

FOR A WORLD IN MOTION

Your first choice for the handling of oil products

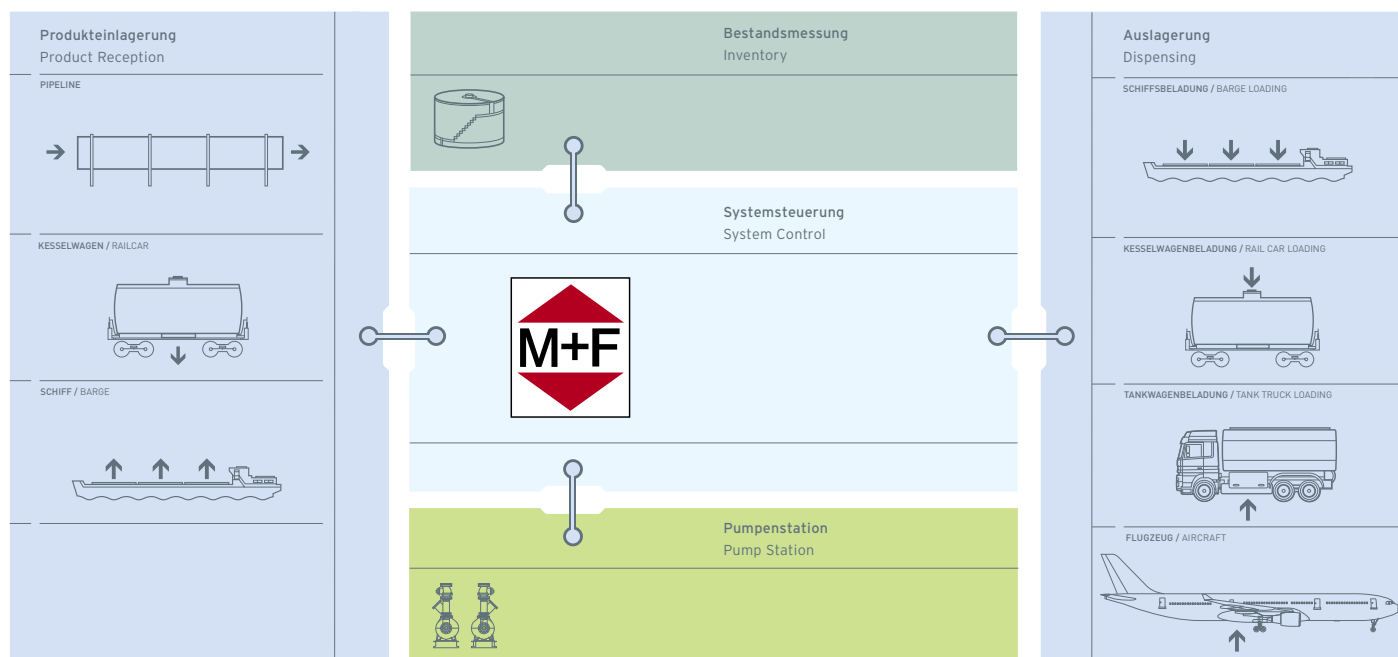
M+F TECHNOLOGIES: YOUR INNOVATIVE SOLUTION PROVIDER

Responding to your individual demands

As a solution provider, **M+F Technologies** provides you with its outstanding expertise in the handling of oil products. Our leading market position is underpinned by our long-standing know-how in loading processes in the oil industry and our continuous development work that benefits our customers around the world: We offer you complete system solutions based on our own technologies and state-of-the-art products, covering all your needs, from consulting and engineering to implementation and even including regular servicing.

As an experienced specialist, we take care of all tasks linked to the automation and management of tank farms, tank terminals and fuel supply systems. Our focus here is on loading systems for tank trucks, rail cars and ships, as well as on blending systems and fuel supply systems at airports.

