1. First steps

Your ***DmxDemux*** Firmware currently supports the conversion of the incoming DMX-512 data stream to 24 analogue channels. The device is equipped with a DMX-512 interface and 24 analogue outputs. The analogue data is controlled via 24 consecutive DMX-512 addresses[1]. The whole DMX-512 address space can be used, though it is advisable to use the lowest possible address permitted by your application.

The selection of the relevant DMX-512 address space is done via three onboard DIP switches. Set the DMX-512 **base address** and the device reserves the next 23 higher addresses to map the DMX data stack to the analogue outputs. The range for the analog output voltage is preadjusted to 00 … 10V and can be altered within a range of +/- 20%. For eased visual operation control two LEDs are provided to check the incoming DMX data stream and the operation of the onboard main processor itself.

Optionally the ***DmxDemux*** can be ordered with a back lighted 20 x 4 character LCD display for status messages and user notification. Additionally an ***Operation*** status led (*green*) and a ***DMX-512 Signal*** control led (*red*) is provided. The backlight facility provides the possibility to check the device settings even in dark environment. The backlight automatically fades out after about 40s if no user interaction is detected by the system to avoid any distortions caused by the backlight in dark environments.

2. Installation guidelines

Mount the ***DmxDemux*** board and the power supply converter unit to a clean, flat and stable surface within your assembly. Check for proper air flow and no electronic contact to the surrounding cabinet. Connect the **+24Vdc** power supply lines to the power supply converter unit and connect the latter to ***JP2*** of your ***DmxDemux*** board.

In case of daisy chaining multiple devices interconnect the ***DmxDemux*** boards via connector P2. Power supply lines and the DMX-512 signal are automatically linked to the slave devices. **See for proper settings of the base address for the daisy chained devices.**

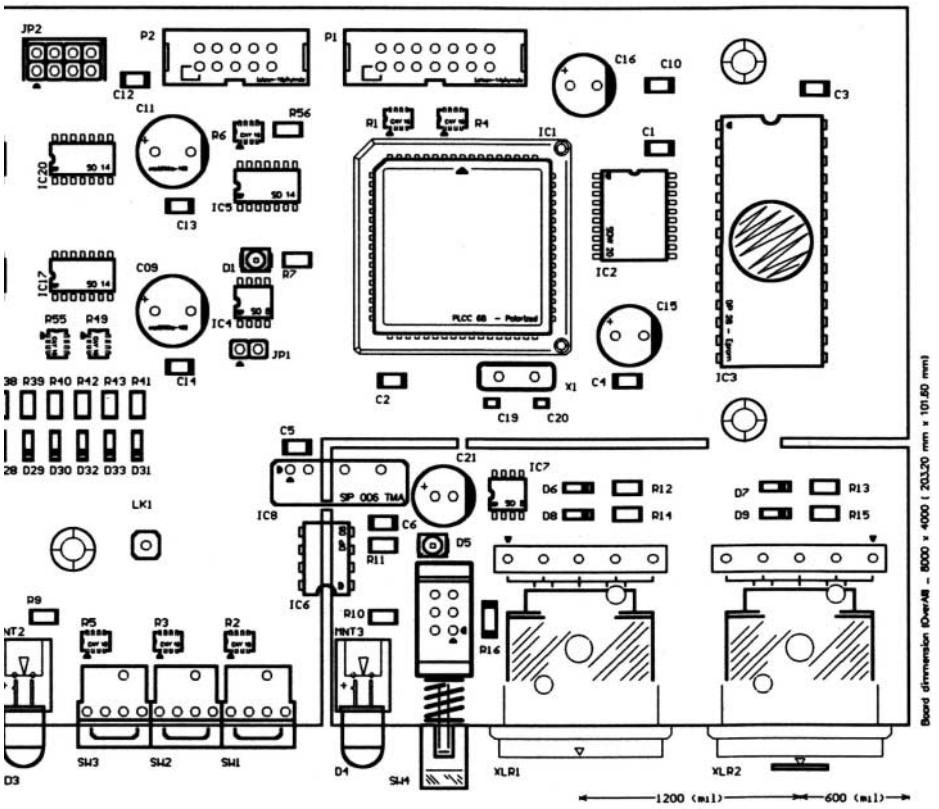
[1] For further information on setting the DMX address or controlling the slide position via DMX-512 standard check section 3.1 – The DMX-512 interface or the appropriate section regarding the ***DmxDemux*** firmware.

