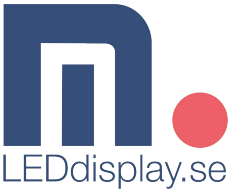


MICROBUS CONSOLE MRT900 (ART. 35-100-90)



ENGLISH

User manual



ENGLISH

Console MRT900 (ART. 35-100-90)

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1. GENERAL INFORMATION

1.1. Purpose

This manual provides the necessary information for the correct use of **Console MRT900** (art.35-100-90), also called “product” in this document. We also suggest you keep the manual for the duration of the product’s life.

1.2. Product description

The product consists of a portable console with touchscreen display which enables control of the Microbus MR-serie scoreboards. Communication between the console and the scoreboards can be wireless or through a connection cable.

1.3. Symbols used in the manual

Portions of the text which are of particular importance in regards to the safety or proper use of the product are indicated by the following symbols.



Warning: risk of danger or injury to persons if instructions or the necessary precautions are not followed.



Caution: situations that could cause damage to your device or other equipment



Note: important information on product use.

1.4. Technical features

<i>Supply:</i>	AC Adapter - Battery charger Input: 90-264V, 47-63Hz, 0.5A (100VAC) Output: 9.0VDC \pm 5%, 0-2.0A, 18W
<i>Temperature of storage:</i>	-10 ... +70°C (Console)
<i>operating:</i>	-20 ... +85°C (Power supply - Battery charger) 0 ... 45°C (Console), 0 ... 50°C (Power supply - Battery charger)
<i>Relative humidity (without condensation) of storage:</i>	5 ... 95%
<i>operating:</i>	10 ... 90%
<i>Altitude of storage:</i>	12000m
<i>operating:</i>	200m
<i>Battery:</i>	for the power supply: lithium polymer battery, 37Wh (typical), 10Ah (typical), 14-hour average life (level 7 display brightness). for the internal clock: button type, lithium battery, CR2032, 230mAh, 3V, 7-year average life expectancy
<i>Size (Width x Height x Depth):</i>	240 x 82 x 168mm
<i>Weight:</i>	1.1kg
<i>Enclosure material:</i>	ABS

1.5. Safety warning



- Do not expose the product to heat sources, to water or to rain.
- Do not crush, pull, bend, excessively twist or modify the power supply cable. Also, do not use the power cable if it has been damaged. If the product is not in use, you have always to disconnect it from the electrical mains.
- The device screen is made of glass. This glass can break if the device is dropped on a hard surface or receives a substantial impact; if the glass breaks, do not touch the glass parts of the device or attempt to remove the broken glass from the device. Stop using the device until the glass is replaced by qualified service personnel.
- Use only the batteries and battery charger that are supplied with the product. Do not dispose of batteries in a fire as they may explode. Obey local regulations. Recycle when possible. Do not dispose as household waste. Do not dismantle, cut, crush, bend, puncture, or otherwise damage the battery in any way. If a battery leaks, do not let liquid touch skin or eyes. If this happens, immediately flush the affected areas with water, or seek medical help. Do not modify, attempt to insert foreign objects into the battery, or immerse or expose it to water or other liquids. Batteries may explode if damaged.
- Switch the device off when mobile phone use is not allowed or when it may cause interference or danger, for example, in aircraft, in hospitals or near medical equipment, fuel, chemicals, or blasting areas. Obey all instructions in restricted areas.

1.6. Guarantee



The guarantee is valid for two years starting from the date of purchase and includes free repair for any defects in materials or construction. The guarantee does not include shipping costs. Batteries are not included in the warranty. More information on guarantee and post-sale support can be found at www.LEDdisplay.se

1.7. Disposal of product

Please dispose of your product in a manner most compatible with the environment and in accordance with federal or state laws, reusing parts and recycling components and materials when possible.



When this crossed-out waste bin symbol is attached to a product it signifies the product should be disposed of in a separate container from other waste.

