

# THE FLEXIBLE GATEWAY UNIGATE<sup>®</sup> CX



- Easy installation
- Norm compliant
- Ready-to-use
- Configurable
- Programmable
- Designed & manufactured in Germany

## THE FLEXIBLE SOLUTION FOR



## MAKING INCOMPATIBLE NETWORKS COMPATIBLE



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## The flexible Gateway

### UNIGATE® CX – To connect incompatible networks

Various fieldbuses and Industrial Ethernet standards have taken over in the automation industry. The challenge of connecting these incompatible communication systems remains a big one.

UNIGATE® CX DIN rail modules have been developed precisely for this purpose. The units combine various fieldbus and Industrial Ethernet interfaces.

Quasi-uniting two UNIGATE® CL in a modular setup, UNIGATE® CXs are available for any fieldbus/Ethernet combination. Currently there are about 120 variants available.

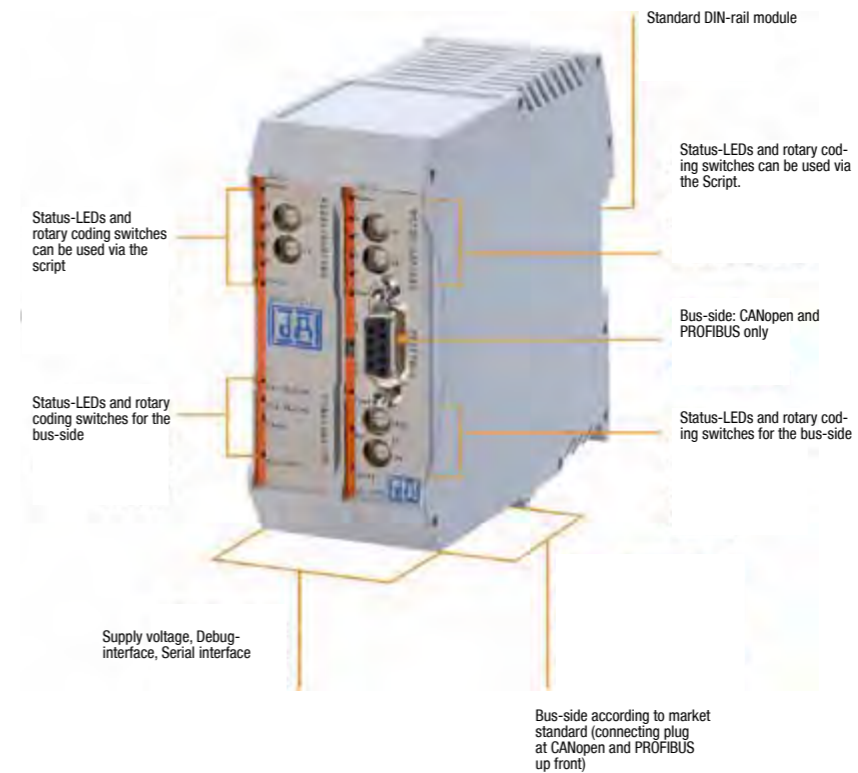
Due to the constant development of new CL modules, for example in the Industrial Ethernet field, the numbers of available options are still rising.



### Your Advantage

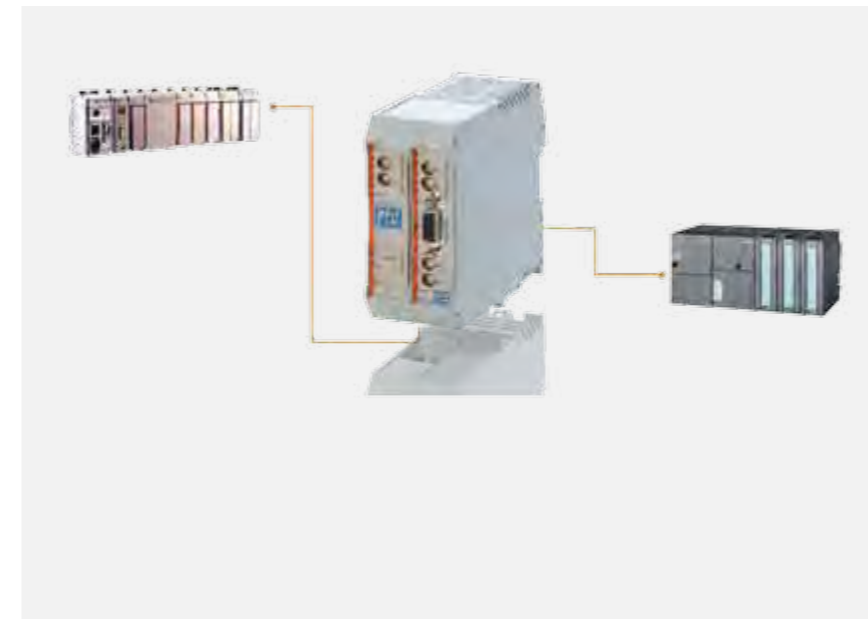
With the UNIGATE® CL modules from Deutschmann you bring existing components into modern networks. As a device manufacturer you save the self-development of the respective fieldbus or Ethernet based interfaces. The consistency of the Deutschmann UNIGATE® CX series allows once generated configurations and scripts to be used for other fieldbus and Ethernet based versions.

