

THE SPECIALIST IN POWER CONVERSION AND DISPLAYS



STANDARD IS JUST THE BEGINNING

3

RESULT



Power for monitoring systems



All weather touch screens



Touch sensitivity with gloves

RELEC's goal is to make a measurable difference to every project by achieving optimum performance and service delivery for your power conversion or display applications.

**ANY
REQUESTS?**

01929 555800

Discover more
www.RELEC.co.uk/Case_Studies.html



REQUEST

**“WE WANT A
BRIGHTER
SCREEN FOR
DAYLIGHT HOURS”**



DISPLAYS

We believe a proud 40 year history in the displays' business constitutes a 'specialist'!

It means RELEC is able to listen, advise and recommend the best products sourced from a wide range of display technologies.

We have supplied literally millions of custom mono displays, standard mono displays and modules to many industries and types of customer.

We believe our range of TFT panels and touch panels, combined with our service, is unrivalled. Working closely with

specialist partners, we can easily provide the panel or monitor you need. We are very happy to develop custom solutions for whatever the application, be it light industrial or heavily ruggedised for the harshest of environments.

We have an on-line brochure that gives a comprehensive view of our capabilities, alternatively call us for a chat, or complete a contact form and we will call you straight back.

REFINE

“YOU ALSO NEED TOTAL ENVIRONMENTAL PROTECTION”

MATHEW REHM
HEAD OF DISPLAYS



TALK TO MAT
01929 555800

E : MAT@RELEC.CO.UK

DISPLAYS



TFT DISPLAYS



SMALL TFT **SIZE 1.77" TO 12.1"**

RELEC's standard TFT display products are available in a wide range of sizes, from small 1.77" up to 12.1". These cover all industry standard resolutions, sizes and interfaces. Standard units are available with brightness levels exceeding 1500 cd / m².

In addition to supplying standard panels, we also have the ability to offer a range of enhancements to improve the optical, mechanical and environmental performance of your display.

These may include:

- Addition of a touch panel
- Improving the readability in bright and direct sunlight
- Ruggedising
- Improving the optical characteristics by use of treatments, filters and optical bondings

LARGE TFT **SIZE 12.1" TO 31.5" +**

We offer a range of larger TFT panels from 12.1" to 31.5" which can be tailored to your specific need.

With access to all the main manufacturers for large TFT displays, we have a wide range of products to use as a base. We then optimise the panel to meet your requirements.

Options include:

- Assembly with a touch panel
- Increasing the backlight brightness
- Improve the viewing angles
- Improving the view-ability in bright and direct sunlight
- Ruggedising
- Optical bonding

IPS PANELS

IPS (In-Plane Switching) was designed to solve the main limitation with conventional TN TFTs of restricted viewing angles and grey scale inversion when viewed away from the preferred viewing direction.

IPS provides true viewing angles from any direction. The technology involves arranging and switching the alignment of the crystal molecules between the glass substrates. This change reduces the amount of light scattered in the matrix.

The benefits not only include having the perfect colour balance from every point, but also allows the LCD to be mounted in either landscape or portrait orientation.

RELEC's range of IPS panels cover all the popular sizes, from 5.0" all the way up to 31.5" and above.

CALL OUR SALES TEAM

AND FIND OUT HOW OUR IPS PANELS CAN HELP YOU SOLVE YOUR PROBLEMS



CALL

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SCREEN ENHANCEMENTS

OPTICAL BONDING

TFT LCDs are susceptible to glare and reflection from either bright light or direct sunlight. This can be dramatically improved by optical bonding.

In almost all displays there is an air gap between the TFT panel and the cover lens. This causes refraction in each level: cover lens, air gap and TFT panel.

Optical bonding is where an optical compound is inserted in the air gap between the cover glass and the TFT LCD, creating a single level of refraction. By reducing the internal reflection, the contrast and view-ability is increased. This in turn makes the display more readily seen in bright conditions, without the need to increase the brightness and the corresponding higher power consumption.



