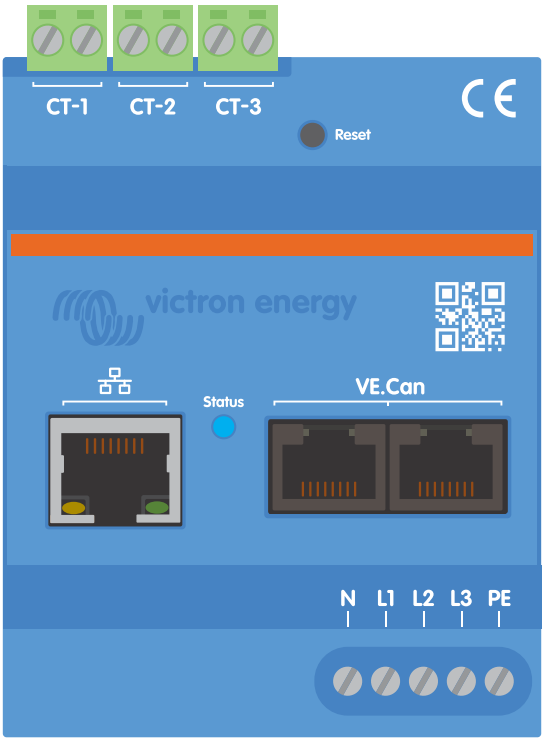
ENGLISH



Victron VM-3P75CT Energy Meter Manual

Rev 10 - 10/2025

This manual is also available in HTML5.

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1. Safety Instructions

General

Please read the safety instructions below before installing and using the VM-3P75CT energy meter to avoid risks of fire, electric shocks, personal injuries or equipment damage.

This product is designed and tested in accordance with international standards. The equipment should be used for its designated application only and in accordance with the specified operating parameters.

Installation

Installation, maintenance, service and adjustments must be made by qualified personnel only. To reduce the risk of electric shock, do not perform any service other than that specified in the operating instructions unless you are qualified.

- For electrical work, follow the local national wiring standards, regulations and these installation instructions. Connection to the mains supply must be in accordance with the national regulations for electrical installations.
- Never install near fire sources, explosive materials, combustibles or other flammable sources. Never use it at places where gas or other chemical explosions could occur.
- Turn off mains power before installing or performing operations on it.
- Do not put fingers or insert objects or sharp metallic objects into the terminals.
- Install it in a dry environment.
- Do not apply strong force on the equipment to prevent crashes and deterioration.
- It is not allowed to use the current clamps on bare wires.
- Make sure the ground connection is properly done to prevent equipment damage.

Operation, service and maintenance

- Do not use the device if it shows any signs of damage or does not function properly.
- Do not use the VM-3P75CT if it is broken, defective, cracked, damaged, or malfunctioning.
- The VM-3P75CT contains no serviceable parts.
- If a current transformer is defective, it must be replaced by qualified personnel.
- Regular maintenance of the VM-3P75CT is not required.
- Avoid moisture, oil/soot/vapours, and keep the device clean.
- Clean using a dry cloth on the front side of the VM-3P75CT.

2. Introduction

The Victron VM-3P75CT energy meter is a standard device to measure the power and energy of single-, split- and three-phase applications and calculates each phase's power values and broadcasts this over VE.Can or Ethernet with a high rate.

It has built-in Ethernet and VE.Can ports for connecting to a GX device and the split-core current transformers enable easy and quick installation without modifying existing wiring.

The energy meter works out of the box (the firmware may need to be updated; details can be found in the Firmware Updates [11] chapter) as a grid meter for systems with a MultiPlus and Quattro. Configuration (via VictronConnect) is only required for changing the role and manual IP configuration rather than the default DHCP.

Its data is displayed on a GX device such as the Cerbo GX or Ekrano GX , as well as in VictronConnect and our VRM Portal.

