UWP, UWPA, UWPM

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Carlo Gavazzi Automation Components - Data aggregation solutions

Carlo Gavazzi Automation Spa - IT Department

ItemCode	Description
UWP-ACTIVATION-KEY	MAIA CLOUD ACTIVATION CODE
UWP-LICENCE-M01B	MAIA CLOUD LICENCE CODE
UWP-LICENCE-M02A	MAIA CLOUD LICENCE CODE
UWP-LICENCE-M02B	MAIA CLOUD LICENCE CODE
UWP-LICENCE-M04B	MAIA CLOUD LICENCE CODE
UWP-LICENCE-M05B	MAIA CLOUD LICENCE CODE
UWP-LICENCE-M10A	MAIA CLOUD LICENCE CODE
UWP-LICENCE-M25B	MAIA CLOUD LICENCE CODE
UWP-LICENCE-M50A	MAIA CLOUD LICENCE CODE
UWP-MODEM-KIT-4G-EU	KIT designed to connect the UWP30RSEXXX module to the 3G or 4G Internet network, throughout the European Union (EU27), in single SIM mode.
UWP-MODEM-KIT-4G-E01	KIT designed to connect the UWP30RSEXXX module to the 3G or 4G Internet network, throughout the European Union (EU27), in single SIM mode.
UWP-MODEM-KIT-4G-E02	KIT designed to connect the UWP30RSEXXX module to the 3G or 4G Internet network, throughout the European Union (EU27), in single SIM mode.
UWP-MODEM-KIT-4G-US	KIT designed to exclusively connect the UWP30RSEXXX module to 3G or 4G Internet network, throughout the United States and Canada
UWP-MODEM-KIT-4G-U01	KIT designed to exclusively connect the UWP30RSEXXX module to 3G or 4G Internet network, throughout the United States and Canada

UWP 3.0

Universal web platform

Microsoft Azure Certified

powered by aws

maia cloud

Security Capabilities Verified SILVER

Description

UWP 3.0 is a monitoring gateway and controller that allows the monitoring and controlling of installations where Energy Efficiency Management, Building Automation and Car Park Guidance functions are needed.
The system monitors and controls connected devices via its local bus management functions; it includes a web server with a powerful and intuitive user interface to display customised dashboards and interact with local devices and remote systems; the UWP 3.0 embedded automation server allows data to be exchanged locally or remotely via standard Internet protocols.
UWP 3.0 can manage the complete lighting control system based on DALI actuators and it can operate as a BACnet/IP gateway.

Benefits

- **Flexibility**. UWP 3.0 is the core of a powerful system which includes a complete range of meters, sensors and actuators
- **Integration**. UWP 3.0 includes all the necessary software tools to set up and operate the required solution. No subscriptions or additional services are required
- **Interoperability**. By leveraging its automation-server functions, it is easy to exchange data with other systems via FTP, SFTP, FTPS, SMTP, Rest-API, MQTT, Modbus and BACnet
- **Scalability**. It is easy to scale up the system, by leveraging its comprehensive set of monitoring, controlling and communication functions
- **Fast installation and set up.** Each function can be programmed with ease by means of the free configuration tool
- **Reliability**. The system is secure against cyber-attacks and computer viruses. It is the ideal Edge unit for providing local control and data redundancy to distributed applications
- **High storage capability.** Thanks to its 4GB of Storage memory, UWP 3.0 can store complex configurations and log history and events
- **IoT Ready**. UWP 3.0 is Microsoft Azure Certified for IoT
- **Powered by AWS**. UWP 3.0 is compatible with Amazon AWS IoT.
- **Awareness**. By means of scheduled reports and email/SMS alerts, users are constantly advised about installation status
- **Compact Size**. All of the above is available in a 2 DIN module
- **Powered by MAIA Cloud**: secure and reliable system for remotely managing, setting and operating UWP 3.0 units Worldwide.
- **IoT Security Rating:** Security Capabilities Verified by UL to Level SILVER for UWP 3.0 SE (*Security Enhancement*).

Applications

UWP 3.0 is suitable for applications in Building Automation, Energy Efficiency Performance Management, Car Parking Guidance and all their combinations are suitable application for UWP 3.0. Its comprehensive set of functions, small dimensions and reliability are the key factors for depending on UWP 3.0 as the local monitoring/controlling unit in a wider distributed scenario.

Main functions

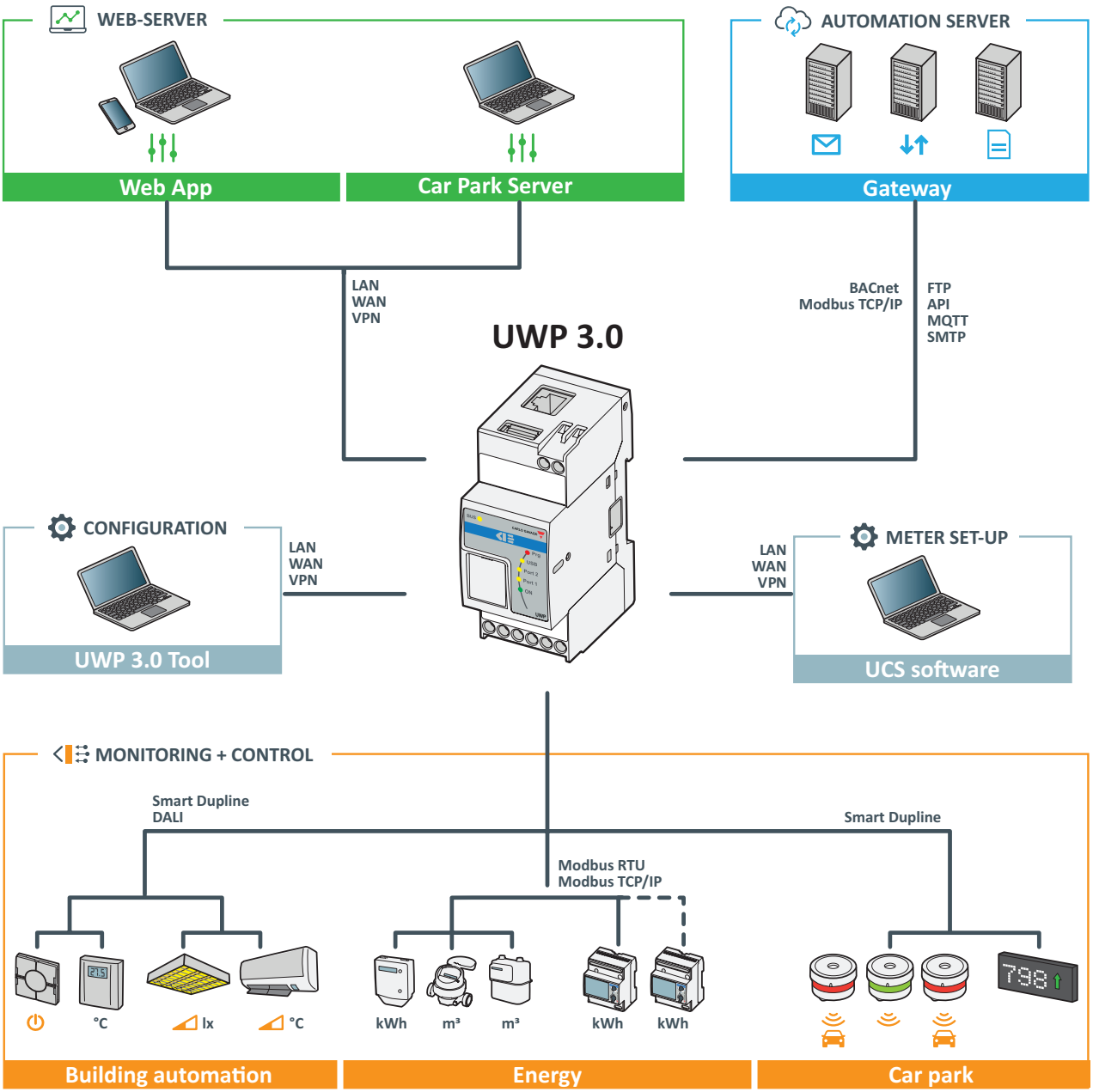
- Monitoring energy control systems so as to check energy efficiency status and improvements.
- Recording, displaying and transmitting information (events and history)
- Defining logical functions, reacting to abnormal conditions and control actuators
- Setting up and operating Building Automation functions
- Setting up and operating Lighting Control functions and DALI
- Setting up and operating Car Parking Guidance systems

Main features

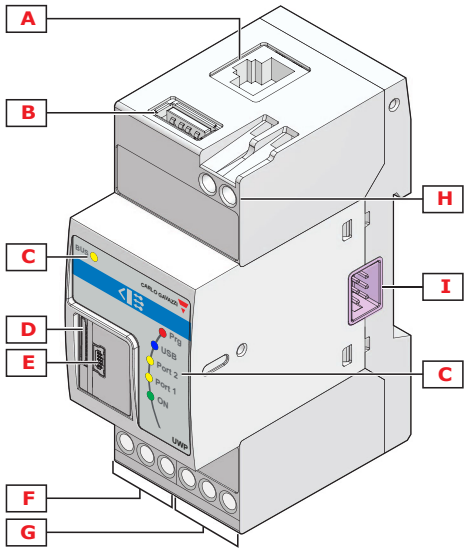
- Up to 5000 managed signals (including variables, I/Os) shared among Energy Management, Building Automation and Car Park applications*.
- Up to 128 Modbus devices connected to RS485 ports (64 devices each port).
- Up to 5 users concurrently connected to the Web-App.
- Up to 5 concurrent M2M connections (API connections, BACnet clients, Modbus masters).
- Up to 150 different products from the Carlo Gavazzi range can be connected to UWP 3.0
- BTL certified (max 500 BACnet points for used BACnet objects).

**Note: when the Car Park system is active, there will be 2000 signals available for the other applications (Energy Management and Building Automation).*

Architecture



Structure

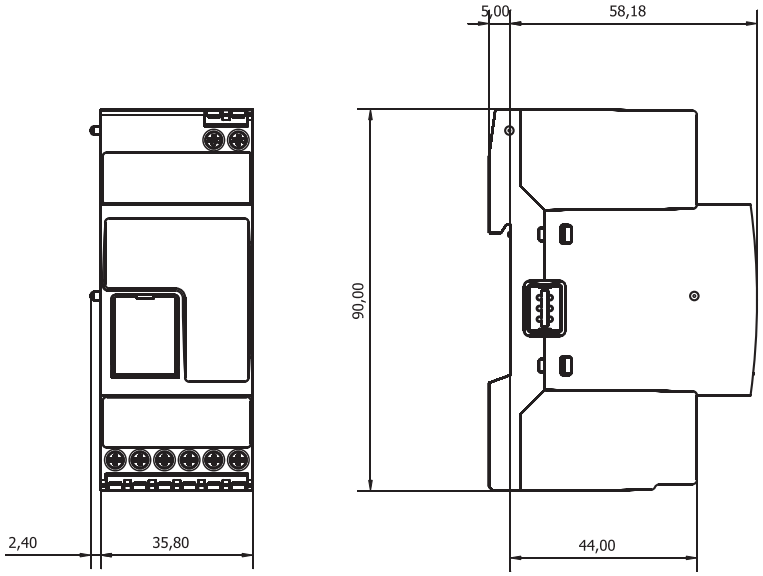


Area	Description
A	Ethernet port
B	USB port (host function)
C	Indication LEDs:
	Green (ON) ON - Power ON OFF - Power OFF
	Yellow (BUS) ON - Communication ON on the HS-bus OFF - No communication is present on the HS-bus Flashing - Communication error on the HS-bus
	Yellow (Port 1) OFF - Communication disabled Flashing 200 ms ON, 600 ms OFF - No communications on RS485 COM1 Flashing 200 ms ON, 200 ms OFF - Communications OK
	Yellow (Port 2) OFF - Communication disabled Flashing 200 ms ON, 600 ms OFF - No communications on RS485 COM2 Flashing 200 ms ON, 200 ms OFF - Communications OK
	Blue (USB) ON - USB device is present OFF - No USB device is present
	Red (Prg) ON - No configuration is present OFF - Configuration present in the UWP Flashing - UWP is connected to the UWP 3.0 Tool
D	Micro SD memory card slot
E	Mini-USB port (Device function)
F	RS485 COM1 port terminals
G	RS485 COM2 port terminals
H	Power supply connection block
I	Local bus ports (left side and right side)

Features

General

Material	Noryl, self-extinguishing V-0 (UL94)
Dimensions	2-DIN module
Weight	150 g
Protection degree	Front: IP40; Screw terminals: IP20
Dielectric strength	4000 VAC RMS for 1 minute
Rejection (CMRR)	>65 dB, from 45 to 65 Hz
Terminals	8 terminals, screw-type; Section: 1.5 mm² maximum; Torque: from 0.4 to 0.8 Nm



Environmental

Operating temperature	-20° to +50°C (-4° to 122°F)
Storage temperature	-30° to +70°C (-22° to +158°F)
Humidity (non-condensing)	20 to 90% RH

Power Supply

Power supply	15-28 V dc
Consumption	≤ 5 W
Battery	1 Metal-ion non-replaceable battery; 0.04 g

Note: The device contains metal-ion batteries. For the sending, you must comply with the relevant packaging and labelling regulation.

