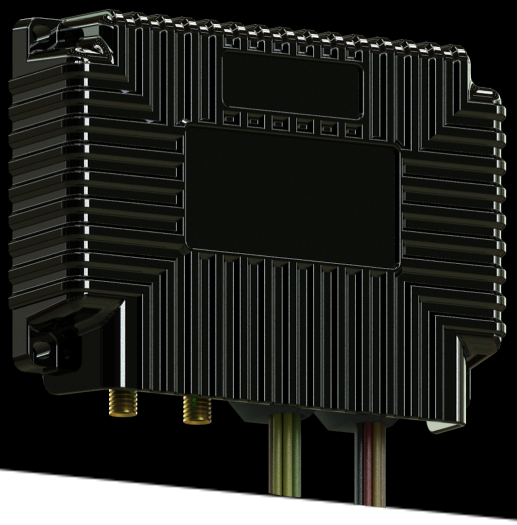
# IY-HUB2 Product Guide

**Cellular Remote Monitoring & Control System**

**12V-48V DC** SKU: IY-HUB2-EU/IY-HUB2-G



## Document Contents



## Box Contents

1 x IY-HUB2 Unit
1 x Power Fuse Loom
1 x 4G / 2G Blade Antenna

6x Sensor Tails
1 x GPS Antenna - 2m

1 x Instruction Manual
1 x Safety and User Guide

## 1. Technical Specifications

| Technical Specifications | |
|---|---|
| Materials & IP Rating: | PC/ABS, A2 stainless fittings |
| Size & Mounting | 110mm x 95mm x 35mm, 4x M4 bolt |
| Connectivity: | 2G, 4G CAT1 LTE EU bands (-EU) or 2G, 4G CAT1 LTE Global Bands (-G) |
| Input Channels: | Battery supply voltage, 6 Analogue 0 - 70 VDC, 2 Temperature, 2 0-10V DC |
| Expansion Channels: | 2 VE (Value Expansion) Channels. VE-Direct and Custom Compatible |
| Output Channel: | 4 via digital interface - connected add on required |
| Operating Power & Fuse: | 7 - 70 VDC, 1A |
| Configuration: | Remote configuration by Cloud Portal |
| Power Draw @ 12VDC | 15 min updates = 5mAh, 5 min updates = 7mAh, Live connection = 40mAh |

## 2. Regulatory/Certificate of Conformity

Metrix Advanced Technologies Ltd , trading as Insytly hereby declares that the product marketed as IY-HUB2 is in compliance with the following:

1. General Product Safety Directive 2001/95/EC
2. EU Radio Equipment Directive (2014/53/EU) Declaration of Conformity (DoC)
3. UKCA Electromagnetic Compatibility Regulations 2016
4. Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) — Directive 2002/95/EC
5. UKCA The Restriction of the Use of Certain Hazardous Substances in Electrical And Electronic Equipment Regulations 2012
6. Schedule 1 of The Product Security and Telecommunications Infrastructure (Security Requirements for Relevant Connectable Products) Regulations 2023 (“Security Requirements”).

Signed : R Kettlety

Robert Kettlety
Managing Director - Metrix Advanced Technologies Ltd
Date: 22th September 2023

## 2a. Health & Safety

Working in the vicinity of batteries, engines, engine room equipment and on vehicles and other installations is potentially hazardous. Please ensure that all local and national government guidelines pertaining to Health & Safety Requirements are adhered to.

The following identified hazards are not exhaustive:

- Wear appropriate Personal Protective Equipment. Including gloves & eye protection.
- Ensure that the appropriate tools are available and that they are well maintained. Ensure that the working area is safe and that potential hazards are identified and mitigated (e.g. working at height, safe lifting practices, availability of a fire extinguisher etc).
- Remove positive battery terminals from all batteries within the installation. Ensure that the equipment cannot be started and/or moved.
- Please take care when working near a battery for shock and explosion through spark.
- Please connect one lead at a time, do not hold two terminals at the same time.
- The device must not be connected to a power source when connecting/removing 4G antenna, GPS antenna, sensor wires or relay expansion module.
- Ensure the device is fitted securely to a solid surface.

