

# Membrane keypads



**The front membrane is the visual and tactile interface between your membrane keypad and the user. It can be labelled and surface-finished using a number of different printing and embossing methods.**

The visual impression made is also of decisive importance for the appeal of your device! Various materials, including polyester and polycarbonate, combined with geometrical flexibility, colour and design, permit ergonomically rational flat membrane keypads for electronically controlled devices.

Our high-quality front membranes conform to high tightness and robustness standards. There are virtually no limits on design. The front membranes can be supplied with or without self-adhesive layers, depending on the customer's requirements. In addition, we can also offer key embossing and display windows, depending on your needs.

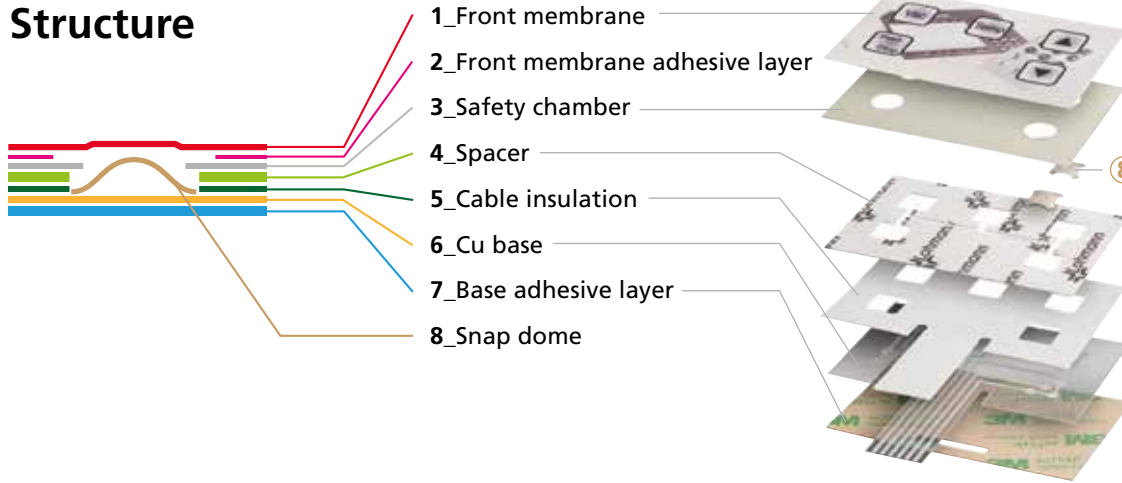


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# The structure

## Structure

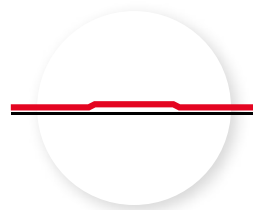


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## Embossing

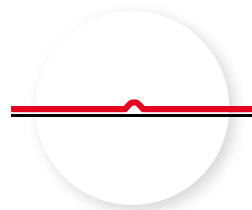
Membranes are embossed primarily to improve ease of use.

Series of keys are made "feelable", while the membrane effect of the embossing improves tactile feedback from the actuating elements.



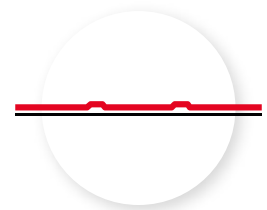
**Raised embossing**

Height: approx. 0.3 - 0.5 mm\*



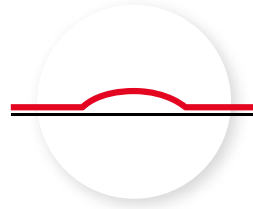
**Cap embossing**

Height: approx. 0.6 - 0.8 mm\*



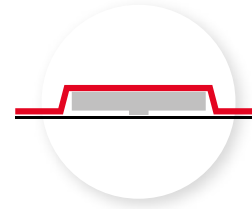
**Rim embossing**

Height: approx. 0.3 - 0.5 mm\*



**Dome embossing**

Height: approx. 0.6 - 1.4 mm\*



**Profiline embossing**

Height: approx. 1.0 - 1.5 mm\*

\* Dependent on the membrane material

## Printing methods



### Screen printing

Industrial screen printing is the most widely-used process for manufacturing all types of especially high-quality membrane keypads / HMIs. Digital printing can supplement or replace screen printing.



