DATA MODUL

Company Brochure

Passion Displayed

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Our vision

We simplify life in a connected world

In a world where displays, touch and electronic components are often seen as individual parts, there is one company that always has the big picture in mind: DATA MODUL. Our history and our drive remind us that our products enable the creation of something great for our customers.

Our mission

As **Passionate Enablers** of technology, we combine next level display integration with smart software powered by professional services.

Corporate values

Success
As a strong and focused partner, we strive for sustainable growth together with our customers.

Professionalism
We work in a reliable, structured and disciplined way to fulfil highest requirements in all areas.

Innovation
With curiosity, courage and competence, we take on tomorrow's technology trends already today.

Passion
Excitement for challenges and personal engagement inspire us every single day to fully commit to our tasks and our customers.

Team spirit
As a global company, we assume joint responsibility and support each other in achieving our goals.

DATA MODUL worldwide

"Local for local" – a global company

At home in Munich, at home in the world: DATA MODUL was founded in the Bavarian metropolis in 1972 from the founder's bold vision of developing modules that can record, process and pass on information. Over the past decades, our company has grown into a major international technology company. Today, more than 550 dedicated employees worldwide are passionately working on innovative visual solutions for the future.

Thanks to our international production, logistics and sales locations, we can effectively serve our customers globally. Our success is based on our deep knowledge of market-specific requirements as well as the interplay of sales components, inhouse development, internal production and global logistics concepts that enable fast and cost-effective delivery. Our sophisticated infrastructure enables us to offer customers worldwide a full service that includes consulting, development, prototyping, bonding technologies, quality management, series production, logistics and application services.

Portland
Chicago
Los Angeles
San Diego
Oklahoma City
Philadelphia
New York
Orlando

Helsinki
Stockholm
Kolding
Birmingham
Paris
Lublin
Weikersheim
Munich (Headquarters)
Milan
Madrid

Shanghai
Hong Kong
Singapore

📍 Sales office
📍 Production & Logistics

Germany (Weikersheim)

Our Technology Flagship in Germany as basis for global processes and production standards awaits with a total area of more than 23,000 square meters. Here, we combine flexible production lines, modern manufacturing islands, prefabrication, mechanics, logistics and prototype construction as well as all bonding technologies at one location.

Poland (Lublin)

Continuous expansion in Poland enables additional capacity and global growth, extended bonding capabilities and lean logistics processes: in 2019, we opened our latest DATA MODUL production site in Lublin, Poland, equipped with state-of-the-art machinery. On around 24,000 square meters, we manufacture according to German quality standards. This strengthens our position as Europe's market leader.

China (Shanghai)

