PRODUCT GUIDE:

ELECTRICITY MONITORING PRODUCTS

Revision: 230113

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INTRODUCTION

OVERVIEW

Eyedro Green Solutions Inc. is a software and electronics design company making electricity usage easy to understand. We provide simple solutions for monitoring your electricity in real-time.

Combined with the MyEyedro cloud service, Eyedro is an affordable, easy to install and scalable electricity monitor for your home and business. Join thousands of customers already using Eyedro to keep an eye on their electricity use.

Thank you for choosing the Eyedro Electricity Monitoring System. You have taken the first step towards better awareness of where your energy is being consumed. Awareness can lead to energy savings, cost savings and peace of mind.

The Eyedro Electricity Monitoring System will help you keep an eye on your electrical consumption. Its non-invasive design measures electrical current supplied to the building and computes the power consumed. Data is stored on a remote server 24 hours a day - 7 days a week - 365 days a year. There is no need to worry about losing your data or running out of storage space. Your data is available for review from anywhere you have access to the internet - at home, at work or on the go! The easy-to-use interface allows you to view your current and historical data, daily averages, bill to date and even predict what your total bill will look like. Use the browser on your mobile phone to walk through your house switching appliances on and off – you may be surprised by what you learn!

The Eyedro Electricity Monitoring System will help you realize just how much electricity you are wasting every day and how much money you could save by reducing that waste. You will soon realize that simple changes in your habits – like turning off lights, unplugging unused equipment, or dialing back the thermostat – will result in less consumption and more money in your pocket.

If you have any questions about using your Eyedro Electricity 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.

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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. This invalidates the product warranty.
- **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.

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ADDITIONAL SAFETY INFORMATION FOR ELECTRICITY MONITORING PRODUCTS

It is important that you observe some simple safety precautions when installing Eyedro Electricity Monitoring products. The Eyedro Electricity Monitor was designed to be non-intrusive and easy to install. Typically, there is no need to disconnect any electrical cabling during the installation. However, there are several safety issues that should be considered when installing and using the system.

UNSURE ABOUT HANDLING ELECTRICAL WIRING? CONSULT A QUALIFIED ELECTRICIAN FOR SENSOR INSTALLATION.

Installation may require the cover of the main electrical panel to be removed while some wires are still electrified. Even when the main breaker has been turned 'OFF' certain areas of the panel may still be dangerous and carry the risk of shock, burn, and electrocution. **Installation should be performed by qualified electrician or duly qualified personnel where required by law. Check with your local authority having jurisdiction for permit and inspection requirements**. **DO NOT** attempt installation unless you know where electrified areas within the panel are.

The **current sensors** clip on to the live service entrance cables which supply electricity to your electrical panel. When installing these sensors:

- **DO NOT** install the sensor onto a cable whose current exceeds the rated current of the sensor.
- **DO NOT** install the sensor onto cabling that is loose, wet, or appears damaged (cracked, burned, bare copper or missing insulation). Contact a qualified electrician and/or your electricity supplier to report your findings.
- **DO NOT** bend or force the service entrance cables during installation.
- **DO NOT** force the sensor onto the cabling if the cable diameter appears to be too large.

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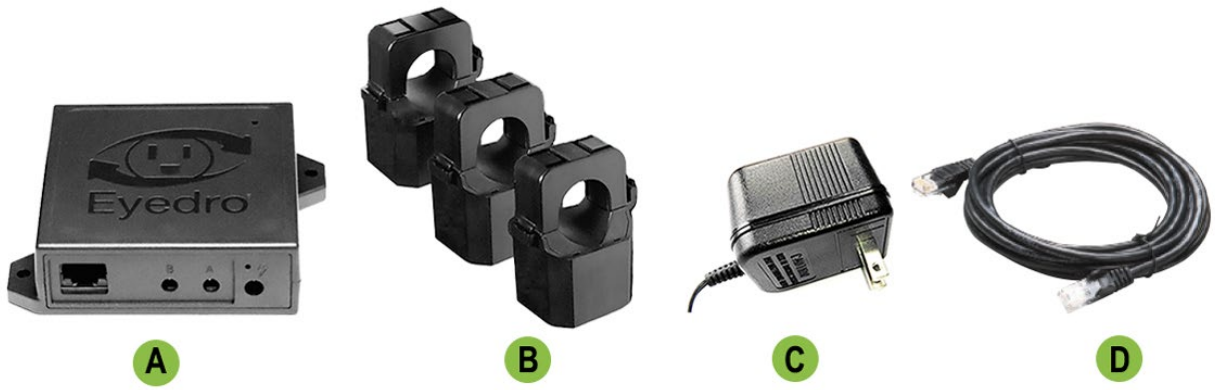
BOX CONTENTS (BY PRODUCT)

EYEDRO ELECTRICITY MONITORS



	Ethernet	Wi-Fi	Ethernet + Wi-Fi	Mesh	Description
A	1	-	-	-	Eyedro Ethernet Electricity Module *(EM5.ENET.*E)*
	-	1	-	-	Eyedro Wi-Fi Electricity Module *(EM5.WIFI.*E)*
	-	-	1	-	Eyedro Ethernet/Wi-Fi Electricity Module *(EM5.ENWI.*E)*
	-	-	-	1	Eyedro Mesh Electricity Module *(EM5.NODE.*E)*
	-	-	-	0 - 1[1]	Eyedro Mesh Gateway Module *(EM5.GATE.0N)*
B	1 - 3[2]	1 - 3[2]	1 - 3[2]	1 - 3[2]	Current Sensors
C	1	1	1	1 - 2[1]	Low-voltage Power Adapter *(North American model shown)*
D	10ft (3m)	-	10ft (3m)	3ft (0.9m)[1]	Ethernet Cable

[1] Gateway, (1) power supply and Ethernet cable are not included in Wireless Expansion products (E5B-M-*)
[2] Sensors supported depend on model. E5B-*-E3 = 3, E5B-*-E2 = 2, E5B-*-E1 = 1
[3] 200A (part number ESCLV-25-200A) standard product. Substitutions available up to 3000A

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HARDWARE INSTALLATION

DO NOT CONTINUE WITH THE INSTALLATION OF THE EYEDRO ELECTRICITY MONITORING SYSTEM UNTIL YOU HAVE READ THE SAFETY SECTION OF THIS GUIDE.

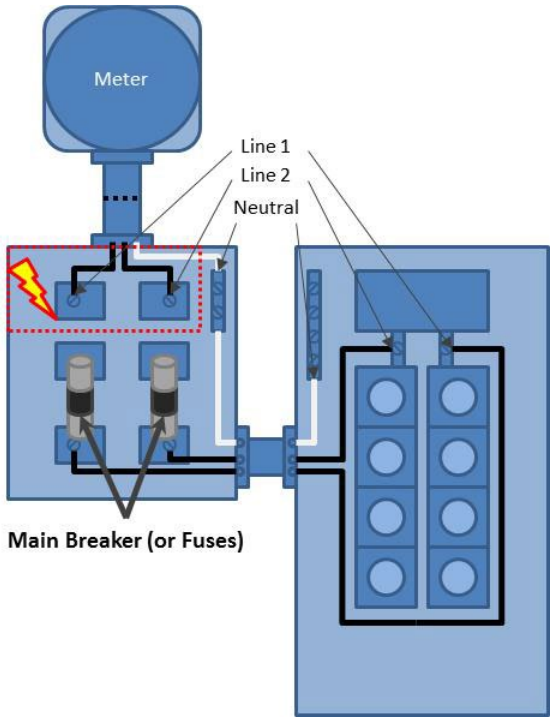
LOCATING THE ELECTRICAL SERVICE

The electricity panel is typically located in the garage or utility room of the building – although this is not always the case. The below diagrams show two typical 120/240V split phase electrical service configurations:

SERVICE BOX AND DISTRIBUTION PANEL

In some cases, the service entrance wires, from the utility company, feed into a box that is isolated from the distribution panel.

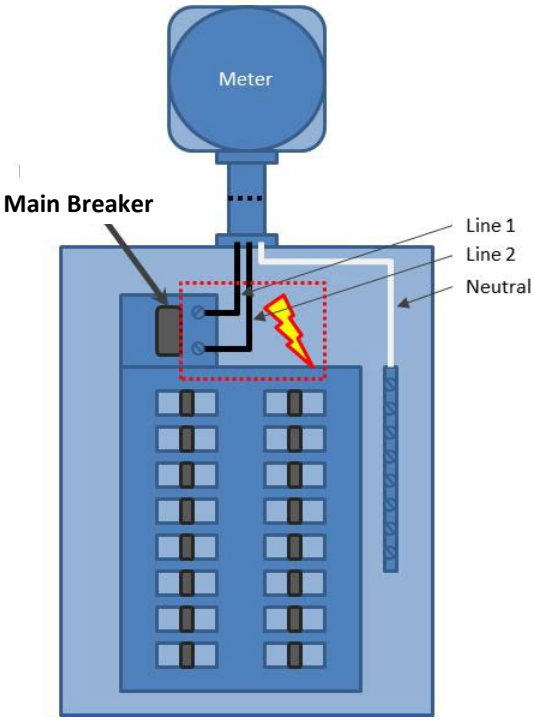
In this configuration, current sensors can be installed on the Line wires in either the service entrance panel or distribution panel.



