



Off the shelf hardware and intuitive design software for rapid development of your next display project.

## Hardware solutions

The top-of-the-range PanelPilotACE, available in 4.3" and 7" versions, uses Lascar's bespoke Design Studio software that allows app development through an intuitive drag and drop interface.

ACE display units accept inputs including 4-20 mA analogue, direct digital I/O, RS485, CANBUS and MODBUS. There are also digital alarm outputs and a built-in PWM generator.



**PanelPilotACE**

◀ SGD 70-A

◀ SGD 43-A

◀ SGD 70-A DK+  
▶ SGD 43-A DK+



▶ EL-SGD 43-ATP

▶ EL-SGD 70-ATP

## Specifications

	SGD 43-A	SGD 70-A
Display	4.3" TFT with 262k colours	7.0" TFT with 16.7M colours
Touch screen	Capacitive touch screen	Capacitive touch screen
Resolution	480 x 272 px	1024 x 600 px
Processor	Freescale i.MX283 (454 MHz, 32-bit, ARM 9)	Freescale i.MX6XSolo (ARM Cortex A9 @800 MHz & Cortex M4 @227 MHz)
Operating temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Supply	5 to 30 V dc (300 mA typical at 5 V dc)	5 to 30 V dc (500 mA typical at 5 V dc)
Outside dimensions	119 x 80 x 20 mm (4.69" x 3.14" x 0.78")	186 x 122 x 21 mm (7.3" x 4.3" x 0.8")
RS485	Requires add-on board S43-RS485	Built-in
Ethernet for FTP (Wired)	Requires add-on board S43 ENET	Built-in
CAN bus	Not available	Requires add-on board S70-CAN
Thermistor	Requires add-on board S43-TP	Requires add-on board S70-TP

## Development kits

Get your project off the ground quickly with a choice of two development kits. No need to create your own wiring loom and test rig. SGD 43-A DK+ and SGD 70-A DK+ are the best choice if you are starting to develop on the PanelPilotACE platform. They include all you need to begin: a PanelPilotACE display module, a development board and a USB cable. The board itself provides switches, dials, LEDs and screw terminal connections for all the input and output functionality of your PanelPilotACE.

## 4-Channel data logging kits

EL-SGD 43-ATP and EL-SGD 70-ATP are four-channel temperature data loggers based on PanelPilotACE technology. Both the 4.3" and 7" panel mounted display modules include a four-channel thermistor temperature board and four compatible temperature probes. Both displays are pre-loaded with an advanced logging application which shows real-time readings for all four temperature channels, live trend graphs and access to a suite of real-time data analysis information. The loggers can store up to 100,000 readings per channel at sample rates from 5 seconds to 12 hours.

PanelPilotACE

# Ace your next display with the PanelPilotACE Design Studio.

## PanelPilotACE Design Studio



Design Studio includes a 'Preview in Emulator' function which emulates the hardware inputs/outputs allowing you to test projects prior to their upload to the PanelPilotACE display via USB.



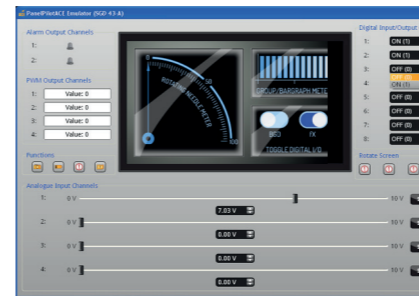
Design Studio includes a library of meters, buttons and switches. You can also create your own content by combining behaviour and graphical elements.

### Code-free development of advanced touch screen display applications

Hardware elements are dragged from the library into a function builder where associations with graphical elements (such as a needle on a meter) can be defined. Set scaling for analogue inputs, define alarm triggers and behaviours for digital I/O.

## Create your new application in 5 easy steps

The suite of tools available in the Design Studio and the sleek design of the displays themselves makes the PanelPilotACE platform a great choice whether you're developing an interactive public display, a control unit for an industrial application or anything in between.



