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Rugged Telematics Device

iW-RainboW-G26I

The Rugged Telematics Device with IP67 protection class is an ideal solution for telematics applications in rugged and off highway vehicles. The device is feature rich, supporting 3 CAN Ports, RS232, RS485 and various wireless connectivity options such as LTE, Wi-Fi and Bluetooth, with an integrated hardware secure element. The device provides you the support to custom build your software.

Key Features

- Powered by NXP i.MX 6ULL Processor
- 3 CAN Ports and Ethernet Port
- LTE Cat-4, Cat-M1, Wi-Fi and BT Connectivity
- Integrated Hardware Secure Element
- Deep power down and sleep modes
- IP67 Protection Class with external antennas
- LINUX BSP offering software flexibility
- FCC and CE Certified

Software flexibility and Security

Powered by a powerful processor, The Rugged Telematics Device is equipped with LINUX Kernel and API's available for the various peripherals, sensors and connectivity modems. Telematics unit provides consumers the flexibility to build their custom application and integrate with various cloud and analytics platforms.

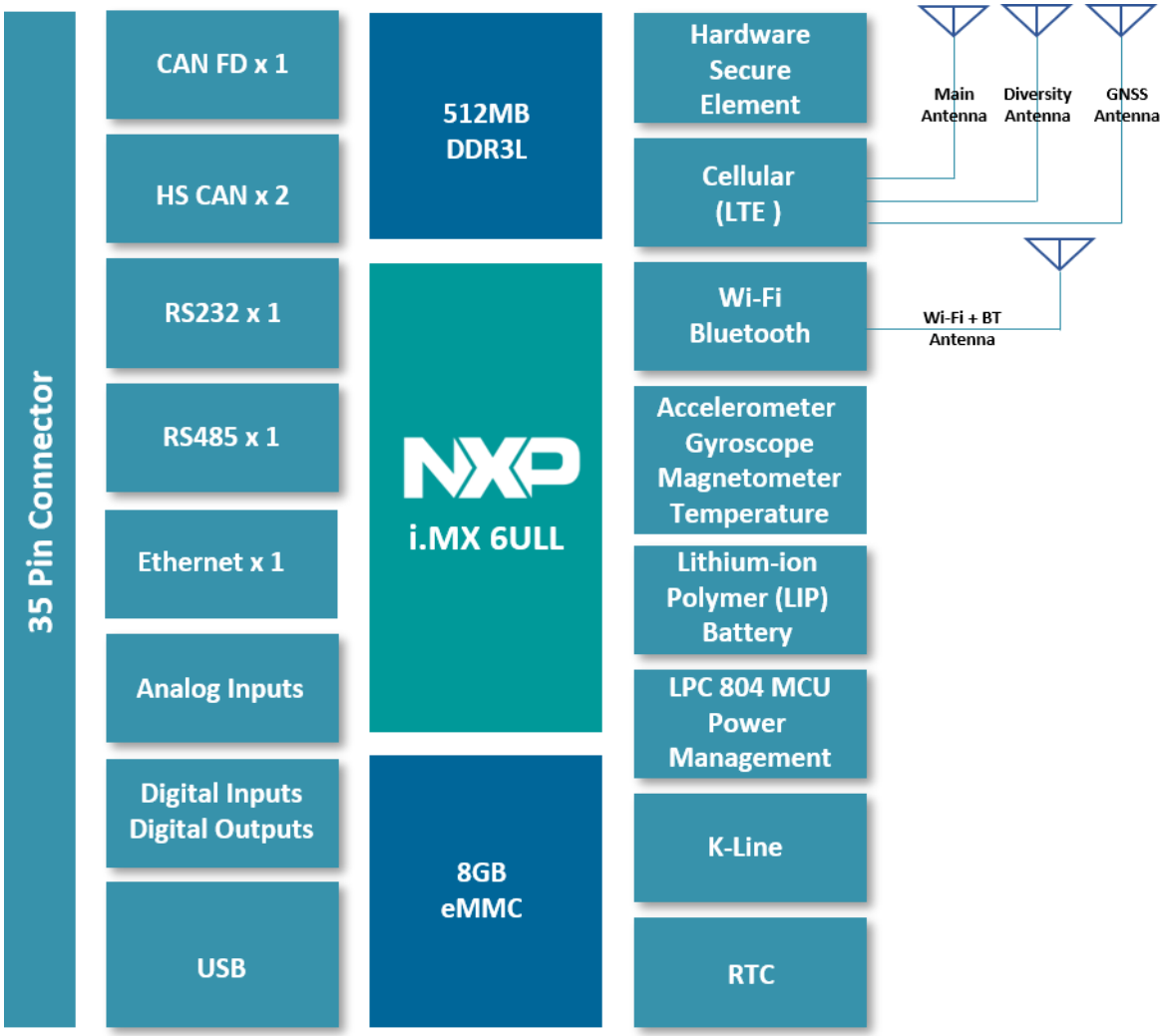
Device is integrated with security module offering secure encryption of data and crypto library support. The processor also helps you integrate various security functions on the connected device.