COMBINATION SERVICE/DISTRIBUTION PANEL

In some cases, the service entrance wires, from the utility company, and main breaker are integrated into a single main electrical panel.

In this configuration, current sensors are installed on the Line wires between the main breaker and the meter.



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INSTALL CURRENT SENSORS

MATERIALS YOU WILL NEED

- ✓ Eyedro Current Sensors
- ✓ Approved bushing or connector (not included)
- ✓ Labels (optional – not included)

TOOLS YOU WILL NEED

- Flashlight
- Screwdriver
- Pliers

PROCEDURE (TYPICAL SERVICE ENTRANCE MONITORING)

sensors are **installed on** the individual **line/live/hot wires only**. This must be done inside the electrical panel or junction box where the electrical connection is separated into the individual line, neutral and ground wires.

- **Do not** install sensors on **neutral or ground conductors**.
- **Do not** install sensors on **extension cords or sheathed/shielded cables**.
- **Do not** install sensors on **conductors exceeding the max rating of the sensor**.

1. Turn off the power by disengaging the main disconnect switch or turning off the main breaker.

CAUTION: EVEN WITH THE MAIN BREAKER IN THE 'OFF' POSITION, THE SERVICE ENTRANCE WIRES WILL STILL BE ELECTRIFIED (BEFORE THE BREAKER). EXTREME CAUTION SHOULD ALWAYS BE TAKEN WHILE WORKING AROUND ELECTRICITY.

2. Carefully remove panel cover(s) to expose service entrance wires.
3. Carefully remove a 'knockout' on the side of the panel and add an approved bushing or connector to protect the wires that will pass through it.
4. Install one current sensor over **each service entrance line/live wire**.
    a. Push the release clip in and open the sensor.
    b. Carefully place the wire in the top of the sensor.
    c. Carefully close the sensor ensuring sensor faces are aligned flush. A slight ‘click’ sound is heard when the sensor is securely closed.
    d. Ensure the sensor is installed in the correct orientation – sensor label side should face the source (towards the service entrance) and sensor cable exit should face the load (towards the circuit being monitored).
5. Optionally, use tape or other label to uniquely identify each sensor at the end of the wire nearest the connector (i.e. "Sensor 1", "Phase A", etc.).
6. Route sensor cables through the bushing/connector so the plug ends are on the exterior of the panel.
7. Once all sensors are installed correctly, replace panel cover(s).
8. Turn on the power.

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PROCEDURE (TYPICAL SINGLE PHASE SERVICE ENTRANCE MONITORING)

Current sensors are **installed on** the individual **line/live/hot wires only**. This must be done inside the electrical panel or junction box where the electrical connection is separated into the individual line, neutral and ground wires.

- **Do not** install sensors on **neutral or ground conductors**.
- **Do not** install sensors on **extension cords or sheathed/shielded cables**.
- **Do not** install sensors on **conductors exceeding the max rating of the sensor**.

1. Turn off the power by disengaging the main disconnect switch or turning off the main breaker.

CAUTION: EVEN WITH THE MAIN BREAKER IN THE 'OFF' POSITION, THE SERVICE ENTRANCE WIRES WILL STILL BE ELECTRIFIED (BEFORE THE BREAKER). EXTREME CAUTION SHOULD ALWAYS BE TAKEN WHILE WORKING AROUND ELECTRICITY.

2. Carefully remove panel cover(s) to expose service entrance wires.
3. Carefully remove a 'knockout' on the side of the panel and add an approved bushing or connector to protect the wires that will pass through it.
4. Install one current sensor over **each service entrance line/live wire**.
    a. Push the release clip in and open the sensor.
    b. Carefully place the wire in the top of the sensor.
    c. Carefully close the sensor ensuring sensor faces are aligned flush. A slight ‘click’ sound is heard when the sensor is securely closed.
    d. Ensure the sensor is installed in the correct orientation – sensor label side should face the source (towards the service entrance) and sensor cable exit should face the load (towards the circuit being monitored).
5. Optionally, use tape or other label to uniquely identify each sensor at the end of the wire nearest the connector (i.e. "Sensor 1", "Phase A", etc.).
6. Route sensor cables through the bushing/connector so the plug ends are on the exterior of the panel.
7. Once all sensors are installed correctly, replace panel cover(s).
8. Turn on the power.

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PROCEDURE (ALTERNATE APPLICATIONS)

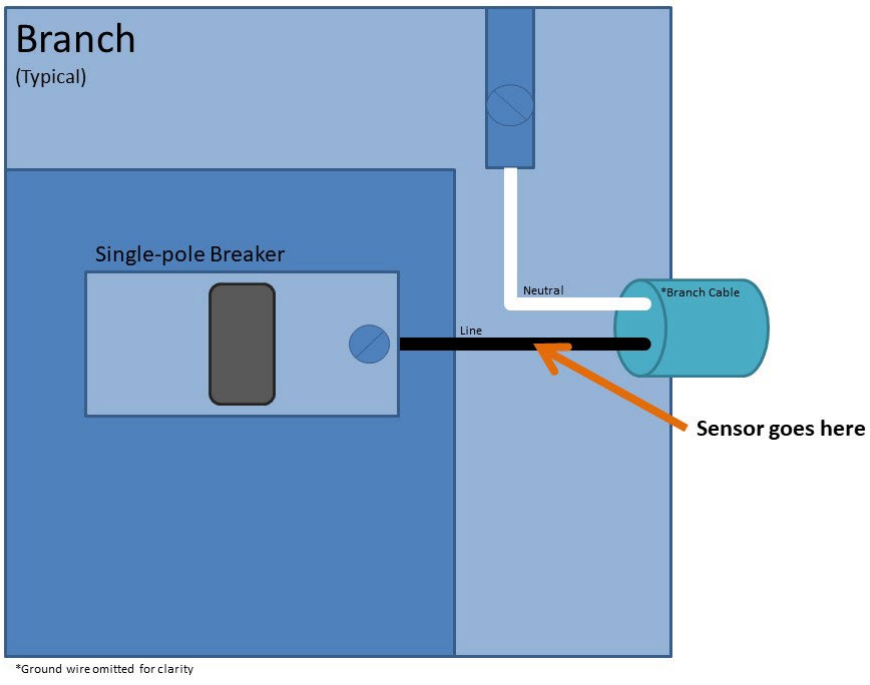
The most common application of Eyedro Electricity Monitoring products is for monitoring of the electrical service entrance of a building. However, there are other common applications where Eyedro Electricity Monitoring products are often used. The following sub-sections provide a brief overview of some of the most common applications.

To use Eyedro Electricity Monitoring products in one of these applications, follow ALL instructions and precautions from the Service Entrance installation procedure but substitute step 4 to install the sensors on the **line/live** conductor of your desired circuit.

BRANCH CIRCUIT MONITORING

Branch circuits are typically used for lighting and receptacles throughout the building. These circuits can be identified by a single-pole breaker in the electrical panel. Cabling typically consists of black (line) and white (neutral) conductors with a bare copper (or green) ground conductor.

1 sensor is required for monitoring branch circuits. The sensor should be installed on the line wire of the circuit (typically black).



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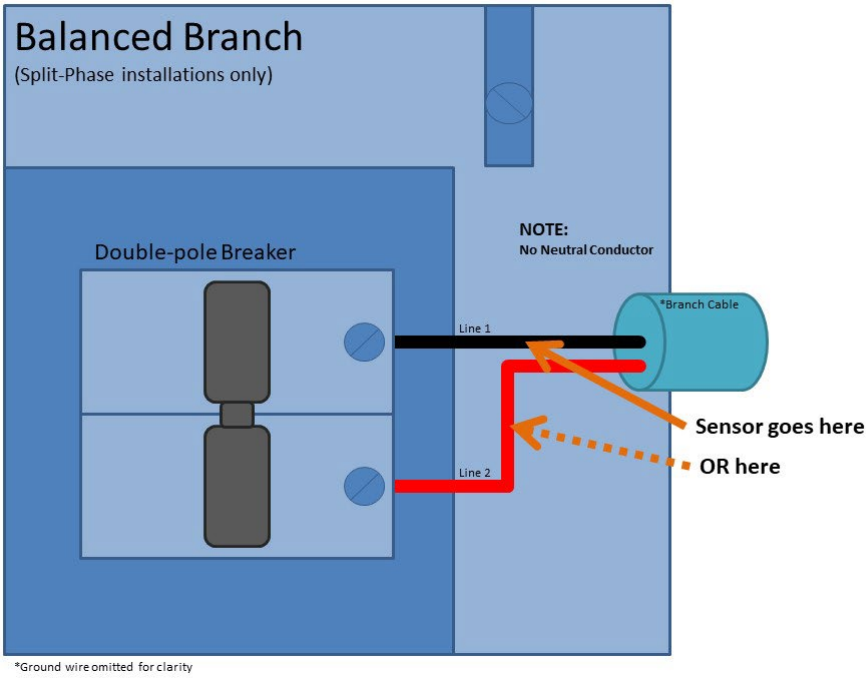
BALANCED BRANCH CIRCUIT MONITORING

Balanced branch circuits are common in split-phase electrical services and typically used for large appliances throughout the building. Common examples of balanced loads are electric heaters/baseboards, electric water heaters, air conditioners, heat pumps, pool pumps, etc. These circuits can be identified by a double-pole breaker in the electrical panel. Cabling typically consists of black (line 1) and red (line 2) conductors with a bare copper (or green) ground conductor. **Note: these circuits do not have white (neutral) conductors.**

1 sensor is required for monitoring balanced branch circuits. The sensor should be installed on either line wire of the circuit (typically black or red).