### Digital printing

Previously unachieved flexibility in front membrane design.

- High-quality photos and graphics
- Various colour gradients and graphics possible
- Fast and flexible
- For short runs and individual printing
- Prototypes

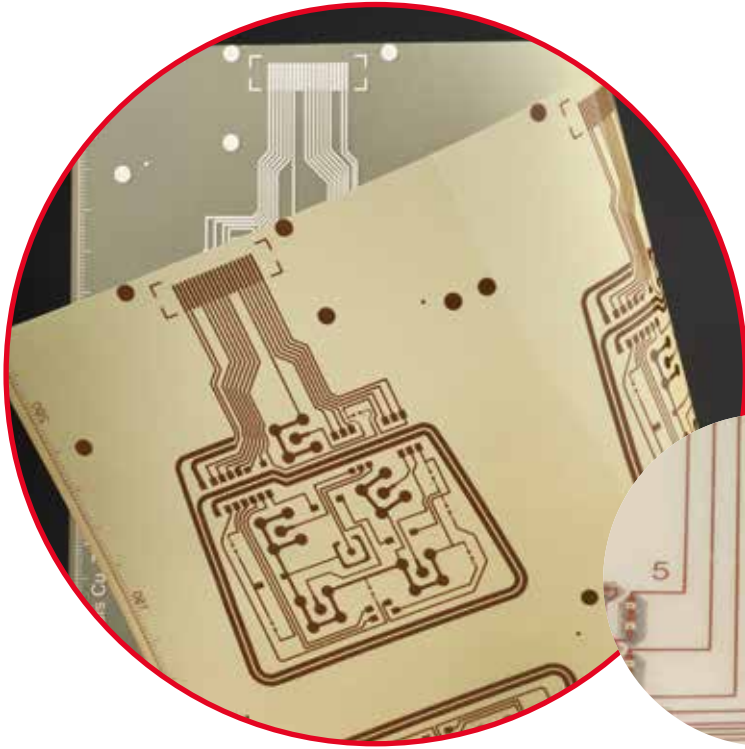


### High-gloss technology

The design can be considerably upgraded by using a smooth membrane and a special textured lacquer in order to create glossy effects in the area of the keys.

# Membrane keypads

## Membranes with copper conductors



For demanding applications, we also create exclusive high-quality membrane keypads that incorporate the outstanding properties of surface-treated copper conductors.

Instead of using adhesives, as with printed silver technology, we can securely and permanently solder LEDs, photo diodes or other components. These are advantages which in practice frequently give our customers the necessary security when using membrane keypads.

## Profiline membrane keypads

This technology succeeds in providing outstanding data-entry operation for a large range of industrial requirements. Customised design for every keypad!

### Profiline embossing

Profiline embossing combined with an inlay generates the so-called "short-stroke feeling" to assure unequivocal tactile feedback. Can be executed in a range of different forms.

#### Improved user-friendliness thanks to:

- Unequivocal tactile feedback
- Exceptionally good key feel
- Freedom of design for key geometry
- Clearly designed key shaping, can also be implemented as a rocker switch and/or oversize key



Profiline membrane keypads  
Height: approx. 1.0 - 1.5 mm\*

\* Dependent on the membrane material



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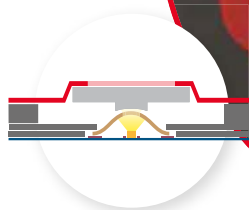
# The technologies

## Profiline illuminated

**In poor light conditions, our illuminated membrane keypads simplify operations, and this ensures that operating errors are minimised.**

### Profiline illuminated

The use of special LEDs and special treatment of the inlay provides homogenous illumination, with long-lasting functionality naturally assured. The light from the LED passes through the aperture in the snap dome and into the integrated acrylic inlay, where it is correspondingly scattered.



Profiline embossing illuminated

Height: approx. 1.0 - 1.5 mm\*

\* Dependent on the membrane material

## USB keypads

**Plug & Play – the membrane keypad for immediate operation using the USB port. We use printed electronics to integrate configurable keypad controllers into the membrane keypad.**

The ribbon cable can be connected directly to USB A sockets, so there is no need for additional hardware to operate traditional membrane keypads.

