WIRELESS SENSORS TECHNOLOGY

WIRELESS GATEWAY IOT DUOS

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.

	Product References	
	Black	White
868MHz	PA160410220	PA160410240
915MHz	PA160410260	PA160410280

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
REST API FOR SYSTEM INTEGRATION

EASY TO CONFIGURE
TEKON CONFIGURATOR SOFTWARE

DS_DUOS_GATEWAT_IOT_E01F

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TECHNICAL SPECIFICATIONS

RADIO SPECIFICATIONS	868MHZ	915MHZ
Range[1]	Up to 4 Km LoS	
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	
Frequency band[2]	868 to 869 MHz	902 to 928 MHz [3]
Radio channels	16	50 [4]
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	¼ λ dipole with SMA connector, 50 Ohms and +3 dBi gain	

SUPPLY VOLTAGE
External power supply with 12 VDC ± 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

ETHERNET COMMUNICATION PORT	
Interface	Ethernet (RJ45) port
Speed	100Mbps
IP address	Dynamic (provided by network DHCP server) or Static (default) IP

Protocol	Modbus TCP/IP (Server/Slave)
Modbus TCP/IP port	1502
Proxy	Configurable

IOT CONNECTIVITY
Integration with Tekon IoT Platform
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	915,000 MHz
Radio Transmit Power	27 dBm	
Radio Transmission Rate	76,8 kbit/s	
Wireless Channel	13	26
Wireless Network ID	Device serial number	
Wireless Device ID	Serial number	
Configuration time window at startup	10 seconds	
Serial Communication	RS-485 / Modbus	
Modbus Address	1	
Baudrate|Bits|Parity|Stop Bits	115200 | 8 | None | 2	
Baudrate(config)|Bits|Parity|Stop bits	19200 | 8 | None | 2	
Parity	none	
Fixed Ethernet IP	192.168.100.1	
Proxy	none	
NTP server	pt.pool.ntp.org	

WIFI ACCESS POINT	
IP	192.168.128.1
Login	admin
Password	admin
SSID	WGW4IOT_<serialNumber>
DHCP	Enabled

CERTIFICATIONS AND APPROVALS
EN 61326 -1 -Class B - Industrial Requirements
EN 300 220-2 V3.1.1
EN 301 489-1 V2.2.0
EN 301 489-3 V2.1.1

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 **868MHz** [6]: 59 - DUOS inHygrotemp | 60 - DUOS inCO_2 | 61 - DUOS inAir | 62 - DUOS inTemp | 67 - DUOS uTemp **915MHz**: 29 - DUOS Temp | 30 - DUOS Hygrotemp | 31 - DUOS DI+Temp | 32 - DUOS CO_2 **915MHz** [6]: 63 - DUOS inHygrotemp | 64 - DUOS inCO_2 | 65 - DUOS inAir | 66 - DUOS inTemp | 68 - DUOS uTemp
	Probe sensor model	1	1	UINT16	01 - TK9808 | 02 - TK07 | 03 - TK939 | 04 - TK871 | 255 - UNKNOWN [6] 8 - TK280 | 9 - TK895 | 10 - PT100 2W | 11 - PT100 3W | 12 - PT100 4W | 13 - PT500 2W | 14 - PT500 3W | 15 - PT500 4W | 16 - PT1000 2W | 17 - PT1000 3W | 18 - PT1000 4W | 19 - TC J | 20 - TC K | 21 - TC R | 22 - TC S | 23 - TC T | 24 - TC N | 25 - TC C | 26 - Ohm | 27 - mV | 28 - TK8095 | 29 - TK30 | 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	**DUOS Temp, DUOS Hygrotemp, DUOS DI+Temp** - External temperature [°C] **DUOS CO_2, DUOS inCO_2** - CO_2 [ppm] **DUOS uTemp** - External temperature [°C] (if sensor model ID between 10 and 25); Ohm [Ω] (if sensor model ID = 26); mV [mV] (if sensor model ID = 27) **DUOS inHygrotemp, DUOS inAir** - Relative humidity [%] **DUOS inTemp** - Digital Input [0|1|2|3|4|5] Little endian byte swap format
	Data 2	13	2	DOUBLE 32	**DUOS Hygrotemp** - Relative humidity [%] **DUOS DI+Temp, DUOS uTemp, DUOS inHygrotemp** - Digital Input [0|1|2|3|4|5] **DUOS CO_2, DUOS inCO_2** - Average CO_2 [ppm] **DUOS inAir** - CO_2 [ppm] Little endian byte swap format
	Data 3	15	2	DOUBLE 32	**DUOS inCO_2** - Barometric pressure [mbar] **DUOS inAir** - Average CO_2 [ppm]
	Data 4	17	2	DOUBLE 32	**DUOS inCO_2** - Digital Input [0|1|2|3|4|5] **DUOS inAir** - Barometric pressure [mbar]
	Data 5	19	2	DOUBLE 32	**DUOS inAir** - Digital Input [0|1|2|3|4|5]

