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COMPANY PROFILE

MEMBRANE KEYBOARDS

ELTAS d. o. o., is a company specialized in development and production of the membrane keyboards, foil overlays and human interface assemblies.

PRIMARY ACTIVITY

Our primary activity is the development and production of custom-made products in small and medium-sized series. We are especially efficient and competitive in this area.

COMPLETE SERVICE

The complete service we are offering – from the basic ideas, recommendations, design to construction, applicative development and production – enables the total adjustment of our products to high demands set by our customers.

HIGH QUALITY

Development with a focus and long years of experiences have perfected our technological conditions and launched our products to the highest quality level.

ADAPTABILITY AND EFFICIENCY

Our great advantage is speed which we accomplish by adapting our production and development. Our company enables the delivery od prototypes in a very short time.

EXTENSIVE OFFER

The extensive offer of various keyboard types enables suitable improvements of electronic devices and satisfaction of all the demands from the field of design and operation.

COOPERATION AND PARTNERSHIP

The relationship with our customers is based on cooperation and aimed at achieving a common goal: perfection in technology and design of the globaly comparative product.

EXCEPTIONAL PEOPLE

39 of us are heart of the company. It is a team of skilled developers, constructors, technical staff and production workers. Along with sales and administration staff we are comitted to provide our customers with exceptional service and support.

OUR MISSION

We are committed to serve our customers and help them by creating aesthetic, functional and successful electronic application.

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OUR VALUES

- satisfied customers
- deliver on commitments
- high quality products
- extensive care for our employees
- continuous development

OUR STRATEGY

We will:

- build the partnership with our customers and suppliers
- continue to invest into our technology, knowledge and development
- carefully plan our development and lead the company towards new experiences, opportunities and success

GENERAL INFORMATION

ELTAS, a company producing membrane keyboards and overlays was establish in 1996 with private capital. The company owns it's market, technology and basic means of production.
The company is based in Šentjernej which is about 85 km east of Ljubljana, the capital of Slovenia, and near important international centers such as Trieste, Graz, Munich and Zagreb.

Official company name:

ELTAS Proizvodnja membranskih tipkovnic d.o.o.

Short form name:

ELTAS d.o.o.

Trubarjeva 7, 8310 Šentjernej, SLOVENIJA
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web: www.eltas.si

Company logo:

ELTAS™
MEMBRANE SWITCH TECHNOLOGIES

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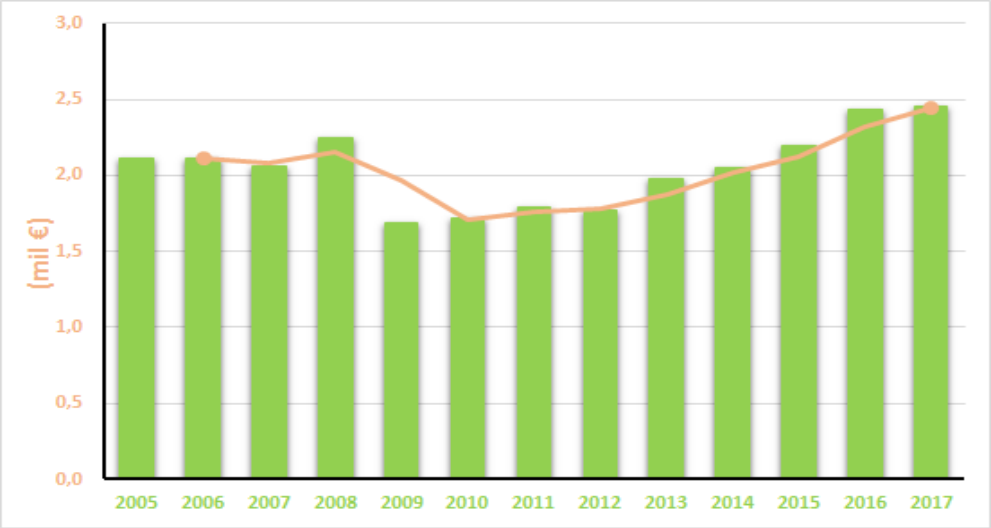
GROWING COMPANY

The company have 43 employees and a production facility of about 740 m^2. In 2015, turnover was 2,2 mio €. About 50% of sale was placed directly on west Europe market (mainly in Germany, Austria and Italy). We estimate that 90 % of our products are sold to foreign countries through our domestic customers.



Our products: membrane keyboards and foils are incorporated into end-products in telecommunications and medical electronic equipment, industrial electronic equipment, measurement, control and regulation instruments, entertainment devices, household equipment, etc... Some of our products are equiped with well-known brand names in electronic industry, like: Bosch, HP, Siemens, Gorenje, Whirpool, Viessmann, Fotona, etc…

BASIC ORIENTATION

The basic orientation of the company is production of small and medium series and CUSTOM designed products. In this area the company is extraordinary effective and competitive. Typical production time for samples is 1 - 2 weeks and for series is 2 – 4 weeks.

PRODUCTION PROGRAM

The company's production programme consists of:

- membrane keyboards
- foil overlays and nameplates
- modular systems included keyboards, basic plates, PCB's.
- Aluminum and plastic base-plates
- Aluminum and plastic housings for electronic devices
- Aluminum front panels with integrated foil overlays and membrane keyboards
- Integration of touch-screens with optical clear adhesives
- Front panels with integrated touch-screens

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SERVICES

A main aim of the ELTAS company organisation is to offer their customers, as part of their services:

- custom-designed products,
- a close working relationship with the customer at the initial R&D stage, and in end-product integration,
- a high quality product, and delivery on time.

The company design involvement at early stage is suggested to ensure a technically correct, practical and cost effective solution to the switching and graphic requirements.

