MRS

Vehicle Electronics

Discover our new products

Your Vision. Our Technology.

We accompany you every step of the way – from the conception and development of a product to series production to after-sales service.

Contents

About MRS Electronic

For more than 20 years, MRS has been developing and producing innovative electronic products, customer-specific hardware, and software solutions at its main location in Rottweil, Germany. With numerous international locations, including the USA, MRS supports customers worldwide.

1971

Foundation of the Company with the name Dieter Barth Digitalelektronik

2006/2011/2019

Increasing the company buildings by an amout of 5500 m²

1999

Management-Buy-Out and renaming into MRS Electronic

Around 20 Employees

2019

20 years anniversary
of MRS Electronic

Over 250
employees in
Germany

Internationalization
of our businesses

since 2015

2022

Environmental & Quality Management

Modern production technologies, open communication and continuous optimization of all business processes reflect our active concept of quality management.

Integrated Management System & Compliance

Quality

Our quality standards are geared to the expectations and wishes of our customers. We don't want to just meet the requirements, we want to exceed them. Quality runs like a red thread through the whole company and every single employee takes responsibility for the quality of his or her daily work.

Environment

We care about the environment, this is why we operate in a sustainable and environmentally conscious manner. We reduce and avoid waste, the use of hazardous substances and work in a resource-saving way. Our ambition is not only to comply with legal obligations, but to expand and exceed them. Therefore, our environmental management system has been certified according to the international standard DIN EN ISO 14001 since 2012.
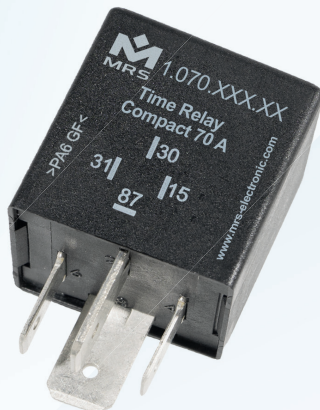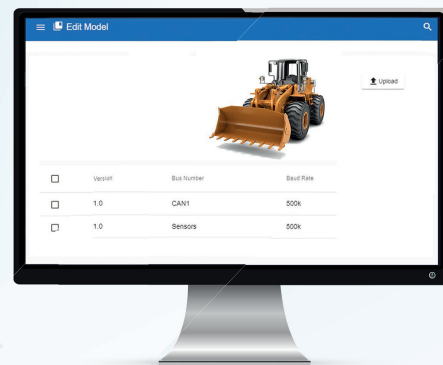
Product Portfolio

Controllers

Gateways

Relays

HMI-Systems

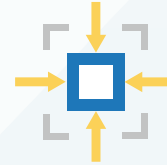
Connectivity

Software Tools

Controllers

Why MRS Controllers?

Flexibility of Inputs and Outputs

MRS controllers offer a high number of inputs and outputs. Thus, they are very flexible in use and can be connected to all common sensors, hydraulic valve types or DC motors on the market, among others.

High Functionality in the Smallest Installation Spaces

Our compact products are particularly space-saving and still offer high flexibility. One of the smallest programmable controllers in the world, for example, is the MicroPlex®.

Certifications Up to IP6K8

Our waterproof and robust products with protection classes up to IP6K8 provide control mechanisms and reliable functionality even in extreme environmental conditions.
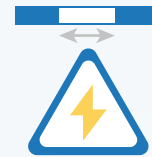
Wide Operating Voltage Range

MRS controllers allow a wide variance in operating voltage. We have options of voltages between 9 and 30 volts.

CAN I/O – CC16WP – latest Generation of CAN I/O

CAN I/O – CC16WP

The CC16WP is the best CAN I/O generation from MRS Electronic. The core piece, the 32-bit processor, provides you with more processing power and thus faster computing cycle times. You also benefit from more powerful gateway functionality and complex programming options for your applications. Due to the enormously high flexibility of the multifunction inputs, the CAN I/O is ideally equipped for a wide variety of cross-sector applications.

Connected Controllers

The networked controllers of MRS Electronic are used to extend existing CAN controllers but can also be used as stand-alone PLC controllers. Optionally, they can also be equipped with an RS485 or RS232 interface. Graphic programming is carried out with the CANgraph software tool, and the appropriate flash programming tool or programming with a C development system.

PLC-Controllers

Controllers (PLC) are digitally operating electronic systems, which in the simplest case work with four components (inputs, outputs, operating systems and interfaces). These four components can be used to control machines or systems, as the name implies. Programmable memory allows user-oriented control statements to be stored and executed via the inputs and outputs.

