

Welcome to BOPLA City!

BOPLA-arena



MEMBRANE KEYPADS



A Phoenix Mecano Company

"ALIQUID STAT PRO ALIQUO!"

"Something stands for something"

Symbols aid communication.

Today they are indispensable in almost all fields of life.

This is because they overcome temporal, cultural and language problems.

Our input systems play an important part in this communication.

BOPLA-arena

BOPLA's "full service" programme



Modern equipment needs professional input systems where human beings and machines meet! In order to be able to offer our customers a "full service" programme, at the start of the 1990s we were the first well-known manufacturer of enclosures to add membrane keypads to our comprehensive range of enclosures. Over the years we have become one of the most important suppliers of enclosure technology and membrane keypads – our products are indispensable in many sectors. Developing and implementing customer-specific system solutions is also a part of what we do – so take advantage of our skills for your own developments!



Permanent communication with our customers plays its part in ensuring that we continue to develop our ability to innovate, our competence and our level of quality in all fields so that we can always provide the best possible service. You can rely on BOPLA to be your competent partner for a successful future!

Setting-up of Bündoplast GmbH in Bünde

1970

First in-house development: start of the Euromas series

1972

Take-over by Phoenix Mecano AG

1977

Development of cable glands and enclosures for electronics

1978

Start of international activities

1981

Entry into USA market

1985

Setting-up of PM's own sales companies

1987

Start of production in Kecskemét (Hungary) Initial setting-up of Far East sales structure

1992

Start of manufacture of input systems, certification according to quality standard ISO 9001

1993

Opening of the logistic centre; a fully-automatic warehouse system is set up

1998

Setting-up of PM Plastic in Sibiu (Romania) as a new production facility

2005

All over the world, contact with electronically controlled equipment and machines is an everyday occurrence – and the link between people and machines is often an input system.

Making input systems as functional as possible, while creating an attractive design – that is our daily task. Just like Philip Rosenthal's motto "Those who stop improving have stopped being good", we make every effort to optimise our processes and increase the tempo of developments to keep our customers satisfied. Our goal is to ensure that today's products satisfy tomorrow's needs.

"Product quality always takes priority!"

Michael Schmidt, Quality Assurance Manager

On-going research and participation in the "Fachgemeinschaft Tastaturen", the specialist association of German manufacturers of flat-panel input devices, guarantee that we always make use of the latest technologies and processes – the on-going development and optimisation of our products is what we do every day. And customer satisfaction is our reward!

Carefully organised work processes ensure the good quality of our work – in accordance with quality management standard ISO 9001, customer satisfaction is at the heart of our developments.

In 2001 and 2002, the quality management system which BOPLA used was adapted to conform to ISO 9001:2000 and successfully audited in June 2002. Regular auditing confirms the certification. The strategic aim of our QM system is to provide optimal support for our customers, to improve our relations with them, and to ensure on-going improvements to our comprehensive range of services.

Your opinions and wishes are important to us! Recognising and satisfying customers' needs takes absolute priority in a certified company. We are always striving to be the best and to keep on improving our services – that's a promise!



Mitglied in der
Fachgemeinschaft Tastaturen

Welcome to BOPLA City...

... your centre for more growth,
future and innovation!

“Functional and attractive designs – we develop professional input systems for all applications and sectors!”

Jochen Niermann, Membrane Keypad Sales Manager

Today, keypads are found in a very wide range of applications. In the industrial sector, in particular, they have to satisfy demands and yet be user-friendly and have an attractive design. This is where BOPLA know-how comes into its own!

The range of applications for our input systems includes medical technology, the automotive industry, and the disposal and recycling industry. No matter whether hygiene is of special importance, or whether the systems are exposed to extreme external influences – we can supply the right membrane keypad for every sector!

Standard membrane keypads

It doesn't matter whether they are handheld, desktop or wall-mounted enclosures – we supply the matching membrane keypad. Our standard keypads are specially designed for our enclosures, so they can easily and quickly be modified. This means that we give our customers an opportunity to fit membrane keypads at low cost even for small quantities. We will also be happy to take on the fitting of your membrane keypad.

Competence in every field – you can count on us!

