OPERATION MANUAL
(vorläufig)

Fieldbus controller
Model 9251

Valid from: 02/07/2024

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Contents

1 Introduction

1.1 Purpose of this manual

This operation manual is intended to help you familiarise yourself with the device and take full advantage of its high performance.

The operation manual contains important information for the safe, proper and effective use of the device. Follow the instructions carefully to minimise repair costs and downtime and to increase the reliability and service life of the device.

1.2 Validity of the manual

This operation manual is only valid for the model 9251 fieldbus controller (“controller”).

1.3 Target group

This operation manual is intended for the personnel responsible for installing and operating the controller.

1.4 Display of information

Standardised formatting, figures, symbols, warnings (see Section 2.2), terms and abbreviations are used so that you can work quickly and safely with this manual.

► Instructions for action are indicated by an arrow.

Hinweis: It is important to heed this information in order to ensure correct handling of the controller.

WICHTIG: Follow the information given in the operation manual.

1.5 Terms used in the manual

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

1.6 Warranty

burster präzisionsmesstechnik gmbh & co. kg provide 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 damages arising from improper use.

Please note the following when sending the controller in for repair:

- If there is a problem with the device, please attach a note to the body of the 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 damages.
- The device must always be dispatched in suitable packaging.

Conversions and modifications

Hinweis: The warranty shall be deemed void **immediately** if you open or dismantle the controller during the warranty period.

The 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 controller.

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

2 Safety

Important: Read the operation manual carefully before using the equipment and keep it for future reference.

2.1 Applications

2.1.1 Intended use

The model 9251 fieldbus controller is a digital instrumentation amplifier for strain gage sensors, potentiometric sensors and sensors with the standard signal output of ±10 V.

Intended use is defined as:

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

Typical applications of the controller include. for example:

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

2.1.2 Foreseeable misuse

Misuse can lead to hazards and damage to the device.

- The device is not a substitute for safety devices and protective equipment. Use safety devices and protective equipment.
- Only use the device outside of potentially explosive areas.
- The device 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.

2.1.3 Restrictions on use

The device 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 improper installation or operation or from misinterpretation of measurement results.

2.1.4 Limitation of liability

All information in this manual has been compiled taking into account the applicable standards and regulations, the state of the art and our many years of knowledge and experience.

The manufacturer accepts no liability for damage due to the following reasons:

- Non-compliance with the manual
- Unintended use
- Use of unqualified personnel
- Unauthorised conversions

The obligations agreed to in the delivery contract, the general terms and conditions and the delivery conditions of the manufacturer and its suppliers and the statutory regulations valid at the time of conclusion of the contract shall apply.

2.2 Representation of hazards

The following representation is used in this operation manual to warn of hazards:

 **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	

2.3 Pictograms

Symbol	Description
	Electric shock hazard
	Important, please note
	Observe the information on protecting the controller

2.4 Symbols on the controller

Symbol	Description
	See manual! It is essential to observe the information in the operation manual for the controller. Follow safety instructions – Professional servicing only

2.5 Requirements for 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 device.

We would be happy to provide your operating personnel with training. To find out more, please see our range of services at www.burster.de.

2.6 Residual hazards

Despite a safe design and technical protective equipment, unavoidable, residual hazards which may not be obvious remain.

▶ Observe all safety instructions in this operation manual to prevent residual hazards.

Electric shock hazard

- **Only** use the controller **outside** of potentially explosive areas.
- The controller is **not a substitute** for safety devices and protective equipment. Use safety devices and protective equipment.
- The 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.

3 Description

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 is a digital instrumentation amplifier for strain gage sensors, potentiometric sensors and sensors with the standard signal output of ±10 V. The analog input signals are digitized and output over the fieldbus interface. The fieldbus controller can be used with all common Ethernet-based fieldbuses such as PROFINET, EtherCAT and EtherNet/IP. In addition to the integrated measurement channel, up to eight model 9250 instrumentation amplifier modules (bus-compatible variant) can be cascaded on the model 9251 fieldbus controller. The scaled measured values are read simultaneously in the real-time data of the fieldbus link.

With an update rate of approx. 3.6 kHz, the measured values 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.com) 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, taring options, 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

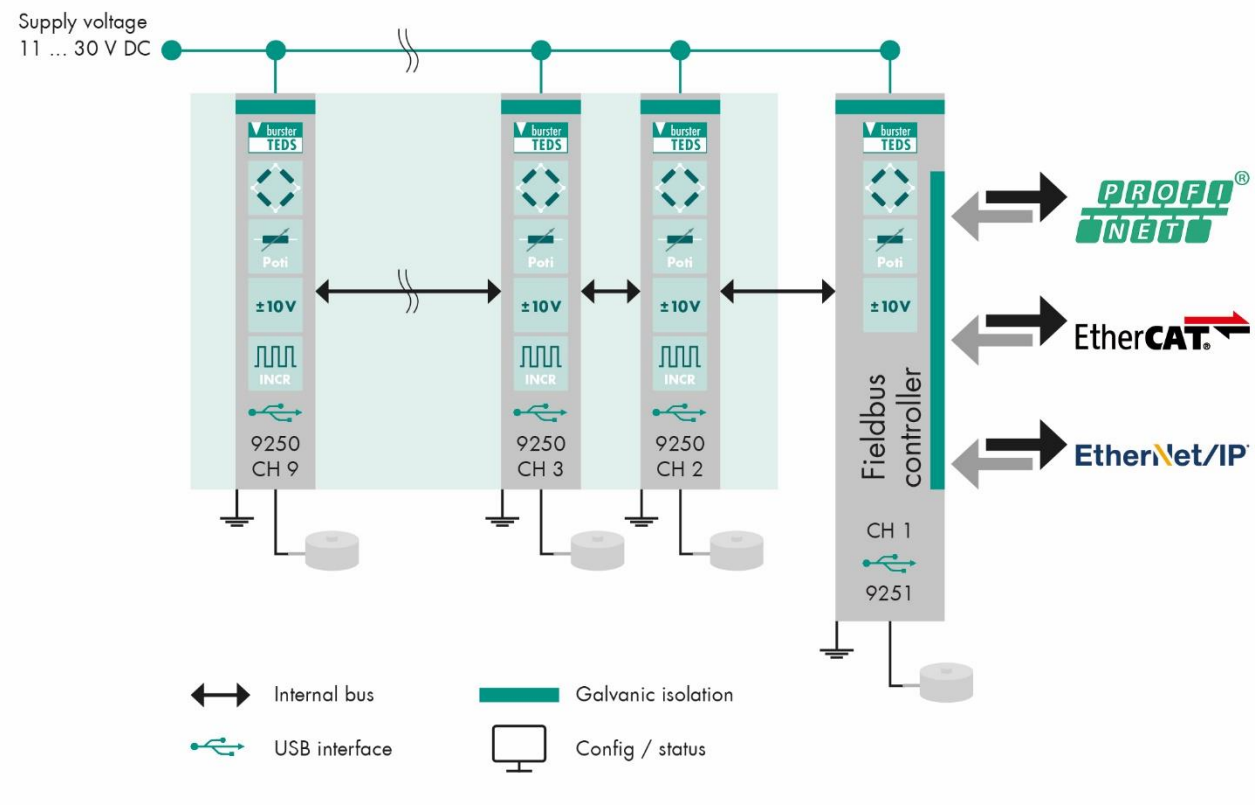


Figure 1 Block diagram of model 9251 fieldbus controller

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.

Hinweis: 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 controller at www.burster.com or simply use the QR code below:

Figure 2 QR code for 9251 fieldbus controller

3.4 Power supply

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

3.5 Suitable sensors

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

The controller can process signals from a wide variety of different sensor technologies.

The controller works with these sensor technologies:

Symbol	Type
	Strain gage sensors
	Potentiometers
	Sensors with standard signal (process signal)

3.6 Automatic sensor recognition of burster TEDS

The controller uses the burster TEDS (Transducer Electronic Data Sheet) to provide automatic sensor recognition, i.e. the instrument reads the relevant sensor specification from an EEPROM fitted in the sensor connector and can then use this data to perform the necessary channel configuration automatically. The memory chip in the sensor plug or sensor cable is programmed when the sensor is first ordered or subsequently calibrated.

Figure 3 Designation for burster TEDS

3.7 Error indicators

Indication	Error description
Status LED flashing rapidly red	Error after power-on Sensor excitation not available Internal malfunction
Status LED lights continuously red	Output of the min. process value since the last memory reset.
Red status LED flashing rapidly and green LED flashing slowly	Output of the max. process value since the last memory reset.

4 Unpacking/Contents of pack/Storage

4.1 Unpacking

DANGER

Risk of electric shock

Never switch on the device if it shows signs of damage incurred in transit. Only ever use the device under the conditions specified in this operating manual.

▶ Inspect the device for damage. If you suspect that the device has been damaged during shipping, notify the delivery company within 72 hours.

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

The device may be shipped only in its original packaging or in packaging capable of providing an equivalent degree of protection.

4.2 Contents of pack

The following components are supplied in the pack:

- Model 9251 fieldbus controller
- Test certificate
- Free version of DigiVision configuration and analysis software

4.3 Storage

The following requirements must be met when storing the controller:

- Storage temperatures between –25 °C and +70 °C
- The controller must be packed in clean packaging
- Dry environment
- No condensation

5 Installation

WARNING

Risk of electric shock

Install the device only on a grounded mounting rail in a grounded control cabinet.

