

KUNBUS

■ industrial communication

DeviceNet™



User Manual Gateway component for DeviceNet™

Table of Contents

- 1 General Information 3**
 - 1.1 Disclaimer 3
 - 1.2 Notes Regarding this User Manual..... 4
 - 1.3 Validity 4
 - 1.4 Limitation of Liability 4
 - 1.5 Customer Service 4

- 2 Safe Use 5**
 - 2.1 User 5
 - 2.2 Symbols 5

- 3 Overview 6**
 - 3.1 Functionality 6
 - 3.2 Control Elements 7
 - 3.3 Status LEDs..... 10

- 4 Installation 12**
 - 4.1 Preparations for Trouble-free Operation..... 12
 - 4.2 Requirements 14
 - 4.3 Connecting Gateway Components..... 15
 - 4.4 Installing a Gateway in the Control Cabinet 16
 - 4.5 Connecting a Power Supply 17
 - 4.6 Connecting a Gateway to the Fieldbus..... 18

- 5 Configuration..... 19**
 - 5.1 Supported Size of the Process Data 19
 - 5.2 Setting MAC-ID and bitrate..... 19
 - 5.3 DeviceNet Objects..... 20

- 6 Technical Data..... 37**
 - 6.1 Technical Data..... 37

1 General Information

1.1 Disclaimer

© 2015 KUNBUS GmbH, Denkendorf (Germany)

The contents of this user manual have been prepared by KUNBUS GmbH with the utmost care. Due to technical development, KUNBUS GmbH reserves the right to change or replace the contents of this user manual without prior notice. You can always obtain the latest version of the user manual at our homepage: www.kunbus.de

KUNBUS GmbH shall be liable exclusively to the extent specified in General Terms and Conditions (www.kunbus.de/agb.html).

The contents published in this user manual are protected by copyright. Any reproduction or use for the in-house requirements of the user is permitted. Reproduction or use for other purposes is not permitted without the express, written consent of KUNBUS GmbH. Contraventions shall result in compensation for damages.

Trademark protection

- KUNBUS is a registered trademark of KUNBUS GmbH
- Windows® and Microsoft® are registered trademarks of Microsoft Corp.

KUNBUS GmbH
Heerweg 15 c
73770 Denkendorf
Germany
www.kunbus.de

1.2 Notes Regarding this User Manual

This user manual provides important technical information that can enable you as a user to integrate the Gateways into your applications and systems efficiently, safely and conveniently. It is intended for trained, qualified personnel, whose sound knowledge in the field of electronic circuits and expertise in DeviceNet™ is assumed.

As an integral part of the module, the information provided here should be kept and made available to the user.

1.3 Validity

This document describes the application of the KUNBUS Gateway with the product number:

- PR100071, release 00

1.4 Limitation of Liability

Warranty and liability claims will lapse if:

- the product has been used incorrectly,
- damage is due to non-observance of the operating manual,
- damage is caused by inadequately qualified personnel,
- damage is caused by technical modification to the product (e.g. soldering).

1.5 Customer Service

If you have any questions or suggestions concerning this product, please do not hesitate to contact us:

KUNBUS GmbH
Heerweg 15 C
73770 Denkendorf
+49 (0)711 3409 7077
support@kunbus.de
www.kunbus.de

2 Safe Use

2.1 User

The Gateway may only be assembled, installed and put into operation by trained, qualified personnel. Before assembly, it is absolutely essential that this documentation has been read carefully and understood. Expertise in the following fields is assumed:

- electronic circuits,
- basic knowledge of DeviceNet,
- work in electrostatic protected areas,
- locally applicable rules and regulations for occupational safety.

2.2 Symbols

The symbols used have the following meaning:

DANGER

Danger

Always observe this information!

There is a safety hazard that can lead to serious injuries and death.

CAUTION

Caution

There is a safety hazard that can result in minor injuries and material damage.

NOTICE

Note

There is a safety hazard that can result in material damage.

3 Overview

3.1 Functionality

The KUNBUS Gateway is a protocol converter. It allows communication between networks with different protocols.

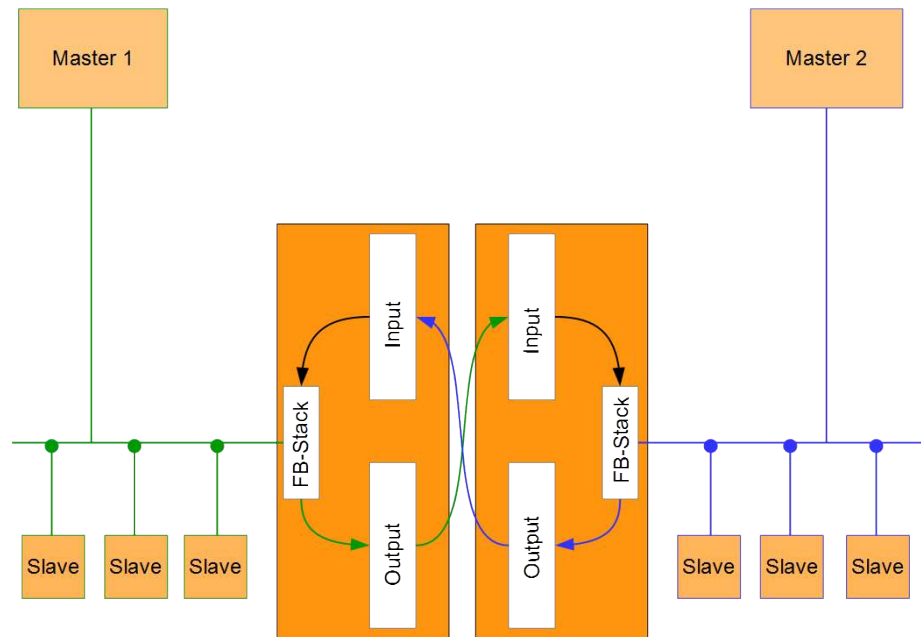


Illustration 1: Functionality

A Gateway consists of 2 gateway components that master one specific protocol each. You can combine these gateway components as you wish. This design offers you a high degree of flexibility, since you can exchange the individual gateway components at any time. The following gateway components are currently available as slaves:

- CANopen
- CC-Link
- DeviceNet
- EtherCAT
- EtherNet/IP
- Modbus RTU
- Modbus TCP
- POWERLINK
- PROFIBUS
- PROFINET
- Sercos III

3.2 Control Elements

Front view

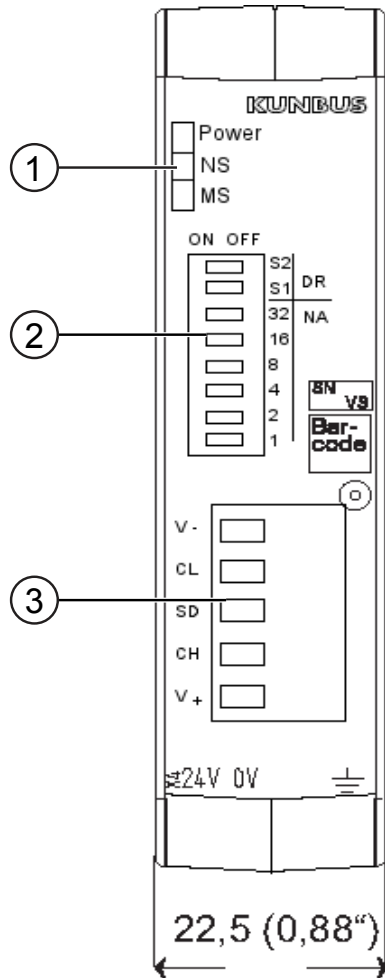


Illustration 2: Front view DeviceNet

1	Status LEDs
2	DIP Switches
3	Fieldbus connection

Top

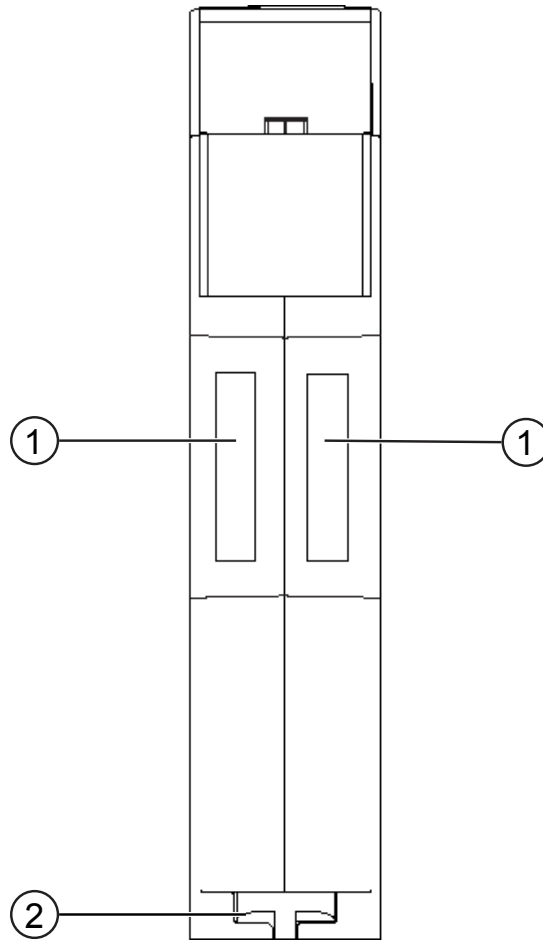


Illustration 3: Top

- | | |
|---|---|
| 1 | Interconnect ports
for interconnecting the gateway components. |
| 2 | Locking clamps
for securely attaching the gateway component to the DIN rail. |

Bottom

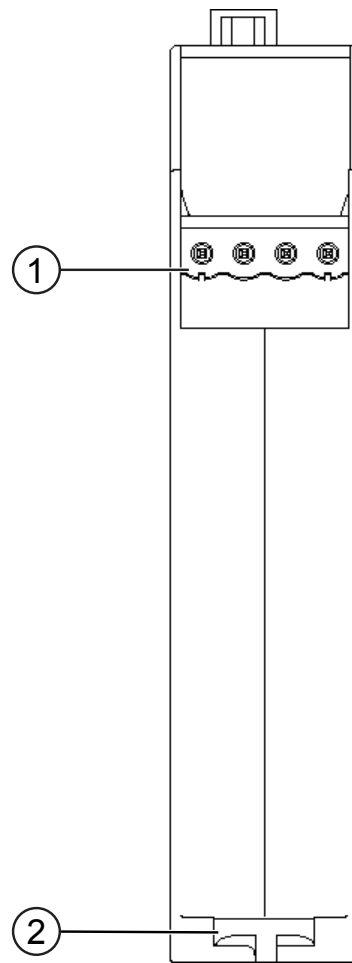


Illustration 4: Bottom

- | | |
|---|--|
| 1 | Mains connection with 24 V power supply |
| 2 | Locking clamps for securely attaching the gateway component to the DIN rail. |

