



Products and Services

for data communication in automotive applications and test benches

About IXXAT

A reliable and capable partner for advanced data communication

IXXAT is one of the leading suppliers of data communication technology for the automation and automotive industry.

With innovative, powerful and cost effective products as well as with high quality standards for our services and products we want to establish long-term partnerships with our customers. To this end we continually invest a considerable amount of our resources in the research and development of new technologies and products.

The quality of our products

For many years quality management has been the foundation of our work and an incentive for continual development.

To ensure the high quality of our products and services, we have a quality management system to ISO 9001 standard. We further develop processes using defined development directives for hardware, software and standardized review processes. For the development of safety-critical hardware and software pursuant to IEC61508, we also employ a functional safety management system.

Experience and primary applications

As a pioneer of data communication technology, we have made major contributions to the successful growth of CAN and FlexRay in automotive applications. Our primary applications in the field of automotive communication systems and test bench networks today involve solutions based on CAN (CANopen, SAE J1939), FlexRay and LIN as well as real-time Ethernet (EtherCAT).

Industries

IXXAT products are used worldwide in a wide variety of applications, including:

- Automobile and commercial vehicle industry
- Trains and rail-bound vehicles
- Marine and aerospace
- Industrial automation and mechanical engineering
- Medical technology
- Elevators
- Regenerative energy systems
- etc...

Developments on behalf of our customers

As a development service provider, we can look back on more than 20 years of experience. In this period we have implemented more than 430 development projects for renowned international customers with a high level of customer satisfaction.

We support our customers throughout the complete development cycle for all relevant technologies in the field of data communication, from system design to development of hardware and software, and series production of hardware assemblies and delivery of complete data communication systems.

Our customers benefit not only from development services, but also significantly from the know-how, we have gained in over 20 years in different industries.

Further information about our services can be found on page 18.



**Dipl.-Ing.
Christian Schlegel**
Managing Director

You can rely on

- ✓ High long-term availability
- ✓ 100 % product testing
- ✓ Fast delivery from stock
- ✓ High quality standard
- ✓ Made in Germany

Content

<i>PC Interfaces</i>	<i>P 4-5</i>
<i>Repeaters</i>	<i>P 6</i>
<i>Bridges and Gateways</i>	<i>P 7</i>
<i>canAnalyser, multibusAnalyser</i>	<i>P 8</i>
<i>CAN Diagnostic Tools</i>	<i>P 9</i>
<i>FlexRay</i>	<i>P 10-11</i>
<i>Automotive Test Platform</i>	<i>P 12</i>
<i>SAE J1939</i>	<i>P 13</i>
<i>CANio 500</i>	<i>P 14</i>
<i>Further Products</i>	<i>P 15-16</i>
<i>CAN and FlexRay Accessories</i>	<i>P 17</i>
<i>Development Services</i>	<i>P 18</i>

PC Interfaces

for analysis and control of CAN, FlexRay, LIN and K-Line systems

IXXAT PC interfaces are used in a wide range of applications, either in test benches to connect the devices to be tested to the test computer or as a control interface in production or handling systems. In combination with the canAnalyser or multibusAnalyser, the interfaces serve as a basis for a powerful CAN and FlexRay analysis system.

The drivers for Windows (VCI), Linux and real-time operating systems (ECI), included in the scope of supply, have an identical programming interface and enable a quick and easy switch between cards without adapting to the customer's application. Thus the optimum CAN interface in terms of area of application, performance requirements or target unit costs can be selected at any time.

In addition to customized applications, the CAN interfaces also form the basis for our comprehen-

sive tool chain consisting of analysis, configuration, simulation and gateway tools. All IXXAT CAN interfaces are developed, produced and tested 100 % before delivery in accordance with the highest quality standards.

Software support

Windows

Every CAN card is delivered with IXXAT's universal "Virtual CAN Interface" (VCI) driver for Windows. This powerful driver package supports all CAN cards, regardless of their PC interface format, with a common application programming interface (API). This means that applications based on the VCI API can be used with all IXXAT CAN cards without changing the application program.

The VCI is designed as a system server and allows simultaneous access by several applications to one or more CAN controllers of one or more PC interfaces.

Moreover, the driver has several application interfaces for C, .NET and JAVA as well as integrated APIs for LabWindows and LabView.

The VCI CAN driver is available for 32 and 64 bit Windows operating systems and also includes a simple CAN bus monitor "miniMon", which enables the transmission and reception of CAN messages.

Linux, INtime and RTX

For use of the CAN interfaces under Linux and in real-time environments (INtime, RTX), IXXAT provides the universal "Embedded Communication Interface" driver (ECI) free of charge. As with the VCI, the user interface is identical for all operating systems. Thus applications based on ECI can be used with all supported IXXAT CAN interfaces without changing. The application interface is designed as a "C" interface and contains all necessary functions for CAN-based applications.



Product	CAN-IB100/PCIe	CAN-IB200/PCIe	CAN-IB120/PCIe Mini	iPC-I XC16/PCI	iPC-I XC16/PMC
PC interface standard	PCI express (V1.1)	PCI express (V1.1)	PCI express mini card (V1.2)	PCI (V2.2)	PMC (V2.2)
Microcontroller	Passive	32 Bit	Passive	16 Bit	16 Bit
Fieldbus interfaces	1-4 x CAN	1-4 x CAN 1-4 x LIN/K-Line optional	1 / 2 x CAN	2 x CAN 1 x LIN (optional)	2 x CAN 1 x LIN
CAN interface (controller/interface/connection)	CAN 2.0 A/B ISO 11898-2, optional switchable to ISO 11898-3 Sub D9 plug acc. to CiA 303-1	CAN 2.0 A/B ISO 11898-2, optional switchable to ISO 11898-3 Sub D9 plug acc. to CiA 303-1	CAN 2.0 A/B ISO 11898-2 Connection cable with open ends	CAN 2.0 A/B ISO 11898-2, optional switchable to ISO 11898-3 Sub D9 plug (CiA 303-1)	CAN 2.0 A/B ISO 11898-2 / 11898-3 switchable Sub D9 plug (CiA 303-1)
LIN interface (interface/connection)	-	ISO 9141 Sub D9 plug	-	ISO 9141 Sub D9 plug	ISO 9141 Sub D9 plug
FlexRay interface (controller/interface/connection)	-	-	-	-	-
Galvanic isolation	optional (1 kV, 1 sec.)	optional (1 kV, 1 sec.)	optional (1 kV, 1 sec.)	optional (1 kV, 1 sec.)	yes (1 kV, 1 sec.)
Temperature range	0 °C ... +70 °C	0 °C ... +70 °C	-40 °C ... +85 °C	-20 °C ... +70 °C	-20 °C ... +70 °C
Power supply	3.3 V DC, 350 mA typ.	3.3 V DC, 390 mA typ.	3,3 V DC	5 V DC, 100 mA typ. and 3.3 V DC, 200 mA typ.	5 V DC, 100 mA typ. and 3.3 V DC, 200 mA typ.
Certification	CE, FCC	CE, FCC	CE, FCC	CE, CSA/UL, FCC, EN 60601-1	CE, FCC
Dimensions	approx. 65 x 105 mm	approx. 65 x 105 mm	30 x 50,95 mm	approx. 89 x 124 mm	approx. 74 x 149 mm
Order number	1.01.0231.xxxxx Low Profile Version: 1.01.0232.xxxxx	1.01.0233.xxxxx Low Profile Version: 1.01.0234.xxxxx	1.01.0237.xxxxx	1.01.0047.xxxxx	1.01.0049.33660

SAE J1939 and CANopen

For use of the CAN interfaces under CANopen and J1939, IXXAT offers driver APIs that provide all protocol specific functions and thus enable quick and easy development of PC-based control and configuration applications.






FlexRay

The FR-IB100/PCIe is a low cost and powerful solution for analysis and control of FlexRay systems.

With the integrated asynchronous receiver, it is also possible to analyze in detail the start-up behavior of FlexRay systems.

The FR-IB100/PCIe is delivered with the VCI for FlexRay, which comes with a C-API for connection to Windows-based applications. The VCI for FlexRay also supports the FRC-EP 150.



				
USB-to-CAN compact	USB-to-CAN II	CAN@net II/VCI	CANblue II/VCI	FR-IB100/PCIe
USB (V2.0, full speed)	USB (V2.0, full speed)	Ethernet	Bluetooth (V2.1)	PCI express (V1.1)
16 Bit	16 Bit	32 Bit	32 Bit	32 Bit
1 x CAN	2 x CAN 1 x LIN (optional)	1 x CAN	1 x CAN	2 x FlexRay
CAN 2.0 A/B	CAN 2.0 A/B	CAN 2.0 A/B	CAN 2.0 A/B	-
ISO 11898-2	2 x ISO 11898-2, optional 1 x ISO 11898-3 switchable	ISO 11898-2	ISO 11898-2	-
Sub D9 or RJ45 plug according to CiA 303-1	2 x RJ45 with Sub D9 adapter	Sub D9 plug according to CiA 303-1	Sub D9 plug acc. to CiA 303-1	-
-	ISO 9141 Sub D9 plug (via included adapter cable)	-	-	-
-	-	-	-	MFR 4310 Bus interface opt. with termination Sub D9 plug
optional (1 kV, 1 sec.)	optional (1 kV, 1 sec.)	yes (1 kV, 1 sec.)	yes (1 kV, 1 sec.)	yes (1 kV, 1 sec.)
-20 °C ... +80 °C	-20 °C ... +80 °C	-20 °C ... +70 °C	-40 °C ... +70 °C	0 °C ... +70 °C
via USB port, approx. 250 mA	via USB port, 400 mA max.	9-32 V DC, approx. 3 W	9-30 V DC, approx. 0.6 W	3.3 V DC, 400 mA typ.
CE, CSA/UL, FCC	CE, CSA/UL, FCC	CE, CSA/UL, FCC	CE, FCC	CE, FCC
approx. 80 x 45 x 20 mm	approx. 98 x 55 x 20 mm	approx. 22,5 x 100 x 115 mm	approx. 82 x 64 x 26 mm	approx. 54 x 106 mm (available as standard and low profile version)
1.01.0087.xxxxx 1.01.0088.xxxxx	1.01.0062.xxxxx 1.01.0066.11220	1.01.0086.10200	1.01.0126.00000	1.01.0103.000xx

Topology components

for test back-ups and system extension

The IXXAT topology components are successful and established in many different application areas, whether in test benches for communication system networks, in production systems or power plants, for system protection and control of noise.