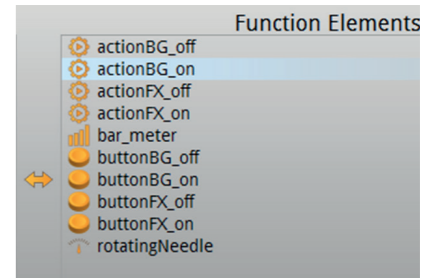
### 3. Emulate in the software

Test your project in software to see the graphical and hardware elements working together.



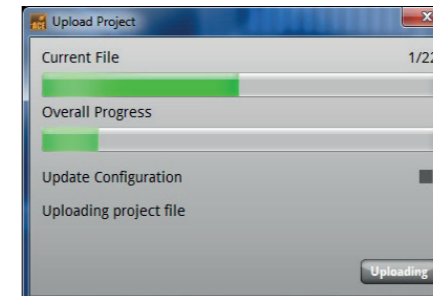
### 1. Design your interface

Add graphical elements to create a unique looking project with navigation, animation and images.



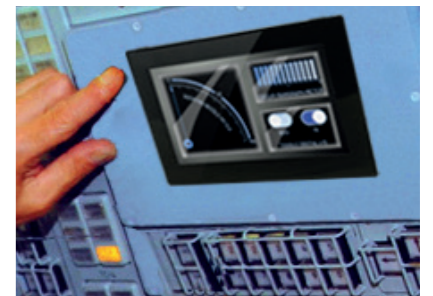
### 2. Configure your hardware

Assign behaviours to the graphical elements to interface with the hardware inputs and outputs.



### 4. Upload to your display

Connect your display via USB and upload your project.



### 5. Mount, connect and complete

Fix in your panel and wire to the display using screw terminals and dual-in-line pins. Your PanelPilotACE is now ready to use.

## PanelPilotACE add-on boards



▲ S43-RS485

### S43-RS485

Compatible with the 4.3" PanelPilotACE display module (SGD 43-A), the S43-RS485 mounts on its rear and provides a 3-wire RS485 interface as well as an optional 120 Ω terminator. The software currently supports ASCII based serial communication as well as the MODBUS (RTU) protocol.

### S43-TP & S70-TP

The S43-TP and S70-TP mount onto the rear of the 4.3" and 7" PanelPilotACE displays providing up to four thermistor inputs which can then be utilised within the free PanelPilotACE Design Studio software to measure, display, log and graph temperature readings.

### S43-ENET

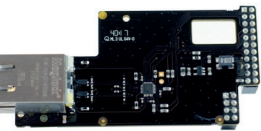
Add-on board for the 4.3" PanelPilotACE display providing a wired Ethernet port to enable transmission of logged data via FTP.

### S70-CAN

Add-on board for the 7" PanelPilotACE display providing a CAN bus interface.



▲ S43-TP & S70-TP



▲ S43-ENET



▲ S70-CAN

## Displays & accessories



**SGD 43-A**  
4.3" Display with analogue, digital, PWM and serial interfaces



**SGD 70-A**  
7" Display with analogue, digital, PWM, serial and wired Ethernet for transmission of logged data via FTP



**SGD 43-A DK+**  
Development kit for SGD 43-A



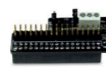
**SGD 70-A DK+**  
Development kit for SGD 70-A



**EL-SGD 43-ATP**  
4.3" four-channel temperature data logger



**EL-SGD 70-ATP**  
7" four-channel temperature data logger



**S43-RS485**  
Add-on board allowing RS485 comms for SGD 43-A



**S43-ENET**  
Add-on board providing a wired Ethernet port for SGD 43-A, enabling transmission of logged data via FTP



**S43-TP**  
Four-channel thermistor add-on board for SGD 43-A



**S70-TP**  
Four-channel thermistor add-on board for SGD 70-A



**S70-CAN**  
Add-on board providing a CAN bus interface for SGD 70-A



## PanelPilotACE University

Whether you've already chosen the PanelPilotACE platform for your next display project, have used its software suite before or are still evaluating its development potential, the PanelPilotACE University is your one-stop shop for all the tools needed to turn your display design concept into a fully-functioning App.