3.3 Status LEDs

The signals of the status LEDs for DeviceNet have the following meaning:

LED designation	Signal	Meaning
Power	off	Gateway not running
	blinks, green	Initialization phase not yet completed
	on, green	All system components are functioning perfectly
	flashes, red	Correctable error (e.g. second gateway component missing)
	on, red	Serious error/defect in the gateway
NS	off	Device is offline Possible causes: <ul style="list-style-type: none"> – The Dup_MAC_ID-Test has not yet been completed – No voltage present (s. module status LED) No network connection
	blinks, green	Online, no connection was established
	green	Connection established
	flashes, red	At least one I/O connection is in timeout state.
	red	Critical error An error has occurred preventing the connection to the network (e.g. duplicate MAC ID, fieldbus is offline).
	flashes red and green	Communication error A network access error was detected.

LED designation	Signal	Meaning
MS	off	The gateway component is not in operation. Check the power supply.
	green, flashes	Start-up At least one system component has not yet finished its initialization. This also includes the automatic bitrate detection.
	green, on	Normal operation All system components are running perfectly. The partner gateway component is connected correctly.
	red, flashes	At least one system component is not running due to a configuration error or the partner gateway component is not connected.
	red, on	Internal system error A fatal internal system error has occurred. Please contact our support.
	flashes green and red	Self-test

4 Installation

4.1 Preparations for Trouble-free Operation

In the following section we have compiled some general information for you that is important for trouble-free operation. If you are already acquainted with this topic, you can skip to the next section. There, you will learn about which conditions are necessary for installing the gateway.

Cable routing

Route your cables separately in cable groups. This will protect your gateway from any unintended electromagnetic interferences.

The following groups should be routed separately from each other:

Group	Line
A	Data and power supply lines for: DC voltage below 60 V AC voltage below 25 V
B	Data and power supply lines for: DC voltage between 60 V and 400 V AC voltage between 25 and 400 V
C	Power supply lines above 400 V

- You can route cables of the same group together in cable ducts or bundles.
- Cables of group A and B:
 - Route the groups in separate bundles or
 - in cable ducts at a minimum distance of 10 cm from each other.
- Cables of group C
 - Route the groups in separate bundles or
 - in cable ducts at a minimum distance of 50 cm from the other groups.

Shielding

Shield your cables. This will reduce any unintended electromagnetic interferences.

Potential equalization

Potential differences occur when devices are connected to different earths. These potential differences cause malfunctions.

To prevent malfunctions, you have to route an equipotential equalization conductor.

When doing so, bear in mind the following points:

- Select an equipotential equalization conductor with low impedance.
- Select the following as a reference value for the cross-section of the potential equalization cable:
 - 16 mm² for potential equalization cables of up to 200 m in length
 - 25 mm² for potential equalization cables of more than 200 m in length
- Use potential equalization cables made of copper or galvanized steel.
- Connect potential equalization cables extensively with the earth rail.
- The smallest surfaces possible should be sandwiched between potential equalization cables and signal cables.

If the devices of the control system are connected by shielded signal cables that are earthed on both sides, the impedance must be 10% of the shielding impedance.

4.2 Requirements

The Gateway was designed for use in a control cabinet.

- ✓ The protection class of the control cabinet must be equivalent to at least IP54.
- ✓ For installation in the control cabinet you need a DIN rail 35 x 7.5 mm (EN50022).
 - Install the DIN rail horizontally in the control cabinet according to the manufacturers' specifications. When doing so, make sure that the Gateway is at a sufficient distance from other devices.

NOTICE

Your gateway could be damaged if temperatures are too high.

- ➔ Make sure that the ambient temperature in the control cabinet is less than 60 °C.
- ➔ Keep the ventilation slots unobstructed. These must not be covered by cables etc.
- ➔ Maintain sufficient distance from other devices.

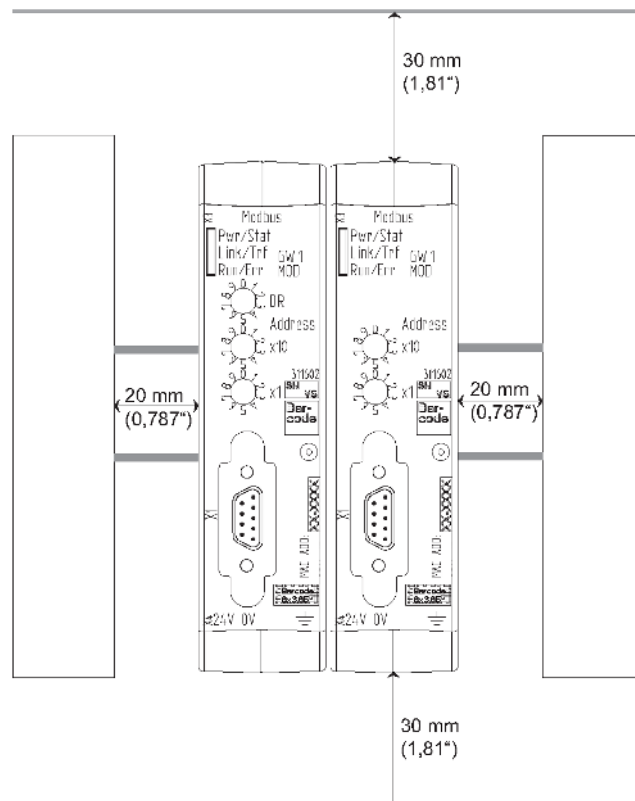


Illustration 5: Distances for installation

- Connect each gateway component individually to functional earth. When doing so, make sure that the power supplies of both gateway components have the same ground.
- ⇒ Your control cabinet now meets all requirements for installing the gateway.