Motor Controllers

The motor controllers are microcontroller controlled modules for e.g. automotive applications. Free configurability and programmability allow the realization of various applications. They are very compact and can therefore be used in many ways.
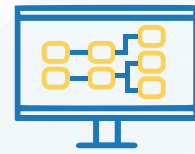
Gateways

Why MRS Gateways?

Flexible Communication Between Different Fieldbus Systems

With the help of the MRS gateways, existing systems can be supplemented and information can be translated from e.g. LIN, CAN or MODBUS as well as RS485 or RS232. The gateways offer high flexibility to convert messages accordingly.

Modification and Manipulation of Bus Messages

Our compact gateway modules are used to modify existing bus messages, e.g. to specifically change message mappings between two ECUs or to filter messages.

Graphical Programming

The MRS Gateway modules are very easy to program. Either with the help of the graphical software programming tool in MRS Developers Studio or directly via C code.

Optimal Use for Various Applications

Universal Gateway 5 x CAN

The Universal Gateway 5x CAN by MRS allows data exchange between CAN-Bus systems. The open and flexible design, tailored to automotive applications, allows a quick adaptation to customer-specific requirements even for small quantities.

Micro Gateway 32-bit

The new Micro Gateway is a compact gateway for automotive applications. The core piece, the 32-bit processor, provides you with higher performance and thus secure routing and gateway functionality at high bus loads.

HMI-Systems

An HMI-system serves as an interface between the operator and the process. Using an HMI-system, production processes can be coordinated and controlled. It reproduces production information in a simple representation so that the operator can react based on this information.

MConn is our new product group of connectivity products with a powerful 32-bit quad-core ARM Cortex-A9 processor with 2D, 3D and vector graphics hardware acceleration. The display can be programmed according to your requirements for Embedded Linux, Android, QNX or WEC7.

In addition to the hardware, we can also implement your user interface programming requirements - with our in-house Qt development team.

Optimal Use for Various Applications

MConn7 Main Features

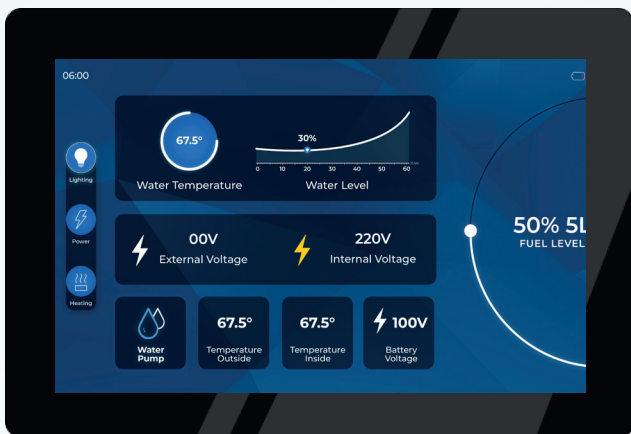▶ 7'' WVGA Touchscreen - 1024x600 resolution

▶ 1000 NITS brightness; contrast ratio 560:1

▶ 32-bit ARM Cortex A9 Quad-core processor

▶ Gigabit Ethernet, Audio/Video, 2 x USB, CAN/LIN

▶ GPS, WiFi, LTE/GSM, Bluetooth – optional

▶ IP54 / IP65 – optional
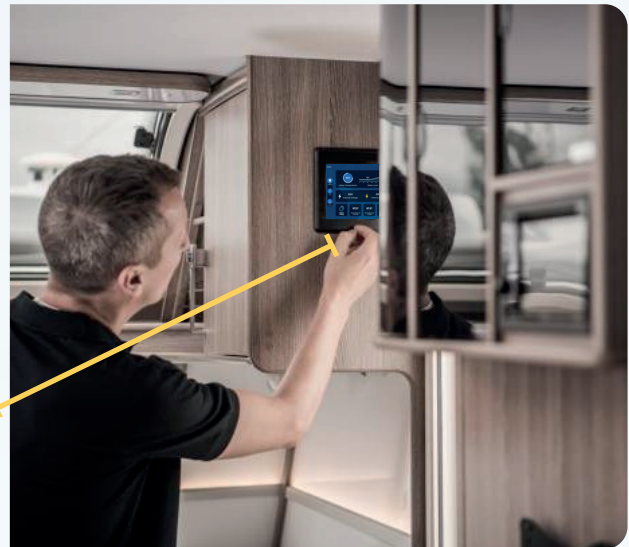
Control various systems - A/C, battery management, water heating, lights.

