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

**Raspberry Pi Display Module Pack**  
**Featuring Round 1.38" LCD Display Module**  
**uLCD-220RD-PI**

**DATASHEET**

**Document Date: 2<sup>nd</sup> July 2014**  
**Document Revision: 1.0**

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## 1. Description

The 4D Systems Round 1.38" Pi Display Module Pack (uLCD-220RD-PI) is made up of a uLCD-220RD Display Module and accessories specifically for the Raspberry Pi.

The Pack comprises of:

- uLCD-220RD Display Module
- 4D Serial Pi Adaptor
- 5 way Female-Female Cable

The Raspberry Pi Display Module Pack enables a Raspberry Pi user to quickly connect the 4D Serial Pi Adaptor to their Raspberry Pi, connect the 5 way cable between the Adaptor and the Display Module, and be connected in seconds to start programming their new 4D Systems Display.

The display module can be programmed in a number of ways, using the 4D Systems Workshop 4 IDE Software. By default the display module will come loaded with the Serial application. Please refer to the next section of this document for alternative configuration options.

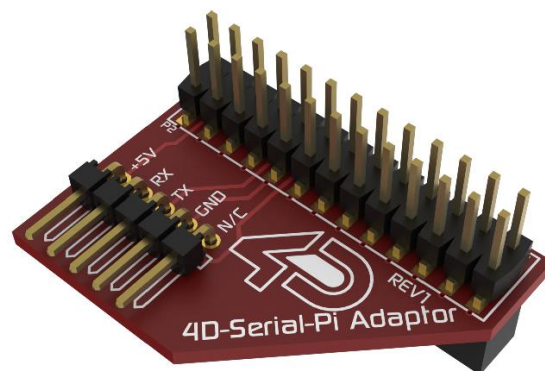
The uLCD-220RD has a comprehensive range of serial commands ready to be received from the Raspberry Pi, to draw primitives such as lines, rectangles, circles and text, to displaying images, playing sound and logging data to uSD card. Many more advanced features are available, see next page.

Communication to the Display Module is performed via the Raspberry Pi's serial port (RX and TX).

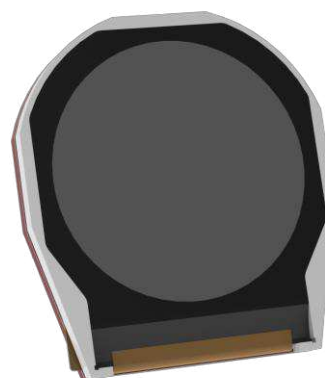
Power for the display is supplied from the Raspberry Pi's 5V bus. No external power is required for the Display Module as all power is supplied from the Raspberry Pi, via the Adaptor.

The 4D Serial Pi Adaptor is compatible with the A, B and B+ versions of the Raspberry Pi.

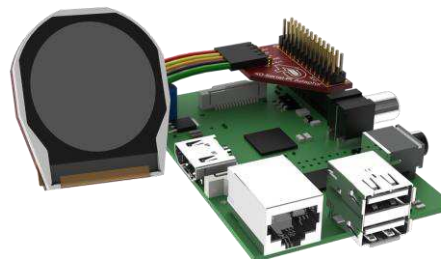
**NOTE (\*):** Raspberry Pi remains the property of the Raspberry Pi Foundation. All references to the words 'Raspberry Pi' are Trademarks of the Raspberry Pi Foundation, and all references to 4D Systems modules/adaptors with the Raspberry Pi are based on compatibility with the Raspberry Pi Hardware, and do not indicate ownership of or to the Raspberry Pi in any way.



4D Serial Pi Adaptor



The uLCD-220RD Display Module



The uLCD-220RD-PI Pack connected together  
(Note: Raspberry Pi NOT included)

## 2. Advanced Hardware Options

The display module (uLCD-220RD) is a very capable and powerful piece of hardware, which can be reconfigured beyond the boundaries of the Serial Environment, which is what is loaded on the module when shipped.

With the use of the 4D Systems Workshop4 IDE Software, the display module can be configured and programmed, which enables the user to utilise the display module in more ways than what is possible when using it in the Serial configuration.

If a user wishes to investigate the capabilities of the uLCD-220RD and reconfigure the display module, please refer to the **Datasheet for the uLCD-220RD**, available from the 4D systems website, [www.4dsystems.com.au](http://www.4dsystems.com.au). The user can freely change back to the configuration the module was shipped in if desired, all via the Workshop4 IDE Software.

To take advantage of the 4D Systems Workshop 4 Software, a 4D Programming Cable is required, which can be purchased from the 4D Systems website, or from a 4D Systems distributor.

Depending on what the user requires, a micro-SD card may also be required. Please refer to the **Datasheet for the uLCD-220RD** for more information, along with information on the Starter Kits which is also available, which includes both the Programming Cable and a micro-SD card.

The Workshop4 IDE enables the uLCD-220RD display module to be configured using 4 different environments.

- The **Designer** environment enables the user to write 4DGL code in its natural form to program the display module.
- A visual programming experience, suitably called **ViSi**, enables click-and-place type placement of objects to assist with 4DGL code generation and allows the user to visualise how the display will look while being developed.
- An advanced environment called **ViSi-Genie** doesn't require any 4DGL coding at all, it is all done automatically for you. Simply lay the display out with the objects you want, set the events to drive them, and the code is written for you automatically. ViSi-Genie provides the latest rapid development experience from 4D Systems.
- A **Serial** environment is also provided to transform the display module into a slave serial module, allowing the user to control the display from any host microcontroller or device with a serial port.

**Designer** and **ViSi** allow the user to program and write their own protocol to communicate between the Raspberry Pi and the Display Module.

**ViSi-Genie** has a set protocol as outlined in the documentation associated with it (Available from the Workshop4 Product page of the website), and 4D Systems has developed a Raspberry Pi Library specifically for the ViSi-Genie environment, to enable a rapid development platform for users. The library is available for download from the uLCD-220RD-PI product page on the 4D Systems Website, [www.4dsystems.com.au](http://www.4dsystems.com.au).

The **Serial** environment loads an application (SPE) onto the display module which enables commands from the Raspberry Pi to communicate directly with the display module and get it to perform specific actions. 4D Systems has developed a generic C library specifically for this environment also, which is available for download from the uLCD-220RD-PI product page on the 4D Systems Website, [www.4dsystems.com.au](http://www.4dsystems.com.au). Note, this will need porting to the Raspberry Pi in order to work. A specific Raspberry Pi version will be available in due course. For detailed information on each of these functions, please refer to the '**Diablo16 Serial Command Set Reference Manual**' Document, available from the Workshop 4 product page on the 4D Systems website

### 3. 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

**Order Code:** uLCD-220RD-PI

**Package:** Bagged 138mm x 100mm x 30mm box and 105mm x 65mm x 30mm box

**Packaging:** Modules sealed in antistatic foam padded 4D Systems Box's

## 4. Legal Notice

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