3. Assembly and Hardware

The following section is intended to make you familiar with the hardware components setting up the ***DmxDemux*** electronics. Primarily, building the core of the control equipment, the main CPU module is build around an Intel 8051™ compatible processor. Controlling the display and keyboard module and additionally handling all user interactions and generating the control sequences for the correct operation of the ***DmxDemux***. Secondly there are the peripheral units, the galvanic de-coupled DMX-512 interface section and the analogue output section.

3.1. CPU core and analogue output module - Motherboard

The CPU core module is built around an Infineon SAB 80C535™ processor taking full advantage of the built in serial communication feature and the ADC circuitry. The CPU core module additionally functions as a signal distribution matrix establishing all the links to the peripheral modules and the eventually daisy chained ***DmxDemux*** Boards. A Dallas DS1232 supervisory unit monitors the supply lines and resets the system in case of power supply dropout (*brown out*) or failure.



Connect the optional display module to connector ***P1***. To daisy chain multiple devices connect them in parallel via connector ***P2***. Contact your hardware vendor for additional interlink cables. Connect

the power supply conversion unit to JP2. **Always disconnect the *DmxDemux* electronics from the mains supply when changing the hardware setup of multiple devices.**

The onboard DMX-512 interface can be accessed via connector **XLR1**. Additional DMX devices can be connected to **XLR2**. The DMX-512 interface is galvanic decoupled and complies with the **TIA/EIA-485** standard for multi-point bus communication and is conform to the **USITT** standard as pointed out in section 9.02 of the DMX-512 08/1990 standard. Internal circuitry features fail save termination and over-voltage protection. The Pin assignment of the **XLR1** connector is summarized below.

Pin 1	***Signal common (shield)***
Pin 2	***Dimmer drive complement (data 1 negative)***
Pin 3	***Dimmer drive true (data 1 positive)***
Pin 4	***Second channel complement (data 2 negative)***
Pin 5	***Second channel true (data 2 positive)***

The RS-485 multi-point transceiver interface ***IC7*** is **SMD** assembled. So replacement in case of line failure is easily done. Depending on the position of the device within the DMX-512 transmission line[2] the interface has to be terminated to avoid signal distortion due to transmission line reflections[3]. Line termination status is flagged by led ***D4*** and can be altered via switch ***SW4***. ***D4*** active red means line is terminated else line termination disabled. As mentioned above termination status is changed via ***SW4***[4]. DMX signal flow can be monitored via **LED *D5***.

Set the DMX-512 base address via ***SW1 .. SW3***. Proceed in the following manner - DMX base address should be set to **169**. Set ***SW1*** to 9, ***SW2*** to 6, proceed with ***SW3*** in the same way.

Main processor operation can be monitored via **LED *D1***. The system can be reset anytime by shorting ***JP1***.

In case of changing the firmware replace the ROM chip *IC3*. Contact your firmware vendor for further details or download the newest firmware release from our homepage at

http://members.vienna.at/pegasus/

The analogue output lines can be accessed via **P3** and **P4**. Output voltage swing is 00V … 10Vdc and the driver sources up to 30mA (***due to serial diode protection - no sink capability***). The outputs

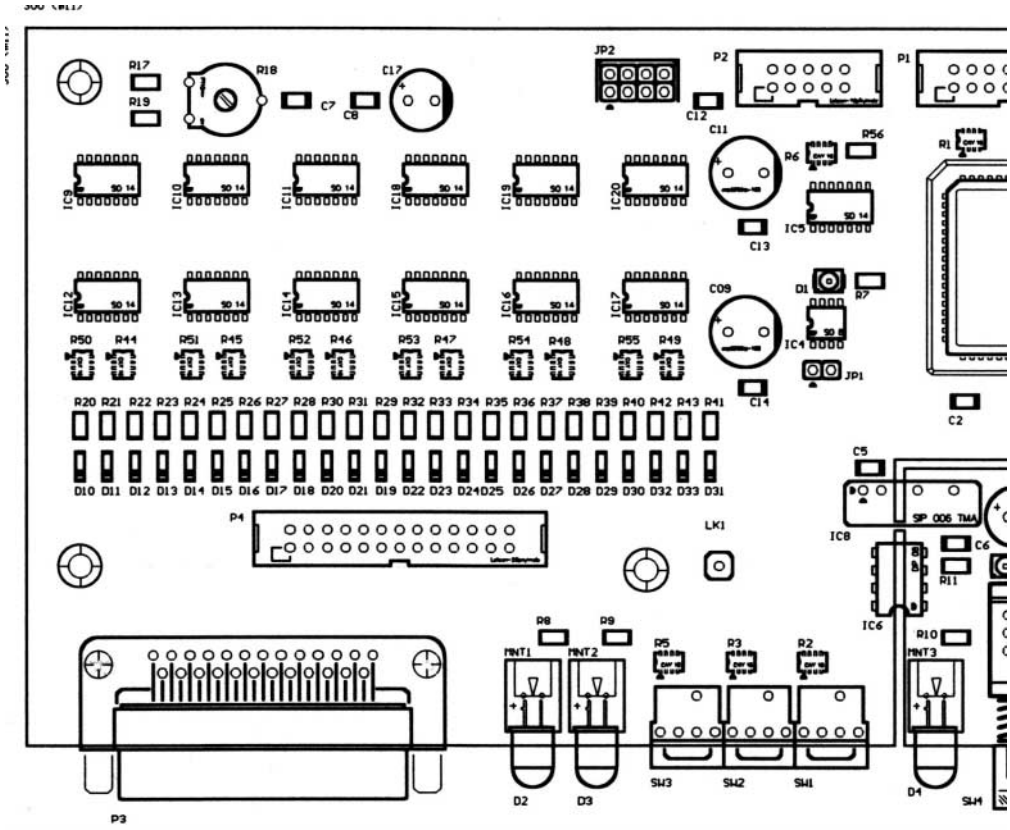
[2] The RS-485 standard defines a maximum number of up to 32 devices per line segment to guarantee correct signal transmission within the driver specification.

