DATASHEET

4D SYSTEMS

TURNING TECHNOLOGY INTO ART

# Arduino Display Module Pack

## Featuring a 1.7” OLED Display Module

## uOLED-160-G2-AR

**Document Date: 24th January 2014**
**Document Revision: 1.1**

Uncontrolled Copy when printed or downloaded.
Please refer to the 4D Systems website for the latest Revision of this document

# Contents

**1. Description** ..... **3**

**2. Advanced Hardware Options** ..... **4**

**3. Arduino Serial Library Functions (For use with Serial/SPE Environment only)** ..... **5**

**4. Specifications and Ratings** ..... **7**

**5. Legal Notice** ..... **8**

**6. Contact Information** ..... **8**

## 1. Description

The 4D Systems Arduino* Display Module Pack (uOLED-160-G2-AR) is made up of a uOLED-160-G2 Display Module and an Adaptor to easily connect an Arduino to the 4D Systems Display.

The Pack comprises of:

- uOLED-160-G2 Display Module
- 4D Arduino Adaptor Shield
- 5 way Female-Female Cable

The Arduino Display Module Pack enables an Arduino user to quickly connect the 4D Arduino Adaptor Shield to their Arduino, connect the 5 way cable between the Adaptor and the Goldelox powered Display Module, and be connected in seconds to start programming their new 4D Systems Display.

The Goldelox processor in the uOLED-160-G2 can be configured in a number of ways using the 4D Systems Workshop4 IDE, which enable a comprehensive range of serial commands ready to be received from the Arduino, to draw primitives such as lines, rectangles, circles and text, to displaying images, playing sound and logging data to uSD card.

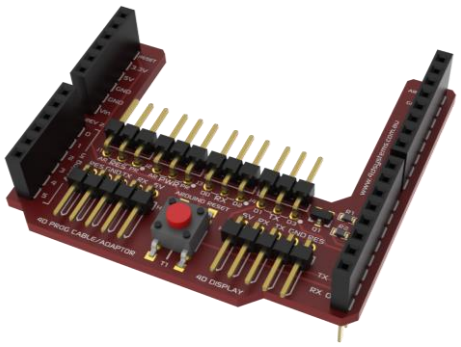
Communication to the Display Module is performed via the Arduino's hardware serial port.

A single digital on the Arduino is utilised for an external reset for the display.

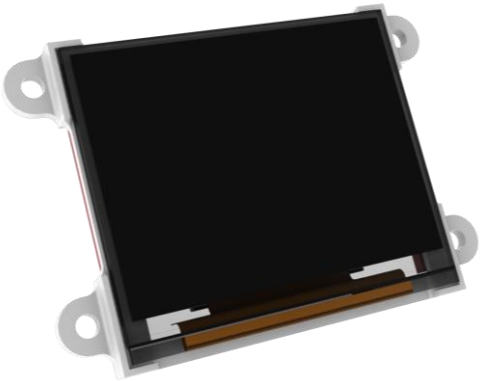
Power for the display is supplied from the Arduino's 5V bus. In most cases, no external power is required for the Display Module as all power is supplied from the Arduino, via the Adaptor Shield. The Arduino DC Jack may be required to supply the Arduino with power if the USB supply of the PC is insufficient.

In some cases, the display may be required to be powered separately to the Arduino, which the Arduino Adaptor Shield allows. Please refer to the Datasheet for the 4D Arduino Adaptor Shield for more information.

For a detailed listing of the capabilities of the display module in this Arduino Pack, please refer to the datasheet for the display itself, available from the 4D Systems website, www.4dsystems.com.au.



**4D Arduino Adaptor Shield**



**The uOLED-160-G2 Display Module**

**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. Advanced Hardware Options

The display module (uOLED-160-G2) is a very capable and powerful piece of hardware, which can be reconfigured beyond the boundaries of the Arduino.

With the use of the 4D Systems Workshop4 IDE Software, the display module can be configured and programmed independently of the Arduino environment.

If a user wishes to investigate the capabilities of the uOLED-160-G2 and reconfigure the display module, please refer to the Datasheet for the uOLED-160-G2, available from the 4D systems website, 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 Workshop4 Software, a 4D Programming Cable is required, which can be purchased from the 4D Systems website, or from a 4D Systems distributor.

The Workshop4 IDE enables the uOLED-160-G2 display module to be configured using 3 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.
- 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 Arduino and the Display Module.

The **Serial** environment loads an application (SPE) onto the display module which enables commands from the Arduino to communicate directly with the Goldelox Processor on the display module and get it to perform specific actions. 4D Systems has developed a library specifically for this environment also, which is available for download from the uLCD-160-G2-AR product page on the 4D Systems Website, www.4dsystems.com.au.

## 3. Arduino Serial Library Functions (For use with Serial/SPE Environment only)

The following is a list of Arduino functions available to use with the 4D Systems Arduino Serial Library for Goldelox Modules. These commands are only relevant if the display is configured to use the Serial Environment. They are not relevant for the other environments available with the Workshop4 IDE.