The PanelPilotACE University has a multitude of resources to make your screen design experience as quick and efficient as possible, from How To Guides and Frequently Asked Questions to an ever growing number of pre-configured ACE Templates and an Icon and Graphic Library.

### Let Lascar Do the Hard Work For You

Our PanelPilotACE software platform gives users the ability to dramatically reduce design time for display applications by eliminating the need for complex code. But if you're really under pressure to finish a design, why not make use of Lascar's Custom Design Service for PanelPilotACE to deliver your solution? Provide us with a description of your display requirements and we can complete the design for you.

[www.lascarelectronics.com/panelpilotace-university](http://www.lascarelectronics.com/panelpilotace-university)

[www.lascarelectronics.com/panelpilot](http://www.lascarelectronics.com/panelpilot)

PanelPilotACE University



## Custom App Design Service

If you're really under pressure to finish an application interface design, why not make use of Lascar's Custom App Design Service for PanelPilotACE to deliver your solution?

Provide us with a description of your display requirements and we can complete the app design for you. Forget months of coding and an enormous development bill. Lascar's unique PanelPilotACE software turns months of work into weeks, days or even hours giving you the quickest route to your new display at a fraction of the cost of typical custom design.



PanelPilotACE App Design

## M-Series

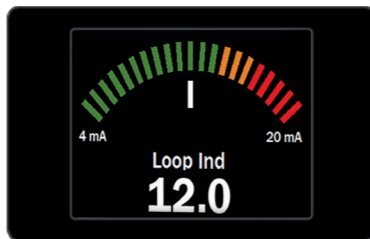
Introducing our range of 8 low cost TFT displays with dual-analogue input, touch-screen, I2C and SPI capabilities.\*

Connect any of the meters to a PC and using our PanelPilot M software select an app from more than 50 meter styles including many touch screen options. Choose custom display colour, text labels and scaling options before saving and uploading your custom app to your display via USB.

\*touch screen not available with IP models.



◀ SGD 24-M  
SGD 24-M-IP  
SGD 24-M420  
SGD 24-M-IP420



◀ SGD 28-M  
SGD 28-M420



◀ SGD 35-M  
SGD 35-M420

### Selection of available meter styles



## Easy to use



### 1. Configurations

Choose from an ever-increasing library of configurations including analogue, digital and bar graph styles with single or dual analogue inputs.



### 2. Customisation

Colours and text labels are fully editable. Voltage input levels can also be set in software, removing the need for scaling resistors on input voltages up to 40 V dc.



### 3. Start-up screen

On power-up a PanelPilot display can be set to show an image of your choice, such as a logo.



### 4. Upload & ready to go!

Connect your display to a PC and upload the configuration via USB. Your display configuration is now saved and can be added to your application. Reconfigure your display at any time.

