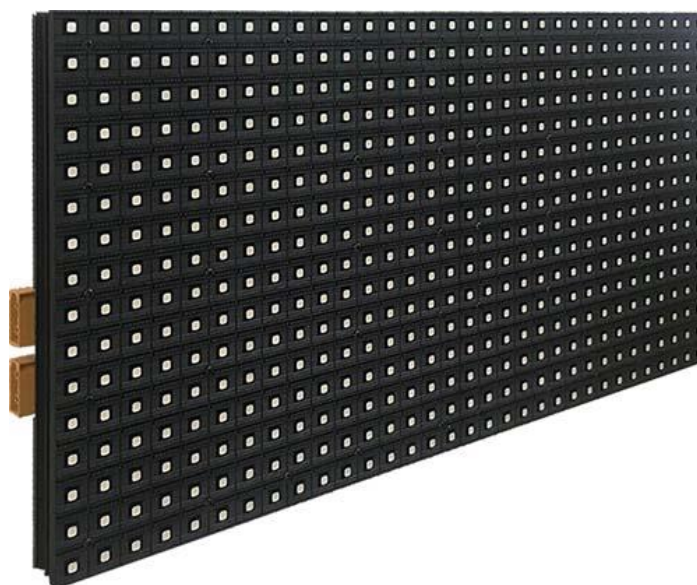


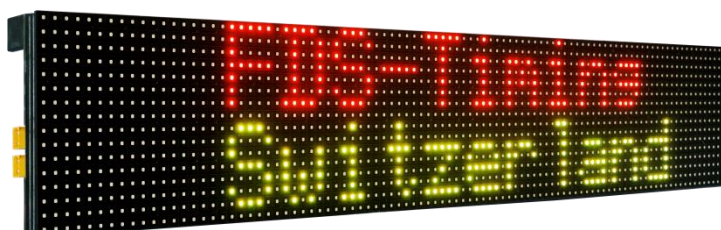
MLED (Modular LED Display)

1. Appearance



The MLED full colour panel introduces a new, flexible way to build and use your timing screens. With its lightweight and modular design you can use as many panels as you need to build your desired display size for your event.

Each MLED has a definition of 32x16 dots and can be assembled in parallel up to a total of 8 panels. Multi lines can also be achieved by mounting multiple MLED panels vertically.



2. Connection

Each panel is equipped with a total of four XT60 connectors (two on each side).

POWER connectors:

There is one power connector on each side. Power input is via the XT60 male on the right side of each panel with the left hand side female XT60 being the voltage output to supply the adjoining MLED panel.

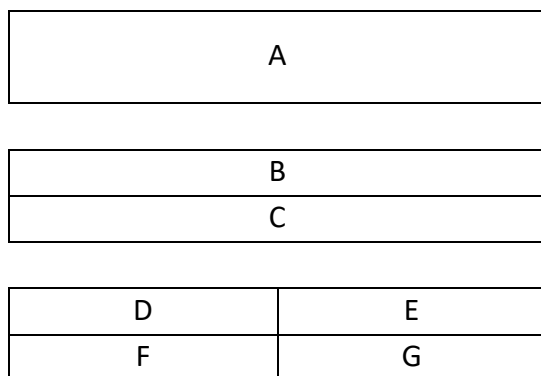
RS232 data connectors:

Similar to the power, there are two XT60 connectors on each panel, the XT60 data connector on the right side of the panel being the RS232 data input from a PC and the left side XT60 connector supplying the RS232 data output to the adjoining MLED panel.

3. Mode of operation

The most common configuration comprises of 3 or 4 MLED panels adjoined to form a display fully configurable to either a single full height line of characters or multiple lines as below.

The total display area is divided into 7 zones (A – G) as the schematic below. Be aware that some zones share the same display area and should not be used together. A line number as well as a color can be assigned to each zone via the PC setup application. It is recommended to assign the value '0' to any unused zone.



Display with 3 panels:

Zone A : 8-9 full height characters depending on the font type selected.

Zone B - C : 16 characters at half height.

Zone D - G : 8 half height characters.

Display with 4 panels:

Zone A : 10 – 12 full characters depending on the font type selected.

Zone B - C : 21 characters at half height.

Zone D - G : 10 half height characters.

4. RS232 Protocol

The FDS RS232 protocol is fully compatible with TAG Heuer basic display protocol described below. An extension of this protocol has been implemented to the enable modification of colours and also additional functions.

4.1. Basic Format

<STX>NLXXXXXXXX<LF>

STX = 0x02
 N = line number <1..9, A..Z>
 L = brightness <1..3>
 X = characters (up to 32)
 LF = 0x0A

Format: 8bits / no parity / 1 stop bit
 Baud Rate: 9600bds

4.2. Characters Set

All standard ASCII characters <32 .. 126> except for the char ^ which is used as delimiter

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPNOPQRSTUVWXYZ
 [\]_`abcdefghijklmnopqrstuvwxyz{|}~

Extended Latin ASCII characters (ISO-8859-1) <224 .. 255>

àáâãäåæçèéêëìíîïðñòóôõö÷øùúûüýþÿ

4.3. Protocol extension

Inline commands can be added between the ^^ delimiters.

Command	Description
^^cs c^^ ^^ce^^	<p>Color overlay</p> <p>cs = start colour overlay cmd c = colour code ce = end of the colour overlay cmd</p> <p><i>Examples A:</i> <STX>13Welcome ^^cs 2^FDS^ce^Timing<LF></p> <p>“Welcome” and “Timing” are in the default line colour “FDS” is in Green</p> <p><i>Examples B:</i> <STX>23^^cs 3^Colour^^cs 4^ Display<LF></p> <p>“Colour” is in Blue “Display” is in Yellow</p>

Colour code :

code	Colour
0	Black
1	Red
2	Green
3	Blue
4	Yellow
5	Magenta
6	Cyan
7	White
8	Orange
9	Deep pink
10	Light Blue

5. How to update the firmware

Updating the firmware is relatively simple. It can be performed on one panel or simultaneously on several panels assembled together.

For this operation you will need to use the software “FdsFirmwareUpdate”.

- a) Disconnect power from the display
- b) Install the program “FdsFirmwareUpdate” on your computer
- c) Connect the RS232 cable to the RS232 XT60 connector on the right side of the panel.
- d) Run the program “FdsFirmwareUpdate”
- e) Select the COM Port
- f) Select the update file (.bin)
- g) Press Start on the program
- h) Connect the power cable to the MLED panel
- i) Once the update completes, “OK” will be displayed on each panel

6. Technical specifications

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
Operating temperature	-20°C to +60°C
Environment	Indoor & Outdoor (IP63)
Size	320x160x27 mm
Weight	800gr

7. Copyright and Declaration

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**Unit 9 Lymedale Court Enterprise Centre
Dalewood Road, Lymedale Business Park
Newcastle, Staffordshire, ST5 9QH**
www.sportstimingsystems.co.uk