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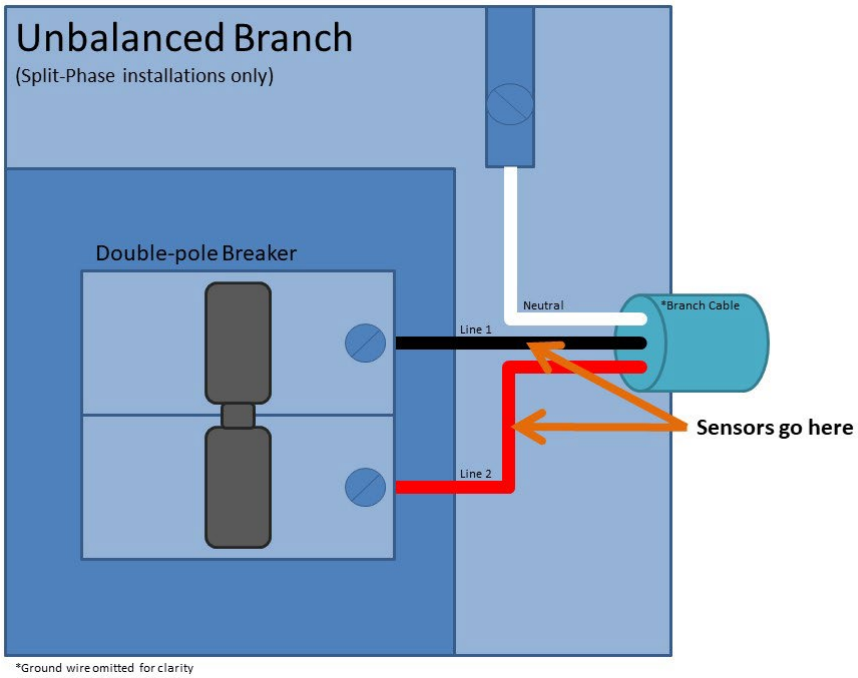
UNBALANCED BRANCH CIRCUIT MONITORING

Unbalanced branch circuits are common in split-phase electrical services and typically used for large appliances, split receptacles, and sub-panel feeders throughout the building. A typical split-phase residential service entrance is also an example of a 240V unbalanced circuit. These are circuits with both 120V and 240V components. Common examples of 240V unbalanced loads are stoves, electric dryers, kitchen receptacles, sub-panels, etc. These circuits can be identified by a double-pole breaker in the electrical panel. Cabling typically consists of black (line 1), red (line 2), and white (neutral) conductors with a bare copper (or green) ground conductor.

2 sensors are required for monitoring unbalanced circuits. The sensors should be installed on both line wires of the circuit (typically black and red).



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THREE-PHASE SERVICE OR BRANCH MONITORING (DELTA OR WYE)

Three-phase installations are common in commercial and industrial environments. These installations require the use of Eyedro Business (E5B*) products.

Note: Electricity monitoring devices must be powered by a receptacle that is downstream of the panel where the current sensors are installed.

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ALIGN WIRELESS MESH MODULES (MESH PRODUCTS ONLY)

Eyedro Mesh Electricity Monitoring (E5B-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. Typical distances of 1000ft (300m) can be expected.

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 (Wi-Fi routers, Wi-Fi devices, Bluetooth devices, microwaves, ZigBee/IEEE 802.15.4 wireless devices).

3. If using a Wi-Fi bridge device for connectivity, create a physical separation (>24”) between Eyedro module(s) and Wi-Fi bridge. If possible, plug the two devices into separate receptacles.

4. Modules should be secured in position with screws, Velcro tape or by other means. They should not be left hanging off wires because if they are bumped it can affect the signal quality.

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

6. Do not lay 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.

7. Do not seal in the panel or other metal enclosure.

8. Try to ensure that the modules are positioned in the best possible orientation as shown in the picture below.

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MOUNT EYEDRO DEVICE(S)

MATERIALS YOU WILL NEED

- ✓ Two (2) #8 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 beside the electrical panel (or router in the case this is the Eyedro Wireless Gateway Module).

   - 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) #8 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.

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CONNECT CABLING

MATERIALS YOU WILL NEED

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

TOOLS YOU WILL NEED

- None

PROCEDURE (ETHERNET INSTALLATIONS)

1. Connect sensor cables to the Eyedro module.
   - Never force connectors or apply levering action.
2. Connect one end of Ethernet cable to Eyedro module.
   - Ensure the retention clip on the cable is intact and connector is securely mated.
3. Connect the other end of the Ethernet cable to the router (or Internet access point).
   - Ensure the retention clip on the cable is intact and connector is securely mated.
4. Connect the appropriate end of the low-voltage power adapter to the Eyedro module.
   - Never force connectors or apply levering action.
5. Plug the other end of the low-voltage power adapter into a nearby AC wall receptacle.
   - Devices should not be plugged into a UPS (Uninterruptible Power Supply) as they may result in inaccurate/incorrect measurements.
6. Secure all wiring neatly with tie wraps.

PROCEDURE (WI-FI INSTALLATIONS)

1. Connect sensor cables to the Eyedro module.
   - Never force connectors or apply levering action.
2. Connect the appropriate end of the low-voltage power adapter to the Eyedro module.
   - Never force connectors or apply levering action.
3. Plug the other end of the low-voltage power adapter into a nearby AC wall receptacle.
   - Devices should not be plugged into a UPS (Uninterruptible Power Supply) as they may result in inaccurate/incorrect measurements.
4. Secure all wiring neatly with tie wraps.

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PROCEDURE (MESH INSTALLATIONS)

1. Connect one end of Ethernet cable to Eyedro Gateway module.
   - Ensure the retention clip on the cable is intact and connector is securely mated.
2. Connect the other end of the Ethernet cable to the router (or Internet access point).
   - Ensure the retention clip on the cable is intact and connector is securely mated.
3. Connect the appropriate end of the low-voltage power adapter to the Eyedro Gateway module.
   - Never force connectors or apply levering action.
4. Plug the other end of low-voltage power adapter into wall receptacle.
5. Connect sensor cables to the Eyedro Sensor Module.
   - Never force connectors or apply levering action.
6. Connect the appropriate end of the low-voltage power adapter to the Eyedro Sensor Module.
   - Never force connectors or apply levering action.
7. Plug the other end of the low-voltage power adapter into a nearby AC wall receptacle.
   - Devices should not be plugged into a UPS (Uninterruptible Power Supply) as they may result in inaccurate/incorrect measurements.
8. Secure all wiring neatly with tie wraps.

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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:

- 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 (E5B-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.

