OPERATING MANUAL

DMX Relay Interface 3202R-H (3202R-HD)
Version Mk5.4

SOUNDLIGHT *The DMX Company* Bennigser Str.1 D-30974 Wennigsen Tel. 05045-91293-11

PREFACE

Thank you for choosing a SOUNDLIGHT device.

The SOUNDLIGHT DMX Relay Interface 3202R-H is an intelligent DMX demultiplexer decoding digital data complying with standards USITT DMX512, DIN 56930-2, ANSI E1-11 DMX512-A or ANSIE1-20 DMX RDM. The interface drives two contact relay outputs. The card can be used with all standard light control systems. Its special advantages include:

- **universal protocol decoding**
  Recognizes all variants of the protocol as defined by USITT / ESTA / DIN

- **future-proof**
  The unit is software controlled an can easily be adapted to any change in protocol definition.

- **integrated hysteresis**
  Adjustable hysteresis ensures flicker free switching

- **simple supply**
  The power supply is from standard mains voltage 230V AC

- **signal loss**
  In the case of a loss of the drive signal a pre-definable action will be taken.

- **cost-effective**
  The SOUNDLIGHT 3202R-H is a cost-effective solution for many purposes.

Features

The relay interface 3202R-H is intended for standard DIN rail mount. It fits on 35mm DIN rails. Configuration is vai DMX RDM; an optional start adress board can be purchased to set DMX start address and personality. The relay interface can be operated with or without start adress board at your option; see below for programming and address setting options. This interface is intended for use in lighting effects and as reliable switching relay ; for limitations see "Additional Notes" on page 7
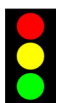
NOMENCLATURE

These symbols are used within this manual:

DANGER ! May cause harm to user and/or equipment

INFO: How to setup your device

INFO: Status information

Please unpack carefully and check that all items are intact. When leaving our factory, the interface has been in good condition. In case of damage during transport please notify the carrier immediately.

When unpacking, you should identify these items:

*   the interface 3202R-H
*   this manual

CONNECTORS

The Relay Interface 3202R-H consists of connectors for five ports:

CN6   **DMX INPUT**

                1 grey   Screen, GND
                2 blue   -DMX
                3 orange   +DMX

CN7   **DMX OUTPUT**

                1 grey   Screen, GND
                2 blue   -DMX
                3 orange   +DMX

CN1   **RELAY OUTPUT #1**
CN2   **RELAY OUTPUT #2**
                white   C   (Common)
                d'grey   NC (Normally Closed)
                l'grey   NO (Normally Open)

CN3   **POWER SUPPLY**

                black   230V AC (L)
                blue   230V AC (N)
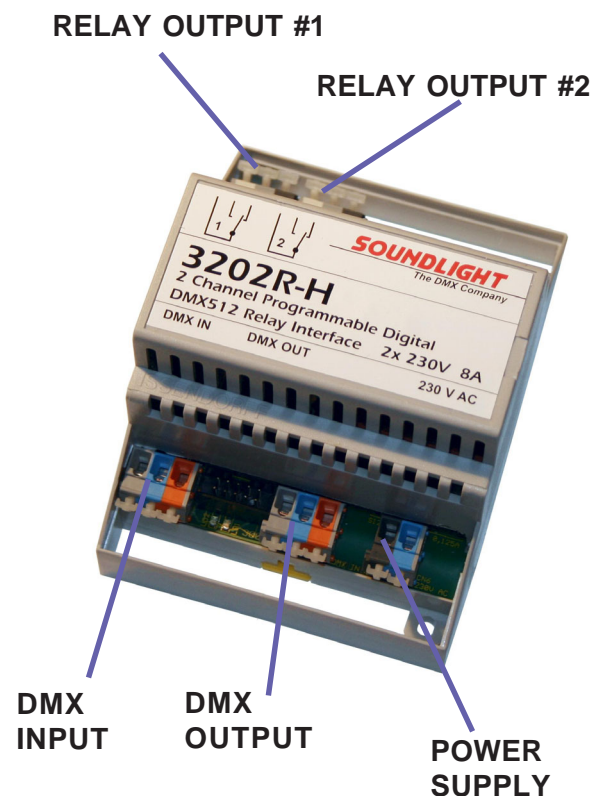
SIGNAL INDICATORS

