

Bespoke Scoreboards



Installation Instructions

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Please read all of this instruction manual before starting the installation. It contains useful information on the installation and may save you time and money. The appendix at the end of this document has information on digit sizes, drawings of the installation processes and suggestions where to buy the materials.

Introduction

The Bespoke Scoreboard system has a maximum of 32 electronic digits (this may be increased during 2011). The system is fully modular and can be installed with all or only a few of the digits on the main display depending on the application. If only a few digits are installed initially then more can be added to the system at a future date without changing the existing installation. Repeater displays can easily be added to the system with either wireless or wired connections

Types of installation

There are three options for installation - a new stand alone score board - a refurbished scoreboard with a new facia or refurbishment by replacement of the existing digits. Each type will require a different approach to the installation process but all will require careful planning before work commences. You should be aware that planning permission for a new scoreboard may be required so contact the planning department at your local council at an early stage as the requirements do vary from one council to another. We cannot be held responsible for a scoreboard which has been erected without planning permission.

Decide how the new score board will look

Draw a plan of the new scoreboard layout to scale to show the position of the numbers and also the location of the text. You will require a minimum text height of 6" (150 mm) for the players and spectators to see round the ground although 8" (200 mm) will be better. If required you can stretch the height of the text or reduce the width to make it fit the space. Similarly the electronic digits should be a minimum of 8" so they can be seen from 100 metres distance. Having different sizes for the digits will make the scoreboard more easy to read, reduce the space required on the scoreboard and reduce the cost. The most popular are 12" digits for total and wickets. 8" for the batters numbers and 10" for the other information. The 6" digits are ideal for repeater scoreboards. If you are unsure of the layout and how it will look build a mock up using cardboard cutouts laid out on a full scale plan on the floor. Dimensioned drawings for all our digits are included in the

back of this instruction book (page 10). To aid the planning process and assembly please be aware that the standard sheet size for plywood is 2440 mm x 1220 mm (8' by 4') and polycarbonate sheet is supplied in either 8' by 4' or 3 metre by 2 metre sheets. Polycarbonate sheets are heavy and flexible so will require careful handling.

Once you have decided on the layout we can supply the scoreboard ready made, in sections so you just have to assemble the panels or in component parts which you will need to assemble into your own fascia. Ready made and part assembled scoreboards will be shipped pre-wired and tested with the text on the board. If you only require the component parts we will make up all of the cables for you if required.

The component parts

Control panel

Electronic digits in either 6", 8", 10", 12" or 15" sizes

Umpires light

The display driver boards which are located on the rear of the digits.

An input serial data board

A fuse board

Interconnecting wires, cables and connectors (20 way ribbon cable, 1.5 mm flexible) cable,

Ribbon cable connectors and crimp type bootlace ferrules.

Connector plate with input connectors.

Tools for the electronics

Wire cutters

Wire strippers

Crimping tools for the ribbon cable connectors and for the bootlace ferrules.

Screwdrivers (3 mm flat blade) for the terminal blocks

Screwdrivers pozidrive No. 1 and No. 2 for the mounting screws

Digital multimeter for testing

Sundry items

Cable clips

Hammer

Bradawl

Drill with bits

Ruler

Tape measure

Wood saw

Silicone sealant and applicator gun

Self Assembly Scoreboards

Part Assembled

The displays, electronics and the wiring between the digits will be supplied ready assembled onto the fascia boards. The ribbon cables and the power cables which run between the fascia boards will be cut to size and have the connectors fitted.

If you are replacing an old scoreboard check the condition of the old woodwork if you are planning to reuse any of it. Remove all of the wood work which is not required before starting work on the new one keeping any wood work which is to be reused.

Plan the timber and polycarbonate sizes before cutting any material.

Timber sizes required

Frame and supports	100 mm x 50 mm (paint before assembly so you do not have to wait until it is dry before fastening the plywood fascia.
Facia board	9 mm exterior plywood (cut the holes and paint before assembly)
Backing board	6 mm exterior plywood (cut out a hole for the connector plate before assembly)
Spacers	between the fascia and the glazing bars 20 mm x 60 mm (paint before assembly).
Sills	150 mm x 25 mm planed with a chamfer on the top and a rebate underneath for the rain to fall away
Screws	100 mm frame fixers 45 mm wood screws 20 mm wood screws
Brackets	50 mm x 50 mm steel

Glazing

Polycarbonate sheet 6 mm thick. This will take a direct hit from a "6".
Glazing bars with gasket material.

If you plan to have opening windows for the scorer then you will require some sliding window gear.

Please note that most apertures for the scoreboard will not be square or parallel and may even bow. You should allow for this when cutting the timber.

