



**4D SYSTEMS**  
*TURNING TECHNOLOGY INTO ART*

## **4D Arduino Adaptor Shield**

Arduino and variant Compatible Shield

## **4Display-Adaptor-Shield**

**\*\* Hardware Revision 2.xx \*\***

**DATASHEET**

**Document Date: 24<sup>th</sup> January 2014**

**Document Revision: 1.2**

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## 1. Description

**\*\* This Datasheet is for the Hardware Revision 2.xx of the 4D Arduino Adaptor Shield, not for the Hardware Revision 1 4D Arduino Adaptor Shield. Please refer to the 4D Arduino Adaptor Shield product page on the 4D Systems website for the datasheet on the previous model if required \*\***

The 4D Arduino\* Adaptor Shield (4Display-Adaptor-Shield) is a simple Arduino Shield designed to provide a convenient interface to attach 4D Systems display modules to the Arduino platform, without having to use jumper wires on the Arduino headers.

The Arduino Adaptor Shield is included in various Arduino Module Packs, but can be purchased separately if a 4D Display Module is not required or is owned already.

Communication to the 4D Systems Display Modules is performed via the Arduinos serial port, and is provided to the user in a simple 5-pin interface, where a 5 way cable (included in the Arduino Module Packs) can be attached between the Shield and the Display Module.

A single digital on the Arduino is utilised for an external reset for the display, and can be disconnected if required. Jumpers are provided to enable selection between different I/O to offer more flexibility over the REV 1 design. Please refer to Section 2 for more information.

Power for the display is supplied from the Arduino's 5V bus, or via an external source such as a 4D Programming Cable or 5V power supply.

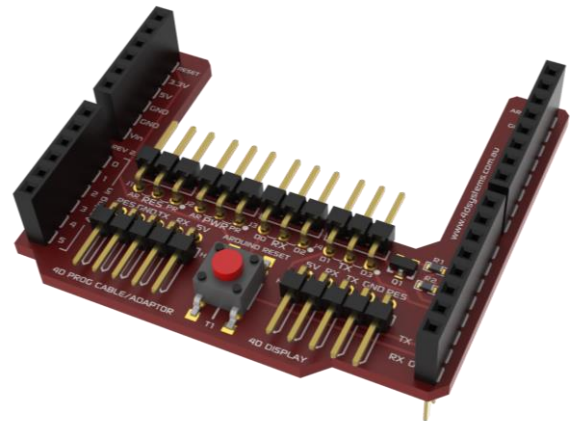
The 4D Arduino Adaptor Shield is compatible with the following 4D Systems display modules:

- uLCD-24PT
- uLCD-28PT
- uLCD-32PT
- uOLED-96-G1/G2
- uOLED-128-G1/G2
- uOLED-160-G1/G2
- uLCD-144-G1/G2
- uLCD-43 (All versions)
- uLCD-24-PTU
- uLCD-28-PTU
- uLCD-32-PTU
- uLCD-32W-PTU
- uVGA-II/III
- uLCD-70DT

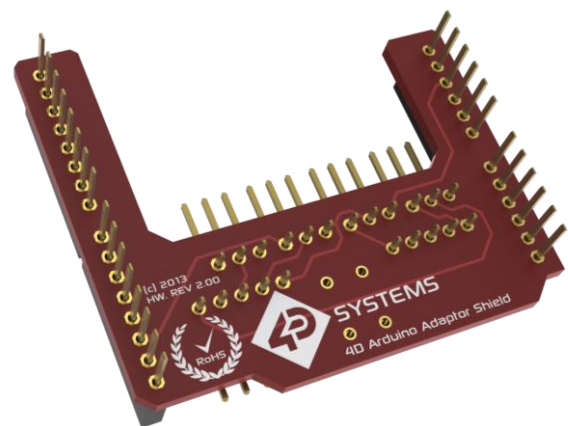
While older modules from 4D Systems may be pin compatible, the 4D Arduino Libraries may not specifically support them.

