SGD 43-A

4.3" PanelPilotACE Compatible Display

SGD 43-A is a 4.3" capacitive touch display designed for use with PanelPilotACE Design Studio, a free drag-and-drop style software package for rapid develoment of advanced user interfaces and panel meters.

The SGD 43-A is the first in a range of PanelPilotACE compatible displays and panel meters. The low-profile display features a 4.3" capacitive touch-screen and a Cortex ARM 9 processor running embedded Linux. The display can be powered from either USB or a 5 to 30V d.c. supply and offers users a wealth of hardware interfaces which include four 16bit bi-polar analogue inputs (to a maximum of ±40V d.c.), eight digital input/output pins, two alarm outputs (maximum current sink 10mA) and four PWM outputs.

Users program the display using the free PanelPilotACE Design Studio software which allows the creation of anything from simple meters and dials, through to advanced user interfaces with control elements.

Specifications

Display	4.3" TFT with 262k colours
Touchscreen	Capacitive touch-screen
Resolution	480 x 272px
Processor	Freescale i.MX283 (454MHz, 32bit, ARM 9)
Analogue Inputs	4 x ±40V or 4-20mA (16bit ADC with max. 1mV resolution and 0.05% typ. accuracy)
Serial Bus Inputs	RS232*, SPI*, I2C*, RS485*, Ethernet*
Memory	1Gbit DDR2 SDRAM
Operating Temperature	0 to 40°C (32 to 104°F)
Supply	5 to 30V d.c. (300mA typical at 5V d.c.)
Outside Dimensions	119.3 x 79.8 x 20.0 mm

* Hardware capability, but not available in software at launch

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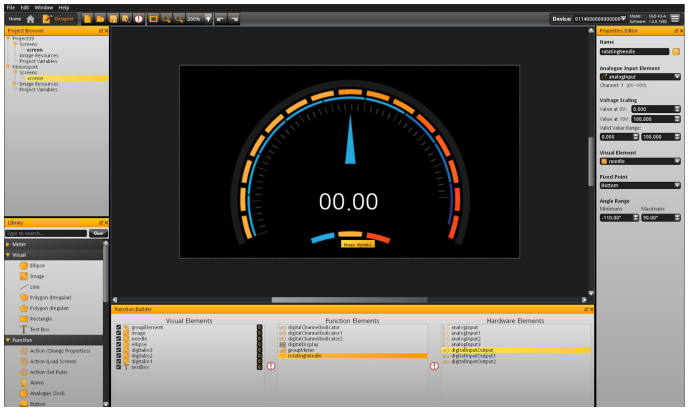
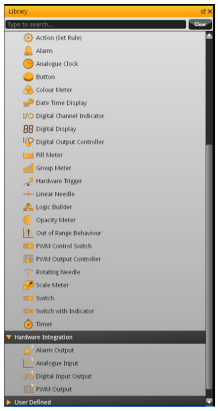
PanelPilotACE Design Studio





Making Industrial User Interface Design Simple

The design software provides a number of building blocks which allow users to drag-and-drop elements onto the screen to quickly create advanced user interfaces. From background images to text elements, analogue style meters, touch-screen navigation elements and even complex logic statements, users can build up multi-screen interfaces without needing to write a line of code.

There is a library of pre-defined elements such as meters, buttons and switches, and users can create their own content by combining elements or importing graphics in a number of formats (including jpg, png, tif, bmp and gif). The software includes support for transparency and multiple-layers.

Hardware interfacing is similarly intuitive, with hardware elements being dragged into a function builder where associations with graphical elements (such as a needle on a meter) can be defined. Here users can determine scaling for analogue inputs, define alarm triggers, behaviours for digital inputs and outputs and configure PWM outputs.

Previewing and Uploading Projects

The software includes a 'Preview in Emulator' function which emulates the hardware inputs/outputs allowing users to test their projects prior to upload. Projects are uploaded to the SGD 43-A via USB.

