

WiSenMeshNET: SmartGateway & Mini Wireless Monitoring System



SmartGateway Mini

WiSenMeshNET SmartGateway Mini is a mini-USB SmartGateway for WiSenMeshNET sensor nodes. It manages the scheduling of the connected sensors and reads data from the node and transmits it to the local data server over USB connection. Locally stored data can be pushed to the Wisen cloud or imported immediately to 3rd party monitoring software. The SmartGateway Mini is directly powered from the USB connection.

Features

- WiSenMeshNET control unit
- USB A connector
- Designed for offline local PC connectivity
- No need for external power

SmartGateway

WiSenMeshNET SmartGateway is a connection gateway and edge computing data hub for WiSenMeshNET nodes. It manages the scheduling of the connected sensors and reads data from the nodes and transmits it to the Wisen data cloud server using the integrated modem. In case of communication failure, data is buffered locally until the communication is restored. The SmartGateway has an internal battery which can last up to 10.5 months, but it can also be powered externally.

Features

- Onboard SD memory card
- COM interface
- Digital interface
- Integrated radio
- Battery life upto 10.5 months
- External DC solutions
- Central WiSenMeshNET data hub

WiSenMeshNET: SmartGateway & Mini

	SMARTGATEWAY MINI	SMARTGATEWAY
PHYSICAL PROPERTIES		
Dimensions (L x W x H)	52mm x 50mm x 40mm (excluding antennas)	180mm x 140mm x 60mm (excluding antennas)
Weight	~80g (excluding antenna)	~2.0kg (excluding antennas)
Casing and Painting Materials	Polycarbonate plastic	Aluminium Alloy & Epoxy Polyester Powder Coating
International Protection Mark Rating	≥IP66	≥IP66
Operating Temperature	-40 to +85°C	-40 to +85°C
Cable Gland	1 x USB-A data & power connection	1 x EMC CMA12 for external RS232 connection 1 x EMC CMA14 for external DC input power connection
Wire Connection	-	External DC Input Spring type wiring terminal
LOCAL STORAGE		
Local Storage	-	8GB SD Card (Min. 1.5 Yrs. Storage)
POWER		
Primary DC Power	5VDC via USB	4 x ER34615 Lithium D Cell Batteries
Battery Connection	-	Standard Aluminium Battery Holder
Secondary External AC/ DC Power Options ^{3,4}	-	7V ~ 32VDC (Min. Current >= 2Amp) 1. WiSen 110~240vAC to 12vDC IP68 Outdoor Adaptor 2. WiSen M001 Non-Rechargeable Battery Enclosure (L 180mm x W 140mm x H 60mm) Extends Primary DC Battery life a further 1.5 times, for example 2 years@ 1-hour intervals. ^{3,4} 3. WiSen M101 Solar Charge Controller Unit (L 180mm x W 140mm x H 60mm) & 10W (5Ahr) PV Panel (L 305mm x W 205mm) LiFePO4 rechargeable battery / 8-12hr recharge duration / 1.5-month battery life @ 1-hour intervals). ^{3,4}
Battery Life Expectancy ^{1,2,3,4}	-	External AC/DC Power - Unlimited / Dependent on secondary power

Internal Power Only

Sampling Interval - T	Duration (Days)	Duration (Months)	Duration (Years)
1 Min ^{1,2,3,4}	12	0.4	-
5 Mins ^{2,3,4}	30	1.0	-
15 Mins ^{2,3,4}	89	2.9	0.3
30 Mins ^{2,3,4}	170	5.6	0.5
1 Hour ^{2,3,4}	321	10.5	0.9

- (1) When less than <5mins the system is constantly connected to the mobile GSM network
 (2) When greater than >5mins the system establishes a new connection to the mobile GSM network at each reading interval
 (3) When greater than 15 nodes to a Gateway these numbers are deduced 25%
 (4) Extendable by upto 50% when reporting interval ratio (DTU_T – Mesh Upload Ratio) is defined as 1:6

