eGauge Meter Documentation

Documents and Information about eGauge Meters

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EG4xxx meters (Core and Pro) documentation

Meter Comparison Chart (difference between Core and Pro meters)

eGauge has 4 current models of meters: Core (EG4015), Core WiFi (EG4215), Pro (EG4030) and Pro WiFi (EG4230).

All EG4*xxx* models have the same integral features. They only differ by the number of CT inputs and communication methods.

Comparison Chart

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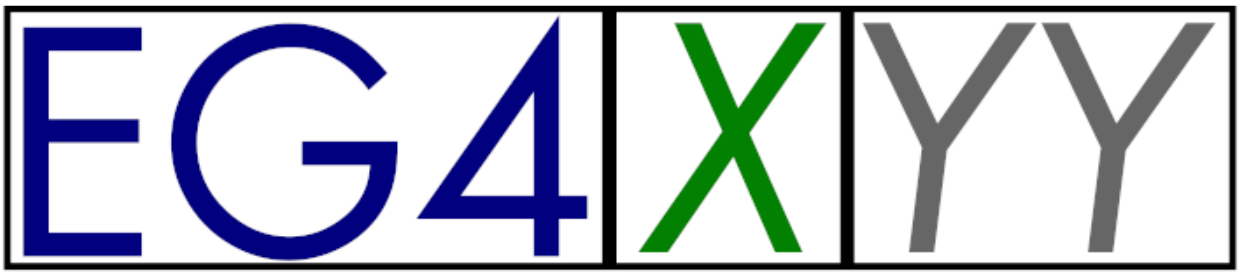
Name	eGauge Core	eGauge Pro	eGauge Core WiFi	eGauge Pro WiFi
Model	EG4015	EG4030	EG4215	EG4230
Sensor Inputs	15	30	15	30
Full Spec Sheet	Download	Download	Download	Download
Online Store Link	Store Link	Store Link	Store Link	Store Link
AC voltages	(0 to 277) Vac Phase-Neutral, (0 to 480) Vac Phase-Phase, 50/60Hz			

DC voltage range	± 60 Vdc
Current measurements	6900 A Max
Logging capabilities	V, A, W, Wh, Hz, VA, VAr, THD, deg, and more
Onboard logging capacity	Last hour: 1 second granular Last year: 1 minute granular Last 10 years: 15-minute granular Meter Lifetime: 1-day granular
Ethernet	Yes
USB	2x USB 2.0 ports for power or supported communication options
LCD Screen	Display kW, kWh and other information, limited configuration and tools
Modbus	Modbus TCP, Modbus RTU (with USB485 serial converter), input and export
BACnet	BACnet IP and MS/TP, export (with USB485 serial converter)
API access	XML API, JSON API automatic data push or poll. JSON API has configuration support and many more features than the XML API.
Accuracy	ANSI C12.20 0.5% Accuracy Compliance
Certifications	UL, FCC, CE

Understanding Model Naming Convention



EG4: Identifies as EG4 Series Meter

X: Communication Method

0 = Ethernet-only

1 = HomePlug + Ethernet

2 = WiFi + Ethernet

Y: Number of Sensor Ports

EG4xxx owner's manual

The owner's manual for the EG4xxx line of hardware. To download, click the link or icon below.

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EG4xxx OWNER'S MANUAL

EG4xxx Certification Documents and Declarations

The EG4xxx Certification and declaration documents details may be viewed and downloaded below. Some documents contained privileged and sensitive information and have been truncated.

- Made In America Compliance Statement
- FCC
- ANSI C12.20 (AccuCT CTs)
- ANSI C12.20 (ECS CTs)
- CE Declaration of Conformity

UL certification may be found in the UL Product iQ service by creating a free account and searching for "eGauge". PDF copies of the page are provided below. Please use the UL Product iQ service for the latest certification statement.

- UL: United States
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- UL: Canada
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Quick Start Guide

An EG4xxx Quick Start guide is included with each meter. A copy may be downloaded here.

