



MADRIX E03 ORION Lighting Control User Guide

[Home](#) » [MADRIX](#) » MADRIX E03 ORION Lighting Control User Guide 

Contents

- [1 MADRIX E03 ORION Lighting Control](#)
- [2 Technical Manual & Quick Start Guide](#)
- [3 Limited Warranty](#)
- [4 Package Contents](#)
- [5 Safety Instructions](#)
- [6 Technical Specifications](#)
- [7 Compatibility](#)
- [8 Using The MADRIX® 5 Software](#)
- [9 Connectivity](#)
- [10 Voltage Characteristics Examples](#)
- [11 Reset To Factory Default Settings](#)
- [12 Technical Support](#)
- [13 Frequently Asked Questions \(FAQs\)](#)
- [14 Documents / Resources](#)
 - [14.1 References](#)



MADRIX E03 ORION Lighting Control



Technical Manual & Quick Start Guide

5th Edition—July 2022

Thank you for purchasing MADRIX® ORION!

Please read this manual carefully and thoroughly before using MADRIX® ORION. Make sure that you fully understand all information.

This MADRIX® ORION Technical Manual is written in English and German.
(Dieses Handbuch wurde in englischer und deutscher Sprache verfasst.)

Developed and made in Germany.

Imprint

Address: inoage GmbH Wiener Straße 56 01219 Dresden Germany

- Web www.madrix.com
- E-mail info@madrix.com
- Phone +49 351 862 6869 0

Managing Directors: Christian Hertel, Sebastian Pinzer, Sebastian Wissmann

Trademark Credits

- Microsoft® and Windows® are U.S. registered trademarks of Microsoft Corporation. Art-Net™—Designed by and Copyright Artistic Licence Holdings Ltd.
- All other products mentioned herein may be trademarks of their respective companies.
MADRIX® is a registered trademark of inoage GmbH.

© 2022 inoage GmbH. All rights reserved.

Information is subject to change at any time and without prior notice. Errors and omissions excepted.

Reproduction, adaptation, or translation without prior written permission is prohibited. inoage GmbH does not grant a guarantee on validity for a particular reason, the marketability, or other properties of the product. There is no way to assert a claim to engage GmbH, neither in the legal way nor in other ways. engage GmbH is not responsible for damages, including all disadvantages that are not just limited to the loss of sales, but that is caused due to the use of the product, due to the loss of serviceability of the product, misuse, happenings, circumstances, or actions that engage GmbH does not have an influence on, no matter if the damages, as well as consequential damages, are direct or indirect; whether they are special damages or others, nor if the damage is caused by the owner of the warranty or a third person.

Limited Warranty

Five years of limited manufacturer's warranty are granted to the purchaser of this product with regards to a constructional fault, material defect, or incorrect assembly the manufacturer has caused or is to be held responsible for.

This warranty will be void if the interface is opened, modified, or damaged through inappropriate handling, wrong usage, overvoltage, or damaged through any other cause. All details are available online at

www.madrix.com/warranty

Package Contents

- 1x MADRIX® ORION
- 1x Set of screw terminals (2x 6-pin and 1x 2-pin)
- 1x USB 2.0 cable (certified)
- 2x Wall-mount brackets
- 1x This technical manual / quick start guide

Please note: Check the package contents and the condition of the interface after unpacking! Contact your supplier if something is missing or damaged. Do not use the device if it seems to be damaged!

Safety Instructions

Please follow the instructions below to avoid mishandling, damage to the device, or personal injury:

- THE DEVICE WORKS WITH LOW VOLTAGE (DC 5 V – 24 V). DO NOT USE ANY OTHER VOLTAGE!
- External USB power supplies: Using non-permissible units poses risk of fire. 5.5 V 500 mA max. output is allowed.
- Any connected external power supply needs to be fused according to its output and/or short-circuit proof.
- In order to cut off the supply of power completely, you need to disconnect any external power-supply unit as well as USB.

Recommendation: DIN-Rail Power Supply 12 V (MEAN WELL HDR-15-12, DC Output, 12 V, 1.25 A, 15 W, 1 SU, DIN Rail) / Order Number: IA-HW-001027 or DIN-Rail Power Supply 24 V (MEAN WELL HDR-15-24, DC Output, 24 V, 0.63 A, 15.2 W, 1 SU, DIN Rail) / Order Number: IA-HW-001031.