Inputs/outputs insulation

Type of input/ output	DC power supply	RS485 COM1	RS485 COM2	Ethernet	USB port "H"	USB port "D"	SH2UMMF124 and SH2DSP24
DC power supply	-	2 kV	2 kV	0.5 kV	0 kV	0 kV	0 kV
RS485 COM1	2 kV	-	0.5 kV	2 kV	2 kV	2 kV	2 kV
RS485 COM2	2 kV	0.5 kV	-	2 kV	2 kV	2 kV	2 kV
Ethernet	0.5 kV	2 kV	2 kV	-	0.5 kV	0.5 kV	0.5 kV
USB port "H"	0 kV	2 kV	2 kV	0.5 kV	-	0 kV	0 kV
USB port "D"	0 kV	2 kV	2 kV	0.5 kV	0 kV	-	0 kV
SH2DSP24	0 kV	2 kV	2 kV	0.5 kV	0 kV	0 kV	-

- **0kV**: inputs / outputs are not insulated.
- **2kVrms**: EN61010-1, IEC60664-1 - over-voltage category III, pollution degree 2, double insulation on systems with max. 300Vrms to ground.
- **0.5kVrms**: the insulation is functional type Mounting.

Compatibility and conformity

Standards	Electromagnetic compatibility (EMC) - immunity: EN61000-6-2
	Electromagnetic compatibility (EMC) - emissions: EN61000-6-3
	Safety: EN60950
Directives	EMC 2014/30/EU LVD 2014/35/EU RoHS 2011/65/EU
Approvals	CE cULus LISTED BTL
	Security Capabilities Verified SILVER — Cybersecurity Rating (SE version)

Ports

Ethernet

Standard	ISO9847
LAN Configuration	Static or DHCP IP Address; Net Mask; Default Gateway, DNS (primary, secondary)
DYNDNS	
Protocols	HTTP, HTTPS, FTP, FTPS, SFTP, Modbus TCP/IP, DP (Data Push), SMTP, NTP, Azure IoT Hub, Modbus Gateway TCP/RTU, BACnet IP
Client connections	WEB server: Port: 80; 5 connections TOOL: 1 connection Modbus TCP/IP: 5 connections
Connection type	RJ45 connector (10 Base-T, 100 Base-TX); maximum distance: 100m

RS485

Number of ports	2
Function	COM1: Master or slave (gateway function) COM2: Master
Number of slaves	COM1: up to 64 COM2: up to 64
Connections	2-wire. Max. distance 600 m
Protocol	Modbus RTU
Data format	Selectable: 1 start bit, 7/8 data bit, no/odd/even/ parity, 1/2 stop bit
Baud-rate	Selectable: from 110 to 256000 bits/s
Driver input capability	1/8 unit load Up to 256 nodes on a network

USB

Type	Hi-speed 2.0 Type-A
Mode	Host
Communication speed	60MB/s
Function	Backup for disaster recovery
Supported Device Type	USB mass storage: direct connection to UWP 3.0 USB modem/router: via additional module SH2DSP24
Supported File System	ext4
Note	Disabled automatically when SH2DSP24 is connected

Mini-USB

Type	Hi-speed 2.0 mini-B
Mode	Device
Speed	60 MB/s
Function	RNDIS (Virtual Ethernet) Network Access via IP: 192.168.254.254

Micro SD slot

Type	Industrial (from -25 to +85 °C / -13 to + 185 °F)
Capacity	SD and SDHC Up to 32 GB
Function	Backup for disaster recovery
Supported File System	ext4

HS Bus

Bus type	RS485 high speed bus
Function	Connection to master channel generator modules (SH2MCG24, SH2WBU230x, SH2DUG24 and SBP2MCG324)
Number of slaves	Maximum 7
Connection	By local bus on the right hand side Note: All the SH2MCG24, SH2WBU230x, SH2DUG24 and SBP2MCG324 modules have to be connected on the right hand side of the SH2WEB24.
Termination	Always required on the last module
Max distance	600 m

TCP/IP Ports

Inbound communication

Port number	Description	Purpose
80	HTTP	Access to the internal web-server, API functions
443	HTTPS	Access to the internal web-server, API functions
52325	SSH	Remote service (reserved to support personnel)
10000	UWP 3.0	Configuration and maintenance (UWP 3.0 Tool)
10002	UWP 3.0	Configuration and maintenance (UWP 3.0 Tool)
52326	UWP 3.0	Firmware update (UWP 3.0 Tool)

Outbound communication

Port number	Description	Purpose
53	DNS	Domain name resolution
123	NTP	Network time services access
21	FTP	Data upload to FTP server
25	SMTP	Email message dispatching
80	HTTP	DP (data push communication)

UCS bridge

Mode	Port	Description
Secure	443	For the HTTPS connection for bridge opening.
Insecure	503*	Through any TCP Modbus client. **Note: This port is the default one. Users can change it from the web-app relevant page.*

Modbus TCP/IP

Function	TCP Port	Purpose
Modbus TCP/IP Slave	502 (selectable)	Modbus TCP data communication
Modbus bridge TCP/RTU	503 (selectable)	Bridge function for accessing (read and write) RTU meter connected to the UWP RTU ports

MAIA Cloud ports

Inbound communication (Through the tunnel)

Port number	Description	Purpose
80	HTTP	Access to the internal web-server, API functions
443	HTTPS	Access to the internal web-server, API functions
52325	SSH	Remote service (reserved to support personnel)
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52326	UWP 3.0	Firmware update (UWP 3.0 Tool)

Outbound communication (Through the tunnel)

Port number	Description	Purpose
53	DNS	Domain name resolution
123	NTP	Network time services access
21	FTP	Data upload to FTP server
25	SMTP	Email message dispatching
80	HTTP	DP (data push communication)

For tunnelling

Access	Ports
MAIA Cloud Web	443/tcp and 1194/udp
MAIA Cloud App software	443/tcp and 1194/udp

Note: through the tunnelling service, all the above-mentioned ports are supported.

Data management

Multi-BUS communication	INPUT from: Modbus RTU, Modbus TCP/IP, Dupline OUTPUT to: Modbus RTU, Modbus TCP/IP, BACnet, Dupline, DALI
Embedded Database	Embedded database for storing system configuration, variables, events Flexible data model based on signals definition and functions creation
Automation server	Automation server for exchanging data with other systems via: FTP, SFTP, FTPS, Rest-API, SMTP, MQTT

**Note: Data stored on the internal UWP 3.0 database (including logged data points, events and configuration parameters) are preserved in the case of system shutdown. UWP 3.0 storage memory size is 4.0 GB (including all the logged data points, events and configuration parameters).*

Functions

Local monitoring and control

Connectable devices	Carlo Gavazzi Meters Smart Dupline sensors and actuators BACnet masters Modbus RTU, Modbus TCP/IP slaves (any Modbus slave can be integrated thanks to the Free Modbus Editor tool)
Monitoring functions	Logging of variables and events Average, Maximum, Minimum calculation Creation of triggers based on events
User Interface functions	Responsive web interface Customised dashboards Charting tools for displaying and analysing history data Cost centres base navigation tree Energy Summary display Dedicated widgets for monitoring control functions
Automation Server functions	M2M communication via: Rest-API, FTP, SFTP, FTPS, MQTT, SMTP, Modbus TCP/IP, BACnet Email or SMS alerts Multi-site data aggregation via Em²-Server Microsoft Azure certified for IoT
Reporting	Online or scheduled reports in XLSX, XML, CSV format XLSX report templates with free variable selection

Local control

Connectable devices	Carlo Gavazzi Meters Smart Dupline sensors and actuators Modbus RTU, Modbus TCP/IP slaves and DALI ballasts
Control functions	ON/OFF switching Standard Light Control functions, including DALI and dimming Advanced Light Control, including Tunable White Control and Constant Light Temperature control Roller Blind control BMS integration via Modbus TCP/IP and BACnet Logic functions, timers, analog comparators Calendar scheduler Math function Analogue (0-10 V) Output Smoke, Water, Intruder alarms Astronomical clock Hour counter Commands over Modbus Modbus driver writing/reading functions for any Modbus device
User Interface functions	Responsive web interface Customised dashboards Dedicated widgets for monitoring control functions and events
Automation Server functions	Integration into BMS systems via BACnet and Modbus TCP/IP Email or SMS alerts
Reporting	Online or scheduled reports in XLSX, XML CSV format for events

Car parking guidance

Connectable devices	Carlo Gavazzi Car Park sensors and actuators
Control functions	Car Park Guidance
User Interface functions	Responsive web interface Real time Car Park zones/bays mapping Analysis of historical occupation Commands and indicators display
Automation Server functions	Scalability via Carlo Gavazzi CPY system

Software and interfaces
MAIA Cloud

Remote access is the key to minimize the Total Cost Of Ownership of an UWP 3.0 powered installation; by leveraging the networking capabilities of MAIA Cloud, it is possible to take control of remote installations without leaving your office.

