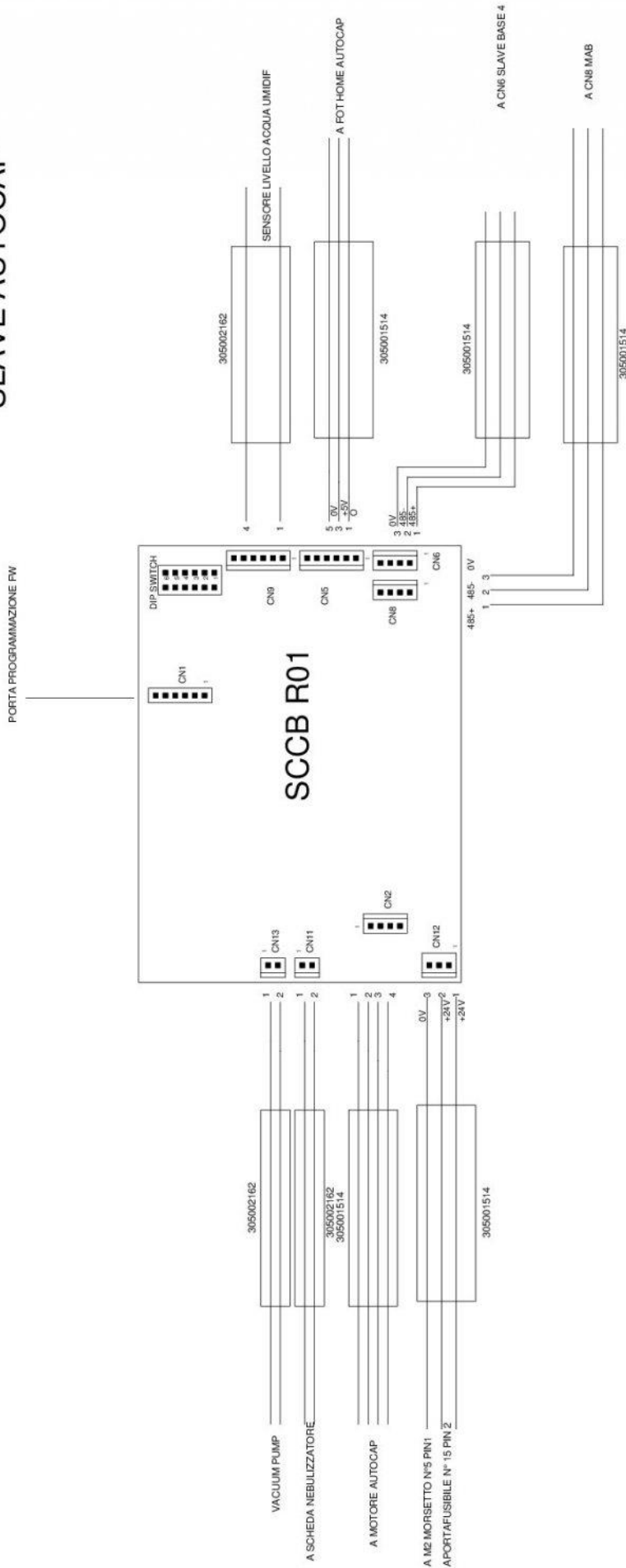
Nota: Tutti i componenti collegati a questo pin sono di serie.

REVISIONI		REVISIONI	
Rev.	Descrizione	Rev.	Descrizione
01	01	01	01
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Page Title: CONNESSION SLAVE BASE 4
 Page No: 55
 Revision: .
 Date: .
 Drawn: .
 Checked: .
 Date: 01/08/13

