

Microbus MR-serie

Montage och felsökningsmanual v.1.3



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Assembly of scoreboard

To ensure fast and affordable shipping, the various modules of the scoreboard are separated before shipping. These modules must be assembled before installation.

Extract all the modules from their packagings. Each module is identified with a label on its back indicating to which panel it belongs: central panel (CENTER), left panel (LEFT) or right panel (RIGHT). The label indicates also the assembling position (1, 2, 3, ...), where no. 1 refers to the upper position.

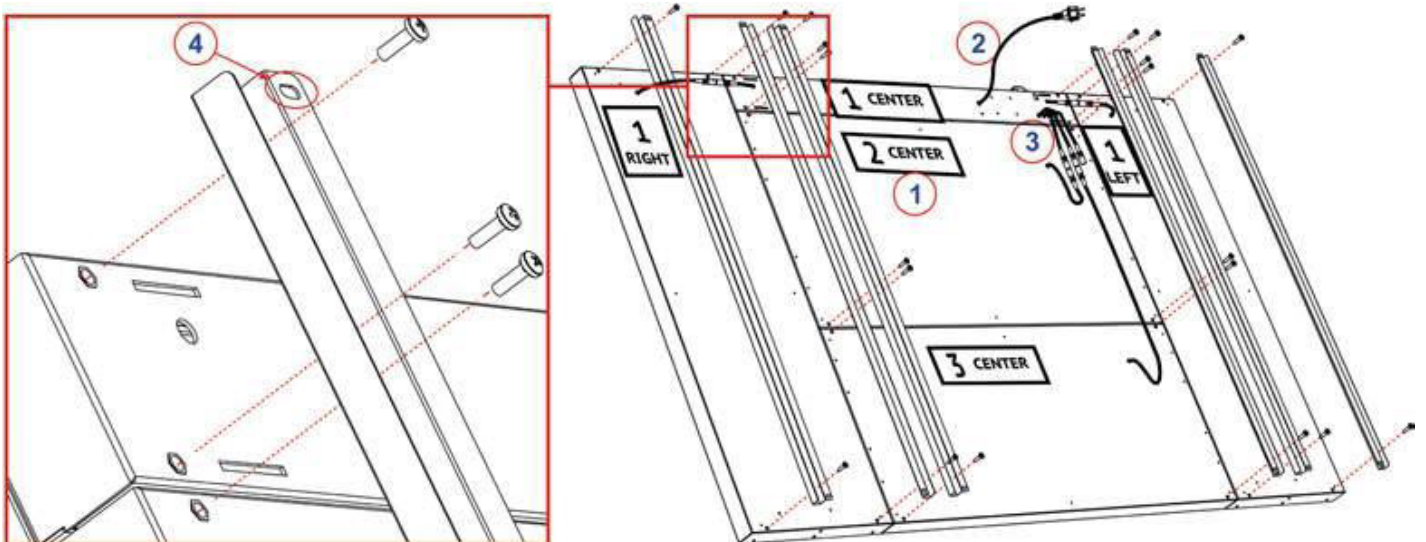


To avoid injuries such as bruises, scrapes, or cuts while handling the scoreboards, we advise wearing protective gloves and safety shoes.

1. Joining the modules by means of brackets

Assemble the scoreboard on the floor before mounting it on the wall. Follow the directions below:

1. Make sure you have all the necessary pieces: modules for putting together the scoreboard (see the various modules), brackets and screws for attaching the brackets to the modules.
2. We suggest placing protective material such as cardboard on the floor to serve as a base for assembling the board. Place the modules face down on the floor and in numerical order from top to bottom (*Fig. 1*), in order to assemble the desired panel.
3. Position the two brackets on the modules of each scoreboard's panel (central, left, right). Align the fixing holes and firmly lock the brackets using the screw provided. The bracket's oval holes for fixing the scoreboard must face the inner side of each panel (*Fig. 2*).



1. Module identification number.
2. Power supply cable.

3. Cables directed to the other modules.
4. Fixing eyelet.

Fig. 1 Fixing of the support brackets.