OPTICAL BONDING HAS MANY OTHER KEY FEATURES WHICH MAKES IT A POPULAR OPTION, THESE FEATURES INCLUDE:

- Improved sunlight readability
- Reduced reflections and refractions
- Greatly improved durability and ruggedness
- Increased contrast ratios
- Improved resistance to vibration and moisture
- Suitable for harsh temperature environments
- Enhances the backlight performance
- Prevents condensation and other contamination ingress
- High impact absorption

OPTICAL BONDING IS AN IDEAL OPTION FOR THE FOLLOWING APPLICATIONS:

OUTDOOR

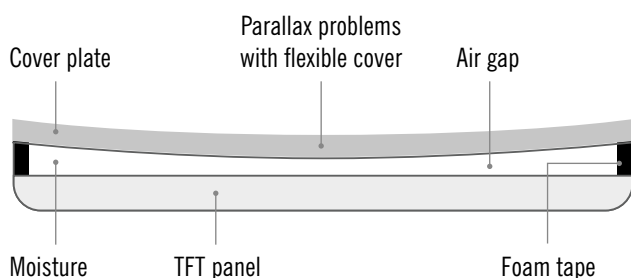
BRIGHT AMBIENT LIGHT CONDITIONS

WHERE A MORE RUGGEDISED DISPLAY IS REQUIRED

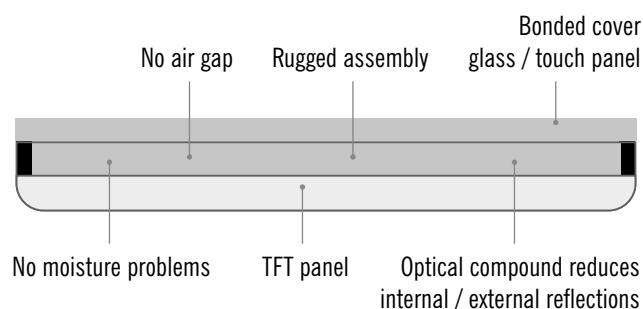
MARINE

MILITARY

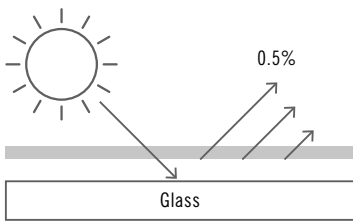
WITHOUT OPTICAL BONDING



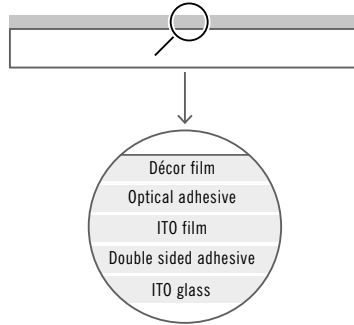
WITH OPTICAL BONDING



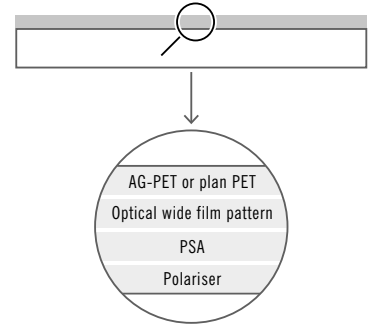
FILMS



Reflection of AR film
(based on 3 x AR coatings)



Touch panel FPC make up



Optical film

ANTI-REFLECTIVE POLARISER

The anti-reflective (AR) polariser is a clear film that is applied to the panel which reduces the amount of reflection created by external bright light.

In a typical TFT display there are three layers which light passes through. These are the cover lens, an air gap, (which can be optionally filled using an optical compound) and the LCD TFT panel.

Within each of these there is a reflection of approximately 5% under direct light, which equals a total of 15%. With the anti-reflective polariser, the reflection is reduced to approximately 9%.

Up to three layers can be applied to a single display to further reduce the reflection. With 2 layers the reflection is reduced to 5% and with three layers the reflection is further reduced to 0.5%.

