Waymeter Pro

Installation Manual





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1. e-Mobility: B2B Energy Services

Waymeter Pro Kit by Gavazzi Installation Guidelines

1.1. Introduction

This document is built for internal or external use. The scope is to support pre-sales and installers to choose, wire and configure the Enel X Way Waymeter[™] by Gavazzi and provide a guideline to troubleshoot problems.

This document must be considered as addition to all the official materials provided by Gavazzi (digital or printed).

1.2. Context

When customer plans to migrate its fleet to electrical vehicle, it needs to install multiple charging stations to charge different EVs at the same time. Charging stations are high power electrical infrastructure and if the customer wants to avoid any costly upgrade on electrical system and avoid high electricity bill, it need a smart way to charge multiple EVs.

With Enel X "Load Optimization Pro" addon, vehicles are charged respecting the residual available power at customer's site, balancing the charging power over multiple charging stations. Furthermore, if one vehicle requires less power, the "unused" is allocated to the other vehicles, maximizing the site power connection.

The residual available power is computed take in consideration real-time building metering, retrieved thank to a metering kit, called Enel X Way Waymeter[™] Pro.

2. Waymeter Pro Kit by Gavazzi – Sales information

2.1. General Information

Enel X Way Waymeter[™] Pro Kit is a metering kit provided by Gavazzi, that can monitor building load (C&I grade) and is required to activate Load Optimization Pro.

It consists of 4 mains components + options:

- > 1. Gateway/data logger: collect the data from the meter and send to the Enel X Cloud systems. Is connected to internet via Ethernet port
- > 2. Power Supply: an AC/DC adapter to power the Gateway and, possibly, the Cellular Interface
- 3. Meter: different energy meters, compatible with difference voltages and installation scenarios (see Annex 1 – Meter comparison)
- Sensors: current transformers or Rogowski coils to read the instant current for each line (see Annex 2 – Sensor comparison and compatibility)

Options:

- > a. Cellular Interface: to connect the gateway to the cloud via a cellular modem
- > **b.** Cellular Modem: an LTE grade cellular model
 - > Cellular modem is provided also with Enel X SIM card with connectivity cost included
- > c. Wi-Fi Access Point: to connect the gateway to the cloud via Wi-Fi connection

For the technical specification, please refer to Enel X Way Waymeter[™] Pro datasheets and manufacturer's documentation.

2.2. Pre-Sales Checklist

This checklist will help to pick appropriate meter and sensor.

- > **1.** Verify meter installation location, max amperage and any constraints to pick appropriate meter (see Annex 1 Meter comparison and Annex 2 Sensor comparison)
 - a. Mounting: all the meters can be installed on DIN rail. Some meter can also be installed on panel
 - > b. Distance Sensors → Meter: is important to keep in mind during site design about the distance between meter and sensors.
 - > In case of 5A sensors, distance can be limited. Please refer to Gavazzi calculation spreadsheet to calculate the max distance.
 - > In case of 333mV sensors, distance can be significantly high (up to 20/30 mt).
 - c. In case of needs, meter can be also installed far away from the other kit components (gateway, modem, etc...). Since communication between meter and gateway is done via RS485, those 2 components can be also far away (up to 1 km).
- > 2. Verify connectivity mode
 - > a. Is it possible to bring an ethernet cable from router/switch to the gateway?
 - > Yes \rightarrow Just use embedded Ethernet connectivity on the gateway
 - > No \rightarrow Wi-Fi present \rightarrow Add Wi-Fi option
 - > No → Cellular → Add cellular option (modem adapter + modem) and Enel MVNO sim card
 - b. If ETH or Wi-fi → Verify firewall policy on customer's site (interfacing with site IT department and/or facility manager). Port used by Waymeter Pro Kit are listed below and are all mandatory.
 - > c. If cellular \rightarrow verify cellular coverage

DESCRIPTION	ENDPOINT	PORT	ENVIRONMENT	NOTE
Temporary credentials	c33s04psko2pez.creden- tials.iot.eu-central-1.ama- zonaws.com	HTTPS+MQTT: 443, 8443, 8883, 1883	NO-PROD	
loT Broker	ax3v62h9b8tp2-ats.iot. eu-central-1.amazonaws. com	HTTPS+MQTT: 443, 8443, 8883, 1883	NO-PROD	
Temporary credentials	c3kcoqjijz8hok.credentials. iot.eu-central-1.amazo- naws.com	HTTPS+MQTT: 443, 8443, 8883, 1883	PROD	
loT Broker	a3869psk1nkr1c-ats.iot. eu-central-1.amazonaws. com	HTTPS+MQTT: 443, 8443, 8883, 1883	PROD	
S3	s3.eu-central-1.amazonaws. com	HTTP+HTTPS: 80, 443	NO-PROD/PROD	
S3	s3.dualstack.eu-central-1. amazonaws.com	HTTP+HTTPS: 80, 443	NO-PROD/PROD	
VPN GAVAZZI	pairing.maiaconnect.com	TCP: 443		
VPN GAVAZZI	remote.pairing.maiacon- nect.com	TCP: 443		
VPN GAVAZZI	vpn.maiaconnect.com	UDP: 1194		
UWP 3 tool	The IP of the UWP 3 ga- teway (cfr. Setup Network and Connectivity)	TCP: 10000,10001, 52326		Only in case of Ethernet or Wi-Fi
UCS Bridge	The IP of the UWP 3 ga- teway (cfr. Setup Network and Connectivity	TCP: 41214		Only in case of Ethernet or Wi-Fi
NTP Server	ntp1.inrim.it	UDP: 123		
NTP Server	ntp2.inrim.it	UDP: 123		

- > 3. Switch board DIN space availability \rightarrow
 - > a. Gateway: 2 DIN modules
 - > **b.** Power Supply: 3 DIN modules
 - > c. Meter: please refer to Annex 1 Meter comparison for DIN requirements
 - d. Cellular Interface: 2 DIN modules that need to be connected directly to left side of the gateway using special connector
 - > e. Cellular Modem
 - > UWP-MODEM-KIT-4G-E02 (that use Teltonika TRM240) is DIN mountable with the provided accessory. Since is width is 74,5, please consider 5 DIN spaces
 - > UWP-MODEM-KIT-4G-U01 (that use Multitech MTCM-LNA3-B03) is a USB key format and is plugged directly on top of the Modem Interface
 - > f. Wi-Fi Access Point:
 - > UWP-WIFI-KIT-02 and UWP-WIFI-KIT-03 (that both use Teltonika RUTX10) size are 115 x 32.2 x 95.2 mm
 - > Please note that it requires some space on the top to install the Wi-Fi antenna. Please refers to the manufacturer's documentation for the detailed technical

2.3. Ordering Info

Please refer to Annex 3 – Ordering information.

