TECHNICAL SPECIFICATION

Programmable OpenWRT LTE IoT Gateway with dual Ethernet and RS485

AG-221



Features

- **OpenWRT system**
- **Fully programmable Linux environment**
- **Additional 512MB memory as overlay**
- **4G LTE, GSM, WiFi and two Ethernet ports**
- **GNSS**
- **2 opto-isolated digital inputs**
- **Opto-isolated RS485**
- **Wide power supply range**
- **Aluminium enclosure**
- **DIN rail mounting**

AG-221 is an innovative 4G LTE cellular Gateway with 2 ethernet ports, WiFi, RS485, digital inputs working on OpenWRT system. It can connect in multiple ways to the Internet with dual SIM capability and a range of advanced functions for mission critical IoT or M2M applications.

AG-221 also supports MQTT protocol for cloud applications and Modbus TCP/IP or RTU for industrial applications. It supports multiple VPN providers and is therefore ideal for remote PLC management and industrial automation monitoring.

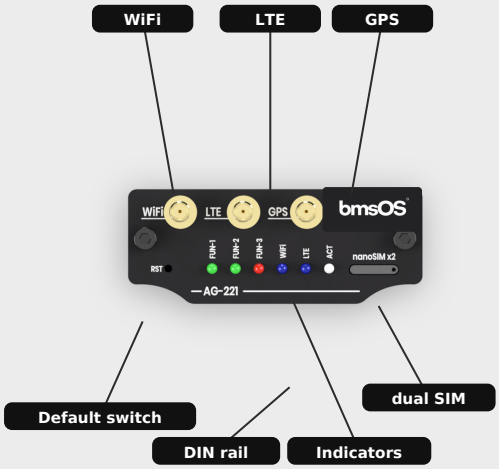
Description	Parameter
Processor	
Type	MIPS24KEc
Clock	580MHz
RAM memory	
Memory size	256MB DDR2
Memory speed	1066max
Storage	
Internal flash	64MB+512MB ExtRoot support (overlay - optional)

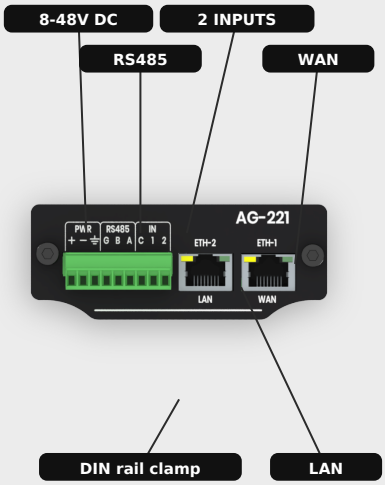
Description	Parameter
Serial RS485	
Port number	1
Interface type	RS485
Data Rate	600 - TBD
Signals	A and B
Connector	Pluggable screw
Protection	Opto-isolated 2.5 kV RMS per UL 1577 IEC 61000-4-2 level 4: - 15 kV (air discharge) - 8 kV (contact discharge) Fail-safe receiver for bus open, short and idle

Description	Parameter
Ethernet	
Number	2
Type	10/100M port
Connector	RJ45 with LED indicators
WiFi	
WiFi type	2.4GHz
WiFi standard	IEEE 802.11/a/b/g/n, Access Points
Antenna connector	SMA female
Cellular modem[1]	
Band	Please refer table of cellular network on page 3 and 4.
SIM card	2 x nanoSIM, tray to prevent cards falling out 3V/1.8V
Antenna connector	SMA female
GNSS[2]	
GNSS systems	GPS, BDS, Galileo, GLONASS, QZSS
Antenna connector	SMA female
Digital inputs	
Input number	2
Input type	Opto-isolated 2.5kV
Configuration	Separate IN-GND
Connector	Pluggable push-in
Max V_{in}	30V DC
Logic 1 voltage	3.5V to max V_{in}

Description	Parameter
System functions indicators	
Indicators	ACT - activity Cellular WiFi Custom use 1 Custom use 2 Custom use 3
System	
Operating systems	OpenWRT 23.05, Kernel 5.15.71, bmsOS Environment V1.01.07
Booting source	Flash memory
Power supply	
Power supply	8-48V
Power consumption	1.6W (24V without LTE on)
Connector	Pluggable screw (+, -, earthing)
PoE	Passive PoE over spare pairs. Not compatible with IEEE802.3af, 802.3at and 802.3bt standards
Protection	Reverse polarity, over voltage
Physical characteristics	
Installation	DIN-Rail, clamp
Housing	Aluminium
Weight	190g
Dimensions	88mm x 64mm x 35mm
Environmental specification	
Operating temp.	-20 ~ 65°C (-4 ~ 149°F)
Storage temp.	-40 ~ 85°C (-40 ~ 185°F)
Ambient RH	5% ~ 95% (non-condensing)

