



opticalCON | powerMONITOR User Manual



NEUTRIK®

version 2.0

opticalCON powerMONITOR

User Manual

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The user manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



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1. Warning & Important Notice

This equipment is intended for use in professional applications where adequate safety mechanisms are being implemented. Review the following safety precautions to avoid injury and prevent damage.



CAUTION: Dispose

Production of this product required the extraction and use of natural resources. The equipment may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. In order to avoid release of such substances into the environment and to reduce the use of natural resource, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately.



CAUTION: Transport

For transportation protect powerMONITOR from rain and handle it carefully.



CAUTION: Voltage

Use dedicated power adapter: Before connecting make sure that voltage rating and polarity is correct



CAUTION: Battery

- Avoid short circuits
- Operate and charge the battery between 0°C and +45°C.
- Do not heat the battery above 60°C.
- Do not dispose of the battery by burning.
- Do not solder directly to the battery.
- Do not disassemble the battery.
- Do not insert the battery in reverse polarity.

The Li-Io battery has a potential for fire or burning.



CAUTION: Laser Handling Precautions

Laser light can damage your eyes. Laser light is invisible. Viewing it directly does not cause pain. The iris of the eye will not close involuntarily when viewing a bright light, consequently, serious damage to the retina of the eye is possible. Never look into the end of a fiber which may have a laser coupled to it. DO NOT use magnifiers in the presence of laser radiation. Diffused laser light can cause eye damage if focused with optical instruments. Should accidental exposure to laser light be suspected



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2. Specifications

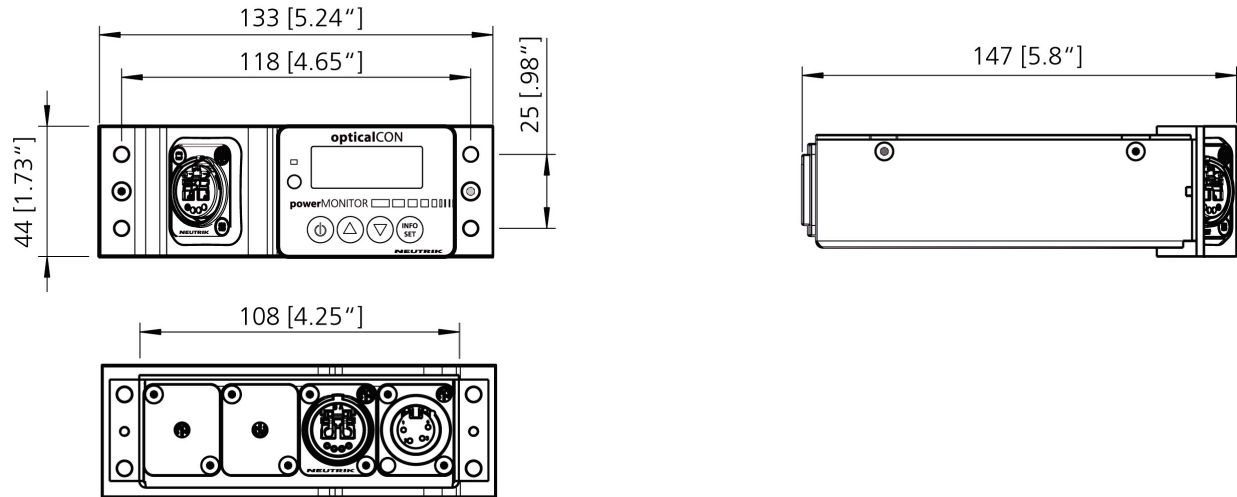
Power supply:	5V DC external
Rechargeable batteries:	2x 1.5V AA
Battery lifetime:	72 h
Max. current:	250 mA
Power Adapter:	110 VAC – 220VAC
Temperature range:	0°C – 70°C
Housing:	steel, gal/black painted
Connectivity:	opticalCON; LC
Return loss:	> 50 dB
Insertion loss:	< 0.5 dB
Factory calibration:	-5 dBm (+/- 0.1) -12 dBm (+/- 0.3) -24 dBm (+/- 0.5)
Tolerance Absolute Value [dBm]	SM: 0.5 / MM (VCSEL): 1.0 / MM (LED): 1.0
Tolerance Relative Value [Δ dB]	SM: 0.1 / MM (VCSEL): 0.5 / MM (LED): 0.5
Area of operation:	SM: +3 dBm to -30 dBm
Wavelengths:	single-mode: 1310/1550 nm multimode: 850/1300 nm
Internal fiber:	single-mode: 9/125 μ m multimode: 50/125 μ m
Protection class:	IP 40
Vibration:	IEC 60068
Shock:	IEC 60068
Signal smoothing:	1s
FCC:	FCC / 47CFR Port 5 (Subpart B, Class B, digital Device)



