

XTBA DMX TO FAST DALI CONVERTER - DIN RAIL

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XTBA FAST DMX/DALI CONVERTER

DIN RAIL MOUNTING RDM compatible – see RDM Section

For power supply requirements – see page 5

If you are unfamiliar with DALI, please read the DALI address programming systems at the end of this document.

A brief explanation as it is a little strange!

The XTBA Fast DMX/DALI converter allows for the conversion of up to 64 DMX channels to the DALI protocol on a one to one basis. Because DALI is a slow protocol (1.2KB) compared to DMX (250KB) problems can occur with fades and fast changes as the DALI output can not keep up with the incoming DMX level so a fade will appear to jump or not respond at all on fast changes.

In order to get around the DALI limitations the incoming DMX is converted to eight simultaneous and sequential DALI outputs – or to put it another way there are eight DMX to DALI converters in one box. The outputs can be set to a minimum of one DALI channel and a maximum of eight. By reducing the number of DALI channels being transmitted on each output the data refresh rate can be increased by a factor, the factor being 64 (the standard DALI channel count) divided by the maximum number of channels sent. So in the case of 8 channels the refresh rate is increased by a factor of 8, in the case of a single channel being sent by a factor of 64 times faster than standard full length DALI. At the end of each DALI send be it a single channel or all eight DMX is converted to DALI and the result sent.

The DALI protocol data structure is not changed simply the refresh rate is speeded up. The down side of this is that more DALI data lines are needed as each line can only carry up to eight DALI channels.

For example with the data length set to 8 the outputs are as follows:

Output 1 DALI Channels 1 through 8
Output 2 DALI Channels 9 through 16
etc,etc
Output 8 DALI Channels 56 through 64

With the data length set to 3 the outputs are as follows:

Output 1 DALI Channels 1 through 3
Output 2 DALI Channels 4 through 6
etc,etc
Output 8 DALI Channels 21 through 24
Channels beyond 24 are ignored.

OPERATION

In normal operation the red power LED will be lit. If valid DMX is being received and the address is set between 1 and 512 the green data LED will be lit. If the DMX address switches are out of range the data LED will flash (except in special functions see below). The starting address of the DMX channels to be converted is selected via the address switches 1 – 512.

Manual mode – 6**

Manual mode will allow for installation testing and fault finding without the need for a DMX input.

If the hundreds address switch is set to six the card will enter manual mode provided that the tens and units are set within the correct length range. If the tens and units are out of range the green LED will flash quickly to indicate an error. If DMX is present it will be ignored. The channel to be control LED is selected via the tens and units address switches. In this mode the green LED will flash slowly and the selected channel will be set to full.

If the length has be altered to less that 8 (see 8** DALI Data Length below) then the allowed range will also be reduced e.g. if the length has been set to 2 (e.g. 16 DMX channels to DALI) and you set 617 then the green LED will flash quickly to indicate an error.

Power up options

The following options are only available when the address switches are set before the unit is powered up. This prevents the options being accidentally entered during normal operation. Setting the address switches beyond 512 when the unit is powered will have no effect, but the green LED will flash to indicate an invalid address.

HOLD LAST FRAME - 701

Setting 701 and then powering up the unit will turn on hold last frame. If DMX is lost the last stored levels will be continuously transmitted

DALI CURVE OFF - 702

Due to the non linear nature of a DALI ballast the first 40% of the input level has little or no effect on the light output. To give a more linear output with DMX the DMX/DALI card has a software look up curve table to give greater control during any fades or level setting.

By setting the hundreds address switches to 702 and powering up the unit the internal lookup table is turned off. This will then convert DMX directly to DALI without the curve profile.

DALI Data Length – 8**

The number of channels transmitted from each of the eight outputs can be altered by setting the hundreds address switch to eight and the number of channels to be transmitted set using units address switch. The card is then

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powered up. The number of DALI ballasts transmitted from each output is then stored in non volatile memory. If the length setting is out of range (e.g. 0 or 9) the green LED will flash.

GLOBAL SEND on length 1

When the data length is set to 1 the converter will send a single DALI channel from each output. In this mode the ballast address is automatically set to Global Mode e.g. any ballast no matter its address will respond on that output. By using the length1/Global Mode the DALI output allows multiple ballasts to be control LED at maximum speed from each of the eight outputs.

FACTORY DEFAULT MODE - 000

Setting the address switches to 000 on power up will reset the unit to full 64 channel operation, curve set on, hold last frame off and store this setting.

Programming mode - 999

On power up if the all three address switches are set to nine (999) the card will enter program mode and the power and data LEDs will alternate. This mode can only be entered - on power up. In this mode the red and green LEDs will alternate to warn you are in programming mode.