## UNIGATE® CX design



## Application example

### The UNIGATE® CX – connects different networks e.g. EtherNet/IP to PROFIBUS DP



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Same mechanical design of all bus versions

Space-saving housing

Wide voltage range

Brand labeling

- own logo
- own article description
- Pre-configuration, import your own script
- Neutral packaging
- Own front panel designed for your CI

### Advantage Deutschmann – This speaks for UNIGATE® CX

- ▼ Available for the most fieldbus and Industrial Ethernet versions
- ▼ The fieldbus or Ethernet side meets the standards, respectively the standard market models.
- ▼ Built-in isolation on the bus side
- ▼ Configuration of the module via configuration tool WINGATE
- ▼ Free programming with PROTOCOL DEVELOPER (Deutschmann Script language)
- ▼ No adjustment of the device firmware needed
- ▼ Additional debug interface on board
- ▼ Modern, slim, DIN rail
- ▼ Same Dimensions in all bus variants
- ▼ Brand labeling
- ▼ Wide voltage range from 10 to 33 VDC
- ▼ Delivery condition with transparent data exchange



## Configuration tool WINGATE®



Picture 1: WINGATE® main window



Picture 2: IP address window

comfortable configuration

consistency for each bus

additioinal fieldbus meachanism

upon delivery, the module is preconfigured (except for the IP address) and has scripts for transparent data exchange

The implementation of the serial interface onto the industrial network is configured with the configuration tool WINGATE®. WINGATE® is running on Windows. The configuration is loaded from the PC into the CL. A once created configuration can be saved and loaded in WINGATE® time and time again. It goes without saying that the created configuration can also be loaded from the UNIGATE® into the WINGATE®.

All models can handle the market standard protocols 3964(R), RK512, DIN 19244, DIN 66348-2 (measurement bus), Modbus ASCII and Modbus RTU (Master and Slave operation possible), and also a universal 232-protocol for a transparent data exchange.

The Technical Support of Deutschmann is by your side, whether you have any questions or need help generating your configuration.

The devices can be delivered pre-configured.



Picture 3: market standard protocols (extract)



Picture 4: subwindow parameter selection

Exceptions: The variants with LONWorks are not configurable.



## Protocol Developer

### Deutschmann Script Language

### The heart of the Deutschmann UNIGATE® / Gateway series

- Flexible solutions are needed. With the usual configuration tools for protocol converters and gateways, the user has to work with the specifications of the manufacturer. To change this unfortunate condition Deutschmann developed its own script language as early as in 1999.
- The user only needs to process the data of the bus and barely has to look after the special characteristics of the fieldbus.
- The Protocol Developer supports a variety of functions to fit the received or to send data into the right "form". Mathematics- or memory processing commands are known from other script languages and are easy to understand implemented, even for laymen.
- Also, the neatly arranged selection of examples enables a quick introduction to laymen.
- Another highlight is the included debug functionality. The common functionalities such as Single-step, running and stopping on breakpoint are available.
- Great emphasis is put on data security. You can activate special error detection routines on request.

### What exactly is a script?

A script is a sequence of commands executed in a given order. A command is always a small, firmly outlined task. The script language also knows commands that control the program flow in the script, which is why you can assemble even complex processes with these simple commands.