## Displays & accessories



**SGD 24-M**  
2.4" PanelPilot compatible smart graphics display

**SGD 24-M420**  
2.4" PanelPilot compatible 4-20 mA display



**SGD 24-M-IP**  
2.4" waterproof current loop indicator PanelPilot compatible display

**SGD 24-M-IP420**  
2.4" waterproof PanelPilot compatible 4-20 mA display



**SGD 28-M**  
2.8" PanelPilot compatible smart graphics display

**SGD 28-M420**  
2.8" PanelPilot compatible 4-20 mA display



**SGD 35-M**  
3.5" PanelPilot compatible smart graphics display

**SGD 35-M420**  
3.5" PanelPilot compatible 4-20 mA display



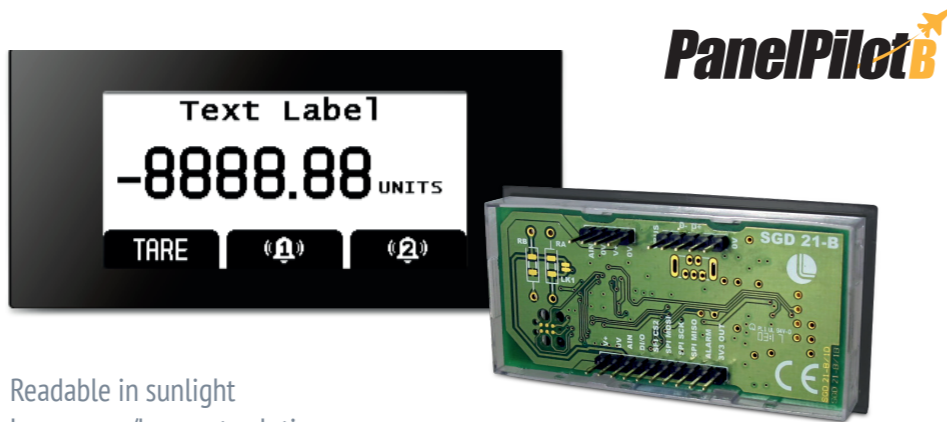
**SGD ADPT-420**  
Dual channel 4-20 mA isolation module for PanelPilot compatible displays



**SGD ADPT-TC**  
Thermocouple conditioning module for PanelPilot compatible displays

Our PanelPilot B range can be quickly configured and customised at the click of a mouse, with easy to use Windows™ software.

Connect the display to the computer via a USB cable and select a display configuration from a choice of various analogue, digital and bar graph meter styles. Then choose your own display colours, text labels and scaling options. Once all selections have been made using this simple click-through software, save the custom configuration and upload it to the display.



- Readable in sunlight
- Low power/low cost solution
- Simple set-up to customise your own application

▲ SGD 21-B

## B-Series

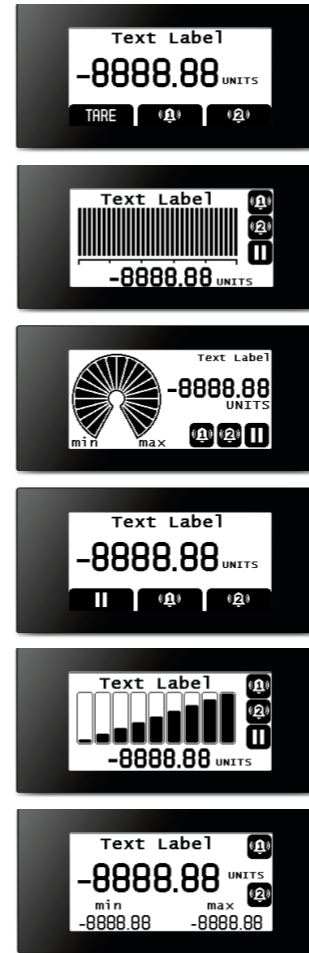
Low-cost configurable e-paper voltmeter

Lascar's SGD 21-B is a low-cost, ultra low-power single channel voltmeter with a sleek, monochrome, e-paper voltmeter, dot-matrix, display. Using Lascar's simple PanelPilotB software, choose from a selection of analogue and digital voltmeter apps and customise labels, scaling and alarms for your own specific application.

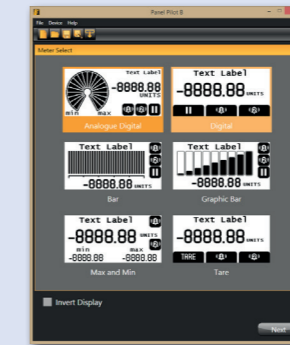
### Specifications

	SGD 21-B
Display	2.1" e-paper, black and white
Resolution	250 x 122 px
Operating temperature	0 to 40°C (32 to 104°F)
Supply	4 to 9 V dc
Outside dimensions	73.8 x 37.5 x 10.8 mm (2.90" x 1.47" x 0.42")

**PanelPilot B**

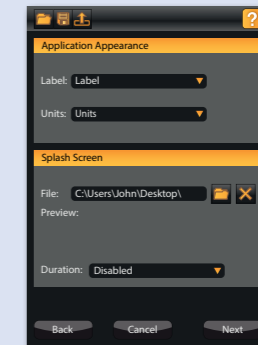


## Create your application in 4 easy steps



### 1. Application Selection

Choose from 6 popular configurations including analogue and bar graph styles.



