

DATASHEET

Telematics Gateway

iW-Rainbow-G41G

The i.MX 8XLite powered Telematics Gateway is built for rugged applications with extensive interfaces such as 5 CAN ports, RS232, RS485, Analog Inputs and Ethernet. With the support for various wireless technologies such as 4G, Wi-Fi and Bluetooth, this platform caters to multiple applications and use cases.

The telematics_gateway designed by iWave offers automakers a flexible and modular computing platform that allows data exchange between multiple electronic control units (ECUs) and servers. It provides a secured execution environment and prevents unauthorized access to the device while maintaining data integrity.

Software flexibility

Powered by a powerful processor, The Telematics Gateway is equipped with Linux 5.15.5 Kernel supported on the BSP with the API for all the peripherals. The API and root access provides customers the flexibility and transparency to build their custom software and analytics applications.

The gateway is integrated with protocol stacks such as J1939, UDS and ISO 15675-4, making the solution compatible with different bus standards and architectures.



Key Features

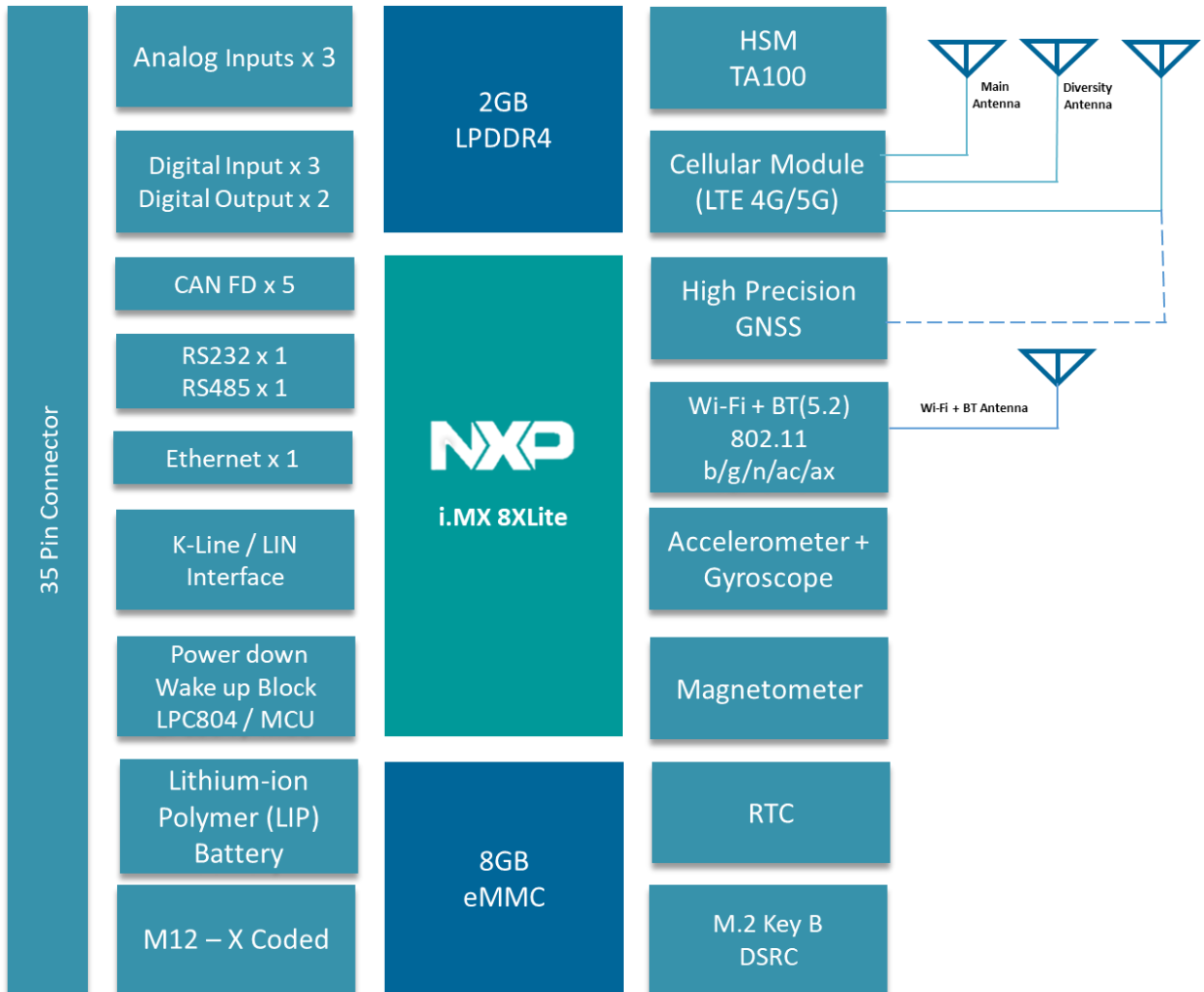
- NXP i.MX 8XLite CPU
- 2 x Cortex-A35 & 1 x Cortex-M4 Core
- 5 CAN-FD Ports
- Wireless Connectivity: 4G / Wi-Fi / BT
- Upgrade Options: 5G / Wi-Fi 6
- Wired Interfaces: RS232 / RS485 / Ethernet / Analog Inputs/Digital input/Digital output
- IP67 Enclosure for Rugged Installations
- LINUX 5.15.5 BSP and API for peripherals
- Wide range of protocol support
 - ISO 15765-4 / J1939 / UDSonCAN / UDSonIP