EG4xxx LCD Manual

eGauge meters in the EG4xxx line feature an integrated LCD display which can be used to view data and make
changes to the device configuration. Navigation is handled through the small control toggle located to the left
of the CT ports. The control toggle has three potentials - left, right and pressed in. By default, the LCD scrolls
through a list of registers (the contents of this list are customizable) and also displays the device hostname
and current IP address.

To access the main menu, press in the control toggle. The following screen will appear:

***Figure 1**: All items in Main Menu view*

The main menu has four options. However, the number displayed on a single screen may vary based on
orientation and font size. Simply scroll using the left or right toggle controls.

Status Bar

The status bar appears at the top of the LCD (main and sub-menus do not show the status bar). There are four
primary pieces of information displayed in the status bar, as shown below:

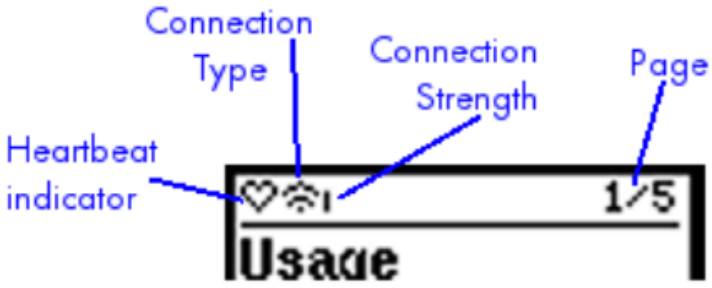

***Figure 2**: The status bar icons*

Heartbeat indicator – alternates between full and empty indicating that the eGauge is running and the
display is active.
• **Connection type** – shows the communication technology in use. There are four possible connection
types:
? - Unknown (generally shown immediately after reboot)
– Ethernet
– HomePlug power-line communication
– WiFi adapter
• **Connection Strength** – Signal/link quality. A single dot indicates 0% signal. The taller the bar, the
stronger the signal.
• **Page** – The active displayed page and total number available (active/total). You may scroll through
pages displayed by moving the control toggle left or right.

Registers

Registers is essentially the “default” state for the LCD. When this option is selected, the LCD will scroll
through every register configured in the eGauge device web interface under Settings → LCD along with
the device hostname and current IP address. The active page number is shown in the top right corner of the
display. Note that the registers displayed will vary from device to device, depending on configuration.

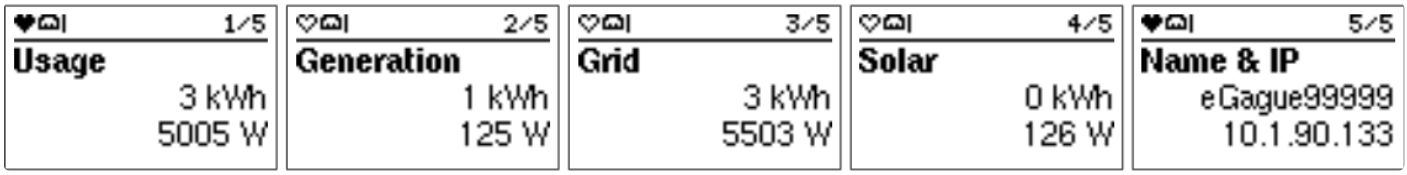

***Figure 3**: Example of scrolling progression in Register view*

Info

The Info section contains device-specific data. This data may be useful for troubleshooting. As some of
this data may be sensitive (particularly the MAC address), it should not be shared with anyone other than
eGauge technical support and individuals who are authorized to make configuration changes to the eGauge.
The available information is summarized below:

- **Name** – eGauge hostname. A unique name identifying the eGauge. This can be used to access the eGauge remotely, using a URL in the form http://DEVNAME.egaug.es where DEVNAME is replaced with the hostname as shown here. Note: the eGauge must be configured for and connected to the d.egauge.net proxy-server for remote communication.
- **Model** – The model number of the eGauge. This may be useful for troubleshooting purposes (different models may have different troubleshooting steps) and identifying the capabilities of the hardware (some models may have features that others lack).
- **Serial #** – A unique identifying serial number, guaranteed not to change. This is generally not needed by the end user, but it may be requested by eGauge technical support or sales. This serial number matches the sticker on the device exterior.
- **IP Address** – Current IP address of the eGauge on the local network. A user can connect to the eGauge using this address provided the computer being used is on the same network as the eGauge. This address may change depending on the network and connection method used.
- **MAC** – the MAC address of the communication interface in use by the eGauge. This will change depending on the type of connection in use. This will not be the same MAC address required for registration purposes or remote configuration assistance if an external USB adapter is in use.
- **Time** – the current system time set on the eGauge. The eGauge should automatically obtain the correct time via NTP, but in cases where it cannot the system time can be verified here.
- **Date** – the current date set on the eGauge. The eGauge should automatically obtain the correct date via NTP, but in cases where it cannot the date can be verified here.
- **Board Temp** – internal temperature of the eGauge. Not the same as ambient temperature.
- **Board Humidity** - internal humidity level of the meter. Note that this is not ambient humidity, but the detected humidity level on the eGauge circuit board. This feature is only available on meters equipped with this sensor.
- **Firmware** – current firmware version. Firmware release notes are available at: http://egauge.net/revs.

- **Kernel** – current kernel version. Generally not required, updated along with firmware when required.

Tools

The tools menu provides access to some basic eGauge utilities.

- **CTid** - can be used to blink the LED on a CTid sensor connected to a chosen port. Toggle the selection switch left and right to scroll through the port numbers. Press to start blinking when the desired port is displayed. Pressing a second time will stop the blinking and exit back to the Tools menu.
- **Reboot** - reboots the eGauge. The same thing as Tools → Reboot. Useful for troubleshooting purpose
- **FW Update** – allows the user to update to the latest firmware. Firmware release notes are available at http://egauge.net/revs/. Note: This tool requires Internet connectivity to the meter.
- **Factory Reset** – resets all settings on the eGauge to factory defaults. Warning – this will cause a loss of data recorded on the device. Depending on the network settings, it may also prevent the eGauge from connecting to the local network or proxy server again. Care should be taken when using this option.

Settings

Certain settings can be modified directly through this menu. The Settings menu is broken down into three
subcategories – Display, HomePlug, and Wireless.

Display

LCD display settings are configured here.

- **Contrast** - controls the LCD contrast level. Range from 0-80%
- **Brightness** – controls the LCD backlight brightness. Range from 0-100% in 20% increments.
- **Duration** – the amount of time until the backlight turns off, measured from the last input on the control toggle. Can be set to “always” (backlight always off), “after 30s”, “after 1m”, “after 5m”, “after 1h”, and “never” (backlight always on).
- **Font** – font size used by the eGauge LCD. Can be set to “small”, “normal”, or “large”.
- **Orientation** – display orientation. Since the eGauge can be mounted in a variety of ways, this can make the display easier to read. Can be set to “normal”, “counter clock-wise”, “upside-down”, or “clockwise”.
- **Timezone** – timezone used by the LCD display and eGauge. This reflects the device interface option Settings → Date & Time → Time Zone.

HomePlug

HomePlug functionality can be accessed through this menu. Note that the “Join others” option will only
attempt to pair with HomePlug adapters or eGauges currently in join mode themselves. If no HomePlug
adapters or eGauges are present and in join mode, it will time out.

- **Status** – shows the current status of the HomePlug interface. This may take up to 30 seconds to fully load. If the eGauge is connected to one or more HomePlug adapters, this will return “Status: member”. Otherwise, it will return “Status: alone”.
- **Join Others** – attempts to pair with another nearby HomePlug adapter for 240 seconds. Make sure to randomize (using Random PW, see below) first. Returns “Status: member” if successful, otherwise returns “Status: timed out”
- **Random PW** – randomizes the HomePlug encryption key on the eGauge, causing it to leave any HomePlug network it may have been connected to. Should always returns “Status: alone”
- **Default PW** – sets the HomePlug encryption key on the eGauge to the protocol default of “HomePlugAV”. This allows the eGauge to communicate with any HomePlug adapter or eGauge using factory default settings. Will return “Default PW set” when successful.