Additional flexibility thanks to local assembly according to German quality standards on a total area of around 2,000 square meters in Shanghai: also our production site in China follows our high-quality approach and enables us to serve the needs of local markets and our globally operating customers based in Asia efficiently and quickly.
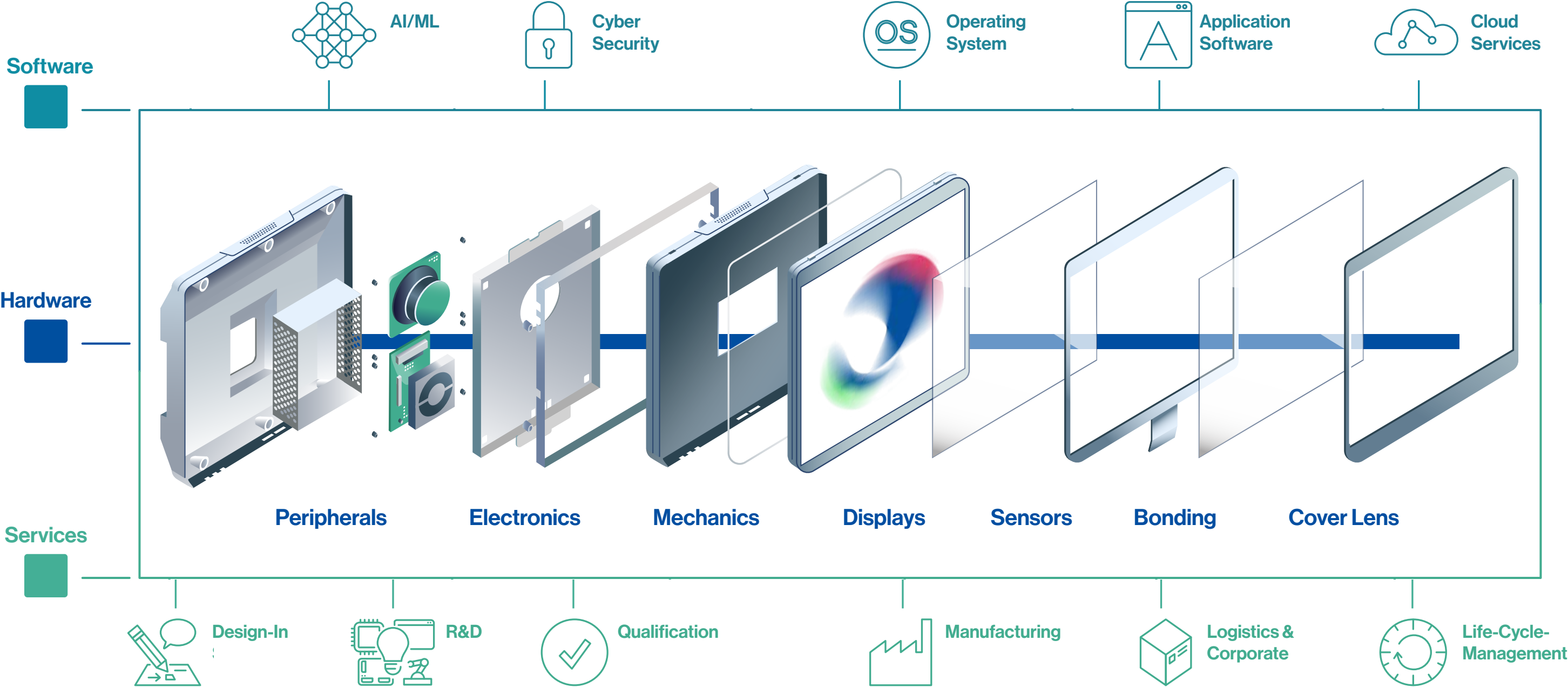
USA (New York)

Expansion of logistics capacities and local sales support in the US - with our subsidiary DATA MODUL Inc., close to New York City, and widespread sales offices all over the US, we follow our "local for local" philosophy to provide system engineering and high-quality support on-site. From concept to design and prototyping to production and certification.

Our business model at a glance

With Hardware, Software and Services, we realise unique display solutions that turn your ideas into reality.

We view our Hardware, Software and Services as building blocks that are combined in a complex interplay to fulfil your expectations. By continuously expanding our hardware portfolio with new components and tapping into important market sectors such as cloud services, AI, ML and cyber security at the software level, we create intelligent and future-proof products. At the same time, we are maintaining our proven modular approach while focussing more on individual needs and the dynamic market requirements.

Software

- AI/ML
- Cyber Security
- Operating System
- Application Software
- Cloud Services

Hardware

Peripherals Electronics Mechanics Displays Sensors Bonding Cover Lens

Services

- Design-In
- R&D
- Qualification
- Manufacturing
- Logistics & Corporate
- Life-Cycle-Management

Hardware

Expansion of our hardware portfolio with new components

Our daily drive is to continuously develop our products and align them with the trends of tomorrow. In addition to products developed inhouse, we offer a diverse distribution portfolio from leading manufacturers. This diversity enables us to offer a comprehensive range of solutions for industrial and professional applications of all kinds.

Displays

Your leading technology partner with strong supplier portfolio

Our extensive distribution portfolio of all leading manufacturers provides the basis for the implementation of state-of-the-art display systems. In addition to a wide range of display sizes and shapes, we also have all common technologies in our constantly growing portfolio and offer semi- and fully-customised display solutions.

Our industry expertise, market know-how and experience in all areas of display technologies make us the perfect partner for professional systems. In addition, we offer a reliable after sales support and ensure long-lasting and efficient display solutions thanks to long-standing supplier relationships and professional lifecycle management.