Check multiple values - fuel level, battery state-of-charge, water level.

Relays

The electromechanical relays from MRS are flexibly programmable and offer the possibility to control a circuit with high voltages and currents with a small circuit. This allows a relay to be used, for example, as a protective relay for machines and devices, and then to switch off immediately in the case of incorrect operating values. In addition, MRS relays are very well suited to control time-delayed circuits of any kind.

Solid State Relays

Electronic solid state relays are the counterpart to classic mechanical relays. They are electronic circuits made of semiconductor devices and other electronic elements.

Pulse Relays

Pulse relays are used when loads need to be turned on or off for a timed range.

Time Relays

Time relays are electronic relays which can switch on or off connected loads after the predefined time has elapsed.

Toggle Relays

With the toggle relay, a load can be switched with a button. If a positive/negative pulse is applied to terminal 15, the relay switches and goes into self-holding. With another impulse, it is brought back to rest.

Special Relays

Special relays are all relays that are not part of our standard program. By way of example we show some special relays which are equipped with different additional circuits, such as decoupling diode and / or freewheeling diode, can be ordered.

Voltage Monitors

Time relays are electronic relays which can switch on or off connected loads after the predefined time has elapsed.

Frequency Monitors

The frequency monitor measures the input signal frequency applied to terminal 15 and energizes/deenergizes the output when the signal frequency exceeds/drops below the defined threshold frequency.

Flashers

Pulse relays are used when loads need to be turned on or off for a timed range.

Standard Relays

The category of standard relays includes micro-relays, high-current relays, relays with special contacts, voltage transformers and standard relays. The relays are available in different sizes and in the 12 V and 24 V versions.
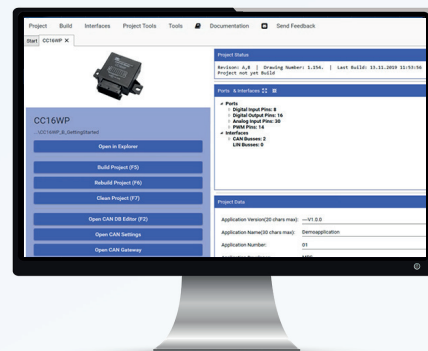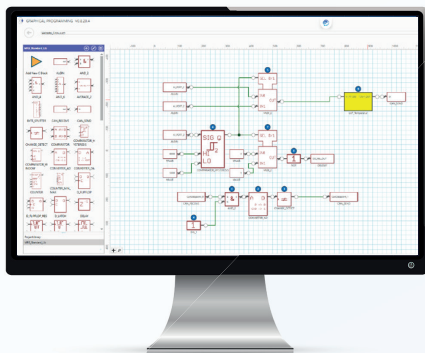
Programming Tools

With our practical programming tools, you can quickly and easily define the parameters and program the products purchased from us according to your wishes and needs.

MRS Applics Studio

The MRS Applics Studio is the new program tool for linked up controls of the new generation (32-bits) of MRS Electronic. All functions of the predecessor's studio MRS Developers were improved.

Now with the own developed graphic program surroundings and the improved program possibilities it is even easier to be programmed your application. You find the documentation online under: applics.dev

Applics Studio

Programming MRS CAN products of the 32-bit generation.

MRS Developers Studio

The MRS Developers Studio was developed for the programming of our CAN products. Programming is carried out graphically, or in the case of complex applications, in „C code" via the easy-to-use user interface. All CAN products have a CAN bootloader that is permanently active on the modules. A new program can be flashed at any time during operation via the bootloader.

The graphical programming is similar to the FUP (function diagram) according to IEC61131. For that reason, no extensive programming knowledge is required.

Developers Studio

Programm complex applications with easy-to use interface

14
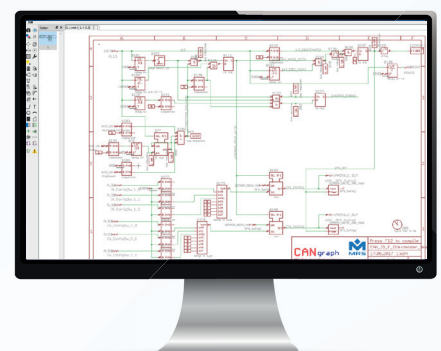
MRS Realizer

The MRS Realizer can be used to quickly and easily program the M1, M3, Micro PLC controllers and the proportional amplifier. The parameters are set via the relay contacts, which means that the housing does not have to be opened. Z-Graph allows you to create your own programs for your application. Graphical function blocks (similar to IEC61131) in Eagle are available for this purpose. For that reason, no extensive programming knowledge is required. A basic knowledge of digital technology is all that is needed to create programs with the MRS Realizer.