We offer maximum competence in all important sectors of technology:

- Copper technology
- FR4 technology
- Silver technology
- Profiline technology
- Gloss technology
- Autotex AM – Anti-microbial decor membrane material
- Touch screens
- FT-E technology
- Electro-luminescence technology (night design)
- Supporting plates

Don't hesitate to contact us – we'll be happy to help you!

Customer-specific solutions

You are looking for a membrane keypad with an individual and sophisticated design? Our keypads are manufactured to meet our customers' exact requirements – whether in terms of size, design or colour, matt, semi-gloss or glossy, with or without a window, with a tactile action point, including LEDs or other components, integrated in supporting plates or pre-mounted on our enclosures. We also develop and manufacture input devices with short-stroke keys and matching front membranes. And of course, assembly of the membrane keypad is part of our service offer.

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"A special feature: copper technology!"

Andreas Wisgien, Membrane Keypad Designer

In contrast to many firms which offer keys using conductive silver technology, BOPLA manufactures high-quality keypads with copper-laminated base membranes, galvanically silver-plated (gold-plated on request).

Technical data: copper base membrane:

Key area	from 7 x 7mm
Min. average distance between keys	11 mm
Installation height	from 0.6 mm
Contact surfaces (depending on type)	copper-laminated, silver- or gold-plated, snap domes gold-plated
Switch travel (depending on construction, up to IP 65)	approx. 0.6 – 0.7 mm
Switch pressure, depending on membrane	3 – 5 N
Protection type (depending on construction)	up to IP 67
Voltage	1 – 42 VDC
Current	≤ 100 mA
Output	≤ 1 W
Conductor strip resistance* depending on design	< 0.1 Ohm (for 100 mm length – 1 mm width)
* Conductor strip resistance depends on the design of the product layout. Conductive silver bridges in CuLs technology increase conductive resistance.	
Insulation resistance	≥ 100 MOhm
Bouncing time (dep. on actuation)	< 10 msec
Operating life	< 1 million actuations
Operating temperature:	
For keypads with embossing	0° C to + 45° C
For keypads without embossing	- 20° C to + 70° C
Transport/storage temperature:	
For keypads with embossing	- 30° C to + 45° C
For keypads without embossing	- 40° C to + 80° C

The copper-laminated material is extremely flexible, so there is almost no possibility of breaks to the membrane cable, and problems such as silver migration are practically impossible.

Instead of using an adhesive as in the case of conductive silver technology, we can safely and permanently solder LEDs, photo diodes or other components, and these are features which give our customers the security they require for everyday use.



“Profiline – superlative technology!”

Bernd Oevermann, Membrane Keypad Designer

Profiline – what is so special and important about this technology?
The main features are the improved haptic and operability.

Profiline offers customers important advantages:

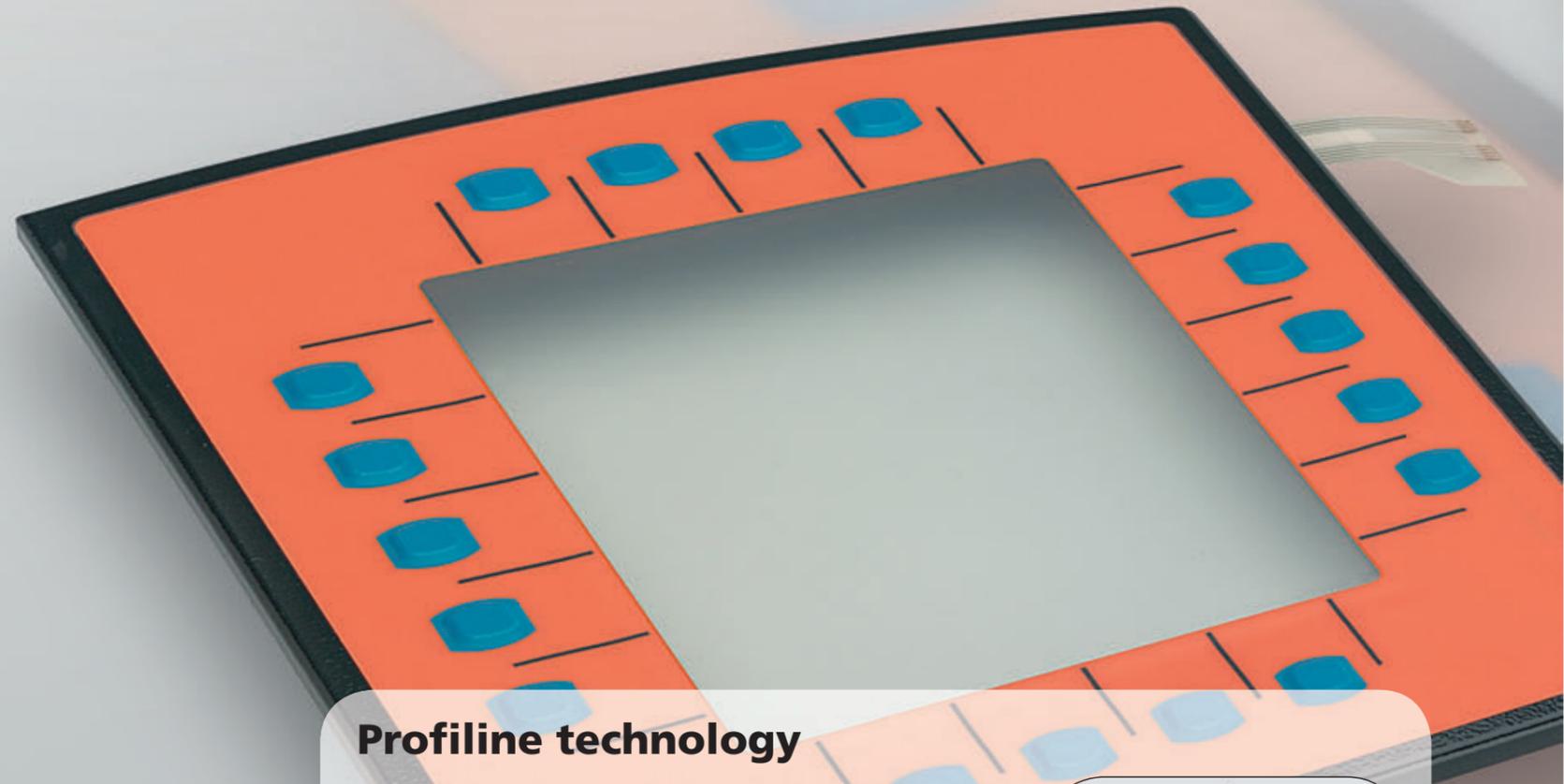
- Very good tactile feedback
- Tactile feeling to the key element
- Optimal force distribution means less pressure on the snap dome
- Optimal finger guiding
- Large-surface keypads and contact elements can be manufactured
- Freedom of design for the key shape

The so-called “short-stroke” feeling considerably improves the input interface, including for keys with extremely small or extremely large surfaces.

This is guaranteed by the highly-tactile, robust key element which is fitted between the snap dome and front membrane.

In addition to providing better feedback, the Profiline key areas are also extremely robust. The integrated acrylic inlay gives protection against dust and moisture and also protects the snap dome against possible deformation. Not even heavy point-specific pressure can damage the key areas.

Profiline – superlative technology – without any doubt, our EU patent is the effective result of our on-going developments to create keypads which offer the best haptic and ergonomic features.



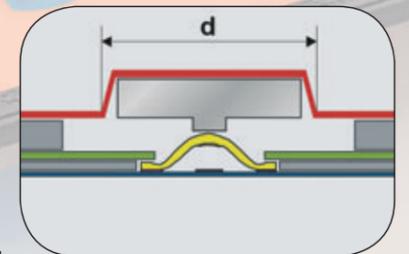
Profiline technology

Electrical characteristics:

Voltage	1 – 42 VDC
Consumption	≤ 100 mA
Insulation resistance	> 100 MOhm
Contact bounce time	< 10 ms
Contact element	Snap dome, gold-plated

Mechanical characteristics:

Key geometry	can be designed as required
Key size (d) min.	≥ 8 mm / 8 x 8 mm cornered / corner radii ≥ 1.0 mm [preferably: R2.0 mm]
Max. key size	260 x 360 mm
Clearance (a) from embossing edge to embossing edge	≥ 10 mm with circular embossing [preferably: 16.0 mm] ≥ 11 mm with parallel embossing edges
Installation height for keypad	1.4 – 1.6 mm (depending on construction) [preferably: 1.6 mm]
Key height	1.0 – 1.5 mm (standard 1 mm), tolerance +0.2 mm
Actuating force	3 – 5 N
Switch actions	up to 1 Mio.
Operating temperature	0° C to + 45° C (storage temperature - 30° C to + 45° C)
Membrane polyester; polycarbonate	PETP; PC (Blend)
Chemical resistance	List available on request



Keypads with night design: EL membranes and Profiline back-lit

“Nowadays there are no limits to the use of electrical equipment in dark surroundings!”