4.3 Connecting Gateway Components

In order to attain a fully functional gateway, you have to interconnect both gateway components.

- Connect an interconnect port to each gateway component using the plug-in jumper (product number PR100204).

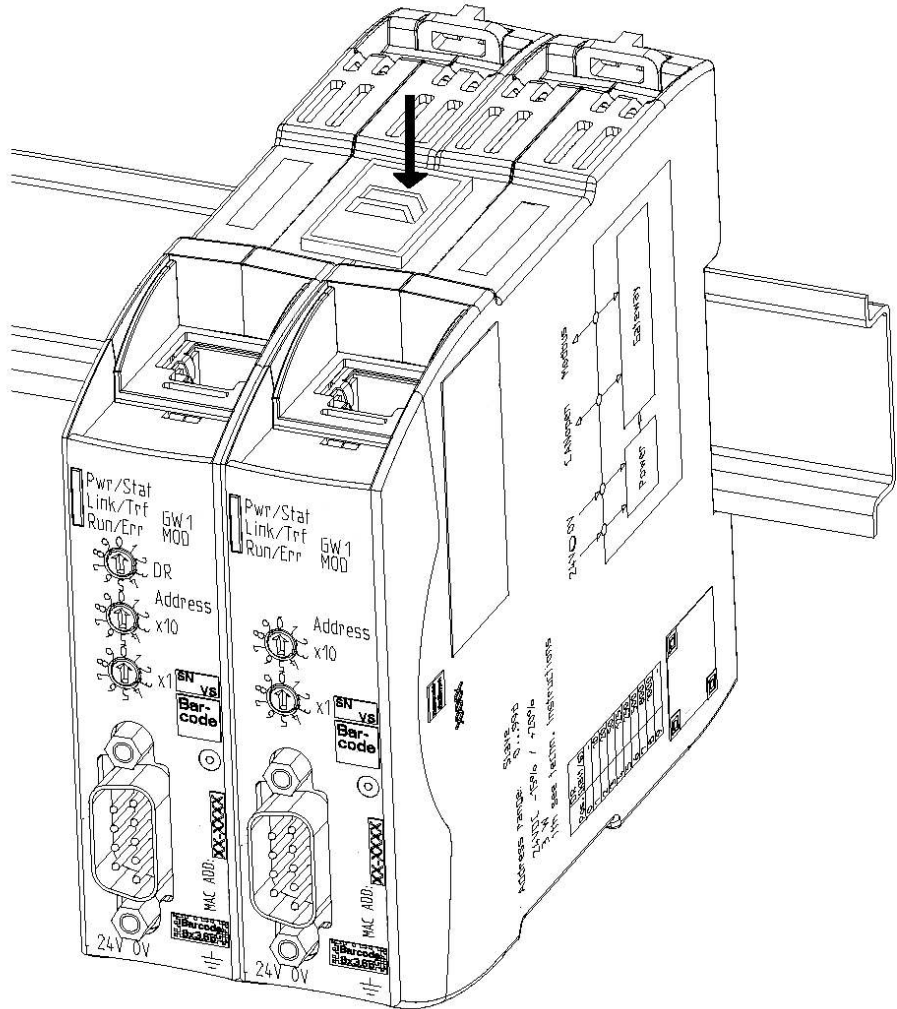


Illustration 6: Connecting gateway components

⇒ You can now install the gateway in the control cabinet.

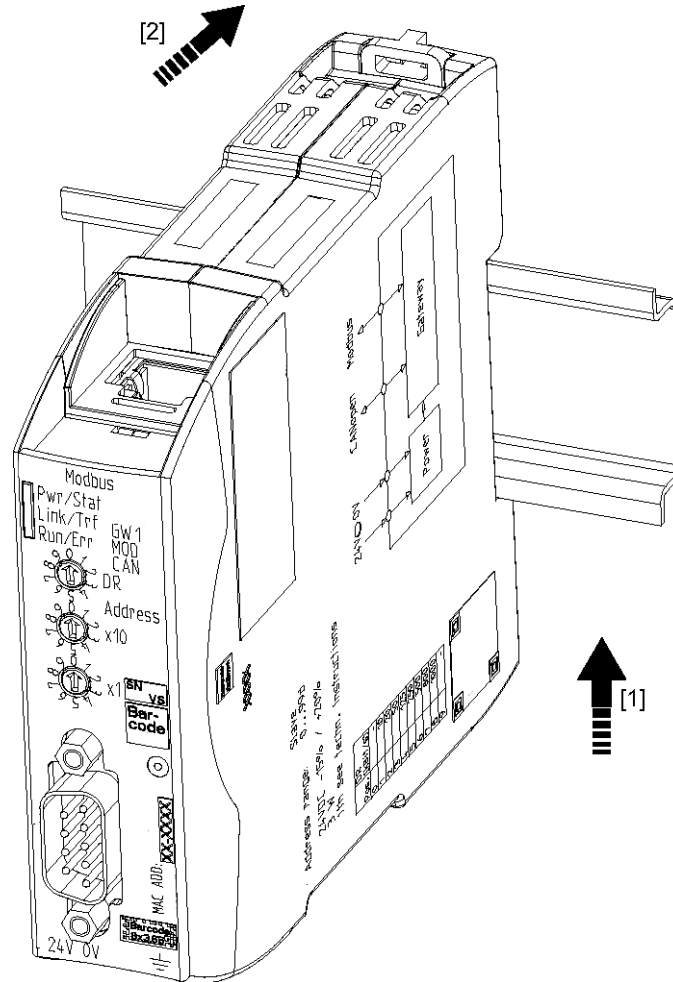
NOTICE

Only ever interconnect 2 gateway components.

