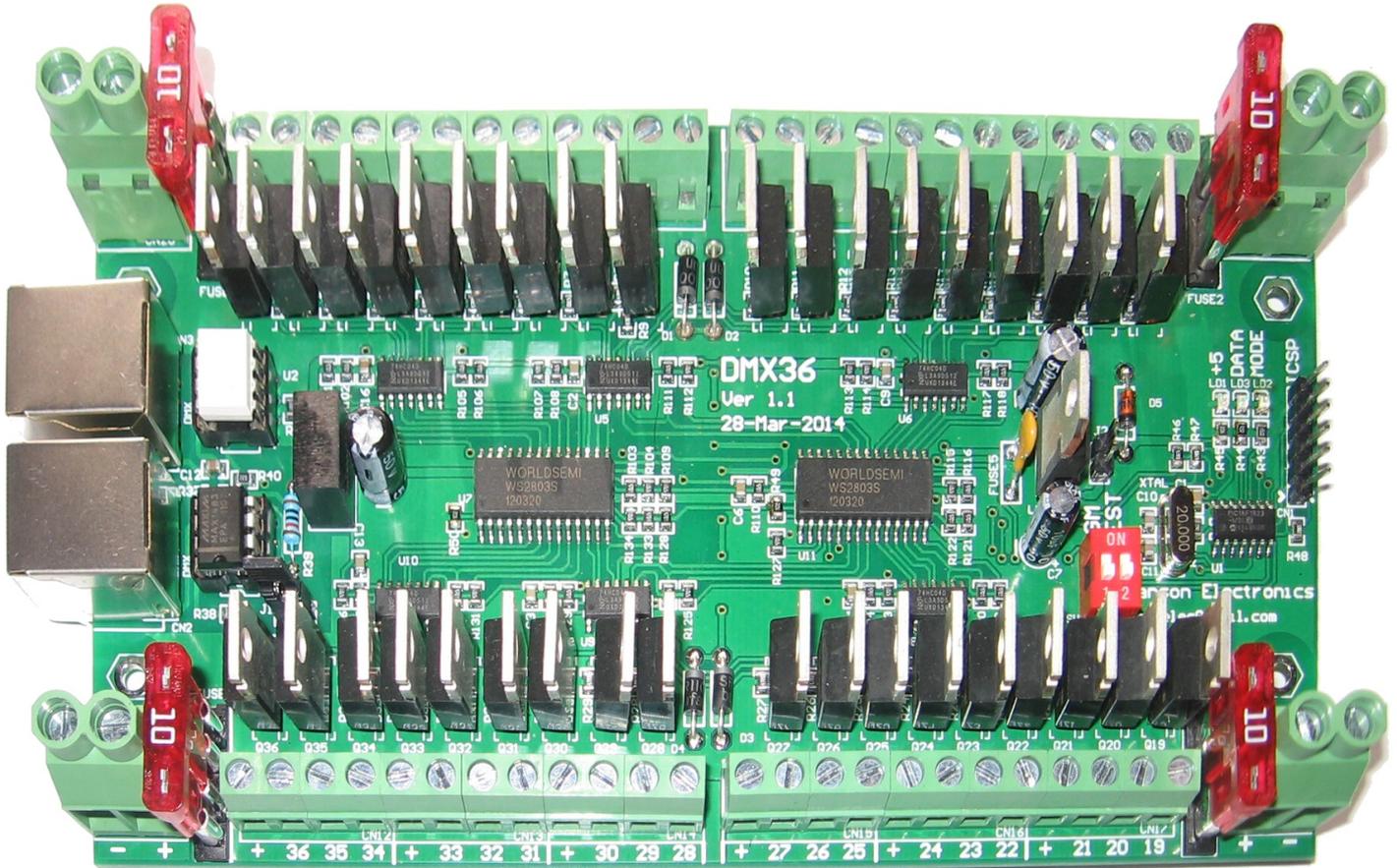


DMX2-18



USER MANUAL

DMX controller for 2 wire 2 channel LED strings

PRELIMINARY

(Contains photos and details from DMX36 and DMX18)

Features

- The DMX2-18 controller accepts DMX data input and drives 9 2 channel, 2 wire led strings.
 - DC input (20 - 40V)
 - 15A (max) ATO blade fuse
 - 18 DC outputs for 9 2 channel, 2 wire led strings
 - True electrically isolated DMX input with ESTA pinout (2x RJ45 sockets for looping)
- PCB size is 92mm x 96mm

Revision 1.0
Suits PCB revision 1.1
10 April 2016

Connections

Dmx Data

There are 2 RJ45 dmx sockets on the board. These are designed for loop in and loop out.

