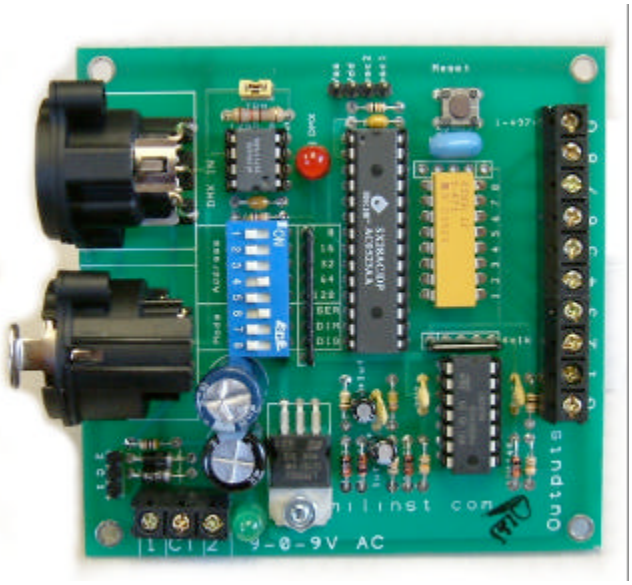
Rev1.5 09/01/2007

DMX Receiver (#1-497)



The DMX receiver module is designed to provide 8 consecutive channels of output from a standard DMX protocol input signal. The outputs may be configured to be digital (on-off), drive standard RC type servos, provide triggering outputs suitable for driving Triac lamp dimmer circuits- or a combination of any two of these. The base address of the module may be set in stages from 1 to 249 using the on-board setting switches (all address switches OFF for addresses 1 to 8).

Set-up

DMX Bus

Twin connectors are provided for connecting the module into the DMX signal system. If the module is the last item on the DMX cable, insert a jumper over the TRM pins to ensure correct end termination (if you do not then there is a risk of echos on the signal bus which may affect the operation of the bus). The twin connectors are wired in parallel.

Outputs

There are 8 Terminals numbered 1 to 8 each provides an output signal and the ground reference is taken from the G terminal on each end.
The address of output 1 is that determined from the address setting jumpers (see below), the address for output 2 is the module base address plus1 etc.
The outputs are each 5V TTL level with a 470 ohm series resistor to limit current draw from the processor. The maximum current rating from the processor chip pins is 20mA sink or source with a total of 60mA across the whole 8 output lines.

The configuration of the outputs is set by switches 6 to 8:

Switch Setting				
6	7	8	Outputs 1-4	Outputs 5-8
Off	Off	Off	None	None
On	Off	Off	Servos	Servos
On	On	Off	Servos	Dimmers
On	Off	On	Servos	Digital
Off	On	Off	Dimmers	Dimmers
Off	On	On	Dimmers	Digital
Off	Off	On	Digital	Digital
On	On	On	Servos	Dimmers

The output configuration switches are read continuously so may be changed with power applied.

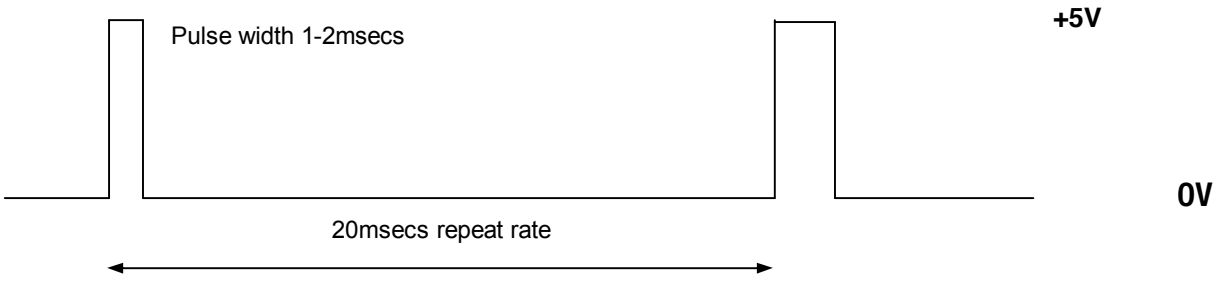
Output signals format

Digital:

