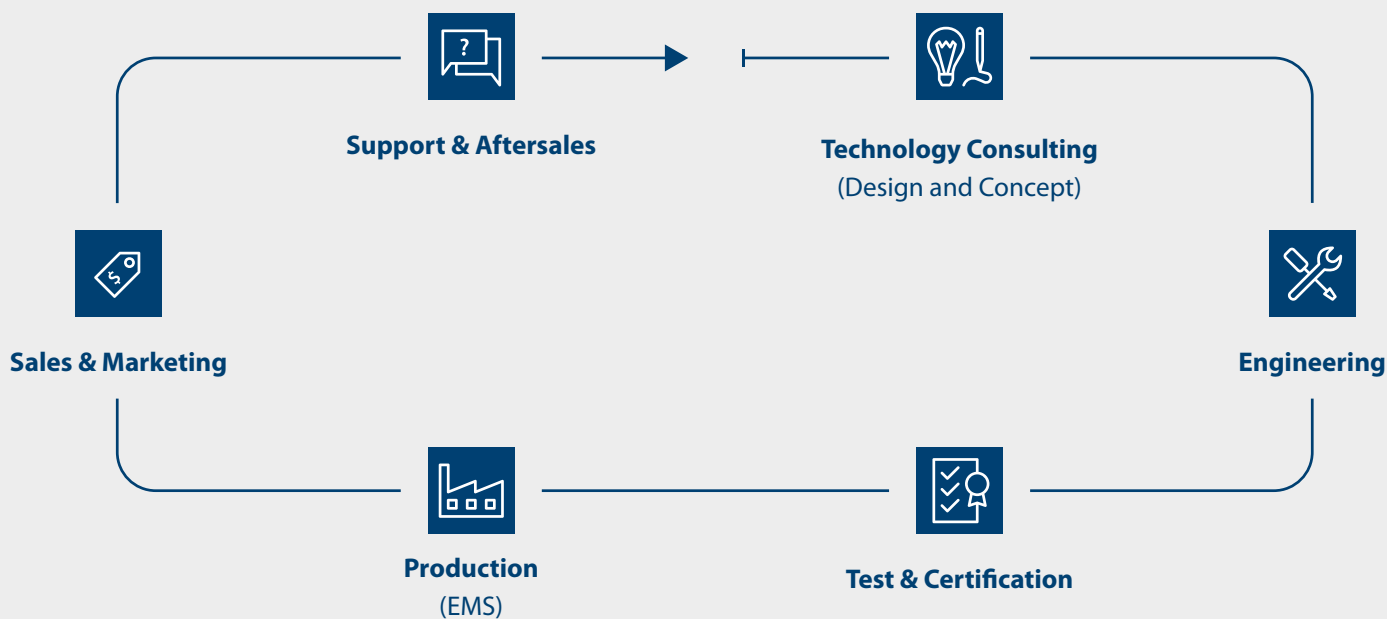


Product Catalog Automotive

Solutions for Automation, Diagnostics and Connectivity





Sontheim – your system supplier for innovative electronics

As a specialist for fieldbus-based communication, control and diagnostic tasks, we are at your side as a reliable partner with our in-depth system know-how. Our modular hardware and software solutions enable optimal networking, automation and analysis of your automotive and industrial systems.

We cover the entire product life cycle, from the design and development phase through production to integration and support. The range of services includes individual prototypes, series deliveries up to customized solutions and complete technology, on-site consulting and training.

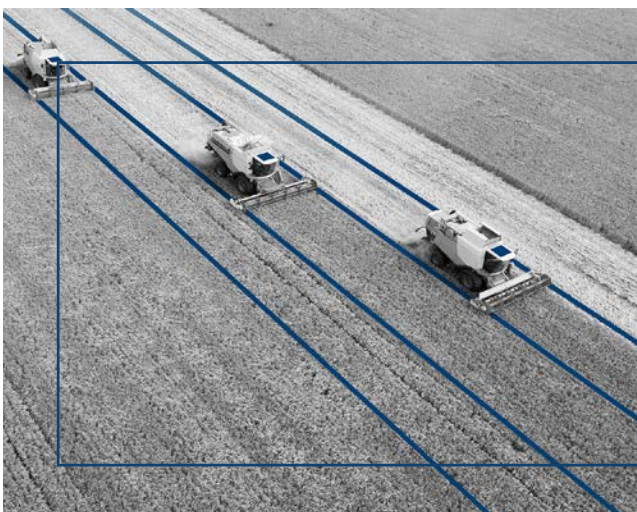
Our system solutions



Mobile Automation



Diagnostics



Connectivity

Our services

For 25 years, our customers worldwide have received a wide range of hardware and software components as well as automation and diagnostic technology services. Sontheim represents technically outstanding products, very close customer service and the combination of individual components to a complete solution that suits your needs. We offer both standardized and customer-specific products tailored to your individual requirements.

We apply our know-how in the area of fieldbus technology in various branches of the automation and automotive industry and thus cover a wide range of applications. Our focus is especially on CAN, EtherCAT, PROFIBUS and the protocols in the automotive sector. We support our customers worldwide, from the first idea and development phase to integration, support and beyond.



Technology Consulting – We bring your ideas to series

From the very beginning, we support you in your tasks and draw on our years of experience from many successfully implemented projects. Through our active participation in various standardization committees such as ASAM, CiA or the AEF, we have the most up-to-date knowledge of the latest standards and technologies. This expertise is always incorporated into our consulting services and guarantees state-of-the-art developments for our customers.

Engineering – As a system provider, we realize your ideas

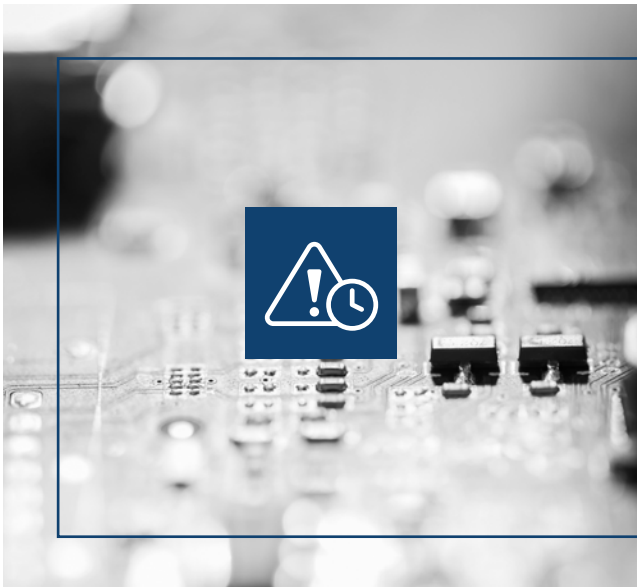
As an expert in various fieldbus technologies, we support you with customer-specific developments. This covers the areas of software, hardware, firmware as well as design and conception of your automation or automotive solution.

Current topics such as efficient energy management, the optimal use of resources or solutions for Industry 4.0, drive us to develop innovative products and integrate them into your system.



Custom electronic systems and components

On our modern production lines we manufacture electronic components and systems according to your ideas in best quality, on schedule and of course cost-optimized. We are characterized by our flexibility and can assemble and manufacture batch sizes from just one prototype to series orders of almost 1,250,000 units per year. Our certifications confirm our constant focus on quality.



Obsolescence Management

With the help of our obsolescence management, we check and monitor the entire life cycle of your product. Often, semiconductors in particular have a shorter life cycle than the entire product and thus the production capability of electronic components depends to a large extent on these components. Our customers receive all relevant information over the complete product life cycle in order to be able to react at an early stage.

Workshops and Trainings

Are you looking for suitable training on CAN, current diagnostic applications and standards such as ODX and OTX, or detailed workshops on our products and services? We would be happy to impart the necessary knowledge in a workshop at our premises or at your site. Here we design the training courses individually and adapted to your needs and convey the contents in an understandable and user-oriented way.





Automotive



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We offer solutions for automation, diagnostics and connectivity of mobile machines. Our systems are future-proof, robust, scalable and based on the latest international standards. In addition to control units, display solutions and sensors, our portfolio includes innovative telemetry systems with associated cloud infrastructure for smooth analysis and evaluation of your vehicle data. We offer a seamless interaction of automation solutions, telemetry and standard-compliant diagnostics.

For more than 25 years, we have been supplying OEMs in the field of diagnostics with an integrated portfolio for the development and execution of complex diagnostic applications. Sonthem covers a wide range of development, service and maintenance applications, such as flash tools, end-of-line (EoL) programming and diagnostic software development. We are distinguished above all by our in-depth expertise with mobile machinery in the agricultural, construction machinery and specialty vehicle sectors as well as commercial vehicles.

Mobile Automation

Controls, Displays and Sensors















eSys-SVCx Product Family

Powerful electronic control units for safety-related applications up to ASIL-C. A rugged construction facilitate an optimal use in mobile machines.

Key Features

-  **Scalable safety controllers up to ASIL-C (acc. to ISO 26262)**
-  **High performance 32-bit Dual-Core Microcontroller**
-  **4× CAN interface acc. to ISO 11898**
-  **1× LIN**
-  **Up to 74 IOs**
-  **AUTOSAR compliant**
-  **Robust aluminium housing with automotive connectors**
-  **Certificated acc. to ECE R10 (eSys-SVC3 xt)**

eSys-SVCx product family

The Safety ECU family consists of two different high-end safety modules with different configuration options. The wide range of applications offers numerous possibilities for use in mobile machines such as trucks and trailers, as well as construction, agricultural and special-purpose machines.

Interfaces and safety-certified up to ASIL-C

A powerful 32-bit dual-core microcontroller with 160 MHz, up to four CAN, one LIN interface and 74 IOs (including PWM current control) can be used for applications up to Automotive Safety Integrity Level C (ASIL-C). The risk classification is defined by the ISO standard 26262 for safety-relevant electrical/electronic systems in motor vehicles. The electronics are protected by a robust die-cast aluminium housing and robust automotive connectors facilitate the connection to the control unit.

AUTOSAR-compliant software

The safety controllers are available with various software packages. Starting with QM (quality management) based software up to ASIL-C and AUTOSAR compliant software, you can choose which software architecture is required for your application. This flexibility allows you to use it for

a wide range of applications and safety requirements. It always provides the customer with the optimum Safety-ECU – optimized for the individual application and the best possible cost-benefit ratio.

The AUTOSAR standard

AUTOSAR is an open and standardized software architecture for automotive ECUs (without infotainment). The architecture scales to different vehicle and platform variants, takes into account system availability and system safety requirements, and supports software transferability, sustainable use of natural resources, and ease of maintenance throughout the entire product life cycle.

Among other things you benefit from:

- Reduction of the number of ECUs in the vehicle by flexible assignment of ECU data with multiple functions
- Easier integration into the vehicle through a defined architecture
- Reusability of functions through fixed standards for important system functions and interfaces
- Easy scalability and expandability. This makes a functional development for smaller quantities interesting
- Function development possible, independent of the existing topology in specific vehicles

Technical Data

CPU	eSys-SVC3 xt	eSys-SVC4 xt
CPU	32-Bit microcontroller dual-core, 160 MHz	
RAM	128 KB internal	
Memory	1 MB internal	

Interfaces & Inputs/Outputs	eSys-SVC3 xt	eSys-SVC4 xt
CAN	3x CAN interface accord. to ISO 11898 & CAN 2.0 B	4x CAN interface accord. to ISO 11898 & CAN 2.0 B
LIN	1x (optional)	1x
Analog inputs, Pulldown 0–5 V and 0–32 V	9x (6x SAFE); 0–5 V and 0–32 V	20x (14x SAFE); 0–5 V and 0–32 V
Digital inputs or RPM inputs	2x (1x SAFE)	16x (1x SAFE)
Pulse inputs	2x	6x
PWM/HSS/LSS outputs	5x PWM (5x SAFE) current range 0 to 2.0 A 4x HSS current range 0 to 2.0 A 2x LSS current range 0 to 1.0 A	15x PWM current range 0 to 2.0 A 10x HSS current range 0 to 2.0 A 4x LSS current range 0 to 1.0 A
Fixed voltage output	2x 5 V, stabilized supply voltage, short-circuit proof	
Sensor voltage output	1x 12.7 V (optional)	1x 12.7 V
3D acceleration sensor	1x (optional)	1x

Housing	eSys-SVC3 xt	eSys-SVC4 xt
Plug	154-pin connector	
Housing	IP68 (opt. IP6K9K), die-cast aluminium	
Dimensions	approx. 170 mm × 214 mm × 34 mm	approx. 229 mm × 228 mm × 34 mm
Operating temperature	–40 °C up to +85 °C housing temperature	
Storage temperature	–40 °C up to +90 °C housing temperature	

Supply Voltage	eSys-SVC3 xt	eSys-SVC4 xt
Supply voltage	8–32 V (12 V or 24 V Board Version)	
Power consumption	Quiescent current approx. ca. 2.9 mA at 28.5 V, total current up to 41 A	Quiescent current approx. ca. 3 mA at 28.5 V, total current up to 80 A



CAN Display

Robust display for mobile machines, commercial vehicles and engine applications. Visualization, monitoring and control of all commands and status information via CAN.

Key Features



High resolution terminal



5" TFT 16:9 display



5 LED illuminated buttons



1× CAN interface acc. to ISO 11898



Linux operating system



Ready for MDT® 2.0 applications

The display has a 5 inch TFT 16:9 display and convinces with a high resolution and with 800–1000 cd/m² a extremely good readability, even in poor lighting conditions. Via CAN according to ISO 11898 and with J1939 protocol support, status information such as alarm messages can be displayed or a specific diagnostic evaluation can be made. The operation is simple and clearly arranged by means of five illuminated buttons

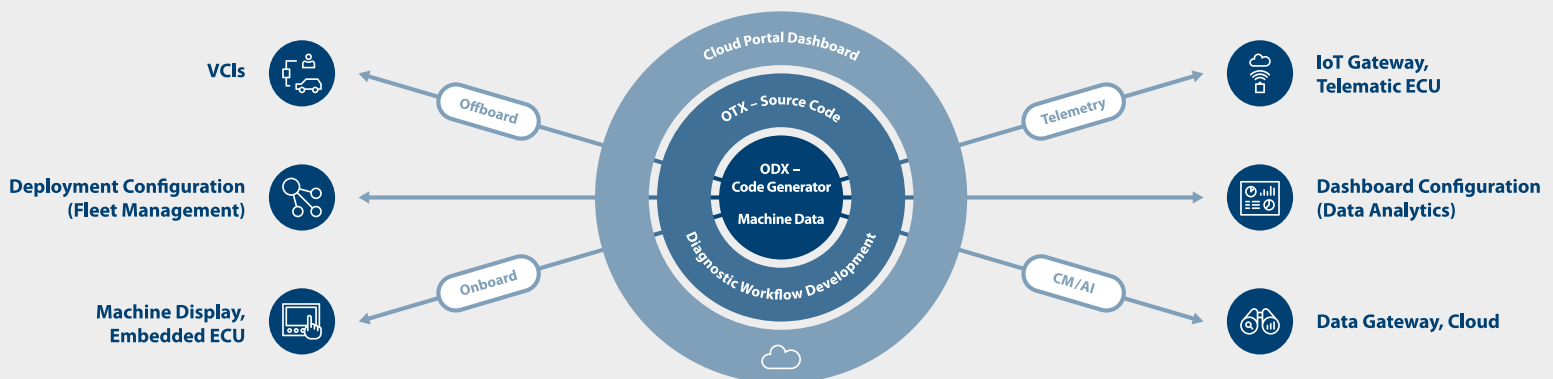
Own customer applications can be implemented using the MDT® 2.0 authoring system. This allows an individual design and unique graphical user interfaces, while adhering to the common diagnostic standards ODX acc. to ISO 22901-1 and OTX acc. to ISO 13209. Thus, the manufacturer is not only able to design his user interfaces and processes on the display, but at the same time to set up the display as an analysis instrument in consideration of diagnostic standards. Embedded diagnostics of your systems is thus possible.