Our Partners

AMPIRE | AUO | BOE
CDTECH | DKE | Eink
HannStar | INNOLUX | KOE
KYOCERA | LG Display | SHARP
TIANMA | ORTUSTECH | POWERTIP

Display technologies

TFT

- IPS, VA, TN, FALD (miniLED), MIP etc.
- Diagonals from < 1" to >100"
- Temperature ranges from -40 up to +85°C
- Standard & special formats such as round, square, stretched, curved, free shape
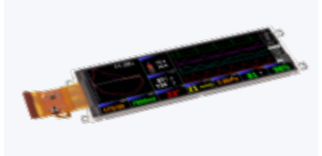- Various specifications: resolution, brightness, interface, power consumption, ruggedness etc.

OLED

- Outstanding optical performance
- Low power
- Extremely slim
- Active & passive matrix
- Monochrome or coloured
- Free of viewing angles
- <1" up to 55"
- Standard, transparent, flexible

E-Paper

- Sunlight readable
- Extremely low power consumption
- Excellent visibility
- "Always on" (even without power)
- Monochrome & colours
- Sizes from around 1" up to 42"
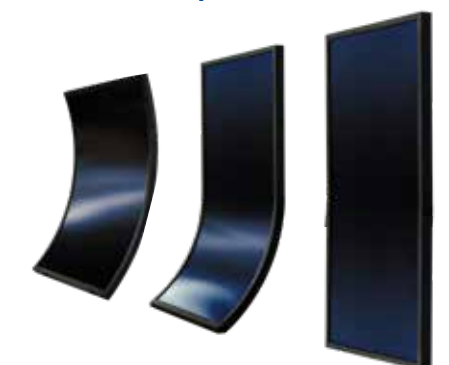- Displays & monitors

Customised displays

- Semi- & full custom displays
- Mechanical changes (size, shape, resolution), FPC
- Electrical adaptions (interface, special circuitry)
- Changes in optical specifications (brightness, colour etc.)
- Improved reliability (temperature range, vibration, EMC)

Next level display integration manufactured in Europe

We can optimise brightness, uniformity, colour gamut NTSC, power consumption and sunlight readability with our own developed and manufactured display.

Made by DATA MODUL

- Integrated back-end assembly of flat & curved display manufacturing in Europe
- Design backlight & front light for displays products
- Modular structural design with optimised performance
- Unique light guide design & innovative film structure

Cover Lens

Device protection & enabler for aesthetic design requirements

Design your device with a cover lens and turn it into your personal and unique application. Our selection of customised glass variants, combined with optional plastic covers, allows you to customise the design according to your wishes.

Material
▸ Float glass in different shapes
▸ Plastic (PMMA/PC)
▸ Aluminosilicate
▸ Chemical & thermal strengthening

Treatments
▸ Passepartouts & logo
▸ Edge & corner finishing
▸ Polishing for camera windows
▸ Cutouts or irregular shapes
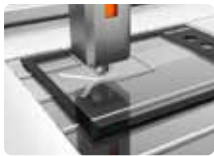▸ AR (anti-reflective), AG (anti-glare) and AF (anti-fingerprint)

Additional features
▸ Smart surface with woodlike structures
▸ Pol+ (Polarisation filter) for readability even with sunglasses
▸ Curved or 3D shapes

Bonding

All technologies inhouse available

We have state-of-the-art bonding methods inhouse, enabling us to offer customised touch display solutions directly from a single source. We select the appropriate bonding method based on your requirements as well as design and environmental conditions and advise you individually. This enhances the display performance by reducing reflections and improving readability.