The output value is set by the msb of the incoming data byte- ie for data values of >127 the output will be high, for values of 127 and lower, the output will be low. Once set, the ouputs will remain unchanged until a new data value is received. The output is refreshed every 4usecs. The start-up and fault value is 0

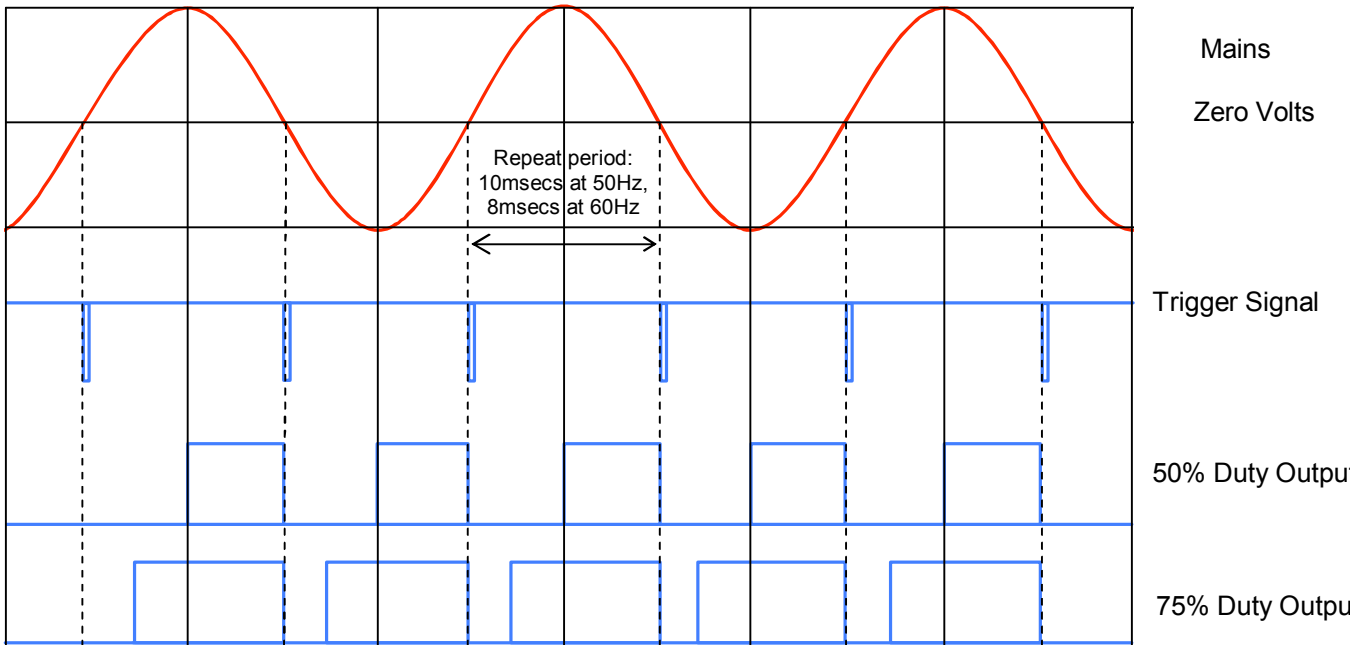
Servo:

The output is a 1-2 msec duration pulse (high) repeated every 20msecs. A data byte of 0 will output a 1msec pulse, a data byte of 255 will output a 2msec pulse. The output values are refreshed every 20msecs. The default start-up and fault value is 1msec.



Dimmers:

Once the module detects the mains zero-crossing point, the dimmer output(s) is set low and the internal clock reset. This format ensures the lamp controlling Triac is switched off. The time before the output is brought high (thereby switching the Triac and lamp on) is determined by the data byte for that channel. A data byte value of 255 will cause the output pin to go high immediately after the zero-crossing point, whereas a value of 0 will hold the output low for the whole period between zero-crossing pulses. The following timing diagram illustrates the operation.



Module Address

Jumpers 1 through 5 set the module's base address.
The minimum base address (jumper 1 to 5 set to Off) is 1.
The maximum base address (jumpers 1 to 5 set to On) is 249.
To calculate the base address: add 1 to the values of the Switches set to the ON position.
Eg-: Switches 1 (8), 3 (32) and 5 (128) set to ON would give a base address of (8+32+128) + 1 = 169
The base address is continuously read.