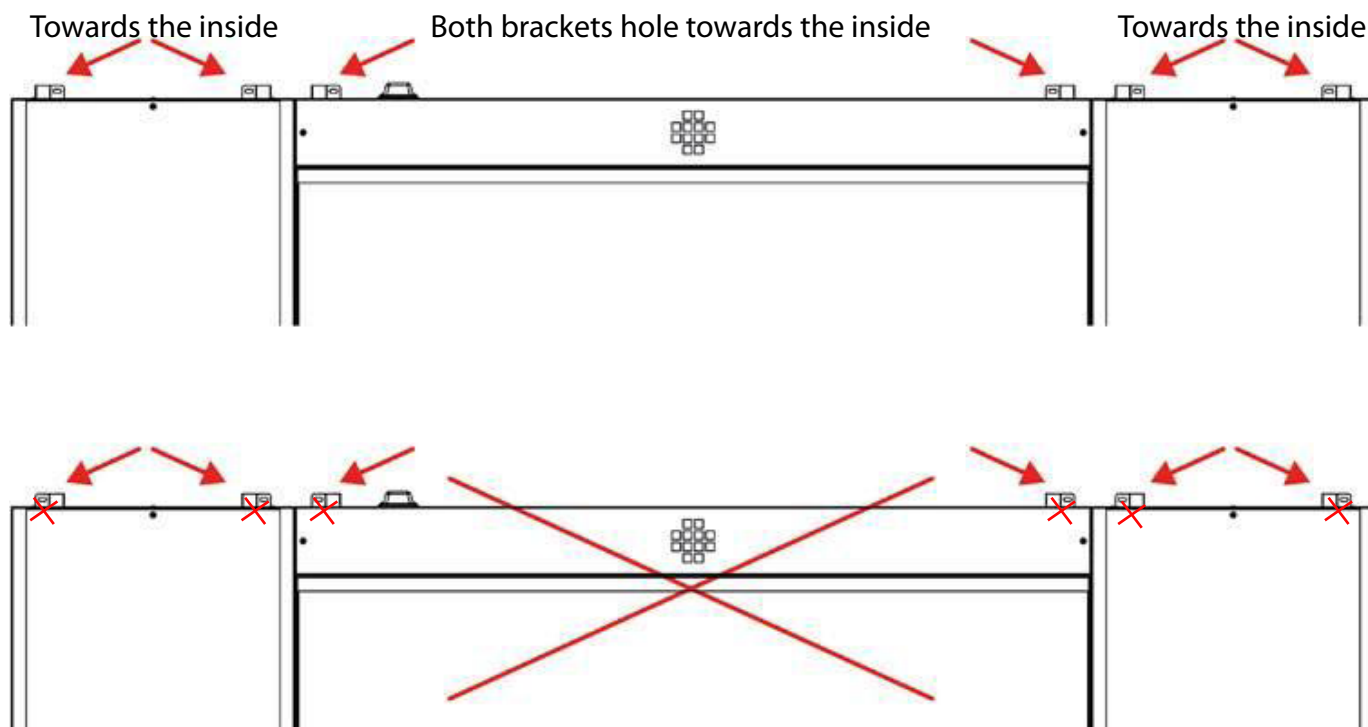


Fig. 2 Alignment of the brackets.

2. Connecting the modules

After attaching the various modules to the brackets, you can now proceed to connecting the electrical system. Connect the cables coming out of the power supply module (identified with: **CENTER 1**) to the cables of the other modules. Any connection sequence between male - female connectors can be used (*Fig. 1*).

Electrical power supply system

Remember that the electrical power system **MUST** be implemented by a qualified technician.

1. Power socket

Each scoreboard comes with a power cord and plug. We suggest that a power supply socket be positioned just above the board.

2. Power switch device



There **MUST** be a power switch device (isolating switch) in the electrical system in order to switch off the scoreboard when it is not being used or while under maintenance.

3. Grounding



The scoreboard **MUST** be connected to a grounding system via the power supply cable and in compliance with the technical regulations of the country where it is installed.

2 Serial data cable system

Such system is not necessary in case of wireless communication with the control Console; however, a cable connection can still be used. Use a network cable (read also the control Console manual).

To install the serial cable correctly, follow the directions below:



- under any circumstances, do not pass the cable through the same conduits used for the cables of the electrical system, both for safety reasons as well as to avoid electrical disturbances from motors, air conditioners, generators, etc.;
- avoid placing the cable where it may be exposed to high temperatures, mechanical damage or vandalism;
- make sure that 50-100 cm of the serial cable remains free and exits the top of the scoreboard about midway between the brackets (see chapter 8.1);
- if you want a point of disconnection near the Command Console, use a short extension cord.

3 Installation on wall



Before installing the assembled scoreboard on the wall, we suggest first running a check test (see chapter 4.2).