2.1. Features

- Capable of measuring up to 80 A_{rms} (Amps root mean square) per phase (but rated at 75 A)
- Modbus/UDP communication over Ethernet
- Split-core current transformers for easy installation without altering existing wiring
- Support for split-phase configuration
- Configurable total energy registration: vector, arithmetic, or absolute
- Reports:
  - line-to-neutral voltage
  - line-to-line voltage
  - power factor (according to IEEE convention)
  - phase sequence (for 3-phase configuration)
  - phase rotation warning (for 3-phase configuration)
  - protective earth voltages
  - neutral and line currents
- Status LED can be set as a pulse counter for quick, at-a-glance diagnostics

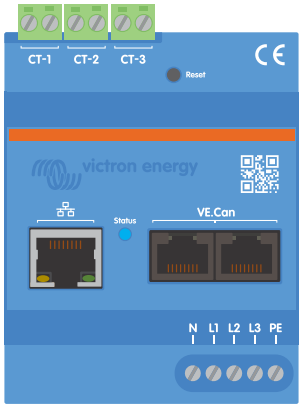
The VM-3P75CT can be configured for various roles in a GX device, such as the Cerbo GX or the Ekrano GX. Depending on the application, it can be used:

- as a grid meter, providing control input for an Energy Storage System (ESS)
- to measure the output of a PV inverter
- to measure the output of an AC genset
- as an AC meter to measure a dedicated AC load circuit
- to track an EV charger
- to track a heat pump

It offers two options for connection to a GX device:

1. A wired Ethernet connection to the local network via the built-in Ethernet port, allowing the GX device to communicate with it.
2. A wired VE.Can connection via the onboard VE.Can port, directly linking it to the GX device.

2.2. What's in the box?

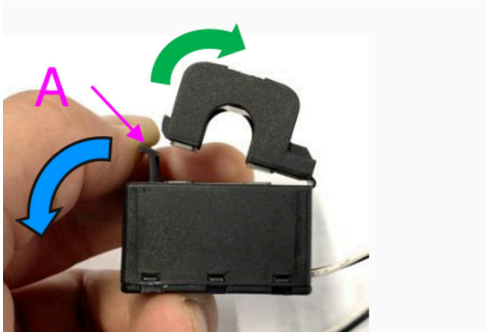
Victron VM-3P75CT with 3 input terminal blocks	
3x Split-core current transformer, wired ready for connection Wire length: 640mm (25.3in)	
VE.Can terminators (2 pcs)	

3. Installation

3.1. Installing and wiring the split-core current transformers

Note the following when installing the split-core current transformers :

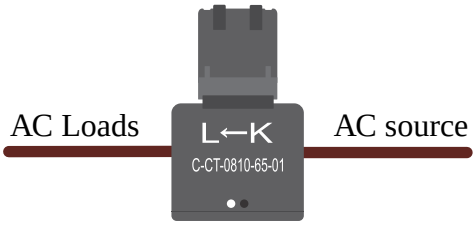
- It is not allowed to use the current clamps on bare wires.
- As the current transformers are quite delicate, the following procedure should be followed when installing the current transformers:



1. First, open Section A. Be careful not to twist the head.

   The head part of the product will naturally lift off.

2. Clamp the head part by hand.
3. Make sure the current transformers are connected to the correct phase wire and input terminal. The transformers are marked with an indicator showing which input port they belong to. The devices are calibrated at the factory, and accuracy will decrease if the current transformers are not matched to the correct input.
4. There is an arrow printed on the CT labelled L ← K. Ensure the arrow points towards loads.



5. Make sure the correct wires are connected to the voltage terminals. The device could be damaged if two phase wires are connected to the neutral and L1 input.

Extending the wires of the split-core current transformers

The wires of the current transformers can be extended if necessary, but note that this will increase the measurement noise slightly.

In general: The longer the cables, the higher the noise floor. However, if the length is doubled, the additional error is still low (almost 0A).

