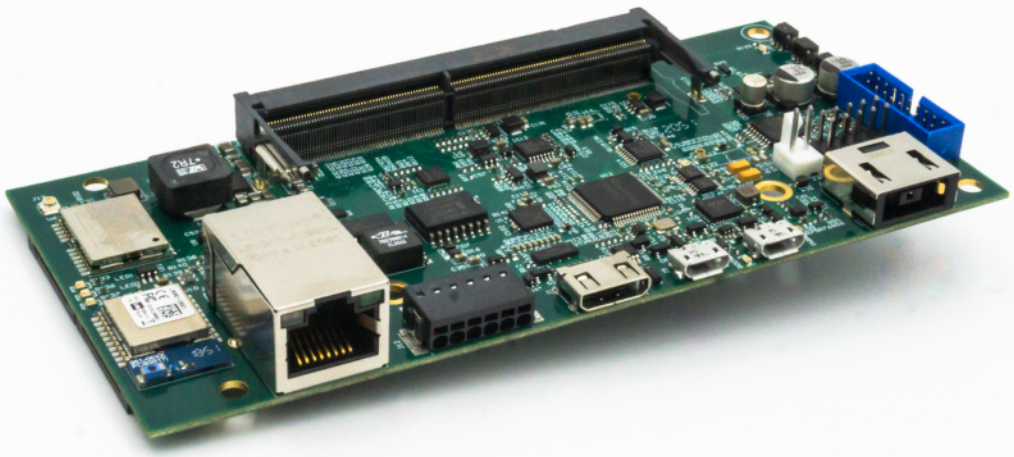
LITA CARRIER BOARD

for NVIDIA®Jetson™ Nano / TX2 NX / Xavier NX

Development Board Model V2.92

BARO ENGINEERING



Designed for CAV's and robotics

LITA CARRIER BOARD is a board designed to be used in the more sophisticated robotics applications with AI, providing compatibility with **NVIDIA Jetson NANO, TX2 NX** and **XAVIER NX**.

The board supplies the peripherals to have a good accuracy in terms of localization, e.g. a built-in automotive grade localization peripheral: a GPS with dead reckoning, offering an advantageous method to localise the device despite an intermittent satellite signal. A **LOCOSYS GPS** module (encasing an IMU) provides a gyroscope, an accelerometer.

In regards to connectivity an M2.KEY B slot is to be used with a **4G/5G** Modem to connect the board to the cloud, completing the communication with a **Bluetooth 5.0** module.

For Computer Vision the board provides Interfaces for **4 MIPI-CSI2 cameras** offering an incredible opportunity to have **360 degrees** to recognise objects and the CANBUS interface to communicate with the robot actuators.

KEY FEATURES

- **Artificial vision**
- **Localization:** GPS with dead reckoning, IMU
- **Communication:** 4G/5G, Bluetooth 5.0
- **CAN-FD interface** (compatible CANBUS) to control actuators
- **MULTICAM** interfaces up to 4 cameras x 2-lane MIPI CSI-2