CAN repeaters

In terms of robustness, temperature range and safety, IXXAT repeaters are specially designed for use in an industrial environment. When used, the reliability of a system can be significantly increased while typically saving costs due to simpler wiring.

The CAN repeaters are used to establish a physical coupling of two or more segments of a CAN bus system. They can be used to implement tree or star topologies as well as for long drop lines. Systems connected by repeaters are independent electrical segments that can be optimally terminated in terms of signals. In addition, network segments can be electrically decoupled using a galvanically isolated repeater.

CAN bridges and gateways

The use of bridges and gateways opens up a large number of possibilities. For example, CAN systems can be implemented with a larger sys-

tem expansion, devices without CAN interfaces can be connected to CAN systems or CAN systems can be coupled using different communication technologies.

CAN bridges can link two or more CAN networks that employ different CAN bit rates or protocols. At this, translation and filter rules can also be used, allowing a protocol adaptation to be carried out between the sub-networks. A bridge can thus also provide simple gateway functions. CAN bridges are appropriate for creating hierarchical networks by transferring only the information to the connected sub-networks via bridges which are relevant to the sub-network.



Product	CAN-CR200	CAN-CR210/FO	CAN-CR220	CAN-Repeater	FO-Repeater
Description	Stackable ISO 11898-2 CAN repeater	Stackable ISO 11898-2 to fiber optic converter	ISO 11898-2 CAN repeater with 4 kV galvanic isolation	ISO 11898-2 CAN repeater with low-speed option	ISO 11898-2 to fiber optic converter
CAN bus interface	2 x ISO 11898-2 with CAN choke 1 x ISO 11898-2 DIN rail bus	1 x ISO 11898-2 with CAN choke 1 x ISO 11898-2 DIN rail bus	2 x ISO 11898-2 with CAN choke	2 x ISO 11898-2 with CAN choke optional ISO 11898-2 to ISO 11898-3	1 x ISO 11898-2 with CAN choke
CAN connection	Sub D9 plug according to CiA 303-1	Sub D9 plug according to CiA 303-1	Sub D9 plug according to CiA 303-1	Screw terminals	Screw terminals
Integrated CAN bus termination	Switchable	Switchable	Switchable	Switchable via soldering jumpers	Switchable via soldering jumpers
Galvanic isolation	CAN 1, CAN 2 (1 kV, 1 sec.)	CAN 1 (1 kV, 1 sec.)	CAN 1, CAN 2 and power supply (4 kV, 1 sec.; optional 3 kV, 3 min.)	CAN 1, CAN 2 (1 kV, 1 sec.)	CAN 1 (1 kV, 1 sec.)
LED indicators	Transmission Defect segment	Transmission Defect segment	Transmission Defect segment	Transmission Defect segment	Transmission Defect segment
Glass fiber connection	-	F-SMA or ST for duplex cable (fiber optic 50/125 µm duplex)	-	-	F-SMA or ST for duplex cable (fiber optic 50/125 µm duplex)
Baudrate	up to 888 kbps	up to 888 kbps	up to 888 kbps	up to 888 kbps	up to 888 kbps
Transmission delay	approx. 200 ns (equal to 40 meter bus length)	approx. 300 ns (equal to 60 meter bus length)	approx. 200 ns (equal to 40 meter bus length)	approx. 200 ns (equal to 40 meter bus length)	approx. 300 ns (equal to 60 meter bus length)
Temperature range	-20 °C ... +70 °C	-20 °C ... +70 °C	-20 °C ... +70 °C	-20 °C ... +70 °C	-20 °C bis +60 °C
Power supply	9-32 V DC, 1.5 W typ., via screw terminals	9-32 V DC, 3 W typ., via screw terminals	9-32 V DC, 1.5 W typ., via screw terminals	9-35 V DC, 1.5 W typ., via screw terminals	9-35 V DC, 3 W typ., via screw terminals
Certification	CE, FCC	CE, FCC	CE, FCC	CE	CE
Housing, dimensions	Plastic DIN rail housing, approx. 22.5 x 100 x 115 mm	Plastic DIN rail housing, approx. 22.5 x 100 x 115 mm	Plastic DIN rail housing, approx. 22.5 x 100 x 115 mm	Plastic DIN rail housing, approx. 110 x 75 x 22 mm	Plastic DIN rail housing, approx. 110 x 75 x 22 mm
Order number	1.01.0067.44010	F-SMA plug 1.01.0068.45010 ST plug 1.01.0068.46010	1.01.0067.44400 Option 3 kV, 3 min. 1.01.0067.44300	1.01.0064.44000 1.01.0064.46000	F-SMA plug 1.01.0063.01010 ST plug 1.01.0063.01020
Accessories	T bus connector 1.04.0073.00000	T bus connector 1.04.0073.00000			

As an extension to the CAN bridges, CAN gateways allow access to CAN networks via other communication systems. In each case, the protocols of the connected bus systems are mapped to the other communication model.

LIN2CAN

The LIN2CAN is an universal device for the analysis of LIN networks via the CAN bus and for emulation of LIN slave or master modules. In addition, the device can be used as a LIN-PC interface for PC-based configuration and monitoring software or computer-aided LIN device development.



Product	CANbridge	CAN@net II/Generic	CAN-GW100/RS232	CANblue II/Generic	LIN2CAN
Description	Configurable CAN/CAN bridge	CAN/Ethernet gateway with ASCII protocol and CAN-Ethernet-CAN bridge operation mode	RS232/CAN converter	CAN/Bluetooth gateway with ASCII protocol and CAN-Bluetooth-CAN bridge operation mode	Universal LIN/CAN gateway with four operation modes
Application field	Extension of the network dimension Network segmentation	CAN connection via Ethernet for Linux or embedded applications Network extension via CAN-Ethernet-CAN bridge	Connection of devices with RS232 interface to CAN/CANopen	Wireless CAN connection of Linux or embedded applications Flexible network connection via CAN-Bluetooth-CAN bridge	LIN/CAN GW as LIN Master/Slave: Transparent message transmission between CAN/LIN systems LIN Slave emulation: Via pre defined transmission table LIN Master/Slave emulation: Via pre defined schedule/transmission lists LIN PC interface
Functionality	Message filtering Identifier conversion Baudrate conversion	Message filtering	CAN/CANopen operation mode	Message filtering	
Fieldbus interf.	2 x CAN	1 x CAN	1 x CAN	1 x CAN	2 x CAN; 1 x LIN
CAN bus interf.	2 x ISO 11898-2	ISO 11898-2	ISO 11898-2	ISO 11898-2	ISO 11898-2 / 11898-3, switchable
CAN connection	DIN rail version via screw terminals Alu version via Sub D9 plug acc. to CiA 303-1	Sub D9 plug according to CiA 303-1	Screw terminals	Sub D9 plug according to CiA 303-1	Sub D9 plug according to CiA 303-1
Further interfaces	RS232 for the device configuration	10/100 Mbit/s Ethernet, auto negotiation, auto crossover, RJ45 plug	RS232 (600 to 115200 Bit/s), handshake	Bluetooth spec. V2.1, Class 1 / +17 dBm	RS232 for device configuration and operation as PC interface
Galvanic isolation	optional	yes	optional	yes	-
LED indicators	Power, CAN, Serial	Power, CAN, Ethernet, CPU	Power, CAN, Serial	CAN, Bluetooth, Mode	-
Temp. range	-20 °C ... +70 °C	-20 °C ... +70 °C	-20 °C ... +70 °C	-40 °C ... +70 °C	-20 °C ... +70 °C
Power supply	9-36 V, 1.5 W	9-32 V DC, 3 W	9-36 V, 1.5 W	9 - 30 V DC, 0.6 W	Automotive: 7 V ... 16 V DC, 1.5 W Industrial: 10 V ... 32 V DC, 1.5 W
Housing, dimensions	DIN rail housing approx. 110 x 75 x 22 mm Aluminum housing approx. 100 x 85 x 32 mm	DIN rail housing approx. 22.5 x 100 x 115 mm	DIN rail housing approx. 110 x 75 x 22 mm	approx. 82 x 64 x 26 mm	Aluminum housing approx. 100 x 85 x 32 mm
Configuration software	9x/Me/NT/2000/XP/Vista/Win7	Via integrated web server	9x/Me/NT/2000/XP/Vista/Win7	-	2000/XP/Vista
Certification	CE	CE, FCC, CSA/UL	CE	CE, FCC	CE
Order number	1.01.0121.xxxxx 1.01.0120.22020	1.01.0086.10201	1.01.0033.xxxxx	1.01.0126.00001	Automotive 1.01.0130.00000 Industrial 1.01.0130.91000

Analysis and diagnostic tools

for testing and optimizing system availability and system performance

The IXXAT analysis and diagnostic tools enable a fast and detailed insight into the system to be analyzed. CAN analysis tools are used for testing and simulation of individual network devices and as a tool to analyze complete networks during the development, start up, service and maintenance phases of a CAN network.

canAnalyser and multibusAnalyser

The canAnalyser and the multibusAnalyser are powerful, versatile tools for development, testing and maintenance of CAN and FlexRay networks. The software packages are based on a modular concept and employ special features that offer exceptional openness and extensibility.

