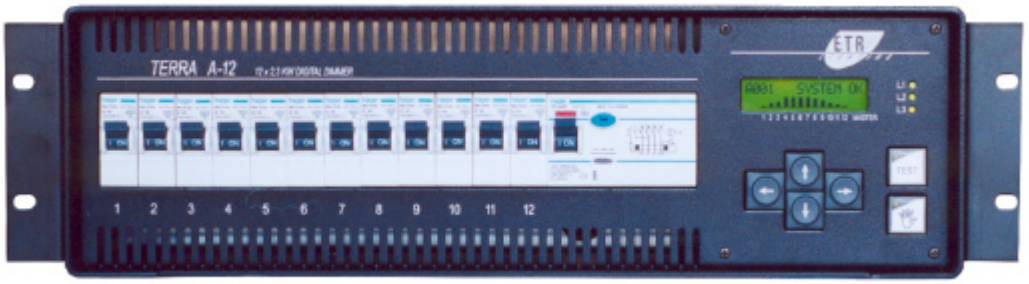
OPERATING MANUAL

TERRA 12
Digital Dimmer



Version 3.1
11/2001

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2001

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Introduction

Congratulations and thank you for choosing TERRA 12 Digital Dimmer. This next generation dimmer offers you the control over 12 circuits with up to 2300 Watts of power per channel.
Our first priority in developing the TERRA Dimmer Series were reliability and electrical security.

Please read this operating manual carefully prior to the installation and operation of your dimmer.

Precautions and Safety Instructions

Never open the dimmer. There are no user serviceable parts inside, however high voltages, which are a threat to your life. Please always refer to qualified personnel for installation and maintenance.

Avoid storing or using the Digital Dimmer in conditions of excessive heat or cold, or in places where it is likely to be subject to vibration, dust or moisture.

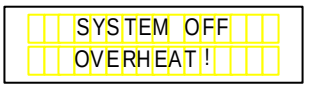
Carefully examine cables and connectors. If they are damaged have them replaced immediately by qualified personnel.

Ventilation

The TERRA Digital Dimmer is designed for continuous operation under full load. A built-in low-noise ventilator is cooling the dimmer. Fresh air enters at the front side, from where it flows through the dimmer. The air leaves at the side-panel to the right. It is essential that the air can flow freely.
Special care is needed when installing the dimmer into a rack. Make sure that there is sufficient space between the side-panel and the rack for the air to flow freely.

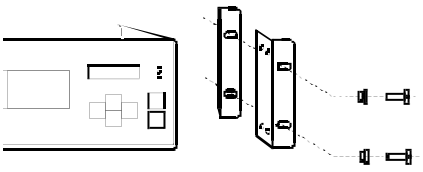
Temperature Control

The temperature in the TERRA 12 is monitored continually. With excessive heat the message OVERHEAT starts to blink in the display. If the temperature continues to rise, the dimmer will turn off automatically. The display shows the messages SYSTEM OFF and OVERHEAT. The ventilator is running. When the dimmer has cooled down, it turns on again automatically.
OVERHEAT is now blinking until the dimmer's temperature has reached an uncritical value.



19 inch Rack Mounting

If not ordered otherwise, each dimmer comes with two sets of rack ears for mounting into a 19-in rack. For proper interference suppression the dimmer has to be isolated with the enclosed washers and rings from the rack rails. Please make sure that adjacent equipment is physically separated.
On the front-side of each side-panel, you find two screws M4x8mm. They are used to secure the right-angle brackets. Make sure that the oval holes face to the front. The brackets are mounted either flush to the front-panel or slightly recessed.
The isolating washers fit between bracket and rack rail. The rings isolate the brackets from the screws.



Note: Only use the M4x8mm thread screws fixed to the dimmer! After removing the brackets, the screws have to be placed back in their original position.

DMX-Control-Signal

The TERRA 12 is controlled by the digital control-format DMX-512. The signals coming from the mixing console are connected to the DMX-IN socket at the rear of the dimmer. From the DMX-OUT connector the control-signals are linked to the next device.
Always use different ducts for control-wires and mains-cables.
You'll find more information on DMX-512 in the appendix.

Power Outputs

The TERRA 12 Dimmer is available with a variety of connections for the power outputs. The pin-assignment of the special connectors is printed on the respective back-panel.

To each output you can connect an incandescent lamp rated at least 60W / 230V and up to 2300W / 230V .
Under certain conditions (see below) you can also connect other loads. For this purpose TERRA 12 offers different dimmer characteristics.

Strobos, machines, motors and the like can not be dimmed. Make sure that you choose a switching characteristics for these kind of loads.
When connecting transformers each of them has to be safeguarded with its own fuse on the primary side.
If you use a low-voltage transformer, you should connect more than one lamp on the secondary side.
When using very low loads it may be necessary to operate a blind load (60W light-bulb) in parallel.