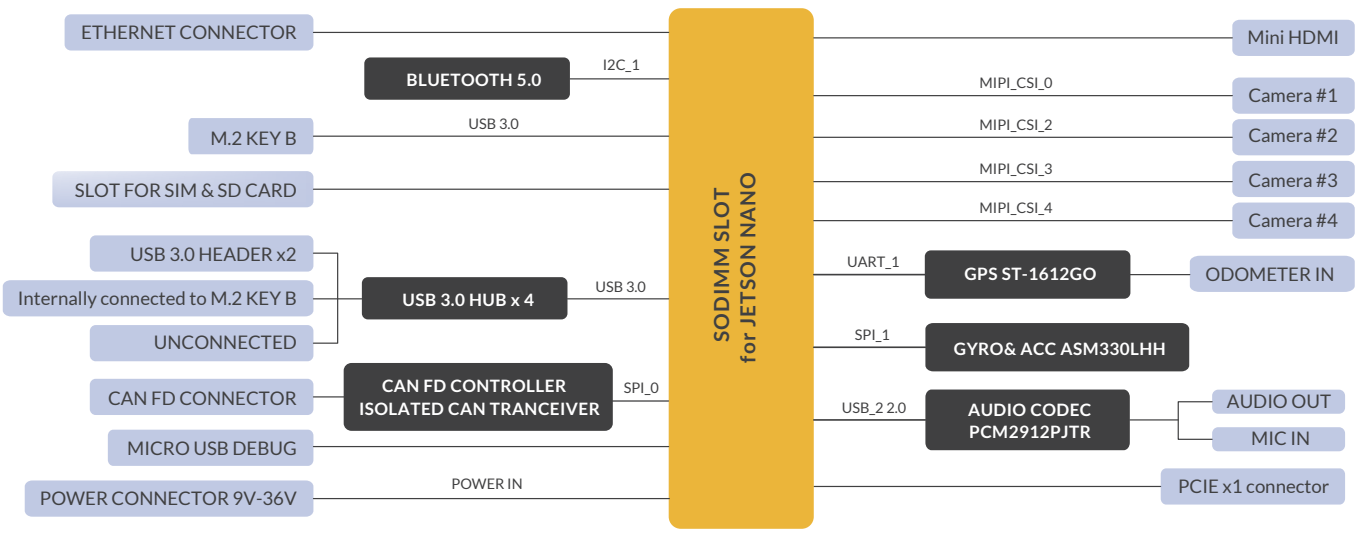
NVIDIA INCEPTION PROGRAM

TECHNICAL SPECIFICATIONS*

Compatibility	• NVIDIA® Jetson Nano™ / TX2 NX / XAVIER NX
Power Supply	• 9 to 36 VDC power input on DC power plug connector
Dimensions	• Board size: 137 x 65 mm
Communication Interfaces	• Gigabit Ethernet on an RJ45 connector • Bluetooth 5.0 • M.2 (Key B) connector exposing PCIe x1 and USB 3.0 (usually for 4G module) • SIM Card Slot • 2 port USB 3.0 header connector • CAN-FD transceiver (compatible CANBUS) • Micro USB debug connector • 10-pin FFC connector exposing PCIe x1 interface (when used with NX)
Display Output	• Mini HDMI video output interface
Video Input	• 4 cameras input 15-pin 1mm-pitch FFC connector exposing 2 lanes CSI-2 each one (compatible Raspberry Pi camera)
Storage	• Micro SD
Robotics Peripherals	• GPS module with dead reckoning - Automotive Grade • IMU MEMS - Accelerometer and Gyroscope sensors - Automotive Grade
Sound Interface	• 10-pin header connector exposing a mono microphone input and stereo output
Other features	• RTC battery backup • EEPROM for storing board ID/SN