Planning the layout

Planning is the secret of success so start by drawing the layout to scale including the text for the total, wickets, batsman, etc. If you have any problems visualising the board draw the scoreboard full size on the floor, cut the digits out to scale from card and then lay them out on the scoreboard. Add the required text and do not forget to allow for a window if required.

If you have ordered the component parts then you will need to cut holes in the fascia for the digits and the umpires light before commencing assembly. A jig for the cutouts will simplify the work. We suggest you use a router for the cutouts using the dimensions in the appendix and paint the fascia before assembly. Fastening the displays to the fascia before installing it to the frame will also make the job easier.

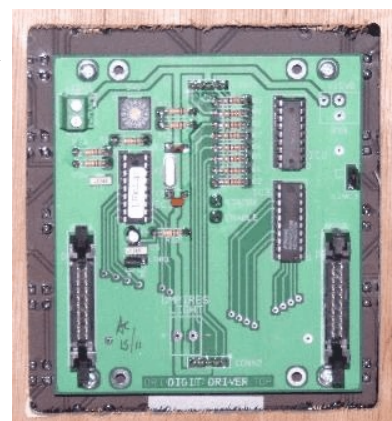
Building and installing the scoreboard

Constructing the frame

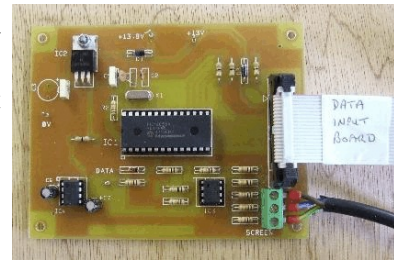
- 1 Start by building the frame using 100 x 50 mm timber (smaller sizes can be used if the available space is restricted but you will need to consider extra pieces for strength) round the inside of the opening. Fasten the frame to the walls with “framefixers”. The frame fixers screw directly into the walls (brick or block work) and do not require wall plugs, but they do require a good quality heavy duty electric screwdriver !
- 2 Fit the vertical and horizontal supports inside the frame to coincide where the plywood fascia panels meet. Use the right angle steel brackets to attach the supports to the frame using 40 mm screws.
- 3 Offer the first plywood fascia panel to the frame and screw using the 45 mm screws spaced about 500 mm apart. Repeat for the other fascia panels
- 4 Seal the joint between the fascia and the walls with mastic or silicon sealer.

Wiring the Electronics

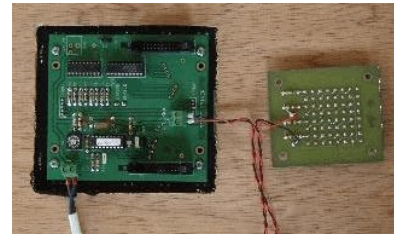
- 5 Fasten the driver boards to the digits, select the switch and jumper link position for the digit from the table (page 8) and then fix the digits to the fascia board.



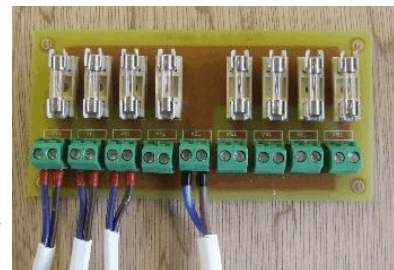
- 6 Fasten the serial data input board to the fascia in a location where the ribbon cable is easily connected to the digits using the spacers provided so that the board is not in contact with the timber. When all the digits and the serial board are in place connect the digits and the serial board together using the 20 way ribbon cable and the connectors supplied.



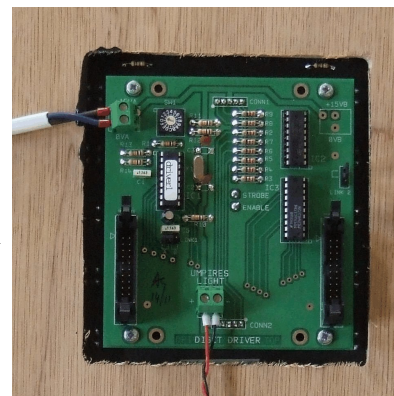
- 7 Connect the umpires light to the driver board which is fastened to the rear of the display for the total score "units".



- 8 Fasten the fuse board to the fascia using the spacers provided. Note that you may not require all of the fuse positions unless you are using a full scoreboard. Wire one group of displays to one fuse. Do not be tempted to wire more than one group to a fuse as the fuses are there to protect the wiring and electronics in case of a component failure.



- 9 Connect the power to the digits. Power is not required to feed all of the digits as the ribbon cable will also distribute the power between the adjacent driver boards. Wiring the power to the digits in groups of upto 5 will be adequate. You will need to break the power feed round the digits using the jumper link on the driver boards to set the power distribution to the groups.