3. Waymeter Pro Kit by Gavazzi – Installation

3.1. Pre-Installation Checklist

- I. If the Waymeter Pro Kit is part of installation of Charging Stations, we suggest installing Waymeter Pro Kit, when the circuit braker installation is performed. This will minimize time and effort.
- > 2. You need the configuration mail, with all the instructions to perform meter SW configuration after the wiring, that is send by Enel X Control Room or technical sales representative
- > 3. You need a PC with ethernet port and Windows 10 or above, .net framework 4.7 or above and at least 8GB of RAM
- > 4. You need to install Gavazzi UWP 3 Tool on your pc (see download instruction here).
 - > Please download latest version on the link above.
 - In case you connect to an UWP 3 Gateway with a newer version of UWP 3 tool compared to the one used for the previous configuration, you need to update gateway firmware (cfr. Firmware Update)
 - > Be aware that UWP3 tools version can coexist on the same PC.
- > 5. You need to install Gavazzi UCS Tool on your pc (download here)
- > 6. An ethernet cable
- > 7. All the manufacturer devices' manuals, that are integral part of this manual.

3.2. Wiring activities

SAFETY WARNINGS: INSTALLATION MUST BE PERFORMED ACCORDING TO APPLICABLE REGULATION AND LAWS

WIRING SCHEMAS

Wire the device, according to the specific wiring schema and manufacturer's documentation

GENERAL GUIDELINES FOR WIRING

- > Meter and it's sensors must be connected to read all the site loads, ideally sooner after utility meter, before main panel.
 - > In case of Solar Panel, a second meter must be installed to monitor solar production.
 - > This meter need to be wired to COM2, while the main meter to COM1
- > Waymeter Pro Kit by Gavazzi devices can be installed wherever is possible (main panel or subpanel), depending on installation scenario.
- > All the necessary wiring (CTs, Ethernet, etc) need to be setup accordingly. In case you need to extend CT cable, please refer to datasheet for the correct cable type.
- > In case of direct insertion meter, the meter need to be installed soon after the main circuit braker.
- > Pay attention to respect correct direction of the sensor (an arrow shows the correct direction of current).

See next image, for more details about wiring.



WIRING SCHEMA EXAMPLE

Following, some examples of wiring are showed as example. Please refer to meter installation manual for the correct wiring, depending on model and grid configuration.

WIRING EXAMPLE - METER: EM210 - EU



WIRING EXAMPLE - METER: EM340 - EU



WIRING EXAMPLE - METER: EM330 - UL



WIRING EXAMPLE - METER: WM15 - UL



WIRING EXAMPLE - METER: EM530 (3P+N) - UL



WIRING EXAMPLE - METER: EM530 (2P+N) - UL



4. Waymeter Pro Kit by Gavazzi – Software Configuration

4.1. Requirements

- > 1. You need a PC with ethernet port and Windows 10 or above, .net framework 4.7 or above and at least 8GB ofRAM
- > 2. You need to install UWP 3 tool on your pc (see download instruction here).
- > 3. An ethernet cable
- > 4. You need to install Gavazzi UWP 3 Tool on your pc (see download instruction here).
 - > Please download latest version on the link above.
 - > n case you connect to an UWP 3 Gateway with a newer version of UWP 3 tool compared to the oneused for the previous configuration, you need to update gateway firmware (cfr. Firmware Update)
 - > Be aware that UWP3 tools version can coexist on the same PC.
- > 5. You need to install Gavazzi UCS Tool on your pc (download here)
- 6. IP policy for the gateway (static IP or DHCP) in case of Ethernet or Wi-Fi connectivity), that must be provided bycustomer's facility manager or its IT department
- > 7. Configuration Mail, sent by Enel X Control Room or technical sales representative

4.2. Configure the gateway via UWP3 Tool

PC SETUP FOR UWP CONFIGURATION

Different ways of proceeding depending on the how the gateway is configured:

STATIC IP MODE AND FIRST INSTALLATION:

- I. Connect your PC Ethernet port directly to Ethernet port on the UWP 3 gateway using an Ethernet cable;
- > 2. Set the network port of your PC to an address of the same class with respect to the IP of the UWP (ex: UWPaddress = 192.168.1.1 Mask 255.255.255.0 -> address to be set on pc = 192.168.1.2 Mask 255.255.255.0)
- > **3.** For first installation or in any other case, a secondary IP address: it is always available a secondary IP address =192.168.253.254 to be used for a poin-to-point connection to

the Ethernet port, just in case the primary IPaddress is not known anymore (in that case, the address to be set on pc = 192.168.253.2 Mask 255.255.255.0)

- > 4. To change your PC IP address:
 - > Open network connection or you can easily go on Start\Run and put "ncpa.cpl" and press run.
 - > Select your ethernet connection, press right-click, than "Proprieties"
 - > Pick from the list "Internet Protocol version 4" and then click "Proprieties"
 - Click on "Use the following IP address" and fill with the correct IP information (see previous point)
 - > Save the address and proceed to the following points of the procedure

DHCP MODE (DEFAULT MODE ON UWP 3):