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3. Design & Dimensions

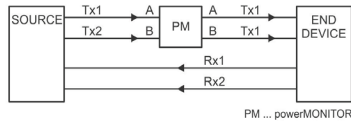
Dimensions [mm / inch]



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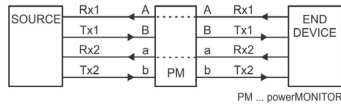
4. Fiber Wiring - Example

NO2*-2F-2R-PM



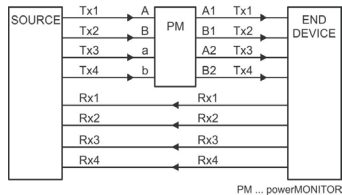
Due to both channels are constantly monitored connect the transmitting lines (e.g. TX 1 & TX 2) on the input port from the powerMONITOR. The receiver lines (RX 1 & RX 2) are hardwired with an additional fiber cable and are not monitored.

NO2*-4F-4R-PM



Transmission lines TX 1 and TX 2 are constantly monitored and RX 1 and RX 2 (not monitored) are hardwired on the powerMONITOR in order to avoid additional fiber cables for the receiving lines.

NO4*-4F-2R-PM
NO4*-4F4R-PM



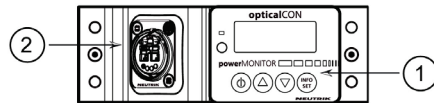
TX 1-TX 4 lines are connected to the input port from the powerMONITOR in order to monitor the transmitted signals. The receiving lines are hardwired with an additional fiber optic cable and are not monitored.



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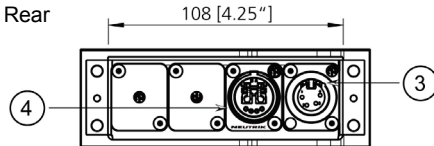
5. Keys & Connectors

Front

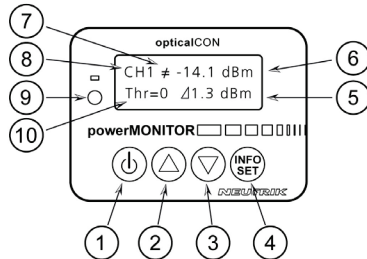


No	Function
1	Monitor unit
2	Fiber input - opticalCON
3	External power supply - (5V DC)
4	Fiber output (opticalCON)

Rear



Monitor Unit



No	Function
1	Power ON / OFF button
2	UP button ▲
3	Down button ▼
4	INFO / SET button
5	Relative attenuation
6	Absolute attenuation
7	Charging character
8	Chosen channel
9	Alarm LED (red light)
10	Threshold level

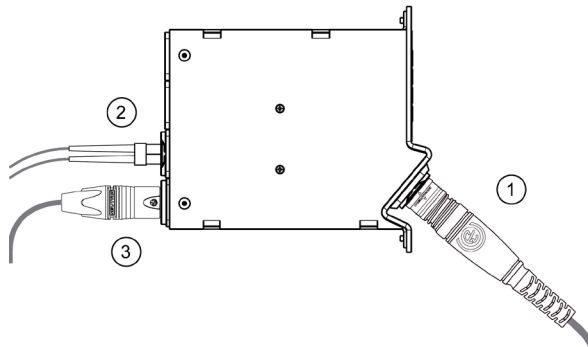


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6. Getting Started

Connect the opticalCON cable from the source (e.g. DVI extender, CCU, etc.) to the input port and the opticalCON cable of the load (e.g. camera, stage box, video wall, etc.) to the output port.

If required plug the external power supply NOPS-1RU-PM to the power socket. Optionally the breakout box can be powered with internal rechargeable batteries (not included).