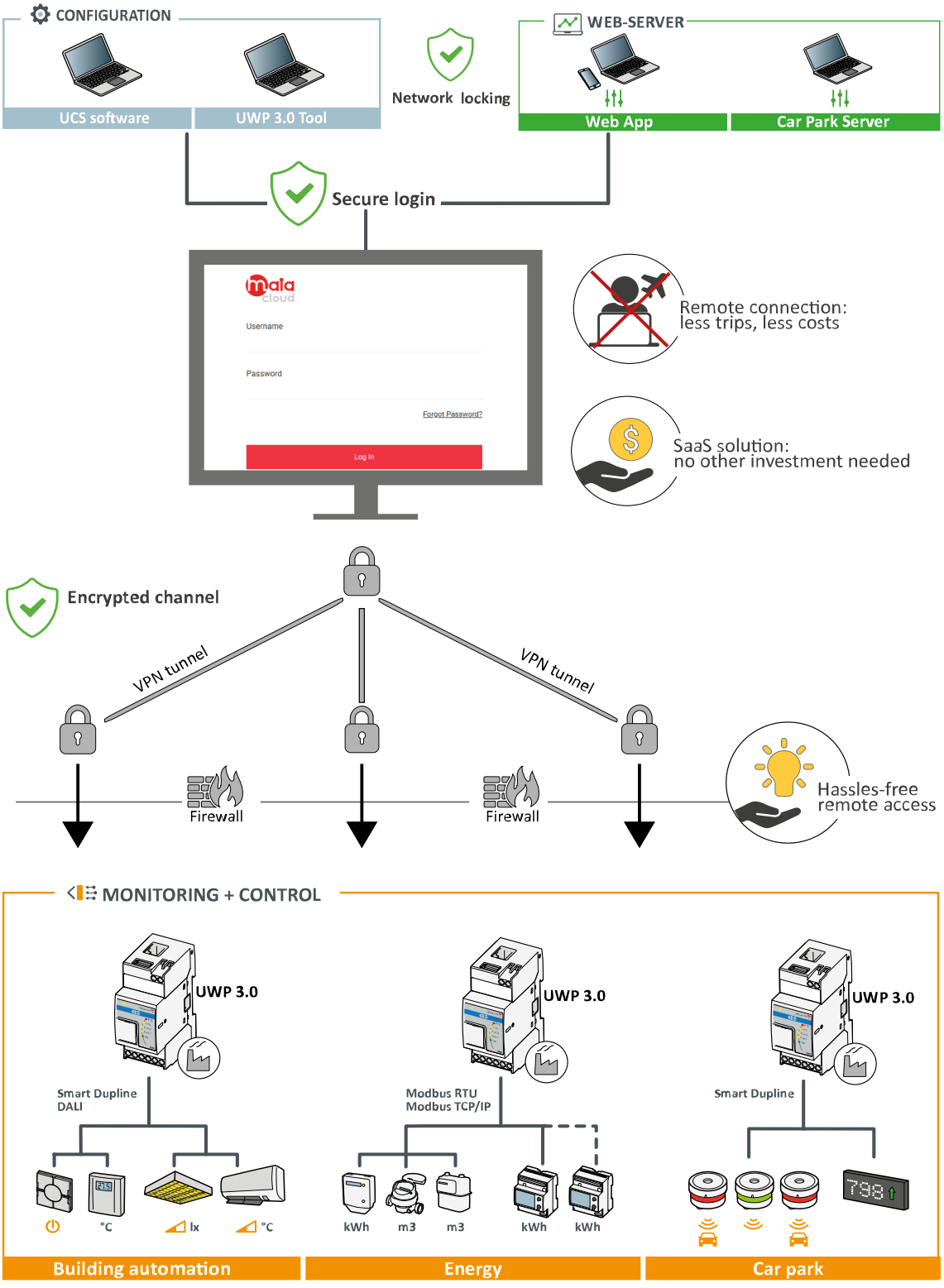
Benefits

- **Reduced costs**. Thanks to the VPN safe remote access, users do not need to travel and consequently waste money and time to solve their customers' issues.
- **Easy automatic remote networking**
- **Hassle free** regardless of destination and IP address.

Main functions

- Authentication: MAIA Cloud users can remotely access their UWP 3.0 fleets and manage them if needed.
- Security. Remote connections to MAIA Cloud and to the remote UWP 3.0 Edge units thanks to encrypted tunnelling.
- Hassle-free. Thanks to the MAIA Cloud tunnelling functions, you do not need to worry about IP address changes and firewalls. You could always access your device, according to your security policies.
- Remote set-up and operation. Thanks to MAIA Cloud, it is possible now to remotely:
  - Set-up of any Modbus/RTU CG Meter (via UCS)
  - Set-up of any Modbus/TCP CG meter (via UCS)
  - Set-up of any Smart Dupline item (via UWP 3.0 Tool)
  - Establishment of a VPN connection to your PC
  - Surfing on the UWP 3.0 web-interface.

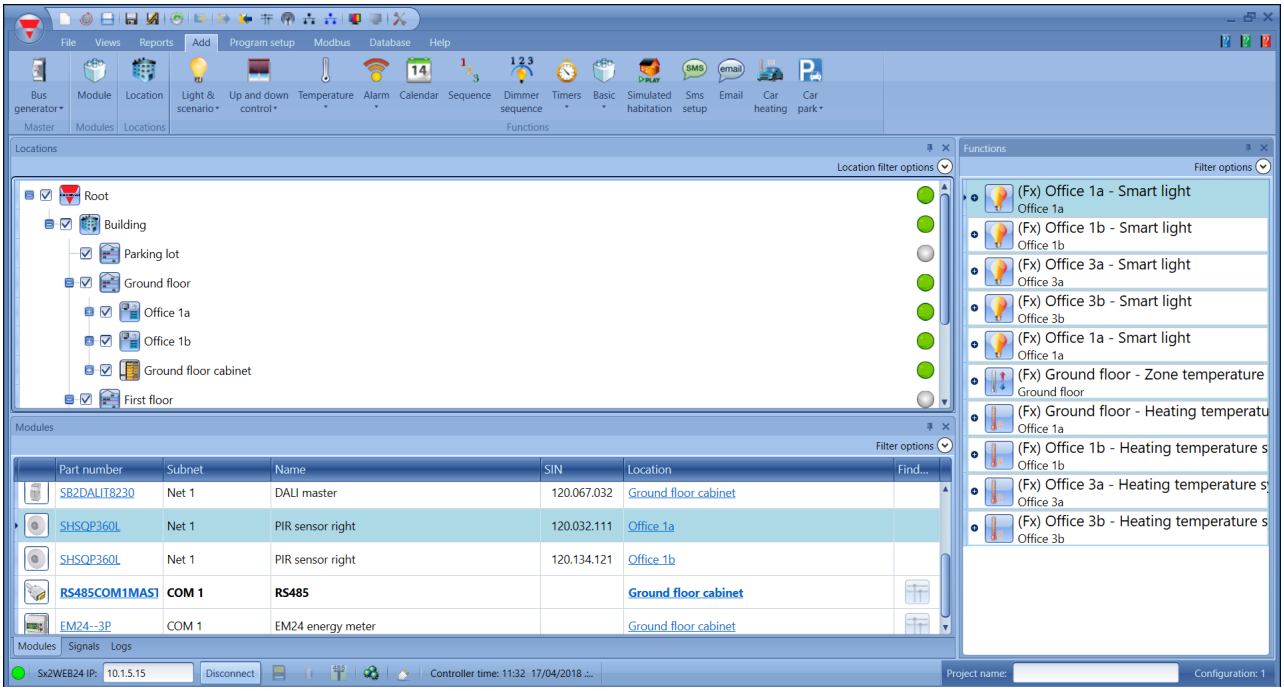
MAIA VPN architecture



UWP 3.0 Tool

UWP 3.0 Tool is the UWP 3.0 configuration software. It allows the user to:

- carry out the system commissioning
- define the automation and control logics
- set the measuring instruments and sensors monitoring.



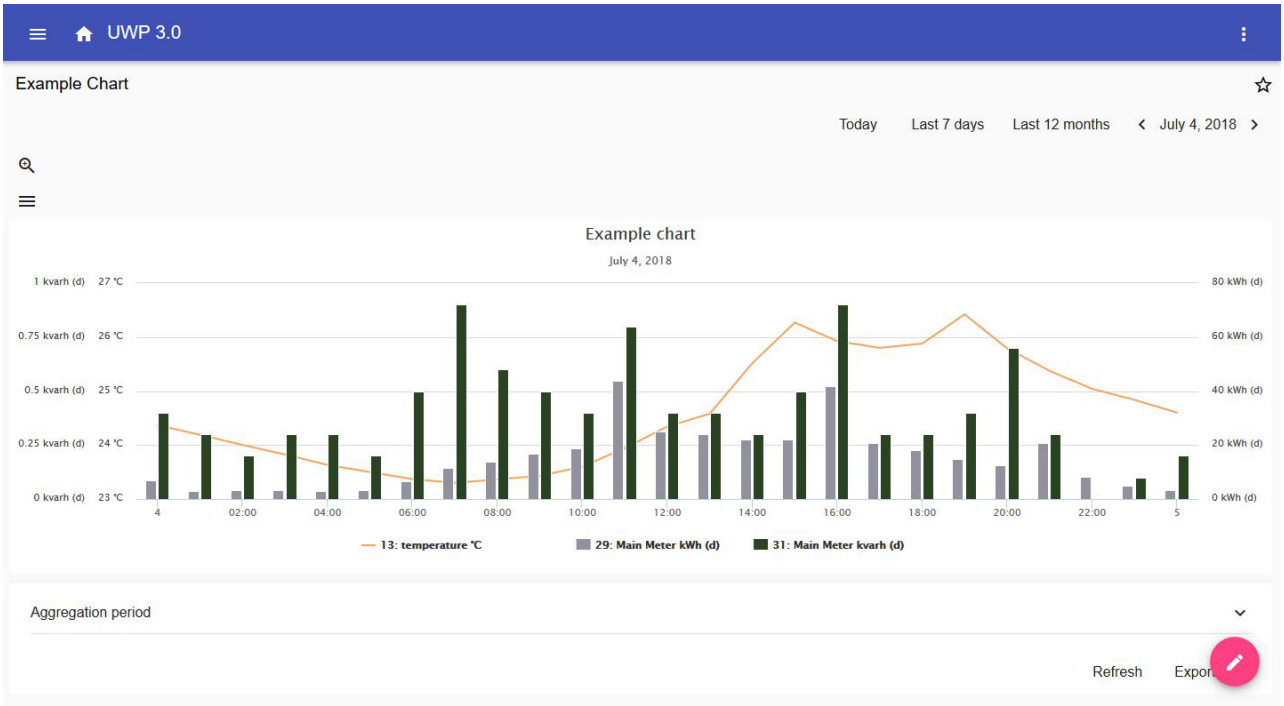
Main functions

- Configure interfaces and communication protocols
- Execute the Dupline modules automatic scan for fast commissioning
- Configure and manage the connected modules
- Define the control and automation functions
- Generate a driver to monitor third party Modbus devices
- Set the data and events collection and storage from Carlo Gavazzi or third party instruments
- Configure the Carlo Gavazzi Car Park system
- Set up the Carpark devices (sensors, indicators, displays)
- Develop Modbus drivers for UWP 3.0 with both reading and writing functions for any Modbus device
- Save a configuration offline for backup or any subsequent use
- Disaster recovery via scheduled or on-demand triggers

UWP 3.0 Web App

The UWP 3.0 Web App is the UWP 3.0 Web Interface, accessible through Web browsers from mobile or desktop devices. Through widgets contained in predefined and customised dashboards, it allows the user to:

- view and export collected data
- control the automation functions
- define specific settings (User Interface and Server Automation).



Main functions

- View collected data as real time values or charts
- Generate data and events reports
- Manage and adjust the functions parameters (e.g. modify temperature set points)
- Send commands (e.g. switching on/off or select scenarios)
- Configure Data Push Services to FTP/SFTP/FTPS servers or Em²-Server (Carlo Gavazzi)
- Configure MQTT link to IoT Hubs (Amazon AWS and Microsoft Azure)
- Learn the main tasks by using the embedded tutorial

Car Park Server

The Car Park solution includes the setup of the system and the monitoring of the installation.
It allows the user to:

- define the configuration of the user interface
- view and export statistics for the car park occupancy.

Main functions

- Collect data from ultrasonic sensors
- Elaborate statistics: real time and historical occupation data from groups of sensors or single bays
- Command displays and indicators
- Represent data using with real time maps on the built-in car park web server
- Set the zone counter function for rooftop car park control or complete indoor/outdoor monitoring.