MRS Realizer

Programming
Relays and PLC Controllers

Cloud Connect

Our fully customizable Cloud Connect web application makes managing telematics data a breeze by allowing you to configure and monitor connected vehicle data on your custom dashboard in real time. Virtually any vehicle or machine can be connected to Cloud Connect by adding our telematics devices.

Start building your own IoT today with Cloud Connect - the world's most innovative and customizable telematics data management available.

IOT Platform
MRS Cloud Connect

Displaying, Managing, and Analyzing vehicle data
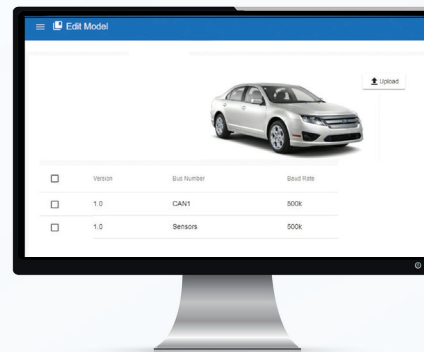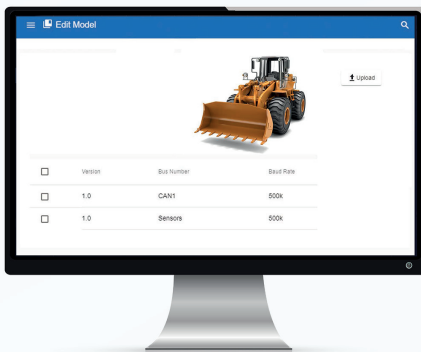
Engineering Services

Hardware and Software Solutions Developed Individually for you

In addition to our broad product portfolio, we also offer you the appropriate development services. Benefit from our competencies in the areas of: Individual development, hardware development and embedded software development.


Individual Development

In addition to innovative standard products for the automotive electronics industry, you also receive customized software and hardware solutions entirely according to your requirements. The development of customer-specific products covers the complete process, from prototype to large-scale production.

Hardware Development

We develop both standard and customized hardware for electronic products according to ISO standards. For various applications, whether simple or complex, we realize individual hardware designs and fulfill your requirements.
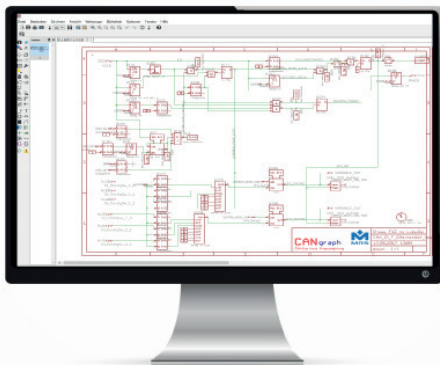

Embedded Software

Software development makes an elementary contribution to the development of almost all MRS products. We develop basic software, for example application software and auxiliary tools for our own products, as well as special solutions for your products. Our strengths lie particularly in application development with CAN and LIN bus interfaces.

Hardware Development

Individual Hardware Designs for your Applications

We develop both standard and customized hardware for electronic products according to ISO standards at our main site in Rottweil. From small and compact vehicle electronics modules such as controllers or relays to user-friendly wallboxes to large and extensive test systems for power semiconductors.

For a wide variety of applications, whether simple or complex, we have been realizing individual hardware designs for many years and meeting your requirements from prototyping to serial production.
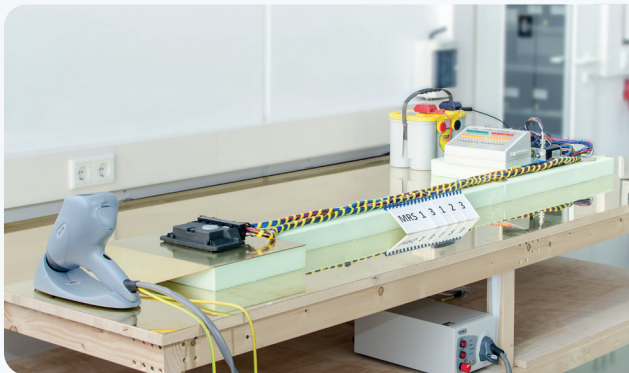
Testing and qualification
We accompany you from prototyping to serial production. Before the hardware goes into serial production, prototypes are created in our in our in-house production facilities and then EMC tests are carried out.