- Do not try to open the device, contact Support immediately.
- Warranty* will be voided if you open the device, an internal detector senses this.
- Higher battery voltages are potentially lethal. In all cases, Insytly products are designed for nominal 12-48V DC systems. Do not attempt modification or addition to systems where higher voltages may be present.
- Do not connect the power loom until all wiring is completed and antennas are connected.

Where IY-HUB2 is being used as a discrete module for starting/stopping generators, or switching loads on and off, safety should be considered. If starting/stopping a generator, controlling motors, lighting circuits etc, some form of manual override or lock-out is required to ensure safety during servicing. Therefore, it is important that IY-HUB2 is carefully set up and configured.

# 3. Installing your Device

## 3a. Installation Guidelines

WARNING - If You are not sufficiently skilled to undertake any part of this installation safely, you must seek the assistance of a suitably qualified person. Your warranty* is voided through incorrect installation faults.

This product is designed for 12V-48V DC Systems and takes power from the Main Battery onboard. Ensure the device is connected on the battery side of your main isolator or the device will power off and you will lose all tracking and monitoring abilities when you isolate the device batteries.

**CAUTION!** Do not use welding equipment without first disconnecting AND COMPLETELY REMOVING the IY-HUB2. Damage caused by electrical welding is not covered by warranty.

A common ground is required to monitor and use the Green, Yellow, Brown, Blue, Orange and White input channels.

Please Note: If you need to change any connections, ensure the 2 pin power loom is removed prior to any other connectors/loom components.

The main unit device, 4G antenna and GPS antenna are water resistant, however the loom connectors are not sealed. We advise adhesive heat shrinking (4:1 shrink) the finished connectors or fitted into a glanded box.

## 3b. Installation Instructions

1. Find a mounting surface within 100CM of a positive and negative connection.
2. Screw the 4G LTE antenna into the 4G LTE connector, as per the connector guide shown below (port 1). The antenna should be no closer than 20CM of other antennas.
3. Screw the GPS antenna into the GPS SMA Connector, as per the connector guide shown below (port 3).
4. Affix the device to a solid surface with 4 screws or bolts. M4 or smaller can be used.
5. Mount the GPS antenna **without metal obstruction pointing to the sky** as per a standard GPS antenna, the adhesive pad MUST be on the ground plane.
6. Connect sensor looms to their corresponding labels as shown in section 4 within the wiring diagram.

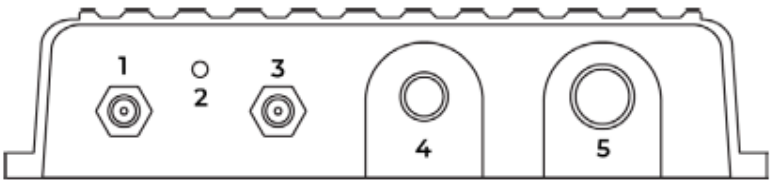
WARNING - You must fuse each connection to each Analogue input with a 0.5-1A Fuse

7. Connect any additional sensors or the relay module at this step.
8. Connect the positive and negative crimps of the power loom to the correct terminals.
9. Connect the power loom to the main loom with the 2 pin connector.

If you need to change any of the wiring or antennas, the device must be full powered off by removing the power loom before changing any connections.