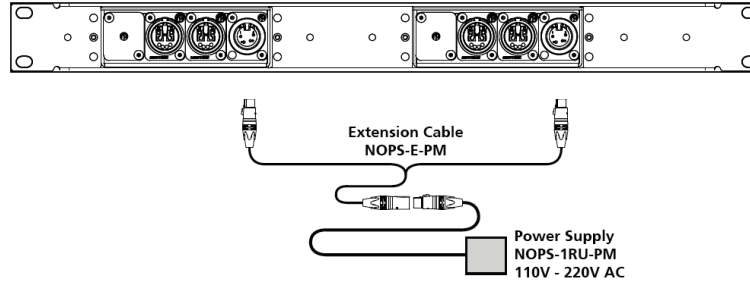
No	Function
1	Fiber input - opticalCON
2	Fiber output - opticalCON or LC
3	Power supply +5V DC

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7. Setup - Power Supply

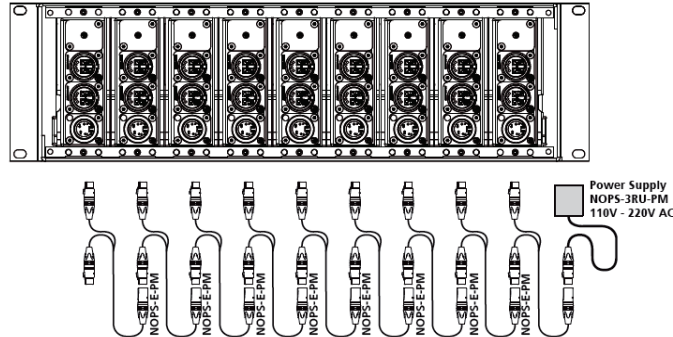
If several power supplies are required in one rack use extension cables.

NZPF1RU - rear view



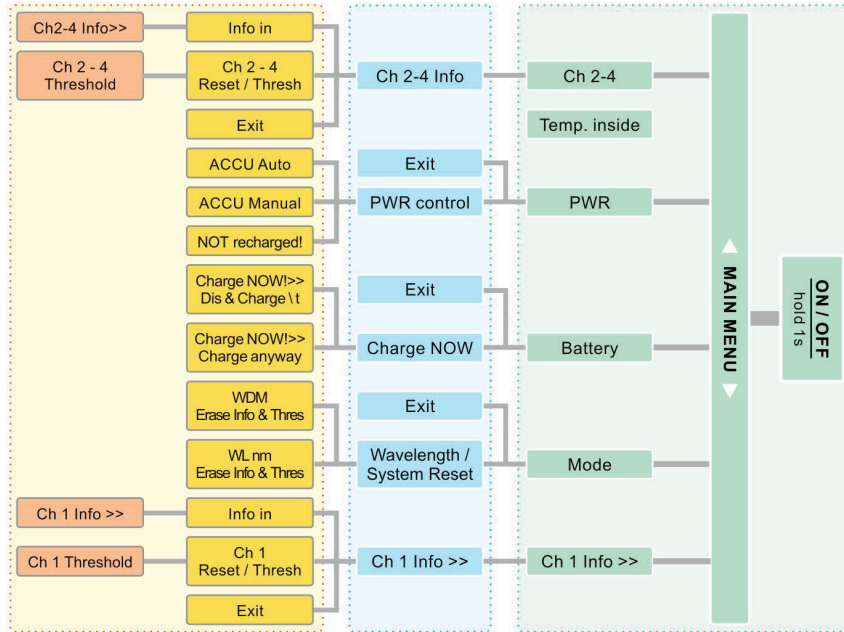
NZPF3RU - rear view

"Daisy chain" the extension cables to supply all units with one external power supply (NOPS-3RU-PM)



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8. Software Menu Structure



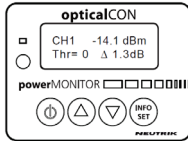
Attention:

The WDM modus in the Wavelength section is available only in single-mode operations. When the powerMONITOR is turned on, an internal test starts and checks the proper functionality of the alarm and LED.




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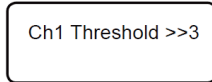
9. Channel Reset / Threshold Selection






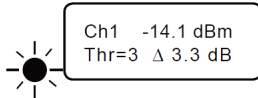
1. Select "Channel Menu" using  or .



2. To enter "Ch1 menu" push  twice.
This will reset the relative attenuation.



3. Select the current threshold level (dB) by pushing  or  and finally  to save.



4. The lower line indicates the chosen threshold and the relative attenuation (ΔdB)



Pls. note: To switch OFF the alarm push  3 times.

