OPERATION MANUAL

Fieldbus controller
Model 9251

Valid from: August 02, 2022

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THE MEASUREMENT SOLUTION.

EU-Konformitätserklärung (nach EN ISO/IEC 17050-1:2010)

EU-Declaration of conformity (in accordance with EN ISO/IEC 17050-1:2010)

Name des Ausstellers: *Issuer's name:* burster präzisionsmesstechnik gmbh & co kg

Anschrift des Ausstellers: *Issuer's address:* Talstr. 1-5, 76593 Gernsbach, Germany

Gegenstand der Erklärung: *Object of the declaration:* Buscontroller / *Buscontroller*

Modellnummer(n) (Typ): *Model number / type:* 9251

Diese Erklärung beinhaltet obengenannte Produkte mit allen Optionen
This declaration covers all options of the above product(s)

Das oben beschriebene Produkt ist konform mit den Anforderungen der folgenden Dokumente:
The object of the declaration described above is in conformity with the requirements of the following documents:

Dokument-Nr. *Documents No.*	**Titel** *Title*	**Ausgabe** *Edition*
2011/65/EU	Richtlinie zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten *Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment*	2011
2014/35/EU	Richtlinie zur Harmonisierung der Rechtsvorschriften der Mitgliedsstaaten über die Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Markt *Directive on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits*	2014
2014/30/EU	Richtlinie zur Harmonisierung der Rechtsvorschriften der Mitgliedsstaaten über die Elektromagnetische Verträglichkeit *Directive on the harmonization of the laws of the Member States relating to electromagnetic compatibility*	2014
EN 61010-1	Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte – Teil 1: Allgemeine Anforderungen *Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements*	2010 + Cor.:2011
EN 61326-1	Elektrische Mess-, Steuer-, Regel- und Laborgeräte – EMV-Anforderungen – Teil 1: Allgemeine Anforderungen *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements*	2013
EN 55011	Industrielle, wissenschaftliche und medizinische Geräte – Funkstörungen – Grenzwerte und Messverfahren, Gruppe 1, Grenzwertklasse A *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement, group 1, class A*	2009 + A1: 2010

Gernsbach	28.07.2020	ppa. Christian Karius
Ort / *place*	Datum / *date*	*Quality Manager*

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According EN ISO/IEC 17050 this document ***is valid without a signature***.

Warnung! Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen.
Warning! This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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1 For your safety

The following symbols on the model 9251 fieldbus controller and in this operation manual warn of hazards.

1.1 Symbols used in the operating manual

1.1.1 Signal words

The following signal words are used in the operating manual according to the specified hazard classification.

 **DANGER**
High degree of risk: indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 **WARNING**
Moderate degree of risk: indicates a hazardous situation which, if not avoided, may result in death or serious injury.
 **CAUTION**
Low degree of risk: indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE
Property damage to the equipment or the surroundings will result if the hazard is not avoided.

Note: It is important to heed these safety notices in order to ensure you handle the model 9251 fieldbus controller correctly.

IMPORTANT: Follow the information given in the operating manual.

1.1.2 Pictograms

	**Electric shock hazard**
	**Important, please note**
	Observe the advice for protecting the model 9251 fieldbus controller.

1.2 Symbols on the 9251 fieldbus controller

Symbol	Description
	See manual! It is essential to observe the information and notes in the operation manual for the model 9251 fieldbus controller. Follow safety instructions – professional servicing only.

1.2.1 Conventions used in the operating manual

Designation	Description
[Text]	Operating buttons
“Term”	Terms used in the instrument menus

2 Introduction

IMPORTANT: Read the operating manual carefully before using the equipment, and keep for future reference.

2.1 Intended use

DANGER

- Only use the model 9251 fieldbus controller outside of potentially explosive areas.
- The model 9251 fieldbus controller is not intended as a substitute for safety devices and protective equipment. Use safety devices and protective equipment.
- The model 9251 fieldbus controller is not intended for use in medical applications or where people are at risk.
- Do not connect voltages that are higher than the specification allows.
- Not for safety-critical applications.

Intended use is defined as:

- For industrial purposes
- For use in EMC-certified control cabinets
- Use only with grounded top-hat rails

Industry-compatible connection and installation technologies make it easier for the user to adapt and integrate the unit in existing mechanical and electrical environments. The outstanding measuring quality makes it ideally suited to use in both development and testing.

Typical applications of the model 9251 fieldbus controller include:

- Factory automation
- Integration of measurement data in a control environment
- Use in test and calibration laboratories
- Measuring and control equipment

2.2 Customer service

2.2.1 Customer service department

For repair inquiries, please telephone our Service department on +49 7224 645-53, or email: service@burster.de (Germany only). If you are outside Germany, you should contact your burster agent (see also www.burster.com).

Please have the serial number to hand. The serial number is essential to establishing the definite technical status of the instrument and providing help quickly. You will find the serial number on the type plate of the model 9251 fieldbus controller.

2.2.2 Contact person

If you have any questions relating to the model 9251 fieldbus controller, please go directly to burster präzisionsmesstechnik gmbh & co kg, or if outside Germany, please contact your burster agent (see also www.burster.com).

Head office

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2.3 Download the test certificate

You have the option to download the test certificate for your model 9251 fieldbus controller online. To do this, use the following link https://tinyurl.com/y45kumy6. You can then download the test certificate directly by entering the serial number.

2.4 Ambient conditions

2.4.1 Storage conditions

The following requirements must be met when storing the model 9251 fieldbus controller:

- Store at temperatures between -25 °C and +70 °C
- The model 9251 fieldbus controller must be packed in clean packaging
- Store in a dry environment
- No condensation

2.4.2 Operating conditions

The following requirements must be met when operating the model 9251 fieldbus controller:

- Indoor operation only
- Maximum altitude 2000 m
- Operate at temperatures between 0 °C and 50 °C
- Humidity: 80% up to +31 °C, decreasing linearly above that temperature to 50% at Tmax, non-condensing
- Class of protection: 3
- Transient overvoltage category: CAT II
- Supply voltage 11 to 30 V DC
- The mounting rail must be grounded (PE)

Note: Avoid condensation after transportation or storage.

2.4.3 Restrictions on use

DANGER

The model 9251 fieldbus controller is not intended as a substitute for safety devices and protective equipment.
Use safety devices and protective equipment.

The model 9251 fieldbus controller does not pose a hazard if used within its specification and in accordance with the safety regulations.

The manufacturer does not accept liability for any personal injury or property damage arising from misinterpretation of measurement results.

2.4.4 Cleaning

DANGER

Electrical shock hazard
Disconnect the model 9251 fieldbus controller from the power supply before cleaning.

Disconnect the model 9251 fieldbus controller from the power supply and use a dry cloth to clean the unit.

NOTICE

Do not immerse the model 9251 fieldbus controller in water or hold it under running water. Do not use strong cleaning agents as these may damage the model 9251 fieldbus controller. Clean the model 9251 fieldbus controller using a slightly damp cloth.

2.5 Personnel

Personnel must be familiar with the relevant regulations. They must follow these regulations. Only trained personnel who are familiar with the applicable safety regulations are permitted to operate the model 9251 fieldbus controller.

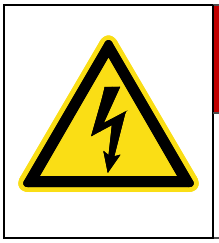
burster is happy to provide your operating personnel with training. To find out more, please look at our range of services at www.burster.de

2.6 Contents of pack

The following components are supplied:

- Model 9251 fieldbus controller
- Operation manual
- Warranty document
- Test certificate
- Free version of DigiVision configuration and analysis software

2.7 Unpacking



DANGER

Electrical shock hazard
Never switch on the model 9251 fieldbus controller if it shows signs of damage incurred in transit. Only ever use the model 9251 fieldbus controller under the conditions specified in this operating manual.

Inspect the model 9251 fieldbus controller for damage. If you suspect that the unit has been damaged during shipping, notify the delivery company within 72 hours.

The packaging should be retained for examination by a representative of the manufacturer and/or the delivery company.

The model 9251 fieldbus controller should be shipped only in its original packaging or in packaging capable of providing an equivalent degree of protection.

2.8 Warranty

burster präzisionsmesstechnik gmbh & co kg provides a manufacturer's warranty for a period of 24 months after delivery.

Any repairs required during this time will be made without charge. This does not include damage arising from improper use.

Please note the following when sending the model 9251 fieldbus controller in for repair:

- If there is a problem with the device, please attach a note to the housing of the model 9251 fieldbus controller summarizing the fault.
- Technical specifications subject to change at any time without notice.
  We also state explicitly that we do not accept liability for consequential damage.
- The instrument must always be dispatched in suitable packaging.

2.9 Conversions and modifications

Note: The warranty shall be deemed void immediately if you open or dismantle the model 9251 fieldbus controller during the warranty period.

The model 9251 fieldbus controller does not contain any parts that are intended to be serviced by the user. Only the manufacturer's own qualified personnel are permitted to open the model 9251 fieldbus controller.

It is not permitted to make any changes to the model 9251 fieldbus controller without the written agreement of burster präzisionsmesstechnik gmbh & co kg. burster präzisionsmesstechnik gmbh & co kg does not accept liability for damages or injury if this condition is disregarded.

3 Device concept

Please refer to the model 9251 fieldbus controller data sheet for full details of dimensions, weight, degree of protection etc.

3.1 Functional scope

The model 9251 fieldbus controller serves as a bridge between cascadable model 9250 universal instrumentation amplifiers and Ethernet-based fieldbuses such as PROFINET, EtherCAT and EtherNet/IP. Up to eight model 9250 instrumentation amplifiers, bus-compatible version, can be connected to the model 9251 fieldbus controller. The scaled measured values are read simultaneously in the real-time data of the fieldbus link. A DC standard signal input with voltage range ±10 V can be used directly on the model 9251 fieldbus controller.

With an update rate of approx. 3.6 kHz, the measured values of the model 9250 instrumentation amplifier and the internal auxiliary channel in the model 9251 fieldbus controller are written to the process data array (real-time data) and therefore made available for process data access by the PLC. In addition to the channel live values, an array of 32 recorded measured values is always available. With the aid of an additional array counter, the higher-level PLC can record and evaluate a highly dynamic series of measured values even at a low access rate.

A USB interface is provided for device configuration. The DigiVision PC software (free version at www.burster.de) enables easy setup and shows the status of all connected model 9250 instrumentation amplifiers.

Additional functions such as a real-time status of all connected model 9250 instrumentation amplifiers and the model 9251 fieldbus controller, tare possibilities, peak value recording and smart limit modes enable the use of the 9250/9251 product bundle in a wide range of measuring tasks in modern industrial applications.

3.2 Block diagram and potentials

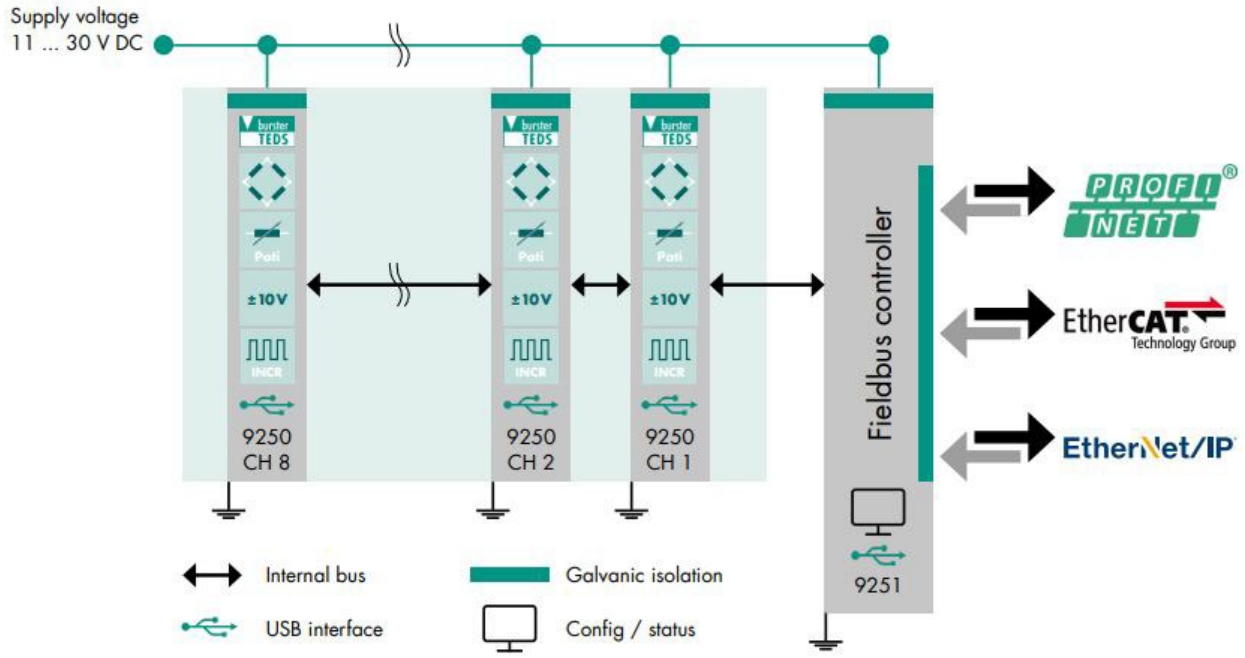


Figure 1: Block diagram model 9251 fieldbus controller

The PLC inputs and outputs, TTL inputs and supply voltage are galvanically isolated from the actual measurement electronics, and accordingly have their own ground connections. The permissible voltage of the respective connections to PE is 20 V.

Note: Each module requires a separate supply voltage.

3.3 Versions

Please refer to the data sheet for details of the different versions. You can obtain the latest data sheet and additional information on the model 9251 fieldbus controller at https://tinyurl.com/y65b5xys or simply use the QR code below:

Figure 2: QR code for 9251 fieldbus controller

3.4 Power supply

The model 9251 fieldbus controller can be operated with a voltage of 11 to 30 V DC. The maximum power consumption of the model 9251 fieldbus controller is 3 W.

3.5 Available sensors (optional)

Via the optional voltage input, sensors with a standard signal (0 to ±10 V) can be connected to the model 9251 fieldbus controller.