Technical Data

	CAN Display	CAN Display xt
CPU	Freescale i.MX6 dual core	
RAM	512 MB DDR2	
Memory	4 GB eMMC	
Display	5" TFT 16:9, 16 million colors, antiglare	
Resolution	800×480 WVGA, 24-bit color	
Backlighting	1000 cd/m ² (50.000 h lifetime)	
CAN	1x CAN acc. to ISO 11898 Standard, 50 Kbit/s up to 1000 Kbit/s (250 Kbit/s default value)	1x CAN acc. to ISO 11898 Standard, 50 Kbit/s up to 1000 Kbit/s (250 Kbit/s default value) 1x galv. isolated CAN acc. to ISO 11898 Standard, 50 Kbit/s up to 1000 Kbit/s (250 Kbit/s default value)
Bluetooth	–	optional
Further protocols	J1939, proprietary protocols	
Buzzer	integrated 75 dBA	
IOs	1x DO 500 mA (LSS)	1x DO 500 mA (LSS), 1x DI, 2x AI
Buttons	5x, static illuminated	
Operating system	Linux	
IP Classification	IP65	
Housing	Plastic Housing PC-ABS	
Dimensions (l×w×h)	108 mm × 139 mm × 45 mm	
Weight	app. 220 g	
Operating temperature	–30 °C up to +70 °C	
Storage temperature	–40 °C up to +85 °C	
Input voltage	6 V up to 32 V DC	



End-to-end diagnostic system solutions



Order information








V966370400	CAN Display 5"
V966370410	CAN Display 5" xt



Ultrasonic Wind Sensor

With CAN interface and J1939 protocol support

Key Features

-  **1x CAN acc. to ISO11898**
-  **J1939 Protocol-Support**
-  **IP69K Protection class**
-  **Windspeed from 0–50 meter/s**
-  **360° wind direction**
-  **Measurement of temperature and humidity**
-  **No moving parts**

The ultrasonic wind sensor convinces by an extremely compact and robust construction. The sensor has no moving parts and therefore no mechanical wear. All environmental data are measured and provided by ultrasonic technology. The data can be transmitted easily and quickly via a CAN interface and J1939 protocol support.

The sensor convinces with extremely fast data handling and can acquire up to 50 measurements per second. Wind speeds of 0–50 meters per second can be recorded. Further measurement data are wind direction, temperature and humidity. To prevent the sensor from freezing in sub-zero temperatures, the device also has an integrated heating system.

Technical Data

CAN	1x CAN acc. to ISO 11898 standard
Further protocols	J1939
IP classification	IP69K
Wind directions	0–360°
Wind speed	0–50 m/s
Wind temperature	–40°C up to +70°C
Humidity	20 % – 80 %, temporarily 0 % – 100 %
Air pressure	300 hPa – 1200 hPa
Heating	Yes
Dimensions	100 mm × 133 mm × 71 mm



Quality

We live electronics – and also quality. That's why we set ourselves the goal of implementing it in every area. We create customer satisfaction through a holistic quality culture for the company, processes, products and services. We want to create real added value for our customers and maintain and build long-term relationships. The basic prerequisite for this is consistently high quality – based on standards and certifications.





Position sensor

2-axis CAN sensor for measuring tilt acceleration

Key Features

CAN

1x CAN interface acc. to ISO 11898

J1939

J1939 protocol support



Robust plastic housing acc. to IP67/IP69K



12 V DC power supply

CAN sensor for the measurement of inclination accelerations with two axes. Communication is via CAN according to ISO 11898, J1939, CANopen or also via RAW CAN.

A robust plastic housing to IP67/IP69K provides the necessary protection for the electronics.

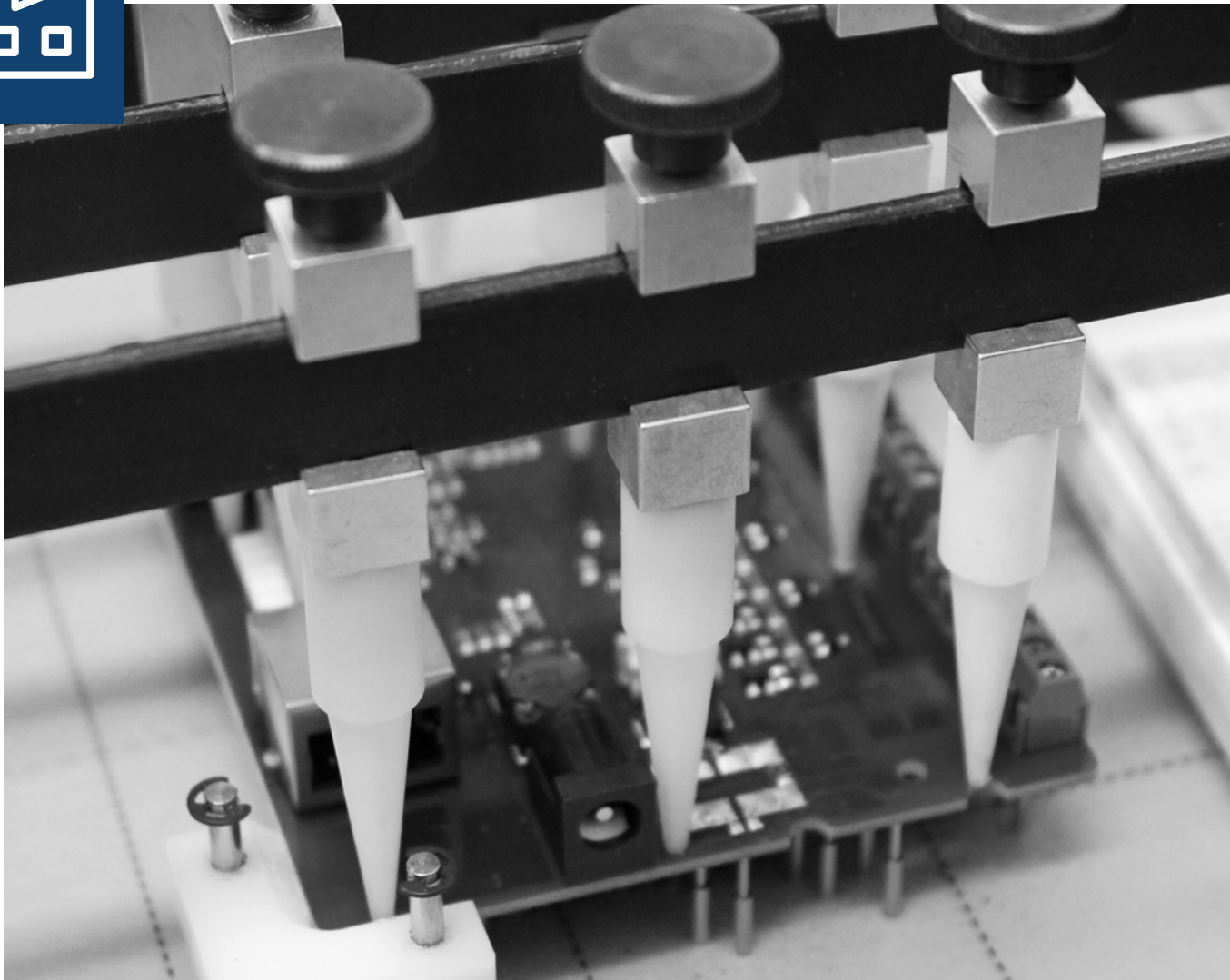
Technical Data

CAN	1x CAN interface acc. to ISO 11898
Further Protocols	J1939
IP Classification	IP67 or IP69K
Acceleration	±3.5 g
Air pressure	up to 115 kPa
Temperature	-20°C up to +85°C



Production

The Sontheim company has been producing the broad portfolio in-house since its foundation and thus has full control over quality and production processes. We cover the entire product life cycle, including the design and development phase, production, and integration and support. This contributes to very close customer support and enables fast and agile responses. The range of services includes individual prototypes, series deliveries and customized solutions.



Diagnostics

Software, VCIs, Protocol Stacks





Sontheim

Sontheim

COMfalcon plus
Communication Interface Generation 2










4-Line COM On Off



MDT® 2.0

The Modular Diagnostics Tool 2.0 offers you next to ODX and OTX standard also a MCD-3D server, simple and modern operation in Visual Studio® and multi-platform compatibility with only one workflow creation

Key Features

-  **ODX acc. to ISO 22901-1**
-  **OTX acc. to ISO 13209**
-  **Multi platform support**
-  **High-performance runtime system**
-  **MCD-3D Server**
-  **ODX and OTX Editor**
-  **Supported standards: CANopen, SAE J2534, SAE J1939, ISO 15765 (KWP2000 on CAN), UDS, DoIP, ...**
-  **RMI native**
-  **Direct Microsoft Project integration**

Future proven diagnostic tool chain – based on standards

The new MDT® 2.0 offers a standardized way to access diagnostic data. The MDT® 2.0 tools offer various possibilities to create, structure and run diagnostic workflows using the industry standard OTX (Open Test sequence Exchange format) defined in ISO 13209. Re-use of your diagnostic service descriptions in ODX (Open Diagnostic Data Exchange) for service execution allows you to instantly achieve your desired results. On top of that MDT® 2.0 supports native RMI as well as an innovative OTX wizard (Sontheim OTX diagnostic wizard) to simplify OTX editing without breaking the ISO standard.

Multi-platform support – one workflow for all applications

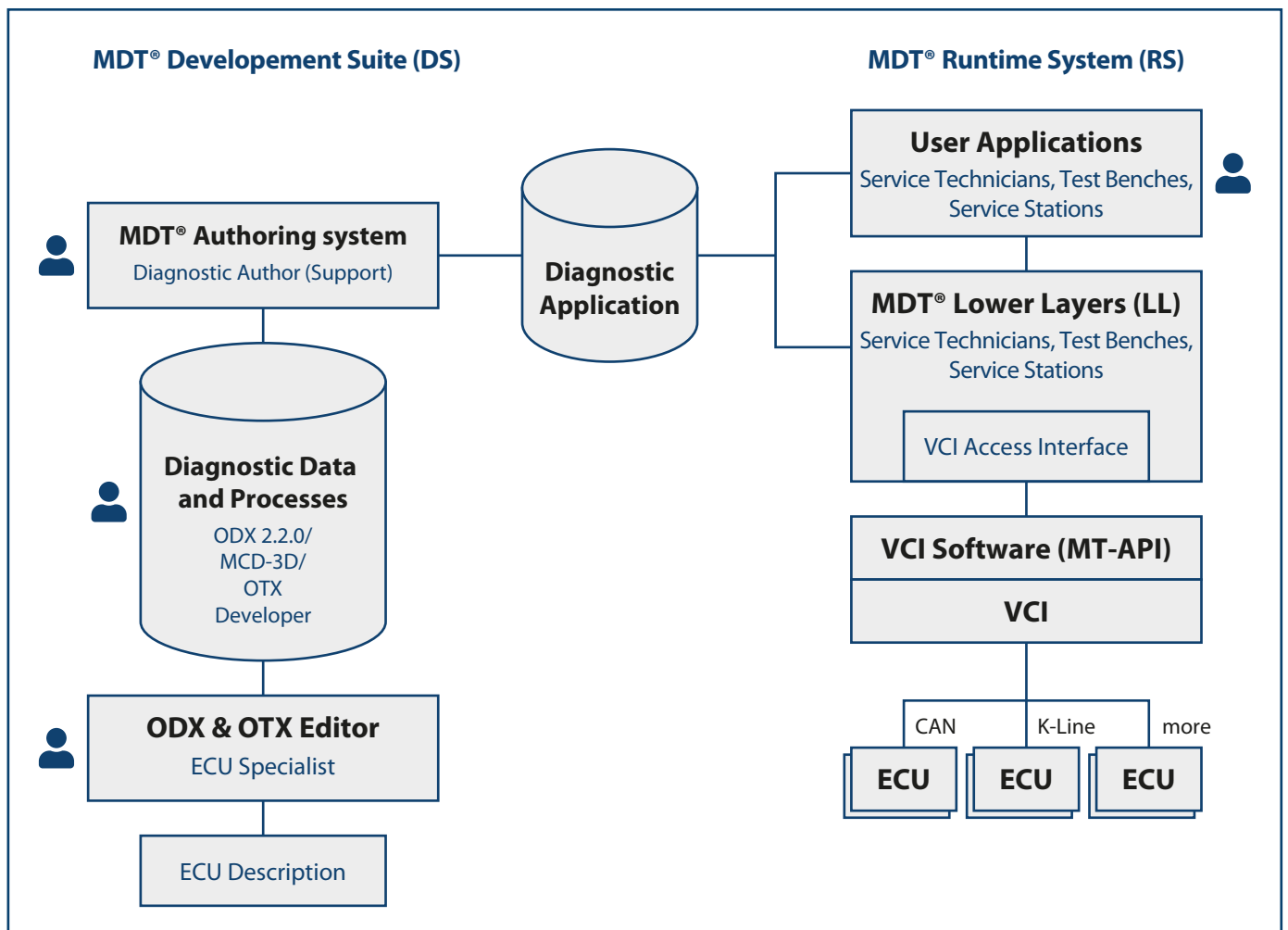
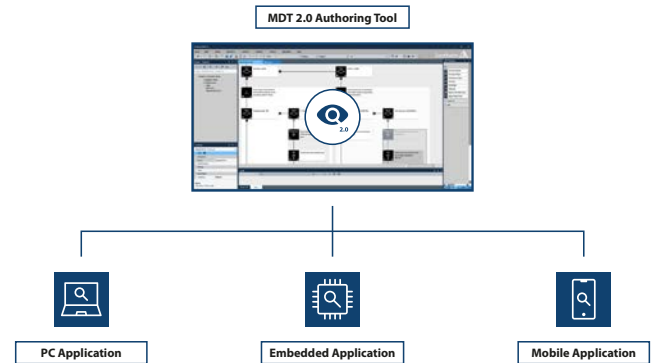
The Runtime was developed especially for multi-platform capabilities and offers GUI support as well as a platform-independent description of the runtime workflow language generated from your OTX and ODX files. This reduces implementation and testing effort for your diagnostic applications across multiple PC and embedded platforms. MDT® 2.0 allows you to develop your application once and have it running on Windows, Linux x86, Linux ARM, QNX and others.

The optimized runtime and the MCD-3D light server have been developed and optimized especially for embedded diagnostic applications. Thanks to the extremely slim runtime system, the diagnostic application can run directly embedded in the vehicle (for example on the terminal or a telemetry unit), which offers the user of the diagnostic application completely new diagnostic options.

Modern design and graphical modules

The MDT® 2.0 Authoring Tool is based on Visual Studio in order to fulfill the needs of modern developers. A new, clear and modern design allows usage of Visual Studio Plug-Ins for SVN, Git and other development extensions

commonly used. In addition, new graphic elements like 2D and 3D animations can be used to make your diagnostic application more visually appealing and lower the learning curve for your service staff and diagnostic application users.



Order information

V940800300	MDT® 2.0 Authoring system
C940800300	MDT® 2.0 Authoring system maintenance



MDT[®] Service Cloud

The MDT[®] Service Cloud enables a comfortable monitoring and maintenance of diagnostic data. Updates of the diagnostic application can be downloaded and installed via update tool worldwide. Moreover data can also be exchanged and analyzed specifically out of the diagnostic application.

Key Features



Easy data exchange of your diagnostic application (Up- and Downloads)



Administration of session logs, vehicle file information, HEX files, reports, etc.



Server hosting included



High data security through HTTPS logging and SSL/TLS encryption



Direct connection to an ERP system

Fast data exchange and update tool

The MDT[®] Service Cloud enables an interactive data exchange of your diagnostic application at any time and from any location. It was implemented for an easier and more effective diagnostic analysis in the Modular Diagnostic Tool (MDT[®]). An update tool enables updates of the diagnostic application which can be downloaded and installed. In addition, out of the diagnostic application itself, data can specifically be up- or downloaded. Thus, for example, session logs, vehicle record information, reports, HEX files, etc. can be loaded or saved in the cloud. The transmitted data formats and contents are freely definable.

Automated interface for ERP system

The MDT[®] Service Cloud is a prefabricated system and can be linked directly with the internal ERP system of your company and be adapted and integrated to the requirements of the customer. Thus the required maintenance is significantly reduced and all data exchange and updates can be managed directly from the ERP system. This relieves the administrative burden and allows, among other things a centralized license management and automated processes. Furthermore, the administration of the diagnostic information can also be done manually using an FTP server.

