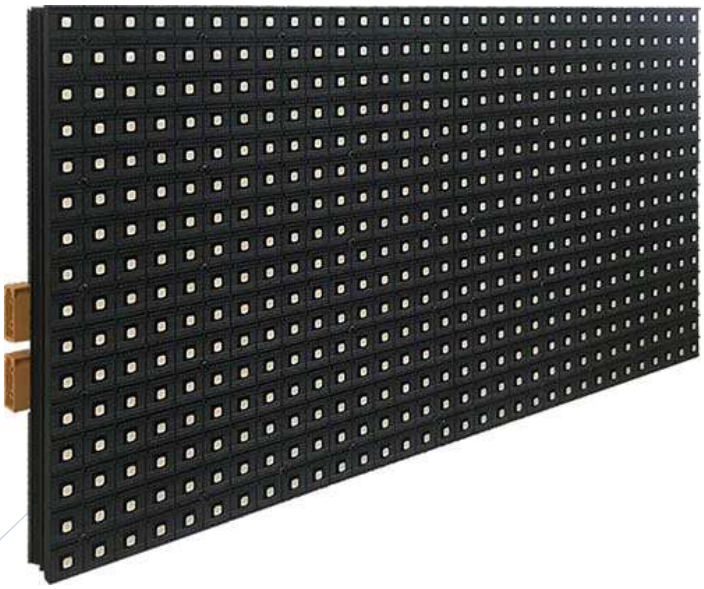
November 2025

MLED (Modular LED Display)

User Manual



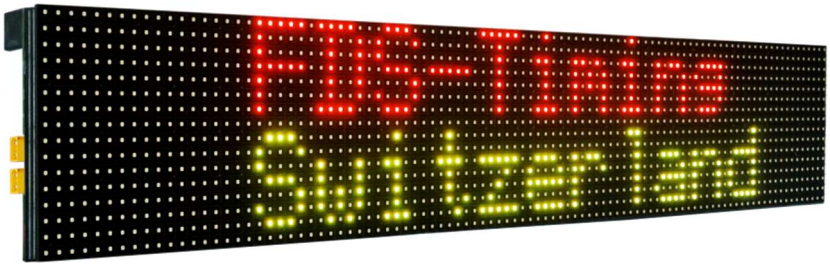
FDS-TIMING, SWITZERLAND

Modular LED display

The MLED Full Color Panel introduces a new, flexible solution for building and using timing screens. With its lightweight, modular design, you can easily combine as many panels as needed to create the perfect display size for your event.
Each MLED module features a resolution of **32 × 16 dots** and can be connected in series with up to **eight panels**.

The most common setup consists of three modules, forming a display area of 96 × 16 cm.

MLED-3S



Another frequently used configuration is a two-row assembly of six modules, forming a display area of 192 × 32 cm.

MLED-26s

1. Connection

Each MLED panel is equipped with two power connectors and two RS232 data connectors. This setup allows seamless power and serial communication between panels in a chain configuration.

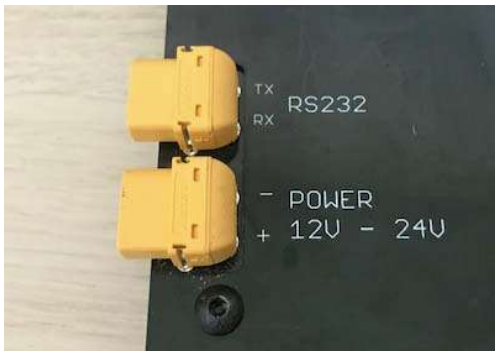
Power Connectors

- Each panel includes two power connectors—one on each side:
  - The right-side connector (XT60 male) provide power to the module (from a power supply).
  - The left-side connector (XT60 female) serves as the power output, supplying voltage to the adjoining MLED panel.
- Input voltage range: 12 V to 24 V ±10%

RS232 Data Connectors

- Each panel features two RS232 connectors—one on each side:
  - The right-side connector is the RS232 data input (from a PC or controller).
  - The left-side connector provides the RS232 data output (to the next MLED panel).
- Depending on the model:
  - **MLED-x0** panels use **XT60 connectors** for RS232 communication.
  - **MLED-x1** panels use **XT60** or **MR30 connectors**.