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PROVISIONING EYEDRO WI-FI

MATERIALS YOU WILL NEED

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

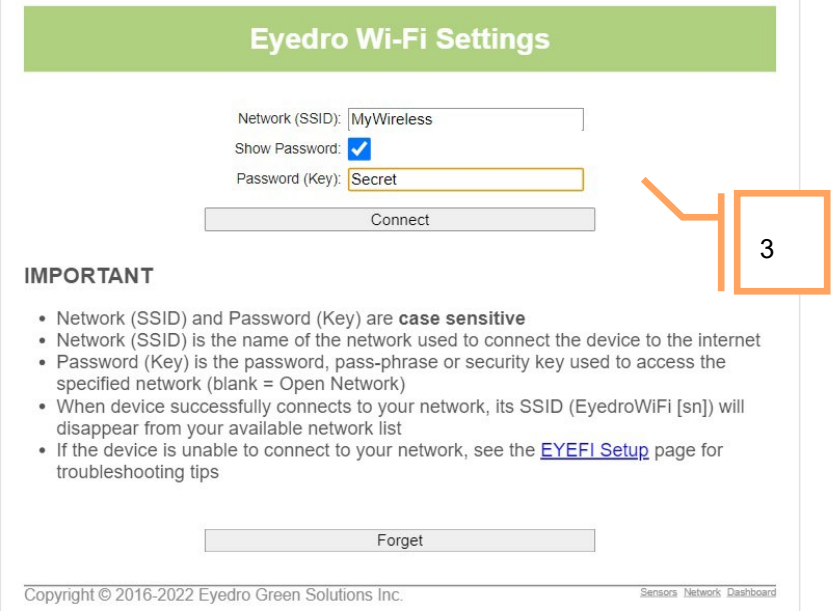
TOOLS YOU WILL NEED

- None

PROCEDURE (WI-FI DEVICES ONLY)

1. Using a phone, tablet, or computer, connect to the Wi-Fi network created by your device
   - The name of the created network will be "Eyedro[xxx-yyyyy]" where xxx-yyyyy matches the serial number of the device.
2. 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.
   - It may be necessary to explicitly disconnect from any other network before connecting to the Eyedro device. Failing to do so may cause the provisioning device to switch back to its original network.
3. 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**.
4. Reconnect to your original network.

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.



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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 electricity usage and cost information. With MyEyedro, your electricity data is automatically and securely stored in the cloud, so it's ready when and where you need it most. MyEyedro presents your electricity data in ways that are engaging, informative and easy to understand. See real-time electricity usage and gain access to many helpful features, including:

- Responsive real-time graphs
- Hourly/Daily/Weekly/Monthly cost estimates
- Bill comparisons and estimates
- Downloadable data for further analysis

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

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SPECIFICATIONS

HARDWARE SPECIFICATIONS

	Ethernet	Wi-Fi	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: 6VAC, 0-350mA			
Operating Conditions	32 to 122°F (0 to 50°C) 80% relative humidity			
Storage Conditions	-4 to 158°F (-20 to 70°C) 80% relative humidity			
Module Dimensions (W x H x D)	3 x 3 x 1 in (77 x 75 x 25 mm)			
Parts Included	1x EM5.ENET.*E 1-3x Current Sensors 1x 10ft Ethernet Cable 1x Power Adapter	1x EM5.WIFI.*E 1-3x Current Sensors 1x Power Adapter	1x EM5.ENWI.*E 1-3x Current Sensors 1x 10ft Ethernet Cable 1x Power Adapter	1x EM5.NODE.*E 1-3x Current Sensors 1x Power Adapter *1x EM5.GATE.** *1x 3ft Ethernet Cable* *1x Power Adapter*
Weight [approximate][2]	1.8 lbs (0.800 kg)	1.8 lbs (0.800 kg)	1.8 lbs (0.800 kg)	2.1 lbs (0.953 kg)
Wireless Link	NA	IEEE 802.11 b/g/n 2.412 to 2.484 GHz	IEEE 802.11 b/g/n 2.412 to 2.484 GHz	IEEE 802.15.4 2.405 to 2.480 GHz
Wireless Range[3]	NA	Indoors: 150ft (46m) Line of sight: 300ft (92m)	Indoors: 150ft (46m) Line of sight: 300ft (92m)	Indoors: 500ft (150m) Line of sight: 1000ft (300m)

[1] Gateway, (1) Power Supply and Ethernet cable are not included in Wireless Expansion products (E5B-M-*E)
[2] Approximate weight is based on 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.

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SENSOR SPECIFICATIONS

Sensor	Input	Output	Accuracy	Opening		Cable Length
200A (XH-SCT-T20-200)	0 to 200A AC 50-60Hz	0 to 0.333V AC	±1% Typical[1]	1.000 in (25.40 mm)		79 in (2000 mm)
The following are available as substitutions for E5B* products						
5A (XH-SCT-T06-5)	0 to 5A AC 50-60Hz	0 to 0.333V AC	±1% Typical[1]	0.400 in (10.0 mm)		98 in (2500 mm)
10A (XH-SCT-T06-10A)	0 to 10A AC 50-60Hz					
15A (XH-SCT-T06-15A)	0 to 15A AC 50-60Hz					
20A (XH-SCT-T06-20A)	0 to 20A AC 50-60Hz					
30A (XH-SCT-T06-30A)	0 to 30A AC 50-60Hz					
40A (XH-SCT-T06-40A)	0 to 40A AC 50-60Hz					
60A (XH-SCT-T06-60A)	0 to 60A AC 50-60Hz					
100A (XH-SCT-T18-100A)	0 to 100A AC 50-60Hz			0.600 in (16.0 mm)		
200A (XH-SCT-0750-200)	0 to 200A AC 50-60Hz			0.75 x 0.75 in (19 x 19 mm)		
400A (XH-SCT-1250-400A)	0 to 400A AC 50-60Hz			1.25 x 1.25 in (31 x 31 mm)		
600A (XH-SCT-1250-600A)	0 to 600A AC 50-60Hz					
800A (XH-SCT-2000-800A)	0 to 800A AC 50-60Hz			2.0 x 2.0 in (51 x 51 mm)		
1200A (XH-SCT-2000-1200A)	0 to 1200A AC 50-60Hz					
2000A (XH-SCT-3000-2000A)	0 to 2000A AC 50-60Hz			3.0 x 5.0 in (76 x 127 mm)		
3000A (XH-SCT-3000-3000A)	0 to 3000A AC 50-60Hz					

[1]Accuracy noted is for sensor readings at 10% to 90% of rated current. This product also requires a continuous internet connection.

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COMPLIANCE

This product has been tested and found in compliance to:

Safety Requirements for Energy Monitoring Equipment [ANSI/CAN/UL 2808:2020 Ed.1]

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.

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WARRANTY

LIMITED ONE YEAR WARRANTY

Eyedro Green Solutions Inc. warrants this product for a period of one year from date of purchase for all defects in material and workmanship. 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 to the provided instructions.
2. Warranty requires the original proof of purchase.
3. Warranty is void if the product has been tampered with or modified in any way.
4. Warranty returns require a Return Material Authorization (RMA) number. Visit eyedro.com/support for an RMA number.

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CONTACT INFORMATION

If you have any questions about using your Eyedro Electricity 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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THE EYEDRO ELECTRICITY MONITORING SYSTEM IS INTENDED TO BE USED TO INCREASE AWARENESS OF ELECTRICITY CONSUMPTION WITHIN THE BUILDING AND AS AN ADDITIONAL RESOURCE TO APPROXIMATE UTILITY COSTS. SYSTEM ACCURACY DEPENDS ON A NUMBER OF FACTORS INCLUDING (BUT NOT LIMITED TO): MEASUREMENT AMPLITUDE, SENSOR CALIBRATION, UP TIME, AND STABILITY OF THE VOLTAGE SUPPLY. IT IS NOT INTENDED TO REPLACE THE ELECTRICITY METER FOR THE BUILDING.

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IMAGES AND/OR INSTRUCTIONS DETAILED IN THIS DOCUMENT MAY DIFFER FROM THE ACTUAL PRODUCT HARDWARE AND/OR SOFTWARE.

APPENDIX A: TROUBLESHOOTING

Device installation is simple and non-invasive but occasionally problems do arise. The following provide troubleshooting tips for the most common issues encountered during (or after) installation. Before contacting support, please refer to this troubleshooting section to see if it provides a solution - support personnel will likely be directing you to its contents.

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NO POWER (ALL DEVICES)

IS THE RECEPTACLE ENERGIZED?

- If you have a multi-meter or receptacle tester, verify receptacle.
- If not, check the following:
    - Try plugging the Eyedro device directly into the wall (bypassing the power bar).
    - Is your receptacle on the same circuit as a wall switch that cuts the power to the receptacle? Try plugging power bar into a different receptacle.
    - Is the receptacle on a timer or smart receptacle device that cuts the power? Try plugging power bar into a different receptacle directly into the wall (bypassing any smart devices).
    - Is the fuse/breaker tripped/off? Ensure fuse/breaker hasn't been tripped at the panel.
    - Have you tried a different receptacle? Try plugging a lamp or other appliance into the receptacle and verify operation.
    - Do other devices work in the same receptacle?

IS THE DEVICE PLUGGED INTO A POWER BAR?

- If you have a multi-meter or receptacle tester, verify receptacle.
- If not, ensure the following:
    - Is the power bar on a timer or smart receptacle device that cuts the power? Try plugging into a different receptacle.
    - Is the power bar on? If applicable, ensure the power switch is on.
    - Does the power bar have a tripped fuse/breaker? If applicable, ensure the reset button/switch is in the correct position.
    - Do other devices work in the same power bar receptacle? Try plugging a lamp or other appliance into the receptacle and verify operation.
    - Have you tried a different receptacle on the power bar?

IS THE 6V ADAPTER OPERATING?

