

PRODUCT DATASHEET



Soldered Qwiic I2C Long Range Extender LTC4331

333415

A Qwiic board that carries I2C over a twisted-pair cable to a second board, up to 30 m at 1 MHz or over 1200 m at lower speeds.

Full product documentation, files and tutorials: solde.red/333415

CORE ATTRIBUTES

SKU **333415**DIMENSIONS **38.0 × 22.0 × — mm**ORIGIN **HR**

DESCRIPTION

I2C was made for short connections on a single board, and a Qwiic cable that stretches much past a metre or two soon stops working. This board turns your I2C bus into a differential link carried by a standard Ethernet cable, so sensors and other I2C devices can live in another room, at the far end of a greenhouse or across a building.

The link needs two boards, one at each end of the cable. The board next to your microcontroller acts as the local side, which is the default. On the board at the far end, connect the REMOTE pin to 3.3 V to make it the remote side, and it will drive the I2C devices attached to it. Your code stays the same: devices at the far end answer at their usual addresses, as if they were on the same bus.

The board's core is the LTC4331 from Analog Devices. Solder jumpers select the link speed, from 1 MHz Fast-mode Plus over as much as 30 m of cable down to 100 kHz over 1200 m, and slower rates beyond that.

Connect your microcontroller or I2C devices through the Qwiic connector, or solder the 2.54 mm headers and use the board on a breadboard. The RJ45 jack takes a standard Ethernet cable and carries the differential pair together with 3.3 V and ground. The headers also bring out the LTC4331's control and status pins: ON to switch it into low-power mode, RDY and LINK to check that the link is up, ALERT to pass interrupts back from the remote side, and CTRL to send one digital signal to the far end.

TECHNICAL DETAILS

- IC: Analog Devices LTC4331 rugged I2C extender
- Link: differential over twisted-pair cable with an RJ45 jack
- Link speed and maximum cable length, selected with the SPEED1/SPEED2 jumpers: 1 MHz / 30 m · 500 kHz / 60 m · 250 kHz / 200 m · 125 kHz / 600 m · 100 kHz / 1200 m · 63, 31, 20 and 12.5 kHz / over 1200 m

- Default speed setting: SPEED1 low, SPEED2 low (1 MHz, 30 m)
- Mode: local by default (the LTC4331 weakly pulls the REMOTE pin low) or remote (REMOTE tied to 3.3 V)
- Control device I2C address: 0x77 (default), or 0x3C - 0x3F / 0x74 - 0x76 with the A1/A2 jumpers, or disabled
- Power supply: 3.3 V
- I/O logic level: 3.3 V
- Pull-up resistors: 10 kΩ on SDA/SCL, disconnectable via a solder jumper
- Connectors: one Qwiic, one RJ45, two 6-pin 2.54 mm headers
- Operating temperature range: -40 °C to 85 °C (LTC4331I)
- Board dimensions: 38 × 22 mm
- Mounting: two 3.2 mm holes

SPECIFICATIONS

INTERFACE	I2C
QWIIC COMPATIBLE	Yes
I2C ADDRESS DEFAULT	0x77
I2C ADDRESS CHANGEABLE	Yes
BREADBOARD COMPATIBLE	Yes
IC PART NUMBER	LTC4331
SUPPLY VOLTAGE MIN V	3.3
SUPPLY VOLTAGE MAX V	3.3
LOGIC LEVEL	3V3 Only
OPERATING CURRENT (mA)	65 mA
SLEEP CURRENT uA	40
PROTECTION FEATURES	Esd

DOCUMENTS

Main IC Datasheet · EN

https://cms.soldered.com/products/333415/documents/ic-datasheet/333415_ic-datasheet_7e37e8.pdf