Beware that the interface works with electrical power. Only use the device in dry environments (indoor use). The IP Rating of the device is IP20. Do not use the interface in humid environments and avoid contact with water or any other liquids. Turn off the power if you are not using the device for a long time. Avoid unwanted voltage on the

cables at all times. Do not remove any parts from the unit or connect to an ungrounded circuit. Do not connect the unit to equipment that is switched on. Only connect the unit to equipment that is initially powered off. There are no user serviceable parts inside or outside the interface. Repair service lies only within the responsibilities of the manufacturer. If the interface appears to be defective, please contact your dealer. After expiration of the warranty period you may contact your supplier or the manufacturer to have the unit repaired against payment of an individual service fee if possible. The interface has several ports and slots. Only connect or insert devices, cables, and connectors to the individual ports and slots using connectors of the same type as the port. Do not use inapplicable equipment. This device should be used by professionals. The device is not designed to be operated by nonprofessionals or children. This electrical device and its accessories need to be disposed of properly. Do not throw the device into normal trash or household waste. Please recycle packaging material whenever possible

Usage

In general, this device is designed as a general-purpose input device for analog input and Ethernet-based output over Art-Net or Streaming ACN for remote control and interactivity. Do not use the interface for any other, deviating purpose. Directly connect to a wide range of compatible sensors, potentiometers, switches, and triggers. Easily create interactive projects using sensors for light, temperature, PIR, and many more. The device can be connected to and disconnected from USB or Ethernet network during use and without a reboot (Hot Swapping & Plug and Play). Multiple interfaces can be used at the same time.

Technical Specifications

Supply Of Power:

(See p. 6 – p. 11)

DC 5 V – 24 V; over A) 2-pin pluggable screw terminal with 500 mA max. load per port when supplying through to the ports, B) 5 V USB, C) Port 1 or Port 2

- **Power Consumption:** < 1.5 W (300 mA) during normal operation (500 mA max. fused)
- **Network Protocols:** Art-Net (I, II, 3, 4), Streaming ACN (sACN / ANSI E1.31)
- **Input Signals:** 0 V – 12 V, analog
- **Ports:** 2x ports (Via 2x 6-pin pluggable screw terminals)
- **Input Pins:** 2x 4 separate pins (8x in total)
- **Ethernet:** 2x RJ45, Auto MDI-X, daisy-chain support, 10/100 MBit/s (Compatible with 1 GBit/s)
- **Ethernet Switch:** Lookup Table (ALU) for 1024 unicast MAC addresses
- **USB:** 1x port, USB 2.0, type-B female socket
- **Case:** Non-conductive, V-0 flammability rating (UL94 test method), designed for 35 mm DIN-rails or wall mounting
- **Dimensions:** 90 mm x 70 mm x 46 mm (Length x Width x Height)
- **Weight:** 105 g | 120 g incl. screw terminals and wall mounts
- **Temperature Range:** -10 °C to 70 °C (Operating) | -20 °C to 85 °C (Storage)
- **Relative Humidity:** 5 % to 80 %, non-condensing (Operating / Storage)
- **IP Rating:** IP20
- **Certificates:** CE, EAC, FCC, RoHS
- **Warranty:** 5 years of limited manufacturer's warranty

IP Address And Other Device Information

You will find the following important information on the side of the device:

- Serial number ('Serial')
- Hardware revision ('Model')
- Default and pre-configured IP address ('Default IP') (See p. 14 to reset the device to the default IP address if needed.)

Compatibility

- MADRIX® ORION is a standard network node for Art-Net or Streaming ACN.
- You can use the device with any compatible software, console, or controller.

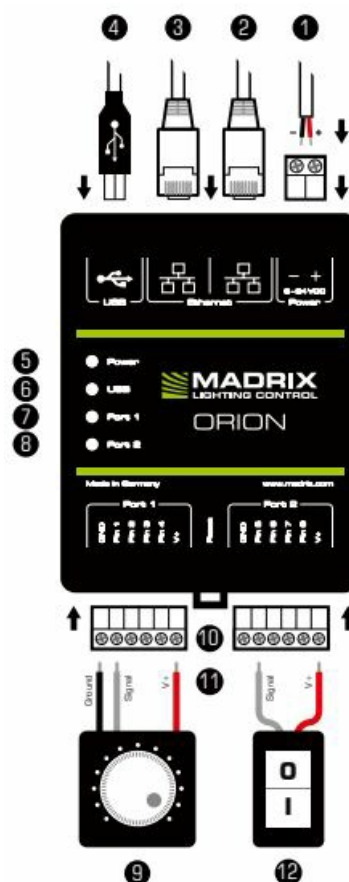
See chapter 'Technical Specifications' on p. 4 for detailed information

Using The MADRIX® 5 Software

MADRIX® 5 is a professional and advanced LED lighting control software. It supports Art-Net and Streaming ACN; among many other communication protocols. It is recommended for usage in combination with MADRIX® ORION, but only required if you would like to receive data from the device over USB.