3.1. Selecting the correct position

Select the position on the wall where you want to install the scoreboard; the board should be installed high enough on the wall to prevent possible attempts at vandalism, but not too high to inhibit proper maintenance. Be reminded that the FC series scoreboards are resistant to damage from balls and therefore no additional front protection cover is required.



Make sure that the wall can support the weight of the scoreboard and that the fixing elements are suitable for the type of wall and environment (e.g., possible corrosion due to dampness). Consult a professional in the field.

3.2. Installing the scoreboard

To wall mount use the oval holes at the end of the supporting brackets. The horizontal distance between the fixing holes is:

- central panel: 126.8 cm;
- side panels: 33.8 cm (only fouls) and 41.8 cm (player's number + fouls);
- between central panel and side panels: 15.0 cm.

The vertical distance depends on the model (Tab. 2).

FC62H25N12B2 203.0 cm	FC56H25-12A1 145.1 cm	FC62H25N 180.4 cm	FC54H25N 145.1 cm	FC50H25N 110.1 cm	FC56H20 135.1 cm	FC50H20 74.9 cm
FC60H25N12B2 203.0 cm	FC54H25N12A1 145.1 cm	FC60H25N 170.4 cm	FC54H25 120.1 cm	FC50H25 84.9 cm	FC54H20 110.1 cm	

Tab. 2 Vertical center distance of the fixing holes.

1. Drill the upper fixing holes in the wall.
2. Lift the scoreboard and correctly secure it.
3. The scoreboard is now adequately installed. However, seeing that there are also lower bracket eyelets, you may also wish to fasten the bottom part of the scoreboard to the wall; this will help to prevent possible oscillation.



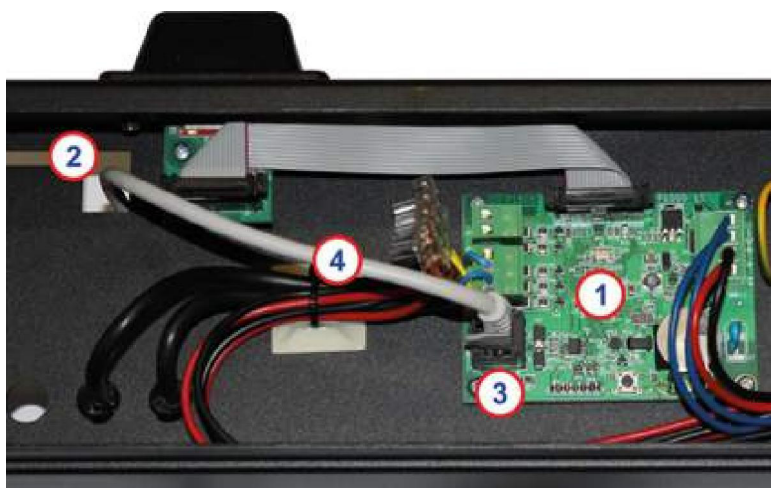
Make sure that you have securely fastened the scoreboard to the wall in order to prevent possible collapse and harm to persons or objects.

4 Final connection and scoreboard test

Once the scoreboard has been installed on the wall, you can proceed with connecting the electrical power supply and serial data communication (cable or radio).

4.1. Connecting the scoreboard

1. If you have bought the Console together with the scoreboard, the system will be delivered already configured for correct wireless communication. Therefore, it is sufficient to connect it to the power supply.
Instead, if you want to activate a wireless connection afterwards, refer to the Console manual.
2. To make a connection using a serial cable:
 - make sure that the power supply to the scoreboard is disconnected;
 - open the power supply module (chapter 5.2);
 - insert the serial data cable coming out of the control console into the slot in the module bottom;
 - connect it to the connector of the FC HUB board.
3. Insert the power cord plug for the scoreboards into the wall socket.



1. FC HUB board.
2. Cable slot.
3. Connector for the cable.
4. Serial cable.

Fig. 3 Connection of the serial data cable.

4.2. Testing the scoreboard

Once the scoreboards have been installed on the wall you can make an overall test to see if all information is displayed correctly.

1. When the scoreboard is power supplied, all the displays switch on for about 1 second, even if the control Console is turned off or disconnected. Then, the timer displays the time of the day. If this does not happen and the scoreboard remains switched off, read chapter 5.
2. Connect the control Console (by radio or cable connection): the scoreboard will display the same information present on the Console display. If this does not happen, read chapter 5.
3. After having checked that the data connection is properly working, perform an overall test by switching on all the control Console displays; to perform the test, read the control Console instructions. For incomplete display of panels, see chapter 5.