- **Understanding of the industry:** proprietary products and pioneering technologies that reflect our profound know-how
- **Expertise:** tailored solutions reflecting the comprehensive understanding of the individual context
- **MID conformity:** measurement systems for all loading applications in the oil industry in accordance with the Measuring Instruments Directive



A STRONG ALLIANCE SINCE 1901

We are a member of the J.H.K. Group

In 1901, a coppersmith by the name of Johann Heinrich Kramer founded J.H.K. in Bremerhaven, Germany. Over the decades, the company developed into a group with international operations. Today, the J.H.K. Group of companies is already family-owned in third and fourth generation by the family Kramer, Bremerhaven, managed by Mr. Ingo Kramer.

The J.H.K. Group consists of five companies whose core areas of expertise are engineering, pipeline construction, specialised steelwork, system solutions for the handling of oil products and industrial coatings.

A defining characteristic of the group's successful activities over the years has been its ability to identify market niches, meet the special needs of its customers, and its commitment to high-quality products. Our customers benefit from our broad range of bundled expertise. Quality assurance and passion for innovation define our successful comprehensive range of products and services, as do our highly motivated specialists, technicians and engineers who work to uphold the company's high standards.

MEMBERS OF THE J.H.K. GROUP

J.H.K.
Anlagenbau
und Service
GmbH & Co. KG

G & K
Montagen-
gesellschaft
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beschichtung
GmbH & Co. KG

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Engineering
GmbH & Co. KG

M+F
Technologies
GmbH

- **Strong foundations:** M+F Technologies with a tradition going back more than 45 years and a member of the J.H.K. Group since 2014
- **Long-standing experience in plant engineering and construction:** extensive service portfolio with state-of-the-art offerings
- **Bundling of expertise:** performance of complex and demanding projects in close cooperation with the other J.H.K. companies



MFX_4: MODULAR FLOW COMPUTER SYSTEM

All processes at a single glance at any time

The high-performance **MFX_4** flow computer complies with the highest standards, allowing for flexible and reliable custody transfer measurement and blending as well as the management of processes for the handling of liquids and, in particular, oil. With more than 30 years of operating experience and in excess of 15,000 installations, the fourth generation combines long-standing industry know-how with state-of-the-art technologies.

Thanks to its support of various protocols and communication standards, all **MFX_4** systems are easy to integrate, can be configured quickly and can be serviced remotely during ongoing operations. The **MFX_4** flow computer sets itself apart with its distributed architecture made up of centralised processing units and decentralised operating units, thus substantially expanding the range of possible applications,

- **Flexibility:** a wide-ranging system family with modules for use in control rooms and external use in explosive environments, even under extreme weather conditions
- **Scalability:** use in various applications, ranging from systems with single loading stations to large, complex transfer systems
- **Security:** rigorously secure parameter access through structured system admission as part of a multi-level security approach with the archiving of all changes

AN EXCEPTIONAL SYSTEM IN DETAIL



The **MFX_4 Controller** is the centralised control unit of the **MFX_4** system. It is available in two housing variants as an explosion-proof (Ex) as well as an unprotected device, whereby the functionality of the electronics is identical. Depending on the model, it can be used both in the control room and under extreme weather conditions in explosive external areas.



The **MFX_4 Terminal** is the human-machine interface (HMI) via which communication with the Controller, other suitable terminals or a SCADA system takes place. To ensure optimum operability, it is equipped with a configurable graphic display and is able to display all process data in various sizes and languages.



The **MFX_4 Compact** combines all functionalities of the **MFX_4 Controller** and **MFX_4 Terminal** in a single explosion-proof (Ex) housing. Thanks to its compact size, the **MFX_4 Compact** is also suitable for use in small systems.