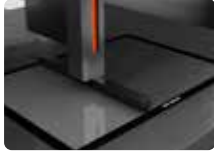### Optical Bonding (Focus on optical performance)

LOCA / OCR Bonding
Dam & fill process with dispensing of liquid adhesive to bond TFT/SITO/cover lens

OCA Lamination
Automatic joining of film sensors to cover lenses via lamination

Hybrid Optical Bonding
Hybrid process (between LOCA and Gel) for high-volume touch solutions with cover lens or display

E-Field
Cost-effective touch solutions with cover lens or display using an electric field in the joining process

Structural Bonding (Focus on mechanical structures)

Structural Bonding
Process with Hot Melt, MS-Polymer or PSA to create adhesive joints with high mechanical resilience

Air Bonding
Use of structural bonding adhesives to successfully bond displays with cover lenses and touch sensors

Gap Filling
Automatic measurement and filling of gaps between cover lens and housing

Plasma
Supporting process for cleaning and activation of plastic surfaces to reach sufficient adhesion
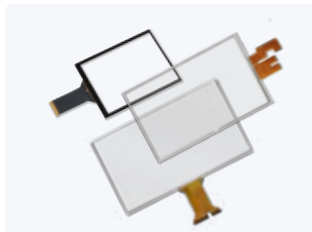
Sensors

Europe's touch technology leader

Our aim is to offer our customers an outstanding touch experience. To achieve this, we rely on touch sensors and controller boards developed inhouse. Our range includes complete PCAP and PCT (Projected Capacitive) solutions that provide all the necessary components - touch sensor, controller, firmware, cover glass and optical bonding - from a single source. This holistic approach ensures that our customers receive high-quality products that are optimally harmonised with each other.

Touch technologies

Our touch technology easyTOUCH offers cost- and time-efficient solutions especially for industrial applications. Even through thick cover glass as well as with gloves, a flawless operation is possible at any time. Individual configuration of touch settings enables the detection and elimination of disturbing influences, e.g. liquids such as sweat, (salt) water or blood. Alternative touch technologies such as resistive, infrared and SAW (Surface Acoustic Wave) are part of our extensive competence spectrum.

Touch sensors
▸ Glass or film sensors
▸ PCAP sensors up to 86"
▸ Resistive sensors up to 21.5"
▸ Temperature ranges from -40 up to +85°C
▸ Customised sensors on demand

Touch controller
▸ Latest PCAP controller
▸ I²C & USB protocol
▸ Chip-on-board or Chip-on-flex
▸ Multi-touch function up to 10 fingers

Tuning
▸ FAE on-site support
▸ EMI & ESD immunity
▸ Glove- & water-operation
▸ Tools for analysis & customisation (easyANALYZER)

Additional features
▸ RFID / NFC
▸ Bluetooth / WiFi
▸ Proximity sensor
▸ Audio & camera integration
▸ Barcode scanner
▸ Ambient light sensor
▸ Face detection

Our Partners HIGGSTEC · DMC Co., Ltd. · MICROCHIP · ILITEK · TouchNetix · GRAYHILL

Alternative input methods

Voice control · Gesture control · Haptic feedback · Force touch · easyKnob & encoders

Electronics

Embedded computing design

We offer a wide selection of configured embedded computing systems based on both x86 and ARM architectures. From pre-configured kits to customised baseboard designs, we offer a variety of embedded solutions. For specific needs, our teams can provide customisation, whether through the development of bespoke baseboards or the realisation of complete embedded board designs according to project requirements.

The most important component is embedded inside

eMotion LCD controller boards

▶ Ideal for industrial applications
▶ Different interfaces, e.g. HDMI, VGA, DisplayPort & DVI
▶ Kit with all necessary components, e.g. cables, converter, power supply unit

COM / SBC solutions

▶ Equipped with the latest processor technology
▶ Numerous form factors
▶ Wide range of COMs (computer-on-module) & SBCs (single board computer)
▶ Individual software support

Customised board design

▶ Various individualisation options
▶ Suitable embedded computing solutions
▶ Advice on defining requirements
▶ Optimal cost design & lifecycle management

Our Partners congatec MSi IPC avalue Technology Inc. ASRock —Industrial— FS Elektronik Systeme Toradex Swiss. Embedded. Computing.

Peripherals

Make it work

Our range of services also includes numerous accessories and special equipment options. Depending on customers' requirements or the respective application, we can adapt and provide the relevant components such as memory, cooling solutions, cables and peripherals.

