TECHNICAL SPECIFICATION

ATREYO
SOLUTIONS THAT SIMPLIFY

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 and two Ethernet ports**
- **GNSS (optional)**
- **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 two 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 support MQTT protocol for cloud application 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)
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

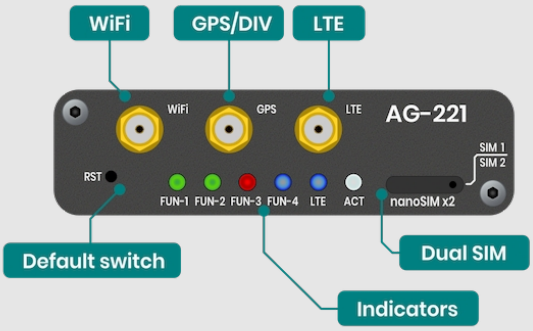
Description	Parameter
Serial RS485	
	IEC 61000-4-2 level 4: – 15 kV (air discharge) – 8 kV (contact discharge)
	Fail-safe receiver for bus open, short and idle
Ethernet	
Number	2
Type	10/100M port
Connector	RJ45 with LED indicators
Cellular modem[1]	
Band	Please refer table of cellular network on page 3 and 4.
SIM card	2 x nanoSIM, tray to prevent cards falling out
	3V/1.8V
Antenna connector	SMA female

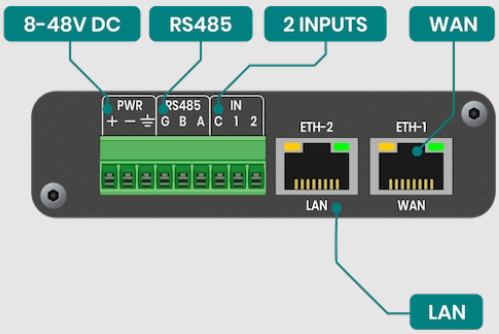
1 Apply to LT models. Refer model selection chart. LTE/GSM Bands are mentioned for in Cellular table section on page 3 and 4.

Description	Parameter
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	Common IN-GND
Connector	Pluggable screw
Max $_{Vin}$	30V DC
Logic 1 voltage	3.5V to max $_{Vin}$
System functions indicators	
Indicators	ACT – activity
	Cellular
	Custom use 1
	Custom use 2
	Custom use 3
	Custom use 4
System	
Operating systems	OpenWRT 23.05, Kernel 5.15.71,

Description	Parameter
System	
	Atreyo 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)
Protection	Reverse polarity, over voltage
Physical characteristics	
Installation	DIN-Rail, clamp
Housing	Aluminium
Weight	190g approx
Dimensions	91mm x 64mm x 25mm
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





2 Apply to LT models. Refer ordering chart.

Cellular modem specification of IN (India CAT1) 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 CAT1) 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 IN (India CAT4) version

IN version of Gateway	Cellular network modem details	
Band LTE FTD	B1/B3/B5/B8	
Band LTE TDD	B34/B38/B39/B40/B41	
Band WCDMA	B1/B5/B8	
Band GSM	EGSM900/DCS1800	
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)
	EGSM900 8-PSK	Class E2 (27 dBm ±3 dB)

IN version of Gateway	Cellular network modem details	
	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	41 Mbps (DL)
	HSUPA	5.76 Mbps (UL)
	WCDMA	384 kbps (DL) Max. 384 kbps (UL)
Maximum data rate GSM	EDGE	236.8 kbps (DL) Max. 236.8 kbps (UL)
	GPRS	85.6 kbps (DL) Max. 85.6 kbps (UL)

Cellular modem specification of GL (global CAT4) 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)
	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 us if you require a custom order.

Model	Hardware Options					More information
	Cellular Network				GNSS	
	GPRS	3G	LTE CAT1	LTE CAT4		
AG-221-S						Without cellular modem
AG-221-S-LT1-EU	✓		✓		✓	Model for India and EU CAT1
AG-221-S-LT4-GL	✓	✓		✓	✓	Global model CAT4
AG-221-S-LT4-IN	✓	✓		✓		Model for India CAT4

Table with model structure for ordering

Model Structure	
Model structure example	**AG-221-S-LT1-EU-GN**

Base model name

AG-221

Submodel

S (slim version of enclosure)

Cellular communication modem

LT1 / LT4 (cellular communication modem CAT1/CAT4)

LTE/GSM module regional information

IN (cellular modem for India)
EU (cellular modem for India and Europe)
GL (global cellular modem)

GNSS

GN – GNSS functionality

Standard package list

1	AG-221 Gateway	
2	Cellular antenna[1]	Magnet with 2 or 3m cable
3	GNSS antenna[2]	Magnet with 3m cable
4	DIN rail clamp with screws	
5	SIM card tray ejector pin	
6	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.
2 Only if the model has built-in GNSS (GN)

For more details scan or click on QR code

Copyright

Copyright © 2026 Atreyo Research and Development Pvt. Ltd. This technical specification is protected under national and international copyright laws. No part of this user manual may be reproduced, distributed, translated, or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or storing in any information storage and retrieval system, without the prior written permission of Atreyo Research and Development Pvt. Ltd.. Copy or use any part of this specifications is prohibited without the prior written permission from the Atreyo Research and Development Pvt. Ltd.

Trademarks

Atreyo and the Atreyo logo are registered trademarks of Atreyo Research and Development Pvt. Ltd.
All other trademarks and copyrights are the property of their respective owners.

Disclaimer

- The information contained in this Technical Specification is provided "as is" and is subject to change without notice. While every effort has been made to ensure the accuracy and completeness of the information contained herein, Atreyo Research and Development Pvt. Ltd. assumes no responsibility or liability for any errors or omissions.
- Images used in this specification may differ in appearance from the actual product.
- All dimensions mentioned in the drawings are not to scale and are subject to change and update as may be decided by the Atreyo Research and Development Pvt. Ltd.
- Atreyo Research and Development Pvt. Ltd. makes no warranties, either express or implied, regarding the contents of this document, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.
- Users of this Technical Specification should verify the applicability and suitability of the information and procedures to their particular use. Atreyo Research and Development Pvt. Ltd. shall not be liable for any damages, including but not limited to direct, indirect, special, incidental, or consequential damages, arising from or related to the use or inability to use this Technical Specification or the products described herein.
- By using this Technical Specification, you agree to the terms and conditions stated above. Atreyo Research and Development Pvt. Ltd. has right to make additions, deletions, alterations or amendments as and when it deems fit and proper, without any prior notice.

Atreyo Research & Development Pvt. Ltd.	**+91 9727741417** **info@atreyo.in**	2106, Z2, Thaltej, Ahmedabad, Gujarat, India