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

5.1 Installation

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

5.2 Removal

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

6 Controls and connections

6.1 Front view

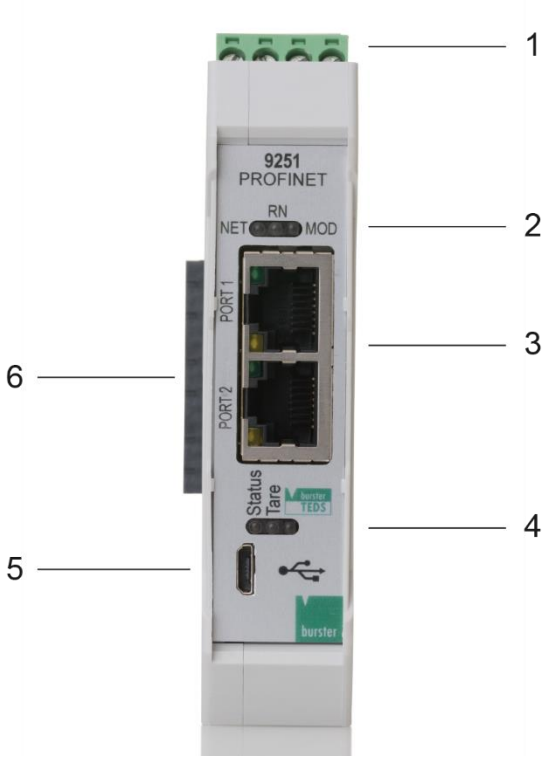


Figure 4 Front view of model 9251 fieldbus controller

Name	Error description
1	External inputs and outputs
2	Fieldbus status indicator
3	Fieldbus ports
4	Status LED/TARE LED/TEDS LED
5	Micro-USB port for configuration
6	Internal bus connection e.g. for model 9250 instrumentation amplifier

6.2 Connection assignment/Pin assignment

Figure 5 Connection assignment/Pin assignment

Number	Name		Number	Name
1	+ Sensor excitation		7	Shield
2	+ Signal		8	Shield
3	– Signal		9	TEDS IO
4	– Sensor excitation		10	TEDS GND
5	+ Sense		11	Supply voltage 11 to 30 V DC
6	– Sense		12	Supply voltage GND

6.3 Fieldbus status indicator

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

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

6.4 LEDs

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

6.5 Status LED (normal operation)

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

Indication	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

6.6 TARE LED and burster TEDS LED

Indication	Description
TARE LED lights continuously orange	TARE is active
TEDS LED lights continuously orange	A TEDS sensor is connected. The TEDS data can be read.

6.7 Grounding and shielding

The controller is grounded via the mounting rail. Use suitable connecting cables for connecting communication interfaces. 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.

6.8 Compatible sensors/inputs

6.8.1 Full-bridge strain gage sensors

There are three measuring ranges to choose from:

- 0 to ±15 mV
- 0 to ±30 mV
- 0 to ±300 mV

The inputs are differential and not relative to ground.

The following sensor excitation voltage settings are possible:

- OFF
- 2.5 V
- 5 V
- 10 V

The max. output current is approx. 40 mA. The sensor excitation voltage is protected against short-circuit.

6.8.2 Potentiometric sensors

- The excitation voltage is fixed at 5 V
- The measuring range is 0 to ±5 V

The max. output current is approx. 40 mA. The sensor excitation voltage is protected against short-circuit. The negative input is internally connected to earth, so an external connection is not necessary.

6.8.3 Voltage measurement/Transmitters with voltage output

- The measuring range is 0 to ±10 V
- The sensor excitation voltage is switched off
- The negative input is internally connected to earth, so an external connection is not necessary
- Transmitters having a voltage output of up to ±10 V can be connected like a voltage source
- The transmitters require a separate power supply

Hinweis: The controller does not provide supply voltages for transmitters.

6.9 Reading in burster TEDS

The controller supports burster TEDS for strain gage, potentiometric and high-level sensors.

▶ Select "Read TEDS" in the DigiVision configuration software.

The controller then reads the TEDS chip of the connected sensor and parameterises itself accordingly.

Hinweis: If a (valid) sensor with a TEDS chip is not connected, you cannot select burster TEDS. If it is determined when reading in that a meaningful device parameterisation cannot be determined from the available information, the process is cancelled and the previous setting is retained.

6.10 MIN and MAX values

The controller has memory for MIN and MAX values. The recording of the current maximum measured value (MAX value) remains at the highest value reached so far, even if the measurement signal has decreased in the meantime. The MAX value is overwritten as soon as the last MAX value is exceeded again. You can reset the MAX value using a control bit via the field bus. The same behaviour applies to the MIN value if undershot.

6.11 Connections

6.11.1 Connecting strain gage sensors

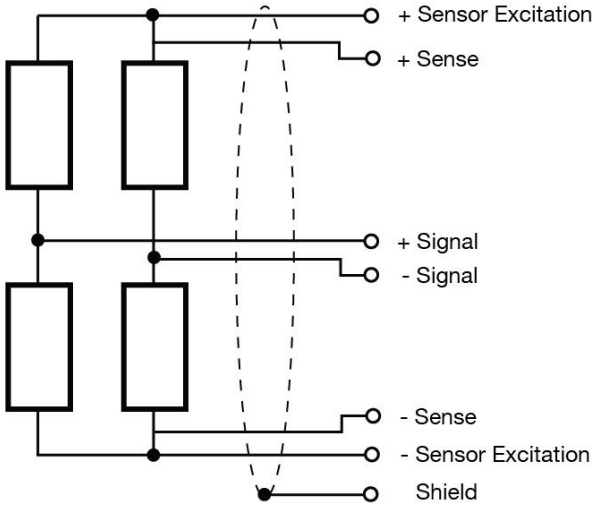


Figure 6 Strain gage connection method

You can connect strain gage sensors with or without sensor lines to the controller. Sensor lines are used to compensate for losses in the cable so that optimum results are achieved regardless of the cable length.

If the strain gage sensors have sensor line connections, use them and, if necessary, also use extension cables with sensor lines.

If you are using strain gage sensors without sensor line connections, you can also connect them directly to the controller. If necessary, use extension cables with sensor lines. Establish a connection between +Sensor and +Excitation as well as –Sensor and –Excitation on the end of the extension cable facing the strain gage sensor.

Connecting strain gage sensors without sensor lines

Connect strain gage sensors without sensor lines as follows:

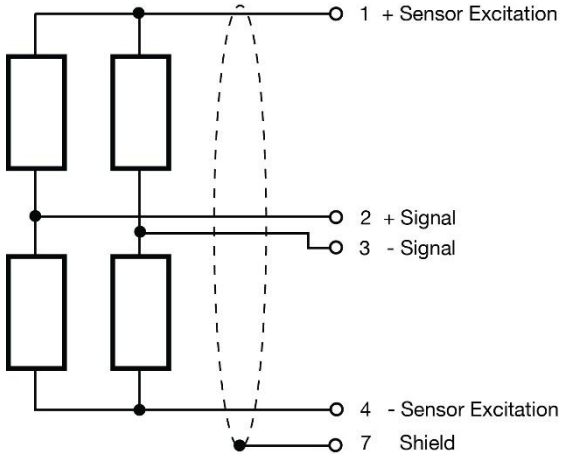


Figure 7 Strain gage sensors without sensor lines

Connecting strain gage sensors with sensor lines

Connect strain gage sensors without sensor lines as follows:

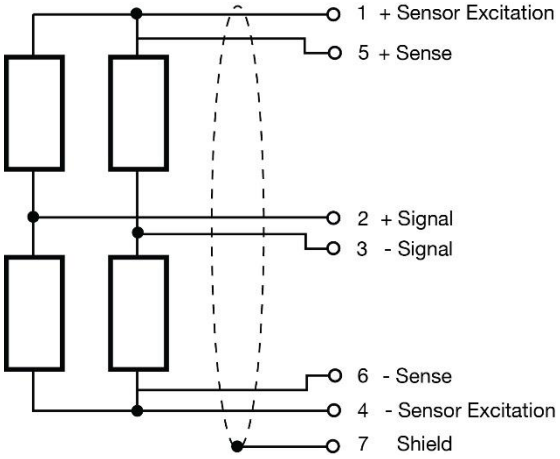


Figure 8 Strain gage sensors with sensor lines

6.11.2 Connecting potentiometric sensors

Connect potentiometric sensors as follows:

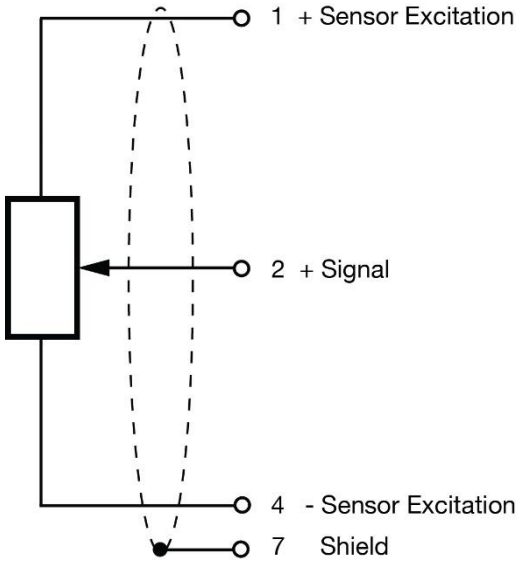


Figure 9 Potentiometric sensors

6.11.3 Connecting transmitters with voltage output

Connect the transmitters as follows:

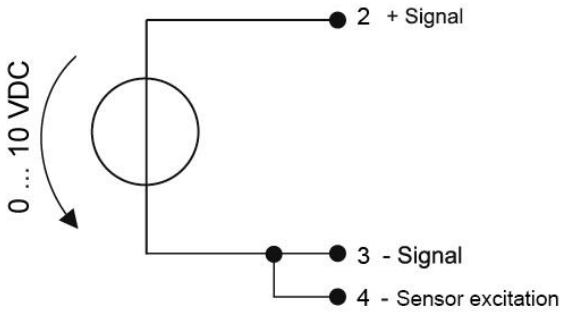


Figure 10 Transmitters with voltage output

The input range is 0 to ±10 V.

Hinweis: The controller does not provide supply voltages for transmitters.

6.11.4 burster TEDS connection

Applies for all sensors with the burster TEDS option.

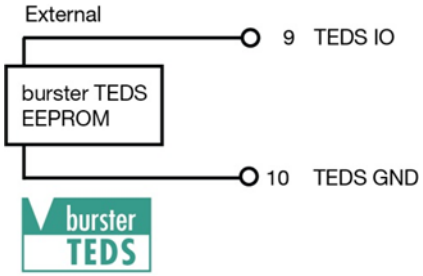


Figure 11 burster TEDS connection

6.12 Micro-USB port for configuration

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

WICHTIG: 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 controller is for a USB 2.0 Micro-B plug.