PanelPilotACE Design Studio is compatible with Windows XP, Vista, 7 and 8 and can be downloaded free from www.panelpilot.com.

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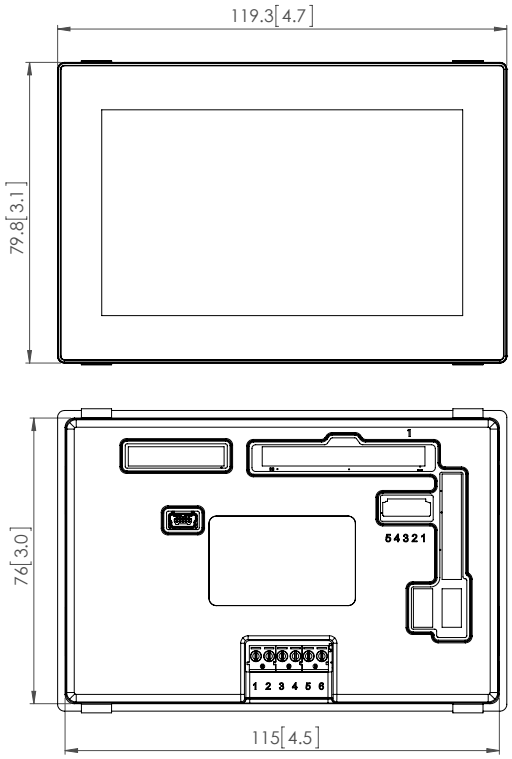
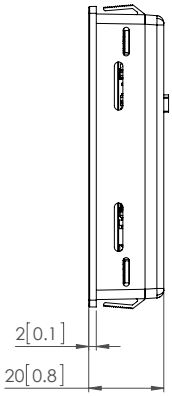
Dimensions

All dimensions are in mm (in)



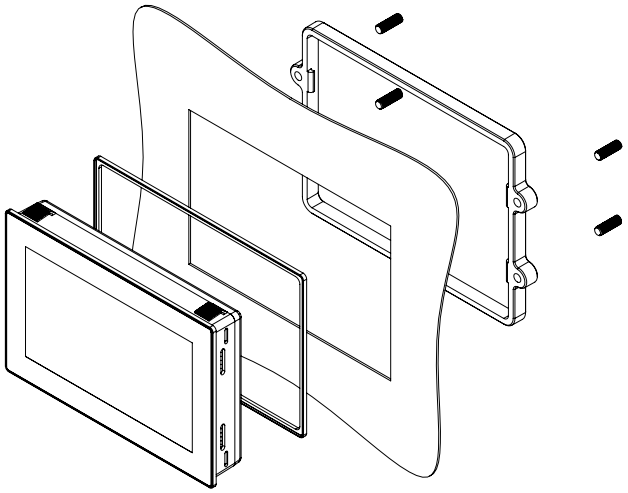


Panel Cut-Out and Fitting

The panel cut-out is 118 x 78mm (4.5" x 3"). There are two mounting methods:

The first uses clips that protude from the plastic assembly and is suitable for panels between 1 and 3mm in thickness.

The second method uses a rear mounting plastic bracket featuring grub screws for a more secure and adaptable fit. This second mounting method is suitable for panels between 0.5 and 4mm in thickness.



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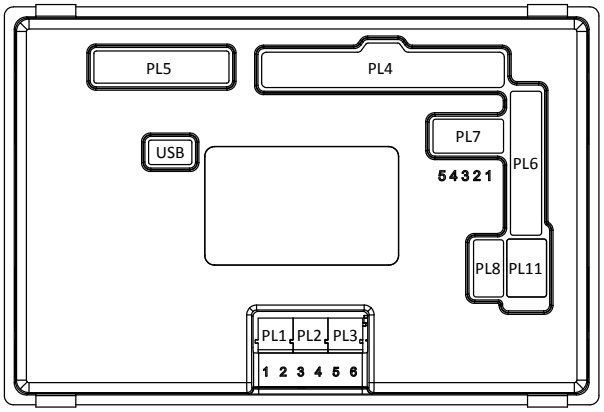
4.3" PanelPilotACE Compatible Display