Note: The Car Park and the Data Push (to Em²-Server and IoT Hubs) functions can not be used concurrently.

Cybersecurity

Introduction

Cybersecurity is the practice of protecting systems, networks, and programs from digital attacks. These cyberattacks are usually aimed at:
- accessing, changing, or destroying sensitive information;
- extorting money from users;
- interrupting normal business processes.

Implementing effective cybersecurity measures is particularly challenging today because there are more devices than people, and attackers are becoming more innovative.

For UWP 3.0 SE (*Security Enhanced*), the security capabilities have been verified by UL to Level SILVER.

The SILVER rating certifies the enhanced security capabilities of UWP 3.0 SE regarding:
- Access Control
- Industry Privacy Best Practices
- Product Security Maintenance.

Pillars

- **Disaster recovery**. UWP 3.0 includes a solid disaster recovery system for saving and restore both configuration and history data on USB stick, SD card, SFTP server.
- **Easy upgrade function**. UWP 3.0 Tool and Web-APP notify users about the availability of a new software and firmware version; the whole upgrade process is managed by the UWP 3.0 Tool.
- **UWP secure bridge function.** It permits you to establish a secure connection through LAN or Internet network between the UCS software and Carlo Gavazzi Modbus meters connected to UWP 3.0 via RS485 or LAN network. This way, you can perform the following tasks remotely:
  - configure a wired device via UCS without disconnecting UWP 3.0;
  - check the proper functioning of the devices, the real time measures, the status of alarms and the inputs/outputs
  - modify or correct the configuration parameters, in case of measures anomalies or of project structure changes.
- **Secure access**: thanks to MAIA Cloud, you can access a UWP 3.0 system through a secure VPN (virtual private network).
- **Minimalist approach**: UWP 3.0 has been designed to include only the necessary sub-systems into a highly optimized linux core, so to avoid unnecessay risks due to attacks to unmonitored services.

For further information, refer to the following guideline: ***"Security in energy monitoring and building automation applications based on the UWP 3.0 ecosystem".***

Connection Diagrams

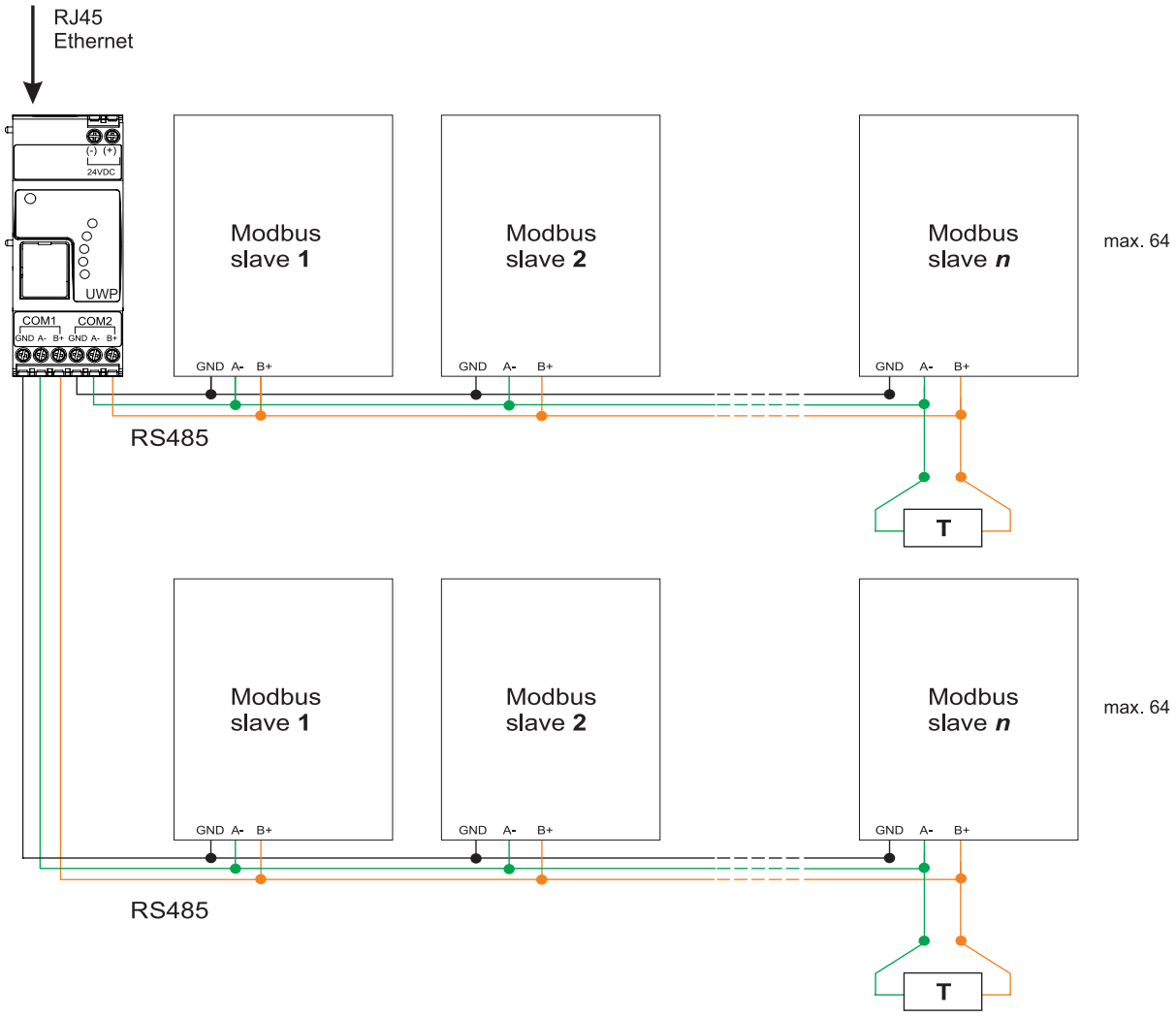


Fig. 1 *Modbus RTU connection. COM 1 master, COM 2 master*

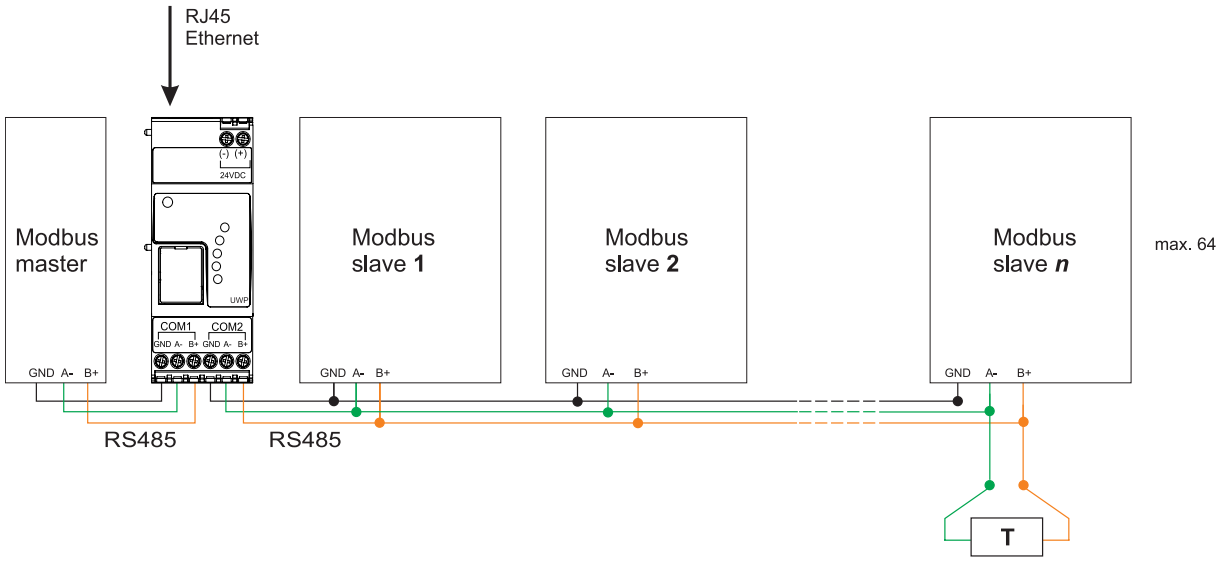


Fig. 2 *Modbus RTU connection. COM 1 slave, COM 2 master*

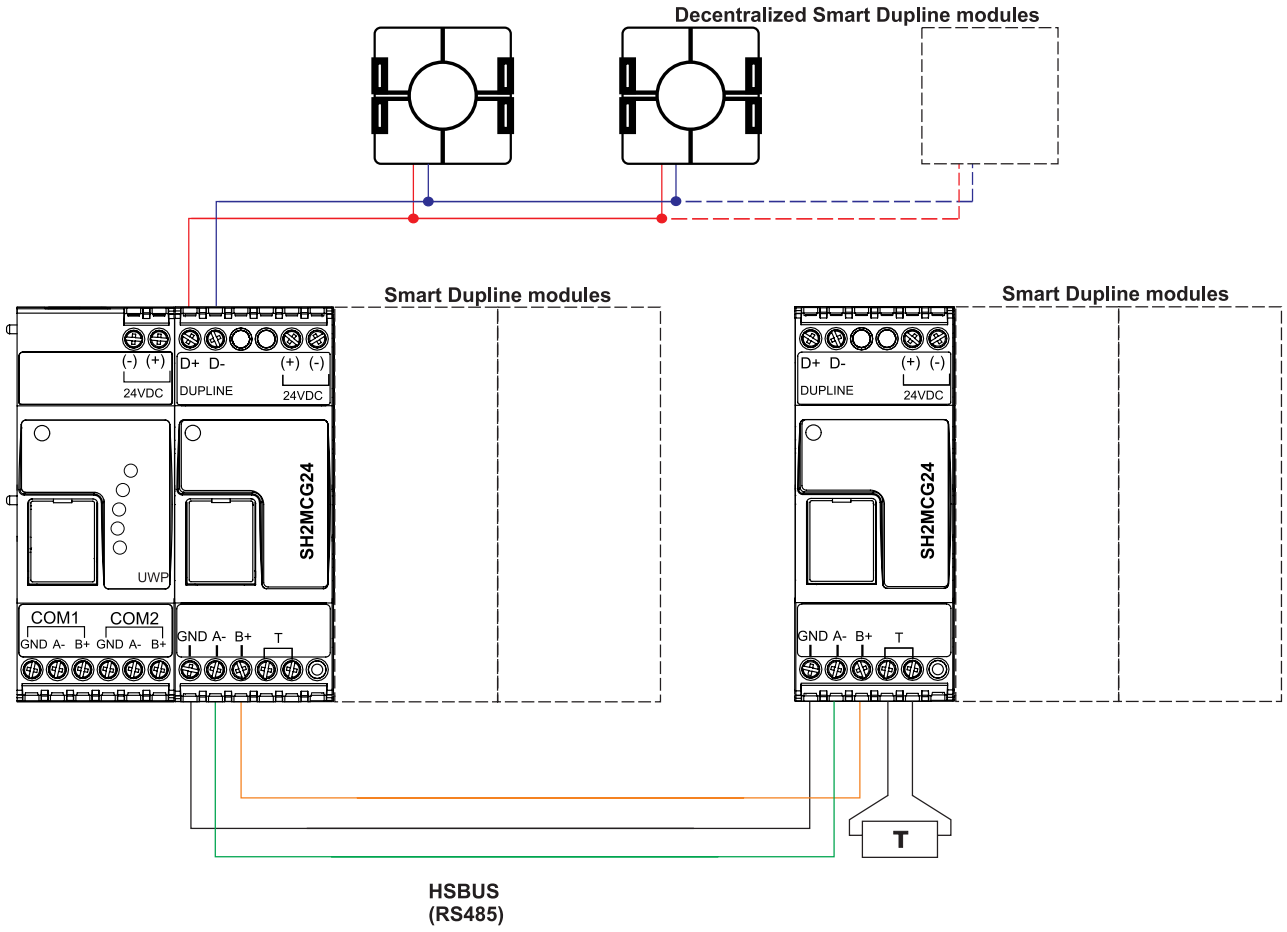


Fig. 3 *Example of Smart Dupline modules connection using master channel generators*

