iW-RainboW-G26

Telematics Control Unit Technical Specification

iWave
Embedding Intelligence

Document Revision History

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Standard Clause

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

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1. HARDWARE SPECIFICATION

Category	Details	Remarks
Processor	Arm® Cortex®-A7 based CPU @ 792MHz i.MX 6ULL	Part number: MCIMX6Y2CVM08AB
RAM	DDR3L SDRAM – 512MB	
Flash	eMMC Flash – 8GB	With provision to expand, if required at additional costs
Communication – Cellular	4G LTE with **Cat-M1/Cat-NB1** Band Supported: • LTE FDD - B1/ B2/ B3/ B4/ B5/ B8/ B12/ B13/ B18/ B19/ B20/B28 • LTE TDD - B39 (for Cat-M1 only) • EGPRS - 850/900/1800/1900 MHz **Cat-4 (EX)** Band Supported: • LTE FDD - B1/B3/B7/B8/B20/B28 • WCDMA - B1/B8 • GSM/EDGE - B3/B8 **Cat-4 (NAX)** Band Supported: • LTE FDD - B2/ B4/ B5/ B12/B13/ B25/ B26 • WCDMA - B2/ B4/ B5	The cellular module is certified for different carrier and regulatory requirements. Note: TCU device will be pre-configured with the Cellular Module as per the requirement.
Communication – Wi-Fi	802.11 b/g/n/ac Wi-Fi Module with hotspot and client mode. PCB Built-in Antenna. With WPA2 feature	Support for both 2.4GHz & 5GHz, not simultaneously
Communication – Bluetooth	Bluetooth v5.0 BR/EDR/LE For the Bluetooth, no profiling stack has been considered.	Interface support to the CPU is Host Controller Interface (HCI)
Communication – Cellular – SIM Provision	Micro SIM / eSIM SIM Support is provided either through the Micro SIM connector or eSIM provision on the PCB	Default configuration support Micro Sim. eSIM to be provided by the customer 1 month before the assembly. And to be shipped to the EMS, by the customer.
Positioning	Integrated GPS Module – GNSS: GPS / GLONASS AGPS Feature: GLONASS	For GNSS, Optional to expand to BeiDou / Galileo Support. For AGPS, only GLONASS support is available

Antenna	• Internal Antenna for GNSS • Internal Antenna for Cellular Primary • Internal PCB trace Antenna for the WiFi/BLE • On-board U.FL connector for the External antenna to support Cellular Diversity.	Optional provisions are available in the PCB, with on-board connectors, to provide external antenna for the Cellular Primary, Cellular Diversity, GNSS and WiFi. The selection needs to be either internal or external antenna and needs to be configured at the time of ordering. ***As a default configuration, only the internal (on-board) antenna is configured.***

Protocol - ISO 15765-4 CAN	• Sending and receiving the ISO15765-4 CAN messages through CAN interface.
	• Supports CAN messages having the length greater than 8 bytes.
	• Supports all the standard OBDII PIDs
	• Collection and parsing of the following parameters as per ISO 15765-4 Protocol
	  ○ Engine coolant temperature
	  ○ Vehicle Speed
	  ○ Ambient Temperature
	  ○ Engine RPM
	  ○ DTC
	  ○ VIN
	  ○ Engine load
		Note: Only the data supported by vehicle can be retrieved by our device. Retrieval of Proprietary data needs information from Manufacturer

Sensors	3 Axis Accelerometer ±2/ ±4/ ±8/ ±16 g full scale	
	3 Axis Gyroscope ±125/±250/±500/±1000/±2000 dps	
	3 Axis Magnetometer Up to ±50 gauss magnetic dynamic range	
Power Input	12V / 24V Tolerance: +/- 10%	Through 18 Pin Micro-Fit Connector
CAN	• HS CAN x 1 Port • Meets the physical layer requirements of ISO 11898-2:2016	Data rate up to 1 Mbps

CAN	• CAN FD x 1 Port • Meets the physical layer requirements of ISO 11898-2:2016 • Meets the datalink layer requirements of ISO 11898-1:2015	• Data rate up to 5 Mbps • Classic CAN backwards compatible • +/- 42 V Bus fault protection +/- 12 V common mode
CAN	• LS CAN x 1 Port • Meets the physical layer requirements of ISO 11898-2:2016	Data rate up to 125 kbps Note: Based on requirement, instead of LS CAN, HS CAN can be supported
Ethernet	• 10/100Mbps: 1 Port • (10Base-T/100Base-TX) • IEEE 802.3 ENDEC, 10BASE-T Transceivers and Filters • IEEE 802.3 PCS, 100BASE-TX Transceivers and Filters • With ESD Protection – 4 kV Human Body Model • With the support of Eth_Activate. • Through the 18 Pin Microfit connector	
UART	• Through the 18 Pin connector (UART6) • DOUT x 1, DIN x 1 • Note: TXD and RXD pins are only in the TTL mode.	The corresponding 12V buffering needs to be done externally, if required.
Temperature Support (Excluding Battery)	Operating Temp.: -20°C to +70°C (Excluding Battery) Storage Temp.: -20°C to +70°C (Excluding Battery)	Components can withstand upto + 85°C
Battery	Lithium-ion Polymer (LIP) 3.7V 1500mAh	• Temperature Support: Battery when discharging: -20°C to +60°C Battery when charging: 0°C to 45°C • Certified with UN38.3 and IEC 62133-2