Programming mode is only available on output 1

Once powered up the tens and units address switches can then be set to the ballast address required – between 1 through 64. If the address is in range the green data LED will turn off and the red LED will flash.

By turning the hundreds address switch from 9 to 8 any ballasts attached to the DALI output will be programmed and the green and red LEDs will alternate three times. By switching the hundreds address switch back to 9 the next ballast can connected and then programmed – by setting the hundreds address switch back to 8. This mode allows multiple ballasts can be programmed before installation simply by connecting DALI data to them with the card in programming mode.

This might seem a little cumbersome but hopefully it ensures that a finished installation can not be accidentally reprogrammed.

NOTE

This operation needs to be carried out on individual ballasts prior to installation. Entering this mode when all the ballasts are connected will set all the connected ballasts to a single address – which was probably not the idea! For this reason this function is also only available following power up of the card. Setting the address switches to 999 during normal operation will have no effect.

Any ballast connected will be reset back to default values and then programmed as follows:

Ballast address = set from the tens and units address switches

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No max or min levels
 System failure level = 0
 Power on level = 3%

Treatment of channel zero

The DALI standard offers a ballast address range between ballast 0 and 63 (64 ballasts in all). DMX has no address zero so it would be unable to talk to any ballast with address zero. So in order to keep the numbering simple (honest!) any ballast programmed as 64 will in fact be programmed as ballast address zero. So when DMX channel 64 is received by the card its level is converted and transmitted to DALI address zero.

This all sounds a little potty but once the system is programmed and installed it will be invisible to the user and does give the full 64 channel range.

Output Monitor

The DALI outputs are monitored by the system and if a short is detected on any output it will shut off all the outputs. The red power LED will flash to indicate a problem. The system will restart the outputs once the short is removed.

DIN ENCLOSURE PIN OUT - as marked on the unit

TERMINAL	FUNCTION
36	+12 to +22V DC IN
35	POWER SUPPLY COMMON
34	OUTPUT 1 + Programming Output in 999 mode
33	OUTPUT 1 Com Programming Output in 999 mode
32	OUTPUT 2 +
31	OUTPUT 2 Com
30	OUTPUT 3 +
29	OUTPUT 3 Com
28	OUTPUT 4 +
27	OUTPUT 4 Com
26	OUTPUT 5 +
25	OUTPUT 5 Com
24	OUTPUT 6 +
23	OUTPUT 6 Com
22	OUTPUT 7 +
21	OUTPUT 7 Com
20	OUTPUT 8 +
19	OUTPUT 8 Com

DMX INPUT

3	DMX +	XLR Pin 3 if using XLR connectors
2	DMX -	XLR Pin 2 if using XLR connectors
1	DMX COM	XLR Pin 1 if using XLR connectors

Power supply

The Fast DALI decoder requires an external power supply. The power supply needs to be between +12 to +22V.

(RS Part number 282-473 is a +24V DC D rail mounted PSU @2A and can be adjusted down to 22 volts)

The DALI output drive is driven directly from the input supply. The DALI protocol requires the output signal should be in the range of +9 to +22 volts.

Output Drive

The maximum output drive from any one output is 20ma. Most DALI ballasts will be in the range of 1 to 2ma, so no more than 10 ballasts can be connected to any one output, but all eight DALI outputs can be have the maximum ten ballasts each.

If you need to drive more then 10 on each output have a look at XTBA's DMX to DALI 64 x 8 decoder.

Specifications

Size = 6 DIN MODULE, WIDTH = 105mm

DMX Input = DMX 1986, 1990. DMX/RDM

DALI Output per DALI channel = 20ma @ 15 volts

DALI Input (data return) = not used as DMX can not issue commands.

Input = 15 - 22V DC @1A

DMX/RDM

DMX/RDM (Remote Data Management) allows a suitably equipped DMX controller to find, set and monitor functions of the DMX to DALI converter. By using RDM the address can be remotely changed, product information, software version and system status found.

DMX/RDM is fully compatible with standard DMX512.

If the control desk is not RDM it will not send a RDM request so the DMX to DALI converter can't respond.

DALI Programming and DALI speed

DALI address programming

Before installing DALI ballasts they need to have their address programmed. Unlike DMX512 there are no address switches so the ballast needs to be powered up and connected to a suitable programmer. Fortunately you are in possession of such a programmer (lucky you) as it comes as part of the software with this converter. See programming mode 999.

Ballasts that have not been programmed are normally supplied in Global mode e.g. they will only respond to a Global command. If you install the ballasts without programming you will end up with a giant single channel installation and you will have to take them out one at a time, program them and then put them back.