The sorted waste collection of the present device is organized and managed by the manufacturer. Users who wish to dispose of their present device should contact the manufacturer and follow the procedure indicated for separate waste collection.

Ensuring proper sorted waste collection, in accordance with environmental standards, for the disposal of further devices helps to protect the environment and the health of persons from any damaging effects. It also favors the reuse and recycling of materials.

Administrative sanctions, in accordance with regulations in effect, will be applied for any improper or abusive disposal of the product on part of the holder.



Battery replacement: the internal lithium polymer battery must be replaced by a qualified technician and recycled or disposed of separately from household waste.

1.8. Compliance with CE regulations

The product meets the essential requirements of the Electromagnetic Compatibility and Safety for electronic devices, in accordance with European directives:

- **2014/53/EU** of 16 April 2014,
- **2014/30/EU** of 26 February 2014,
- **2014/35/EU** of 26 February 2014,
- **2011/65/EU** of 8 June 2011, **2016/863/EU** of 31 May 2016.



This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

For the USA:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct

the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To satisfy FCC RF exposure requirements for mobile and base station transmission devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

For the Canada:

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

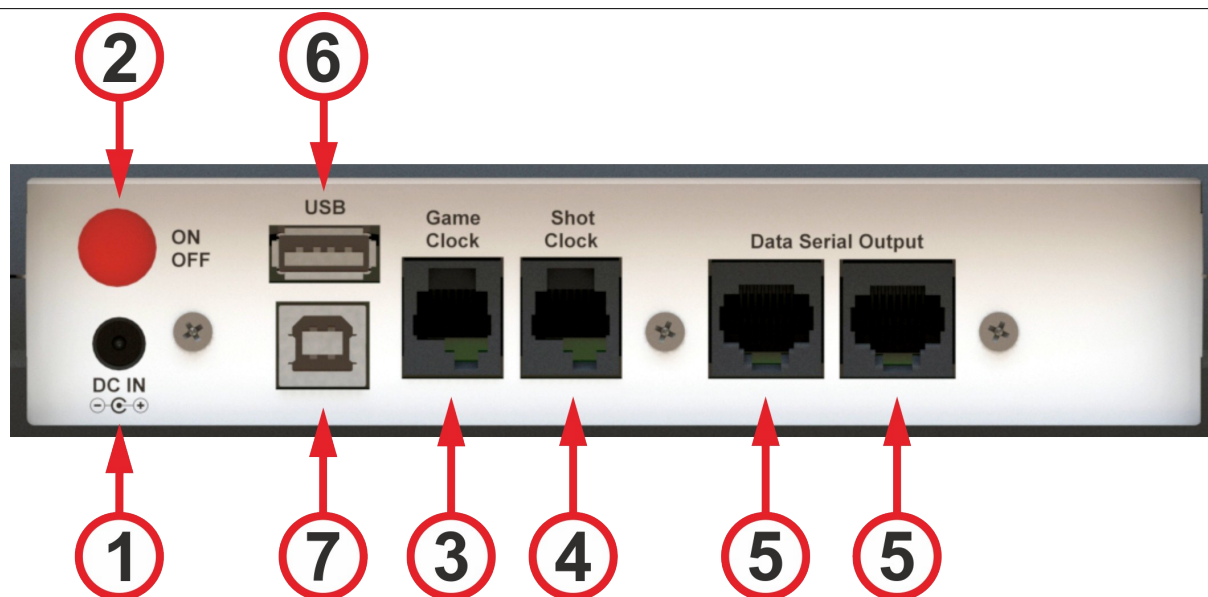
2. OPERATION

The main functions of the product are described below.

Fig. 2.1 shows the Console MRT900 connections, located on the back.

2.1. How to switch the product on and off

To switch the product on and off, press the **ON/OFF** button on the back (see Fig. 2.1).