If the DMX2-18 is the last dmx device on the dmx cable then the signal should be terminated with the termination jumper. Basically if only 1 cable is plugged in to the dmx sockets then the termination jumper should be installed. If both sockets are used then the termination jumper should be left off.

The DMX2-18 uses the ESTA pinout. If connecting to a LOR device (dongle or controller) a crossover cable or adaptor will need to be connected in between.

DC Power Input

The board will control any DC voltage between 20 and 40V . The DMX2-18 comes supplied with a 10A fuse fitted. Fuses up to 15A can be used. It is recommended changing the fuse to the closest size for the total current that the board will be supplying.

Dimmer Outputs

There are 18 channel outputs for controlling 9 2 channel 2 wire led strings. A DC voltage in the range of 20 to 40V can be used.

The maximum load per string is **2 Amps**, but remember that the overall limit is 15 Amps. This means that you can't turn on all 9 strings with the maximum load.

See the Connection Examples section for the methods of connecting lights.

ICSP Connector

An ICSP (in circuit serial programming) header connector is provided for initial programming of the microprocessor and for program (firmware) updates.

USING THE DMX2-18

Status Leds

There are 3 small LEDs near the centre of the PCB adjacent to the micro.

Red led-5V Power, Blue led-MODE, Green led-DATA

-Red led	5V power	
-Blue MODE led flashing slowly.	Green DATA led off.	Test mode
Test mode takes precedence over normal running so errors/status message	other than test mode won't be displayed if in test mode.	
-Blue MODE led on solid.	Green DATA led flashing 10 Hz.	Normal run mode. Dmx packets being received
-Blue MODE led on solid.	Green DATA led off.	Normal run mode. No dmx data
-Blue MODE led flashing 10Hz.	Green DATA led off.	PGM/Address setting mode. No valid address yet
-Blue MODE led flashing 10Hz.	Green DATA led on.	PGM/Address setting mode. Valid address received

9 CH

There is a switch that allows the DMX2-18 to work in 9 channel (9 CH) mode. This means that both channels of a string will be dimmed at the same setting. Using the DMX2-18 in this mode only 9 DMX addresses are used.

Start Channel

The start channel is set via the PGM switch and data being sent to the board. DMX addresses can be anywhere between 1 and 512. The address of the DMX2-18 can be anywhere in the range of 1 to 495 (a start address of 495 uses the addresses from 495 to the maximum 512). If the address is set outside of this range an error is indicated via the 2 status leds. See **Status Leds**. The start channel can be changed at any time by turning on the PGM switch and sending the data. The start address is sent and stored as 2 8 bit numbers. For a start address of 1-255 the 2nd address/channel should be 0. For addresses over 255 (255-495) the 2nd start address channel is set to 1 and the 1st address channel is set to the start address minus 255.

When you receive your DMX2-18 it will have a DMX start address of 1. That is, it will respond to channels 1 to 18. To change the start address perform the following procedure:

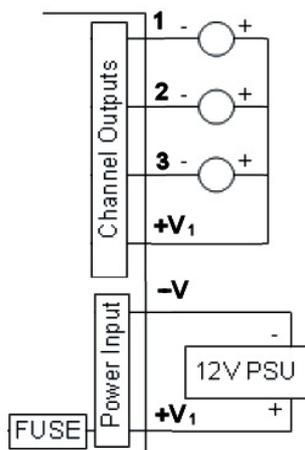
- Power up the DMX2-18.
- Connect a DMX source of DMX data like a sequencer, test software or dedicated start channel programmer (like da_start from http://www.da-share.com/software/da_start/) etc that you can set at least channels 1 & 2 to a DMX address to the full 0-255 range (not a 0-100% setting)
- Set DMX channel 1 to value 1..255 to the required setting for the new DMX start address
- Set DMX channel 2 to a non-zero value if it's required to add 256 to the new DMX start address
- Turn on the PGM dipswitch. The MODE led will flash and the DATA led will be off.
- After a valid start address in the range of 1-495 is received the DATA led will turn on. The new DMX start address is then stored in the EEPROM
- Turn off the PGM switch and the DMX2-18 is ready to use with the new start address.
- If using da_start then ensure DMX18 is selected to allow the correct address range to be selected

Test Mode

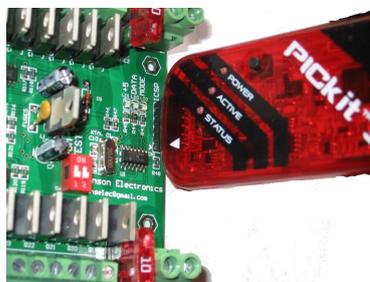
There is a switch which places the control into a test mode. In this mode a test program runs and all 18 outputs are cycled through. This mode allows for soak testing of lights without the need for a source of dmx data. The control will cycle through 6 modes of testing from 1 channel on at a time, 1 string at a time, 1 half of all strings, other half of all strings etc.

Connection Examples

Typical connection arrangement showing 2 wire 2 channel led string. The strings connect between channels 1 and 2 for string 1, 3 and 4 for string 2 etc. The order of the lights on the 2 channel 2 wire lights can be changed by swapping the pairs of wires from 1 and 2 to 2 and 1. As the leds on a string are typically relatively closely spaced the difference probably isn't noticeable or worth the effort.



Firmware Updates



Firmware update can be loaded through the ICSP header with a Pickit3 (or PicKit2) pic programmer. Pin 1 of the ICSP header is marked on the pcb and is shown to the left. Ensure the pin 1 (the arrow) of the header is aligned with pin 1 of the programmer.

Via MPLAB

MPLAB must be installed. It is available from microchip.com

Plug your PicKit 3 into a spare USB port, then start MPLAB X IDE (or version 8.84 or whatever). Once it has loaded, click Configure > Select Device to bring up the device selection window. From the device drop-down list, select PIC16F1823 and click OK.

A dialog saying "New firmware must be downloaded for PicKit 3 to work with the part selected." may pop up at this stage. If it does, click OK and wait for MPLAB to download the programming firmware to the Pickit 3. You will see some activity in the PicKit 3 tab of the output window for up to a minute or so. When MPLAB is ready you will see "PicKit 3 Connected" and possibly an error stating "PK3Err0045: You must connect to a target device to use Pickit 3". This is not a problem and just a warning that the PicKit 3 cannot "see" the chip yet.

Then, click File > Import and browse to the DMX2-18 1.0 HEXFILE.hex file (latest version at time of writing) and click Open. The last line of the build tab of the output window should read "Loaded C:\...\DMX2-18****.HEX."

Now, connect the PicKit 3 the 6 pin ICSP header next to the micro. Make sure the arrows on the Pickit 3 and the 6 pin header are aligned. Then power up the DMX2-18. The PicKit 3 tab of the output window should now read "Target Detected".

Click Programmer > Program to initiate the ICSP operation. The PicKit 3 tab of the output window will show "Programming...", then "Programming/Verify complete" once it is done. Disconnect the PicKit 3. The PicKit 3 tab of the output window will show "Target Removed".

Via "Programmer To Go" feature of PicKit3

If a PicKit 3 has been preprogrammed with firmware then all is required is that the DMX2-18 board is powered up. Plug the PicKit3 onto the header as shown above. Power the PicKit3 by plugging it into any usb socket. The power led on PicKit will light, the status led will be green and the blue active led will be flashing. Press the pushbutton. The status led will turn red, the active led will turn solid red. When then Status led turns green again and the blue Active led starts flashing the firmware has been updated.