State-of-the-art Testing Equipment
Environmental tests are carried out in our own test laboratory using using e. g. climate chambers.

Functional Safety Designs
If required, our hardware development and component manufacturing is focusing on Functional Safety, i.e. functional or technical safety for motor vehicles in accordance with ISO standard 26262. In addition, our hardware has CE and/or ECE R10 approval.

Markets

Automotive

MRS has been certified with the IATF-16949 standard since 2017 and is therefore a qualified manufacturer of OEM products. By auditing our development and work processes, you can directly use parts of our product range without an incoming inspection procedure, thus saving time and money.

Commercial

The applications of commercial vehicles include public authorities in addition to commercial and agricultural applications. MRS offers you the right product variety to realize various functions, such as sensor-actuator communication by data evaluation and transmission.

Speciality

Special vehicles are used in many sectors due to the individual adaptation of your functionalities. The flexible use of our controllers and gateways enables you to use a wide variety of control and monitoring functions for complex conversions and additional equipment of all kinds.

Agriculture

Our solutions, specially developed for the agricultural sector, are perfect for monitoring and supporting the functionalities of your application in the field. The compact and reliable MRS modules offer you precise and robust control mechanisms.

Construction

Whether valve, windscreen wiper, hydraulic, axle or lighting control in construction vehicles and equipment – MRS offers you a broad portfolio of compact control systems, heavy-duty relays and gateways that are particularly suitable for use in case of extreme vibrations and difficult environmental conditions.

Maritime

Management and monitoring solutions are becoming increasingly important in the maritime sector. With the robust MRS Maritime solutions, various applications can be implemented, and thus existing boats, vessels or fleets can be retrofitted cost-effectively and optimized in a simple way.

Applications Hydraulic Control

Control electro-hydraulic movements of your vehicles, such as construction equipment, agricultural or municipal vehicles, using our compact and waterproof MRS modules.

Control of Various Types of Hydraulic Valves

Directional valves

Our MRS-solution is used to control directional valves for changing the direction of the hydraulic fluid. For example, you can enable cylinder extension and retraction or change the direction of rotation on a hydraulic motor.
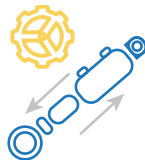
Pressure relief valves

Use the MRS-modules to dynamically set the required pressure of the hydraulic system, e.g., by means of a proportionally controlled pressure relief valve, and thus protect the hydraulic circuit from overloads.
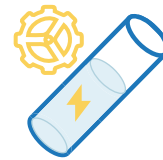
Flow control valves

You can also use the MRS-modules to control flow valves, i.e., to control the flow rate in order to adjust the speed of movement of cylinders and motors.

Applications for Mobile Machines

Agricultural vehicles
Control hydraulic functionalities of your attachments such as a round baler, a mower, a loader wagon and many more.

Construction machinery
Control a wide range of applications in your wheel loader or excavator with the help of MRS modules.

Municipal vehicles
Quickly and easily control the functions of various attachments, such as the mower, the casting arm or the front-mounted sweeper.

The Austrian family-owned company PÖTTINGER is a specialist for grassland, soil cultivation and seeding technology in the field of agricultural technology. With our hydraulic solutions, we facilitate functions in PÖTTINGER loader wagons and provide hydraulic control for mowers and round balers.

Round baler
Hydraulic control of the tailgate and the wrapping and tipping process.
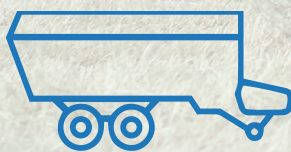
Loader wagon
Control of the hydraulic cutterbar swivel.

Cutterbar
Hydraulic control of mower units.

Lighting Control

Whether switching the lighting on and off, monitoring the load current, detecting a defective light source or after glowing the light source for a predefined period of time - MRS offers a complete product portfolio of controllers, connected controllers and relays for controlling light sources in vehicles and mobile machinery.