Pin Out

PL1, 2 & 3: Power & Analogue Inputs

Pin Number	Function
1	Input Voltage (VIN+)
2	0V
3	Analogue Input 4
4	Analogue Input 3
5	Analogue Input 2
6	Analogue Input 1



PL1: 5 to 30V d.c. Input
PL2: Analogue Input (IN3 & IN4)
PL3: Analogue Input (IN1 & IN2)
PL4: Alarms, Serial Input and Digital I/O
PL5: JTAG (for internal use)
PL6: Ethernet and Expansion I/O
PL7: RS232 Interface
PL8: 4-20mA Current Loop Configuration
PL11: Analogue Inputs

PL4: Alarms, Serial Input and Digital I/O

Pin Number	Function
1	0V
2	Input Voltage (VIN+)
3	Alarm O/P 1 (open collector)
4	Alarm O/P 2 (open collector)
5	I2C0 SCL
6	I2C0 SDA
7	SPI SS1
8	SPI MOSI
9	SPI MISO
10	SPI SCK
11	Digital I/O Channel 1
12	Digital I/O Channel 2
13	Digital I/O Channel 3
14	Digital I/O Channel 4
15	Digital I/O Channel 5
16	Digital I/O Channel 6
17	Digital I/O Channel 7
18	Digital I/O Channel 8
19	PWM Channel 1
20	PWM Channel 2
21	PWM Channel 3
22	PWM Channel 4
23	DUART TX (for internal use)
24	DUART RX (for internal use)
25	USB D+
26	USB D-
27	I2C1 SDA (for internal use)
28	I2C1 SCL (for internal use)
29	+5V
30	High Speed ADC
31	+3V3
32	0V
33	Firmware Upgrade Enable
34	Firmware Upgrade Enable

Pin Out (continued...)

PL6: Ethernet & Expansion I/O

Pin Number	Function
1	ENT CLK
2	ENT MDC
3	ENT MDIO
4	ENT RXD0
5	ENT RXD1
6	ENT RX EN
7	ENT TXD0
8	ENT TXD1
9	ENT TX EN
10	Digital I/O 9 (expansion)
11	Digital I/O 10 (expansion)
12	Digital I/O 11 (expansion)
13	Digital I/O 12 (expansion)
14	Digital I/O 13 (expansion)
15	Digital I/O 14 (expansion)
16	Digital I/O 15 (expansion)
17	Digital I/O 16 (expansion)
18	Digital I/O 17 (expansion)
19	+5V
20	0V
21	External Module Hardware ID
22	External Module Hardware ID

PL7: RS232 Interface

Pin Number	Function
1	TX
2	RTS
3	RX
4	CTS
5	0V

PL8: 4-20mA Current Loop Measurement

Pin Number	Function
1-2	4-20mA current loop measurement (IN1) when shorted
3-4	4-20mA current loop measurement (IN2) when shorted
5-6	4-20mA current loop measurement (IN3) when shorted
7-8	4-20mA current loop measurement (IN4) when shorted

PL11: Analogue Inputs

Pin Number	Function
1	Analogue Input 1
2	0V
3	Analogue Input 2
4	0V
5	Analogue Input 3
6	0V
7	Analogue Input 4
8	0V

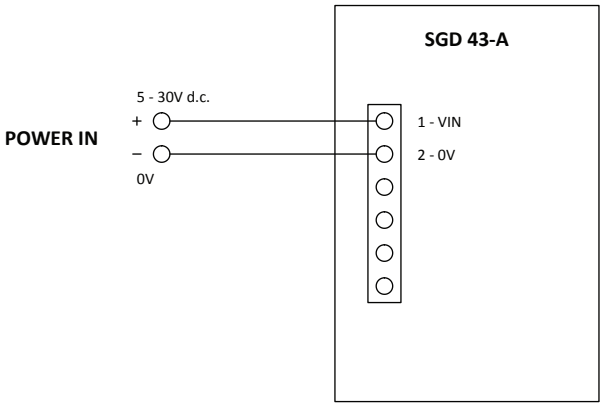
Various Operating Modes

Supply Voltage

Supply to the display module is through the screw terminals, via PL4, or the mini-USB connector.