- > 1. Connect your PC to the same network switch\router as the gateway;
- 2. Using an IP address discovery software (e.g. advanced IP scanner) locate the address of the UWP instrument or follow the procedure written below
 - > It is also possible to perform a network discovery to search for devices on your IP address class, using the appropriate "controller" button, present in the quick command bar, as shown in the following figure:

•		0491	e e e 👬 🗛 🕸	¥X)			198	an a	(1				_ # X
) antour Justice	File Vitre Report infoni Importationi ref park progetto corrente Earling	Importanteri Importanteri e satema di default practori general	Access Trumpt	S Detabase A Mat IP Gentore Importa BACnet IP Sacual Import	to Dyn DNS Seni Colorado Articological	Contraction of the second	Lappite Lange	Re-	Esperta importante di progetto Importante	ni Importa importazioni di Steme				18 19
local											a x	Furnise	-	# X
	Root			Tentre del	ineria tell						a x)	1		
	K1 SH2MCG24			Rete Ether	we 10.38.195.5			Faniglia			Aggiorra			
	K2 SH2RE1A424			P Addres		HCP North	¢ /		MVC	Revisione firmware	Famiglia			
	K3 SHPINCNTS04			10.38.155	57	4			00:19:EE:10:BF:8F	8.2.11.3.R286	UWP30RSELOOK			
	K4 SHSUCOTH													
_														
Maculi														
	Codice identificativo	Sottorete	Nome											
	SH2MCG24	Rete 1	K1 SH2M	CG24								1		
1	SH2RE1A424	Rete 1	K2 SH2RE	IA424										
ei,	SHPINONTSOM	Rete 1	K3 SHPING	INTSC										
	SHSUCOTH	Rote 1	K4 SHSUC	OTH Reside co	rpleta					F	Amula			
												1		
Moduli	Segnal Registro attività													
Di es	MP Centroller: 10.38.155.5	? Corretti	1 B										Nome progetter	Configurations: 1

- Source Section 2. Source Se
- > 4. Save the address and proceed to the following steps of the procedure.

SOFTWARE CONNECTION

When starting the software, in the lower left section of the window you can find the string where to enter the address of the instrument and make the connection using the "connect" button, as shown in the figure below:



PASSWORD UNLOCK

If the Gateway is password protected (not during first installation)you need to insert the password in the bottom right corner and click on "UWP Controller locked" to unlock.



PROJECT DETECTION FROM THE DEVICE

i NOTE: Note: this operation is not necessary for the first configuration of UWP 3

It is recommended, in order to preserve the integrity of the software on the device, that every time you connect to an instrument, carry out the "reading from the controller" (appropriate button on the bar functions as image below) and save the project as a backup on your pc.



FIRMWARE UPDATE

When connected, the controller will check the alignment between your own firmware and the pc, and in case of difference, it will identify the update of the same through a red button indicating an exclamation point "!". This indication will be shown next to the string for entering the IP address of the instrument, as well as in the "system settings" section, under the appropriate "update firmware" button.

In case of need for updating:

- > 1. Be sure that you detect the project from the device, downloading it (not for first installation)
- > 2. Press the appropriate update button to upgrade the firmware (bottom-left corner)
- 3. Select the file relating to the new firmware on your PC (file .bin image UWP, the folder containing the file will open automatically)
- > 4. Launch the update and wait for the device to reboot
- > 5. Upload the configuration to the gateway

SETTING THE TIME AND NTP SERVER

The next step includes the setting the time on the controller:

- > 1. In the "system setting" section, select "set date and time";
- > 2. Click on the Green check icon to enable field
- > 3. In the first window "Set date and time", flag the item "synchronize with pc" and then press "send to UWP controller";
- > 4. In the window "update date and time from internet" it is necessary to indicate the reference NTP server for the real time update of the device; the possible solutions vary according to the connection of the device under the customer LAN network or via Enel SIM:
 - > NTP with customer network (or sim with a public operator): ntp1.inrim.it, ntp2.inrim.it
 - > NTP with Enel SIM card network: tempo.enel [10.124.232.150, 10.124.232.114, 10.124.233.89]
 - > Enter the server address in the appropriate string and press the "add" button, then press the "save the settings in the UWP controller" button
- > 5. Finish the procedure with "Confirm"

GENERAL NOTES

IMPORTANT: the changes made to the project and saved **are NOT sent to the controller** until when the specific **"SEND TO CONTROLLER"** command is triggered. Remember to always send the changes to the device.

Configurazione guidata		
Imposta d	ata e ora dell'UWP Controller Imposta data e ora dell'UWP Co	ntr
	Data e ora del controller	
Configurazione guidata	Imposta data e ora Aggiornamento data e ora da Internet	
Data e ora del controller	Aggiorna data e ora del controller tramite internet 💜 🔛	
	Server addizionale ntp1.inrim.it 1.pool.ntp.org Aggiungi Rimuovi Aggiungi server di default Imp1.inrim.it Salva impostazioni nell'UWP Controller	
		Conferma

SETUP NETWORK AND CONNECTIVITY

INTERNET CONNECTION VIA ETHERNET PORT

You need to define the network parameters:

- > **1.** In "system setup", select "IP settings";
- 2. Depending on the architecture chosen, it will be possible to define the choice of DHCP or static address; in this second case it is necessary to define the standard parameters provided by the ip network manager (IP address, mask, gateway and possibly DNS if present on the internal network, alternatively enter DNS 8.8.8.8);

INTERNET CONNECTION VIA WI-FI

Follow the instructions of the Wi-Fi gateway to set up the instrument. Once configured, connect it to the UWP 3 ethernet port.

INTERNET CONNECTION VIA CELLULAR MODEM

The Waymeter Pro Kit can include the use of cellular modem, which can be set with the following steps:

- > 1. In the "system setup" section, select "current project settings";
- > 2. From the setup wizard popup select "communication settings";
- > **3.** In the last lines of the window, fill-in the parameters for the router connection, in particular:
 - > Modem type = "USB" (Pay attention to select not "Router USB" or any other element, but just "USB")
 - > Activation of modem data connection = data connection always active;
 - > Periodic modem reset = none;
 - > 4G modem = V (Yes)
 - > Modem ping reset = V (YES)
 - > Modem ping reset host
 - > In case Enel Sim Card: 10.14.234.143
 - > In case of other Sim Card: 8.8.8.8l draws
 - > APN, User and Password are provided directly from control room via the configuration mail.