Cables & adaptors

Peripherals

Memory

Cooling solutions

Mechanics

The key for system engeneering

From open frame to rack mount and desktop applications: thanks to our modular concept, we offer versatile customised solutions for monitors and panel PCs. Our system solutions are used worldwide in professional applications with high quality standards. We integrate state-of-the-art embedded boards, touch technology and intelligent functions into attractive housings to create powerful systems that meet our customers' requirements.

Delivered according to your needs

For us, the successful cooperation with our customers as well as long-term support and long-standing partnerships is always of high importance. We can offer professional and comprehensive advice on special product design requirements such as housing materials or temperature, humidity and vandalism protection. We are proficient in a wide range of production technologies and select the optimum process for each product and project.

System design for

▶ Harsh environmental conditions
▶ Tight installation spaces
▶ Optimum optics & haptics
▶ Optimised user experience
▶ EMI & ESD immunity

easyTOUCH display

▶ 3.5" to 55"
▶ Chip-on-flex or separate touch controller
▶ USB or I²C interface
▶ Various cover lenses
▶ Quick & easy integration

Monitors

▶ 10" to 75" monitors
▶ Up to 4K / high resolution,
▶ DVI, DP1.4, HDMI 2.0
▶ Open frame or desktop version
▶ Curved solution

Panel PCs

▶ 7"to 75" panel PCs
▶ PCAP touch integration
▶ Latest x86- & ARM-platforms
▶ Open frame & Stand-alone panel PCs for plug & play use

Box-PCs

▶ x86-platform
▶ Latest Intel technology
▶ Different performance levels
▶ Wide temperature range
▶ Various interfaces

All sorts of finishing methods

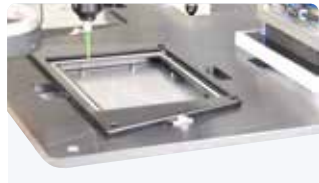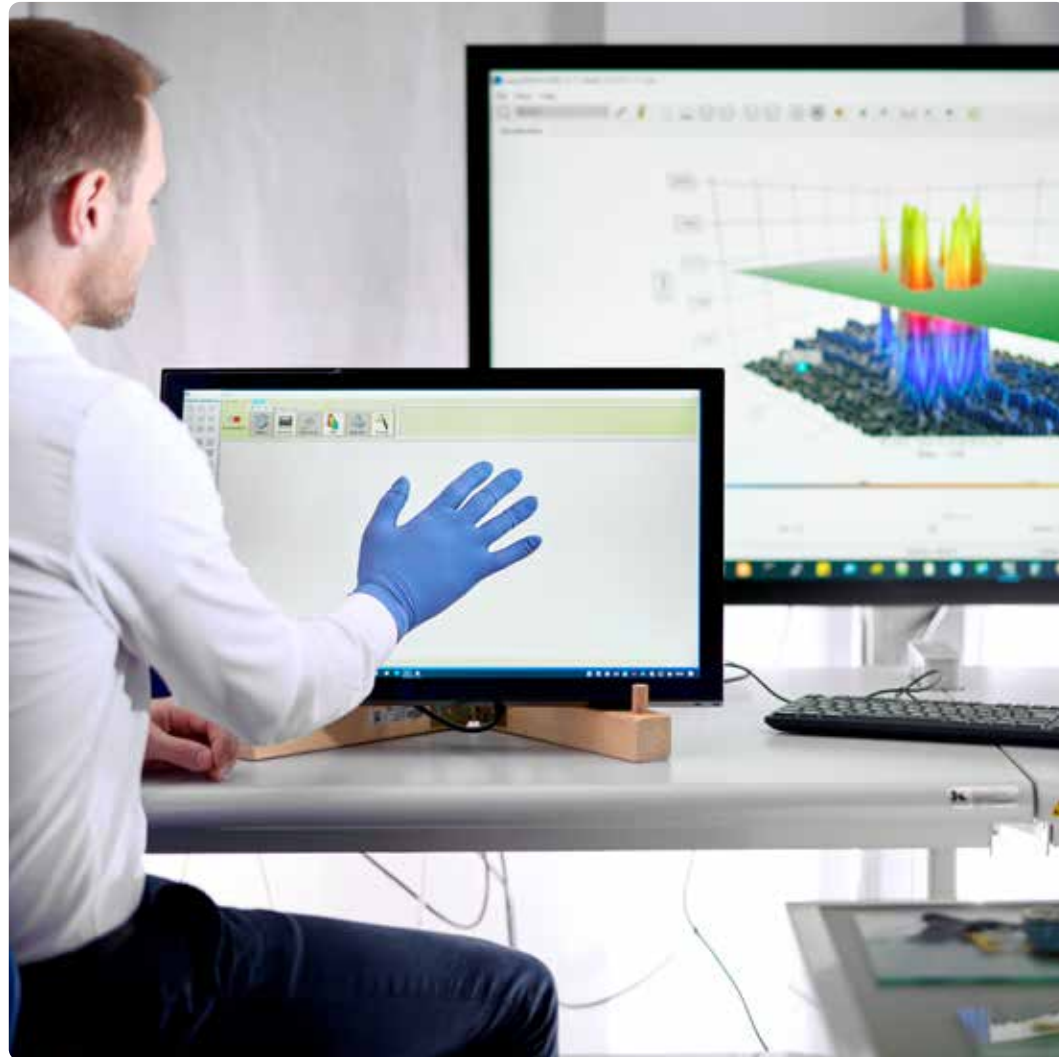**Die castings**

