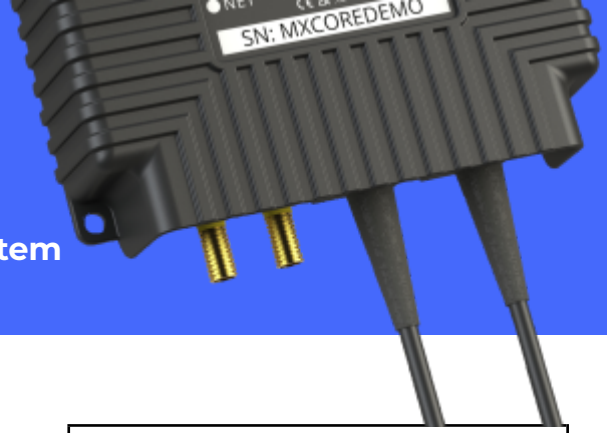
VC-HUB
Instruction Manual

GLOBAL Cellular Remote Monitoring & Control System
12V-48V DC SKU: VC-HUB-G



Thank you for choosing our remote monitoring device.
Here is some useful information you need to know.

1a. Box Contents

1 x VC-HUB Unit
1 x Power Fuse Loom
6x Sensor Tails

1 x Instruction Manual
1 x Safety and User Guide
1 x GPS Antenna - 2m
1 x 4G / 2G Blade Antenna

For Use on:

Vesscomm

1b. Contents

1c. Technical Specifications

Technical Specifications	
Materials & IP Rating:	PC/ABS, A2 stainless fittings, TPU rubber, IP64
Size & Mounting	110mm x 95mm x 35mm, 4x M4 bolt
Connectivity:	2G, 4G CAT1 LTE GLOBAL bands
Input Channels:	Battery supply voltage, 5 analogue 0 - 72 VDC, boot pin, 100A CT, 2 NTC Temperature
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 minute updates = 5mAh, 5 minute updates = 7mAh at 12V and Live connection = 75mAh

2a. Regulatory/Certificate of Conformity

Metrix Advanced Technologies Ltd , trading As Vesscomm hereby declares that the product marketed as VC-HUB 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

Signed : *R Kettlety*

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

2b. Installation Instructions

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 VC-HUB. 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. +++

2c. Health & Safety

Working in the vicinity of batteries, engines, engine room equipment and on vehicles, boats 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:

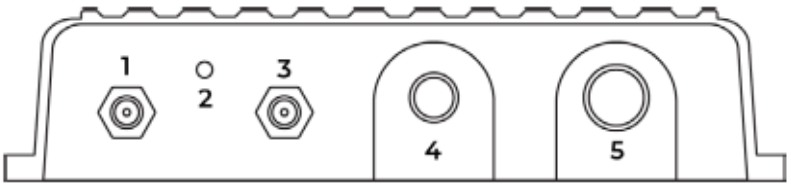
- Wear appropriate Personal Protective Equipment. Including gloves & eye protection.
- Ensure that the appropriate tools are available and that they are well maintained. Ensure that the working area is safe and that potential hazards are identified and mitigated (e.g. working at height, safe lifting 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 1 lead at a time, do not hold 2 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, Vesscomm 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 not connect the power loom until all wiring is completed and antennas are connected.

3a. Installing your Device

1. Find a mounting surface within 50 CM of a Positive and Negative connection.
2. Screw the 4G antenna Pigtail into the 4G LTE connector.
3. Screw the GPS antenna into the GPS SMA Connector.
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. Fit the 4G LTE antenna as per the drawing, no closer than 50CM of other antennas.
7. Connecting sensor looms to their corresponding colours below:
8. WARNING - If you are using your own loom you must fuse each connection, Extensions wires purchased from us are always fused with 1A.
9. When connecting sensor wires, connect the 8.4mm ring crimp first
10. Connect the positive and negative crimps of the power loom to the correct terminals.
11. Connect the power loom to the main loom with the 2 pin connector.
12. Your device should now be powered - follow the next steps of setup.
13. If you need to change any connections, ensure the 2 pin power loom is removed prior to any other connectors/loom components.