The AR polarisers can be applied to the top and bottom of the cover glass or both to further reduce reflection. With a display that comes with PCAP (projective capacitive touch panel) the AR polariser can only be applied to the top of the cover glass due to the sensor film.

DÉCOR FILM

Décor film is an individual design option that is available for displays fitted with 4 wire resistive touch panels. The décor film is a customisable decorative surround, framing the TFT module.

The key features of the décor film mean that it can be mounted directly to the touch panel surface and allow the customer to have a flat product design. The film can be supplied with rounded corners for example or formed to a custom shape.

The whole décor film can be customised to allow for different colours, cut outs, indentations and printing with your logo.

This construction is based on a film-film-glass panel. Typically the décor film with a 4-wire resistive touch panel will have the upper ITO film manufactured larger than the bottom ITO glass. This allows for the extra space needed to bend the FPC if applicable.

OPTICAL FILM

The optical film (O-film) polariser increases the viewing angle up to 80° and improves grey scale inversion.

Most TFT LCDs have narrow viewing angles. Without an O-film, viewing the display from an unconventional angle the image would either have a wash out effect (the lighter colours become more visible) or greyscale inversion (the darker colours become more visible).

Both of these effects make the display almost unreadable. With the O-film polariser applied to the TFT LCD from almost all angles it will show the ideal colour balance.



LET'S CREATE YOUR IDEAL
TOUCH SCREEN SOLUTION
01929 555800

SCREEN ENHANCEMENTS

SURFACE TREATMENTS



ANTI-FINGERPRINT SURFACE TREATMENT

Anti-fingerprint (AF) surface treatments reduce finger print marking when directly handling the display. This is most commonly combined with a touch panel.

The AF treatment is a spray coating which is applied to the front on the module and uses fluoride nano-molecules within the coating. This isolates any natural oil on a person's finger and greatly reduces finger prints being transferred to the display.

The AF treatment also significantly increases the touch panel's sensitivity and accuracy when used in high moisture environments and as a by-product, also provides a softer feel to the panel when touched.

The AF coating has no effect on the optical characteristics on the display or the sensitivity when combined with a touch panel.

ANTI-BACTERIAL SURFACE TREATMENT

The anti-bacterial (AB) surface treatment is a coating that is applied to the cover glass.

Nano-silver technology is widely used in the medical world, and when combined with a SiO₂ layer, breaks down the bacterial cell wall and reduces bacteria reproduction by 99.999%.

The AB coating has no effect on any optical characteristics of the display nor does it affect the sensitivity when used with a touch panel. Popular applications of this surface treatment include:

MEDICAL
POINT OF SALE
MULTI-USER

ANTI-GLARE SURFACE TREATMENT

The anti-glare (AG) surface treatment is a cost effective solution to reducing glare and any unwanted reflections. In normal circumstances light reflects in a predictable way. This is either specular or diffused.

Once light strikes an AG coated display, it is dispersed in different directions hence reducing the glare. The AG coating has no effect on the optical characteristics or sensitivity when used with a touch panel.



ANY REQUESTS?

TALK TO US ABOUT YOUR SCREEN ENHANCEMENT REQUIREMENTS.



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E : ENQUIRIES@RELEC.CO.UK

TOUCH PANELS

PROJECTED CAPACITIVE

RELEC is proud to offer a comprehensive range of PCAP touch panels with a variety of options. These include custom cover glass graphics as well as apertures for LEDs or USB ports. We can also incorporate capacitive switches behind the cover glass for more bespoke solutions.

RELEC's range of touch panels are suitable for applications from commercial grade to high end automotive and military. We have solutions with noise immunity up to 32V/m which suit medical, automotive and avionic applications. In fact anywhere where operation and reliability are mission critical.



Projective capacitive touch panels (PCAP) offer the most responsive, sensitive and durable type of touch screen technology.

The PCAP sensor is constructed from a grid of conductive material which is layered on sheets of glass.