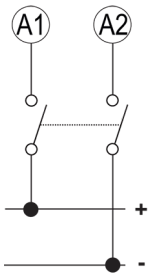


Fig. 4 *Power supply*

References

Compatible devices

Device	Instruction manual
UWP-MODEM-KIT-4G-U01	
UWP-MODEM-KIT-4G-E01	
UWP-MODEM-KIT-4G-E02	
UWP-WIFI-KIT-01	

Further reading

Information	Document	Where to find it
Hardware manual	UWP 3.0 HW manual	
Software manual	UWP 3.0 Tool manual	
Wireless manual	UWP 3.0 wireless installation manual	
White paper	UWP 3.0 for Azure IoT- whitepaper	
Web App manual	UWP 3.0 Web App - Instruction manual	
User manual	MAIA Cloud system user manual	
UWP 3.0 How to order	How to order	
UWP 3.0 Cybersecurity Guideline	Cybersecurity Guideline	
UWP 3.0 Quick connection guide	Quick connection guide	

MAIA Cloud licences

Licence	Description	Document
UWP-LICENCE-M01B	MAIA PLUS LICENCE-12 MONTHS VPN	
UWP-LICENCE-M02A	MAIA STANDARD LICENCE-2 DEVICES	
UWP-LICENCE-M02B	MAIA PLUS LICENCE-24 MONTHS VPN	
UWP-LICENCE-M04B	MAIA PLUS LICENCE-48 MONTHS VPN	
UWP-LICENCE-M05B	MAIA PLUS LICENCE-60 MONTHS VPN	
UWP-LICENCE-M10A	MAIA STANDARD LICENCE-10 DEVICES	
UWP-LICENCE-M25B	MAIA PLUS LICENCE-300 MONTHS VPN	
UWP-LICENCE-M50A	MAIA STANDARD LICENCE-50 DEVICES	
UWP-ACTIVATION-KEY	MAIA ACTIVATION LICENCE	

How to order

Code	Description
UWP30RSEXXX	Monitoring gateway and controller
UWP30RSEXXXSE	Monitoring gateway and controller security enhanced

UWPA, UWPM

Long-range wireless gateway: endpoint adapter and master concentrator

Description

UWPA is an endpoint adapter that provides LoRa® or LoRaWAN® communication to an RS485 Carlo Gavazzi meter. UWPM is a master concentrator that permits UWP 3.0 to gather data from multiple UWPA.

Benefits

- **Long range communication**. Up to 10 km range in open air, 1 km in typical applications.
- **Low operating expenses.** Wireless solution (EU 868 MHz ISM band and US 915 MHz ISM band) with no SIM card or annual fees.
- **Easy and fast configuration** via free software.
- **Easy commissioning and diagnostics** thanks to the push button for communication test.
- **Security**. Embedded end-to-end AES128 encryption.
- **Reliable communication** thanks to high-performance antenna, interferences/obstacles immunity and downlink server acknowledge.
- **Compatibility**. It permits to interface a Carlo Gavazzi meter and analyser with standard third-party LoRaWAN® networks or with UWP 3.0 platform.

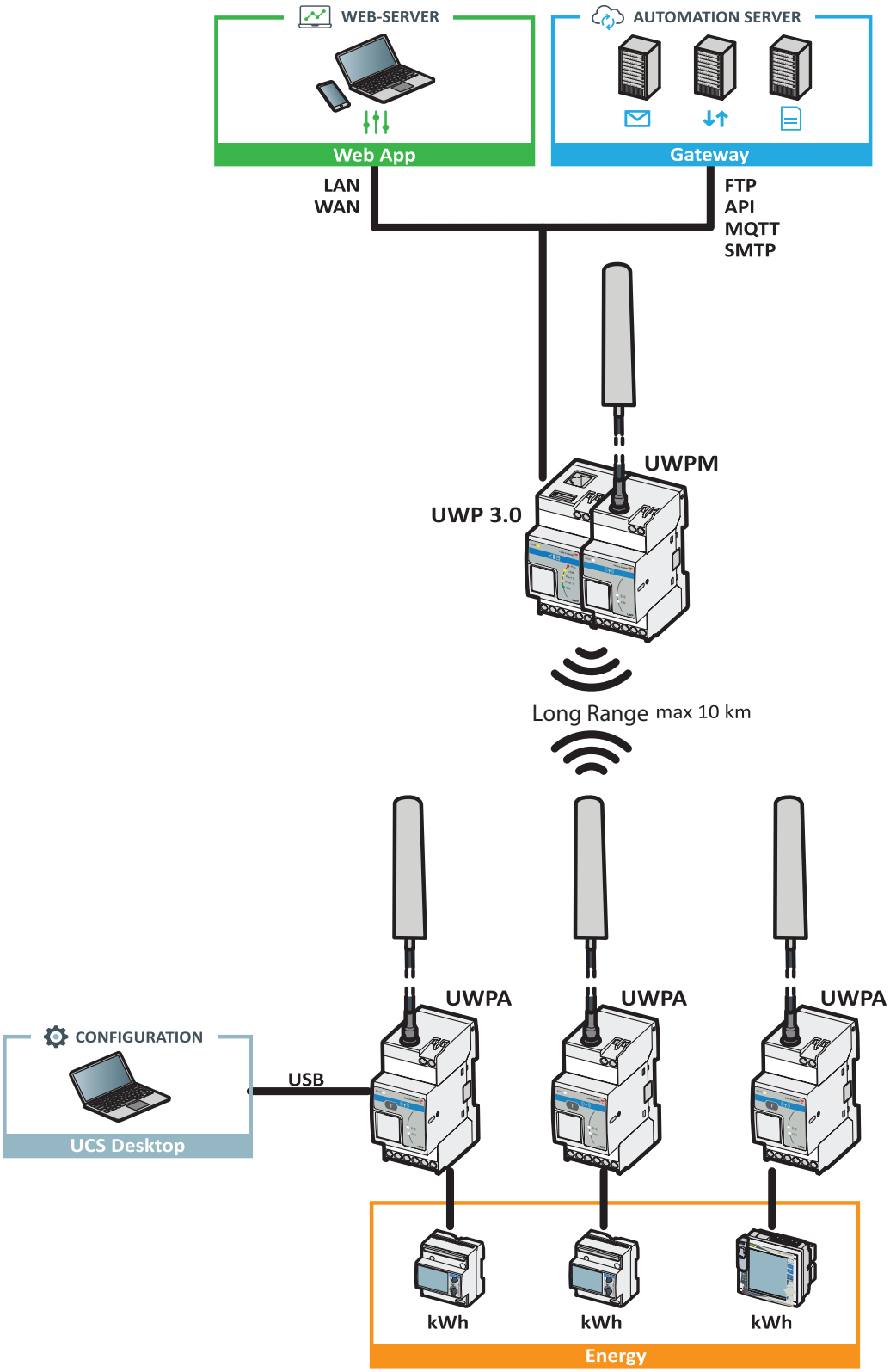
Applications

Energy efficiency monitoring and energy cost allocation, sub-metering in large buildings, big facilities, farms and city areas are the best use cases for long range wireless Carlo Gavazzi systems. Thanks to LoRa®/ LoRaWAN® long communication range, security and robustness, wireless networks can be easily set-up, without high expenses due to the use of SIM cards or repeaters.

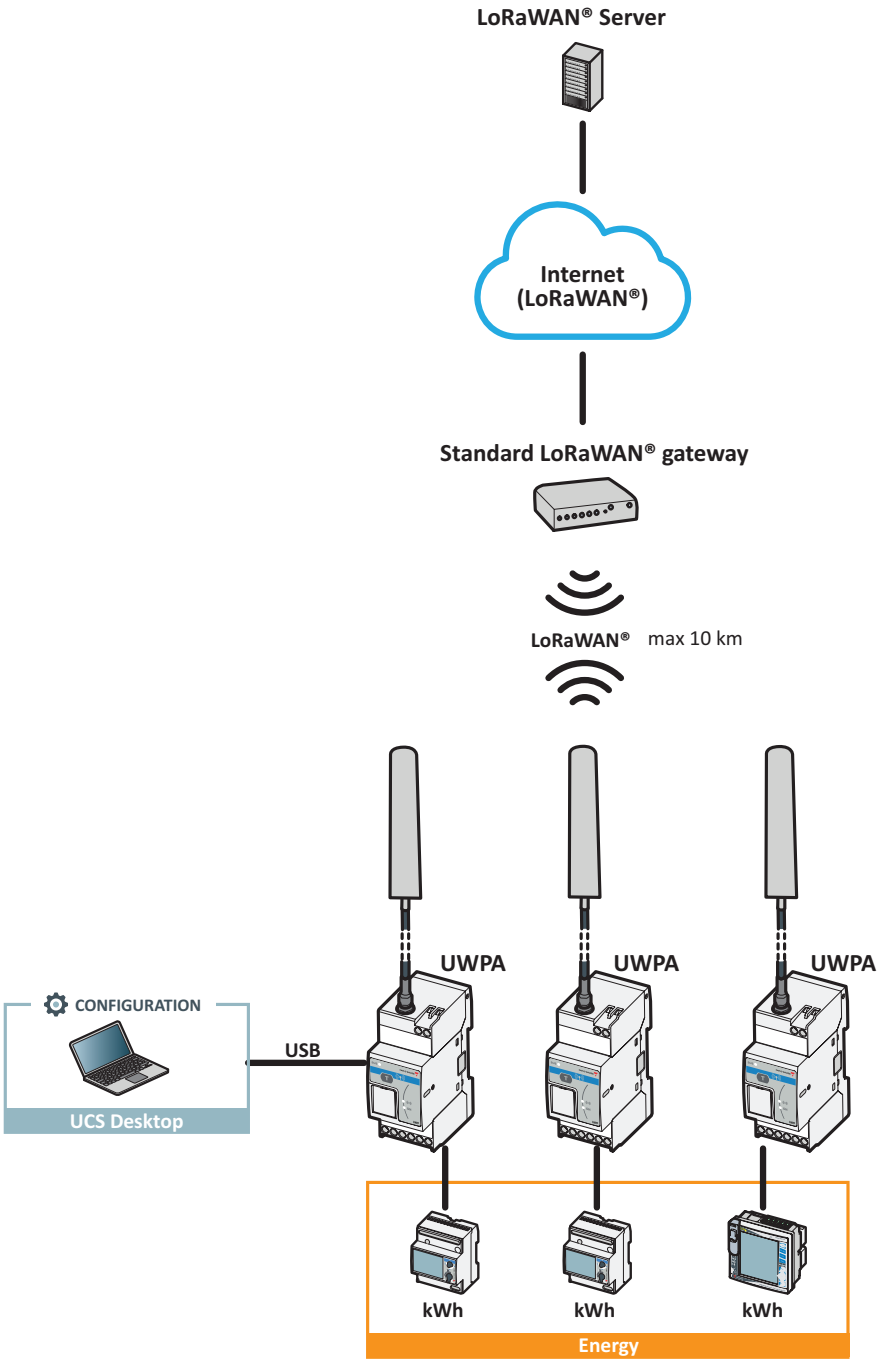
Main functions

- LoRa®/LoRaWAN® communication for a RS485 Carlo Gavazzi meter and analyser (UWPA)
- Plug'n play commissioning of a long-range wireless monitoring system based on UWP 3.0 (UWPA+UWPM)
- Integration of pulse output meters (electricity, gas and water) in combination with VMU-MC/OC.

