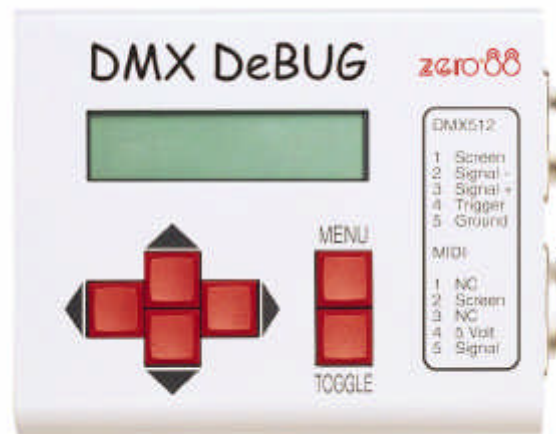


DMX DeBug



Zero 88 Lighting Ltd

**Z E R O 8 8 L I G H T I N G
P R O D U C T
R E G I S T R A T I O N F O R M**

Product: DMX DeBug

Version No.

Serial No.

Date Purchased:

Supplier:

Name:

Company Name:

Address:

Post/Zip Code:

Phone No.

Comments:

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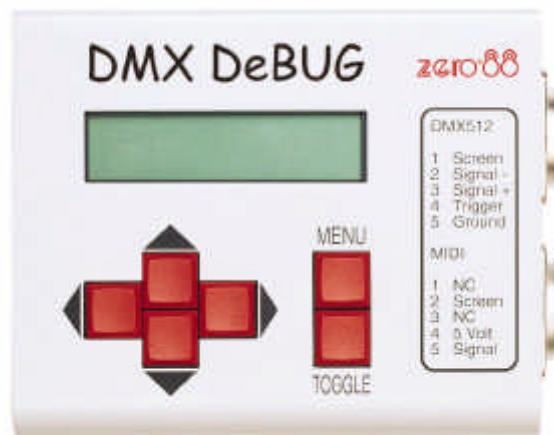
I N T R O D U C T I O N

QUICK START

Welcome to the DMX DeBug manual. DMX DeBug is a sophisticated DMX512 and MIDI analyser, but is remarkably simple to operate.

Users who are familiar with either DMX512 or MIDI should find that a scan of the Control Surface section is sufficient to get started.

Please remember to return your product registration card, so that we can keep you informed of new developments.



DMX DEBUG FEATURES

DMX DeBug provides the following features:

- Receives DMX512 & MIDI Display as bar chart, decimal, percentage or hexadecimal
 - Display update rate, number of channels, Break and MaB time
 - Display maximum, minimum and current value of a single channel
 - Double and single ended cable test
 - Generate DMX512 or re-transmit buffered DMX512 or MIDI
 - Fifteen Preset memories with snapshot
 - Automatic Moving Lamp test
 - Auto-backup, transmits Preset if console fails.
 - PC Link to Mic-Edit Software
-

WHAT'S NEW IN DMX DEBUG

A range of powerful new features has been added to DMX DeBug.

1. A number of existing features and new options have been added to the new setup menu. The setup menu is activated by switching on DMX DeBug with the MENU key held down. When the setup menu is active, the menu number displayed in the bottom right of the lcd screen is prefixed with 's'.

The setup menu provides access to:

- External Power Monitor
 - Firmware Version Number
 - Backlight Enable/Disable Status
 - Power Saving Enable/Disable Status
 - Dark Channel Level
 - DMX Start Code
 - Communication with Mic-Edit
2. The Moving Lamp Library has been expanded:
 - Total capacity of 192 fixtures.
 - Each Moving Lamp can now test up to 36 channel attributes.
 - Moving Lamp definitions can be edited using the PC software Mic-Edit.
 - New 'Pan & Tilt' test allows the DMX DeBug cursor keys to control pan and tilt for manual focusing.
 - New 'All' test steps through each attribute test in sequence.
 - The ramp speed of the automated tests can now be controlled.
 3. The Dark Level feature has been added, this allows the channels that would normally be at zero in the 'Rig Check' or 'Transmit Dynamic' modes to be set to a level. This is effectively a pre-heat function and can significantly improve lamp life, as the lamp filaments are kept warm during rig check.
 4. A Power Save Disable option has been added which allows users to ensure that DMX DeBug will continue transmitting at all times. This is particularly useful when using DMX DeBug as a battery powered DMX booster.
 5. Communication to Mic-Edit, the optional PC Editor has been added. Mic-Edit provides the following features:
 - Edit up to 192 lamp personalities. (Over 120 pre-programmed entries are supplied with the software).
 - Control the lamp personalities displayed by DMX DeBug.
 - Save custom setups to disc allowing users to reprogram DMX DeBug with the information needed for a specific show.
 - Edit all 15 Presets.
 - Drag and Drop lamps onto presets to generate custom test patterns.
 - Control setup parameters such as Start Code, Power Save.
 - Enter a User Name that DMX DeBug will display at start up and power save.
-

T H E C O N T R O L S U R F A C E

OVERVIEW The six front panel buttons operate DMX DeBug. The buttons function as follows:

MENU

The MENU key is used to select the operating mode of DMX DeBug. Pressing MENU once will display the currently selected mode. The LEFT and RIGHT cursor keys are then used to select a new operating mode. Pressing MENU a second time completes the process. The MENU Key is held down whilst power is switched on to access the Setup Menu

TOGGLE

When DMX DeBug is in DISPLAY RECEIVED DMX512, the TOGGLE key is used to step through the different display formats (bar graph, percent, decimal etc.).