Wireless

If using an EG42xx model meter, wireless functionality can be accessed through this menu. When using
WPS, access to the wireless router is required.

Status – shows the status of the WiFi interface. This may take up to 30 seconds to load.

- If the eGauge is connected to a WiFi network, “Connected to ” is displayed.
- If no wireless adapter is detected, “No WLAN device” is displayed.
- If the eGauge has a wireless adapter, but not configured for a WiFi network, “Status: inactive” is displayed.
- If a network is configured but can’t be found, or the password is wrong, “status: scanning” may be displayed.

Setup via AP - Activates the EG42xx access point for 60 minutes to allow for wireless connectivity to the meter interface. For details on connecting to the EG42xx Access Point please see: EG42xx Wifi Connection

- If the eGauge is not connected to a WiFi network the Access point will broadcast and the LCD will display the SSID and the number of seconds remaining before the AP automatically deactivates.

- If the eGauge is connected to a WiFi network already, you will be asked if you want to disconnect from the Wifi network. Choose No to leave the meter connected, choose Yes if you want the meter to disconnect and activate the Access point functionality.
- While the meter is in the process of connecting to a Wifi network "connecting" is displayed along with the number of seconds remaining until the eGauge stops trying to connect to the chosen WiFi network.
- If the eGauge is unable to connect to the local WiFi network, "Timed out" is displayed.

WPS Setup – connects the eGauge to a router using WPS push-button pairing. To perform WPS setup, consult your router's manual. Generally this process requires holding a button labeled "WPS" on your router between 1 and several seconds, then initiating the "WPS Setup" function on the eGauge.

- If the eGauge successfully connects to a network, "Connected to " will be displayed
- If already configured for a WiFi network, "Disconnect first" will be displayed. Navigate to Settings → Wireless → Disconnect to disconnect before joining.
- If the eGauge can't find a router to pair WPS with, it will display "Status: timed out". This may be due to the router being out of range, or never being put into WPS pairing mode.
- If no WiFi adapter is found, "No WLAN device" is displayed.

Disconnect – Reset the WiFi configuration, forgetting any networks it has been configured to connect to.

- Forgetting all networks should return "Success".
- If no wireless adapter is found, "No WLAN device" is displayed.
- If no wireless network has been configured, "Already disconnected" is returned.

Legacy Meters (EG3xxx, eGauge2)

Older models, EG3xxx and eGauge2

eGauge2 Owner's Manual

The owner's manual for the legacy eGauge2 line of hardware. To download, click the link or icon below.

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eGauge2 OWNER'S MANUAL

What do the different colors on the Status LED mean?

> EG4xxx hardware features an LCD screen - as such, there is no status LED and the information below does not apply to EG4xxx hardware. Please see the LCD guide for more information when using an EG4xxx meter.

eGauge2 and EG30xx hardware features a front-mounted status LED which can convey useful information regarding device connectivity.

LED **Blinking**

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GreenEG301x (Using HomePlug) and eGauge2: Device is connected to the eGauge proxy server and HomePlug speed is good (≥2Mbps).

LED **Alternating Green and Cyan**

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EG301x (Using HomePlug) and eGauge2: HomePlug speed is good (≥2Mbps) but device was unable to obtain IP address from a DHCP server, and has defaulted to 192.168.1.88. Verify that a DHCP server is running or configure a static IP.

LED **Blinking Blue**

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EG30xx (Using Ethernet): Device is connected to the eGauge proxy server.

EG301x (Using HomePlug) and eGauge2: Device is connected to the eGauge proxy server and HomePlug speed is marginal (≤2Mbps).

LED Alternating Blue and Cyan

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EG30xx (Using Ethernet): Device unable to obtain IP address from DHCP server. Verify Ethernet media connections, assign static IP if no DHCP is available.

EG301x (Using HomePlug) and eGauge2: HomePlug speed is marginal (≤2Mbps) or nonexistent, device was unable to obtain an IP address from DHCP server. Verify communication between eGauge and HomePlug adapter.