1. "DC IN": power supply input for the connection of the power supply unit-battery charger.
2. "ON OFF": button to switch the console on and off.
3. "Game Clock": connection to the external console to control the game clock.
4. "Shot Clock": connection to the external console to control the shot clock.
5. "Data Serial Output": cable connection to the LED boards, when the wireless communication is not used; using the specific cable splitters, each of the console's two outputs can control up to 8 LED boards at a distance of 200m.
6. "USB Host": USB flash drive connection to update the software (see Chap.3).
7. "USB Device": PC connection (not in use).

Fig. 2.1: Console MRT900 connection panel

2.2. Main screen

Press the touchscreen buttons displayed on the console screen to modify scores, fouls, timeout, game clock, etc. (see Fig. 2.2).

Press this button  to open the Configuration menu (see Chap. 2.3).

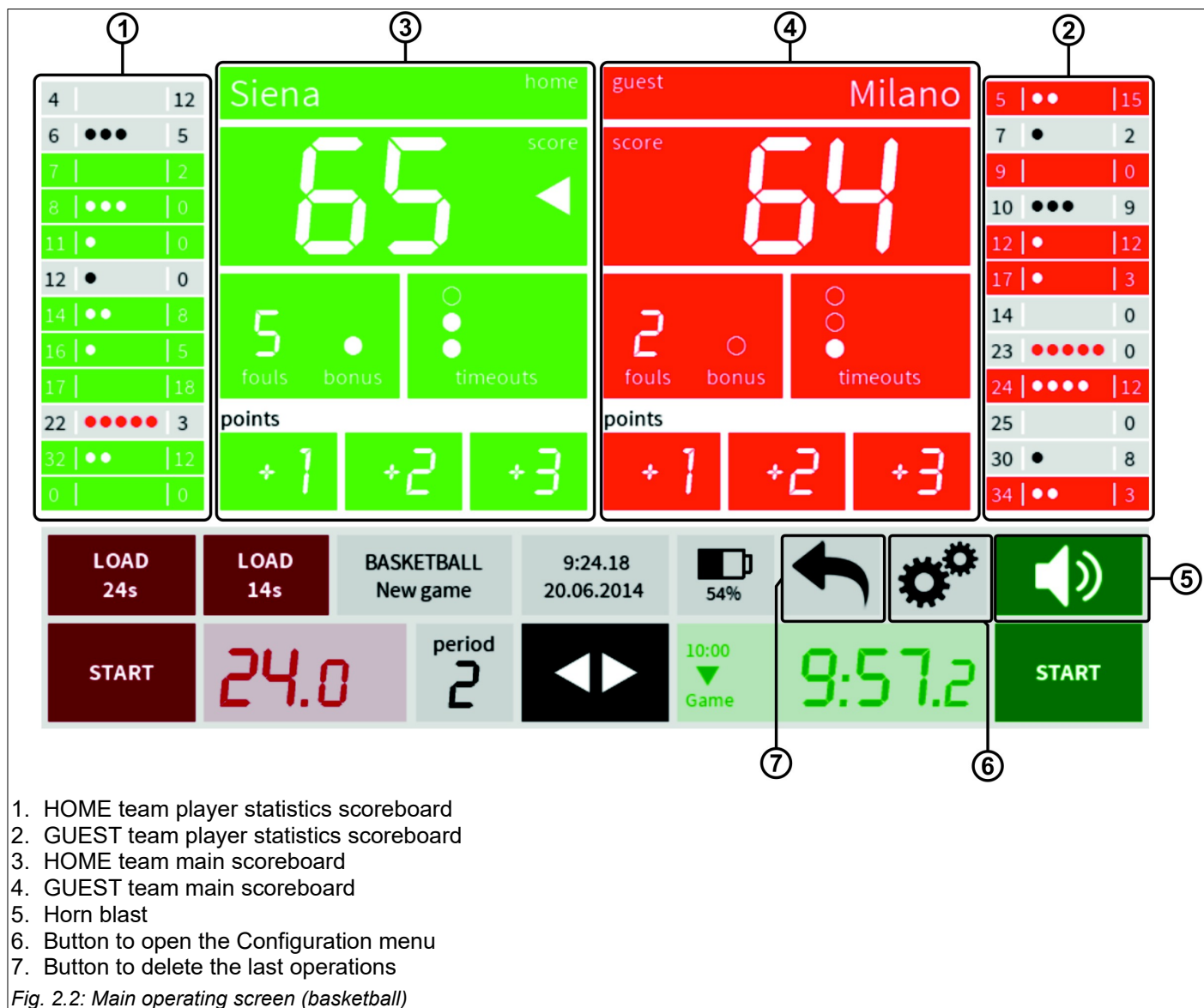
Press this button  to delete the last operations carried out. Operations carried out on times (game time, interval, timeout and penalties) cannot be deleted.

