Microfire LLC Isolated Dev Board

Single, Double, Triple

Release Information

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Release History

Release	Date	Description
1.0.0	5/5/2021	Initial

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Microfire LLC Isolated Dev Board

Description

The Isolated Qwiic Dev Board is a development board that incorporates a Microfire Mod–ISO and sensor module together with two Qwiic connectors, a Pass Through Hole I²C header, a U.FL probe connector, and a 1–Wire connector for using a 1–Wire Temperature Sensor.

Features

- Universal carrier board for isolation and sensing modules, available in single, double, and triple isolation/sensor configurations
- EN pin allows the board to fully shut–down, reducing current to nearly 0 mA
- Allows for a fully functional module system
- Designed to allow easy incorporation into existing hardware
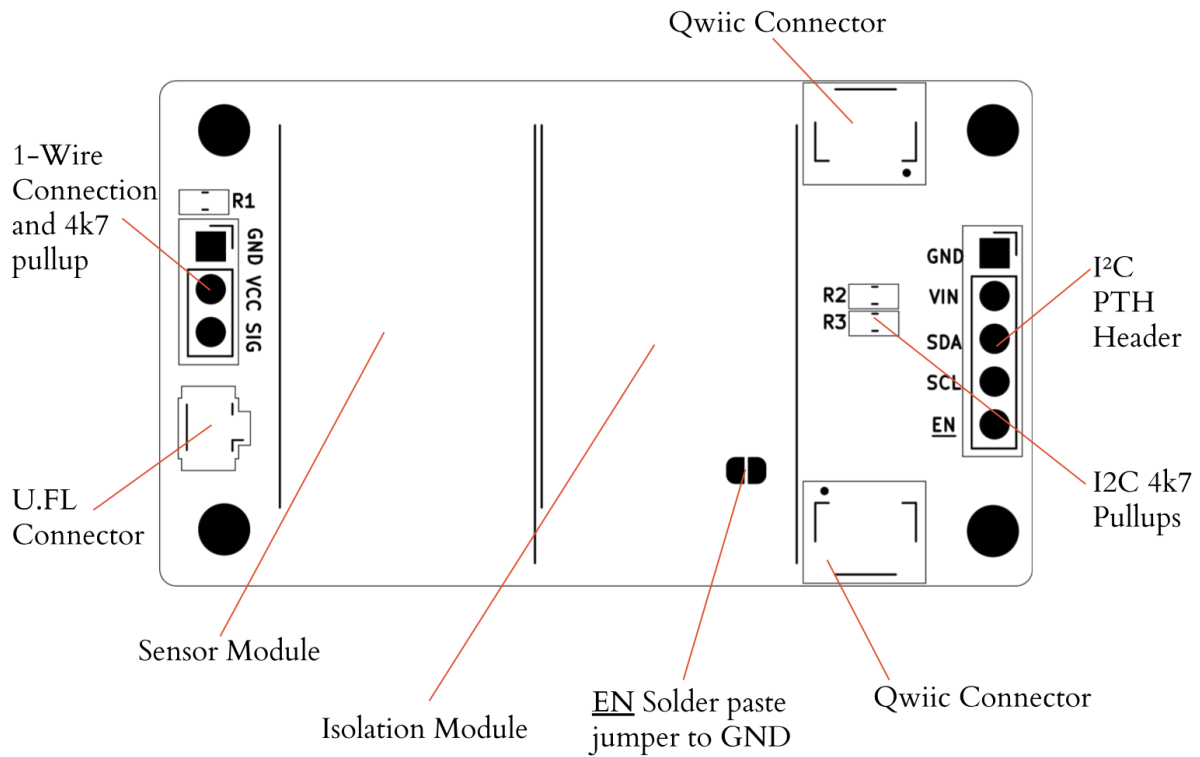
Single Version