The state of the demultiplexer card is signalled with two indicator LEDs.

green: OPERATION
            valid DMX data present: continuous
            wrong start address setting: blinking
red: ERROR (blinking)
            Error blinking at data errors or at loss of communication.
            red/green blinking alternatively 4 times: a programming cycle ocurs
yellow: RDM data (blinking), RDM programming present (continuous)

3

ADDRESS SWITCHES
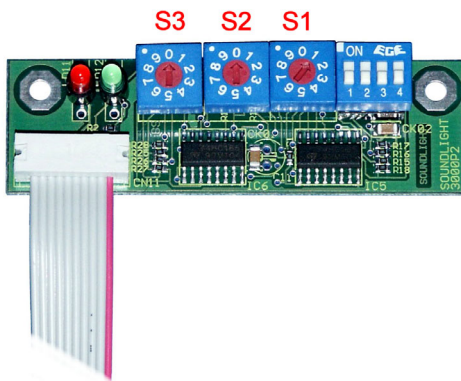
The DMX start address can be set via DMX RDM or a separately available start address board 3000P, 3003P or 3005P. A start address board is NOT included with DIN rail mountable devices and must be ordered separately. The start address board can be used with all types of SOUNDLIGHT interfaces.
At your option, a start address board 3000P (switches) or a start address board 3003P (LED display) can be used.

Use the rotary switches to set the DMX start address and the DIP switches to select the DMX personality. When using the start address board 3003P, use the ADR setting to set the start address and use Functions F1...F4 to set the personality.

Setting address 000 disables all outputs, regardless of data received. To manually set the outputs, use these settings:

Address 801:	RELAY #1 ON
Address 802:	RELAY #2 ON

IMPORTANT NOTICE: It may take some seconds until the new start address is being recognized and activated. A fourfold red-green blinking of the indicator LEDs indicates succesful programming of parameters.
The address board can be detached when all settings have been made and stored in memory.

DIP SWITCH SETTINGS

The DMX relay interface can be set to meet your specific needs using the DIP switches.

S1:   HOLD Mode

OFF	HOLD Mode OFF
ON	HOLD Mode ON ("last look" retained at loss of control)

S2:   SAFETY LEVEL

When HOLD MODE (S1) has not been activated, S2 takes control:
S2=OFF   all Outputs OFF at loss of control signal
S2=ON   all Outputs ON   at loss of control signal

S3, S4: DMX PERSONALITY, trip points

S3=OFF	S4=OFF	Personality 1	
		<45%	Relay switches OFF
		>55%	Relay switches ON
S3=OFF	S4=ON	Personality 2	
		<3%	Relay switches OFF
		>97%	Relay switches ON

S3=ON	S4=OFF	Personality 3
		<25% Relay switches OFF
		>75% Relay switches ON
S3=ON	S4=ON	Personality 4
		0% Relay switches OFF
		>0% Relay switches ON

Function Programming

The DMX relay 3202R-H can also be configured as DMX detector. This is RDM personality 5, can be accessed directly via RDM. In non-RDM environments, us function programming to set/reset detector mode.

In detector mode, output relays are not triggered from DMX data, but from presence of a valid DMX signal itself. Both relays are operated simultaneously, thus two changeover contacts can be used to switch signal or power.

To enable detector mode, use programming address 805.
To disable detector mode, use programming address 800.

To do the programming, procedd as follows::

1. Remove power
2. Connect a start address board 3000P.
3. Set the given programming address
4. Re-apply power and wait for a full programming cycle to occur
       (LEDs red-green blink 4x alternatively).
5. Remove power again

6. Set any valid start address and re-power the device. You may then rermove the start address board.

NOTE: In detector mode, DIP switches 3/4 are disabled.
A fast blinking red LED denotes a start address 000. This is not a valid setting.
Set a start address within the range 001...511
When the red LED is permanently lit, the start adress is beyound 512. This is not a valid setting. Set a start address within the range 001...511

Function programming will only be possible at device start up.

The detector mode can be selected as DMX RDM Personality #5. DMX RDM allows a simple transition from standard mode to detector mode, there is no additional function programming necessary. RDM programming will always override other settings.