For more information about MADRIX® 5, including its minimum system requirements and supported operating systems, visit the website: www.madrix.com

Connectivity



- Power
- Right Ethernet port, incl. 2 status LEDs
- Left Ethernet port, incl. 2 status LEDs

- USB port
- Status LED for Power
- Status LED for USB
- Status LED for Port 1
- Status LED for Port 2
- Port 1
- Reset button
- DIN-rail unlocking clip
- Port 2

Please note:

The package contents do not include network cables, power cables, or input equipment

2x Mounting Brackets:

Put each bracket in the pre-drilled holes on the device's left and right side. Safely secure the assembled unit only on solid surfaces using screws with $\varnothing = 3.5$ mm

Connecting Your Input Equipment

See chapter 'Connection Diagram Examples' on p. 8 for more information.

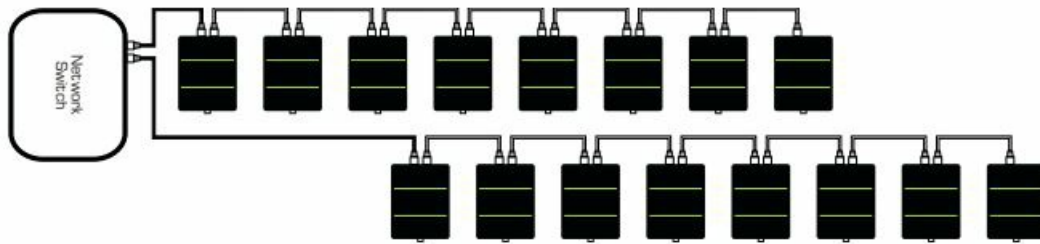
- **Step 1)** Completely switch off your supply of power before connecting your input equipment to the device!
- **Step 2)** Connect your input equipment to the provided 6-pin screw terminals:
You may connect only to Port 1, only to Port 2, or to Port 1 and Port 2.
 - For each pin, connect GND (Ground) and V+ to the same port as the pin.
 - Pay attention where to connect Ground, Signal, and V+; as indicated on the device as well as required by the diagram.
 - Insert each individual wire consecutively and tighten the corresponding screw with a suitable screw driver.
- **Step 3)** Plug the 6-pin screw terminals into the device. The screws must face upwards.
- **Step 4)** Continue with '2) Connecting To Power And Data' below.

Connecting To Power And Data

- **Step 1)** Be careful when handling the device and electrical power! Completely switch off your supply of power before connecting to the device!
- **Step 2)** Connect your power cables to the provided 2-pin screw terminal:
 - Pay attention where to connect + and –; as indicated on the device.
 - Insert each individual wire consecutively and tighten the corresponding screw with a suitable screwdriver.
 Plug the 2-pin screw terminal into the device. The screws must face upwards. Alternatively, you can supply 5 V power over USB
- **Step 3)** Connect to USB or to Ethernet network to send data as required.
- **Step 4)** Do not switch on your supply of power until all required power cables are connected to MADRIX® ORION.
- **Step 5)** Continue by configuring your device as described in chapter '3) Device Configuration' on p. 13.

Daisy-Chain Support

MADRIX® ORION features 2 separate Ethernet network ports. Either one is fully functionally for IN and OUT and can be used for the data connection without using a separate network switch or router. It is recommended to connect a maximum of 8 units after one another in a row.