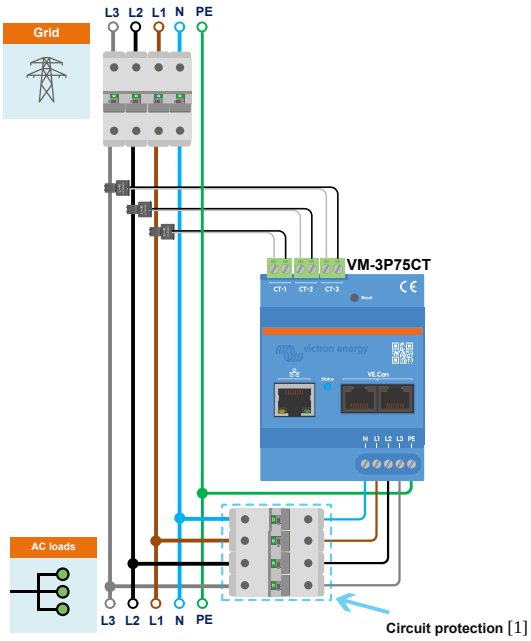
To minimise induced noise, it is recommended to twist the wires like the wires supplied with the device.

Should a split-core transformer become damaged, you can order a replacement from your Victron dealer or via this link.

3.2. Power wiring and overcurrent protection

The VM-3P75CT includes a built-in, non-replaceable fuse that protects its internal circuitry. When the same wire gauge is used to connect the VM-3P75CT as for the rest of the circuit downstream of the main breaker, no additional circuit breaker is required. In most European installations, 2.5 mm² wiring protected by a 16 A breaker is used, which is also suitable for the VM-3P75CT.

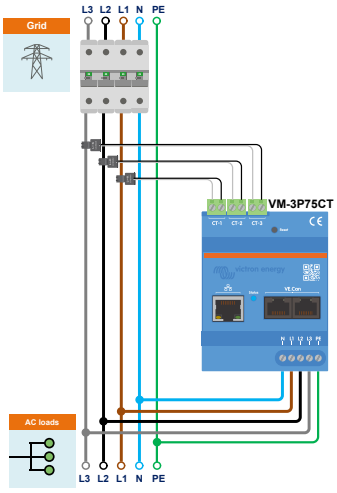
If a different wire gauge is used, a separate circuit breaker must be installed in accordance with applicable national wiring regulations. This requirement ensures that the overcurrent protection device, typically a circuit breaker, corresponds to the smallest wire gauge in the circuit [1].



