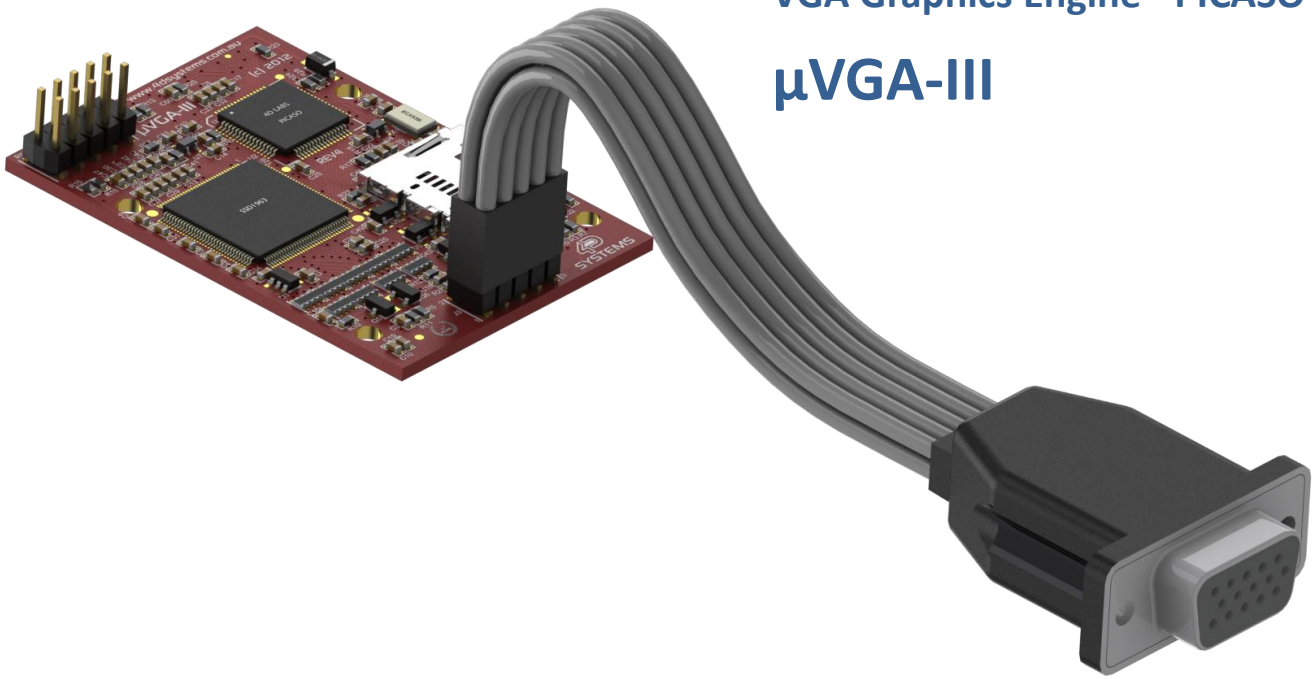
# microVGA

## VGA Graphics Engine - PICASO

## µVGA-III



# MESSAGE FROM THE CEO

To our valued customers,

Thank you for your interest in 4D Systems and the products we have to offer.

We are constantly looking for ways to improve our customer experience and it is hoped that a Product Brief such as this, can instil confidence in choosing 4D Systems as your supplier of superior embedded electronic products.

We invite you to showcase our latest release and thank you again for your continued support.