5 Maintenance

This chapter contains information on how to quickly resolve the principal problems that may occur with the scoreboard over time. If you have further problems that cannot be solved herein, please contact us. For all malfunctions, the following is a list of operations that should be carried out to re-establish the scoreboard's proper functioning.



All maintenance, repair and checking operations on the scoreboard **MUST** be performed only by qualified technicians.

5.1 Malfunctions

Malfunction	Solution
1. The scoreboard does not light up when switched on	<p>When the scoreboard is supplied with electricity, all the display panels light up for circa 1 second, even if the Command Console is turned off or disconnected. If this does not occur, check that:</p> <ul style="list-style-type: none"> (a) the mains voltage is present in the power supply cable; (b) the scoreboard's power supply cable plug is correctly inserted in the socket; (c) the display modules' connection to the power supply module on the back of the scoreboard is undamaged (<i>Fig. 1</i>). <p>Open the power supply module (read chapter 5.2) and check that:</p> <ul style="list-style-type: none"> (d) the cables are connected and undamaged. <p>Disconnect the FC HUB board (read chapter 5.6) and, on the back of the scoreboard, disconnect the display modules. Measure the power supply unit's output voltage with a multimeter:</p> <ul style="list-style-type: none"> (e) Voltage < +20VDC → replace the power supply unit; (f) Voltage > +20VDC → restore the connections one at the time to identify the part causing voltage drop.
2. The scoreboard lights up for 1 second but then switches off completely	<p>For the scoreboards <u>with timer</u>, open the power supply module (see chapter 5.2) and check that:</p> <ul style="list-style-type: none"> (a) the cables are connected and undamaged (b) and if the (red) LED present on the FC HUB board is switched off or on. If: <ul style="list-style-type: none"> - switched off, replace the FC HUB board (chapter 5.6). - switched on, contact technical assistance.
	For scoreboards <u>without timer</u> carry out the verifications as per point 3.
3. The scoreboard displays only the time.	<p>If there is no communication with the control Console, the scoreboards display only the time on the timer. Make sure that:</p> <ul style="list-style-type: none"> (a) the time display on the Console is deactivated.
	<p>For cable connection:</p> <ul style="list-style-type: none"> (b) check that the cable is undamaged and that the connections are correct; (c) use another Console output; (d) replace the FC HUB board (chapter 5.6).
	<p>For radio connection, make sure that:</p> <ul style="list-style-type: none"> (e) mode FS2 is set and active on the Console; (f) no other Consoles are activated with the same number. <p>Carry out the association procedure (read the Console manual).</p> <ul style="list-style-type: none"> (g) If the association procedure has been correctly completed and the scoreboard does not display the information sent by the Console, replace the FC HUB board (chapter 5.6). (h) If the procedure fails, replace the radio module (chapter 5.7).

Malfunction	Solution
4. Part or all of a LED display board does not light up	<p>Open the module containing the board (read chapter 5.3). Replace the LED board that does not work with another one of the same module;</p> <p>(a) if the latter works, replace the faulty LED board;</p> <p>(b) if again it does not work, connect the cable of the LED board to another connector of the control board (FC DRIVER).</p> <ul style="list-style-type: none"> - If the LED board works, replace the FC DRIVER - If the LED board works, replace the cable.
5. The scoreboard is not bright enough	Check the level set on the control Console.
6. An entire display module does not light up	<p>If the module remains completely switched off when it is turned on, make sure that:</p> <p>(a) the connection of the module to the power supply module on the back of the scoreboard is undamaged.</p> <p>Connect the module to another cable coming out of the power supply module.</p> <p>(b) If the module lights up, replace the cable of the power supply module.</p> <p>Open the module (read chapter 5.3) and:</p> <p>(c) check that the connections are connected and undamaged;</p> <p>(d) if the LED of the control board (FC DRIVER) is switched on, replace the board (chapter 5.5).</p> <p>Measure the voltage between the power supply terminals of the FC DRIVER board (Fig. 7).</p> <p>(e) Voltage > +20VDC → replace the FC DRIVER board (chapter 5.5).</p> <p>(f) Voltage < +20VDC → replace the module cable.</p>
	<p>If the module lights up for 1 second when it is turned on, but then remains completely switched off, connect the module using another cable coming out of the power supply module.</p> <p>(g) If the module displays the information sent by the Console, replace the cable of the power supply module.</p> <p>Open the module (read chapter 5.3):</p> <p>(h) check that the connections are undamaged;</p> <p>(i) replace the FC DRIVER board (chapter 5.5).</p>
7. The acoustic signal does not work	<p>Check that on the control Console:</p> <p>(a) the volume is correctly set;</p> <p>(b) the programmed sound duration is > 0.</p> <p>Open the power supply module (read chapter 5.2). Disconnect the horn and then feed it directly with +24VDC (we recommend the use of hearing protection devices):</p> <p>(c) if it works → replace the FC HUB board (chapter 5.6);</p> <p>(d) if it does not work → replace the horn.</p>