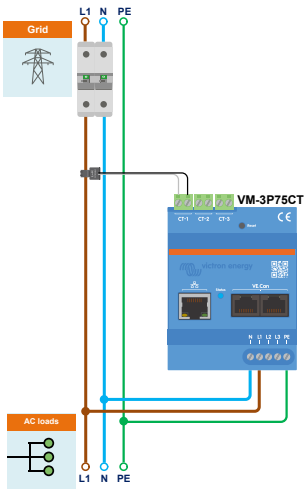
VM-3P75CT circuit protection

3.3. Wiring examples by application

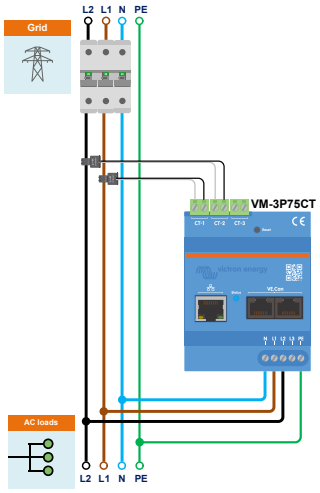
General AC wiring examples



VM-3P75CT 3-phase wiring when used as a grid meter

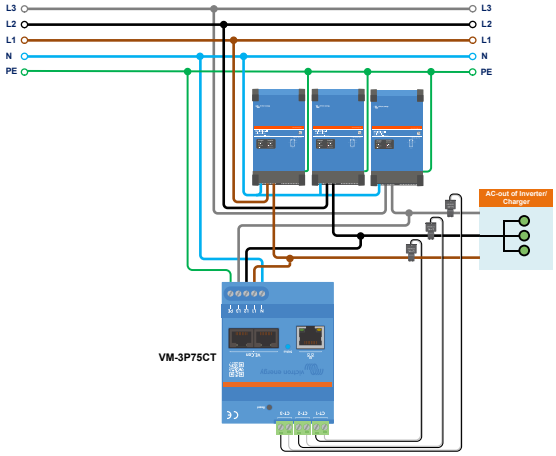


VM-3P75CT 1-phase wiring when used as a grid meter

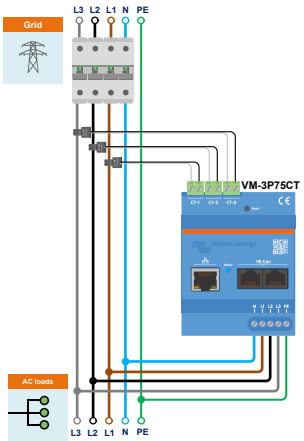


VM-3P75CT split-phase wiring when used as a grid meter

Specific AC wiring examples depending on application and role



VM-3P75CT 3-phase wiring - Role is set to measure AC loads



VM-3P75CT 3-phase wiring - Role is set to measure a PV Inverter (or Generator)

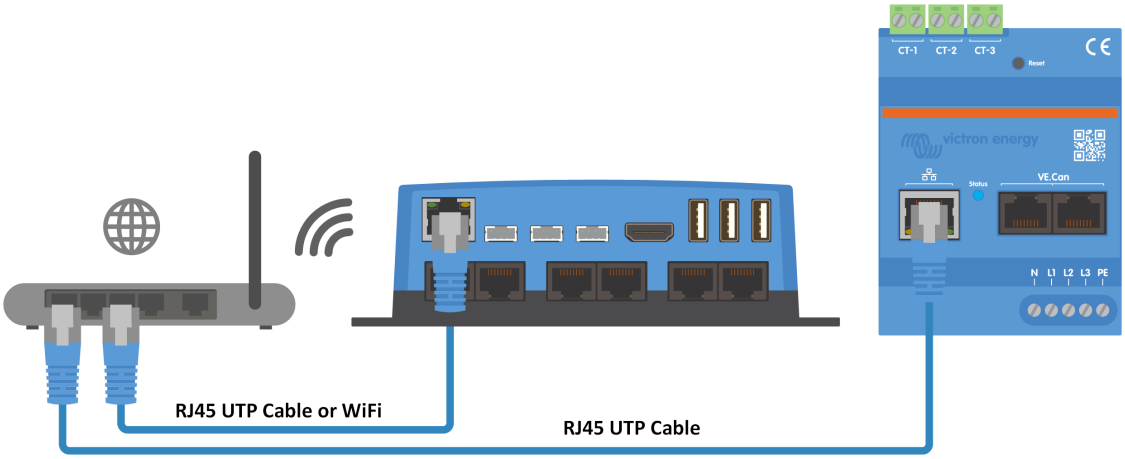
3.4. Ethernet and VE.Can wiring

The VM-3P75CT can be connected to the GX device either via VE.Can or Ethernet.

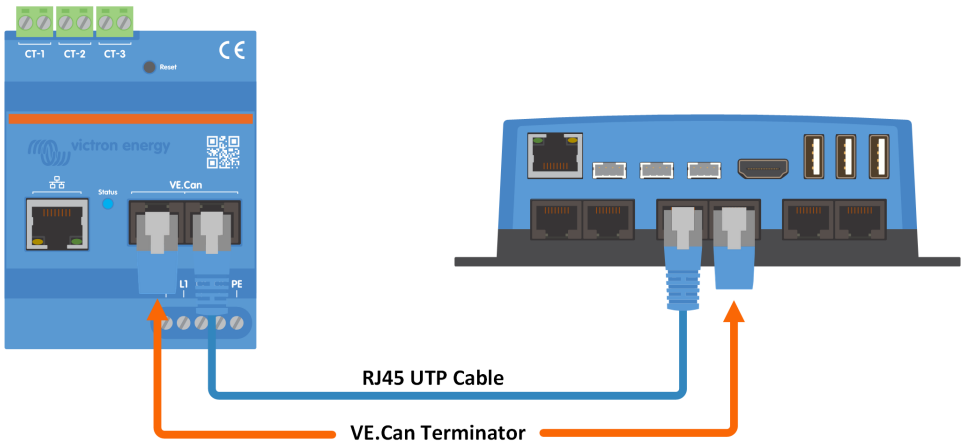
Suppose there is a local network with an Ethernet connection (via a router) to which the GX device is connected via Ethernet or WiFi. In that case, connecting the energy meter to the same network via Ethernet is reasonable.