In TRANSMIT mode, the TOGGLE key is used to invert the level of the selected channel.

In TRANSMIT LAMP mode, the TOGGLE key selects each of the automated tests in sequence.

LEFT RIGHT

When DMX DeBug is in DISPLAY RECEIVED DMX512, the LEFT and RIGHT cursor keys are used to select a new base address.

In TRANSMIT DMX512 modes, the LEFT and RIGHT cursor keys are used to select a new transmit channel.

If DMX DeBug is displaying the menu, the LEFT and RIGHT cursor keys are used to select the next operating mode.

UP DOWN

The UP and DOWN cursor keys are used to increment or decrement the level of the displayed data.

MENUS

Upon entering MENU mode, twelve different operating modes may be selected (using the LEFT & RIGHT cursor keys). These are:

DISPLAY RECEIVED dmx512	1	Displays the DMX512 signal from any console, in any of the six available formats
TRANSMIT RIG CHECK	2	Transmit DMX512. Only a single channel on at a level. This is the basic flash through rig mode.
TRANSMIT PRESET NUMBER: 15	3	Transmit and edit one of 15 Presets. Each Preset allows all 512 channels at individual levels.
TRANSMIT lamp vari ^l ite v16	4	Automatically test any automated luminaire from the library.
TRANSMIT DYNAMIC dmx512	5	Transmit any range of channels at a level or continuously ramping.
snapshot dmx to preset: 15	6	Copy received DMX to any of the 15 Presets. Used to create show backup or record useful test patterns.
FILL PRESET WITH PATTERN	7	Fill one of the 15 Presets with a symmetrical pattern of channel levels.
double ended cable test	8	Fully test all three pins of DMX512 or MIDI cables for shorts and open circuits.
SINGLE ENDED CABLE TEST	9	Test the two signal pins of DMX512 or MIDI cables for shorts, when only the console cable end is available.
AUTOBACKUP IF DMX FAILS	10	Allows DMX DeBug to connect in-line between desk and dimmers. Switches to a selected Preset if the desk fails.
BUFFER DMX MIDI ENABLED	11	Switch between the DMX512 output of DMX DeBug and a regenerated version of the received signal.
DISPLAY RECEIVED MIDI	12	Display MIDI data characters in hexadecimal form.

T H E M E N U S

DISPLAYING RECEIVED DMX512

In DISPLAY RECEIVED DMX512 mode the following keys are active:

- LEFT Decrement the current DMX512 start address
- RIGHT Increment the current DMX512 start address
- TOGGLE Select the display format

Received DMX512 data is displayed in one of seven formats. They are:

- Bar Graph
- Decimal

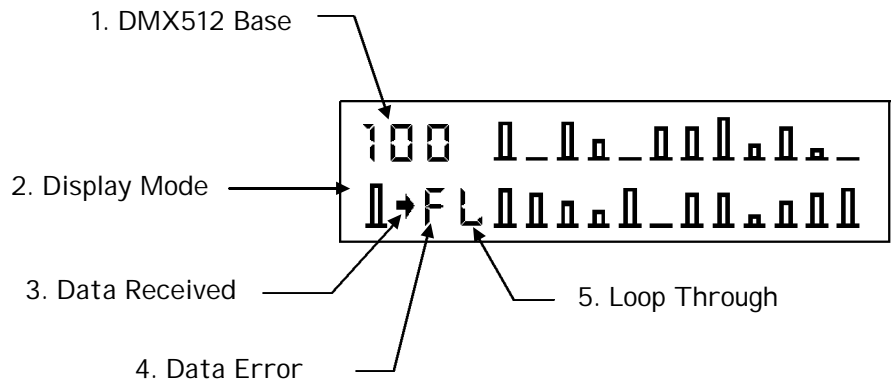
- Percent
- Hex
- Binary
- Max/Min & Flicker Hunt
- Detail

STATUS

The first five display formats also include the following information:

1. DMX512 base address
2. Display mode
3. Data received indicator
4. Data error indicator
5. Loop-Through indicator

The diagram below shows DMX DeBug receiving DMX512 in bar graph mode.



DMX BASE

The DMX base address is in the range 1 to 512 and defines the first channel displayed. This value is also used to set the TRIGGER OUTPUT.

DISPLAY MODE



This character shows the currently selected display mode:

Bar-graph mode displays twenty four channels as a bar-graph with a resolution of 12.5%. Whilst the resolution of this mode is limited, it is often the most useful when the DMX line is running show information. It is easy to pick out chases, which in other display modes could be mistaken for flickering data.