Server hosting for local and in-house infrastructure

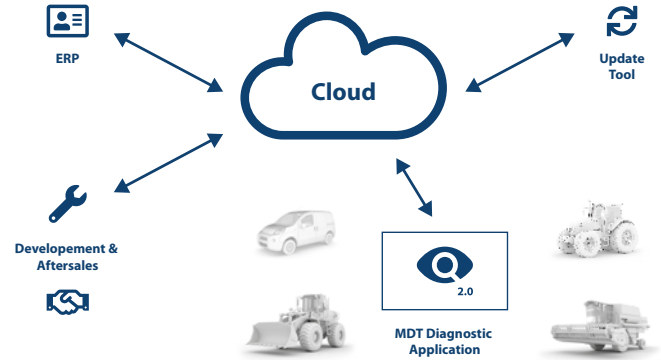
Sontheim offers a server hosting, thus there is no additional effort for the user of MDT® Service Cloud. This infrastructure can also be used locally or internally to exchange and manage for example data of test rigs or end of line programming.

High data security through HTTPS and SSL/TLS encryption

The safe way to the Internet can lead only through a secured and authenticated connection. Therefore HTTPS logging and encrypted data transfer using a SSL/TLS certificate are used for the MDT® Service Cloud. Using the digital certificate the reliability of the server and the con-

nection is ensured. In addition to the encryption also an authentication (user and password) of the client excludes an access by third parties.

Schematic overview of the MDT® Service Cloud



MDT® toolchain overview



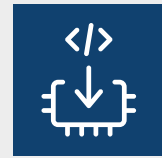
MDT® Authoring System SIE Setup Tool
MDT® Service Cloud



CLC Manager
ODX-Editor



CANexplorer 4



Flash-Tools
End-of-Line (EOL)



Protocol stacks



ECU flash- and
bootloader



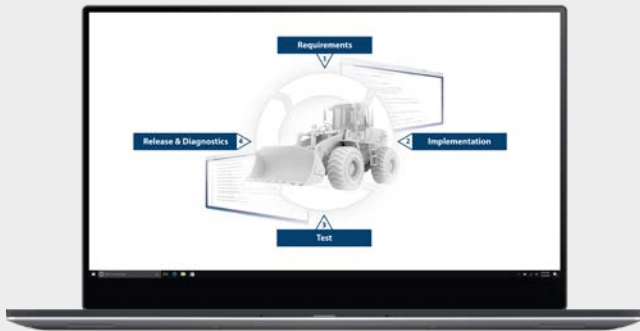
Multithread API



VCIs/CAN Interfaces

Order information

V940810010	MDT® Cloud SIE Server
V940810020	MDT® Cloud Customer Server
V940810030	MDT® Cloud License



Communication Lifecycle Manager 2.0

Key Features



Web-based tool



Management of all fieldbus-based data from specification to release



Development, mapping and maintenance of the communication interfaces of ECUs



Description of the entire data flow between ECUs and in the ECU itself



Simple linking with the Sontheim MDT®



ODX 2.2.0 Support

The Communication Lifecycle Manager 2.0

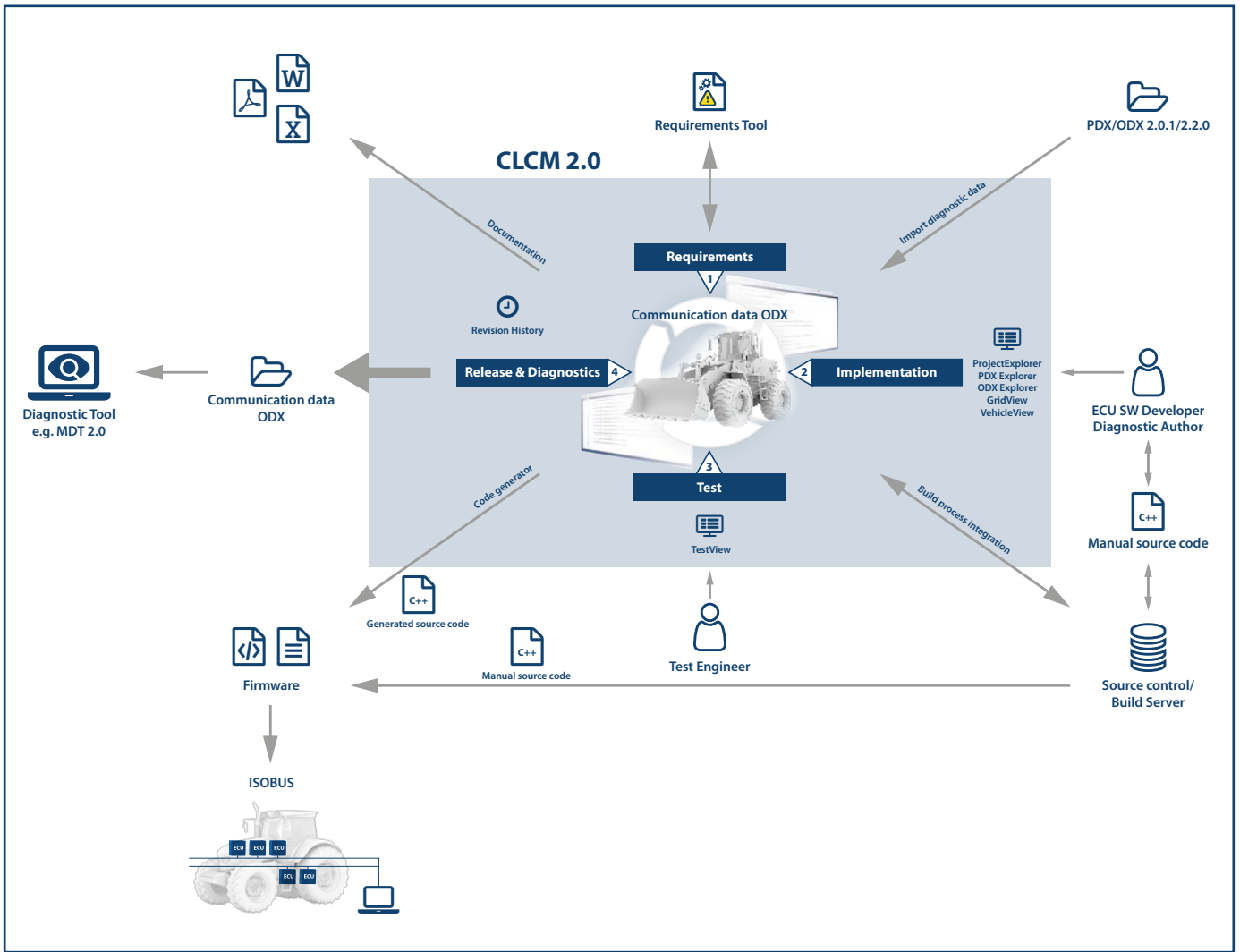
The CLCM 2.0 of the Sontheim Industrie Elektronik GmbH is a centralized system for managing and authoring the diagnostic and communication description of ECUs and complete vehicles. It is a client-server-based web application that allows several users to work collaboratively on the same project. There is no client installation necessary and the server can be accessed from different platforms via browser.

The CLCM 2.0 can be integrated in the existing infrastructure and development workflow. It is intended to accompany the whole development process of ECUs or vehicle:

All advantages at a glance:

- Beginning with a high-level overall vehicle structure during the requirements phase
- More refined specification of the ECUs during implementation phase
- Validation of the described network during testing phase
- Provision of generated source code, documentation and diagnostic description after the release

System Overview

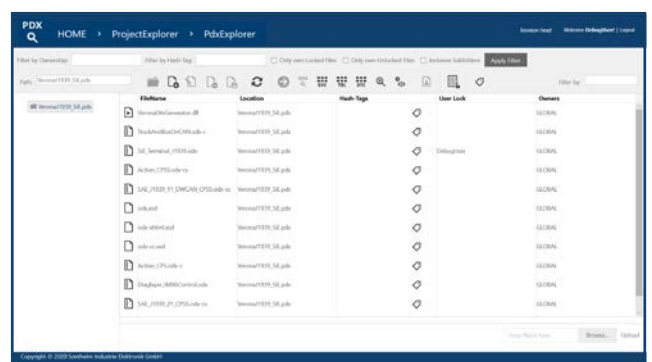
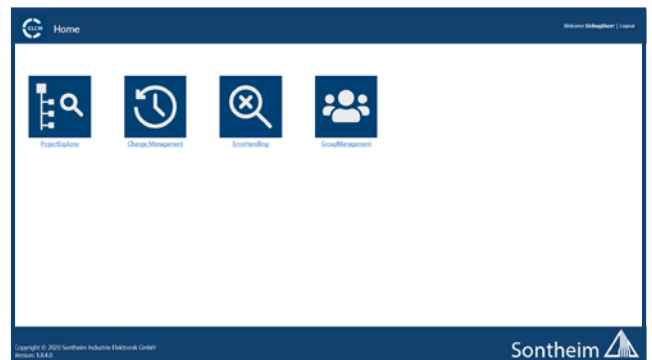


Diagnostic and communication description

The diagnostic interface of the ECUs is defined in ODX 2.2.0 format. In addition, a description of the communication between ECUs within the vehicle network can be added. The described diagnostic data serve as the base data for source code and documentation generation.

The data is stored in a database server that allows management of large diagnostic projects. Existing legacy data or vendor supplied data can be imported. The database keeps a change history that allows to export and view previous (= older) states.

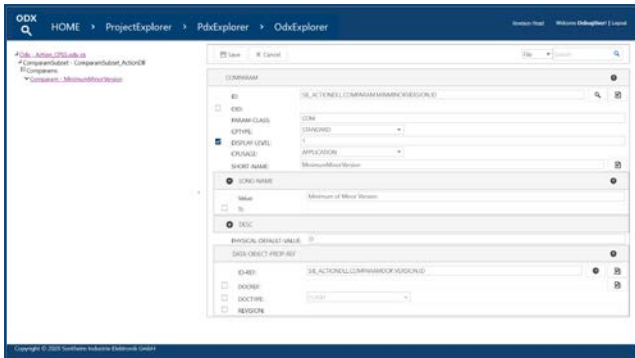
CLCM 2.0 is independent of the protocol and communication system which is used to describe the diagnostics and communication data. Thus, various technologies are supported, including: CAN, K-Line, Ethernet, EtherCAT, J1939, KWP2000onCAN, UDS, CANOpen, UDP, TCP/IP etc.



Editing Views

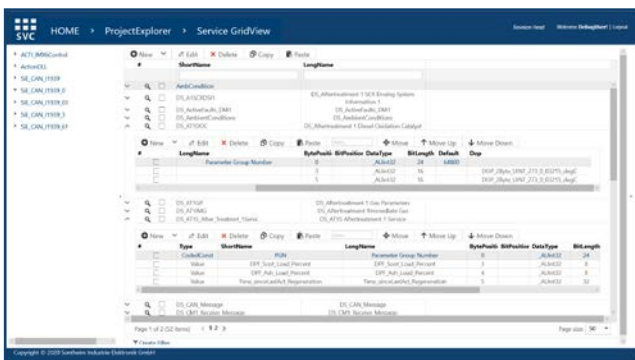
ODX Explorer

The CLCM 2.0 features an ODX Explorer that allows the navigation through the hierarchical structure of an ODX file and provides form-based editors for the elements. For example, this view allows users with advanced ODX knowledge to define the overall structure of an ODX file and also to make specific changes to certain elements. The view provides usability features like reference handling, search and copy&paste.



Grid View

The CLCM 2.0 features a Grid View that allows a generic and protocol specific representation of commonly used data structures, e.g.: DIAG-SERVICES, TABLES, DTCS and ENV-DATAS. For example, this view allows an ECU developer to define multiple diagnostic services that have the same fundamental structure and only have different identifiers and payload data. The underlying complex ODX structures are hidden and displayed in a simplified way to only show the relevant information necessary to accomplish this task. The Grid View has wide-scaled customization possibilities to incorporate company specific guidelines for the diagnostic description.



Vehicle View

The CLCM 2.0 features a Vehicle View for the high-level management of different vehicle types of a company. For each vehicle model the bus and the connected ECUs can be represented to give an overview of communication within the vehicle network. It allows the assignment of software packages and the released software version for the ECUs.



Test View

The CLCM 2.0 features a Test View that allows to verify the defined diagnostic services against the actual ECU or simulation. Services are configured and executed using MDT® 2.0. It is a D-PDU API based runtime system. The connection with the ECU is realized either with:

- A locally connected VCI via USB (e.g. SiE MT-API) or
- An ethernet based VCI via LAN/WLAN (e.g. using J2534)



COMfalcon® IoT

The new high-end VCI with Linux operating system and IoT functionality thanks to mobile data transmission.

Key Features

- CAN
4× independent CAN interfaces
- 4G
LTE/2G
- WLAN
WLAN interface
- LAN
LAN interface
- Bluetooth
Bluetooth optional
- BroadR-Reach
BroadR-Reach optional
- Data logging
Data logging, scripting, CAN
- GNSS
GNSS optional
- Bumper
Housing with integrated bumper
- IP44
Protection class IP44

The Vehicle Communication Interface – new standards in the service sector

COMfalcon® IoT combines the robustness of our proven interfaces with the latest interfaces and features. Thanks to modern LTE (2G fallback) communication, you can transmit data at any time and from anywhere. Remote diagnostics or even flash-over-the-air applications, such as on an integrated on-board telemetry are thus possible at any time, even in the handheld area. Other wireless interfaces include WLAN and Bluetooth 5.0 LE to establish a connection to a diagnostic device. In addition, the device also has a LAN interface and a BroadR-Reach interface for broadband data exchange. The VCI can be connected to a vehicle via four independent CAN (CAN FD ready) channels.

Housing and status indicators

The COMfalcon® IoT has a IP44 housing with bumper as well as extremely stable heavy-duty connectors. A software configurable trigger function for easy and individual data recording is also integrated. Thanks to its compact design and high shock resistance, COMfalcon® IoT can be used in various areas of the automotive industry. Two multicolor LED bars and an LED status display always visualize the current status/error code of the device.

Technical Data

CPU	32-bit microcontroller, Cortex-A9 (dual core)
RAM	512 MB DDR3
Memory	Up to 64 GB
CAN	4× galvanically isolated CAN interfaces acc. to ISO 11898 (CAN FD capable)
Baud rates	50 Kbit/s up to 5 Mbit/s
CAN Port	4× on 25-pol. D-Sub
BroadR-Reach	1× on 25-pol. D-Sub
LAN	M12 4-pin female connector 10/100 Mbit LAN
WLAN	1× acc. to IEEE 802.11b, g, n (internal antenna)
Bluetooth	1× optional 2.1+EDR, Power Class 1.5, BLE 4.0 and ANT
Mobile communications	LTE
LEDs	LAN status LED (green and yellow) WLAN/Bluetooth status LED (green and yellow) 4× CAN status LED (green and yellow)
Dimensions (l×w×h)	110 mm × 150 mm × 35 mm
Housing	Synthetic material, protection class IP44
Operating temperature	−40 °C up to +60 °C
Storage temperature	−40 °C up to +85 °C
Supply	via D-Sub 12 V – 24 V via round pole 12 V stabilised



Customized cable harnesses

In addition to standard cable sets, customer-specific cable sets can be provided at any time. A 25 pin connector allows the VCI to connect to a vehicle via the customized or standardized (OBD/ISO) interface.

Embedded diagnostics

Own embedded applications can be operated directly on the COMfalcon® IoT. This makes the connection to a third device (laptop or PC) obsolete. Information, such as flash routines or ECU descriptions, can thus be created and implemented on the VCI. This enables users to access the CAN or file system, for example. OTX workflows and ODX descriptions thus work out-of-the-box with the new COMfalcon® IoT. This allows applications to be rethought. Diagnostic applications can be implemented holistically on the VCI, with any LAN/WLAN-capable end device (WIN/MAC/Android) taking over the display. The embedded applications are portable and reusable for future Sontheim VCI generations.

Controller and operating system

A powerful dual core controller, 500 MB of RAM and the integrated Linux operating system ensure maximum performance and flexibility. Data up to 64 GB can be stored on the integrated memory.

Further functionalities

In addition, GNSS integration is available for the Vehicle Communication Interface. The current location is recorded and transmitted worldwide. In addition, the IoT Device Manager provides the appropriate cloud software. Whether updates-over-the-air or fleet management – the portal offers OEMs all the possibilities of a state-of-the-art analysis of all devices in the field.