Below is the screenshot of a USB router configuration:

Configurazione guidata		
Imposta	proprietà del programma Modifica proprietà di programma	
200	Impostazioni di comunicazione	
Configurazione guidata	aggiunte alla mappa Modbus	
Informazioni di sistema Impostazioni di comunicazione	Tipo di modem	
Impostazioni BACnet	Attivazione connessione dati modem Connessione dati sempre attiva	
Impostazioni avanzate Etichetta moduli	Reset periodico del modem (hh)	
Locali predefiniti	Reset ping del modern	
E-mail / SMS Protocollo Sofia	Modem 4G	
Protocollo Sentilo	PPP modem APN	
Http port settings	Nome utente modem PPP	
	Password modem PPP	Ţ
		nferma

Now, send the configuration to the controller by clicking on "Send to controller" button on the toolbar on top of the screen. It's important to send the configuration now, since the gateway has no configuration onboard and the following step will be not accessible.

4.3. Configure the meter settings

ENABLE UWP SECURE BRIDGE

Enabling UWP Secure bridge is mandatory also if the meter setting are setup via local display.

From any web browser, type the instrument IP address or the default address if not previously set, logging in with credentials (can be different, if changed):

- > User: admin
- > Password: admin

Below is a brief description of the configuration steps to be carried out:

- > 1. From the menu at the top left select "Service" and then "CG Secure Bridge"
- > 2. Enable "Secure Communication" and change the password as indicated in the configuration file
- > **3.** Change "Service" to "Enable"
- > 4. Click on Save icon (pink icon on the bottom right corner)

CG Secure Bridge	
 Service configuration 	
Service	
Enable	
Password *	

CONFIGURE THE METER VIA UCS TOOL OR LOCAL DISPLAY

OPTION 1 (PREFERRED) – USING UCS TOOL

- > 1. Open UCS tool on your PC
- > 2. Go to Connections\Connection via UWP Secure Bridge and click on "Connect"

🔻 Carlo Gavazzi UCS 7 - Unive	rsal Configuration Software	– 🗆 X
7	Connections	
Connections	Latest connection IP address: 192.18.65.15	Automatic Connection Modbus RTU
METERS	Status: Disconnected	
Online		Automatically find all the devices attached to a serial port (no need to know all the connection parameters)
Recordings	Favourite Recent	COM1 • 🗘
. Offline	No favourite connections	Connect >
GATEWAYS		Manual Connection
M-Bus Gateway		
-)) UWPA		Set up manually all the connection parameters Connect >
		Connection via UWP Secure Bridge
Settings		COM2) or connected to the same LAN Connect >

> 3. Select "Manual" and insert the IP address of the UWP3 controller and click "Connect"

onnection type	Manual	•
IP address		
192 . 168	. 0 . 1	
URL		
www.bridge.com		

> 4. Fill the information in the window:

Credentials			
Password			UWP Secure Bridge port
		<₽>	41214
Connection Type			
Modbus RTU Modbu	IS TCP Modbus TCP	Gateway	
Port	Addresses	Range	
COM1	• 1 - 1	10	
Speed			
2400 4800 9600	19200 38400	57600	115200
Parity	Stop Bits	Tin	neout
None Even Odd	1 2	10	00

> a. If UWP Secure bridge service (cfr. Enable UWP Secure Bridge) is password protected, insert the password

Connect >

- b. Port: please select the right COM port (RS485) of the UWP3 where the meter is connected to
- > c. Address Range: 1 1
- > d. Click on "Connect"
- > 4. Select the meter
- Settings" and set the right parameters and their value based on Annex 4 Meter configuration

For solar panel, you need to install a second meter and configure it repeating the previous

OPTION 2 – USING METER DISPLAY

- > **1.** When the meter boot-up, enter in the settings menu and setup the correct meter configuration
 - > It depends on meter model, so please refer to Meter's installation manual to check how to enter in the setting and how to change settings:
- > 2. Set the right parameters and their value based on Annex 4 Meter configuration

4.4. Meter Data Management

ACQUISITION OF MODBUS DEVICES

The interfacing of modules or devices via Modbus to the UWP controller is carried out using the drivers present in the internal Gavazzi software library; the software is equipped with all the drivers referring to Carlo Gavazzi instruments and provides the possibility of creating special drivers for the connection of third-party instruments (not needed for Waymeter Pro Kit).

Here are the steps for inserting a new Modbus device into acquisition in the controller (in this case, we just need to connect to a single meter):

- > 1. Be sure that you are still connected with the UWP 3 to the UWP 3 controller
- 2. Under the "add" section, insert a new "Bus generator", selecting the RS485 COM1 or COM2 depending on where the device is connected (see wiring schema of UWP 3 and Meter);
 - If the site has solar panel, a second meter must be installed and connected to COM2, while main meter is connected to COM1 (this is to avoid the Modbus port remapping, since all the meter are by default on ID=1)
- 3. Still in the "add" section, select the "module" button and from the "guided configuration" window, under the "list of drivers" item, select the instrument to be acquired (in the screenshoot below is "EM24");
- > 4. Indicate the device number of the selected type and press the "add" button; at the end of the addition, press the "Confirm" button.