This Adaptor Shield is also compatible with other platforms which feature Arduino style headers and use Arduino Shields, such as the Intel Galileo.

Arduino Libraries are available to download from the 4D Systems website, [www.4dsystems.com.au](http://www.4dsystems.com.au)



4D Arduino Adaptor Shield Top

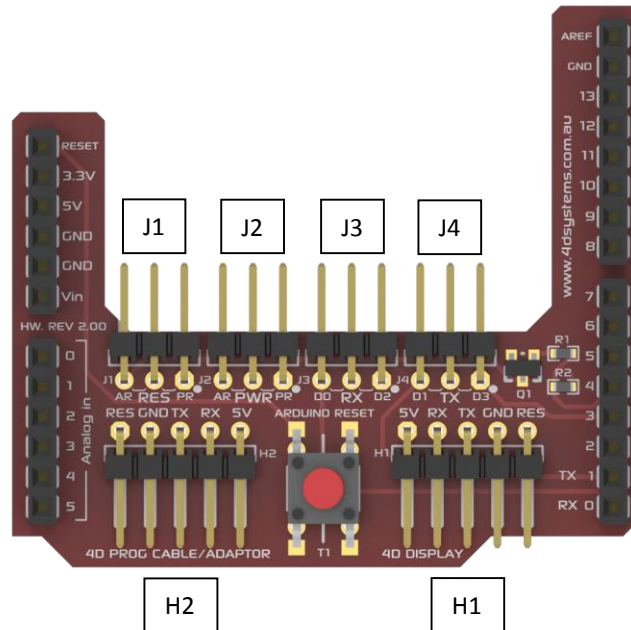


4D Arduino Adaptor Shield Bottom

**NOTE (\*):** Arduino remains the property of the Arduino Team. All references to the word Arduino and Arduino Hardware are licensed under the Creative Commons Attribution Share-Alike license

## 2. Configuration Options

On the 4D Arduino Adaptor, four jumpers (J1, J2, J3 and J4) have been added to provide flexibility to the users Arduino project, to enable I/O to be changed or disabled as required, including the power source for the display.



### 2.1. Header 1 (H1)

Header 1 (H1) is used to connect the 4D Arduino Adaptor Shield to the 4D Systems display module of choice, using the 5 way cable supplied with the shield. This cable provides 5V, GND, TX, RX and Reset signals to/from the display and Arduino, allowing them to communicate.

### 2.2. Header 2 (H2)

A 4D Programming Cable/Adaptor connector (**H2**) has been added which can be used to power the display module in the case the display being used requires more power than can be provided by the Arduino (for example if the Arduino is powered off a laptop USB rather than a 5V Jack). If the 4D Programming Cable/Adaptor isn't used and an external power supply is, then the RES pin can be used to reset the display externally, if required. See **J1** below. The power supply source is determined by the **J2** jumper, please refer below.

**NOTE:** The RX and TX Signals from the 4D Programming Cable/Adaptor are **NOT** passed from this header, it is used to provide additional power only.

### 2.3. Arduino Reset Button (T1)

**T1** is a reset button for the Arduino, not for the display. This allows access to the Arduino's reset button which may be covered up when a shield is placed on top of the Arduino for a number of the Arduino models.

## 2.4. Jumper 1 (J1)

**J1** enables the Display Reset to be changed from being triggered from the Arduino on GPIO D4 when in the AR position, or from the H2 connector by means of an external source, when in the PR position. If the jumper is connected between the AR pin and the central RES pin, then the display can be reset by setting D4 low in the Arduino logic, and then high again. If the jumper is connected between the PR pin and the central RES pin, then the display reset is controlled via the **H2** Connector. This could be switched low by an external circuit, providing an external method of resetting the display.

Removing the jumper from **J1** entirely will disconnect the displays Reset from the Arduino completely, which may be valid for some projects.