## 3c. Connector Guide:

1. 4G LTE Antenna
2. Status Indicator
3. GPS Connector
4. Secondary Loom
5. Main Connection Loom



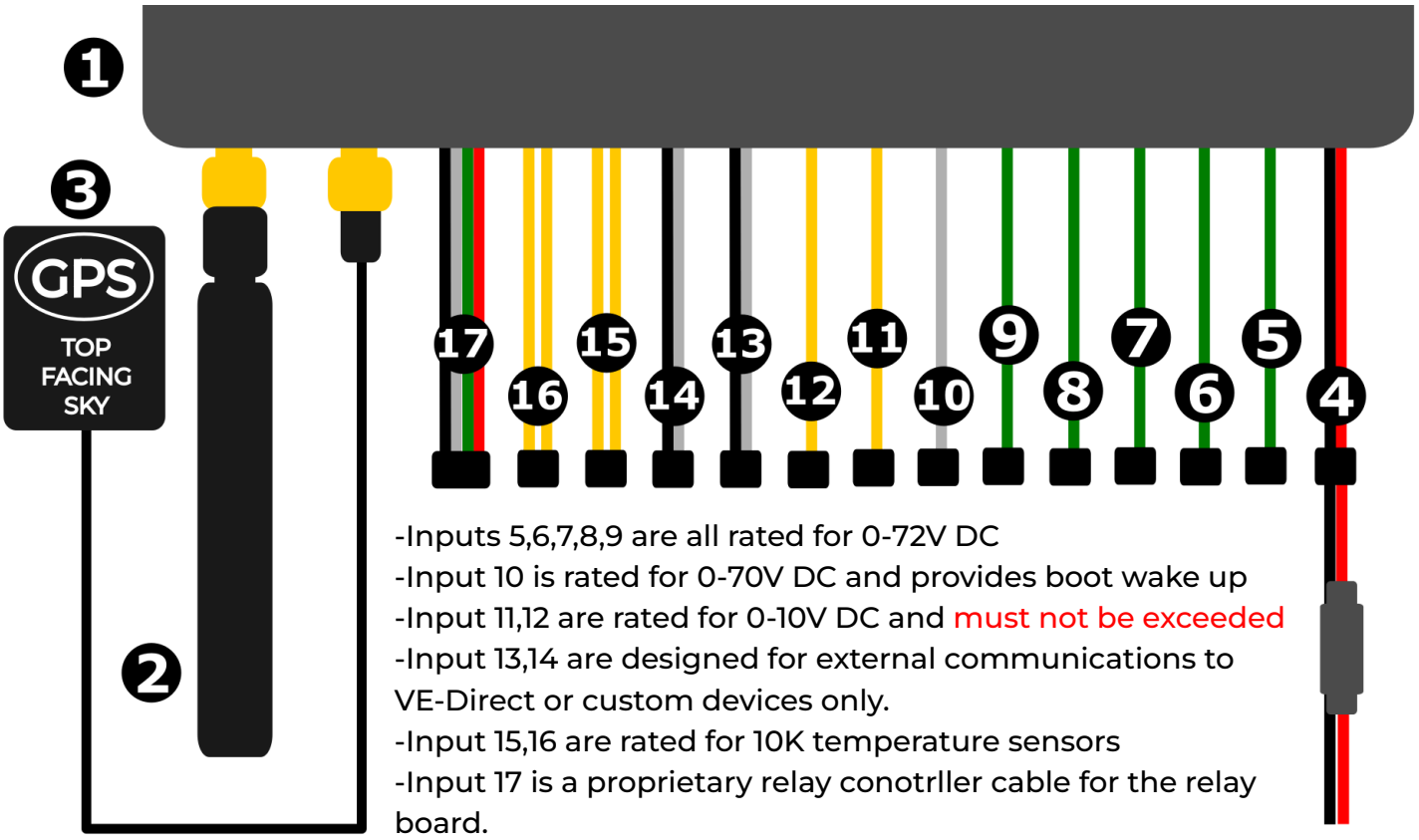

**Your device should now be powered** - please check that the device is flashing green or green/orange from the LED status indicator. This indicates a cellular connection.

If the device is showing anything other than this, please check the “Device Status Codes” section of this manual.