If you connect additional components, severe defects could result on all devices.

4.4 Installing a Gateway in the Control Cabinet

- Hold the raster element of the gateway on the DIN rail.
- Press down the locking elements towards the gateway.
- Make sure that the gateway is firmly attached to the DIN rail.



4.5 Connecting a Power Supply

To connect the gateway component to the power supply, you need a spring-loaded terminal (e.g. Metz-Connect SP995xxVBNC).

You have to connect each gateway component separately to a power supply. Never interconnect functional earth and GND, otherwise the galvanic isolation between gateway GND and fieldbus ground will be removed. Instead, connect the functional earth with low impedance to the potential equalization. You can then dispense with this connection if the shield of the fieldbus cable is connected to the potential equalization with lower impedance when entering the control cabinet.

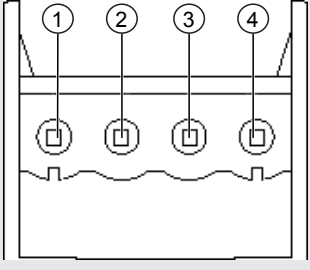
NOTICE

Connect each of the two gateway components to its own power supply

→ Ensure in particular that no potential differences occur between the GND pins (2).

Pin assignment:

Pin	Assignment
1	24 V for module supply
2	GND
3	Do not connect!
4	Functional earth



NOTICE

Do not connect GND to PE

This connection could cause unintended malfunctions.

4.6 Connecting a Gateway to the Fieldbus

To connect the gateway component to DeviceNet, you need One 5-pin Combicon connector.

The pin assignment complies with the specifications of the ODVA.

Cable color	Signal
White	CAN_H
Blue	CAN_L
Not isolated	drain
Black	V-
Red	V+

5 Configuration

5.1 Supported Size of the Process Data

The gateway component for DeviceNet supports process data of a length up to 64 bytes.

An additional 448 bytes are available for the asynchronous data traffic.

NOTICE

Bear in mind that the maximum length of the process data is always determined by the fieldbus with the shorter data length.

5.2 Setting MAC-ID and bitrate

The MAC-ID and bitrate are assigned in binary format.

You can set the MAC ID via the DIP switches 1-32, and via switches S1 and S2 you can set the bitrate.

Set an address switch to "OFF" to switch bit value 0 or to "ON" to switch bit value 1.

Valid value range for the bitrate:

Valid value range for the MAC-ID: 0-63

Example: Here, you can see the switch setting for the MAC address 42 and the bitrate 500 kBit/s.

Designation	S2	S1	32	16	8	4	2	1
Switch setting	on	off	on	off	on	off	on	off

5.3 DeviceNet Objects

To configure the gateway component, you have to make the appropriate settings in the DeviceNet objects with the configuration software of your Device master.

Object structure

DeviceNet™ uses the application layer CIP™ (Common Industrial Protocol) that was specified by the ODVA (Open DeviceNet Vendor Association - <http://www.odva.org>). Physically based DeviceNet on CAN (Controller Area Network).

CIP is a connection oriented protocol. It allows the exchange of I/O data via cyclical I/O messages and the exchange of general data for configuration, diagnosis and Management via explicit messages. For this purpose, CIP defines 4 essential functions:

- Uniform object model for addressing data
- Uniform communication model for exchanging data
- Uniform configuration methods
- Uniform device profiles

Each DeviceNet device is characterized by a collection of objects. Each object has a defined behavior. Each object belongs to a class. Objects belonging to the same class are called instances of this class. Data elements within an object are called attributes. All attributes can be addressed with class, instance and attribute IDs. Services are explicit tasks that an object can execute.

The following sections describe which objects, attributes and services are supported by the gateway component.

Class Code 0x01Hex

This class contains information about the identification of the module.

The gateway component supports the following functions in this class:

- Get Attribute Single (0x0e): This function returns the content of certain attributes.
- Reset Service (0x05)
 - Type 0: The module restarts the DeviceNet software.
 - Type 1: The module is reset to the original settings.

The Gateway supports the following services in the instances:

Instance 0

#	Name	Access	Type	Value
1	Revision	Get	UINT	0x1

Instance 1

#	Name	Access	Type	Description
1	Vendor ID	Get	UINT	1168 (KUNBUS GmbH Industrial Communication)
2	Device Type	Get	UINT	0x00c
3	Product Code	Get	UINT	0x0049 (73)
4	Revision	Get	STRUCTof:	Version number
	Major		USINT	Main version
	Minor		USINT	Sub-version number
5	Status	Get	WORD	s. Table Device Status
6	Serial number	Get	UDINT	Assigned by KUNBUS during the production process.
7	Product Name	Get	SHORT_STRING	KUNBUS-mGate DeviceNet

Bit(s)	Name
0	These is a connection to the master/scanner
1	Reserved (set to 0)
2	Configured (always set to 0)
3	Reserved (set to 0)
4-7	Extended Device Status
0000b	Unknown
0010b	Timeout
0011b	No IO connection established
0100b	Not implemented
0110b	Connection in Run mode
0111b	Connection in idle mode
Others	Reserved
8	A recoverable error has occurred
9	An unrecoverable error has occurred
10	A serious recoverable error has occurred
11	A serious unrecoverable error has occurred
12-15	Reserved (set to 0)

Table 1: Device Status

Class Code 0x02 Hex

This class represents a communication connecting point. This allows a service to be triggered in any class or instance.

