

# WiSenMeshWAN: SmartGateway & Mini Wireless Monitoring System



## SmartGateway Mini

WiSenMeshWAN SmartGateway Mini is a mini-USB SmartGateway for WiSenMeshWAN 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 3<sup>rd</sup> party monitoring software. The SmartGateway Mini is directly powered from the USB connection.

### Features

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

## SmartGateway

WiSenMeshWAN SmartGateway is a connection gateway and edge computing data hub for WiSenMeshWAN 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 7.5 months, but it can also be powered externally.

### Features

- Onboard SD memory card
- COM interface
- Digital interface
- Integrated radio
- Battery life upto 7.5 months
- External DC solutions
- Central WiSenMeshWAN data hub

# WiSenMeshWAN: SmartGateway & Mini

	SMARTGATEWAY MINI	SMARTGATEWAY																								
<b>PHYSICAL PROPERTIES</b>																										
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																								
<b>LOCAL STORAGE</b>																										
Local Storage	-	8GB SD Card (Min. 1.5 Yrs. Storage)																								
<b>POWER</b>																										
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 <sup>3,4</sup>	-	7V ~ 32VDC (Min. Current ≥= 2Amp) <ol style="list-style-type: none"> <li><b>WiSen 110~240vAC to 12vDC IP68 Outdoor Adaptor</b></li> <li><b>WiSen M001 Non-Rechargeable Battery Enclosure</b> (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. <sup>3,4</sup></li> <li><b>WiSen M101 Solar Charge Controller Unit</b> (L 180mm x W 140mm x H 60mm) &amp; 10W (5Ahr) PV Panel (L 305mm x W 205mm) LiFePO4 rechargeable battery / 8-12hr recharge duration / 1.5-month battery life @1-hour intervals). <sup>3,4</sup></li> </ol>																								
Battery Life Expectancy <sup>1,2,3,4</sup>	-	<b>External AC/DC Power</b> - Unlimited / Dependent on secondary power <b>Internal Power Only</b>																								
		<table border="1"> <thead> <tr> <th>Sampling Interval - T</th> <th>Duration (Days)</th> <th>Duration (Months)</th> <th>Duration (Years)</th> </tr> </thead> <tbody> <tr> <td>1 Min <sup>1,2,3,4</sup></td> <td>7</td> <td>0.2</td> <td>-</td> </tr> <tr> <td>5 Mins <sup>2,3,4</sup></td> <td>21</td> <td>0.7</td> <td>-</td> </tr> <tr> <td>15 Mins <sup>2,3,4</sup></td> <td>60</td> <td>2.0</td> <td>0.2</td> </tr> <tr> <td>30 Mins <sup>2,3,4</sup></td> <td>121</td> <td>4.0</td> <td>0.3</td> </tr> <tr> <td>1 Hour <sup>2,3,4</sup></td> <td>231</td> <td>7.6</td> <td>0.6</td> </tr> </tbody> </table>	Sampling Interval - T	Duration (Days)	Duration (Months)	Duration (Years)	1 Min <sup>1,2,3,4</sup>	7	0.2	-	5 Mins <sup>2,3,4</sup>	21	0.7	-	15 Mins <sup>2,3,4</sup>	60	2.0	0.2	30 Mins <sup>2,3,4</sup>	121	4.0	0.3	1 Hour <sup>2,3,4</sup>	231	7.6	0.6
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<p>(1) When less than &lt;5mins the system is constantly connected to the mobile GSM network                  (2) When greater than &gt;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 1:4</p>																										
Mobile Network Stop Voltage	-	≥= 2.65VDC																								
Low Power Mode	-	Interval ≥=3 min and Server Connection Ratio (DTU_T) = 1-99																								
<b>NETWORK INTERFACES</b>																										
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																								
<b>RADIO SPECIFICATIONS</b>																										
Protocol	WiSenMeshWAN® proprietary radio encryption	WiSenMeshWAN® proprietary radio encryption																								
Radio Frequency	868MHz System (UKCA)	868MHz System (UKCA)																								
ISM Radio Band	865-865MHz (UKCA)	865-865MHz (UKCA)																								
Maximum Transmit Power	14dBm (868MHz Configuration) (The maximum power may be different depending on region regulations)	14dBm (868MHz Configuration) (The maximum power may be different depending on region regulations)																								
Receive Sensitivity	-112dBm (Min)	-112dBm (Min)																								
Bandwidth	500kHz	500kHz																								
Transmission Speed	19.2kb/s	19.2kb/s																								
Radio Program Types	<b>Mesh Star</b>	<b>Mesh Star</b>																								

Reading/Sampling Interval	Mesh = 1 to 60 minutes Star = 1 to 3600 seconds	Mesh = 1 to 60 minutes Star = 1 to 3600 seconds
Number of Mesh Hops (Standard Mesh Radio Program)	6 Hops	6 Hops
Range	<b>Mesh Topology</b> Rural (Line of Sight) = 1500m+ per hop Urban (Line of Sight) = 1000m per hop Tunnels (Line of Sight) = 400-600m per hop  <b>Star Topology</b> Rural (Line of Sight) = 12km Urban (Line of Sight) = 2-4km Tunnels (Line of Sight) = 1.0-1.5km	<b>Mesh Topology</b> Rural (Line of Sight) = 1500m+ per hop Urban (Line of Sight) = 1000m per hop Tunnels (Line of Sight) = 400-600m per hop  <b>Star Topology</b> Rural (Line of Sight) = 12km Urban (Line of Sight) = 2-4km Tunnels (Line of Sight) = 1.0-1.5km
Maximum Network Size (Per Gateway)	Typically, 100 Nodes <b>Mesh</b> 30 Nodes <b>Star</b>	Typically, 100 Nodes <b>Mesh</b> 30 Nodes <b>Star</b>

#### SERVICE INSPECTOR

	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: -
London Underground	Reg Number: -	Reg Number: -

#### ACCESSORIES

Radio Antennas	
WA029-00040	WiSenMeshWAN Whip Mesh Antenna (+5dBi/195mm)
WA029-00046	WiSenMeshWAN High Gain Mesh Antenna with 0.3m Extension Lead (+8dBi/400mm)
WA029-00047	WiSenMeshWAN High Gain Mesh Antenna with 5.0m Extension Lead (+8dBi-400mm)
WM028-00192	WiSen Fixing Bracket for High-Gain or 50m GSM Antenna

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

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

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

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	