XTBA DMX SSR8 D

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XTBA

Unit 2 The Old Curatage
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Overview

The XTBA DMX SSR8 D provides a simple and inexpensive method of interfacing DMX512 to eight low voltage solid state relays. In addition the SSR8 is fully RDM compatible so it can be used in line with a DMX/RDM system – see the RDM section at the end of the document.

The relay's output voltage can be set for 5V or 12V DC internally or by the use of external DC power supply between 9V to 28V DC. All outputs are fitted with flyback diodes for connections to relays or solenoids.

The relay switch on level can be set by the user between 10% to 90% in 10% steps. Individual channels can be configured in 'one shot mode' where the relay's output will go high for up to 0.25 to 2.25 seconds (user settable) and then low until reset.
The unit can also be set for 'emergency mode' to close relays in the event of DMX loss.

The SSR8 can also be configured for 'trigger offset'. If two or more relays are triggered, a short time delay of 10ms to 90ms (user selectable) between any two relays closing will be added. So if the SSR8 is being used in situations where multiple contactors or power relays are in use the potential power surge can be reduced.

Output Voltage Selection, Power Output
The relays output voltage can be internally selected. The internal PCB mounted switch next to the micro can be set to 5VDC or 12VDC. There is a maximum of 200ma @ 5V DC or 140ma @ 12V DC provided from the internal power supply across all eight outputs.

External Power
If the output voltage or the output current does not suit your needs (sir!) then the SSR8 can be run from an external DC power supply from 9VDC to a maximum of 28VDC.
If powered from an external source the SSR8 does not need mains power as it will take its power from that input. The external DC power input is polarity protected.

When using an external power supply the maximum current through any single relay is 1 amp and a maximum of 4 amps across all eight.

Flyback diodes
Each relay output is fitted with a flyback diode. When driving inductive loads such as mechanical relays or solenoids the flyback diode prevents voltage spikes and RF when the relay or solenoid is turned off.

Operation
In use the red LED will be lit when power is supplied to the unit. The green data LED will light if valid data is being received and will blink slowly if the address switches are out of range or if the unit is in 600 test mode.
The data LED will only be lit if the input is correctly formatted DMX. If the green data LED flashes incorrect data is being received, if it pulses twice DMX pins 2 and 3 are likely to be crossed over.

If data is lost the green LED will turn off after 1 second and the relay output will be maintained, or lost dependant on the hold last frame setting – see 881 mode.

DMX Loop Through
DMX in and DMX through on the SSR8 are the same connections. So simply parallel wire the in and through cables.

600 Test Mode - with the hundreds address switch set to six (the tens address switch is ignored) the unit will enter the test mode. This mode can be entered at any time. The green data led will flash quickly to indicate the unit is off line. The setting of the units address switch will then switch the appropriate numbered relay. Test mode will mimic the relays' settings. So if a relay is set to 'one shot mode' it will only fire once until the switch is changed and then the relay reselected.

USER SETTINGS IN POWER UP
These settings are only available on power up. Setting when the unit is powered will have no effect, but the green led will flash to indicate an invalid address.

Default is set for 50% relay closed, 48% relay open, hold last frame off, no emergency mode, no offset and normal output mode, one shot time (if used) 0.25.

Following the power up the level or setting will be stored in non volatile memory and the data and power leds will flash. The green data led will now flash to indicate an invalid address, so now change the address to the first DMX address required or power down reset the switches to the next option required and power up again.

77? Relay Trigger Point – **On power up the unit will check if the hundreds and tens address switches are set for 77, the units address switch will then set the relay close level between 1 to 9. 1 being 10% and 9 being 90% relay close level.**

The relay open level is 2% lower than the relay close setting (e.g. 50% close 48% open) This gives a 1% window and allows the relay to operate with 'noisy' analogue faders or sub masters.

790 to 799 Trigger Offset - On power up setting the unit to 791 will set the trigger offset to 10ms. Each unit's value adds 10ms to the time so setting 795 will make the time 50ms. When a relay is set to on the delay is added before another relay can be triggered. So if all eight relays are set to on simultaneously they will sequence 1 to 8 with the time delay selected between each relay switching on. The trigger offset works with both normal and one shot outputs.