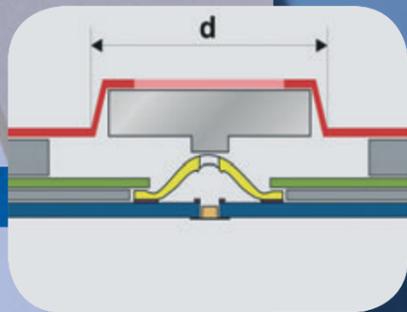
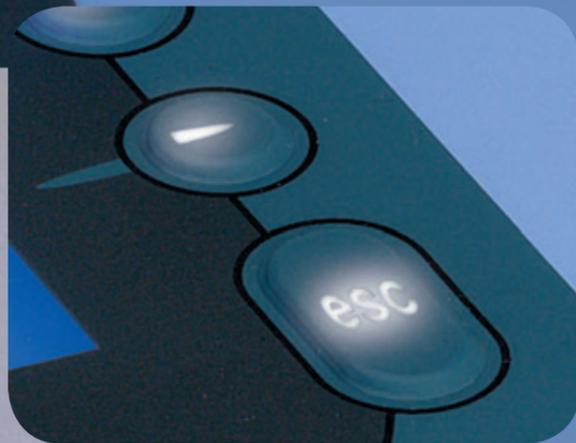
Niko Kotzmaier, Membrane Keypad Designer
Illuminated short-stroke keys, our back-lit Profiline keypad and EL membranes show the way!

There are many constructional advantages to the use of EL membranes, including their low mechanical installation height, their flexibility, and their low power requirements. An additional advantage is the homogeneous light distribution in the back-lighting process.

In contrast to points of light, the electro-luminescent phosphor particles are evenly distributed on the surface of the membranes, so the membranes emit homogeneous light over the entire surface. This high degree of efficiency means that the EL membranes consume very little power. If electric bulbs or LEDs are replaced with EL membranes, the power consumption is reduced by more than 50%. Almost any design can be created, because EL membranes are manufactured using silk-screen printing.

The back-lit Profiline keypad has additional advantages such as operating life, power consumption and haptic. This technology makes it possible to illuminate the keys separately – the light passes through a hole in the special snap dome into the integrated acrylic inlay, where it is scattered accordingly.

The easy-to-feel key element makes it much easier to use.



Keypads for dark situations Profiline back-lit

The back-lit Profiline keypad is constructed in a similar way to the standard Profiline keypad, so it offers the decisive features of this technology and provides the well-known advantages for the customer.

One main difference in the construction of the back-lit Profiline keypad is the base membrane which is designed on the basis of an FR4 PCB. An LED is fitted in the middle of the key field on the back of this PCB.

- The key area is clear lacquered, max. \varnothing 10.0 mm
- Key height: approx. 12 mm, tolerance \pm 0.2 mm
- Installation height of the keypad: approx. 2.8 mm, tolerance \pm 10%
- Actuation force: approx. 5N



State-of-the-art technology –
BOPLA's modern, high-quality input systems

"The design of our input systems ensures a high level of functional safety!"

Nikolai Wilke, Input Device Product Manager

When manufacturing our membrane keypads, we only use high-quality materials which ensure a long operating life, no matter under which conditions they are used. Our keypads are tested to guarantee their long-term functioning.

For special occasions – high-gloss technology

A special type of surface design can be created by using a glossy membrane and a special structure lacquer. The partial glossy sections upgrade the design considerably, giving the keypad a sophisticated and high-quality look and ensuring that it stands out from standard industrial keypads.

For extra protection: double contact

High safety standards demand a high level of reliability, especially when it comes to operating devices and machines. This can be achieved by the use of keypads with two-stage key functions, which is why we offer the keypad with a double-contact function.

The user can easily distinguish between two switch functions, and TÜV requirements for two separate switch levels are easily met.

