PRODUCT GUIDE:

EYEDRO PULSE MONITORING PRODUCTS

Revision: 230608

CONTENTS

If you have any questions about using your Eyedro Monitoring System please visit eyedro.com for information, documentation, videos, and answers to frequently asked questions.

PLEASE READ ALL ENCLOSED INSTRUCTIONS PRIOR TO THE INSTALLATION.

EACH STEP OF THE ENCLOSED INSTRUCTIONS MUST BE FOLLOWED CAREFULLY.

IMPORTANT SAFETY INFORMATION FOR EYEDRO MONITORING PRODUCTS

The Eyedro Monitoring products (and all components) are designed for **INDOOR USE ONLY** and should be installed inside a suitable building or panel. When installing:

- **DO NOT** subject the unit or sensors to excessive temperature, humidity, force, shock, or dust.
- **DO NOT** use or store this product in locations that could adversely affect the product such as rain, snow, or desert.
- **DO NOT** immerse the unit in water or other liquids. If liquid is spilled over it, remove power, and clean up the spill immediately with a soft, lint-free, cloth and allow all electronics to fully dry before attempting to use.
- **DO NOT** use this product where the use of radio frequency products can cause interference in other critical control equipment (i.e., hospitals).

The Eyedro Monitoring products (and all components) are **NOT USER SERVICEABLE**. Please contact Eyedro Green Solutions Inc. if any component appears damaged or faulty.

- **DO NOT** open the case of the unit or tamper with any of the internal components.
- **DO NOT** attempt to repair the product by yourself.
- **DO NOT** dispose of this product in your household waste. At the end of its serviceable life please ensure product is disposed of according to local electrical and electronics equipment disposal practices.

The following notes apply to Eyedro Wireless products:

This equipment has been tested and found to comply with the limits for a Class A 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 in accordance with 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 can be determined 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 and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

To satisfy FCC RF Exposure requirements for mobile and base station transmission devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

BOX CONTENTS (BY PRODUCT)

EYEDRO BUSINESS PULSE MONITORS

A

B

C

D

	Ethernet + Wi-Fi	Mesh	Description
A	1	-	Eyedro Ethernet/Wi-Fi Pulse Module *(EMx.ENWI.2P)*
	-	1	Eyedro Mesh Pulse Module *(EMx.NODE.2P)*
	-	0 - 1[1]	Eyedro Mesh Gateway Module *(EMx.GATE.0N)*
B	2	2	39in (1m) Interface Cable.
C	1	1 - 2	Low-voltage Power Adapter
D	10ft (3m)	3ft (0.9m)[1]	Ethernet Cable

[1] Gateway, (1) Power Supply and Ethernet cable are not included in Wireless Expansion products (ExB-M-2P)

HARDWARE INSTALLATION

INSTALL PULSE SENSORS

Eyedro Pulse Monitors are intended to interface with the following pulse meter output formats:

Form A (KY) dry contact pulses
5V DC wetting value
Rising or falling edge detection (default is rising edge)
Minimum pulse width is 5ms
Maximum frequency is 100Hz

NOTE: A higher wetting value (up to 24V) can be achieved by connecting a separate DC power supply (not provided) to input port C of the Eyedro Pulse Monitor module. The mating connector for port C is a 1.65mm (i.d) x 3.5mm (o.d) x 9mm (length) barrel plug with center pin positive.

MATERIALS YOU WILL NEED

- Interface Cable(s)
- Tie wraps (optional – not included)
- Labels (optional – not included)

TOOLS YOU WILL NEED

- Screwdriver

PROCEDURE

1. Connect pulse cable to the output of the pulse meter
    a. Black conductor of the pulse cable to the K output of the pulse meter.
    b. White conductor of the pulse cable to the Y output of the pulse meter.
2. Route pulse cable(s) to the Eyedro Pulse Monitoring module and optionally secure cabling with tie wraps.
3. Optionally, use tape or other label to uniquely identify each sensor at the end of the wire nearest to the connector.
4. Connect the pulse cables to the sensor input ports (A or B) of the Eyedro Pulse Monitor module. ***The mating connector is a 1.3mm (i.d.) X 3.5mm (o.d.) X 9mm (length) barrel plug.***

WIRELESS MESH BEST PRACTICES (MESH PRODUCTS ONLY)

Eyedro Mesh Electricity Monitoring (ExB-M*) products have all the same features as the non-wireless version but do not require a network connection near the point where the sensors are installed. The modules will communicate with each other over their own **private wireless network** so that the sensors can be installed where you need them, and the gateway module can be located near an available RJ45 Ethernet network connection.

