

WIRELESS GATEWAY IOT DUOS

REF.: PA160410220 / PA160411920



Wireless Gateway IoT DUOS is an easy-to-use solution specially designed to create a network of physical data monitoring, such as: temperature and relative humidity.

This device is compatible with all Wireless System DUOS, supporting up to 55 DUOS transmitters, real time transmission of physical data, as well as RF signal strength and battery level.

It could be connected through Serial and TCP/IP Modbus protocols to any PLC, Temperature controller, SCADA, HMI or to a PC using our Software Tekon Datalogger/ Configuration Software.

Dimensions: 142 x 73 x 34.5 mm

Weight: 100 g

Material: ABS UL94HB/Silicone

Protection Index: IP40

KEY FEATURES

SCALABLE NETWORK

SCALABLE UP TO 55 DUOS TRANSMITTERS

MULTIPLE NETWORKS SIMULTANEOUSLY

UP TO 12 REPEATERS IN SERIES

ETHERNET TCP/IP MODBUS COMMUNICATION

AUTOMATIC MESH NETWORK MANAGEMENT

AES KEY DATA ENCRYPTION 128 BITS

SERIAL AND TCP/IP MODBUS COMMUNICATIONS

INTEGRATION WITH TEKON IOT PLATFORM

CONNECTION TO MICROSOFT AZURE
AND IBM BLUEMIX IOT PLATFORMS
REST API FOR SYSTEM INTEGRATION

EASY TO CONFIGURE

TEKON CONFIGURATOR SOFTWARE

DS_DUOS_GATEWAY_IOT_E01B

TECHNICAL SPECIFICATIONS

RADIO SPECIFICATIONS	868MHZ	915MHZ
Range ¹	Up to 4 Km LoS, 27 dBm (500mW)	Up to 4 Km LoS, 27 dBm (500mW)
Minimum communication distance	3 m @ 27 dBm (500mW)	3 m @ 27 dBm (500mW)
Radio transmit power ²	0 to 27 dBm	8 to 27 dBm
Radio receiver sensitivity ²	-97 to -110 dBm	-97 to -110 dBm
Frequency band ²	868 to 869 MHz	902 to 928 MHz
Radio channels	16	50
Radio transmission rate ²	1,2 to 76,8 kbit/s	
Modulation	GFSK	
Encryption method	AES 128 (Advanced Encryption Standard)	

WIRELESS NETWORK

Maximum devices	55
Maximum hops	13

ANTENNA	868MHZ	915MHZ
Range	$\frac{1}{4} \lambda$ dipole with SMA connector, 50 Ohms and +3 dBi gain	$\frac{1}{4} \lambda$ dipole with SMA connector, 50 Ohms and +3 dBi gain

SUPPLY VOLTAGE

External power supply with 12 VDC \pm 5%
Maximum current draw of 250 mA ²

INTERFACE

1 blue LED for general operation status
1 red LED signaling radio data transmission
1 green LED signaling radio data reception
1 M8 female socket with 5 poles for power supply and device configuration through host computer
1 Ethernet (RJ45) communication port
1 WiFi Access Point
1 switch for operation mode selection

SERIAL COMMUNICATION (RS-485)

Protocol	Modbus RTU (Slave)
Interface	2-wire RS-485
Baud rates	4,8k to 115,2k
Data format	8 data bits, no parity/even/odd, 1/2 stop bit
Available modbus addresses	1 to 247

¹Range depends on the RF propagation environment and Line of Sight (LoS). Always verify your wireless network's range by performing a Site Survey.

²Dependent on radio channel selection.