Benefits and Value Proposition

The Rugged Telematics Device with IP67 protection class is built to track your vehicles even in tough conditions. The powerful processor provides the provision to enable various protocol standards, 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 for the customer to build their proprietary application and integration, makes the device the right choice for end applications.

Functional Block Diagram



Note: *Standard delivery varies with respect to the few sections of this block diagram, depending on the ordered configuration*

Ordering Part Numbers – Standard SKU

Part number	Description
iW-G26ISA-512-08G-MIW-XM-12-EM-LI1BXX	Rugged Telematics Device with LTE Cat-M1 Connectivity, Wi-Fi and Bluetooth
iW-G26ISA-512-08G-EIW-XM-12-EM-LI9BXX	Rugged Telematics Device with LTE Cat-4 (EMEA / APAC), Wi-Fi and Bluetooth
iW-G26ISA-512-08G-NIW-XM-12-EM-LI9BXX	Rugged Telematics Device with LTE Cat-4 (NA / Canada), Wi-Fi and Bluetooth

Note:

- *In production order, The Rugged Telematics Device can be configured as per the required features*
- *For more details on custom configurations, please contact iWave sales team at mktg@iwavesystems.com*
- *Part Numbering of configurations may vary, please contact iWave sales team for configuration part number*

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Processor Core and Storage

CPU	Arm® Cortex®-A7 based CPU i.MX 6ULL Micro-Processor
MCU	Arm Cortex-M0+ MCU LPC 804 Micro-Controller
RAM	512MB DDR3L SDRAM (Expandable upto 1GB)
FLASH	8GB eMMC Flash (Expandable upto 16GB)

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
	LTE Cat M1 LTE FDD - B1/ B2/ B3/ B4/ B5/ B8/ B12/ B13/ B18/ B19/ B20/B28 LTE TDD - B39
Wi-Fi	802.11 a/b/g/n/ac Hotspot and client mode With WPA2 feature
Bluetooth	Bluetooth v5.0 BR/EDR/LE

Interfaces and Peripherals

CAN FD	1 port
	Data rate up to 5Mbps
	Identifier Support: 11 and 29 bit
	Classic CAN backwards compatible
High-speed CAN	2 ports
	Data rate up to 1 Mbps
	Identifier Support: 11 and 29 bit
RS232[1] / RS485[1] / K-Line[1]	RS232: 2-wire x 1 port (or) RS485: 4-wire x 1 port (or) K-Line: 1 port (Optional)
Ethernet	10/100Mbps x 1 port (10Base-T/100Base-TX)
Digital Inputs	2 Ports (Max 32V)
Digital Outputs	2 Ports (5V- 24V, Sink Current: 300mA)
Analog Input	2 Ports (0-32V). Through the On-Board MCU
USB	USB OTG x 1 Port