Atilla Aknar
Founder & CEO

# Table of Contents

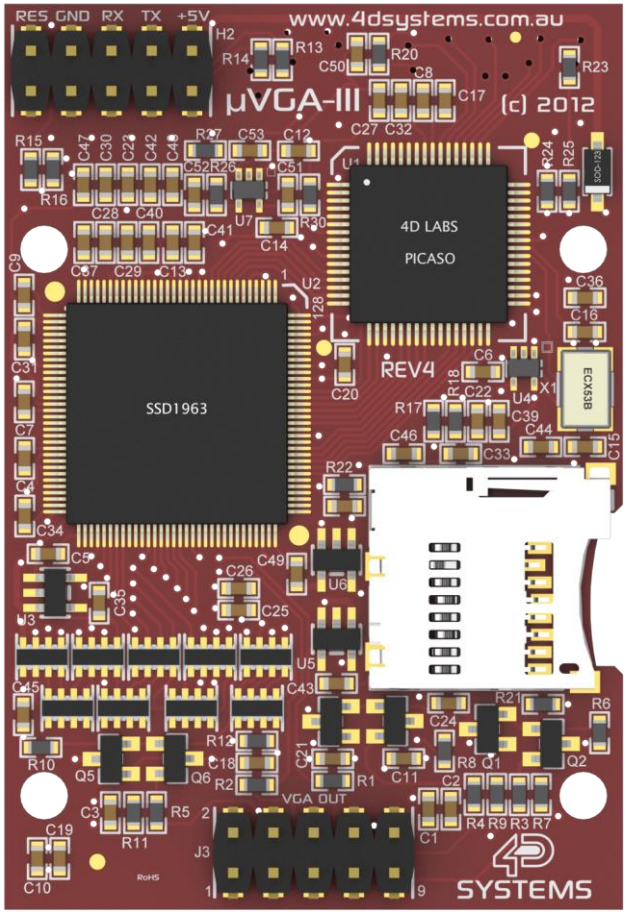
# 1. Overview of the µVGA-III

The **µVGA-III** is an Intelligent VGA Graphics Engine packed with plenty of features, ready to become the GUI for your next target application. It is the perfect choice for many applications that require a front end smart graphics interface.

Embedded at the heart of the design is the **PICASO** Graphics Processor, which is driven by a highly optimised virtual core engine; EVE (Extensible Virtual Engine).

The **µVGA-III** combines a display driver capable of 320x240 (QVGA), 640x480 (VGA) and 800x480 (WVGA) resolution output to a standard VGA display, micro-SD card connector, along with a group of general purpose input/output pins (GPIO's), including I2C and serial UART communications.

The **µVGA-III** can be programmed in its native 4DGL language (similar to C), using the Workshop4 IDE software tool suite, or it can be configured as a serial slave device to use with your favourite host controller. The freedom is at your fingertips with this microVGA module.



# 2. Module Features

01 **PICASO** Graphics Processor

02 **VGA Interface** with cable included, with following resolutions supported:

- **320 x 240**
- **640 x 480**
- **800 x 480**

03 2 x 5 Pin Serial Programming Interface

04 2 x 15 pin Header for Expansion, on the rear

05 micro-SD Card Slot

06 Dedicated Line-Level PWM Audio Output

07 DOS compatible file access (FAT16)

08 Dual serial UART ports, RX0/TX0 and RX1/TX1

09 $I^2C$ Communication Bus

10 SPI Communication Bus for uSD Storage

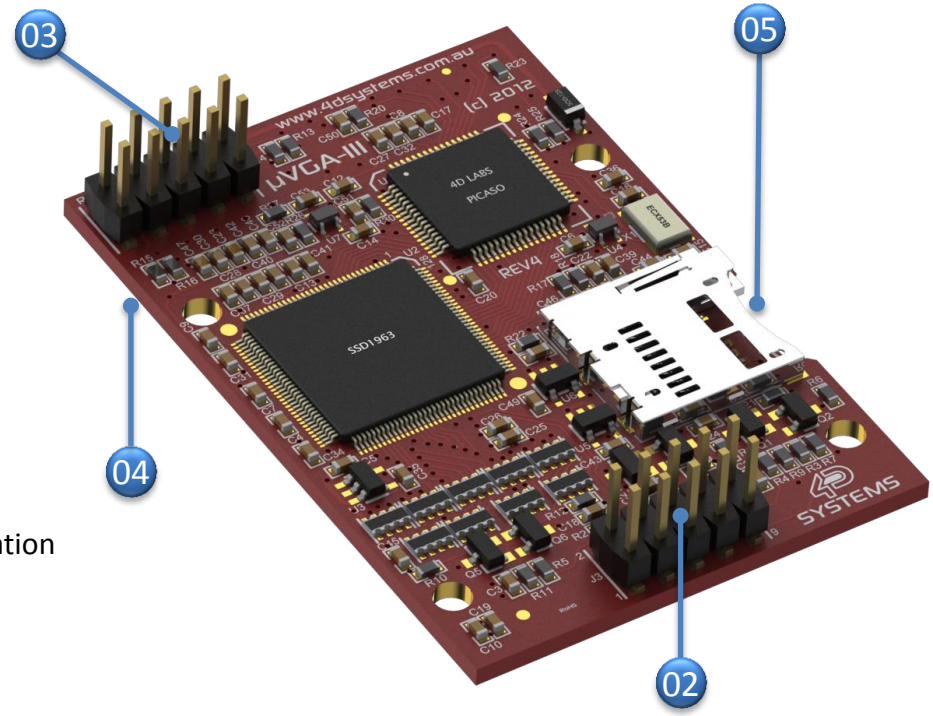
11 13 General Purpose IO

12 8 x 16 bit timers with 1ms resolution

13 8 of the GPIOs useable in a parallel bus configuration

14 4 x Mounting Tabs with 3mm holes

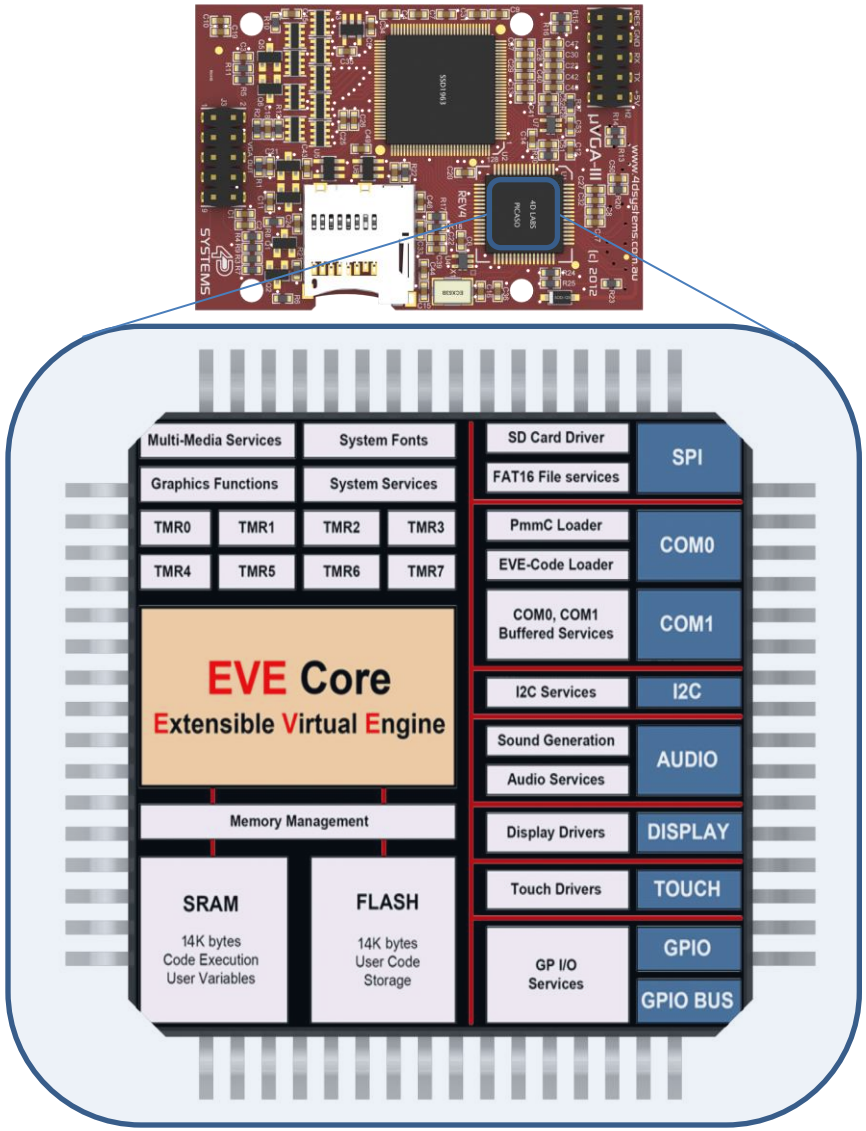