### 2. Appearance & Splash Screen

Select colour style, either black on white or inverted, add custom text labels. Also choose an image of your choice, such as a logo, that can be set-up to appear on power-up.



### 3. Scaling & Alarms

Select custom scaling options and alarm settings.

### 4. Set-up is Complete

Connect your display to the PC and upload your configuration.



PanelPilot B

# Panel Instruments

Lascar has an extensive range of LCD and LED voltmeters, 4-20 mA indicators, temperature indicators, data displays and graphics modules for use in sensors, process and test & measurement applications.



## SP5 & SP Series

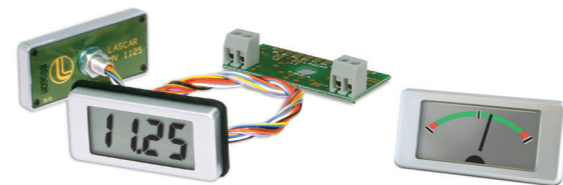
Low profile, splashproof displays

The SP5 Series includes 3-digit, 2-wire signal powered voltmeters, and a 128 x 64 pixel graphic dot matrix display.

The SP Series voltmeters are available in LCD and LED format with 12-pin modules. 9-pin versions are lower cost, easier to use and more suited to new designs. All modules are splashproof protected from the front when fitted with the rubber seal supplied.






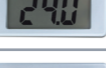
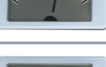

 <b>SP 300</b> 3½ digit 200 mV LED voltmeter, 9 pin	 <b>SP 100</b> 3½ digit 200 mV dc LED voltmeter, 12 pin
 <b>SP 200</b> 200 mV dc full scale, LED backlit, 12 pin DIL connection	 <b>SP 300-BLUE</b> 3½ digit 200 mV blue LED voltmeter
 <b>SP 400-BLUE</b> 3½ digit 200 mV blue backlit LCD voltmeter	 <b>SP 400</b> 3½ digit 200 mV backlit LCD voltmeter, 9 pin

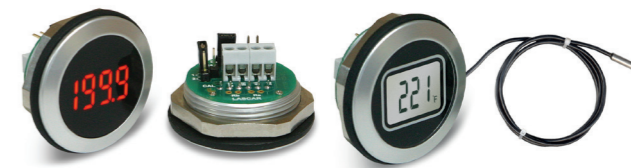


## EM Series

Round hole fitting

EM Series meters are fitted with a threaded stud which allows mounting through a 5.5 mm hole. A rubber seal (supplied) provides splashproof protection when fitted between the meter and the mounting panel.

 <b>EMV 1125</b> 200 mV dc full scale, round hole mounted, wire connections
 <b>EMC 1500</b> Elapsed hour LCD digital panel meter
 <b>EMT 1900</b> Internal NTC thermistor LCD thermometer with external thermistor option
 <b>EMV 1200 / EMV 1200-40</b> 3 digit, 4-25 V or 4-40 V signal powered LCD digital panel meters
 <b>EMA 1710</b> Analogue style 1 V LCD voltmeter
 <b>EMV 1025S-01</b> 200 mV full scale, round hole mounted, wire connections



## EM32 Series

Round hole fitting with waterproof option

The waterproof EM32 Series is designed to be panel mounted with a 32.5 mm dia. cut-out. The metal bezel and rubber seal provide NEMA 4X / IP67 protection once the module is fitted into a panel and secured with the nut provided. These products are designed so no soldering is required.

 <b>EM32-1B</b> Waterproof, 3½ digit, 200 mV LCD voltmeter
 <b>EM32-1B-LED</b> Waterproof, 3½ digit, 200 mV LED voltmeter
 <b>EM32-1900</b> Waterproof, 3 digit, LCD thermometer
 <b>NTC Probe-1900</b> 10K NTC thermistor probe for use with EM32-1900 and EMT 1900





## Large displays with waterproof options

This range of LCD and LED instruments includes 3½ digit, ±200 mV dc full scale reading LCD voltmeters, a 500 V ac voltmeter, a 4-20 mA loop powered meter and LED voltmeter. Optional NEMA 4X / IP67 rated alloy bezels fit all meters.