In any case it is the user's responsibility to ensure the correct installation, use and operation. Please check all devices before connecting.

Mains Connection

The TERRA 12 dimmer can be connected directly to a three-phase five-wire power-system 3NPE with 400V and 50 to 60Hz (three phases + neutral + earth, 230V between phase and neutral). The dimmer will automatically adapt to the power line frequency.
The power-connection and cord have to be protected against overload and short-circuit.
For safe and reliable operation the TERRA 12 has to be grounded properly.
Interrupt the power-supply with the mains switch or the fuse before connecting or disconnecting the mains-plug.

Fi-Switch (optional)

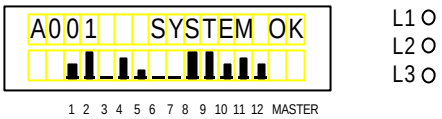
The FI-switch (fast interrupt) is – if present – located at the center of the front-panel. Operating the switch disconnects the power-supply on all phases. Operate the test-button regularly to check the correct operation of the switch.

Channel Fuses

A separate fuse is assigned to each output channel on the left side of the front panel. The fuses protect against overload and short circuit. Did a fuse blow, make sure to find and remove the cause (load too heavy, broken lamp, broken cable etc.) before turning on again.

Phase – Control

The three LEDs to the right of the display show the presence of the three phases L1, L2 and L3.
TERRA 12 has a separate power supply unit for each phase. It thus operates even if one or two phases fail.
When installing the dimmer at a new place, please check that all three LEDs light up with the same brightness. If some are brighter than others or if some don't light up at all, this indicates that the neutral conductor is poorly or not at all connected.
In this case, immediately disconnect the power supply and have the power supply checked by a professional electrician.



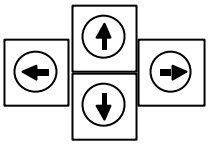
The Display

The Display shows all information except the phase-control (see above).
The main menu displays SYSTEM OK on the top right corner, as soon as the dimmer is ready.
Top left shows the DMX start address.
The bottom row shows the output value for each channel. The height of each bar corresponds to the output-value.
However, if no DMX-control-signal is present, the bottom row reads NO DMX SIGNAL!

Note: Avoid any mechanical strain to the display.

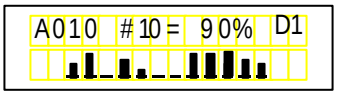
The Arrow Keys

The arrow keys give you access to all settings and parameters. Prolonged pressing of a key-button starts a search run where appropriate. The simultaneous pressing of two opposite buttons sets the cursor to the end position.



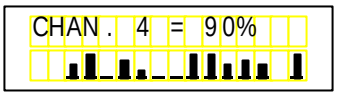
Retrieving Channel Information

In the main menu pressing the arrow keys ← and → shows additional information about every channel.
The display shows top left the DMX-address of the respective channel, the channel-number (preceded by a #), the output-value in % (preceded by a =). Top right shows the dimmer-curve associated to the channel.
After 1 minute approximately or after pressing the arrow key ↑ or ↓ the display returns to the main menu.



Manual Operation

You can operate the dimmer without external control device (such as a mixing console). To start manual operation continue to press the hand-button till its LED lights up.
The arrow keys ← and → select the channel you want to set up. The display shows on top the channel number and the actual output value in percent. The latter can be changed using the arrow keys ↑ and ↓. The bottom line shows the bars representing the output values of the channels and – bottom right – of the master. The master determines the overall brightness of this manual set-up.
Positioning the cursor completely to the left shows you the message, whether you want to delete all settings. If yes, press the arrow key ↑ for approximately 1 second. The arrow key → returns to the previous display without deleting the settings.

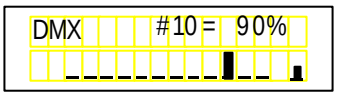


To turn off manual operation press the manual-button until the LED goes off. The set values remain stored.

Note: The manual mode does not suppress any DMX-control-signals from the control-desk. The higher value will be effective.
You can not enter manual mode while in test mode.

Test Mode

The test mode helps installing and adjusting a lighting system. Independent from the mixing-console can you feed the channels with a test-signal or turn them off.
To enter the test-mode press the TEST-button until its LED lights up. Choose with the arrow-keys ← and → the channel you want to adjust. The selected channel is indicated in the display with its number (#) and its percentage (%).
Top left of the display shows what controls the output. DMX is shown, when a DMX control-signal is active. OFF means the DMX-signal is turned off, PULS or FIX show that a test-signal is active. The arrow-keys ↑ and ↓ select one of these three options.
Bottom right the display indicates the test-signal with a bar. Moving the cursor to this bar gives you the option to change the test-signal. With the arrow-key ↑ you enter the change-mode.
In the change mode the arrow-keys ← and → move the cursor along the bottom line of the display. In the left position you choose with the arrow-keys ↑ and ↓ whether the test-signal is pulsating or fix. In the middle position you determine the brightness by its percentage. When you move the curser to OK you can enter the settings with the arrow-key ↑.