Once your device is successfully powered you can now add your device within the cloud platform.

++++++ All installation points are for guidance only. ++++++

PLEASE NOTE THAT DATE & TIME ARE SET TO GMT+0 LONDON.




-Inputs 5,6,7,8,9 are all rated for 0-72V DC
-Input 10 is rated for 0-70V DC and provides boot wake up
-Input 11,12 are rated for 0-10V DC and must not be exceeded
-Input 13,14 are designed for external communications to VE-Direct or custom devices only.
-Input 15,16 are rated for 10K temperature sensors
-Input 17 is a proprietary relay conotrller cable for the relay board.

## 4. Wiring Diagram

- All cables are labelled with their values and are colour and keyway separated.
- A1-A6 can be used for digital inputs to gain data on run time or detection, voltage trigger value set in the cloud interface from 7V DC advised.
- 15,16,17 Require additional parts purchase.
- Inputs 11,12 can be scaled in the cloud side for use as a 0-5v sensor or other values.

| | | | |
|---|---|---|---|
| 1. IY-HUB2 | 2. 4G Antenna | 3. GPS Antenna<br>*2M Cable* | 4. Fused Power Loom<br>**POWER**-*RED/BLACK* |
| 5. Analogue 1<br>**A1**-*GREEN* | 6. Analogue 2<br>**A2**-*GREEN* | 7. Analogue 3<br>**A3**-*GREEN* | 8. Analogue 4<br>**A4**-*GREEN* |
| 9. Analogue 5<br>**A5**-*GREEN* | 10. Analogue 6/Boot<br>**BOOT**-*WHITE* | 11. Analogue 0-10V A<br>**0-10V A**-*YELLOW* | 12. Analogue 0-10V B<br>**0-10V B**-*YELLOW* |
| 13. External Temp 1<br>**TEMP 1**<br>*-YELLOW/YELLOW* | 14. External Temp 2<br>**TEMP 2**<br>*-YELLOW/YELLOW* | 15. VE 1 Connector<br>**VE1**-*WHITE/BLACK* | 16. VE 2 Connector<br>**VE2**-*WHITE/BLACK* |
| 17. Relay Module Cable<br>**RELAY**-*4CORE* | | | |

# 5. Data from the IY-HUB2 Device

## Output Relay Module - Relay Position Status

| | | | |
|---|---|---|---|
| Channel 1 (1/0) | Channel 2 (1/0) | Channel 3 (1/0) | Channel 4 (1/0) |

## Battery Supply Voltage

| | | | |
|---|---|---|---|
| Voltage (V) | Average Voltage (V) | Max Voltage (V) | Minimum Voltage (V) |

## 0-70V DC A1, A2, A3, A4, A5 (GREEN wire) - Analogue input, 0/1 or Runtime

| | | | |
|---|---|---|---|
| Voltage (V) | Average Voltage (V) | Max Voltage (V) | Minimum Voltage (V) |
| Digital State (1/0) | Period Runtime (s) | Period Length (s) | Runtime (%) |

Run time values are dictated by runtime voltage triggers being set.

## 0-70V DC A6 (BOOT/WHITE wire) - Analogue input, 0/1 or Runtime

| | | | |
|---|---|---|---|
| Voltage (V) | Average Voltage (V) | Max Voltage (V) | Minimum Voltage (V) |
| Digital State (1/0) | Period Runtime (s) | Period Length (s) | Runtime (%) |

Run time values are dictated by runtime voltage triggers being set.

