



redz-sc.com

hi@redz-sc.com

# STG Series WMBus (Wireless MBus) Modbus TCP/RTU Gateway with MQTT Publisher

with 2 × 10/100Base-T(x) Ports,  
1 × RS232 and 1 × RS485 Serial Ports  
and option for BPL (Broadband Power Line Link)



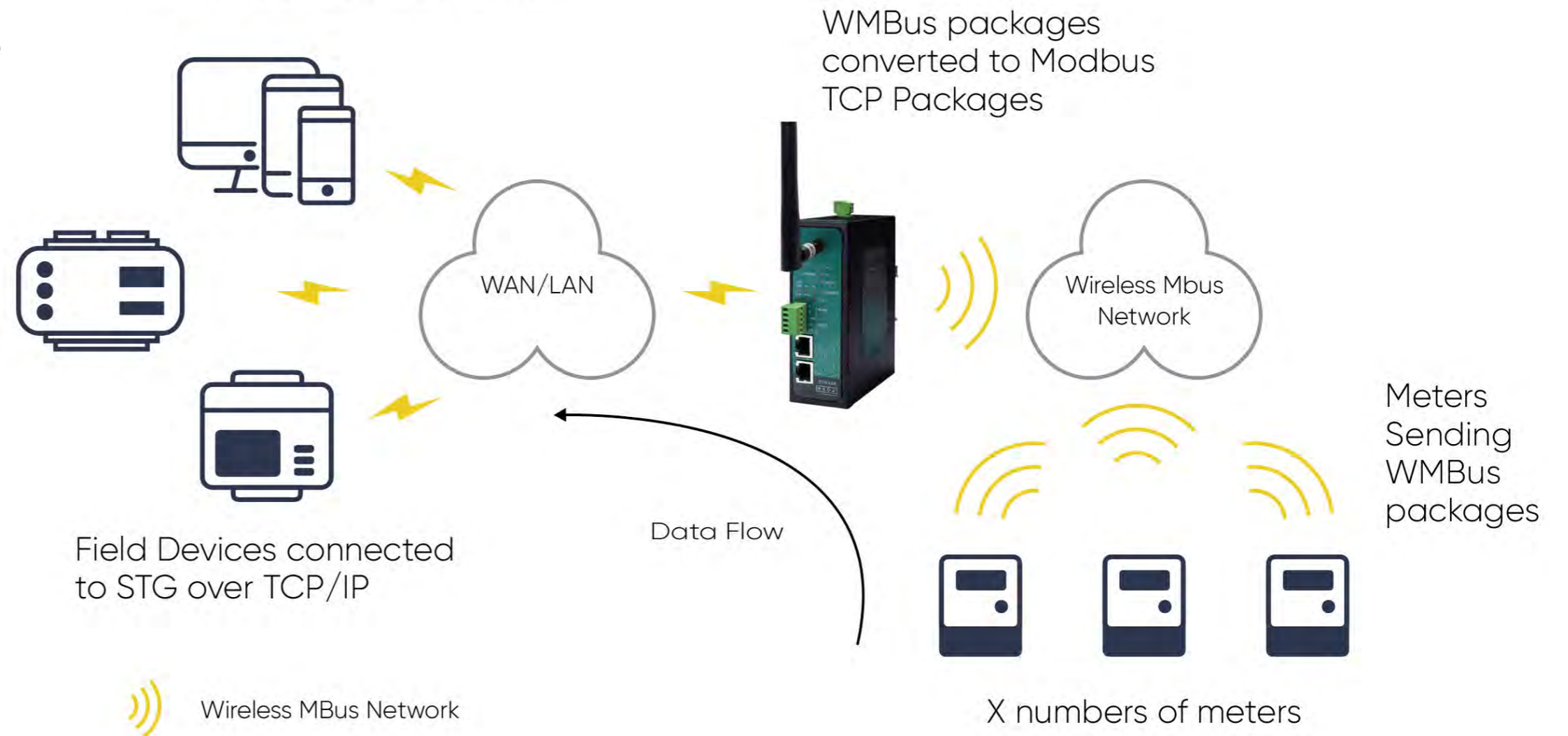
STG Series Wireless MBus (WMBus) Gateways with MQTT Publisher are designed for industrial grade Radio Frequency (RF) communication. STG Series WMBus Gateways are tailored to perform various features such as wide temperature range, wide power input range and several connectivity ports. Thus, STG Series WMBus Gateways are the best choice for smart metering, power utility, telecommunication and all other applications that require industrial Wireless MBus Radio Frequency connectivity.