15 Light Weight at only ~ **17gm**



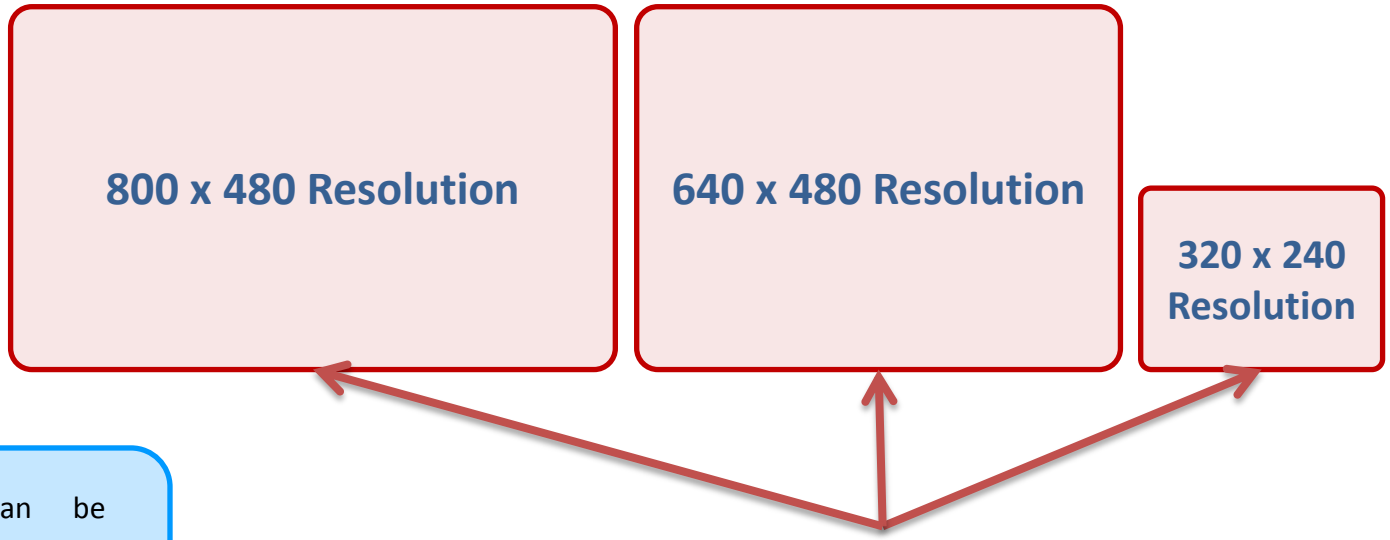
# 3. PICASO Processor

The **PICASO** is a custom embedded graphics Processor designed to drive 16 bit 80-Series CPU Interface Display/VGA driver chips. Powerful graphics, text, image, animation and countless more features are built right inside the chip.

The **PICASO** offers a complete suite of features, crafted to be at the forefront of any product requiring colour, animation, images and sound. The **PICASO** is also powerful enough to control and communicate with peripheral devices over SPI, $I^2C$ or Serial Port.