5.2 Opening the power supply module

1. Disconnect the scoreboard's power supply.
2. Remove the screws of the module's front panel.
3. Remove the front panel.



Dangerous voltages are present inside the module!

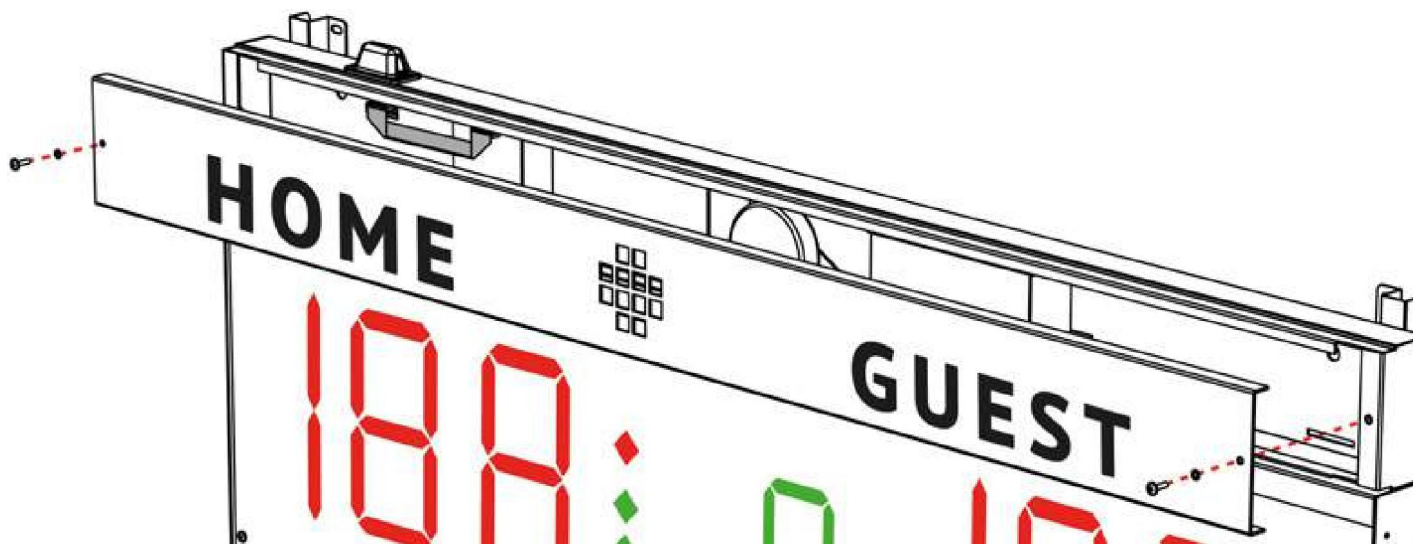


Fig. 4 Opening of the power module.

5.3 Removing of the transparent front panel

1. Disconnect the scoreboard's power supply.
2. Remove the two screws from the transparent front panel.
3. Remove the scoreboard's transparent panel as follows
 - centrally, slide the transparent panel upwards, then extract it slightly from the base and take it out of its seat from below;
 - laterally, slide the transparent panel horizontally towards one side, then extract it slightly from the opposite side and take it out of its seat.