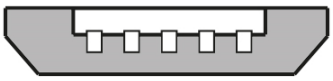


Figure 12 USB Micro-B

Pins	Description
1	+5 V
2	Data –
3	Data +
4	ID (not used)
5	GND

7 Device configuration

7.1 DigiVision installation

Please download the latest version of the software from our website, www.burster.de.

7.2 Device list

You can use the device finder facility to automatically detect and display the controllers that are connected.

1. Launch the DigiVision configuration and analysis software.
2. Click “Search”. A list is displayed of all available serial ports present, and a search is carried out for connected controllers. Once they have been found, all controllers are listed under the ports.

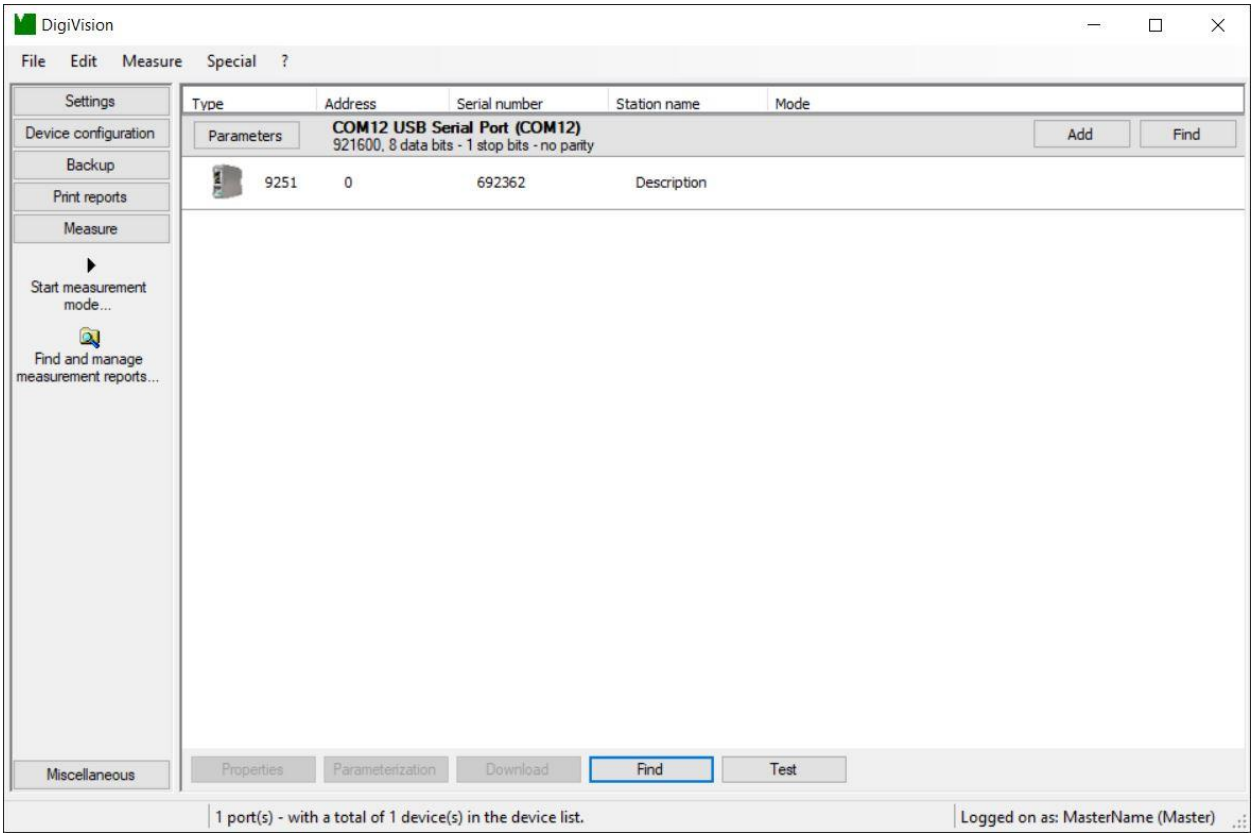


Figure 13 DigiVision home page

7.3 Device settings

After a successful device search, you can configure the controllers via the device list.

1. Select the desired controller by clicking it with the mouse.
2. Click “Parameterisation”. You are in the device settings.

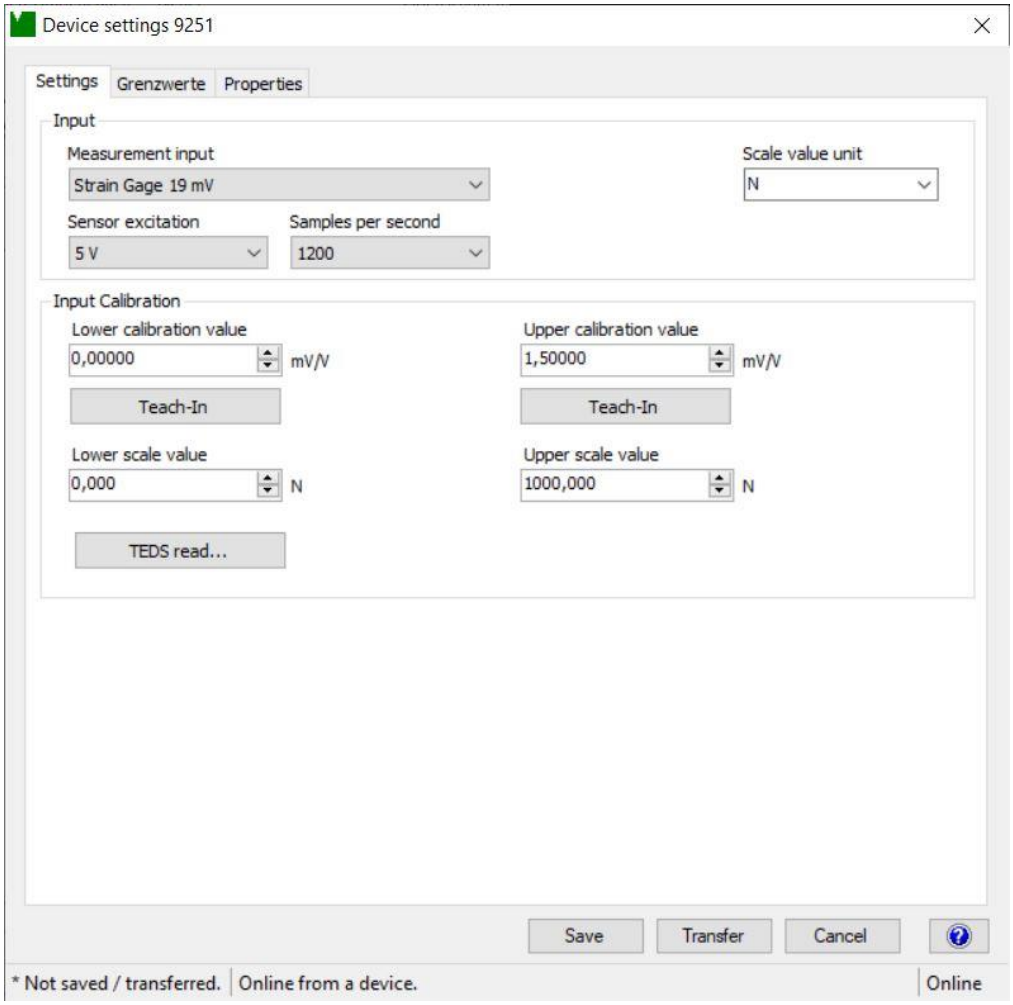


Figure 15 Device settings

7.3.1 Device settings

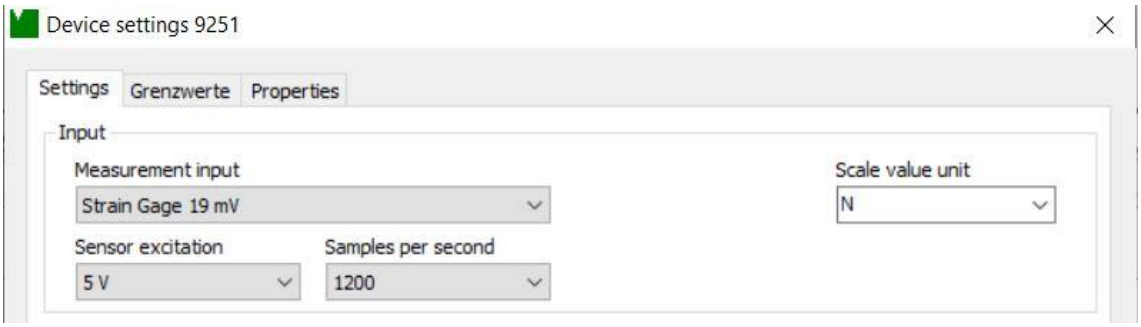


Figure 16 9251 device settings

Measurement mode

In order to be able to use 100% of the measurement range of the connected sensor, the selected input range must be ≥ the sensor sensitivity.

The following input measurement ranges are possible:

- 0 to ±15 mV
- 0 to ±30 mV
- 0 to ±300 mV
- Potentiometer (5 V)
- 0 to ±10 V

Unit

Set here the physical units required for the measurement. If the units that you require are not included in the list, you can also enter these by hand.

Sensor excitation voltage

The following sensor excitation voltages can be selected:

- OFF
- 2.5 V
- 5 V
- 10 V

The correct value for the sensor excitation voltage is listed on the respective datasheet or on the test and calibration certificate of the sensor.

Measurements per second

Here, set the measurement rate at which the measurement at the input amplifier and the output are to work. The measurement rate applies to both sides. The standard measurement rate is 1,200 measurements per second. Optionally, up to 3,600 measurements per second are possible.