In the standard version, the analysers offer functions covering many areas of application, such as transmission of individual messages and sequences, reception and interpretation of messages and display of statistical data.

Additional functions are provided by optional modules for the canAnalyser, such as the protocol-

specific display of messages, e.g. in J1939 based systems. Customized functions can be easily integrated via an open .NET programming interface in the form of individual modules.

An integral part of the canAnalyser is the interpretation of messages based on a database. With this, each message can be allocated a name and the signals transmitted in the data field can be broken down, interpreted and displayed as physical parameters.

The canAnalyser also processes the widely used CANdb format. The MultibusAnalyser supports the FIBEX standard.

In addition, the main file formats for data stream logging are supported, so that data exchange can be carried out with other analysis and simulation tools.

The canAnalyser is based on the VCI driver from IXXAT and can be used with all CAN interfaces offered by IXXAT.

Bus access of the multibusAnalyser can be provided by the universal FRC-EP150 FlexRay/CAN interface or the low cost FR-IB 100/PCIe FlexRay card from IXXAT.

Diagnostic tools

By using IXXAT diagnostic tools, CAN systems can be analyzed and evaluated in operation and during installation. The tools allow long-term recording of the transmitted data and errors as well as detection of signal, transmission and wiring errors.

Based on the analysis results, quick and easy localization and elimination of errors are enabled or an existing system can be optimized to achieve higher reliability.

The CANcorder MMC allows specific logging of CAN messages in stationary or mobile systems over long periods in order to evaluate them later with the aid of an analysis tool at the workplace or with a notebook. The device has powerful filter and trigger functions.

The CANcheck is a mobile, robust handheld device offered by IXXAT for maintenance and commissioning CAN systems. With this tool the wiring, the line length and the termination resistors as well as the quality of the transmitted signals can be tested.

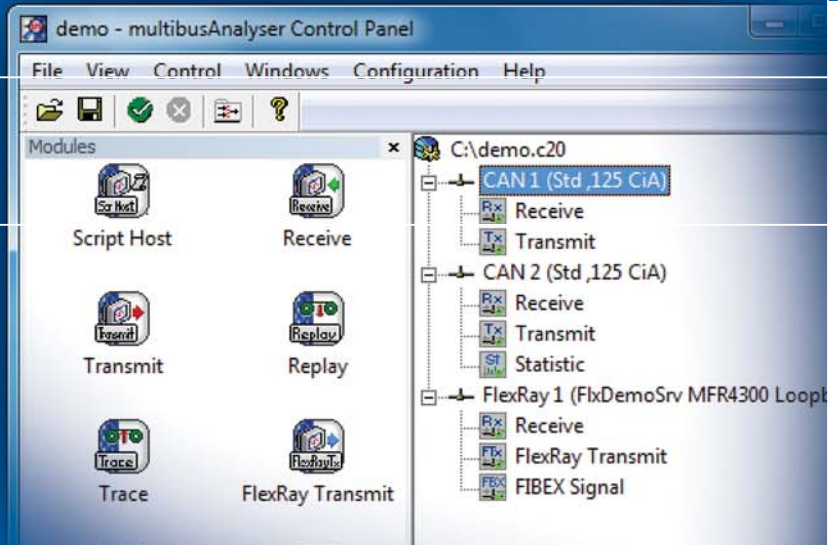
Product	canAnalyser	canAnalyser lite	CANopen Module	DeviceNet Module	SAE J1939 Module
Description	PC based analyzing tool for CAN systems	PC based analyzing tool for CAN systems	CANopen extension for canAnalyser /-lite	DeviceNet extension for canAnalyser /-lite	SAE J1939 extension for canAnalyser /-lite
Included functions/modules	- Reception, Transmission, Trace module - Graphic, Signal, Statistic module - Sequencer module - Programming interface - Scripting host	- Reception, Transmission, Trace module - Statistic module - Sequencer module	Interpretation and display of CAN messages in accordance with the CANopen standard (CiA 301, ...)	Interpretation and display of CAN messages in accordance with the DeviceNet standard	Interpretation and display of CAN messages in accordance with the SAE J1939 standard
Features	Online monitoring of bus traffic Transmission of single-shot or cyclic messages and message sequences Recording of CAN messages with configurable trigger conditions Statistical analysis Creation of command controlled message sequences Graphical signal presentation Multi-line mode, multiple module instances Open programming interface Scripting host	Online monitoring of bus traffic Transmission of single-shot or cyclic messages and message sequences Recording of CAN messages with configurable trigger conditions Statistical analysis Detection/presentation of the bus load Creation of command controlled message sequences	Message display in scroll or overwrite mode Configurable display color Import of EDS, DCF, XDD files Change highlighting and receive statistics Filtering by node number and message type Interpretation of the LSS protocol and the Flying Master Protocol	Message display in scroll or overwrite mode Configuration of explicit and fragmented connections Evaluation and monitoring of the fragmentation protocol with message-wise or fragment presentation Filtering by Message Group, Message ID, MAC ID and message type	Message display in scroll or overwrite mode Interpretation of application, diagnosis and connection management messages Filtering by PGN (Parameter Group Number) destination and source address Export and import of the module configuration and filter settings
Supported operating systems	2000/XP/Vista/Windows 7	2000/XP/Vista/Windows 7	2000/XP/Vista/Windows 7	2000/XP/Vista/Windows 7	2000/XP/Vista/Windows 7
Order number	1.02.0133.00000	1.02.0166.00000	1.02.0145.00000	1.02.0148.00000	1.02.0149.00000

Operation of the device is intuitive via testing processes controlled by a display and keypad. All test results can be saved and printed out on the PC for logging.

The CANcheck comes with calibration documents and therefore can be used as test equipment for manufacturing and assembly according to ISO 9001.

The CAN-Bus-Tester (CBT) and the CANobserver enable detailed analysis of the signals and of the transmission errors occurring in the CAN systems. The CBT is connected to the PC via USB and operated with a Windows program. The software enables online analysis with numerous test functions.

The CANobserver is permanently integrated in the system to be tested and monitors it automatically. The device saves all error occurrences in the internal memory, so sporadic bus impairments and a slowly deteriorating signal quality can be detected over time.



Product	CANcorder MMC + Remote Control	CANcheck	CAN-Bus-Tester (CBT)	CANobserver
Description	Stand-alone data logger for CAN systems for long-term data recording	Hand-held installation tester for CAN systems for commissioning, troubleshooting and maintenance	Powerful tool for the CAN bus physics and protocol analysis	Long-term monitoring and recording of faults and early failure reporting
Functionality	Recording of data, error, remote frames Storage in ASCII, can-Analyser, CANalyzer and CSV format Config. start/stop and filter function CANdb import Sending of predefined messages 4 MB memory, expandable via SD/MMC card Config. sleep mode SMS transmission and remote access via GSM	Test of wiring, terminators, cable length, impedance Measurement of signal level and bus load Determination of the transmitted identifiers and display of reception frequency Display of error frames per time unit Autom. baudrate detection Operation via LCD display and keypad CANopen mode: Display according to node number Storage of measurement results and transm. via USB	Analysis of the signal quality (levels, slopes, faults) Integrated oscilloscope Powerful trigger functions Monitoring of bus status, bus load, error messages Wiring test Integrated monitor for transmission/reception Automatic baudrate detection Creation of inspection reports	Physical monitoring (noise voltage, edges) Logical monitoring (active/passive error frames, overload frames, acknowledge error) Control center access via SNMP Error notification by e-mail Service without a PC, continuous recording Export of results in XML format for processing with the CAN Bus Tester 2
Display	LEDs for status and configuration	LCD display with backlight	-	LEDs for signal quality, errors, bus load, status
Fieldbus interf.	2 x CAN	1 x CAN	1 x CAN	1 x CAN
CAN bus interface	2 x ISO 11898-2 opt. 1 x ISO 11898-3	1 x ISO 11898-2	ISO 11898-2	ISO 11898-2
CAN connection	Sub D9 plug according to CiA 303-1	Sub D9 plug according to CiA 303-1	Sub D9 plug according to CiA 303-1 as well as various adapter cables	Sub D9 plug according to CiA 303-1 or screw terminals
Further interfaces	Digital input (TTL, 5 V) and digital output (TTL, 5 V)	USB 2.0 for PC based control and message download	USB 2.0 for PC connection; BNC trigger output for the oscilloscope	Ethernet for configuration and download; Programmable error outputs
Galvanic isolation	optional	-	-	-
Temp. range	-20 °C ... +80 °C	0 °C ... +50 °C	+5 °C ... +40 °C	+5 °C ... +40 °C
Power supply	7 - 50 V DC	4 x 1.5 V AA battery or USB	9 - 36 V DC; Power supply included	9 - 36 V DC
Housing, dimensions	approx. 165 x 85 x 32 mm	approx. 116 x 160 x 34 mm	approx. 40 x 134 x 170 mm	approx. 125 x 50 x 124 mm
SW for operation and configuration	For 9x/Me/NT/2000/XP/Vista	Via terminal program	Win XP/Server2003/ Vista & Win7 (32/64 Bit)	Via integrated web server
Order number	1.01.0096.XXXXX (also for rental)	1.01.0097.00000 (also for rental)	1.04.0402.00000 (also for rental)	1.04.0410.00000
Accessories	1.01.0081.00000 Cable remote control		Add-ons for higher layer protocols and monitor	



multibusAnalyser

PC based analyzing tool for FlexRay and CAN systems

- Reception, Transmission, Trace module
- Graphic, Signal, Statistic module
- Sequencer module
- Programming interface
- Scripting host

Online monitoring of bus traffic

Transmission of messages

Recording of FlexRay and CAN messages with configurable trigger conditions

Statistical analysis

Graphical signal presentation

Multi-line mode, multiple module instances

Open programming interface

Scripting host

2000/XP/Vista/Windows 7

1.02.0241.00000

FlexRay

Real-time residual bus simulation and gateway solutions

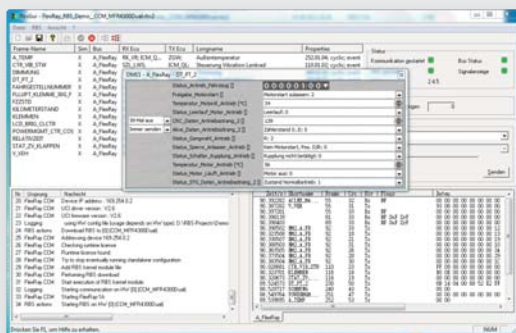
Residual bus simulation for FlexRay and CAN systems

The residual bus simulation provides a simulation environment for one or more control devices that can be tested independently of other nodes. This includes the generation of the message traffic that is necessary for the device to be tested and the reaction to messages transmitted by the control devices under test.