- If you have a multi-meter, verify 6V output from the power adapter. Shield=Ground, Pin=6V AC
- If you are going to try a power adapter from another appliance, ensure it matches the output specification of the one provided with your Eyedro system:
    - Voltage: 6VAC
    - Current: 0.5A
    - Connector: 1.65mm DC barrel
    - Polarity: Center pin positive (shield=GND/0V, pin=6.5VAC)

CAN YOU SEE THE STATUS LIGHTS?

- Looking through the hole in the top of the enclosure should reveal status lights. Lights on (in any state) indicate that there is power to the device - Note the status lights and skip to the appropriate internet and/or wireless communication troubleshooting section(s).
- LED Status (E5* devices):
    - GREEN/OFF flashing (~2sec) indicates operational and connected to internet
    - BOTH/OFF flashing (~2sec) indicates operational with no network connection (Wi-Fi only)
    - RED/OFF flashing (~1sec) indicates no IP address
    - RED/OFF flashing (~2sec) indicates no communication with server
    - RED (long) / GREEN (short) indicates failsafe storage mode
    - Other – contact support

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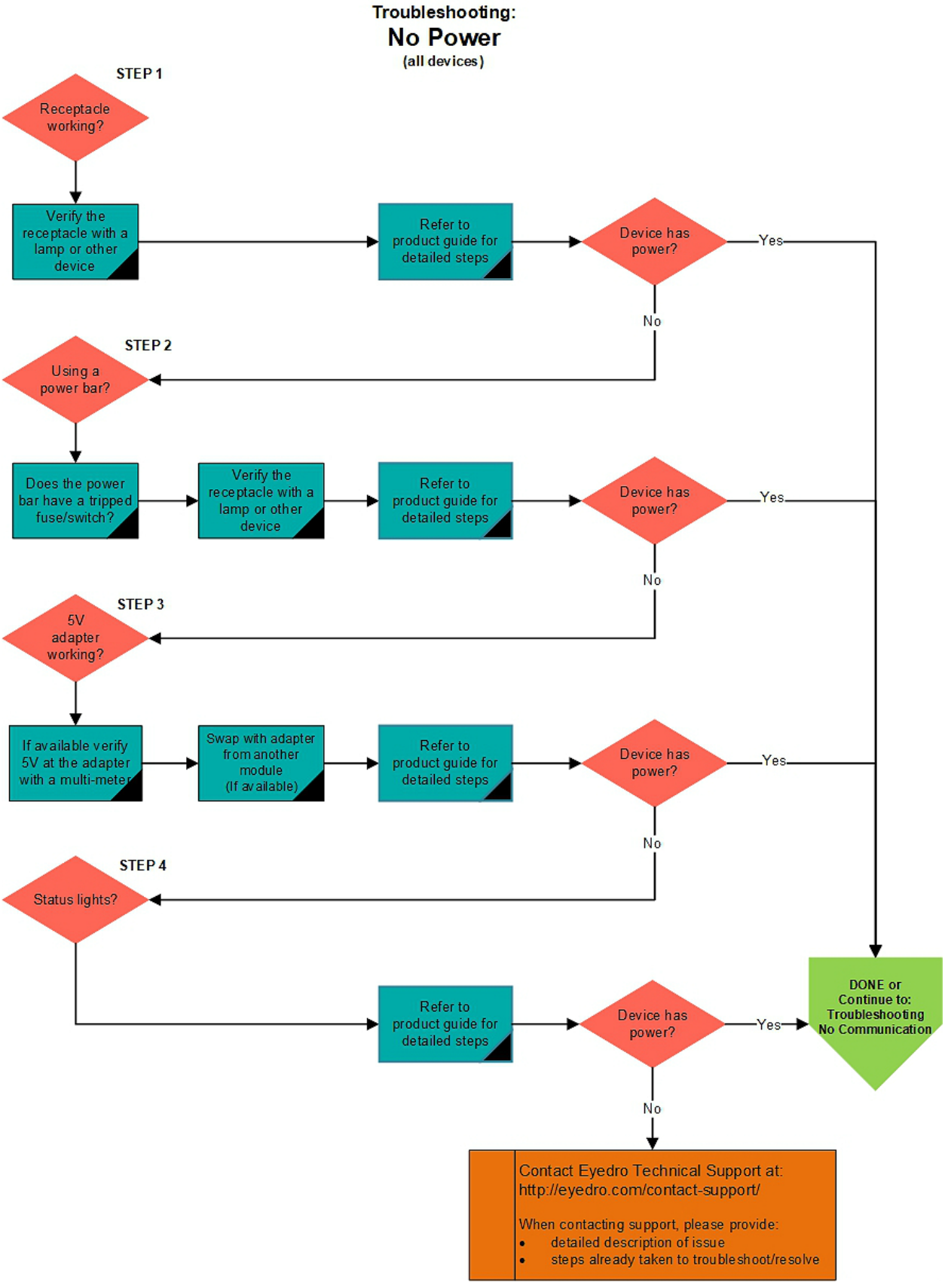

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NO COMMUNICATION – PART A VERIFY INTERNET

HAVE YOU VERIFIED DEVICE HAS POWER?

- Follow troubleshooting tips to verify power.

IS THERE EVIDENCE OF PHYSICAL DAMAGE?

- Is there evidence of physical damage to the port on your Eyedro device (bent/missing pins, corrosion, or debris)?
- Is there evidence of physical damage to the port on your router/switch/modem (bent/missing pins, corrosion, or debris)?
- Is there evidence of physical damage to the Ethernet cable (bent/missing pins, corrosion, debris, frayed or damaged wires/cable jacket or broken/missing retention clips)?
- Ensure the cable is properly secured at both ends and retention clips are not missing.
- Try connecting to a different port on your router/switch/modem.
- If possible, try connecting with a different Ethernet cable.

DOES THE PORT ON YOUR ROUTER/SWITCH/MODEM WORK WITH OTHER DEVICES?

- Have you tried plugging another device (i.e. laptop) into the same port? Try to use the same Ethernet cable when testing other devices to remove variables.
- Is the port intended for specific functions or hardware (VOIP, etc.)? Try a different port
- Does the port accept traffic from 10Base-T Half-Duplex devices? Old network devices may not support co-existence or require toggle switches or software configuration set appropriately.
- Verify your router and/or modem is running the most recent firmware versions.

IS THERE A DHCP SERVER ON YOUR NETWORK?

- Can anyone come in and connect a device into your network or do you need to take specific steps to allow them access?

IS THERE A FIREWALL BLOCKING TRAFFIC?

- Eyedro devices communicate using port 80 (HTTP). All communication to/from the device looks like standard web traffic.
- Eyedro servers sit behind load balancers and do not use static IP addresses. Any allowance should be made based on domain and not specific IP addresses.
- Have you tried disabling (temporarily) to see if it resolves the issue?
- If applicable, have you tried connecting to a DMZ port (bypassing firewalls) to see if it resolves the issue?

HAVE YOU TRIED MINIMIZING THE NUMBER OF NETWORK DEVICES BETWEEN YOUR EYEDRO AND INTERNET CONNECTION?

- For complex networks with many devices between, try connecting further downstream in your network (as close to the internet access point as possible) to see if it resolves the issue.

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ARE YOU USING A WI-FI BRIDGE DEVICE?

- Try plugging the device into a known working port directly on your switch/router/modem.
- Try plugging the Wi-Fi bridge into a different receptacle or power bar than the one used to power your Eyedro device.
- Does your Wi-Fi bridge accept input from a 10Base-T Half-Duplex device?

NOTE: Eyedro devices can be configured to operate using static network parameters. To do this, you will need to contact support and provide the desired IP Address, Gateway, Netmask, DNS1 and DNS2 settings. Your device will need to be active and temporarily connected to the internet for configuration to be successfully sent to your device.

