

# TECHNICAL SPECIFICATION

## Advanced ARM Cellular IoT Gateway

## AG-707



### Features

- **Dual core ARM Cortex A53 processor**
- **Fully programmable Linux environment**
- **OpenWRT Linux OS**
- **4G LTE/5G cellular**
- **One 2.5Gbps and one 1Gbps Ethernet port**
- **GNSS**
- **WiFi and Bluetooth (optional)**
- **Two opto-isolated digital inputs**
- **One relay output**
- **Dual opto-isolated RS485**
- **USB host with storage support**
- **Cellular signal strength indicator**
- **Wide power supply range up to 57V**
- **Aluminium enclosure**
- **DIN rail mounting**

AG-707 is an innovative 4G LTE/5G cellular gateway with 2 Ethernet ports, two RS485, digital I/Os working on OpenWRT or Debian system. It has also optional WiFi module. 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-707 also support MQTT protocol for cloud application and Modbus TCP/IP or RTU for industrial applications. The gateway supports systems such as Docker, openPLC and Node-RED.

The gateway's debug port enables advanced users to easily develop their own applications.

Description	Specification
<b>Processor</b>	
Type	ARM Cortex-A53, 64bits
Number of cores	Dual core
Clock	Up to 1.3GHz
<b>RAM memory</b>	
Memory size	515MB/1GB
Memory speed	2133MHz
<b>Storage</b>	
Internal memory	8 to 64GB eMMC
SD card	One microSD card slot

Description	Specification
<b>USB</b>	
USB port number	2
USB type	USB 2.0, host with storage support
Connector	USB type A
Protection	IEC 61000-4-2 level 4: - 15 kV (air discharge) - 8 kV (contact discharge)
USB overload	500mA
<b>Serial RS485</b>	
Port number	2
Interface Type	RS485

Description	Specification
<b>Data Rate</b>	1200bps to 921600bps
<b>Signals</b>	A and B
<b>Connector</b>	Pluggable push-in
<b>Protection</b>	Opto-isolated 1.5kV 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
<b>Ethernet</b>	
<b>Number</b>	2
<b>Type</b>	1 x 2.5Gbps, 1 x 1Gbps
<b>Ethernet connector</b>	RJ45 with LED indicators
<b>WiFi<sup>1</sup></b>	
<b>WL1</b>	2.4Ghz and 5Ghz band
<b>WL2</b>	2.4Ghz
<b>WL3</b>	2.4Ghz
<b>Antenna connector</b>	SMA female
<b>Bluetooth<sup>2</sup></b>	
<b>Bluetooth</b>	Only with selected WiFi modules
<b>Cellular modem<sup>3</sup></b>	
<b>Cellular bands</b>	Refer cellular specification chart
<b>SIM card</b>	2 x nanoSIM, tray to prevent cards falling out
	3V/1.8V
<b>Antenna connector</b>	SMA female
<b>GNSS<sup>4</sup></b>	
<b>GNSS systems</b>	GPS, BDS, Galileo, GLONASS, QZSS
<b>Antenna connector</b>	SMA female
<b>Digital inputs</b>	
<b>Input number</b>	2
<b>Input type</b>	Opto-isolated 2.5kV
<b>Configuration</b>	Separate IN-GND, PNP/NPN
<b>Connector</b>	Pluggable push-in
<b>Max <math>v_{in}</math></b>	30V DC
<b>Logic 1 voltage</b>	3.5V to max $v_{in}$
<b>Relay output</b>	
<b>Output number</b>	1
<b>Output type</b>	Relay NO (normal open)
<b>Load<sub>max</sub></b>	3A 160V AC or 3A 30V DC
<b>Connector</b>	Pluggable push-in

1 WiFi is optional. There are different options of WiFi card offered by Atreyo. Refer ordering chart and WiFi card selection chart.

2 Bluetooth is on WiFi card module. Available with selected WiFi modules.

3 Apply to LT models. Refer ordering and cellular specification chart.

4 Apply to LT models. Refer ordering and cellular specification chart.

Description	Specification
<b>System function indicators</b>	
<b>Indicators</b>	ACT – activity
	Cellular signal level – 4 LED
	Custom use – 2 LEDs
	Cellular – 1 LED SIM-1 and SIM-2
<b>Debug and development</b>	
<b>System debug</b>	C-type USB to UART inbuilt
<b>Reset</b>	Reset push button
<b>Default</b>	Default, recover and system load push buttons.
<b>System</b>	
<b>Operating system</b>	OpenWRT Linux
<b>Booting source</b>	U-boot from flash and OS from eMMC
<b>Application</b>	
<b>Language support</b>	C, Python, Java and all supported by Linux
<b>Local logic apps</b>	NodeRED
	Any other custom app
<b>Web interface</b>	Luci app in OpenWRT
	Any other custom made
<b>Power supply</b>	
<b>Power supply</b>	8-57V DC
<b>Power consumption</b>	TBD
<b>Connector</b>	Pluggable push-in (+, -, earthing)
<b>Protection</b>	Reverse polarity, over voltage
<b>Physical characteristics</b>	
<b>Installation</b>	DIN-Rail, clamp
<b>Housing</b>	Aluminium
<b>Weight</b>	TBD
<b>Dimensions</b>	114mm x 32mm x 104mm
<b>Environmental specification</b>	
<b>Operating temp.</b>	-0 ~ 75°C (32 ~ 167°F)
<b>Storage temp.</b>	-40 ~ 85°C (-40 ~ 185°F)
<b>Ambient RH</b>	5% ~ 95% (non-condensing)

## Gateway



### Standard model list

Standard gateway models that are in regular production. If you have requirements for a different configuration, then select a specific specification from the table "Table with model structure for ordering".