- D** Decimal mode displays six channels as numbers in the range 0 to 255. This mode shows the entire resolution of each channel. It is most useful when dealing with moving lights and colour changers.
- %** Percent mode displays six channels as numbers in the range 0 to 100. This mode provides the most familiar numbering system.
- \$** Hexadecimal mode displays six channels as numbers in the range 00 to FF. This mode is most useful when working with DMX devices such as relay boxes and smoke machines, which use bit control. See Appendix for conversion tables.
- B** Binary mode displays two channels as both binary and hexadecimal. This mode is most useful for electronic designers and engineers when solving complex electronic problems such as a damaged data bus.

**DATA
RECEIVED**

This character cell displays a tilde to show that data is being received. The data is not necessarily valid DMX512.

DATA ERROR

This character cell is clear when good data is being received. If an error occurs, one of the following is displayed:

- H** DMX512 is being received with a non-matching **H**header or start code.
- F** Data is being received with **F**raming errors. This can be caused by noise pick-up and also occurs when the phase pins of the connector are reversed.
- O** Data is being received with **O**verrun errors. This can be caused by noise pick-up and also occurs when a phase pin is disconnected.
- T** The received data is outside the DMX512 **T**iming specification. This display occurs when either the number of channels per frame exceeds 512, or the Break time is less than 88uS, or the MaB time is less than 4uS.

LOOP THROUGH

This character cell displays 'L' when DMX DeBug's output is providing a clean and buffered version of the incoming DMX512. When the character cell is clear, DMX DeBug's DMX512 generator is connected to the output.

MAX/MIN MODE

Max/Min mode is the "Flicker Finder". A single DMX512 channel is displayed as the current value, minimum value and maximum value. All three numbers are decimal 0 to 255.

This mode will capture any fluctuations in the level of a channel.

To clear the Max and Min values, press the MENU key twice. When data is not received on the selected channels, the Max value is set to 0, and the Min value to 255.

001	CUR 154
MIN 153	MAX 155

FLICKER HUNT

The UP & DOWN cursor keys are used to start the automatic 'Flicker Hunt' mode. In this mode DMX DeBug analyses the level of each

channel in thirty consecutive frames of DMX512. Any level which has varied outside the flicker band causes the hunt to stop and the display reverts to MAX/MIN mode, displaying the erroneous channel data. The DOWN cursor key cycles through the range of flicker band values between \$01 and \$3f. When the flicker band is set to \$01, a single bit fluctuation in the level of a single channel will cause the display to revert to MAX/MIN mode.

flicker hunt \$01
current chan: 012

DETAIL MODE

Detail mode provides four further pieces of information about the DMX signal.

The Period "P" is the time between received Breaks on the DMX512 signal. The reciprocal of this number gives the refresh rate. The second number is the Break time "Bk". This is the length of the synchronising code used to restart a new DMX frame. The

p=023ms	bk=150us
C=512	MAB=012us

specification requires this value to be 88uS or greater. If this is not the case, the timing error icon "T" will be displayed in the main receive

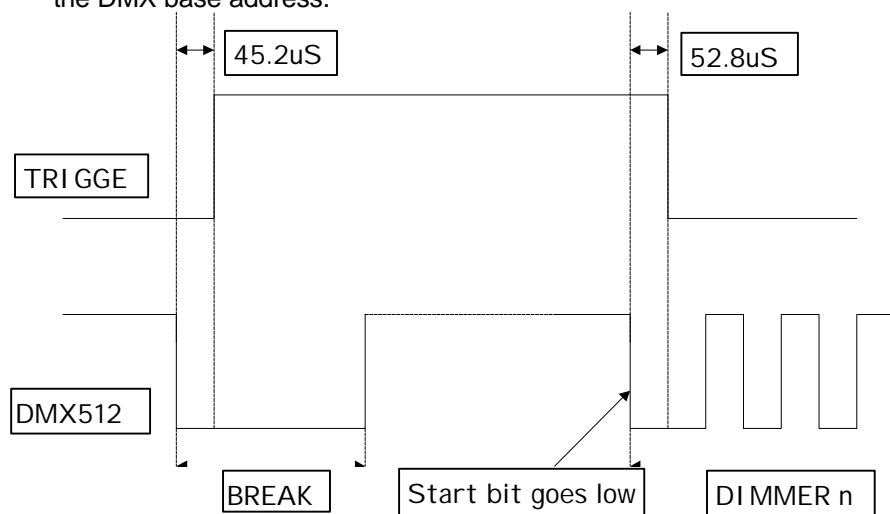
window.

The third number "C" represents the number of dimmer channels received in the last DMX packet. This number should be constant, although the value may be less than 512, depending on the type of console used.

The fourth number is the Mark after Break time "MaB". This is the delay between the end of a Break and transmission of the header code. The specification requires a MaB of 4us or greater. If this is not the case, the timing error icon "T" will be displayed in the main receive window. (The MaB limit was increased to 8uS in the DMX512 1990 Revision).

TRIGGER OUTPUT

The spare two pins of the DMX512 output are used to provide a TTL (5V) oscilloscope trigger output. This signal can be used to synchronise the oscilloscope to either the falling edge of the break or the DMX base address.



TRANSMIT RIG CHECK

The TRANSMIT RIG CHECK menu allows any single dimmer channel to be switched on at a level.