QUALITY

Company ELTAS d.o.o. has implemented and maintains a Management System which meets the requirements of the standard ISO 9001:2008.

SIQ ISO 9001 Q-962

CERTIFIED IQNet MANAGEMENT SYSTEM

PRODUCTS

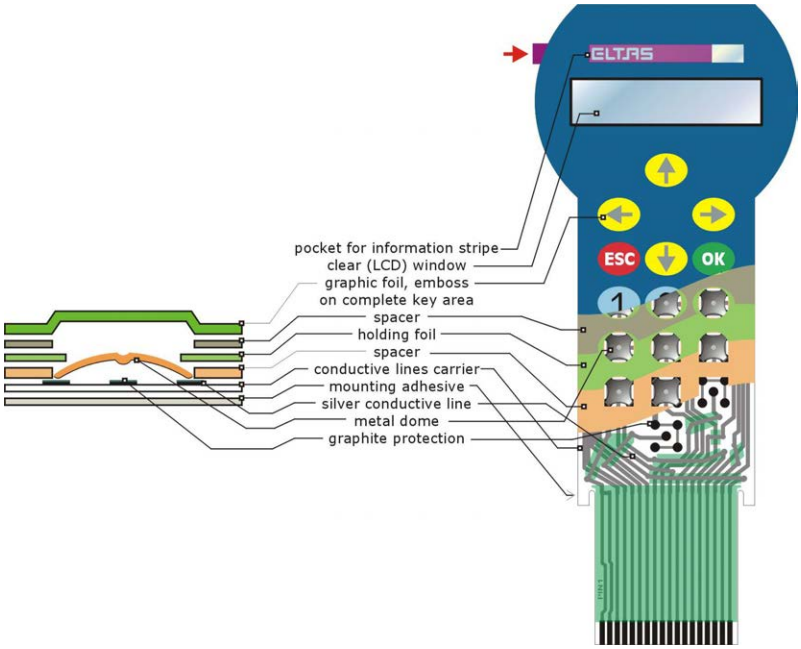
BASIC SECTIONS

The company products can be divided in three basic sections:

- foil keyboards (presence of electrical function)
- foil overlays
- metal and plastic sub panels, housings and mechanic parts

The products from all three partitions can be combined with different additional parts into modular system.

FOIL KEYBOARDS



CONDUCTIVE CONNECTIONS AND SWITCHES

Membrane keyboard is usually composed of two polyester films to which silver conductive connections and connective surfaces are placed through the method of screenprinting. A self-adhesive foil of suitable thickness (spacer foil) with cuttings where connective surfaces are separates both key poles and forms a firm foil composite. The cuttings enable an electrical contact between both poles of a key.

GRAPHIC LAYER

The upper layer of the composite is equipped with foil which is the carrier of distinct information for each key. We name it »graphic foil« because it has to do with graphic procedures of printing colours. It is important that the colours (symbols and signs) are printed on the bottom side of the graphic foil – on the side which is fixed to the basic composite. This procedure prevents the user from coming in touch with the printed colour which enables durability of the printed information. An appropriate quality of a graphic foil also enables the use of membrane keyboards in extremely demanding environments (the presence of dust, chemicals and high humidity) especially where maintenance and cleaning is needed. This is of extreme importance in the case of medical devices where the membrane keyboard has become almost irreplaceable.

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ASSEMBLING ADHESIVE

The bottom side of the basic composite is equipped with assembling adhesive the purpose of which is to fix the keyboard to the complete keyboard area. This is why the use of membrane keyboards assures high IP standards.

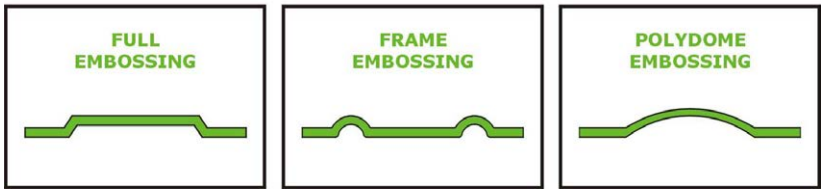
TACTILE ELEMENT

The insertion of tactile elements in the basic composite creates the physical feeling - so called 'click' effect - when pressing the key which is synchronized with the electrical function of a key. It is an important feature of the membrane keyboard because it abolishes the need for additional signalization (sound, light). Some kind of signalization is necessary in the case of a keyboard without the feeling of switch because it informs the user that the key when pressed did its task. The feeling can be created with metal tactile elements (metal domes) or an appropriate embossing of the graphic foil (poly-dome). The presence of the tactile feeling provides for the basic division of membrane keybords: keybords with and without a 'click'

EMBOSSING AS AN OPTION

The ergonomy and practicability of the keyboard can be additionaly perfected by selective embossing of keyboard's graphic foil's active surfaces – keys. By so doing the keys become more attainable and the switching feeling better. It also enhances the attractiveness and appearance of the entire application. The shape of the embossed areas is arbitrary.

EMBOSSING POSSIBILITIES



TRANSPARENT SURFACES

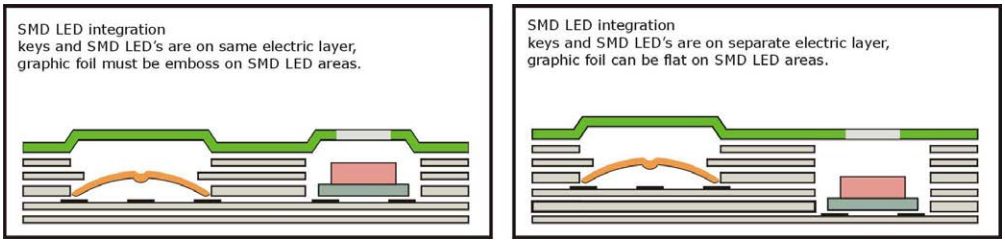
Indispensable parts of almost any interface between the user and the device are the display and the neccessary light signalization. A broad specter of various treatments of a graphic foil enables the integration of transparent surfaces of different quality within every membrane keyboard. Selective adjustment of graphic foil's certain surfaces makes possible for the use of LCD and LED displayes. A perfect clearness and transparency of the keyboard can be achieved if needed as well as only semi - transparency in various colour shades.