Battery Indication	Voltage based Monitoring Battery charging indication	
LED	Two LEDs are mounted in the PCB, inside the enclosure. LED 1: RED – Power Indication LED 2: Green - Status Indication	For LED 2, API will be provided for Configuration

Note:

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2. SOFTWARE SPECIFICATION

Category	Details	Remarks
Board support package (BSP)	• U-Boot 2015.04 • Linux version: 4.1.15	
Software Support	• API for Access to Sensors / Modem / Connectivity and Interface peripherals • Power Management – Libraries/API for device wake-up based on Ignition / CAN • API for LED	More detailed information in the API Reference Manual
Data Collection Test Application	• Fixed parameters collected for GPS, CAN, Sensor • Fixed Interval Sampling • Data communication through LTE Modem	
Cloud Communication	• Default: MICROSOFT Azure Platform	AZURE Credentials to be purchased by customer

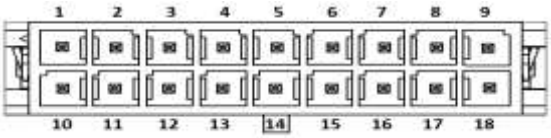
3. ENCLOSURE SPECIFICATION

Sl.No	Category	Details
1	Dimension	106 X 87 X 28.5 mm (approximate)
2	Weight	85 gm (Enclosure alone)
3	Enclosure Material	Polycarbonate UL 94 V0
4	Manufacturing Process	Injection Moulded
5	Assembly Type	Snap Fit
6	Colour of Enclosure	Black (RAL 9005) Opaque
7	Enclosure Surface Finish	Texture Finish VDI 30
8	Protecting Class	IP 30
9	Mounting Options	Slots for Cable Tie
10	Number of Enclosure Parts	2
11	Certification – for the Enclosure	Flammability rating, UL94-V0

4. Y-CABLE SPECIFICATIONS

External 18 Pin Micro-Fit interface connector	
Connector Specification	• Number of Pins - 18 • TCU Connector Part Number - CP3518P1HST-NH • Mating Connector Part Number (for reference to make cables) - CP3518S0010-NH and crimp pins from CviLux

Connector Pinout



Pin No	Signal Name	Description
1	CAN3-HS-High	CAN3 bus I/O line high level
2	UART RXD	Debug UART RXD
3	CAN1-FD-High	CAN1 FD bus I/O line high level
4	Battery +	External Battery Input Voltage Positive
5	IGN_DET	Ignition Detection Input
6	UART TXD	Debug UART TXD
7	DOUT	Digital OUT
8	ETHERNET_TXM	Ethernet TXM
9	ETHERNET_RXM	Ethernet RXM
10	CAN3-HS-Low	CAN3 bus I/O line low level
11	DIN	Digital IN
12	CAN1-FD-Low	CAN1 FD bus I/O line low level
13	CAN2-HS-High	CAN2 bus I/O line high level
14	CAN2-HS-Low	CAN2 bus I/O line low level
15	Battery -	External Battery Input Voltage Negative
16	ETH_ACTIVATE	Ethernet Activate (with 510E pull up)
17	ETHERNET_TXP	Ethernet TXP
18	ETHERNET_RXP	Ethernet RXP

Note:

Above Signal names are for reference only. Few Signal names & Pin No will change depending upon the configurations.

Standard Y-Cable with ISO 15765-4 CAN Interface Specifications	
Specification	• Standard Off the Shelf Available Y- Cable Customised Cable, if required, will be taken up at additional costs • P1 : 18 pin TCU mating Connector • P2 : Standard Male OBD II connector • P3 : Standard Male OBD II connector (Blue in Colour) • P4 : 10 pin IO Connector

Y-Cable Pinout

Pin No	Standard OBD II Connector (CAN)-P2	Standard OBD II Connector (Ethernet)-P3	IO Connector-P4
1	CAN3-HS-High	IGN_DET	UART TXD
2	NC	NC	UART RXD
3	CAN1-FD-High	ETHERNET_RXP	DOUT
4	NC	NC	DIN
5	GND	GND	Battery -
6	CAN2-HS-High	CAN2-HS-High	Battery +
7	NC	NC	IGN_DET
8	CAN3-HS-Low	ETH_ACTIVATE	NC
9	NC	NC	NC
10	NC	NC	NC
11	CAN1-FD-Low	ETHERNET_RXM	
12	NC	ETHERNET_TXP	
13	NC	ETHERNET_TXM	
14	CAN2-HS-Low	CAN2-HS-Low	
15	NC	NC	
16	Battery +	Battery +	

Note:

Above Signal names are for reference only. Few Signal names & Pin No will change depending upon the configurations.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