I2C/SPI Activity Board User Manual

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1 Targets

The Aardvark I²C/SPI Activity Board features three different targets for testing and development. Specifications for each target device can be found on the manufacturer's websites. Below you will find the part numbers and a link to online resources for each part.

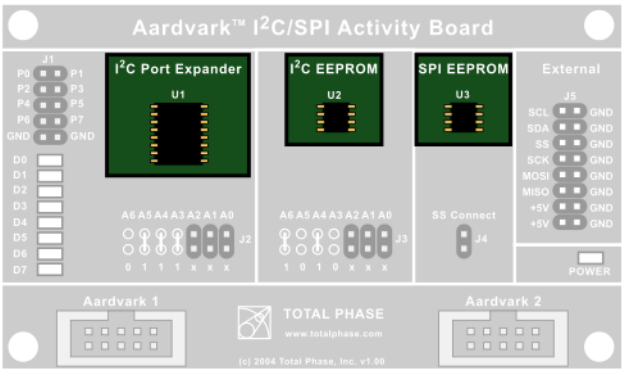


***Figure 1** : Aardvark I²C/SPI Activity Board Targets.*

Please note that these links may become outdated and Total Phase cannot guarantee that they will function. For the latest information about these targets, please visit our website: https://www.totalphase.com/

I²C Port Expander (U1)

PCA9554AD – 8-bit I²C and SMBus I/O Port with Interrupts (Philips, now NXP)
http://www.nxp.com/products/interface_and_connectivity/i2c/i2c_general_purpose_i_o/PCA9554AD.html

I²C EEPROM (U2)

AT24C02 – 2-Wire Bus Serial EEPROM (Atmel)
256 bytes / 2 kilobit – 8 bytes / page
https://www.microchip.com/en-us/product/at24c02c

SPI EEPROM (U3)

AT25080A – SPI Bus Serial EEPROM, High Speed, supports SPI Mode 0 and 3. (Atmel)
1 kilobyte / 8 kilobit – 32 bytes / page

2 Connectors

There are multiple connectors on the Aardvark I²C/SPI Activity Board.

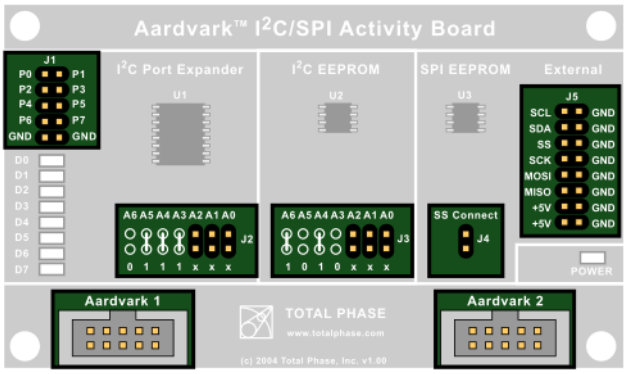


***Figure 2** : Aardvark I²C/SPI Activity Board Connectors.*

Port Expander (J1)

The pins of J1 are connected directly to the port expander IC. Signals can be connected to an external source through these pins.

The LEDs (D0-D7) are also tied to the pins of this connector (P0-P7).

I²C Port Expander configurable address (J2)

Additional jumpers may be used to set the slave address of the I²C Port Expander. These jumpers are not included with the board. For more information about how to set the address, please see section 2.1.

I²C EEPOM configurable address (J3)

Additional jumpers may be used to set the slave address of the I²C EEPROM. These jumpers are not included with the board. For more information about how to set the address, please see section 2.1.

SS Connect (J4)

When this jumper is bridged, both Aardvark adapters are connected to the SPI EEPROM slave select (SS) line. The slave select (SS) lines of the two Aardvark adapters are always connected to each other.

A jumper is included with the board to conenct the Aardvark adapters to the SPI EEPROM.

External Monitor Connector (J5)

An external bus monitor or logic analyzer can be connected to these pins. Each pin of the J5 connector is labeled with the signal name.