CHAN: 001 @ 100%
RIG CHECK

The following keys are active:

- LEFT Decrement the dimmer channel
- RIGHT Increment the dimmer channel
- UP Increment the dimmer level
- DOWN Decrement the dimmer level
- TOGGLE Invert dimmer level

The display shows the current dimmer channel, followed by its level as a percentage.

The DMX512 output continues when DMX DeBug is in Receive mode.

TRANSMIT PRESET

The TRANSMIT PRESET menu allows any one of the fifteen Presets to be transmitted to the dimmers

and also edited. Each Preset contains individual level settings for all 512 channels and is held in non volatile memory. The Preset to be transmitted and edited is selected by the UP and DOWN keys when the menu display is active. Press the MENU key to enter edit mode.

```
CHANNEL 001 @ 100%
11111111 $FF 255
```

The following keys are active:

- LEFT Decrement the dimmer channel
- RIGHT Increment the dimmer channel
- UP Increment the dimmer level
- DOWN Decrement the dimmer level
- TOGGLE Invert dimmer level

All dimmer channel levels may be set individually. The display shows the current dimmer channel, followed by its level in percent, binary, hexadecimal and decimal.

The DMX512 output continues when DMX DeBug is in Receive mode. The SNAPSHOT and FILL menus are alternative methods of programming the Presets.

TRANSMIT LAMP

The TRANSMIT LAMP menu is the most powerful method of testing automated luminaires. DMX DeBug contains a library of nearly 200 lamp definitions which can be used to automatically test lamps.

When the menu is active, the UP & DOWN cursor keys are used to select the required lamp from the library.

To accept the lamp selection press

MENU. The display changes to

show the start address of the lamp, the current test and the selected lamp.

At this point the DMX output will command the selected lamp to point to it's centre position with the beam on at full white with no gobos.

The following keys are active:

- LEFT Decrement the start channel to the previous lamp
- RIGHT Increment the start channel to the next lamp
- UP Increment by one the start channel
- DOWN Decrement by one the start channel
- TOGGLE Select the next automatic test

The automatic tests consist of ramping the levels up then down between defined values for the channels which relate to each lamp attribute. The Speed at which the ramp operates can be defined in Mic-Edit.

The automatic tests function as follows:

Name	Function
On	Point lamp at centre of Pan & Tilt range with a full power white beam.
Int	Ramp up and down the lamp intensity. If a dimmer exists in the lamp it is used, otherwise the mechanical shutter is used.
Pan	Pan the beam from one extent to the other
Tilt	Tilt the beam from one extent to the other.
P&T	Pan & Tilt the beam from one extent, diagonally to the other.
<PT>	Pan & Tilt are controlled by the cursor keys. This is particularly useful for manually focussing a moving lamp.

```
TRANSMIT LAMP
VARI*LITE VL7
```

```
LAMP 001-007  CN
VARI*LITE VL7
```

Name	Function
COL 1-7	Exercise the colours available. This tests up to seven colour attribute channels of the lamp. Depending on the lamp type, the order will be either: RED BLUE GREEN COLOUR-WHEEL 1-4 or YELLOW MAGENTA CYAN COLOUR-WHEEL 1-4
GOB 1-7	Run through all the available gobos.
STRB	Test the Strobe effects.
ZOOM	Test the Zoom.
FOCS	Test the Focus.
IRIS	Test the Iris.
PRIS	Test the Prism.
EFFX	Test the Effects.
AUX 1-7	Test a further seven attributes as defined in the lamp library.
ALL	Run all of the tests listed above in sequence. When the ALL test is running ,the display alternates between 'ALL' and the current attribute.

The DMX512 output continues when DMX DeBug is in Receive mode. You can download a copy of Mic-Edit from our web site to inspect the detailed channel allocations for each moving lamp.

TRANSMIT DYNAMIC DMX512

The TRANSMIT DYNAMIC DMX512 selection allows any range of dimmer channels to be switched on at a level, or ramp continuously. The following keys are active:

CHAN: 001 - 512
@100%

- LEFT Decrement the end dimmer channel
- RIGHT Increment the end dimmer channel
- UP Increment the start dimmer channel
- DOWN Decrement the start dimmer channel
- TOGGLE Stop or Start the channels ramping

Any range of dimmers can be controlled. The display shows the start and end dimmer channel, followed by the current percentage level. The level ramp requires ten seconds to increment from zero to full and then decrement back to zero.

If the end channel is set to a lower value than the start channel, all output channels are set to zero.

The DMX512 output continues when DMX DeBug is in Receive mode.

SNAPSHOT DMX TO PRESET

The SNAPSHOT menu allows any one of the fifteen Presets to be filled with data captured from the DMX512 input. The Preset to be used is selected

DMX RECORDED TO
PRESET: 15

by the UP and DOWN keys when the menu display is active. Press the MENU key to take the snapshot. The process requires eight consecutive frames of DMX512 to capture the data. The snapshot can be aborted (for example if the DMX512 input fails) by pressing the TOGGLE button.

When the data has been successfully captured, the display shows:

FILL PRESET WITH PATTERN

The FILL menu allows any one of the fifteen Presets to be filled with a symmetrical pattern of channel levels.