Alternatively, you can connect the energy meter directly to the GX device via its VE.Can connectors. Ensure that the VE.Can network is properly terminated at both ends with the supplied VE.Can terminators.

For both applications, use a good quality Ethernet cable such as the Victron RJ45 UTP Cable, which can also be purchased from your Victron dealer in different lengths.



The VM-3P75CT connected to the GX device via Ethernet



The VM-3P75CT connected to the GX device via VE.Can

4. Configuration & Monitoring

The VM-3P75CT is configured via VictronConnect.

- When using a VE.Can connection, the VM-3P75CT is automatically detected once connected to the VE.Can port and properly terminated. Ensure that the VE.Can profile of the GX device's VE.Can port is set to 250 kbit/s.
- When using an Ethernet connection, the VM-3P75CT is automatically recognised by the GX device.

VictronConnect configuration and monitoring

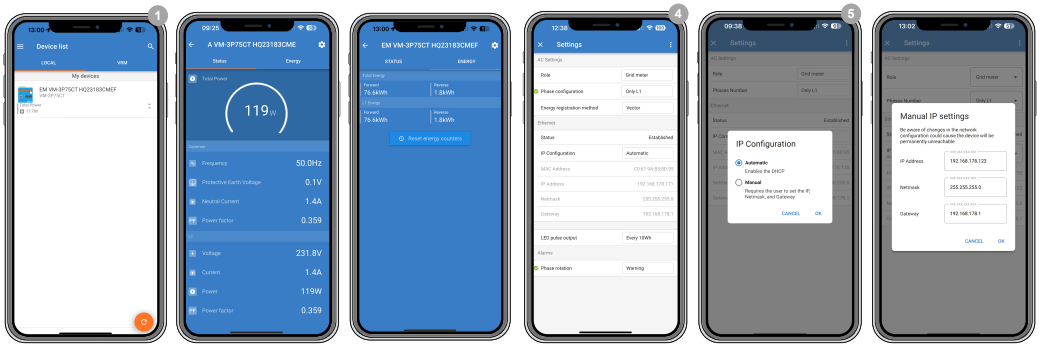
There are two ways to connect to the VM-3P75CT with VictronConnect from a mobile device, laptop, or PC:

1. Directly via Ethernet using the Modbus/UDP connection in the local network.
2. Remotely via VictronConnect-Remote (VC-R), using either VE.Can or Modbus/UDP (requires the GX device to be connected to the VRM Portal).

The VM-3P75CT supports Instant Readout of key data (total power and power per phase) directly from the Device list (1) in VictronConnect. This works via both a local network connection and VictronConnect-Remote (VC-R).

The VictronConnect data display is divided into:

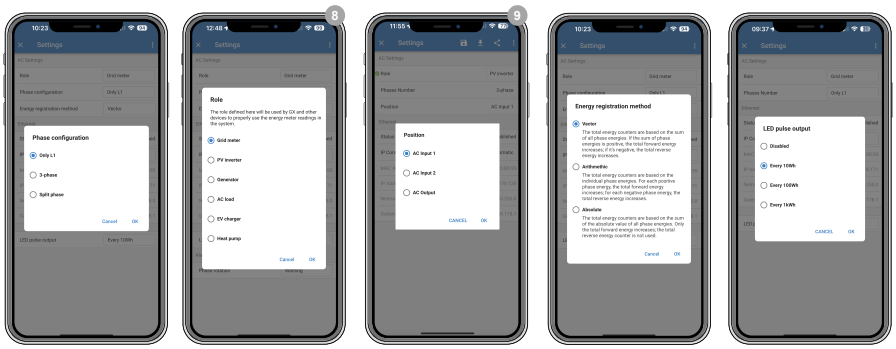
- A Status page (2), displaying frequency, line-to-neutral voltage, line-to-line voltage, power factor (according to IEEE convention), phase sequence for 3-phase configuration, phase rotation warning for 3-phase configuration, and protective earth voltages as well as neutral and line current.
- An Energy page (3), showing the energy fed into and purchased per phase.