An electrostatic field is then created once a voltage is applied. When a conductive object (e.g. finger) comes into contact with the sensor, the PCAP controller measures the change in capacitance at that point which is then accurately converted to the X and Y coordinates.

Because a PCAP panel senses a touch by projection through an outer layer, this means that the top cover lens can be constructed from strengthened glass. This makes it the perfect solution for outdoor or harsh applications.

SMALL TO MID RANGE PCAP 3.5" TO 10.4"

Fully assembled TFT + PCAP touch panels available with a choice of glass thicknesses from 1mm up to 6mm (anti-vandal) with the option of customising the cover lens with print and graphics as required.

We can support multi touch of up to 10 points and provide the source code for popular operating systems (Linux and Android).

LARGE RANGE PCAP 7" TO 31.5"

Solutions designed with quality and performance as the main priority. We use a proprietary chip which has the highest possible signal-to-noise ratio available on the market.

Features and benefits

- Improved EMC immunity (Up to 32V/m)
- Up to 10 points of touch
- Glass thickness of 0.7mm to 10mm +
- Operation with nearly all types of gloves
- Water rejection
- Full operation with water
- Choice of interface; USB, RS232 and I²C
- Driver support for all major operating systems



MORE THAN ONE TOUCH CAN BE SENSED SIMULTANEOUSLY

HIGH ACCURACY TOUCH POINT

EXTREMELY DURABLE

IMPROVED EMC PERFORMANCE

BESPOKE SOLUTIONS THAT WORK WITH THICK GLOVES

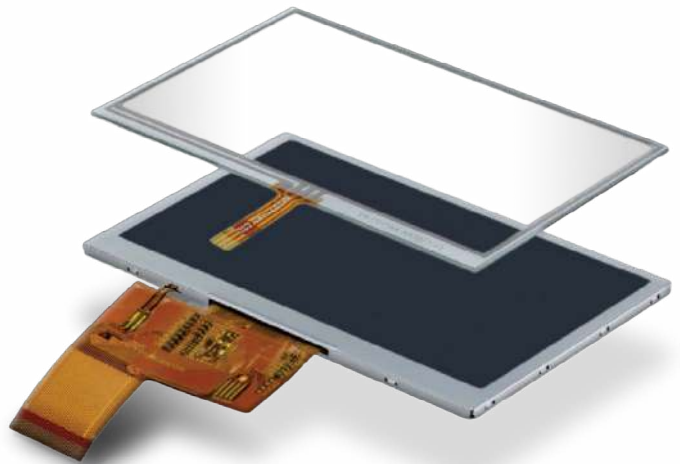
TOUCH PANELS

RESISTIVE TOUCH PANELS

Resistive touch panels (RTP) have traditionally been the most common touch panel technology in the industrial market.

There are two main types of resistive touch panel, 4-wire and 5-wire RTP. Each consists of a two layer construction for determining the X and Y coordinates.

Typical applications include handheld devices or any product that requires a low cost single touch solution.



4-WIRE RESISTIVE TOUCH PANEL

The most cost effective touch panel is the 4-wire RTP. These have an Indium Tin Oxide (ITO) resistive coating on the inner side of each layer to create the X axis and the Y axis. Voltage is then applied to each layer individually. Once touched both layers make a contact, the co-ordinates for the X and Y axis are then calculated using a voltage divider.

One disadvantage to the 4-wire RTP is that the flexible coversheet (top layer) acts as one of the axes as well as a uniform voltage gradient. Certain factors can cause the linearity and accuracy on this axis to decrease, including for example environmental conditions and high frequency of operation.

Occasional re-calibration may be required to maintain a level of touch point accuracy. A typical life time durability for repeated touch on a single spot is 1 million times, based on a finger touch.

5-WIRE RESISTIVE TOUCH PANEL

The 5-wire resistive touch panel offers a similar construction and design concept to the 4-wire RTP. The 5-wire RTP only uses the bottom layer to create both X and Y axis coordinates and the top layer acts as a voltage probe. This results in excellent stability, durability, sensitivity and reliability due to the top layer not being used for one of the axes.