Benefits and Value Proposition

The i.MX 8XLite processor is purpose-built to support standalone telematics units in automotive applications while enabling various protocol support, making the device compatible with different types of vehicles. The ruggedness of the solution with compact design makes it a perfect fit.

The software flexibility and value add for the customer to build their proprietary application and integration, makes the device the right choice of consumers.

Functional Block Diagram



Note: Above block diagram shows all supported optional features. Depending on the ordered configuration, the delivered features would vary.

Ordering Part Numbers

Part number	Description
iW-G41GOA-02G-08G-4EIW-SM-11-EM-LI1BXX	Telematics Gateway (Cat-4 Connectivity – EMEA / APAC , Wi-Fi , BT)
iW-G41GOA-02G-08G-4NIW-SM-11-EM-LI1BXX	Telematics Gateway (Cat-4 Connectivity – NA / Canada , Wi-Fi , BT)
iW-G41GOA-02G-08G-4EIW-SM-11-EM-LI1BXX-D	Telematics Gateway Evaluation Kit (Cat-4 Connectivity – EMEA / APAC , Wi-Fi , BT)
iW-G41GOA-02G-08G-4NIW-SM-11-EM-LI1BXX-D	Telematics Gateway Evaluation Kit (Cat-4 Connectivity – NA / Canada , Wi-Fi , BT)

- Note:**
- For Volume production other configurations could be supported as per the requirement. please contact iWave sales team at mktg@iwavesystems.com

Processor Core and Storage

CPU	NXP i.MX 8XLite Processor, 2 x Cortex-A35 @1.2GHz 1 x Cortex-M4F cores @264MHz
RAM	LPDDR4 - 2GB
FLASH	eMMC Flash – 8GB expandable up to 128GB

Wireless Connectivity

Cellular Connectivity	LTE Cat 4 EMEA/APAC - B1/B3/B7/B8/B20/B28 North America/Canada - LTE FDD - B2/ B4/ B5/ B12/B13/ B25/ B26
5G ¹	Automotive 5G NR module with 4G (LTE Cat 19)/3G/2G fallback, supporting both 5G NR NSA and SA modes
Wi-Fi	IEEE 802.11a/b/g/n/ac/d/e/h/i/mc Hotspot and client mode With WPA2 feature 802.11ax Wi-Fi 6 (Optional)
Bluetooth	Bluetooth v5.2 BR/EDR/LE