Order information

V930232600

COMfalcon® IoT



COMfalcon®

COMfalcon® is a powerful VCI with WLAN/LAN interface and various equipment options. Use it for monitoring, flashing or analyzing CAN networks and handling layer-7 protocols like CANopen or SAE J1939. It is a very flexible and easy to use tool for the detection of CAN data and monitoring of entire networks.

Key Features

- CAN
4× independent CAN channels
- WLAN
WLAN interface
- ✓

RS
232

RS
422

RS
485
- K-Line
K-Line
- ☑
Protocol handling
- 📄
Optional with data logging, scripting, CAN voltage level oscilloscope functionality
- SD
Optional with integrated SD card
- IP
Compact housing with protection class IP65

Housing and status indicators

The device has a fairly rugged housing built of aluminium with IP65 protection. Thanks to the compact design and high shock resistance, COMfalcon® can be used for various automotive applications. Two 14-segment displays and nine LEDs are always showing the current status/error code of the device.

Interfaces

The COMfalcon® has four independent CAN channels and is based on the CAN interface CIN with a Freescale PowerPC architecture. WLAN/LAN (infrastructure mode) is used to connect to a diagnostic laptop/PC. In addition to the CAN interfaces a various of other interfaces such as RS232, RS422, RS485 or K-Line are available for diagnostic purposes.

Error frame detection

This feature allows surveillance and monitoring of a CAN network. The COMfalcon® possesses an own logic for detecting error frames and counting them up in a specific internal memory area. That is used for finding intermittent errors like falsified messages of a CAN participant.

Technical Data

CPU	Freescale PowerPC
RAM	64 MB
Memory	16 MB (for data logging optionally up to 128 MB)
CAN interface	4× CAN interface acc. to ISO 11898
Baud rates	50 Kbit/s up to 1 Mbit/s
CAN termination resistance measurement	Terminating resistor of the vehicle CAN network with active bus
CAN Port	2× 7-pole M16 port (like Sontheim CANUSB-2)
RS232 interface	D-Sub9 Plug A
Serial multiplex interface	D-Sub9 Plug A; 5 different serial interfaces, changeable via software
K-/L-Line interface	K-/L-Line (acc. to ISO 9141-2, ISO 14230-4), Baud rate up to 56 kBaud/s
RS485 interface	EIA/TIA-485 compatible Baud rate up to 10 Mbit/s no integrated termination resistor
RS422 interface	ANSI/TIA/EIA-422 compatible Baud rate up to 10 Mbit/s no integrated termination resistor
LAN	M12 4-pin female connector 100 Mbit/s LAN, D-codiert
WLAN	1× acc. to IEEE 802.11g, up to 54 Mbit/s
14-segment display	Boot information, K-line mode, RS-mode, measurement, error codes
LEDs	Power LED (green) LAN status LED (green and yellow) WLAN status LED (green and yellow) 4× CAN status LED (green and yellow) 2× RS status LED (green and yellow)
Dimensions (l×w×h)	110 mm × 150 mm × 35 mm
Housing	Aluminium, protection class IP65
Storage temperature	−40 °C up to +85 °C
Operating temperature	−20 °C up to +60 °C
Supply	a.) 6 up to 32 V DC with load-dump protection b.) via USB V = 5 V, IMAX < 500 mA (with Mini-B-USB connector)



ID-based level measurement – resistance measurement/current measurement

This feature allows to read the CAN level even IO-related and to measure active and passive termination resistors, for example for various diagnostics on a vehicle or a machine. This is especially important if the network may lose data caused for example by short circuits.

The Sontheim Modular Diagnostic Tool Chain

You can easily create your individual and professional diagnostic solution for automotive application with the help of the Sontheim interfaces and diagnostic software. Some use cases by linking hardware and software are:

- CAN data visualization, monitoring and processing
- Parameterization and control of whole CAN networks
- Vehicle diagnostics
- Flash processes of electronic control units (ECUs)

Pin assignment

RS1



1	VTRAC
2	GND
3	COM+
4	COM−
5	ISOK
6	ISOL
7	NC
8	RS422 RX+
9	RS422 RX−

CAN 1/2



1	CAN2 low
2	CAN2 high
3	NC
4	CAN1 low
5	CAN1 high
6	Ubat
7	CAN GND

RS2



1	NC
2	RS232 RX
3	RS232 TX
4	NC
5	GND
6	NC
7	NC
8	reserved
9	reserved

CAN 3/4



1	CAN4 low
2	CAN4 high
3	NC
4	CAN3 low
5	CAN3 high
6	Ubat
7	CAN GND

LAN



1	TX+
2	RX+
3	TX−
4	RX−

Order information

V930232000

COMfalcon®



COMfalcon® plus

COMfalcon® plus is a powerful VCI with WLAN/LAN and optional Bluetooth communication and various equipment options. Use it for monitoring, flashing or analyzing CAN networks and handling layer-7 protocols like CANopen or SAE J1939. Profit also from a Linux operating system and LUA scripting.

Key Features

- CAN
4x independent CAN channels
- WLAN
WLAN interface
- ✶
Bluetooth optional
- RS 232
RS232
- K-Line
K-Line
- ☑ =
Protocolhandling
- 0101
1010
0101
Optional with data logging, scripting, CAN voltage level Oscilloscope functionality
- SD
Optional with integrated SD card
- IP 65
Compact housing with protection class IP65

Interfaces

The COMfalcon® plus has four independent CAN channels and a Freescale PowerPC architecture. WLAN/LAN and optional Bluetooth is used to connect to a diagnostic device. In addition to the CAN interfaces a various of other interfaces such as RS232 or K-Line are available for diagnostic purposes.

Housing and status indicators

The device has a fairly rugged housing built of aluminium with IP65 protection and a easy to use trigger button for logging data. Thanks to the compact design and high shock resistance, the VCI can be used in various fields of the automotive industry. A double 14-segment display and nine LEDs are always showing the current status/error code of the device.

LUA Scripting

Own embedded applications are running directly on the COMfalcon® plus in LUA without the need of a third device. Several scripts can be run in parallel. Among other things, it's possible to create and implement own information, such as flash routines, ECU descriptions and more, and thus, for example, access to the CAN or file system. The embedded applications are portable and reusable for future Sontheim VCI generations.

Technical Data

CPU	Freescale PowerPC
RAM	64 MB
Memory	4 GB (up to 32 GB)
CAN interface	4× CAN interface acc. to ISO 11898
Baud rates	50 Kbit/s up to 1 Mbit/s
CAN termination resistance measurement	Terminating resistor of the vehicle CAN network with active bus
CAN Port	2× 7-pole M16 port (like Sontheim CANUSB)
RS232, K-/L-Line interface	M12 5-Pin female connector
LAN	M12 4-pin female connector 10/100 Mbit LAN
WLAN	1× acc. IEEE 802.11b,g,n,d,e,i up to 65 Mbit/s
Bluetooth (optional)	2.1+EDR, Power Class 1.5, BLE 4.0 and ANT
USB	Type mini-B
14-segment display	Boot information, K-line mode, RS-mode, measurement, error codes
LEDs	LAN status LED (green and yellow) WLAN/Bluetooth status LED (green and yellow) 4× CAN status LED (green and yellow) RS232, K-/L-Line status LED (green and yellow)
Dimensions (l×w×h)	110 mm × 150 mm × 35 mm
Housing	Aluminium, protection class IP65
Storage temperature	−40 °C up to +85 °C
Operating temperature	−40 °C up to +60 °C
Supply	via CAN 12 V – 24 V

Pin assignment

CAN 1/2



1	CAN2 low
2	CAN2 high
3	CAN GND
4	CAN1 low
5	CAN1 high
6	Vbat
7	oV

CAN 3/4



1	CAN4 low
2	CAN4 high
3	CAN GND
4	CAN3 low
5	CAN3 high
6	Vbat
7	oV

RS232 / K-/L-Line



1	RS232_RX
2	RS232_TX
3	K_Line
4	L_Line
5	GND

USB



1	VCC
2	USB_D−
3	USB_D+
4	USB_ID
5	GND

LAN (green)



1	ETH_TX+
2	ETH_RX+
3	ETH_TX−
4	ETH_RX−



Error frame detection

This feature allows surveillance and monitoring of a CAN network. The COMfalcon® possesses an own logic for detecting error frames and counting them up in a specific internal memory area. That is used for finding intermittent errors like falsified messages of a CAN participant.

ID-based level measurement – resistance measurement/current measurement

This feature allows to read the CAN level even IO-related and to measure active and passive termination resistors, for example for various diagnostics on a vehicle or a machine. This is especially important if the network may lose data caused for example by short circuits.

The Sontheim Modular Diagnostic Tool Chain

You can easily create your individual and professional diagnostic solution for automotive application with the help of the Sontheim interfaces and diagnostic software. Some use cases by linking hardware and software are:

- CAN data visualization, monitoring and processing
- Parameterization and control of whole CAN networks
- Vehicle diagnostics
- Flash processes of electronic control units (ECUs)

Order information

V930232400







COMfalcon® plus



OBDfox

Smart CAN-to-Bluetooth Gateway with OBD interface.

Key Features

-  **1× CAN interface acc. to ISO 11898**
-  **1× Bluetooth 4.1**
-  **1× 3D acceleration sensor (optional)**
-  **12 V or 24 V compatible**
-  **Extremely compact**
-  **IP20 protection class**

Smart CAN-to-Bluetooth gateway

The very compact OBDfox is equipped with a CAN interface according to ISO 11898-2. By means of an OBD connection, the VCI can easily be connected to a vehicle and the data can be sent via Bluetooth to a smartphone, tablet or mobile device (Android and IOs compatible). An optional 3D accelerometer enables notification in case of unauthorised use of the machine (anti-theft protection) or provides useful information for repair and maintenance work, for example after very hard vehicle vibration.

Technical Data

CPU	32-bit microcontroller, Cortex-M4/M0
Memory	2 MB SPI-Flash
CAN	1x CAN interface acc. ISO 11898-2 (2x CAN optional)
Bluetooth	4.1 + LE, BR/EDR
3D Acceleration sensor	1x, optional with $\pm 2g$, $\pm 4g$, $\pm 8g$
Status	2x LED
Dimensions (l×w×h)	61 mm × 45 mm × 22 mm
Operating temperature	0°C up to +60°C
Storage temperature	-20°C up to +85°C
Protection classification	IP20
Power supply	12 V or 24 V compatible



Integrated MT-API interface

The integrated API allows a fast and easy realization of OEM applications. The OEM can thus implement his own CAN plug and play functionalities for his vehicle efficiently and quickly. With OBDfox it is possible to check the connectivity on the CAN bus or to perform live monitoring of the machine data. In addition, the device provides a simple overview of relevant operating and service data and can execute simple diagnostic applications.

Your compact OBD to Bluetooth solution









With only 61 mm × 45 mm × 22 mm the OBDfox is very compact. You can easily plug it on every OBD interface, regardless of how much space you have (glovebox, armrest, center console, ...). The compact gateway fits in every pocket and is ready to use anytime.



ISOfox

Smart ISOBUS gateway with Bluetooth

Key Features

-  **1× CAN interface acc. to ISO 11898**
-  **1× ISOBUS acc. to ISO11898**
-  **1× Bluetooth 4.1**
-  **12 V or 24 V compatible**
-  **Extremely compact**
-  **IP20 protection class**
-  **Trigger Button**
-  **1× WLAN (optional)**

Smart ISOBUS Gateway

The very compact ISOfox is equipped with one ISOBUS interface according to ISO 11783 and one CAN interface according to ISO 11898-2. You can simply connect the device to the ISOBUS and the data is sent via Bluetooth or WLAN (optional) to a smartphone, tablet or mobile device. The VCI is compatible with any ISOBUS tractor or implement.

Technical Data

CPU	32-Bit Microcontroller, Cortex-M4/M0
RAM	32 MB SDRAM
Memory	4 GB up to 64 GB eMMC NAND Flash
CAN	1x acc. to ISO 11898-2
ISOBUS	1x acc. to ISO 11783
Bluetooth	1x 4.1 + LE, BR/EDR
WLAN (optional)	1x IEEE 802.11 b/g/n WPA/WPA2, WEP, TLS/SSL, HTTPs, TCP, UDP, DHCP, DNS
Status	3x LED, 14-segment display
Dimensions	74 mm × 40 mm × 40 mm
Operating temperature	0 °C up to +60 °C
Storage temperature	-20 °C up to +85 °C
Protection classification	IP20
Power Supply	12 V or 24 V compatible



Integrated MT-API interface

The integrated API of ISOfox allows a quick and easy realization of OEM applications. The OEM can thus implement his own ISOBUS plug and play functionalities for his vehicle efficiently and quickly. With ISOfox it is possible to check the connectivity on the ISOBUS or to perform live monitoring of the machine data. In addition, the device provides a simple overview of relevant operating and service data and can execute simple diagnostic applications.

Your compact ISOBUS gateway solution

With only 74 mm × 40 mm × 40 mm the ISOfox is as small as a standard ISOBUS connector. You can easily plug it on every ISOBUS interface, regardless of how much space you have (glovebox, armrest, center console, ...). The compact gateway fits in every pocket and is ready to use anytime.

Order information









V930351100	ISOfox
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CANfox®

The CANfox® is a VCI of the Sontheim fieldbus-to-USB adapter. Besides its CAN interface it contains a RS232 channel for a maximum of flexibility. The device can be used for monitoring of CAN networks, setting parameters of machines or vehicles etc.

Key Features

-  **1× galv. isolated CAN interface acc. to ISO 11898**
-  **1× RS232**
-  **Connection via USB 2.0**
-  **Free configuration of baud rate including 800 Kbit/s**
-  **Powerful 32-bit microcontroller**
-  **CODESYS Gateway-driver available**
-  **Multi-Thread API for own applications**
-  **Driver for Windows 2000 up to Windows 10 with 32- and 64-bit**

Housing and interfaces

It is housed in a compact plastic case and offers one RS232 and one galvanic isolated CAN interface. This is implemented via a D-Sub9 connector according to CiA standard. Its USB 2.0 interface enables the CANfox® to be used at any laptop, embedded PC or desktop PC. Once you have installed the driver you will benefit from hot plug and play, which is a connection of device to PC without restart. Consequently, CANfox® offers all necessary interfaces located in a tiny case for mobile or stationary use.

More performance, less costs

It is a powerful device within the Sontheim interface group with its 32-bit microcontroller for data-handling. However, the CANfox® is meant to be a flexible and very inexpensive tool. Thus, you can configure the baudrate via software and adapt it to your processes.

Technical Data

CPU	32-bit Microcontroller
CAN	1x CAN interface acc. to ISO 11898, via D-Sub9
RS232	1x RS232 interface, via D-Sub9
USB	1x Standard USB Typ A, 75 cm cable length
Baud rates	50 Kbit/s up to 1 Mbit/s, free configuration
Max. Data transfer	1 Mbit/s at 90% Bus load
LEDs	3x 3 mm LED
Housing	compact plastic
Operating temperature	-20 °C up to +60 °C
Storage temperature	-40 °C up to +85 °C
Rel. Humidity	20% – 90% non-condensing
Power supply	via USB interface
CANAPI (=Windows DLL)	Windows 2000, XP, Vista, 7, 8; 32-bit. Windows 98 on request

Pin assignment

USB



1	VCC (VBUS)
2	- Data
3	+ Data
4	GND

CAN



2	CAN low
3	CAN Ground
7	CAN high

RS232



2	TXD
3	RXD
5	GND

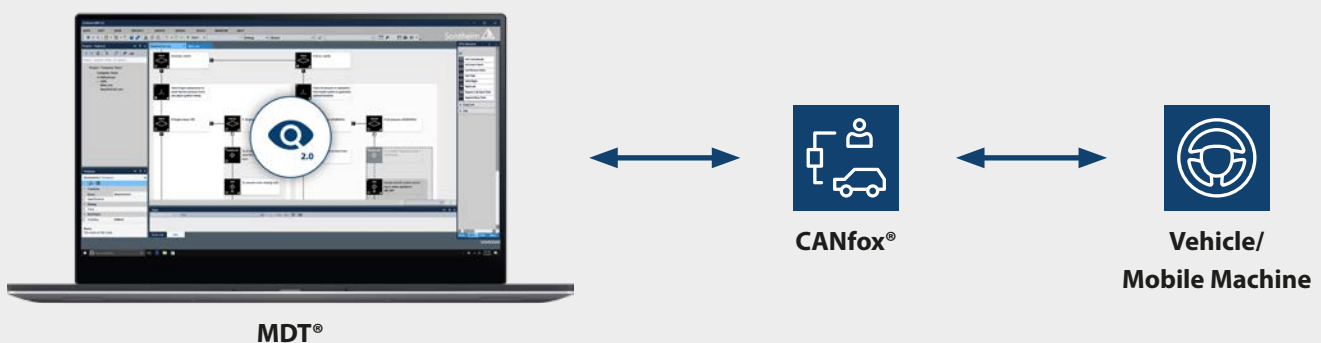
Comprehensive software support

Of course, CANfox® is supported by all Sontheim tools like CANexplorer 4 for CAN bus diagnostics or MDT® for vehicle applications like diagnostics or End-of-Line processes. With the help of the included software interface (API), users can also run their own software. There is also a CODESYS support implemented in order to use the device for PLC and motion control tasks. Use it as a programming gateway for CODESYS-based PLCs or for downloading programs directly out of a CODESYS programming environment.