CHANGEABLE INFORMATION

By inserting information stripe pockets adjusting of inscriptions and funtions of any key and changing of arbitrary inscriptions on the keyboard in possible. This way the feasibility of making a basic keyboard type which can be modified separately on any device is formed. The pocket is equipped with a transparent window on a graphic foil and with an entry for the carrier of changable signs. One can find the entry on the side or at the back of the keyboard which preserves IP standards. The pocket position is conditionally arbitrary and depends on the keyboard configuration. In some types of keyboards the pocket can be found at the position of keys.

ELECTRONIC COMPONENTS INTEGRATION

Miniaturisation of electronic components has additionaly improved the usefullness of mebrane keyboards because it enabled their insertion in the keyboard. The insertion of SMD LED diodes simplificates the mechanic construction of the device and is very widespread. The additional increase in level of integration brings the option of combining the membrane keyboard with PCB which is the carrier of conductive connections between keys and which enables the integration of other electronic components.



STANDARD AND OPTIONAL PROTECTION

Standard protection which is applied to any membrane keyboard:

- graphite layer as a protection of silver conductive connections on contact surfaces of a connection tail and on contact surfaces of tactile elements,
- holding foil which creates a security chamber and prevents movements of tactile elements within the keyboard,
- isolation lacquer which protects tactile elements on a connective tail prevents unwanted electric contact within the device,
- two-sided protection of clear windows (LCD windows) with protective foil;

Optional protection which can be inserted on the basis of client's special requests:

- optional foil protection of conductive connections on the connective tail which is necessary in cases of demanding environments and in cases of pasting a keyboard on metal carriers,
- EMV protection realized through an optional conductive layer (silver or graphite layer) which can be contacted on a connective tail of a keyboard or with a separate connective tail;

CONNECTION TAIL

The membrane keyboard is usually equipped with a connection tail, whose length can be adjusted to device demands. The connection with electronics inside the application can be created through a broad selection of suitable connectors. In the case of 2,54 mm pitch the connectors can be crimped on the connection tail. In the case of smaller pitches the connection tail of the keyboard is prepared for the use of FFC-FPC connectors which are parts of electronics and are not delivered together with the keyboard.

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TECHNICAL SPECIFICATION

ELECTRICAL	
VOLTAGE	25 VDC max *
CURRENT	50 mA max *
POWER	0,6 W max *
CIRCUIT RESISTANCE	<100 Ohms **
INSULATION RESISTANCE	5 x 10^6 Ohms
CONTACT BOUNCE	<20 mS max

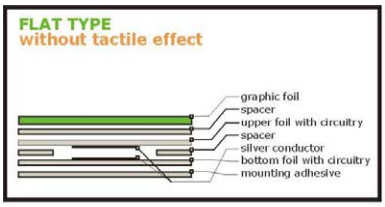
MECHANCIAL	
DIMENSIONAL TOLERANCES	+/- 0,2 mm
ACTUATION FORCE	2 - 4 N
SWITCH TRAVEL	0,15 - 0,2 mm
KEYBOARD THICKNESS	1,5 mm max
BENDING RADIUS CONNECTION TAIL	> 3 mm

OPERATING LIFE	
WITHOUT TACTILE ELEMENT	> 4.000.000 operations
METAL DOME TACTILE	> 1.000.000 operations
POLYESTER DOME TACTILE	> 2.000.000 operations

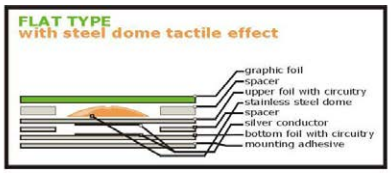
ENVIRONMENTAL	
OPERATING TEMPERATURE RANGE	- 20 do + 70 °C
STORAGE TEMPERATURE RANGE	- 40 do + 80 °C

* switch rating for optimum life: 20 VDC, 10 mA, 0,25 W
** depend on length of conductive lines, conductive line resistance: < 8 Ohm at 100 mm length, 1mm width

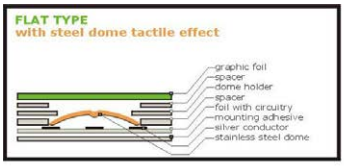
TYPE OF KEYS



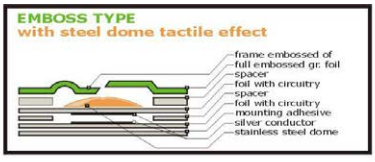
- MOST ECONOMICAL MEMBRANE KEYBOARD TYPE
- ALLOWS FOR A WIDE VARIETY OF KEYS SIZES AND SHAPES
- TYPICAL LIFE EXPECTANCY EXCEEDS 2.000.000 OPERATIONS
- OPERATING TEMPERATURE RANGE -20°C DO +70°C
- CONTACT MATERIAL: SILVER CONDUCTIVE PASTE/SILVER CONDUCTIVE PASTE
- POSSIBLE REALIZATION OF TRANSPARENT AREAS (LCD AND LED WINDOWS)
- PROTECTION CLASS FROM FRONT SIDE: IP65