The following keys are active:

- LEFT Select one of the pre-defined patterns
- RIGHT Select one of the pre-defined patterns
- UP Increment the Preset number
- DOWN Decrement the Preset number
- TOGGLE Execute the Fill

Fill patterns are selected from the following list:

Name	Function
ALL CHAN OFF	Clear the Preset
ALL CHAN HALF	Set all channels to 50%
ALL CHAN ON	Set all channels to 100%
ODD CHAN ON	Set all odd channels (1,3,5..511) to 100%
EVEN CHAN ON	Set all even channels (2,4,6..512) to 100%
RAMP UP	Set incrementing ramp from channel 1 to 256 and 257 to 512
RAMP DOWN	RAMP DOWN Set decrementing ramp from channel 1 to 256 and 257 to 512

TESTING CABLES

DMX DeBug offers two methods of testing DMX512 cables.

The DOUBLE ENDED TEST is used when both ends of the cable are available. DMX DeBug can test for short circuits and open circuits on any of the three active pins of the DMX512 cable.

The SINGLE ENDED TEST is used when only the console cable end is accessible. DMX DeBug can test for a short circuit between the two signal pins.

DOUBLE ENDED CABLE TEST

The DOUBLE ENDED TEST display shows the connectivity of each of the three active pins of the DMX512 or MIDI cable. An OPEN CIRCUIT is shown by a period, and a SHORT CIRCUIT is shown by the pin number. The diagram below shows a correct DMX512 cable.

```
DOUBLE END 1.. =1..  
.2.=.2. GOOD ..3=..3
```

The diagram below shows a DMX512 cable with pins 2 & 3 swapped.

```
DOUBLE END 1.. =1..  
.2.=..3      ..3=.2.
```

SINGLE ENDED CABLE TEST

The SINGLE ENDED TEST display shows the short circuit status of pins 2 and 3 of the DMX512 output connector. The display will show the following when there is a connection between pins 2 & 3.

This test can be used to test for short circuit in the cable or to confirm that the cable is properly terminated.

```
SINGLE END  
2 & 3 SHORT/TERM
```

AUTO BACKUP IF DMX FAILS

The AUTO-BACKUP menu allows DMX DeBug to be connected in-line between a lighting desk and dimmers. DMX DeBug monitors the received DMX512 and should the signal fail, switches one of the fifteen Presets to the output.

**AUTO-BACKUP IF
DMX FAILS**

This mode provides a useful backup, which forces a known look on stage, should the console fail. When the backup mode is triggered, the user can snap between the presets.

When the menu is entered, the following display is shown and received DMX512 is looped to the output. The UP and DOWN keys are used to select the Preset that will be output should the received DMX512 fail.

**AUTO-BACKUP: 15
WAIT-DMX IS GOOD**

If the DMX fails, the following display is shown and the selected Preset is output to the dimmers. When the problem with the received DMX512 has been corrected, simply press MENU twice to reset AUTO-BACKUP mode.

**AUTO-BACKUP: 15
ACTIVE-DMX FAIL**

When AUTO-BACKUP is active, the UP and DOWN keys are used to snap between consecutive Presets.

LOOP THROUGH

The BUFFER DMX/MIDI option is used to select between DMX DeBug's Generator output and a buffered copy of the incoming DMX512 signal.

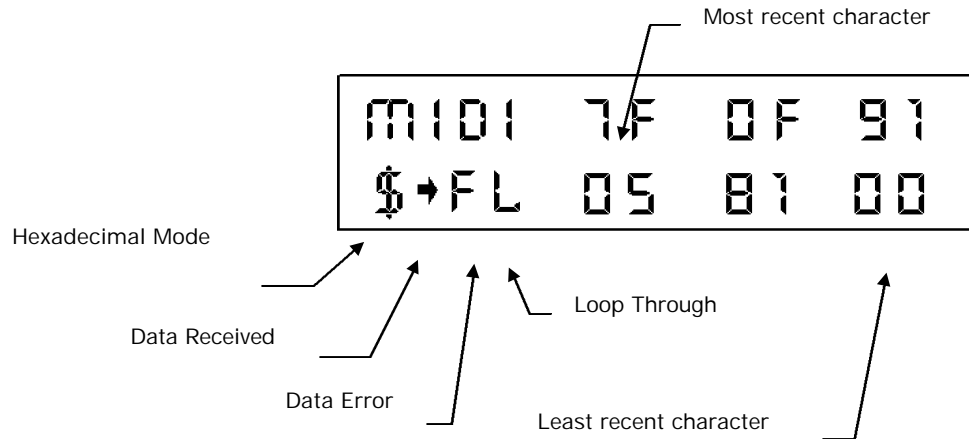
**BUFFER DMX MIDI
DISABLED**

The Loop Through mode is selected by pressing the TOGGLE key when the menu is displayed. The BUFFER mode of operation allows DMX DeBug to be used as a signal booster for long DMX512 or MIDI cables.

BUFFER mode is switched off when the Generator Menu is next selected. When BUFFER mode is active, "L" is shown in the receive window to denote "Loop Through".

DISPLAYING RECEIVED MIDI

DISPLAY RECEIVED MIDI shows six MIDI characters in hexadecimal format. The external MIDI adapter cables are required to use this mode. The TOGGLE key is used to freeze the data display. The following diagram shows the screen layout.