Power Characteristics

Power Input	9 - 32V
Power Consumption	Current consumption at normal mode: 270mA at 12V
Power saving modes	Stand-by Mode: 10mA Deep Power Down Mode : 1.2mA

Positioning

GNSS	GPS/GLONASS/BeiDou/Galileo
Receiving Channel[2]	72 Channel
Time to update position[2]	1s
Receiver sensitivity[2]	Tracking & Nav: –157 dBm
	Cold starts: –146 dBm
	Hot starts: –157 dBm
Time to First Fix[2]	Cold starts: 11.54s
	Warm starts: 2.52s
	Hot starts: 1.82s

Sensors

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

SIM Provision

SIM connector	Micro SIM Connector eSIM[1]

Environmental Conditions

Operating Temperature	-40°C to +70°C [3]
Storage Temperature	-40°C to +85°C [3]

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

[2] Above table gives information about satellite positioning as per the module specification

[3] Temperature range subject to use case and operational functionality

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Security

Security[1] Module	Integrated Hardware Secure Element Crypto-Automotive Security IC Microchip TA100

Antenna

External Antenna Connectors	SMA Connectors : 1 x LTE Primary, 1 x LTE Diversity[1] , 1 x GNSS RP-SMA Connector : 1 x Wi-Fi / BT

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

RTC

RTC[1]	Tiny Real-Time Clock/calendar with alarm function, battery switch-over, time stamp input

LED

LED 1	Red: Power
LED 2	Green: Status Indication
LED 3 & 4	Status 1 & Status 2(Optional)

Software Specifications

Board support package (BSP)	Linux version: 5.15
API Support	• Sensors / Cellular Connectivity / Wi-Fi / Bluetooth • Interface peripherals: CAN Data • Wake-Up based on Ignition / CAN / Timer / Accelerometer/ RTC • LED
Time Synchronization	GNSS and NTP
Power Saving Modes	Stand-By Mode / Deep Power Down Mode
Wake-Up Modes	Ignition / CAN / Timer / Accelerometer/ RTC[1]
CAN Protocol[1]	Socket CAN, ISO 15765-4, CANopen, J1939, UDSonCAN, UDSonIP
Security[1]	• Secure boot • Secure storage • Wi-Fi Security
Software Modules[1]	• 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