- 10 Cut a hole for the power and signal connector plate on one of the plywood backing pieces and then mount the plate into the hole.
- 11 Connect the power and signal input connector plate to the fuse board and the data input board.
- 12 Power up the power supply and check the output voltage is 13.8v (there is a selector switch located under the power supply unit to set the output to 13.8v) before connecting the power supply to the scoreboard.
- 13 Connect the control panel to the fascia plate using the cables supplied.
- 14 Connect the power supply to the scoreboard and switch on. Observe the voltage and current on the power supply which should be 13.8v with a maximum of 0.5A per digit if the digit is displaying "8" and for a "1" it will be about 0.14A.

15 Setting the digits. The required display for each digit is set by the HEX switch and the jumper link on the driver board. See the table for the correct positions of the switches.

16 If you are happy with the displays, then after switching the power off, fix the back plywood to the frame.

Glazing can be done either after you have wired up the digits or as soon as the fascia board is fastened to the frame. If rain is forecast you will want to do the glazing before the electronics gets wet.

17 Fasten the spacing bars to the fascia using the 45 mm wood screws. You will need to fasten one spacing bar down each side of the scoreboard and one down where the fascia boards join (unless your scoreboard is using 3 metre x 2 metre polycarbonate when you will need to fix the spacers to suit the sheet of glazing). You do not require a spacer for the top or bottom of the scoreboard as this will allow ventilation to avoid condensation on cold days and the build up of heat on sunny days.

18 Cut the glazing bars to size and drill holes for the wood screws at about 300 mm centres.

19 Tack the gasket strip for the glazing bars on to the spacers.

20 Using 2 or 3 screws loosely fasten the first glazing bar to the fascia.

21 Offer the first sheet of polycarbonate to the glazing bar taking care to have the gasket under the polycarbonate and then loosely fix the second glazing bar to hold the polycarbonate sheet in place and then tighten the screws in the first glazing bar and screw in the remaining screws for that bar.

22 Repeat the above procedure for the second and third sheets of poly carbonate.

23 Connect the control panel to the scoreboard (wired systems) using the leads supplied.

Data Black cable with a 3 pin XLR to 3 pin XLR connector to connect between the control panel and the scoreboard.

Power White cable (0.75 mm) with a 4 pin XLR to 4 pin XLR connector to connect between the scoreboard and the control panel.

Power White cable (1.5 mm) with a 4 pin XLR connector to two 4 mm plugs to connect between the scoreboard and either the power supply or the 12v battery

24 Now you have finished your scoreboard switch it on and stand outside and admire your work. Take the opportunity to check round the ground to see the areas from which is it visible. Ask your assistant to operate the control panel making sure that all the functions work and you are familiar with the controls.

25 Play your first match.

Wireless Systems

All the scoreboards can be wireless operated and they may be upgraded at any time by adding a wireless receiver and an aerial to the scoreboard. The control panel will require the addition of the wireless transmitter, aerial and battery charger all of which need to be done in the factory. This work will take about a week to complete. Please note that the wireless control panel and the scoreboard will still work with wires between the control panel and the scoreboard after the wireless conversion.

- 25 Aerial location. Decide on the best position for the aerial which should be as high as possible and pointing to the place from where the control panel is to be operated to obtain the best results. UHF radio signals travel in straight lines and the signal power is reduced as the distance between the control panel transmitter and the receiver aerial is increased. In normal use a distance of 200 metres is easily achieved but for greater distances you may need to fix an aerial for the control panel transmitter above head height as the transmitted radio signals are absorbed by people and other objects.
- 26 The wireless receiver should be located inside the scoreboard. The data cable and the power cable can be made so they are routed round the scoreboard (50 metres will not be a problem)
- 27 Connect the aerial to the receiver using CT100 cable with BNC connectors on both ends being careful to avoid sharp bends in the cable as this will degrade the UHF signal. You will probably have to drill a hole through the wall of the scoreboard for this cable making sure that the cable entry does not allow water to run inside the scoreboard. For long distances between the control panel transmitter and the receiving aerial an aerial amplifier may be required which is placed between the receiver aerial and the receiver input.
- 28 Connect the signal and power cables between the wireless receiver and the connection plate on the rear of the scoreboard.
- 29 Switch the control panel and scoreboard on and then observe that the digits light. Test the system just as you did for the wired version.

Battery Systems

The main battery.

To determine the battery size required see the appendix on page 9

Fasten the terminals to the battery taking care to fasten the RED one to the positive terminal and the BLACK one to the negative terminal. **WARNING connecting the battery or the power supply the wrong way round when charging the battery may result in a melted cable. We are unable to accept any liability for incorrect connections.** If you inadvertently connect the cable the wrong way round immediately switch off the power supply and disconnect the cable.