Model 2020: SN < 00800



Model 2023: SN > 00800

2. Embedded Radio Receiver

The **MLED Model 20** is equipped with an integrated radio receiver**.**
In a display setup composed of multiple MLED panels, the Model 20 must be positioned on the lower right side of the assembly, where it functions as the master module**.**
The TBox Model 41 can transmit wireless data to the MLED-20, either in “Auto Timing” mode or under the control of the SmartChrono App**.**
Data can also be transmitted from any computer using the WINP software configured as a transmitter, with a dedicated special firmware**.**

MLED-3R (front face)

MLED 10-xxxxx	MLED 10-xxxxx	MLED 20-xxxxx

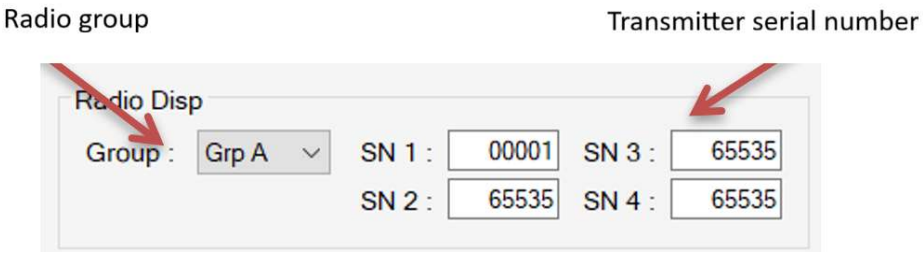
Radio Communication Guidelines

- The MLED-20 (radio model) should ideally be located within 100 m of the transmitter.
- The new MLED-21 version includes an external antenna, providing improved reception and extended range — from several hundred meters up to 1 kilometer under optimal environmental conditions.
- The radio band must correspond to that used by the TBox-41 transmitter (based on the country’s frequency regulations).
- Only Groups A–D can be used with the MLED radio.
- Ensure that TBox, MLED, and WIRC are all configured to the same group.
- For optimal reception, position the display in a clear, unobstructed area, avoiding placement against walls or metallic structures.

⚠ Radio transmissions can never be 100% guaranteed. An unfavorable environment, lack of line of sight, interference or an improper installation might lead to the loss of data.
FDS cannot be held responsible for any of the above.

1.1. Settings

The MLED radio accepts data only from a predefined list of transmitter serial number (White list). This list must be set using the PC application “Display Setup Manager”.



3. Control and Configuration

When the MLED display is used without any extension module (such as the MLED-CTRL or DBox), configuration and control are performed exclusively via the RS232 port located on the right side of the panel.

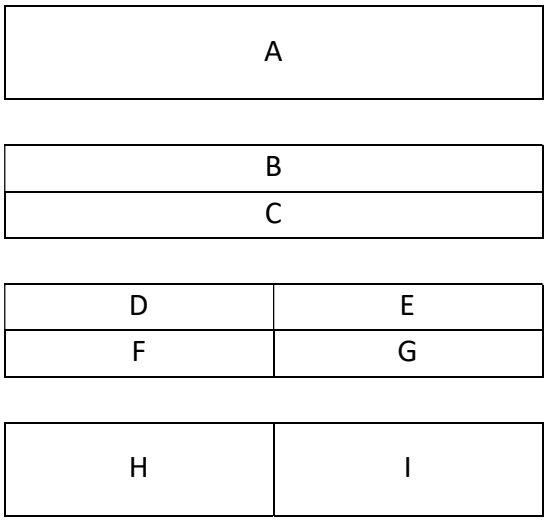
In an assembly consisting of multiple MLED modules, the lower right-hand MLED module functions as the master unit. Therefore, the RS232 connection from the PC or controller must be made to this master module.

Important Notes

- All configuration settings are stored in the master MLED module.
- If the master module is replaced or swapped, the new module must be reconfigured to match the previous display settings.

4. Display zones and settings

The total display area is divided into nine zones (labeled A through I) as shown below. Please note that some zones share the same display area and therefore should not be used simultaneously.