Tapping the cog wheel in the top-right corner of the Status or Energy page opens the Settings page. From here, you can adjust the network settings and configure the meter.

The Settings menu (4) includes the following options:

- **Role:** (8) Set this to Grid meter, PV inverter, Generator, AC load, EV charger, or Heat pump, depending on the appliances you want to measure.
- **Phase Configuration:** (7) For single-phase installation, set to Only L1. For three-phase installation, set to 3-phase. For split-phase installation, set to Split phase.
- **Energy registration method:** (10) Default: Vector. Energy registration methods vary by country. Consult your energy supplier to confirm the method used in your region.
- **IP Configuration:** (5) We recommend leaving this setting on Automatic (DHCP). Manual configuration (6) is only necessary in very rare cases. Contact your network administrator for the details.
- **Position:** (9) If the role is set to PV inverter, AC load, EV charger, or Heat pump, adjust the position depending on where it is connected relative to the Multi/Quattro AC input or AC output.
- **LED pulse output:** (10) The status LED can be configured as an energy pulse signal to provide a quick visual indication of load. Each pulse corresponds to a defined energy amount. Options are: Disabled, 10 Wh (default), 100 Wh, and 1 kWh.
- **Phase rotation:** (4) Enables a phase rotation warning. Disabled by default.

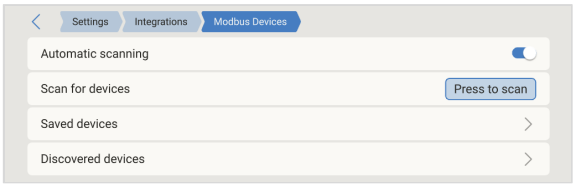


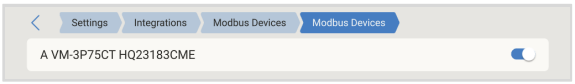
Once the Role has been properly set, the configuration is done.

GX device monitoring

After the VM-3P75CT has connected to the GX device in the local network, it must be activated in the Modbus TCP/UDP menu before it appears in the Device list.

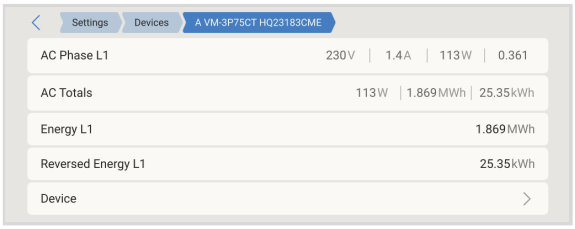
Navigate to Settings → Integrations → Modbus Devices → Discovered devices, and enable the discovered energy meter. By default, the device is disabled when first installed and powered on.

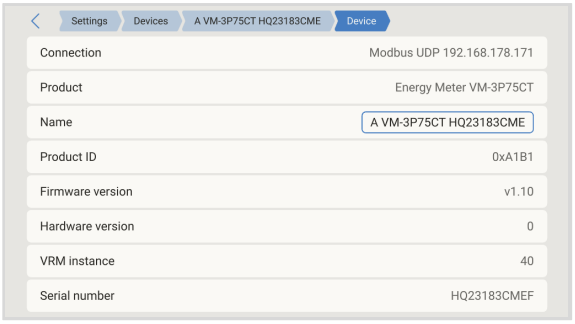




After activation, the energy meter appears in the Device list and the Overview page, from where you can access the following parameters:

- AC Phase L1..L3: voltage, current, power, power factor
- AC Totals: power, forwarded energy, reversed energy
- Energy L1..L3: forwarded energy
- Reversed Energy L1..L3: reversed energy
- Device page: overview of the connection and hardware-specific data, with the option to assign a custom name to the meter





4.1. LED codes

The VM-3P75CT has a built-in LED that shows the status of the energy meter.

