Technical Specification Document

DeIOT4G
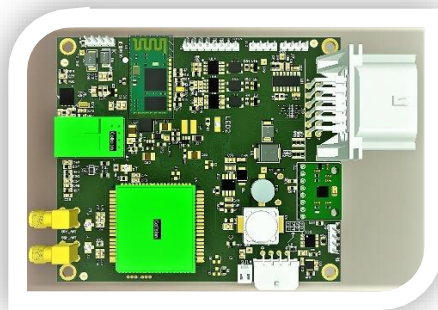
DEVISE ELECTRONICS Pvt. LTD   shekhar.malani@deviseelectronics.com
Office No 207-208, Wing B,   +91-7219204002
Satyam Industrial Estate,
SBI Lane, Off Gulwani Maharaj Road   sumedh.pise@deviseelectronics.com
Erandwane,   +91-8793691003
PUNE, Maharashtra 411038, INDIA   www.deviseelectronics.com

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INTRODUCTION

- DEL_MEGA200 DATALOGGER is IoT based system device used to receive and log data from vehicle through CAN communication. The main feature of datalogger is having three separate CAN channel to reduce data traffic & create multipurpose powertrain data analysis.

- DEL_MEGA200 DATALOGGER electronics unit consist of following embedded facilities:
    1) SD card Data Logging
    2) 4G GSM connectivity
    3) GPS connectivity
    4) Real time Clock accessibility
    5) CAN communication
    6) Wi-Fi communication
    7) Bluetooth 5.0 (BLE) communication
    8) Open-source/customized android application for datalogging

- The multipurpose of datalogger unit can analyze & gather Vehicle information within minimum timestamp so as to keep track of requirement and telemetry data posted to cloud via GSM configuration with GPS coordinates (Latitude, longitude, altitude) & current time stamp.

- The SD card datalogging feature help to keep the data tracking where GPS/GSM data loss happens during system level application & .csv data file format is getting created as reference. The DEL_MEGA200 DATALOGGER is enable with IoT interface as logged data file in SD card can be posted to server via FTP protocol.

- The DEL_MEGA200 DATALOGGER is enable with Wi-Fi interface which will able to explore local Wi-Fi network as well as connect to 150 feet indoor & 300 feet outdoor area. Also, device is configured with Bluetooth (Bluetooth low energy) chip BLE 5.0 able to generate encrypted point to point wireless data transfer.

- Overall, DEL_MEGA200 datalogging activity available with SD card, open-source/customized android application & IoT configured data logging on server.

METHODOLOGY

Hardware & Software Specification

Device Features

- ❖ 3 X CAN Trans-receiver for powertrain communication
- ❖ 1 X GPS onboard Integration available
- ❖ 1 X GSM onboard Integration available for sending data to cloud
- ❖ 1 X SD card onboard Integration available
- ❖ 68 X general purpose Input/Output onboard and offboard available
- ❖ 4 X ADC input off board available
- ❖ 1 X Wi-Fi chipset available
- ❖ 1 x Bluetooth chipset available
- ❖ 1 X Ignition circuit available
- ❖ 1 X EEPROM interface available
- ❖ 2 X dual SIM card support available
- ❖ 1 X RS485 interface available
- ❖ 1 x RS232 interface available
- ❖ 1 X GYROSCOPE interface available

Hardware Technical Specifications

Parameter	Description
Microcontroller	STM 32 Bit cortex 1.0 MB FLASH 144-LQFP • 3.3 V power supply • -40 °C to 85°C temperature range
GSM Module	Quectel EC20 R2.1 LTE + GNSS Module
GPS Module	Quectel EC20 R2.1 LTE + GNSS Module
Antenna	GSM & GPS antenna Integrated on board
SD card	SDMMC/SDHC card support using SDIO interface
CAN Module	Trans receiver for Vehicle CAN communication
RTC	Onboard Real time clock for timestamp calculations
Wi-Fi	Wi-Fi chip for local network connection establishment
Bluetooth	BLE 5.0 (Bluetooth Low energy) latest chip set
GYROSCOPE	Gyroscope for wheel rotation measurement
I2C/SPI	Controller peripheral interface protocol available
UART/RS232/RS485	Serial communication protocol onboard