2.3. Configuration menu

Press this button  to open the Configuration menu (see Fig. 2.2).

The Configuration menu allows you to:

- select the desired sport and set the corresponding parameters;
- select the teams with the corresponding players or create new teams;
- activate/deactivate the wireless communication and set the corresponding parameters;
- set the system's general parameters (brightness, sound level, time, date, etc.);
- set the language for Console MRT900



1. HOME team player statistics scoreboard
2. GUEST team player statistics scoreboard
3. HOME team main scoreboard
4. GUEST team main scoreboard
5. Horn blast
6. Button to open the Configuration menu
7. Button to delete the last operations

Fig. 2.2: Main operating screen (basketball)

2.4. Charging the batteries

The Console MRT900 is provided with an internal, 14-hour average life rechargeable battery; therefore it can be used without being plugged in. The battery charge level is indicated on the product display. To charge the batteries, connect the power supply unit-battery charger provided to the **DC-IN** connector on the back of the product. The product can be used while charging.



- To charge the battery, use only the supplied battery charger.
- To ensure a long battery life, do not leave batteries uncharged. If the device is not used for long periods, it is advisable to charge the battery at least every six months.

2.5. Communication with LED scoreboards

Communication with the scoreboards can be either wireless or wired.

For wireless communication see Chap. 2.5.1.

For wired communication see Chap.2.5.2.

2.5.1 Wireless communication

If you have bought the Console MRT900 together with the scoreboard, the system will be delivered already configured for correct wireless communication. In this case read Chap. 3.

Otherwise, if the Console MRT900 has not been delivered together with the scoreboard, it must be associated with the scoreboard to enable wireless communication (check for compatibility at our website www.LEDdisplay.se)

If the scoreboards are connected to a radio receiver like the one shown in Fig. 2.3, follow the instructions provided in point A), otherwise follow the instructions provided in point B).

A) Association procedure for radio communication through FS1 protocol (to be carried out only with the radio receiver of Fig. 2.3)

- in the **Configuration menu**, select the “RADIO Communication” tab;
- enable the “Activate radio transmission” parameter;
- select “FS1” in the “Radio protocol” parameter;
- in the “FS1 radio channel” parameter, choose a channel among the available ones¹;
- enable the “FS1 radio association” parameter to connect the console to the scoreboard.

For more information on the association between MRT900 and the scoreboards with the FS1 protocol, read the radio receiver manual.



Fig. 2.3: Radio receiver with FS1 protocol

B) Association procedure for radio communication through FS2 protocol:

- in the **Configuration menu**, select the “RADIO Communication” tab;
- enable the “Activate radio transmission” parameter;
- select “FS2” in the “Radio protocol” parameter;
- if other Console MRT900 are used nearby, make sure that each console has a different value for the “Number assigned to the console” parameter;
- Select the “Associate FS2 radio devices...” parameter and press the “SEARCH DEVICES...” button so that the console can identify any nearby scoreboards; select the scoreboards you want to associate and press the “ASSOCIATE!” button.

2.5.2 Wired communication

If you want to connect the Console MRT900 to the scoreboards by cable, you can use a standard straight-network cable, Cat. 5 UTP or Cat. 6 UTP, (EIA/TIA-568A/B).