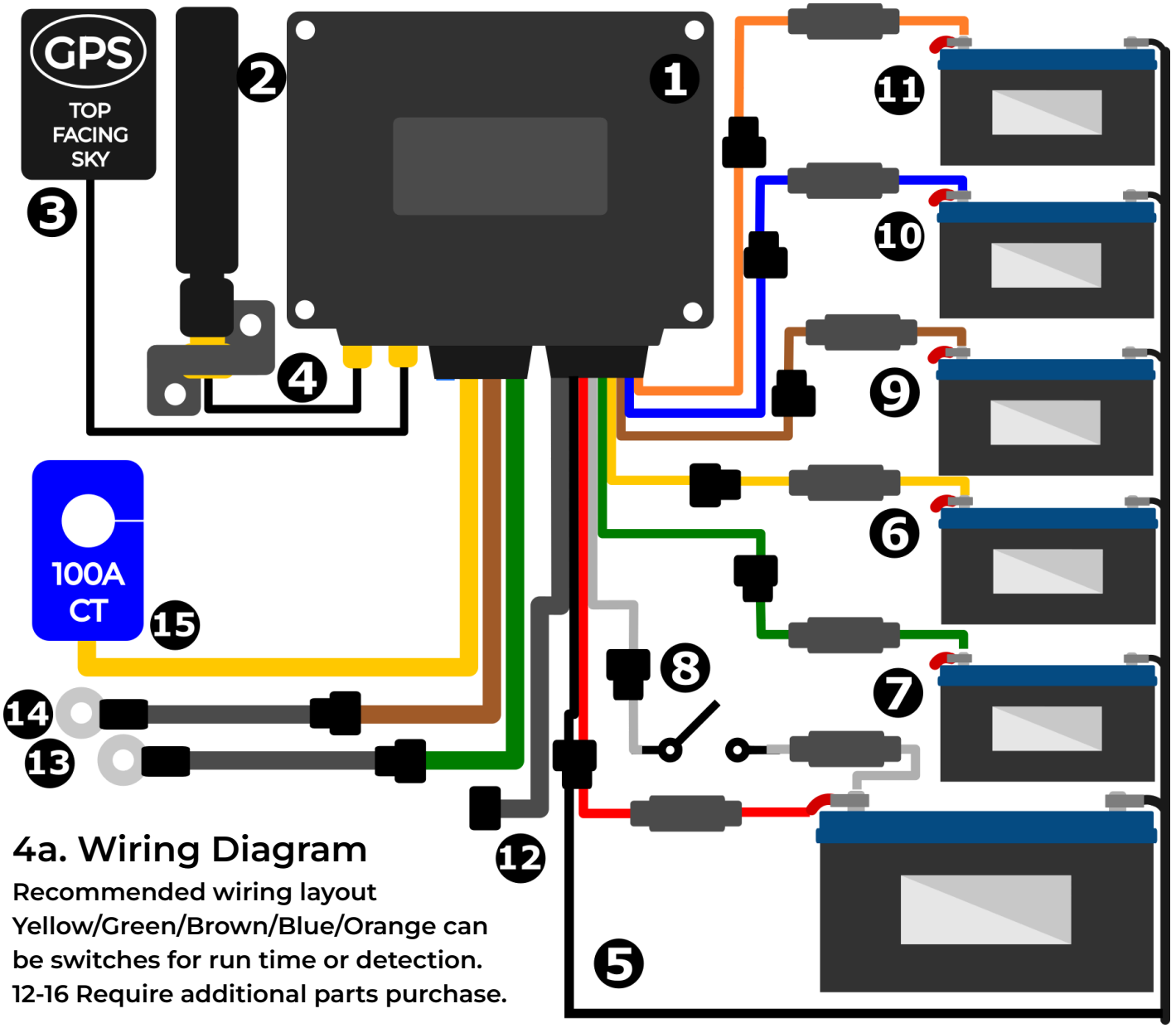
1. 4G LTE Antenna
2. Status Indicator
3. GPS Connector
4. Secondary Loom
5. Main Connection Loom



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.

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

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



4a. Wiring Diagram

Recommended wiring layout
Yellow/Green/Brown/Blue/Orange can be switches for run time or detection.
12-16 Require additional parts purchase.

1. VC-HUB	2. 4G Antenna	3. GPS Antenna	4. 4G Mount & Pigtail
5. Fused Power Loom INCLUDED	6. Yellow Wire 1M Tail NO FUSE	7. Green Wire 1M Tail NO FUSE	8. White Wire 1M Tail NO FUSE
9. Brown Wire 1M Tail NO FUSE	10. Blue Wire 1M Tail NO FUSE	11. Orange Wire 1M Tail NO FUSE	12. Relay Module Connector
13. External Temp 1 NOT INCLUDED	14. External Temp 2 NOT INCLUDED	15. 100A AC CT NOT INCLUDED	

Fused looms can be purchased in any colour & lengths 2.5m, 5m, 10m, 20m, 20AWG stranded tinned copper silicone jacket. External temperature 1 & 2, AC CT and DC Shunt can be purchased to connect to your unit.