STG Series which have REDZ Broadband Power Line (BPL) link allows devices to communicate with full transparent TCP/IP standard over Low Voltage power lines and allows easy connection between TCP/IP based terminals without use of extra cables.

STG Series WMBus Gateways can listen WMBus RF network and connect Serial and/or ETH based devices with Wireless MBus devices. All communication can be done over Radio Frequency network based on WMBus standard.

### STG Configuration

- Server Mode
- Device Function: WMBus - Modbus TCP Gateway
- Wmbus Device Mode Other



STG Series WMBus Gateways are all in one devices and can operate in 3 main modes:

- Transparent Mode,
- WMBus OMS Converter to Modbus TCP packages (in this mode meter data can also be sent to MQTT Server in several formats),
- MBus OMS Converter to Modbus RTU packages.

Typical applications: Automated Meter reading, Home – Building – Industrial Automation, Wireless Sensors, Telemetry...



# Main Features

- Supports 2 x 10/100Base-T(X) ports
- Supports Full/Half-Duplex, auto MDI/MDI-X on each port
- DHCP Server Capability
- Supports 1 x RS232 and 1 x RS485 Serial Connection up to 460800 Baud
- Embedded web interface for ease of use
- 868MHz Wireless MBus (WMBus) Radio Frequency (RF) Communication
- **3 Main Device Functions:**
  - WMBus OMS to Modbus TCP Converter (and/or send Meter Data to MQTT Server)
  - WMBus OMS to Modbus RTU Converter
  - Transparent Mode (Sends/Receive WMBus Packages to/from TCP/IP or Serial Side)
- Up to 20 Modbus device connection in Modbus TCP or RTU Conversion Modes
- MQTT Publisher with different data transfer options
  - Raw WMBus Decrypted Frame
  - Parsed WMBus Frame As Objects
  - Parsed WMBus Frame As Modbus Frame
- WMBus link mode Configurable (S - Mode, T - Mode, C - Mode, C/T - Mode together)
- AES Decryption of Received Frames for up to 40 Devices (Mode 5, Mode 7, Mode 128 and custom modes)
- Supported CI Values: 53h, 5Bh, 60h, 6Ch, 6Dh, 6Eh, 6Fh, 72h, 74h, 75h, 78h, 7Ah, 7Ch, 7Dh, 80h, 8Ah, 8Bh, 8Ch, 8Dh, 8Eh, 8Fh, C3h, C4h, C5h
- Unlimited Numbers of WMBus device data can be listened over air and WMBus frames can be sent to remote server in Transparent Mode

- WMBus Radio Power Level Configurable (-1 dBm to 13 dBm) when sending WMBus frames in Transparent Mode
- AES Encryption of Transmitted frames is available in Transparent Mode
- WMBus device mode Configurable (Meter - send frames or Other Device - listen frames)
- Easy to follow WMBus data packages on web interface
- Easy monitor of parsed WMBus OMS Parsed data on web interface
- Easy to follow Device Status on web interface
- Black List and White List based WMBus package filter
- Firmware Upgrade over Web
- 2 firmware storage capability on same device (1 active only)
- AC or DC wide range power options
- Wide operating temperature range from -25 to 70 °C AC and -40 to 85 °C DC power input versions
- Rugged Metal IP-40 housing design
- DIN-Rail mounting

## Extra Features for Models with BPL ( Broadband Powerline)

- Supports 2 x 10/100Base-T(X) ports + 1 x BPL link
- Wide range 3 phase AC input
- Supports up to 30Mbps PHY rate on BPL with Up to 10 hops and 1000 nodes
- Up to 432 sub-carriers from 2 to 28MHz analog bandwidth
- Support LDPC-C FEC with 128-bit AES core
- Plug and play with Master/Slave selection via web interface