### Command groups overview

Declarations	variable declaration
Flow Control	Subfunction calls, jumps, branches
Math	Mathematical functions, data conversions
Communication	Send and receive data
Device Control	Set and read parameters. For example the baud rate for the serial interface.
Bus Specific	bus-specific values



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Simple script commands

Wide range of functions

Marketable protocols are included as a script command

Quick induction

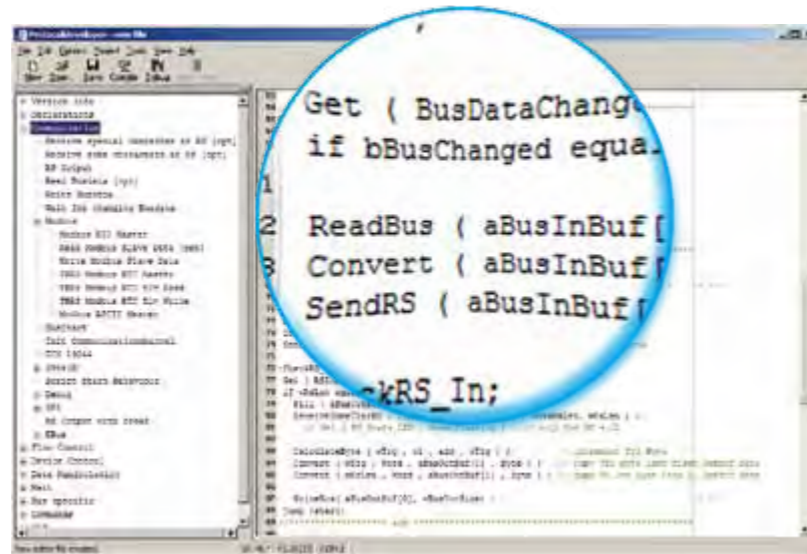


## The amount of tasks which can be handled with a script is infinite.

Scripts are imaginable which

- automatically determine a participants data at the serial interface, edit this data and then outline it in the bus
- only carry out action if the bus data is altered
- carry out timed actions
- share communication states
- exchange the data between 2 serial participants (RS485) and present the state in the bus

The script programming gives you a flexible possibility to solve your communication task. On both sides, i.e., on the RS-side and on the bus side, data can be edited, converted and arranged.

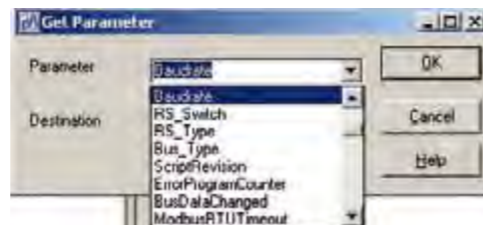


Picture 1: script example in the Protocol Developer

## The 1x1 of the Protocol Developer

Picture one shows you an example script in the editor surface and the tree view of all available commands (Command-Tree). It is the tool for easy script generating for our script gateways, its operation is aimed on it.

In addition to programming via text commands, the Command-Tree also offers dialogue-based programming. If defined, and necessary for the correlating command, a dialogue goes through the command parameters (picture 2) and inserts the resulting command into the script.



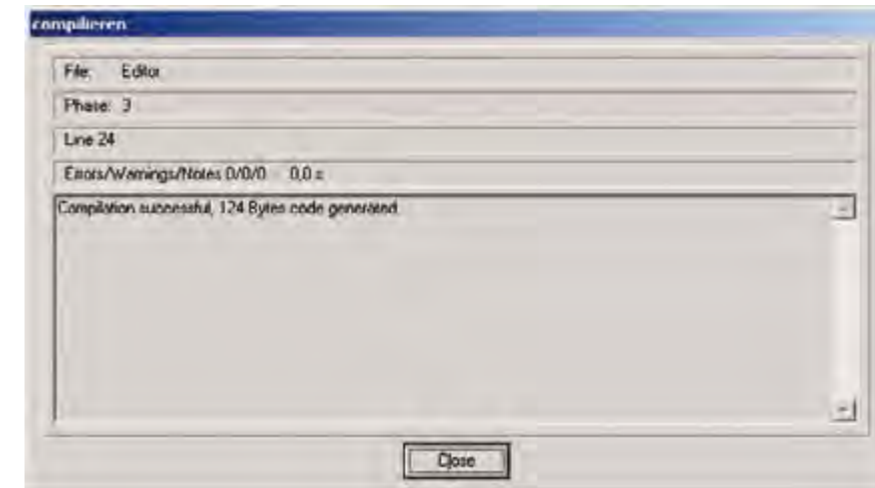
Picture 2: command parameters



## Compile

Before a script can be loaded into a UNIGATE®, it has to be compiled. The resulting code is very storage efficient. Even extensive scripts fit comfortably in the internal memory of the UNIGATE®.