The residual bus simulation is based on the description of the communication network via a Fibex file. The Fibex file is imported and analyzed by the IXXAT RBS configuration software. With a few logically consecutive steps, the user can then graphically configure the required residual bus simulation.

To run the residual bus simulation, the IXXAT software generates a specific C-Code including possible signal-specific CRCs or Alive counters. This code is loaded to the FRC-EP150 and started there. As the C-code is translated via the integrated cross-compiler into a file which can be run on the FRC-EP150, it is executed in real-time without the PC.

In addition, it is possible to extend the code with user-specific program elements within pre-generated "user code skeletons". It is, therefore, possible to react to specific signals and, if required, send a message on the bus in the same cycle.



RBS Configuration Tool

Easy stimulation of signals is possible via integrated signal panels specifically generated for each RBS. Here the required values can be entered in physical form or - in the case of enumerated values - selected from a menu. Automated control of the RBS is also possible via an additional gateway application or via Ethernet.

XCPonEthernet

With the XCPonEthernet extension it is possible to control the residual bus simulation via a standardized protocol or to evaluate communication data. For this purpose, all signals of the Fibex file are compiled in an A2L file. This A2L file can then be imported from other commercial software solutions. An extension of existing logger solutions with further FlexRay and CAN interfaces is equally as possible as the defined stimulation of transmission signals at a physical level.

HiL signal manipulation

Based on a FlexRay/CAN residual bus simulation, it is possible to manipulate the signals transmitted by the RBS in a defined way. This includes on/off switching of signals for a defined time or number of cycles, transmission of defined substitute values for switched off signals and the defined corruption of CRCs and Alive counters for all signals transmitted by the RBS. The signal manipulation can be controlled via user code, the Gateway or the XCPonEthernet standard.

FlexRay/CAN/Ethernet gateway

With the gateway configurator software, gateway solutions can be implemented quickly and easily. The software is available in two different versions and for different hardware platforms. All versions can be configured very easily via drag&drop and can run stand-alone on the target platform.

In the simplest and free available version, the gateway configurator can be used for the configuration of pure CAN/CAN gateways. Configuration can be carried out on the basis of existing CANdb bus description files or manually. Mapping of messages of a source bus to a target bus is carried out via drag&drop on the graphical interface of the gateway configuration software. The configuration thus created can be loaded to the IXXAT CAN-bridge or the FRC-EP150 and can be executed stand-alone.

For complex gateways, a licensed version of the configuration software is required that also enables creation of signal-based FlexRay/CAN gateways. This is based on an IXXAT FlexRay residual bus simulation, which is responsible for the transmission of data with corresponding CRCs and Alive counters in time.

Mapping is carried out by drag&drop, as with the CAN/CAN gateway. With the signal-based gateway it is possible to combine signals of various source messages to form a target message. Transmit triggers and possible signal default values can be freely selected.

If the signal description of the source and target signal do not match (conversion of raw value to physical value), an automatic signal transforma-

tion is generated as an option and integrated into the gateway. This ensures that the signal interpretation of the source and target signal is identical.

Signal-based gateways will run on the FRC-EP150 as target hardware. In addition to the FlexRay and CAN interfaces physically available in the device, it is also possible to define up to 16 "virtual CANs on Ethernet". The protocol of the IXXAT CAN@net is used here, which allows reception and transmission of CAN messages from and to 16 different IP addresses.

The stimulation, for example by test bench computers, can therefore be implemented directly on Ethernet via the simple CAN@net ASCII protocol, or a new conversion to CAN can be made via connected CAN@net devices.

FRC-EP150 - Universal FlexRay/CAN embedded platform

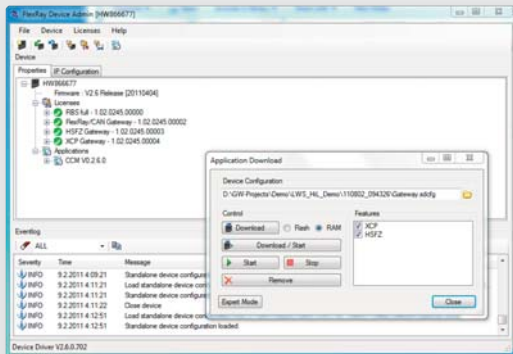
The FRC-EP150 is a powerful FlexRay/CAN platform for both PC-based and stand-alone applications. Due to the robust aluminum housing, the extended temperature range and high quality, self-locking plug connectors, the device is ideal for heavy-duty use in the test benches or vehicles. The device is connected to the PC via the integrated Ethernet interface. All interfaces are galvanically isolated from each other.

As a pure PC interface, the FRC-EP150 with its open PC interface is a measuring hardware for comprehensive analysis tasks in FlexRay and CAN networks. The FlexRay analysis is carried out both via the FlexRay protocol chip and via an asynchronous bit stream analysis. It is therefore also possible, in addition to the pure synchronous analysis, to log the start-up behavior of a FlexRay network. The accuracy of the time stamp is 100 ns for all interfaces.

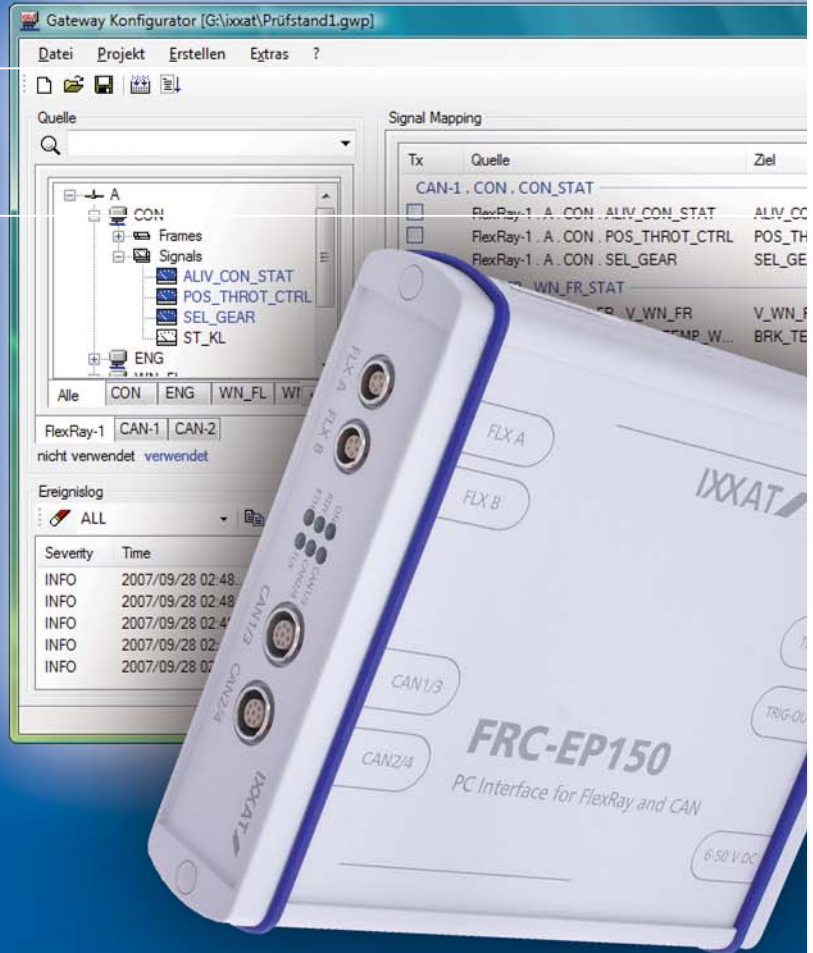
In stand-alone mode, the device is only configured with the relevant software and the application can then run without a PC. Saving the configuration to the non-volatile memory also enables self-starting of the required functionality after power-on.

The powerful microcontroller system of the FRC-EP 150 allows real-time-critical tasks to be carried out. In addition to the IXXAT applications, such as residual bus simulation or FlexRay/CAN/Ethernet gateway, customer-specific applications can be carried out.

The dual chip extension for the FRC-EP150 enables implementation of two FlexRay cold-start nodes on one hardware platform. The device can therefore also start FlexRay networks containing only integration nodes.



FlexRayDeviceAdmin Software Tool



The scope of supply of the FRC-EP150 includes the VCI-FlexRay Windows driver software, which provides the functions for configuration as well as receipt and transmission of FlexRay and CAN messages. Users can easily develop their own applications based on the driver. The scope of supply also includes the FlexRayDeviceAdmin tool for carrying out software updates, administration of IP addresses, maintenance of runtime licenses and download of stand-alone applications.