3.5.1 Sensor technologies (optional)

Symbol	Type
±10V	Sensors with standard signal (process signal)

3.6 Error indicators

Indicator	Error description
Status LED flashing rapidly red	Error after power-on Sensor supply not available Internal malfunction
Status LED lights continuously red	Input overload
Status LED red flashing rapidly and LED green flashing slowly	The ADC is not providing measurements because it has been stopped via the PLC input

Table 1: Error indicators, model 9251 fieldbus controller

4 Controls and connections

4.1 Front view

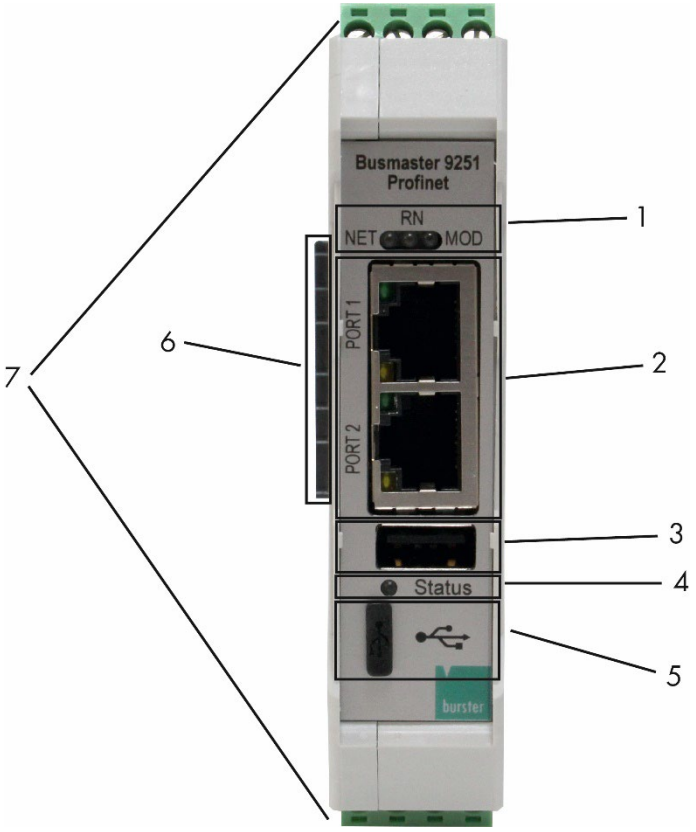


Figure 3: Front view of model 9251 fieldbus controller

Label	Description
1	Fieldbus status indicator
2	Fieldbus ports
3	USB host
4	Status LED
5	Micro-USB port for configuration
6	Internal bus connection e.g. for model 9250 instrumentation amplifier
7	External inputs and outputs

Table 2: Connections on model 9251 fieldbus controller (front view)

4.2 Terminal assignment / pin assignment

Pin	Assignment
1	Analog input (±10 V) (optional)
2	Analog input GND
3	Shield
4	Not used
11	Supply voltage 11 to 30 V DC
12	Supply voltage GND
13	PLC input 1
14	PLC input 2
15	PLC output 1
16	PLC output 2
17	PLC supply GND
18	PLC supply +24 V
19	Shield

Table 3: Pin assignment model 9251 fieldbus controller

4.3 Fieldbus status indicator

The fieldbus status indicator on the model 9251 fieldbus controller depends on the chosen version. You can choose between the different fieldbuses PROFINET, EtherCAT and EtherNet/IP.

See the respective fieldbus section for a detailed description of the status indicators.

4.4 LEDs

LEDs	Description
Flashing	Lamp test on power-on
“Status” LED	Status LED, dual-color LED green and red
OFF	Offline
Green	Online (RUN)

Table 4: Meaning of LEDs model 9251 fieldbus controller

4.5 Status LED (normal operation)

The status LED is a multi-color LED that tells you the status of the model 9251 fieldbus controller.

Indicator	Description
Status LED flashing slowly green	Normal measuring mode
Status LED flashing rapidly green	Boot phase
Status LED flashing 3x repeatedly red	Fieldbus module error: Module not recognized
Status LED flashing 4x repeatedly red	Fieldbus module error: Module not supported
Status LED flashing 5x repeatedly red	Fieldbus module error: Module not responding
Status LED flashing 6x repeatedly red	Fieldbus module error: Module shut down
Status LED flashing 7x repeatedly red	Fieldbus module error: Unexpected error
Status LED continuously flashing slowly red and green	Analog input overload

Table 5: Status LED (normal operation) on model 9251 fieldbus controller

4.6 Grounding and shielding

The model 9251 fieldbus controller is grounded via the mounting rail. Use suitable connecting cables for connecting communication interfaces and for controlling I/O signals. Ideally you should connect sensors using burster connecting cables and with a minimum length of cable.

We strongly recommend the following:

- In general, keep sensor connecting leads as short as possible.
- When using control lines from remote PLC systems, make sure all the system components are suitably grounded.
- When using detachable extension leads, make sure the shielding is continuous.
- Spatially separate the signal and power supply lines.

4.7 Compatible sensors / inputs

4.7.1 Voltage measurement / transmitter with voltage output (optional)

Via the optional analog input, transmitters with a voltage output of up to ±10 V can be connected.

- The measuring range is 0 to ±10 V.
- Transmitters having a voltage output of up to ±10 V can be connected like a voltage source.
- The transmitters require a separate power supply.

Connect transmitters as follows:

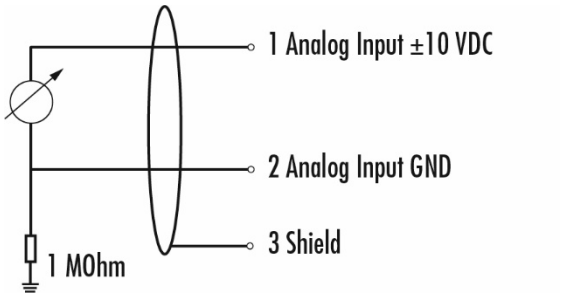


Figure 4: Transmitter with voltage output

The input range is 0 to ±10 V.

Note: The model 9251 fieldbus controller does not provide supply voltages for transmitters.

4.8 PLC inputs

The model 9251 fieldbus controller optionally (in conjunction with the analog input option) has two independent PLC inputs to which different functions can be assigned. The PLC inputs are only available with the optional analog input. Possible functions are:

- Tare
- Reset tare
- Reset limit memory 1 or 2
- Copy input to corresponding output

Note: The PLC inputs are galvanically isolated from the measurement electronics, but not from the PLC outputs.

4.9 PLC outputs

The model 9251 fieldbus controller optionally (in conjunction with the analog input option) has two independent PLC outputs to which different functions can be assigned. The PLC outputs are only available with the optional analog input.

The following functions are possible:

- Dynamic limit threshold under / dynamic limit threshold over:
  The output is set as long as the value remains above/below the threshold. If this condition is no longer fulfilled, the output is cleared (dynamic behavior).
- Static limit threshold under / static limit threshold over:
  The output is set as long as the value remains above/below the threshold and stays set even if this condition is no longer fulfilled. The output can only be reset via a corresponding RESET signal at the PLC input (static behavior).
- Window mode:
  The output is set as long as the measurement signal is between a lower and an upper limit threshold value. If the signal leaves this range, the output is cleared. If the signal subsequently fulfills the condition again, the output is set again (dynamic behavior).

Note: The PLC outputs are galvanically isolated from the measurement electronics, but not from the PLC inputs.

4.10 Micro-USB port for configuration

The model 9251 fieldbus controller has a Micro-USB port for configuration via the free software DigiVision. The USB interface conforms to USB 2.0 Micro-B.

IMPORTANT: The Micro-USB port is for configuration purposes only. A connected device may cause interference during measurement operation.

USB interface

The USB interface complies with the USB 2.0 standard and the pin assignment is as usual. The built-in connector on the model 9251 fieldbus controller is for a USB 2.0 Micro-B plug.

Pin	Name
1	+5 V
2	Data -
3	Data +
4	ID (not used)
5	GND

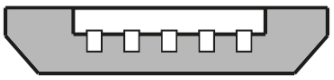


Figure 5: USB Micro-B

4.11 USB host

Note: The USB Type-A port is not currently used.

5 Using the instrument for the first time

DANGER

Electrical shock hazard

- Never switch on the model 9251 fieldbus controller if it shows signs of damage incurred in transit. Only ever use the model 9251 fieldbus controller under the conditions specified in this operating manual.
- Only use the model 9251 fieldbus controller outside of potentially explosive areas.
- Do not connect voltages that are higher than the specification. For the supported ranges, see the data sheet for the model 9251 fieldbus controller.

5.1 Installation/removal

WARNING

Install the model 9251 fieldbus controller only on a grounded mounting rail in a grounded control cabinet.

The model 9251 fieldbus controller must be installed on a grounded mounting rail in accordance with DIN EN 60715 in a grounded control cabinet.

Installation

This is how it works

1. Place the upper edge of the mounting section on the mounting rail.
2. Press the model 9251 fieldbus controller from the front against the mounting rail until it audibly engages.
3. Pull lightly on the model 9251 fieldbus controller to check it is securely mounted.

Removal

This is how it works

1. Use a screwdriver to release the catch on the bottom of the model 9251 fieldbus controller from the mounting rail.
2. Tilt the model 9251 fieldbus controller slightly upward, grip its top edge and lift it off the mounting rail.

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After the power-on process, the model 9251 fieldbus controller communicates with the connected model 9250 instrumentation amplifiers to initialize them. During the startup process, the status LED (green) flashes rapidly.

If the initialization was successful, the model 9250 instrumentation amplifiers show their channel number in the LED field. If the model 9251 fieldbus controller was not recognized, then the status LED on the model 9250 instrumentation amplifiers flashes continuously in a 1-1-1 pattern. When module detection is complete, the status LED flashes continuously and slowly. The fieldbus-specific LEDs represent the status of the fieldbus.

For integration into a PROFINET network, during the configuration phase it is necessary to define how many bytes are exchanged between the controller and the device during each access cycle. The GSD file describes the physical properties of the model 9251 fieldbus controller. The structure, content and coding of this device description data is standardized, which allows the model 9251 fieldbus controller to be configured using common configuration tools. Please consult this manual for details of how to program the model 9251 fieldbus controller.

Note: The current PROFINET GSD XML file is available on the burster website (https://www.burster.com/en/download-area).

Example setup of model 9251 fieldbus controller with 8 model 9250 instrumentation amplifier modules:

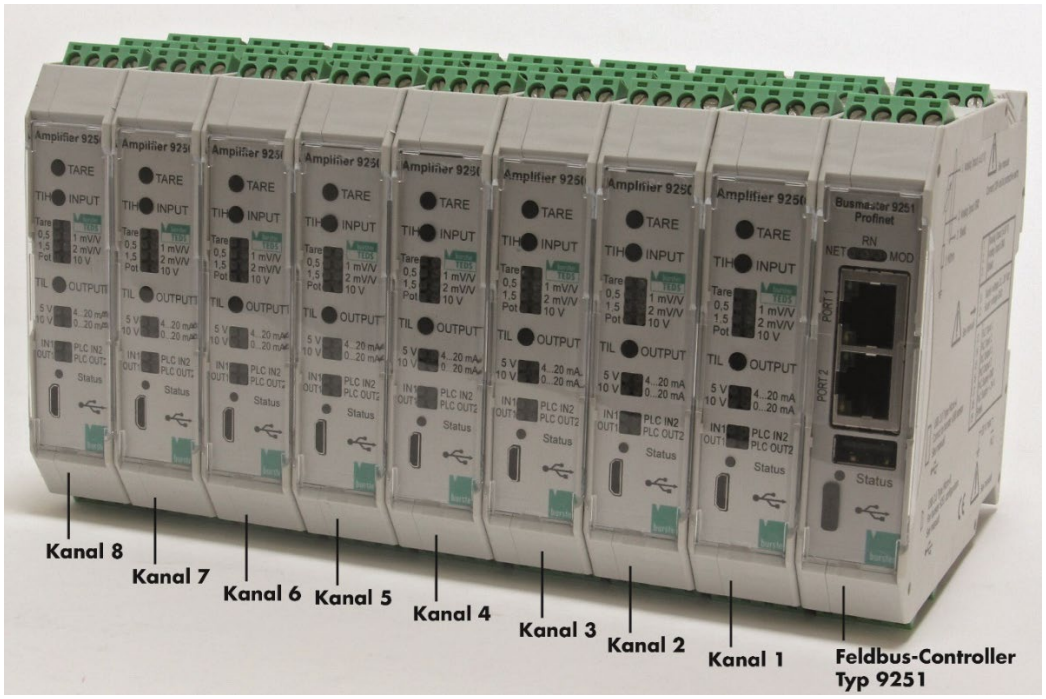

Figure 6: Example setup

6.1 Port identification

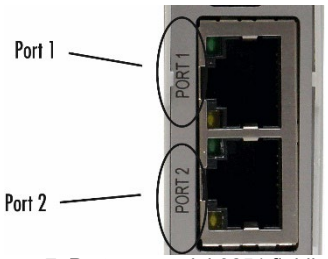

Figure 7: Ports on model 9251 fieldbus controller

6.2 Planning a PROFINET network

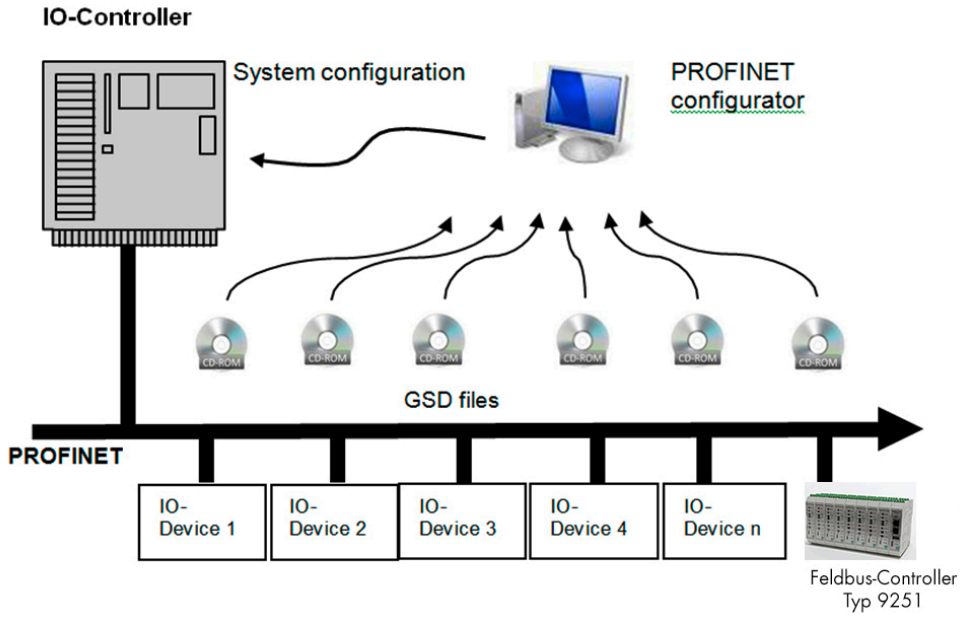

Figure 8: Planning a PROFINET network

6.3 PROFINET fieldbus-specific LED functions

Figure 9: Fieldbus-specific LEDs on model 9251 fieldbus controller

LED	Status	Description
RN	Off	There is no connection between the model 9251 fieldbus controller and the master, or no power supply is connected.
	Green	The model 9251 fieldbus controller is in RUN state and the connection to the master is established.
	Green, single flashes	The fieldbus controller is in the STOP state, the I/O data contains errors or an error has occurred in the IRT synchronization. The connection to the master is established.
	Green, flashing	Is used by engineering tools to identify nodes in the network.
	Red, on	System error, please contact us.
	Red, single flashes	Station name not assigned.
	Red, double flashes	IP address not assigned.
	Red, triple flashes	Configuration error.
RN	Off	The model 9251 fieldbus controller is not ready for operation or the power supply is not connected.
	Green	The model 9251 fieldbus controller is ready for operation.
MOD	Off	The model 9251 fieldbus controller is in the NW_INIT state or there is no power supply.
	Green	The model 9251 fieldbus controller is ready for operation.
	Green, flashes	Diagnostics for the model 9251 fieldbus controller are active.
	Red, on	The model 9251 fieldbus controller is in an exception state or a system error has occurred. Please contact us.