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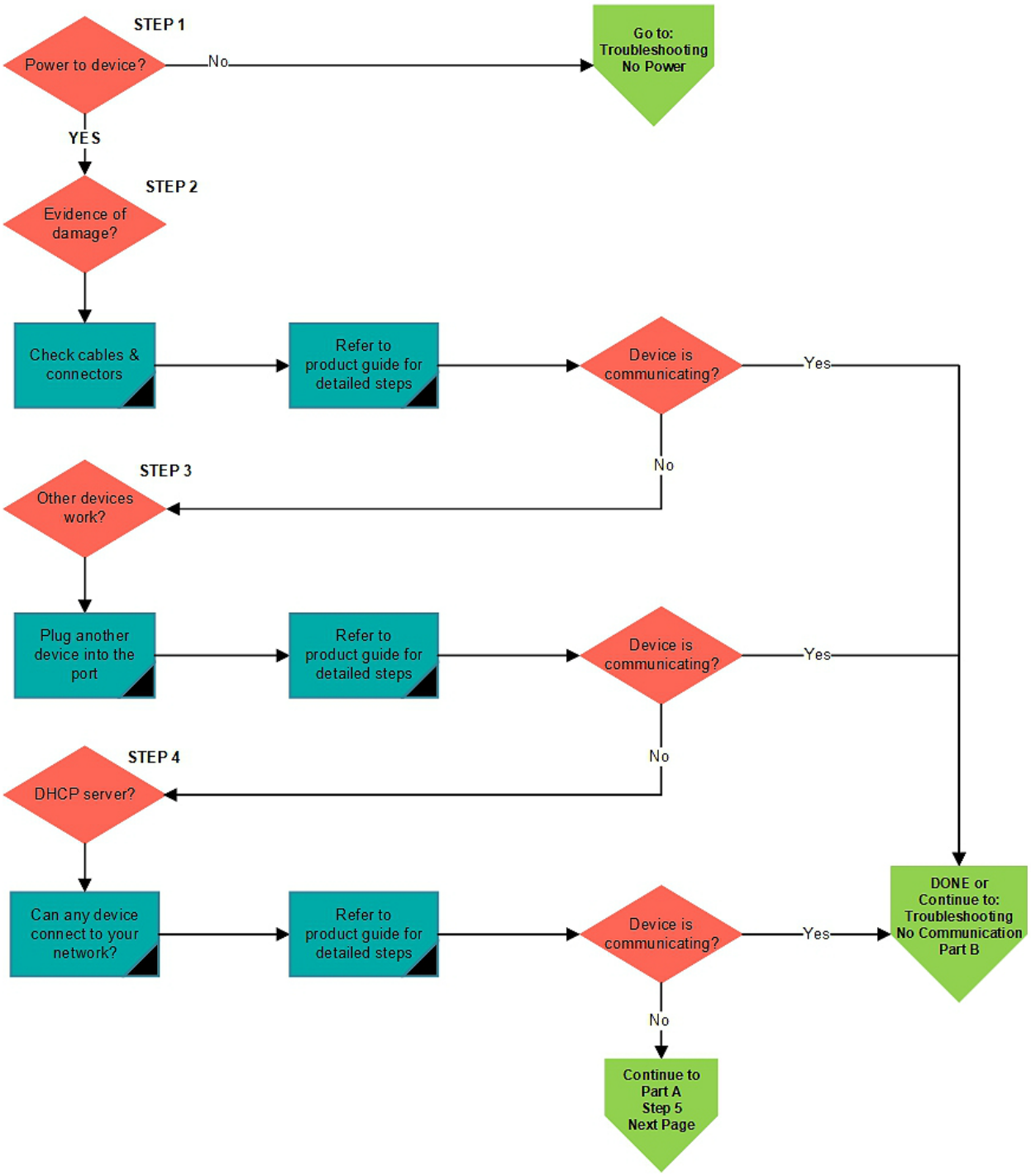
Troubleshooting:
No Communication
Internet Connectivity
(Wired and Gateway Devices)



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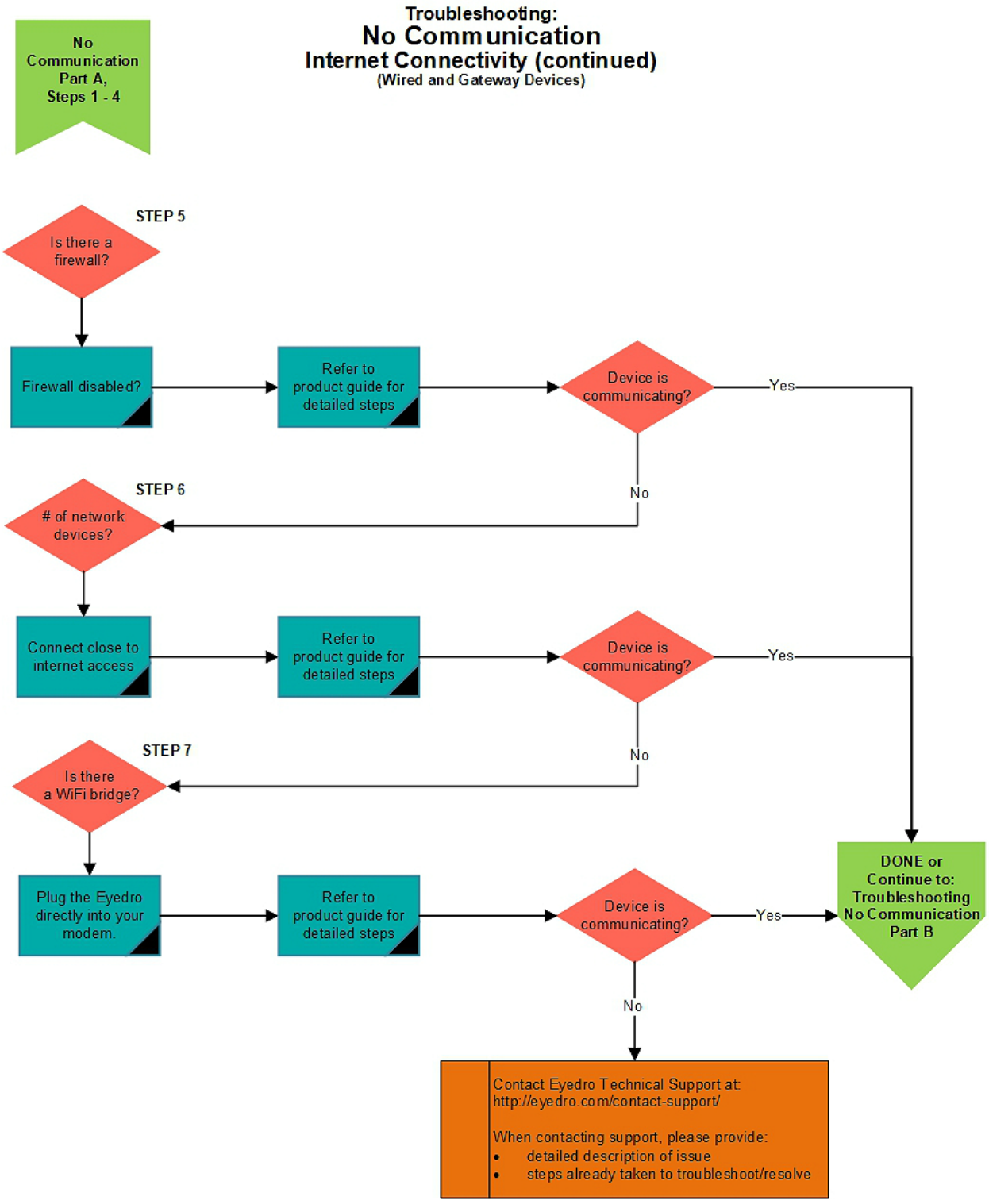

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NO MESH COMMUNICATION – PART B VERIFY MESH CONNECTIVITY (MESH DEVICES)

HAVE YOU VERIFIED DEVICE HAS POWER?

- Follow troubleshooting tips to verify power.

IS THE GATEWAY POWERED AND CONNECTED TO THE INTERNET?

- Follow troubleshooting tips to verify your Gateway has power and is communicating with the Eyedro server (device status shows active in MyEyedro). Follow troubleshooting steps to establish communication between the Gateway and Eyedro servers before attempting to troubleshoot mesh connectivity issues.

HAVE YOU OBSERVED THE BEST PRACTICES INDICATED IN THE ALIGN WIRELESS MODULES SECTION OF THE PRODUCT GUIDE?

- Minimize the number of obstructions between modules where possible (interior/exterior walls, floors, windows, trees, etc.). Line of sight provides best performance.
- Minimize the number of 2.4GHz radiators near the modules (Wi-Fi routers, Wi-Fi devices - including cell phones, tablets and computers/laptops, Bluetooth devices, microwaves, ZigBee/IEEE 802.15.4 wireless devices).
- Modules should be secured in position with screws, Velcro tape or by other means. They should not be left hanging off wires because if they are bumped it can affect the signal quality.
- Keep the area around the Eyedro module free from metallic objects.
- Do not lay 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.
- Do not seal in the panel or other metal enclosure.

DO THE DEVICES WORK CORRECTLY WHEN IN THE SAME ROOM?

- Try temporarily relocating the sensor module closer to the Gateway;
    - Move module and power supply (you can leave the sensors installed in the panel).
    - During this test, ensure appropriate separation (>18”) between the two wireless modules (Gateway and Sensor Module) – i.e. Plug it into a receptacle on the other side of the room.
- If the devices work when in the same room, try to relocate the Gateway closer to the sensor module or minimize the number of obstructions between the two devices.

ARE THERE MULTIPLE GATEWAYS IN YOUR INSTALLATION?

- Try unplugging all but one Gateway in your installation. Keep the closest gateway connected or the one with the fewest obstructions in the line of sight from the sensor module under test.

ARE THERE MULTIPLE SENSOR MODULES IN YOUR INSTALLATION?