As an alternative to the FRC-EP150, IXXAT also offers the FR-IB100 interface for purely PC-based FlexRay analysis (see PC interfaces).

Product	FRC-EP150
Description	Embedded platform for FlexRay and CAN
Field of application	Host for IXXAT applications: Residual bus simulation, FlexRay/CAN/Ethernet gateway, XCPonEthernet, HiL signal manipulation Analysis of the FlexRay start-up behavior (asynchronous analysis mode), e.g. with IXXAT multibusAnalyser Measurement hardware for customer specific analysis and configuration applications
PC connection	Ethernet 10/100 MBit/s
Interfaces	2 x FlexRay, each with 10 MBit/s 4 x CAN - 2 x ISO/IS 11898-2 - 2 x ISO/IS 11898-2 Et 11898-3, switchable via SW 4 x Trigger output 2 x Trigger input
FlexRay protocol chip/bus connection	Freescale MFR4310 Philips TJA 1080
Microcontroller	MPC 866 with 130 MHz
Memory	64 MByte RAM, 32 MByte Flash
Temperature range	-40 °C ... +70 °C
Power supply	6.5 ... 50 V DC; 400 mA typ. at 12 V
Dimensions	158 x 140 x 36 mm
Order number	FRC-EP150: 1.01.0102.00011 FRC-EP150 [MFR4310 Dual-Chip]: 1.01.0102.00014 RBS Runtime Full License: 1.02.0245.00000 GW Runtime License Bundle: 1.02.0245.00005 FlexRay Runtime License: 1.02.0245.00006 XCP Runtime License: 1.02.0245.00008 IEEE1588-V1 Runtime License: 1.02.0245.00009

Product	Residual Bus Simulation for FlexRay/CAN	FlexRay/CAN/Ethernet Gateway
Description	Residual bus simulation for FlexRay and CAN systems based on the FRC-EP150 hardware platform	Universal configurable tool for the FlexRay/CAN message conversion based on the FRC-EP150 or CANbridge hardware platform
Features	Generation of FlexRay and CAN messages as well as reaction to messages received Provision of a cold starter node for starting up a FlexRay system PC controlled and stand alone operation Easy configuration based on FIBEX file data Signal manipulation for all signals transmitted by the RBS Stimulation via XCPonETHERNET and commercial third-party software	Message conversion between FlexRay, CAN and Ethernet Creation and download of the configuration via Windows gateway configuration tool Easy allocation of signals from the source to the target bus via drag & drop, optional based on a Fibex or CANdb bus description file Automatic signal conversion (optional) Automatic plausibility and consistency check of the configuration Configuration download also via FlexRayDeviceAdmin
Order number	FlexRay Residual Bus Simulation 1.02.0243.00000 FlexRay and CAN Residual Bus Simulation 1.02.0243.00002 On the target device a corresponding runtime license is required	FlexRay/CAN Gateway Configuration Tool 1.02.0244.00000 On the target device a corresponding runtime license is required

Automotive Test Platform

Universal embedded platform for the implementation of specific software

The Automotive Test Platform (ATP) is a powerful hardware platform with interfaces for all common fieldbus systems. It is designed for customers who intend to develop specific application software for the automotive sector but do not have the relevant target hardware.

The Automotive Test Platform is based on a dual processor architecture. The fieldbus controller is pre-configured and represents the interface to the supported field buses. The customer specific application runs on the main processor. The user access to the fieldbus controller is mapped via a well-documented API supplied with the platform. The API provides all necessary functions for communicating via the various buses, I/O interfaces and system functions. In addition to functions for initialization, starting and stopping an interface, functions are also available for transmitting and receiving data.

Programming environment

Optionally, a software development kit is provided for the ATP. This extends the Microsoft Visual Studio development environment for the software development of applications on the ATP. Beside that, part of the contents of delivery are also further tools which - for example - ensure the synchronization with the PC.

Application development

Customer applications are implemented on the main processor using Windows CE in C, C++ or C#. For the application development Microsoft Visual Studio is used. For test purposes, the code is transparently loaded to the target hardware, and can then be tested with the integrated high-level language debugger. After testing, the program can be stored on the compact flash card and is available for every start-up.

FlexRay support

As standard, the ATP has an integrated FlexRay controller. It is therefore possible to receive and send FlexRay data parallel to CAN via the API. The integrated time-stamping with a resolution of 1 µs allows a precise, time-based comparison of messages on various buses. An additional runtime license is required in order to execute a FlexRay application on the device.

Diagnostic and transport protocols

As an option, fully programmed diagnostic and transport protocols can be purchased for the ATP. These are supplied as loadable DLLs and can be used by the customer's own application. It is possible

to use higher protocols for communicating with the control units without the need for detailed knowledge of the protocols. The execution of the optional protocol is enabled by additional run-time licenses.

Serial production

After successful completion of the application, IXXAT also offers adaptation or reduction of the ATP design to specific customer requirements in the context of customized development.

Development services

IXXAT offers software development services that can adapt the standard software to fit specific requirements. The resulting code is forwarded to the customer with documentation for subsequent modification.

Product	Automotive Test Platform
Description	Universal embedded platform for implementation of specific software
Interfaces	<ul style="list-style-type: none"> - USB host and PC interface - 10/100Base-T Ethernet - 4 x CAN high-speed interface ISO 11898-2 - FlexRay interface with two channels (A/B) - 2 x LIN interface (Slave) - K-Line - 2 x RS232 - 4 x Analog input, 10 Bit, 0-5 V - 4 x Analog output, 10 Bit, 0-5 V - Real-time clock (with battery)
Supported protocols	Optional available protocols: TP2.0 (CAN), ISO 15765-2 (CAN), ISO 14230-2 (K-Line), KWP2000, UDS, CCP (CAN)
Operating system	WinCE
Microcontroller	Main CPU: Marvell XScale PXA270, 520 MHz
Memory	32 MByte Flash, 64 MByte SDRAM Internal compact Flash card with 512 MByte
Display	7" graphic display, TFT 16:9, 800x480 pixels with touch-panel (ATP standard only)
Temperature range	-20 °C ... +70 °C
Power supply	6.5-40 V DC; 300 mA typ. at 24 V
Dimensions	220 x 160 x 40 mm
Order number	ATP Basic (without Display) 1.01.0010.00000 ATP Standard (with Display) 1.01.0010.00001 ATP Software Development Kit 1.02.0247.00000 Runtime Licenses: FlexRay: 1.02.0246.00100 ISO 15765: 1.02.0246.00000 ISO 14230: 1.02.0246.00001



SAE J1939

Protocol Software, Tools, Windows API

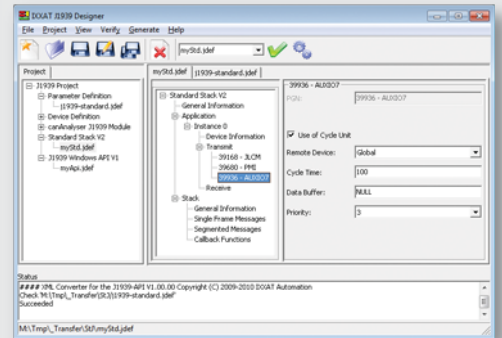
IXXAT offers a comprehensive, cost-effective tool chain for SAE J1939 applications. This ranges from the protocol software, analysis and configuration tools to the Windows API based test destination device.

Thanks to a central definition of all relevant parameters based on a database, header files can be generated for the protocol software and configuration files for the Windows API of the canAnalyser. This avoids errors due to inconsistent data.

Protocol software

With the cross-platform **SAE J1939 Protocol Software**, combined with the J1939 CAN driver, J1939 devices can quickly and easily be developed. The software is available in three variants: "Micro" for 8-bit systems, "Single Channel" for solutions with one CAN channel and "Multi Channel" for solutions with more than one channel.

The **SAE J1939 CAN Driver** serves as the basis for the J1939 protocol software (single/multi channel) and also contains the abstraction modules for the CPU and operating system. The driver is available for various CAN controllers.



SAE J1939 Designer

Tools and APIs

With the **SAE J1939 Designer** IXXAT offers an editor and code generator for J1939 projects. It is used to produce J1939 network descriptions and to generate code and configuration files for the various IXXAT J1939 products. The Designer is available for Windows and Linux.

The **SAE J1939 API** is a Windows DLL, based on the IXXAT J1939 protocol software for the development of SAE J1939 service and test applications. The DLL offers convenient interfaces at the signal level for the development of applications in C/C++ or Python.

Product	SAE J1939 Protocol Software	SAE J1939 API for Windows	SAE J1939 Designer
Description	Software package for the development of J1939 devices	DLL for the development of J1939 service and test applications	Editor and code generator for J1939 projects
Included functions	Transmission and reception of application specific messages (confirmed and unconfirmed) Processing of the J1939 transport protocols for large data blocks (message/node oriented) Simultaneous communication with multiple nodes Support of the "address claiming" procedure Cyclical transmission and reception of messages with timeout monitoring Optional: - ISO 15765-2 extension - NMEA2000 extension - J1939 CAN driver	Supports all the features of the protocol software Automatic conversion of received messages into signals and vice versa Use of the J1939 designer data base for signal interpretation Supports multiple CAN channels and therefore also J1939 networks	Definition of parameters (SPNs), messages (PGNs) and devices Configuration of the J1939 protocol software (generation of H- and C-files) Configuration of the J1939 API for Windows Configuration of the J1939 canAnalyser module Storage of the configuration as XML file
Order number	Single Channel Version 1.02.0351.00000 Multi Channel Version 1.02.0351.00001 Micro Version 1.02.0286.TTDDC J1939 CAN Driver 1.02.0350.00TTT ISO 15765-2 Extension 1.02.0352.00000 NMEA2000 Extension 1.02.0353.00000 Diagnostics Extension (J1939-73): 1.02.0354.00000	1.02.0287.00000	J1939 Designer for Windows 1.02.0360.00000 J1939 Designer for Linux 1.02.0360.00001

CANio 500

Universal I/O gateway for CAN and CANopen systems

The CANio 500 enables the quick and easy connection of analog and digital input and output signals to CAN and CANopen systems – whether in experimental setups, test benches or vehicles.