Interfaces and Peripherals

CAN FD	5 ports
	Data rate up to 5Mbps
	Identifier Support: 11 and 29 bit
	Classic CAN compatible
Ethernet	10/100 BASE-T [Standard Ethernet] 100BASE-T1 ¹ [Automotive Ethernet]
RS232	2-wire x 1 port
RS485	2-wire x 1 port [half duplex]
K-Line/LIN Interface ¹	Compatible with LIN 2.0, LIN 2.1, LIN 2.2, LIN 2.2 A and ISO/DI17987 4.2
Analog Input	2 Ports (0-32V)
Digital Input	2 Ports (Max 32V)
Digital Output	2 Ports (5V- 24V, Sink Current: 300mA)

SIM Provision

SIM connector	Micro SIM Connector eSIM ¹
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Power Characteristics

Power Input	9V - 32V
Power Consumption	Current consumption at normal mode: 360mA at 12V
Power saving modes	Stand-by Mode: TBD Deep Power Down Mode : 2mA

Sensors

Accelerometer	Function: 3 Axis
	Sensitivity Range: $\pm 2/ \pm 4/ \pm 8/ \pm 16$ g full scale
Gyroscope	Function: 3 Axis
	Sensitivity Range: $\pm 125/ \pm 250/ \pm 500/ \pm 1000/ \pm 2000$ dps
Magnetometer ¹	Function: 3 Axis
	Sensitivity Range: Up to ± 50 gauss magnetic dynamic range

Positioning

High precision GNSS ¹	GPS/BeiDou/Galileo/SBAS/QZSS/AGNSS
GNSS	GPS/GLONASS/BeiDou/Galileo
Receiving Channel	72 Channel
Time to update position	1 Second
Receiver sensitivity	Tracking & Nav: -157 dBm
	Cold starts: -146 dBm
	Hot starts: -157 dBm
Time to First Fix	Cold starts: 11.57s
	Hot starts: 1.8s

Antenna

External Antenna	3 SMA Connectors: 1 x LTE main, 1 x LTE Diversity , 1 x GNSS. 2 RP-SMA Connectors: Wi-Fi, BT
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¹ Optional features: For more information please contact iWave sales team at mktg@iwavesystems.com

Environmental Conditions	
Operating Temperature	-40°C to +85°C ²
Storage Temperature	-40°C to +85°C ²

Internal Battery	
Capacity	Lithium-ion Polymer (LIP) 1500mAh
Temperature Support	Battery when discharging: -20°C to +60°C Battery when charging: 0°C to 50°C
Certification	Certified with UN38.3 and IEC 62133-2

Microcontroller	
MCU	LPC804 Micro-Controller

LED	
LED 1	Red Cellular Module Power Indication
LED 2	Green Status Indication Software configurable

Security	
Security Module	Crypto-automotive Security IC Microchip TA100

RTC	
RTC	Tiny Real-Time Clock/calendar with alarm function, battery switch-over, time stamp input

Software Specifications	
Board support package (BSP)	<ul style="list-style-type: none"> U-Boot 2022.04 Linux version: 5.15.52
API Support	<ul style="list-style-type: none"> Sensors / Cellular Connectivity / Wi-Fi / Bluetooth Interface peripherals: CAN Data Wake-Up based on Ignition / CAN / Timer / Accelerometer LED
Time Synchronization	GNSS and NTP
Power Saving Modes	Stand-By Mode / Deep Power Down Mode
Wake-Up Modes	Ignition / CAN / Timer / Accelerometer
CAN Protocol ¹	<ul style="list-style-type: none"> Socket CAN ISO 15765-4 CANopen J1939 UDSonCAN K-Line UDSonIP
Security ¹	<ul style="list-style-type: none"> Secure boot Secure storage Wi-Fi Security
Software Modules ¹	<ul style="list-style-type: none"> OTA Update Power Management Data collection application on the device Cloud Platform SDK Integration