Below is the screenshot of the configuration of the parameters referring to the Modbus of a device:procedure to configure it

(→)) @ □ □ □ Ø Ø Ø 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.007.2.0 (too 1) fee not seleer () : 82.12.3 (555	_ & X
File Viste Rapporti Agglungi Impostazione sistema Modbus	tabase Anto	N 19
Generative Module Locke Controlling Temperature Alleme Calendar Share Matter Module Local	Sequences Sequences Timer Basis Similar costs and the action of the acti	
Local	Opzioni di fittaggio 🗣	Punzioni • X Opzioni di filtraggio 🕢
Week Statescontinuaster Codies identificativo Sottorete Massion Rediscontinuaster Codies identificativo Sottorete Rediscontinuaster Com 1 Kis Ediscontinuaster Com 1 Week Seguiti Tageto attivitie	Configurazione guidaza Separati al segonica Separati al segonica	
Disconnetti	Ore controller: 16:54 25/09/2020	Nome progetto: Configurazione: 1

The procedure for adding a new device under the COM port is terminated after confirming the popup, however it is now necessary to upload the project created so far to the device. It is therefore necessary, after verifying that the UWP controller is connected via the green LED on the lower left side, to press the "send to controller" button to finish installing the project on the device.



For the second meter (solar) you need to repeat all the previous procedure.

HISTORICAL DATABASE CONFIGURATION AND ON-FIELD READINGS VERIFICATION

At the end of the creation of all the devices, it will be necessary to enable the device to display and log the desired values by following the steps below:

> 1. In the "database" section, select "database management"



> 2. From the "database manager" window it will be possible to flag the datapoints to be selected indicated in the configuration mail that was provided by country control room or technical sales. For each data point ("Name" column), the historical mode ("Data log") must be selected and the "AVG" field set to "1 min".

												-	_	Filter
e ali	Expand all								_			(_) Publish	ed	
_	Name	Part number	Location	Subnet	SIN	Events log	Data log	Avg	1	Enable Min/Max	Number of sample	Relationship name	Re	altime
<u>pi</u>	(Fx) Root - System function	System function	Root											
ę	(Fx) Root - System function.Status		Root									Fx Event		
ŝ	K2 EM2103P	EM2103P	Root					[
۲	1: Group3P-1.A L1	EM2103P	Root	COM 1				1 (min)				AL1		
۲	2: Group3P-1.A L2	EM2103P	Root	COM 1			Ø	1 (min)				A L2	3	
۲	3: Group3P-1.A L3	EM2103P	Root	COM 1				1 (min)				A L3		82
•	4: Group3P-1.Hz	EM2103P	Root	COM 1			v	1 (min)				Hz	8	
C	5: Group3P-1.PF L1	EM2103P	Root	COM 1			-		_			PF L1	2	
C	6: Group3P-1.PF L2	EM2103P	Root	COM 1								PF L2	2	
¢	7: Group3P-1.PF L3	EM2103P	Root	COM 1								PF L3	2	
C	8: Group3P-1.PF sys	EM2103P	Root	COM 1								PF sys	2	
C	9: Group3P-1.Phase sequence	EM2103P	Root	COM 1		•						Phase sequence	2	
۲	10: Group3P-1.V L1-L2	EM2103P	Root	COM 1								V L1-L2	1	
0	11: Group3P-1.V L1-N	EM2103P	Root	COM 1								V L1-N	7	
0	12: Group3P-1.V L2-L3	EM2103P	Root	COM 1								V L2-L3	1	
۲	13: Group3P-1.V L2-N	EM2103P	Root	COM 1								V L2-N	1	
0	14: Group3P-1.V L3-L1	EM2103P	Root	COM 1								V L3-L1	1	
0	15: Group3P-1.V L3-N	EM2103P	Root	COM 1								V L3-N	2	
0	16: Group3P-1.V L-L sys	EM2103P	Root	COM 1								V L-L sys		
0	17: Group3P-1.V L-N sys	EM2103P	Root	COM 1								V L-N sys	1	
	18: Group3P-1.kVA L1	EM2103P	Root	COM 1								kVA L1	2	
	19: Group3P-1.kVA L2	EM2103P	Root	COM 1								kVA L2	2	
	20: Group3P-1.kVA L3	EM2103P	Root	COM 1								kVA L3		
6	21: Group3P-1.kVA sys	EM2103P	Root	COM 1								kVA sys		

- 3. At the end of the selection of the expected parameters, confirm with the appropriate button and, as per normal procedure, proceed to send the configuration to the device with the "send to controller" button.
- > 4. At this point it will be possible to verify the correct functioning of the system:
- 5. In the lower window of the project, select the "signals" page, the system will highlight in blue the values measured in realtime, which are NOT acquired for the moment;
- Solution > 6. Enable the "Enable live signals" function in the function bar at the top of the screen as shown in the following image:

	Re 6 Do 5	44 48			
Contraction Importantia Accord Paralament Commercial Important	DNS Segment Adjuster Avent	Labora importances importations			
particular perspecti control annual anticative material anticative Perspective and anticative Perspective and anticative and anticative anticat					
Configurations general Babaet imposu	azioni di refe	Importa/Esporta impostazioni	. ×	100-000	
			Opzioni di filtraggio 📿	Funzione	Opzioni di filtrago
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KOOT					
K1 SH2MCG24					
K2 SH2RE1A424			0		
K3 SHPINCNTS04					
K4 SHSUCOTH					
			ت بن . ت بن		
an			0 Ominei di fitraccio 🖓		
nd	BACnet object type	BACnet instance n B. SIN /	Opzioni di Miraggio (C	2	
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Nome 1: Root - Master generator K1 Corrente 1 3: Root - Sensore ambientale K4 Presenza 1 6: Root - Sensore ambientale K4 Tensione del bus 1 5: Porto - Genera ambientale K4 Tensione del bus 1	BACost object type Analog Input Binay Input Analog Input Analog Input	BACnet instance n., B., SIN / 0 005. 8 004. 9 004. 8 004.	Cptioni di fitragio 🗭 CH Value 131,136 053,188 053,188 053,188		
Nome 1: Root - Master generator K1 Corrente 1 2: Root - Sensore ambientale K4 Presroza 1 6: Root - Sensore ambientale K4 Urnsina del bus 1 1: Root - Sensore ambientale K4 Urniolità 3 > Pontor - Sensore ambientale K4 Urniolità 3	BACnet object type Analog Input Binary Input Analog Input Analog Input Analog Input	BACnet instance n B. SIN / 0 0055 8 004 9 004 8 004 7 004	Opscivil di fitraggio (* 131.136 535.188 555.188 555.185 555.187 555.197 555.197 555.197 555.197 555.197 555.197 555.1		
Norme 1: Root - Master generator K1 Corrente 1 2: Root - Sensore ambientale K4 Presena 1 5: Root - Sensore ambientale K4 Tensione del bus 1 3: Root - Sensore ambientale K4 Clumidità 3 2: Root - Sensore ambientale K4 Clumidità 3 2: Root - Sensore ambientale K4 Vancer CQ2 1	BACnet object type Analog input Binary input Analog input Analog input Analog input Analog input	BACnet instance n B. SIN / 0 005 8 004 9 004 8 004 7 004 6 004	Casioni di fitraggio C CH Value 131.136 053.188 053.188 053.188 053.188 053.188 053.188 053.28 Q ppm		
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Nome 1: Root - Master generator K1 Corrente 1 2: Root - Sensore ambientale K4 Presenza 1 6: Root - Sensore ambientale K4 Unicità 3 2: Root - Sensore ambientale K4 Unicità 3 2: Root - Sensore ambientale K4 Valore CO2 1 1: Root - Moduli I/O K3 Confluenzione OK 1	BACnet object type Analog Input Binary Input Analog Input Analog Input Analog Input Analog Input Binary Input Binary Input	BACnet instance n B SN / 0 005 004 9 004 004 7 004 004 6 004 04 7 004 04	Opsioni di fitraggi € CH Value 131,136 553,188 553,188 553,188 553,188 553,188 553,188 553,188 553,188 553,188 523,554 523,188 523,554 523,555 527,551		
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Nome I Root - Master generator K1 Corrente 1 Root - Sensore ambientale K4 Presenza 1 (e Root - Sensore ambientale K4 Unicità 3 Root - Sensore ambientale K4 Unicità 3 Root - Sensore ambientale K4 Valore CO2 1 Root - Sensore ambientale K4 Valore CO2 1 Root - Moduli (/O K3 Indice qualità Bus 1 Root - Moduli (/O K3 Configurazione OK 1 Sensor - Moduli (/O K3 Presenza 1)	BACinet object type Analog Input Binay Input Analog Input Analog Input Analog Input Analog Input Binay Input Binay Input Binay Input Binay Input	EACnet instance n B. SN / 0 005 004 9 004 004 7 004 6 004 5 004 7 004 6 004 6 004 7 004 6 004 4 004 4 004	Cypooni di fittaggi C CH Value 131.136 053.168 053.16		
Nome 1: Root - Master generator K1 Corrente 1 2: Root - Sensore ambientale K4 Presena 1 3: Root - Sensore ambientale K4 Umicità 3 2: Root - Sensore ambientale K4 Umicità 3 2: Root - Sensore ambientale K4 Variote C02 1 7: Root - Moduli //O K3 Configurazione K1 6: Root - Moduli //O K3 Presina 1 7: Root - Moduli //O K3 Presi	BACnet object type Analog Input Binary Input Analog Input Analog Input Analog Input Analog Input Binary Input Binary Input Binary Input Binary Input Binary Input Binary Input	BACnet instance n B SIN / 0 005 004 9 004 004 8 004 004 6 004 004 7 004 004 6 004 004 7 004 004 6 004 004 5 004 004 5 004 5	Opsioni di fitraggio CH Value 131.136 1 053.188 53.5 %RH 053.188 53.5 %RH 053.188 8.28 ppm 020.518 2.48 °C 020.518 2.48 °C 020.519 2.48 °C 020.551 02.051 020.551 02.051		
Nome Nome Nome	BACINI object type Analog input Binay input Analog input Analog input Analog input Analog input Binay input Binay input Binay input Binay input Binay input Binay input Binay input	BACnet instance n B. SN / 0 005 8 004 9 004 6 004 5 004 6 004 6 004 5 004 6 004 5 004 4 004 9 004	Cpcioni di fitraggio C El Value 131136 053188 053188 053188 053188 053188 053188 053188 053188 053188 024.8 °C 027051 02		
Nome I Root - Master generator K1 Corrente 1 Root - Sensore ambientia K4 Presenza 1 Root - Sensore ambienta K4 Unicità 3 Root - Sensore ambienta K4 Unicità 3 Root - Sensore ambienta K4 Valore CO2 1 Root - Moduli (// K3 Inferupatura 2 Root - Sensore ambienta K4 Configurazione (K1 Root - Sensore ambienta K4 Configurazione (K1) Root - Sensore ambienta K4 Configurazione (K1) Root - Sensore ambienta K4 Configurazione (K1)	BACnet object type Analog Input Binary Input Analog Input Analog Input Analog Input Analog Input Binary Input Binary Input Binary Input Binary Input Binary Input Binary Input Binary Input Binary Input Binary Input	BACnet instance n B SIN / 0 005 004 8 004 004 7 004 004 6 004 004 7 004 004 7 004 004 6 004 004 5 004 04 6 004 04 9 004 9	Capacini di Nitrageo (24 Value 131.136 053.188 053.188 053.188 053.188 053.188 053.188 053.188 053.188 053.188 828 ppm 027.051 027.0		
	BACnet object type Analog Input Binay Input Analog Input Analog Input Analog Input Analog Input Binay Input Binay Input Binay Input Binay Input Binay Input Binay Input Binay Input	BACnet instance n., B., SIN / 0 005 8 004 9 004 7 004 6 004 5 004 6 004 4 004 5 004 4 004 5 004 4 004 5 004 4 004 5 004	Cpatoni di fitraggio C C4 Value 131.136 053.168 053.168 053.168 053.168 24.8 °C 053.168 828 ppm 027.051 027.0		

7. To end the display of the values, press the "disable live signals" button next to the button previously pressed.

4.5. Web platform and Enel X cloud connection

The last configuration step involves the connection with the Enel X cloud and the synchronization of the logs to the IoT platform. With reference to this section, it will be necessary to have the configuration mail.