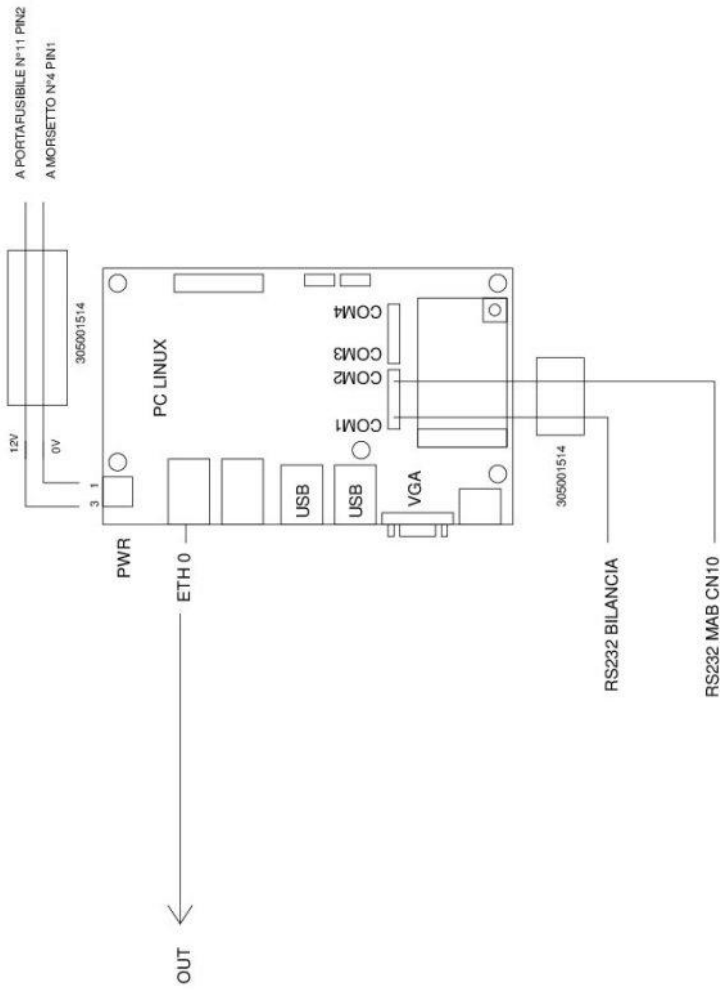
SLAVE AUTOCAP



REVISION		HISTORY		APPROVAL	
Rev.	Descr.	Modificato	da	Autore	Approvato
01	01				
02	02				
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Design File:
CONNECTION SLAVE AUTOCAP
 PROJECT:
305001514
 DRAWING NO:
305001514
 DRAWING DATE:
2014/01/20
 DRAWING SCALE:
1:1
 DRAWING SHEET:
4 of **13**