7.3.2 Device settings – Limit values

You have the following selection options:

- Limit value overshooting, dynamic
- Limit value undershooting, dynamic
- Limit value overshooting (limit value memory), static
- Limit value undershooting (limit value memory), static

Window mode

- Lower limit value overshot AND upper limit value undershot, dynamic
- Upper limit value overshot OR lower limit value undershot, dynamic
- Upper limit value overshot OR lower limit value undershot, static

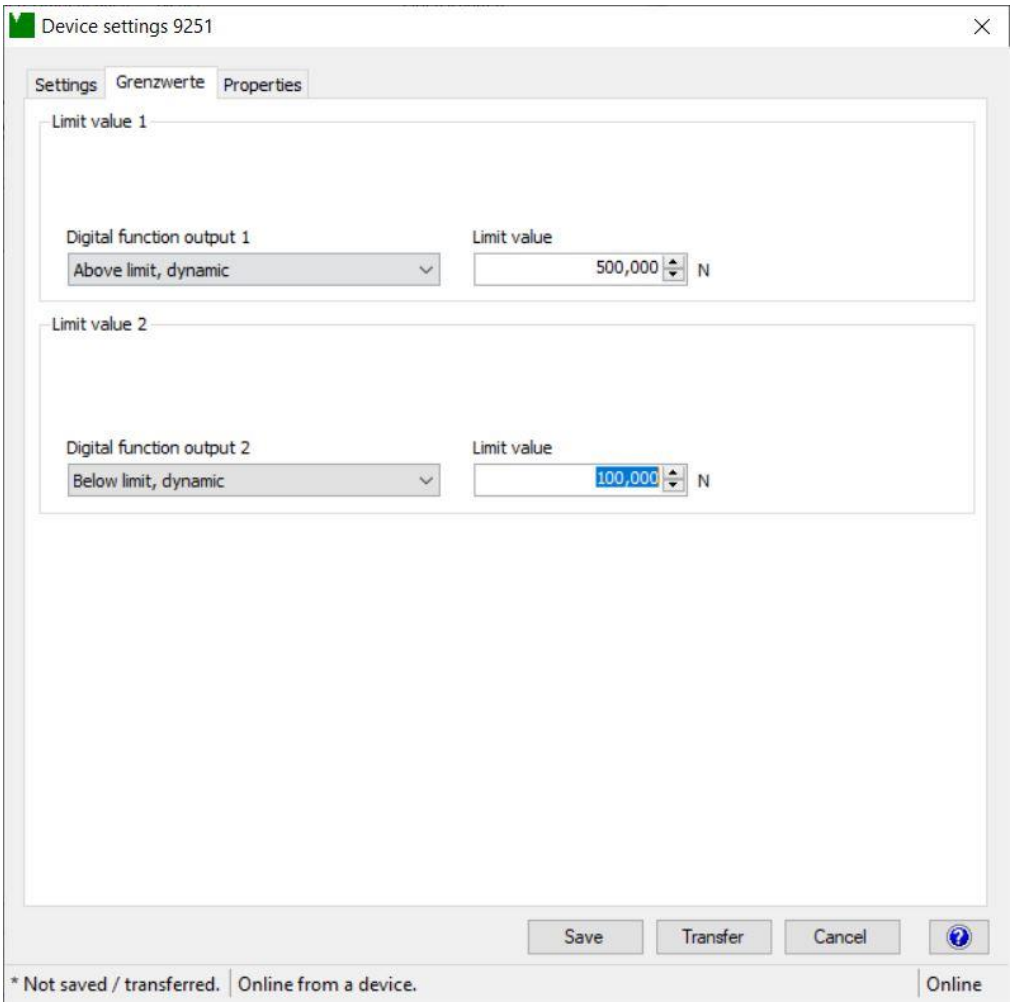


Figure 17 Configuration of limit values

In case of overshooting, dynamic

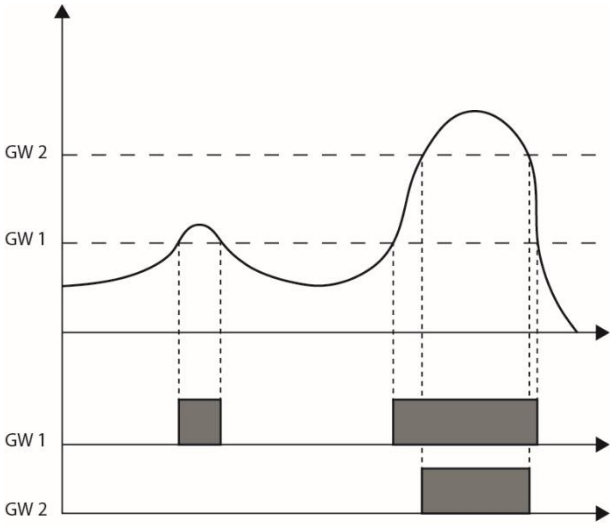


Figure 18 Overshooting, dynamic

In case of undershooting, dynamic

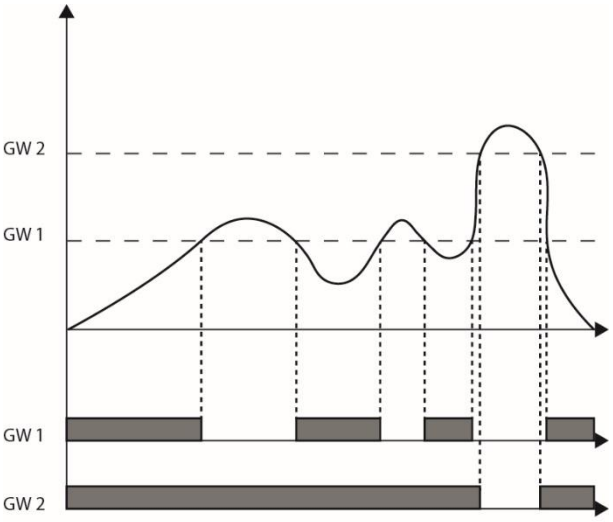


Figure 19 Undershooting, dynamic

Lower limit value overshot and upper limit value undershot, dynamic

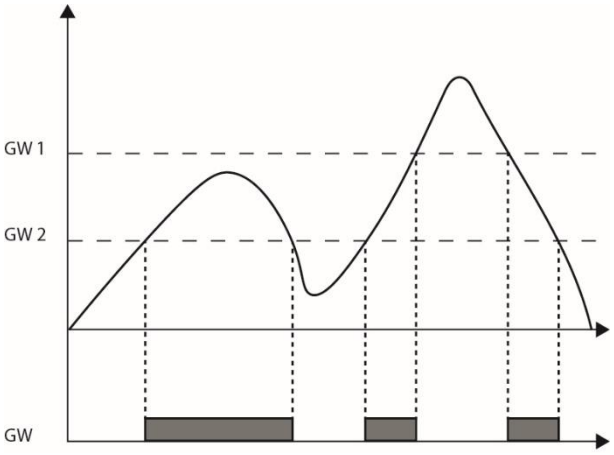


Figure 20 Lower limit value overshot and upper limit value undershot, dynamic

Upper limit value overshot or lower limit value undershot, dynamic

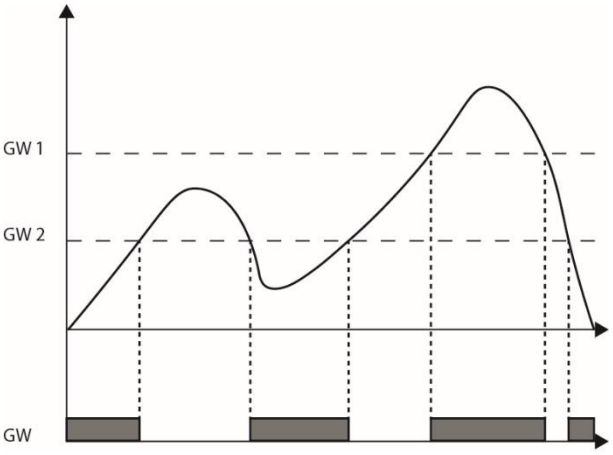


Figure 21 Upper limit value overshot or lower limit value undershot, dynamic

7.3.3 Configuration of digital inputs

You have the following selection options:

- TARE
- TARE reset
- Reset MIN/MAX peak-value memory
- Reset limit value memory 1
- Reset limit value memory 2
- Reset limit value memory 1 and 2
- Reset limit value memory 1, 2 and MIN/MAX peak-value memory
- HOLD

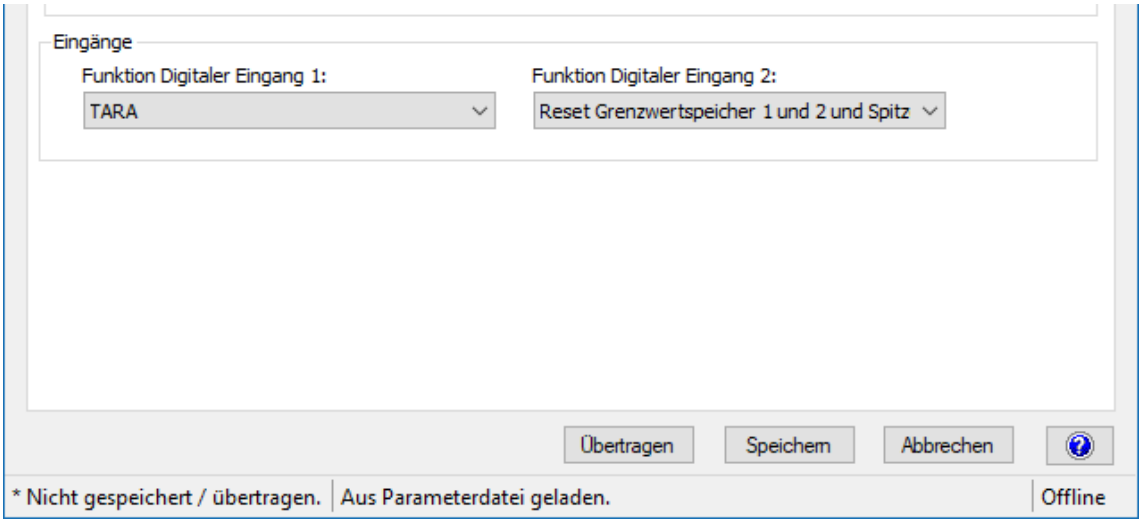


Figure 22 Configuration of digital inputs

7.3.4 Device settings – Properties

You can make or view the following settings under 9251 Device Settings > Properties (“Properties for...”):