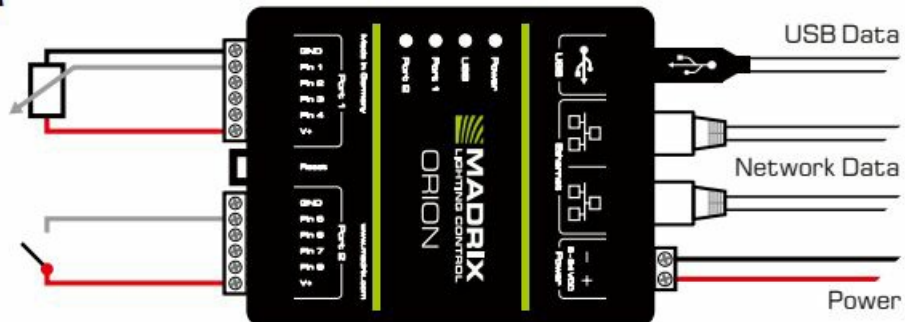
Connection Diagram Examples

You can connect your input equipment, MADRIX® ORION, supply of power, and data cables in different ways. The following pages show several examples. These schemes are to be seen independently of the direction, position, and mounting method. Please see p. 6 and p. 7 for further information. **WARNING: SUPPLY POWER TO ORION ONLY ONCE! DO NOT CONNECT V+ MULTIPLE TIMES BY CONNECTING IT VIA PORT 1/2 AND POWER**

Legend

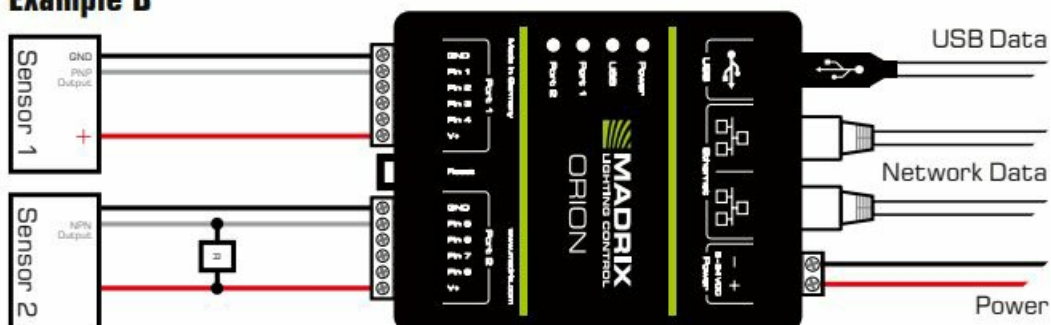
- Connection required for Ground.
- Connection required for Signal.
- Connection required for V+.

Example A

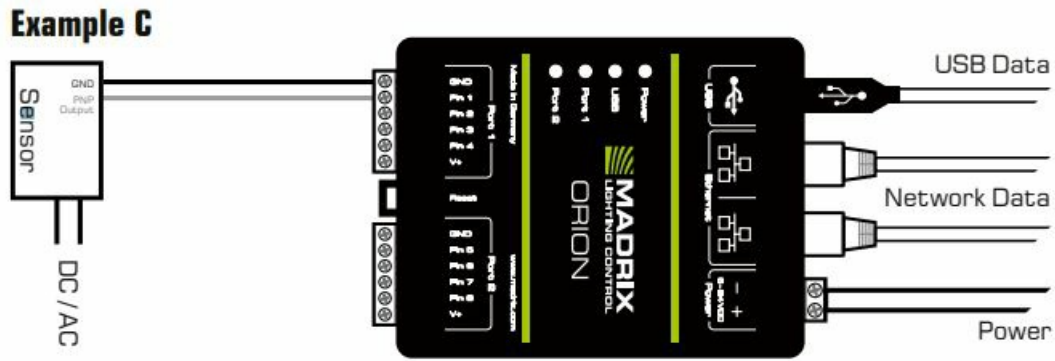


Description: Power is supplied only once to ORION and also used for the input equipment. Each Port is protected with 500 mA max. For example, a potentiometer is connected to Port 1 via Ground, Signal at Pin1, and V+, while a switch is connected to Port 2 via Signal at Pin 5 and V+