Model	Hardware Options							More information
	Memory	RAM	Cellular Network			GNSS	WiFi	
	GB	GB	GPRS	3G	LTE			
AG-707	32GB	0.5						Without cellular
AG-707-32G-0.5G-LT-EU	32GB	0.5	✓		✓	✓		For India and EU
AG-707-32G-0.5G-LT-EU-WL4	32GB	0.5	✓		✓	✓	✓	For India and EU
AG-707-32G-0.5G-LT-GL	32GB	0.5	✓	✓	✓	✓		Global model
AG-707-32G-0.5G-LT-GL-WL4	32GB	0.5	✓	✓	✓	✓	✓	Global model

### WiFi and Bluetooth selection chart

Not all WiFi cards have all features in all operating systems offered. Therefore, before choosing a card, read the information on the documentation page or contact Atreyo.

WiFi option	WiFi specification		Bluetooth	Bluetooth version
<b>WL3</b>	Standard	802.11b/g/n		
	Band	2.4GHz		
	Speed	54Mbps and 150Mbps for IEEE 802.11g and 802.11n OFDM		
	2.4GHz:	ch1 ~ ch14		
<b>WL4</b>	Standard	802.11b/g/n AP/ STA/ AP + STA		
	Band	2.4GHz and 5Ghz		
	Modulation	CCK/ DBPSK/ DQPSK/ BPSK/ QPSK/ 16QAM/ 64QAM		
	Speed	802.11a 54 Mbps 802.11b 11 Mbps 802.11g 54 Mbps		

		802.11n 150 Mbps		
<b>WL5</b>	Standard	IEEE 802.11 a/b/g/n AP/ STA	✓	V5.2
	Band	2.4GHz and 5GHz		
	Channel bandwidth	20 MHz/ 40 MHz		
	Speed	802.11a 54 Mbps 802.11b 11 Mbps 802.11g 54 Mbps 802.11n 150 Mbps		
	5.0GHz:	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 130, 132, 136, 140, 149, 153, 157, 161, 165		

### Cellular modem specification of EU (Europe and India) version

EU version of gateway		Cellular network interface details	
<b>Band LTE FTD</b>	B1/3/5/7/8/20/28		
<b>Band LTE TDD</b>	B38/ 40/ 41		
<b>Band GSM</b>	B2/3/5/8 (900/1800MHz)		
<b>GPRS slot</b>	Multi-slot class 12/10		
<b>Bandwidth</b>	1.4/ 3/ 5/ 10/ 15/ 20 MHz		
<b>Output power</b>	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)	
<b>Maximum data rate</b>	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)	
<b>Power</b>	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 interface details	
<b>Band LTE FTD</b>	B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28	
<b>Band LTE TDD</b>	B38/B39/B40/B41	
<b>Band WCDMA</b>	B1/B2/B4/B5/B6/B8/B19	
<b>Band GSM</b>	B2/B3/B5/B8	
<b>Output power</b>	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)
	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)
<b>Maximum data rate LTE</b>	LTE-FDD	150 Mbps (DL)/Max. 50 Mbps (UL)
	LTE-TDD	130 Mbps (DL)/Max. 30 Mbps (UL)
<b>Maximum data rate UMTS</b>	DC-HSDPA	42 Mbps (DL)
	HSUPA	5.76 Mbps (UL)
	WCDMA	384 kbps (DL)/Max. 384 kbps (UL)
<b>Maximum data rate GSM</b>	EDGE	296 kbps (DL)/Max. 236.8 kbps (UL)
	GPRS	107 kbps (DL)/Max. 85.6 kbps (UL)

## Table with model structure for ordering

Model Structure	
<b>Model example</b>	AG-707-8G-1G- LT-EU- WL4
<b>Base model name</b>	
AG-707	
<b>Internal memory</b>	
8G, 32G, 64, 128G (eMMC)	
<b>RAM memory</b>	
0.5G, 1G (size of RAM in GB)	
<b>Cellular modem</b>	
LT/5G (cellular modem present)	
<b>Cellular regional information</b>	
EU (cellular modem for India and Europe) GL (global cellular modem)	
<b>WiFi version</b>	
WL3 /WL4/WL5 (refer WiFi selection chart)	

## Standard package list

1	AG-707 Gateway	
2	Cellular antenna <sup>1</sup>	Magnet with 3m cable
3	WiFi antenna (only WiFi models)	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 16 pin main connector without cable	

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

<sup>1</sup> Models without a cellular modem will also not include cellular and GNSS antennas.

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