ETHERNET COMMUNICATION PORT

Interface	Ethernet (RJ45) port
Speed	100Mbps
IP address	Dynamic IP (provided by network DHCP server)
Protocol	Modbus TCP/IP (Server/Slave)

IOT CONNECTIVITY

Integration with Tekon IoT Platform
Integration with Azure IoT
Integration with IBM Blue Mix
REST API

CASING

Dimensions	142 x 73 x 34,5 mm
Weight	100 g
Material	ABS UL94HB/Silicone
Protection index	IP40

OPERATING ENVIRONMENT

-10 °C to +60 °C
95% maximum relative humidity (non-condensing)

FACTORY DEFAULT SETTINGS	868MHZ	915MHZ
Frequency	869,525 MHz	904,000 MHz
Radio Transmit Power	27 dBm	27 dBm
Radio Transmission Rate	76,8 kbit/s	
Wireless Channel	13	4
Wireless Network ID	Device serial number	
Wireless Device ID	101	
Configuration time window at startup	10 seconds	
Serial Communication	RS-485 / Modbus	
Modbus Address	1	
Baud rate	19200	
Baud rate (config mode)	19200	
Parity	none	

WIFI ACCESS POINT

IP	192.168.128.1
Login	admin
Password	admin

CERTIFICATIONS AND APPROVALS

EN 61326 Electrical equipment for measurement, control and laboratory use. EMC requirements.

EN 300 228 - Electromagnetic compatibility and Radio Spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive.

EN 300 440 - Electromagnetic compatibility and Radio Spectrum Matters (ERM); Short Range Devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive.

IEC 61000-4-2 Radiated, Radio-Frequency, Electromagnetic Field Immunity Test

IEC 61000-4-3 Electrical fast transient/burst immunity Test

IEC 61000-4-4 Surge Immunity Test

IEC 61000-4-5 Electrostatic discharge immunity test

MODBUS REGISTER CONFIGURATION

The following table presents the MODBUS register configuration and the presented values can be changed in accordance with the transmitter model in use.

	DESCRIPTION	ADDRESS	NUMBER OF WORDS	DATA TYPE	DATA
TRANSMITTER 0	Transmitter model	0	1	UINT16	868MHz: 03 - DUOS Temp 11 - DUOS Hygrotemp 12 - DUOS DI+Temp 13 - DUOS CO ₂ 915MHz: 29 - DUOS Temp 30 - DUOS Hygrotemp 31 - DUOS DI+Temp 32 - DUOS CO ₂
	Probe sensor model	1	1	UINT16	01 - TK9808 02 - TK07 03 - TK939 04 - TK871 255 - UNKNOWN
	RSSI	2	1	UINT16	RSSI RSSI in dBm = RSSI/-2
	Communication period	3	1	UINT16	Transmitter' communication period in seconds
	Elapsed time	4	1	UINT16	Transmitter' time without communicating (in seconds)
	Power supply voltage	5	1	UINT16	Power supply voltage Volts = Power supply voltage/10
	FW version Major Minor	6	1	UINT8 UINT8	Firmware version Major Minor
	FW Version Revision	7	1	UINT16	Firmware version Revision (LSB)
	HW Version Major Minor	8	1	UINT8 UINT8	MAJOR MINOR
	Data 0	9	2	DOUBLE 32	Internal temperature [°C] ● ▲ ■ ○
	Data 1	11	2	DOUBLE 32	External temperature [°C] ● ▲ ■ CO ₂ [ppm] ○
	Data 2	13	2	DOUBLE 32	Relative humidity [%] ▲ Digital Input State ■ Average CO ₂ [ppm] ○
	Data 3	15	2	DOUBLE 32	For future use
	Data 4	17	2	DOUBLE 32	For future use
	Data 5	19	2	DOUBLE 32	For future use