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9.1 Change Channel Designation

Ch1 -30.1 dBm
Thr=0 Δ 1.3dB

Ch1 Info in

Ch1 Info >>
CAMERA _

Ch1 info:
CAMERA

1. Select "*Channel Menu*" using  or .
2. To enter "*Ch1 info*" - menu press  twice.
3. To change the channel designation press  or  till display indicates "*Ch1 info*" - menu and confirm with .
4. Change the displayed symbol by using  or  and select character with .
5. Repeat step 3 and 4 for additional characters.
6. To save move the cursor to the right end of the display.
7. Check the entry by pushing . (returns to main info after 10 seconds)






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10. Mode - Wavelength Selection (Single-mode)



Set the wavelength according to your application: 1310 / 1550 nm or WDM for single-mode

MODE:
SM 1310

1. Select the "Wavelength Menu" using  or .


2. Push  twice to modify the settings.

WL nm >> SM 1550
Erase Info&Thres

3. Hit  or  to switch between the wavelengths and WDM section.

SM: 1310 / 1550 nm / WDM
MM: 850 / 1300 nm

WDM
Erase Info&Thres

4. Push  to save the settings. Now the powerMONITOR restarts.

WDM section only works in single-mode operations

Pls. note: A modification of the wavelength selection will reset all settings to factory default.








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10.1 Mode - Wavelength Selection (Multimode)


Adjust the settings according to the used wavelength and type of light source (LED, VCSEL)

Mode:
MM850 VCSEL

WL >> MM850 VCSEL
Erase Info & Thres

1. Select the "Wavelength Menu" using  or .
2. Push  twice to modify the settings.
3. Hit  or  to switch between the following wavelengths and types of light source.

Symbol	Description
MM850 LED	850 nm, multimode, LED light source
MM850 VCSEL	850 nm, multimode, VCSEL light source
SM1300 LED	1300 nm, multimode, LED light source
SM 1300 VCSEL	1300 nm, multimode, VCSEL light source

4. Push  to save the settings. Now the powerMONITOR restarts.









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11. Battery Status / Instant Charging

Battery: 2.61 V
↑! □□□□

Charge NOW! >>
Charge anyway τ

1. Select "Battery Menu" using  or .
2. Press .
3. Press  or  to switch between the two charging modes.
4. To set a mode press .

Mode	Function
Dis - Charge \ &	Discharges battery before recharging (gently)
Charge anyway τ	Starts battery charging immediately



Attention:



If the battery status is undercutting a defined voltage level, an alarm sounds.



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12. Power Control Selection




PWR: EXTERNAL
NOT recharge! ⚡

1. Press  or  till the "power control" - menu is displayed.

If there is an external power supply plugged in, the first line of the display indicates *EXTERNAL*.

The second line shows the current battery mode.

2. Hit .

3. To switch between the battery mode press  or  and confirm with .

Internal PWR >>
NOT recharge! ⚡

Mode	Function
ACCU Auto \ & τ	Depending on the battery status the powerMONITOR starts to discharge/charge automatically (gently). Only works with rechargeable batteries.
ACCU Manual τ	Charging starts immediately without checking the battery status.
NOT recharge! ⚡	No charging.



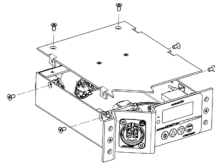
Attention:

The battery can only be charged by using an external power supply! (NOPS-1RU-PM)

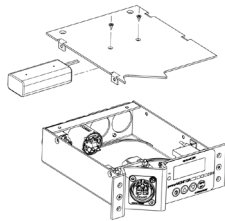


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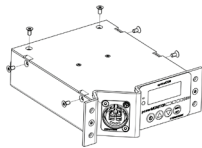
13. Appendix – Change Rechargeable Batteries



1. Untighten the screws and remove the metal plate from the powerMONITOR



2. Remove internal battery holder to replace the rechargeable battery (2x 1.5V AA) by untighten the 2 screws on the top from the metal plate.



3. Attach the metal plate by tightening the 12 screws.



Attention:

Do not jam the fibers or damage the print circuit board (PCB) inside the powerMONITOR.

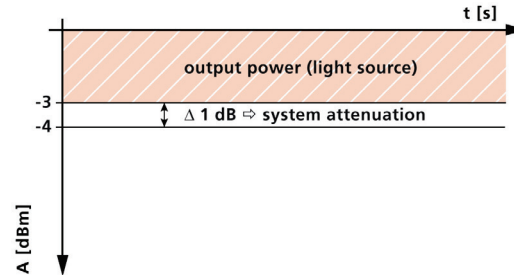
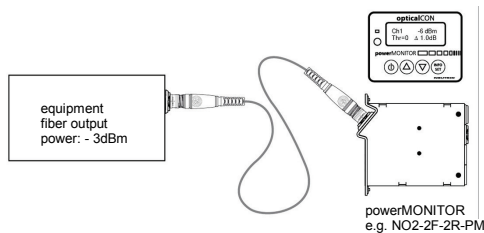
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14.1 Appendix System Monitoring

a) System monitoring with known output power

The powerMONITOR measures the deviation of the signal power at the end of the system as reference to the typical fiber output power from the light source (e.g. DVI converter, SFP transceiver, etc.) according to the device specifications.