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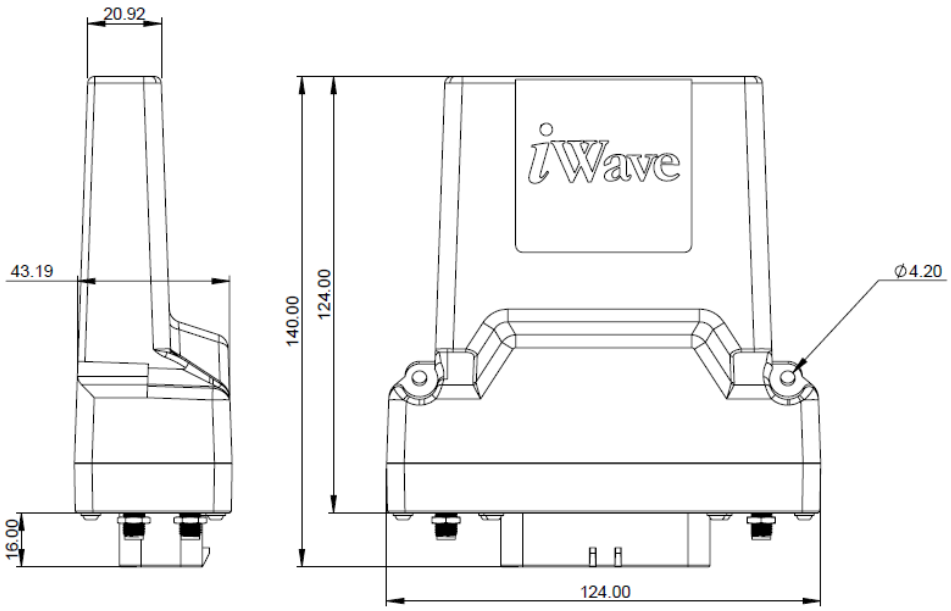
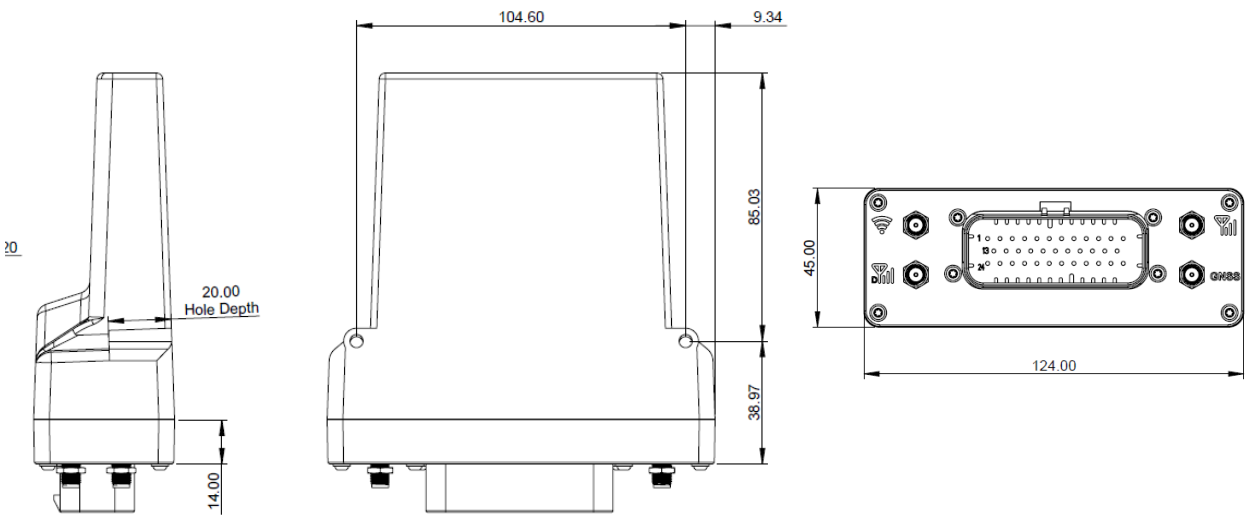
Mechanical	
Dimensions (H x W x D)	140 x 124 x 45 mm
Enclosure Material	Bayblend FR3010
Manufacturing Process	Injection Moulding
Colour of Enclosure	Black (RAL 9005)
Enclosure Surface Finish	Textured Finish
Protection Class	IP67
Mounting Options	Panel mount
Number of Enclosure Parts	2
Enclosure Certification	Flammability rating, UL94-V0

Top View



Bottom View



Rugged Telematics Device

Compliance Test Standards and Certifications*	
Test Cases	**Standards**
Regulatory Test	
FCC	FCC KDB 996369
ISED	▪ ISED RSS-132 ▪ ISED RSS-130 ▪ ISED RSS-139 ▪ ISED RSS-199 ▪ ISED RSS-102
CE	▪ 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
Overvoltage	ISO 17650-2
Reverse voltage	ISO 17650-2
Short circuit protection	ISO 17650-24
Pulse 1	ISO 7637-2
Pulse 2a	ISO 7637-2
Pulse 3a	ISO 7637-2
Pulse 3b	ISO 7637-2
Pulse 4	ISO 16750-2
Pulse 5b	ISO 16750-2
Jump start	ISO 16750-2
Momentary Drop in Supply Voltage	ISO 16750-2
Mechanical Test	
Mechanical shock	IEC 60068-2
Random Vibration Test	IEC 60068-2-64
Sinusoidal vibration Test	IEC 60068-2-6
Environmental Test	
Ingress Protection test	ISO 20653
Humidity test	ISO 16750-4
Temperature Storage test	ISO 16750-4
High temperature operating	ISO 16750-4
Low temperature operating	ISO 16750-4
Temperature Cyclic	ISO 16750-4
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 mktg@iwavesystems.com*