- Try unplugging all but one Sensor Module (the device under test) in your installation.

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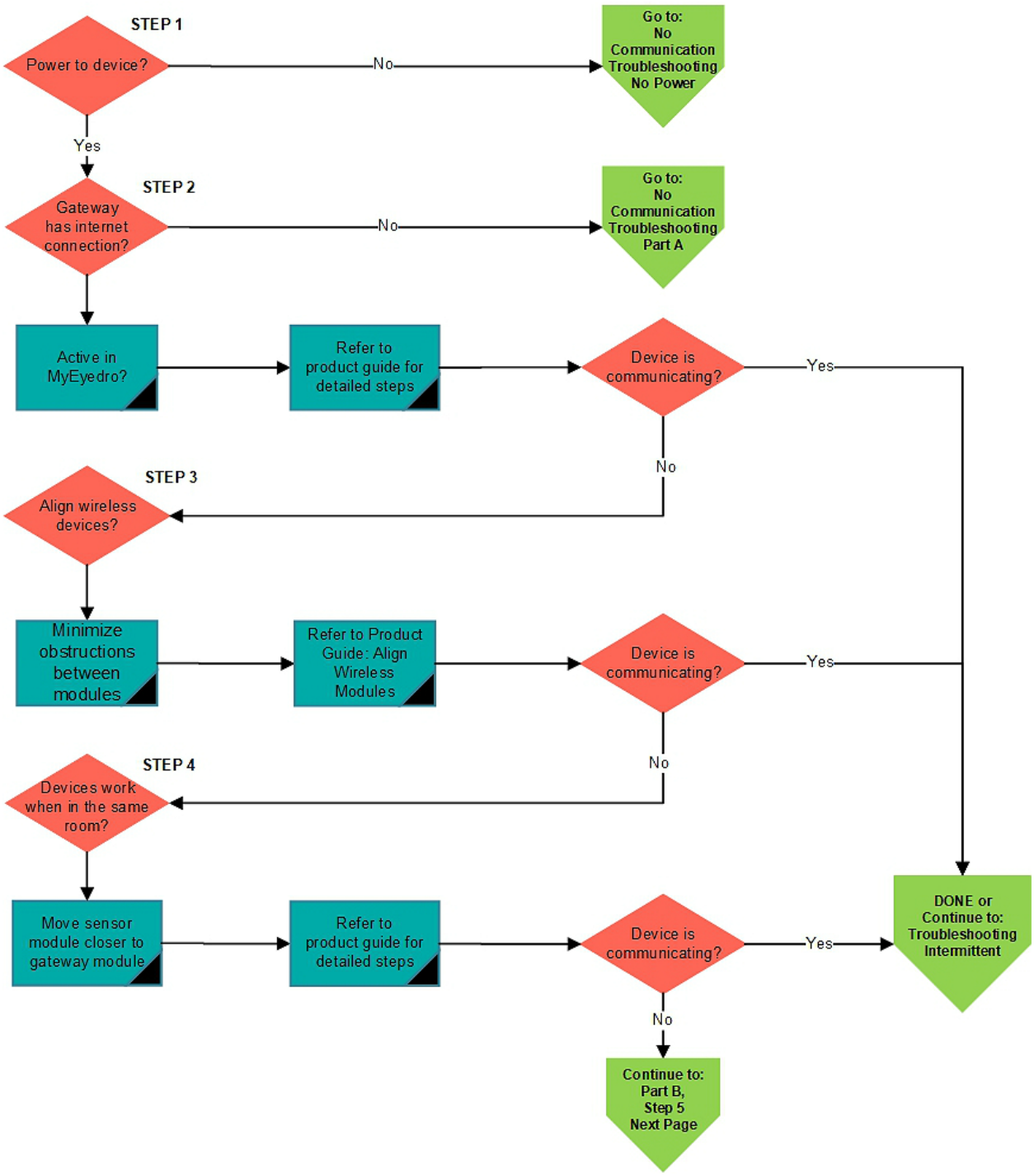
Troubleshooting:
No Communication
Wireless Connectivity
(Wireless Devices)



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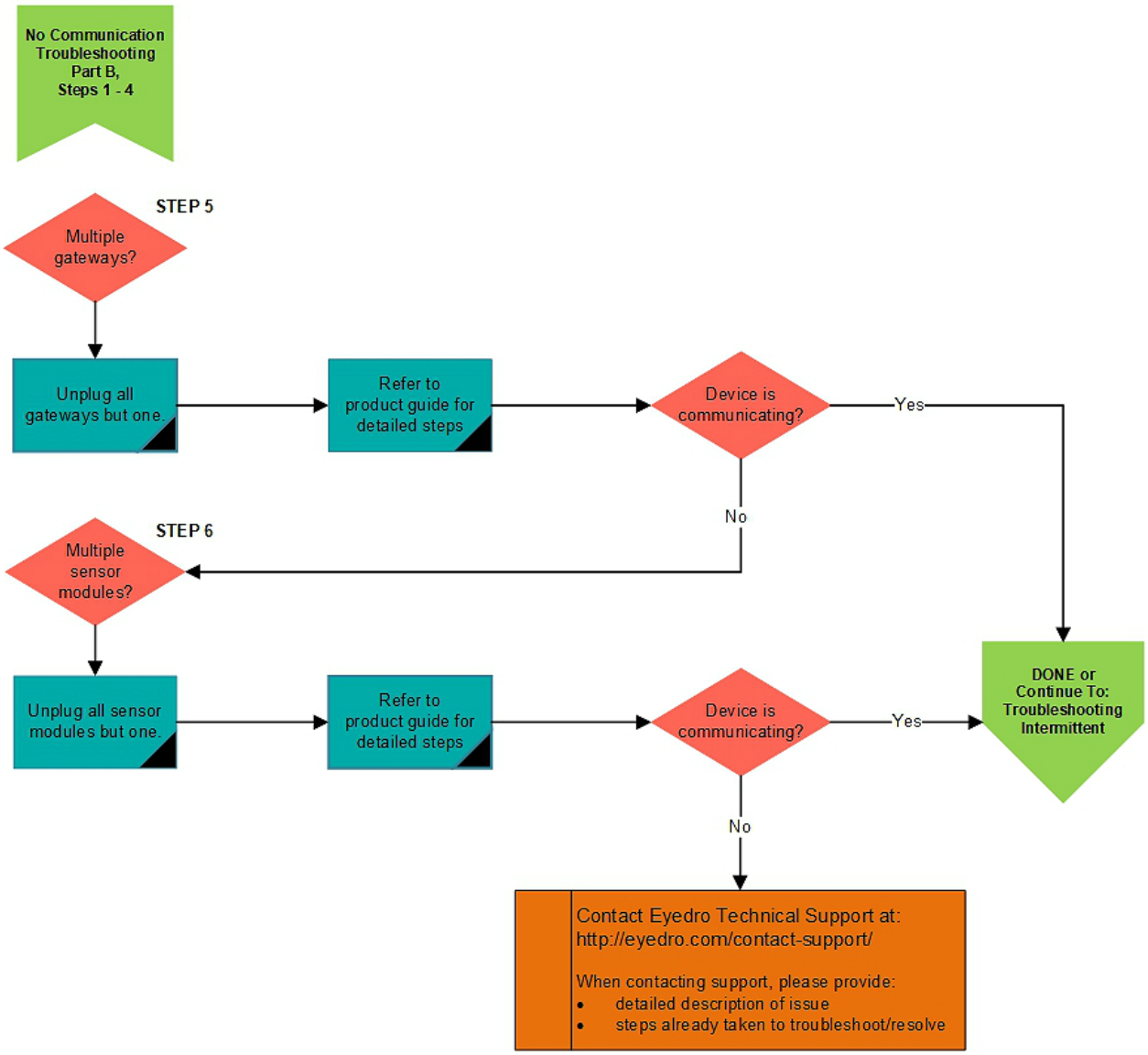
Troubleshooting:
No Communication
Wireless Connectivity (continued)
(Wireless Devices)



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INTERMITTENT COMMUNICATION/MEASUREMENTS

HAVE YOU FOLLOWED THE INTERNET CONNECTIVITY TROUBLESHOOTING TIPS?

- Follow troubleshooting tips to verify internet connectivity.

HAVE YOU FOLLOWED THE WIRELESS CONNECTIVITY TROUBLESHOOTING TIPS?

- Follow troubleshooting tips to verify wireless connectivity.

DOES IT DROP OUT AT SPECIFIC TIMES OF THE DAY?

- Is a receptacle or power bar being turned off that provides power to the unit?
- Do you notice issues on any other internet connected devices?
- Has a device joined your network and introduced an IP address conflict?
- Is there a significant increase in the amount of on/off transactions in the building/branch/load being monitored? Try switching to use polled (10-30 second) mode for detection.
- Wireless devices:
    - Is a door being opened/closed effecting the communication between wireless devices?
    - Is a 2.4GHz radiator being introduced? Do you come home and set your cellphone or laptop up near the Eyedro device? Does another wireless device turn on (casting device, smart appliance, etc.)?