[3] The correct termination resistor of 120Ω is assembled onto the DMX interface board, so termination is easily done by closing ***SW4.***

[4] Use a small screwdriver to alter the termination status by pushing the nozzle of ***SW4***.

are short circuit protected and clamped against a driving voltage of about 50V. The Pin assignment of the **P3** and **P4** connector is summarized below.

Pin 1 … Pin24	***Analog output line 00V … +10Vdc***
Pin 25[add. 26]	***Signal common (GND)***



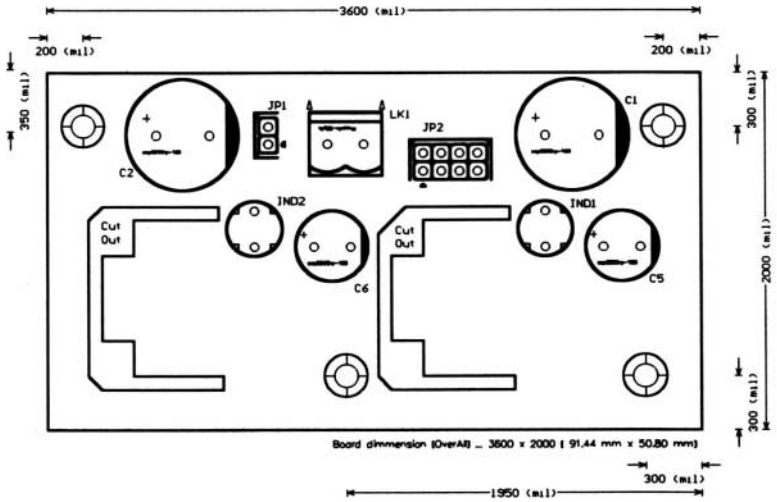
The analog output voltage can be adjusted via ***R18***. The output is factory pre-adjusted to a range of **00V … 10Vdc**. In case of needing a different output swing use ***R18*** to alter the range within +/- 20% of the full scale.

Monitor DMX-512 data stream and processor activity via ***D2*** and ***D3***.

For mounting the board to your framework use drill holes with diameters fitted for M3 screws - partly provided by the XLR connectors.

3.2. Power supply conversion unit

Connect the power conversion unit to the external **+24Vdc** power supply unit. See for proper air flow to avoid thermal overload of the module – especially when daisy chaining multiple ***DmxDemux*** devices.



Use extra care when mounting the sensor to the mechanical framework due to the dual sided component assembly. Observe the direction of the arrows at the sensor chip – **they have to point to the device**.

Connection to the motherboard via a 8 x 350mm single lead cable AWG 24.

For mounting the board to your framework four drill holes with diameters fitted for M3 screws are provided near each end of the board.

4. Firmware

The following section is intended to introduce you to the firmware of the ***DmxDemux*** and explains the operation. The following table gives you a quick idea on the DMX-512 address assignment. The base address is set via the DMX address switches ***SW1 .. SW3*** (see hardware section).

Primary mode operation	
Base address	Analog output channel **00**
Base address + 1	Analog output channel **01**
Base address + N	Analog output channel **N**
Base address + 23	Analogue channel **24**