RELAY DATA

The relays used feature a high voltage changeover contact for universal use for all applications.

max. switching current: 10A @ 230V resistive load
max. inrush current: 12A @ 230V resistive load

Approbationen

max. switching voltage:	440V AC @ resistive load
max. switching power:	3000VA AC
contacts:	1x changeover (NC/NO)

IMPORTANT NOTICE:

When selecting and ordering the appropriate relay card, please note, that all data given by the relay manufacturers are for **RESISTIVE LOAD** only. Incandescent lamps may be considered to be resistive loads. Switching inductive loads, such as transformers or solenoids, requires lower loads - we strongly recommend not to exceed 50% of the resistive load data. Besides, contacts may burn due to inductive spikes and sparks. Make sure to add protective circuitry (RC combinations, VDR resistors) if switching inductive loads. Switching inductive loads on the mains power supply may also generate high frequence noise and degrade the power supply quality. If switching capacitive loads (electronic ballasts or psu) inrush current limiting devices may be required to prevent contact damage.

TECHNICAL DATA

Dimensions:	85 mm x 66 mm x 112 mm (W x H x D)
	for standard DIN rail 35mm, width 5TE
Power Supply:	230V AC max. 5VA (US Version: 115VAC)
DMX IN:	USITT DMX512/1990, DIN56930-2, ANSI E1-11 DMX512-A,
	ANSI E1-20 DMX RDM, ANSI E1-37
	1 Unit Load
DMX OUT:	fed thru
Outputs:	2
Relay Out:	250V AC max. 10A (resistive load), changeover contact
Operating temperature:	0-50°C
Storage temperature:	-10-70°C
Order Code:	3202R-H

DISTURBANCES

If a trouble-free operation cannot be guaranteed, disconnect the relay card interface and secure it against unwanted operation. This is especially necessary, when
- the unit has visible damages;
- the unit does not operate;
- internal parts are loose;
- connection cables show visible damages.

LIMITED WARRANTY

This DMX interface ist warranted against defects in metarials and workmanship for a period of 24 month, beginning with the date of purchase. The warranty is limited to repair or exchange of the hardware product; no further liability is assumed. SOUNDLIGHT is not responsible for damages or for loss of data, sales or profit which arise from usage or breakdown of the hardware product. In Germany, SOUNDLIGHT will repair or replace established defects in hardware, provided that the defective part is sent in, freight paid, through the responsible dealer along with warranty card and/or sales receipt prior to expiration of warranty.

Warranty is void:
- when modifying or trying to repair the unit without authorisation;
- modification of the circuitry;
- damages by interference of other persons;
- operation which is not in arccordance with the manual;
- connection to wrong voltage or current;
- misuse.

CE CONFORMITY

This DMX relay is microprocessor controlled and uses high frequency (8 MHz quartz). The interface has been tested in our EMC lab to comply with DIN EN55015 for lighting control equipment.
Please make sure that shielded data cable is used and the shield is connected properly to the GND pin. Shield must never make contact to other signal lines.

FCC STATEMENT

This product has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or devices
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

FCC Caution: Any change or modification to the product not expressly approved by SLH could void the user's authority to operate the device.

SERVICE

There are no parts within the DMX relay 3202R-H which require the user's attention. Should your unit require servicing, please send it to the factory, freight paid.

END OF LIFETIME

When the useful lifetime of this product has been reched, it must be disposed of properly. Electronic devices must not be placed in domestic waste. Consult your local authorities to find the nearest collection point of used electric and electronic devices. SOUNDLIGHT is a WEEE registered company (Reg No. DE58883929).

INTERNET-HOTLINE

Please check our internet domain **http://www.soundlight.de** for new versions, updates etc. If you have any comments which may be worth considering, please send a message to *support@soundlight.de*. We will check your message and reply accordingly.

ADDITIONAL NOTES

The relay interface 3202R-H has been designed for use in lighting effects or as effects unit. Thus, switching performance has been optimized and the 3202R-H is a *fast switching* card.
We do **not** recommend to use this board as switching board in power distribution systems, where high noise immunity, but only slow switching speed is required. As DMX512 by itself does not contain any provisions for error detection or error correction, false or disturbed data packets could lead to short interval erreneous switching. When switching loads such as discharge lamps (e.g. followspots, scanners or moving heads), this then could lead to lamp problems as many lamps cannot be hot-restriked, or moving lights would shut off and then go though their initialization sequence.