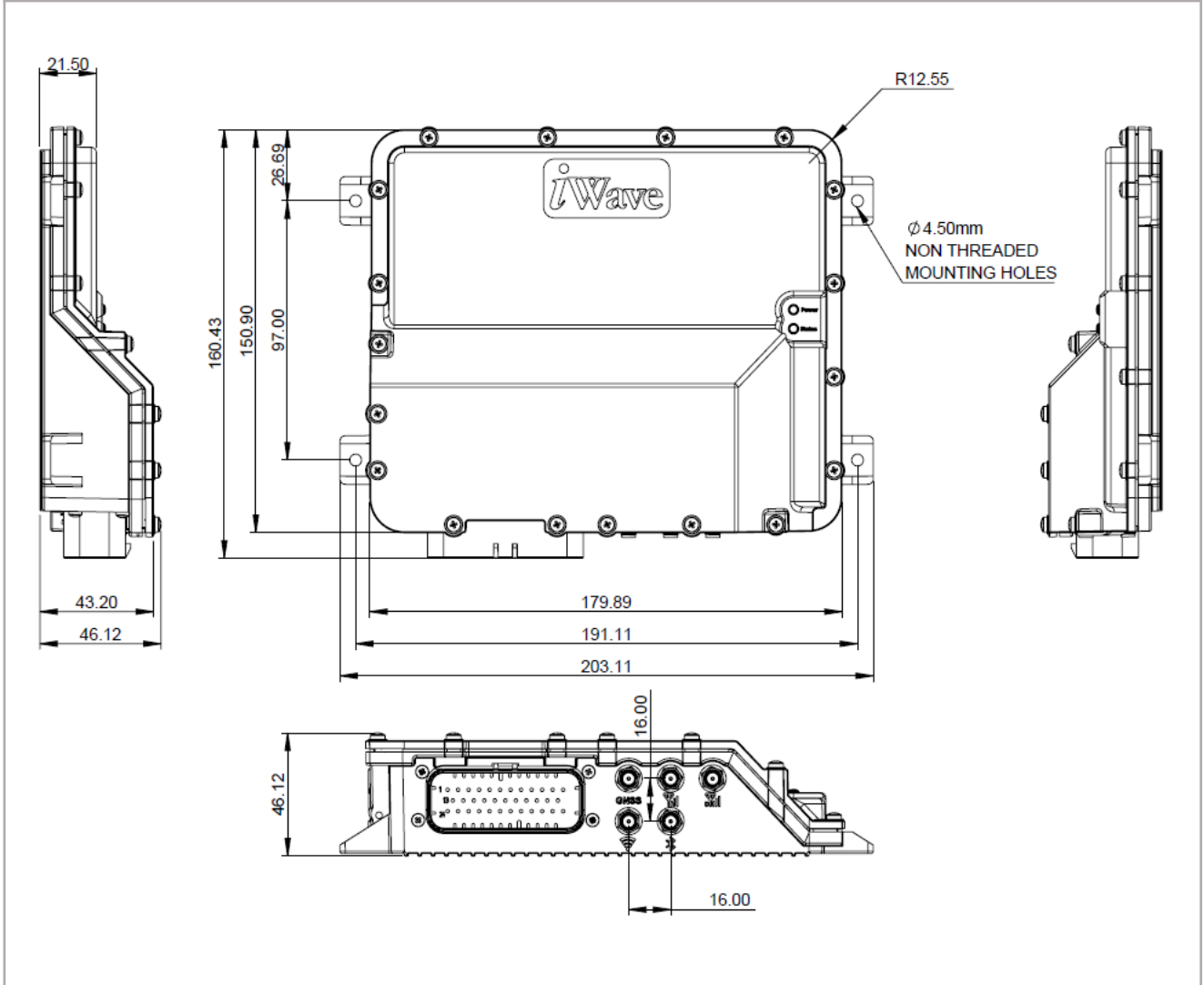
¹ Optional features: For more information please contact iWave sales team at mktg@iwavesystems.com