Technical features of our membrane keypads:

- Contact elements embedded between high-quality polyester membranes
- Stainless steel snap dome with gold-plated contact side
- Safety chamber for each snap dome, depending on design
- Elegant matt front membrane
- Protected against dirt and splashing water acc. to DIN EN 60529
- Base membrane in copper technology or in conductive silver technology

Genius and simplicity combined: FT-E technology

The sheer simplicity of our FT-E technology will fascinate you: the input unit (FT) and the accompanying electronics (E) are on the same carrier material, without any expensive connectors which are susceptible to defects.

We supply your complete membrane keypad, including PCB and fitted with active and passive components such as LEDs, resistors etc.

First the various membrane layers and switch elements are assembled on the PCB, and then the outer edges are milled or punched and the required components fitted to the extended base membrane.

Low cost: Keypad construction without supporting plate

By using a direct combination of keypad fields with PCBs, a supporting plate can easily be dispensed with.

In this case, the thickness of the PCB material (FR4 etc.) is selected so as to ensure that the stability is comparable with that of a metal supporting plate.

Threaded bolts can be fitted, and openings or relief milling are possible. The decor layer is then fitted to the front in the same way as a conventional keypad. Using this method results in considerable savings for our customers.

"The customer has high standards – and we are happy to meet them!"

Andreas Balzer, Head of National Sales

Do you need a complete production run from one source? We are the professional partner you can rely on when it comes to developing system solutions. You, the customer, can take advantage of our many years of experience in designing and manufacturing enclosure systems, membrane keypads, electronic modules and all-in system solutions.

System solutions

Using only state-of-the-art production facilities and operating on the basis of highly-efficient teamwork, we process our enclosures according to the customer's exact specifications.

This service includes the usual mechanical processes such as drilling and milling. We also take care of (i) terminal insertion, (ii) equipment with Pg or metric cable glands, and (iii) assembly of all the electronic elements. Personalised printing and front membranes can be applied and fitted to the enclosure.

Service

Our highly-qualified and motivated employees are always ready to develop and produce electronic modules, terminals and systems which are tailored to meet your special requirements.

Production capability ranges from the insertion, soldering and testing of the PCBs through to the actual assembly of the modules. If required, we can also seal the PCBs and provide the appropriate ESD packaging for transport purposes.

Electronics

The modern systems of today require professional input devices at the all-important interface between human operator and machine.

Designing keypads which are both functional and attractive is what we do every day. Individual customised solutions are a special feature of our work. Any new developments introduced are all based on everyday practice and are the result of constructive and ongoing dialogue with our customers.

Keypads

Whether working on a standard solution or one specified by the customer, we develop the complete enclosure in full consultation with you, the customer.

BOPLA enclosures protect the valuable components against damage and, thanks to a neutral but aesthetically pleasing design, have an attractive and recognisable look.

Enclosures

“Touch screens: control by touch!”

Stefan Matthes, Input Device Designer

Graphic user interfaces can be found everywhere today. We have been implementing the integration of touch screens in connection with our enclosures and membrane keypads for years.

