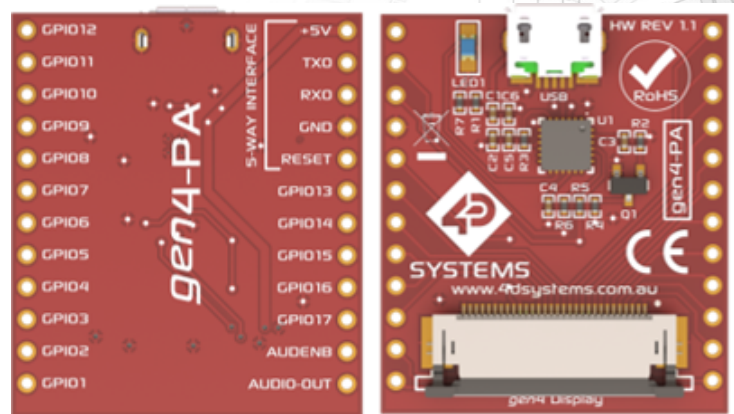


gen4-PA



Datasheet

Revision 1.6

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Content may change at any time. Please refer to the resource centre for latest documentation.

Contents

| | |
|--|---|
| 1. Description | 3 |
| 2. Example Hardware Connections | 5 |
| 3. FFC Cable | 6 |
| 4. Schematic Diagram | 7 |
| 5. Revision History | 8 |
| 6. Legal Notice | 9 |
| 6.1. Proprietary Information | 9 |
| 6.2. Disclaimer of Warranties & Limitations of Liabilities | 9 |

1. Description

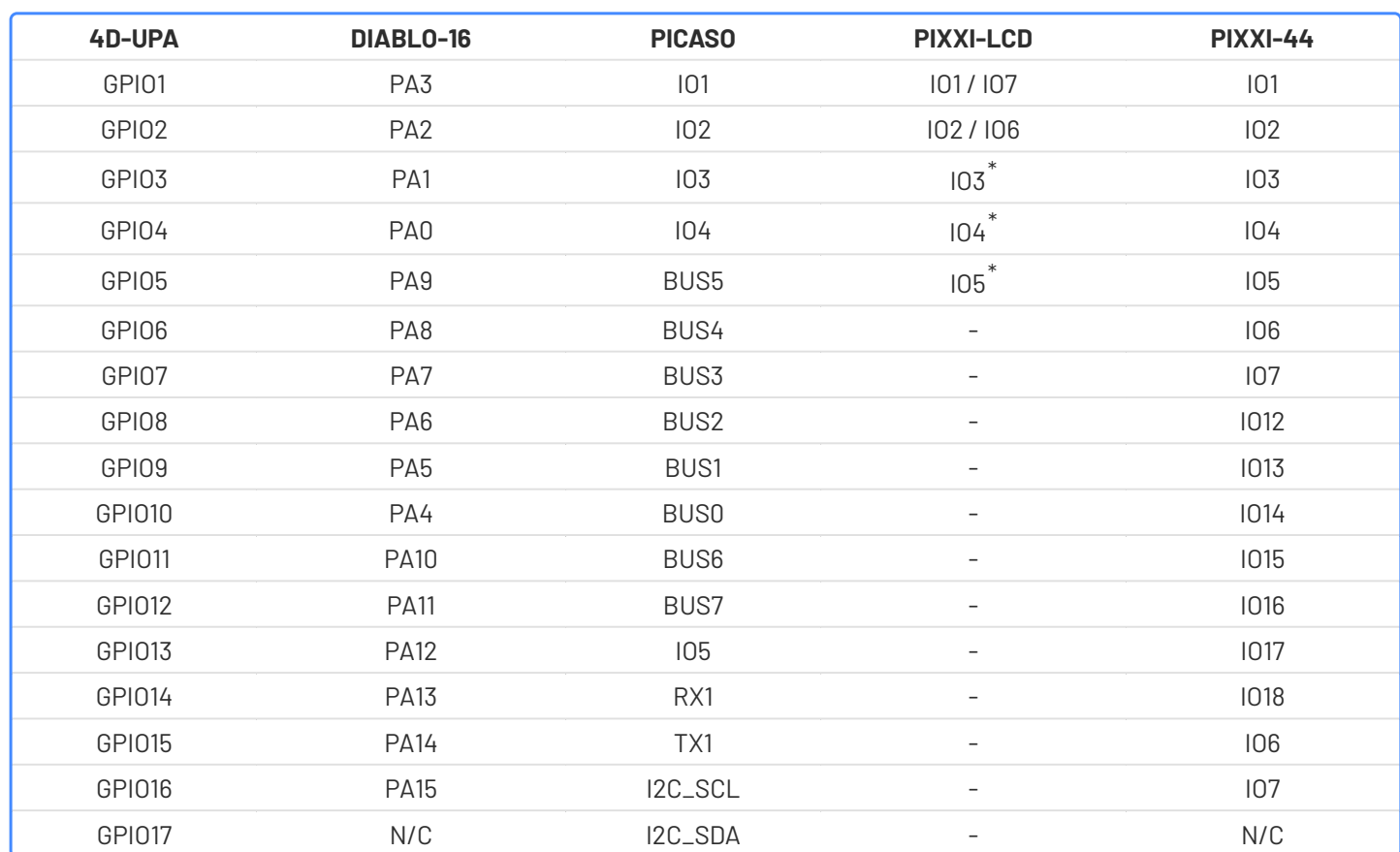
This datasheet covers the gen4-PA (Programming Adaptor) which is compatible with all of the gen4 range of Intelligent Display modules which feature Picaso or Diablo16 graphics processors. It is included in the Starter Kit (SK) packs, and is a quick and easy way to interface and program the gen4 range, without having to break out the signals from the 30-way FFC cable.