The Sontheim Modular Diagnostic Tool Chain

You can easily create your individual and professional diagnostic solution for automotive application with the help of the Sontheim interfaces and diagnostic software. Some use cases by linking hardware and software are:

- CAN data visualization, monitoring and processing
- Parameterization and control of whole CAN networks
- Vehicle diagnostics
- Flash processes of electronic control units (ECUs)



Order information

V930322000

CANfox®



CANUSB

This is a top seller among the Sontheim VCI family. It facilitates a quick and sturdy connection between PC or notebook and CAN bus. CANUSB is highly flexible, user-friendly and market-proven. Thousands of units are already in the field, used for monitoring of CAN networks, setting parameters of machines or vehicles etc.

Key Features



Shock-resistant aluminium extrusion housing



1 or 2 galv. isolated CAN channels with 1 Mbit/s transfer capacity at 90 % bus load



Hot plug and play ensures fast and convenient commissioning



MT-API

MT-API enables access to CAN bus for own applications



Optional variant with error frame detection



Ideal for use with a PC or notebook

Housing

The device has a fairly rugged housing built of aluminium. Its compact design and resistivity against shock make it very popular in many areas of the automation and automotive industry.

CAN channels

There are either one or two galvanically isolated CAN channels available which comply with ISO 11898-2. The transfer rate ranges up to 1 Mbit/s at 90 % bus load.

Flexible data processing

Its USB 2.0 interface enables the CANUSB to be used at any laptop, embedded PC or desktop PC. Once you have installed the driver you will benefit from hot plug and play, which is a connection of device to PC without restart.

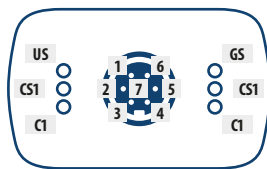
CPU and firmware update

The Motorola STAR12 and the Philips PDIUSB12 guarantee a quick data processing. Both CAN 2.0 A and CAN 2.0 B are supported. CANUSB is suited for numerous operating systems like Windows XP, XP embedded, Vista and 7. All firmware updates can be loaded via USB.

Technical Data

CPU CAN	Motorola Star12, 16-bit
CPU USB	Philips PDIUSB12
CAN	1x CAN interface acc. to ISO 11898-2, galv. isolated (optional 2x CAN)
USB	1x USB 2.0
CAN connection	1x 7-pin round plug
USB connection	1x standard USB connector type A
Cable CAN	optional 2 m CANUSB cable
Cable USB	1 m Standard USB
Max. Data transfer	1 Mbit/s at 90 % bus load
Error frame detection	optional
Analog level measurement	integrated
LEDs	2x triple 3 mm LED angled
Dimensions (l×w×h)	100 mm × 57 mm × 32 mm
Weight	166 g
Housing	Solid aluminium
Operating temperature	0°C up to +70°C
Storage temperature	-20°C up to +85°C
Rel. Humidity	20 % - 90 % non-condensing
Power consumption	max. 350 mA at 5 V
Power supply	via USB interface

Pin assignment



CAN

US	USB Status
CS1	CAN Status 1
C1	CAN 1 receive / transmit action
GS	Device status
CS2	CAN Status 2
C2	CAN 2 receive / transmit action
1	CAN2 low
2	CAN2 high
3	-
4	CAN1 low
5	CAN1 high
6	-
7	CAN GND

USB

1	VCC (VBUS)
2	- Data
3	+ Data
4	GND

Order information

V930204000	CANUSB, 2x CAN, Errorframe, level measurement
V930205000	CANUSB, 2x CAN, Errorframe
V930206000	CANUSB, 2x CAN
V930207000	CANUSB, 1x CAN, Errorframe, level measurement
V930208000	CANUSB, 1x CAN, Errorframe
V930209000	CANUSB, 1x CAN
V930220000	CANUSB-cable, 2 m, 120 Ohm
V930220100	CANUSB-cable, 2 m, (2x D-Sub9 male)

Error frame detection

This feature allows surveillance and monitoring of a CAN network. The CANUSB possesses an own logic for detecting error frames and counting them up in a specific internal memory area. That is used for finding intermittent errors like falsified messages of a CAN participant.

Level measurement

This feature is designed for an analog measurement of CAN levels. It is used for doing diagnostics at vehicles of all kinds or machines. It is especially important when data is lost from the network, which can be caused by short circuits, for example.

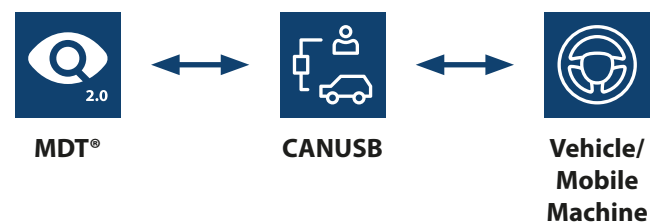
Programming interface

The CANapi provides all functions for programming own applications. It supports all Sontheim interfaces and several third-party devices which is why we enclose our SiECA132 MT-CANapi with four simultaneous handles at every interface dongle.

The Sontheim Modular Diagnostic Tool Chain

You can easily create your individual and professional diagnostic solution for automotive application with the help of the Sontheim interfaces and diagnostic software. Some use cases by linking hardware and software are:

- CAN data visualization, monitoring and processing
- Parameterization and control of whole CAN networks
- Vehicle diagnostics
- Flash processes of electronic control units (ECUs)






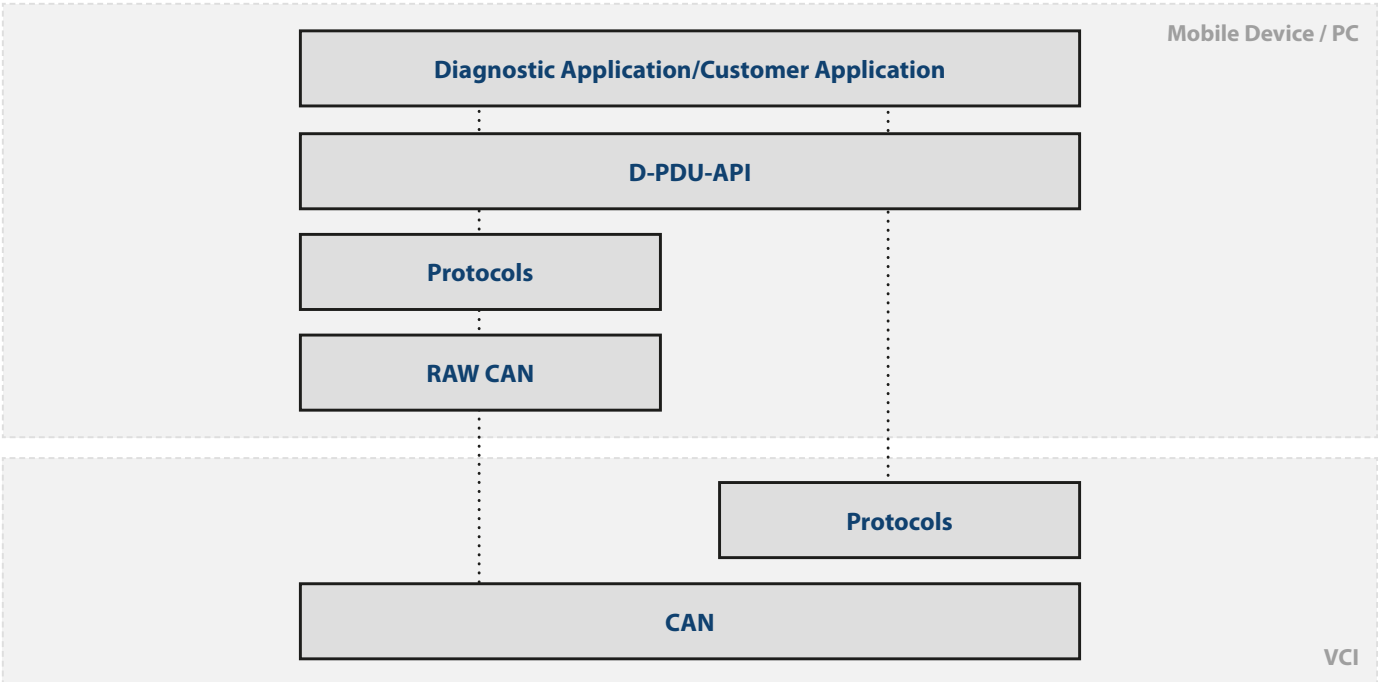


D-PDU-API

Vehicle access via standardized D-PDU-API according to ISO 22900-2

Key Features

-  **Standardized vehicle access**
-  **Support of the Sontheim VCIs**
-  **Easy integration into the MDT®**






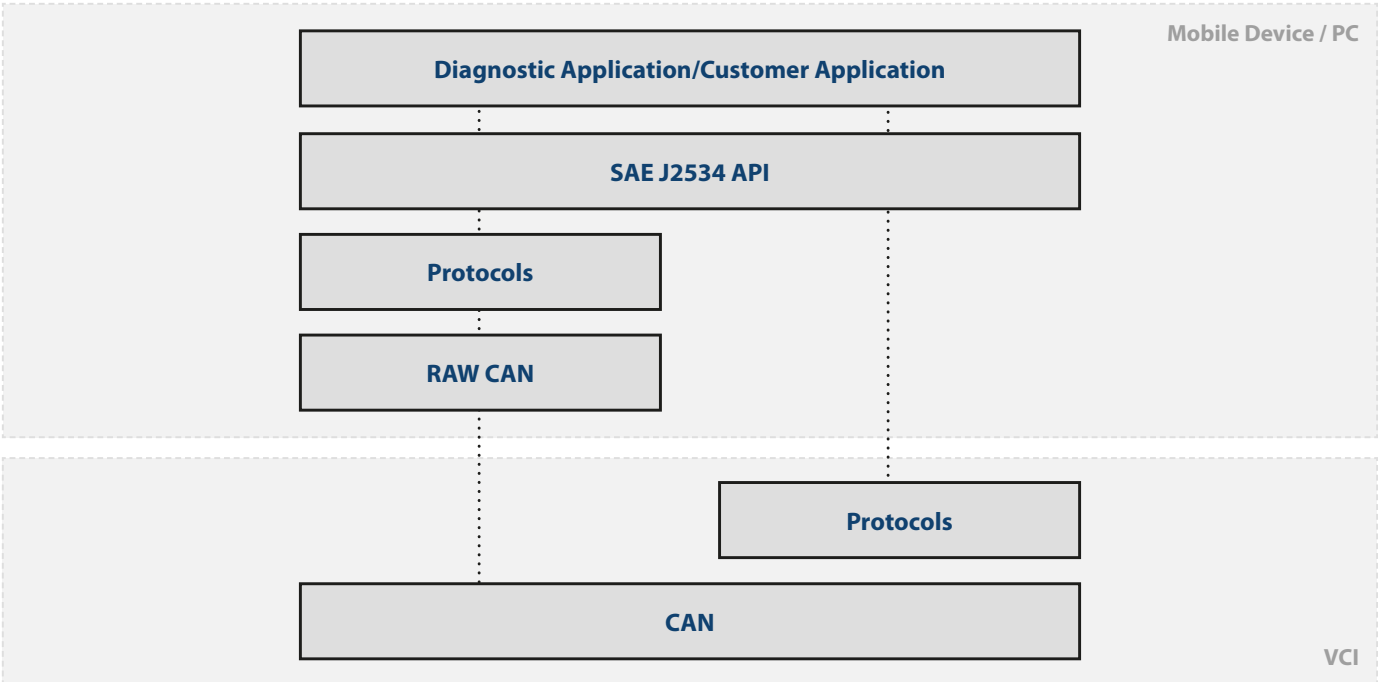


SAE J2534 API

PassThru API

Key Features

-  **ISO** Standardized vehicle access
-  **Support of the Sontheim VCIs**
-  **Easy integration into the MDT®**





Protocol Stacks

DoIP, UDS and more protocol stacks available in our portfolio

Key Features



Very performant and stable programming



Modular design



Individual adjustments easy to implement



Unified Diagnostic Service (UDS) Stack acc. to ISO 14229



DoIP Transport Protokoll Stack acc. to ISO 13400



Transport protocol for UDS and KWP2000 acc. to ISO 15765



Diagnostic event manager for UDS and J1939



Flashbootloader (developed acc. to ISO 25119 SRL-2)



CAN basic driver for your platform

Performant protocol stacks – standard based and proprietary

A performant programming and clearly defined interfaces are essentially important for the creation of protocol stacks. Based on standards and proprietary customer-specific requirements that set the rules of communication, the Sontheim Industrie Elektronik GmbH has already developed several stacks for various application areas.

Great expertise with different communication protocols

For implementing your customized solution we can fall back on the already-implemented stacks such as Device-Net, J1939-21 including address claiming, J1939-73 (DM1 and DM2), KWP 2000, UDS, CANopen slave and master, to support you optimally. Due to our extensive experience in the development of protocol stacks and our modular software architecture, we can implement at any time individual and proprietary protocol stacks and integrate it into our software products.

Many years of experience with various microcontroller platforms

Our protocol stacks were often ported by us on various hardware platforms and microcontrollers, such as PowerPC, ColdFire MCF548x, Infineon XC164CS, Atmel AT89C51CC03C ARM7 LPC2458, Star12, HC12.

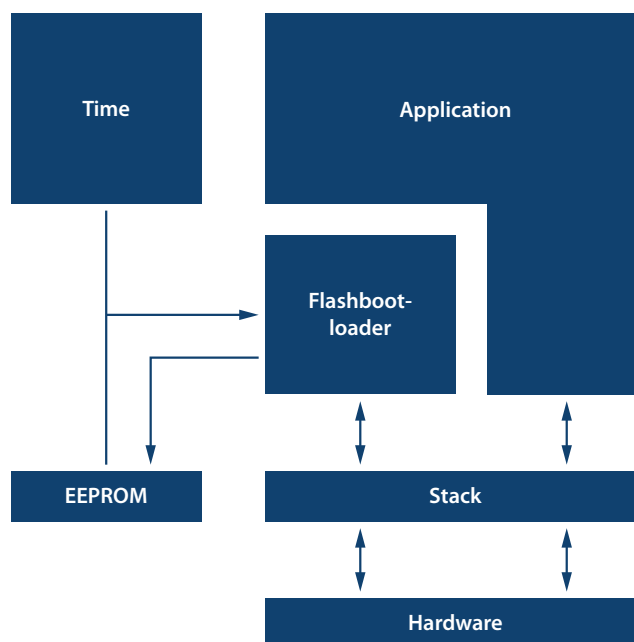
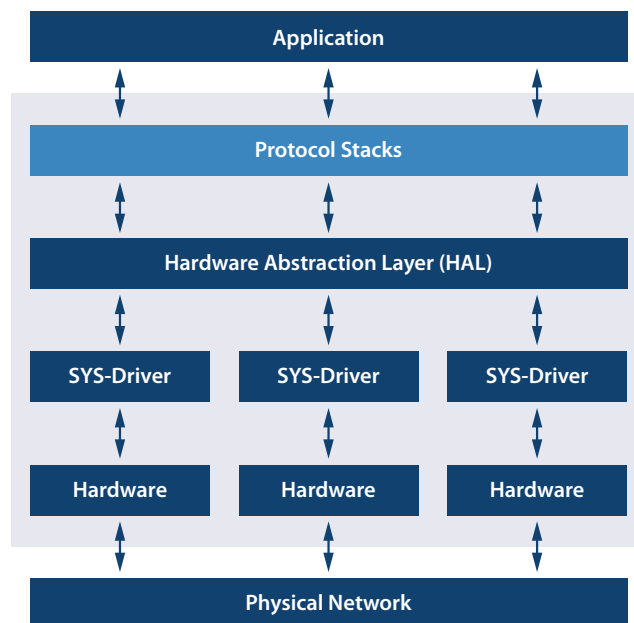
Real time for critical applications

In the field of automation technology we employ our CAN stacks in real-time environments and so we can offer as a example control PCs, which are suitable for critical applications, such as complex systems.