# 4. VGA Interface



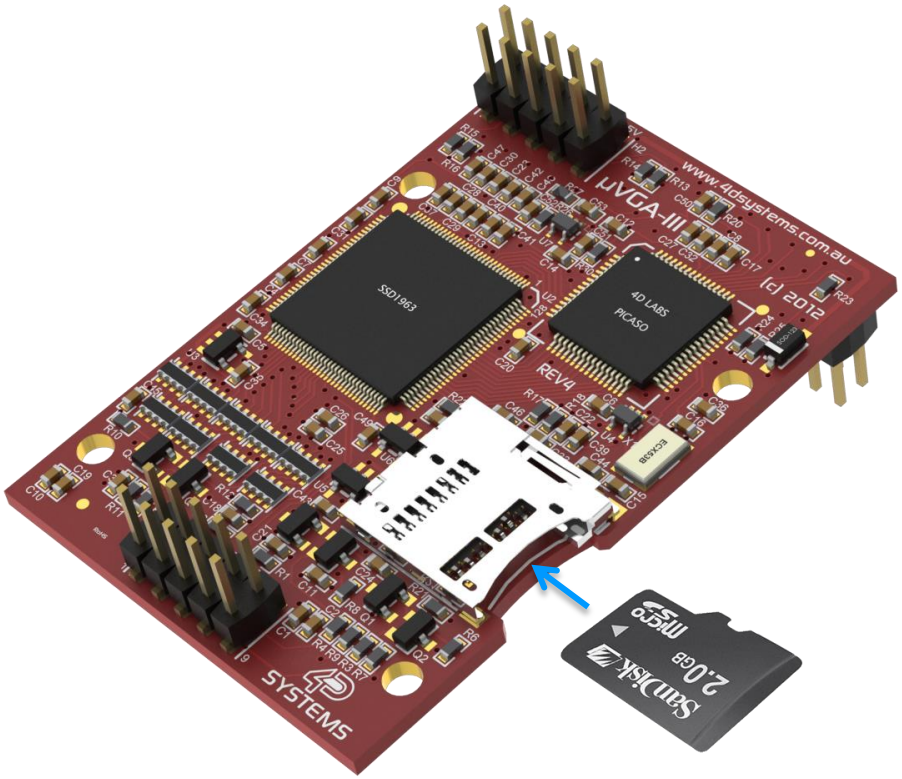

The **µVGA-III** module can be interfaced with a VGA Monitor or a screen with VGA interface, supporting 320x240, 640x480 or 800x480 resolutions, to showcase the power and capabilities of the PICASO processor.

The **µVGA-III**, with **65K** True to Life colours, delivers an astounding plethora of colours perfect for animations, slideshows and a number of multimedia presentations through the VGA interface, which consists of R, G, B, Vsync, Hsync and Clock signals,.

# 5. micro-SD Card Slot

The **µVGA-III** supports **micro-SD** memory cards via the on-board micro-SD connector. This provides the user with expandable memory space suitable for all multimedia file retrieval; such as images, animations and movie clips, as well as data logging applications.

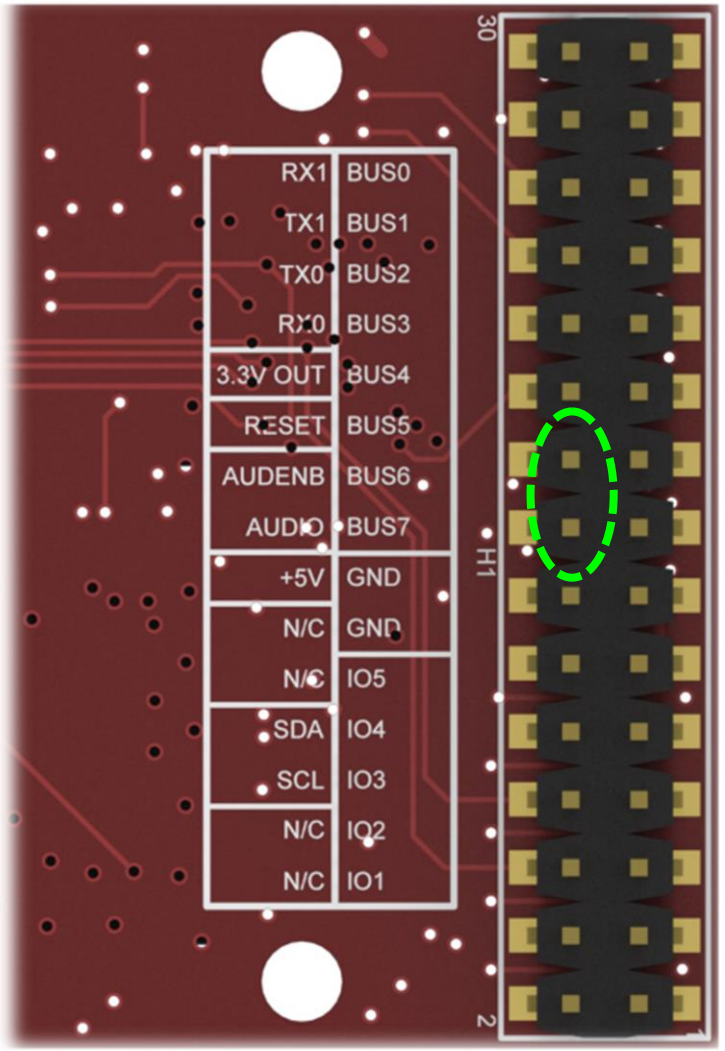
Supports up to 2GB micro-SD as well as micro-SDHC memory cards starting from 4GB and above.