Double version

3

2

R1
GND VCC SIG

1

2

JP1

1

R2
R3

GND
VIN
SDA
SCL
EN
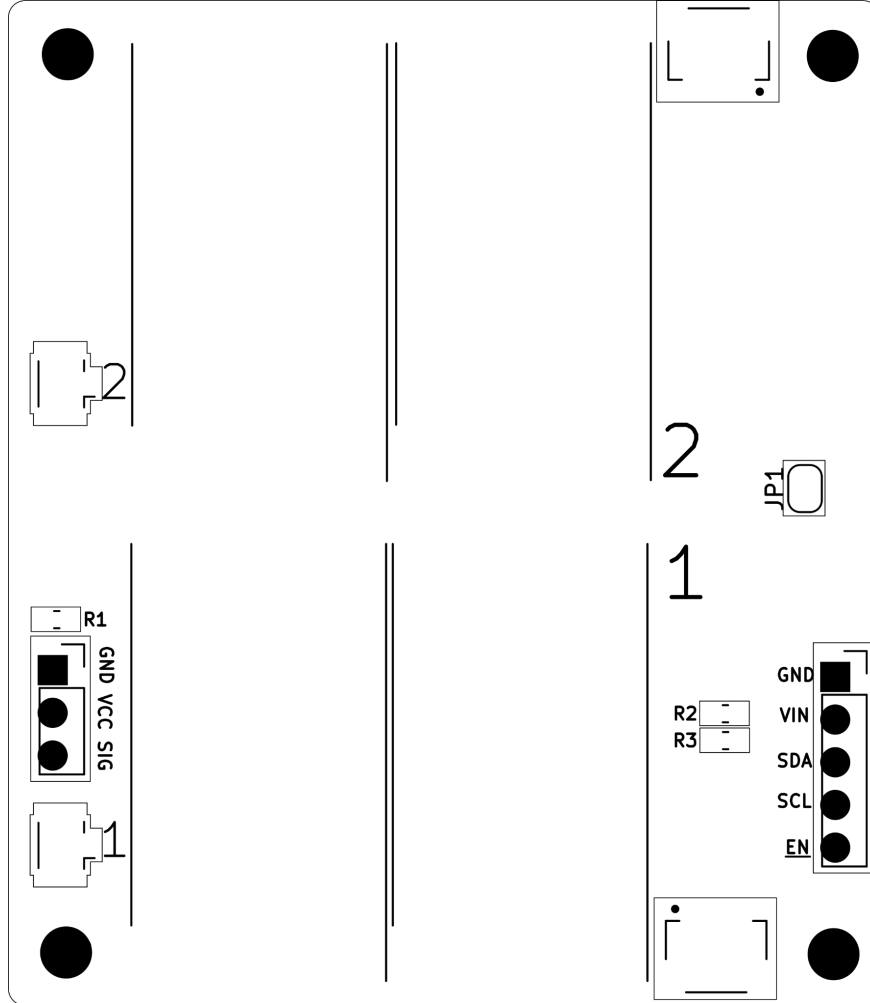
Triple Version (third module on back)

Precautions

EN Pin

The <u>EN</u> pin is attached to *GND* through a solder paste jumper as shown above (JP1). When <u>EN</u> is *LOW*, it enables the isolation module, when it is *HIGH*, the module turns off. By default, the jumper is connected, enabling the module, but removing the ability to control the pin externally.

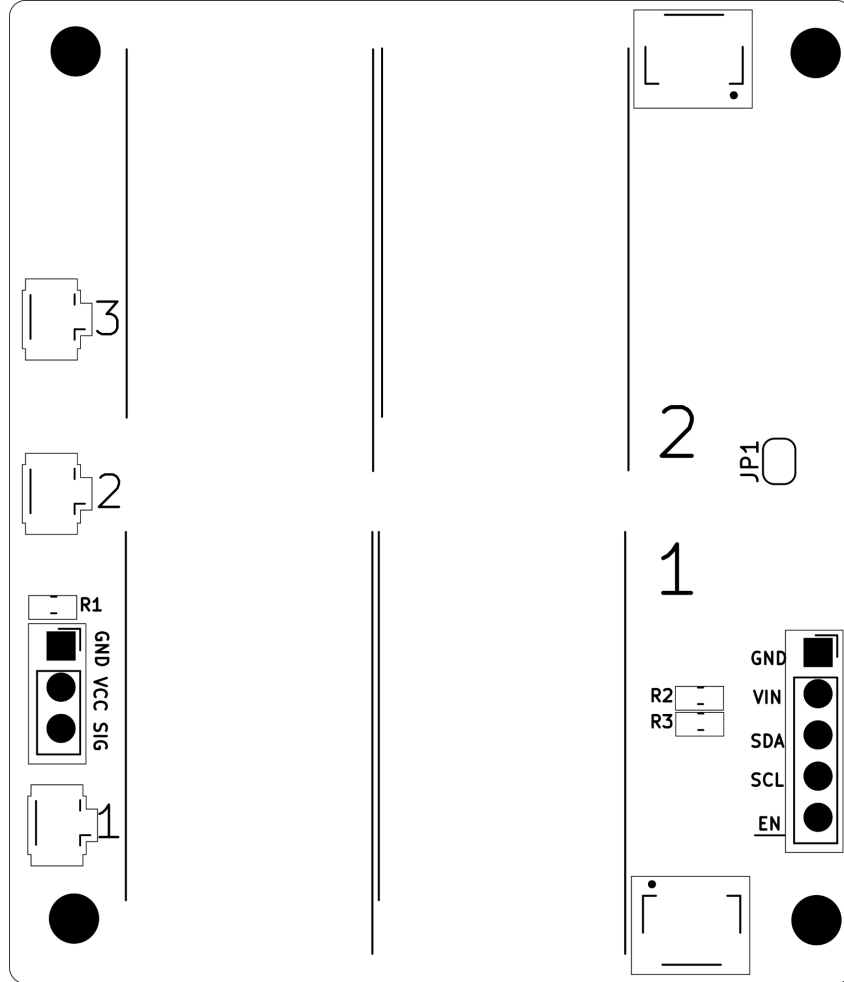**To drive <u>EN</u> *HIGH*, the solder jumper must be cut or *VIN* will short to *GND.* There is a small trace between the two pads of the jumper, cut it with an exacto knife or similar. Ensure the connection has been broken with a continuity tester between the two pads. To revert this change, the pads can be connected with solder paste again.**