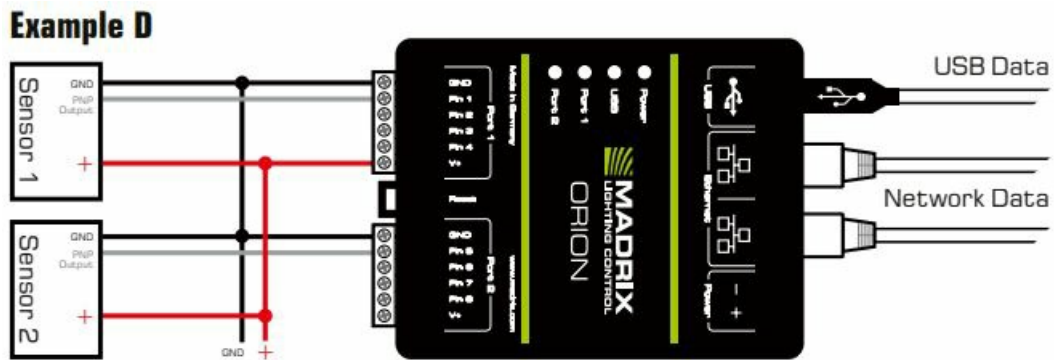
Example B



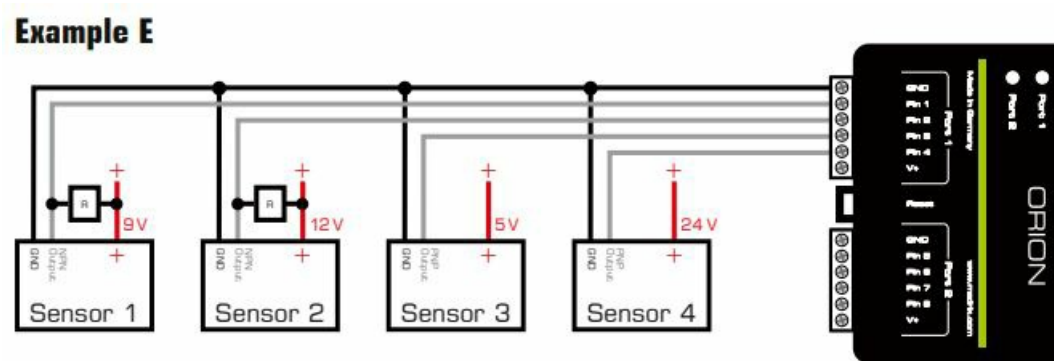
Description: Power is supplied to ORION and supplied separately to the input equipment. The sensor is connected to Port 1 via Ground and Signal at Pin 1, but not V+



Description: 5 V – 24 V power is supplied externally and to all input equipment. For example, a sensor is connected to Port 1 via Ground, Signal at Pin1, and V+ to supply power to ORION once, while a second sensor is connected to Port 2 via Ground and Signal at Pin 5, but not V+!

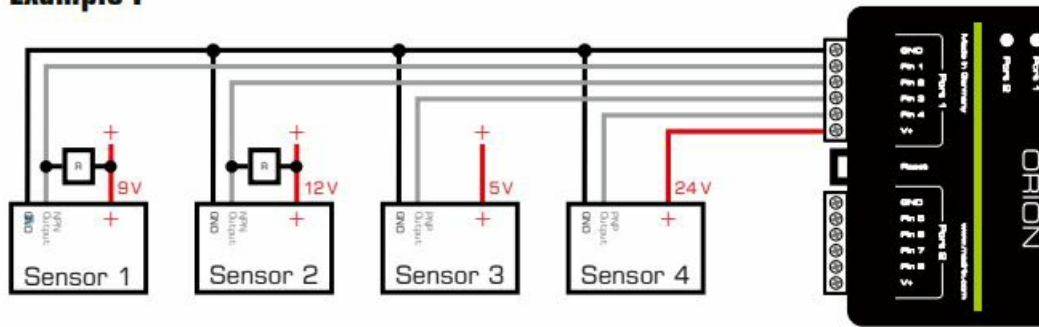


Description: 5 V – 24 V power is supplied externally and to all input equipment. For example, a sensor is connected to Port 1 via Ground, Signal at Pin1, and V+ to supply power to ORION once, while a second sensor is connected to Port 2 via Ground and Signal at Pin 5, but not V+!