Class Code 0x03 Hex

In this class you will find information about the configuration and status of a DeviceNet port.

The gateway component supports the following functions in this class:

Class Services

- Get Attribute Single (0x0e)

Instance Services

- Get Attribute Single (0x0e)
- Set Attribute Single (0x10)
- Allocate Master/Slave Connection Set (0x4b)
- Release Master/Slave Connection Set (0x4c)

The gateway component supports the following data in this class:

Instance 0

#	Name	Access	Type	Value
1	Revision	Get	UINT	0x2

Instance 1

#	Name	Access	Type	Description
1	MAC ID	Get	USINT	Value range 0–63. Default value: 63 You can set the MAC-ID on the DIP switches.
2	Bitrate	Get	USINT	Value Range <ul style="list-style-type: none"> – 0: 125 kBit/s – 1: 250 kBit/s – 2: 500 kBit/s – 3: Automatic bitrate detection Default value: 125 kBit/s You can set the bitrate on the DIP switches.
3	BOI	Get/Set	BOOL	Bus–Off Interrupt
4	Bus–Off Counter	Get/Set	USINT	This value indicates how often the module changes to the Off state. Value range 0–255
5	Allocation Information	Get	STRUCT of:	You can find further information in the DeviceNet specifications volume 3, in section 5.11.
	Allocation Choice Byte		BYTE	

	Master's MAC ID	USINT	Value range 0–63, 255 MAC ID from the master Change is only possible by allocation from the master.
6	MAC ID Switch Get Changed	BOOL	This value indicates whether the node ID has been changed since the last restart. 0 = No change 1 = Change since the last start
7	Bit Rate Switch Get Changed	BOOL	This value indicates whether the bitrate has been changed since the last restart. 0 = No change 1 = Change since the last start
8	MAC ID Switch Get Value	USINT	Current values of the switches for the node ID Value range 0-99
9	Bit Rate Switch Get Value	USINT	Current values of the switches for the bitrate. Value range 0–9
10	Quick_Connect Get/Set	BOOL	Activates or deactivates Quick Connect. 0 = Deactivated 1 =Activated

Class Code 0x04 Hex

This object enables you to access the input and output data.

The gateway component supports the following functions in this class:

Class Services

- Get Attribute Single (0x0e)

Instance Services

- Get Attribute Single (0x0e)
- Set Attribute Single (0x10)

The gateway component supports the following data in this class:

Instance 0

#	Name	Access	Type	Value
1	Version	Get	UINT	0x0001

Instance 0x64

#	Name	Access	Type	Value
3	Data	Get	Array of BYTE	Enables access to the input data area
4	Length	Get	UNIT	Length of the input and output data area

Instance 0x96

#	Name	Access	Type	Value
3	Data	Get/Set	Array of BYTE	Enables access to the output data area

Class Code 0x05 Hex

The gateway component supports the following functions in this class:

Class Services

- Get Attribute Single (0x0e)

Instance Services

- Get Attribute Single (0x0e)
- Set Attribute Single (0x10)

The gateway component supports the following data in this class:

Instance 0

#	Name	Access	Type	Value
1	Version	Get	UINT	0x0002

Instance 1

#	Name	Access	Type	Description
1	State	Get	USINT	State of the object 3: Established 5: Delete latent objects
2	Instance type	Get	USINT	Indicates whether it is an I/O connection or explicit connection.
3	Transport-Class trigger	Get	BYTE	Defines the behavior of the connection
4	DeviceNet produced connection id	Get	UINT	Positioned in CAN identifier field if data is transmitted via the existing connection in a DeviceNet- Subnet.
5	DeviceNet consumed connection id	Get	UINT	Value is in the CAN Identifier field. It signals that messages can be received.
6	DeviceNet initial comm characteristics	Get	BYTE	Defines the message group of this connection based on production and consumption.
7	Produced connection size	Get	UINT	Maximum number of bytes that were transmitted via this connection
8	Consumed connection size	Get	UINT	Maximum number of bytes that were received via this connection
9	Expected packet rate	Get/Set	UINT	Defines the timing of the current connection
12	Watchdog timeout action	Get/Set	USINT	Controls the behavior during inactivity and Watchdog Timeouts
13	Produced connection path length		UINT	Number of bytes of the attribute "Produced_connection_path"
14	Produced connection path		Packed EPATH	Displays the application object(s) whose data was produced in the current connection.
15	Consumed connection path length		UINT	Number of bytes of the attribute "Consumed_connection_path"
16	Consumed connection path		Packed EPATH	Displays the application object(s) whose data was used in the current connection.

