XTBA DMX TO DALI CONVERTER 64 CHANNEL X 8 - DIN RAIL

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Product #04805 - 07/2011

XTBA DMX/DALI 64 x 8 CONVERTER DIN RAIL MOUNTING

RDM compatible – see RDM Section

For power supply requirements – see page 4

Please read the DALI address programming and DALI speed note if you are unfamiliar with DALI systems at the end of this document.

The XTBA DMX to DALI 64 x 8 will convert 512 DMX channels to eight 64 channel DALI (the DALI limit) universes. Housed in a single DIN rail case it provides a simple cost effective solution for multiple DMX/DALI conversion. In addition it can be used to program ballasts and the DALI output length can be altered to increase DALI update speed if required.

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.

In normal full 512 channel operation the unit will convert DMX to DALI in the following way:

DMX Channels	1 - 64	DALI Output 1	DALI Channels 1 - 64
DMX Channels	65 - 128	DALI Output 2	DALI Channels 1 - 64
DMX Channels	129 - 192	DALI Output 3	DALI Channels 1 - 64
DMX Channels	193 - 256	DALI Output 4	DALI Channels 1 - 64
DMX Channels	257 - 320	DALI Output 5	DALI Channels 1 - 64
DMX Channels	321 - 384	DALI Output 6	DALI Channels 1 - 64
DMX Channels	385 - 448	DALI Output 7	DALI Channels 1 - 64
DMX Channels	449 - 512	DALI Output 8	DALI Channels 1 - 64

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 controlled 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 in each of the eight outputs.
e.g. if the unit is set 603 then the third DALI channel in each output will be set to full.

If the length has be altered to less that 64 (see 8** DALI Data Length below) then the allowed range will also be reduced e.g. if the length has been set to 40 and you set 641 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** See DALI speed note at the end of the document.
If the converter is to be used with less than 512 DMX channels the DALI transmit length on each output can be shortened to increase update speed. By setting the hundreds address switch to eight and the number of channels to be transmitted is then set using the tens and units address switches. The card is then 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 above 64) the green led will flash.

When the DALI transmit length is altered converted channels are automatically reallocated to the DALI outputs. e.g. if the length is set for 64 then the first channel on the second output will be 65. If the length is set to 40 then the first channel on the second DALI output will be 41 and the first channel on output three will be 81 etc..

In this way any number less than 512 DMX channels can be allocated in a continuous DMX block rather than having gaps in the DMX input of unused channels.

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 controlled at maximum speed from each of the eight outputs.

DEFAULT MODE - 000
Setting the address switches to 000 on power up will reset the unit to full 64 channel x 8 operation, curve set on 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
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
52	+12 to +22V DC IN
51	POWER SUPPLY COMMON
48	OUTPUT 1 + Programming Output in 999 mode
47	OUTPUT 1 Com Programming Output in 999 mode
46	OUTPUT 2 +
45	OUTPUT 2 Com
44	OUTPUT 3 +
43	OUTPUT 3 Com
42	OUTPUT 4 +
41	OUTPUT 4 Com
35	OUTPUT 5 +
34	OUTPUT 5 Com
33	OUTPUT 6 +
32	OUTPUT 6 Com
31	OUTPUT 7 +
30	OUTPUT 7 Com
29	OUTPUT 8 +
28	OUTPUT 8 Com

DMX INPUT

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

Power supply
The DMX/DALI 64 x 8 decoder requires an external power supply. The power supply needs to be between +12 to +22V @ 2A.
(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 200ma @ 20 volts. Most DALI ballasts will be in the range of 1 to 2ma, so up to 100 ballasts can be connected to any one output, but all eight DALI outputs can be have the maximum 100 ballasts each.

Specifications
Size = 9 DIN MODULE, WIDTH = 157mm
DMX Input = DMX 1986, 1990. DMX/RDM
DALI Output per DALI channel = 200ma @ 20 volts
DALI Input (data return) = not used as DMX can not issue commands.
Input = 15 - 22V DC @2A

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.

DALI Speed

DALI is a fine protocol for what it was originally designed for. What it was not designed for was fast fades and chasing. Once you have programmed the ballasts connected the converter you are ready to start dimming. Do not be surprised if fast fade times e.g. less the 10 seconds result in a fade that is little 'steppy'. This is not a problem with the XTBA converter but a function of data rate.

DALI is 200 times slower than DMX as a result the 2 second fade DMX can do will be translated into a two or three step fade. A way around this problem is to reduce the number of channels transmitted using the 8** mode on the converter. Send 32 channels rather than 64 will double the data update rate.

If the converter is being used to control multiple ballasts set to a single address e.g. house light control, then by setting the converter to length 1 Global mode will be sent allowing for maximum data speed.