For best results, ensure the power supply is free from electrical noise.

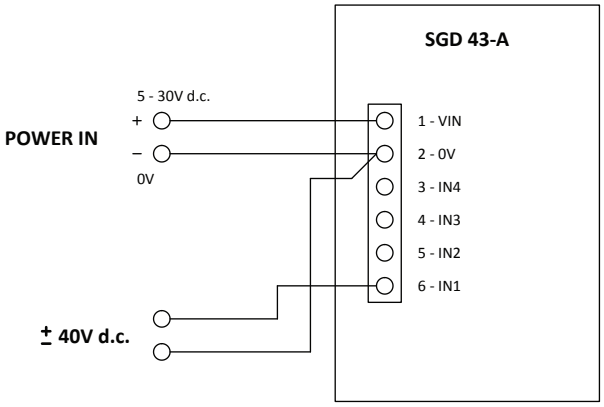
Supply Voltage	Screw Terminals (PL1)	Pin (PL4)
V+	1	1
GND	2	2



Measuring an Analogue Voltage

An analogue voltage can be connected to either the screw terminals or via PL11.

Analogue Input		Screw Terminals	Pin (PL11)
1	IN1	6	1
	0V	2	2
2	IN2	5	3
	0V	2	4
3	IN3	4	5
	0V	2	6
4	IN4	3	7
	0V	2	8



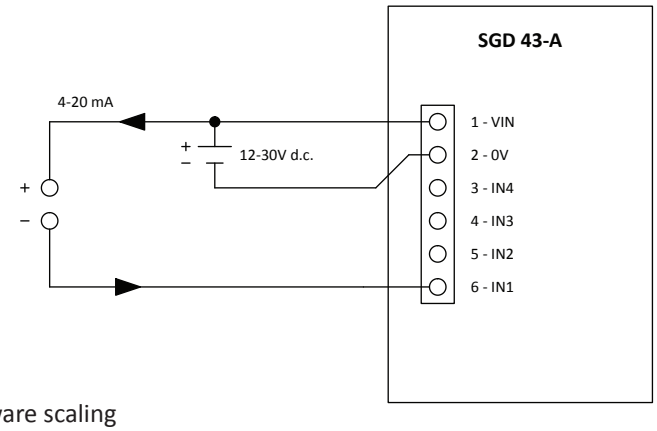
Note how the 0V connection is made. This is to ensure that offsets due to current in the power supply are minimised.

Various Operating Modes (continued...)

Measuring a 4-20mA Current

The 4-20mA signal should be connected as for "Measuring an Analogue Voltage" but a jumper link should be placed across PL8 as follows:

Analogue Voltage	Jumper link PL8
Analogue Input 1	1 & 2
Analogue Input 2	3 & 4
Analogue Input 3	5 & 6
Analogue Input 4	7 & 8



Scaling: The sense resistors used are 110Ω. Therefore in software scaling 4mA equates to 0.44V and 20mA equates to 2.2V.