Control of Vehicle Lighting

Direct lighting control according to user input

With our modules, you can control the lighting of vehicle interiors (Ambiance/ Mood Lighting) or activate interval-switched applications such as turn signals or hazard lights. The controls and relays receive the driver´s information via device input, usually a switch, knob or operating display, and forward the commands on to the respective light sources.

Indirect lighting control after engine start

Our control systems enable you, among other things, to automatically activate the work environment lighting of construction machinery when the engine is turned on (daytime running lights) or to switch on the revolving lights of special vehicles such as sweepers or snow groomers without operator intervention. The modules activate the lights when a defined action such as engine activation occurs.

Monitoring, detection and warning of broken lights

Monitor the load current with our MRS-controllers. If this decreases or fails, this is detected by the controller and an indication or warning message is sent that this light is broken and has failed.

Motor Control

To control direct current (DC) motors in vehicles and mobile machines, we offer you the perfect solutions. The main applications include acceleration and braking processes of the motor or the variation of the direction of rotation. In addition, the motor current can be monitored and thus the motor can be switched off or reversed at a previously defined threshold. For this purpose, MRS offers various motor controls with different current consumptions.

Application Areas of Motor Controls

Control of lifting systems

Use our motor controller to control lifting systems in your special vehicles, such as the ambulance stretcher or the coffin lift function in a hearse.

Control of the temperature regulation of hydraulic oil coolers

With the motor controllers, you can control the automatic temperature regulation of electrically operated hydraulic oil coolers by increasing or decreasing the fan speed so that the oil temperature remains below a defined value.
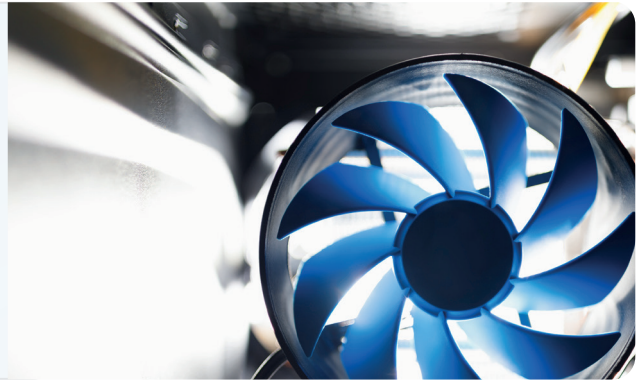
Realization of comfort functions

Control various comfort functions such as automatic seat adjustment of the backrest or footrest, electrically adjustable side mirrors, opening and closing of doors or trunk lids, or operating the blinds.

Sensor Processing

For the processing of sensor data we offer a complete product portfolio of controllers and gateways. In addition to reading and logging data, these can be converted and forwarded with controllers and gateways into a current, CAN- or LIN-bus message. In interaction with a controller, programmed actions are executed if required.

Processing of Various Sensor Data

Detection of objects
Use the MRS-products in the area of object detection and process the information from ultrasonic sensors, inductive and magnetic proximity switches, capacitive sensors or mechanical precision switches.

Monitoring of process values
Monitor the measured process values of your vehicle sensors such as temperature, pressure, level, or flow. Based on this, you can have required actions processed automatically, such as automatically adjusting the fan speed depending on the hydraulic oil temperature or switching off a feed pump when a predefined fill level is reached.

Angular position control
Let your vehicles use MRS-controllers to evaluate and process data from inclination sensors. In this way, log and control the angular position of mobile machines such as the alignment of an elevating work platform or the pallet fork of a telescopic loader.

Measuring forces and strains
Measure forces and strains on your mobile working machine and prevent operating errors or damage, such as cranes tipping over or drive train overloads.

Processing distance information
Process distance information from ultrasonic distance sensors, inductive distance sensors or radar sensors, e.g., in the area of ground distance control or during material-friendly opening and closing of hydraulic rear walls.

Evaluation of ambient data
Let the vehicle sensor evaluate and process the surrounding data. For example, the MRS-products receive information from the rain/light sensor about rain intensity or brightness and automatically control the windshield wiper or vehicle lighting depending on this.

Rosenbauer is the world's leading manufacturer of firefighting technology for fire protection and civil protection management, such as fire engines and firefighting equipment of all kinds. MRS facilitates various applications in the PANTHER, which is one of the most successful, efficient and variable airport fire fighting vehicles worldwide.

Extinguishing agent display

A message is sent to the MRS controller via a CAN message indicating what percentage of the tank is full. This message is converted and displayed in predefined bar units in the form of an LED display in the vehicle.