Mobile Network Stop Voltage	-	>= 2.65VDC
Low Power Mode	-	Interval ≥3 min and Server Connection Ratio (DTU_T) = 1-99
NETWORK INTERFACES		
Wireless Mobile Module	-	Compatible with 2G/2.5G/3G/4G of Micro SIM Card (3FF)
Wireless Wi-Fi Module	-	Compatible with 2.4GHz Routers (2.400-2.4835GHz – 802.11b/g/n)
Wired Ethernet Module	-	Compatible with LAN RJ45 & through PoE Extenders
Wired RS-485 Module	-	RS485 to RS232
Wired Port	USB	RS232
RADIO SPECIFICATIONS		
Protocol	WiSenMeshNET® proprietary radio encryption	WiSenMeshNET® proprietary radio encryption
Radio Frequency	2.4GHz System	2.4GHz System
ISM Radio Band	2.405 – 2.480GHz	2.405 – 2.480GHz
Maximum Transmit Power	3.0dBm (Typically 1.5dBm)	3.0dBm (Typically 1.5dBm)
Receive Sensitivity	-102dBm (Min)	-102dBm (Min)
Bandwidth	500kHz	500kHz
Transmission Speed	250kb/s	250kb/s
Radio Program Types	Mesh Star	Mesh Star

Reading/Sampling Interval	Mesh = 4 seconds to 60mins Star = 1 to 3600 seconds	Mesh = 4 seconds to 60mins Star = 1 to 3600 seconds
Number of Mesh Hops (Standard Mesh Radio Program)	10 Hops	10 Hops
Range	Mesh Topology Rural (Line of Sight) = 400m per hop Urban (Line of Sight) = 150m per hop Tunnels (Line of Sight) = 75-100m per hop Star Topology Rural (Line of Sight) = 400m per hop Urban (Line of Sight) = 150m per hop Tunnels (Line of Sight) = 75-100m per hop	Mesh Topology Rural (Line of Sight) = 400m per hop Urban (Line of Sight) = 150m per hop Tunnels (Line of Sight) = 75-100m per hop Star Topology Rural (Line of Sight) = 400m per hop Urban (Line of Sight) = 150m per hop Tunnels (Line of Sight) = 75-100m per hop
Maximum Network Size (Per Gateway)	Typically, 180 Nodes Mesh 50 Nodes Star	Typically, 180 Nodes Mesh 50 Nodes Star

SERVICE INSPECTON

	Every 3 Years by Manufacture (or inspected by arranged methods)	Every 3 Years by Manufacture (or inspected by arranged methods)
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CERTIFICATION

Regional Conformity	UKCA	UKCA
Network Rail	PADS Number: -	PADS Number: 0055/162721
London Underground	Reg Number: -	Reg Number: 3224

ACCESSORIES

Radio Antennas	
WA029-00002	WiSenMesh NET Whip Mesh Antenna (+5dBi/195mm)
WA029-00039	WiSenMesh NET Whip Mesh Antenna (+10dBi/395mm)

GSM/Wi-Fi Antennas	
WA029-00029	WiSen GSM Paddle Antenna 2G/3G/4G
WA029-00033	WiSen GSM Omni Antenna 2G/3G/4G with 50m Coaxial Cable Extension

Power Supply	
WW001-00073	WiSen Solar Charge Controller Unit with 10W Solar Panel-M101
WW001-00074	WiSen 10.8V Non-Rechargeable Battery Enclosure-M001
WL034-00054 / WL034-00076	WiSen Gateway 110-240v AC to 12v DC@3.0A Outdoor Power Adaptor (0.8m) or (5.0m)
WM028-00192	WiSen Fixing Bracket for High-Gain or 50m GSM Antenna
WB016-00016	3.6V ER34615 19Ahr D Cell Lithium Battery

Daughterboard Module Options	
WW002-0062	WiSen GSM 4G connection board EMEA
WW002-0054	WiSen Wi-Fi Module
WW002-0055	WiSen Ethernet Module
WW002-0090	WiSen RS485 Module

Mounting	
WM028-00153	WiSen Standoff Mounting for Enclosures*
WM028-00186	WiSen Flat Mounting Plates with U Clamps for Enclosures*
WM028-00148	WiSen 0.4m Tower Bracket for Enclosures
WM028-00150	WiSen 1.0m Tower Bracket for Enclosures
WM028-00230	WiSen L-Shaped Bracket with U Clamp for Tower Bracket
*Compatible with magnet fixings for non-intrusive installations	