A key feature of the CANio 500 are the inputs and outputs for digital and analog signals, which can be configured very flexibly. At this, the analog interfaces do have a 12 bit resolution.

A special focus, during the development of the CANio 500, was the device operability within CANopen and also standard CAN systems. For this reason, the CANio 500 was designed as a self-starting CANopen slave, with all important parameters, such as Node-ID, sampling rates for the analog inputs or voltage range of the analog outputs, stored as default values on the device. This enables the device to operate directly after start up without further settings in accordance with basic CAN operation.

The individual configuration of the CANio 500 for different applications can be done either by loading configuration data via a CANopen master or by sending configuration messages in a pure CAN network or offline via the free CANio 500 configuration tool. Configurations that have been created with the CANio 500 configuration tool can be saved as a project and on customer request preinstalled on ordered devices before delivery.

CANio 500 ADK

For the simple development of customized applications on the CANio 500

As a standard product, the CANio 500 represents an I/O gateway implementation in which the analog and digital inputs/outputs can be queried or triggered via CAN messages.

The Application Development Kit enables creation of custom device applications with customer-specific functionality in the C programming language. Industrial controls or vehicle control devices can

therefore be simply implemented without own hardware.

The CANio 500 ADK contains all drivers required for communication via the CAN bus and for triggering the various inputs and outputs, which allows development of custom applications even without specific hardware know-how.

The drivers are delivered as a binary library together with a comprehensive C-source demo application. The demo application demonstrates use of the various functions and can be very easily extended according to individual requirements. As development platform an evaluation kit of the CANio 500 is included in the scope of supply.

Together with a development environment, available for free, and a low-cost hardware debugging solution, custom applications can thus be created, uploaded to the target and verified. On completion of the test and verification phase, the application can be uploaded to standard CANio 500 devices. This is carried out via the CAN bus with the aid of the CANio 500 configuration tool and the bootloader permanently installed on the devices.

We will also be pleased to develop adapted software solutions for customers based on the CANio 500. The custom software is delivered with documentation that allows further modification by the user.



Product

- CAN protocols
- CAN bus interface
- Galvanic CAN isolation
- Digital inputs
- Digital outputs
- Analog inputs
- Analog outputs
- Further interfaces

- Temperature range for operation
- Power supply
- Types of plugs
- Protection class
- Dimensions
- Order number

Product	CANio 500 Application Development Kit
Description	Package for the easy development of customized applications on the CANio 500
Content of delivery	CANio 500 evaluation kit I/O drivers, boot loader, demo application Programming manual The development environment and the debugger are not included in the scope of delivery
Order number	1.03.0098.00000

Further Products

*Solutions for test benches
and production automation*

IXXAT offers a wide range of solutions for CAN and real-time Ethernet in the industrial sector, including EtherCAT and CANopen.

Industrial Ethernet Module

The Industrial Ethernet Module (IEM) enables use of the main Industrial Ethernet protocols with the same hardware and application software. For this, the module is connected to the target device via its open hardware and software interfaces and then provides the complete communication layer. Therefore, the customer can easily map the application-specific functions in the target device. All communication functions are provided by the IEM.

Based on a powerful FPGA, the module provides all necessary components, including switch or hub and Ethernet connection.

Typical areas of application of the IEM are, for example, the integration of measurement nodes or actuators in an existing Ethernet system, whether used in an EtherCAT based test bench or a production line with PROFINET.

Due to the complete mapping of the communication layer, the IEM supports communication over a number of popular Industrial Ethernet standards such as EtherCAT, POWERLINK, EtherNet/IP, PROFINET and Modbus-TCP without changing the IEM hardware.

For development, IXXAT offers evaluation kits, which in addition to software and documentation also contain a carrier board and adapter boards for connection of various CPU modules. If the form factor of the Industrial Ethernet Module for integration into the customer's device does not fit, it is also offered as a design-in solution. In addition, IXXAT also offers complete customized solutions.

www.ixxat.com/iem

EtherCAT®

EtherCAT Master

IXXAT offers an EtherCAT Master software package for a wide variety of platforms enabling the development of controls in EtherCAT-based systems.

The EtherCAT Master software complies with ETG.1000 supporting CAN Application over EtherCAT (CoE), Ethernet over EtherCAT (EoE) and Distributed Clock (DC).



Industrial Ethernet Module

The EtherCAT Master Stack is specially optimized for operation in embedded operating systems (or real-time operating systems) and is characterized by its modular structure, its high performance with low CPU load and low memory requirement.

Due to the support of standard Ethernet controllers, no other special hardware is required. The interfaces of the individual modules are open, which means that sub-components can be easily replaced if required and adapted to the relevant requirements.

For Windows CE, VxWorks, On Time RTOS-32, QNX Neutrino RTOS and IntervalZero RTX, already adapted real-time-compatible variants are available, which can be implemented quickly and easily. Versions for Windows XP and Linux are also available.

If necessary, the EtherCAT Master Stack can be easily ported to any embedded operating system. If required, IXXAT offers implementation and adaptation as a service.

EtherCAT Analyser

The EtherCAT Analyser enables optimization of the system functions – comparable with the IXXAT Analysers for CAN and FlexRay. Due to the use of the EtherCAT Analyser it is possible to ensure that your EtherCAT system is operated continuously and with optimum efficiency.

EtherCAT Slave Test Center (AT-STC)

The EtherCAT Slave Test Center is aimed mainly at the vendors of EtherCAT Slave devices for carrying out tests. The AT-STC is used typically during the development of the Slave software and for quality assurance in production.

www.ixxat.com/ethercat

...continued on page 16



CANio 500
I/O - to - CAN - Gateway

CANio 500
CAN, CANopen
ISO 11898-2
yes (500 V DC)
4 x + clamp 15 (between 0 ... 60 V, threshold at 50 %)
4 x, max. 1 Ampere, output voltage free selectable, up to 34 V
4 x, 12 bit resolution +/- 5 V, or 0-10 V, or +/- 100 mA
4 x, 12 bit resolution +/- 5 V, or +/- 10 V, or 0-5 V, or 0-10 V, switchable via software
- 2 LEDs
- Measurement of the power supply
-40 °C to +70 °C
6-32 V
CAN: D-SUB-9; I/O: D-SUB-HD15
IP42
120 x 82 x 32 mm
Version with 0 to 10 V analog inputs 1.01.0098.00000
Version with -5 bis +5 V analog inputs 1.01.0098.00001
Version with +/- 100 mA analog inputs 1.01.0098.00002

CAN Accessories

Termination Resistors and Cables

As accessories for the CAN products, IXXAT offers termination resistors of various designs, cables for the connection of nodes, adapter cables as well as glass fiber cables for use in combination with IXXAT glass fiber repeaters.

Further Products

from page 15...

CANopen

CANopen Protocol Software

For CANopen-based systems, IXXAT offers various CANopen protocol software packages optimized for the individual requirements, which enable quick and easy development of CANopen Slave, Master or Manager devices.

The software packages are available for a large number of different microcontroller systems in adapted versions, further platforms are available on request.

The functional scope of the CANopen software complies with the CANopen specification CiA 301. In addition, the status displays are supported according to CiA 303-3 and the Layer Setting Services according to CiA 305.

Specially designed for use in embedded systems, the software has a modular structure with comprehensive configuration and scaling options and is highly efficient with minimum resource requirements.

CANopen Master API

The CANopen Master API is a Windows-based software that enables users to develop CANopen Master applications.

The application is provided with CANopen Slave data via a functional interface that allows direct access to the CANopen Slave devices and their object directories. Both sophisticated control programs as well as service and test applications can be very quickly implemented using the CANopen Master API.

www.ixxat.com/canopen

Additional information about Ethernet and CANopen solutions is available in the IXXAT catalog "Industrial Communication Solutions" or at www.ixxat.com or call IXXAT for assistance with your application.



Product	Sub-D9 Connector with Termination	CAN Termination	CAN Termination
Plug/Sockets	Sub D9 Male/Female	Sub D9 male	Sub D9 female
Termination	120 Ohm	120 Ohm	120 Ohm
Dimensions			
Further information			
Order number	1.04.0075.03000	1.04.0075.02000	1.04.0075.01000







* Customer specific length on request.