# Technical Specifications

## Connectors and Ports

SMA Antenna Connector	1 Standard SMA Female Interface for WMBus, 50 ohm
Console Port	Micro USB or USB Type-C connection for LOG in 115200 baud
10/100T(X) RJ45 Ports	Ethernet Connection on 2 ports
Serial Ports	5 pin wired Terminal Connection Tx, Rx, GND for RS232 A and B for RS485
Reset Buttons	Reset to Client and Reset to Server Operating modes buttons



## WMBus Technology

WMBus Module	868MHz Wireless MBus (WMBus) Radio Frequency (RF) Communication
Output Power Level	Power Level Configurable (-1 dBm to 13 dBm)
Link Budget	Up to 130 dB
Communication Distance	Up to 3km (line of sight)
Typical Communication Distance Indoor/Urban	~100m
Link Modes	Configurable (S - Mode, T - Mode, C - Mode, C/T - Mode together)
Supported CI Values	53h, 5Bh, 60h, 6Ch, 6Dh, 6Eh, 6Fh, 72h, 74h, 75h, 78h, 7Ah, 7Ch, 7Dh, 80h, 8Ah, 8Bh, 8Ch, 8Dh, 8Eh, 8Fh, C3h, C4h, C5h for standart models
Decryption	AES Decryption of Received Frames for up to 40 Devices (Mode 5, Mode 7, Mode 128 and custom modes) in standart models  There is also version with up to 16 device decryption and supports only Mode 5
Device Mode	Configurable Meter - send frames or Other Device - listen frames
Transparent Mode	Unlimited Numbers of WMBus device data can be listened over air and WMBus frames can be sent to remote server in Transparent Mode

# Modbus Characteristics

Modbus Protocol	Modbus TCP or RTU Configurable
Modbus Devices	Up to 20 Modbus device connection in Modbus TCP or RTU Conversion Modes (This is value of Modbus Master Devices)
Modbus Address	Modbus address freely can be assigned up to 40 WMBus Devices in standart models  There is also version with up to 20 WMBus devices data parsing and modbus mapping
Modbus Data	Data can be read via Function Code 3 Read Holding Registers (4x)
Data Structure	Modbus data is stored in three parts: Status Block, several Data Blocks depends on number measurements stored in WMBus device and finally the Service Block.  Status Block, 6 Registers: - WMBus Device ID: 2 Registers - WMBus Man ID: 1 Register - WMBus Version: 1 Register - WMBus Type: 1 Register - Total Data Count: 1 Register (Represents how many data blocks exists)

Data Block, each 5 Bytes total n bytes:

- Storage Number: 1 Register
- Function Field: 1 Register
- Data Type: 1 Register
- Data Value: 2 Registers

Service Block, 2 Registers:

- Access Number: 1 Register
- RSSI Value: 1 Register

## MQTT Details

MQTT Publisher can be enabled and can be used in parallel with  
Modbus conversion (or stand alone)

MQTT Connection	Broker IP and Port can be entered Client ID , User name and Password can be set  Publish Topic and Subscribe Topic can be defined from web interface
Data Send Interval	User can send Data send interval in seconds Default is 60 seconds and STG will send meter data to MQTT server in that interval
NTP Server	NTP server time will be added to each MQTT message
Data Format	There are 3 predefined formats RAW WMBUS DECRYPTED DATA: STG will share WMBus frame as it is but decrypted PARSED DATA AS OBJECTS: STG will share WMBus data as parsed objects PARSED DATA AS MODBUS FRAME: STG will share WMBus data as Modbus like frame

## Ethernet Switch Technology

Ethernet Standards	IEEE 802.3 for 10Base-T IEEE 802.3u for 100Base-T(X) IEEE 802.3x Flow Control
Mac Table	1K MAC address entry
Processing	Store-and-Forward
Memory	448K bits packet buffer memory

## BPL (Broadband Powerline) Technology for BPL Models

PHY Data Rate	Up to 240 MHz
MAC Layer Protocol	CSMA/CA
Modulation Technology	OFDM-432
VLAN	IEEE802.1q/ IEEE802.1p/ IEEE802.3d