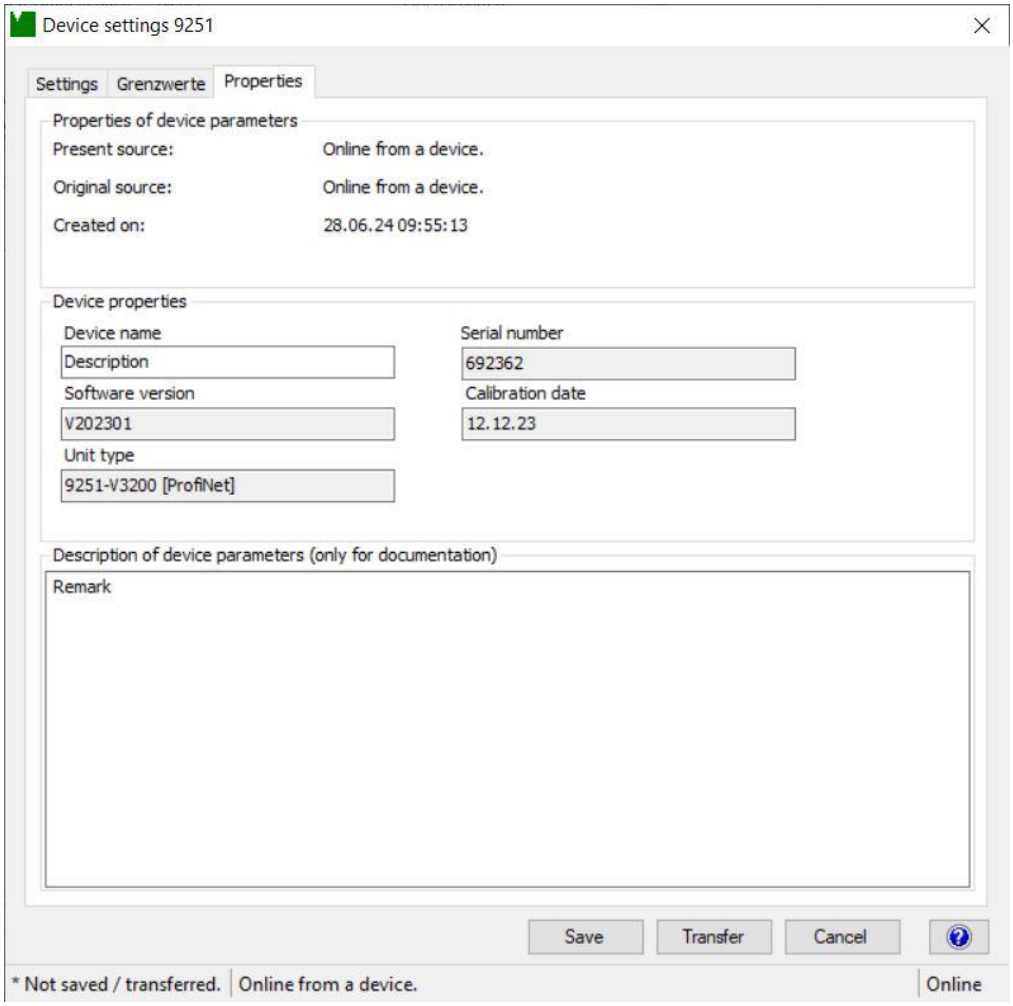


Figure 23 Device settings (“Properties”)

- Device name
  A freely selectable station name can be entered here.
- Software version
  Displays the current version of the software in the controller.
- Device type
- Serial number
  Displays the serial number of the connected controller.
- Calibration date
  The calibration date is updated with the date and time whenever new data are transmitted to the controller.

8 Calibration of the controller with sensors

Calibration is necessary in order to define the relationship between the electrical signals measured by the connected sensors and the measured values to be displayed.

8.1 Calibration with strain gage sensors

The controller can be calibrated using various methods:

- Calibration with physical variable
- Calibration using data from the test and calibration certificate of the strain gage sensor

The following sections describe the various calibration options in greater detail.

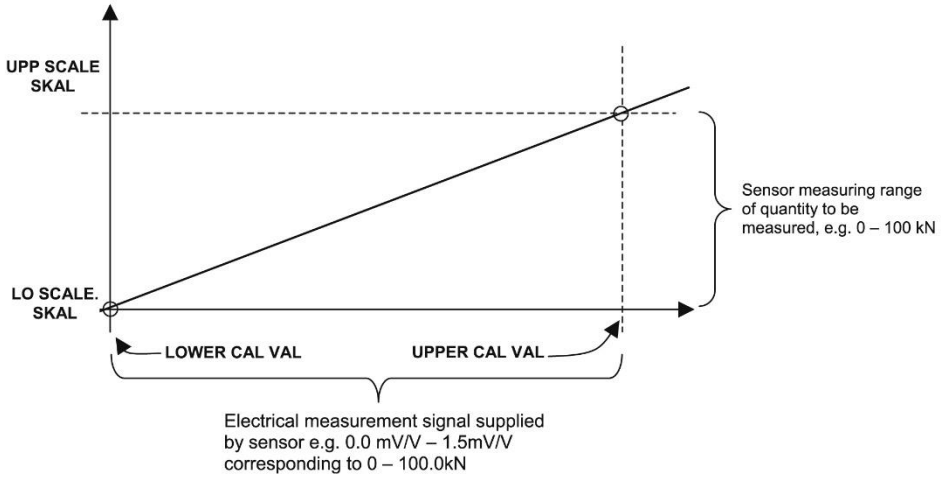


Figure 24 Characteristic sensor curve

The relationship between the electrical measurement signal from the connected strain gage sensor (lower calibration value, upper calibration value) and the measurement to be displayed (lower scale value, upper scale value) is defined below. It is a simple two-point calibration procedure.

The values are related as follows:

Lower scale value	⟷	Lower calibration value
Upper scale value	⟷	Upper calibration value

The lower calibration value is the electrical signal from the strain gage sensor when the “load” given by the lower scale value is applied (usually the zero point of the strain gage sensor). Since the zero point of a strain gage tends to shift from the origin as a result of the way the gage is mounted (components used to transfer the force exert a pre-load themselves) or material aging, the electrical value specified as the “zero point” on the test and calibration certificate rarely tallies with the value actually measured. We therefore advise that you always perform a teach-in for this value.

Other terms:

Rated load	→	Upper scale value or analog value
Zero signal	→	Zero point, zero signal without assembly parts, lower calibration value
Rated output	→	Output signal, rated output in preferential measurement direction, upper calibration value

8.1.1 Calibration with physical variable by the teach-in method

The teach-in method involves the two-stage online teach-in of sensor data to the controller, where two states are taught in sequentially. The first state is the zero point under no load (lower scale value or analog value), and the second state is the final value (upper scale value or analog value).