RLS evaluation

The rain/light sensor tells the vehicle whether it is currently raining and there is water on the windshield. The MRS control system evaluates this information and the PANTHER's windshield wiper is automatically activated in wet conditions.

Towbar Modules

We have already developed various modules that ensure the function of the trailer lighting as well as the retractable trailer coupling smoothly and safely. Our modules are freely programmable and reliable. Whether your system is analog or uses CAN-Bus, we have a module that supports both functions.

Control your Trailer Lighting and Trailer Hitch Functions

Analog Trailer Module

Controls your trailer lights and supports a variety of programming options.

CAN Trailer Module

Smart control of trailer lights via CAN-Bus with free programmability for individual functionalities.

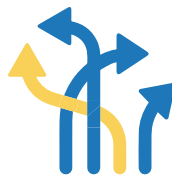### Retractable Trailer Hitch Control Module
Controls retractable towbar folding functions and ensures safe user experience.

Your Advantages of our Solution

Robust products "made in Germany"

Modern manufacturing technologies as well as international certifications for products and manufacturing - we create high-quality and long-lasting solutions.

Flexible Functionality

The space-saving robust products offer you high flexibility. They are easy to program and highly customizable for your requirements.

Full Safety Compliance

All our retractable trailer hitch modules are ISO 26262 compliant and are ASIL A or B rated, depending on the system. All modules are tested to ECE R10 and can therefore be used in on-road vehicles without further testing.

Emission Monitoring

Our diesel exhaust emissions monitoring system is a complete, stand-alone solution for diesel engine retrofit and compliance with emissions and environmental regulations. It is designed to monitor the diesel particle filter of your on/off-road vehicles and boats by continuously measuring, displaying and logging NOx levels, exhaust gas temperature, counter-pressure (DPF) and engine speed. If necessary, you can initiate appropriate countermeasures to reduce NOx gases and thus reduce CO_2 emissions.

Monitor your Emissions

Emission monitoring evaluates the emission values received from the sensors and compare them with preconfigured settings. If there is a deviation in these values, user intervention in the form of maintenance or service is required. The system alerts the user with a visual and acoustic alarm and stores the incident.

Application Areas of thr Emission Monitoring System

Maritime

With our emission monitoring solution, you can retrofit old diesel engines of boats and ships such as tourist boats, yachts, commercial ships or cargo ships. Emission levels become measurable and can be tracked, monitored and showed in a cloud web application.

Mining

In the mining sector, especially in underground mining, it is particularly important to monitor the air pollution generated by the various mining machines. Our MRS solution can be used in a wide variety of machines to monitor engine and DPF filter levels. Among others, our solution has already been used in underground mining in Australia since 2014.

Construction Industry

Our solution is also particularly well suited for retrofitting the legally required DPF monitoring in the construction machinery sector. Use our products in a wide variety of mobile work machines and record the exhaust gas values of your diesel engines.

E-Mobility

No matter which electric car you prefer our MCharger wallbox provides an easy charging experience.

From simple installation process, user friendly interface, IP54 protection class, to several user access solutions and online control options. Choose the MCharger model that fits your needs, add our smartly designed accessories and enjoy the advantages of e-mobility to the fullest!

Highlights

Charging Power up to 22 kW
One to three phase grid connection up to 32 A

Easy Installation
Only few screws needed, electricity cable input possible from three different directions

Color Display
Shows charging status, time, charging power, consumption and notifications

IP55 Protection
Protected from dust ingress and water spray

Protected Power Supply
Robust power pack with internal protection and filter device

Certified
CE, RoHS, WEEE, IEC

MCharger Easy

Simple but effective charger with Type 2 socket or 5 meters long cable with Type 2 plug. There are two available power options (11 kW and 22 kW) to choose from depending on your car or house grid capabilities.

MCharger Easy is designed for single household use. Just plug in and charge, no user management available for this model. All Easy models have a color display showing the charging status, time, power and consumption as well as notifications.

MCharger Connected

A smart charger with user authentication, RFID and load balancing if several chargers are connected in one line. Also allows to adapt the power to the electrical grid conditions. These models are up to 22 kW with Type 2 socket or 5 meters long cable and Type 2 plug. The owner can adjust max charging power in a web application if needed.

MCharger Connected provides user management with up to 128 user accounts with 2 RFID cards per user. You can see each user's charging patterns and get full overview of the charging history and export it as a PDF file.