## Onboard Temperature

| | | | |
|---|---|---|---|
| Temperature (°C) | Temperature (°F) | Average Temperature (°C) | Average Temperature (°F) |
| Max Temperature (°C) | Max Temperature (°F) | Min Temperature (°C) | Min Temperature (°F) |

## External Temperature 1 & 2

| | | | |
|---|---|---|---|
| Temperature (°C) | Temperature (°F) | Average Temperature (°C) | Average Temperature (°F) |
| Max Temperature (°C) | Max Temperature (°F) | Min Temperature (°C) | Min Temperature (°F) |

## 100mv DC Shunt

| | | |
|---|---|---|
| Current (A) | Average Current (A) | Maximum Current (A) |
| Minimum Current (A) | Total Period Current (Ah) | |

## Tilt & Acceleration Runtime

| | | | |
|---|---|---|---|
| Period Length Seconds (s) | Acceleration wake triggered (1/0) | Vibration Runtime (Seconds) | |
| Vibration Runtime (%) | XY TILT (°) | XZ TILT (°) | ZY TILT (°) |

### Onboard Accelerometer

| | | | | | |
|---|---|---|---|---|---|
| Current X Acceleration (m/s^2) | Average X Acceleration (m/s^2) | Maximum X Acceleration (m/s^2) | Minimum X Acceleration (m/s^2) | Current Y Acceleration (m/s^2) | Average Y Acceleration (m/s^2) |
| Maximum Y Acceleration (m/s^2) | Minimum Y Acceleration (m/s^2) | Current Z Acceleration (m/s^2) | Average Z Acceleration (m/s^2) | Maximum Z Acceleration (m/s^2) | Minimum Z Acceleration (m/s^2) |

### Location & Cell

| | | |
|---|---|---|
| Latitude (°) | Longitude (°) | Altitude (m) |
| Signal Strength (RSSI) | Operator Code | Speed Over Ground (Kn) |

## 6. Hardware Troubleshooting

| Issue | Solution |
|---|---|
| My device isn't showing any data in the cloud or app | Check the LED on the unit to make sure it is connected. See the table below on device status codes. |
| Device data in the cloud or app is not accurate | Check the connections to the battery and make sure they are secured. |
| My device isn't powered on | Make sure your power source has sufficient power to run the device and the fuse has not blown. |
| My device isn't sending data | Check the flash code of the device. Try power cycling the device. Ensure you have a signal where the device is fitted with your phone or 4G device. |
| Something about my hardware does not look right or not fitted correctly | Contact us immediately and DO NOT open the product as this will void your warranty* and we cannot offer a replacement. |

For further assistance, please refer to our knowledge base, accessible through the portal or our website. You can also find a QR code for direct access in Section 8.

### 6a. Device Status Codes - These only show at start up, device wake triggers and during the reporting period unless the device is used in live mode.

| Light Action | Meaning |
|---|---|
| No Lights | Device starting or powered off or asleep. |
| Orange | Device started, looking for OTA updates/attempting OTA update. |
| Red | Device attempting connection. |
| Green | Device is connected to the cloud |

# 7. Remotely configurable settings via 4G Cloud Interface

*- Please request cloud account access for this feature and to change the below.*
The section below is technical and used primarily for those who like to understand how our system functions. In your settings interface in the cloud platform, a simple click and set dashboard is available for all settings below. Settings only change during a cycle unless the device is in LIVE mode. Your device will still function out of the box as standard running our set values. Default values are stated in the cloud platform settings.