Loop Through may also be used with MIDI. The output circuitry used by DMX DeBug is RS485 compatible. Whilst this is correct for DMX512, MIDI specifies a simpler and less expensive set of circuitry. However, the two sets of circuitry are compatible and the circuitry used by DMX DeBug overcomes the very short cable limitation usually encountered with MIDI.

The MIDI input of DMX DeBug is opto-isolated.

T H E S E T U P M E N U S

SETUP MENU The Setup Menu is entered by powering on DMX DeBug whilst holding down the MENU key. Five different operating modes may be selected. These are:

BACKLIGHT IS ENABLED S1	Allows the LCD backlight to be enabled or disabled.
POWER SAVING DISABLED S2	Power Save option can be disabled to ensure that DMX DeBug always transmits DMX512.
SELECT DARK LEVEL:000 S3	Set the level of transmitted DMX channels that are at zero. This is the lamp preheat function.
SELECT DMX CODE: 000 S4	Sets the DMX512 Start Code for both transmit and receive.
TALK TO MIC-EDIT S5	Starts communication with the PC program Mic-Edit.

ENABLE BACKLIGHT (S1)

The BACKLIGHT menu is used to enable or disable the display backlight. The Backlight operates as follows:

**BACKLIGHT IS
ENABLED**

- **DISABLE** The backlight is off giving the longest possible battery life.
- **ENABLE:** When external power is connected the backlight is on in all modes.

When operating on battery power the backlight is normally on, but powers down after one minute of inactivity. The next key press will re-enable the backlight.

The TOGGLE key is used to enable or disable the backlight selection.

POWER SAVING (S2)

The POWER SAVING menu is used to enable or disable the power save features of DMX DeBug. The power saving operates as follows:

**POWER SAVING IS
DISABLED**

- **DISABLE** The DMX DeBug will not enter power saving mode. This feature is most important when DMX DeBug is used as a signal booster or left in a remote location as a DMX512 transmitter.
- **ENABLE:** DMX DeBug will enter power save mode after about two minutes of inaction. This will only occur if there is no external power and no DMX512 input.

The TOGGLE key is used to enable or disable the selection.

DARK CHANNEL (S3)

The DARK CHANNEL menu is used to set the level to be transmitted in place of zero (dark) channels when operating in either Rig Check or Transmit Dynamic Mode.

**SELECT DARK CHAN
LEVEL: 000**

This is effectively a preheat feature and can significantly improve lamp life.

The UP DOWN keys are used to increment or decrement the level.

SELECT DMX START CODE (S4)

The START CODE menu is used to select non-zero DMX512 start codes. The START code is defined in the protocol but has not been implemented by many manufacturers.

**SELECT DMX START
ccode: 000**

The UP and DOWN keys are used to select any one of the 256

possible values. The same value is used for both receive and transmit DMX512.

If a non-zero value is selected, a warning is displayed when the DMX DeBug is next switched on.

The Toggle key selects “Don’t Care” mode that is displayed as “xxx”. In this mode a value of zero is used for the transmit start code. However, received DMX512 will be displayed as good data whatever the start code. This is particularly useful with Compulite equipment, as they have implemented multiple start codes on their equipment.

The following table details the currently registered alternate Start Codes.

Decima l	Hexadecimal	Description
000	0x00	Standard Lighting Data
000	0x00	Standard Lighting Data
002	0x02	Packet contains 256 x 16 bit levels in lo-hi order (T-Recursive)
003	0x03	Proprietary format (R A Gray)
004	0x04	Checksum message (T-Recursive)
005	0x05	Answerback query (T-Recursive)

Decima l	Hexadecimal	Description
006	0x06	LSB of double precision transmission (T-Recursive)
007	0x07	Compressed data (T-Recursive)
008	0x08	Compressed 16 bit data (T-Recursive)
009	0x09	Proprietary format (Rosco ET)
016	0x10	Proprietary format (ADB)
017	0x11	Proprietary format (Tokyo Broadcast Systems Inc)
023	0x17	Text Packet (Zero 88 / ESTA)
024	0x18	Proprietary format (Zero 88)
038	0x26	Proprietary configuration format (High End)
060	0x3c	Internal configuration (Avab)
061	0x3d	Smart 16 bit format (Avab)
065	0x41	Proprietary format (Microlite)
079	0x4f	Proprietary backup format (Oscar)
085	0x55	Installation Test Packet
112	0x70	Proprietary format (ETC)
113	0x71	Proprietary format (ETC)
114	0x72	Proprietary format (ETC)
115	0x73	Proprietary format (ETC)
116	0x74	Proprietary format (ETC)
117	0x75	Proprietary format (ETC)
118	0x76	Proprietary format (ETC)
119	0x77	Proprietary format (ETC)
120	0x78	Proprietary format (ETC)
121	0x79	Proprietary format (ETC)
122	0x7a	Proprietary format (ETC)
123	0x7b	Proprietary format (ETC)
124	0x7c	Proprietary format (ETC)
125	0x7d	Proprietary format (ETC)
126	0x7e	Proprietary format (ETC)
127	0x7f	Proprietary format (ETC)
128	0x80	Curve select (Leviton)
129	0x81	LSB 16 bit data (Leviton)
130	0x82	Patch (Leviton)
131	0x83	Dim/non dim (Leviton)
170	0xaa	Proprietary format (Sun)
223	0xdf	Proprietary format (Doug Fleenor)
224	0xe0	ENR mode control (NSI / Colortran)
225	0xe1	Dim/non dim control (NSI / Colortran)
237	0xed	Dimmer download (EDI)
255	0xff	Dimmer curve select (Avolites)

TALK TO MIC-EDIT (S5)

The TALK menu is used to start communication with the PC Mic-Edit Software. Enter this mode prior to pressing the Download button on Mic-Edit.