	Alternating red/green	The model 9251 fieldbus controller is performing a firmware update. Notice: Do not disconnect the power supply. Switching the device off during a firmware update may cause serious permanent damage.

Table 6: PROFINET fieldbus-specific LED functions

6.4 Cyclical data transmission from the 9251 fieldbus controller to the control system

The cyclical data of the model 9250 instrumentation amplifier with model 9251 fieldbus controller is divided into data blocks per measuring channel. Each measuring channel corresponds to a hardware module. Each module has the same data structure and length, including the model 9251 fieldbus controller. The first data block is always the model 9251 fieldbus controller, the second data block is the first measuring channel from the first model 9250 instrumentation amplifier, the third block represents the second measuring channel from the second model 9250 instrumentation amplifier, and so on.

Please note that there are only as many data blocks as there are devices. A combination of model 9251 fieldbus controller and model 9250 instrumentation amplifiers with four measuring channels is represented by five data blocks. The first data block is the 9251 fieldbus controller, the other four data blocks are assigned to the four model 9250 instrumentation amplifiers.

Two different methods of data transmission are available:

Single measured value transmission (“short”)

The “short” method is suitable for very slow measurements or very fast PLC communication. The latest measured value is written at offset address 2 in the structure. Every time a new value is available, the old entry is overwritten. To check whether there is a new entry or a measured value has not been read, there is a so-called live counter at offset address 6. This counter is incremented with each new measured value. The counter is one byte which overflows at 255 to 0 and then counts up again.

Note: A small amount of space (8 bytes) is used in the PLC memory. At high measurement rates, it must be ensured that the data is read fast enough.

Simultaneous transmission of 32 measured values (“extended”)

The “extended” method is suitable for high measurement rates, where it is not possible to be certain that the fieldbus system is fast enough to record every single measurement. A complete array of 32 measured values (starting with address offset 8) is written into the data structure once 32 measurements have been acquired. The fieldbus system therefore only has to detect every 32nd measurement and read out all 32 measured values in the array. This array-based method also has its own live counter, which is incremented every time a new array with 32 measurements is written.

Note: The communication module BusCoupler Data Extended / 9250 Strain Gage Extended corresponds to the setting “Representation in a 32-array (Extended)”. This setting requires more capacity in the PLC memory (163 bytes), but the data can be accessed at a slower speed.

The live values are transmitted without a unit. For the scaling of the measurement channels, see the test certificate for the relevant model 9250 instrumentation amplifier module.

6.4.1 Data packets for data transmission from the 9251 fieldbus controller to the control system using the “short” method

	Content	Length/Bytes	∑ Bytes
9251	Device status	2	Sum: 8 bytes
	Measurement value (real)*	4	
	Measurement counter*	1	
	reserved	1	
9250 channel 1	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 8 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	reserved	1	
9250 channel 2	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 8 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	reserved	1	
9250 channel 3	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 8 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	reserved	1	
9250 channel 4	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 8 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	reserved	1	
9250 channel 5	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 8 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	reserved	1	
9250 channel 6	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 8 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	reserved	1	
9250 channel 7	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 8 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	reserved	1	
9250 channel 8	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 8 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	reserved	1	

* only active with analog input option

Table 7: Inputs overview – short

6.4.2 Data packets for data transmission from the 9251 fieldbus controller to the control system using the “extended” method

	Content	Length/Bytes	∑ Bytes
9251	Device status	2	Sum: 136 bytes
	Measurement value (real)*	4	
	Measurement counter*	1	
	Measurement array counter*	1	
	Measurement value array (real)*	128	
	Content	**Length/Bytes**	**∑ Bytes**
9250 Channel 1	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
	Content	**Length/Bytes**	**∑ Bytes**
9250 Channel 2	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
	Content	**Length/Bytes**	**∑ Bytes**
9250 Channel 3	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
	Content	**Length/Bytes**	**∑ Bytes**
9250 Channel 4	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
	Content	**Length/Bytes**	**∑ Bytes**
9250 Channel 5	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
	Content	**Length/Bytes**	**∑ Bytes**
9250 Channel 6	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
	Content	**Length/Bytes**	**∑ Bytes**
9250 Channel 7	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
	Content	**Length/Bytes**	**∑ Bytes**
9250 Channel 8	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	

* only active with analog input option

Table 8: Inputs overview – extended

6.4.3 Complete data protocol for data transmission from the 9251 fieldbus controller to the control system using the "short" method

Address Offset	Length (Bytes)	Description	
0	1	STATUS 1	
		xxxx xxx1	Bit0: TARE is active
		xxxx xx1x	Bit1: Error, analog input overload
		xxxx x1xx	Bit2: Warning: ADC inactive Warning: Ua/Ia is not related to input signal
		xxxx 1xxx	Bit3: Logic state digital input A
		xxx1 xxxx	Bit4: Logic state digital input B
		xx1x xxxx	Bit5: Logic state digital output A
		x1xx xxxx	Bit6: Logic state digital output B
		1xxx xxxx	Bit7: Configuration fault
1	1	STATUS 2 (not used)	
2	4	Newest measurement value (real)	
6	1	Live counter, will be incremented with every new measurement value	
7	1	Reserved	

Table 9: Complete data protocol (short) – model 9251 fieldbus controller – inputs

6.4.4 Data protocol for data transmission from the 9250 instrumentation amplifier to the control system using the "short" method

Address Offset	Length (Bytes)	Description	
0	1	STATUS 1	
		xxxx xxx1	Bit0: TARE is active
		xxxx xx1x	Bit1: Measurement error
		xxxx x1xx	Bit2: Warning: Ua/Ia is not related to input signal (due to input overload, peak hold mode, ADC inactive)
		xxxx 1xxx	Bit3: Logic state digital input A
		xxx1 xxxx	Bit4: Logic state digital input B
		xx1x xxxx	Bit5: Logic state digital output A
		x1xx xxxx	Bit6: Logic state digital output B
		1xxx xxxx	Bit7: Configuration fault
1	1	STATUS 2 (not used)	
2	4	Newest measurement value (real)	
6	1	Live counter, will be incremented with every new measurement value	
7	1	reserved	

Table 10: Complete data protocol (short) – model 9250 instrumentation amplifier – inputs

6.4.5 Data protocol for data transmission from the 9251 fieldbus controller to the control system using the “extended” method

Address Offset	Length (Bytes)	Description	
0	1	STATUS 1	
		xxxx xxx1	Bit0: TARE is active
		xxxx xx1x	Bit1: Error, analog input overload [bus coupler: overload]
		xxxx x1xx	Bit2: Warning: ADC inactive Warning: Ua/Ia is not related to input signal
		xxxx 1xxx	Bit3: Logic state digital input A
		xxx1 xxxx	Bit4: Logic state digital input B
		xx1x xxxx	Bit5: Logic state digital output A
		x1xx xxxx	Bit6: Logic state digital output B
		1xxx xxxx	Bit7: Configuration fault
1	1	STATUS 2 (not used)	
2	4	Newest measurement value (real)	
6	1	Live counter, will be incremented with every new measurement value	
7	1	Array live counter, will be incremented with every new 32-array written	
8	4	Value no. 0 of measurement value array (real)	
12	4	Value no. 1 of measurement value array (real)	
16	4	Value no. 2 of measurement value array (real)	
20	4	Value no. 3 of measurement value array (real)	
24	4	Value no. 4 of measurement value array (real)	
28	4	Value no. 5 of measurement value array (real)	
32	4	Value no. 6 of measurement value array (real)	
36	4	Value no. 7 of measurement value array (real)	
40	4	Value no. 8 of measurement value array (real)	
44	4	Value no. 9 of measurement value array (real)	
48	4	Value no. 10 of measurement value array (real)	
52	4	Value no. 11 of measurement value array (real)	
56	4	Value no. 12 of measurement value array (real)	
60	4	Value no. 13 of measurement value array (real)	
64	4	Value no. 14 of measurement value array (real)	
68	4	Value no. 15 of measurement value array (real)	
72	4	Value no. 16 of measurement value array (real)	
76	4	Value no. 17 of measurement value array (real)	
80	4	Value no. 18 of measurement value array (real)	
84	4	Value no. 19 of measurement value array (real)	
88	4	Value no. 20 of measurement value array (real)	
92	4	Value no. 21 of measurement value array (real)	
96	4	Value no. 22 of measurement value array (real)	
100	4	Value no. 23 of measurement value array (real)	
104	4	Value no. 24 of measurement value array (real)	
108	4	Value no. 25 of measurement value array (real)	
112	4	Value no. 26 of measurement value array (real)	
116	4	Value no. 27 of measurement value array (real)	
120	4	Value no. 28 of measurement value array (real)	
124	4	Value no. 29 of measurement value array (real)	
128	4	Value no. 30 of measurement value array (real)	
132	4	Value no. 31 of measurement value array (real)	

Table 11: Complete data protocol (extended) – model 9251 fieldbus controller – inputs

6.4.6 Data protocol for data transmission from the 9250 instrumentation amplifier to the control system using the “extended” method

Address Offset	Length (Bytes)	Description	
0	1	STATUS 1	
		xxxx xxx1	Bit0: TARE is active
		xxxx xx1x	Bit1: Measurement error
		xxxx x1xx	Bit2: Warning: Ua/Ia is not related to input signal (due to input overload, peak hold mode, ADC inactive)
		xxxx 1xxx	Bit3: Logic state digital input A
		xxx1 xxxx	Bit4: Logic state digital input B
		xx1x xxxx	Bit5: Logic state digital output A
		x1xx xxxx	Bit6: Logic state digital output B
		1xxx xxxx	Bit7: Configuration fault
1	1	STATUS 2 (not used)	
2	4	Newest measurement value (real)	
6	1	Live counter, will be incremented with every new measurement value	
7	1	Array live counter, will be incremented with every new 32-array written	
8	4	Value no. 0 of measurement value array (real)	
12	4	Value no. 1 of measurement value array (real)	
16	4	Value no. 2 of measurement value array (real)	
20	4	Value no. 3 of measurement value array (real)	
24	4	Value no. 4 of measurement value array (real)	
28	4	Value no. 5 of measurement value array (real)	
32	4	Value no. 6 of measurement value array (real)	
36	4	Value no. 7 of measurement value array (real)	
40	4	Value no. 8 of measurement value array (real)	
44	4	Value no. 9 of measurement value array (real)	
48	4	Value no. 10 of measurement value array (real)	
52	4	Value no. 11 of measurement value array (real)	
56	4	Value no. 12 of measurement value array (real)	
60	4	Value no. 13 of measurement value array (real)	
64	4	Value no. 14 of measurement value array (real)	
68	4	Value no. 15 of measurement value array (real)	
72	4	Value no. 16 of measurement value array (real)	
76	4	Value no. 17 of measurement value array (real)	
80	4	Value no. 18 of measurement value array (real)	
84	4	Value no. 19 of measurement value array (real)	
88	4	Value no. 20 of measurement value array (real)	
92	4	Value no. 21 of measurement value array (real)	
96	4	Value no. 22 of measurement value array (real)	
100	4	Value no. 23 of measurement value array (real)	
104	4	Value no. 24 of measurement value array (real)	
108	4	Value no. 25 of measurement value array (real)	
112	4	Value no. 26 of measurement value array (real)	
116	4	Value no. 27 of measurement value array (real)	
120	4	Value no. 28 of measurement value array (real)	
124	4	Value no. 29 of measurement value array (real)	
128	4	Value no. 30 of measurement value array (real)	
132	4	Value no. 31 of measurement value array (real)	

Table 12: Complete data protocol (extended) – model 9250 instrumentation amplifier – inputs

6.5 Cyclical data transmission from the control system to the 9251 fieldbus controller

As described above in “Cyclical data transmission” section 6.4 on p. 243, all cyclical data of the model 9251 fieldbus controller and model 9250 instrumentation amplifier is structured in data blocks. Each measurement channel has the same data structure and length. The first data block always corresponds to the model 9251 fieldbus controller, the second data block corresponds to the first model 9250 instrumentation amplifier (to the left of the model 9251 fieldbus controller), the third data block corresponds to the second model 9250 instrumentation amplifier, and so on.

Note: The number of data blocks always corresponds to the number of available devices.

Example: A 9251/9250 combination with four measurement channels is represented by five data blocks. The first data block corresponds to the model 9251 fieldbus controller, the remaining four correspond to the respective measurement channels of the model 9250 instrumentation amplifiers.

6.5.1 Controlling the device functions

Multiple functions of the device can be controlled using the first two bit-coded bytes.

Note: To activate the control function, the MSB of Control B must be set.

Cyclic commands

Float values such as “tare” or “limits” can be written in address offset 2. To do this, first the command “idle” has to be sent. In the next cycle, the desired command should be sent, e.g. “tare”, and the new float value to offset 4. When the “cyclic command” entry (offset 2) changes to e.g. 0x01 for “tare”, the value transferred to offset 4 is read and set as the new value. After completion of the write command, “cyclic command” has to be set to “idle” again in preparation for a next command.