**Note:** D4 is always pulled low to GND via a 4.7K Resistor due to the nature of the reset circuit. So even if the **J1** is disconnected, the Arduino D4 input is always going to have a 4.7K pull down on it. In most cases this should not affect operation of D4 if it is to be used for something else in a project when **J1** is disconnected, however it should be noted that this is the case when using this shield.

## 2.5. Jumper 2 (J2)

**J2** enables the Power Source for the display to be changed from being powered via the Arduino's 5V Supply, or via the **H2** connector. If the Arduino is powered from the Users' computers USB, some computers cannot provide enough current for both the Arduino and the Display to be powered off the same USB port, so auxiliary power can be required. If **J2** is connected between the AR pin and the central PWR pin, then the display is powered off the Arduino's 5V supply. If **J2** is connected between the PR pin and the central PWR pin, then the display is powered off the **H2** connector, via something like the 4D Programming Cable. 5V could also come from an external power source if desired. Removing the jumper from **J2** entirely will disconnect power from the display.

## 2.6. Jumper 3 (J3)

**J3** enables the Serial signals from the display to be received either onto D0 or D2. D0 on most Arduinos is the Hardware Serial Port 0 RX Pin. D2 is often used for Software Serial. This allows flexibility for different setups. If the jumper is connected between the D0 pin and the central RX pin, then the Arduino's hardware serial port 0 will be connected to the display. In this configuration, programming of the Arduino is not possible without disconnecting the display, as the USB programming signals for the Arduino will also be received by the display, which will result in corrupt programming signals being received if the Display transmits anything, resulting in a failed programming attempt. Disconnecting this jumper will disconnect the Arduino from the Display, allowing the Arduino to be programmed. If the jumper is connected between the D2 pin and the central RX pin, this will allow Software Serial (or similar) to be used to communicate to the display. The Arduino should be able to be programmed successfully when the jumper is in this position without having to remove the display from **H1** due to the display and Arduino not sharing the same serial port as the Arduino's USB programming.

