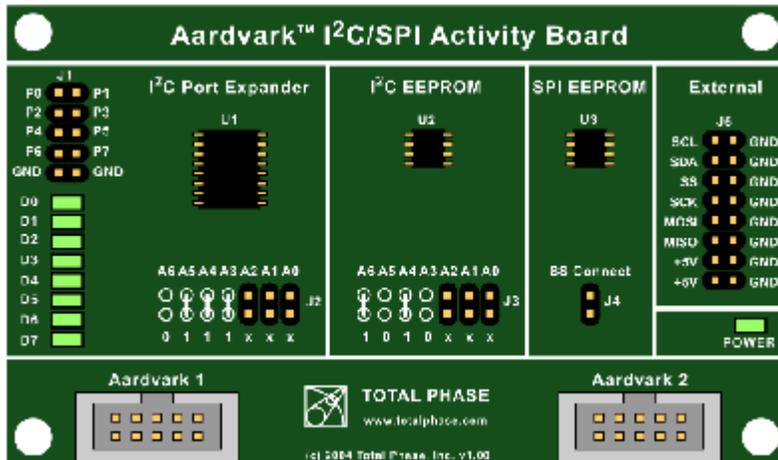


# Aardvark I<sup>2</sup>C/SPI Activity Board



Supported products:



Activity Board  
User Manual v1.00  
August 20, 2004

## Summary

The Aardvark I<sup>2</sup>C/SPI Activity Board is a great tool to help with embedded systems development. This activity board provides working slave devices to aid developers in the debugging of their systems and interface software.

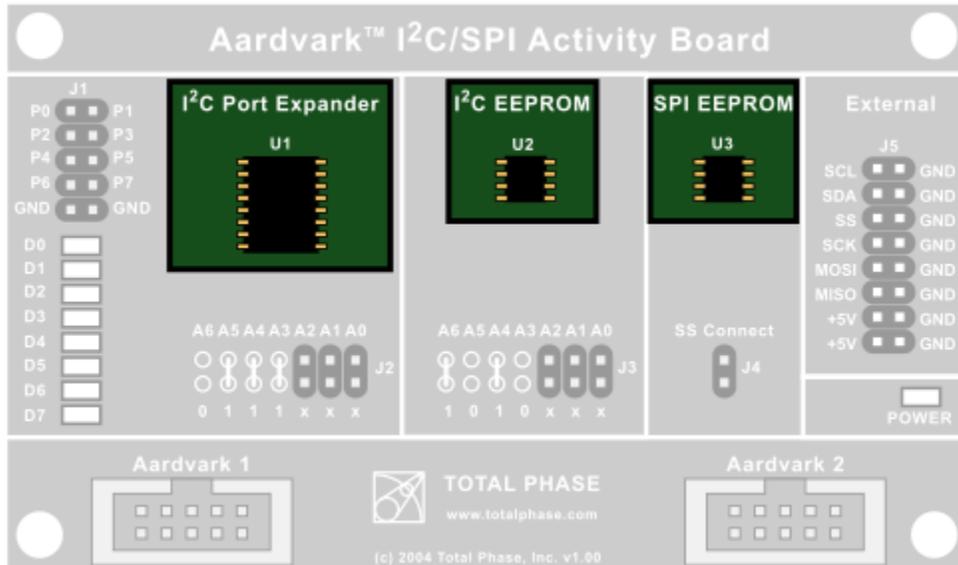
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# 1 Targets

The Aardvark I<sup>2</sup>C/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 I<sup>2</sup>C/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Please note that these links may become outdated and Total Phase cannot guarantee that they will function.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/>

## I<sup>2</sup>C Port Expander (U1)

**PCA9554AD** – 8-bit I<sup>2</sup>C and SMBus I/O Port with Interrupts (Philips, now NXP)  
<https://www.nxp.com/search?keyword=PCA9554AD>

## I<sup>2</sup>C EEPROM (U2)

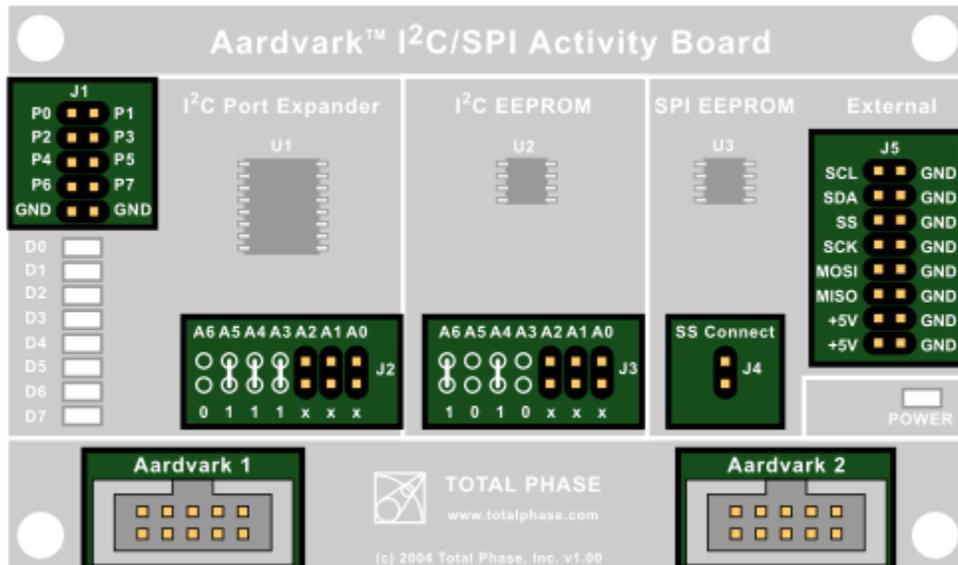
**AT24C02** – 2-Wire Bus Serial EEPROM (Atmel, now Microchip)  
 256 bytes / 2 kilobit – 8 bytes / page  
<https://www.microchip.com/sitesearch/search/All/AT24C02>