We have programmed a noise-immune slow-speed switching version of the well renowned 3206R interface, which is available as 3206R-H. This interface is **limited in speed due to multiple packet detection** and performs multiple interpretations of the incoming DMX512 signal. It will change its output state **only** if the appropriate DMX command can be detected reliably **and** repeatedly. Thus we advise to use the 3206R-H for power switching applications.

The decoder 3202R-H complies to DMX RDM Standard 1.0. The unit is identified as "DMX Relay" within the RELAY_MECHANICAL category of products. It can be operated in five DMX personalities.

Personality 1:   OFF   <45%   >55%   ON
Personality 2:   OFF   <3%   >97%   ON
Personality 3:   OFF   <25%   >75%   ON
Personality 4:   OFF   0%   >0%   ON
Personality 5:   Detector Mode

List of RDM functions

RESET DEVICE

Used to reset the unit. A "cold" reset or a "warm" reset are available. The "cold" reset will increase the DEVICE POWER CYCLES counter.

Function: SET

        Parameters: 01 ($01) generates a warm reset

                      255 ($FF) generates a cold reset

DEVICE POWER CYCLES

reads the number of device power-ups. Cannot be reset.

Function: GET

        Parameters: none

        Return data: 1 word (0-65535, $0000-$FFFF)

DMX HOLD MODE

sets the behaviour at loss of data signal and reflects the state of DIP switches 1 and 2 (or settings S1, S2, repectively - see above).

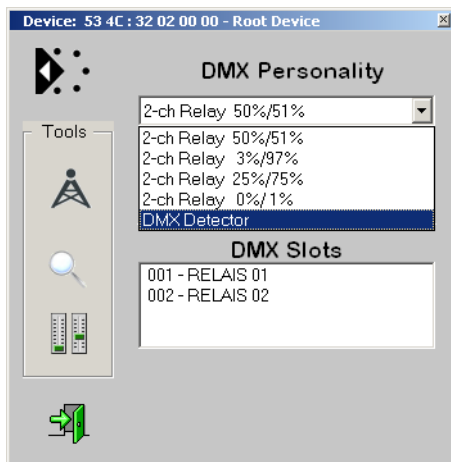Function: GET / SET

        Parameters: 1 Byte (0-2)   0=non-hold, all outputs OFF
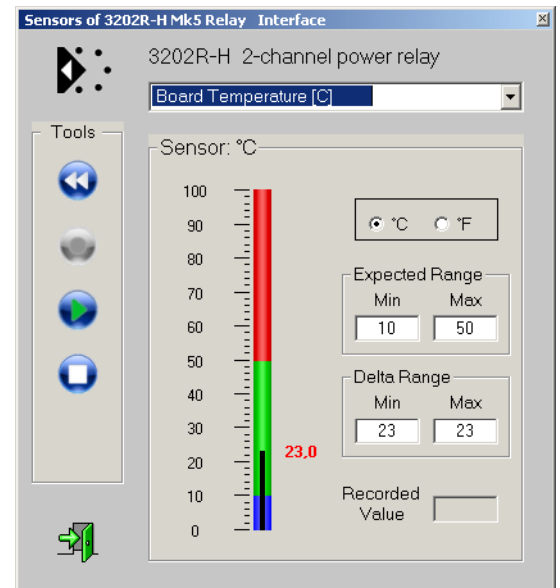
                                        1=non-hold, all outputs ON

                                        2=DMX HOLD (last valid value retained)

Setting the DMX personality using DMX RDM
(shown using JESE Get/Set Software)

The 3202R-H features an internal temperature sensor to monitor the internal electronics temperature.
(shown using JESE Get/Set Software))

All commands detailed below refer to Standard ANSI E1-37 "Additional Commands for RDM". This standard defines additional commands for DMX RDM, and since it is a new standard many

controllers do not yet provide support for these functions. Thus we have assigned an additional manufacturer specific PID to allow retrieving or setting data using the standard masks.
Some controllers (e.g. the JESE GET/SET software) do already provide several specific masks for E1-37 commands. Thus examples given refer to the GET/SET application.