From the application to the hardware

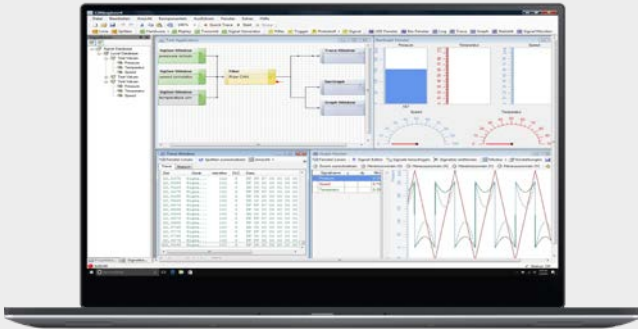
Of course, it is also possible to implement proprietary protocols. We have already several basics by different customer-specific projects, which have been successfully implemented. PC side as well as in the embedded sector, we have specific know-how. In addition, a quick integration is facilitated by the modular design in your system and we like to develop a custom solution for you. With the Sontheim Flash boot loader we offer a tailor-made solution for your system. Our fast and efficient solutions are already in many systems in use and allow a reliable boot up process, as well as software programming. In addition to the stacks, the HAL and the drivers for hardware, you receive also hardware components such as CAN interfaces and industrial PCs and control units.

Schematic structure of the stack and the flash bootloader



For specific voting requirements and a customized solution, we provide you with a team of project managers and software specialists. If you are interested we are looking forward to your request!

CANexplorer 4



Modular, intuitive, efficient – CANexplorer 4 is a completely new developed field bus-analyzing software which represents the huge know-how in working with CAN networks in complex machines and vehicles. The new generation obtains a significantly enhanced range of functions and an improved handling. This makes the CANexplorer 4 a very intuitive and powerful tool.

Key Features



User-defined measurements setups with graphic elements and Drag and Drop



Receive, edit, transmit and abstract raw data



J1939-protocol support



CANopen-protocol support



Modular design with expansion options



Import and export from signal databases

Data processing

CANexplorer 4 offers various functions for processing CAN data, e.g. classical text-based traces, graphs, bar graphs, LEDs, filters and triggers. Generating a test set-up can be carried out by connecting different functional elements via Drag and Drop. This enables the software to consequently display complex processes in a visual and common manner.

Visualization

You can adapt the data visualization by defining triggers and filters. It is also possible to take an active part in the bus communication and generate and transmit messages that are also shown in a visualization. Have your telegrams sent manually, fully automatic or via trigger.

Data abstraction

Use an integrated protocol abstraction for automatically interpreting data to CANopen and J1939. The CAN data is then available as pre-processed and readable information. Further protocol stacks can easily be added with updates. All proprietary protocols and RawCAN data can be processed with a manual symbol editor. This tool is used for defining symbols and translating the payload of a CAN frame into comprehensible values.

Parallel processes

CANexplorer 4 obtains a multi-thread support for parallel usage next to other applications running on a PC and the visualization of various modules at the same time.

Overview of the most important modules:

Input:

CANexplorer 4 obtains various possibilities for manually or automatically creating CAN data as well as reading CAN messages at the bus.



Signal generator Transmit

Creation of signal processes.
Fast access to pre-defined CAN messages.



Replay

Replay of previously recorded CAN log-data for an analysis of the CAN bus data.
It is possible to apply original time-settings of the records.



Hardware Inputs

Receiving and transmitting of CAN data. All Sontheim interfaces are supported, e. g. CANUSB, CANUSBlight and PowerCAN.

Processing:

Different filters provide a comfortable handling of the various CAN data. Moreover, the user can abstract the data to J1939 and CANopen.



Filter

One can use filters for CAN identifier, areas of CAN identifier, data bytes and message types. The filters have a positive and a negative output.



Protocol Filter

The integrated filters J1939 and CANopen offer an abstraction and pre-processing of CAN bus data traffic.



Trigger

Creation of an event which can start a pre-defined operation. The user can choose between different triggers (e. g. data bytes or data bits) for a maximum of flexibility.

Visualization And Recording:

The modular-based design of the CANexplorer provides individual adaptation of the visualization and the display of specifically required data. The CAN bus traffic can be recorded and visualized easily via different elements. Of course, the various instruments can be chosen and configured according to the user's requirements.



Log Module

Easy writing of CAN messages into a log-file.



Trace

Tabular display of CAN messages in the static or trace mode.



Graph

Visualization of signals via graphs. Underlining events via placing of markers.

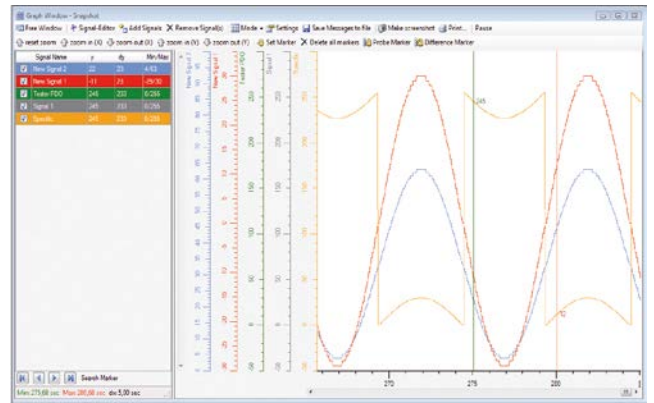


Signal Monitor Symbol Editor Bar-Graph Statistic

Display of signals in a table, including minimum and maximum. Definition of symbols down to the Bit layer for a simplified and more lucid illustration of CAN information. Visualization of signals via bar-graphs or tachometer. Indication of bus statistics (e.g. amount of received / transmitted messages, bus-charge and others).

Technical Data

Operating system	Windows 2000 SP4, XP, Vista (32-Bit), 7, 8, 10
CPU	1.6 GHz Intel Pentium
RAM	512 MB
Graphics	1024x768 px, 16 mio. colors
Minimum hard disk space	min. 80 MB
Supported CAN Hardware	COMfalcon® CANUSB CANfox® CANUSBlight PowerCAN-PCI V1 and V2 PowerCAN-PCI04+ PowerCAN-PCI04 V2 Other CAN hardware available upon enquiry



Features

Receiving and transmitting CAN messages	Signal generator with different signals (sinus, saw tooth, rectangle) Manual transmitting of definable CAN messages Cyclic transmitting of definable CAN messages Transmitting in block mode
Filter	CANexplorer 4 supports filtering for identifier, data bytes, symbols and message types
Trigger	Canexplorer 4 uses pre- and post-trigger
Signal database	Saving of messages in a database as well as visualization via texts and graphic elements for intuitive handling Editor for generating and processing of signals (message, multiplexer, key, groups and signal) For both data import and export there are various data types supported
Visualization	Trace, graph, bar-graph, tachometer, symbol-monitor
Data processing	Writing in log-file, replay mode
Protocol support	RawCAN, CANopen, J1939, implementation of proprietary protocols upon enquiry
Bus statistic	Overview of transmitted and received messages bus-charge and CAN levels
Quick Trace	Quick monitoring of the CAN channels without previous creation of a test setup

Order information

V940340010	CANexplorer 4 Basis
V940340099	Software maintenance
V940340020	Extended graph
V940340021	Extended measurement setup
V940340022	BarGraph & Tacho, LED
V940340023	Protocol filter J1939
V940340024	Protocol filter CANopen
V940340025	Signal-generator
V940340026	DBC-import & export
V940340027	ASC-support
V940340029	Vector-support for CANcardXL
V940340030	Peak-support for PCAN-USB



Custom Developments

As an expert in various fieldbus technologies, we would be happy to support you with customer-specific developments in the area of software, hardware, firmware, as well as the design and conception of your automation or automotive solution. Here you benefit from our holistic know-how as a system provider and the perfect interaction of functional hardware and suitable firmware up to the modular and optimized software.









BOB 2 L6

Breakout box for the connection of various measurement setups

Key Features

-  **2× analysis plug, 5× CAN interface acc. to ISO 11898, 1× serial**
-  **Simple cabling**
-  **Cross-plant and multidisciplinary project**
-  **Solid aluminium housing for top hat rail mounting**

Technical Data

Analysis plug	2× analysis socket (D-Sub25)
CAN	5× CAN interface acc. to ISO 11898 (D-Sub9)
Serial Trace	1× serial interface (D-Sub9)
Dimensions (l×w×h)	121 mm × 120 mm × 81.5 mm
Weight	ca. 400 g
Operating temperature	0 °C up to +60 °C
Storage temperature	-20 °C up to +70 °C
Humidity	90 % non-condensing
Protection class	IP20

Overview

Breakout box is designed for simple wiring and connection of numerous different measurement setups via analytics interfaces. It is a device that covers different branches and divisions and can be used for all vehicles starting at L6. All necessary pins of the analytics plugs 1 & 2 are being lead through. In addition to the Breakout box, there are also adaptor cables for the analytics interfaces 1 & 2 as well as a connection cable and an Y-cable for interface 3 (Flex Ray) available. A key advantage of the little device is in its easy-to-handle interfaces. They are all pluggable via banana jacks and D-Sub plugs. The module itself is made of rigid aluminium with a top hat rail for easy assembly.

Interfaces

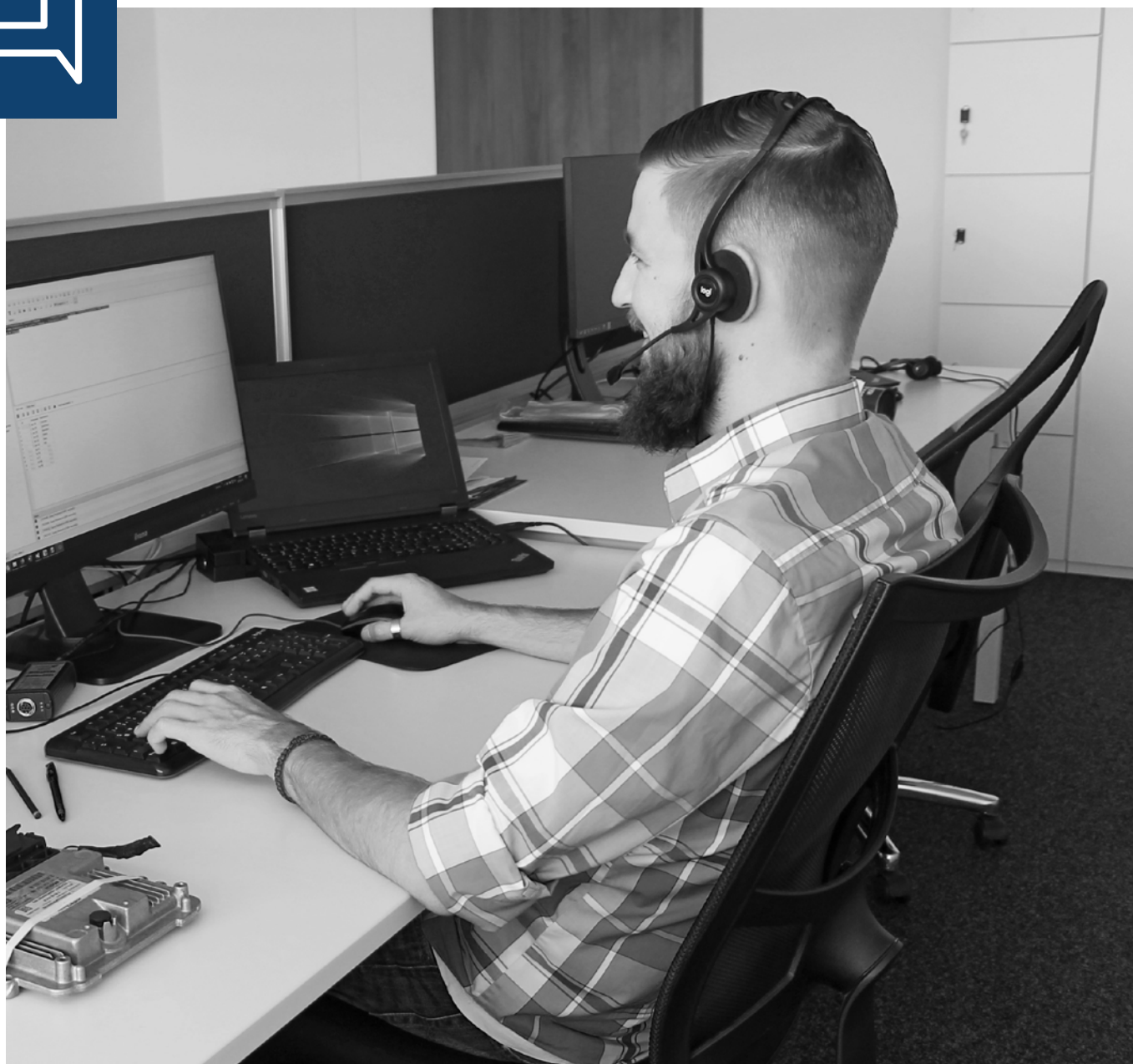
Interfaces are all located on the front cover resulting in a fast and clearly arranged wiring. Overall, there are five CAN interfaces and two D-Sub25 female interfaces for analytics plugs available. The Serial Trace interface is made for D-Sub9. Besides that Breakout box offers ten interfaces for banana jacks that have a LED for signaling a connected plug.



Do you have Questions?

Please feel free to contact us. If you have any questions, suggestions or requests regarding our products and the company, we will be happy to help you.

You can reach us at info@s-i-e.de



Connectivity

Telemetry Gateways, Cloud Software














COMhawk®

COMhawk® is a control device for communication and diagnostic tasks. In addition to the standard interfaces such as CAN and Ethernet the module also offers a WLAN interface. The variety of interfaces and the extremely rugged IP69K housing opens the module various fields of applications in the automotive and automation area.

Key Features

-  **Powerful 32-bit microcontroller**
-  **3× CAN interface acc. to ISO 11898 (opt. 4× CAN)**
-  **1× Ethernet, 10/100 Mbit/s**
-  **WLAN acc. to IEEE 802.11 b/g/n**
-  **Data-logging**
-  **Protection class IP69K**
-  **Vibration protected**

Housing and interfaces

The new COMhawk® is equipped with up to four CAN channels, Ethernet, Wi-Fi and optional two digital inputs and one digital output. In addition, great emphasis was placed on an extremely robust and durable design to meet the current safety standards. The control device is designed for the use outside the cabin of a vehicle and is vibration tested. A temperature range of -40°C to $+85^{\circ}\text{C}$ and the compact housing with protection class IP69K are ensuring an extensive protection.

Wide field of applications

A powerful 32-bit microcontroller allows even the most demanding applications and thanks to the built-in NAND flash memory of up to 16 GB amounts of data can be stored. Thus COMhawk® can be used both, in the automotive as well as in the automation industry for a variety of communication and diagnostic tasks such as a communication interface, gateway, event logger or telemetry node.