The LED states are as follows:

- **Blinking fast alternately green/red:** Bootloader/update mode.
- **Solid green:** All ok, normal running mode.
- **Blinking green @ 1Hz (50% duty cycle):** Identify unit. Stops after 60s.
- **Off for 3 seconds, on for another 10 seconds and off again while pressing the reset button for about 15 seconds:** Reset to factory defaults.
- **Off and immediately on after pressing the reset button briefly:** Restart the device.
- **Solid red:** The LED will illuminate solid red if there is an error.
- **Short red pulse:** Each pulse corresponds to a specific amount of energy passing through the meter. These pulses represent increments such as 0.01 kWh, 0.1 kWh, or 1 kWh.

5. Firmware Updates

The firmware of the VM-3P75CT can be updated in multiple ways:

- VRM: Remote firmware update: This works over Ethernet and VE.Can connection
- VictronConnect-Remote (VC-R): This works over Ethernet and VE.Can connection
- VictronConnect locally via Ethernet/WiFi connection on the local network

6. Restart and reset to factory defaults

The VM-3P75CT has a recessed RESET button that allows you to reset the energy meter to factory defaults or to restart the device if a problem occurs without interrupting the power supply. In addition, a factory reset can also be carried out via VictronConnect.

Restart

To restart the energy meter, briefly press the RESET button. The LED goes off and immediately on again.

Reset to factory defaults

A factory reset resets the following settings to:

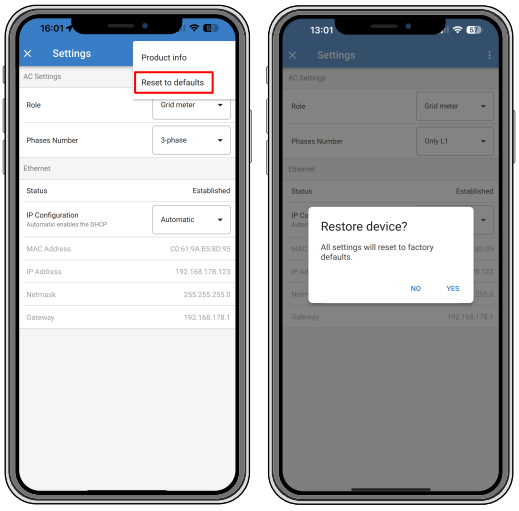
- **IP configuration**: Automatic (DHCP)
- **Role**: Grid
- **Phase configuration:** 3-phase
- **Custom name:** VM-3P75CT plus the serial number

Reset to factory defaults step-by-step using the RESET button:

1. Press and hold the RESET button.
   The unit resets and will blank the LED for ~3 seconds. The device then restarts, and the LED lights up green again.
2. Keep pressing the button for another ~10 seconds.
   After 10 seconds, the LED will go blank again.
3. Release the button.
   The device will restart.

Reset to factory defaults step-by-step using the VictronConnect app:

1. Open the VictronConnect app and tap the energy meter you want to reset in the device list.
2. On the status page, tap the gear icon.
3. On the Settings page that opens, tap the 3 vertical dots at the top right.
4. Tap Reset to defaults on the pop-up menu.
5. In the next pop-up menu, confirm the process by tapping on YES.



After the factory reset, the energy meter must be configured again as outlined in the chapter Configuration & Monitoring.

7. Troubleshooting

7.1. The LED alternates between green and red blinking (bootloader mode)

There can be two reasons for this behaviour:

1. A firmware update is currently being carried out. Once the firmware update is complete, the energy meter automatically returns to application mode, indicated by a solid green LED.
2. A firmware update was unsuccessful, or there is no application to start. The energy meter remains in bootloader mode until the application has been installed through a firmware update.

   To fix this, perform the firmware update again as outlined in the Firmware Updates [11] chapter.

> When the energy meter is in bootloader mode, the only available methods for performing a firmware update are through VictronConnect locally (via Ethernet or WiFi) or remotely using VRM: Remote firmware updates (utilising VE.Can or Ethernet connectivity).
>
> Performing a firmware update via VictronConnect Remote (VC-R) in bootloader mode is impossible.