Instance 2

#	Name	Access	Type	Description
1	State	Get	USINT	State of the object 3: Established 5: Delete latent objects
2	Instance type	Get	USINT	Indicates whether it is an I/O connection or explicit connection.
3	Transport-Class trigger	Get	BYTE	Defines the behavior of the connection
4	DeviceNet produced connection id	Get	UINT	Positioned in CAN identifier field if data is transmitted via the existing connection in a DeviceNet- Subnet.
5	DeviceNet consumed connection id	Get	UINT	Value is in the CAN Identifier field. It signals that messages can be received.
6	DeviceNet initial comm characteristics	Get	BYTE	Defines the message group of this connection based on consumption and production.
7	Produced connection size	Get	UINT	Maximum number of bytes that were transmitted via this connection
8	Consumed connection size	Get	UINT	Maximum number of bytes that were received via this connection
9	Expected packet rate	Get/Set	UINT	Defines the timing of the current connection
12	Watchdog timeout action	Get/Set	USINT	Controls the behavior during inactivity and Watchdog Timeouts
13	Produced connection path length		UINT	Number of bytes of the attribute "Produced_connection_path"
14	Produced connection path		Packed EPATH	Displays the application object(s) whose data was produced in the current connection.
15	Consumed connection path length		UINT	Number of bytes of the attribute "Consumed_connection_path"
16	Consumed connection path		Packed EPATH	Displays the application object(s) whose data was used in the current connection.

Instance 3

#	Name	Access	Type	Description
1	State	Get	USINT	State of the object 3: Established 5: Delete latent objects
2	Instance type	Get	USINT	Indicates whether it is an I/O connection or explicit connection.
3	Transport-Class trigger	Get	BYTE	Defines the behavior of the connection
4	DeviceNet produced connection id	Get	UINT	Positioned in CAN identifier field if data is transmitted via the existing connection in a DeviceNet- Subnet.
5	DeviceNet consumed connection id	Get	UINT	Value is in the CAN Identifier field. It signals that messages can be received.
6	DeviceNet initial comm characteristics	Get	BYTE	Defines the message group of this connection based on consumption and production.
7	Produced connection size	Get	UINT	Maximum number of bytes that were transmitted via this connection
8	Consumed connection size	Get	UINT	Maximum number of bytes that were received via this connection
9	Expected packet rate	Get/Set	UINT	Defines the timing of the current connection
12	Watchdog timeout action	Get/Set	USINT	Controls the behavior during inactivity and Watchdog Timeouts
13	Produced connection path length		UINT	Number of bytes of the attribute "Produced_connection_path"
14	Produced connection path		Packed EPATH	Displays the application object(s) whose data was produced in the current connection.
15	Consumed connection path length		UINT	Number of bytes of the attribute "Consumed_connection_path"
16	Consumed connection path		Packed EPATH	Displays the application object(s) whose data was used in the current connection.

Instance 4

#	Name	Access	Type	Description
1	State	Get	USINT	State of the object 3: Established 5: Delete latent objects
2	Instance type	Get	USINT	Indicates whether it is an I/O connection or explicit connection.
3	Transport-Class trigger	Get	BYTE	Defines the behavior of the connection
4	DeviceNet produced connection id	Get	UINT	Positioned in CAN identifier field if data is transmitted via the existing connection in a DeviceNet- Subnet.
5	DeviceNet consumed connection id	Get	UINT	Value is in the CAN Identifier field. It signals that messages can be received.
6	DeviceNet initial comm characteristics	Get	BYTE	Defines the message group of this connection based on consumption and production.
7	Produced connection size	Get	UINT	Maximum number of bytes that were transmitted via this connection
8	Consumed connection size	Get	UINT	Maximum number of bytes that were received via this connection
9	Expected packet rate	Get/Set	UINT	Defines the timing of the current connection
12	Watchdog timeout action	Get/Set	USINT	Controls the behavior during inactivity and Watchdog Timeouts
13	Produced connection path length		UINT	Number of bytes of the attribute "Produced_connection_path"
14	Produced connection path		Packed EPATH	Displays the application object(s) whose data was produced in the current connection.
15	Consumed connection path length		UINT	Number of bytes of the attribute "Consumed_connection_path"
16	Consumed connection path		Packed EPATH	Displays the application object(s) whose data was used in the current connection.

17	Production inhibit time		UINT	Defines the minimum time between the data productions. This attribute is necessary for all I/O client connections. Excluded from this are connections with cyclical production triggers.
----	-------------------------	--	------	---

Instance 10...12

#	Name	Access	Type	Description
1	State	Get	USINT	State of the object 3: Established 5: Delete latent objects
2	Instance type	Get	USINT	Indicates whether it is an I/O connection or explicit connection.
3	Transport-Class trigger	Get	BYTE	Defines the behavior of the connection
4	DeviceNet produced connection id	Get	UINT	Positioned in CAN identifier field if data is transmitted via the existing connection in a DeviceNet- Subnet.
5	DeviceNet consumed connection id	Get	UINT	Value is in the CAN Identifier field. It signals that messages can be received.
6	DeviceNet initial comm characteristics	Get	BYTE	Defines the message group of this connection based on consumption and production.
7	Produced connection size	Get	UINT	Maximum number of bytes that were transmitted via this connection
8	Consumed connection size	Get	UINT	Maximum number of bytes that were received via this connection
9	Expected packet rate	Get/Set	UINT	Defines the timing of the current connection
12	Watchdog timeout action	Get/Set	USINT	Controls the behavior during inactivity and Watchdog Timeouts

Class Code 0x2b Hex - Acknowledge Handler Object

The gateway component supports the following functions in this class:

Class Services

- Get Attribute Single (0x0e): This function resets the content of certain attributes.