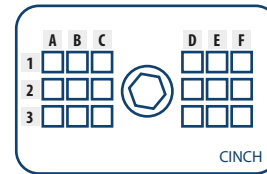
Technical Data

CPU	32-bit microcontroller, SPC 5123 400 MHz
RAM	32 MB up to 256 MB
Memory	16 MB up to 16 GB NAND Flash Memory
CAN	3× CAN acc. to ISO 11898 (optional up to 4× CAN)
Ethernet	1× Ethernet, 10/100 Mbit/s
WLAN	1× IEEE 802.11 b/g/n
IOs	optional 2× DI optional 1× DO
Operating system	RTOS (μC/OS-II) or LINUX
Plug	18-pole Automotive Plug
Housing	IP69K
Dimensions (l×w×h)	approx. 130 mm × 124 mm × 38 mm
Weight	375 g
Operating temperature	−40 °C up to +85 °C
Storage temperature	−40 °C up to +85 °C
Power supply	6–32 V DC

Comprehensive software support

The freely programmable and real-time capable ECU system can be programmed by the user application specifically. Over a configurable data interface for example an individual configuration of the interfaces or the structure of an application could be solved expeditiously. Furthermore control loops can be mapped easily over an integrated script interpreter. Another advantage is the reusability of this type of programming, whereby future work can even be more efficient. The user profits from a complete development environment.

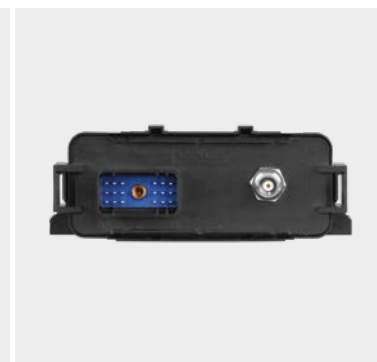
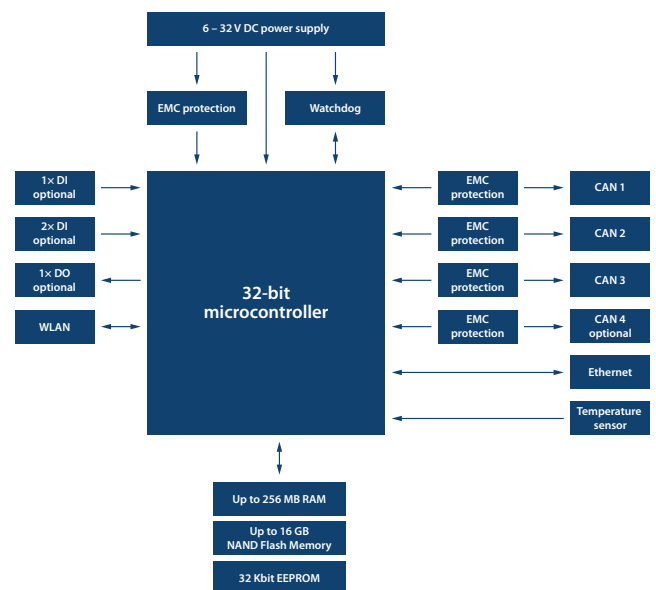
Pin assignment



COMhawk®

1A	Ubat
1B	GND
1C	LAN_SHLD
2A	DIG_IN1 (opt.)
2B	LAN_RX−
2C	LAN_RX+
3A	DIG_IN2 (opt.)
3B	LAN_TX−
3C	LAN_TX+
1D	DIG_OUT1 (opt.)
1E	CAN4_High (opt.)
1F	CAN4_Low (opt.)
2D	CAN3_Low
2E	CAN2_Low
2F	CAN1_Low
3D	CAN3_High
3E	CAN2_High
3F	CAN1_High

Block Diagram



Order information

V930238200










COMhawk®



COMhawk[®] xt

COMhawk[®] xt is an embedded application ECU for telemetry and diagnostic tasks. A variety of interfaces and the extremely rugged architecture opens the module various fields of applications for mobile machines.

Key Features

-  **Powerful ARM Cortex A9**
-  **4× CAN interface acc. to ISO 11898**
-  **GNSS**
-  **2G/LTE**
-  **WLAN acc. to IEEE 802.11 b/g/n**
-  **1× Ethernet, 10/100 Mbit/s**
-  **Data logging**
-  **Vibration protected**
-  **IP67**

Communication interfaces and position determination

The new COMhawk[®] xt is equipped with four CAN channels and a Ethernet connection. For wireless data exchange, WLAN and LTE CAT4 mobile radio connection are available. The COMhawk[®] xt is also optional equipped with a GNSS receiver for position determination. Further equipment includes four digital outputs and one digital input (500 mA).

Wide field of applications

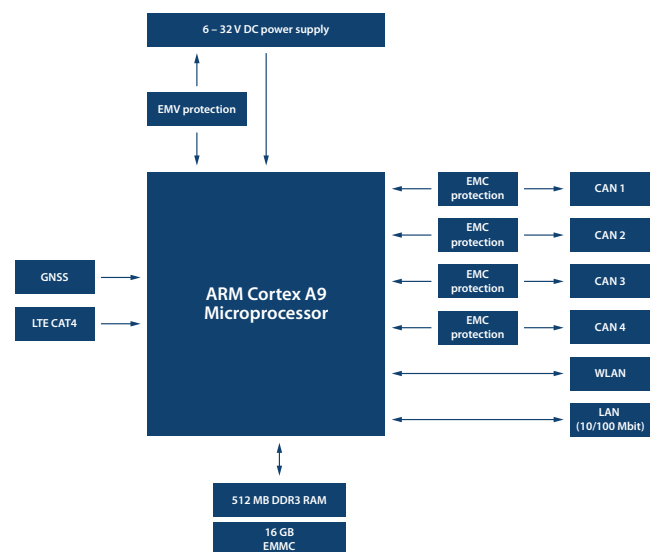
COMhawk[®] xt can be used for many applications from a simple data logger, which wirelessly transmits the recorded operating data, right up to the central communication, telemetry and diagnostic gateway, which unites different communications standards. Thanks to a temperature range of -20°C to $+80^{\circ}\text{C}$ and the compact housing with protection class IP67, the device is ensuring an extensive protection, even were vibrations and temperature are at their maximum. A Linux operating system provides an easy and optimal basic for creating OEM-applications in a fast way and without any further costs.

Technical Data

Processor	32-bit microcontroller, Cortex-A9 (single/dual core)
RAM	512 MB DDR3 RAM (opt. up to 1 GB)
Memory	16 GB eMMC NAND Flash (opt. up to 64 GB)
CAN	4× CAN acc. to DIN ISO 11898
Ethernet	1× Ethernet, 10/100 Mbit/s
WLAN	1× IEEE 802.11 b/g/n; Client- and Accesspoint-Mode (FAKRA E green)
GNSS	GPS/GLONASS, Beidou (FAKRA C blue)
2G/LTE	LTE CAT4 (FAKRA D violet)
IOs	4× DI, 1× DO (500 mA)
RTC	With 2 weeks buffer
Connector	30-pole automotive connector
Antenna connection	external; 3× FAKRA (opt. SMA)
Operating system	LINUX
Housing	IP67
Dimensions (l×w×h)	about 130 mm × 124 mm × 38 mm
Weight	app. 375 g
Operating temperature	-20 °C to +80 °C (higher temperature classes on demand)
Storage temperature	-40 °C to +85 °C
Power supply	6-32 V DC, incl. load dump protection
SIM Card	Including Sontheim SIM
Certifications	Europe



Block Diagram



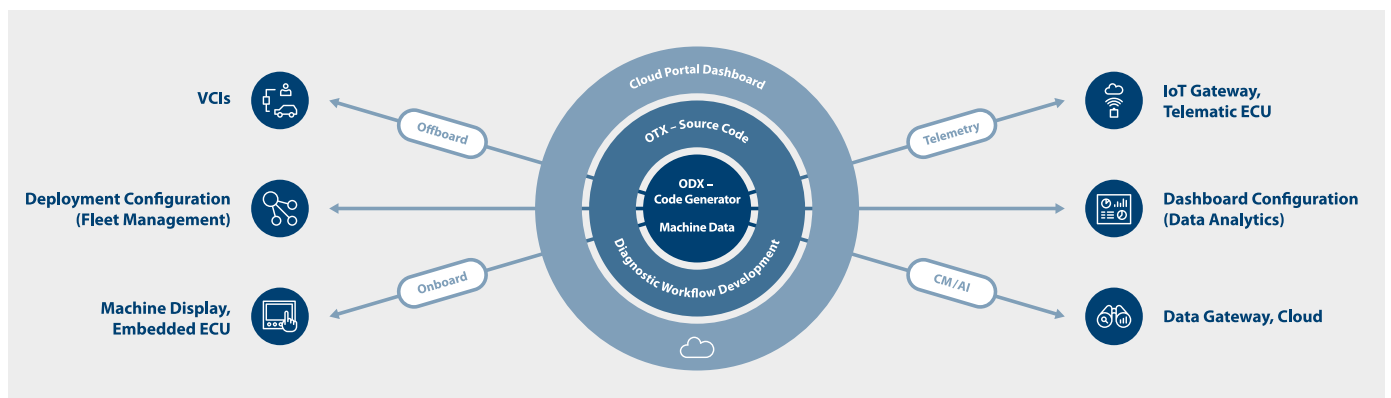
The Sontheim Modular Diagnostic Tool Chain

You can easily create your individual and professional diagnostic solution for automotive application with the help of the Sontheim interfaces and diagnostic software. Some use cases by linking hardware and software are:

- CAN data visualization, monitoring and processing
- Parameterization and control of whole CAN networks
- Vehicle diagnostics
- Flash processes of electronic control units (ECUs)

Order information

V930238600	COMhawk® xt
V966306450	Hirschmann Antenna
V940871100	IoT Device Manager
V940871200	IoT Analytics Manager









COMhawk[®] xt light

COMhawk[®] xt is an embedded application ECU for telemetry and diagnostic tasks. The cost-optimized light version enables simple telematics tasks with an optimal price-performance ratio.

Key Features

-  **1× CAN interface acc. to ISO 11898 with J1939 Protocol Support**
-  **2G/LTE**
-  **FOTA (Flash-over-the-air)**
-  **Protection class IP67**

Interfaces and mobile communication

The new COMhawk[®] xt light has one CAN channel with J1939 protocol support. A 2G/LTE mobile radio connection is available for wireless data exchange. This can be used to run FOTA applications, which can be managed by our IoT Device Manager.

Wide range of applications

COMhawk[®] xt light can be used in various applications of mobile machines, but also in stationary machines. From a simple IoT gateway, which transmits the recorded operating data wirelessly, to a central communication, telemetry and diagnostic gateway, the range of applications is wide. The extended temperature range from -30°C up to $+70^{\circ}\text{C}$ and the compact housing with IP67 protection guarantee comprehensive protection. The embedded operating system also offers a simple and optimal basis for creating OEM applications without increased effort and costs.

Technical Data

CPU	32-bit microcontroller
CAN	1x CAN interface acc. to ISO 11898
Further protocols	J1939
2G/LTE	GSM/GPRS/EDGE/LTE
Antenna connection	internal
Housing	IP67
Dimensions (l×w×h)	approx. 120 mm × 111 mm × 34 mm
Weight	260 g
Operating temperature	-30 °C up to +70 °C (higher temperature class on request)
Storage temperature	-40 °C up to +85 °C
Power supply	6-32 V DC



IoT Device Manager

The IoT Device Manager is a cloud-based tool for simple and clear management of your telematic units in the field. You can group and structure your devices via drag and drop and can manage software packages for over-the-air updates.

Collect live data during vehicle operation or flash software over-the-air via:

- Mobile networks (2G/LTE)

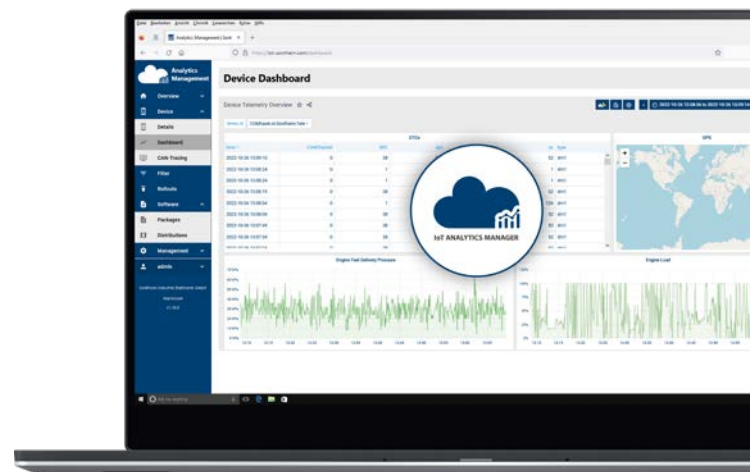
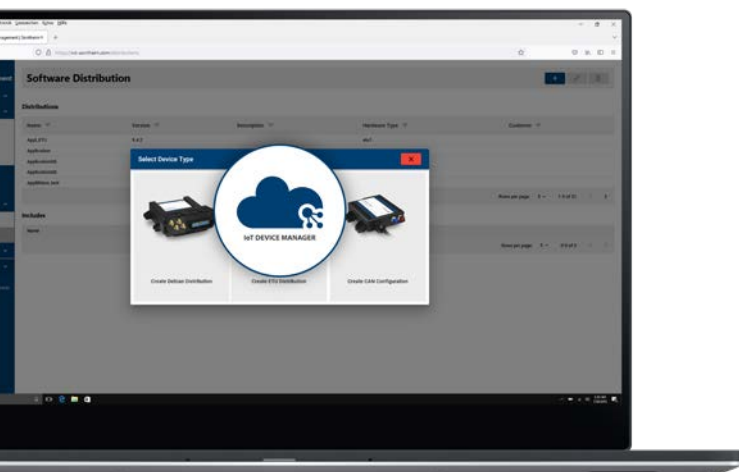
Store telemetry data for further analysis to support:

- QA statistics
- Usage statistics
- Servicing intervals
- Vehicle Lifecycle Support
- After sales offerings

IoT Analytics Manager

The IoT Analytics Manager is a cloud-based tool for storing and visualizing your operation data (big data).

An OEM is able to analyze and evaluate data in different configurable dashboards, widgets and histograms. The data amount and traffic can be individually set up for different use cases. Furthermore, a live data integration for real-time monitoring is also possible and can be individually configured by the customer.





Beacon BT

Smart and ultra-compact Bluetooth module with integrated battery supply and extended version with accelerometer

Key Features



Bluetooth 5.0 Low Energy



Optional accelerometer with $\pm 16/24$ g



IP67 protection class



Casted electronics



Operating temperature -40°C to $+65^{\circ}\text{C}$



CE certified

Make your machines smart – with the extremely compact Bluetooth node from Sontheim. Thanks to a size smaller than a bank card, the module can be easily and specifically be attached to almost all machines. With an integrated memory of 2 MB, data of the connected machine can be stored (10-digit identification number, 4×128 byte data) and retrieved via Bluetooth. Thus, for example, the presence, operating hours or special operation modes can be transmitted and queried easily and efficiently. In addition, the module can be seamlessly integrated into the infrastructure of our COMhawk® xt telemetry series.

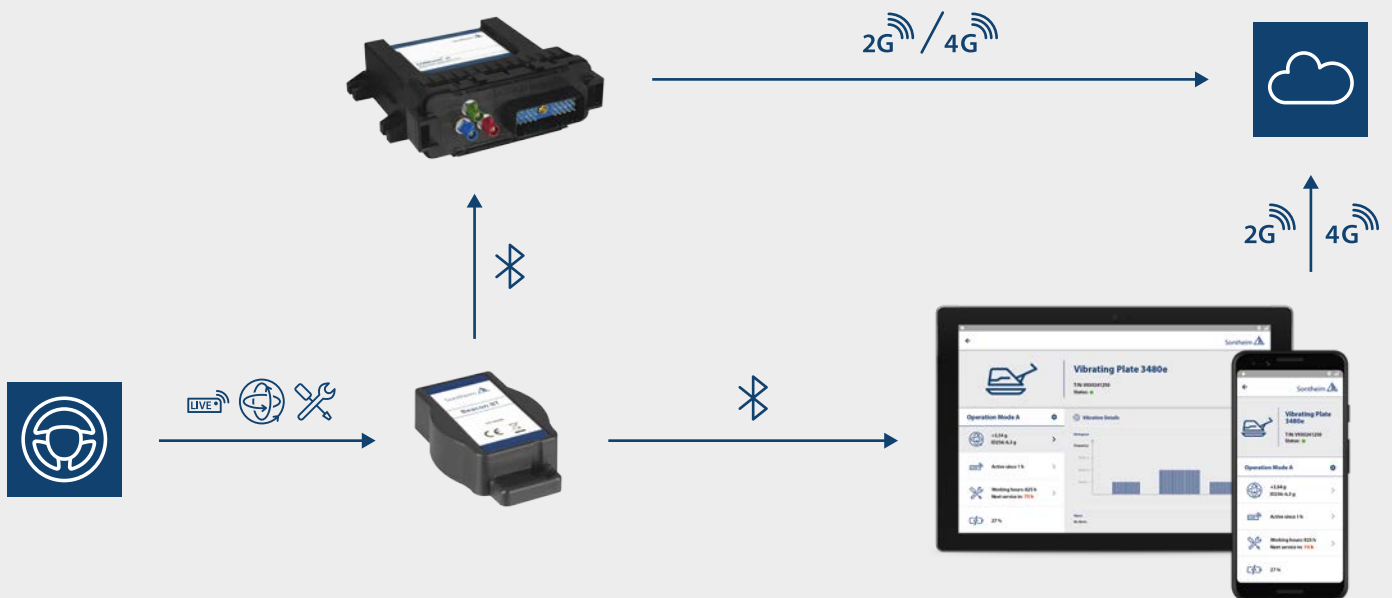
Information from the machine can thus be recorded via Bluetooth and transferred to a cloud for further analysis using the telemetry module. Various operating modes can be recorded, categorized and made available via an additionally integrated acceleration sensor (Beacon BTA variant). With its casted electronics and an IP67 protection class, the module offers the necessary protection for harsh environmental conditions and installation outside the cabin. An operating temperature of -40°C to $+65^{\circ}\text{C}$ and CE certification round off the overall package.