6.5.2 Data protocol cyclical data for data transmission from the control system to the 9251 fieldbus controller

Address Offset	Length (Bytes)	Description	
0	1	CONTROL BYTE A	
		xxxx xxx1	Bit0: Execute Tare Function! (0->1 Edge triggered)
		xxxx xx1x	Bit1: Reset Tare Function! (0->1 Edge triggered)
		xxxx x1xx	Bit2: Reset MinMax! (0->1 Edge triggered)
		xxxx 1xxx	Bit3: Reset Static Limit Out1! (0->1 Edge triggered)
		xxx1 xxxx	Bit4: Reset Static Limit Out2! (0->1 Edge triggered)
		xx1x xxxx	Bit5: unused
		x1xx xxxx	Bit6: unused
		1xxx xxxx	Bit7: unused
1	1	CONTROL BYTE B	
		xxxx xxx1	Bit0: unused
		xxxx xx1x	Bit1: Control DigOutA (DAUA! has to be set up correctly)
		xxxx x1xx	Bit2: Control DigOutB (DAUB! has to be set up correctly)
		xxxx 1xxx	Bit3: unused
		xxx1 xxxx	Bit4: unused
		xx1x xxxx	Bit5: unused
		x1xx xxxx	Bit6: unused
		1xxx xxxx	Bit7: PLC Fieldbus Bus Control Enable (Important: has to be set to ‘1’ or all settings here will be ignored!)
2	2	Cyclic command, value will be written with change from (Idle) → (WriteXXX) “New Value” is taken from “New Real Value 1” (offset address 4) 0x00 Idle 0x01 Write “New Value” to Tare value in [UserUnit] 0x02 Write “New Value” to Lower Limit A in [UserUnit] 0x03 reserved	

		0x04 Write “New Value” to Upper Limit A in [UserUnit] 0x05 reserved 0x06 Write “New Value” to Lower Limit B in [UserUnit] 0x07 reserved 0x08 Write “New Value” to Upper Limit B in [UserUnit] 0x09 reserved
4	4	New Real Value1 (can be written with Cyclic Command)
8	4	New Real Value 2 – reserved and not used
12	4	New Real Value 3 – reserved and not used

Table 13: Data protocol cyclical data for data transmission from the control system to the model 9251 fieldbus controller

6.5.3 Data protocol cyclical data for data transmission from the control system to the 9250 instrumentation amplifier

Address Offset	Length (Bytes)	Description	
0	1	CONTROL BYTE A	
		xxxx xxx1	Bit0: Execute Tare Function! (0->1 Edge triggered)
		xxxx xx1x	Bit1: Reset Tare Function! (0->1 Edge triggered)
		xxxx x1xx	Bit2: Reset Peak Hold Function and MinMax! (0->1 Edge trigd)
		xxxx 1xxx	Bit3: Reset Static Limit Out1! (0->1 Edge triggered)
		xxx1 xxxx	Bit4: Reset Static Limit Out2! (0->1 Edge triggered)
		xx1x xxxx	Bit5: unused
		x1xx xxxx	Bit6: unused
		1xxx xxxx	Bit7: Stop the ADC!
1	1	CONTROL BYTE B	
		xxxx xxx1	Bit0: Reset Config Error
		xxxx xx1x	Bit1: Control DigOutA (DAUA! has to be set up correctly)
		xxxx x1xx	Bit2: Control DigOutB (DAUB! has to be set up correctly)
		xxxx 1xxx	Bit3: unused
		xxx1 xxxx	Bit4: unused
		xx1x xxxx	Bit5: unused
		x1xx xxxx	Bit6: unused
		1xxx xxxx	Bit7: PLC Fieldbus Bus Control Enable (Important: has to be set to ‘1’ or all settings here will be ignored!)
2	2	Cyclic command, value will be written with change from (Idle) → (WriteXXX) “New Value” is taken from “New Real Value 1” (offset address 4) 0x00 Idle 0x01 Write “New Value” to Tare value in [UserUnit] 0x02 Write “New Value” to Lower Limit A in [UserUnit] 0x03 Write “New Value” to Lower Limit A in [Volt] 0x04 Write “New Value” to Upper Limit A in [UserUnit] 0x05 Write “New Value” to Upper Limit A in [Volt] 0x06 Write “New Value” to Lower Limit B in [UserUnit] 0x07 Write “New Value” to lower Limit B in [Volt] 0x08 Write “New Value” to Upper Limit B in [UserUnit] 0x09 Write “New Value” to Upper Limit B in [Volt]	
4	4	New Real Value1 (can be written with Cyclic Command)	
8	4	New Real Value 2 – reserved and not used	
12	4	New Real Value 3 – reserved and not used	

Table 14: Data protocol cyclical data for data transmission from the control system to the model 9250 instrumentation amplifier

6.6 Acyclical data

The model 9251 fieldbus controller and the model 9250 instrumentation amplifier have a number of acyclical entries that can be accessed via PROFINET.

Each data module has the same structure. Individual entries are addressed via index offsets, the individual module blocks are addressed via their hardware IDs. The corresponding hardware IDs can be viewed in the PLC configuration program (e.g. TIA Portal).

Note: Reading configuration entries while the module is controlled via the PLC is not allowed. Cyclic Output Offset 1 / Bit 7 (PLC Fieldbus Bus Control Enable) must be reset.

6.6.1 Data protocol acyclical data 9251 fieldbus controller

ID	Index (dec)	Type	Size/Bytes	Access	Entry
HW-ID of requested module Please also consider that write access addresses a different module than read access	3	Real	4	RO	Minimum Value
	4	Real	4	RO	Maximum Value
	5	Real	4	RW	Tare Value
	6	Real	4	RW	Limit A Lower Value in [User Unit]
	7	-	-	-	Not Available
	8	Real	4	RW	Limit A Upper Value in [User Unit]
	9	-	-	-	Not Available
	10	Real	4	RW	Limit B Lower Value in [User Unit]
	11	-	-	-	Not Available
	12	Real	4	RW	Limit B Upper Value in [User Unit]
	13	-	-	-	Not Available
	14	UINT16	2	RO	Channel Type 0: undefined / error 99: Bus Coupler
	15	STR20	20	RO	Serial Number as ASCII String
	16	STR20	20	RO	Software Version
	17	STR20	20	RO	Additional Info (not supported yet)
	18	Binary	540	RW	Complete Configuration

Table 15: Data protocol acyclical data model 9251 fieldbus controller

6.6.2 Data protocol acyclical data 9250 instrumentation amplifier

ID	Index (dec)	Type	Size/Bytes	Access	Entry
HW-ID of requested module Please also consider that write access addresses a different module than read access	3	Real	4	RO	Minimum Value
	4	Real	4	RO	Maximum Value
	5	Real	4	RW	Tare Value
	6	Real	4	RW	Limit A Lower Value in [User Unit]
	7	Real	4	RW	Limit A Lower Value in [V]
	8	Real	4	RW	Limit A Upper Value in [User Unit]
	9	Real	4	RW	Limit A Upper Value in [V]
	10	Real	4	RW	Limit B Lower Value in [User Unit]
	11	Real	4	RW	Limit B Lower Value in [V]
	12	Real	4	RW	Limit B Upper Value in [User Unit]
	13	Real	4	RW	Limit B Upper Value in [V]
	14	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gage 99: Bus Coupler
	15	STR20	20	RO	Serial Number as ASCII String
	16	STR20	20	RO	Software Version
	17	STR20	20	RO	Additional Info (not supported yet)
	18	Binary	664	RW	Complete Configuration

Table 16: Data protocol acyclical data model 9250 instrumentation amplifier

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After the power-on process, the model 9251 fieldbus controller communicates with the connected model 9250 instrumentation amplifiers to initialize them. During the startup process, the status LED (green) flashes rapidly.

If the initialization was successful, the model 9250 instrumentation amplifiers show their channel number in the LED field. If the model 9251 fieldbus controller was not recognized, then the status LED on the model 9250 instrumentation amplifiers flashes continuously in a 1-1-1 pattern. When module detection is complete, the status LED flashes continuously and slowly. The fieldbus-specific LEDs represent the status of the fieldbus.

The model 9251 fieldbus controller with EtherCAT uses the EtherCAT technology CoE (CANopen over EtherCAT) for data transmission. There are two different types of data objects that are transmitted with each cycle: PDO (process data objects) and data that is only transmitted on demand, SDO (service data objects). SDO data is addressed by a combination of index and subindex. A description of the data objects is provided in the following tables in this operation manual.

Note: The current EtherCAT ESI file is available on the burster website (https://www.burster.com/en/download-area).

Note: Further documents, such as installation instructions and specifications for EtherCAT, are available from www.beckhoff.com

Example setup of model 9251 fieldbus controller with 8 model 9250 instrumentation amplifier modules:

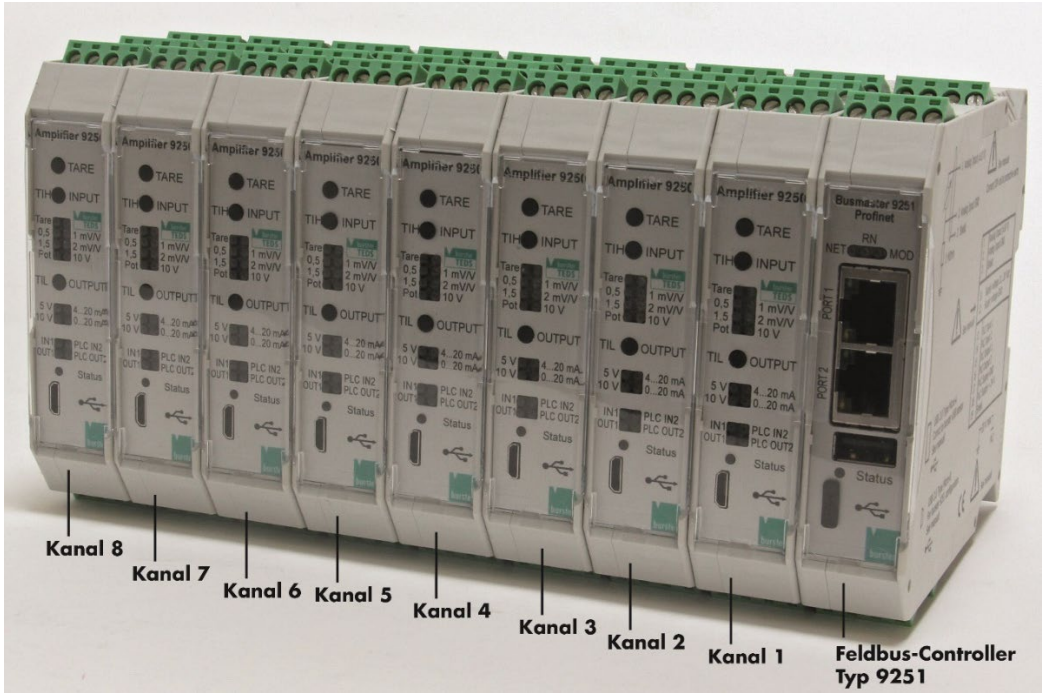


Figure 10: Example setup

7.1 Port identification

The burster model 9251 fieldbus controller can be integrated into the fieldbus network via 2x RJ45 ports.

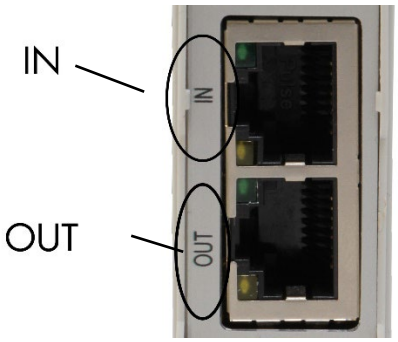


Figure 11: Port assignment on model 9251 fieldbus controller

7.2 EtherCAT fieldbus-specific LED functions

Figure 12: EtherCAT LED functions

LED	Status	Description
RUN	Off	The model 9251 fieldbus controller is in the INIT state or no power supply is connected.
	Green, flashing	The model 9251 fieldbus controller is in the PRE-OPERATIONAL state.
	Green, brief flashes	The model 9251 fieldbus controller is in the SAFE-OPERATIONAL state.
	Green, on	The model 9251 fieldbus controller is in the OPERATIONAL state.
ERR	Off	No error, EtherCAT communication is in operation.
	Red, flashing	Configuration is invalid or contains errors.
	Red, single flashes	Unrequested EtherCAT status change in model 9251 fieldbus controller.
	Red, double flashes	Sync Manager watchdog timeout has occurred.
	Red, on	System error, please contact us.
OP	Green	Setup complete, the model 9251 fieldbus controller is ready for operation.
	Flashing	Booting error. An error occurred during startup.
	Red	The Application Controller has encountered an error.
MEAS	Green, flashing rapidly	Booting: System is starting.
	Green, flashing slowly	System is operating normally.
	Red	The analog input of the model 9251 fieldbus controller is overloaded.
	Red, 3x flashing	Fieldbus module error: No module detected
	Red, 4x flashing	Fieldbus module error: Module not supported
	Red, 5x flashing	Fieldbus module error: Module not responding
	Red, 6x flashing	Fieldbus module error: Module shut down
	Red, 7x flashing	Fieldbus module error: System error

Table 17: EtherCAT fieldbus-specific LED functions

The LED functions conform to the EtherCAT specifications (you can find more information at http://www.ethercat.de “EtherCAT Indicator and Labeling ETG.1300 S (R) V1.1.0”).

7.3 EtherCAT PDO – Process Data Objects

The process data objects (PDO) of the model 9250 instrumentation amplifier with model 9251 fieldbus controller are transmitted cyclically and are divided into data blocks per measuring channel. Each measuring channel corresponds to a hardware module. Each module has the same data structure and length, including the model 9251 fieldbus controller. The first data block is always the model 9251 fieldbus controller, the second data block is the first measuring channel from the first model 9250 instrumentation amplifier, the third block represents the second measuring channel from the second model 9250 instrumentation amplifier, and so on.

Please note that there are only as many data blocks as there are devices. A combination of model 9251 fieldbus controller and model 9250 instrumentation amplifiers with four measuring channels is represented by five data blocks. The first data block is the 9251 fieldbus controller, the other four data blocks are assigned to the four model 9250 instrumentation amplifiers.

The live values are transmitted without a unit. For the scaling of the measurement channels, see the test certificate for the relevant model 9250 instrumentation amplifier module.