I²C Pins

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SCL
Serial Clock line – the signal used to synchronize communication between the master and the slave.

SDA
Serial Data line – the signal used to transfer data between the transmitter and the receiver.

SPI Pins

Top

SS
Slave Select – control line that allows slaves to be turned on and off via hardware control.

SCK
Serial Clock – control line that is driven by the master and regulates the flow of the data bits.

MOSI
Master Out Slave In – this data line supplies output data from the master which is shifted into the slave.

MISO
Master In Slave Out – this data line supplies the output data from the slave to the input of the master.

Aardvark I²C/SPI Host Adapter connectors (Aardvark 1 and Aardvark 2)

Two connectors are provided for two Aardvark I²C/SPI Host Adapters. These two connectors are always connected together pin-for-pin.

Powering the Activity Board

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To power the Activity Board, the Aardvark adapter must be configured to send target power to the board. This can be accomplished via the Rosetta Language Bindings or the Aardvark Control Center Software. When powered-on, the board's POWER LED will be lit.

Cross Connecting Aardvark Adapters

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When cross connecting two Aardvark adapters, the board must be pow- ered on. Otherwise, results can be totally unexpected. If you experience problems, please make sure that the Power LED on the board is lit.

Connecting Multiple Activity Boards

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Multiple activity boards may be daisy-chained through these connectors using a standard 10-pin ribbon cable. However, the user must ensure that only one of the boards has its J4 (SS Connect) jumper connected to prevent SPI EEPROM output signal contention.

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2.1 Configurable I²C Address

The I²C Port Expander and the I²C EEPROM have hardware configurable I²C addresses. You will notice on the board the following diagram:

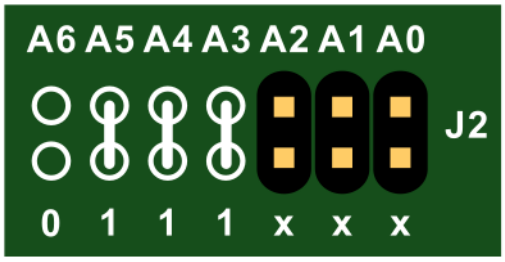


***Figure 3** : Default I²C Port Expander address.*

This diagram gives the address of the I²C Port Expander. The "x" indicates a configurable value. If the connectors are bridged, the value is 1, otherwise the value is 0.

In its default state, the I²C Port Expander has a address of:

```
0111000 == 0x38 == 56
```

When a jumper is added in to A1,

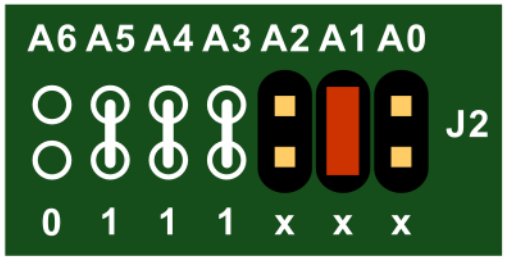


***Figure 4** : I²C Port Expander address has been configured using a jumper (red) on position A1. This effectively changes the target's address from 0x38 to 0x3a.*

the address becomes

```
0111010 == 0x3a == 58
```

The jumpers for configuring the target addresses are not included with the board.

3 References

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3.1 Examples

Example scripts which communicate with the target ICs are available for download on the Total Phase website via the API packages for your chosen Host Adapter: Aardvark Host Adapter, Cheetah Host Adapter, or Promita Serial Platform

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3.2 Technical Specifications

Detailed information about the Technical Specifications of the Aardvark I²C/SPI Host Adapter and the Aardvark I²C/SPI Activity Board can be found on the Total Phase website: Activity Board Product Page.

4 Legal / Contact

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4.3 Contact Information

Total Phase can be found on the web at https://www.totalphase.com/. If you have support-related questions, please email support@totalphase.com. For sales inquiries, please email sales@totalphase.com.

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activity-board-v1.00.pdf (300 KB)

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High-Speed Flash Demo Board User Manual