Display with 3 x MLED panels (MLED-3S):

Zone A: 8-9 characters, height 14-16cm depending on the font type selected
Zone B - C: 16 characters per zone, height 7cm
Zone D - G: 8 characters per zone, height 7cm
Zone H - I: 4 characters per zone, height 14-16cm

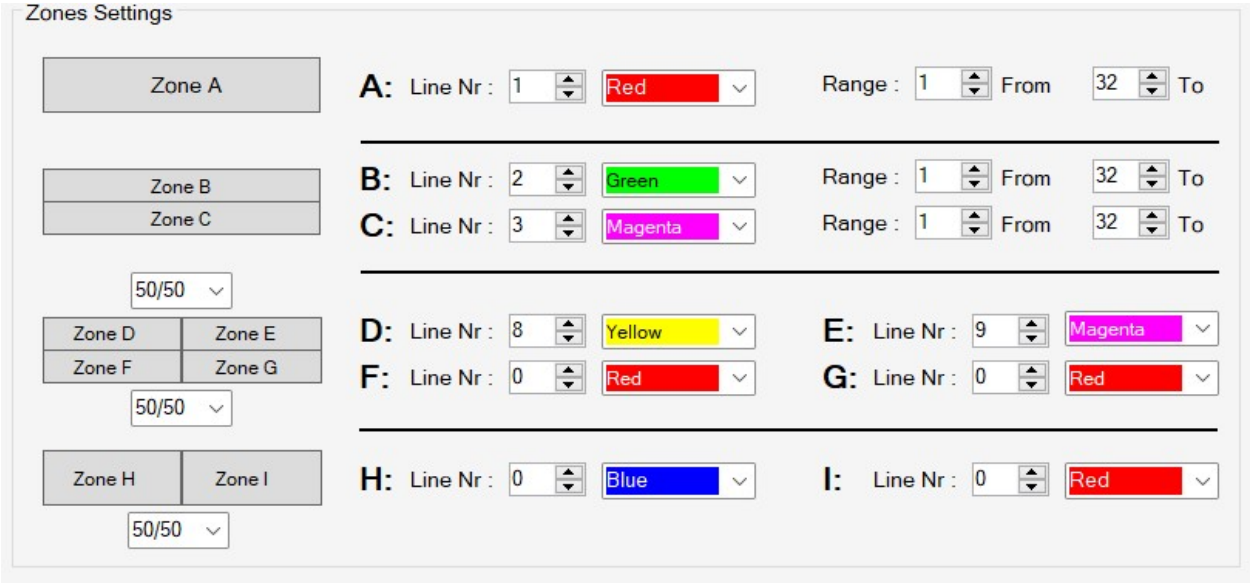
Display with 2x6 MLED panels (MLED-26S):

Zone A: 8-9 characters, height 28-32cm depending on the font type selected
Zone B - C: 16 characters, height 14-16cm per zone
Zone D - G: 8 characters, height 14-16cm per zone
Zone H - I: 4 characters, height 28-32cm per zone

4.1. Standard Zones Settings

- Line number & color:
  - Each zone must have a line number and a color defined.
  - Line number = 0 → zone disabled (not used).
- Range (only for zones **A–C**):
  - Optional `range_from` and `range_to` can be defined to display a substring of the received frame.
  - For example, if a range is set from 5 to 15 and the received frame is "this is a range demo", the DLED-96 will display the text “is a range”.
- The proportion between adjacent zones (D–E, F–G, H–I) can be adjusted.
- Auto Scroll:
  If the “Auto Scroll Speed” parameter defined for a zone is greater than zero, any text longer than the zone width will be automatically scrolled across the display.
- Fonts:

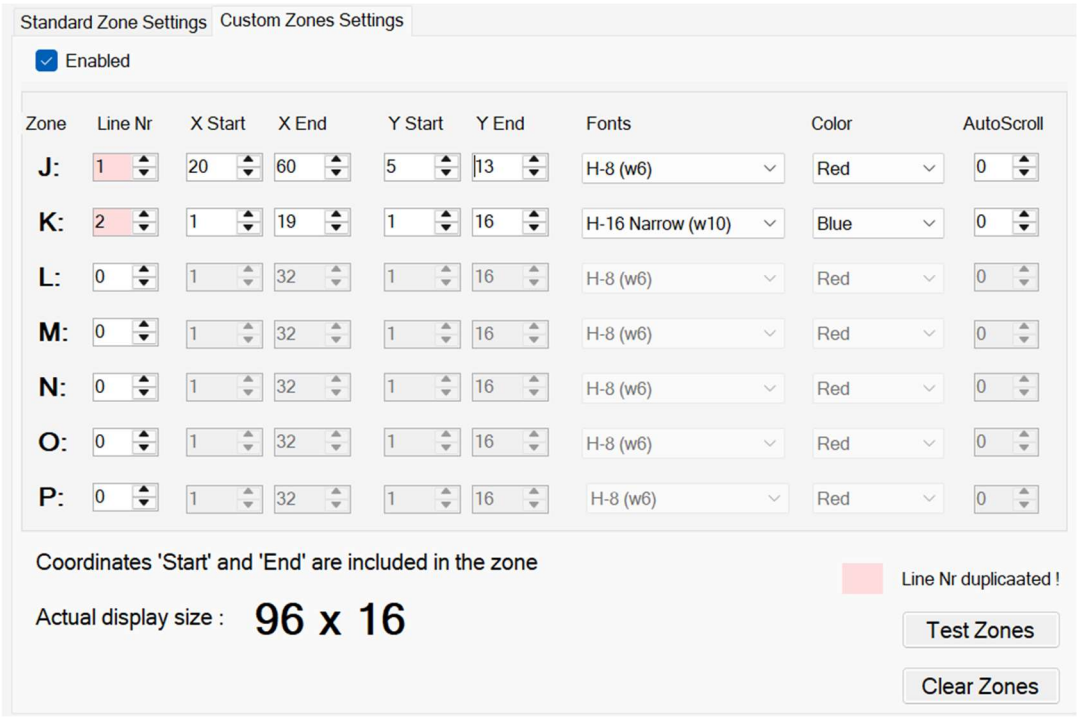
“Display Setup Manager” application



4.2. Custom Zones Settings

Starting from firmware **V2.4.0**, it is now possible to set up custom zone sizes and positions, giving you full control over your display area.
Zones **J–P** can be activated and configured using our « Display Setup Manager » application.

- Position and size:
  Select each custom zones position and size on your display aera.
- Line number & color:
  - Define a line number and a text color.
  - Line number = 0 → zone disabled (not used).
- Fonts:
  Any Fonts can be selected for any zone.
- Auto Scroll:
  If the “Auto Scroll Speed” parameter defined for a zone is greater than zero, any text longer than the zone width will be automatically scrolled across the display.

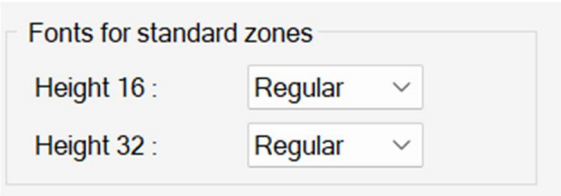


Note: Make sure line numbers are not duplicated with standard Zones.

4.3. Fonts

For standard zones with a height of 16 or 32 pixels, you have the choice between 3 different fonts.

a) Regular : 14x12 or 28x24 pixels
b) Full height : 16x12 or 32x24 pixels
c) Narrow : 14x10 or 28x20 pixels



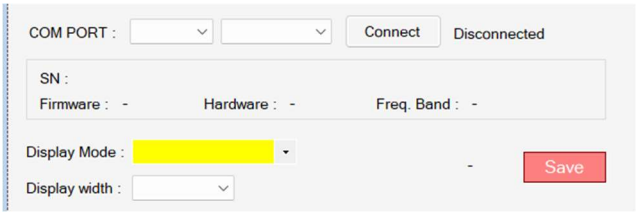
For custom zones, you have the same selection but with an extra fonts' height of 24 pixels.