7.3.1 Overview of data packets, data transmission from the 9251 fieldbus controller to the control system

	Content	Length/Bytes	∑ Bytes
9251	Device status	2	Sum: 136 bytes
	Measurement value (real)*	4	
	Measurement counter*	1	
	Measurement array counter*	1	
	Measurement value array (real)*	128	
9250 Channel 1	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
9250 Channel 2	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
9250 Channel 3	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
9250 Channel 4	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
9250 Channel 5	**Content**	**Length/Bytes**	**∑ Bytes**
	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	

	Content	Length/Bytes	∑ Bytes
9250 Channel 6	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
	Content	**Length/Bytes**	**∑ Bytes**
9250 Channel 7	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
	Content	**Length/Bytes**	**∑ Bytes**
9250 Channel 8	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	

* only active with analog input option

Table 18: Overview of the data protocol for data transmission from the model 9251 fieldbus controller to the control system

7.3.2 Data protocol for data transmission from the 9251 fieldbus controller to the control system

Address Offset	Length (Bytes)		
0	1	**STATUS 1**	
		xxxx xxx1	Bit0: TARE is active
		xxxx xx1x	Bit1: Error, analog input overload [bus coupler: overload]
		xxxx x1xx	Bit2: Warning: ADC inactive Notice: Ua/Ia is not related to input signal (due to input overload, peak hold mode, ADC inactive) [Bus coupler: ADC inactive]
		xxxx 1xxx	Bit3: Logic state digital input A
		xxx1 xxxx	Bit4: Logic state digital input B
		xx1x xxxx	Bit5: Logic state digital output A
		x1xx xxxx	Bit6: Logic state digital output B
		1xxx xxxx	Bit7: Configuration fault
1	1	STATUS 2 (not used)	
2	4	Newest measurement value (real)	
6	1	Live counter, will be incremented with every new measurement value	
7	1	Array live counter, will be incremented with every new 32-array written	
8	4	Value no. 0 of measurement value array (real)	
12	4	Value no. 1 of measurement value array (real)	
16	4	Value no. 2 of measurement value array (real)	
20	4	Value no. 3 of measurement value array (real)	
24	4	Value no. 4 of measurement value array (real)	

28	4	Value no. 5 of measurement value array (real)
32	4	Value no. 6 of measurement value array (real)
36	4	Value no. 7 of measurement value array (real)
40	4	Value no. 8 of measurement value array (real)
44	4	Value no. 9 of measurement value array (real)
48	4	Value no. 10 of measurement value array (real)
52	4	Value no. 11 of measurement value array (real)
56	4	Value no. 12 of measurement value array (real)
60	4	Value no. 13 of measurement value array (real)
64	4	Value no. 14 of measurement value array (real)
68	4	Value no. 15 of measurement value array (real)
72	4	Value no. 16 of measurement value array (real)
76	4	Value no. 17 of measurement value array (real)
80	4	Value no. 18 of measurement value array (real)
84	4	Value no. 19 of measurement value array (real)
88	4	Value no. 20 of measurement value array (real)
92	4	Value no. 21 of measurement value array (real)
96	4	Value no. 22 of measurement value array (real)
100	4	Value no. 23 of measurement value array (real)
104	4	Value no. 24 of measurement value array (real)
108	4	Value no. 25 of measurement value array (real)
112	4	Value no. 26 of measurement value array (real)
116	4	Value no. 27 of measurement value array (real)
120	4	Value no. 28 of measurement value array (real)
124	4	Value no. 29 of measurement value array (real)
128	4	Value no. 30 of measurement value array (real)
132	4	Value no. 31 of measurement value array (real)

Table 19: Complete data protocol for data transmission from the model 9251 fieldbus controller to the control system

7.3.3 Data protocol for data transmission from the 9250 instrumentation amplifier to the control system

Address Offset	Length (Bytes)		
0	1	**STATUS 1**	
		xxxx xxx1	Bit0: TARE is active
		xxxx xx1x	Bit1: Measurement error
		xxxx x1xx	Bit2: Warning: Ua/Ia is not related to input signal (due to input overload, peak hold mode, ADC inactive)
		xxxx 1xxx	Bit3: Logic state digital input A
		xxx1 xxxx	Bit4: Logic state digital input B
		xx1x xxxx	Bit5: Logic state digital output A
		x1xx xxxx	Bit6: Logic state digital output B
		1xxx xxxx	Bit7: Configuration fault
1	1	STATUS 2 (not used)	
2	1	Live counter, will be incremented with every new measurement value	
3	1	Array live counter, will be incremented with every new 32-array written	
4	4	Newest measurement value (real)	
8	4	Value no. 0 of measurement value array (real)	
12	4	Value no. 1 of measurement value array (real)	
16	4	Value no. 2 of measurement value array (real)	
20	4	Value no. 3 of measurement value array (real)	
24	4	Value no. 4 of measurement value array (real)	
28	4	Value no. 5 of measurement value array (real)	
32	4	Value no. 6 of measurement value array (real)	
36	4	Value no. 7 of measurement value array (real)	
40	4	Value no. 8 of measurement value array (real)	

44	4	Value no. 9 of measurement value array (real)
48	4	Value no. 10 of measurement value array (real)
52	4	Value no. 11 of measurement value array (real)
56	4	Value no. 12 of measurement value array (real)
60	4	Value no. 13 of measurement value array (real)
64	4	Value no. 14 of measurement value array (real)
68	4	Value no. 15 of measurement value array (real)
72	4	Value no. 16 of measurement value array (real)
76	4	Value no. 17 of measurement value array (real)
80	4	Value no. 18 of measurement value array (real)
84	4	Value no. 19 of measurement value array (real)
88	4	Value no. 20 of measurement value array (real)
92	4	Value no. 21 of measurement value array (real)
96	4	Value no. 22 of measurement value array (real)
100	4	Value no. 23 of measurement value array (real)
104	4	Value no. 24 of measurement value array (real)
108	4	Value no. 25 of measurement value array (real)
112	4	Value no. 26 of measurement value array (real)
116	4	Value no. 27 of measurement value array (real)
120	4	Value no. 28 of measurement value array (real)
124	4	Value no. 29 of measurement value array (real)
128	4	Value no. 30 of measurement value array (real)
132	4	Value no. 31 of measurement value array (real)

Table 20: Complete data protocol for data transmission from the model 9250 instrumentation amplifier to the control system

7.3.4 Data protocol for data transmission from the control system to the 9251 fieldbus controller

Address Offset	Length (Bytes)	Description	
0	1	CONTROL BYTE A	
		xxxx xxx1	Bit0: Execute Tare Function! (0->1 Edge triggered)
		xxxx xx1x	Bit1: Reset Tare Function! (0->1 Edge triggered!)
		xxxx x1xx	Bit2: Reset MinMax! (0->1 Edge triggered!)
		xxxx 1xxx	Bit3: Reset Static Limit Out1! (0->1 Edge triggered)
		xxx1 xxxx	Bit4: Reset Static Limit Out2! (0->1 Edge triggered)
		xx1x xxxx	Bit5: unused
		x1xx xxxx	Bit6: unused
		1xxx xxxx	Bit7: unused
1	1	CONTROL BYTE B	
		xxxx xxx1	Bit0: unused
		xxxx xx1x	Bit1: Control DigOutA (DAUA! has to be set up correctly)
		xxxx x1xx	Bit2: Control DigOutB (DAUB! has to be set up correctly)
		xxxx 1xxx	Bit3: unused
		xxx1 xxxx	Bit4: unused
		xx1x xxxx	Bit5: unused
		x1xx xxxx	Bit6: unused
		1xxx xxxx	Bit7: PLC Fieldbus Bus Control Enable (Important: has to be set to ‘1’ or all settings here will be ignored!)
2	2	Cyclic command, value will be written with change from (Idle) -> (WriteXXX) “New Value” is taken from “New Real Value 1” (offset address 4) 0x00 Idle 0x01 Write “New Value” to Tare value in [UserUnit] 0x02 Write “New Value” to Lower Limit A in [UserUnit] 0x03 reserved 0x04 Write “New Value” to Upper Limit A in [UserUnit] 0x05 reserved 0x06 Write “New Value” to Lower Limit B in [UserUnit] 0x07 reserved	

		0x08 Write “New Value” to Upper Limit B in [UserUnit] 0x09 reserved
4	4	New Real Value1 (can be written with Cyclic Command)
8	4	New Real Value 2 – reserved and not used
12	4	New Real Value 3 – reserved and not used

Table 21: Data protocol for data transmission from the control system to the model 9251 fieldbus controller

7.3.5 Data protocol for data transmission from the control system to the 9250 instrumentation amplifier

Address Offset	Length (Bytes)	Description	
0	1	CONTROL BYTE A	
		xxxx xxx1	Bit0: Execute Tare Function! (0->1 Edge triggered)
		xxxx xx1x	Bit1: Reset Tare Function! (0->1 Edge triggered!)
		xxxx x1xx	Bit2: Reset Peak Hold Function and MinMax! (0->1 Edge triggered!)
		xxxx 1xxx	Bit3: Reset Static Limit Out1! (0->1 Edge triggered)
		xxx1 xxxx	Bit4: Reset Static Limit Out2! (0->1 Edge triggered)
		xx1x xxxx	Bit5: unused
		x1xx xxxx	Bit6: unused
		1xxx xxxx	Bit7: Stop the ADC!
1	1	CONTROL BYTE B	
		xxxx xxx1	Bit0: Reset Config Error
		xxxx xx1x	Bit1: Control DigOutA (DAUA! has to be set up correctly)
		xxxx x1xx	Bit2: Control DigOutB (DAUB! has to be set up correctly)
		xxxx 1xxx	Bit3: unused
		xxx1 xxxx	Bit4: unused
		xx1x xxxx	Bit5: unused
		x1xx xxxx	Bit6: unused
		1xxx xxxx	Bit7: PLC Fieldbus Bus Control Enable (Important: has to be set to ‘1’ or all settings here will be ignored!)
2	2	Cyclic command, value will be written with change from (Idle) -> (WriteXXX) “New Value” is taken from “New Real Value 1” (offset address 4) 0x00 Idle 0x01 Write “New Value” to Tare value in [UserUnit] 0x02 Write “New Value” to Lower Limit A in [UserUnit] 0x03 Write “New Value” to Lower Limit A in [Volt] 0x04 Write “New Value” to Upper Limit A in [UserUnit] 0x05 Write “New Value” to Upper Limit A in [Volt] 0x06 Write “New Value” to Lower Limit B in [UserUnit] 0x07 Write “New Value” to lower Limit B in [Volt] 0x08 Write “New Value” to Upper Limit B in [UserUnit] 0x09 Write “New Value” to Upper Limit B in [Volt]	
4	4	New Real Value1 (can be written with Cyclic Command)	
8	4	New Real Value 2 – reserved and not used	
12	4	New Real Value 3 – reserved and not used	

Table 22: Data protocol for data transmission from the control system to the model 9250 instrumentation amplifier

7.4 EtherCAT SDO – Service Data Objects

The service data objects (SDO) are described from the master's point of view.

Note: The instance number must always be set to 0, except when reading/writing the entire configuration.

The following abbreviations are used below:

Abbreviation	Description
WO	Write Only
RO	Read Only
RW	Read and Write
BOOL	Data type Boolean
REAL	Data type Real, length = 4 bytes
STRn	Data type String, string of n bytes
U8	Data type Unsigned 8, length = 1 byte
U16	Data type Unsigned 16, length = 2 bytes
U32	Data type Unsigned 32, length = 4 bytes

Table 23: EtherCAT abbreviations

7.4.1 Acyclical data 9251 fieldbus controller

Index (hex)	Type	Size (Bytes)	Access	Entry
0x2067	Real	4	RO	Minimum Value
0x2068	Real	4	RO	Maximum Value
0x2069	Real	4	RW	Tare Value
0x206A	Real	4	RW	Limit A Lower Value in [User Unit]
0x206B	-	-	-	Not Available
0x206C	Real	4	RW	Limit A Upper Value in [User Unit]
0x206D	-	-	-	Not Available
0x206E	Real	4	RW	Limit B Lower Value in [User Unit]
0x206F	-	-	-	Not Available
0x2070	Real	4	RW	Limit B Upper Value in [User Unit]
0x2071	-	-	-	Not Available
0x2072	UINT16	2	RO	Channel Type 0: undefined / error 99: Bus Coupler
0x2073	STR20	20	RO	Serial Number as ASCII String
0x2074	STR20	20	RO	Software Version
0x2075	STR20	20	RO	Additional Info (not supported yet)
0x2076	Binary	540	RW	Index 0: Number of indices to read complete configuration Index 1-135: Complete configuration in 4-byte pieces

Table 24: Acyclical data of the model 9251 fieldbus controller

7.4.2 Acyclical data 9250 instrumentation amplifier module 1

Index (hex)	Type	Size (Bytes)	Access	Entry
0x20CB	Real	4	RO	Minimum Value
0x20CC	Real	4	RO	Maximum Value
0x20CD	Real	4	RW	Tare Value
0x20CE	Real	4	RW	Limit A Lower Value in [User Unit]
0x20CF	Real	4	RW	Limit A Lower Value in [V]
0x20D0	Real	4	RW	Limit A Upper Value in [User Unit]
0x20D1	Real	4	RW	Limit A Upper Value in [V]
0x20D2	Real	4	RW	Limit B Lower Value in [User Unit]
0x20D3	Real	4	RW	Limit B Lower Value in [V]
0x20D4	Real	4	RW	Limit B Upper Value in [User Unit]
0x20D5	Real	4	RW	Limit B Upper Value in [V]
0x20D6	UINT16	2	RO	Channel Type

				0: undefined / error 1: Strain Gage 99: Bus Coupler
0x20D7	STR20	20	RO	Serial Number as ASCII String
0x20D8	STR20	20	RO	Software Version
0x20D9	STR20	20	RO	Additional Info (not supported yet)
0x20DA	Binary	664	RW	Index 0: Number of indices to read complete configuration Index 1-166: Complete configuration in 4-byte pieces

Table 25: Acyclical data of the model 9250 instrumentation amplifier module 1

7.4.3 Acyclical data 9250 instrumentation amplifier module 2

Index (hex)	Type	Size (Bytes)	Access	Entry
0x212F	Real	4	RO	Minimum Value
0x2130	Real	4	RO	Maximum Value
0x2131	Real	4	RW	Tare Value
0x2132	Real	4	RW	Limit A Lower Value in [User Unit]
0x2133	Real	4	RW	Limit A Lower Value in [V]
0x2134	Real	4	RW	Limit A Upper Value in [User Unit]
0x2135	Real	4	RW	Limit A Upper Value in [V]
0x2136	Real	4	RW	Limit B Lower Value in [User Unit]
0x2137	Real	4	RW	Limit B Lower Value in [V]
0x2138	Real	4	RW	Limit B Upper Value in [User Unit]
0x2139	Real	4	RW	Limit B Upper Value in [V]
0x213A	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gage 99: Bus Coupler
0x213B	STR20	20	RO	Serial Number as ASCII String
0x213C	STR20	20	RO	Software Version
0x213D	STR20	20	RO	Additional Info (not supported yet)
0x213E	Binary	664	RW	Index 0: Number of indices to read complete configuration Index 1-166: Complete configuration in 4-byte pieces

Table 26: Acyclical data of the model 9250 instrumentation amplifier module 2

7.4.4 Acyclical data 9250 instrumentation amplifier module 3

Index (hex)	Type	Size (Bytes)	Access	Entry
0x2193	Real	4	RO	Minimum Value
0x2194	Real	4	RO	Maximum Value
0x2195	Real	4	RW	Tare Value
0x2196	Real	4	RW	Limit A Lower Value in [User Unit]
0x2197	Real	4	RW	Limit A Lower Value in [V]
0x2198	Real	4	RW	Limit A Upper Value in [User Unit]
0x2199	Real	4	RW	Limit A Upper Value in [V]
0x219A	Real	4	RW	Limit B Lower Value in [User Unit]
0x219B	Real	4	RW	Limit B Lower Value in [V]
0x219C	Real	4	RW	Limit B Upper Value in [User Unit]
0x219D	Real	4	RW	Limit B Upper Value in [V]
0x219E	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gage 99: Bus Coupler
0x219F	STR20	20	RO	Serial Number as ASCII String
0x21A0	STR20	20	RO	Software Version
0x21A1	STR20	20	RO	Additional Info (not supported yet)
0x21A2	Binary	664	RW	Index 0: Number of indices to read complete configuration Index 1-166: Complete configuration in 4-byte pieces