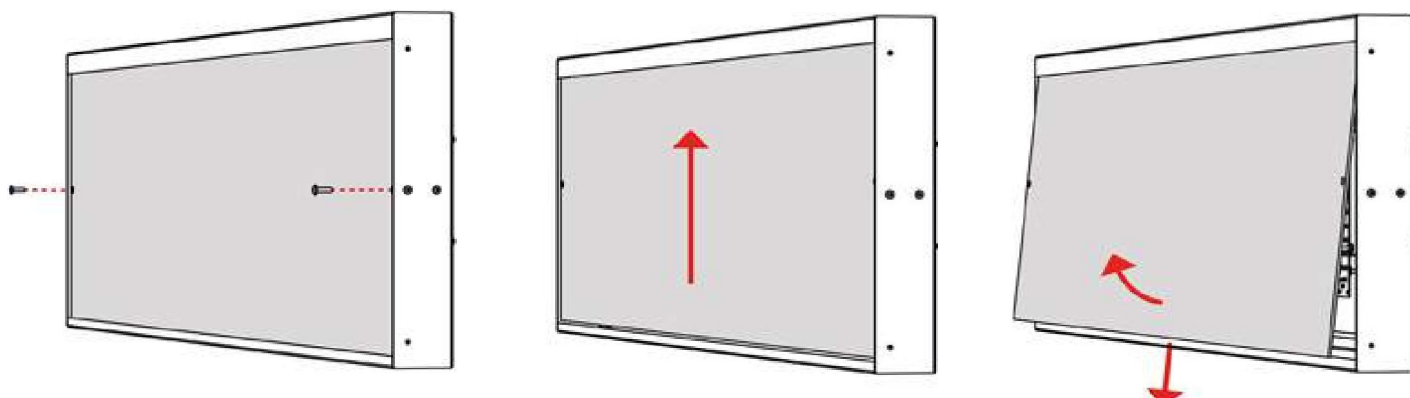
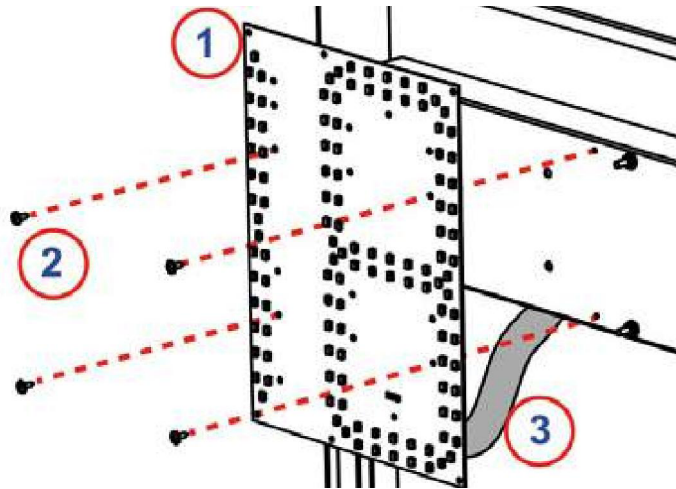


Fig. 5 Removing of the transparent front panel.

5.4 Replacing a LED display board

1. Remove the front panel of the module where the board to be replaced is mounted as indicated in chapter 5.3.

2. Remove the screws from the LED display board; slightly distance the board from its position in order to remove the flat cable connector.
3. Insert the flat cable connector in the new board and then tighten the screws.
4. Reposition the front panel and refasten it to the scoreboard.

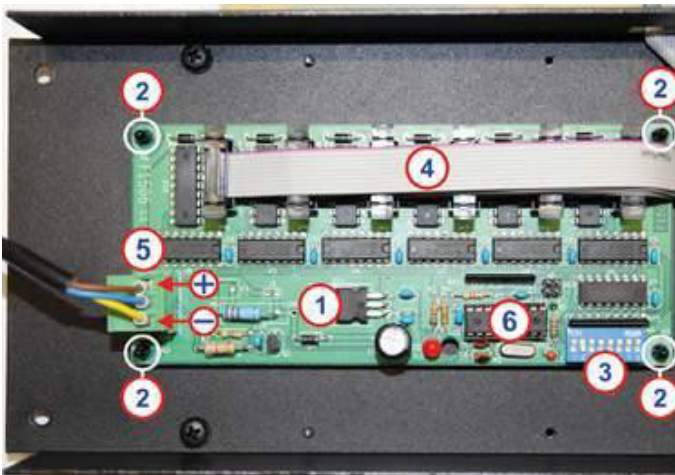


1. LED display board.
2. Fixing screws.
3. Flat cable.

Fig. 6 Replacing a LED display board.