PC LINUX



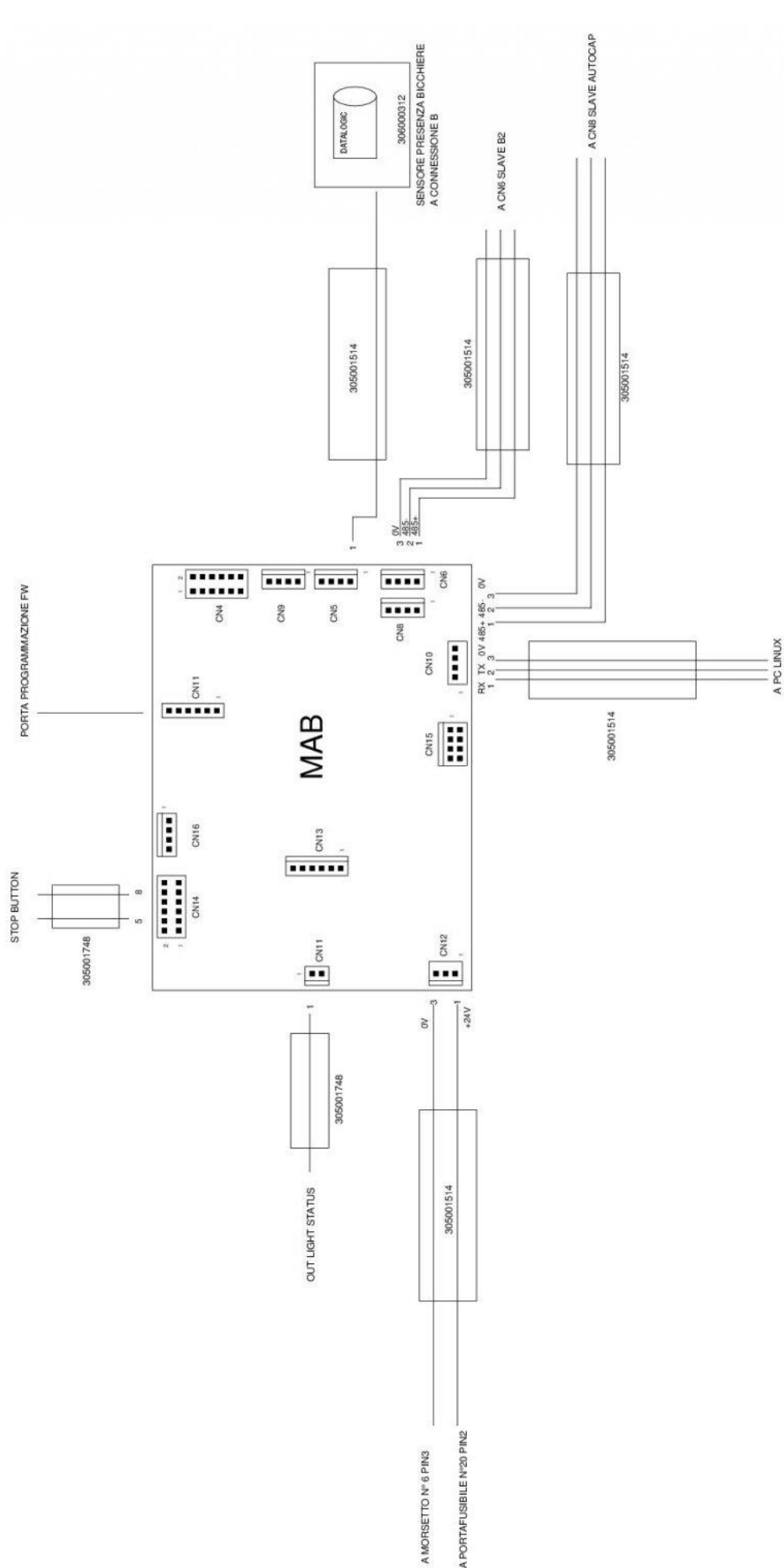
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DATA	DESCRIZIONE	DATA	DESCRIZIONE	DATA	DESCRIZIONE	DATA	DESCRIZIONE

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HISTORIC
 PROJECT No: **CONNESSIONI PC LINUX**
 PAGE No: **SCHEMATICO**
 SCHEMATIC CODE:

Sheet 3 of 10

MAIN AUTOMATION BOARD



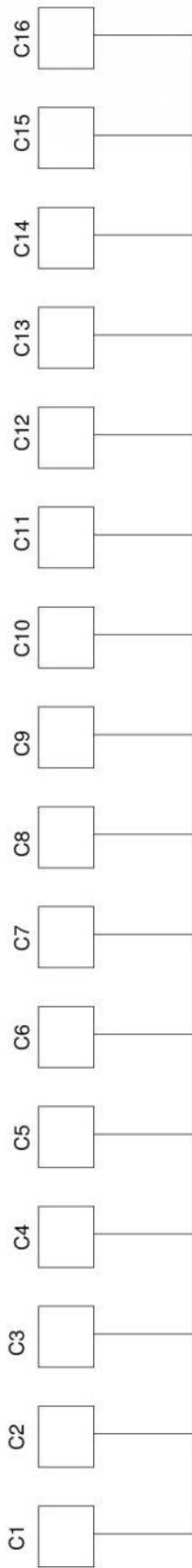
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Nome	Descr.	Autore	Revisione	Approvato
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 305001514 MAB AUTOCAP (PC BOARD)
 SCHEMATICO
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Sheets 2 of 13

CAVO MULTI COLOR LAB DISPENSER COD.305000928



RS 485

A CN16 SLAVE BASE 1

FILO VERDE	48V
FILO ROSSO	24V
FILO NERO	0V

A CONNESSIONE B PIN2 +48 COLORANTI

A CONNESSIONE B PIN1 +24 COLORANTI

A CONNESSIONE B PIN3 -24 COLORANTI

Nota: Per le spiegazioni degli simboli e dei simboli di riferimento, vedere il capitolo 1.