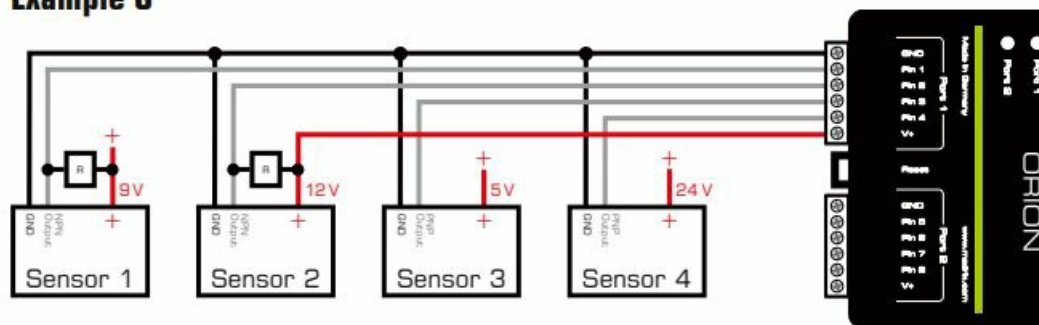
Description: 4 different sensors, each with their own supply of power, are connected to the 4 pins of a single device port. All are connected to ORION together via Ground. To Pin 1 and Pin 2 each, an NPN output sensor with an open collector is connected plus a 1kΩ– 10kΩresistor. Power to ORION is supplied separately with DC 5 V – 24 V or 5 V USB.

Example F



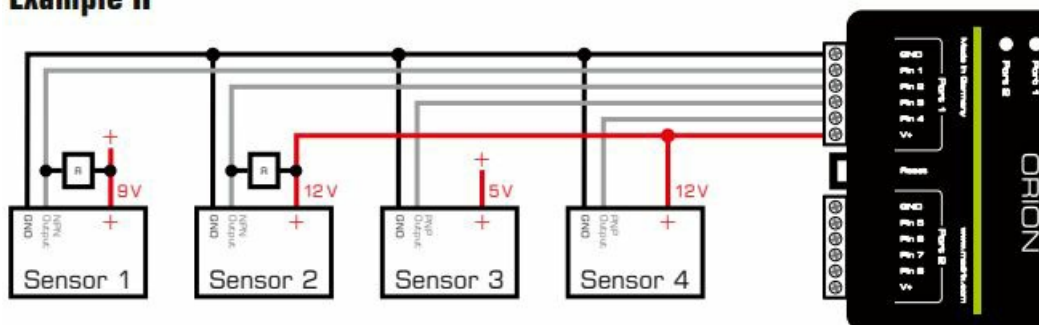
Description: 4 different sensors are connected to the 4 pins of a single device port and together via Ground. The required 24 V power for Sensor 4 is supplied from ORION, while power is supplied separately and individually to the other sensors. To Pin 1 and Pin 2 each, an NPN output sensor with an open collector is connected plus a 1k Ω – 10k Ω resistor. DC 24 V power is supplied to ORION

Example G



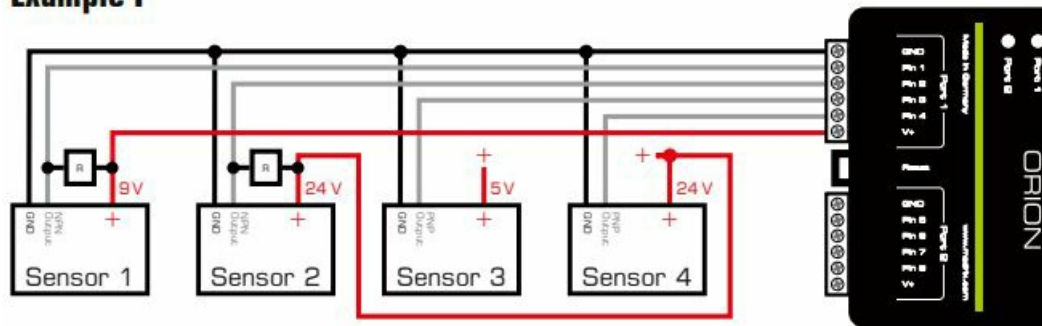
Description: 4 different sensors are connected to the 4 pins of a single device port and together via Ground. The required 12 V power for Sensor 2 is supplied from ORION, while power is supplied separately and individually to the other sensors. To Pin 1 and Pin 2 each, an NPN output sensor with an open collector is connected plus a 1k Ω – 10k Ω resistor. DC 12 V power is supplied to ORION.

Example H











Description: 4 different sensors are connected to the 4 pins of a single device port and together via Ground. The required 12 V power for Sensor 2 and Sensor 4 is supplied together from ORION, while power is supplied separately and individually to the other sensors. To Pin 1 and Pin 2 each, an NPN output sensor with an open collector is connected plus a 1k Ω – 10k Ω resistor. DC 12 V power is supplied to ORION.