5.5 Replacing a control board (FC DRIVER)

1. Remove the front panel of the module where the board to be replaced is mounted as indicated in chapter 5.3.
2. Unscrew the four end nuts located at the two far ends of the metal support base covering all the display boards.
3. Distance the support base containing the display boards from the bottom of the scoreboard: be careful not to disengage the display boards and connection cables.
4. Identify the control board (or boards) housed inside the support base. Keeping in mind their original positions, remove all connectors from the control board.
5. Unlock the 4 fixing elements of the board and remove it from its seat.
6. Set the dip-switches of the new control board to the same settings of those of the control board you replaced (see chapter 6) and fix the new board into the casing.
7. Reinsert the control board's connectors into their original positions; replace the metal support base of the display board on the bottom of the scoreboard and fasten it with the end nuts provided.
8. Replace and tighten the front panel to the board.

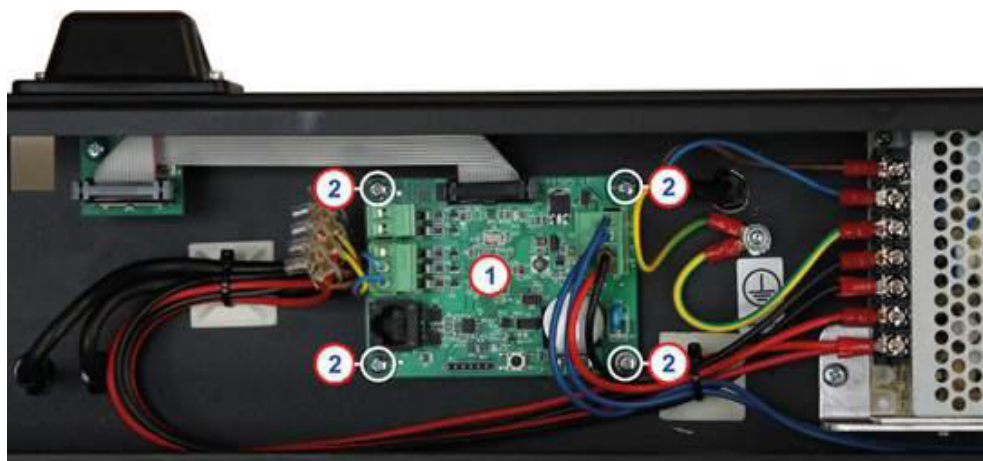


1. Control board (FC DRIVER).
2. Control board fixing elements.
3. Microswitches.
4. Connections to the LED display boards.
5. Power supply connections.
6. Micro-controller.

Fig. 7 Replacing a control board (FC DRIVER).

5.6 Replacing the FC HUB board

1. Open the power supply module as described in chapter 9.2.
2. Remove all the connectors from the board, taking note of their original position.
3. Unlock the 4 fixing elements of the board and remove it from its seat.
4. Mount the new board in the same seat of the old one.
5. Insert the connectors in their original position.

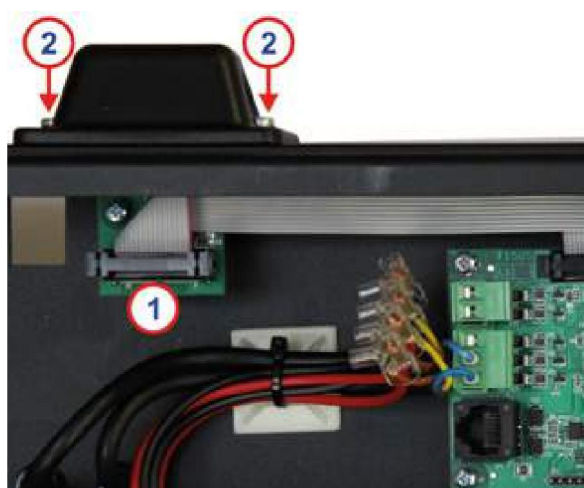


1. FC HUB board.
2. Board fixing.

Fig. 8 Replacing a FC HUB board.

5.7 Replacing the radio module

1. Open the power supply module as described in chapter 5.2.
2. Remove the connector from the module.
3. Unscrew the 2 fixing elements of the protection cover and remove the assembly from its seat.
4. Mount the new module in the same seat of the old one.