| Setting | Description |
|---|---|
| Battery Voltage Boot Trigger | A voltage higher than the battery voltage threshold will put the device into boot mode. |
| Battery Voltage Boot Trigger Threshold | Set the battery voltage threshold. |
| Boot Pin Boot Trigger | A voltage higher than the boot pin voltage threshold on the boot pin will put the device into boot mode. |
| Boot Pin Boot Trigger Threshold | Set the boot pin voltage threshold |
| Acceleration Boot Mode Trigger | Acceleration over the acceleration threshold will put the device into boot mode. |
| Acceleration Boot Mode Threshold | Set acceleration threshold in G's |
| GPS | Enable or disable GPS readings. |
| Buffering | Enable or disable buffering. |
| Read Interval In Sleep Mode | Set how often to read during sleep mode in seconds. |
| GPS Fix Max Time | How long to wait for a gps fix before giving up (seconds) |
| Boot Report Interval | Set how often to send reports during boot mode in seconds. |
| Report Interval | Set the report interval in seconds. |
| Digital/Runtime Threshold Voltage A1 | Set voltage for 0/1 on A1 for runtime and digital state. |
| Digital/Runtime Threshold Voltage A2 | Set voltage for 0/1 on A2 for runtime and digital state. |
| Digital/Runtime Threshold Voltage A3 | Set voltage for 0/1 on A3 for runtime and digital state. |
| Digital/Runtime Threshold Voltage A4 | Set voltage for 0/1 on A4 for runtime and digital state. |
| Digital/Runtime Threshold Voltage A5 | Set voltage for 0/1 on A5 for runtime and digital state. |
| Digital/Runtime Threshold Voltage A6 | Set voltage for 0/1 on A6 for runtime and digital state. |
| Sleep | Enable or disable sleep between reports. |
| Relay 1 Mode | On/Off Control or 3 Second Reset Mode for Relay 1 |
| Relay 2 Mode | On/Off Control or 3 Second Reset Mode for Relay 2 |
| Relay 3 Mode | On/Off Control or 3 Second Reset Mode for Relay 3 |
| Relay 4 Mode | On/Off Control or 3 Second Reset Mode for Relay 4 |
| Get All Settings | Command to return all settings |

# 8. Setup Disclaimer & Support

This part of the documentation is to provide guidance on what can be configured on the hardware device. All configurations are made on the cloud portal and via the 4G connectivity of the product. The IY-HUB2 is a self install product, for assistance please raise a ticket and we can put you in touch with a local installer.

Our software is updated continually to give you the best new features. Up to date help can be found in the knowledge base of the cloud application or by scanning the QR CODE, where we have all commonly asked questions and articles relating to our software.

SCAN ME

For any further queries across the hardware or cloud that are not answered in the knowledge base, please raise a support ticket from your portal or call +44 (0)1983 897179.

Insytly provides a full suite of products for business and industry tracking, monitoring and controlling all types of assets from security towers to generators.
To view our full range of products, find distributors and installers, download digital versions of literature and guides or for any other information, visit https://insytly.com.

# 9. Insytly Cloud & Mobile Platform

## 9a. Installing the App

***NOTE:*** *Our mobile app is designed for monitoring, control and receiving notifications. For initial account creation, device setup and modifying settings, please use a laptop or desktop*

GET IT ON Google Play

Download on the App Store

To install our application on your mobile device, proceed to the app store that corresponds with your phone and search “Insytly”. Our App is available to download for free for Apple® and Android™ devices.

*Google Play and the Google Play logo are trademarks of Google LLC.*
*App Store and the App Store logo are trademarks of Apple Inc.*

## 9b. Logging into your Cloud Account

The following setup requires a Desktop Chrome/Edge browser login to app.Insytly.com

To access your device, please create an account at app.insytly.com if this is your first device or log in to your existing account.
Follow the on screen instruction when signing up. You will need to receive a confirmation email, if this is not delivered due to blocking filters please contact us to manually verify your account.

## 9c. Adding Your Device

A valid credit/debit card or BACS must be setup prior to adding a device.

1. To add a new device to your account, click the button “Create”.
2. While adding your device you will need the unique code on the device label. This can be scanned to add via the mobile app or manually entered on a web browser.
3. You will be able to set the asset name and icon at this point. All other changes for the device can be made once it is added.

## 9d. Device Tariff and Billing

Each device added requires a tariff, the tariffs will show after you fill in the device details as part of the process to add a new device. Ensure you select the HUB2 device option when adding your device. The tariff is monthly, payments are collected automatically and you will be notified if there are any issues with the payment method.

Failure to pay subscription charges will result in device access being revoked after 7 days and automatic termination after 30 days of non payment, a restart fee £50 + VAT will apply.