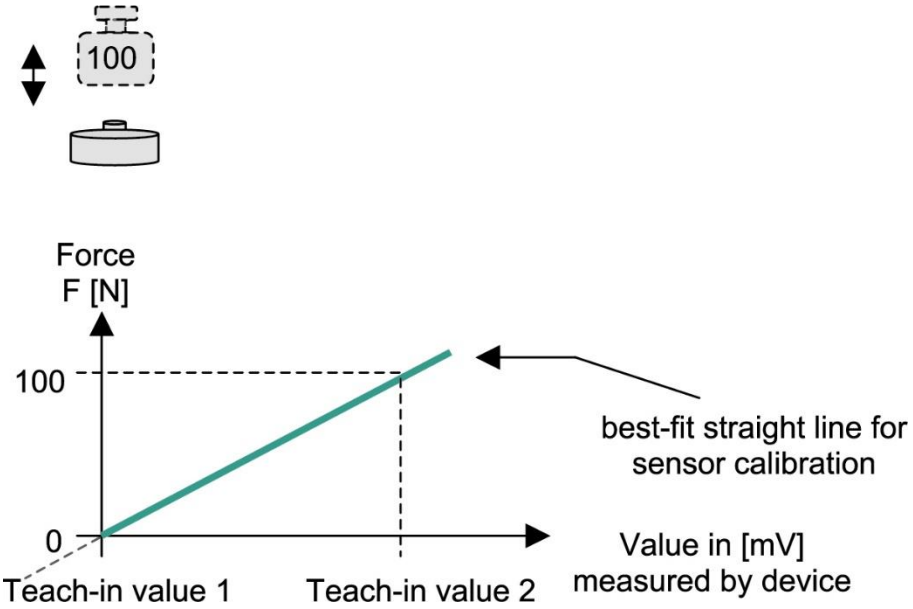


Figure 25 Characteristic sensor curve

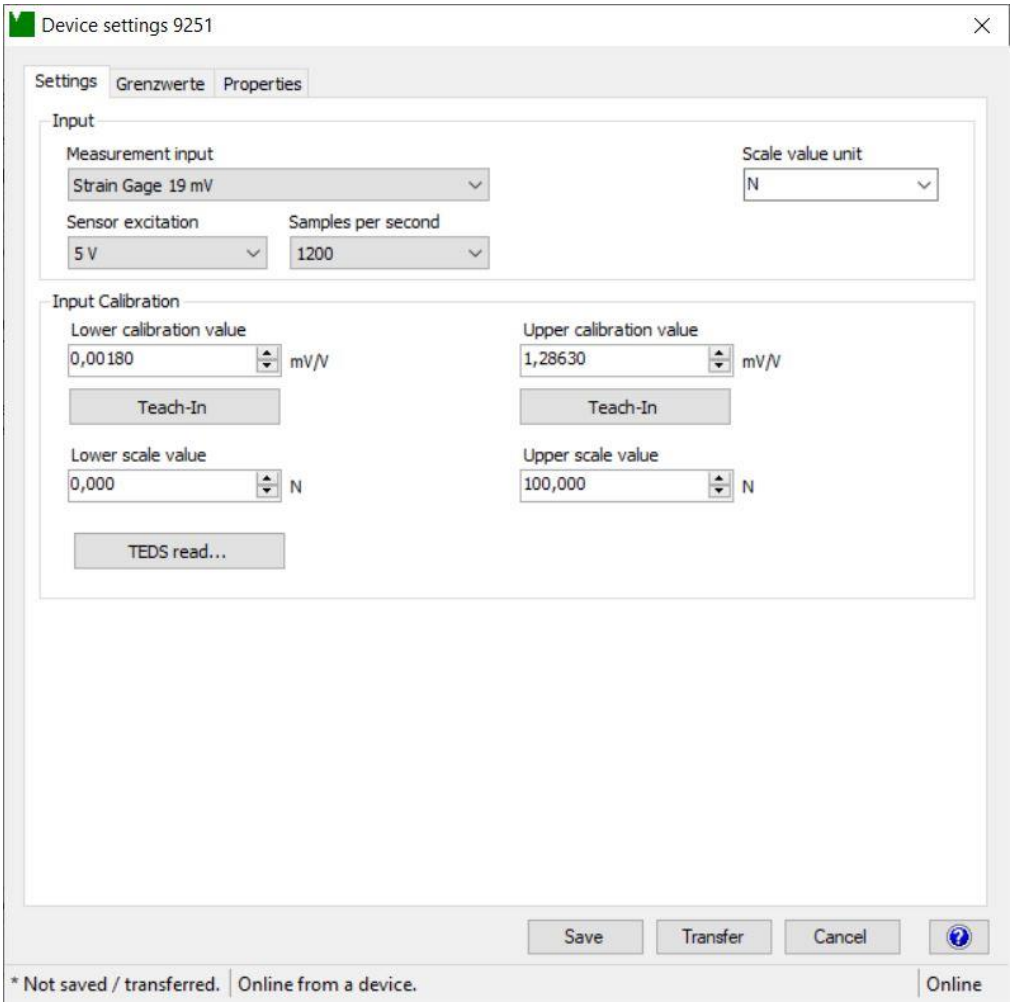
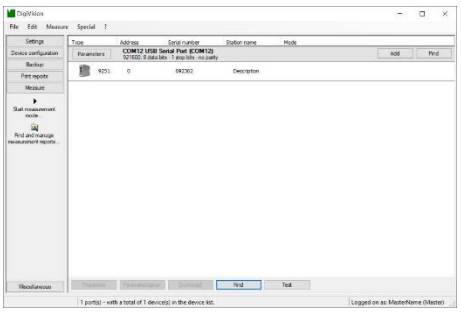
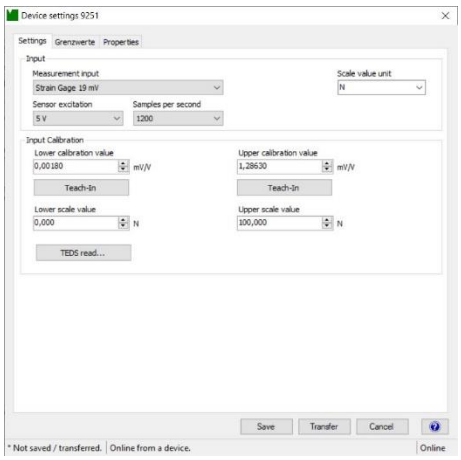


Figure 26 9251 device settings

1. Start the DigiVision configuration and evaluation software and make sure that the controller is connected correctly and appears in the device list.	
2. Click “Import parameters from device (online)” in the left-hand menu bar. When you do this, you import the parameter data of the strain gage sensor saved in the controller into the DigiVision configuration and evaluation software. The parameter data of the strain gage sensor can be taught in (teach-in method).	
3. Remove any load from the strain gage sensor and calibrate the zero point F = 0 N (lower scale value or analog value).	

4. Enter the lower scale value or analog value of the measurement range of the strain gage sensor. This is normally “0”.

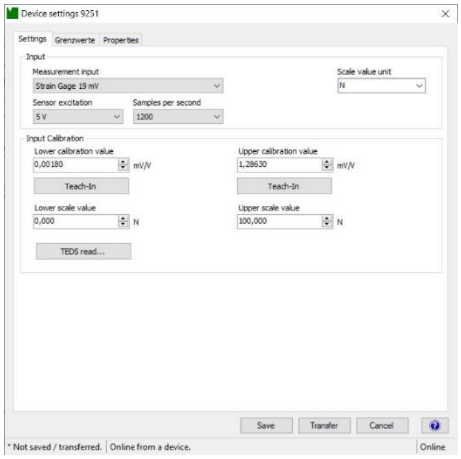


5. Click [Teach in] under “Lower calibration value” and confirm with “OK”.
   The lower calibration value is entered (e.g. 0.0765).
   The lower calibration value is the electrical signal from the strain gage sensor when the “load” given by the lower scale value or analog value is applied (usually the zero point of the strain gage sensor).

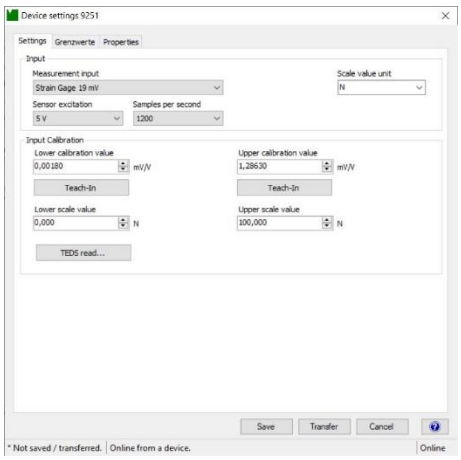
Hinweis: The scale value setting is only available in the bus version.

Hinweis: With strain gage sensors, zero point shifts can occur due to the installation situation (load-application parts, couplings, connection adapters etc., which can already generate a pre-load) or due to material ageing. This causes the electrical value specified as the “zero point” on the test and calibration certificate of the strain gage sensor to deviate from the measured zero point. We therefore advise that you always perform the teach-in for the zero point of the strain gage sensor.

6. Enter the upper scale value or analog value of the measurement range of the strain gage sensor. For force sensors, this is usually the rated load of the sensor. In our example, the rated load equals 100 N.

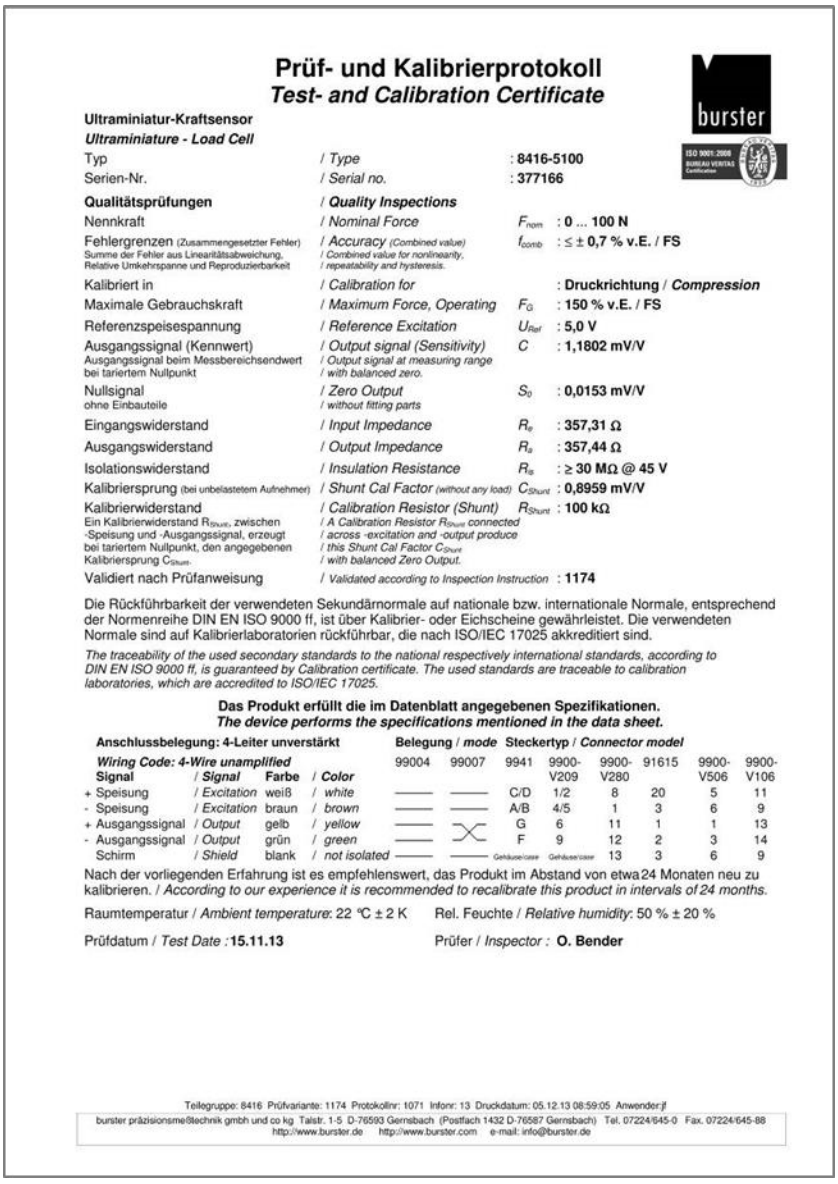


7. Then apply a known reference force to the strain gage sensor,
   e.g. F = 100 N (upper scale value or analog value), to set the final value.

8. Click [Teach in] under “Upper calibration value” and confirm with “OK”.	
9. Click “Transmit”. Teach-in is complete.	
10. If desired, you can also save the parameter data of the strain gage sensor in a file.	

8.1.2 Calibration using the test and calibration certificate

This procedure is a two-point calibration in which you enter the required data directly into the controller. All necessary calibration data can be found on the test and calibration certificate of the strain gage sensor.