Before connecting the battery check the voltage selection switch under neath the power supply is set to 13.8 volts. Do not be tempted to set to a higher voltage as this will damage the battery. Check the output voltage is correct by switching the power supply on without connecting the battery. Switch the power supply off before connecting the battery.

To charge the battery switch the power supply off and then connect it to the battery with the red terminal connected to the red (positive) terminal of the battery and the black terminal connected to the black (negative) terminal of the battery. Switch on the power and the current will rise to a maximum and then fall during the charging cycle to less than 0.1 amp. The inrush current to the battery may be in excess of 25 amps for the first minute or so.

You must remember to recharge the battery after use to avoid embarrassment during a match.

The control panel battery (wireless systems).

For wireless operation the control panel has 6 rechargeable D size nickle metal hydride (NiMH) cells fitted inside the case. These can be recharged from the power supply using the 4 pin XLR to 4 mm plug lead supplied or from the 12 volt leisure battery using the same lead. The charging cycle is automatic and will start with a small charging current before the full charging current is connected. The charging current will be about 0.5 amps for most of the charging time which may last upto 20 hours depending on the state of the charge in the batteries. When the batteries are fully charged the internal charging electronics will switch to a trickle charge. It is good practice to recharge the batteries after use although a fully charged control panel may last for upto 20 hours.

Cricket Scoreboard - Allocation of Serial Data Bytes

Byte No.	Switch Code	Function	
0	00	Test	
1	01	Total	Units
2	02	Total	Tens
3	03	Total	Hundreds
4	04	Wickets	Units
5	05	Wickets	Tens
6	06	Extras	Units
7	07	Extras	Tens
8	08	Overs	Units
9	09	Overs	Tens
10	0A	Bat A	Units
11	0B	Bat A	Tens
12	0C	Bat A	Hundreds
13	0D	Bat B	Units
14	0E	Bat B	Tens
15	0F	Bat B	Hundreds
16	10	Bat A Number	Units
17	11	Bat A Number	Tens
18	12	Bat B Number	Units
19	13	Bat B Number	Tens
20	14	Last Man	Units
21	15	Last Man	Tens
22	16	Last Man	Hundreds
23	17	Partnership	Units
24	18	Partnership	Tens
25	19	Partnership	Hundreds
26	1A	Last Wicket	Units
27	1B	Last Wicket	Tens
28	1C	Last Wicket	Hundreds
29	1D	1 st Innings	Units
30	1E	1 st Innings	Tens
31	1F	1 st Innings	Hundreds

Battery Size

The maximum current required for each digit when all segments are illuminated is:

15"	0.70 Amps		
12"	0.56 Amps	12" + 1	0.64 Amps
10"	0.50 Amps	10" + 1	0.57 Amps
8"	0.45 Amps	8" + 1	0.52 Amps
6"	0.30 Amps	6" + 1	0.34 Amps

Using the above you will be able to calculate the maximum current required if every digit is showing an "8" but this will not be the case, so a good estimate of the average current required is to assume that only half the segments in the whole display to be illuminated at any one time.

Example

For a small scoreboard with 6 off 12" digits the maximum current required is 3.36 amps and using the 50% rule 1.7 amps is the average for the match. A 50 over match will last about 7 hours (including tea) and also including any time before the match then allow 8 hours at 1.7 amps to estimate a battery requirement of 13.6 Ampere Hours (Ah). A large scoreboard with 30 digits may require $30 \times 0.56 \times 8 = 67.2$ Ah.

You will need to recharge the battery after every time you use it though some large clubs will have a larger battery to allow for 2 or 3 matches before the battery requires recharging. A 120 Ah leisure battery will be a good size.

Digit sizes

The nominal size of the digit is the distance between the centres of the top and bottom segments.

Digit	Panel Size		Digit Size		Segment Width
	Inches	mm	Inches	mm	
15"	17 x 9.5	432 x 242	16 x 8.4	406 x 213	30
12"	14 x 8	352 x 204	13 x 7	330 x 178	25
10"	12 x 7	305 x 178	10.9 x 5.9	277 x 150	23
8"	10 x 6	254 x 152	8.9 x 4.9	226 x 125	22
6"	7 x 4.5	178 x 115	6.4 x 3.5	163 x 89	10
12"+1	14 x 11.6	352 x 295	13 x 7	330 x 178	25
10"+1	12 x 10.4	305 x 264	10.9 x 5.9	277 x 150	23
8"+1	10 x 9	254 x 152	8.9 x 4.9	226 x 125	22
6"+1	7 x 6.9	178 x 175	6.4 x 3.5	163 x 89	10

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