LED Solid Green

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EG301x (Using HomePlug) and eGauge2: HomePlug speed is good (≥2Mbps) and device is not connected to the eGauge proxy server. Check that "Settings --> General Settings --> Proxy-server hostname" is set to "d.egauge.net". Contact an IT professional if there are continued problems connecting to the proxy server. See the eGauge Network Connections knowledgebase article for technical information on the eGauge's networking requirements.

Devices set to use a static IP address will show a solid green LED if HomePlug speed is good (≥2Mbps) and the eGauge can't reach the proxy server.

LED: Solid Blue

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EG30xx (Using Ethernet): Device is not connected to proxy server, or there is no Ethernet connection to the eGauge. Check firewall settings and verify Ethernet port LED activity.

EG30xx (Using HomePlug) and eGauge2: HomePlug speed is marginal (≤2Mbps) and device is not connected to the eGauge proxy server. Follow steps in owner's manual to improve HomePlug speed. All models: Check that "Settings --> General Settings --> Proxy-server hostname" is set to "d.egauge.net". Contact an IT professional if there are continued problems connecting to the proxy server. See the eGauge Network Connections article for technical information on the eGauge's networking requirements.

Devices set to use a static IP address will show a solid blue LED if HomePlug speed is marginal (≤2Mbps) or the device is connected via Ethernet and the eGauge can't reach the proxy server.

Other Colors

EG30xx and eGauge2: In some cases, the Status LED may display other colors. This is most commonly observed immediately after a reboot, when the Status LED may flicker purple before settling into one of the patterns above. However, the Status LED may also show blinking red, which indicates the eGauge is overheating (ambient temperatures in excess of 158 degrees Fahrenheit). Should this happen, the eGauge should be powered down and allowed to cool, and steps should be taken to reduce the ambient temperature (for example, using a larger enclosure or installing a sun shield). The Status LED may also show solid red or solid orange, which indicates a hardware or software failure. This typically cannot be resolved onsite - contact eGauge technical support (support@egauge.net) for additional assistance.

EG30xx datasheet

The EG30xx datasheet, available for download. Covers the EG3000, EG3010, EG3001, and EG3011 models.

DATASHEET

EG30xx owner's manual

The owner's manual for the EG30xx (including EG3000 and EG3010). Available for download.

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EG30XX OWNER'S MANUAL

EG30xx quickstart guide

The quickstart guide provides a useful reference for the eGauge installation and configuration process.

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QUICKSTART GUIDE EG30XX

Where can I find a HomePlug 1.0 adapter for my eGauge2?

The eGauge2 requires a HomePlug (PLC) adapter that uses the HomePlug 1.0 standard. Adapters that use the HomePlug AV standard (such as the TP-Link TL-PA2010) will **not** work with the eGauge2. eGauge Systems no longer stocks HomePlug 1.0 adapters, so they must be sourced through a third party.

> HomePlug 1.0 adapters are no longer available new through any manufacturer. Used or NIB (new in box) adapters may still be available through third parties.

In general, any HomePlug 1.0-compliant adapter should work with the eGauge2. You will only need a single HomePlug 1.0 adapter, however it may be beneficial to purchase multiple adapters if available as HomePlug 1.0 adapters are becoming harder to find. As a general rule, adapters with a speed of 85Mbps or lower are generally HomePlug 1.0, while adapters with a speed of 200Mbps or higher are generally HomePlug AV. If you have questions about a particular adapter, eGauge Support may be able to assist with verifying whether the adapter will function as expected.

eGauge does not offer any sort of warranty on HomePlug 1.0 adapters sourced through third parties. Limited technical support is available. If necessary, eGauge2 devices can be replaced with a newer eGauge meter - any data can be copied from the original eGauge2 and copied over to the replacement. The same CTs can be used. Contact eGauge technical support for additional information on replacing an eGauge2 meter at support@egauge.net.

Encryption Support

> EG4xxx meters have full TLS 1.2 support.

Proxy-server HTTPS support

Legacy meters do not support encryption between the meter and proxy server. However, encryption may be supported between the proxy server and the client requesting data.