The gen4-PA is a programming adaptor for the gen4 display module that also breaks out the signals found on the 30-way FFC cable coming from your gen4 display module. These signals are available via 2.54mm pitch (0.1") pads around the edge of the gen4-PA. It also groups the common 5-way signals found on other 4D Systems products (and the gen4-IB), for easy interface to other products such as our -AR and -PI kits for the Arduino and Raspberry Pi.

The gen4-PA replaces the need for a separate standard programmer, such as the uUSB-PA5 or 4D Programming Cable. The gen4-PA has the circuitry found on the uUSB-PA5-II built into it, and features a microUSB jack, for connection to your PC. Cable is not included with the gen4-PA or in our Starter Kits.

The gen4-PA can be used for programming gen4 display modules, interfacing to a breadboard for prototyping, interfacing to Arduino and Raspberry Pi interfaces (see gen4 -AR and -PI kits), or for interfacing to virtually any host.

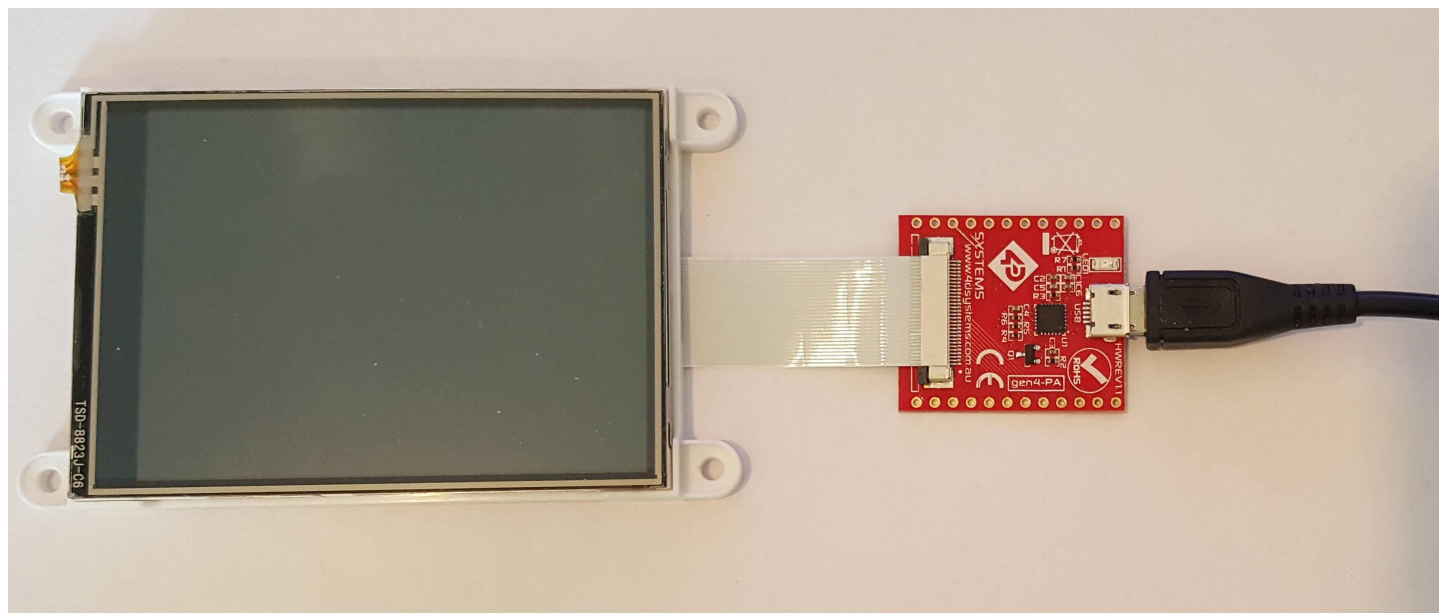
The pinout naming, shown on the back of the gen4-PA has been generalised to GPIOx naming, as the gen4-PA can be used with both Picaso and Diablo16 gen4 products, and the naming of GPIO is different for these. Please refer to the following [table](#).