Architecture (private UWP network)



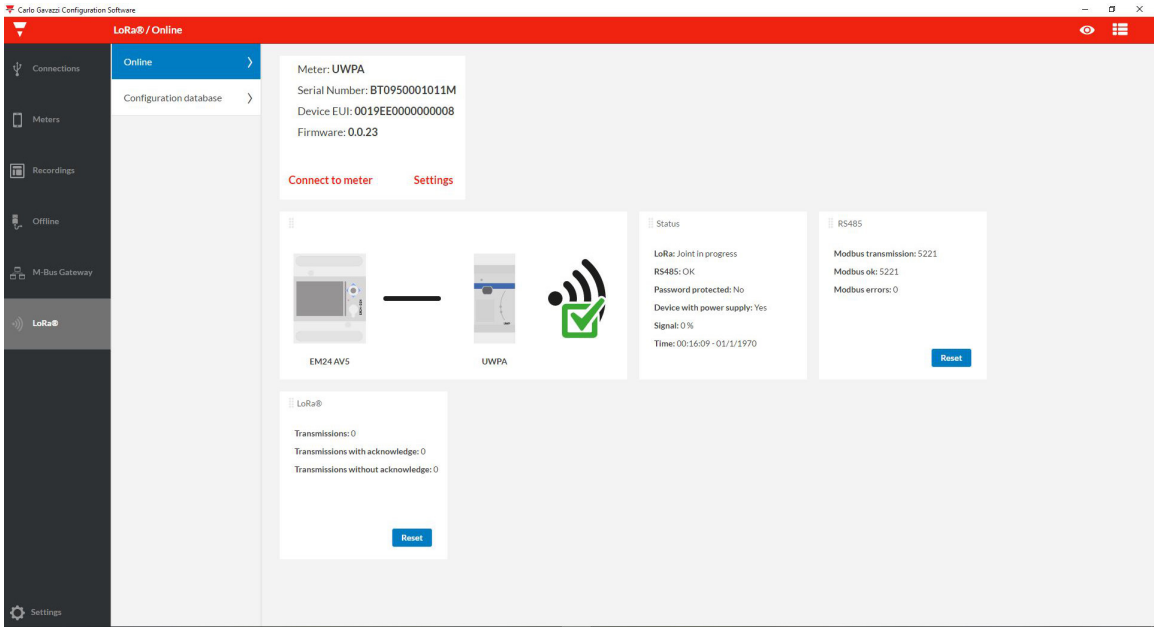
Architecture (LoRaWAN® network)

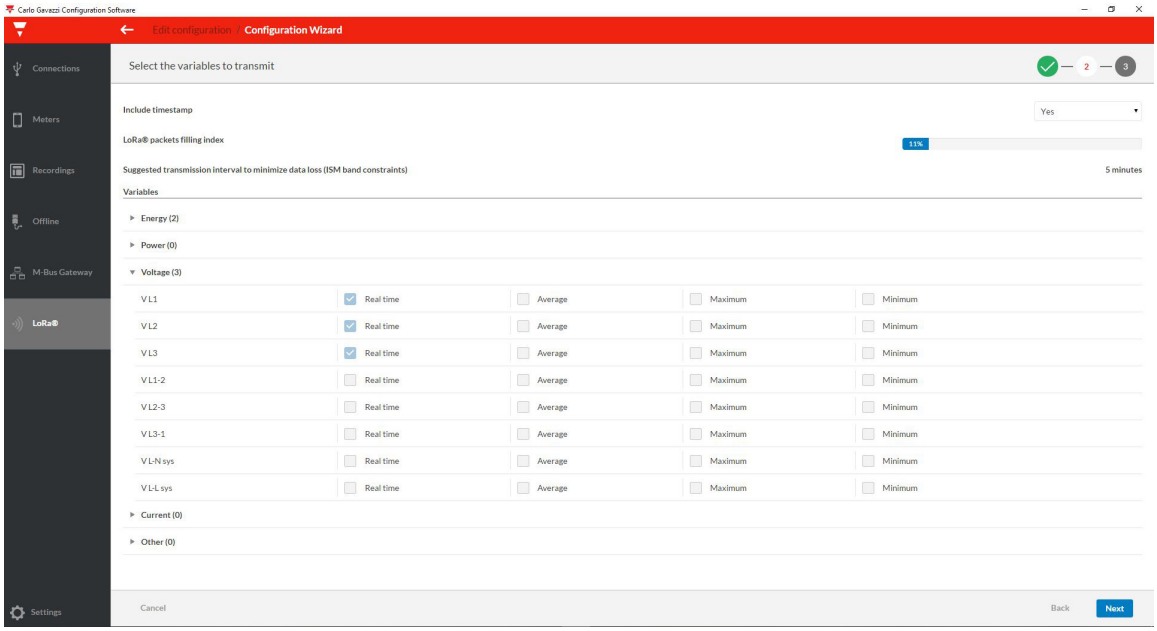


Main features

- Compatibility with generic LoRaWAN® Gateways/Servers/Networks (UWPA)
- Full ownership of data with no need to rely on any wireless/cloud operator (UWPA+UWPM)
- EU 868 MHz ISM band communication
- US 915 MHz ISM band communication
- Up to 50 UWPA per UWPM (max. 3 UWPM per UWP 3.0)

UCS (Universal configuration software) specifications





- Free software, compatible with Windows® PCs
- Intuitive user interface
- The same software for configuring UWPA and a Carlo Gavazzi meter
- UWPA password management for protecting your LoRa®/LoRaWAN® network
- Configurations database for helping system integrators
- Real time diagnostics and datalogging
- Export of .csv or Excel files from the configured devices list for an easy integration into LoRaWAN® network
- Export of the configured devices file for the UWP network to import into UWP 3.0

UWPA

Wireless endpoint gateway

Main features

- Gateway from RS485 to LoRa®/LoRaWAN® for Carlo Gavazzi meters (one meter for each UWPA)
- USB port for easy set-up via UCS Software
- Universal power supply
- Configurable LoRaWAN® communication
- OTAA or ABP authentication
- Long communication range (10 km in open air, from 200 m to 3 km in typical applications)
- Communication interval from 5 min to 24 h
- Remote diagnostics via LoRa® RF technology communication
- LED indication of operating status

Description

UWPA is a device to be connected to a Carlo Gavazzi meter via RS485. The resulting system transmits measured data either to standard third-party LoRaWAN® systems or to the UWPM concentrator using LoRa® technology.

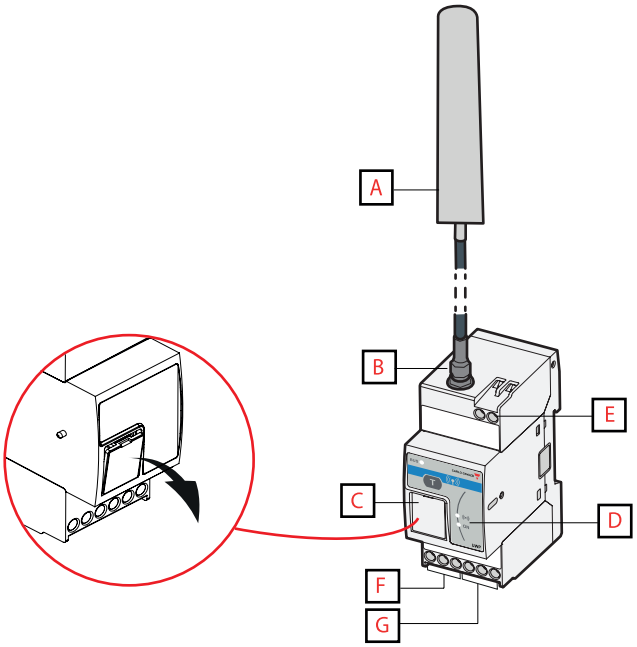
Applications

Energy efficiency monitoring and energy cost allocation, sub-metering in large buildings, big facilities, farms and city areas are the best use cases for long range wireless Carlo Gavazzi systems. Thanks to LoRa®/ LoRaWAN® long communication range, security and robustness, wireless networks can be easily set-up, without high expenses due to the use of SIM cards or repeaters.

Main functions

- LoRa®/LoRaWAN® communication for RS485 Carlo Gavazzi meters and analyzers
- Plug'n play commissioning of a LoRa®-based monitoring system based on UWP 3.0 (in combination with UWPM)
- Compatibility with standard third-party LoRaWAN® Gateways/Servers/Networks
- Full ownership of data with no need to rely on any wireless/cloud operator (in combination with UWPM)
- Local diagnostics thanks to micro-USB connection and dashboard displaying the status in UCS software
- Communication test via push button

Structure



Area	Description
A	High-performance antenna
B	Antenna connector
C	USB port
D	LEDs: Green: Power supply Yellow: RS485 Blue: LoRa®
E	Power supply connection block
F	Terminals for RS485 connection to meter
G	Terminals for RS485 termination

Special functions

- Meter auto scan via RS485
- Powered by USB for setting up without an external power supply
- Password protected configuration
- The same software (UCS) to configure both UWPA and connected device
- Adapter firmware upgrade: user can select the firmware file and activate the firmware upgrade procedure
- Clock synchronization with server time via wireless downlink

LED indication

Colour	Status LED	Description
Green	ON	Power supply OK
	OFF	No Power supply
	Fast Blinking	Hardware failure
Yellow	ON	Communication in progress without errors
	OFF	Communication disabled
	Slow blinking	Meter auto scan in progress
	Fast blinking	Not valid meters or communication error
Blue	ON	Push button disabled to comply with ISM band restrictions on duty cycle
	OFF	LoRa® RF technology communication disabled or network joint successfully executed (waiting for the next communication)
	Slow blinking	Communication in progress
	Fast blinking	Network joint not executed or communication failed

Features

General

Material	Noryl, self-extinguishing V-0 (UL 94)
Protection degree	Front: IP50 Terminals: IP20 Antenna: IP65
Terminals	Cable Section: 1.5 mm^2 Torque: from 0.4 to 0.8 Nm
Mounting	DIN rail
Dimensions	2-DIN module
Weight (packaging included)	520 g
Antenna cable length	2 m
Antenna dimensions	See picture 2

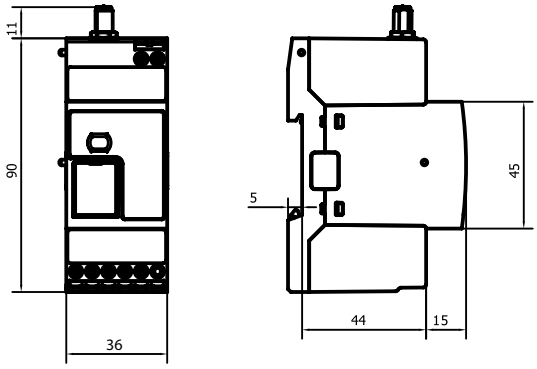


Fig. 1 *UWPA dimensions*

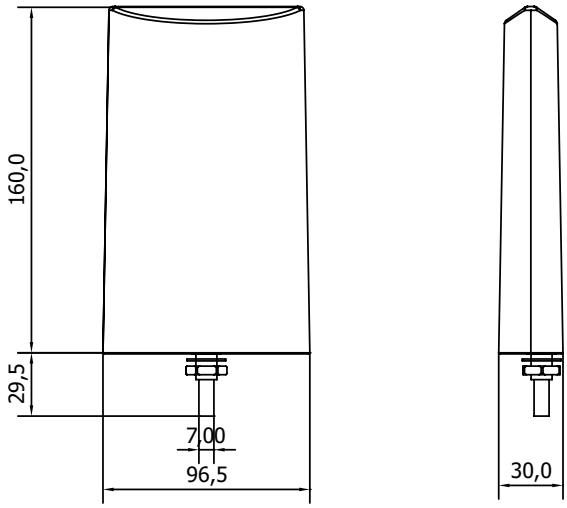


Fig. 2 *High-performance antenna dimensions*

Power supply

Power supply	24 V dc +/-20% 115-240 V ac 50/60 Hz +/-10%
Consumption	DC: 1.3 W max. AC: 5.5 VA max.
Connector	Screw terminals