*A in-depth command description is available from our website **www.rdm.soundlight.de**, where you will find descriptions and programming examples for various RDM controllers.*

PID0141: DMX FAIL MODE   Behaviour at loss of data
Selects the behaviour at loss of data. This function is similar to DMX HOLD MODE (see above) but has a different parameter set to match future standard E1-37.

FUNCTION:	GET / SET
Parameters:	GET: nothing, returns 7 bytes
	SET: 7 bytes

DMX HOLD	DMX FAIL MODE
0: goto OFF	$00 $00 $00 $00 $FF $FF $00
1: goto ON	$00 $00 $00 $00 $FF $FF $FF
2: keep last	$00 $00 $FF $FF $FF $FF $FF

PID0640: LOCK PIN   Set a LOCK PIN
PID8330: PIN SETTING   Set a LOCK PIN
Allows to define a PIN code to lock various functions. This parameter is used to get and set the PIN code for devices that support locking. The lock state is set using the LOCK_STATE message.

FUNCTION:	SET
	Parameters: 2 words (4 bytes): <current PIN> <new PIN>

A PIN can be any value between 0000(dec) and 9999(dec), that is, $0000 and $270F. The default PIN is 0000. Please keep the PIN in a safe place, since there is no way to retrieve a lost PIN.

Example: Set the PIN to1234(dec)
Enter: 000004D2 since 1234(dec) = 04D2(hex)

NOTE: The PIN can *never* be read. Once changed, make sure to remember your PIN or the unit will become unaccessible. There is ***no way*** to reset the PIN except returning the unit to the factory for a complete reprogramming.

PID0641: LOCK STATE   DEVICE LOCKING
PID8331: LOCK STATE

This parameter is used to determine the lock state for devices that support locking. A lock, when applied, can have a variable level of what is protected against in the device. The locking mechanism is designed to deter tampering and is not intended to provide absolute security.
With the 3202R-H, there are two different lock states available.

FUNCTION: GET / SET
Parameters: GET: none,
returns 2 Bytes: <current lock state>,
<# of lock states>

SET: 3 bytes: <PIN> <desired lock state>

LOCK STATES: 0= no lock state active
1= lock configuration
2= lock setup
3= lock both

Configuration lock includes:
- SET DMX PERSONALITY
- SET DMX FAIL MODE
- SET DMX HOLD

Setup lock includes:
- SET EXCLUSIVE MODE
- SET FAST MODE
- SET MONOSTABLE TIME u.a.m.

Example: using the PIN defined above, set the lock state to
"lock setup". Enter data: 04 D2 02

You will need your PIN to set or reset lock states. See above.
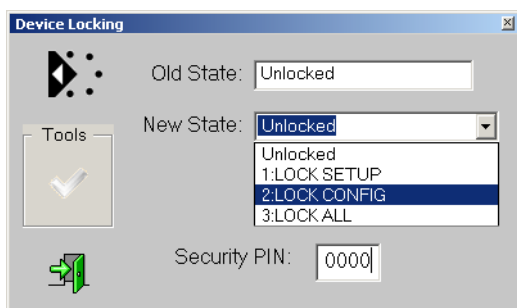
Device Locking Mask
(shown using JESE GET/SET Controller)

**PID0642: LOCK STATE
DESCRIPTION**
**PID8332: LOCK STATE
DESCRIPTION**

Lock state description

Returns a description for the requested lock state.
FUNCTION: GET
Parameters: GET: 1 byte (no. of lock state requested)
returns: 1-33 bytes <# lock state> <text: 0..32 bytes>

PID1040: IDENTIFY MODE
PID8340: IDENTIFY MODE

IDENTIFY-Modus

00: Quiet Mode: Identify output only on signalling LEDs
FF: Loud Mode: Identify output on power outputs

Identify-Mode setting
(shown using JESE GET/SET Controller)

PIDC0F0: MONOSTABLE TIME

Setting the monostable pulse duration

The 3202R-H operate in latching mode. The relays can be set to monostable operation by defining a pulse duration. That is where PIC C0F0 comes in.