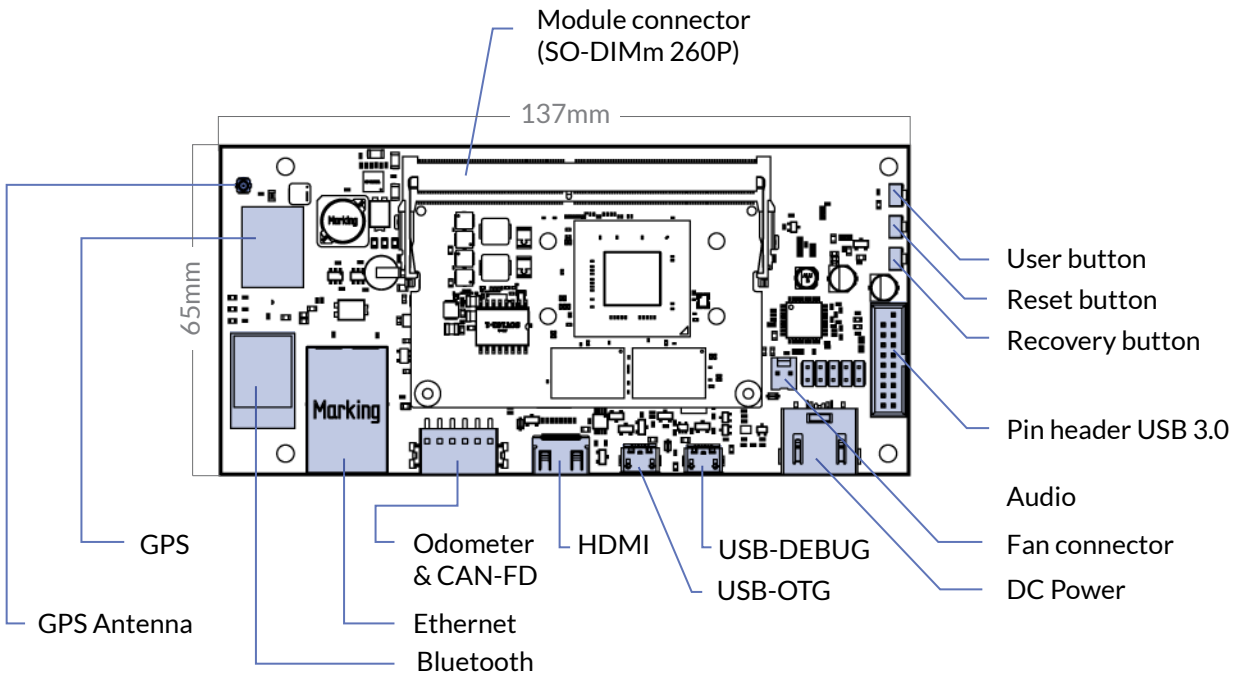
**Specifications subject to change without notice.*