# 6. Audio

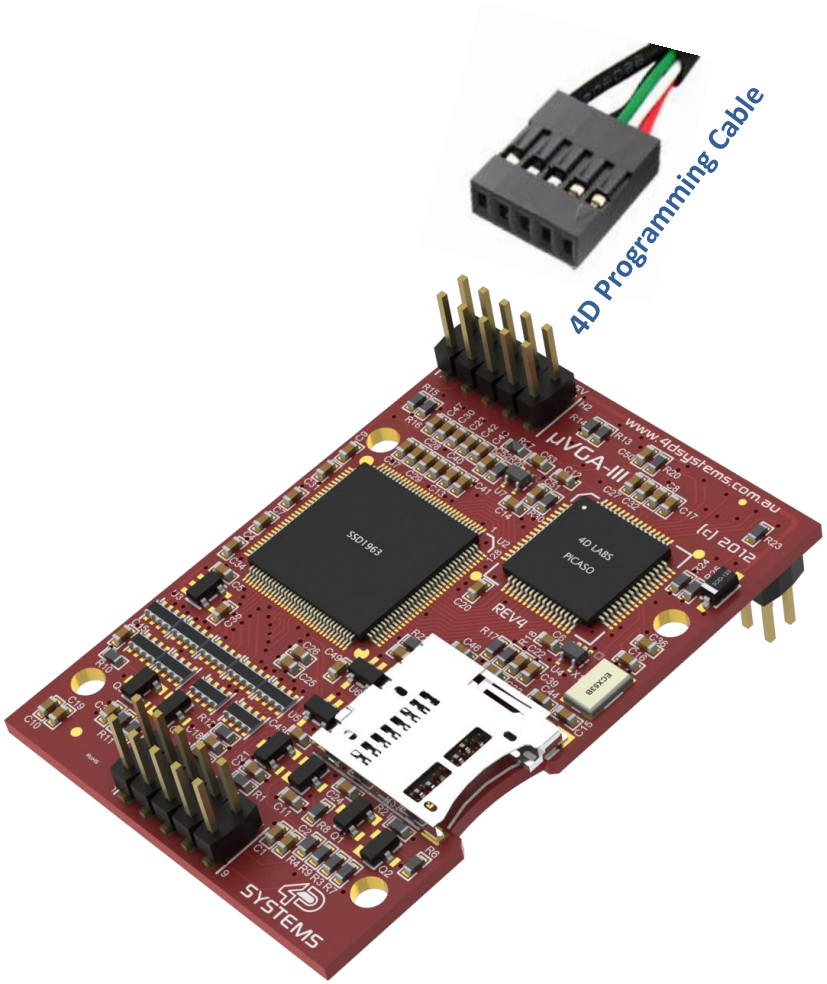
Audio playback support in the PICASO Processor enables the **µVGA-III** module to play audio WAV files stored in the micro-SD memory card. Audio is available at Line Levels through the expansion header.

A simple instruction enables the user to play/pause/stop audio files while continuing the execution of the users code, such as display updates, touch recognition, communications, etc. The audio system also allows real time pitch change of audio samples.



# 7. Powering Your Device

Powering the **µVGA-III** is as simple as connecting to a PC via a 4D Programming Cable. Power can also be supplied by a regulated 5V DC source.

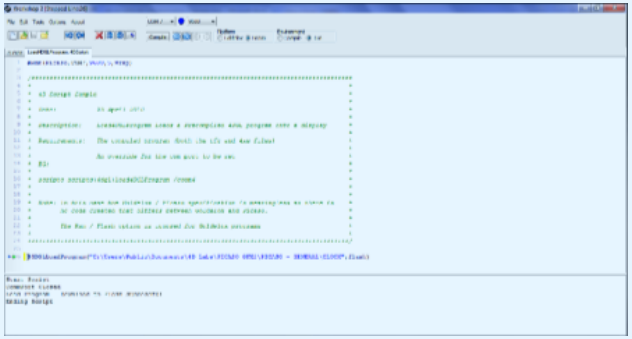


# 8. What you need

## Essential items

4D Programming Cable

Windows Based PC



4D Workshop4 IDE Software Tool

## Optional Items


micro-SD Card & SD Adaptor

# 9. Development Environment

**Workshop4** is a comprehensive software IDE tool suite that provides an integrated software development platform for all of the 4D family of processors and modules. The Workshop4 IDE supports four different **Development Environments** for the user, to cater for different requirements and skill level.

**Designer:** The Designer environment enables the user to write 4DGL code in its natural form to program the µVGA-III.

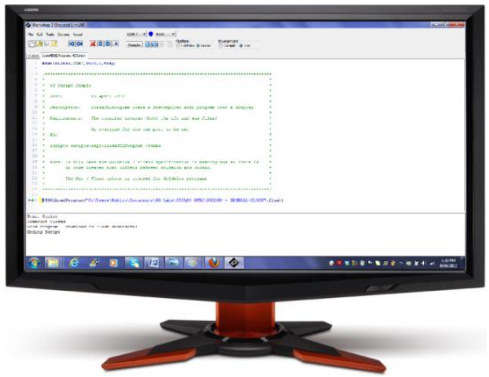
**ViSi:** A visual programming experience, suitably called ViSi, enables drag-and-drop type placement of objects to assist with 4DGL code generation and allows the user to visualise how the display will look while being developed.