The loading of a script into the device can be done directly from the Protocol Developer. For serial programming a script-download tool is available.

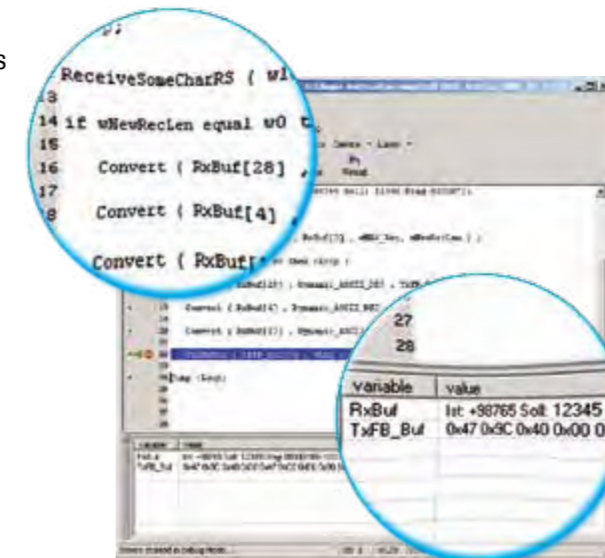


Picture 3: compilation

## Debuggen

All UNIGATE® devices have a built-in debugging interface. A special debug software is not needed. To test even extensive scripts quickly you'll find many functions for comfortable debugging, such as

- Breakpoints
- Single-step
- Display of the variables and their values
- Error display



Picture 4: debug window with variables and their content



- Integrated debug environment
- Convenient testing of the script
- Memory efficient compilation of script code
- Examples for each script command
- Templates for each bus variant
- Workshops
- Hotline by phone / E-Mail



## Technical overview

### CANopen



- › Complete CANopen slave interface
- › Max. 32 TPDO and max. 32 RPDO process data objects
- › Bus baud rate and Bus ID adjustable via DIP-switch
- › Isolated CANopen-interface with 9-pin. D-sub-connector
- › CANopen peer-to-peer messaging
- › Generic EDS file

### EtherNet/IP



- › EtherNet/IP adapter function
- › Max. 500 byte input- and 500 byte output data
- › Baud rate 10 or 100 Mbit/s
- › Isolated EtherNet interface with 2x RJ45 connector
- › IT-functions: Web server, FTP server
- › IP address adjustable via WINGATE®
- › Generic EDS file



### DeviceNet



- › Complete DeviceNet interface
- › Max. 255 byte input- and 255 byte output data
- › Bus baud rate and Bus ID adjustable via DIP-switch
- › Isolated DeviceNet-interface with 5-pin. terminal connection
- › DeviceNet functions: I/O slave messaging, polling
- › Generic EDS file

### Fast Ethernet Modbus TCP



- › Complete Fast Ethernet Modbus TCP slave interface
- › Max. 512 byte input- and 512 byte output data
- › Baud rate 10 or 100 Mbit/s
- › Isolated Fast Ethernet interface with 2x45-connector
- › IT-functions: Web server, FTP server

### EtherCAT



- › Max. 1486 byte input- and output data
- › 100 MBaud full-duplex transmission
- › Isolated EtherCAT interface with 2xRJ45-connector
- › Supports CANopen-communication objects, PDO and SDO
- › Fixed MAC-address given automatically
- › Generic EDS file

### LONWorks62



- › Complete LONWorks slave interface
- › Max. 512 byte input- and 512 byte output, 62 In and Out SNVTs
- › Baud rate FTT-10A, 78 kBit/s
- › Isolated LONWorks interface with 4-pin screw connector
- › Fixed Neuron ID

### EtherNet Powerlink



- › EtherNet Powerlink adapter function
- › Max. 500 byte input- and output data
- › Baud rate 100 Mbit
- › Isolated EtherNet Powerlink interface with 2x RJ45 connector
- › IP address adjustable via rotary switch

