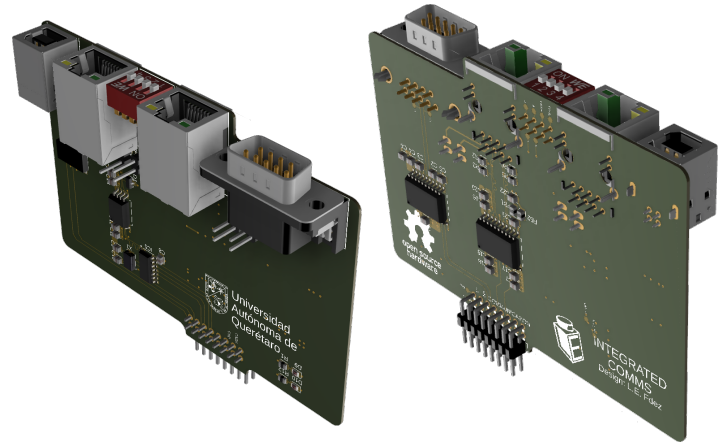


LOW-level Engineering

Integrated Communication Module (Rev. D)

1 Overview

- Fully Isolated CAN FD, RS-485, RS232 Communications Interfaces
- Full Duplex RS-485 Interface
- FTDI USB Transceiver
- Selectable CAN and RS-485 termination resistors
- Selectable 5V Supply on RJ-45 connectors



2 Description

- General purpose isolated communications interfaces transceivers with pin header connectors to be used on the LOW-level Engineering expansion module base as dedicated communications interfaces. (Note. USB interface is not isolated.)
- Communications available are UART to Full duplex RS-232 Bridge, UART to Full duplex RS-485 Bridge, UART to USB Bridge with FTDI driver, SPI to CAN FD controller and transceiver.
- User selectable 5V Supply on RJ-45 connectors to interface and power additional hardware.
- The CAN and RS-485 interfaces can be used as midpoints in the network or terminated with the selectable termination resistors when used for data transmission on larger distances.
- LED indicators are provided for the data transmission in the USB interface in addition to the supply voltage.
- The ADM3251E RS-232 Line driver is used to provide a more robust single device isolated link. Further information can be found in its own **Datasheet**.
- The ADM2587E Full Duplex RS-485 Isolated Transceiver is used to provide a more robust differential data link without an specific protocol implemented. Further information can be found in its own **Datasheet**.
- The FT232RL USB to UART interface is used as it provides an easy link to PC for data transmission. Further information can be found in its own **Datasheet**.
- The MCP2518FD CAN FD Controller with SPI interface is used as the main IC in the CAN interface providing a configurable interface with data packet generation and verification including CRC and Interrupts for data errors and data reception. Further information can be found in its own **Datasheet**.
- The ADM3050E Signal Isolated CAN FD transceiver to complete the CAN interface while providing isolation from the external connected devices. Further information can be found in its own **Datasheet**.

- 4 layer PCB stack-up is used to provide power and signal reference planes (Signal, Power, Ground, Signal).

3 Suggested Applications

- General purpose isolated communications interfaces transceivers.
- UART to RS-485, RS-232 and USB bridge.
- SPI to CAN bridge.

4 Technical specification

	Unit	Value		
		Min	Rated	Max
Digital Supply voltage (isolated ground)	<i>V</i>	3.3	5	-
Analog Supply voltage	<i>V</i>	-	5	-
Supply current	<i>mA</i>	-	50	-
Dimensions	<i>mm</i>	101.93 x 68.81 x 17.96		
Weight	<i>g</i>	-	52	-
Operating Temperature range	<i>°C</i>	0	-	85

5 Termination Resistors Switches

Switch	Signal
1	RS-485 Transmit Output Termination
2	RS-485 Receive Input Termination
3	CAN High signal Termination
4	CAN LOW signal Termination

6 Connector pinout

6.1 Pin Header Connector

Pin	Signal
1	USB UART RX
2	USB UART TX
3	NC
4	CAN controller interrupt pin
5	CAN controller SPI MOSI
6	CAN controller SPI CLK
7	CAN controller SPI CS
8	CAN controller SPI MISO
9	RS-485 UART TX
10	RS-485 UART RX
11	RS-232 UART TX
12	RS-232 UART RX
13	Digital Ground (isolated ground)
14	3.3V (referenced to Digital Ground)
15	Analog Ground
16	5V (referenced to Analog Ground)

6.2 RS-232 Bus DB-9 Connector

Pin	Signal
1	NC
2	RS-232 UART TX
3	RS-232 UART RX
4	NC
5	NC
6	NC
7	NC
8	NC
9	NC
Shield	Analog Ground

6.3 CAN Bus RJ-45 Connector

Pin	Signal
1	CAN High signal
2	CAN LOW signal
3	NC
4	NC
5	NC
6	NC
7	NC/Analog Ground
8	NC/5V (referenced to Analog Ground)
Shield	Analog Ground