**ViSi-Genie:** 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.

**Serial:** A Serial environment is also provided to transform the µVGA-III into a slave serial module, allowing the user to control the display from any host microcontroller or device with a serial port.

# 10. Getting Started

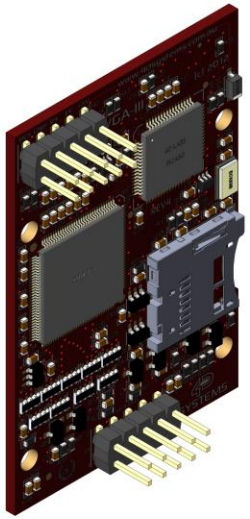
4D Programming Cable

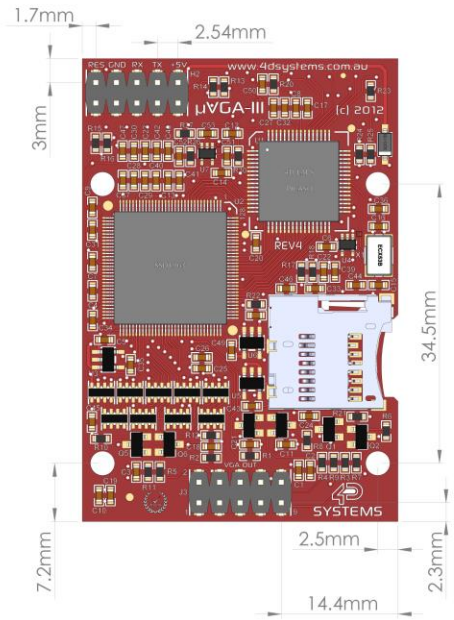



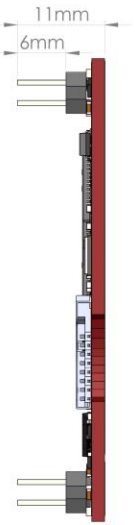
Getting started is as simple as connecting the 4D Programming Cable to the display module, and choosing your product and Development Environment in the 4D Workshop4 IDE.

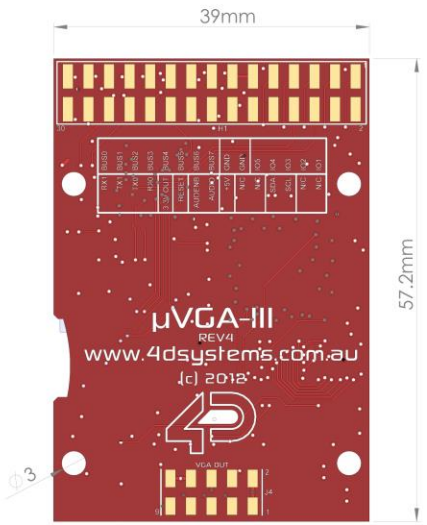
4D Workshop4 IDE guides you through the relevant aid tools with adequate explanation to get your application up and running in no time.

# 11. Mechanical Dimensions






Weight

**~17gm**


UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
SURFACE FINISH:
TOLERANCES:
LINEAR:
ANGULAR:

TITLE: **uVGA-III**

A3

| | NAME | DATE |
|---|---|---|
| DRAWN | JB | 18/10/2012 |
| CHK'D | | |
| APPV'D | | |

4D SYSTEMS

DO NOT SCALE DRAWING | REVISION 4 | SCALE: 2:1 | SHEET 1 OF 1

## Proprietary Information



## Disclaimer of Warranties & Limitation of Liability


For additional information on the µVGA-III, please refer to the µVGA-III Datasheet or visit 4D Systems website at www.4dsystems.com.au

If you require specific help with a 4D Systems product, information can be sourced from the FAQ and relevant forum threads on the website, or by contacting a direct member of our Tech Support team at 4D Systems at support@4dsystems.com.au

For enquiries regarding sales, distributors, or business relations, please contact Sales at sales@4dsystems.com.au