Table 27: Acyclical data of the model 9250 instrumentation amplifier module 3

7.4.5 Acyclical data 9250 instrumentation amplifier module 4

Index (hex)	Type	Size (Bytes)	Access	Entry
0x21F7	Real	4	RO	Minimum Value
0x21F8	Real	4	RO	Maximum Value
0x21F9	Real	4	RW	Tare Value
0x21FA	Real	4	RW	Limit A Lower Value in [User Unit]
0x21FB	Real	4	RW	Limit A Lower Value in [V]
0x21FC	Real	4	RW	Limit A Upper Value in [User Unit]
0x21FD	Real	4	RW	Limit A Upper Value in [V]
0x21FE	Real	4	RW	Limit B Lower Value in [User Unit]
0x21FF	Real	4	RW	Limit B Lower Value in [V]
0x2200	Real	4	RW	Limit B Upper Value in [User Unit]
0x2201	Real	4	RW	Limit B Upper Value in [V]
0x2202	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gage 99: Bus Coupler
0x2203	STR20	20	RO	Serial Number as ASCII String
0x2204	STR20	20	RO	Software Version
0x2205	STR20	20	RO	Additional Info (not supported yet)
0x2206	Binary	664	RW	Index 0: Number of indices to read complete configuration Index 1-166: Complete configuration in 4-byte pieces

Table 28: Acyclical data of the model 9250 instrumentation amplifier module 4

7.4.6 Acyclical data 9250 instrumentation amplifier module 5

Index (hex)	Type	Size (Bytes)	Access	Entry
0x225B	Real	4	RO	Minimum Value
0x225C	Real	4	RO	Maximum Value
0x225D	Real	4	RW	Tare Value
0x225E	Real	4	RW	Limit A Lower Value in [User Unit]
0x225F	Real	4	RW	Limit A Lower Value in [V]
0x2260	Real	4	RW	Limit A Upper Value in [User Unit]
0x2261	Real	4	RW	Limit A Upper Value in [V]
0x2262	Real	4	RW	Limit B Lower Value in [User Unit]
0x2263	Real	4	RW	Limit B Lower Value in [V]
0x2264	Real	4	RW	Limit B Upper Value in [User Unit]
0x2265	Real	4	RW	Limit B Upper Value in [V]
0x2266	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gage 99: Bus Coupler
0x2267	STR20	20	RO	Serial Number as ASCII String
0x2268	STR20	20	RO	Software Version
0x2269	STR20	20	RO	Additional Info (not supported yet)
0x226A	Binary	664	RW	Index 0: Number of indices to read complete configuration Index 1-166: Complete configuration in 4-byte pieces

Table 29: Acyclical data of the model 9250 instrumentation amplifier module 5

7.4.7 Acyclical data 9250 instrumentation amplifier module 6

Index (hex)	Type	Size (Bytes)	Access	Entry
0x22BF	Real	4	RO	Minimum Value
0x22C0	Real	4	RO	Maximum Value
0x22C1	Real	4	RW	Tare Value
0x22C2	Real	4	RW	Limit A Lower Value in [User Unit]
0x22C3	Real	4	RW	Limit A Lower Value in [V]
0x22C4	Real	4	RW	Limit A Upper Value in [User Unit]
0x22C5	Real	4	RW	Limit A Upper Value in [V]

0x22C6	Real	4	RW	Limit B Lower Value in [User Unit]
0x22C7	Real	4	RW	Limit B Lower Value in [V]
0x22C8	Real	4	RW	Limit B Upper Value in [User Unit]
0x22C9	Real	4	RW	Limit B Upper Value in [V]
0x22CA	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gage 99: Bus Coupler
0x22CB	STR20	20	RO	Serial Number as ASCII String
0x22CC	STR20	20	RO	Software Version
0x22CD	STR20	20	RO	Additional Info (not supported yet)
0x22CE	Binary	664	RW	Index 0: Number of indices to read complete configuration Index 1-166: Complete configuration in 4-byte pieces

Table 30: Acyclical data of the model 9250 instrumentation amplifier module 6

7.4.8 Acyclical data 9250 instrumentation amplifier module 7

Index (hex)	Type	Size (Bytes)	Access	Entry
0x2323	Real	4	RO	Minimum Value
0x2324	Real	4	RO	Maximum Value
0x2325	Real	4	RW	Tare Value
0x2326	Real	4	RW	Limit A Lower Value in [User Unit]
0x2327	Real	4	RW	Limit A Lower Value in [V]
0x2328	Real	4	RW	Limit A Upper Value in [User Unit]
0x2329	Real	4	RW	Limit A Upper Value in [V]
0x232A	Real	4	RW	Limit B Lower Value in [User Unit]
0x232B	Real	4	RW	Limit B Lower Value in [V]
0x232C	Real	4	RW	Limit B Upper Value in [User Unit]
0x232D	Real	4	RW	Limit B Upper Value in [V]
0x232E	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gage 99: Bus Coupler
0x232F	STR20	20	RO	Serial Number as ASCII String
0x2330	STR20	20	RO	Software Version
0x2331	STR20	20	RO	Additional Info (not supported yet)
0x2332	Binary	664	RW	Index 0: Number of indices to read complete configuration Index 1-166: Complete configuration in 4-byte pieces

Table 31: Acyclical data of the model 9250 instrumentation amplifier module 7

7.4.9 Acyclical data 9250 instrumentation amplifier module 8

Index (hex)	Type	Size (Bytes)	Access	Entry
0x2387	Real	4	RO	Minimum Value
0x2388	Real	4	RO	Maximum Value
0x2389	Real	4	RW	Tare Value
0x238A	Real	4	RW	Limit A Lower Value in [User Unit]
0x238B	Real	4	RW	Limit A Lower Value in [V]
0x238C	Real	4	RW	Limit A Upper Value in [User Unit]
0x238D	Real	4	RW	Limit A Upper Value in [V]
0x238E	Real	4	RW	Limit B Lower Value in [User Unit]
0x238F	Real	4	RW	Limit B Lower Value in [V]
0x2390	Real	4	RW	Limit B Upper Value in [User Unit]
0x2391	Real	4	RW	Limit B Upper Value in [V]
0x2392	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gage 99: Bus Coupler
0x2393	STR20	20	RO	Serial Number as ASCII String
0x2394	STR20	20	RO	Software Version
0x2395	STR20	20	RO	Additional Info (not supported yet)

0x2396	Binary	664	RW	Index 0: Number of indices to read complete configuration Index 1-166: Complete configuration in 4-byte pieces

Table 32: Acyclical data of the model 9250 instrumentation amplifier module 8

7.5 EtherCAT error codes

Error code	ID of operant
0xC0650031 or 0x06020000	Object does not exist in the object dictionary
0xC065003A or 0x06090011	Subindex does not exist (read access)
0xC0CF8013 or 0x06090011	Subindex does not exist (write access)
0xC0CF8006 or 0x06010002	Object is read-only and cannot be written
0xC0CF8010 or 0x06070012	Data type does not match
0xC0CF8011 or 0x06070012	Data length is too long
0x06070013	Data length is too short
0xC0650028	Timeout
0xC065002F or 0x06010001	Object is write-only and cannot be read
0x06090030	Value out of range (only for write access)
0x08000022	Invalid present device state
0x05040005	Out of memory
0x06090031	Value too high
0x06090032	Value too low
0x08000021	Protected access
0x08000000	General error

Table 33: EtherCAT error codes

8 EtherNET/IP

After the power-on process, the model 9251 fieldbus controller communicates with the connected model 9250 instrumentation amplifiers to initialize them. During the startup process, the status LED (green) flashes rapidly.

If the initialization was successful, the model 9250 instrumentation amplifiers show their channel number in the LED field. If the model 9251 fieldbus controller was not recognized, then the status LED on the model 9250 instrumentation amplifiers flashes continuously in a 1-1-1 pattern. When module detection is complete, the status LED flashes continuously and slowly. The fieldbus-specific LEDs represent the status of the fieldbus.

For integration into an EtherNet/IP network, the configuration phase defines which bytes are to be are transferred between the adapter (9251) and the scanner (controller). The EPS file describes the properties of the structure, content and coding of this device data are standardized in such a way that the data are standardized in such a way that the Type 9251 Fieldbus Controller can be integrated into the configuration tools into the control environment. Information about the procedure and a complete interface description can be found in this manual. The current EtherNet/IP EPS file is available on the burster website (https://www.burster.com/en/download-area).

Note: Further documents, such as installation instructions and specifications for EtherCAT, are available from www.odva.org

Example setup of model 9251 fieldbus controller with 8 model 9250 instrumentation amplifier modules:

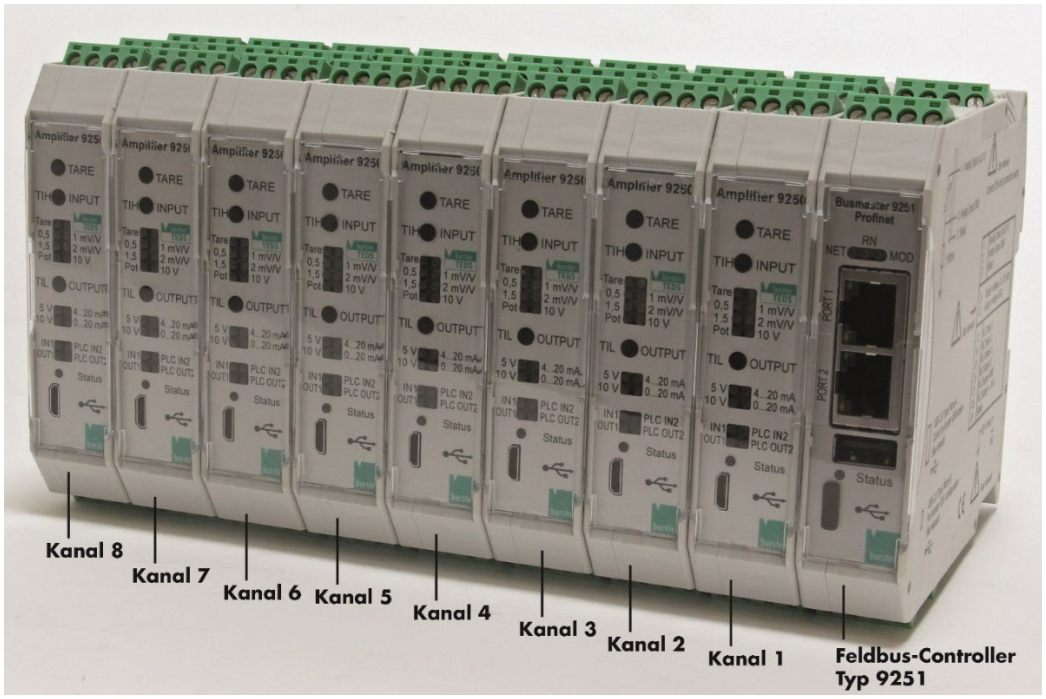


Figure 13: Example setup

8.1 Port identification

The burster fieldbus controller type 9251 can be integrated into the fieldbus network via 2x RJ45 ports.

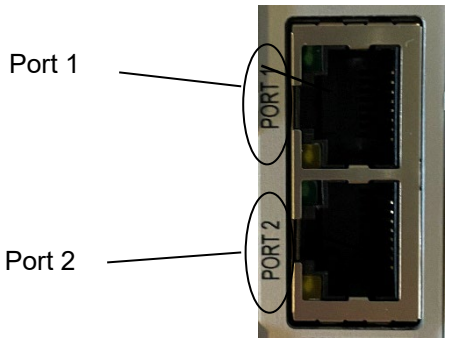


Figure 14: Port assignment on model 9251 fieldbus controller

8.2 EtherNET/IP fieldbus-specific LED functions

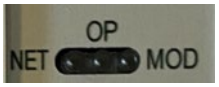


Figure 15: EtherNET/IP LED functions

LED	Status	Description
LNK	Off	No link, no activity or no power
	Green	Link (100 Mbit/s) established
	Green, flickering	Activity (100 Mbit/s)
	Yellow	Link (10 Mbit/s) established
	Yellow, flickering	Activity (10 Mbit/s)
NET	Off	No power or no IP address
	Green, flickering	Online, no connections established
	Green	Online, connections established
	Red	Duplicate IP address or FATAL error
	Red, flickering	One or more connections timed out
MOD	Off	No power
	Green, flickering	Not configured, Scanner in Idle state, or, if CIP Sync is enabled, time is synchronized, Grandmaster clock
	Green	Controlled by a Scanner in Run state and, if CIP Sync is enabled, time is synchronized to a Grandmaster clock
	Red	Major fault (EXCEPTION-state, FATAL error etc.)
	Red, flickering	Recoverable fault(s). Module is configured, but stored parameters differ from currently used parameters.
OP	Green	Internal Setup completed, module is running
STATUS	Green, fast flickering	Boot-up
	Green, slow flickering	Normal operation
	Red	Analogue Input overflow
	Red, 3x flickering	Fieldbus module error: Module not detected
	Red, 4x flickering	Fieldbus module error: Module not supported
	Red, 5x flickering	Fieldbus module error: Module not answering
	Red, 6x flickering	Fieldbus module error: Module shutdown
	Red, 7x flickering	Fieldbus module error: Unexpected error

Table 34: EtherNET/IP fieldbus-specific LED functions

8.3 General information on EtherNET/IP

For EtherNet/IP (implicit messaging) one must define at the configuration stage how many bytes are transferred between Controller (Scanner) and Device (Adapter) during each cyclic access.

The device is controlled using the data transferred from Controller (Scanner) to Device (Adapter). This data always consists of 16 bytes for the 9251 EtherNet/IP unit. The function of these 16 bytes is explained in chapter PLC inputs – Transfer from Scanner to Adapter (9251)

NOTE

You may have to adjust the amount of transmitting data depend on how many modules are actually connected. Each module sends 8 bytes to and receives 16 bytes from an EIP Scanner. So if you have a full configuration, contained of 1x 9251 bus coppler and 8x 9250 slaves, you have to set the output size to 16 bytes x 9 modules = 144 bytes and the input size to 8 bytes x 9 modules = 72 bytes.