- EFFECTIVE TYPE IN APPLICATION WITH KEYS DENSITY
- STANDARD DOME SIZES: FI 9,0 mm; FI 12,0 mm
- OTHER DOME SIZES UPON CUSTOMER REQUEST
- CONTACT MATERIAL SILVER CONDUCTIVE PASTE/SILVER CONDUCTIVE PASTE
- TYPICAL LIFE EXPECTANCY EXCEEDS 1.000.000 OPERATIONS
- ACTUATION FORCE: 3N +/- 0,5 N
- OPERATING TEMPERATURE RANGE -20°C DO +70°C
- POSSIBLE REALIZATION OF TRANSPARENT AREAS (LCD AND LED WINDOWS)
- POSSIBLE REALIZATION OF INFORMATION STRIPE POCKETS
- POSSIBLE REALIZATION OF EMV PROTECTION
- PROTECTION CLASS FROM FRONT SIDE: IP65



- FALSE ENTRY IS ELIMINATE SINCE THE STEEL DOME IS IN DIRECT CONTACT WITH THE CIRCUITRY
- STANDARD DOME SIZES: FI 9,0 mm; FI 12,0 mm; FI 16,0 mm
- CONTACT MATERIAL: SILVER CONDUCTIVE PASTE WITH GRAPHITE PROTECTION / Au
- TYPICAL LIFE EXPECTANCY EXCEEDS 1.000.000 OPERATIONS
- ACTUATION FORCE: 3 N +/- 0,5 N
- OPERATING TEMPERATURE RANGE -20°C DO +70°C
- POSSIBLE REALIZATION OF TRANSPARENT AREAS (LCD AND LED WINDOWS)
- POSSIBLE REALIZATION OF INFORMATION STRIPE POCKETS
- POSSIBLE REALIZATION OF EMV PROTECTION
- PROTECTION CLASS FROM FRONT SIDE: IP65



- EFFECTIVE TYPE IN APPLICATION WITH KEY DENSITY
- STANDARD DOME SIZES: FI 9,0 mm; FI 12,0 mm
- OTHER DOME SIZES UPON CUSTOMER REQUEST
- CONTACT MATERIAL SILVER CONDUCTIVE PASTE/SILVER CONDUCTIVE PASTE
- TYPICAL LIFE EXPECTANCY EXCEEDS 1.000.000 OPERATIONS
- ACTUATION FORCE: 3N +/- 0,5 N
- OPERATING TEMPERATURE RANGE -20°C DO +70°C
- POSSIBLE REALIZATION OF TRANSPARENT AREAS (LCD AND LED WINDOWS)
- POSSIBLE REALIZATION OF INFORMATION STRIPE POCKETS
- POSSIBLE REALIZATION OF EMV PROTECTION
- PROTECTION CLASS FROM FRONT SIDE: IP65
- POSSIBLE SMD LED INTEGRATION WITHOUT ADDITIONAL ELECTRIC LAYERS

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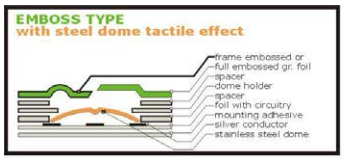
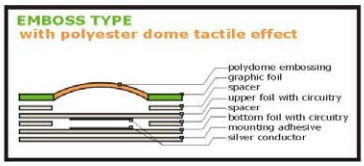
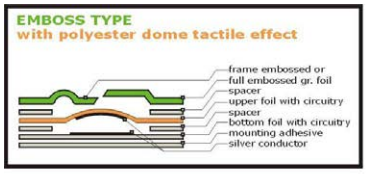


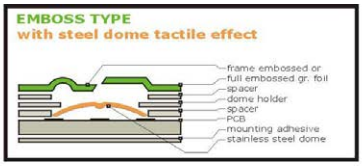
- FALSE ENTRY IS ELIMINATE SINCE THE STEEL DOME IS IN DIRECT CONTACT WITH THE CIRCUITRY
- STANDARD DOME SIZES: FI 9,0 mm; FI 12,0 mm; FI 16,0 mm
- CONTACT MATERIAL: SILVER CONDUCTIVE PASTE WITH GRAPHITE PROTECTION / Au
- TYPICAL LIFE EXPECTANCY EXCEEDS 1.000.000 OPERATIONS
- ACTUATION FORCE: 3 N +/- 0,5 N
- OPERATING TEMPERATURE RANGE -20°C DO +70°C
- POSSIBLE REALIZATION OF TRANSPARENT AREAS (LCD AND LED WINDOWS)
- POSSIBLE REALIZATION OF INFORMATION STRIPE POCKETS
- POSSIBLE REALIZATION OF EMV PROTECTION
- PROTECTION CLASS FROM FRONT SIDE: IP65
- POSSIBLE SMD LED INTEGRATION WITHOUT ADDITIONAL ELECTRIC LAYERS



- COST EFFECTIVE IN APPLICATION WITH HIGH KEYS DENSITY
- COST EFFECTIVE TYPE IN SMALLER AND SIMPLE KEYBOARDS WITH HIGHER VOLUME REQUIREMENTS
- STANDARD DOME SIZES: FI 9,0 mm; FI 10,0 mm; FI 12,0 mm
- CONTACT MATERIAL: SILVER CONDUCTIVE PASTE / SILVER CONDUCTIVE PASTE
- TYPICAL LIFE EXPECTANCY EXCEEDS 1.000.000 OPERATIONS
- ACTUATION FORCE: 2,5 N +/- 1,0N
- OPERATING TEMPERATURE RANGE -20°C DO +55°C
- POSSIBLE REALIZATION OF TRANSPARENT AREAS (LCD AND LED WINDOWS)
- POSSIBLE SMD LED INTEGRATION WITHOUT ADDITIONAL ELECTRIC LAYER
- PROTECTION CLASS FROM FRONT SIDE: IP65