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

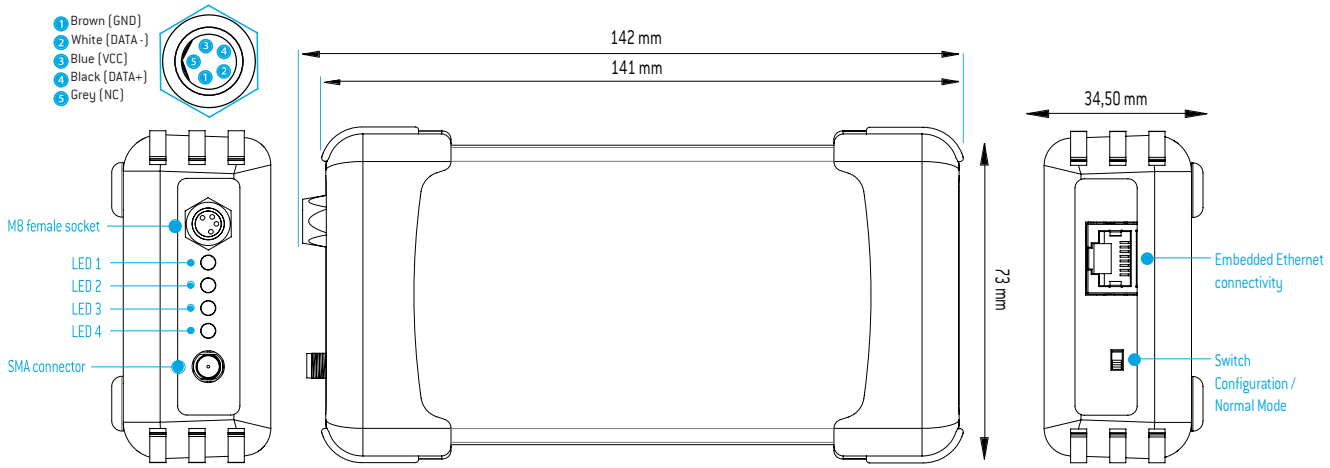
*Transmitter Device ID [1-55]

[1] Range depends on the RF propagation environment and Line of Sight (LoS). Always verify your wireless network's range by performing a Site Survey.
[2] Dependent on radio channel selection.
[3] In some countries, the frequency band admitted is not so extended as the default range.
[4] The radio frequencies admitted in Australia are available from channel 26 to channel 50.
[5] For devices with a hardware version lower than "1.0", the maximum power supply voltage supported is 12V DC.
[6] Only available in devices with a image version >= 3.1.0.

TECHNICAL DRAWINGS

DIMENSIONAL DRAWINGS, INTERFACE DESIGN

POWER SUPPLY AND COMMUNICATIONS CONNECTOR



LED 1 (Red)	RS485 communication status
LED 2 (Blue)	Operation mode (Normal / Configuration mode)
LED 3 (Red / Green)	Wireless network status
LED 4 (Red / Green)	RF Tx/Rx

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”;
E01C	Review of "Factory Default Settings" table; Review of "IoT Connectivity" table; Review of "IP Address" information on the "Ethernet communication port" table;
E01D	Update of power supply voltage information. Supported power supply voltage for devices with a hardware version equal or higher than "1.0"
E01E	Removal of 2,4 GHz frequency
E01F	Update of "Modbus Register Configuration" table Delete "Related Products" table

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