FlexRay Accessorie

Cables for the FRC-EP150








Product	FlexRay Y Cable	FlexRay 1:1 Cable	CAN 1:1 Cable
Plug/Sockets	Lemo plug (5 pins, type FGB.0B.305) to Sub-D9 socket and Sub-D9 plug	Lemo plug (5 pins, type FGB.0B.305) to Sub-D9 socket	Lemo plug (8 pins, type FGC.1B.308) to Sub-D9 plug
Dimensions	2 m	2 m	1 m / 3 m
Temperature range	-40 °C ... +85 °C	-40 °C ... +85 °C	-40 °C ... +85 °C
Order number	1.04.0092.00001 With open ends 1.04.0092.00011	1.04.0092.00000 With open ends 1.04.0092.00010	1 m cable length 1.04.0093.00000 3 m cable length 1.04.0093.00003

					
CAN Cable	CAN Adapter Cable	CAN Y Cable	T-Bus Connector	Glass Fiber Cable F-SMA	Glass Fiber Cable ST
Sub D9 male to female	RJ45 plug to SUB D9 plug	Sub D9 socket to socket/plug		F-SMA; Preassembled with two plugs per side	ST; Preassembled with two plugs per side
-	-				
2 m	20 cm	22 cm		2 m *	2 m *
1-to-1 connection with shielding	Set of two cables	1-to-1 connection	T-Bus connector for creating star couplers in conjunction with the IXXAT CAN repeaters	Duplex cable; Wave length 820 nm; Glass fiber 50/125 µm; Attenuation 3 dB/km	Duplex cable; Wave length 820 nm; Glass fiber 50/125 µm; Attenuation 3 dB/km
1.04.0076.00180	1.04.0074.01000	1.04.0076.00001	1.04.0073.00000	1.04.0003.01012	1.04.0003.01022

S

New

				
CAN T Cable	Trigger Cable	Trigger Cable	Ethernet Cross Cable	Power Cable
Lemo plug (8 pins, type FGC.1B.308) to two Sub-D9 plugs	Lemo plug (8 pins, type FGB.1B.308) to 4 BNC plugs	Lemo plug (8 pins, type FGB.1B.308) to 5 banana plugs	Lemo plug (8 pins, type FGG.1B.308) to RJ45 plug	Lemo socket (2 pins, type FGJ.1B.302) to two 4 mm banana plugs
1 m	2 m	2 m	3 m	2 m
-40 °C ... +85 °C	-	-	Flexible -5 °C ... +40 °C Mounted -40 °C ... +70 °C	-40 °C ... +85 °C
1.04.0093.00001	1.04.0094.00000	1.04.0094.00001	1.04.0090.00000	1.04.0091.00000

Engineering Services

We support you in all phases of your development

For well over twenty years, development services have been an important part of IXXAT's activities. More than 80 % of our 80 employees are electronics engineers and computer scientists. About half of our development engineers support our customer projects with their experience.

IXXAT offers services in all phases of development. This begins with the definition phase of products or systems. As a discussion partner, IXXAT is available to produce studies, to develop concepts and requirement specifications and to review your requirements with regard to the most suitable technologies.

Especially at system solutions with specific requirements in the field of data communication our know-how ensures to get the best solution with maximum investment protection. In the implementation phase, IXXAT develops hardware and software for embedded systems and PCs from scratch or from modified versions of existing IXXAT designs. In the test phase, IXXAT is able to define and perform tests.

Our range of services

- Customized OEM hardware (e.g. gateways, interface modules, embedded computer systems)
- Embedded software (e.g. drivers, protocol software, application software)
- Devices and systems for test and service
- Analysis and configuration applications

Project Examples

AZG3000

Test and diagnosis device for testing vehicle control units with CAN-, K-Line and FlexRay interface

According to the requirements of a leading automotive supplier, IXXAT developed a universal testing device used in the fields of development, testing and service as well as functional testing and debugging in vehicles or test benches.

Based on a graphic touch screen, the device employed an easy-to-use user interface. The device supports a variety of functions, such as the reading of ECU fault memory, display and output of configurable metrics, reading and writing of ECU parameters as well as CAN monitor functions.

In addition to the development and testing, IXXAT furthermore manufactures and maintains the product.

DPA 05

With the DPA 05, IXXAT developed a universal gateway for a leading manufacturer of commercial vehicles that is used in various forms for the diagnosis in commercial vehicles.

The DPA 05 employs a variety of interfaces such as CAN, ISO 9141 (K-Line and L-Line), J1708, USB 2.0, RS232, digital inputs and outputs as well as analog inputs. A boot loader is used to easily update the firmware and thus to individually adapt the device to new requirements.

IXXAT manufactures and provides long-term maintenance of this product for the customer.

CANopen/SAE J1939 interface for joystick

For a manufacturer of joysticks used for the control of special vehicles, IXXAT developed an interface providing a CANopen and J1939 connection for the devices. The necessary hardware and software were specified and developed by IXXAT. Besides the microprocessor board, an additional I/O board provides a variable number of digital and analog I/Os, which enable customer-specific modifications of the joystick handle with additional control elements.

FlexRay/CAN Gateway

Based on the FlexRay/CAN gateway solution, IXXAT adapted a gateway configuration especially for use in test benches for a tier-one automotive supplier.

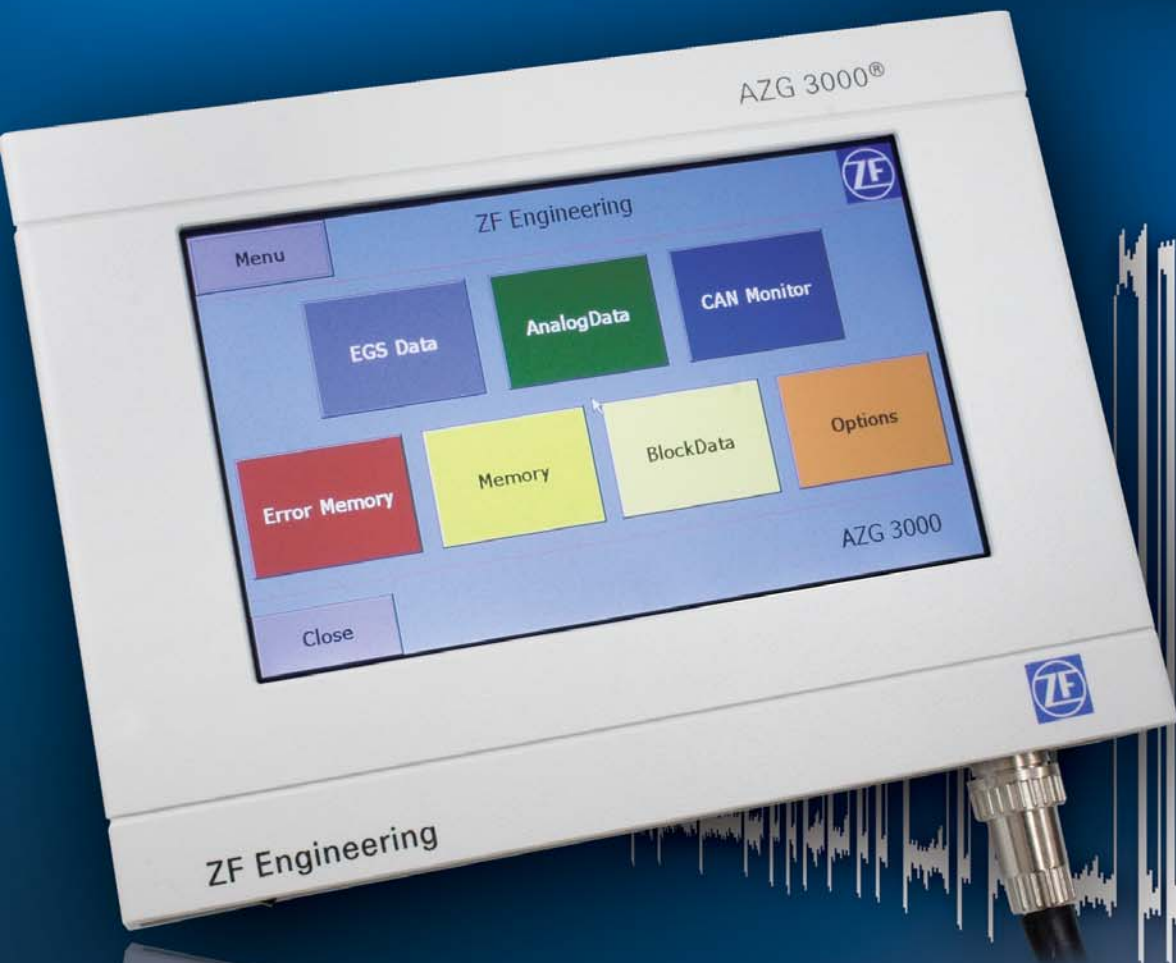
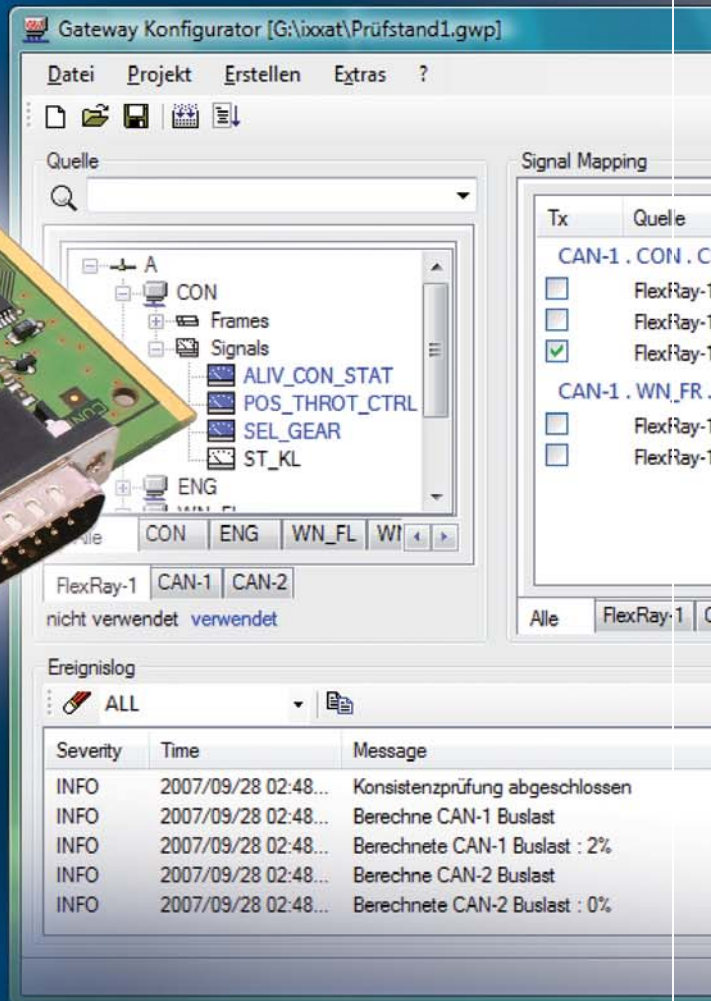
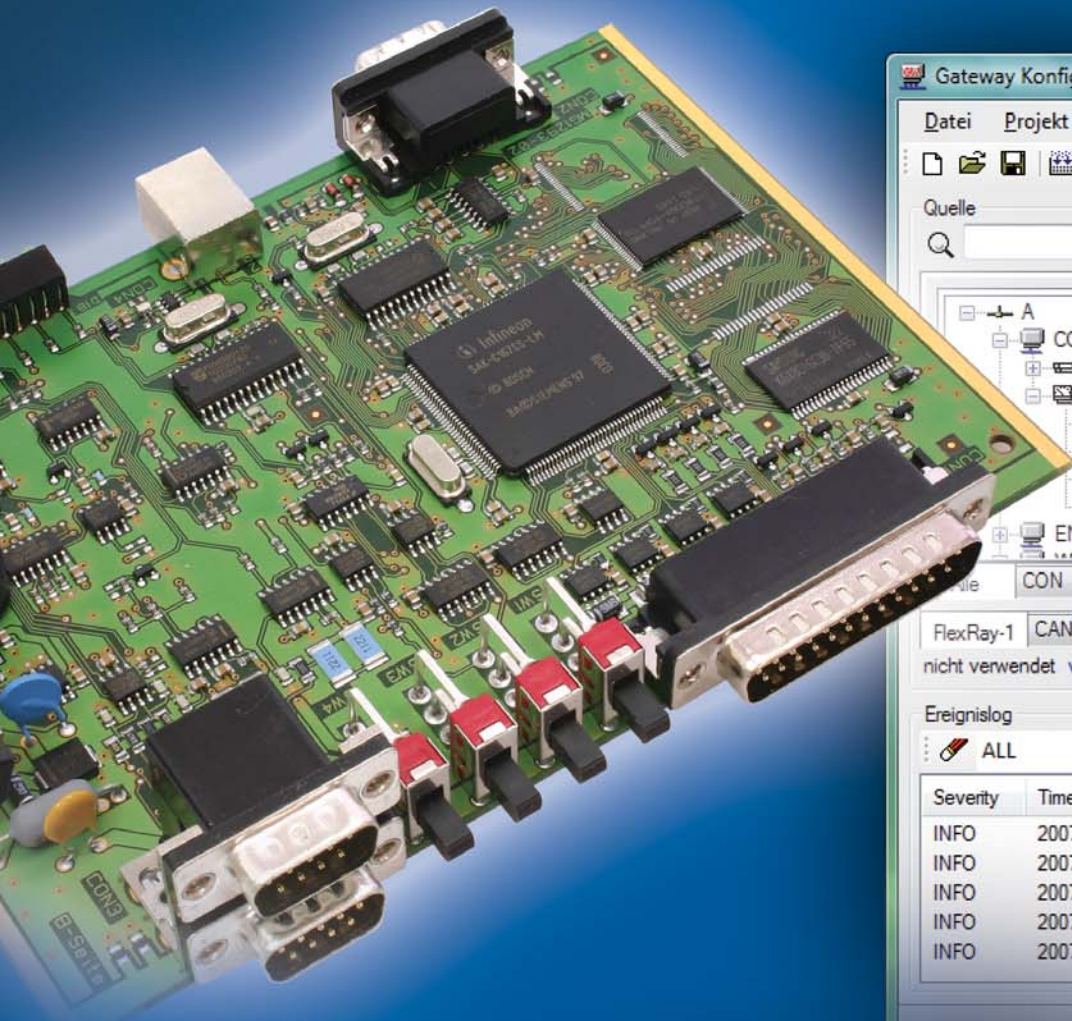
In this application, the FlexRay messages of the device under test were translated to the corresponding CAN messages of the existing test system as specified by the customer.