From any web browser, type the instrument IP address or the default address if not previously set, logging in with credentials (can be different, if changed):

- > User: admin
- > Password: admin

Below is a brief description of the configuration steps to be carried out:

- From the menu at the top left select "system information", and in the right panel check the connection status (green led);
 - > From the "system settings" section it is possible to check the network settings and, if necessary, to restart the device.

2. In the "services" menu, selecting "EnelX IoT service" you need to insert all the information for the configuration of the connection to the IoT cloud, as indicated in the configuration mail. To avoid mistake, it's suggested to use copy/paste feature, paying attention that there is no blank/space at the end of the files after the paste action.

 Service configuration 	S3 configuration	Information	
st address *	Host address *	Status	
(3v62h9b8tp2.iot.eu-central-1.amazonaws.com	https://enel-noprod-esol-ap29732-iotmvp.s3.eu-central- 1.amazonaws.com	Last data transmission 4/22/2022, 9:04	
nteway id * XEUR_ROME_TDQ_1644848302366	s3 certificate path * test/private/esol_ap29732_test_EXEUR_ROME_TDQ_1644848302366/E	Show logs - OK	0
vironment " St	S3 access key * AKIAQSTAYCXKO7INJQOJ	Show logs - Errors	[
vironment prefix * sol_ap29732_test	S3 secret key *		
igion * I-central-1	83 log path test/private/esol_ap29732_test_EXEUR_ROME_TDQ_1644848302366		
art date 26/2021, 15:52	Temporary credentials c33s04psko2pez credentials iot eu-central-1 amazonaws.com		
isent data recovery			

- > 3. Set "Unsent data recovery" on "Disable"
- A. At the end of parameters configuration, select the "Service" field and change to "Enable" and save (fuchsia button in the lower right corner of the window), making sure that the led was initially white, after a couple of minutes of process, it changes to green led. Other led colors:
 - > White (off): service not active
 - > Green: service active, gateway registered and working properly
 - > Yellow: service active, registration in progress. Please wait
 - > Red: connectivity problem and/or communication error (see log for details)
- > 5. On the right side of the window there are two links to the logs
 - > Show logs OK: that logs all the correct activities happened
 - > Show logs Errors: that highlight any connection problems
- 6. After connecting the device, move to the "Variables" page, click on the pink icon and then edit
- 7. Here it will be possible to select all the variable (and please be sure to check all the one listed) and afterenter the name of the thing and its TrendID, values that can be obtained from the configuration mail.

- > NOTE: the values shown on this page include all the datapoints flagged as "historical" in the "database management" page.
- 8. Once the entire data has been filled, it will be necessary to communicate the end of the activity to the Enel X country control room or technical sales, which will start the activation of the things through specific payloads directly from the IoT platform.
 - > The activation process takes few minutes.
- 9. The correct activation of each thing will be highlighted by the green led on the left of the string



4.6. Closing Activity

REPORT UWP3 KEY TO ENEL CONTROL ROOM

- I. From any web browser, type the instrument IP address or the default address if not previously set, logging in with credentials (can be different, if changed):
- > 2. From the menu at the top left select "Service" and then "Remote Support VPN"
- > 3. Check that the service is "Enabled" and the icon is Green
- A. Click on the eye icon to show the "Activation Code" (the activation code is also provided in a closed envelope in the UWP3 Gateway package)
- 5. Copy the "Activation Code" and report to Enel Control Room (i.e. via mail, replying to configuration mail)

5. Troubleshooting

5.1. Gateway Factory Reset

Those operations must be done only if asked by Enel X

FACTORY RESET THE GATEWAY

This operation will completely delete all the settings from the gateway and will delete the association with Enel X Cloud

- > 1. Open UWP 3 Tool and connect to the gateway (cfr. Software connection)
- > 2. Go to "Program Setup" and click on "Factory Reset"
- 3. After this operation, you need to repeat the full procedure to configure the entire kitpreviously set, logging in with credentials (can be different, if changed):



6. Annex 1 – Meter comparison

METER	EM111	EM340	EM210	EM330	EM530	WM15
System (Phase)	1	3	3	1, 2, 3	1, 2, 3	1, 2, 3
Voltage	230V	120 to 230 V L-N 208 to 400 V L-L	160 to 240 V L-N 277 to 415 V L-L OR 57.7 to 144 V L-N 100 to 230 V L-L	230 to 277 V L-N 400 to 480 V L-L	120 to 240 V 208 to 415 V	120 to 240 V L-N 208 to 415 V L-L OR 120 to 347 V L-N 208 to 600 V L-L
Sensor	CT 333mV	Direct insertion (up to 65A)	CT 333mV or Ro- gowski Coils	CT 5A	CT 5A	CT 5A
Mounting	DIN (1 modules)	DIN (3 modules)	DIN (4 modules) or Panel 72x72*	DIN (3 modules)	DIN (3 modules)	Panel 96x96
Communication	RS485 Modbus RTU	RS485 Modbus RTU	RS485 Modbus RTU	RS485 Modbus RTU	RS485 Modbus RTU	RS485 Modbus RTU
Certification	CE	CE	CE, UL	CE, UL	CE, UL	CE, UL
Use case	1P Installa- tion	Small installation EU	Can cover all EU in- stallation***	Installation in US	Installation in US	Cover all US Voltages

7. Annex 2 – Sensor comparison and compatibility

MODEL	CTD		СТА	СТУ	ROG*
Code	CTD [x] X	CTD [x] S	CTA	CTV	ROG4
Core	Solid	Split	Split	Split	N/A
Mounting	Busbar/ cable	Busbar	Cable	Cable	Busbar/cable
Cabling	To be wired	Already wired (cable length 1/2 mt)		Already wired (cable length 1,5 mt)	Already wired (cable length 3 mt)
Primary Current	200 A 600 A 1600 A	1600 A	200 A 600 A	100 A 400 A	Up to 4000A
Secondary Output	5 A	5 A		333 mV	333 mV
Distance CT→Meter	<3 mt**			20-40mt	20-40mt
Meter compatibility	EM330, EM530, WM15			EM111, EM210	EM210