- COST EFFECTIVE IN APPLICATION WITH HIGH KEYS DENSITY
- STANDARD DOME SIZES: FI 9,0 mm; FI 10,0 mm; FI 12,0 mm
- CONTACT MATERIAL: SILVER CONDUCTIVE PASTE / SILVER CONDUCTIVE PASTE
- TYPICAL LIFE EXPECTANCY EXCEEDS 1.000.000 OPERATIONS
- ACTUATION FORCE: 2,5 N +/- 1,0N
- OPERATING TEMPERATURE RANGE -20°C DO +55°C
- POSSIBLE REALIZATION OF TRANSPARENT AREAS (LCD AND LED WINDOWS)
- POSSIBLE SMD LED INTEGRATION WITHOUT ADDITIONAL ELECTRIC LAYER
- POSSIBLE REALIZATION OF EMV PROTECTION
- PROTECTION CLASS FROM FRONT SIDE: IP65

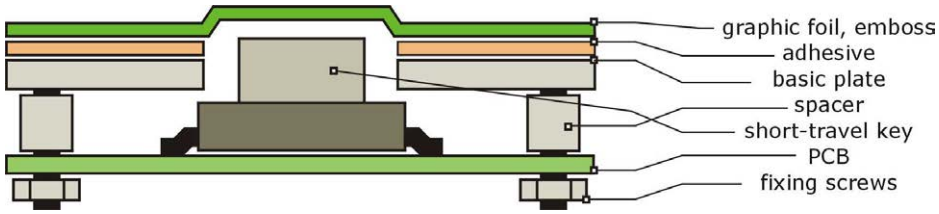


- OFERS HIGHER INTEGRATION LEVEL OF METAL DOMES AND OTHER ELECTRONIC COMPONENTS
- STANDARD DOME SIZES: FI 9,0 mm; FI 12,0 mm; FI 16,0 mm
- CONTACT MATERIAL: Au / Au
- TYPICAL LIFE EXPECTANCY EXCEEDS 1.000.000 OPERATIONS
- ACTUATION FORCE: 3 N +/- 0,5 N
- OPERATING TEMPERATURE RANGE -20°C DO +70°C
- POSSIBLE REALIZATION OF TRANSPARENT AREAS (LCD AND LED WINDOWS)
- POSSIBLE REALIZATION OF INFORMATION STRIPE POCKETS
- POSSIBLE REALIZATION OF EMV PROTECTION
- PROTECTION CLASS FROM FRONT SIDE: IP65

FOIL OVERLAYS

DECORATION AND PROTECTION

Keyboards with mechanical keys indicate several defectiveness in demanding environments especially when liquid and dust are present. An additional protection of the mechanical keys can be realized wih a graphic foil which is equipped with assembling adhesive. A product with this funtion is called a foil overlay. It is actually a decorative part of a membrane keyboard with all of its properties and funtions with the exception that in this case the electric function is done by mechanical keys of an appropriate quality placed on a PCB(Printed Circuit Board). The keys which are suitable for this realization are also called »short travel« keys.



GRAPHIC PART

Colour layers are printed from the bottom side of the graphic foil so that wearing out of information is not possible. An appropriate quality of a graphic foil enables the necessary maintenance and cleaning of devices and the use in most demanding environments.

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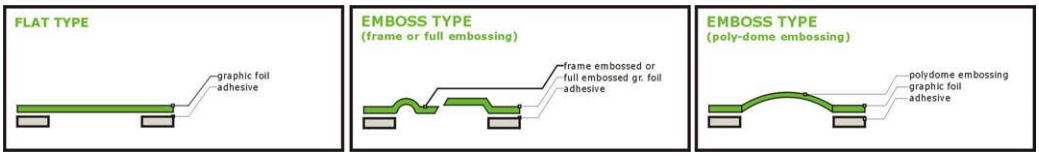
ASSEMBLING ADHESIVE

The bottom side of a printed graphic foil is equipped with assembling adhesive the purpose of which is to fix the foil to the carrier. Thickness of the glue can be adjusted to the keyboyard construction in a way that the optimal contact between mechanical keys and the foil is achieved which enables a suitable key responsiveness. The adhesive is removed from the keys' positions and transparent windows' positions. The represented keyboard composition assures high IP standards as well.

FOIL OVERLAY CAN BE EMBOSSED

The ergonomy and usefullness of a mechanical keyboard equipped with a foil overlay can be additionaly perfected by selective embossing of a graphic foil in the area of keys. The graphic foil forming improves attractiveness and the appearance of the entire application at one time. The shape of the embossed surface is arbitrary.



TRANSPARENT SURFACES

The foil overlay as a product retains all the possibilities considering the integration of transparent surfaces of different quality. Selective adjustment of graphic foil's certain surfaces makes possible for the use of LCD and LED displayes. A perfect clearness and transparency of the keyboard can be achieved if needed as well as only semi - transparency in various colour shades.

CHANGEABLE INFORMATION

An insertion of information stripe pockets is an option. The pocket can be formed between a graphic foil and the carrier or within a foil overlay with an additional foil level.

MATERIALS FOR MAKING A GRAPHIC FOIL

When making a graphic foil or a membrane keyboard polycarbonate and polyester foils can be used as a basic substratum for the realization of the graphic part. An appropriate superficial foil treatment enables the resistance of a graphic foil against the superficial wearing out and it's chemical resistance. The upper surface of a graphic foil is clear or semi-transparent.