- USB 2.0 compliant Full Speed 12Mbps maximum speed.
- Hardware or Xon/Xoff handshaking supported, 300bps to 2Mbps
- UART supports 5, 6, 7, 8 data bits, 1, 1.5, 2 stop bits, odd/even/mark/space and no parity
- Supports Windows 2000 and above, MAC (OSX-8 and above) and Linux (2.4 kernel and above)
- USB powered
- -40 to +85 degrees Celsius temp range

2. Example Hardware Connections

The following pictures illustrate how to connect the gen4-PA to various hardware. Note, the display module illustrated below is the **gen4-uLCD-32DT**.



Typical connection of gen4 display module to gen4-PA

When connecting another device (such as an Arduino) to the gen4-PA to interface to the gen4 Display Module, you will not be able to use the TX/RX pins (COM0) on the gen4-PA for the Arduino. The USB chip on the gen4-PA will hold the TX/RX lines and prevent the Arduino being able to communicate with the gen4 Display. To get around this, configure Workshop4 IDE to use a different COM port for communications to the host.

For example, on Diablo display modules, there are 3 additional UARTs which can be assigned to GPIO pins. Configure one of these UART's to use 2 of the Diablo GPIO pins, and then physically wire these 2 pins from the gen4-PA header pads to the Arduino. This leaves the COM0 (TX/RX) pins just for programming the display over USB, and all communications to the host will go out COM1 for example.

In Workshop4, this can be configured easily for the Serial environment, and the ViSi-Genie environment by setting the pins or COM port in the Workshop4 options. In Designer and ViSi, because these are coded 100% by the User, using COM1/2/3 commands instead of COM0 will achieve the same result. The same can be done for Picaso modules, but it has a fixed COM1 interface predefined.

Check the **table** under the Description Section to show how the Diablo and Picaso pins relate to the markings found on the gen4-PA, so the correct header pads are connected to.