**DPM 742-BL**  
4-20 mA loop powered, LED backlight, bezel mounted



**DPM 750S-BL**  
200 mV dc full scale, LED backlight, annunciators, bandgap reference, bezel mounted



**DPM 942-BL**  
4-20 mA loop powered, LED backlight, bezel mounted



**DPM 950 / DPM 950S**  
200 mV dc full scale, LED backlight, bezel mounted. Single rail option (DPM 950S)



**DPM 959B**  
3½ digit LED voltmeter



**DPM 970**  
500 V ac full scale, LED backlight, digital hold, bezel mounted



**BEZ 700 IP**  
Optional NEMA 4X / IP67 rated alloy bezel for 700 Series products



**BEZ 900-IP**  
Optional NEMA 4X / IP67 rated alloy bezel for 900 Series products



## Snap-in sub-miniature digital panel meters

A range of snap-in, sub-miniature digital panel instruments with LED backlighting for low light conditions and single or dual rail operations for ease of use. LED and 4-20 mA versions of the range are also available.



**DPM 1AS-BL**  
200 mV dc full scale, LED backlight, snap-in



**DPM 2AS-BL**  
200 mV dc full scale, LED backlight, snap-in



**DPM 3AS-BL**  
200 mV dc full scale, LED backlight, snap-in



**DPM 340**  
200 mV dc full scale, snap-in LED



**DPM 342**  
4-20 mA loop powered, LED backlight, snap-in



## Low cost voltmeters for OEMs

The V 1, V 125 and V 600 modules are very low cost, 3½ digit LCD voltmeters with 7-12 V dc operation, a ±200 mV dc full scale reading and typical accuracy of 0.25% V (±3 counts).



**V 1 / V 1 PK OF TEN**  
200 mV dc full scale, bezel mounted. Also available in packs of 10.



**V 125 / V 125 PK OF TEN**  
200 mV dc full scale, bezel mounted. Also available in packs of 10.



**V 600 / V 600 PK OF TEN**  
200 mV dc full scale, bezel mounted. Also available in packs of 10.

These ultra-miniature, component-style LCD and LED voltmeters are ideal for applications where space is at a premium.



**OEM-1B**  
200 mV dc full scale, LCD, component style



**OEM 1B-LED**  
200 mV dc full scale, LED, component style



## Indicators red/green status

Ideal for go-stop applications. During standard operation the backlight is green. As a reading moves outside programmable thresholds, the backlight turns red.



**DPM 942-FPSI**  
4-20 mA loop meter with programmable backlighting



**DPM 950S-FPSI**  
3½ digit LCD voltmeter with programmable backlighting

## LCD voltmeters for low light conditions

Enhanced black LCD with white LED backlighting ensures excellent readability in low light conditions. Three sizes available.



**SP 400-EB-W**  
3½ digit LCD voltmeter module with white backlighting



**DPM 750S-EB-W**  
3½ digit LCD voltmeter with white backlighting



**DPM 950S-EB**  
3½ digit LCD voltmeter with white backlighting

# Turn your new product concept into reality with Lascar.

With over 40 years' experience in delivering cutting edge technology, we're leading designers and manufacturers of data capture, touch screen and wireless products.



## Hardware, Software and IoT Capabilities Under One Roof



Design



Prototype



Sourcing



Manufacture



Supply

## Look to a Colourful Future

Talk to us to start your next success.

# Lascar delivers

- IoT, electronics and plastics design and manufacture
- Firmware, software and App development, Cloud integration
- Low and high volume manufacture (UK and Far East)
- Unbeatable cost-effectiveness and lead time reductions
- Supply chain and stock management

Custom Design



**PanelPilot** 

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[www.lascarelectronics.com/panelpilot](http://www.lascarelectronics.com/panelpilot)

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