NOTE: The colour wires in your kit may vary from those labelled above. While we ensure the correct quantity of wires, our efforts to reduce waste and our current supply may result in multiple wires of the same colour (e.g., three green wires instead of green, blue, and brown).

All wires serve the same function; the colours labelled above aid in differentiating them for the wire diagram.

Control on the VC-HUB Device

Output Relay Module - Relay Position Status

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

Data from the VC-HUB Device

Battery Supply Voltage

Voltage (V)	Average Voltage (V)	Max Voltage (V)	Minimum Voltage (V)

Voltage Channel Instance 1 - Green Wire Monitoring Voltage

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.

Voltage Channel Instance 2 - Yellow Wire Monitoring Voltage

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.

Voltage Channel Instance 3 - Brown Wire Monitoring Voltage

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.

Voltage Channel Instance 4 - Blue Wire Monitoring Voltage

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.

Voltage Channel Instance 5 - Orange Wire Monitoring Voltage

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.

Voltage Channel Instance 6 - White Wire Monitoring Voltage

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)	

100A AC CT Clamp

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

Tilt & Acceleration Runtime

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

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)

System Data

Version	Runtime (ms)	Ram Free (b)	Minimum Ram Free (b)

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 Wire 1	Set voltage digital threshold on wire 1 for runtime and digital state.
Digital/Runtime Threshold Voltage Wire 2	Set voltage digital threshold on wire 2 for runtime and digital state.
Digital/Runtime Threshold Voltage Wire 3	Set voltage digital threshold on wire 3 for runtime and digital state.
Digital/Runtime Threshold Voltage Wire 4	Set voltage digital threshold on wire 4 for runtime and digital state.
Digital/Runtime Threshold Voltage Wire 5	Set voltage digital threshold on wire 5 for runtime and digital state.
Digital/Runtime Threshold Voltage Wire 6	Set voltage digital threshold on wire 6 for runtime and digital state.
RTC Time	Set RTC time in unix time format.
Sleep	Enable or disable sleep between reports.
Calibrate	Send calibration command for accelerometer
Switch Mode Channel 1	0 for on off switching mode and 1 for reset switching mode. For Switch 1 - Reset provides a 3 Second Pulse
Switch Mode Channel 2	0 for on off switching mode and 1 for reset switching mode. For Switch 2 - Reset provides a 3 Second Pulse
Switch Mode Channel 3	0 for on off switching mode and 1 for reset switching mode. For Switch 3 - Reset provides a 3 Second Pulse

Switch Mode Channel 4	0 for on off switching mode and 1 for reset switching mode. For Switch 4 - Reset provides a 3 Second Pulse
Empty Buffer	Command to empty buffer
Reset	Command to reset device
Get All Settings	Command to return all settings

8a. 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. Please see the cloud support for help, bottom right once logged in.

Our software is updated continually to give you the best new features. Up to date help can be found in the support area of the cloud application. If you think something is missing or not working correctly, please email us.

The VC-HUB is a self install product, for assistance please contact support and we can put you in touch with a local installer.

Vesscomm

Contacting Support:
Phone: +44 (0)1983 897179
Email: support@Vesscomm.com
Support Tickets: Via Portal

This hardware is designed for our web application and mobile applications “Vesscomm” available for all browsers and Android/iOS devices.
Vesscomm provides a full suite of products for the marine industry and boat owners for tracking, monitoring and controlling all types of boats from RIBs to yachts. As well as a range of integration modules for onboard use. To view our full range of products and to download digital version of literature and guides, visit https://Vesscomm.com
For spare parts, please contact support@Vesscomm.com or raise a support ticket from your portal. For information on a local dealer or installer, please contact sales@Vesscomm.com

8b. Installing the App

PLEASE NOTE: Our Mobile application is primarily designed for monitoring and receiving notifications. For initial account creation and setup, we recommend using a laptop, desktop, or large tablet device.

To install our application on your mobile device, proceed to the app store that corresponds with your phone and search “Vesscomm”

GET IT ON Google Play

Download on the App Store

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.

The following setup requires a standard web browser login to app.Vesscomm.com - We advise the latest Chrome or Safari browser

9a. Logging into your Cloud Account

To access your device, please create an account at app.Vesscomm.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.

9b. Adding Your Device

To add a new device to your account, go to your account settings page and find the tab/button “Add New Device” You will be required to add a valid credit/debit card prior to adding a device. While adding your device you will need the unique code on the device label. You will be able to set the asset name and icon at this point. All other changes can be made once it is added.

9c. Device Tariff and Billing

Your Vesscomm Device includes 5 Years of basic data and platform access as standard. There may be optional additions in the Web Portal.