IS YOUR DEVICE INSTALLED IN A HARSH ENVIRONMENT?

- If modules are installed in direct sunlight, ensure the temperature is not exceeding maximum operating temperature.
- If modules are installed in unconditioned spaces (i.e. garages), ensure temperature is not exceeding minimum or maximum operating temperatures.

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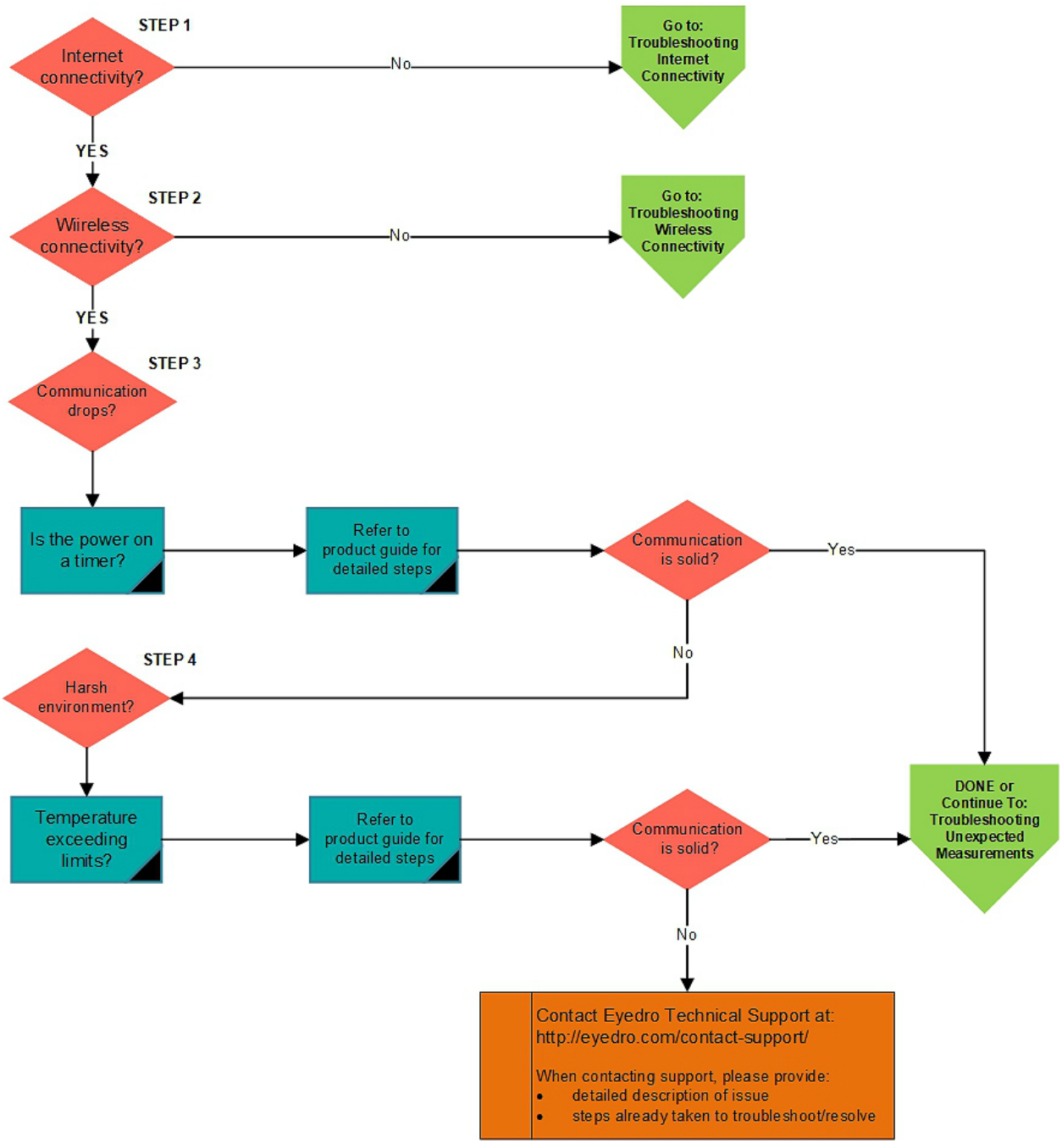
Troubleshooting:
Intermittent Communication/ Measurements



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UNEXPECTED MEASUREMENTS

IS YOUR DEVICE REPORTING A MEASUREMENT YOU ARE NOT EXPECTING?

- If available, verify expected measurement with a clamp on current meter.

- Verify device and sensor parameters in MyEyedro and adjust accordingly:
    - Do you have the correct sensor type selected in MyEyedro?
    - Are your voltage and power factor settings correct in MyEyedro? Note that line voltage and power factor may fluctuate over time.
    - Are your voltage configuration (delta or other) and multiplier settings correct MyEyedro?
    - Are you looking at the correct device? MyEyedro allows display groups to be built from sensors spanning devices, make sure the display group you are looking at contains the sensors you expect.

- Does the expected reading exceed the maximum rating of the sensor? Use a higher rated sensor.
- Is the sensor clamped around a single current carrying conductor (not an appliance cord or extension cord)?
    - Sensor should be clamped around a line conductor (not neutral or ground).
    - Sensor should be clamped around a single conductor.
- Is the sensor closed completely?
    - Please ensure that your sensors are closed securely as this can affect your readings.
    - You will almost always hear an audible click when you snap the sensors shut.
    - If you don't hear the click there is a good chance that the sensor is not closed properly.
    - The current sensors can be snapped shut by gently pushing down and forwards simultaneously.
- Are there signs of physical damage to the sensor (ferrite, hinge, clip, cable or connector) or Eyedro sensor port?
- Is there a source of magnetic or RF interference?
    - Try repositioning module and cabling (as far away as practical).
    - Try powering from a different receptacle (as far away as practical)
- Try connecting affected sensor to a different port. Did it follow the sensor or stay with the port?

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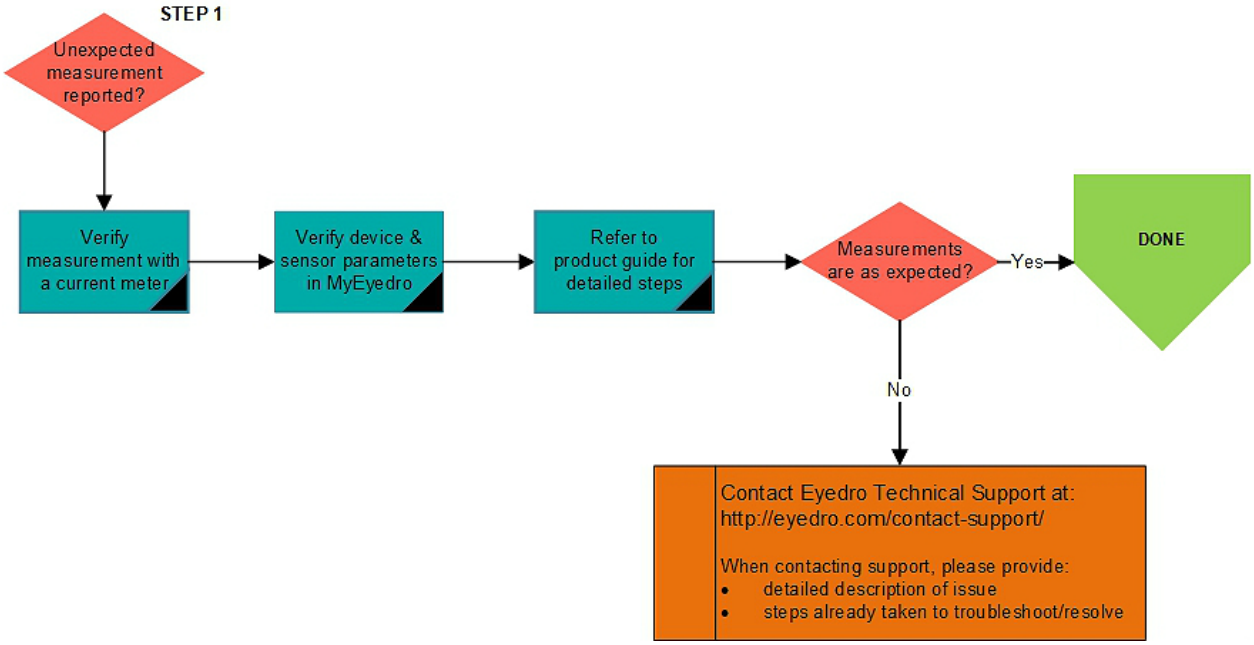
Troubleshooting:
Unexpected Meaurements



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