² Temperature range subject to use case and operational functionality

Mechanical

Dimensions (H x W x D)	203 x 160 x 46 mm
Enclosure Material	Top: Polycarbonate (Plastic) Bottom: ADC 12 (Aluminium Alloy)
Manufacturing Process	Injection Molding & Die casting
Assembly Type	Screw
Colour of Enclosure	Black (RAL 9005)
Enclosure Surface Finish	Textured Finish & Powder Coating
Protecting Class	IP67
Mounting Options	Panel mount
Number of Enclosure Parts	2

Top and Bottom View

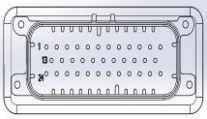


Compliance Test Standards and Certifications*	
Test Cases	Standards
Regulatory Test #	
FCC	FCC KDB 996369
ISED	<ul style="list-style-type: none"> ▪ ISED RSS-132 ▪ ISED RSS-130 ▪ ISED RSS-139 ▪ ISED RSS-199 ▪ ISED RSS-102
CE	<ul style="list-style-type: none"> ▪ IEC 62368-1 ▪ EN IEC 62368-1 ▪ EN IEC 62311 ▪ EN301 489-1 ▪ EN301 489-3 ▪ ETSI EN 301 489-17 ▪ ETSI EN 301 489-19 ▪ EN 301 489-52 ▪ EN301 908-1 ▪ EN301 908-13 ▪ EN301 511 ▪ EN300 328 ▪ EN301 893 ▪ EN300 440 ▪ EN303 413
Electrical Test	
Direct current supply voltage	ISO 17650-2-4.2
Overvoltage	ISO 17650-2-4.3
Slow decrease and increase of supply voltage	ISO 17650-2-4.5
Reverse voltage	ISO 17650-2-4.7
Open circuit tests	ISO 17650-2-4.9
Short circuit protection	ISO 17650-24.10.2
Pulse 1	ISO 7637-2
Pulse 2a	ISO 7637-2
Pulse 3a	ISO 7637-2
Pulse 3b	ISO 7637-2
Pulse 4	ISO 7637-2
Pulse 5b	ISO 16750-2-4.6.4.2.3
Mechanical Test	
Mechanical shock	IEC 60068-2-27
Random Vibration Test	IEC 60068-2-64
Sinusoidal vibration Test	IEC 60068-2-6
Environmental Test	
Ingress Protection test	IEC 20653
Humidity test	ISO 16750-4: 2010/ 5.6.2
Temperature Storage test	ISO 16750-4: 2010/ 5.1.1 and 5.1.2
High temperature operating	ISO 16750-4: 2010/ 5.1.2
Low temperature operating	ISO 16750-4: 2010/ 5.1.1
Temperature Cyclic	ISO 16750-4:2010 5.3.1
ESD	ISO 10605
Immunity and Emission Test	
Radiated Emission test	ISO 13766-1
Radiated Immunity (BCI) #	ISO 11452-4
Radiated Immunity (ALSE) #	ISO 11452-2
Conducted Emissions (CE Test)	CISPR 25

* Certifications can vary based on the configuration. Please contact iWave sales team for more information at mkta@iwavesystems.com