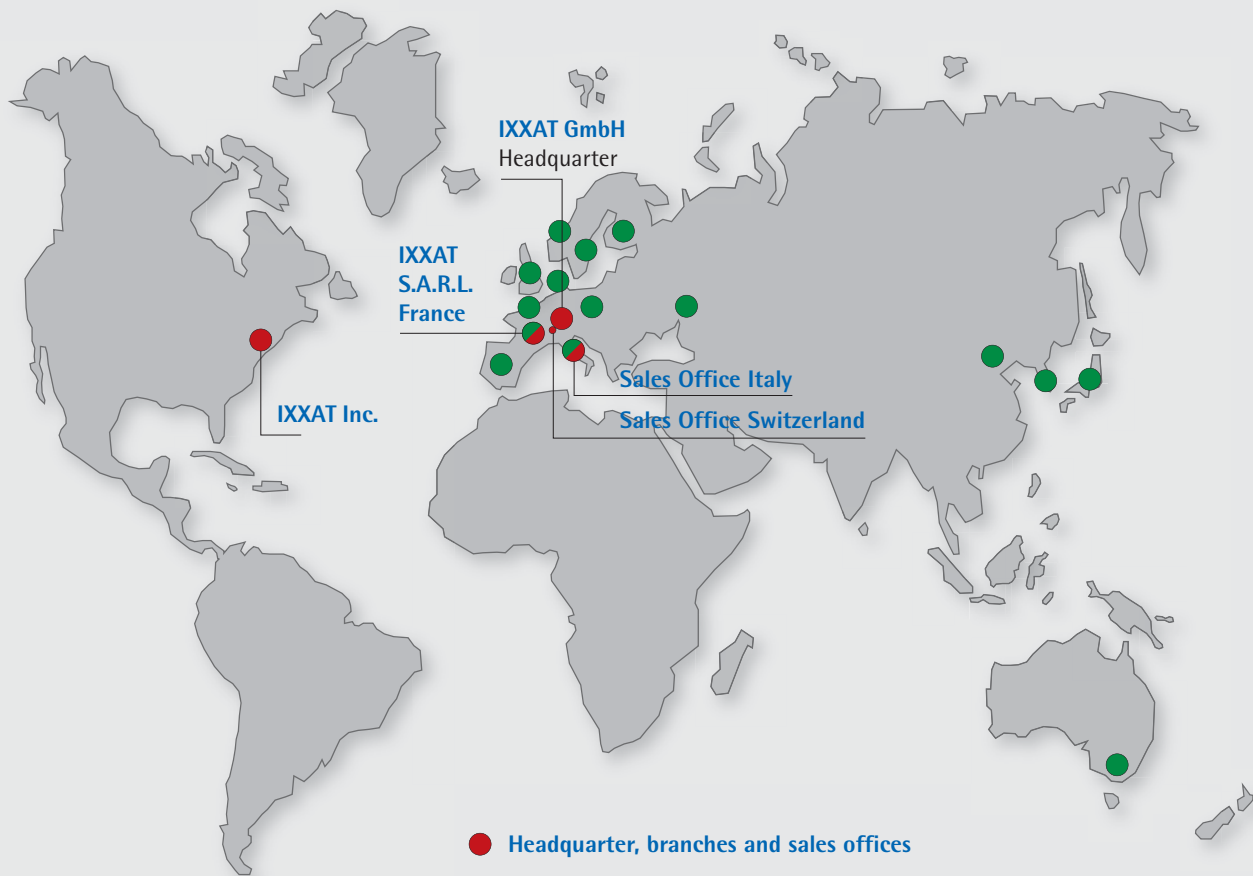
With this gateway developed by IXXAT the customer benefitted from using existing CAN technology for its new FlexRay based control units without making any change.

IXXAT provided pre-configured FRC-EP150 devices, enabling the customer to put the new test benches into operation in time.

Developing with IXXAT means

- ✓ Shorter time to market
- ✓ Avoiding development risks
- ✓ Predictable development costs
- ✓ Competitive advantage through use of modern technologies
- ✓ Focus on core competencies





● **Headquarter, branches and sales offices**

● **Distributors**

Further information about our distributors can be found on our website www.ixxat.com

Distributed by

IXXAT Automation GmbH

Leibnizstr. 15 · 88250 Weingarten · Germany
 Phone: +49-(0)7 51 / 5 61 46-0 · Fax: +49-(0)7 51 / 5 61 46-29
 Internet: www.ixxat.de · E-Mail: info@ixxat.de

IXXAT Inc.

120 Bedford Center Road · Bedford, NH 03110 · USA
 Phone: +1 / 6 03 / 4 71 - 08 00 · Fax: +1 / 6 03 / 4 71 - 08 80
 Internet: www.ixxat.com · E-Mail: sales@ixxat.com

IXXAT S.A.R.L.

Parc Orsay Universite · 2, rue Jean Rostand · 91893 Orsay cedex · France
 Phone: +33 / 1 69 85 24 29 · Fax: +33 / 1 69 41 81 15
 Internet: www.ixxat.fr · E-Mail: info@ixxat.fr

IXXAT Sales Office Switzerland

Erlenstrasse 29 · 8645 Jona · Switzerland
 Phone: +41 / 55 212 96 36 · Fax: +41 / 55 212 96 37
 Internet: www.ixxat.ch · E-Mail: info@ixxat.ch

IXXAT Sales Office Italy

Via 11 Settembre 2001, 13 · 10074 Lanzo Torinese (TO) · Italy
 Phone: +39 / 0123 326426 · Fax: +39 / 0123 322510
 Internet: www.ixxat.com · E-Mail: info@ixxat.it