## SPI EEPROM (U3)

**AT25080A** – SPI Bus Serial EEPROM (Atmel, now Microchip)  
 1 kilobytes / 8 kilobits – 32 bytes / page  
<https://www.microchip.com/sitesearch/search/All/AT25080A>

## 2 Connectors

There are multiple connectors on the Aardvark I<sup>2</sup>C/SPI Activity Board.



*Figure 2 : Aardvark I<sup>2</sup>C/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).

### I<sup>2</sup>C Port Expander configurable address (J2)

Additional jumpers may be used to set the slave address of the I<sup>2</sup>C Port Expander. These jumpers are not included with the board. For more information about how to set the address, please see section 2.1.

### I<sup>2</sup>C EEPROM configurable address (J3)

Additional jumpers may be used to set the slave address of the I<sup>2</sup>C 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 connect 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.

### **I<sup>2</sup>C Pins**

#### **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**

#### **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 I<sup>2</sup>C/SPI Host Adapter connectors (Aardvark 1 and Aardvark 2)**

Two connectors are provided for two Aardvark I<sup>2</sup>C/SPI Host Adapters. These two connectors are always connected together pin-for-pin.

### Powering the Activity Board

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

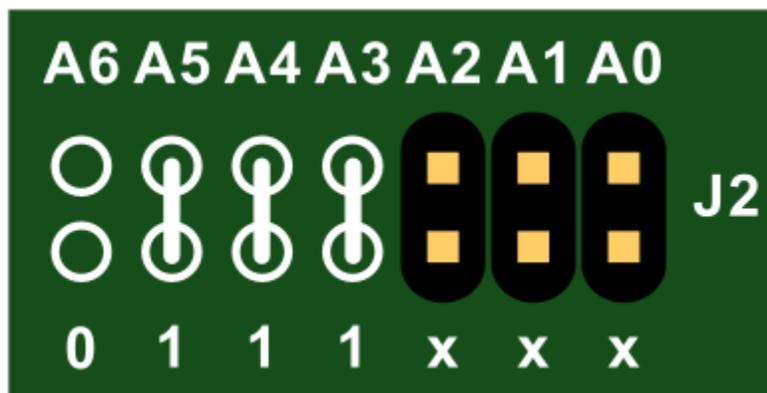
When cross connecting two Aardvark adapters, the board must be powered on. Otherwise, results can be totally unexpected. If you experience problems, please make sure that the Power LED on the board is lit.

### Connecting Multiple Activity Boards

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.

## 2.1 Configurable I<sup>2</sup>C Address

The I<sup>2</sup>C Port Expander and the I<sup>2</sup>C EEPROM have hardware configurable I<sup>2</sup>C addresses. You will notice on the board the following diagram:



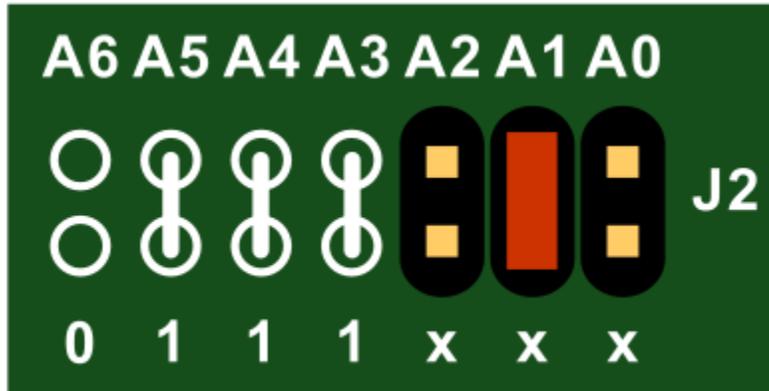
**Figure 3** : Default I<sup>2</sup>C Port Expander address.

This diagram gives the address of the I<sup>2</sup>C 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 I<sup>2</sup>C Port Expander has a address of:

0111000 == 0x38 == 56

When a jumper is added in to A1,



**Figure 4** : I<sup>2</sup>C 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

### 3.1 Examples

Example scripts which communicate with the target ICs are available for download on the Total Phase website: <https://www.totalphase.com/>

### 3.2 Technical Specifications

Detailed information about the Technical Specifications of the Aardvark I<sup>2</sup>C/SPI Host Adapter and the Aardvark I<sup>2</sup>C/SPI Activity Board can be found on the Total Phase website: <https://www.totalphase.com/>.

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