● DUOS Temp ▲ DUOS Hygrotemp ■ DUOS DI+Temp ○ DUOS CO₂

MODBUS ADDRESSING CONVENTION

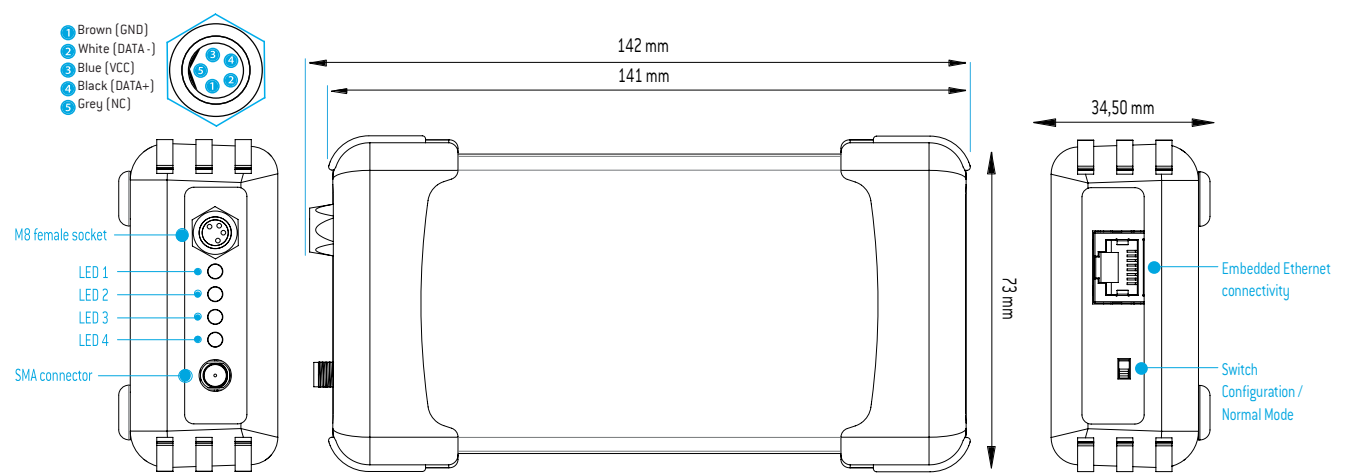
MEASUREMENTS	FORMULA
Transmitter model	{Transmitter Device ID - 1} x 21
Probe sensor model	{Transmitter Device ID - 1} x 21+1
RSSI	{Transmitter Device ID - 1} x 21+2
Communication period	{Transmitter Device ID - 1} x 21+3
Elapsed time	{Transmitter Device ID - 1} x 21+4
Supply voltage	{Transmitter Device ID - 1} x 21+5
Firmware Major Minor	{Transmitter Device ID - 1} x 21+6
Firmware Revision	{Transmitter Device ID - 1} x 21+7
Hardware version Major Minor	{Transmitter Device ID - 1} x 21+8
Data 0	{Transmitter Device ID - 1} x 21+9

Data 1	(Transmitter Device ID - 1) x 21+ 11
Data 2	(Transmitter Device ID - 1) x 21+ 13
Data 3	(Transmitter Device ID - 1) x 21+ 15
Data 4	(Transmitter Device ID - 1) x 21+ 17
Data 5	(Transmitter Device ID - 1) x 21+ 19

³Transmitter Device ID [1-55]

TECHNICAL DRAWINGS

DIMENSIONAL DRAWINGS, INTERFACE DESIGNPOWER SUPPLY AND COMMUNICATIONS CONNECTOR



COMPLEMENTARY PRODUCTS

DUOS TEMP WIRELESS TRANSMITTER

REF.: PA160410410 / PA160411810



- Dual temperature probe: internal and external;
- Up to 4Km (868MHz) / 2Km (2.4GHz) communication distance (LoS) with 128-bit AES encryption;
- Multi-hop mesh network with self-forming, self-healing and self-optimizing features;
- Battery voltage and wireless link quality (RSSI) monitoring;
- Low power and long battery life;
- Extreme operating temperature range -40°C (868MHz) / -20°C (2.4GHz) to 80°C and IP67 protection;
- Simple and intuitive USB configuration via Tekon Configurator (free software).