GRAPHIC MATERIAL CHARACTERISTICS

	POLYCARBONATE	POLYESTER
AVAULABLE THICKNESSES	0,175; 0,375 mm	0,15; 0,2; 0,28 mm
SURFACE FINISHES	matte	clear, matte, velvet
OPTICAL CLARITY	excelent	very good
PRINTABILITY	excelent	acceptable
CUTTING AND EMBOSSING	excelent	acceptable
LASER CUTTING	acceptable	excelent
CHEMICAL RESISTANCE	acceptable	excelent
OUTDOOR EXPOSURE STABILITY	acceptable	acceptable
ABRASION RESISTANCE	acceptable	excelent
LIFE TIME	50.000 - 200.000 cycles*	1,0 - 5,0 milion cycles**
THERMAL STABILITY	excelent	acceptable
THERMAL EXPANSION	acceptable	excelent

* 50.000 cycles in embossed application, 200.000 cycles in flat applications
** 1,0 milion cycles in embossed application with metal domes, 5,0 milion cycles in flat, non-tactile application

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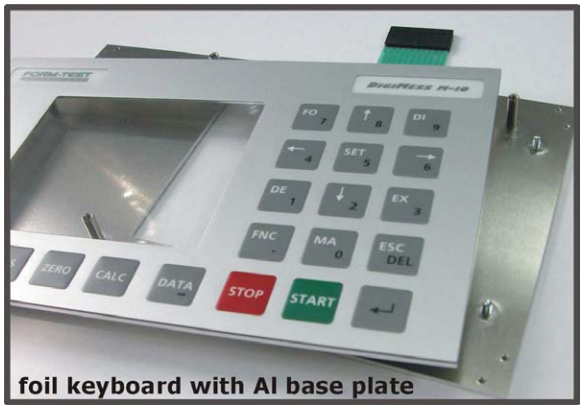
BASE PLATES

HIGHER LEVEL OF INTEGRATION

In accordance with the demands of the market, where there is a growing tendency towards a high level of integration of the delivered product, we have started with the production of supporting metal and plastic panels. Considering the mounting of keyboards onto an appropriately prepared surface and additional quality control afterwards, we have saved the final buyer from a few difficulties. Producing all components in one place ensures an appropriate construction, suitable accuracy and product quality.

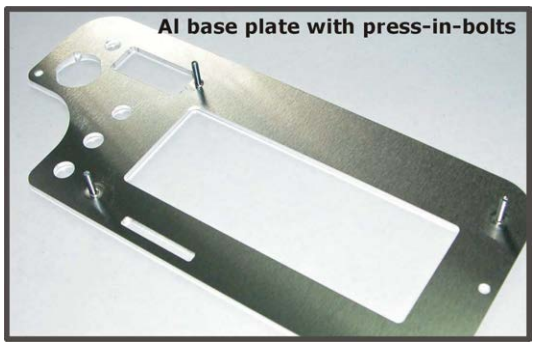


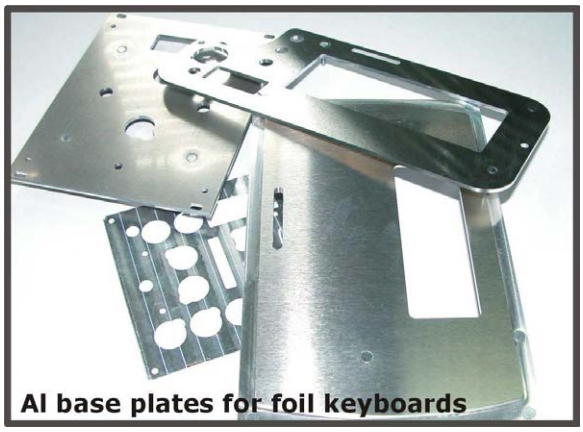
foil keyboard with Al base plate

foil keyboard with Al base plate

ADDITIONAL POSSIBILITIES

The base plates can be equipped with additional components, such as press-in-bolts screws, which additionally simplifies the construction of each base plate and enables a suitable integration of the communication part into an appropriate housing. The choice of press-in-bolts is wide and can satisfy even the most complex requirements.


Al base plate with press-in-bolts


Al base plates for foil keyboards

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ALUMINIUM AND PLASTIC HOUSINGS

CUSTOM DESIGNED HOUSINGS FOR SPECIAL PURPOSES

Wide possibilities offered by milling capabilities and other technologies present in our company result with complex products we are able to produce. AL housings with integrated keyboards, foil overlays and necessary plastic parts can be suitable solution for special products where quality is on first place. Such products frequently solve customer's demands for custom designed housings in process of product development, samples production and pilot production. Very often, in case of products where production quantities doesn't exceed small and medium size quantities, this kind of solutions also stay like final solutions.

Aluminum housing, black eloxation, front side with hard-coated PMMA, printed color and integration of capacitive touch-screen, transparent illuminated card holder, Press-in-bolts for fixing on product housing.

Aluminum housing with integrated membrane keyboard, integrated acryl light guides for LED's.

Housing made from aluminum and acryl glass.

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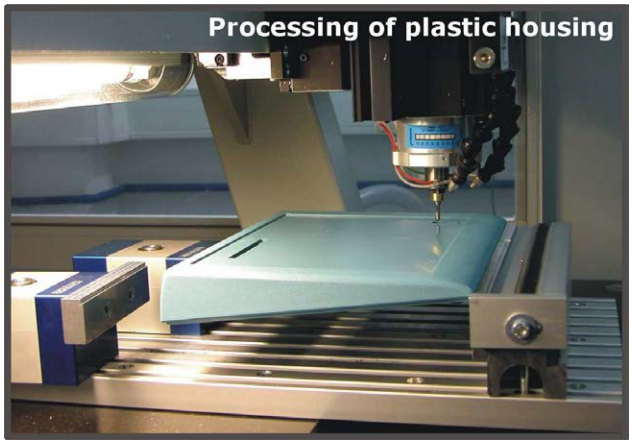
PROCESS QUALITY

The surfaces are manufactured through the milling process by top-level equipment, which ensures the process quality and the necessary accuracy, and most definitely suitable production time.