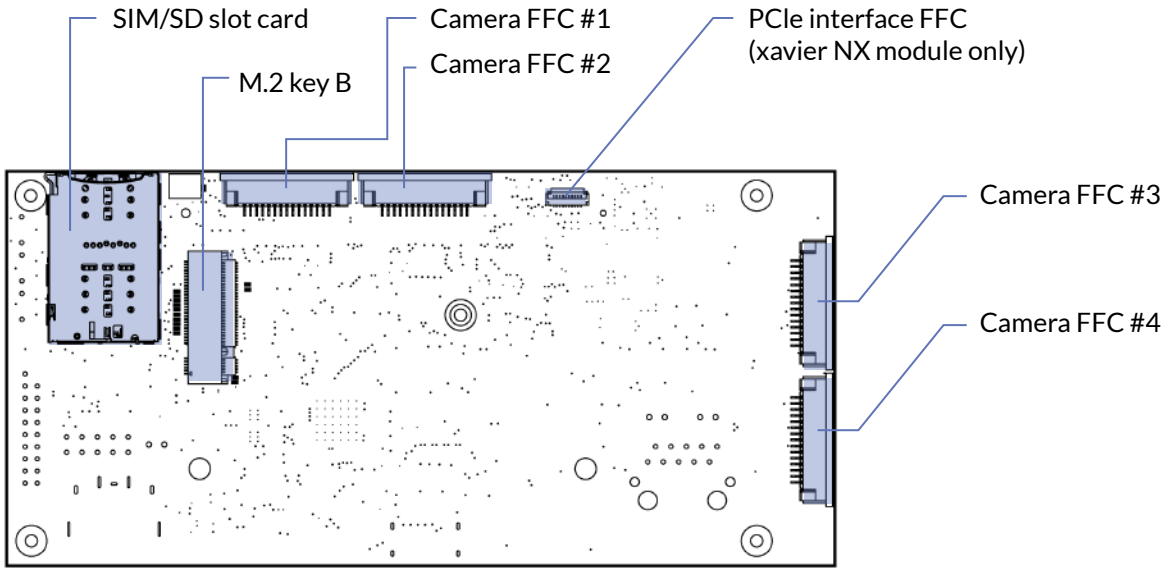
BLOCK DIAGRAM



PIN DETAIL JETSON NANO WITH PERIPHERALS

PERIPHERALS	INTERFACE	PIN	FUNCTION	DESCRIPTION
BLUETOOTH	I2C_1	189 191	I2C1_SCL I2C1_SDA	Serial clock Serial data
M.2 KEY B	USB3.0 of the HUB			Connected to the HUB
SIM SLOT				Comes from the M.2 KEY B, to get enable te connectivity through a 4G module.
SD SLOT		229 219 221 223 225 227	SD_CLK SD_DAT0 SD_DAT1 SD_DAT2 SD_DAT3 SD_CMD	SDIO Clock SDIO Data 0 SDIO Data 1 SDIO Data 2 SDIO Data 3 SDIO Command
USB 3.0 HUB	USB3.0	115 117 166 168 161 163	USB1_D_N USB1_D_P USBSS_TX_N USBSS_TX_P USBSS_RX_N USBSS_RX_P	USB 2.0 Port 1 Data- USB 2.0 Port 1 Data+ USB SS Transmit– USB SS Transmit+ USB SS Receive– USB SS Receive+
CAN-FD	SPI_0	91 93 89 95	SPI0_SCK SPI0_MISO SPI0_MOSI SPI0_CS0	SPI 0 Clock SPI 0 Master In / Slave Out SPI 0 Master Out / Slave In SPI 0 Chip Select 0
GPS	UART_1	203 205	UART1_TX UART1_RX	UART #1 Transmit UART #1 Receive
GYRO&ACC	SPI_1	106 108 104 110	SPI1_SCK SPI1_MISO SPI1_MOSI SPI1_CS0	SPI 1 Clock SPI 1 Master In / Slave Out SPI 1 Master Out / Slave In SPI 1 Chip Select 0
AUDIO CODEC	USB2.0	121 123	USB2_D_N USB2_D_P	USB 2.0 Port 2 Data- USB 2.0 Port 2 Data+
CAMERA #1	CSI_0	4 6 16 18 10 12 114 116	CSI_A_D0_N CSI_A_D0_P CSI_A_D1_N CSI_A_D1_P CSI_A_CLK_N CSI_A_CLK_P FFC1_PWDN FFC1_MCLK CAM0_SCL CAM0_SDA	chanel A lane 0 - chanel CSI_0 lane 0 + chanel CSI_0 lane 1 - chanel CSI_0 lane 1 + chanel CSI_0 clock - chanel CSI_0 clock + camera #1 powerdown or GPIO camera #1 reference clock connected to the I2C multiplexer connected to the I2C multiplexer
CAMERA #2	CSI_2	22 24 34 36 28 30	CSI_E_D0_N CSI_E_D0_P CSI_E_D1_N CSI_E_D1_P CSI_E_CLK_N CSI_E_CLK_P CAM1_SCL CAM1_SDA	chanel CSI_2 lane 0 - chanel CSI_2 lane 0 + chanel CSI_2 lane 1 - chanel CSI_2 lane 1 + chanel CSI_2 clock - chanel CSI_2 clock + connected to the I2C multiplexer connected to the I2C multiplexer
CAMERA #3	CSI_3	21 23 33 35 27 29 120 122	CSI_F_D0_N CSI_F_D0_P CSI_F_D1_N CSI_F_D1_P CSI_F_CLK_N CSI_F_CLK_P FFC3_PWDN FFC3_MCLK CAM2_SCL CAM2_SDA	chanel CSI_3 lane 0 - chanel CSI_3 lane 0 + chanel CSI_3 lane 1 - chanel CSI_3 lane 1 + chanel CSI_3 clock - chanel CSI_3 clock + camera #3 powerdown or GPIO camera #3 reference clock connected to the I2C multiplexer connected to the I2C multiplexer
CAMERA #4	CSI_4	46 48 58 60 52 54	CSI_C_D0_N CSI_C_D0_P CSI_C_D1_N CSI_C_D1_P CSI_C_CLK_N CSI_C_CLK_P CAM3_SCL CAM3_SDA	chanel CSI_4 lane 0 - chanel CSI_4 lane 0 + chanel CSI_4 lane 1 - chanel CSI_4 lane 1 + chanel CSI_4 clock - chanel CSI_4 clock + connected to the I2C multiplexer connected to the I2C multiplexer





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www.barovehicles.com
sales@barovehicles.com
+44 (0) 20 3695 5353