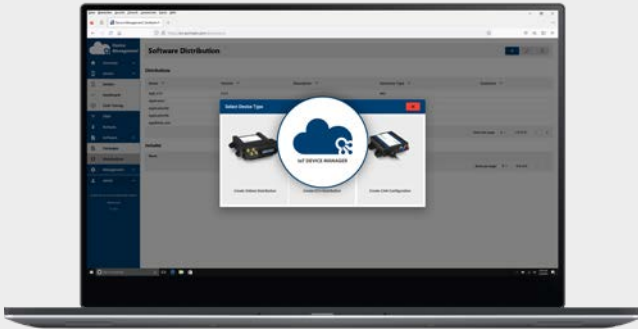
Technical Data

Bluetooth	5.0 Low Energy
Memory	2 MB
Accelerometer	±16/24 g (Beacon BTA variant)
Protection Class	IP67 (casted electronics)
Dimensions (l×w×h)	app. 75 mm × 43 mm × 17 mm
Weight	app. 53 g
Battery	Integrated, life expectancy 7–10 years
Operating temperature	−40 °C up to +65 °C
Storage temperature	−40 °C up to +85 °C



Possible Communication Beacon BT





IoT Device Manager

Cloud-based platform for managing your devices in the field.

Key Features



Management of all telematics units



Drag and drop functionality



Managing updates over-the-air



Simple configuration of all devices



Fast data consumption analysis



Live data monitoring

The IoT Device Manager is a cloud-based tool for the simple and clear management of your telematics units in the field. You can group and structure your devices by drag and drop and manage software packages for wireless over-the-air updates.

Collect live data during vehicle operation or flash software wirelessly:

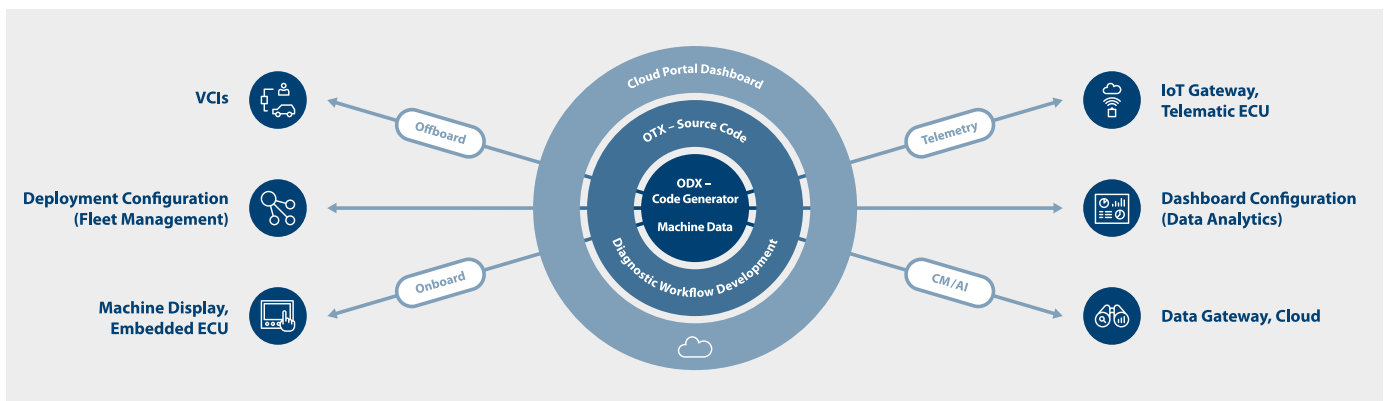
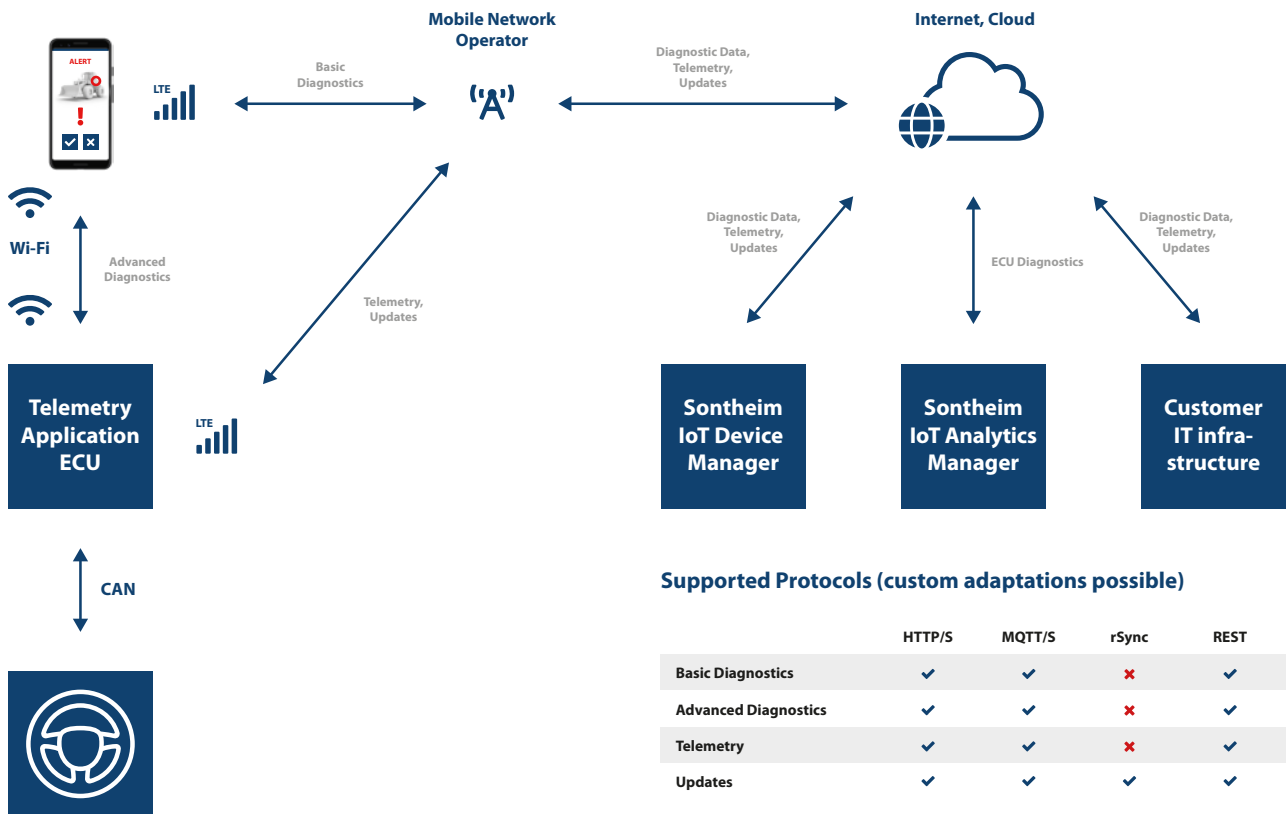
- Mobile networks (2G/LTE)
- WLAN

Store telemetry data for further analysis and support the following functions:

- QA Statistics
- Usage statistics
- Planning of service intervals
- vehicle lifecycle support

Store telemetry data and check information such as:

- SIM card number (IMSI)
- Serial number of the LTE device
- Last connection to the server
- Signal Quality
- Network Bandwidth
- Device configuration

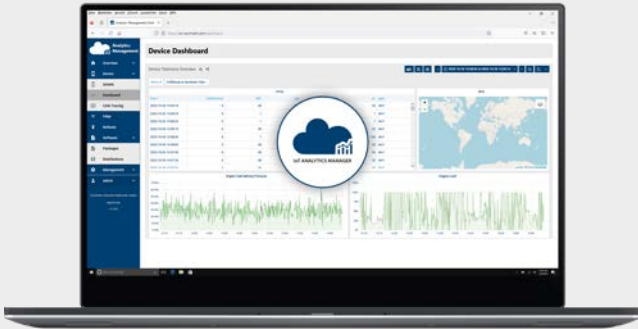


The IoT Device Manager can be hosted on a server on the Sonheim side or seamlessly integrated into an existing customer infrastructure. Secure data transfer is ensured thanks to SSL/TLS certification and can even be extended according to individual customer requirements. The IoT Device Manager can be branded OEM-specific. This allows the user to create different user levels, for viewing with different rights or for easy integration of sub supplier views.

Order information

V940871100

IoT Device Manager



IoT Analytics Manager

Cloud-based platform for data visualization and analysis

Key Features



Analysis and evaluation charts



Storage and visualization of device and vehicle data



Drag and drop functionality



Live data monitoring



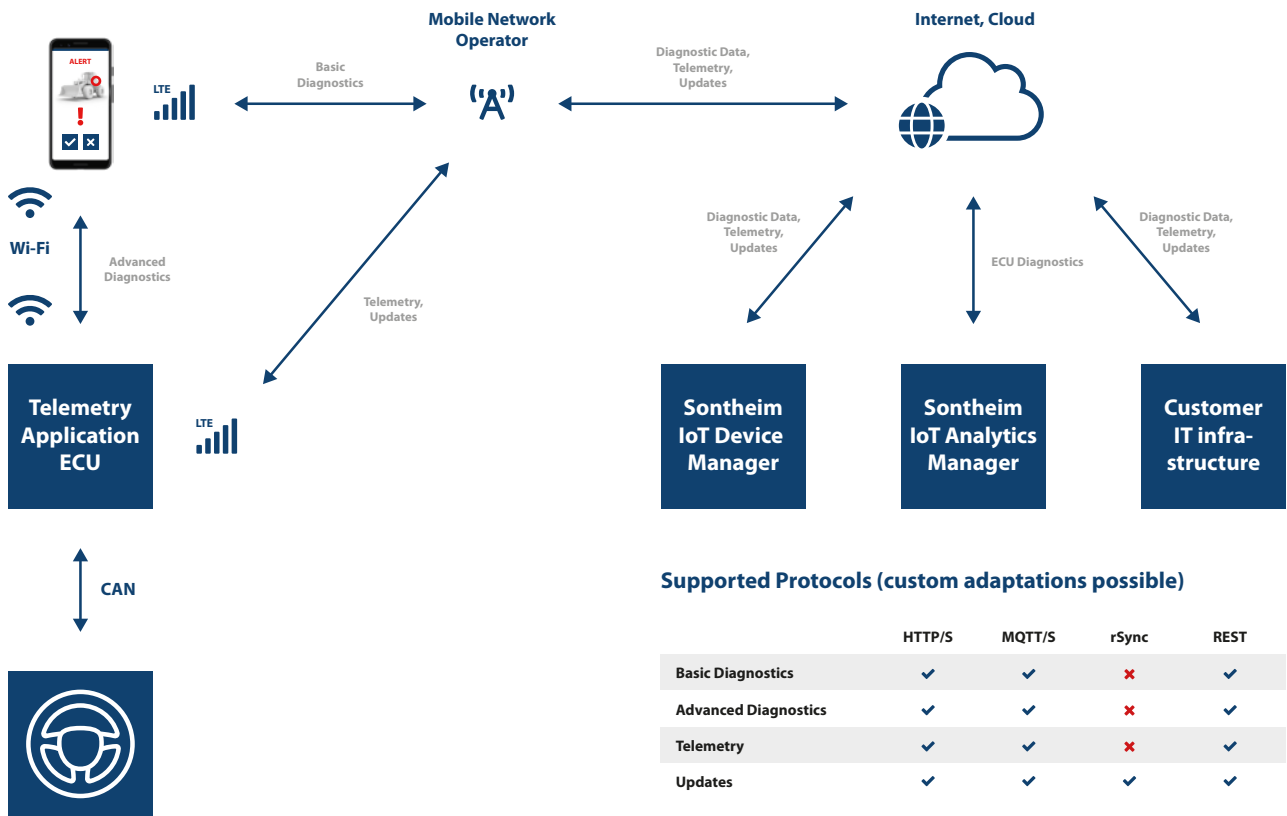
Configurable dashboards, widgets and histograms



Individual configuration

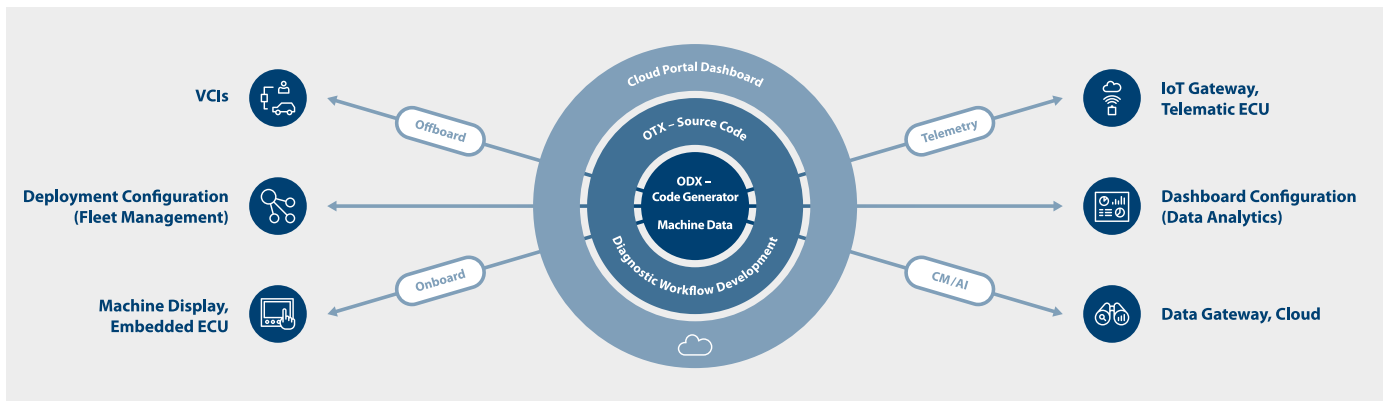
The IoT Analytics Manager is a cloud-based tool for storing and visualizing your operational data (Big Data). OEM data can be analyzed and evaluated in various configurable dashboards, widgets and histograms. The amount of data and data traffic can be individually configured for different use cases. In addition, live data integration for real-time monitoring is possible, which can be individually configured by the customer.

The IoT Analytics Manager can be hosted on a server on the Sontheim side or seamlessly integrated into an existing customer infrastructure. Secure data transfer is ensured thanks to SSL/TLS certification and can even be extended according to individual customer requirements. IoT Analytics Manager can be branded OEM-specific. This allows the user to create different user levels, for viewing with different rights or for easy integration of sub supplier views.



Supported Protocols (custom adaptations possible)

	HTTP/S	MQTT/S	rSync	REST
Basic Diagnostics	✓	✓	✗	✓
Advanced Diagnostics	✓	✓	✗	✓
Telemetry	✓	✓	✗	✓
Updates	✓	✓	✓	✓



Order information

V940871200	IoT Analytics Manager
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Mobile Automation



Industrial Automation



Diagnostics



Connectivity

We are looking forward to your enquiry!

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