The 5-wire RTP is an ideal touch panel solution for applications where touch durability and reliability are crucial or the touch input is potentially from an inanimate object.

A few benefits of the 5-wire RTP are:

A CONSTANT LEVEL OF ACCURACY, EVEN IF THE TOP LAYER IS DAMAGED

TOUCH RESPONSE AND ACCURACY IS UNAFFECTED BY HARSH ENVIRONMENTAL CONDITIONS

CALIBRATION ONLY REQUIRED AFTER INITIALISATION OF THE SYSTEM

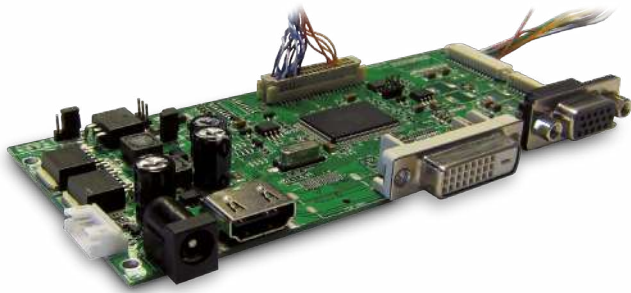
We aim to provide everything you need to integrate your display and touch panel into your system. We can supply controller boards that allow you to easily interface to your systems and equipment. Interface examples include USB, RS232 and PS/2. Operating systems supported include Windows, CE and Linux.

A TYPICAL LIFE TIME DURABILITY FOR REPEATED TOUCH ON A SINGLE SPOT IS 30 MILLION



ACCESSORIES

AD BOARDS AND COVER LENS OPTIONS



AD BOARDS

An AD board is a TFT LCD controller board which provides an analogue connection for the TFT panel. Acting as an interface between the TFT panel and PC systems, the AD board transfers the image created from the PC to the TFT.

RELEC'S OFFERING OF AD BOARDS INCLUDE THE FOLLOWING OPTIONS

- Input connections for VGA, DVI, HDMI, DP or a combination of all 4
- Resolutions from VGA to FHD
- Automatic image scaling
- OSD keypads for basic control settings (e.g. brightness & contrast control and input selection)
- LED driver boards (if not already built in to the TFT)
- All cables

CUSTOM COVER LENS

Available across our entire TFT range, RELEC offers a custom cover lens service. This can be included on any of our products, with or without a touch panel. Suitable when specific mounting methods are required, or custom graphics / logos.

THE CUSTOM COVER LENS CAN INCLUDE THE FOLLOWING

- Cover lens material of either glass or PMMA
- Custom design, size and shape
- Printing graphics in multiple colours (i.e. custom logo)
- Apertures for other connections (i.e. USB sockets or mechanical switches)
- Thick & strengthened cover for rugged & harsh environments
- An array of capacitive switches
- Optical bonding

CUSTOM DESIGNS

RUGGED MONITORS

RELEC's 40 years of expertise in displays means we are able to offer not just components, but also a range of ultra rugged monitors.

Aimed at the extremely harsh environment market, RELEC can provide monitors sealed from IP65 through IP67, IP68 and even IP69K.

Truly meeting these specifications is a difficult requirement but every single monitor built is subjected to testing to the required rating ensuring that when installing in typically high value applications the user can have confidence that the monitor will perform as required.

Typical applications include military, rail, offshore, marine, construction and harsh industrial environments.



Ranging from 4.5" to 42" every project is typically bespoke and tailored to the application.

With our knowledge and access to a wide range of display technologies including resistive touch, PCAP, anti-reflective and more dedicated technologies such as anti-bacterial coatings for the medical industry and anti-finger marking treatments for high use areas, we can combine the best display technologies into a monitor that will be used in the harshest environments for many years.

Most displays up to 12.1" can be modified into rugged solutions. If you need daylight viewing for example, we can modify the backlight and apply surface treatments to provide a complete product which meets your requirements.