Connect the cable to one of the two “**Data Serial Output**” connectors located on the back of the console.

Use the supplied splitters to connect all the installed LED boards. You can freely choose the connection topology you prefer: “star”, “backbone”, “tree”, etc.

You can use indifferently one or both “**Data Serial Output**” outputs present on the back of the console (see Fig. 2.1); each output can control up to 8 LED boards at a distance of 200m.

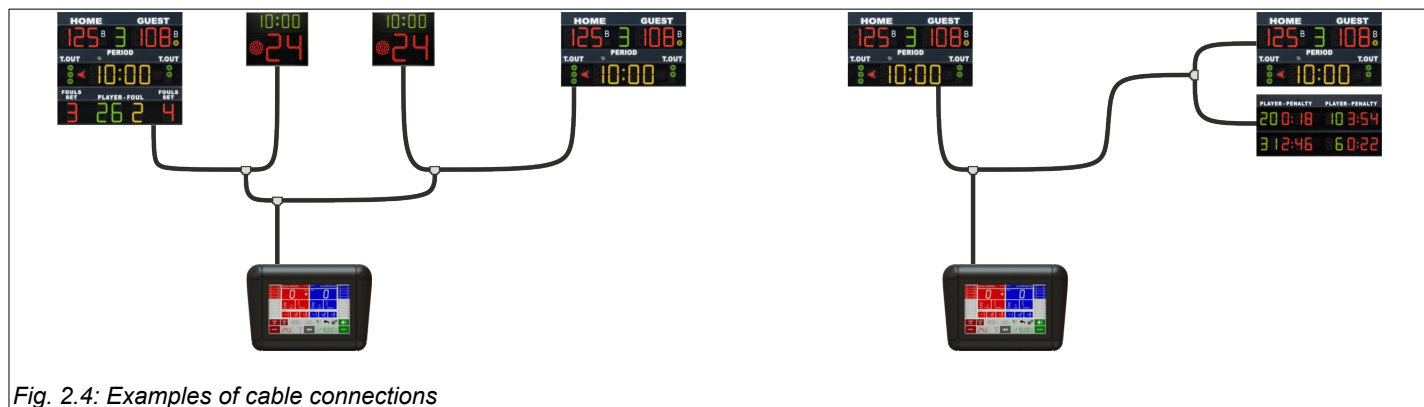


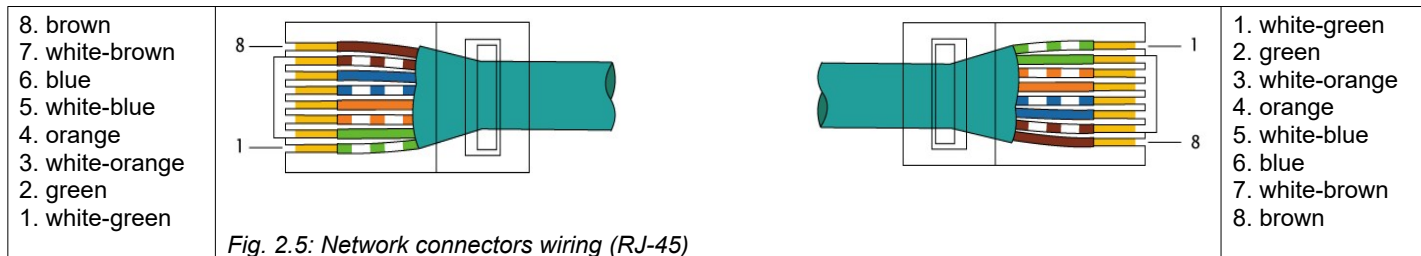
Fig. 2.4: Examples of cable connections



If you have tailor-made cables or in environments where the presence of electric devices may cause disturbances (such as electric motors, compressors, air conditioners, inverters, radio links, etc.), it is advisable to connect each cable conductor as indicated in Fig. 2.5.

Avoid passing the cable through the same cable conductor used for the power grid cables.