Injection moulding

Integration of lighting elements

Sealing solutions

Software

Customised software solutions - tailored to your needs

Our R&D department focuses on providing customised software solutions that meet the diverse requirements of different industries. Our aim is to ensure that our software is robust, reliable and flexible to meet specific market requirements. We take a holistic approach that includes continuous updates and support for innovative technologies to ensure the efficiency and security of our systems. By partnering with us, you gain access to customised software solutions that are designed for maximum operational efficiency and security.

Operating systems

At the core of our embedded hardware solutions lies our commitment to a stable and secure OS. Our goal is to fulfil a wide range of application requirements in different market segments.

▸ Embedded Linux, YOCTO based Board-Support Packages (BSP)
▸ Bootloader development (U-Boot & Barebox)
▸ Hardware driver development & upstreaming
▸ Real-time operating systems
▸ MCU bare metal programming

Application software

Go beyond the display with our application software products and development services. In addition to our easyANALYZER and the "maXcs" software suite, our main expertise lies in customised software developments.

▸ Application software development in C++, Qt or C#
▸ Database applications on embedded platforms
▸ UI/UX Design with qualified partners

Cyber security

Our cyber security solutions are built around the unique needs of the display industry, ensuring that your visual data remains confidential, integral and available at all times.

▸ Linux Yocto BSP Maintenance
▸ Vulnerability assessment using CVE database
▸ Embedded system hardening
▸ Customised service contracts

Cloud services

Unlock the potential of cloud-driven display content with us so that your displays are always updated, connected, and scalable – for example with our content management expertise.

▸ Content Management Systems
▸ Cloud SDK integration in Embedded Linux BSPs
▸ Over-the-air update concepts

AI & Machine Learning

Whether it's predictive maintenance in industrial automation, passenger analytics in mobility – our Artificial Intelligence and Machine Learning solutions help how industries see, interpret and interact with visual data.

▸ Machine vision systems
▸ AI/ML enabled embedded platforms
▸ Solution design & 3rd party products

We create intelligent and future-proof products based on new market sectors

In a world driven by visual technologies, software services are an important part of the big picture. From operating systems, application software and cyber security to cloud, artifical intelligence and machine learning services: our goal is to take your system to the next level and provide smart software products and services.

Services

Your reliable partner along the product development process

Starting with the concept and design-in, through the research and development phase to qualification: based on our services, we bring your ideas to life. Coupled with our manufacturing, logistics and lifecycle management services as well as our passion for making things possible, we realise every project, no matter how complex, exactly according to your requirements.

Design-In

In our day-to-day work, we rely on close coordination between our project teams and customers as well as early involvement in the development process to ensure a smooth design-in process and start of series production.

▶ Technical consulting
▶ Project management
▶ 1st level application &
  2nd level R&D support

R&D

From development and design to certification support, our Research & Development services are designed to bring our customers' hardware and software ideas to life.