* external probe not included

DUOS HYGROTEMP WIRELESS TRANSMITTER

REF.: PA164520110 / PA164520510



- Dual probe: external temperature and humidity + internal temperature;
- Up to 4Km (868MHz) / 2Km (2.4GHz) communication distance (LoS) with 128-bit AES encryption;
- Multi-hop mesh network with self-forming, self-healing and self-optimizing features;
- Battery voltage and wireless link quality (RSSI) monitoring;
- Low power and long battery life;
- Extreme operating temperature range -40°C (868MHz) / -20°C (2.4GHz) to 80°C and IP67 protection;
- Simple and intuitive USB configuration via Tekon Configurator (free software).

* external probe not included

DUOS DI+TEMP WIRELESS TRANSMITTER

REF.: PA160411210 / PA160412510



- Dual temperature probe: internal and external;
- External digital input for event detection;
- Up to 4Km (868MHz) / 2Km (2.4GHz) communication distance (LoS) with 128-bit AES encryption;
- Multi-hop mesh network with self-forming, self-healing and self-optimizing features;
- Battery voltage and wireless link quality (RSSI) monitoring;
- Low power and long battery life;
- Extreme operating temperature range -40°C (868MHz) / -20°C (2.4GHz) to 80°C and IP67 protection;
- Simple and intuitive USB configuration via Tekon Configurator (free software).

* external probe not included

DUOS CO2 WIRELESS TRANSMITTER

REF.: PA160411110 / PA160412410



- Dual probe: external CO2 and internal temperature;
- Up to 4Km (868MHz) / 2Km (2.4GHz) communication distance (LoS) with 128-bit AES encryption;
- Multi-hop mesh network with self-forming, self-healing and self-optimizing features;
- Battery voltage and wireless link quality (RSSI) monitoring;
- Low power and long battery life;
- Extreme operating temperature range -40°C to 60°C and IP67 protection;
- Simple and intuitive USB configuration via Tekon Configurator (free software)

* external probe not included

DUOS WIRELESS REPEATER

REF.: PA160410310 / PA160412010



- Up to 12 repeaters in series for extra-long range;
- Extra repeaters for network redundancy and robustness;
- Up to 4Km (868MHz) / 2Km (2.4GHz) communication distance (LoS) with 128-bit AES encryption;
- Multi-hop mesh network with self-forming, self-healing and self-optimizing features;
- Simple and intuitive USB configuration via Tekon Configurator (free software).

ACCESSORIES



DUOS RS485-USB CONVERTER CABLE
REF.: PA160410004
USB power and communication cable to be used with the Wireless Gateway and Repeater DUOS.



DUOS GATEWAY EXTERNAL CABLE
REF.: PA160410007
Cable for external power and communication with the Wireless Gateway DUOS.

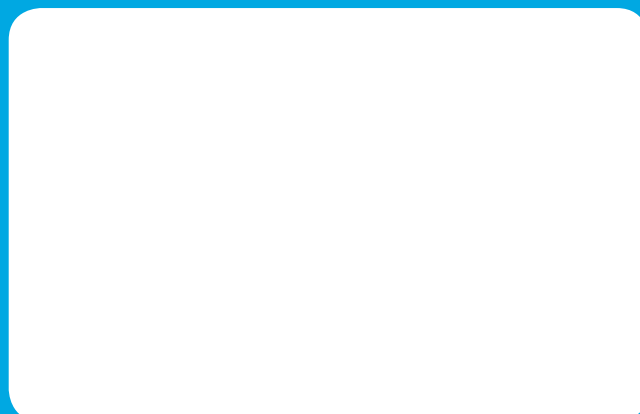
REVISION HISTORY

VERSION	
E01B	Addition of 915MHz frequency information in "Radio Specifications", "Antenna", "Factory Default Settings" and "Modbus Register Configuration" tables; Revision of "Peak current" topic in "Power Supply" table; Reform of "Voltage Threshold" table; Identification of led number in "Interface" table; Reform of "Certifications and approvals" table; Led layout in "Technical Drawings";

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