## Led Indicators

Power indicator	Power LED
10/100T(X) Indicators	Activity LEDs: ETH1, ETH2 and STG (Activity of device itself)
WMBus Indicators	Alive (Blinks during normal operation), Tx and Rx of data LEDs
System Indicators	Status LED, Tx and Rx of data LEDs and Server LED (LED ON: Server Operating Mode, LED OFF: Client Operating Mode)
Console Indicators	Tx and Rx of data LEDs

## Power - DC Models

Input Range	5-48V DC wide range Power Input (Allows up to 60 V DC)
Reverse Polarity Protection	Available
Thermal Shutdown and Current Limit Protection	Available

## Power - AC Models

Input Range	100 - 240V AC (120 - 370V DC), 50Hz to 60Hz AC input
Isolation	Fully Isolated >4200Vrms, 5mA 1 Min
Insulation	Class II



## Physical & Environmental Characteristics DC Models

Enclosure	Metal, IP 40
Dimensions	43 x 95 x 124 (w x d x h) mm
Weight	~ 380 gr
Storage Temperature	- 65 to 150 °C
Operating Temperature	- 40 to 85 °C
Operating Humidity	5% to 95% Non-condensing

## Physical And Environmental Characteristics AC Models

Enclosure	Metal, IP 40
Dimensions	43 x 95 x 124 (w x d x h) mm
Weight	~400gr
Storage Temperature	-40 to 85 °C
Operating Temperature	-30 to 70 °C
Operating Humidity	10% to 95% Non-condensing

## Physical And Environmental Characteristics BPL Models

Enclosure	Metal, IP 40
Dimensions	43 x 95 x 124 (w x d x h) mm
Weight	~400gr
Storage Temperature	-65 to 150 °C
Operating Temperature	-40 to 85 °C
Operating Humidity	5% to 95% Non-condensing



# Ordering Information

**STG154:** 868MHz WMBus – Modbus TCP/RTU Gateway with MQTT Publisher, 2x 10/100 T(x) ETH ports, 1 x RS232 & 1 x RS485, 5-48V ( max. 60V) DC Power Input

**STG254:** 868MHz WMBus – Modbus TCP/RTU Gateway with MQTT Publisher, 2x 10/100 T(x) ETH ports, 1 x RS232 & 1 x RS485, 100 - 240V AC (120 - 370V DC), 50Hz to 60Hz AC Power Input

**STG655:** 868MHz WMBus – Modbus TCP/RTU Gateway with MQTT Publisher, 2x 10/100 T(x) ETH ports + 1 x BPL (Broadband Power Line) Link, 1 x RS232 & 1 x RS485, 3 Phase AC Power Input, 110V-240V/50-60Hz

**STG154 - D16:** 868MHz WMBus – Modbus TCP/RTU Gateway with MQTT Publisher, 2x 10/100 T(x) ETH ports, 1 x RS232 & 1 x RS485, 5-48V ( max. 60V) DC Power Input

**STG254 - D16:** 868MHz WMBus – Modbus TCP/RTU Gateway with MQTT Publisher, 2x 10/100 T(x) ETH ports, 1 x RS232 & 1 x RS485, 100 - 240V AC (120 - 370V DC), 50Hz to 60Hz AC Power Input

**STG655 - D16:** 868MHz WMBus – Modbus TCP/RTU Gateway with MQTT Publisher, 2x 10/100 T(x) ETH ports + 1 x BPL (Broadband Power Line) Link, 1 x RS232 & 1 x RS485, 3 Phase AC Power Input, 110V-240V/50-60Hz

## Product Comparison

Model	Up to 40 WMBus Device Data Parse	Up to 20 WMBus Device Data Parse	5-48V (max. 60V) DC Power Input	100 - 240V AC (120 – 370V DC), 50Hz to 60Hz AC Power Input	3 Phase AC Power input, 110V240V/ 50-60Hz AC Power Input	2 x 10/100 T(x) ETH ports	1 x RS232 and 1 x RS485 Serial Ports	BPL (Broadband Power Line) Link
STG154	●		●			●	●	
STG254	●			●		●	●	
STG655	●				●	●	●	●
STG154 - D16		●	●			●	●	
STG254 - D16		●		●		●	●	
STG655 - D16		●			●	●	●	●