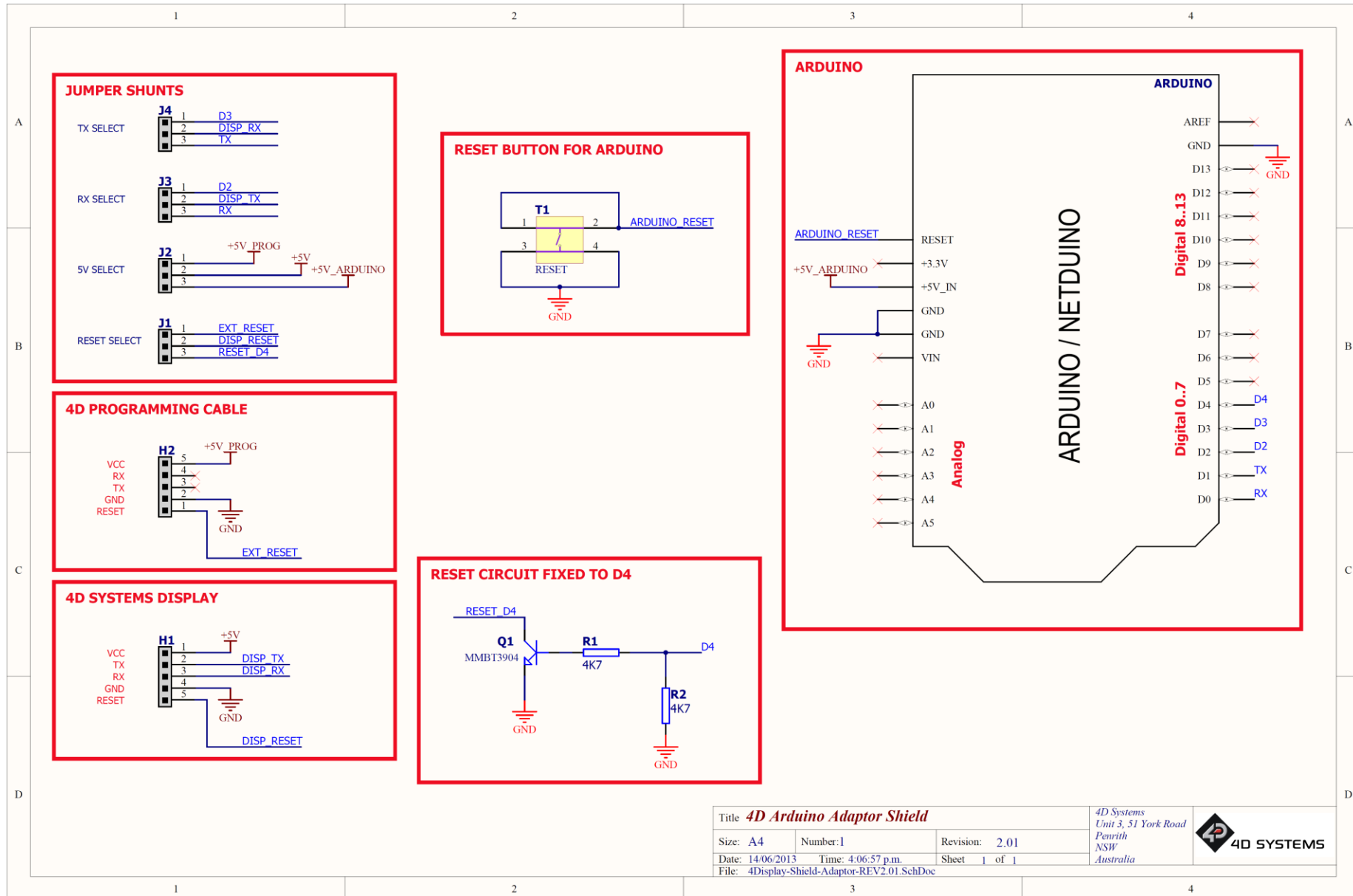
If desired, a jumper wire can be placed from the central pin of J3, to a completely different pin on the Arduino, such as D19 on an Arduino Mega, allowing Hardware Serial1 to be used. Jumper wires are not included.

## 2.7. Jumper 4 (J4)

**J4** enables the Serial signal to the display to be transmitted from either the Arduino's D1 or D3 pins. D1 on most Arduinos is the Hardware Serial Port 0 TX Pin. D3 is often used for Software Serial. Please refer to the description for J3 above, the same applies for **J4**. If the jumper is connected between the D1 pin and the central TX pin, then the Arduino's hardware serial port 0 will be connected to the display. If the jumper is connected between the D3 pin and the central TX pin, will allow Software Serial to be used to communicate to the display. Removing the jumper will disconnect the Arduino from the Display.

If desired, a jumper wire can be placed from the central pin of J4, to a completely different pin on the Arduino, such as D18 on an Arduino Mega, allowing Hardware Serial1 to be used. Jumper wires are not included.

3. Schematic Diagram



Title <b>4D Arduino Adaptor Shield</b>			4D Systems Unit 3, 51 York Road Penrith NSW Australia	
Size: A4	Number: 1	Revision: 2.01		
Date: 14/06/2013	Time: 4:06:57 p.m.	Sheet 1 of 1		
File: 4Display-Shield-Adaptor-REV2.01.SchDoc				

## 4. Specifications and Ratings

RECOMMENDED OPERATING CONDITIONS					
Parameter	Conditions	Min	Typ	Max	Units
Supply Voltage (VCC)		4.5	--	5.5	V
Operating Temperature		-10	--	+70	°C

ORDERING INFORMATION
<b>Order Code:</b> 4Display-Adaptor-Shield
<b>Packaging:</b> Module sealed in antistatic foam padded 4D Systems Box

## 5. Legal Notice

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## 6. Contact Information

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Website: [www.4dsystems.com.au](http://www.4dsystems.com.au)

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