* Product code include 3 coils

** calculation of distance depends on burden value of CT. Please refere to calculation slide and CTs datasheets

8. Annex 3 – Ordering information

EUROPE/CE

BRAND	CATEGORY	CGPN	EAN	ENEL X PART NUMBER	DESCRIPTION
Gavazzi	Gateway and Accessories	UWP30RSEXXX	8030956085242	153-000290	Gateway
Gavazzi	Gateway and Accessories	SPMA24301	5350035433645	153-000291	Power Supply
Gavazzi	Gateway and Accessories	EM200-96 ADAPTER	8030956077070	153-000308	96x96 adaptor for EM210
Teltonika	Gateway and Accessories	UWP-WIFI-KIT-02	8030956091762	835-000050	Wi-Fi Interface + inter- nal antenna
Gavazzi	Gateway and Accessories	SH2DSP24	8030956078770	153-000295	Modem interface
Teltonika	Gateway and Accessories	UWP-MODEM-KIT- 4G-E02	8030956090666	835-000051	LTE Modem + internal/ external antenna
Enel	Gateway and Accessories			145-000348- A	Enel Sim Card Global
Enel	Gateway and Accessories			145-000349- A	Enel Sim Card Italy
Gavazzi	Meters	EM21072DMV53XOSX	8030956079579	153-000309	Meter 3-phs, 240 V L-N / 415 V L-L, 333mV
Gavazzi	Meters	EM21072DMV63XOSX	8030956079609	153-000310	Meter 3-phs, 100 V L-N / 230 V L-L, 333mV
Gavazzi	Meters	EM340DINAV23XS1X	8030956070187	153-000315	Meter 3-phs, 400 V, 65A dir.
Gavazzi	Meters	EM112DINAV01XS1X	8030956069594	153-000316	Meter 1-ph, 230 V, 100A dir.
Gavazzi	Meters	EM111DINAV81XS1X	8030956069433	153-000317	Meter 1-ph, 230 V, 32A direct, no UL
Gavazzi	Sensors	CTV2X100A333MV	8030956065848	190-000227	CT split, 333mV for EM210, up to 100A
Gavazzi	Sensors	CTV6X400A333MV	8030956083415	190-000229	CT split, 333mV for EM210, up to 400A
Gavazzi	Sensors	ROG4X1002M3503X	8030956089820	190-000231	Rogowski coil for EM210, up to 4000A
Gavazzi	Sensors	CTA5X200A5A	8030956085716	190-000225	CT split miniature max 200A
Gavazzi	Sensors	CTA6X600A5A	8030956085785	190-000226	CT split miniature max 600A
Gavazzi	Sensors	CTV2X100A333MV	8030956065848	190-000227	CT split, 333mV for EM210, up to 100A
Gavazzi	Sensors	CTV6X400A333MV	8030956083415	190-000229	CT split, 333mV for EM210, up to 400A
Gavazzi	Sensors	ROG4U1002M4003X	8030956091212	190-000232	Rogowski coil (USA and Canada) for EM210_MV

9. Annex 4 – Meter configuration

METER MODEL	PARAMETER	ATTRIBUTE NAME ON UCS TOOL	ATTRIBUTE NAME ON DISPLAY	VALUE	NOTE
EM111	VT primary (only in case of CT)	Voltage sensor primary current	Pri Curr	CT→Primary Current	i.e. for CTV-2X 100A 333MV, CT primary is 100
EM330	CT Ratio	Current transfor- mer ratio	Ct rAtlo	Primary current= de- pending on CT Secondary current=5 (always 5Amps)	I.e for CTD-2X 200 5A XXX, CT ratio is: Primary=200 Secondary=5 Ratio=200/5=40
	System Type	Electrical system	SYStEM	3P→3 phases system 3P.n→3 phases system with neutral 2P→2 phases with neu- tral	
	Measurement Type	Measurement Mode Selection	MEASurE	В	
EM340	System Type	Electrical system	SYStEM	3P→3 phases system 3P.n→3 phases system with neutral 2P→2 phases with neu- tral	
	Measurement Type	Measurement Type	MEASurE	В	
EM530	CT Ratio	Current transfor- mer ratio	CT RAT	Primary current= de- pending on CT Secondary current=5 (always 5Amps)	I.e for CTD-2X 200 5A XXX, CT ratio is: Primary=200 Secondary=5 Ratio=200/5=40
	System Type	Electrical system	SYSTEM	3P→3 phases system 3P.n→3 phases system with neutral 2P→2 phases with neu- tral	
	Measurement Type	Measurement Mode Selection	MEASurE	В	

	1	[1	1	
EM210	Sensor Type	Sensor Selection	SEnSOR	Ct→VT sensors Rog→Rogowski 100mV	
	VT primary (only in case of CT)	Voltage transfor- mer ratio	Ct Prin	CT→Primary Current	i.e. for CTV-2X 100A 333MV, CT primary is 100
	Rogowski Range (only in case of Rogowski coil)	Rogowski Sensor Range	roG	"1,00k", that means 1000A "2,00k", that means 2000A "4,00k" , that means	please select the upper value (in kAmps) compared to the nominal available
					current in the site. (i.e. if the available max current is 1050 Amps, please select "2,00k")
	System Type	Electrical system	SYS	3P→3 phases unbalan- ced system 3P.n→3 phases unbalan- ced system with neutral 3P.1→3 phases balanced	
	Application	Application	APPLiCAt	E	
WM15	CT ratio	Current transfor- mer ratio	CT Ratio	CT Ratio→[primary current]/[secondary current]	I.e for CTD-2X 200 5A XXX, CT ratio is: 200/5=40
	System Type	Electrical system	SYS	3P→3 phases unbalan- ced system 3P.n→3 phases unbalan- ced system with neutral 2P→2 phases with/wi- thout neutral 1P→single phase	