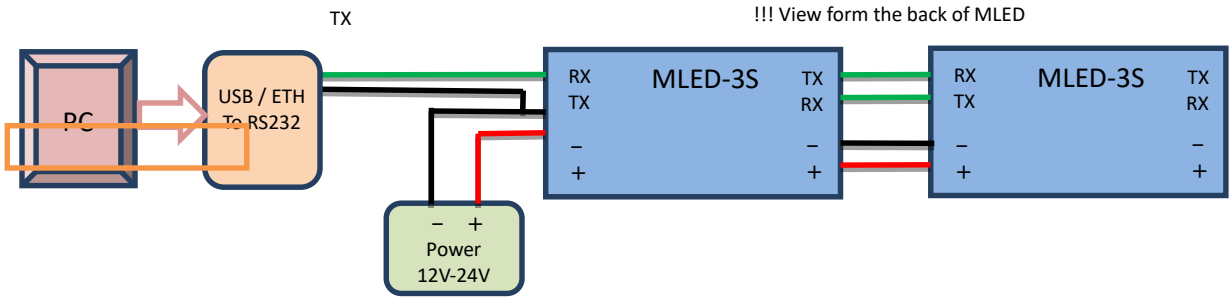
5. Setup and wiring

Dual side or 2 separate MLED-3S:

This configuration is identical to that of an MLED-6s. The two MLED-3s can be operated independently by assigning them to zones D through I in the setup application.

For dual-side applications displaying identical data, set the **Display width** parameter to **3s**. For all other configurations, leave it at the default value, **Max width**.