Eyedro mesh products operate on a custom wireless protocol operating on the **2.4GHz** frequency band. Operating range varies for each installation depending on the distance between and the number (and material) of obstructions the wireless communication must pass through and how much other wireless traffic there is in the area.

To achieve the best performance in wireless installations the following guidelines should be followed:

1. Minimize the number of obstructions between modules where possible (interior/exterior walls, floors, windows, trees, etc.). Line of sight provides the best performance.

2. Minimize the number of 2.4GHz radiators near the modules and in the surrounding environment (Wi-Fi routers, Wi-Fi devices, Bluetooth devices, microwaves, ZigBee/IEEE 802.15.4 wireless devices).

3. If multiple Eyedro mesh devices are in the same area, create a physical separation between the modules. There should be a minimum separation of at least 24” (60cm).

4. If using a Wi-Fi bridge device for connectivity, create a physical separation between Eyedro module(s) and Wi-Fi bridge. There should be a minimum separation of at least 24” (60cm). If possible, plug the two devices into separate receptacles.

5. Modules should be secured in position with screws, Velcro tape or by other means. Do not let the device hang by the wires. Doing so may affect the signal quality and/or cause damage.

6. Keep the area around the Eyedro module free from metallic objects.

7. Do not mount the Eyedro module on the metal electrical panel - if unavoidable, put an insulating material, like wood or foam, between the Eyedro module and the metal.

8. Do not seal the Eyedro module in the electrical panel or other metal enclosure.

MOUNT EYEDRO DEVICE(S)

MATERIALS YOU WILL NEED

- Two (2) #8 (4.2mm) pan head or round head mounting screws (optional – not included)
- Double-sided tape (optional – not included)

TOOLS YOU WILL NEED

- Screwdriver

PROCEDURE (VERTICAL MOUNT)

1. Write down the 8-digit serial number from the back of the module. This will be required during software setup.

    - The serial number will be in the format "**123 - 45678**"

2. Find a clear area on the wall or surface to mount the device.

    - Make sure all cables will easily reach the module before securing.

3. Secure the module using either:
    a) Screws (recommended method)
        i. Drive the two (2) screws into the wall surface through the flange holes on the sides of the enclosure.
        ii. **Carefully** tighten the screws until snug. Do not overtighten or it may cause damage to the flange(s).
        iii. Ensure secure fit.
    b) Double-sided tape
        i. Cut several pieces of double-sided tape and place on back of module.
        ii. Peel tape backing off.
        iii. Press module carefully but firmly against surface to be mounted on.
        iv. Hold in place as per tape instructions.
        v. Ensure module is held securely in place.

PROCEDURE (HORIZONTAL MOUNT)

Mounting is not required for horizontal installations (i.e. on a desktop or shelf). If added security is desired, follow instructions for vertical mounting using screws or double-sided tape.

CONNECT CABLING

MATERIALS YOU WILL NEED

- Ethernet cable
- Low-voltage power adapter(s)
- Tie wraps (optional – not included)

TOOLS YOU WILL NEED

- None

IMPORTANT

- Ensure all connectors and sockets are free from damage prior to mating them.
- If applicable, ensure the retention clip on the Ethernet cable is intact.
- Never force connectors or apply levering action.
- Ensure all connections are secure.
- For devices with both Ethernet and Wi-Fi (ExB.ENWI.2P), the **Ethernet cable must be plugged in before power** is applied to the device for Ethernet communication to be used.

PROCEDURE (ETHERNET INSTALLATIONS)

1. Connect sensor cables to the Eyedro module.
2. Connect one end of Ethernet cable to Eyedro module.
3. Connect the other end of the Ethernet cable to the router (or Internet access point).
4. Connect the appropriate end of the low-voltage power adapter to the Eyedro module.
5. Plug the other end of the low-voltage power adapter into a nearby AC wall receptacle.
6. Secure all wiring neatly with tie wraps.