For detailed information on each of these functions, please refer to the Arduino Library itself available from the samples menu of the 4D Systems Workshop 4 Software or from the 4D Systems Github Repository. Please also refer to the product page and to the Application Notes, available from the 4D Systems website, www.4dsystems.com.au

**Graphics Functions:**

- gfx_Cls()
- gfx_ChangeColour(oldColour, newColour)
- gfx_Circle(x, y, radius, colour)
- gfx_CircleFilled(x, y, radius, colour)
- gfx_Line(x1, y1, x2, y2, colour)
- gfx_Rectangle(x1, y1, x2, y2, colour)
- gfx_RectangleFilled(x1, y1, x2, y2, colour)
- gfx_Polyline(n, vx, vy, colour)
- gfx_Polygon(n, vx, vy, colour)
- gfx_Triangle(x1, y1, x2, y2, x3, y3, colour)
- gfx_Orbit(angle, distance)
- gfx_PutPixel(x, y, colour)
- gfx_GetPixel(x, y)
- gfx_MoveTo(xpos, ypos)
- gfx_LineTo(xpos, ypos)
- gfx_SetClipRegion()
- gfx_ClipWindow(x1, y1, x2, y2)
- gfx_Set(function, value)

  **gfx_Set shortcuts:**
  - gfx_BGcolour(colour)
  - gfx_Clipping(mode)
  - gfx_TransparentColour(colour)
  - gfx_Transparency(mode)
  - gfx_FrameDelay(delay)
  - gfx_ScreenMode(delay)
  - gfx_OutlineColour(colour)
  - gfx_Contrast(value)
  - gfx_LinePattern(pattern)

**Text and String Functions:**

- charwidth('char')
- charheight('char')
- putstr(pointer)
- putCH(pointer)
- txt_Set(function, value)

  **txt_Set shortcuts:**
  - txt_FGcolour(colour)
  - txt_BGcolour(colour)
  - txt_FontID(id)
  - txt_Width(multiplier)
  - txt_Height(multiplier)
  - txt_Xgap(pixelcount)
  - txt_Ygap(pixelcount)
  - txt_Opacity(mode)

- txt_Bold(mode)
- txt_Italic(mode)
- txt_Inverse(mode)
- txt_Underlined(mode)
- txt_Attributes(value)
- txt_MoveCursor(line, column)

**Media Functions (SD/SDHC memory Card):**

- media_Init()
- media_SetAdd(HIword, LOword)
- media_SetSector(HIword, LOword)
- media_ReadByte()
- media_ReadWord()
- media_WriteByte(byte_val)
- media_WriteWord(word_val)
- media_Flush()
- media_Image(x, y)
- media_Video(x, y)
- media_VideoFrame(x, y, frameNumber)

**Image Control Functions:**

- blitComtoDisplay(x, y, width, height, data)

**Sound Functions:**

- BeeP(note, duration)

**Serial (UART) Communications Functions:**

- setbaudWait(index)

**System Functions:**

- sys_GetModel()
- sys_GetVersion()
- sys_GetPmmC()
- SSTimeout(timeout)
- SSSpeed(speed)
- SSMode(mode)

**Memory Access Functions:**

- peekW(word)
- pokeW(word, value)
- peekB(byte)
- pokeB(byte, value)

**GPIO Functions:**

- joystick()

## 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 |
|---|
| **Order Code:** uOLED-160-G2-AR<br>**Packaging:** Module sealed in antistatic foam padded 4D Systems Box |

## 5. Legal Notice

**Proprietary Information**

The information contained in this document is the property of 4D Systems Pty. Ltd. and may be the subject of patents pending or granted, and must not be copied or disclosed without prior written permission.

4D Systems endeavours to ensure that the information in this document is correct and fairly stated but does not accept liability for any error or omission. The development of 4D Systems products and services is continuous and published information may not be up to date. It is important to check the current position with 4D Systems. 4D Systems reserves the right to modify, update or makes changes to Specifications or written material without prior notice at any time.

All trademarks belong to their respective owners and are recognised and acknowledged.

**Disclaimer of Warranties & Limitation of Liability**

4D Systems makes no warranty, either expressed or implied with respect to any product, and specifically disclaims all other warranties, including, without limitation, warranties for merchantability, non-infringement and fitness for any particular purpose.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications.

In no event shall 4D Systems be liable to the buyer or to any third party for any indirect, incidental, special, consequential, punitive or exemplary damages (including without limitation lost profits, lost savings, or loss of business opportunity) arising out of or relating to any product or service provided or to be provided by 4D Systems, or the use or inability to use the same, even if 4D Systems has been advised of the possibility of such damages.

4D Systems products are not fault tolerant nor designed, manufactured or intended for use or resale as on line control equipment in hazardous environments requiring fail – safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, direct life support machines or weapons systems in which the failure of the product could lead directly to death, personal injury or severe physical or environmental damage ('High Risk Activities'). 4D Systems and its suppliers specifically disclaim any expressed or implied warranty of fitness for High Risk Activities.

Use of 4D Systems' products and devices in 'High Risk Activities' and in any other application is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless 4D Systems from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any 4D Systems intellectual property rights.

## 6. Contact Information

For Technical Support: support@4dsystems.com.au

For Sales Support: sales@4dsystems.com.au

Website: www.4dsystems.com.au

**Copyright 4D Systems Pty. Ltd. 2000-2014.**

# OCEAN CHIPS
## Океан Электроники
## Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».

AVIC JONHON

**«JONHON»** (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

**«FORSTAR»** (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

FORSTAR®

Телефон: 8 (812) 309-75-97 (многоканальный)
Факс: 8 (812) 320-03-32
Электронная почта: ocean@oceanchips.ru
Web: http://oceanchips.ru/
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А