Parameter: <Relay number> <Monotime>
where: Relay number = 0001: output 1
Relay number = 0002: output 2
Relay number = FFFF: all outputs

Monotime: 01...7F   in 25ms steps
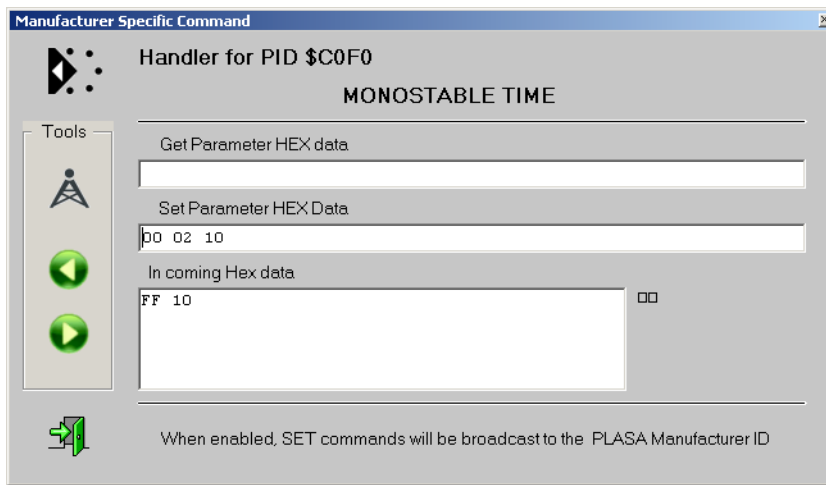FF: bistable Mode
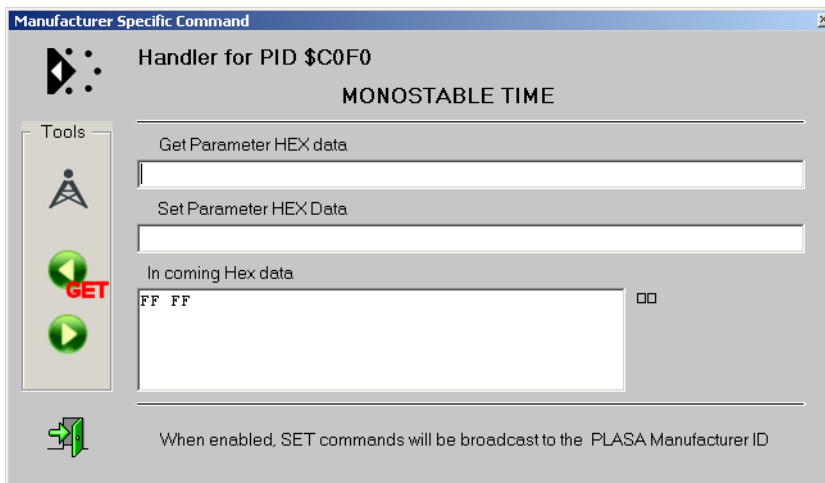
Press GET to read the current setting (see left). In the demo shown, both outputs are configured as latching outputs.
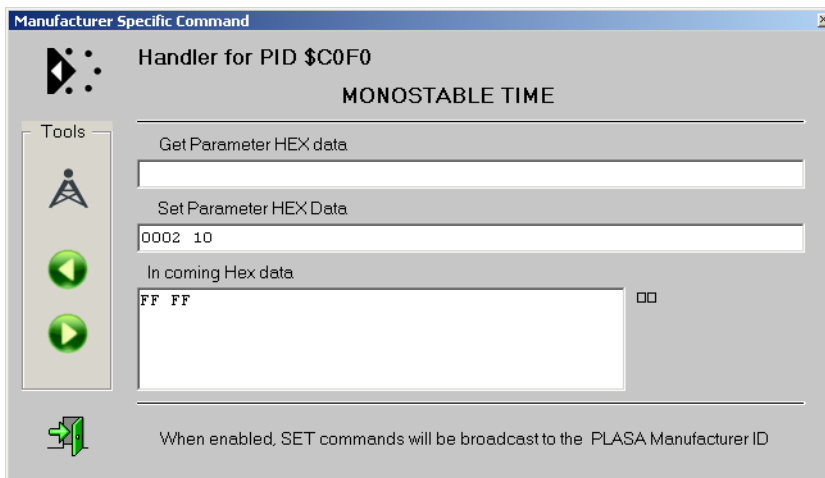
To configure relay 2 to monostable mode using a monostable pulse time of 0,4s (400msec), enter:
0002 10   (hex), since

10hex = 16dez, 16*25ms = 400ms

Press SET to program data.