RFID authentication
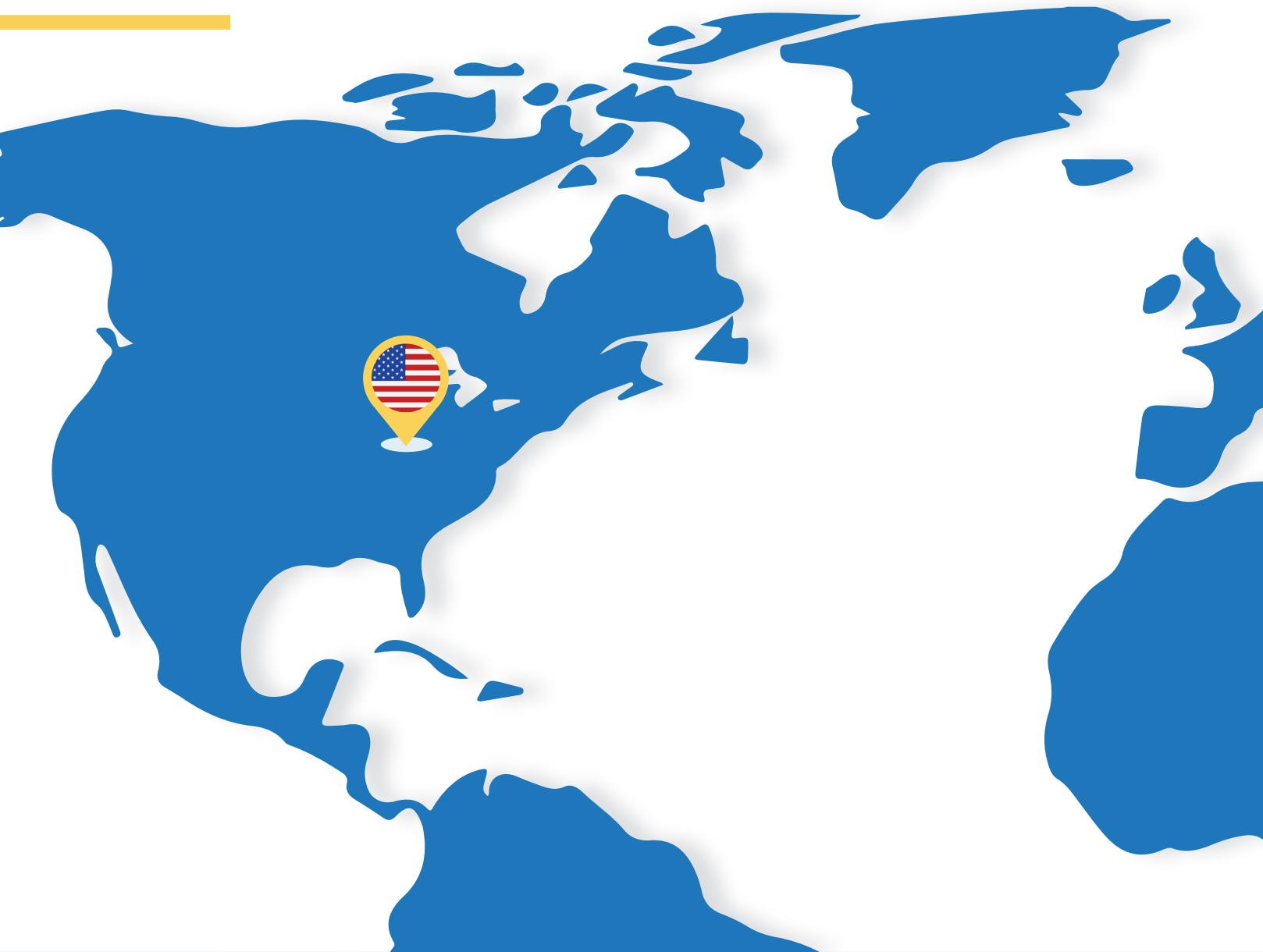
WiFi, LAN and Bluetooth connection

User management with charging history

Web application

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44000 Islamabad, Pakistan

Get more information now at mrs-electronic.com

About MRS

Your Vision. Our Technology.

For more than 20 years, MRS has been developing and producing innovative electronic products and customer-specific hardware and software solutions at its Headquarters in Rottweil in Germany. With 4 business areas and numerous international locations, MRS supplies customers worldwide.

With a young and committed team of over 350 employees worldwide, new ideas for innovative products are created every day and individual customer projects are implement. The majority of our teams focus on development topics.

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