→ **MFX_4 Controller:** configurable for individual applications for blending or addition and including an integrated PLC control system via scripting

→ **MFX_4 Terminal:** interface between the measurement device (e.g. **MFX_4 Controller**) and the user in the field

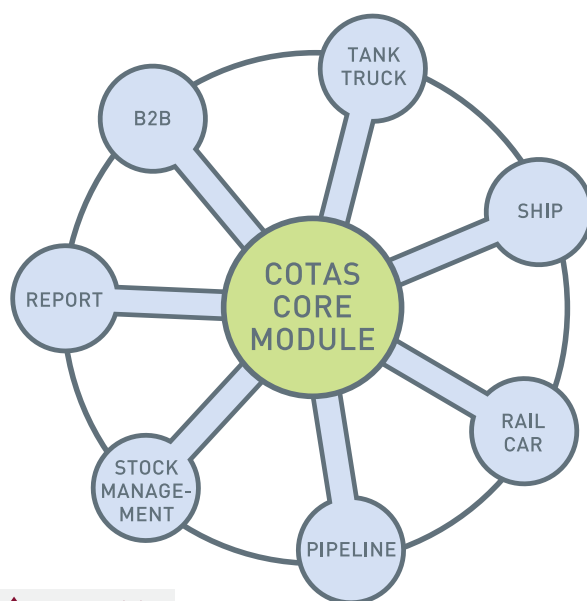
→ **MFX_4 Compact:** especially suitable for smaller systems in which a single housing is advantageous

COTAS: TRANSPARENCY IN THE TANK FARM

The software solution for greater flexibility

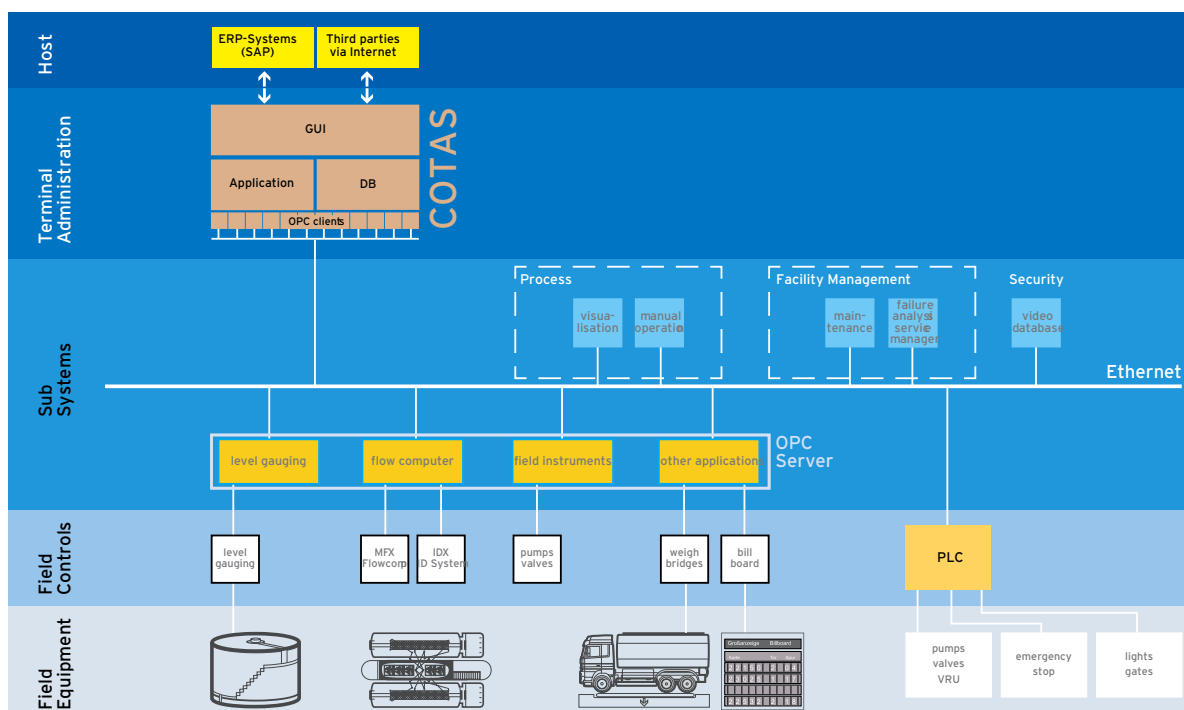
The terminal automation system **COTAS** is the complete solution for product transfer management and the controlling of all loading processes in the tank farm. The PC-based software coordinates the business processes, from storage and multi-client stock balancing to dispensing. **COTAS** is linked to all instrumentation in the field and controls the loading processes.