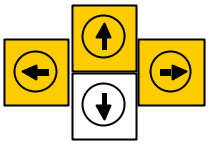
Note: If a switching characteristics is applied to a channel, this is indicated with ! ! ! displayed alternating with OFF or ON. Such a channel is always addressed with 100% or 0%. It always has to be switched on and off separately.
You can not enter test mode while in manual mode.
If you don't change any settings for a while, TERRA leaves the test-mode automatically.

The Menu Superuser

In the menu Superuser you can configure and select the following:

- DMX – start-address
- DMX-patch
- voltage for the preheating of the lamps
- select dimmer characteristics
- limit the output voltage
- manage the access
- language

You enter the menu Superuser by simultaneously pressing the arrow-keys ◄ ► and ▲. Now the display shows the functions of the arrow-keys. After selecting a function the arrow-keys ◄ and ► move the cursor. The arrow-keys ▲ and ▼ change the parameters.
EXIT leaves the mode you are actually in, without saving any changes. OK saves the changes and leaves the mode.



Selecting the DMX–Start-Address

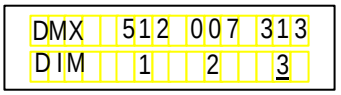
The DMX-start-address determines to which of the 512 DMX-circuits channel #1 of the dimmer reacts. Dimmer-channels 2 through 12 react to the following DMX-addresses.

Setting the DMX-ADDRESS
You set the DMX-start-address between A001 and A512 in the bottom-line of the display. By setting the address to "0" – the display shows PATCH - you activate the DMX-patch.

Setting the DMX-Patch

In the DMX-patch you can choose a separate DMX-address for every dimmer-channel. DMX-patch appears in the menu if activated in the DMX-start-address menu.

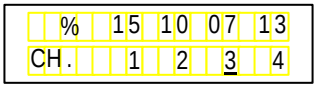
Selecting DMX-PATCH
The display shows on the bottom line the number of the dimmer channel. The top line shows the selected DMX-channel. To leave the menu move the cursor completely to the right and click 'OK'.



Preheating the Lamps

A small voltage applied permanently to each dimmer-channel heats the filament without emitting light. It thus reduces transient impulses when turning on which in turn prolongs the mean time before failure.

Selecting PREHEAT
The display shows on the bottom line the number of the dimmer channel. The top line shows the selected value for preheating in percent. 'SW' instead of percentage means that this channel is switched and therefore can't be preheated.
To leave the menu move the cursor completely to the right and click 'OK'.



Selecting Dimmer Characteristics

To each dimmer channel one of the following characteristics can be applied:

D1 voltage linear
The output voltage changes corresponding to the DMX-controlsignal.

D2 square law
The output voltage raises fast at the lower end and ends with a gentle slope at the maximum end.

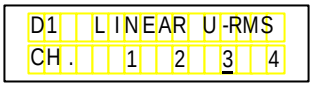
D3 linear degree
The phase angle changes corresponding to the DMX-value (S-shape curve).

FL fluorescent
This curve is best suited for dimmable fluorescent tubes. It gives you a nearly linear light-output.

S1 switching @ 50%
The channel is no longer controlled but switched on and off. The threshold is a DMX-value of 50%.

S2 switching @ 10%

S3 switching @ 90%

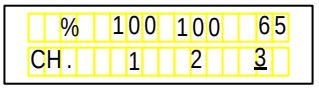


Selecting DIMMER-CURVE
The display shows on the bottom line the number of the dimmer channel
The top line shows the selected dimmer characteristics.
To leave the menu move the cursor completely to the right and click 'OK'.

Limiting the Output Voltage to a Maximum Value

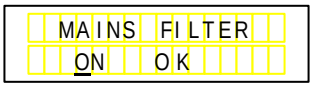
The maximum output voltage of each channel can be limited to a value between 100% and 30% of the available output value.

Selecting U OUTPUT MAX
The display shows on the bottom line the number of the dimmer channel
The top line shows the corresponding maximum output-voltage in percent. 'SW' instead of percentage means that this channel is switched and therefore can't be limited.
To leave the menu move the cursor completely to the right and click 'OK'.



Electronic Mains Filter

The TERRA dimmer features an electronic line filter to eliminate superimposed control signals and all AC power disturbances.
Operation of the dimmer with certain power generators or with very long power cords may cause inproper operation of the filter. (The dimmer turns on and off automatically.) In such a case, the filter has to be turned off.