PROCEDURE (WI-FI INSTALLATIONS)

1. Connect sensor cables to the Eyedro module.
2. Connect the appropriate end of the low-voltage power adapter to the Eyedro module.
3. Plug the other end of the low-voltage power adapter into a nearby AC wall receptacle.
4. Secure all wiring neatly with tie wraps.

PROCEDURE (MESH INSTALLATIONS)

1. Connect one end of Ethernet cable to Eyedro Gateway module.
2. Connect the other end of the Ethernet cable to the router (or Internet access point).
3. Connect the appropriate end of the low-voltage power adapter to the Eyedro Gateway module.
4. Plug the other end of the low-voltage power adapter into wall receptacle.
5. Connect sensor cables to the Eyedro Pulse Module.
6. Connect the appropriate end of the low-voltage power adapter to the Eyedro Sensor Node.
7. Plug the other end of the low-voltage power adapter into a nearby AC wall receptacle.
8. Secure all wiring neatly with tie wraps.

INTERNET CONNECTION

All Eyedro products are designed to take advantage of the MyEyedro cloud services – thus requiring the product(s) to be always connected to the internet. There is a small amount of internal memory to store data in the event of a temporary disruption to your internet service.

For most networks, it only requires that you connect the device to the network with a DHCP server somewhere on the network. A DHCP server is enabled on most routers by default and will provide connected hardware with an IP address so they can communicate via the internet.

In some cases, additional security has been added to the local network (firewall, port filtering, etc.) making some additional configuration necessary. A good test would be to plug a laptop or computer into the same Ethernet port that you intend to use for your (wired) Eyedro product, or, if installing a Eyedro Wi-Fi product, provision it to connect to the same Wi-Fi network – if you can open a browser and navigate the web no additional configuration is likely needed.

A couple of important notes:

- **Wi-Fi** devices utilize the **2.4GHz** frequency band. Ensure your Wi-Fi router supports 2.4GHz devices.

- For devices with both Ethernet and Wi-Fi (ExB.ENWI.2P), the **Ethernet cable must be plugged in before power** is applied to the device for Ethernet communication to be used.

- Ethernet devices require connection to **an active Ethernet port** on your router, switch, or hub.
- Ethernet devices ship with Ethernet patch cords (straight-through). Most routers, switches and hubs provide crossover functionality, but some old hardware may not. In those cases, it may be necessary to connect to a specific port or use a crossover cable.
- Ethernet devices communicate via **Half-Duplex 10Base-T**. Most routers, switches and hubs provide coexistence, but some may not. In those cases, it may be necessary to configure the connected port appropriately.

- All devices require **a DHCP server** somewhere on the network.
- If your network does not have a DHCP server, or it is restricted, you may need to reserve an IP address for the device based on the MAC address of the device.
- The **MAC address** of your device will be **60:54:64:XX:YY:ZZ** – where XX:YY:ZZ are based on digits of your module serial number. For example, a module with the serial number **123**-45**678** will have the MAC address 60:54:64:**12**:**36**:**78**. Devices with both Ethernet and Wi-Fi will substitute the first device specific digit with ‘E’ for the Ethernet MAC (the Wi-Fi MAC will remain the same) – the above example will become 60:54:64:E2:36:78.
- All devices communicate using **port 80 (HTTP)** – all communication to/from the device looks like standard **web traffic**.
- If you have changed the DNS settings in your router (i.e., to use an ad blocker), try switching back to use the default settings. Alternately use Google’s DNS servers 8.8.8.8 (primary) and 8.8.4.4 (secondary)

- Eyedro Mesh products (ExB-M*) do **not** communicate using the **Wi-Fi** protocol. They use a custom wireless protocol between modules and the gateway unit plugs into a physical Ethernet port, on your router or switch, to access the internet.