Once the device is assigned to a tariff it cannot be adjusted without contacting support.

*You are now ready to start configuring and using your device.*

## 9e. Accessing Remotely Configurable Hardware Settings

To access the device hardware settings, navigate to your device, then settings, this will be a gear type icon or similar. Then click dvanced Settings/Remote Hardware Settings.
Your cloud user account will need the correct access rights enabled if you re not the admin.

## 9f. Data Transmission and Storage

The IY-HUB2 unit can be configured to send data at intervals ranging from 1 to 300 minutes. The collected data is stored in the cloud for 30 days. For intervals over 5 minutes, the device will enter sleep mode between transmissions to optimise power usage if sleep is turned on in the cloud settings. We recommend setting the interval to 15 minutes for optimal performance and power efficiency unless live control of relays are required .

## 9g. Interval and Tariff Information

Please note that different data transmission intervals are associated with different tariff prices. Only the "LIVE" tariff plan includes live control capabilities. For other tariffs, control operations will occur at the same interval as the data transmission setting.

This information helps ensure you choose the appropriate interval and tariff plan to meet your specific needs while managing costs and maintaining efficient power usage.

## 9h. Accelerometer Thresholds

After installing the device, the accelerometer may display incorrect data. Follow these steps to calibrate and set thresholds:

1. **Set Acceleration Thresholds**: Configure the acceleration thresholds to enable the device to send an alert if the specified values are reached. This can indicate heavy movement or impact.
2. **Activate Acceleration Alerts**: Turn on the "Acceleration Send" feature to activate this functionality.

This process ensures accurate data from the accelerometer and allows for timely alerts based on movement or impact thresholds.

## 9i. Boot Pin - White Wire

The boot pin, controlled by the white wire, enables the device to wake up with a 7V+ signal. This feature puts the device into a fast data mode, which is particularly useful for detecting start key activation and usage.

# *10. Warranty*

Your product comes with a two year warranty against the main hardware units function for connecting with our cloud services as long as an active subscription is paid for with no due payments outstanding, the device has not been tampered with or damaged in any way including water damage and the subscription has not been paused for any period during this time. Once a device subscription is cancelled it cannot be restarted without being returned to our main office for fitment of a new SIM, a charge applies.

Metrix Advanced Technologies Ltd will repair or replace faulty product during this period at its sole discretion subject to the failure not being a result or caused by any of the following conditions:
1. Reverse polarity, connection to the incorrect voltage or reverse switch/contactor polarity.
2. Damage caused by incorrect installation that may include (but is not limited to): Incorrect wiring, Ingress of water, salt, vapour, corrosive gases, diesel, petrol or other distillates of oil.
3. Physical damage/abuse.
4. Damage caused by third party systems, fire, flood, lightning and other atmospheric phenomena.
This warranty expressly excludes all consequential costs including (but not limited to): Loss of use, loss of reputation, cost of installation/engineers time, cost of return freight, any banking charge etc.
To Claim Warranty please contact your Dealer. To return goods directly to Metrix Advanced Technologies Ltd, please contact our support. Metrix Advanced Technologies Ltd accepts no liability for goods returned without Returns Authorisation.
Metrix Advanced Technologies Ltd & Insytly accepts no liability for loss, injury of damage caused by installing or fitting this equipment. If you do not accept this no liability clause, do not install the equipment. Please return the goods (carriage paid) in original packaging for a full refund. Installing it constitutes acceptance of these terms. Please ensure that the goods are suitable and appropriate for the installation. Full technical details, manuals and expert help is available from Metrix Advanced Technologies Ltd and online at insytly.com

Please note that this warranty, exceptions and terms do not infringe your statutory rights that may vary from country to country and state to state.

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IY-HUB2 Instruction Manual | Product: IY-HUB2 | SKU: IY-HUB2-EU/IY-HUB2-G | Version: Q4 2024
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