DMX DeBug displays:

**TALK TO
MIC-EDIT**

When the Mic-Edit Download button is pressed, DMX DeBug displays:

**WAITING FOR
MIC-EDIT TO TALK**

When the transfer starts, DMX DeBug displays:

**MIC-EDIT
IS THINKING**

Followed by:

**RECEIVING
DATA BLOCK**

When Mic-Edit has finished sending data, the following message is displayed:

**TRANSFER DONE
PRESS MENU**

EXTERNAL CONNECTIONS

POWER SUPPLY

DMX DeBug has an internal Ni-Cd rechargeable battery that provides a life of about 25 hours between recharges (this is reduced to 15 hours when the backlight is used continuously). The external 9 Volt DC power supply is used to power and recharge Show-Control.

As with all Ni-Cd battery products, the best battery life is obtained by completely discharging DMX DeBug prior to recharging. The power switch is used to switch off DMX DeBug, battery charging will continue if the power connector is plugged in.

DMX DeBug contains a sophisticated battery manager, which regulates battery charging. A full charge is obtained in three hours, after which the external power supply is used solely to power DMX DeBug.

CONNECTOR

Pin	Function
Centre	+9VDC 350mA
Skirt	Ground

RECEIVE DMX

The DMX receive input connects via the male 5 pin XLR. The pin allocation is as follows:

Pin	Function
Pin 1	Screen
Pin 2	DMX Receive Signal
Pin 3	DMX Receive Signal
Pin 4	MIDI Receive Anode
Pin 5	MIDI Receive Cathode

The MIDI receive feature of DMX DeBug uses pins 4 & 5 which are undefined by the DMX512 protocol. These pins may be disconnected internally should this conflict with your DMX512 implementation.

MIDI ADAPTER WIRING

A MIDI adapter cable is available from Artistic Licence or can be simply constructed from the following wiring plan:

Female 5 pin XLR	Female 5 pin DIN
Pin 1 connect to screen	No connection
Pin 4	Pin 4
Pin 5	Pin 5

TRANSMIT DMX

The DMX transmit output connects via the female 5 pin XLR. The pin allocation is as follows:

Pin	Function
Pin 1	Screen
Pin 2	DMX Transmit Signal-
Pin 3	DMX Transmit Signal
Pin 4	Scope Trigger Output
Pin 5	Scope Trigger Ground

The Trigger feature of DMX DeBug uses pins 4 & 5 which are undefined by the DMX512 protocol. These pins may be disconnected internally should this conflict with your DMX512 implementation.

C O N V E R S I O N T A B L E S

Dec	Hex	Binary	Dec	Hex	Binary	Dec	Hex	Binary
0	00	0000 0000	32	20	0010 0000	64	40	0100 0000
1	01	0000 0001	33	21	0010 0001	65	41	0100 0001
2	02	0000 0010	34	22	0010 0010	66	42	0100 0010
3	03	0000 0011	35	23	0010 0011	67	43	0100 0011
4	04	0000 0100	36	24	0010 0100	68	44	0100 0100
5	05	0000 0101	37	25	0010 0101	69	45	0100 0101
6	06	0000 0110	38	26	0010 0110	70	46	0100 0110
7	07	0000 0111	39	27	0010 0111	71	47	0100 0111
8	08	0000 1000	40	28	0010 1000	72	48	0100 1000
9	09	0000 1001	41	29	0010 1001	73	49	0100 1001
10	0A	0000 1010	42	2A	0010 1010	74	4A	0100 1010
11	0B	0000 1011	43	2B	0010 1011	75	4B	0100 1011
12	0C	0000 1100	44	2C	0010 1100	76	4C	0100 1100
13	0D	0000 1101	45	2D	0010 1101	77	4D	0100 1101
14	0E	0000 1110	46	2E	0010 1110	78	4E	0100 1110
15	0F	0000 1111	47	2F	0010 1111	79	4F	0100 1111
16	10	0001 0000	48	30	0011 0000	80	50	0101 0000
17	11	0001 0001	49	31	0011 0001	81	51	0101 0001
18	12	0001 0010	50	32	0011 0010	82	52	0101 0010
19	13	0001 0011	51	33	0011 0011	83	53	0101 0011
20	14	0001 0100	52	34	0011 0100	84	54	0101 0100
21	15	0001 0101	53	35	0011 0101	85	55	0101 0101
22	16	0001 0110	54	36	0011 0110	86	56	0101 0110
23	17	0001 0111	55	37	0011 0111	87	57	0101 0111
24	18	0001 1000	56	38	0011 1000	88	58	0101 1000
25	19	0001 1001	57	39	0011 1001	89	59	0101 1001
26	1A	0001 1010	58	3A	0011 1010	90	5A	0101 1010
27	1B	0001 1011	59	3B	0011 1011	91	5B	0101 1011
28	1C	0001 1100	60	3C	0011 1100	92	5C	0101 1100
29	1D	0001 1101	61	3D	0011 1101	93	5D	0101 1101
30	1E	0001 1110	62	3E	0011 1110	94	5E	0101 1110
31	1F	0001 1111	63	3F	0011 1111	95	5F	0101 1111