In Progress

Connector Specifications

Number of Pins	Connector on Device : 35 Pin Ampseal Connector Tin Plated (Part Number: 776163-1) Mating Connector : 35 Pin Ampseal Connector Housing (Part Number: 776164-1)		
Connector Pinout	Pin No	Signal Name	Description
	1	Analog_I/P_1	Analog input 1
	2	DOUT2	Digital Output 2
	3	RS232_DOUT	RS232 transmit Data
	4	RS232_RIN	RS232 Receive data
	5	FD_CAN4_H	Flexible data rate CAN4 Data High
	6	FD_CAN4_L	Flexible data rate CAN4 Data Low
	7	FD_CAN1_L	Flexible data rate CAN1 Data Low
	8	FD_CAN1_H	Flexible data rate CAN1 Data High
	9	USB_OTG2_DN_C	USB OTG data negative
	10	FD_CAN3_L	Flexible data rate CAN3 Data Low
	11	ETH_MAG_A_RXP	Ethernet RXP
	12	ETH_MAG_A_RXM	Ethernet RXM
	13	DIN1	Digital Input 1
	14	NC	Not connected
	15	DIN2	Digital_Input_2
	16	RS485_A	RS485_TD_A+
	17	RS485_B	RS485_TD_B-
	18	FD_CAN0_H	Flexible data rate CAN0 Data High
	19	FD_CAN0_L	Flexible data rate CAN0 Data Low
	20	USB_OTG2_DP_C	USB OTG2 Positive data
	21	FD_CAN3_H	Flexible data rate CAN3 Data High
	22	UART_RX	Debug console UART RX
	23	UART_TX	Debug console UART TX
	24	MAIN_VCC_OBD_IN	Main Power Input
	25	GND_OBD	Main OBD Ground
	26	IGN_DET	Ignition Detection signal
	27	DOUT1	Digital Output 2
	28	ANALOG_I/P_2	Analog Input 2
	29	FD_CAN2_H	Flexible data rate CAN2 Data High
	30	FD_CAN2_L	Flexible data rate CAN2 Data Low
	31	USB_GND	USB Ground
	32	USB_OTG_VBUS_C	USB OTG Power
	33	NC	Not connected
	34	ETH_MAG_A_TXP	Ethernet TXP
	35	ETH_MAG_A_TXM	Ethernet TXM

Related Products



Telematics Connect Hub

The Telematics Connect Hub is a powerful compact device that supports 2 CAN-FD ports, an integrated hardware secure element, LTE Cat-1 bis cellular connectivity and Bluetooth Connectivity. The hub is an ideal solution for electric vehicles, 2 Wheelers, racing motorbikes, enabling next generation telematics and edge intelligence.



Rugged Telematics Device

The Rugged Telematics Device with IP67 protection class is integrated with 3 CAN Ports, RS232 and RS485 Ports, with various wireless connectivity options such as 4G, Wi-Fi and Bluetooth. Rugged device is built to track your vehicles even in tough conditions.



Telematics Control Unit

Telematics Control Unit is built to power your connected mobility and telematics applications across a range of connected vehicles. It is integrated with multiple CAN ports, a wide range of protocol support and a multitude of wireless connectivity options.



V2X OBU / RSU

Integrated with C-V2X and DSRC technologies, the hybrid V2X OBU / RSU provides a scalable and modular platform. Designed to serve a plethora of V2X Applications, the V2X Application gateway can be positioned as an On-Board Unit (OBU) or as a Road-Side Unit (RSU).

Document Revision History

Document Number	iW-PRGOT-DS-01-REL1.5	
Release	Date	Description
1.0	9 th Dec 2022	Official Release Version
1.1	23 rd Feb 2023	Updated Release
1.2	19 th July 2023	Antenna and Certification details updated
1.3	3 rd Aug 2023	Updated Release
1.4	8 th Aug 2023	Added description to part numbers
1.5	9 th Feb 2024	Ethernet, Block Diagram and Part numbers are updated
1.6	31 st Feb 2024	Updated the Antenna connector section
1.7	4 th June 2024	Updated the Unit Image ,Top and Bottom view Image

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We are committed to provide the best possible support to our customers. For assistance and more detailed information please contact us at mktg@iwave-global.com

iWave Systems Technologies

mktg@iwave-global.com

iWave Global EMEA FZ-LLC

mktg@iwave-global.com

iWave Global GmbH

sales.germany@iwave-global.com

iWave Europe

sales.europe@iwave-global.com

iWave USA

sales.usa@iwave-global.com

iWave APAC Co.Ltd

sales.apac@iwave-global.com

iWave Korea

sales.korea@iwave-global.com

iWave Japan

sales.japan@iwave-global.com

iWave
Global

The bottom half of the page features a large, stylized logo for 'iWave Global' in a dark blue serif font. Below the logo is a background image of a city at night, viewed from an elevated perspective. The city lights are overlaid with a white, glowing network of interconnected nodes and lines, symbolizing global connectivity and data flow.

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