- The preset value for the radio channel is 20. The channel must be changed only in the following cases:
 - if other Console MRT900s are present nearby; each console must have a different radio channel to avoid interference between channels;
 - if interference from other devices causes the scoreboards to work intermittently, it is advisable to select the “Measure radio interferences” parameter and look for a channel free from interference; as an alternative, try the following series of channels: 20, 15, 19, 23, 15, 18, 14, 22, 12, 21, 14, 22, 16, 13, 17.



3. SOFTWARE UPDATE

In the product page at www.LEDdisplay.se you will find the last available software version. To update the software, please follow the instructions below:

- 1) download the zip file of the new software from the Favero website;
- 2) extract all the files in the zip file and copy them in the root of an USB memory pen;
- 3) make sure that the console battery is fully charged;
- 4) unplug the battery charger and turn off the console;
- 5) insert the USB pen on the USB connector you find on the back (see Fig.2.1);
- 6) press and keep pressed the "ON-OFF" button until you hear 3 consecutive beeps;
- 7) the console will update its own software and at the end, it will display the initial screen where you will be able to verify that the firmware version is the one desired.

4. PROBLEM SOLVING

This chapter contains information on the main problems which may occur during the product's life. Its purpose is to help you quickly solve them.

If during the use of the product, you encounter a problem which is not indicated in this manual, please describe it in detail and send an email to support@MicrobusGroup.se

4.1. The console does not switch on

The battery charge might be too low. Make sure the power supply unit voltage is 9V and then connect it to Console MRT900.

4.2. The battery does not charge

Make sure the battery charger voltage is 9V, otherwise order a new one.

4.3. The console does not switch off

Keep the ON/OFF button pressed for at least 5 seconds, until the Console MRT900 switches off.

4.4. The brightness of the display is too low

In the **Configuration menu**, select the "SYSTEM SETTINGS" tab; then increase the "Brightness of the console display" parameter.

4.5. The scoreboard horns make no sound

In the **Configuration menu**, select the "SPORT" tab; then make sure that the "Sound at the end of game" parameter is higher than zero. Then check that the "Horn volume" parameter in the "SYSTEM SETTINGS" menu is higher than zero.

4.6. The touchscreen buttons are not correctly detected

The touchscreen must be calibrated: in the **Configuration menu**, select the "SYSTEM SETTINGS" tab and the "Touchscreen calibration..." parameter. Then carry out the operations prompted on the screen.

4.7. The scoreboard does not display the Console MRT900 data

As soon as the power supply is connected to the scoreboard, all its LEDs are switched on for about one second; if this does not occur, check the mains voltage.

If the connection between Console MRT900 and scoreboard is wireless:

- check that the “Activate radio transmission” parameter in the “**RADIO communication**” menu of the **Configuration menu** is enabled;
- make sure that the radio protocol set on Console MRT900 is supported by the scoreboards and the radio receivers (see Chap. 2.5);
- check that the “Radio power” parameter is set to level 3;
- if you are using the FS1 radio protocol, read point A in Chap. 2.5.1;
- if you are using the FS2 radio protocol, read point B in Chap. 2.5.1;
- try using a cable connection (see Chap. 2.5.2).

If the connection between Console MRT900 and scoreboard is wired:

- switch the connector of the scoreboard connection cable to the second “**Data Serial Output**” port, located on the back of the product;
- check cable integrity and replace it, if necessary.

4.8. The scoreboards freeze or switch off

This is usually due to radio interference:

- check that the “Radio power” parameter in the **Configuration menu** is set to level 3; if you are using the FS1 radio protocol, read point A in Chap. 2.5.1;
- if you are using the FS2 radio protocol, read point B in Chap. 2.5.1;
- make sure there are no obstacles, particularly metal ones, between the Console MRT900 and the scoreboards or the radio receivers; change the position of Console MRT900, if necessary;
- try using a cable connection (see Chap. 2.5.2).



Microbus Electronic Service AB