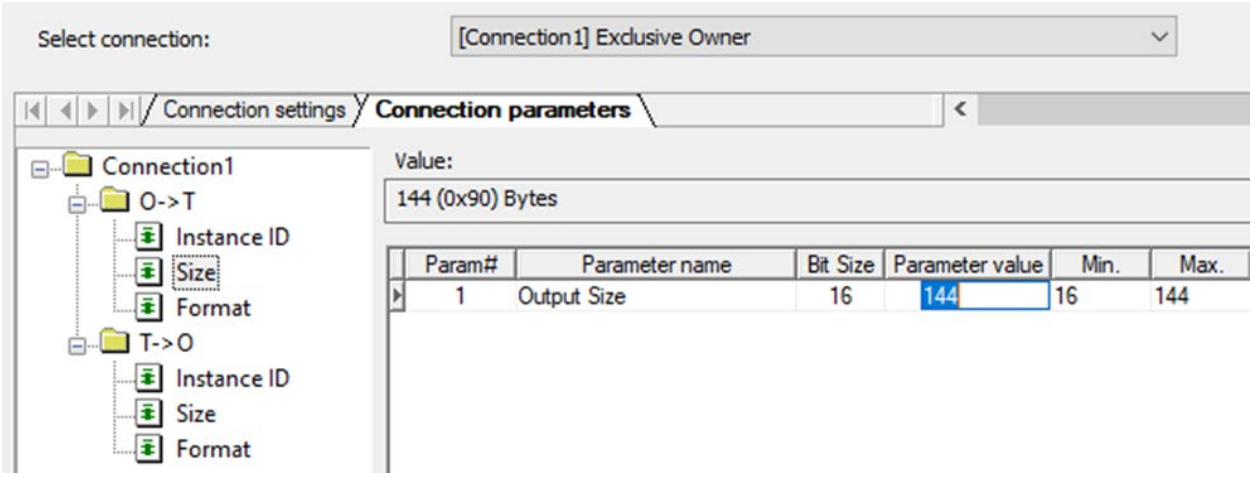


Figure 16: Configuration of the output variable

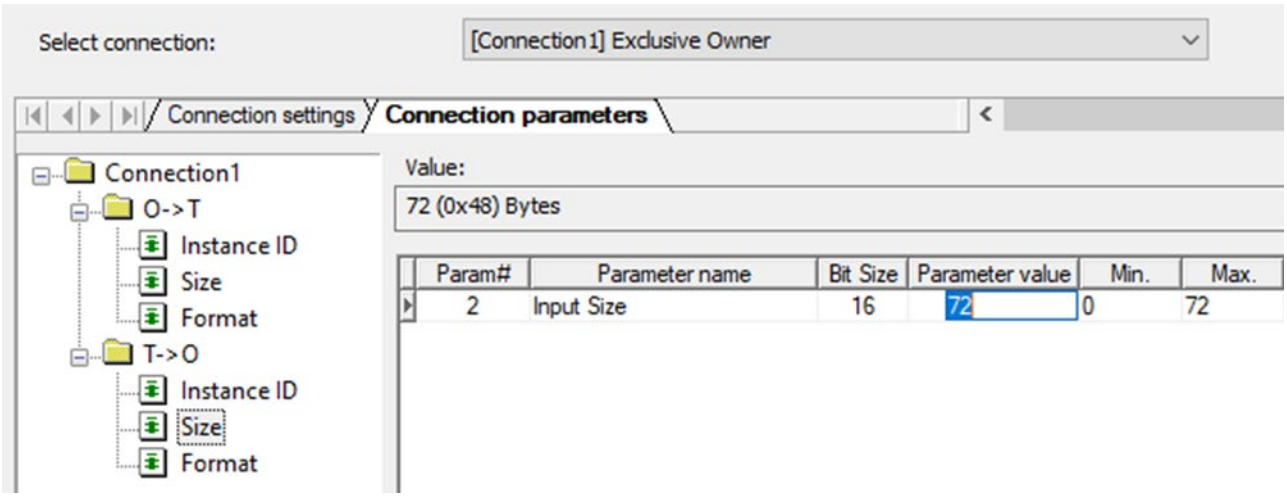


Figure 17: Configuration of the input variable

8.4 EDS file

9251 equipment with the EtherNet/IP option is supplied with a CD. This disk includes the Electonic Data Sheet (EDS) file BURSTER-9251-V0X0X.EDS. This EDS file contains the EtnerNet/IP configuration information for the 9251 EtherNet/IP® device.

The structure, contents and encoding of this device description data is standardized so that any EtherNet/IP devices can be configured using configuration tools from various manufacturers.

The EDS file does not specify what data is transferred or how this data should be interpreted. The user must glean this information from the operating manual and program his Controller accordingly.

8.5 Data conversion

8.5.1 Description of the data formats in this manual

The floating-point numbers mentioned are four bytes long (32 bits) and are based on the IEEE-754 standard.

Numbers that are not specifically labeled or are labeled with "d" or "dec" are decimal numbers. (Example: 1234, 1234dec, dec1234, 1234d)

Numbers that are labeled with "0x" or "hex" are hexadecimal numbers. (Example: 0x1234, hex1234, 1234hex, 1234h)

Numbers that are labeled with "b" or "bin" are binary numbers. (Example: b1100, bin1100, 1100b, 1100bin).

8.5.2 Handling problems that arise when reading floating-point numbers

This only concerns cases in which floating-point numbers need to be read from the 9251 unit.

Floating-point numbers (data type REAL), according to IEEE 754, are encoded as four bytes for transfer. This may create problems depending on the type of PLC used.

Cause

In the 9251, the sign bit is transferred last. Some PLCs expect this byte in the highest of the four addresses not in the lowest address. This inevitably leads to misinterpretation of the numeric value. In this case the order of the four bytes has to be changed by the PLC as shown in the Figure 18:.

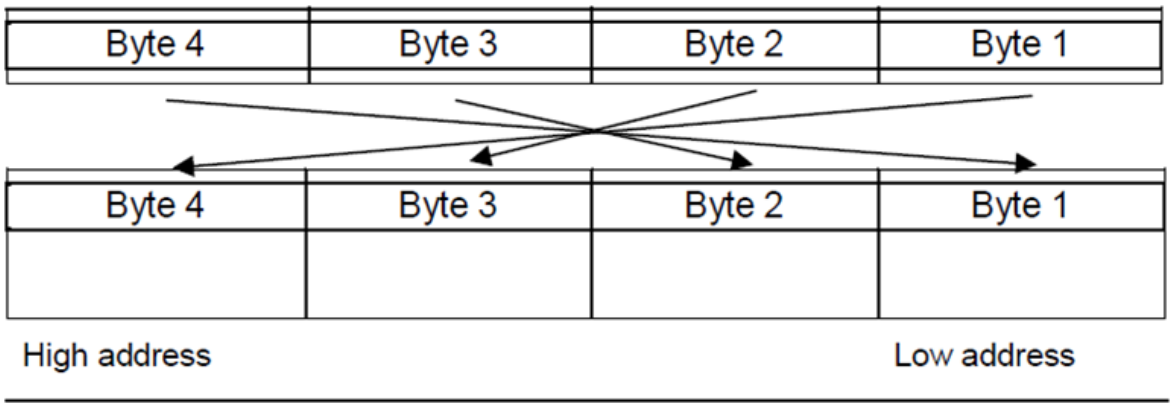


Figure 18: Swapping the byte order due to misinterpretation of the numeric value

8.6 PLC outputs – Transfer from Adapter (9251) to Scanner

8.6.1 Introduction

The cyclical data from the 9251/9250 measurement device is divided into data blocks per hardware modules. Every hardware module (measurement channel) has identical data structure and length, even the bus coupler. The first data block is always the 9251 bus coupler, the second data block is the first 9250 measurement channel to the left, the third data block represents the second 9250 measurement channel on the bus couplers left side and so on. Please note that there are only as many data blocks as devices, e.g. a 9251/9250 combination with four measurement channels is represented with five data blocks: the first for the 9251 bus coupler and the other four for the four 9250 measurement channels.

The measurement values can be represented in two ways:

Single representation

The newest measurement value is written at offset address 2 in the structure. Every time a new value is available, the old entry will be overwritten. In order to see if there is a new entry or to recognize if a measurement value was missed for reading, there is a so-called live counter at offset address 6. This counter will be incremented with every new measurement value. It is just a byte and will overflow at 255 to 0 and count up again.

This method was meant for situations with slow measurement or very fast PLC communication.

8.6.2 Data protocol for cyclic data transmission from the 9251 fieldbus controller to the scanner

Address-offset	Length (Bytes)		
0	1	**STATUS 1**	
		xxxx xxx1	Bit0: TARE is active
		xxxx xx1x	Bit1: Error, Analoge input overrun [Buskoppler: Übersteuert]
		xxxx x1xx	Bit2: Warning: ADC inactive Achtung: Ua/Ia unabhängig vom Eingang (Übersteuert, Schleppzeigerbetrieb, ADC angehalten) [Buskoppler: ADC inaktiv]
		xxxx 1xxx	Bit3: Logic state Digital Input A
		xxx1 xxxx	Bit4: Logic State Digital Input B
		xx1x xxxx	Bit5: Logic State Digital Output A
		x1xx xxxx	Bit6: Logic State Digital Output B
		1xxx xxxx	Bit7: Configuration Fault
1	1	STATUS 2 (Not used)	
2	4	Newest measurement value (real)	
6	1	Live Counter, will be incremented with every new measurement value	
7	1	Array Live Counter, will be incremented with every new 32-array written	

Table 35: Data protocol cyclic data: Transfer adapter (9251) to scanner

8.6.3 Data protocol for cyclic data transmission from the 9250 measuring amplifier to the scanner

Address-offset	Length (Bytes)		
0	1	STATUS 1	
		xxxx xxx1	Bit0: TARE is active
		xxxx xx1x	Bit1: Measurement Error
		xxxx x1xx	Bit2: Warning: Ua/Ia is not related to input signal (due to input overrun, Peak Hold Mode, ADC inactive)
		xxxx 1xxx	Bit3: Logic state Digital Input A
		xxx1 xxxx	Bit4: Logic State Digital Input B
		xx1x xxxx	Bit5: Logic State Digital Output A
		x1xx xxxx	Bit6: Logic State Digital Output B
		1xxx xxxx	Bit7: Configuration Fault
1	1	STATUS 2 (Not used)	
2	1	Live Counter, will be incremented with every new measurement value	
3	1	Array Live Counter, will be incremented with every new 32-array written	
4	4	Newest measurement value (real)	

Table 36: Data protocol for cyclic data transmission from the 9250 measuring amplifier to the scanner

8.7 PLC inputs – Transfer from Scanner to Adapter (9251)

As described in the section Cyclic Input Data, all cyclical data from the 9251/9250 measurement device is structured in data blocks. Every measurement channel has the identical data structure and length, even the bus coupler. The first data block is always the 9251 bus coupler, the second data block is the first 9250 measurement channel to the left, the third data block represents the second 9250 measurement channel on the bus couplers left side and so on. Please note, that there are only as many data blocks as devices, e.g. a 9251/9250 combination with four measurement channels is represented with five data blocks: the first for the 9251 bus coupler and the other four for the four 9250 measurement channels.

The first two bytes of the cyclic output data are bit-coded and can control several functions of the device. Please note, that the MSB of control byte B has to be set to enable the whole control function. If this bit is not set, all other entries will be ignored.

At address offset 2 there is a 16-bit-ushort entry. With that entry float values e.g. for tare or new limits can be written. To do this, you first have to transmit the “Idle”-command at this entry. Then, in the next cycle you have to send the desired command, e.g. “Tare” (and of course also the new float value at offset 4). Every time, when the entry “cyclic Command” on offset 2 changes from “Idle” to something else (e.g. 0x01 for “Tare”), the value transmitted at offset 4 will be read and be used as new value (as tare value in this example). After the write command was completed, you have to set the “Cyclic Command” back to “Idle”. This transition does not lead to any action, but has to be done in preparation for the next command.

8.7.1 Data protocol for cyclic data transmission from the scanner to the 9250 measuring amplifier

Address Offset	Length (Bytes)		
0	1	**CONTROL BYTE A**	
		xxxx xxx1	Bit0: Execute Tare Function! (0->1 Edge triggered)
		xxxx xx1x	Bit1: Reset Tare Function! (0->1 Edge triggered!)
		xxxx x1xx	Bit2: Reset Peak Hold Function! (0->1 Edge triggered!)
		xxxx 1xxx	Bit3: Reset Static Limit Out1! (0->1 Edge triggered)
		xxx1 xxxx	Bit4: Reset Static Limit Out2! (0->1 Edge triggered)
		xx1x xxxx	Bit5: unused
		x1xx xxxx	Bit6: unused
		1xxx xxxx	Bit7: Stop the ADC!
1	1	**CONTROL BYTE B**	
		xxxx xxx1	Bit0: Reset Config Error
		xxxx xx1x	Bit1: Control DigOutA (DAUA! has to be set up correctly)
		xxxx x1xx	Bit2: Control DigOutB (DAUB! has to be set up correctly)
		xxxx 1xxx	Bit3: unused
		xxx1 xxxx	Bit4: unused
		xx1x xxxx	Bit5: unused
		x1xx xxxx	Bit6: unused
		1xxx xxxx	Bit7: PLC Fieldbus Bus Control Enable (**Important**: has to be set to ‚1' or all settings here will be ignored!)
2	2	**CYCLIC COMMAND**	
		Value will be written with change from (Idle)→(WriteXXX) „New Value" is taken from „New Real Value 1"(offs Adr 4) 0x00 Idle 0x01 Write „New Value" to Tare value in [UserUnit] 0x02 Write „New Value" to Lower Limit A in [UserUnit] 0x03 Write „New Value" to Lower Limit A in [Volt] 0x04 Write „New Value" to Upper Limit A in [UserUnit] 0x05 Write „New Value" to Upper Limit A in [Volt] 0x06 Write „New Value" to Lower Limit B in [UserUnit] 0x07 Write „New Value" to lower Limit B in [Volt] 0x08 Write „New Value" to Upper Limit B in [UserUnit] 0x09 Write „New Value" to Upper Limit B in [Volt]	
4	4	New Real Value1 (can be written with Cyclic Command)	
8	4	New Real Value 2 – reserved and not used	
12	4	New Real Value 3 – reserved and not used	

Table 37: Data protocol cyclic data: Transfer scanner to adapter (9251)

8.8 Unconnected Explicit Messaging (Acyclic services)

The services are described from the point of view of the controller.

Note: The Class number has always to be set to 0xA2 (162d) and the attribute number to 0x05 (5d).