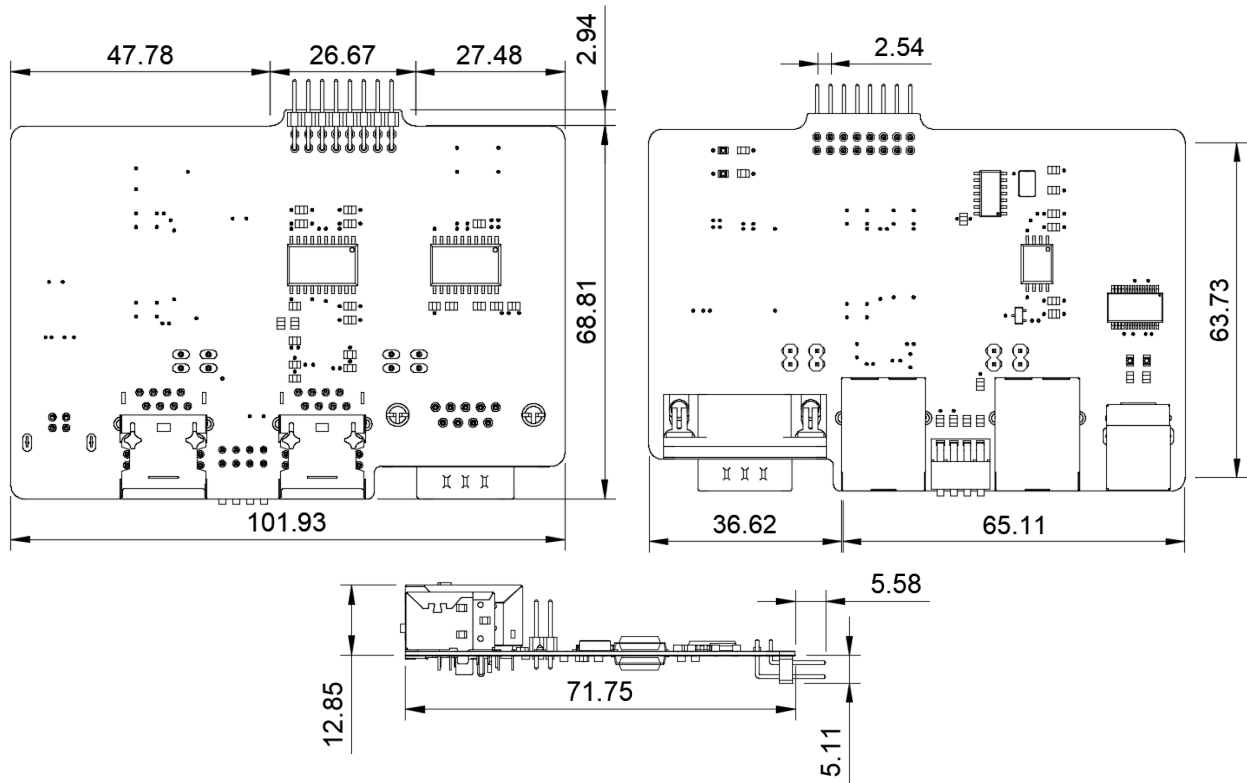
6.5 RS-485 Bus RJ-45 Connector

Pin	Signal
1	NC
2	NC
3	RS-485 Transmit Output Y
4	RS-485 Transmit Output Z
5	RS-485 Receive Input A
6	RS-485 Receive Input B
7	NC/Analog Ground
8	NC/5V (referenced to Analog Ground)
Shield	Analog Ground

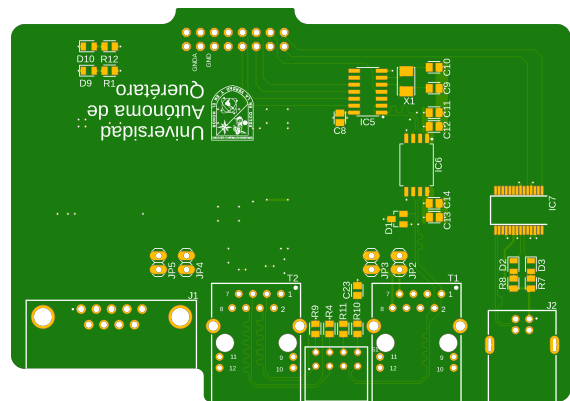
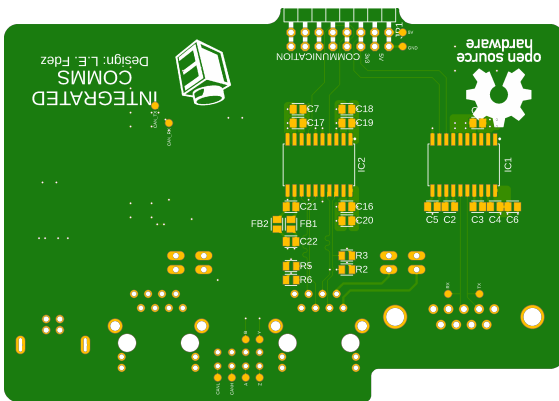
6.4 USB Type B Connector

Pin	Signal
1	USB bus voltage
2	USB Data D-
3	USB Data D+
4	Digital Ground (isolated ground)
Shield	NC

7 Physical dimensions



8 Printed circuit board



9 Schematic diagram