### Advantages of a USB keypad:

- Cost, space and time-savings
- Optimum for connection to PC or embedded system
- 188 functions thanks to three control levels (FN keys)
- 19 macros, mouse function, multimedia keys
- Other bus interface possible



# Touch / display integration

**As a result of their widespread use in mobile telephones and tablets, many electronic devices are now also operated in industrial applications by means of a touch screen or a display. Convince yourself of the advantages of this versatile technology.**

We support you in developing cost-effective, user-friendly devices with touch operation by integrating capacitive and resistive touch screens in standard and customers' own electronics enclosures.

The combination of a touch screen with a conventional membrane keypad is also possible. In addition, we offer solutions with a continuous front membrane (resistive touch screens) or a continuous cover glass (capacitive touch screens) for every application in which there must be no dirt-collecting edges – examples include the medical technology and foodstuffs sectors.



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# The technologies

## Capacitive touch screen

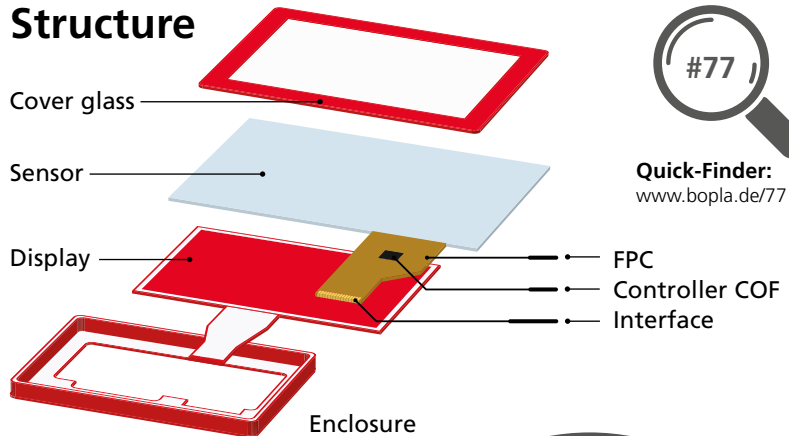
Until recently, membrane keypads and conventional resistive touch screen solutions have been used in the industrial environment, but capacitive touch screen technology is now increasingly taking over. Capacitive technology, definitively shaped by the consumer market, now meets the high demands made in all sectors of industry.

This technology is noted for its exceptionally high reliability, intuitive operation and unique functionality.

### Additional advantages of a PCAP (projected capacitive) solution:

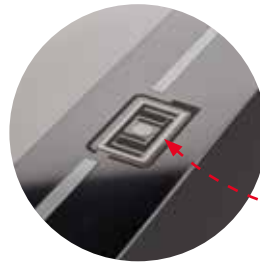
- Vandal-proof
- Easy cleaning
- Can be operated wearing gloves
- Temperature resistance
- UV resistance
- Operation in wet environments no problem
- Extremely high service-life

## Structure



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Depending on the requirement, printed silver conductors can also be created, for example in the form of an additional key.



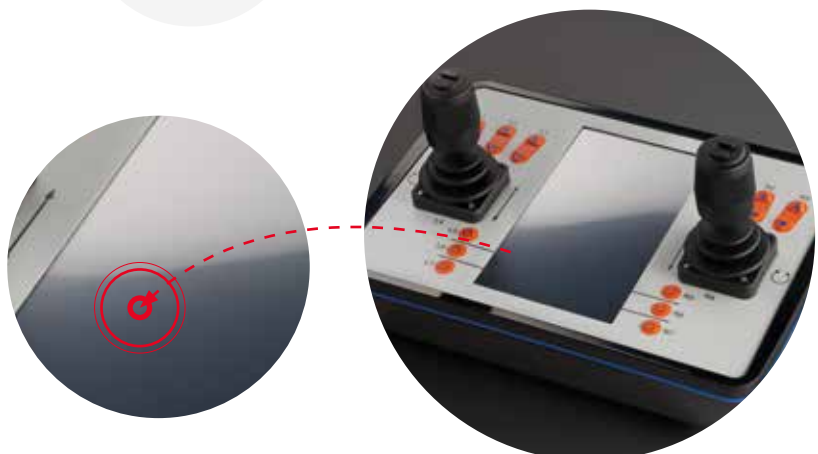
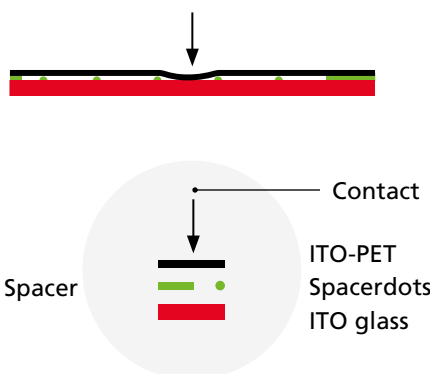
## Resistive touch screen