Setting the unit to 790 on power up will clear the offset time to zero.

881/882 Hold last frame set/clear
Setting the address switches to 881 and then powering up, the unit will then be set to 'hold last frame' on DMX loss. Setting 882 will clear this setting. So in the event of DMX loss the relays will hold their last position - except relays configured in 'emergency mode' see 999 Mode below.

950 to 959 – one shot mode relay select
On power up with the hundreds set for 9 and the tens address set for 5 the units switch will select which output is assigned as a one shot output. One shot outputs will fire once for a time selected (see 901 mode below) until the level falls below the relay off value. The one shot on that relay is then re-enabled.
Any or all relay outputs can be set to one shot so if multiple one shot outputs are required the unit need to be powered down between each setting.

Setting the unit to 950 and powering up will clear any one shot outputs and set the unit back to normal output mode.

901 to 909 – one shot time
The relay's on time is set with the units address switch in 0.25 second increments where 1 = 0.25, 5 = 1.25 and 0 = 2.25 seconds. So setting the unit to 906 will set the one shot time to 1.5 seconds. When the individual relay's on level is reached the relay will output for the time selected. The one shot time applies to any relay set for one shot mode .

The units default is 0.25 of a second.

This slightly strange feature allows DMX to control button pushes on external equipment by wiring the switches to be controlled through an external signal relay. The switch can then be controlled via DMX, as once switched the SSR8 will disconnect so continuous switch closure is avoided.

991 to 998 Emergency Mode Set– Switch on DMX loss
During power up setting the address switches to 991 to 998 will add a single relay output be added to emergency mode. In the event of DMX loss the selected relay outputs will switch high.

Any or all relay outputs can be set to emergency mode so if multiple outputs are required the unit need to be powered down, the address switches changed and powered up again between each setting.

If an output is selected to both emergency and one shot mode then on data loss the output will switch high for its one shot time and then turn off.

981 to 988 Emergency Mode Clear– Do not switch on DMX loss
As above but selecting the relay output using the units address will clear the emergency setting for that relay – if set.

000 Mode – On power up if the address switches are set to 000 the unit will default back to the factory settings. Default is set for 50% relay closed, 48% relay open, hold last frame off, no emergency mode, no offset and normal output mode.

Technical Specifications

Protocol	DMX512 1990 / DMX512 1986 / DMX RDM
Maximum Update Rate:	44 updates/s
Switch Point	DMX 50% On, DMX 48% Off or user settable.
Relay Outputs:	5V internal setting 200ma max across all 8 outputs. 12V internal setting 140ma max across all 8 outputs. External DC 9 to 28VDC 4A max across all 8 outputs. 1A max for a single output.
Power :	200/230VAC or 9 to 28V DC external.

RDM OPERATION
The SSR8 is fully DMX/RDM compatible. Any RDM devices on its output may be discovered and configured from the input. The SSR8 will pass through RDM requests and responses interleaved with DMX level data at the same time, so it can be used in real time during set up and focusing sessions. The SSR8 itself can also be discovered and information viewed from controller.

DMX/RDM is fully compatible with standard DMX512.
If the control desk is not RDM it will not send a RDM request so the SS8D can't respond.

By using RDM the address and personality can be remotely changed, product information, software version and system status found.

RDM Commands supported:
SET Device Label - Label the unit
SET Display Level – turn on/off the ident display on selection
SET Factory Defaults – reset the unit back

SET DMX Address – The front panel address switches can be overridden by a SET Address RDM command. This value will be used as the DMX start address unless the front panel address switches are changed. Once changed this new start address will now be used by the unit

SET DMX Personality – The SSR8D has nine RDM personalities to control the relay on trigger level and can be altered via RDM or by using 77? mode with the address switches. Other settings are be controlled from the address switches.

GET Commands Supported:
GET Device Model Description, Device Label, Manufacturer Label, Software Version, DMX Address/Slot Footprint, Personality.

CE Declaration of conformity
XTBA declares that the following equipment meets the requirements of the EMC Directive 89/366/EEC. WEE/FC2753ZS

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