Environmental specifications

Operating temperature	-25° to +55°
Storage temperature	-30° to +70°

NOTE: R.H. < 90% non-condensing

Input and output insulation

	Power supply	RS485	USB
Power supply	-	4 kV VRMS	4 kV VRMS
RS485	4 kV VRMS	-	0.5 kV VRMS
USB	4 kV VRMS	0.5 kV VRMS	-

Communication

RS485 port

Communication type	Multidrop, bidirectional (static and dynamic variables)
Connection type	Screw terminals 3 wires
Protocol	Modbus RTU
Data	All
Data format	1 start bit, 8 data bits, Parity (None/ Odd/ Even), 1 or 2 stop bit
Configuration parameters	Modbus address (from 1 to 247) Baud rate: 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbps Parity (None/ Odd/ Even) Stop bit (1 or 2)
Maximum number of connected devices	1 meter x 1 UWPA

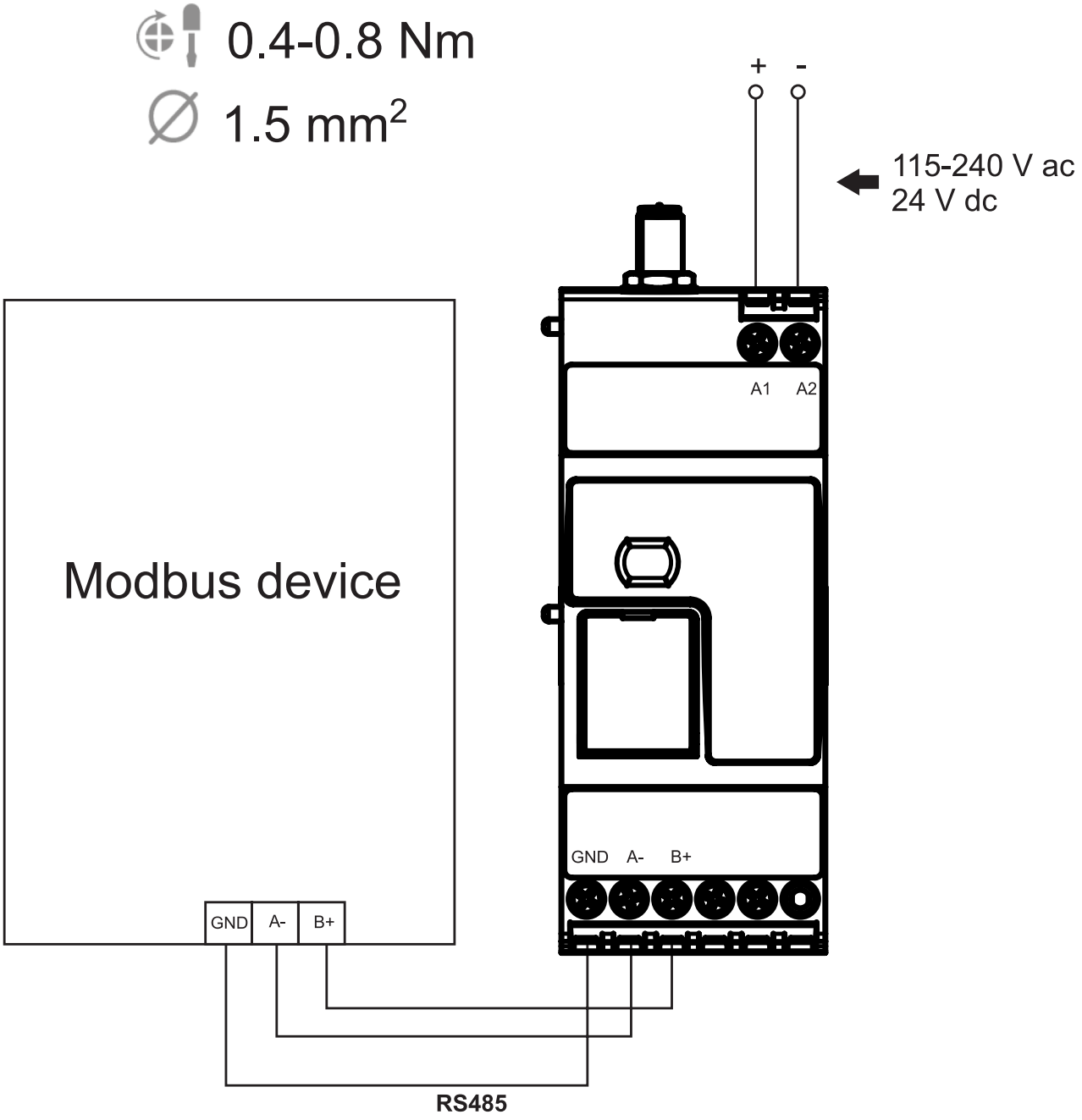
USB port

Type	USB2.0/USB3.0
Connection type	Micro-USB
Protocol	JBUS/Modbus compatible
Configuration parameters	Modbus address (from 1 to 247) Baud rate: 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbps Parity (None/ Odd/ Even) Stop bit (1 or 2)

LoRa® and LoRaWAN®

Protocol	LoRa® (private UWP network, in combination with UWPM) or LoRaWAN® (LoRaWAN® network)
Configuration parameters	Transmission interval Authentication type (ABP or OTAA) Appkey or Appskey and Nwkskey
Frequency	EU 868 MHz ISM band
	US 915 MHz ISM band
Encryption	Embedded end-to-end AES128 encryption
Transmission interval	Configurable from 5 min to 24 h
Antenna	Included high performance antenna (SMA connector, cable length 2m)
Test function	Push button command for diagnostic or commissioning purposes

Connection Diagrams



References

Further reading

Document	Where to find it
Guidelines	
Instruction manual	

CARLO GAVAZZI compatible components

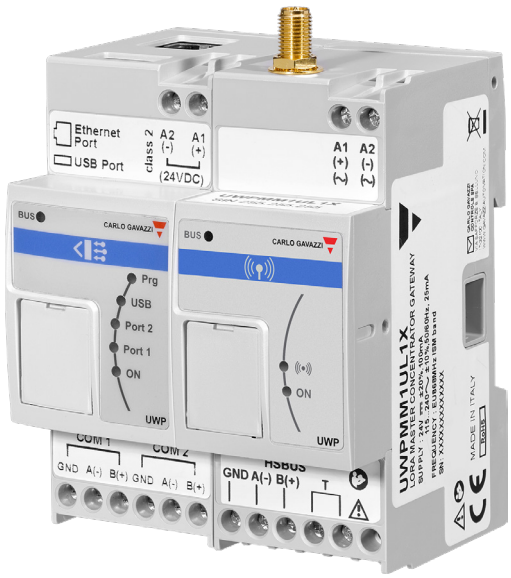
Purpose	Component name/code key	Notes
Energy analyzers	EM24 (family), EM210 (family), EM50	See relevant datasheet
Energy meters	EM100-300 (family)	See relevant datasheet
Power quality analyzers	WM20-30-40 (family), CPA (family)	See relevant datasheet
Power transducers	ET100-300 (family)	See relevant datasheet
Pulse concentrator	VMU-MC / OC	See relevant datasheet
Power analyzer	WM15	See relevant datasheet

Conformity

Directives	For UWPAM1US1L1X	• 2014/53/EU (RED) • 2011/65/EU + 2015/863/EU (RoHS)
	For UWPAM1US1L2X	• FCC Rules Part 15 • ISED compliance statements: ICES-003 / NMB 003 • Radio compliance for Mexico: NOM-208-SCFI-2016 • 2011/65/EU + 2015/863/EU (RoHS) • 2014/35/EU (LVD)
Standards	• Electromagnetic compatibility (EMC) - Immunity EN61000-6-2 • Electromagnetic compatibility (EMC) - Emission EN61000-6-3 • EN60950-1 • ETSI EN 300 220-1 • ETSI EN 300 220-2 • EN62479 • UL standard compliance: 60950-1 • Electrical safety for Mexico: NOM-019-SCFI-1998	
Approvals	UWPAM1US1L1X and UWPAM1US1L2X	CE c UL us LoRaWAN CERTIFIED
	UWPAM1US1L2X only	FC NOM NYCE
Certifications	LoRaWAN Certified CM	

UWPM

Master concentrator gateway



Main features

- Wireless solution with no SIM card (ISM band)
- Data concentrator for up to 50 UWPA endpoints
- Long communication range (up to 10 km in open air)
- Fast commissioning
- Robust and secure communication
- Compatible with Carlo Gavazzi UWP 3.0 platform
- High-performance antenna

Description

UWPM is a master concentrator that permits UWP 3.0 to gather data from multiple UWPA. This allows setting-up and operating a secure and robust wireless data network in the ISM band.

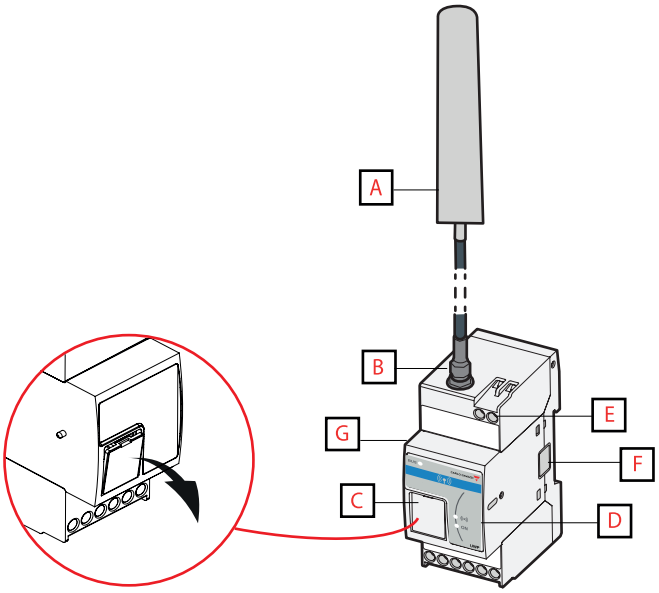
Applications

Energy efficiency monitoring and energy cost allocation, sub-metering in large buildings, big facilities, farms and city areas are the best use cases for LoRa®-based Carlo Gavazzi systems. Thanks to LoRa® long communication range, security and robustness, wireless networks can be easily set-up, without any expenses due to the use of SIM cards or repeaters.