Example I



Description: 4 different sensors are connected to the 4 pins of a single device port and together via Ground. The required 9 V power for Sensor 1 is supplied from ORION. The required 5 V power for Sensor 3 is supplied separately and individually. Sensor 2 and Sensor 4 are supplied 24 V power separately, but together from one power source. To Pin 1 and Pin 2 each, an NPN output sensor with an open collector is connected plus a 1k Ω – 10k Ω resistor. DC 9 V power is supplied to ORION.

Voltage Characteristics Examples

INPUT EQUIPMENT	VOLTAGE CHARACTERISTICS	MEASURE FUNCTION
Resistor 		'Analog'
Potentiometer 		'Analog'
Trigger / Switch 		'Digital'
Propellor 		'Counter'

How To Update The Firmware

It is highly recommended to always update devices to the latest firmware.

MADRIX® HARDWARE MANAGER is a separate software for basic device configuration and to perform firmware updates. It is available for download from www.madrix.com and requires an active internet connection to download firmware files.

- **Step 1)** Connect devices to your computer over USB or network, but not both!
- **Step 2)** Make sure to stop sending control data to the devices!

- **Step 3)** Start the MADRIX® HARDWARE MANAGER Software and navigate to the tab 'Devices' > column 'Firmware' and select the new firmware from the list for your devices.

For more information, see the MADRIX® HARDWARE MANAGER User Manual.

Device Configuration

You can access and change specific device settings, including the IP address, pin input, DMX channels, input sent to network, and more.

Please note: In order to put MADRIX® ORION fully into operation, configure the device according to your requirements and input equipment.

Web Configuration Through A Web Browser

- **Step 1)** Connect MADRIX® ORION and your computer to the same network.
- **Step 2)** Assign correct network settings in the computer's operating system. (Recommended: IP address 10.0.0.1 / Subnet mask 255.0.0.0)
- **Step 3)** Open your web browser and enter the IP address of MADRIX® ORION. (You can find the default IP address on the side of the ORION device.)
- **Step 4)** The built-in web configuration tool will be launched. Confirm or change the settings as required. The device then sends out data (over network) as configured.
- **Step 5)** Change any other settings as required. Apply changes with 'Set'.

For more information, see the MADRIX® ORION User Manual.

Basic Configuration Using The MADRIX® HARDWARE MANAGER Software

- **Step 1)** Connect devices to your computer over USB or network, but not both!
- **Step 2)** Make sure to stop sending control data to the devices!
- **Step 3)** Start the MADRIX® HARDWARE MANAGER Software.
- **Step 4)** In MADRIX® HARDWARE MANAGER, go to the tab 'Devices' and confirm or change the network settings and any other settings for your devices as required.

On a selected device, use Right Mouse Click > 'Open Device Configuration Via HTTP...' to open the web configuration through a web browser, as explained above.

On a selected device, use Right Mouse Click > 'Restore Factory Default Settings' to perform a reset to factory default settings.

For more information, see the MADRIX® HARDWARE MANAGER User Manual. The software is available for download from www.madrix.com

Description Of Status LED Codes

STATUS	STATUS LED POWER	
<i>Powered off</i>	Power not connected. → The device has no power.	
Permanently green	Connected to power. → The power is on.	
Blinking green	Bootloader activated. → Reset device / upload firmware.	

STATUS	STATUS LED USB	
<i>Powered off</i>	USB not connected.	
Red + blinking green	Communicating over USB. → Sending or receiving data over USB. The USB port works.	
Fading between red + green	Connected to USB; Drivers installed correctly. → No data is sent over USB.	
Orange	Connected to USB; No drivers installed. → Reinstall software and drivers or try a different USB port.	

STATUS	STATUS LED PORT 1	STATUS LED PORT 2
<i>Powered off</i>	No data is sent.	No data is sent.
Blinking green	Receiving data / changes. → The input port works.	Receiving data / changes. → The input port works.

STATUS	STATUS LEDs ETHERNET PORTS
Green off	10 MBit/s connected.
Green on	100 MBit/s connected.
Orange on	Network connected.
Orange blinking	Sending or receiving data. → The Ethernet port works.