Thanks to its diverse and open interfaces, **COTAS** can integrate various measurement devices without difficulty and can itself be easily incorporated into higher-level ERP systems, such as SAP. Its highly flexible configuration means that **COTAS** can also be deployed rapidly in both small and large tank farms without any programming work.



↑ COTAS modules

- **Modularity:** a broad selection of COTAS modules to satisfy varying requirements and configurable to suit the specific needs of the customer
- **Integrated solution:** a comprehensive overall understanding of all automation steps thanks to M+F flow computer technology
- **Short implementation times:** as an industry-specific software solution with rapid adjustability to suit customer requirements
- **Database independent:** open interfaces
- **EMCS integration:** fully automated integration in the European EMCS system for the movement of excise goods under duty suspension



↑ OPC technology



M+F | Solutions

SKID SYSTEMS: AS INDIVIDUAL AS YOUR SITE

Intelligent units made to measure

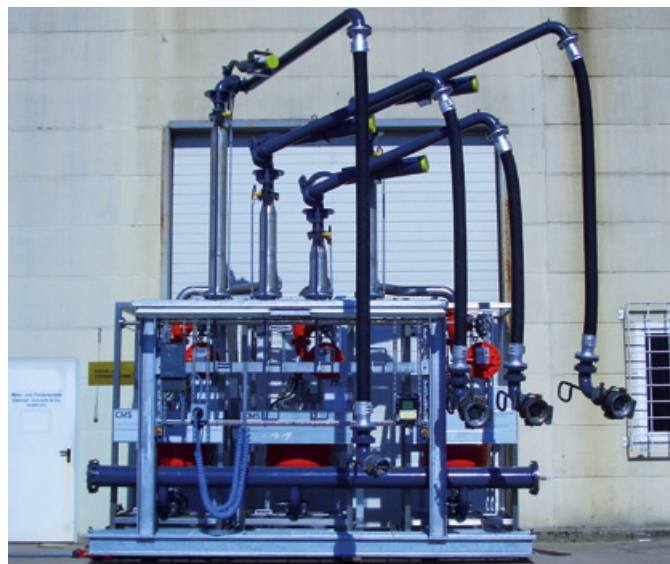
We provide you with a broad range of modular and scalable skids for the handling of oil products that are tailored to your respective needs. For example, compact metering skids (CMS) facilitate the custody transfer measurement of oil products. Furthermore, compact blending units (CBU) allow for the injection of additives and dyeing of the product stream.

Additionally, compact metering skids and blending units can be easily combined modularly to create complete multi-product loading stations. Our components of course meet all mandatory legal requirements, standards and guidelines, such as ATEX and MID.

- **Comprehensive support:** consulting, engineering and project realization from a single source
- **Broad product range:** modular, scalable and high-quality skids for the handling of oil products
- **Short installation times:** assembly and preliminary test at our factory under operating conditions
- **High level of flexibility:** greater transportability, easy combination and later expandability due to stable modular design



↑ CMS: compact metering skid



↑ MOBOTOP

LOADING TERMINALS: INTEGRATED EFFICIENCY

Handling systems for transports both land and water

TANK TRUCKS AND SHIPS

Regardless of the transportation means, we offer you all of the services that ensure the loading systems meet all requirements at the highest level - from the consulting stage to engineering and realization. The profitability of a tank farm heavily depends on the optimum functionality of the loading terminals. Our service range comprises individual components and skids as well as complete systems for the loading of tank trucks.



↑ Filling of tank trucks

Loading systems for the marine transportation of oil are subject to particularly stringent regulations concerning health, safety, environmental and water protection. Our integrated solutions guarantee maximum efficiency even under these requirements. You can also make use of tailored solutions for the growing market of ship- and land-based bunker stations with integrated blending functionality.

- **Profitability:** cost-efficient and secure handling of oil products
- **Integrated solution:** complete systems with highest accuracy in the recording and documentation of all product movements
- **Certification:** metrological approvals (MID, OIML, etc.)