Via "PicKit 3 Programmer" software

The Pickit 3 programmer software can be downloaded at <http://ww1.microchip.com/downloads/en/DeviceDoc/PICkit%203.3.0%20Setup%20A.zip>.

Extract and run in. Select PIC16F1823 as the Device. Select File>Import Hex> and browse to the DMX2-18 1.2 HEXFILE.hex file (latest version at time of writing) . Plug in the PicKit 3. If the DMX2-18 is powered then click on write and it will update the firmware. If the board isn't powered then click on the "On" button in the "Target Power" section. The power and mode light on DMX2-18 should then power up. Click on "Write".

Faultfinding

Fault

Power Led (red led) not lit

Solution/solutions

- Fuse/s blown (note the control only needs power to 1 zone for power led to be on and for that zone to work). Check fuses
- Power supply faulty or not turned on.
- Power supply section of pcb damaged. No user repairable parts. Return for repair

1 or more Zones not working

- Fuse for that zone is blown, power supply powering that Zone is faulty or there is a wiring fault

Led string failing to turn on

Driver IC has detected an overload and has turned off. Cycling the power should reset it. Too long a string attached to a channel or a shorted string are the likely causes

Half of LED string turned on all the time -Driver IC may be damaged

No DMX signal

- Termination jumper is installed when both DMX sockets are in use
- No data is being sent. Check software, dongle, cable etc
- DMX (RS485) receive IC is damaged. IC is socketed for easy replacement. It is U3 (a MAX1483 or compatible)
- Optoisolation IC is damaged. This would usually only be caused by applying excessive voltage to the DMX data line. The IC is socketed for easy replacement. It is U2 (a 6N137). Ensure the polarity is correct. A notch or dot on the IC must match the notch in the IC socket
- Insufficient channels being sent by sequencing/test software

Fuse blowing

- Fuse selection too low for lights that are connected
- 1 or more lights connected have short circuited wires
- Power polarity is/was incorrect

Warranty

This dmx light controller is covered by a warranty for a period of 12 months from the time of purchase.

The warranty covers only faulty material and workmanship if properly setup and operated in accordance with the specifications and setup sections of this document.

The repair and or replacement of this controller will only be at the workshop of Alan Hanson. The cost of freight to/from will be borne by the user.

The warranty does not cover damage to the controller due to misuse i.e.. shorting of outputs, connecting AC supply, connecting a supply higher than the rated voltage.