### MPI



- › Complete MPI slave interface
- › Max. 240 byte input- and output data
- › Baud rate adjustable via script
- › Bus ID adjustable via rotary switch
- › Isolated MPI interface with 9-pin D-sub-connector

### PROFIBUS



- › Complete PROFIBUS-DP slave interface
- › Max. 488 byte total, max. 244 byte input- and 244 output data
- › PROFIBUS adjustable via rotary switch
- › Automatical Baud rate recognition (9600 bit/s - 12 Mbit/s)

### PROFINET



- › Complete PROFINET-IO-Device interface (slave)
- › Max. 1440 byte input- and output data
- › Isolated PROFINET interface with 2x RJ45 connector (integrated switch)
- › 100 Mbit full-duplex transmission
- › 32-Bit micro processor for short reaction times
- › Bus ID adjustable via "Device Name"
- › Generic GSD file



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#### General specifications:

- › dimensions: 46 x 115 x 100 mm (W x D x H)
- › weight: approx. 190 g
- › DIN rail IP20
- › 2 rotary coding switches on the serial side for free use of the customer
- › Bus ID / Baud rate adjustable via switch
- › Baud rates 110 Baud to 625 KBAud
- › Operating temperature: -40°C to +85°C
- › Operating voltage: 10 to 33Volts
- › Humidity 0% to 95% / non condensing
- › CE and bus-specific certifications
- › RoHS

#### Delivery

- › Each unit is supplied in a single pack
- › Each delivery has a DVD with current documents and tools
- › Bulkpacks and special designs on request

### PROTOCOL CONVERTER UNIGATE® CL – The solution for all devices with a serial interface



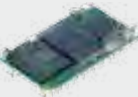
- › RS232, RS485, RS422, SSI (encoder interface) on board
- › Standard protocols can be configured (e.g. Modbus RTU, Modbus ASCII, 3964R...), more protocols can be included if needed
- › Flexible protocol adaption via Deutschmann script language
- › Module consists of standard components
- › Designed and manufactured in Germany

### UNIGATE® CM – CANopen to all Fieldbuses and Ethernet



- › Application-side: CANopen, RS232, RS485, RS422, SSI (encoder interface) on board
- › Transport protocols can be configured (e.g.: CANopen mapping, Universal (L2 11Bit) COB-ID, Universal (L2 11/29Bit) COB-ID, L2 11Bit (Tgl+FBlen))
- › Flexible protocol adaption via Deutschmann script language
- › Module consists of standard components
- › Designed and manufactured in Germany

### ALL-IN-ONE-BUS NODE UNIGATE® IC – Ready-to-install



- › Easy integration into your own electronics
- › Module consists of standard components
- › Connection to your host processor via UART or SPI
- › Flexible protocol adaption via Deutschmann script language
- › Standard protocols like Modbus, 3964R, etc. included
- › Designed and manufactured in Germany

### UNIGATE® FC - The connectable Multi-Protocol-Module



- › Easy integration into your own electronics
- › Module consists of standard components
- › Connection to your host processor via UART or SPI
- › Flexible protocol adaption via Deutschmann script language
- › Standard protocols like Modbus, 3964R, etc. included
- › Designed and manufactured in Germany

### UNIGATE® EL – Fast Ethernet to all Fieldbuses



- › Application-side: Fast Ethernet, RS232, RS485, RS422, SSI (encoder interface) on board
- › Transport protocols can be configured (e.g. TCP server (port23) default, UDP, TCP server, TCP client, Modbus TCP server, Modbus TCP client)
- › Flexible protocol adaption via Deutschmann script language
- › Module consists of standard components
- › Designed and manufactured in Germany

### Option I/O 8



- › 24V / 0,7 mA (short term 1A) at max. 3A for all 8 Outputs
- › Short circuit protection
- › Available for the UNIGATE® CL, CM, EL series
- › Designed and manufactured in Germany

### ELECTRONIC CAM CONTROLS - Still an essential tool



- › Diverse devices
- › Logic functionalities
- › Dynamic idle time compensation
- › Short, constant cycle times and a high number of outputs



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Protocol Converter

Embedded systems

Gateways

Electronic Cam Controls

Option I/O 8



UNIGATE® CX now with



**What is PriorityChannel?**

PriorityChannel eliminates the effects of network traffic loading on the device – ensuring accurate cycle-time response and safeguarding against unwanted disconnects. Industrial Ethernet has many network traffic components. In addition to the time critical cyclic messages, there are standard Ethernet messages being routed, Network Management protocols running, and Application Layer sending messages. All of these other components can interfere with the cyclic messages causing them to be delay and introducing jitter.