Gateway





1 Apply to LT models. Refer model selection chart. LTE/GSM bands are mentioned in the cellular tables on pages 3 and 4.

2 Apply to LT models. Refer ordering chart.

Cellular modem specification of IN (India) version

IN version of gateway	Cellular network modem details	
Band LTE FTD	B1/ 3/ 5/ 8	
Band LTE TDD	B34/ 38/ 39/ 40/ 41	
Band GSM	B3/ 8 (900/1800MHz)	
GPRS slot	Multi-slot class 12/10	
Bandwidth	1.4/ 3/ 5/ 10/ 15/ 20 MHz	
Output power	LTE-FDD	Class 3 (23 dBm ±2 dB)
	LTE-TDD	Class 3 (23 dBm ±2 dB)
	EGSM900	Class 4 (33 dBm ±2 dB)
	DCS1800	Class 1 (30 dBm ±2 dB)
Maximum data rate	LTE-FDD	10 Mbps (DL)/ 5 Mbps (UL)
	LTE-TDD	8.96 Mbps (DL)/ 3.1 Mbps (UL)
	GPRS	85.6 Kbps (DL)/85.6 Kbps (UL)

Cellular modem specification of EU (Europe and India) version

EU version of gateway	Cellular network modem details	
Band LTE FTD	B1/3/5/7/8/20/28	
Band LTE TDD	B38/ 40/ 41	
Band GSM	B2/3/5/8 (900/1800MHz)	
GPRS slot	Multi-slot class 12/10	
Bandwidth	1.4/ 3/ 5/ 10/ 15/ 20 MHz	
Output power	LTE-FDD	Class 3 (23 dBm ±2 dB)
	LTE-TDD	Class 3 (23 dBm ±2 dB)
	EGSM900	Class 4 (33 dBm ±2 dB)
	DCS1800	Class 1 (30 dBm ±2 dB)
Maximum data rate	LTE-FDD	10 Mbps (DL)/ 5 Mbps (UL)
	LTE-TDD	8.96 Mbps (DL)/ 3.1 Mbps (UL)
	GSM	85.6 kbps (DL)/ 85.6 kbps (UL)
Power	Compliant to GSM phase 2/2+	
	- Class 4 (2 W 900MHz)	
	- Class 1 (1 W 1800MHz)	

Cellular modem specification of GL (global) version

GL version of gateway	Cellular network modem details	
Band LTE FTD	B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28	
Band LTE TDD	B38/B39/B40/B41	
Band WCDMA	B1/B2/B4/B5/B6/B8/B19	
Band GSM	B2/B3/B5/B8	
Output power	GSM850	Class 4 (33 dBm ±2 dB)
	EGSM900	Class 4 (33 dBm ±2 dB)
	DCS1800	Class 1 (30 dBm ±2 dB)
	PCS1900	Class 1 (30 dBm ±2 dB)
	GSM850 8-PSK	Class E2 (27 dBm ±3 dB)

GL version of gateway	Cellular network modem details	
	EGSM900 8-PSK	Class E2 (27 dBm ±3 dB)
	DCS1800 8-PSK	Class E2 (26 dBm ±3 dB)
	PCS1900 8-PSK	Class E2 (26 dBm ±3 dB)
	WCDMA	Class 3 (24 dBm +1/-3 dB)
	LTE-FDD	Class 3 (23 dBm ±2 dB)
	LTE-TDD	Class 3 (23 dBm ±2 dB)
Maximum data rate LTE	LTE-FDD	150 Mbps (DL)/Max. 50 Mbps (UL)
	LTE-TDD	130 Mbps (DL)/Max. 30 Mbps (UL)
Maximum data rate UMTS	DC-HSDPA	42 Mbps (DL)
	HSUPA	5.76 Mbps (UL)
	WCDMA	384 kbps (DL)/Max. 384 kbps (UL)
Maximum data rate GSM	EDGE	296 kbps (DL)/Max. 236.8 kbps (UL)
	GPRS	107 kbps (DL)/Max. 85.6 kbps (UL)

Standard model list

These are models in regular production. Other models are only made on order with a minimum order quantity. Please contact hello@bmsos.com if you require a custom order.

Model	Hardware Options					
	Cellular Network			GNSS	Supply Voltage	More information
	GPRS	3G	LTE			
AG-221					8-48V	Without cellular modem
AG-221-LT-EU	✓		✓	✓	8-48V	Model for India and EU
AG-221-LT-GL	✓	✓	✓	✓	8-48V	Global model

Table with model structure for ordering

Model Structure

Model structure example **AG-221- LT-EU**

Base model name

AG-221

Cellular communication modem

LT (cellular communication modem present)

LTE/GSM module regional information

IN (cellular modem for India)

EU (cellular modem for India and Europe)

GL (global cellular modem)

Standard package list

1	AG-221 Gateway	
2	Cellular antenna[1]	Magnet with 3m cable
3	WiFi antenna	Magnet with 1.5m cable
4	GNSS antenna	Magnet with 3m cable
5	DIN rail clamp with screws	
6	SIM card tray ejector pin	
7	Female connector without cable	

Please note: The set does not include a power supply.

1 Models without a cellular modem will also not include cellular and GNSS antennas.

For more details scan or click the QR code

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