We can also offer features such as KVM integration. This allows the monitor to be mounted remotely in its challenging environment, whilst the operating PC can be kept in a clean room. We can also offer bespoke brackets and accessories to allow you to commission and mount your monitor as required.

CHOICE OF FINISHES INCLUDING ANODISING, SPECIAL FINISHES, FDA APPROVED OR WATER REPELLENT

- Up to IP69K
- Sunlight viewing
- Thermal management
- KVM integration
- Machined case
- High brightness
- Touch screen options



CALL OUR SALES TEAM

AND WE WILL WORK WITH YOU TO PRODUCE A VERY SPECIAL MONITOR TAILORED TO YOUR EXACT REQUIREMENTS.



CALL
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FUTURE PROOFING

PROVIDING CONTINUITY

FUTURE PROOFING NEW DESIGNS

It is a well-known problem that TFT displays can have a limited production life and it is understandably a major cause for concern for anyone selecting a TFT panel.

Problems are often more acute with smaller displays, typically below 3.5". This is because there are effectively two grades of TFT panel, consumer and industrial. Below 3.5" displays are aimed at the consumer market which of course itself has a short lifespan.

There are a limited number of foundries manufacturing TFT panels. Their capacity is huge but production is driven by the needs of high volume consumer products. Technology changes and requests for cost down mean production of older panels can stop with little or no notice.

All of the above impacts on the supply chain and potentially your product.

“RELEC HAS THE ANSWER TO HELPING INDUSTRIAL COMPANIES ENSURE CONTINUED SUPPLY.”

WE CONTROL ALL THE HARDWARE AND CIRCUITRY OF OUR MODULES.

1. We have agreements in place with our suppliers to minimise the effects of component obsolescence. We will firstly give you 6 months' notice of any planned changes. This initially gives us both time to arrange a last time buy and the holding of suitable buffer stocks.
2. We will then source and replace the panel component with an alternative. Often this means other changes to the PCB, bezel and other components to accommodate the new panel. We then build a sample for you to test.

It will be a form, fit and function identical part, meaning that you don't need to make any changes to your design. The engineering work and sample is supplied free of charge.

This stage is very important and one of the areas which set RELEC apart. We aim to support all of our customers this way rather than simply replacing a panel with an alternative which is not 100% compatible with the old.
3. After approval we will start supplying the replacement panel. This should allow uninterrupted production of your product.

HELP WITH OBSOLETE PANELS

We have helped many customers who have found themselves in the unfortunate position where the panel they have been buying is no longer available. They have been told that there is either no replacement or the suggested replacement requires the customer to spend huge amounts of time and money to redesign their circuits and hardware.

RELEC can work with you to provide a drop in replacement. When provided with a specification of your obsolete panel we will endeavour to recreate every aspect including cable position, pin out, mechanical constraints, and perhaps even offer to upgrade your equipment by offering a brighter backlight for example.



**TALK TO US ABOUT FUTURE
PROOF SOLUTIONS
01929 555800**

MONO LCDS

STANDARD AND CUSTOM

MONO ALPHANUMERIC AND GRAPHICS DISPLAY INCLUDING CUSTOM DESIGNS

RELEC has been providing standard and custom mono displays for nearly 40 years. We have been involved in countless projects supplying everything from simple glass through to full modules and complete products using our factories in Asia. We are proud of our quality, we have many long running projects where we have zero failures.

We are able to work with you to develop to your needs. Technologies include TN, STN, IBN, fast response ISTN and BCD. We can also add touch panels where required.

Any design can incorporate other features. For example, to save space we can include other components and circuitry on any PCB. If serial numbering, date coding or use of bar codes is required these can all be included. The aim is to provide a ship to line part, fully tested and meeting your production needs without any further intervention.



CALL OUR SALES TEAM

IF YOU ARE LOOKING FOR EITHER A
STANDARD PART, OR WOULD LIKE TO
CONSIDER SOMETHING FOR YOUR OWN
DESIGN WE'LL BE PLEASED TO HELP.



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