Reset To Factory Default Settings

In rare cases, you might need to do a reset to factory default settings:

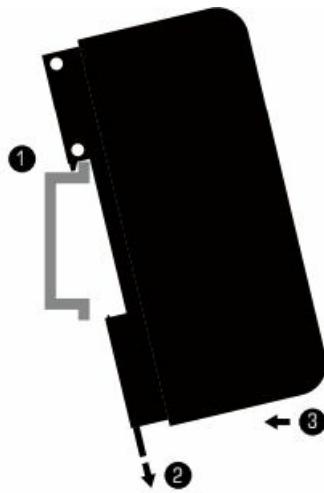
- **Step 1)** Disconnect all connections from the device (power, data, input).
- **Step 2)** Use a suitable tool to press the reset button (between 'Port 1' and '2').
- **Step 3)** Continue to press the reset button and supply power again over 'Power' or over 'USB'.
- **Step 4)** Continue to press the reset button and wait until all status LEDs of the device flash repeatedly or wait 10 seconds

Please note: Simply repeat these steps should the process fail.

How To Install On DIN-Rails

Mounting (Pictured Left)

- **Step 1)** Hook the device in an angle onto the upper edge of the rail.
- **Step 2)** Pull the unlocking clip.
- **Step 3)** Press the lower part of the device against the rail and let the clip snap into position.



Unmounting (Pictured Right)

- **Step 1)** Pull the unlocking clip.
- **Step 2)** Lift the lower part of the device from the rail in an angle.
- **Step 3)** Lift the device from the rail.

Using The MADRIX® 5 Software

You can mainly use 3 operating modes together with the MADRIX® 5 Software:

- DMX-IN Via Art-Net
- DMX-IN Via Streaming ACN
- DMX-IN Via USB

In MADRIX® 5, make sure to activate the correct drivers first:

- For USB, go to 'Preferences' > 'Options...' > 'Devices USB',
- For sACN, go to 'Preferences' > 'Options...' > 'Devices Network',
- For Art-Net, go to 'Preferences' > 'Device Manager...' > 'Art-Net'.

Then, configure your devices and activate input in order to receive the data:

- Go to 'Preferences' > 'Device Manager...' > 'DMX Devices',
- Go to 'Preferences' > 'Device Manager...' > 'DMX Input'.

Further Information

Digital documentation files, including this technical manual, the general user manual, as well as the datasheet are available online at help.madrix.com

They are also downloaded automatically by the MADRIX® HARDWARE MANAGER Software. Go to the tab 'Devices' > Right Mouse Click on a selected device > 'Show Documentation Directory...' to access them.

Technical Support

In case of further questions concerning handling of MADRIX® ORION or technical problems, use the following resources for troubleshooting:

- Read the MADRIX® ORION User Manual
- Contact your dealer
- Have a look at the website and online forum at www.madrix.com
- You can also directly contact info@madrix.com

Frequently Asked Questions (FAQs)

What do the blinking LEDs on the device mean?

Please read the chapter 'Description Of Status LED Codes' (see p. 14).

How can I change the IP address?

You can use the built-in web configuration tool (see p. 13).

The current IP address cannot be reached. What can I do?

You could perform a reset to factory default settings (see p. 14).

Does the device support RDM?

No. RDM is not supported by MADRIX® ORION at this time.

Is it possible to use more than one MADRIX® ORION?

Yes. Art-Net or Streaming ACN is recommended for large projects by connecting multiple devices to a switch (1 GBit/s) via suitable components to create a network or use the built-in daisy-chain support (see p. 8).

Where can I find the latest firmware update?

Use the MADRIX® HARDWARE MANAGER Software (see p. 12).

Can I use other receivers apart from the MADRIX® 5 Software?

Yes. When using MADRIX® ORION as a standard network node, you can use it in combination with other compatible software, consoles, and controllers.

Can I repair MADRIX® ORION myself?


No. Do not attempt any repairs. Any attempt will void your warranty (see p. 3)!

What can I do if my unit does not work anymore?




Please contact your dealer or supplier if the device seems to be defective.

www.madrix.com

Documents / Resources

	<p>MADRIX E03 ORION Lighting Control [pdf] User Guide E03, E03 ORION Lighting Control, ORION Lighting Control, Lighting Control, Control</p>
---	--

References

-  [MADRIX Documentation](#)
-  [MADRIX | LIGHTING CONTROL - Home](#)
-  [MADRIX | LIGHTING CONTROL - Limited Warranty / Eingeschränkte Herstellergarantie](#)

Manuals+.