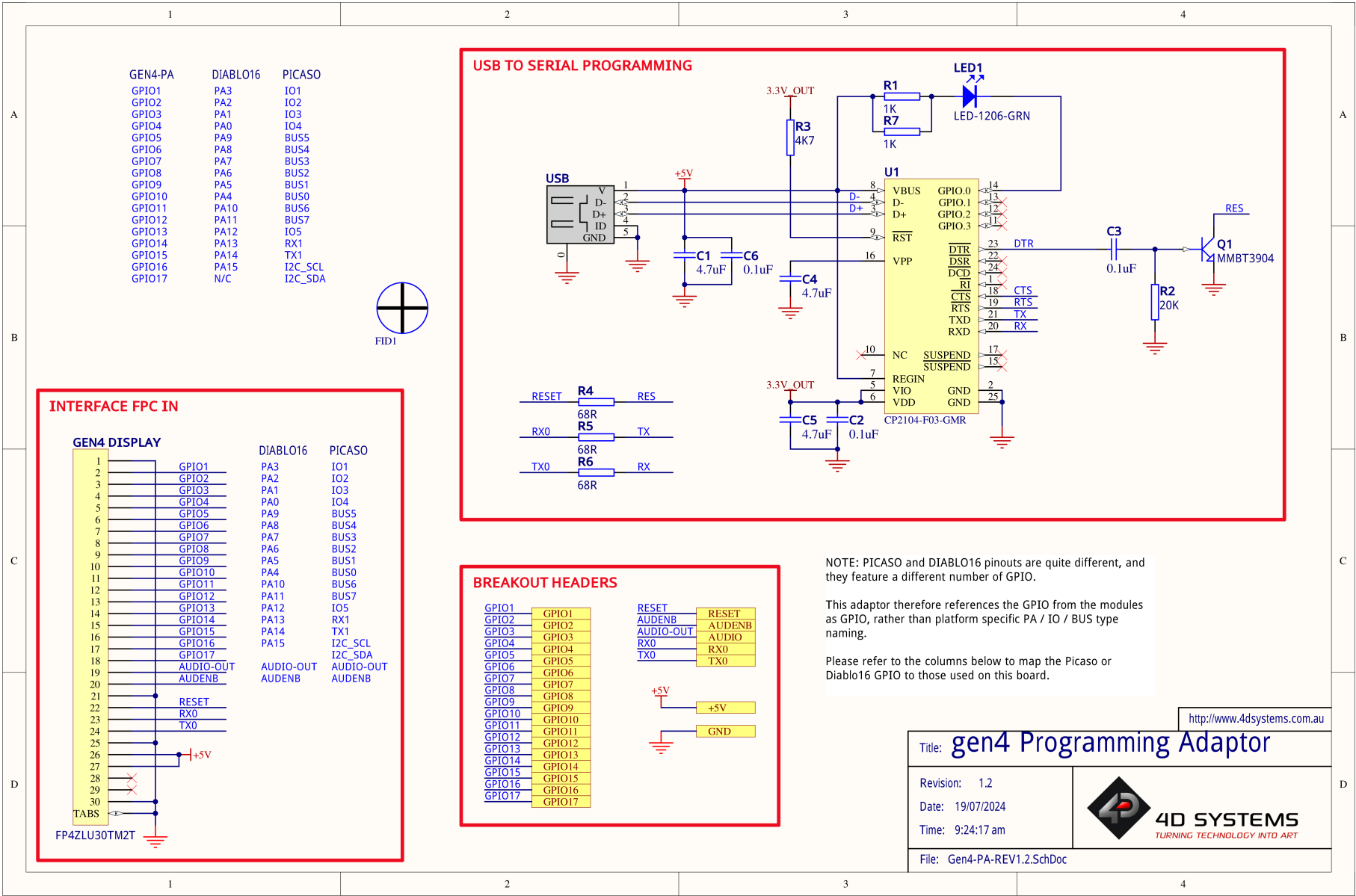
On the back of the gen4-PA, is a '5-way interface' marking. This is designed for connecting non-gen4 display modules to the gen4-PA for programming. This utilises the standard 5V, RX, TX, GND, RESET pins which are found on the 30-way FFC connector, for connecting to uLCD or uOLED modules typically, which do not have FFC connectors like gen4. This should not be used for connecting a Host, due to the reasons stated above.

3. FFC Cable

The Standard FFC cable supplied has the following specifications:

- 30 Pin Flexible Flat Cable, 150mm Long, 0.5mm (0.02") pitch
- Cable Type: AWM 20624 80C 60V VW-1
- Heat Resistance 80 Degrees Celsius
- Connections on the opposite side at each end (Type B)

4. Schematic Diagram



5. Revision History

| <div><div></div>Hardware Revision</div> | | |
|---|------------|--|
| Revision Number | Date | Description |
| 1.1 | 21/06/2016 | Initial Public Release Version |
| 1.2 | 31/08/2017 | Updated the microUSB connector part/brand, no changes to the circuit, cosmetic changes to silkscreen only. |

| <div><div></div>Datasheet Revision</div> | | |
|--|------------|---|
| Revision Number | Date | Description |
| 1.1 | 21/06/2016 | Initial Draft |
| 1.2 | 07/03/2019 | Cosmetic Changes to gen4-PA Datasheet |
| 1.3 | 17/12/2020 | Clarification on UART gen4-PA |
| 1.4 | 27/02/2023 | Modified datasheet for web-based documentation. |
| 1.5 | 07/03/2024 | Updated formatting for resource centre redesign |
| 1.6 | 19/07/2024 | Added missing Rev 1.2 hardware revision information and updated schematic diagram |

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