Selecting MAINS FILTER
The filter can be turned on and off using the bottom left position in the display. To exit the menu move the cursor to OK.

Setting Access

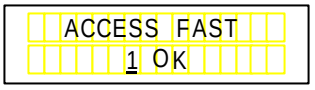
To prevent unwanted operation , the reaction to the keys 'Manual Operation' and 'Test' and to the menu Superuser can be slowed down or turned off. There are four levels.

Level 1: ACCESS FAST
The keys react without delay.

Level 2: ACCESS MIDDLE
You have to press the keys for about one second until they react.

Level 3: ACCESS SLOW
You have to press the keys for about 3 seconds until they react.

Level 4: ACCESS DENIED
This setting denies access to the 'Manual Operation'- and 'Test'-keys.
If you activate this lock while in manual operation-mode, you can't change or turn off the lighting-scene anymore.
To go back to the menu Superuser you have to press the arrow-keys ← → and ↑ simultaneously for at least 5 seconds.



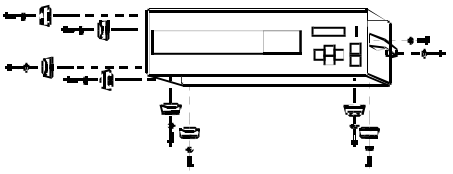
Selecting ACCESS
The bottom line of the display shows the selected level. You can change it with the cursor.

Selecting a Language

Selecting LANGUAGE
With the arrow-keys ← and → you choose one of the languages which are shown in the top line off the display.

Optional Accessories

A set consisting of eight large rubber stands and a carrying handle is available as an option.



Appendix

Specifications

Mains connection	3 NPE ~ 50/60Hz 400V
Consumption	40A max. per phase
Rated power	2300W / 10A per channel
minimum load	60W per channel
Power line frequency	45 – 65Hz
Dimensions	428mm x 130mm x 318mm
rack-version	19“, 3U, 318mm depth
Weight	approx. 14kg (31lbs) depending on version

CE

Phase-assignment	L1 / channels 1, 4, 7, 10
	L2 / channels 2, 5, 8, 11
	L3 / channels 3, 6, 9, 12

DMX-512 Pin-assignment and General Information

5-pin XLR-socket: pin 1 = ground, pin 2 = data-, pin 3 = data+, pin 4 and 5 hard wired form In to Out.

DMX-512/1990 is a digital data-format. It was developed especially for the control of lighting equipment by the USITT (U.S. Institute of Theatre Technology) and revised 1990.
Two shielded wires transmit the data to control up to 512 circuits. The values for the brightness of each circuit are serially transmitted in digital form. The transmission is repeated ca. 40 times a second.
Electrically, the DMX-512-output is identical to a RS-485 interface. That means it can drive up to 32 receivers using cables up to 300 m long. No junctions are allowed. The signal coming from the transmitter (mixing console) has to be connected to the input of the first dimmer. From its output it is daisy-chained to the input of the next receivers etc.
The end of the line is ideally terminated with a matching impedance. A resistor rated 120 Ohm / 0,3 W soldered between pin 2 and pin 3 of a XLR-connector makes a perfect terminating connector. It is plugged into the DMX-Out socket of the last receiver.
If the DMX-signal breaks down TERRA saves the last setting.

Terminals

This version is for qualified personnel only! The TERRA dimmer is shipped without connectors and has to be processed further before installation!

The terminals are located behind the back-panel. To access them, you need to unscrew eight M4 screws and remove the back-panel. (Back-panels fitted with sockets have countersunk screws.)

Mains Connection

After removing the back-panel, the terminals for connecting to the mains are accessible from the rear. They accept wires with a cross-section up to 10mm². They are labeled L1, L2 and L3 for the phases. N means neutral and PE the protective earth.

The cable clamp fixed to the rear panel accepts cables with an outer diameter of ca. 20mm.
Pull the cable through the clamp and secure it with the strain-relief. Make sure the incoming neutral-conductor has a cross-section equal to or larger than the phase-conductor.

Output Terminals

After removing the back-panel, the output-terminals are accessible from the rear. They accept wires with a cross-section up to 2,5 mm². 12 terminals for the earth-conductor "PE" are located to the right of the mains terminals. 12 neutral terminals "N" are located to the left below the mains terminals. The terminals for the phases are placed next to the triacs and labeled with large numbers from 1 to 12.
On the top heat-sink two nylon-holders for fixing the cables are available.

Please note that this terminal-section also serves as air-duct for ventilation. Therefore don't fill it with wires and connectors, if not necessary. During operation always have a back-panel without big holes mounted.