RAIL CARS

Our rail car loading systems have been proving their superior quality for years, functioning successfully in day-to-day operation in harsh environments and under extreme climatic conditions around the world. In addition to serial

loading, we have also acquired a special reputation for the on-spot loading of rail cars. Our on-spot filling pipe technology facilitates high-speed loading processes using hydraulic telescopic loading arms.



↑ On-spot rail car loading

- **Minimum personnel requirements:** high level of automation
- **Short loading times:** volume flows of up to 20,000 tonnes per day for multi-track operations
- **High level of flexibility:** multi-product loading using only a single loading arm
- **High degree of emission and environmental protection:** optimal vapour recovery technology, TA Luft certification (German Clean Air Act)



M+F | Solutions

AVIATION: EXPERTISE AT THE AIRPORT

Top-quality fuel supply

For decades, **M+F Technologies** has been a leading provider of fuel supply systems at airports. As an innovative specialist, we incorporate our experience in pioneering concepts and develop, produce and implement all system components used for the handling of jet fuel at airports. We equip airfield refuelling vehicles with state-of-the-art technology for flow measurement, additivation, data communication and complete fleet management.

For the reliable monitoring of underground hydrant systems, we provide you with dynamic systems for identifying major leaks and static systems for the detection of the smallest leakages.

- **Comprehensive system know-how:** strict compliance with the international JIG Guidelines of the IATA
- **Everything from a single source:** from basic design to detailed engineering
- **Modularity:** highly available system components for needs-oriented fuel supply at airports
- **Environmental protection:** computer-based tight pipe check (TPC)



↑ Filtration skid



↑ Refueller loading skid

SECURITY AND RELIABILITY FROM A SINGLE SOURCE

On call for you at all times

Our control room offers round-the-clock monitoring and remote maintenance services for our own hardware and software products, even during ongoing operations. Additionally, our service engineers together with our authorised local service partners provide a comprehensive on-site service. We thereby ensure the high availability and operational reliability of your systems. You enjoy investment security and reliable support over the entire life cycle of our products. Even for older generations of our products we offer a reliable repair service thanks to our specialist workshop and our large inventory of spare parts.

Furthermore, we offer individual service deployments as well as comprehensive maintenance agreements in a variety of levels and characteristics. At our training centre, you receive practical hands-on and result oriented coaching for our products and systems. Your employees will be well acquainted with the technology and will be optimally prepared for their tasks even before the commissioning at your site.

↓ On-site service

- **Around the clock:** control room for continuous monitoring and remote maintenance services even during ongoing operations - highest availability thanks to rapid interventions and little downtime
- **Comprehensive:** on-site service from our own service engineers and authorised service partners
- **Investment security:** skilled repairs and reliable availability of spare parts over many years
- **Training centre:** intensive practical hands-on training using real systems





M+F | Components & Repair

BETTER ADVICE GUARANTEED

Comprehensive support across the entire process chain

We'd be delighted to advise you on components such as meters, valves, armatures, filter systems, gas separators and other pieces of mechanical equipment. One of our strengths is our high inventory level and the quick availability of components and replacement parts. Our specialists select the most suitable equipment for your specific application from a manufacturer-independent range in accordance with your individual requirements.

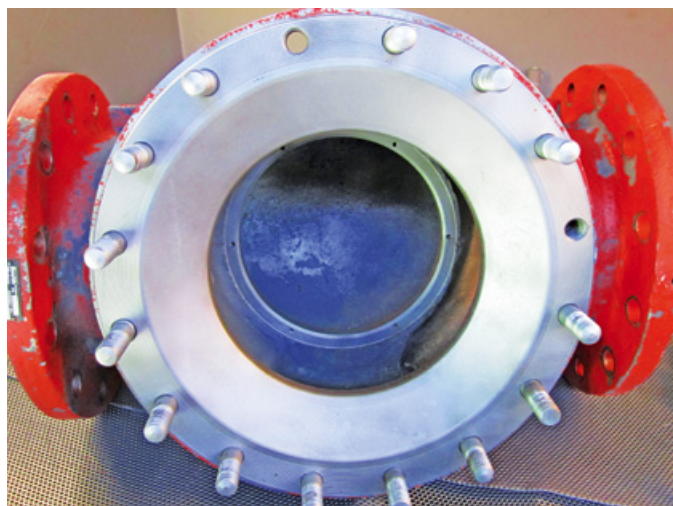
Should your system suffer electromechanical faults, our specialist staff will ensure that the issue is quickly rectified either at our specialist workshop or directly at your site. In addition to a rapid repair and recommissioning, precision and safety is our top priority. For the maintenance of meters, instruments, valves, loading arms and other electromechanical components, you can make use of our entire range of services, including repair, testing, calibration, modernisation and upgrade offerings.