At the example below a light source with constant output power (-3dBm) is connected with an opticalCON cable to the powerMONITOR. The monitor unit shows a received power on -4 dBm which means the deviation Δ is 1 dB in reference to the output power of -3 dBm. The relative deviation is the system attenuation caused by the opticalCON cable on this example.



Fiber output power | -3 dBm |
- Received power (absolute value): | -4 dBm |

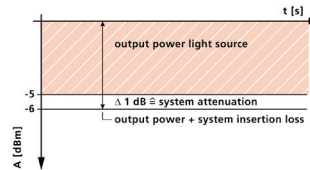
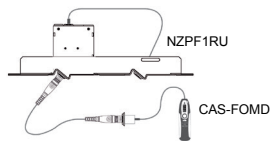
System attenuation (relative value Δ dB): 1 dB

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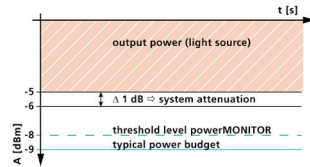
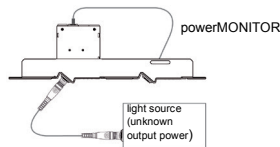
... Appendix – System Monitoring

b) System monitoring with unknown output power

To determine the attenuation of a system, connect a light source with defined output power like Neutrik's measurement KIT (CAS-FOMD¹) with help of a LC patch cable and the used opticalCON cable (e.g. NKO4S-R-0-50¹) and powerMONITOR. In the example below the output power from the light source is -5 dBm. The powerMONITOR shows on the display -6 dBm which is a 1 dB insertion loss deviation (Δ).



Second connect the light source with unknown output power with the powerMONITOR. The measured values are the output power reduced through the system insertion loss from the opticalCON cable.



Set the threshold level according the known power budgeted from the system. Consider that insertion loss caused by cable bending and fiber contamination requires additional headroom to the power budget limit. If no power budget is known use typical attenuation values from the table below

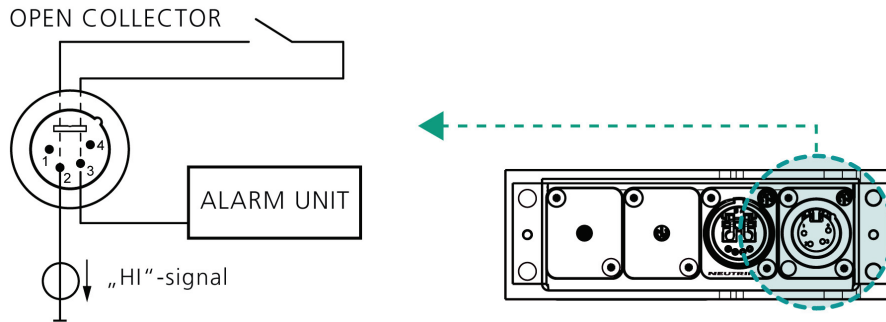
Fiber Type	Single-mode	Multimode
Power budget	-9 dB	-7 dB

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14.2 Appendix – External Alarm Signal

With help of a custom cable (not included) there is the option to connect an external alarm unit (e.g. lamp) with the powerMONITOR. Pin 2 and 3 from the power supply (see section 5) are connected to an internal, normally open solid state relay. If the alarm starts the relay closes the internal circuit and the signal from pin 2 reaches the output pin 3.

Relay parameter	Value
Max. voltage	30 Vp
Max. current	1.2 A



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15. Warranty

Neutrik AG warrants that the product will be free from defects in materials and workmanship for a period of 2 years from the date of original purchase from an authorized Neutrik distributor. If the product proves defective during this warranty period, Neutrik AG, at its option, either will repair the defective product without charge for parts and labour, or will provide a replacement in exchange for the defective product. Parts, modules and replacement products used by Neutrik AG for warranty work may be new or reconditioned to like new performance. All replaced parts, modules and products become the property of Neutrik AG.

In order to obtain service under this warranty, Customer must notify Neutrik AG of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the headquarters. This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Neutrik AG shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Neutrik AG representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non - Neutrik AG supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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