Dec	Hex	Binary	Dec	Hex	Binary	Dec	Hex	Binary
96	60	0110 0000	128	80	1000 0000	160	A0	1010 0000
97	61	0110 0001	129	81	1000 0001	161	A1	1010 0001
98	62	0110 0010	130	82	1000 0010	162	A2	1010 0010
99	63	0110 0011	131	83	1000 0011	163	A3	1010 0011
100	64	0110 0100	132	84	1000 0100	164	A4	1010 0100
101	65	0110 0101	133	85	1000 0101	165	A5	1010 0101
102	66	0110 0110	134	86	1000 0110	166	A6	1010 0110
103	67	0110 0111	135	87	1000 0111	167	A7	1010 0111
104	68	0110 1000	136	88	1000 1000	168	A8	1010 1000
105	69	0110 1001	137	89	1000 1001	169	A9	1010 1001
106	6A	0110 1010	138	8A	1000 1010	170	AA	1010 1010
107	6B	0110 1011	139	8B	1000 1011	171	AB	1010 1011
108	6C	0110 1100	140	8C	1000 1100	172	AC	1010 1100
109	6D	0110 1101	141	8D	1000 1101	173	AD	1010 1101
110	6E	0110 1110	142	8E	1000 1110	174	AE	1010 1110
111	6F	0110 1111	143	8F	1000 1111	175	AF	1010 1111
112	70	0111 0000	144	90	1001 0000	176	B0	1011 0000
113	71	0111 0001	145	91	1001 0001	177	B1	1011 0001
114	72	0111 0010	146	92	1001 0010	178	B2	1011 0010
115	73	0111 0011	147	93	1001 0011	179	B3	1011 0011
116	74	0111 0100	148	94	1001 0100	180	B4	1011 0100
117	75	0111 0101	149	95	1001 0101	181	B5	1011 0101
118	76	0111 0110	150	96	1001 0110	182	B6	1011 0110
118	77	0111 0111	151	97	1001 0111	183	B7	1011 0111
119	78	0111 1000	152	98	1001 1000	184	B8	1011 1000
120	79	0111 1001	153	99	1001 1001	185	B9	1011 1001
121	7A	0111 1010	154	9A	1001 1010	186	BA	1011 1010
122	7B	0111 1011	155	9B	1001 1011	187	BB	1011 1011
123	7C	0111 1100	156	9C	1001 1100	188	BC	1011 1100
124	7D	0111 1101	157	9D	1001 1101	189	BD	1011 1101
125	7E	0111 1110	158	9E	1001 1110	190	BE	1011 1110
126	7F	0111 1111	159	9F	1001 1111	191	BF	1011 1111

Dec	Hex	Binary	Dec	Hex	Binary
192	C0	1100 0000	224	E0	1110 0000
193	C1	1100 0001	225	E1	1110 0001
194	C2	1100 0010	226	E2	1110 0010
195	C3	1100 0011	227	E3	1110 0011
196	C4	1100 0100	228	E4	1110 0100
197	C5	1100 0101	229	E5	1110 0101
198	C6	1100 0110	230	E6	1110 0110
199	C7	1100 0111	231	E7	1110 0111
200	C8	1100 1000	232	E8	1110 1000
201	C9	1100 1001	233	E9	1110 1001
202	CA	1100 1010	234	EA	1110 1010
203	CB	1100 1011	235	EB	1110 1011
204	CC	1100 1100	236	EC	1110 1100
205	CD	1100 1101	237	ED	1110 1101
206	CE	1100 1110	238	EE	1110 1110
207	CF	1100 1111	239	EF	1110 1111
208	D0	1101 0000	240	F0	1111 0000
209	D1	1101 0001	241	F1	1111 0001
210	D2	1101 0010	242	F2	1111 0010
211	D3	1101 0011	243	F3	1111 0011
212	D4	1101 0100	244	F4	1111 0100
213	D5	1101 0101	245	F5	1111 0101
214	D6	1101 0110	246	F6	1111 0110
215	D7	1101 0111	247	F7	1111 0111
216	D8	1101 1000	248	F8	1111 1000
217	D9	1101 1001	249	F9	1111 1001
218	DA	1101 1010	250	FA	1111 1010
219	DB	1101 1011	251	FB	1111 1011
220	DC	1101 1100	252	FC	1111 1100
221	DD	1101 1101	253	FD	1111 1101
222	DE	1101 1110	254	FE	1111 1110
223	DF	1101 1111	255	FF	1111 1111

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