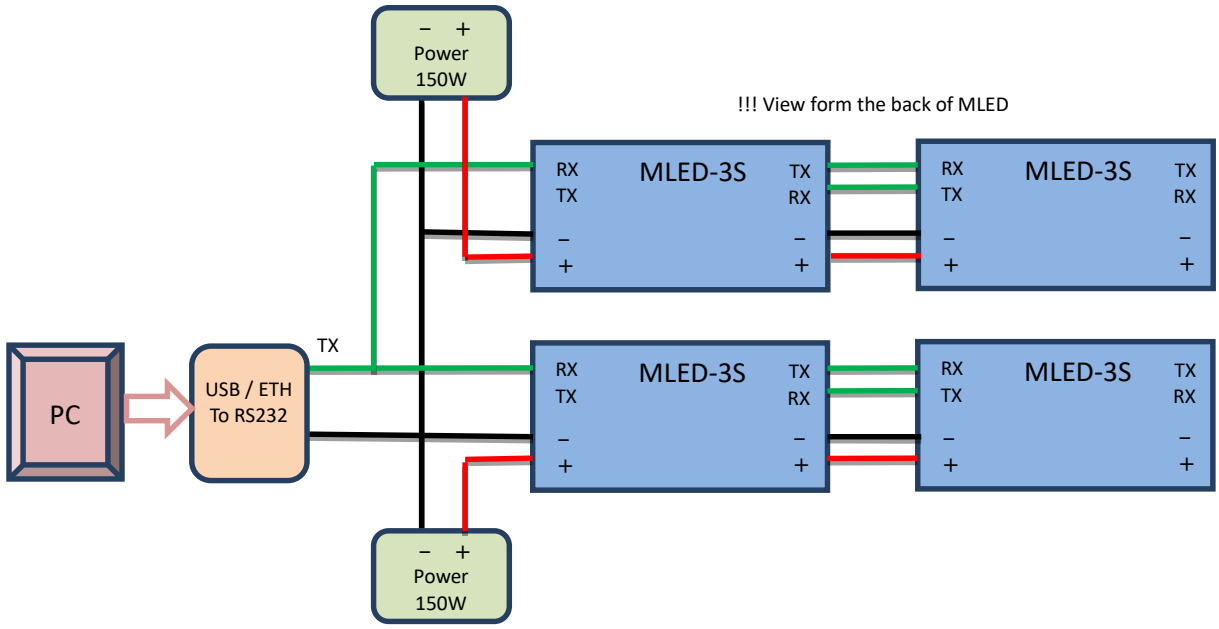




2 Lines dual side or 4 separate MLED-3S:

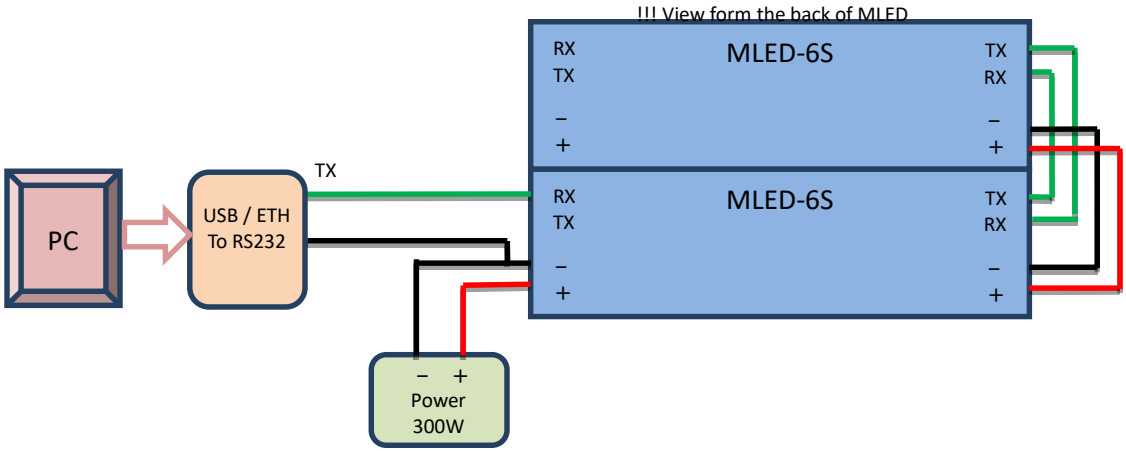
This setup is similar to the setup above, but it uses two lines of two MLED-3S modules, or four separate MLED-3S modules (configured using Zones D to I for each line).

Many other configurations can be achieved by assigning different zones to each line.



Multi Row display (MLED-26S):

This configuration is considered as a single display composed of 2 × 6 MLED modules.
Various configurations can be achieved by assigning different zones.



When multiple rows of MLED modules are assembled together (such as the 2×6 example above), module enumeration must be performed before the first use. (This step is not required if a control box is used.) To enumerate the modules after assembly:

1. Connect the lower-right display module to the PC via RS232.
2. Open the **"MLED Multi Rows"** PC application, available on the **Download page** of our website.
3. Click the **"Enumerate"** button. Each module will display its position in blue, as shown in the example below.
4. Power cycle the display. The system is now ready for use.

00	01	02	03	04	05
10	11	12	13	14	15

Note: If you want to disassemble all MLED modules, it is important to first clear the module enumeration.
To do this, click the **"Clear Enum"** button. A small yellow 'c' will appear on each module, indicating that the enumeration has been cleared.
Failing to clear the enumeration may cause issues if the modules are not reassembled in the exact same positions. In such cases, each module will need to be cleared individually before a new setup can be created.

c	c	c	c	c	c
c	c	c	c	c	c

6. Firmware Update Procedure

Updating the MLED firmware is straightforward. The FdsFirmwareUpdate software is required. Multiple MLED forming a display can be update simultaneously.

1. **Install Software**
   - Install the application **FdsFirmwareUpdate** on your computer.
   - Launch the application.
2. **Connect Device**
   - Make sure the display is switched OFF.
   - Connect the RS232 cable between your PC and display.
3. **Select COM Port**
   - Choose the COM port corresponding to the connected display.
4. **Select Firmware File**
   - Select the **".bin" firmware file** for the update.
5. **Start Update**
   - Press **Start** in the program, and switch the power ON.
   - All MLED modules firmware will update automatically.

7. Technical specifications

MLED (1 module):

Resolution	32 x 16 (RGB Leds)
Power supply	12V-24V (+/- 10%)
Average current under 12V	0.8A for red text 2.0A for white text
Max power	47W
Operating temperature	-20°C to +60°C
Environment	Indoor & Outdoor (IP63)
Size	320x160x27 mm
Weight	800gr

MLED-3S (3 modules):

Resolution	96 x 16 (RGB Leds)
Power supply	12V-24V (+/- 10%)
Average current under 12V	2.4A for red text 6.0A for white text
Max power	140W
Operating temperature	-20°C to +60°C
Environment	Indoor & Outdoor (IP63)
Size	960x160x27 mm
Weight	2.4kg (without frame)

MLED-26S (12 modules):

Resolution	192 x 32 (RGB Leds)
Power supply	12V-24V (+/- 10%)
Average current under 12V	9.6A for red text 24A for white text (2x300w power supply is advised)
Max power	560W
Operating temperature	-20°C to +60°C
Environment	Indoor & Outdoor (IP63)
Size	1920x320x27 mm
Weight	9.6kg (without frame)

8. Copyright and Declaration

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