Fault LED

The red fault LED will flash regularly if the module does not detect an incoming DMX signal. During this condition, all the outputs are set to their start-up values (0).
The fault LED will extinguish once a valid DMX signal is received but any previous output state information will need to be re-sent.

Power Supply

There are two possible minimum power supply requirements for the module depending on the outputs configuration.

Dimmer Ouputs

If any Dimmer outputs are required, the module requires a 9-0-9V AC power-supply at 2.5VA or more rating. This configuration is crucial if flicker free operation is required. The 0V of the power supply must be earthed to ensure a stable mains zero crossing point is detected. The balanced power input is used to provide the processor an accurate signal when the mains frequency crosses the 0 volts level..This determines the on-board clock reference for the triac outputs. The module automatically corrects for either 50 or 60 Hz operation- it measures the incoming supply frequency during start-up.
A suitable power supply circuit schematic is shown below.

Note that for correct operation, the module MUST run from the same phase as the AC lights being controlled
The module cannot control lights connected to different phases

Servos/Digital Outputs only.
For non-dimmer outputs, the power supply can be more relaxed – connect a 9V DC at 0.5 Amps minimum supply to the terminal block: +ve connection to either connections 1 or 2 and the ground (-ve) to the central CT connection.
The green LED indicates when power is supplied to the module.

Physical Dimensions
Board size: 86x85x35mm high (3.4/8" x 3.4/8" x 1.3/4")
3mm diameter fixing holes at 79 x 77mm centres (3.1/4"x3.5/16")

DMX Modules available from Milford Instruments:

DMX-Check	View data on the DMX system
DMX-Transceiver	Multi-purpose DMX transmitter and receiver module
DMX Relay	8 Relay output receiver board
DMX Receiver	DMX receiver with Digital, Servo and Dimmer outputs

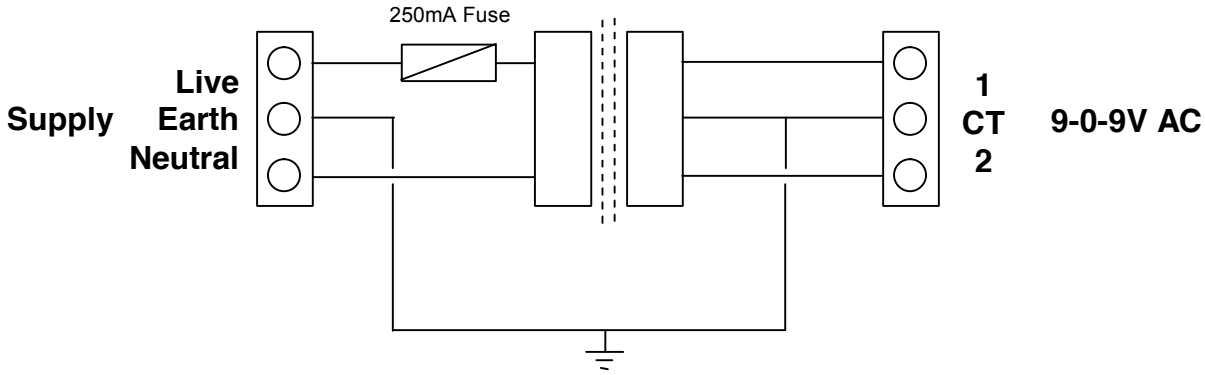
Details on these products may be downloaded from our web site

Dimmer Modules

We recommend using standard solid state relays such as the Crydom D2410-10 (Digi-key part # CC1079-ND or RS part # 291-2034 for the D2450-10 {a 50A version}) that will switch 120/240V AC at up to 10A. If using the D2410, connect the DMX receiver outputs to terminals 3 and 4.
If using an alternative supplier, ensure you choose modules that permit DC controlled random turn-on.

Power Supply Module

Schematic:
9-0-9 V AC supply module suitable for the DMX receiver.
Input 240V AC
Output 9-0-9 VAC at 2.5VA



Interconnection details for Dimmer operation