Our flexible and rationally-priced touch screen solution for your product!

Selection of the optimum technology is of decisive importance, especially in the field of touch screen systems. We supply resistive and capacitive touch / display solutions, with their differing technical requirements, in numerous standard formats, or developed specifically to meet your individual needs.

This is why detailed analysis of the operating requirements, covering all mechanical components, is a vital necessity at the very start of device development. We are at the side of our customers' technical departments to provide support on all of these items.

## Structure



### Selection of our possible implementation routes:

- Full-surface lamination on a decorative foil
- Viewing windows cut out in the decorative foil
- Partial lamination on the decorative foil
- Rear installation in the enclosure
- Combination of touch screen with membrane keypad

# Touch / display integration

## Our solutions for all enclosures



**Individual enclosures, optimised for the installation of capacitive and resistive touch screens.**

In addition to the integration of standard displays, our enclosures also make possible the installation of resistive and capacitive touch screens.

In both cases, the integration of the touch screen can be achieved in many ways. For applications in which dirt-collecting edges are not allowed to remain, we provide solutions behind glass or with a continuous front membrane – full-surface laminated or with rear spacer dots.

- Individual solutions for all types of enclosures
- Enclosure, front membrane or glass backprinted or printed for specific projects
- Special grouting compound technologies for optimal protection against harsh environment, shock and vibration

## Digital Label System – DLS



**DLS offers individual, exchangeable new marking of keys during ongoing operation.**

By using DLS, keys can constantly be digitally re-marked. DLS can carry out multiple occupancies of keys, in addition to customised symbols or languages. The markings are also visible when the keys are voltage-free. By using e-paper displays, DLS operates energy-efficiently because energy is only needed when the markings are changed. Various interfaces allow new marking with the symbols available in the memory.

- Fewer keys
- Re-marking of keys
- Customised personalised marking
- Voltage-free display operation
- User-friendly configuration software

# Printed electronics

## Capacitive keypads

**Touch sensor membranes convert nonconductive surfaces such as membranes, glass panels or, e.g., enclosures into a capacitive keypad.**

### Touch-sensor membranes

A touch-sensor membrane can, for instance, be bonded behind non-conductive surfaces in order to convert these surfaces into a membrane keypad. Direct printing of enclosure parts with touch-sensor systems makes it possible to efficiently combine production operations, save resources and reduce consumption of materials.

- Cost-savings
- Plug & Play sensor-surface and controller solution
- Reduced risk of failure
- Direct printing of alternative surfaces
- Good optical transparency
- No mechanical wear
- Easy cleaning thanks to sealed surfaces



## Printed antennas

**Antennas of various geometries are needed for RFID products, depending on the particular application – we design the antenna geometry needed for your application.**



### Ready to receive

We design the antenna geometry needed for your application and can print it using our tried-and-proven copper technology. Copper technology provides greater range, faster read potentials and higher data-transmission rates compared to conductive silver.

In addition, we use NFC and RFID chips to integrate a passive digital identification feature into the membrane for you.

- Range up to 7 cm thanks to copper technology
- Direct integration into front membranes and membrane keypads
- Password-protected memory contents
- Easy and cost-efficient integration into existing systems, even in small production runs

## On request

### Pressure sensor systems

- Low-profile and lightweight
- Combinations with other sensors possible
- Sensor electronics can be integrated for better scalability
- Integration of customer designs

### Printed heaters

- Low-profile, lightweight and flexible
- Can be integrated into membrane keypads, glass and touch systems
- Self-regulating or with integrated measuring electronics
- Up to 200°C in continuous operation (depending on overall system)