PROVISIONING EYEDRO WI-FI

MATERIALS YOU WILL NEED

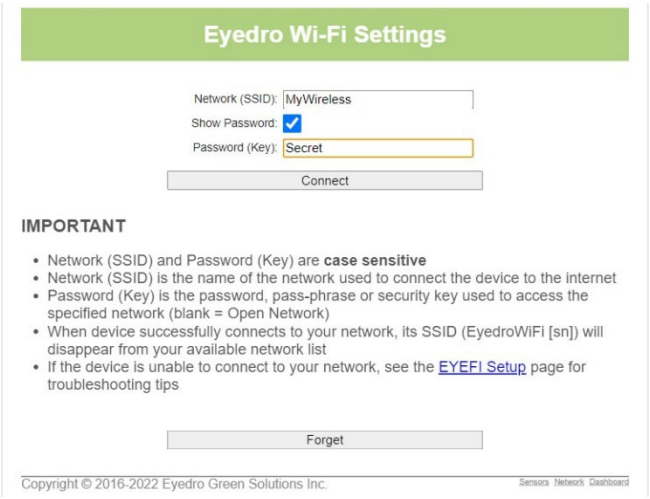
- None

TOOLS YOU WILL NEED

- Phone, tablet, or computer (to connect to the device's network)

PROCEDURE (WI-FI DEVICES ONLY)

1. Using a phone, tablet, or computer, disconnect from your current Wi-Fi network.
   - It may be necessary to explicitly deselect 'auto-connect'. Failing to do so may cause the provisioning device to switch back to its original network during provisioning.
   - If your device has an alternate path to the internet (i.e., cellular), it may be necessary to disable that network connection during provisioning (i.e., turn off cellular).
   - It may be necessary to temporarily disable your virus scanner during provisioning.
2. Using the same phone/tablet/computer, search for available Wi-Fi networks and connect to the Wi-Fi network created by your Eyedro device.
   - The name of the created network will be "Eyedro[xxx-yyyyy]" where xxx-yyyyy matches the serial number of the device.
3. Open a browser and go to eyedro.com/setup.
   - If not automatically redirected to the setup page, it may be necessary to enter **192.168.1.1** in the browser URL.
   - On some mobile devices, you may get a message indicating 'Sign in'. Click sign in and you should be redirected to the setup page. If not, refresh the page and/or open a browser and browse to eyedro.com/setup or 192.168.1.1.
4. Input the Wi-Fi credentials (Network SSID and Password) for the network you would like the device to connect to in the appropriate fields and click **Connect**.



5. Reconnect your phone, tablet, or computer to your original Wi-Fi network. Don't forget to re-enable your cellular connection and/or virus scanner if you turned them off during provisioning.

Important note: If the setup is not successful, the device will recreate its own network and reappear in your available network list. Your device must be connected to the internet before you will be able to claim it on your MyEyedro Account.

TIPS

When applying power to the device it will run through its startup tests. Approximately 10 seconds after power has been applied, the status lights will indicate the status of the communication:

- **Red**/**Green** (both) toggle 2 seconds on/off = **Not connected**.
  SSID, “Eyedro [xxx-yyyyy]”, should be visible in your available Wi-Fi network list.
- **Green** toggle 2 seconds on/off = **Connected**.
  Device is connected to the provisioned network and should appear as ‘Active’ in MyEyedro.

If the status lights are still not green (connected) after following the procedure, cycle power to the Eyedro device and try the procedure again – carefully following all instructions and notes.

Wi-Fi connection videos can be found online at the following links:

Eyedro Wi-Fi connection setup via Desktop: video link

Eyedro Wi-Fi connection setup via mobile: video link

Additional tips and troubleshooting advice can be found online at:

Website: eyedro.com

Support: eyedro.com/support

How To: https://eyedro.com/how-to-connect-an-eyefi-to-the-internet/

Troubleshooting: eyedro.com/support-troubleshooting

SOFTWARE CONFIGURATION

MYEYEDRO.COM

The **MyEyedro** cloud service is the interface for your Eyedro device(s). Eyedro and MyEyedro are always working together to measure, analyze and store your usage and cost information. With MyEyedro, your data is automatically and securely stored in the cloud, so it's ready when and where you need it most. MyEyedro presents your data in ways that are engaging, informative and easy to understand. See real-time usage and gain access to many helpful features, including:

- Responsive real-time graphs
- Hourly/Daily/Weekly/Monthly cost estimates
- Comparisons and estimates
- Configurable reports

MyEyedro is easy to use and accessible from a standard web browser.