Power Supply Requirements (PSHR) for Hardware

- ❖ Power consumption of unit: ±50mA
- ❖ Actual Input Voltage requirement: 12V
- ❖ Maximum current: 4A for GPIO (General purpose input/output) driver pins.
- ❖ Supply Range:
    - ▪ Minimum input supply: 8V
    - ▪ Maximum input supply: 32V

Hardware Protections

- ❖ Over Voltage protection
- ❖ Reverse polarity protection
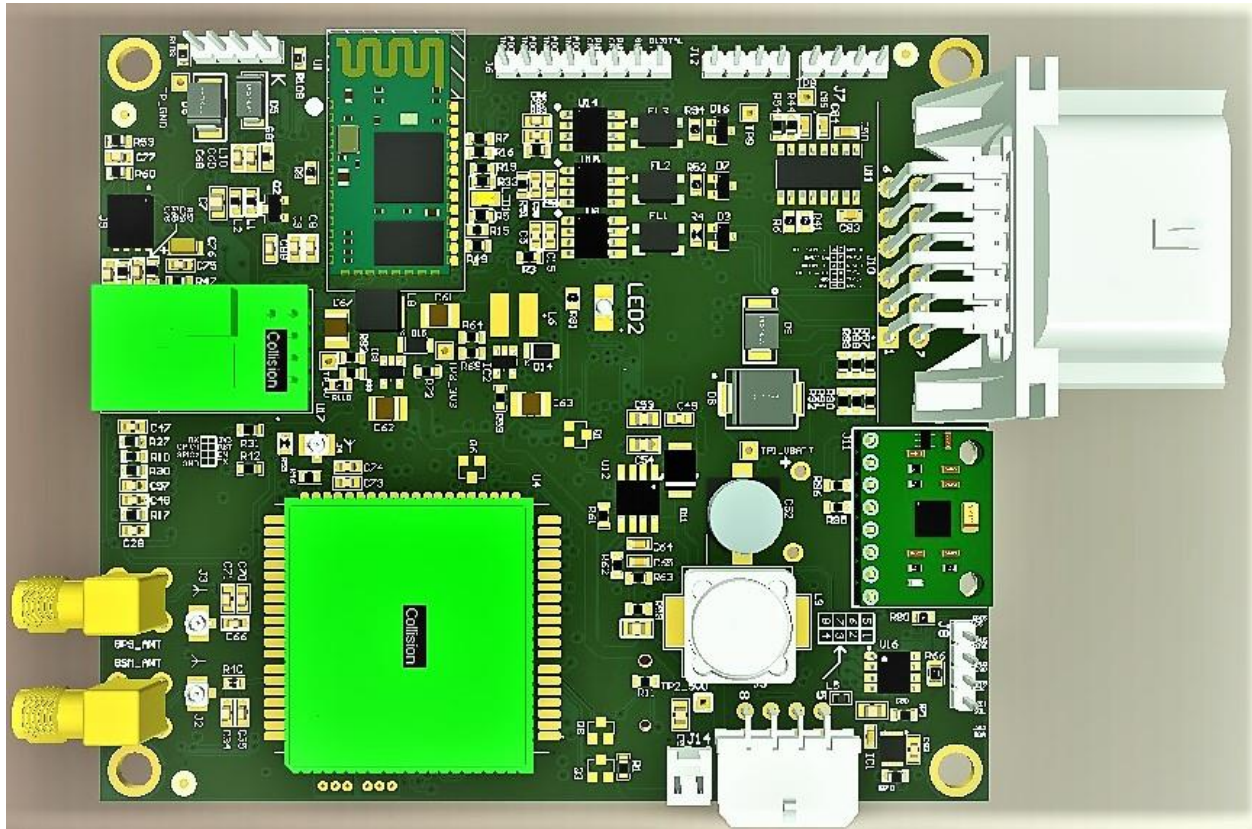- ❖ Surge current protection