- **In-depth advisory expertise:** best possible selection of components for your needs
- **Rapid recommissioning:** specialist workshop and on-site service for the repair of components
- **High inventory level:** quick availability of components and replacement parts

DETAILED REPAIR RESULTS



↑ Before



↑ After

EXAMINATION UNDER EXTREME OPERATING CONDITIONS

From testing to approval

Our PTB-approved calibration test bench allows for equipment inspections under a wide range of operating conditions. Furthermore, our fully automated, TÜV-approved pressure test bench checks complete systems or system components - including outside the mechanical clamping area. If required, approval can be granted in the presence

of a third party inspector. Even safety valves can be set, checked and approved. Our specialist staff can also perform acceptance tests, evaluations and re-stamping for metallic materials.

→ **Check:** testing of systems, system components and safety valves, including under extreme operating conditions

→ **Approval:** Office of Weights and Measures, MID, TÜV

TEST RIGS IN DETAIL

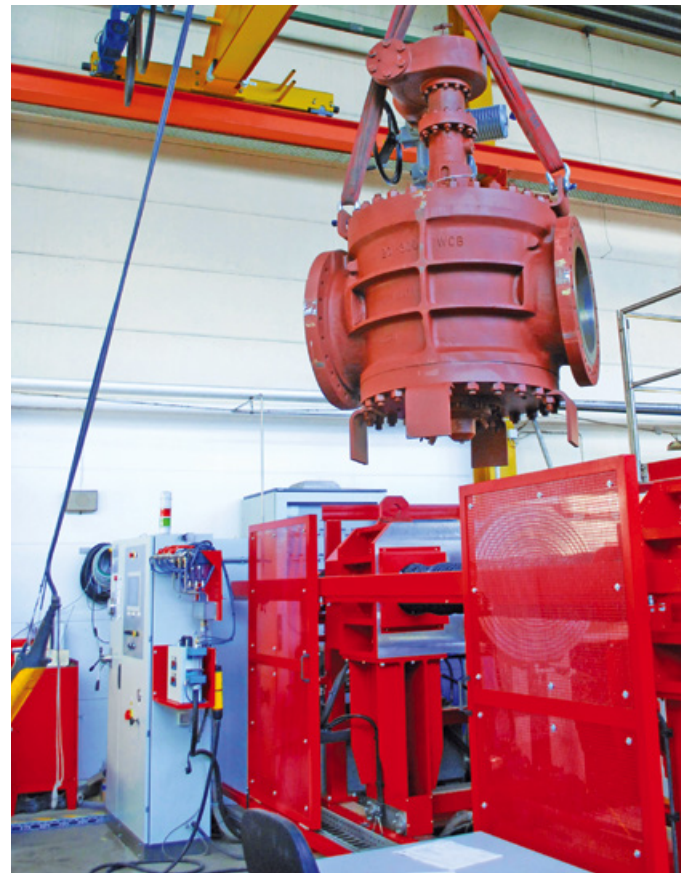
↓ Calibration test bench



→ **Own calibration test bench:**

PTB-approved; 1200 m³/h; gravimetric method; accuracy 0.02%;
test medium: heating oil / diesel

↓ Pressure test bench



→ **Own pressure test bench:** up to DN750/30" (larger on request);
pressure classes up to PN420/ANSI2500; tests in accordance with DIN
EN 12266, API6D, API598, ANSI etc.; detection of minor leaks by laser



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J.H.K.

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