HTTPS Support and certificate validation

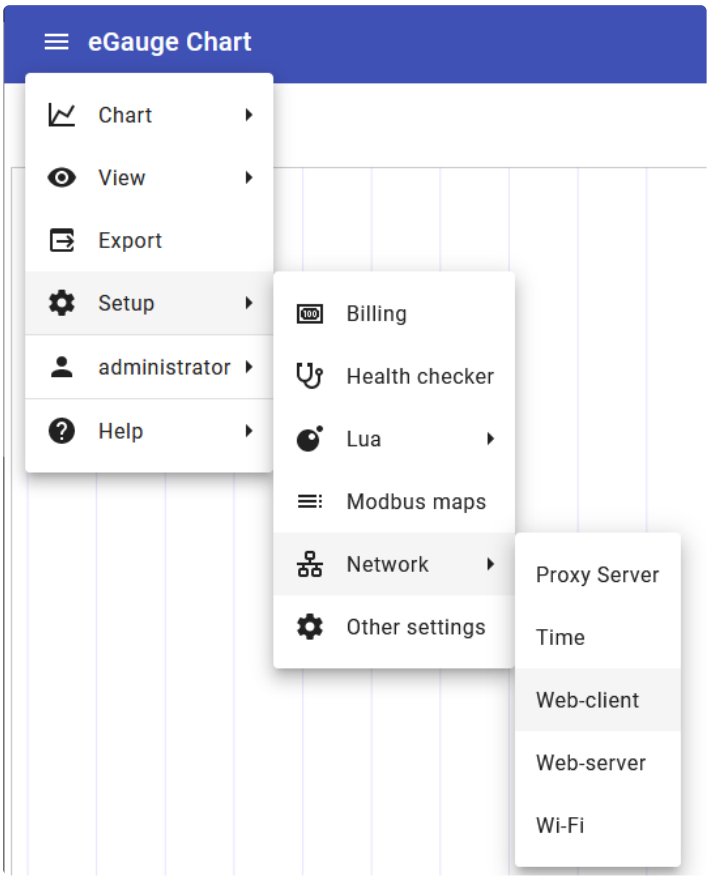
eGauge2 and EG30xx meters have limited TLS 1.1 encryption support. By default, on modern firmware, client-side (meter) initated HTTPS requests (such as Data Sharing or Alert Service to an HTTPS URL) will attempt to validate the HTTPS certificate before sending data. Due to the older SSL library used on legacy meters, some certificates may fail to validate even if they support TLS 1.1. This may include the eGuard Alert Service.

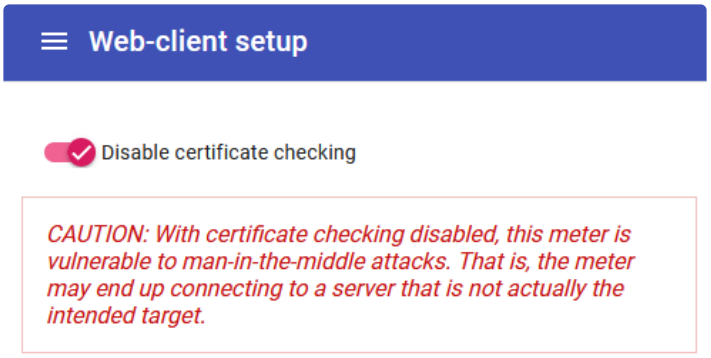
Disabling certificate validation

> Certificate validation must not be disabled if the information being sent is sensitive. Disabling certificate validation can allow for man-in-the-middle (MITM) attack if, for example, the local network the meter is using is compromised. The data will still be encrypted, but the meter will not be able to verify the destination's identity.

Beginning in firmware v4.5.5, The Modern Interface may be used to disable this certificate validation which can allow the meter to push data via HTTPS to certain services that support TLS 1.1 but which the meter cannot validate the certificate. To disable certificate validation, navigate to:

Setup → Network → Web-client, and toggle the "Disable certificate checking" option.





In addition, the WebAPI may be utilized to configure the certificate validation via the `/config/net/http/client/insecure` endpoint