Hardware PCB design
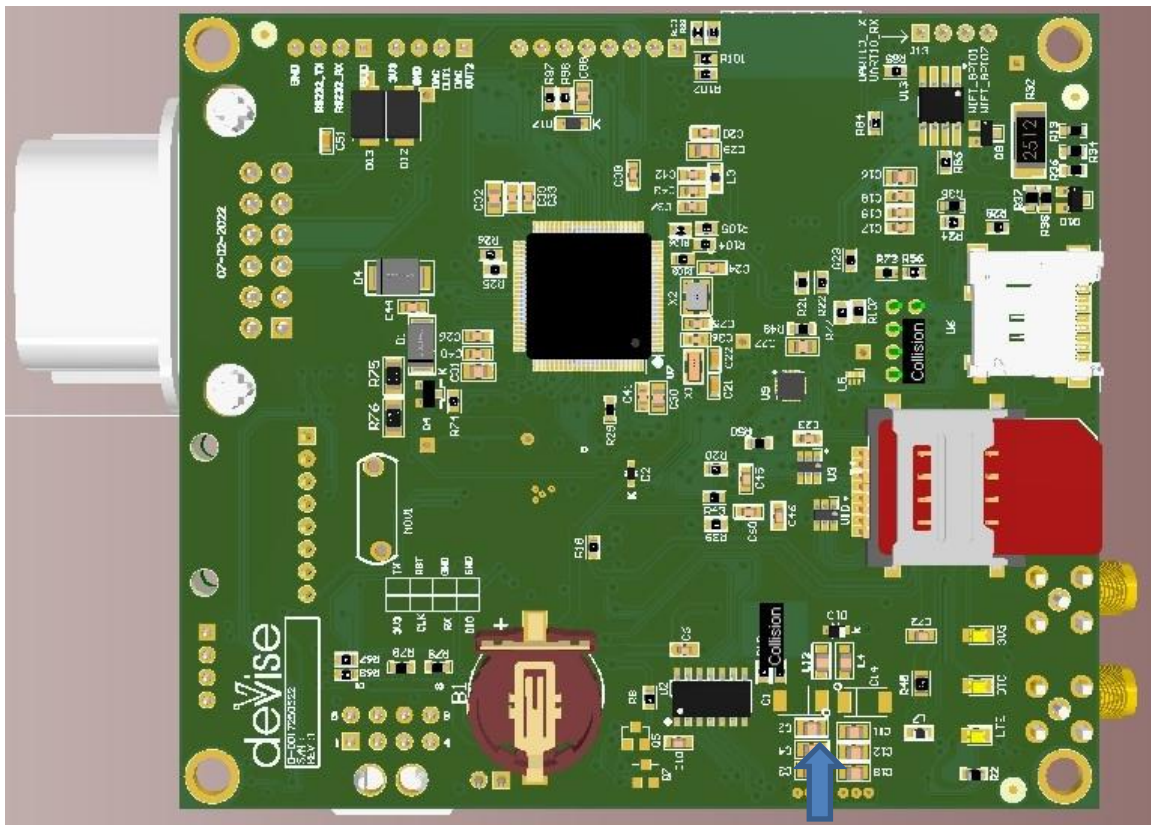

Figure 1: (PCB TOP VIEW)

PCB View for SD card & SIM Card Insertion

SIM CARD

Procedure for SIM card Insertion:

- Please verify the card position before insertion.
- PCB consist of SIM card holder having spring lock which will lock the SIM card after insertion.

Antenna connection

GPS

GSM

Procedure for SD card Insertion:

- Please verify the card position before insertion.
- PCB consist of SD card holder having spring lock which will lock the SD card after insertion.

SD CARD

Figure 2: (PCB BOTTOM VIEW)

IoT Harness details

Connector details: -

- CONNECTOR Part Number: 36783-1201

- CONNECTOR MATING Part Number: 36792-1201

- CONNECTOR CRIMP PIN Part Number: 36799-0002

- CONNECTOR CAVITY SOCKET Part Number: 0368040001

Connector Pin Layout: -

1	2	3	4	5	6
7	8	9	10	11	12

Connector Pin detailed Pin description: -

PIN NO	LABEL	WIRE COLOR	WIRE LENGTH
1	VBAT	RED COLOR	1 METER
2	GROUND	BLACK COLOR	1 METER
3	ON OFF SWITCH	ANY COLOR	1 METER
7	CAN1_L	BLUE COLOR	1 METER
8	CAN1_H	YELLOW / GREEN COLOR	1 METER
9	CAN2_L	BLUE COLOR	1 METER
10	CAN2_H	YELLOW / GREEN COLOR	1 METER
11	CAN3_L	BLUE COLOR	1 METER
12	CAN3_H	YELLOW / GREEN COLOR	1 METER