Prüf- und Kalibrierprotokoll
Test- and Calibration Certificate

Ultraminiatur-Kraftsensor
Ultraminiature - Load Cell

Typ	/ *Type*		: **8416-5100**
Serien-Nr.	/ *Serial no.*		: **377166**
Qualitätsprüfungen	/ ***Quality Inspections***		
Nennkraft	/ *Nominal Force*	F_{nom}	: **0 ... 100 N**
Fehlergrenzen (Zusammengesetzter Fehler) Summe der Fehler aus Linearitätsabweichung, Relative Umkehrspanne und Reproduzierbarkeit	/ *Accuracy (Combined value)* / *Combined value for nonlinearity, / repeatability and hysteresis.*	f_{comb}	: ≤ ± **0,7 % v.E. / FS**
Kalibriert in	/ *Calibration for*		: **Druckrichtung / *Compression***
Maximale Gebrauchskraft	/ *Maximum Force, Operating*	F_G	: **150 % v.E. / FS**
Referenzspeisespannung	/ *Reference Excitation*	U_{Ref}	: **5,0 V**
Ausgangssignal (Kennwert) Ausgangssignal beim Messbereichsendwert bei tariertem Nullpunkt	/ *Output signal (Sensitivity)* / *Output signal at measuring range / with balanced zero.*	C	: **1,1802 mV/V**
Nullsignal ohne Einbauteile	/ *Zero Output* / *without fitting parts*	S_0	: **0,0153 mV/V**
Eingangswiderstand	/ *Input Impedance*	R_e	: **357,31 Ω**
Ausgangswiderstand	/ *Output Impedance*	R_a	: **357,44 Ω**
Isolationswiderstand	/ *Insulation Resistance*	R_{is}	: ≥ **30 MΩ @ 45 V**
Kalibriersprung (bei unbelastetem Aufnehmer)	/ *Shunt Cal Factor (without any load)*	C_{Shunt}	: **0,8959 mV/V**
Kalibrierwiderstand Ein Kalibrierwiderstand R_{Shunt}, zwischen -Speisung und -Ausgangssignal, erzeugt bei tariertem Nullpunkt, den angegebenen Kalibriersprung C_{Shunt}.	/ *Calibration Resistor (Shunt)* / *A Calibration Resistor R_{Shunt} connected / across -excitation and -output produce / this Shunt Cal Factor C_{Shunt} / with balanced Zero Output.*	R_{Shunt}	: **100 kΩ**
Validiert nach Prüfanweisung	/ *Validated according to Inspection Instruction*		: **1174**

Die Rückführbarkeit der verwendeten Sekundärnormale auf nationale bzw. internationale Normale, entsprechend der Normenreihe DIN EN ISO 9000 ff, ist über Kalibrier- oder Eichscheine gewährleistet. Die verwendeten Normale sind auf Kalibrierlaboratorien rückführbar, die nach ISO/IEC 17025 akkreditiert sind.

The traceability of the used secondary standards to the national respectively international standards, according to DIN EN ISO 9000 ff, is guaranteed by Calibration certificate. The used standards are traceable to calibration laboratories, which are accredited to ISO/IEC 17025.

Das Produkt erfüllt die im Datenblatt angegebenen Spezifikationen.
The device performs the specifications mentioned in the data sheet.

Anschlussbelegung: 4-Leiter unverstärkt				**Belegung** / ***mode***		**Steckertyp** / ***Connector model***					
Wiring Code: 4-Wire unamplified				99004	99007	9941	9900-V209	9900-V280	91615	9900-V506	9900-V106
Signal	/ ***Signal***	**Farbe**	/ ***Color***								
+ Speisung	/ *Excitation*	weiß	/ *white*	——	——	C/D	1/2	8	20	5	11
- Speisung	/ *Excitation*	braun	/ *brown*	——	——	A/B	4/5	1	3	6	9
+ Ausgangssignal	/ *Output*	gelb	/ *yellow*	——	X	G	6	11	1	1	13
- Ausgangssignal	/ *Output*	grün	/ *green*	——	X	F	9	12	2	3	14
Schirm	/ *Shield*	blank	/ *not isolated*	——	——	Gehäuse/case	Gehäuse/case	13	3	6	9

Nach der vorliegenden Erfahrung ist es empfehlenswert, das Produkt im Abstand von etwa 24 Monaten neu zu kalibrieren. / *According to our experience it is recommended to recalibrate this product in intervals of 24 months.*

Raumtemperatur / *Ambient temperature*: 22 °C ± 2 K Rel. Feuchte / *Relative humidity*: 50 % ± 20 %

Prüfdatum / *Test Date* : **15.11.13** Prüfer / *Inspector* : **O. Bender**

Teilegruppe: 8416 Prüfvariante: 1174 Protokollnr: 1071 Infonr: 13 Druckdatum: 05.12.13 08:59:05 Anwender:jf

burster präzisionsmeßtechnik gmbh und co kg Talstr. 1-5 D-76593 Gernsbach (Postfach 1432 D-76587 Gernsbach) Tel. 07224/645-0 Fax. 07224/645-88
http://www.burster.de http://www.burster.com e-mail: info@burster.de

Figure 27 Test and calibration certificate of a strain gage sensor (example)

For two-point calibration, enter two points in succession. The first point is the zero point under no load (lower scale value or analog value), and the second point is the final value (upper scale value or analog value), for example.

Hinweis: It does not necessarily have to be zero point and final value, as in principle any two pairs of values are sufficient.

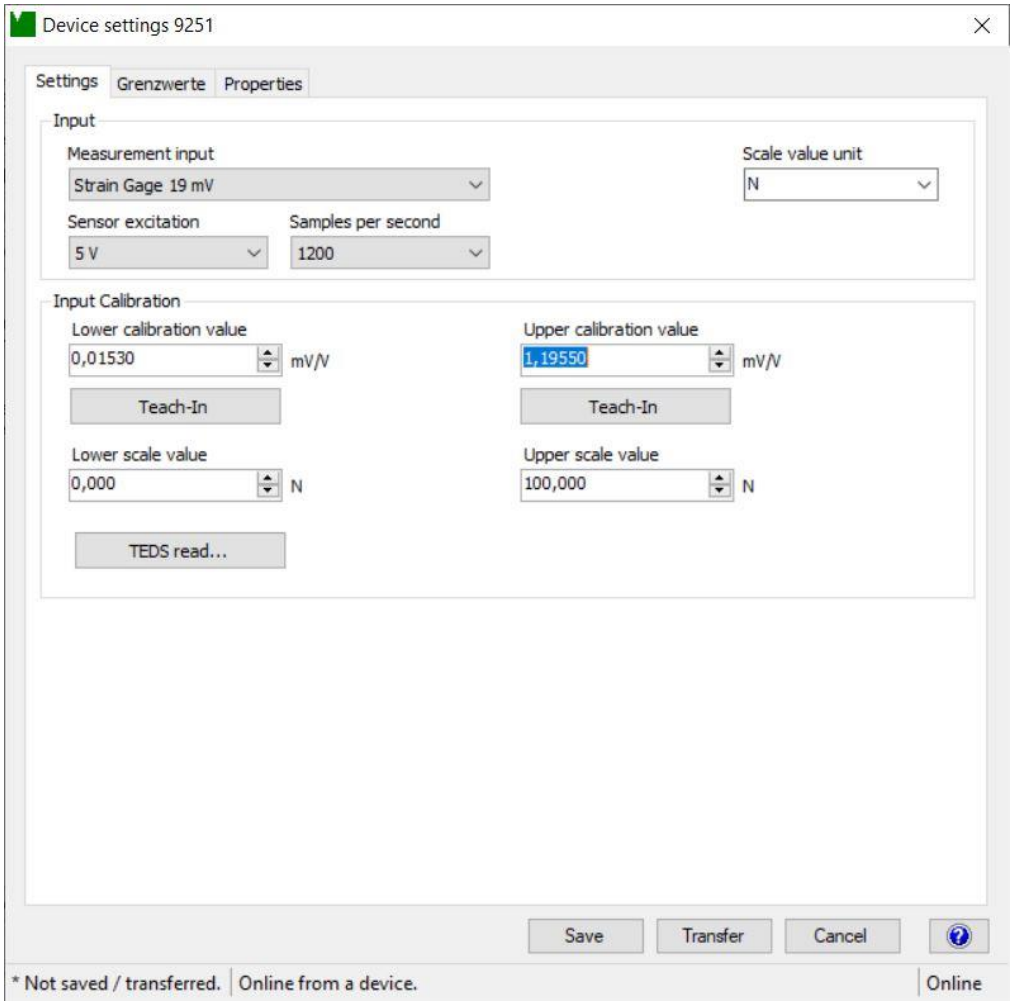
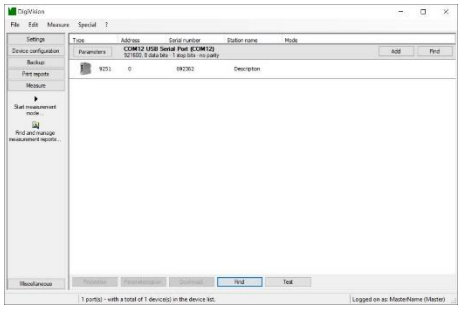


Figure 28 Device settings

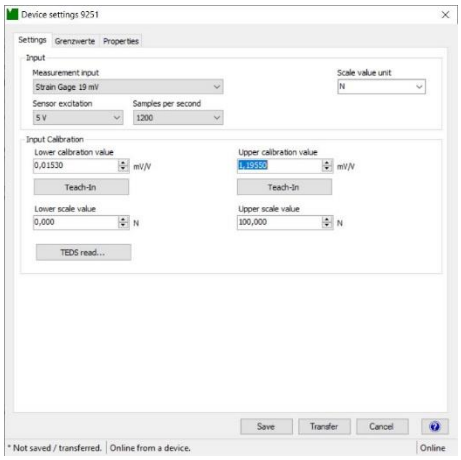
1. Start the DigiVision configuration and evaluation software and make sure that the controller is connected correctly and appears in the device list.

2. Click “Import parameters from device (online)” in the left-hand menu bar. When you do this, you import the parameter data of the strain gage sensor saved in the controller into the DigiVision configuration and evaluation software.
The parameter data of the strain gage sensor can be entered.