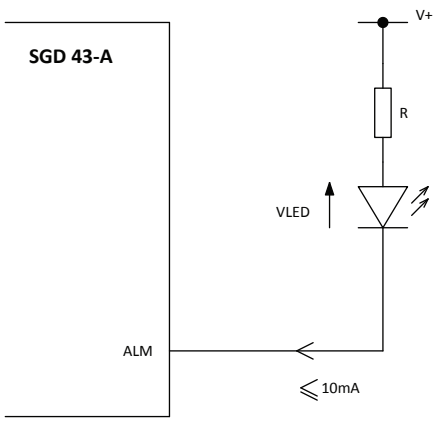
Note: transmitter terminals (+ or -) must be isolated from the power supply

Driving an Alarm Output

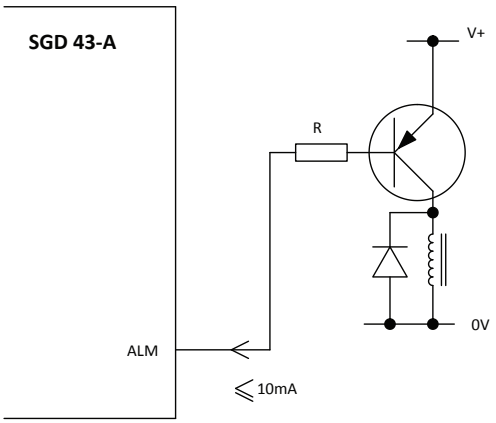
The alarm outputs are open-collector. When an alarm is active, the output can pull down up to 10mA.

Alarm outputs are connected via PL4:

Alarm Output	Pin (PL4)
1	3
2	4



Driving an LED using alarm output



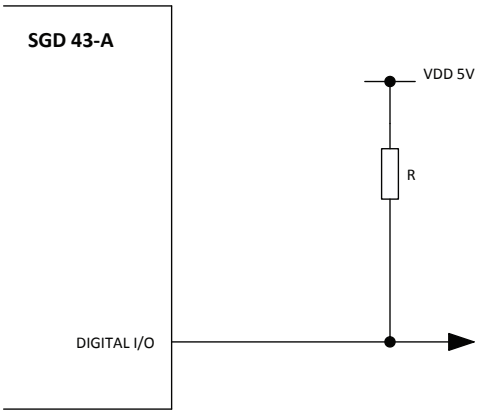
Driving a relay using alarm output

Various Operating Modes (continued...)

Using Digital Input/Output Pins

Digital inputs/outputs are connected via PL4:

Digital I/O	Pin (PL4)
Channel 1	11
Channel 2	12
Channel 3	13
Channel 4	14
Channel 5	15
Channel 6	16
Channel 7	17
Channel 8	18

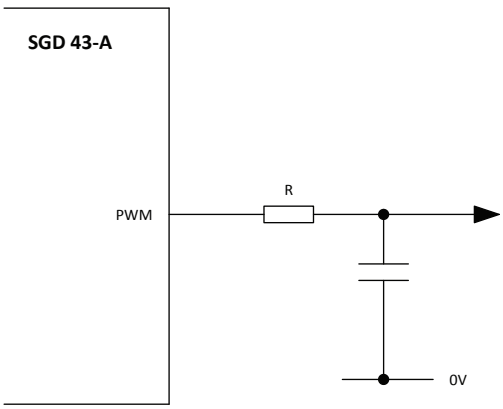


Using PWM Output

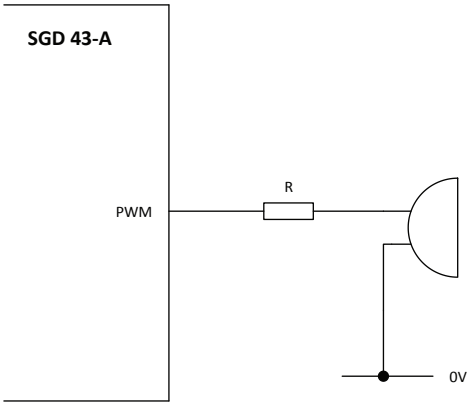
If the SGD-43A is configured to have PWM output, it can be used to drive a buzzer or produce a simple digital-to-analogue converter.

The PWM outputs are connected via PL4:

PWM Output	Pin (PL4)
Channel 1	19
Channel 2	20
Channel 3	21
Channel 4	22



Using PWM output to convert digital to analogue



Using PWM output to drive a buzzer

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