PriorityChannel is a combination of software optimized on the unique, patented architecture of the fido1100 communication controller to separate non real-time Ethernet traffic from real-time Industrial Ethernet traffic. This is not just a special queue or sophisticated filtering. The silicon provides a separate data pathway and a separate on-chip execution environment for real-time messages to tunnel straight to the device application. Non real-time messages can never interrupt real-time messages making it possible to stay well within 160 µs of the desired EtherNet/IP cycle time, and within 10 µs of the desired Profinet cycle time.

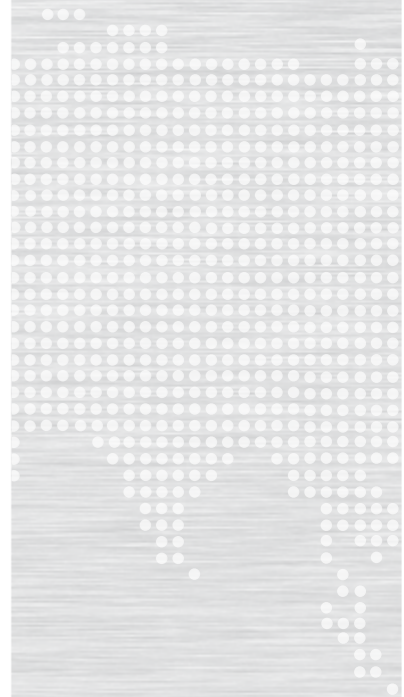
**Why do you need PriorityChannel?**

Conventional Industrial Ethernet solutions have difficulty dealing with critical messages when network traffic increases, resulting in unpredictable packet delays, excessive latency, or even connection failure. You can't rely on the fact that factory networks will be properly segmented to keep traffic well behaved. Given the flexibility and myriad of capabilities Industrial Ethernet brings to the factory, you don't know how the network will morph over time. How do you know your device will survive?

You need PriorityChannel to protect your device from the uncertainties on the factory floor. Regardless of the network condition or load, PriorityChannel to eliminate the effects of network traffic now and in the future. Critical messages are delivered on-time, every time without packet delays or excessive latency. The bottom line is, Priority Channel ensures your device will never disconnect from the network.

PriorityChannel is a feature of the FIDO products from Innovasic.

PriorityChannel™ is integrated in all Deuschmann PROFINET & EtherNet/IP products.





## Global availability



## The company

Deutschmann Automation, a German company based in Bad Camberg is working in the automation technology since 1976 and became known with cam controls in the 1980s.

In 1989 Deutschmann Automation started operating in the fieldbus technology. The development of one's first own bus system DICNET was an essential step. Since 1996 different fieldbus and Industrial Ethernet products are offered under the brand name UNIGATE®.

Thanks to a competent quality management and continuous enhancement Deutschmann became one of the leading suppliers in the automation industry. The entire development and manufacturing takes place in Germany.

We offer workshops for our All-In-One Bus nodes of the UNIGATE® IC series and the Software tool Protocol Developer. In these workshops you will learn everything you need to know about our products and how you can easily realize your projects with Deutschmann.

For all products the necessary documents and tools can be found, free of cost, on [www.deutschmann.com](http://www.deutschmann.com). Additionally the Deutschmann Technology Wiki, [wiki.deutschmann.de](http://wiki.deutschmann.de), makes technological information easily accessible for our customers and users, cross-linking application know-how and ensuring that the information is up to date. Our experts in development, sales and support have the right solution for your demands.



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### UNIGATE® CL

- Protocol Converter for all devices with a serial interface



### UNIGATE® IC

- Easy integration into your own electronics



### UNIGATE® FC

- Connectable Multi-Protocol-Module



### UNIGATE® CX

- Making incompatible networks compatible



### UNIGATE® EL

- Fast Ethernet to all Fieldbuses



### UNIGATE® CM

- CANopen to all Fieldbuses and Ethernet



### ELECTRONIC

- CAM CONTROLS

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