Instance Services

- Get Attribute Single (0x0e): This function resets the content of certain attributes.
- Set Attribute Single (0x10): This function changes the value of an attribute

The gateway component supports the following data in this class:

Instance 0

#	Name	Access	Type	Value
1	Version	Get	UINT	0x0001
2	Max Instance	Get	UINT	0x0001

Instance 1

#	Name	Access	Type	Description	Value
1	Acknowledge Timer	Get/Set	UINT	Waiting time for the acknowledgement	Value range 1-65, 535 ms 0=invalid default value: 16
2	Retry Limit	Get/Set	USINT	Number of timeouts to be expected. Afterwards, a message is sent to the controller reporting that the repetition limit was exceeded	Default value: 1
3	Producing Connection Instance	Get/Set	UINT	Connection instance containing the path of the production data which have sent an acknowledge to the controller.	Default value: 4
4	Ack List Size	Get	BYTE	Maximum number of participating instances in the acknowledge list.	1
5	Ack List	Get	Array of USINT	List of all active connection instances containing acknowledges.	N/A

6	Data with Ack Path List Size	Get	BYTE	Maximum number of participants from the attribute "Data with Ack Path List"	1
7	Data with Ack Path List	Get	Array of USINT	List of all connection participants. Used to forward data that was received with an acknowledgement	N/A

Class Code Hex 0xa0 - I/O Data Input Mapping

In this object you have the option to access the I/O data. The process data input area is distributed here to the various attributes in instance 1 of this class.

You can also access these values via class 3, instance 0x96-0x9a.

The gateway component supports the following functions in this class:

Class Services

- Get Attribute Single (0x0e): This function resets the content of certain attributes.

Instance Services

- Get Attribute Single (0x0e): This function resets the content of certain attributes.

The gateway component supports the following data in this class:

Instance 0

#	Name	Access	Type	Value
1	Version	Get	UINT	0x0001

Instance 1

#	Name	Access	Type	Description
1	Data	Get	Array of USINT	The first 64 bytes of the process data input area Also available in instance 0x64
2-8	Data	Get	Array of USINT	Not used

Class Code Hex 0xa1 - I/O Data Input Mapping

In this object you have the option to access the I/O data. The process data output area is distributed here to the various attributes in instance 1 of this class.

You can also access these values via the assembly object.

The gateway component supports the following functions in this class:

Class Services

- Get Attribute Single (0x0e): This function resets the content of certain attributes.

Instance Services

- Get Attribute Single (0x0e): This function resets the content of certain attributes.

The gateway component supports the following data in this class:

Instance 0

#	Name	Access	Type	Value
1	Version	Get	UINT	0x0001

Instance 1

#	Name	Access	Type	Description
1	Data	Get/Set	Array of USINT	The first 64 bytes of the process data input area Also available in instance 0x64
2-8	Data	Get/Set	Array of USINT	Not used

Class 0xa2 - I/O Data Output Mapping

With this object you can poll data via the partner gateway component.

The gateway component supports the following functions in this class:

Class Services

- Get Attribute Single (0x0e)

Instance Services

- Get Attribute Single (0x0e)
- Set Attribute Single (0x10)

The gateway component supports the following data in this class:

Instance 0

#	Name	Access	Type	Value
1	Version	Get	UINT	0x0001

Instance 1

#	Name	Access	Type	Description
1	Type ID	Get	Array of USINT	Type ID of the partner gateway component
2	Input Size	Get	Array of USINT	Input size of the partner gateway component
3	Output Size	Get	Array of USINT	Output size of the partner gateway component
4	Bus State	Get	Array of USINT	State of the fieldbus connection of the partner gateway component

6 Technical Data

6.1 Technical Data

Dimensions	
Width	22.5 mm
Height	96 mm
Depth	110.4 mm
Weight	90 g

Electrical data	
Power supply	24 V DC
Power consumption during operation (cyclical data exchange)	100 mA
Status display	LED

Environmental conditions	
Ambient temperature	0 – 60 °C
Storage temperature	- 25 – 60 °C
Humidity	93 % (at 40 °C)
Condensing	Not allowed
Protection class	
Control cabinet	IP54
Housing	IP20
Terminal area	IP20

Assembly data	
DIN rail	35 x 7.5 mm
Height	96 mm
Depth	110.4 mm

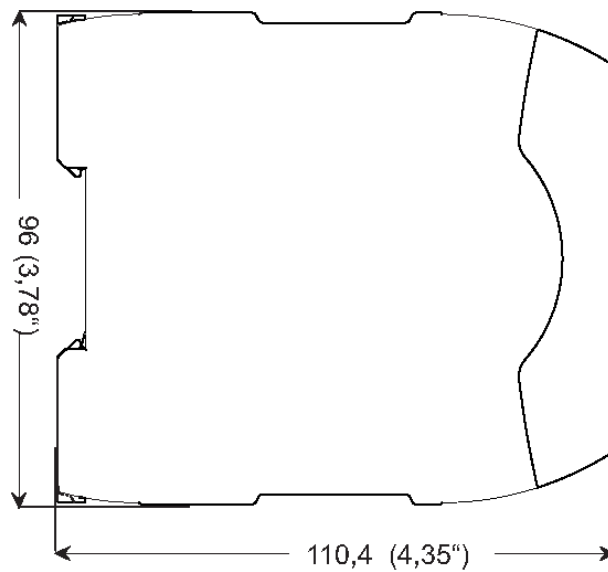


Illustration 7: Side dimensions

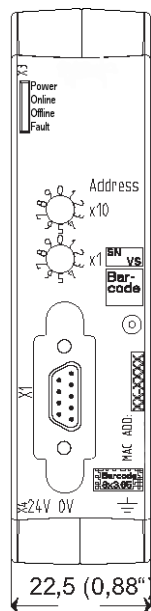


Illustration 8: Front dimensions