STORIA		REVISIONI	
DATA	DESCRIZIONE	REVISIONE	CAUSA

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CAVO MULTI COLOR LAB DISPENSER
SCHEMATICO

REVISIONI
1

Pagina 1 di 13

8. TROUBLE SHOOTING

Error code	Error detected	Error description	Resolution of the problem
1	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.
2	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..7	TIMEOUT_COM_MAB_B"X" , where "X"=1..4	Slave B"X" 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 Slave B"X" board.
12..27	TIMEOUT_COM_MAB_C"X" , where "X"=1..16	Slave C"X" 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 Slave C"X" board.
44	TIMEOUT_COM_MAB_AUTOCAP	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 Slave AUTOCAP board.
55	TIMERMG_TEST_FAILED,	Software timer management error	Unexpected error. Contact technical support
57	SUPPLY_FAILED,	Dispensing aborted due to the absence of a cup before dispensing or the presence of a cup after unloading	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.
59	DATA_SUPPLY_FAILED,	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.
60	TIMEOUT_SUPPLY_FAILED,	Dispensing duration time-out	Check for a mechanical jam in the dispenser and eliminate it if possible.
61	EEPROM_SLAVES_CONFIGURATION_CRC_FAULT	Slave configuration parameter CRC fault	Verify whether the Slaves are enabled and present in the Devices menu. If they are not present or have been disabled, check the corresponding Flags and save the changes.
62	CONTAINER PRESENCE RESET	A can has been detected by the photocell during the Reset operation.	Remove the can and try again.

Error code	Error detected	Error description	Resolution of the problem
100..103	B"X"_COLOR_HOME_POS_ERROR, where "X"=1..4	Loss of steps: deviation upon the detection of slave B"X" zero position	Verify the cleanliness of the B"X" circuit parts (e.g. pusher, photocell, etc.), and check for any wear of the pusher and damage of the photocell. Clean or replace the parts as required.
108..123	C"X"_COLOR_HOME_POS_ERROR, where "X"=1..16	Loss of steps: deviation upon the detection of slave C"X" zero position	Verify the cleanliness of the C"X" circuit parts (e.g. pusher, photocell, etc.), and check for any wear of the pusher and damage of the photocell. Clean or replace the parts as required.
140	AUTOCAP_HOME_POS_ERROR,	Loss of steps: deviation upon the detection of slave AUTOCAP zero 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.
148..151	B"X"_BASE_TOUT_ERROR, where "X"=1..4	MAB communication time-out (detected on the SLAVE B"X" 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 Slave B"X" board
156..171	C"X"_COLOR_TOUT_ERROR, where "X"=1..16	MAB communication time-out (detected on the SLAVE C"X" 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 Slave C"X" board
188	AUTOCAP_TOUT_ERROR,	MAB communication time-out (detected on the AUTOCAP side)	
196..199	B"X"_BASE_RESET_ERROR, where "X"=1..4	Slave B"X" reset procedure duration time-out	Verify the cleanliness and positioning of the photocell mounted on the B"X" unit, 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 a problem of an electronic type remains, replace the SCCB board.
204..219	C"X"_COLOR_RESET_ERROR, where "X"=1..16	Slave C"X" reset procedure duration time-out	Verify the cleanliness and positioning of the photocell mounted on the C"X" unit, 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 a problem of an electronic type remains, replace the SCCB board.

Error code	Error detected	Error description	Resolution of the problem
236	AUTOCAP_RESET_ERROR,	Slave AUTOCAP reset procedure duration time- out	Verify the cleanliness and positioning of the photocells of the AUTOCAP 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.

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