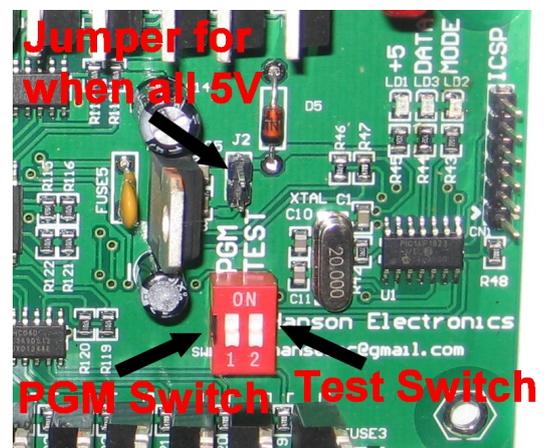
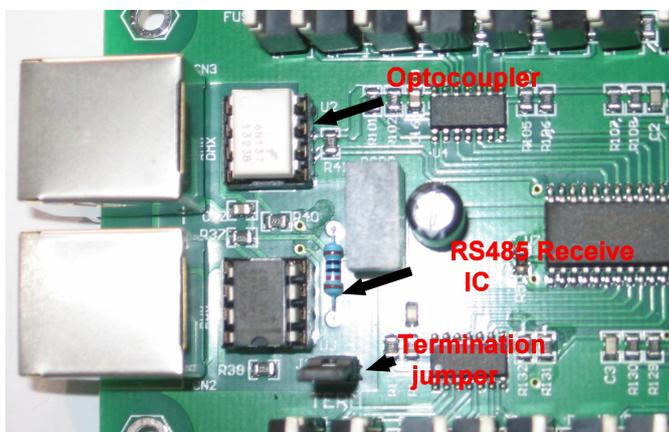
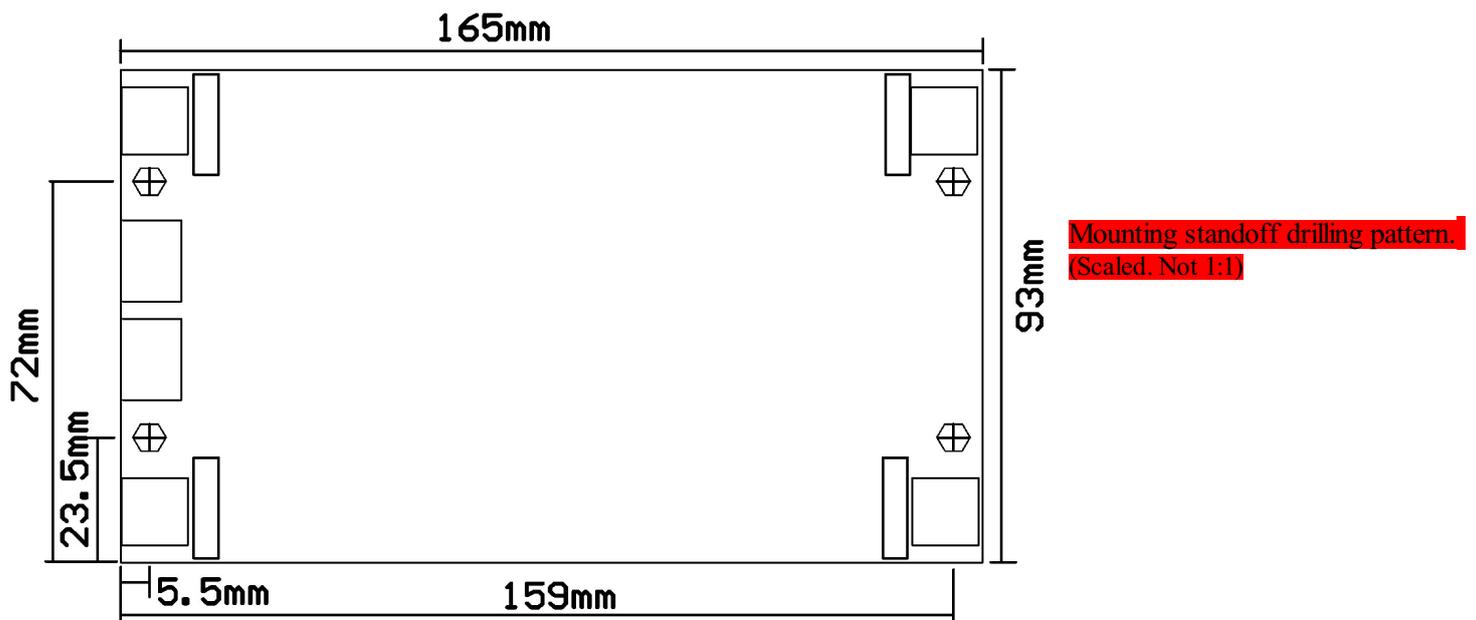
The controller is supplied as is. Alan Hanson and Hanson Electronics reserves the right to make changes to the firmware, specifications and the design without notification.

Misuse, using this for other than its designed use, water damage, mechanical damage or attempting to modify or repair your controller will void this warranty.

Alan Hanson and Hanson Electronics shall not be liable for any incidental damage, inconvenience, rental, loss of profits or any other loss due to the unsuitability, failure or use of this controller.

If the user does not agree to these terms the cost of the product (minus freight) will be refunded on the return of the product. The controller must be in unused condition and must be returned within 14 days.

Please return this controller with a copy of your invoice if it develops a fault. Any controller returned without a copy of the invoice will be charged at a standard repair rate. The warranty does not cover freight.



Enquiries/Repairs :-

Hanson Electronics

Alan Hanson

16 York St

Eaglehawk Victoria Australia 3556

Mobile 0408 463295

email hanselec@gmail.com

www.hansonelectronics.com.au