PROCESSING OF STANDARD HOUSINGS

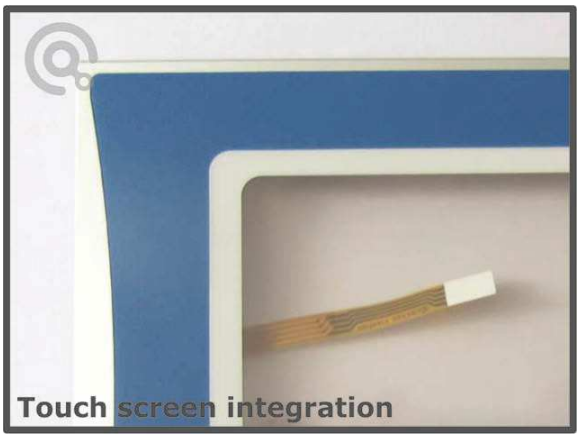
The company also offers services of processing standard casings, so that it prepares the front panels for mounting of keyboards and front foils. Mounting and further quality control is considered indubitable in these cases as well.

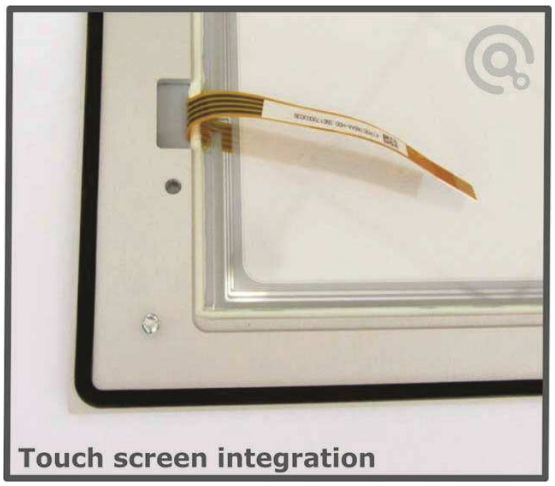


TOUCH SCREEN INTEGRATION

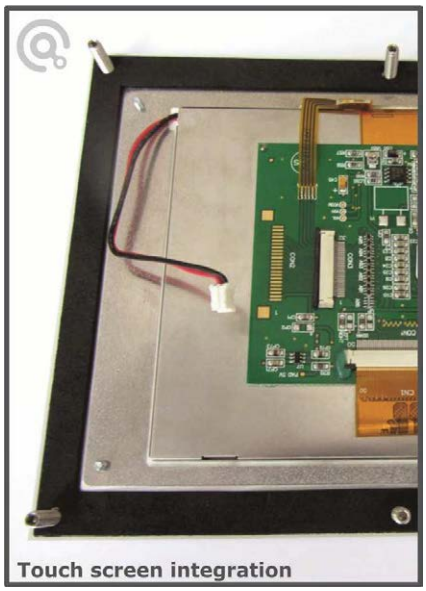
HIGHER LEVEL OF INTEGRATION

Touch screens become important component on wide palette of electronic application. Suitable way of integration of touch screens is requested on devices which operate in demanding and harsh environment. Eltas have a lot of experiences on products where integration of touch screens under the foil (resistive touch-screens) or glass (capacitive touch-screens) is necessary. So far we integrate resistive touch screens in size up to 21,5'' (24'' will be integrated in next month's).





Complete front panel (exclusive touch screen) can be produced in our production. On pictures above we show Al panel, natural eloxated with inserted press-in-bolts and integrated gasket. Resistive touch screen is integrated with optical clear adhesive on antiglare polyester foil where graphic design was printed before. In final part of production process front foil was laminated on AL frame and touch screens was sealed with suitable resin.



Touch screen can be part of LCD module. Also in this case integration of touch screen on suitable way is possible. On the pictures above we show such product. Al frame was coloured with powder coating colour.

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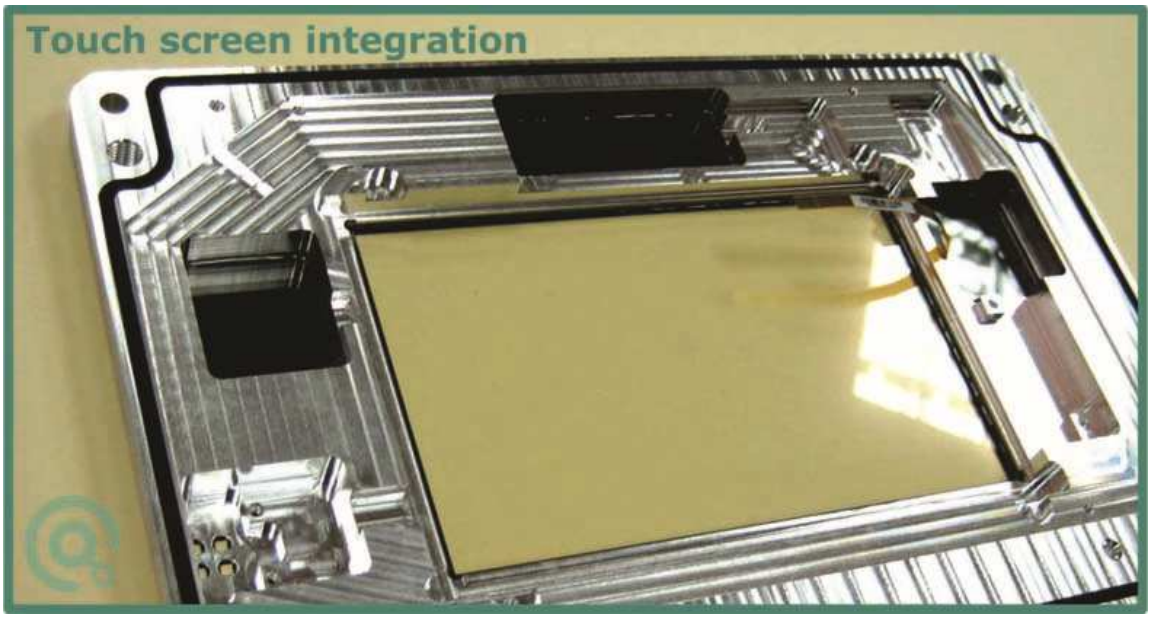
Also larger size of touch screens can be integrated with optical clear adhesives on graphic foil. Such panels can be used also in very demanded environment: medicine application, food production and similar. Panels where touch screens are protected with polyester foil offer perfect cleaning possibilities and suitable protection of application.