▶ Process development
▶ Prototyping & mock-up
▶ Proof-of-concepts

Qualification

When it comes to certification, inhouse testing and documentation, one of our priorities is to ensure that our customers' products not only meet the required standards, but exceed them.

▶ Approvals CE, UL, FCC
▶ Medical standards ISO 13485
▶ Automotive standards IATF 16949

Manufacturing

At our international production sites, we realise individual system solutions tailored precisely to the customer's wishes and vision.

▶ Global assembly and manufacturing
▶ Quality assurance with world wide standards
▶ Manufacturing as a service

Logistics & Corporate

Short delivery times and the highest possible degree of material availability are our top priorities.

▶ Logistics for customers
  (buffer & consignment stocks)
▶ Various financial services
▶ Order tracking

Lifecycle Management

For us, reliable lifecycle management is one of the cornerstones of successful collaboration. We pay particular attention to change management.

▶ Obsolescence management with successor models
▶ Traceability
▶ After sales support

Your all-round service is our priority

To achieve optimum results, we attach great importance to a reliable all-round service. Thanks to our wide range of services, our customers receive comprehensive support for a smooth process from concept to completion.

Our markets & sectors

The right fit for any application

Our professional display solutions are firmly established worldwide in a wide range of market-specific applications. Thanks to the harmonious combination of our three central building blocks - hardware, software and services - we can not only offer customised solutions that are flexibly tailored to the diverse needs of our customers, but also meet even the most demanding market requirements.

Industrial Automation
- Industrial HMI
- Robotics
- Logistics & portable devices
- Food industry
- OEM services (EMS)

Mobility
- EV-Charging & refuel
- Automotive
- Marine
- Avionics
- Military & defense
- Public transportation

Smart Building & White Goods
- Smart building
- Home appliances
- White goods
- Office & conference systems
- Professional kitchen

Medical & Healthcare
- Patient care
- Laboratory diagnostics
- Fitness & rehabilitation

Entertainment
- Gaming
- Infotainment

Smart Retail & Signage
- Measuring & weighing systems
- Point of Sales (POS)
- Digital signage (POI)

Why DATA MODUL?

Your benefits at a glance

We understand customised solutions as a process that begins with attentive listening and targeted questions. As pioneer, we stand by your side as a holistic partner to realise your wishes and visions. By using high-quality components, many years of experience, comprehensive expertise and great passion, we implement your individual requirements precisely.

Our modular building blocks
- Modular hardware: display, sensors, electronics & mechanics
- Intelligent & secure software solutions
- Services along the product lifecycle

Our basis for your success
- Intensive requirements analysis of the customer's wishes
- Individual consulting
- > 50 years of product, technology & process knowledge

Selection of components
- Customised product mix according to the "best-fit" principle
- Variety of inhouse product developments
- Extensive portfolio of distribution products

Start of production
- Experienced Research & Development expert teams
- Fast prototyping
- Professional & efficient project management

All-round services
- Broad vertical range of manufacture at locations worldwide
- Qualification & approval for diverse markets
- Reliable lifecycle & obsolescence management

Warehouse & logistics
- Customised, global warehouse concepts
- Short, flexible call-off & delivery times
- Variable financing options

Our local for local approach
- Direct sales, product management & R&D access
- Immediate local on-site service
- Open communication

Customised market applications
- Broad market expertise
- Fulfilment of certifications
- Semi- & fully customised products

Sounds interesting?

Dive into the world of DATA MODUL:

easyTOUCH starterkit
- 13.3 inch PCAP display (FHD)
- eMotion LCD contoller board with all necessary accessories
- easyANALYZER tuning tool

Embedded starterkit
- Perfectly matched components: SMARC carrier board & module, passive cooling solution & all necessary accessories
- Smooth integration into customised monitor concepts
- Individual firmware & software
- Approval after extensive tests

DATA MODUL
Passion Displayed

All good things come in threes:

With **Hardware**, **Software** and **Services**, we realise
unique display solutions that turn your ideas into reality.

www.data-modul.com