The acyclic EtherNet/IP services allow access to following 9251 functions:

- Complete device configuration
- Reading of minimum and maximum values

WO	Write Only
RO	Read Only
RW	Read and Write
BOOL	Data type Boolean
REAL	Data type Real, Length = 4 Byte
STR*n*	Data type String, String of *n* Bytes
U8	Data type Unsigned 8, Length = 1 Byte
U16	Data type Unsigned 16, Length = 2 Byte
U32	Data type Unsigned 32, Length = 4 Byte

Table 38: Acyclic EtherNet/IP services

8.8.1 Acyclic data Fieldbus controller 9251

Instance	Type	Size (Bytes)	Access	Entry
103	Real	4	RO	Minimum Value
104	Real	4	RO	Maximum Value
105	Real	4	RW	Tare Value
106	Real	4	RW	Limit A Lower Value in [User Unit]
107	-	-	-	Not Available
108	Real	4	RW	Limit A Upper Value in [User Unit]
109	-	-	-	Not Available
110	Real	4	RW	Limit B Lower Value in [User Unit]
111	-	-	-	Not Available
112	Real	4	RW	Limit B Upper Value in [User Unit]
113	-	-	-	Not Available
114	UINT16	2	RO	Channel Type 0: undefined / error 99: Bus Coupler
115	STR20	20	RO	Serial Number as ASCII String
116	STR20	20	RO	Software Version
117	STR20	20	RO	Additional Info (not supported yet)
118	Binary	540	RW	Index 0: Number of indicies to read complete configuration Index 1-135: Complete configuration in 4 bytes pieces

Table 39: Data protocol acyclic data: Fieldbus controller type 9251

8.8.2 Acyclic data measuring amplifier 9250 module 1

Instance	Type	Size (Bytes)	Access	Entry
203	Real	4	RO	Minimum Value
204	Real	4	RO	Maximum Value
205	Real	4	RW	Tare Value
206	Real	4	RW	Limit A Lower Value in [User Unit]
207	Real	4	RW	Limit A Lower Value in [V]
208	Real	4	RW	Limit A Upper Value in [User Unit]
209	Real	4	RW	Limit A Upper Value in [V]
210	Real	4	RW	Limit B Lower Value in [User Unit]
211	Real	4	RW	Limit B Lower Value in [V]
212	Real	4	RW	Limit B Upper Value in [User Unit]
213	Real	4	RW	Limit B Upper Value in [V]
214	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gauge 99: Bus Coupler *More channel type in preparation* *2: Piezo* *3: PT100* *4: Resistance* *5: LVDT* *6: Thermocouple*
215	STR20	20	RO	Serial Number as ASCII String
216	STR20	20	RO	Software Version
217	STR20	20	RO	Additional Info (not supported yet)
218	Binary	664	RW	Index 0: Number of indicies to read complete configuration Index 1-166: Complete configuration in 4 bytes pieces

Table 40: Data protocol acyclic data: Measuring amplifier type 9250 module 1

8.8.3 Acyclic data measuring amplifier 9250 module 2

Instance	Type	Size (Bytes)	Access	Entry
303	Real	4	RO	Minimum Value
304	Real	4	RO	Maximum Value
305	Real	4	RW	Tare Value
306	Real	4	RW	Limit A Lower Value in [User Unit]
307	Real	4	RW	Limit A Lower Value in [V]
308	Real	4	RW	Limit A Upper Value in [User Unit]
309	Real	4	RW	Limit A Upper Value in [V]

310	Real	4	RW	Limit B Lower Value in [User Unit]
311	Real	4	RW	Limit B Lower Value in [V]
312	Real	4	RW	Limit B Upper Value in [User Unit]
313	Real	4	RW	Limit B Upper Value in [V]
314	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gauge 99: Bus Coupler *More channel type in preparation* *2: Piezo* *3: PT100* *4: Resistance* *5: LVDT* *6: Thermocouple*
315	STR20	20	RO	Serial Number as ASCII String
316	STR20	20	RO	Software Version
317	STR20	20	RO	Additional Info (not supported yet)
318	Binary	664	RW	Index 0: Number of indicies to read complete configuration Index 1-166: Complete configuration in 4 bytes pieces

Table 41: Data protocol acyclic data: Measuring amplifier type 9250 module 2

8.8.4 Acyclic data measuring amplifier 9250 module 3

Instance	Type	Size (Bytes)	Access	Entry
403	Real	4	RO	Minimum Value
404	Real	4	RO	Maximum Value
405	Real	4	RW	Tare Value
406	Real	4	RW	Limit A Lower Value in [User Unit]
407	Real	4	RW	Limit A Lower Value in [V]
408	Real	4	RW	Limit A Upper Value in [User Unit]
409	Real	4	RW	Limit A Upper Value in [V]
410	Real	4	RW	Limit B Lower Value in [User Unit]
411	Real	4	RW	Limit B Lower Value in [V]
412	Real	4	RW	Limit B Upper Value in [User Unit]
413	Real	4	RW	Limit B Upper Value in [V]
414	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gauge 99: Bus Coupler *More channel type in preparation* *2: Piezo* *3: PT100* *4: Resistance*

				5: LVDT *6: Thermocouple*
415	STR20	20	RO	Serial Number as ASCII String
416	STR20	20	RO	Software Version
417	STR20	20	RO	Additional Info (not supported yet)
418	Binary	664	RW	Index 0: Number of indicies to read complete configuration Index 1-166: Complete configuration in 4 bytes pieces

Table 42: Data protocol acyclic data: Measuring amplifier type 9250 module 3

8.8.5 Acyclic data measuring amplifier 9250 module 4

Instance	Type	Size (Bytes)	Access	Entry
503	Real	4	RO	Minimum Value
504	Real	4	RO	Maximum Value
505	Real	4	RW	Tare Value
506	Real	4	RW	Limit A Lower Value in [User Unit]
507	Real	4	RW	Limit A Lower Value in [V]
508	Real	4	RW	Limit A Upper Value in [User Unit]
509	Real	4	RW	Limit A Upper Value in [V]
510	Real	4	RW	Limit B Lower Value in [User Unit]
511	Real	4	RW	Limit B Lower Value in [V]
512	Real	4	RW	Limit B Upper Value in [User Unit]
513	Real	4	RW	Limit B Upper Value in [V]
514	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gauge 99: Bus Coupler *More channel type in preparation* *2: Piezo* *3: PT100* *4: Resistance* *5: LVDT* *6: Thermocouple*
515	STR20	20	RO	Serial Number as ASCII String
516	STR20	20	RO	Software Version
517	STR20	20	RO	Additional Info (not supported yet)
518	Binary	664	RW	Index 0: Number of indicies to read complete configuration Index 1-166: Complete configuration in 4 bytes pieces

Table 43: Data protocol acyclic data: Measuring amplifier type 9250 module 4

8.8.6 Acyclic data measuring amplifier 9250 module 5

Instance	Type	Size (Bytes)	Access	Entry
603	Real	4	RO	Minimum Value
604	Real	4	RO	Maximum Value
605	Real	4	RW	Tare Value
606	Real	4	RW	Limit A Lower Value in [User Unit]
607	Real	4	RW	Limit A Lower Value in [V]
608	Real	4	RW	Limit A Upper Value in [User Unit]
609	Real	4	RW	Limit A Upper Value in [V]
610	Real	4	RW	Limit B Lower Value in [User Unit]
611	Real	4	RW	Limit B Lower Value in [V]
612	Real	4	RW	Limit B Upper Value in [User Unit]
613	Real	4	RW	Limit B Upper Value in [V]
614	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gauge 99: Bus Coupler *More channel type in preparation* *2: Piezo* *3: PT100* *4: Resistance* *5: LVDT* *6: Thermocouple*
615	STR20	20	RO	Serial Number as ASCII String
616	STR20	20	RO	Software Version
617	STR20	20	RO	Additional Info (not supported yet)
618	Binary	664	RW	Index 0: Number of indicies to read complete configuration Index 1-166: Complete configuration in 4 bytes pieces

Table 44: Data protocol acyclic data: Measuring amplifier type 9250 module 5

8.8.7 Acyclic data measuring amplifier 9250 module 6

Instance	Type	Size (Bytes)	Access	Entry
703	Real	4	RO	Minimum Value
704	Real	4	RO	Maximum Value
705	Real	4	RW	Tare Value
706	Real	4	RW	Limit A Lower Value in [User Unit]
707	Real	4	RW	Limit A Lower Value in [V]
708	Real	4	RW	Limit A Upper Value in [User Unit]
709	Real	4	RW	Limit A Upper Value in [V]

710	Real	4	RW	Limit B Lower Value in [User Unit]
711	Real	4	RW	Limit B Lower Value in [V]
712	Real	4	RW	Limit B Upper Value in [User Unit]
713	Real	4	RW	Limit B Upper Value in [V]
714	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gauge 99: Bus Coupler *More channel type in preparation* *2: Piezo* *3: PT100* *4: Resistance* *5: LVDT* *6: Thermocouple*
715	STR20	20	RO	Serial Number as ASCII String
716	STR20	20	RO	Software Version
717	STR20	20	RO	Additional Info (not supported yet)
718	Binary	664	RW	Index 0: Number of indicies to read complete configuration Index 1-166: Complete configuration in 4 bytes pieces

Table 45: Data protocol acyclic data: Measuring amplifier type 9250 module 6

8.8.8 Acyclic data measuring amplifier 9250 module 7

Instance	Type	Size (Bytes)	Access	Entry
803	Real	4	RO	Minimum Value
804	Real	4	RO	Maximum Value
805	Real	4	RW	Tare Value
806	Real	4	RW	Limit A Lower Value in [User Unit]
807	Real	4	RW	Limit A Lower Value in [V]
808	Real	4	RW	Limit A Upper Value in [User Unit]
809	Real	4	RW	Limit A Upper Value in [V]
810	Real	4	RW	Limit B Lower Value in [User Unit]
811	Real	4	RW	Limit B Lower Value in [V]
812	Real	4	RW	Limit B Upper Value in [User Unit]
813	Real	4	RW	Limit B Upper Value in [V]
814	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gauge 99: Bus Coupler *More channel type in preparation* *2: Piezo* *3: PT100* *4: Resistance* *5: LVDT*

				6: Thermocouple
815	STR20	20	RO	Serial Number as ASCII String
816	STR20	20	RO	Software Version
817	STR20	20	RO	Additional Info (not supported yet)
818	Binary	664	RW	Index 0: Number of indicies to read complete configuration Index 1-166: Complete configuration in 4 bytes pieces

Table 46: Data protocol acyclic data: Measuring amplifier type 9250 module 7

8.8.9 Acyclic data measuring amplifier 9250 module 8

Instance	Type	Size (Bytes)	Access	Entry
903	Real	4	RO	Minimum Value
904	Real	4	RO	Maximum Value
905	Real	4	RW	Tare Value
906	Real	4	RW	Limit A Lower Value in [User Unit]
907	Real	4	RW	Limit A Lower Value in [V]
908	Real	4	RW	Limit A Upper Value in [User Unit]
909	Real	4	RW	Limit A Upper Value in [V]
910	Real	4	RW	Limit B Lower Value in [User Unit]
911	Real	4	RW	Limit B Lower Value in [V]
912	Real	4	RW	Limit B Upper Value in [User Unit]
913	Real	4	RW	Limit B Upper Value in [V]
914	UINT16	2	RO	Channel Type 0: undefined / error 1: Strain Gauge 99: Bus Coupler *More channel type in preparation* *2: Piezo* *3: PT100* *4: Resistance* *5: LVDT* *6: Thermocouple*
915	STR20	20	RO	Serial Number as ASCII String
916	STR20	20	RO	Software Version
917	STR20	20	RO	Additional Info (not supported yet)
918	Binary	664	RW	Index 0: Number of indicies to read complete configuration Index 1-166: Complete configuration in 4 bytes pieces

Table 47: Data protocol acyclic data: Measuring amplifier type 9250 module 8

8.9 EtherNet/IP error codes

Error Code	Description
0x00	SUCCESS *No error, write/read successful*
0x02	RESOURCE_UNAVALIABLE
0x05	BAD_CLASS_INSTANCE *This class/instance is not specified*
0x08	SERVICE_NOT_SUPPORTED
0x09	BAD_ATTR_DATA *The request has been declined.* *Please check your data and data length here*
0x0C	OBJECT_STATE_CONFLICT
0x0E	ATTRIBUTE_NOT_SETTABLE
0x0F	PERMISSION_DENIED *Reading /Writing of this attribute is not supported*
0x11	REPLY_DATA_TOO_LARGE
0x13	NOT_ENOUGH_DATA
0x14	UNDEFINED_ATTR *This attribute is not implemented by the firmware. Please refer to operation manual to check whether the attribute number is correct.*
0x15	TOO_MUCH_DATA
0x1E	SERVICE_ERROR *Read/Write request has been declined by device. Please refer to device operation manual to check if this parameter is writeable/readable*
0x1F	VENDOR_SPECIFIC_ERROR
0x23	BUFFER_OVERFLOW
0x2C	ATTRIBUTE_NOT_GETTABLE
0xB2	RESERVED_CLASS *Read/Write from/to this class is not supported*

Table 48: EtherNET/IP error codes

9 Service offering for the 9251 fieldbus controller

To complement the model 9251 fieldbus controller package you have purchased, burster präzisionsmesstechnik gmbh & co kg offers the following customer services:

- On-site support for preparing the instrument for use
- Product training (in-house at burster or on-site)
- Initial calibration and recalibration, including sensors

To inquire about our customer services for your model 9251 fieldbus controller, please call our Service department on +49 7224 645-53, or email: service@burster.de (Germany only). If you are outside Germany, you should contact your burster agent (see also www.burster.com).

10 Technical data

Please refer to the model 9251 fieldbus controller data sheet for specifications and technical data. You can obtain the latest data sheet and additional information on the model 9251 fieldbus controller at https://tinyurl.com/y65b5xys or simply use the QR code below:

Figure 19: QR code for the model 9251 fieldbus controller product page

10.1 Electromagnetic compatibility

10.1.1 Interference immunity

Interference immunity in compliance with EN 61326-1:2013

Industrial environment

10.1.2 Interference emission

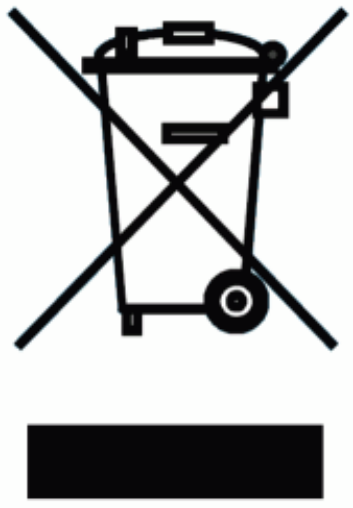
Interference emission in compliance with EN 61326-1:2013

11 Accessories available

Please refer to the model 9251 fieldbus controller data sheet for data sheet for details of the accessories available. You can obtain the latest data sheet and additional information on the model 9251 fieldbus controller at https://tinyurl.com/y65b5xys or simply use the QR code below:

Figure 20: QR code for the model 9251 fieldbus controller product page

12 Disposal



Battery disposal

In Germany, the end user is legally obliged to return all used batteries, and it is illegal to dispose of batteries in the household waste. This law may also affect you as purchaser of the instrument described here. Please dispose of your used batteries properly and in accordance with national statutory regulations. Either take them to the relevant collection point in your organization or to the collection points provided by your local authority, our company or any battery retail outlet.

Instrument disposal

If your instrument is no longer usable, please comply with your legal obligations by disposing of the instrument described here in accordance with statutory regulations. You will then be helping to protect the environment!