Touch and membrane keypad

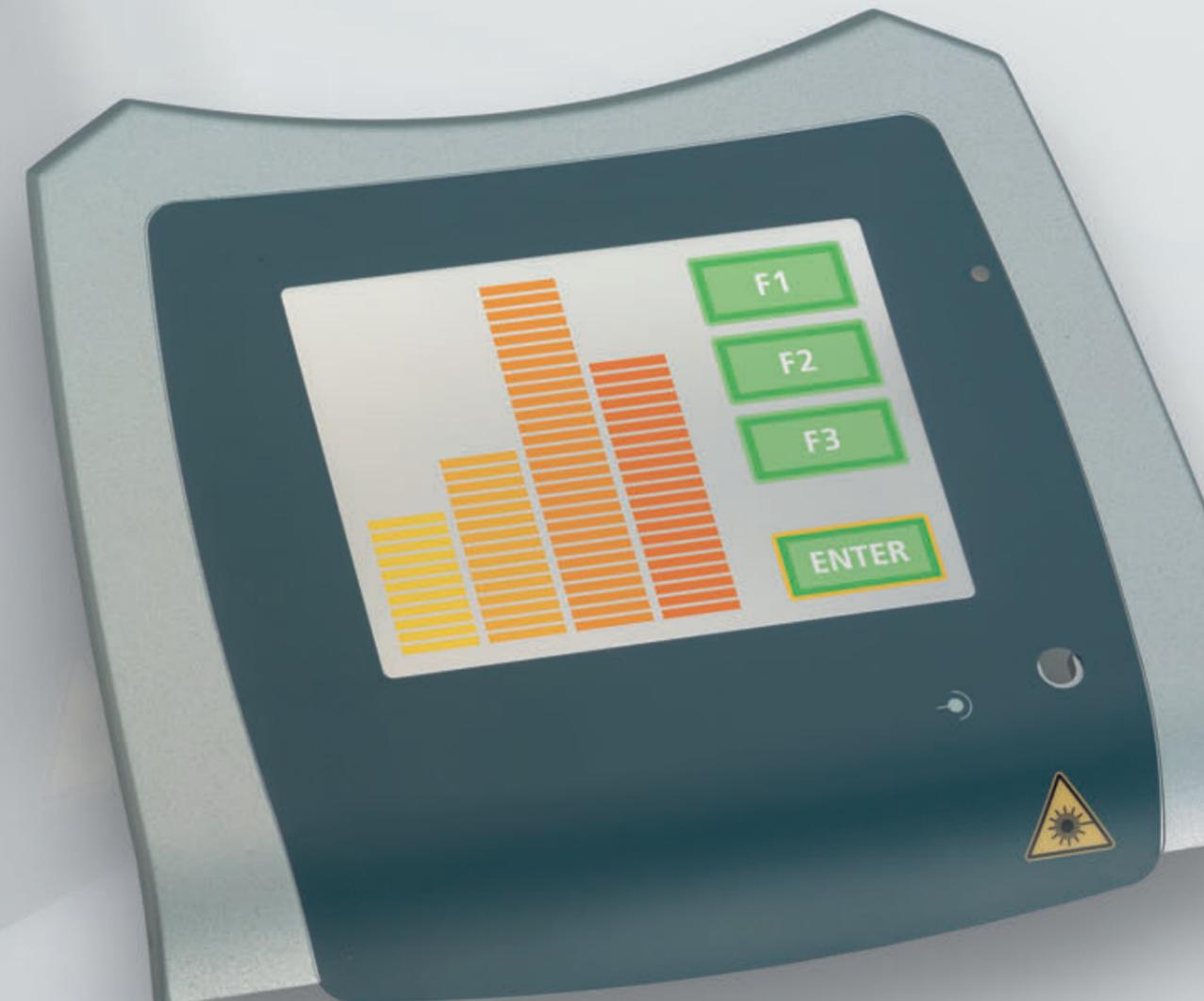
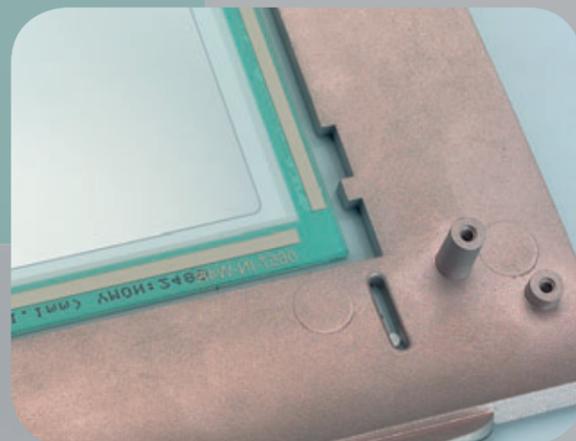
In the past it was often claimed that touch screens would replace membrane keypads. Our customers see it differently, and increasingly they are calling for a combination of both input systems.

We will be happy to develop and implement solutions of this kind for you, so do not hesitate to contact us.



Integration of touch screens and glass

The integration of touch screens with enclosures or customer-specific supporting plates can be achieved in many ways. For applications which preclude the presence of edges which might harbour dirt (medical technology or foodstuffs), we also offer solutions with a continuous front membrane, laminated over the entire area or with spacer dots on the back.



BOPLA sales organization Germany

Sales addresses are valid as of 01.01.2008



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- 4 Postcode 40-42, 47 (exclud. 475), 50-52
- 6 Postcode 35, 360, 363, 53-57, 60-69, 747-749, 767-768
- 7 Postcode 72, 77-79, 88, 890-894, 8958-8959, 896, 86-87
- 10 Postcode 90-96, 80-85
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