Main functions

- Plug'n play commissioning of a wireless monitoring system based on UWP 3.0 (in combination with UWPA)
- Full ownership of data with no need to rely on any wireless/cloud operator (in combination with UWPA)

Structure



Area	Description
A	High-performance antenna
B	Antenna connector
C	USB port
D	LEDs: Green: Power supply Yellow: HSBus Blue: LoRa®
E	Power supply connection block
F	Right-side female HSBus connector for additional modules
G	Left-side male HSBus connector for UWP 3.0

Special functions

- Fully integrated with UWP 3.0 platform
- Data gathered by UWPM can be logged, displayed, transmitted to other systems thanks to UWP 3.0 powerful capabilities

LED indication

Colour	Status LED	Description
Green	ON	Power supply OK
	OFF	No Power supply
	Fast Blinking	Hardware failure
Yellow	ON	HSBus communication in progress without errors
	OFF	HSBus communication error
	Fast blinking	
Blue	Slow blinking	Receiving message
	Fast blinking	The message is not valid or has been sent by a UWPA not included into the configuration

Features

General

Material	Noryl, self-extinguishing V-0 (UL 94)
Protection degree	Front: IP50 Terminals: IP20
Terminals	Cable Section: 1.5 mm^2 Torque: from 0.4 to 0.8 Nm
Mounting	DIN rail
Dimensions	2-DIN module
Weight (packaging included)	520 g
Antenna cable length	2 m
Antenna dimensions	See picture 2

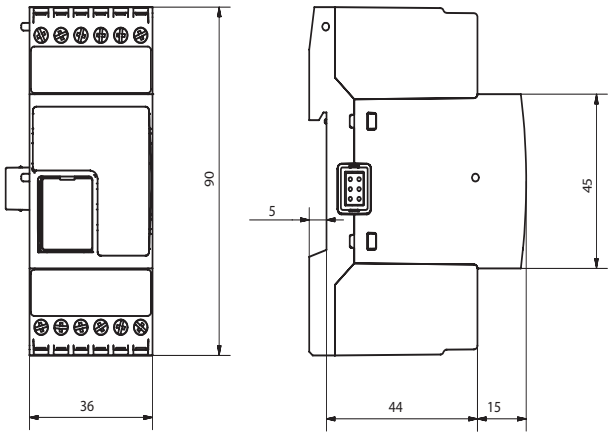


Fig. 3 *UWPM dimensions*

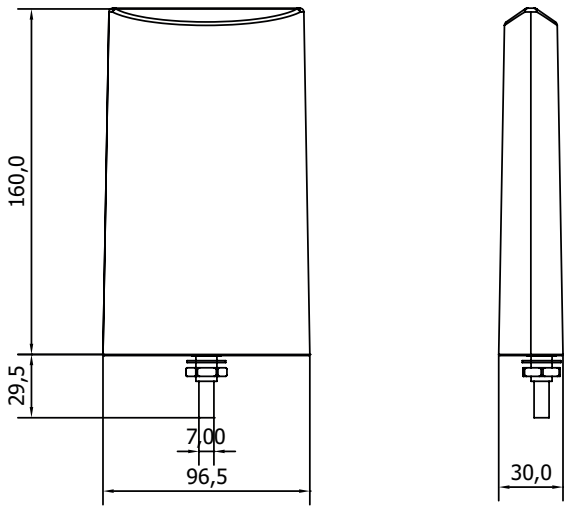


Fig. 4 *High-performance antenna dimensions*

Power supply

Power supply	24 V dc +/-20% 115-240 V ac 50/60 Hz +/-10%
Consumption	DC: 1.3 W max. AC: 5.5 VA max.
Connector	Screw terminals

Environmental specifications

Operating temperature	-25° to +55°
Storage temperature	-30° to +70°

NOTE: R.H. < 90% non-condensing

Communication

Long-range wireless

Protocol	LoRa® (private UWP network, in combination with UWPA)
Configuration parameters	Managed UWPA devices and variables by means of UCS file import
Frequency	EU 868 MHz ISM band US 915 MHz ISM band
Encryption	Embedded end-to-end AES128 encryption
Antenna	Included high performance antenna (SMA connector, cable length 2m)
Diagnostics	Signal strength UWPA status
UWPA number	Maximum: 50 UWPA per UWPM. The number may change according to the transmission interval and the interferences.

HSBus

Bus type	RS485 high speed bus
Protocol	Internal proprietary protocol
Number of slaves	Max. 3 per UWP 3.0
Connection type	By local bus (left and right connectors) or terminals GND, A(-), B(+) T1, T2: terminalization inputs

UWPA per UWPM and transmission parameters

1 package (max. 8 variables*)

		UCS parameters	
Transmission interval	**Maximum number of UWPA per UWPM**	**Spreading factor**	**Retry**
5 min	**10**	**SF11**	**1**
10 min	**10**	**SF12**	**1**
	50	**SF11**	**2**
15 min	**50**	**SF12**	**2**

2 packages (max. 16 variables*)

		UCS parameters	
Transmission interval	**Maximum number of UWPA per UWPM**	**Spreading factor**	**Retry**
10	**10**	**SF11**	**1**
15	**10**	**SF12**	**1**
30 min	**10**	**SF12**	**1**
	50	**SF11**	**2**

		UCS parameters	
Transmission interval	Maximum number of UWPA per UWPM	Spreading factor	Retry
1 h	50	SF12	2

3 packages (max. 24 variables*)

		UCS parameters	
Transmission interval	Maximum number of UWPA per UWPM	Spreading factor	Retry
15 min	10	SF11	1
30 min	10	SF12	1
1 h	50	SF12	2

**The maximum number of variables for each package depends on their format. The indicated value refers to the real time variables (such as voltage, current, power); with hour counter variables (such as energy) that value has to be halved.*

Note: The SF11 spreading factor, unlike the SF12, reduces the distance and the resilience to interferences of the signal. This reduction is more evident with spreading factors inferior to SF11.

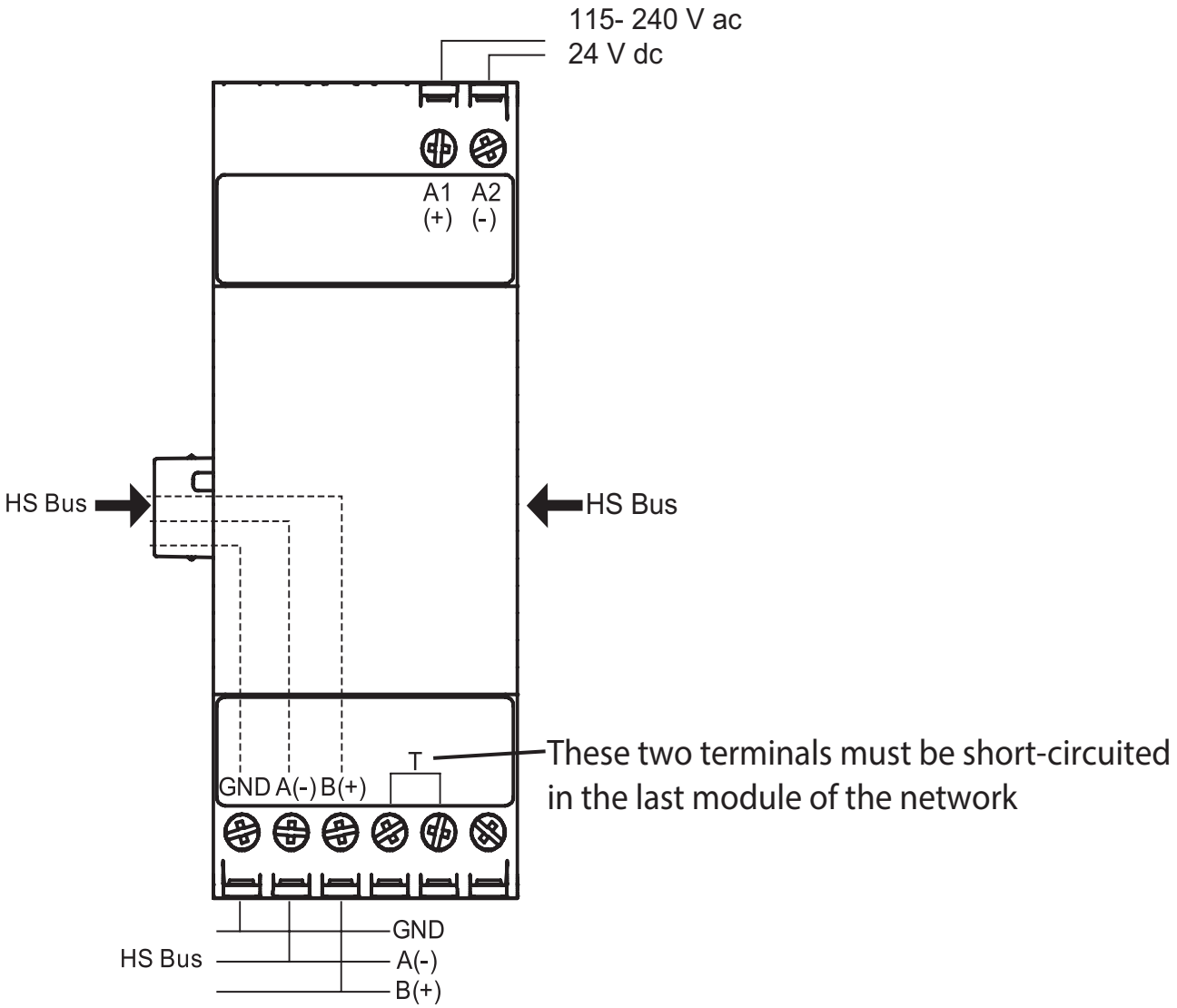
Frequencies (Europe model UWPMM1UL1X)

Name	Type	Channel (MHz)	Bandwidth (MHz)	Band	Band duty cycle (%)
FA	Base	868.100	125	M-B1	1
FB	Base	868.300	125	M-B1	1
FC	Base	868.500	125	M-B1	1
F1	Custom	869.900	125	R-B4	1
F2	Custom	867.100	125	L-B0	1
F3	Custom	867.300	125	L-B0	1
F4	Custom	867.500	125	L-B0	1

Frequencies (US model UWPMM1UL2X)

Name	Type	Channel (MHz)	Bandwidth (MHz)
F64	Standard	903.000	500
F65	Standard	904.600	500
F66	Standard	906.200	500
F67	Standard	907.800	500
F68	Standard	909.400	500
F69	Standard	911.000	500
F70	Standard	912.600	500

Connection Diagrams



References

Further reading

Document	Where to find it
Guidelines	
Instruction manual	

CARLO GAVAZZI compatible components

Purpose	Component name/code key	Notes
Universal web platform	UWP 3.0	See relevant datasheet
Europe wireless endpoint gateway	UWPA	See relevant datasheet

Conformity

Directives	For UWPMM1UL1X	• 2014/53/EU (RED) • 2011/65/EU + 2015/863/EU (RoHS)
	For UWPMM1UL2X	• FCC Rules Part 15 • ISED compliance statements: ICES-003 / NMB 003 • Radio compliance for Mexico: NOM-208-SCFI-2016 • 2011/65/EU + 2015/863/EU (RoHS) • 2014/35/EU (LVD)
Standards	• Electromagnetic compatibility (EMC) - Immunity EN61000-6-2 • Electromagnetic compatibility (EMC) - Emission EN61000-6-3 • EN60950-1 • ETSI EN 300 220-1 • ETSI EN 300 220-2 • EN62479 • UL standard compliance: 60950-1 • Electrical safety for Mexico: NOM-019-SCFI-1998	
Approvals	UWPMM1UL1X and UWPMM1UL2X	CE c UL us
	UWPMM1UL2X only	FC NOM NYCE

How to order

UWPA

Code	Description
UWPAM1US1L1X	Europe wireless endpoint gateway
UWPAM1US1L2X	USA wireless endpoint gateway

UWPM

Code	Description
UWPMM1UL1X	Europe master concentrator gateway
UWPMM1UL2X	USA master concentrator gateway

По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

Россия (495)268-04-70
Киргизия (996)312-96-26-47
Казахстан (7172)727-132

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