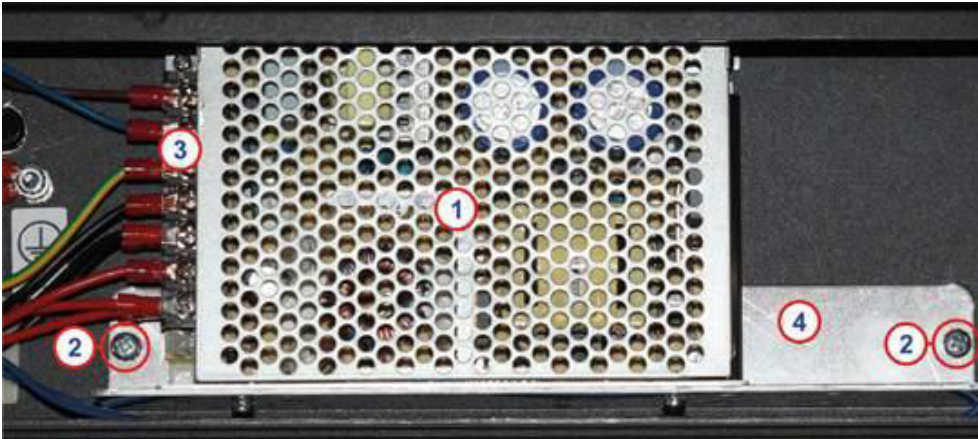
1. Radio module.
2. Module fixing.

Fig. 9 Replacing the radio module.

5.8 Replacement of the power supply unit

1. Depending on the models, one or two power supply units may be present.
 2. Open the power supply module as described in chapter 5.2.
 3. Disconnect all the connections taking note of their position.
 4. Remove the support bracket fixing elements and extract the assembly.
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5. Mount the new power supply unit in the same position of the old one.

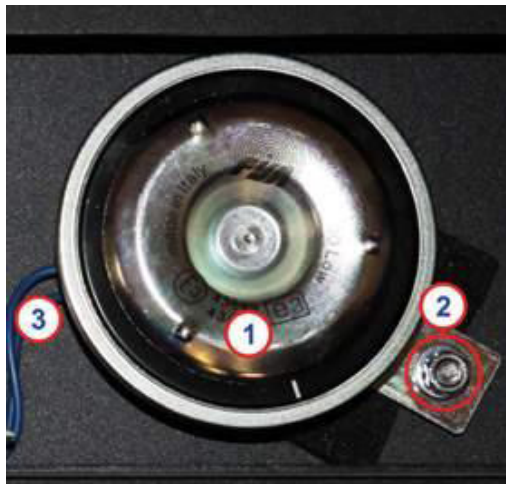


1. Power supply unit.
2. Fixing elements.
3. Connections.
4. Support bracket.

Fig. 10 Power supply unit replacement.

5.9 Horn replacement

1. Open the power supply module as described in chapter 5.2.
2. Remove the horn fixing elements.
3. Remove the connections from the horn and connect them to the new horn.
4. Mount the new horn in the same position of the old one.


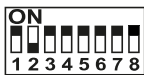

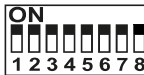

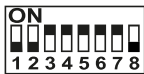
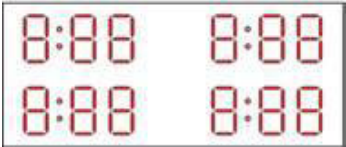
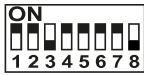
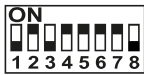
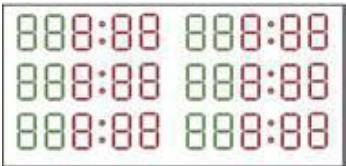



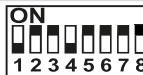
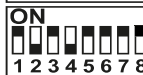
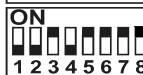
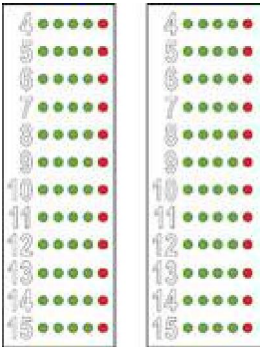
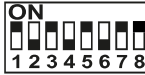
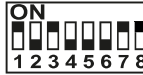
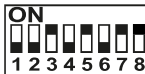



1. Horn.
2. Fixing elements.
3. Connections.

Fig. 11 Horn replacement.

6 Configuration of module dip-switches

This chapter shows the configuration of the control board's DIP switches situated inside each scoreboard module; the configuration of the DIP switches determines the information that will be displayed by the module.

Module	DIP switches	
Scores - Period		
Timer		
Penalty time - Team fouls		
Penalty time		 
Player number + Penalty time		     
Player number (not programmable) + Player fouls/penalties		   
Player number + Player fouls/penalties	