1. Go online to: http://my.eyedro.com to create your online account (or login if you have an existing account).
2. From the system configuration screen, enter the serial number of your Eyedro Module(s) – found on the back of the device(s).

For more information on MyEyedro and complete instructions for adding devices, refer to the online documentation and user guide found at http://eyedro.com/support

SPECIFICATIONS

HARDWARE SPECIFICATIONS

	Ethernet + Wi-Fi	Mesh[1]
Power Supply	Class 2 Power Supply Input: 120Vac, 60Hz (North America/Type A) Input: 240Vac, 50Hz (Europe/Type C) Output: 5V DC, 0-350mA	
Pulse Input	Form A (KY) dry contact pulses 5V DC wetting value Rising or falling edge detection (default is rising) Minimum pulse width is 5ms Maximum frequency is 100Hz	
Ambient Operating Conditions	0°C to 50°C (32°F to 122°F) 80% relative humidity	
Storage Conditions	-20°C to 70°C (-4°F to 158°F) 80% relative humidity	
Module Dimensions (W x H x D)	77 x 75 x 25 mm (3 x 3 x 1 in)	
Parts Included	1x EMx.ENWI.2P 2x Pulse Cables 1x 10ft Ethernet Cable 1x 5V DC Power Adapter	1x EMx.NODE.2P 2x Pulse Cables 1x 5V DC Power Adapter *1x EMx.GATE.0N[1]* *1x 3ft Ethernet Cable[1]* *1x 5V DC Power Adapter[1]*
Weight [approximate][2]	0.363 kg (0.8 lbs)	0.499 kg (1.1 lbs)
Wireless Link	IEEE **802.11 b/g/n** 2.412 to 2.484 GHz	IEEE **802.15.4** 2.405 to 2.480 GHz
Wireless Range [typical][3]	Indoors: 50m (150ft) Line of sight: 100m (300ft)	Indoors: 150m (500ft) Line of sight: 300m (1000ft)

[1] Gateway, (1) Power Supply and Ethernet cable are not included in Wireless Expansion products (ExB-M-2P)
[2] Approximate weight is based on standard two (2) sensor models including packaging and contents. Mesh assumes complete system (gateway and node).
[3] Wireless range is dependent on the location and environment that device(s) are installed in. Typical values provided.

COMPLIANCE

This product has been tested and found in compliance to:

Safety Requirements for Electrical Equipment For Measurement, Control, And Laboratory Use - Part 1: General Requirements [UL 61010-1:2012 Ed.3+R:19Jul2019]

Safety Requirements for Electrical Equipment For Measurement, Control, And Laboratory Use – Part 1: General Requirements (R2017) [CSA C22.2#61010-1-12:2012 Ed.3+U1;U2]

CAN ICES-3 (B)/NMB-3(B); ISED Canada ICES-003, Issue 6, Class B – Information Technology Equipment (Including Digital Apparatus).

Federal Communications Commission (FCC), Part 15, Subpart B, Class B - Unintentional Radiators.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

WARRANTY

LIMITED ONE YEAR WARRANTY

Eyedro Green Solutions Inc. shall provide warranty for all defects in material and workmanship for a period of one year from the original date of purchase. Defective parts may be repaired or replaced, at the discretion of the manufacturer, free of charge during this period.

Warranty Conditions:

1. The product must be installed and operated in strict accordance with the provided instructions.
2. The product must be installed and operated in strict accordance with the operating conditions.
3. Warranty claims require original proof of purchase. A photo of the product may also be requested.
4. Warranty is void if the product has been tampered with or modified in any way.
5. Warranty returns require a Return Material Authorization (RMA) number. Visit eyedro.com/support for an RMA number.
6. Warranty excludes shipping fees outside of the continental United States and Canada 7 days after shipment.

TROUBLESHOOTING

Device installation is simple and non-invasive but occasionally problems do arise. Before contacting support, please refer to our online troubleshooting resources.

Troubleshooting: eyedro.com/support-troubleshooting

CONTACT INFORMATION

If you have any questions about using your Eyedro Monitoring System please visit our website for documentation, videos, frequently asked questions and contact forms.

Website: eyedro.com

Support: eyedro.com/support

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