Complex Aluminium front plate with integrated plastic parts, gasket, graphic foil and touch screen is result of development and construction in our company.

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TECHNOLOGY AND PRODUCTION

PRODUCTION FACILITIES: SCREEN PRINTING


screen-printing facility

SCREEN PRINTING

- SCREEN PREPARATION
- MATERIAL PREPARATION
- COLORS PREPARATION
- SCREEN PRINTING electric parts
- SCREEN PRINTING graphic parts
- QUALITY CONTROL

ASSEMBLING


colour printing

printing of conductive pastes

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PRODUCTION FACILITIES: ASSEMBLING


assembling facility


die-cutting
and embossing


knife cutting plotters -
spacers and adhesives

SCREEN PRINTING

ASSEMBLING

- SPACER AND ADHESIVE cutting
- EMBOSSING
- CUTTING OF PREPRINTED ELECTRIC PARTS
- SPACER AND ADHESIVE LAMINATING
- METAL DOMES PLACEING
- SMD LED INTEGRATION
- GRAPHIC FOIL LAMINATING
- OUTLINE CUTTING
- CONNECTORS CRIMPING
- QUALITY CONTROL
- PACKAGING
- DELIVERY

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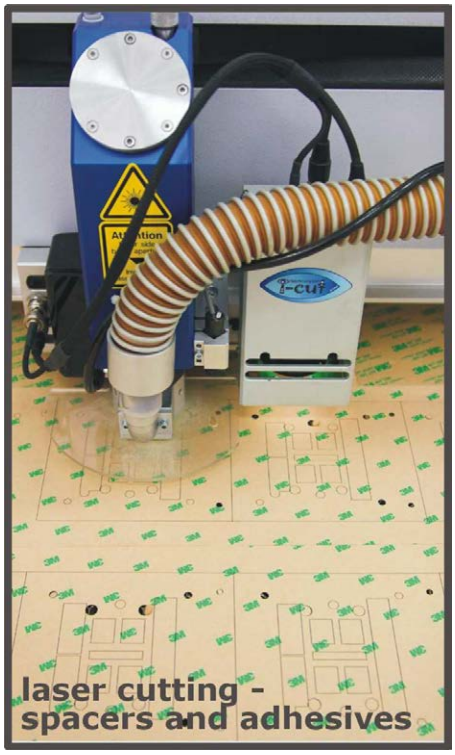
PRODUCTION FACILITIES: LASER CUTTING


laser cutters

laser cutting with i-cut system - outline cuttings of pre-printed materials



laser cutting - spacers and adhesives

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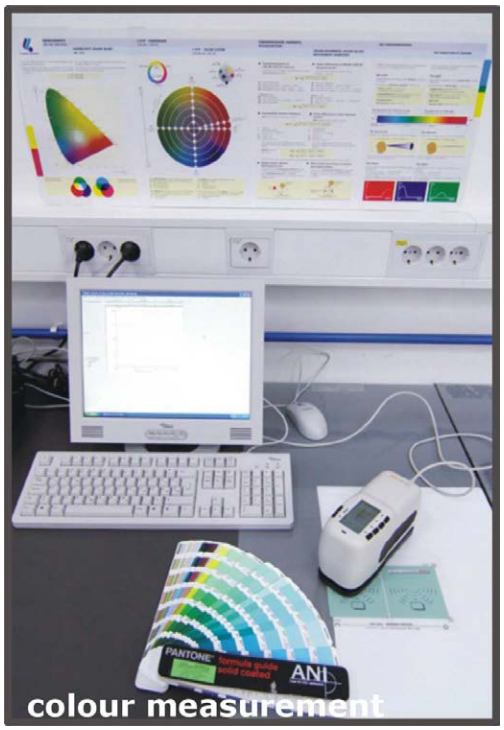
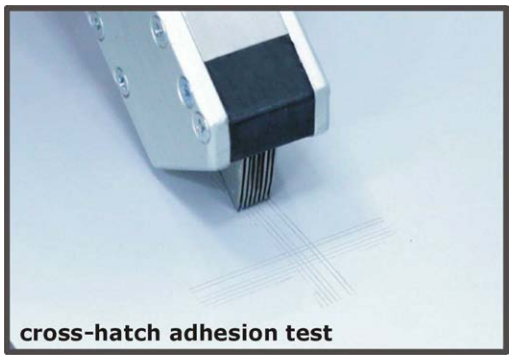
PRODUCTION FACILITIES: QUALITY CONTROL

life-time test



colour measurement


cross-hatch adhesion test


colour preparation

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PRODUCTION FACILITIES: MECHANIC PARTS PRODUCTION