Connector Specifications

Description

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	DIN3[1]	Digital Input 3[1]
2	ANALOG_IN1	Analog Input 1
3	DIN2 / ETH_ACTIVATE[1]	Digital Input 2 / ETH_ACTIVATE[1]
4	HS_CAN2_H	High Speed CAN2 High
5	HS_CAN2_L	High Speed CAN2 Low
6	FD_CAN_H	Flexible Data Rate CAN High
7	FD_CAN_L	Flexible Data Rate CAN Low
8	IGN_DET	Ignition Detection Input
9	RS485_RX_M[1]	RS485 RXM[1]
10	RS232_RXD1[1]/ RS485_RX_P[1] / UART_RXD[1]	RS232 RXD1[1] / RS485 RXP[1] / UART_RX[1]
11	ETH_MAG_RXP	Ethernet RXP
12	ETH_MAG_RXM	Ethernet RXM
13	DIN4[1]	Digital Input 4[1]
14	USB_OTG_ID / DOUT3[1]	USB_OTG_ID / Digital Output 3[1]
15	DOUT2	Digital Output 2
16	DOUT1	Digital Output 1
17	HS_CAN1_H	High Speed CAN1 High
18	HS_CAN1_L	High Speed CAN1 Low
19	ANALOG_IN2	Analog Input 2
20	RS232_TXD1[1]/ RS485_TX_P[1] / UART_TXD[1]	RS232 TXD1[1] / RS485 TXP[1] / UART_TX[1]
21	RS485_TX_M[1] / K-Line[1]	RS485 TXM[1] / K-Line[1]
22	ETH_MAG_TXP	Ethernet TXP
23	ETH_MAG_TXM	Ethernet TXM
24	MAIN_VCC_OBD_IN	Power Input (12V Typical)
25	GND_OBD	Ground
26	DIN1	Digital Input 1
27	UART5_TX	Debug UART_TX
28	UART5_RX	Debug UART_RX
29	I2C2_SCL[1] / ETH_ACTIVATE[1]	I2C2_Serial Clock[1] / ETH_ACTIVATE[1]
30	I2C2_SDA[1] / USB_OTG_ID[1]	I2C2_Serial Data[1] / USB_OTG_ID[1]
31	VCC_3V3	3.3V Power Out
32	5V_USB	USB Power
33	USB_OTG_D+_CONN	USB_OTG_D+
34	USB_OTG_D-_CONN	USB_OTG_D-
35	USB_GND	USB_GND

[1] Marked one are optional features which are not supported by the standard configuration .. For example, pin 3 is DIN2 / ETH_ACTIVATE[1], per standard delivery DIN2 is supported and ETH_ACTIVATE[1] is an optional feature. For optional features support, contact your representative at iWave.

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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.

Telematics Gateway

The i.MX 8XLite powered Telematics Gateway is built with extensive interfaces: 4 CAN Interfaces, RS232, RS485, Analog Inputs and Digital Inputs. With the support for multiple protocols and powerful edge firmware, the gateway is suitable for wide range of applications.

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 Connectivity Hub

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

Document Revision History

Document Number	iW-PRGST-DS-01-REL1.4	
Release	**Date**	**Description**
1.0	27th April 2022	Draft Release
1.1	18th July 2022	Updated Antenna & Power modes
1.2	08th Nov 2022	Additional info added to Wake-Up Modes & Mechanical Features
1.3	4th July, 2023	Updated Certifications & Technical Specifications
1.4	7th Feb, 2024	Updated Certifications and Technical Specifications

CONTACT US

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NOTE: "Please refer the actual configuration that has been ordered. Few sections of this manual may not apply, depending on the ordered configuration"