Handler for PID $C0F0

MONOSTABLE TIME

Tools

Get Parameter HEX data

Set Parameter HEX Data

`00 02 10`

In coming Hex data

`FF 10`   `□□`

When enabled, SET commands will be broadcast to the PLASA Manufacturer ID

Check:
Press GET to read the new setting. Output 2 is now set to 10, meaning: monostable operation, 16*25ms = 400ms pulse time.

PIDC0E0: DMX DATA POLARITY   **Triggering flank for monostable mode**

Monostable operation is usually being triggerd from a positive flank (e.g. changing level from 0% to 100%). You may select the falling flank instead. Syntax is as with monostable time.

Parameter: <Relay number> <Polarity>
   where: Relay number = 0001: output 1
         Relay number = 0002: output 2
         Relay number = FFFF: all outputs

         Polarity: 00   inverted
                      FF   normal

PIDC0C0: INTERNAL PATCHING   **Assign a data source for relay triggering**

Normally relay 1 will be triggered by DMX data slot 1, relay 2 will be triggered by DMX data slot 2. You may assign a relay to any data source, which allows triggering multiple relays (in different operating modes) from a common data source. Syntax is as with monostable time.

Parameter: <Relay number> <Source>
   where: Relay number = 0001: output 1
         Relay number = 0002: output 2
         Relay number = FFFF: all outputs

         Source: 01   Data slot 1
                    02   Data slot 2

Relay functions in Detector Mode

The PIDs C0C0, C0E0 und C0F0 can be called when in detector mode, but do not have any effect then. Since no data slots are available in detector mode, no listings occur and no entries can be made.

Use DIP2 or DMX HOLD to set the output relay polarity in detector mode:
DIP2=OFF (default):   Relay engaged when DMX signal present
DIP2=ON   Relay disengaged when DMX signal present

SOUNDLIGHT
The DMX Company

14

PIDC0F1: EXCLUSIVE MODE   **Relays switch exclusively only**

Use EXCLUSIVE MODE to prevent both relays switching simultaneously.

CH1	CH2	RELAY1	RELAY 2
OFF	OFF	OFF	OFF
ON	OFF	ON	OFF
OFF	ON	OFF	ON
ON	ON	OFF	OFF

Parameter: <MODE> [Byte]
    MODE = $FF (255):   Exclusive ON
    MODE= $00 (0):   Exclusive OFF

PIDC0C0: FAST MODE   **Set to FAST switching mode**

This mode suppresses multiple telegram interpolation, resulting in fast relay switching.

Parameter: <MODE> [Byte]
   MODE = $FF (255):   Fast Mode ON
    MODE= $00 (0):   Fast Mode OFF

More RDM Functions

For more RDM functions, pls refer to our website (http://www.rdm.soundlight.de). Full descriptions of all standard RDM functions are available in the standards documents E1-20 and E1-37, which can be obtained from PLASA or the ANSI Standards Store (www.ansi.org).

ACCESSORIES

To set the DMX start address and change the operating parameters without using DMX RDM, a DMX start address board is needed. These boards are optionally available:
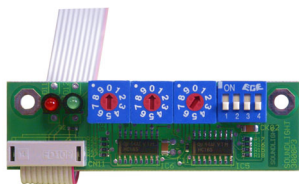
DMX START ADDRESS BOARD 3000P

Three address BCD switches and a DIP switch to set operating parameters. This is the standard board, which is compatible wil all our decoders (both pcb and DIN rail mount)

DMX START ADDRESS BOARD 3003P

Start address board with LED display and pushbuttons to set the DMX start address. Adress is retained in nonvolatile onboard memory, two settings may be stored.
DIP switches are emulated by soft functions F1...F4.

Start address boards are not contained with DIN rail mount decoders and must always be ordered separately!