7.2. Error codes

The VM-3P75CT indicates an error by turning the LED solid red when an error is present. Simultaneously, an error code appears on the GX device, VRM, and VictronConnect.

The following error codes can be displayed:

- **116 - Calibration data lost**

  If the unit does not work and error 116 pops up as the active error, the unit is faulty. Contact your dealer for a replacement.

- **119 - Settings corrupt**

  The energy meter cannot read its configuration and stopped.

  To fix the error, perform a factory reset as described in the Restart and reset to factory defaults [12] chapter.

- **122 - kWh counters corrupt**

  To fix this error, reset the kWh counter.

7.3. FAQ

7.3.1. The current value seems abnormally high for the displayed power

The energy meter calculates each phase's active power (P, in Watts), which is what is shown on the display. Active power is determined by:

- **Single-phase system:**

  $P = \text{Voltage} \times \text{Current} \times \text{Power Factor} (\cos \theta)$

- **Three-phase system:**

  $P = \sqrt{3} \times \text{Voltage} \times \text{Current} \times \text{Power Factor} (\cos \theta)$

If the power factor is unity ($\cos \theta = 1$), the real (active) power equals the apparent power (S), which is simply RMS voltage × RMS current.

In most real-world systems, inductive and/or capacitive loads introduce reactive power. This lowers the power factor, so apparent power (S) becomes higher than active power (P).

In AC systems, it is therefore normal and expected for the apparent power (S) to be higher than the active power (P) whenever the power factor is below 1.

The VM-3P75CT also reports the power factor directly. If the current seems unusually high compared to the power reading, check the displayed power factor: a low value confirms that reactive loads are the cause.

Examples of poor power factor:

- Small electronic devices such as USB chargers and LED lighting often have a particularly poor power factor.

- Renewable generation devices, on the other hand, are legally required to operate close to unity power factor. This can exaggerate the difference between P and S, since the “good” power factor from generation cancels out, leaving only the “poor” factor from the loads.

Possible solutions:

- Use loads with built-in power factor correction (common in modern PC power supplies).
- Or consider installing dedicated power factor correction equipment.

7.3.2. The firmware update via the Ethernet connection failed

If you encounter problems updating the VM-3P75CT's firmware via Ethernet, try connecting it to the GX device via VE.Can (see the Ethernet and VE.Can wiring [7] section for details), perform the update again as outlined in the Firmware Updates [11] chapter, and then reconnect via Ethernet.

8. Technical data

8.1. Technical specifications

VM-3P75CT	REL200300100
VOLTAGE INPUTS	
Voltage connection	Direct
Input voltage range L-N	85 to 265 VAC
Input voltage range L-L	150 to 460 VAC
Frequency	50/60 Hz
CURRENT INPUTS	
Current connection	Via current transformers (included - wire length 640 mm (25,2in)
Rated current	75 A
COMMUNICATION	
VE.Can communication port	Two RJ45 connectors (VE.Can terminators included)
Ethernet communication port	One RJ45 connector, Modbus UDP
Refresh rate	100 ms
POWER SUPPLY	
Type	Self-power supply via L1-N
Switch or circuit breaker	Required as means of a disconnecting device - not included
Consumption	1,45 W / 3,1 VA
Frequency	50/60 Hz
ENCLOSURE	
Material & colour	Polycarbonate, blue (RAL5012)
Voltage connection	Screw terminals 1,0 - 2,5mm^2 (22 - 12 AWG)
Current transformer connection	Pluggable screw terminals (included)
Protection category	IP20
Weight	370 g (including packaging)
Dimensions	90 x 71 x 59 mm (3,5 x 2,8 x 2,3 in)
ENVIRONMENTAL	
Indoor/outdoor usage	Indoor only
Operating temperature	From -10 to +55 °C
Storage temperature	From -20 to +70 °C
Relative humidity	< 90 % non-condensing
Altitude	2000 m (6562 ft)
Mains supply voltage fluctuations	±0,1 Vin
Overvoltage category	Cat. III
Pollution degree	2
STANDARDS	
Safety	EN-IEC 61010-1

8.2. Enclosure dimensions