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

Configuring Hardware Settings of the VC-HUB

9d. Connecting to your device

Now your device is fitted and powered up, please check the following before progressing: The device is flashing green or green/orange - this indicates a cellular connection. - If it is showing anything other than this, please check the “Device Status Codes Section”

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 Advanced Settings/Remote Hardware Settings.
Your Cloud User account will need Setup turned on to allow settings access.

10a. Setting Date & Time

Your device will already come preset with the correct time and date. If your device has been off for more than 12 months or a considerable time since purchase, on first connection it will set its time and date. If it does not, please wait 1 hour, contact support if it does not set.

10b. Setting Data Transmission and Control Interval

The VC-HUB unit can be configured to send data collected between 1-300 minutes, this data is then stored in the cloud for 30 days. For all timings over 5 minutes the device will sleep

between sending for the best power usage. We recommend 15 minutes for the interval of this device. Please note that the different intervals may have an additional service charge for your location.

10c. Calibrate Accelerometer and Threshold

After a device is fitted the Accelerometer may show incorrect data, please click the “calibrate Accelerometer to set the current angle to 0 in X, Y & Z directions. Setting the acceleration thresholds enable the device to send a message if the value is reached, this could be to indicate heavy movement or impact. Turn Acceleration send on for the feature to work.

10d. Boot Pin - White Wire

Turning the boot pin on or off allows the device to wake on a 7V + signal, this puts the device into a fast data mode and useful for start key detection and usage.

10e. Cloud Based configurations - See Self Support Center

- Device details, manufacturer information, Owner, Registration, Icon, Static GPS, etc.
- Adding sensors, setting colour and notification thresholds, visual bars, access rules.
- User access to the device, email notifications, push notification.
- Setting up switches - Switch Logs also.
- Setting Geofences, viewing trip history
- Notifications and setting notifications for each sensor

Your Account:

- User account details, billing details, password, marketing choices
- List of all devices on your account, add new device, delete a device
- Terms and Conditions.

Please use the support button in the bottom right of the cloud application for self service help or to raise a support ticket for the above items.

High Cost Network Charges Disclaimer

Whilst we at Vesscomm and Metrix endeavour to get the best network rates possible for your devices included, this can change without notice or in some cases there are networks across the caribbean with very high per Mb charges, in cases where long term access to these networks in used, a member of our team will be in touch to discuss the slight price increase that will need to be paid for the period of use. We will only charge the difference in rate charge for the data used each month. For example, Turks and Caicos would have a £4 Monthly overage charge whilst in use.

You are now ready to start using your device.

11a. 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

11b. 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.
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.

11c. Safety Considerations

There are no special specific safety considerations (except for observing good installation practices covered elsewhere in this manual) for the VC-HUB product.
Where VC-HUB 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 VC-HUB is carefully set up and configured.

11d. Warranty

Your product comes with a lifetime 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 & Vesscomm 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 Vesscomm.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.

IMPORTANT!

METRIX ADVANCED TECHNOLOGIES LTD MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, REGARDING THESE Vesscomm PRODUCTS AND MAKES SUCH Vesscomm PRODUCTS AVAILABLE SOLELY ON AN “AS IS” BASIS. IN NO EVENT SHALL METRIX ADVANCED TECHNOLOGIES LTD BE LIABLE TO ANYONE FOR SPECIAL, COLLATERAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING OUT OF PURCHASE OR USE OF THESE METRIX ADVANCED TECHNOLOGIES LTD PRODUCTS. THE SOLE AND EXCLUSIVE LIABILITY TO METRIX ADVANCED TECHNOLOGIES LTD., REGARDLESS OF THE FORM OF ACTION, SHALL NOT EXCEED THE PURCHASE PRICE OF THE Vesscomm PRODUCTS DESCRIBED HERE IN.

Metrix Advanced Technologies ltd reserves the right to revise and improve its products as it sees fit. This publication describes the state of this product at the time of its publication and may not reflect the product at all times in the future Installation of the product supplied with this manual constitutes full acceptance of these terms. If you do not agree to them, return the product, unused to Metrix Advanced Technologies Ltd for a full refund.

METRIX
Advanced Technologies

VC-HUB Instruction Manual | Product: VC-HUB | SKU: VC-HUB-G | Version: Q4 2023
Designed and Manufactured by Metrix Advanced Technologies Ltd , 7 Carter Avenue, Shanklin, Isle of Wight, PO37 7LQ, United Kingdom
Sales and support: +44 (0)1983 897179
https://metrixadvancedtechnologies.com

IMPORTANT: PLEASE RETAIN THIS INFORMATION FOR FUTURE REFERENCE.

MADE IN BRITAIN