U.FL Connector

U.FL connectors are fragile and not intended for repeated connections.
- Avoid unnecessary stress on the connector by not allowing the cable to hang loosely. One possible solution would be to use a small zip-tie and pass it through a nearby mounting hole with the cable as a form of strain relief. Tape can also be used. Ideally, the BNC end would be mounted on an enclosure wall and the board would be securely mounted inside which is the intended use of the board.
- When making a connection, make sure the cable is even and flat on top of the connector before pressing down. This will avoid damaging the connector or cable and ensure they are seated properly.
- To remove the cable, use a [purpose-built tool](#), or pull the cable up using steady pressure while ensuring the cable remains flat. Prying will cause damage.

Requirements

1. Isolated Qwiic Dev Board
2. An Arduino MCU or Raspberry Pi Zero/3/4
3. Qwiic wires if the Qwiic connectors will be used or 4 point-to-point wires to use the PTH header.
4. U.FL to BNC cable
5. Probe
6. Optional 1-Wire Temperature Sensor

Connections

Make the following connections.

Note: in double and triple configurations, there will still be only a single I²C connection; the additional modules are internally connected to the same bus exposed through the headers.

I²C

Controller	Isolated Dev Board
GND	GND
3.3 to 5 Volts	VIN
SDA	SDA
SCL	SCL
GPIO (optional)	EN (optional)

Probe

There is one U.FL connector per isolation/module slot. On the single module version, the slot is not numbered. On the double and triple versions, the slots and corresponding U.FL connectors are numbered 1, 2 and 3.

1. Attach the U.FL to BNC cable to the connector.
2. Attach the probe to the U.FL cable

1–Wire Waterproof Temperature Sensor

1–Wire DS18B20	Isolated Qwiic Dev Board
BLK	GND
RED	VIN

YELLOW	SIG

This sensor is always connected to slot1 on double and triple sensor configurations.

Software

The Dev Board is just a carrier board for the sensor modules and doesn't have any software requirements of its own. To use the mounted module or modules, install the appropriate libraries.

Arduino

All the required libraries can be installed through the Arduino IDE or PlatformIO library manager. Search for `Microfire` and all the available libraries will be in the results list. Examples are included.

Raspberry Pi

Links to the Python libraries for Raspberry Pi can be found on the sensor's individual pages.

I²C Bus

The I²C system in Raspberry Pi OS is slightly different from an MCU. In an MCU, the I²C system is accessed by connecting the appropriate lines, SDA and SCL. In Raspberry Pi OS, there are also SCL and SDA pins which need to be properly connected, but the pins aren't how the I²C system is referenced in software.

Each set of SDA and SCL pins is given a bus number and treated as a file; they are listed in */dev/i2c-#* where # is the bus number. By default, Raspberry Pi OS has the I²C system turned off. Follow their directions to enable the I²C system.

All the examples assume *i2c-1*. The pins for *i2c-1* **SDA** are **GPIO2** and **SCL** is **GPIO3**. A pinout diagram can be found here.

The *Shell* Example

Every library comes with a *Shell* example which allows for a command–line like interface to all the module's features.

Each example is slightly different according to the sensor, but there are some similarities between each version.

Typing:
- *config*: display all calibration and system information
- *reset:* revert all calibration data to default values
- *temp*: take a temperature measurement using the attached DS18B20 sensor
- *low/mid/high/sin*: calibrate the sensor at the low, mid, high or single points
- *i2c*: change the I²C address of the module

Microfire LLC

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Modules
Mod–EC
Mod–pH
Mod–ORP
Mod–ISO_I2C_UART

Development Boards
Isolated Qwiic Dev Board
Mod–EVAL
Mod–EVAL_ISO

Probes
Industrial pH Probe
Industrial EC Probe
Industrial ORP Probe
Lab pH Probe
Lab EC Probe
Lab ORP Probe

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