3. Remove any load from the strain gage sensor and calibrate the zero point F = 0 N (lower scale value or analog value).

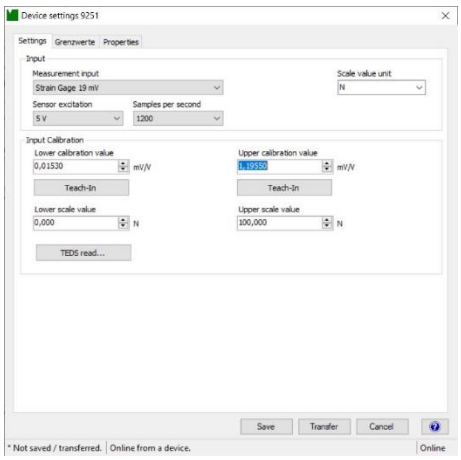
4. Enter the lower scale value or analog value of the measurement range of the strain gage sensor. This is normally “0”.



5. Click [Teach in] under “Lower calibration value” and confirm with “OK”.
The lower calibration value is entered (e.g. 0.0153).
The lower calibration value corresponds to the electrical zero signal of the sensor. If the value is taken from the test certificate, it is the zero signal without attachment parts. Clicking "Teach-In" calibrates the zero signal in the installed state.

Hinweis: The scale value setting is only available in the bus version.

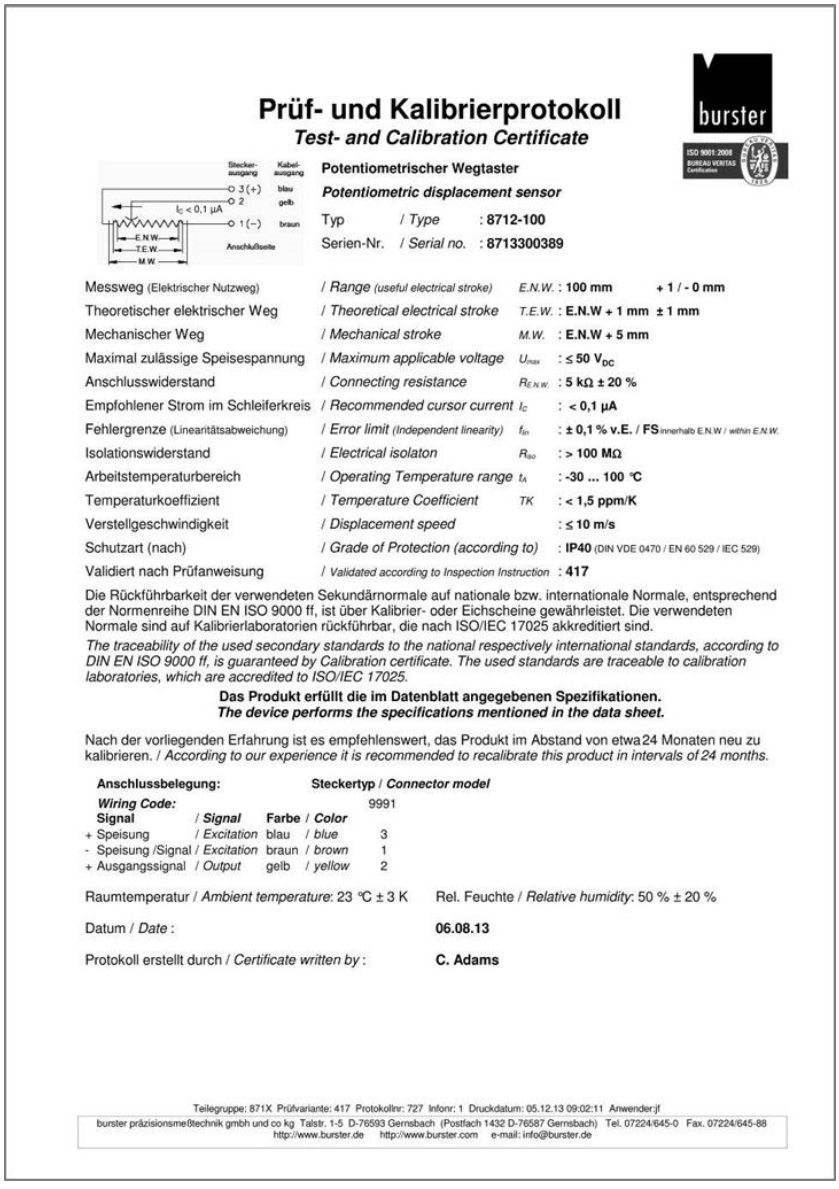
Hinweis: With strain gage sensors, zero point shifts can occur due to the installation situation (load-application parts, couplings, connection adapters etc., which can already generate a pre-load) or due to material ageing. This causes the electrical value specified as the “zero point” on the test certificate of the strain gage sensor to deviate from the measured zero point. We therefore advise that you always perform the teach-in for the zero point of the strain gage sensor.

6. Enter the upper scale value or analog value of the measurement range of the strain gage sensor. For force sensors, this is usually the rated load of the sensor. In our example, the rated load equals 100 N.	
7. You need to enter a corrected value for the rated output of the strain gage sensor in the preferential measurement direction. Add the teach-in value for the lower calibration value (0.0153 in our example) to the full-scale output of the strain gage sensor. The full-scale output of the strain gage sensor is stated on the test and calibration certificate (e.g. 1.1802). Enter the calculated value (1.1802 + 0.0153 = 1.1955) under “Upper calibration value” using the keypad.	
8. Click “Transmit”. Calibration using the test and calibration certificate is complete.	
9. If desired, you can also save the parameter data of the strain gage sensor in a file.	

8.2 Calibration with potentiometric displacement sensors with teach-in method

The teach-in method involves the two-stage online teach-in of sensor data to the controller, where two states are taught in sequentially. The first state is the zero point under no load (lower scale value or analog value), and the second state is the final value (upper scale value or analog value). All other required calibration data can be found on the test and calibration certificate of the potentiometric displacement sensor.

Measurements using a calibrated gage block have proved to be the most straightforward and practical way of calibrating systems that measure position and length (such as potentiometric displacement sensors). Potentiometric angular position sensors can also be connected.



Prüf- und Kalibrierprotokoll
Test- and Calibration Certificate

Potentiometrischer Wegtaster
Potentiometric displacement sensor

Typ / *Type* : **8712-100**
Serien-Nr. / *Serial no.* : **8713300389**

Messweg (Elektrischer Nutzweg)	/ *Range (useful electrical stroke)*	*E.N.W.*	: **100 mm + 1 / - 0 mm**
Theoretischer elektrischer Weg	/ *Theoretical electrical stroke*	*T.E.W.*	: **E.N.W + 1 mm ± 1 mm**
Mechanischer Weg	/ *Mechanical stroke*	*M.W.*	: **E.N.W + 5 mm**
Maximal zulässige Speisespannung	/ *Maximum applicable voltage*	U_{max}	: **≤ 50 V_{DC}**
Anschlusswiderstand	/ *Connecting resistance*	$R_{E.N.W.}$	: **5 kΩ ± 20 %**
Empfohlener Strom im Schleiferkreis	/ *Recommended cursor current*	I_C	: **< 0,1 µA**
Fehlergrenze (Linearitätsabweichung)	/ *Error limit (Independent linearity)*	f_{lin}	: **± 0,1 % v.E. / FS** *innerhalb E.N.W / within E.N.W.*
Isolationswiderstand	/ *Electrical isolaton*	R_{iso}	: **> 100 MΩ**
Arbeitstemperaturbereich	/ *Operating Temperature range*	t_A	: **-30 ... 100 °C**
Temperaturkoeffizient	/ *Temperature Coefficient*	*TK*	: **< 1,5 ppm/K**
Verstellgeschwindigkeit	/ *Displacement speed*		: **≤ 10 m/s**
Schutzart (nach)	/ *Grade of Protection (according to)*		: **IP40** (DIN VDE 0470 / EN 60 529 / IEC 529)
Validiert nach Prüfanweisung	/ *Validated according to Inspection Instruction*		: **417**

Die Rückführbarkeit der verwendeten Sekundärnormale auf nationale bzw. internationale Normale, entsprechend der Normenreihe DIN EN ISO 9000 ff, ist über Kalibrier- oder Eichscheine gewährleistet. Die verwendeten Normale sind auf Kalibrierlaboratorien rückführbar, die nach ISO/IEC 17025 akkreditiert sind.

The traceability of the used secondary standards to the national respectively international standards, according to DIN EN ISO 9000 ff, is guaranteed by Calibration certificate. The used standards are traceable to calibration laboratories, which are accredited to ISO/IEC 17025.

Das Produkt erfüllt die im Datenblatt angegebenen Spezifikationen.
The device performs the specifications mentioned in the data sheet.

Nach der vorliegenden Erfahrung ist es empfehlenswert, das Produkt im Abstand von etwa 24 Monaten neu zu kalibrieren. / *According to our experience it is recommended to recalibrate this product in intervals of 24 months.*

Anschlussbelegung:				**Steckertyp** / ***Connector model***
Wiring Code:				9991
Signal	/ ***Signal***	**Farbe** / ***Color***		
+ Speisung	/ *Excitation*	blau	/ *blue*	3
- Speisung /Signal	/ *Excitation*	braun	/ *brown*	1
+ Ausgangssignal	/ *Output*	gelb	/ *yellow*	2

Raumtemperatur / *Ambient temperature*: 23 °C ± 3 K Rel. Feuchte / *Relative humidity*: 50 % ± 20 %

Datum / *Date* : **06.08.13**

Protokoll erstellt durch / *Certificate written by* : **C. Adams**

Teilegruppe: 871X Prüfvariante: 417 Protokollnr: 727 Infonr: 1 Druckdatum: 05.12.13 09:02:11 Anwender:jf

burster präzisionsmeßtechnik gmbh und co kg Talstr. 1-5 D-76593 Gernsbach (Postfach 1432 D-76587 Gernsbach) Tel. 07224/645-0 Fax. 07224/645-88
http://www.burster.de http://www.burster.com e-mail: info@burster.de

Figure 29 Test and calibration certificate of a potentiometric displacement sensor (example)

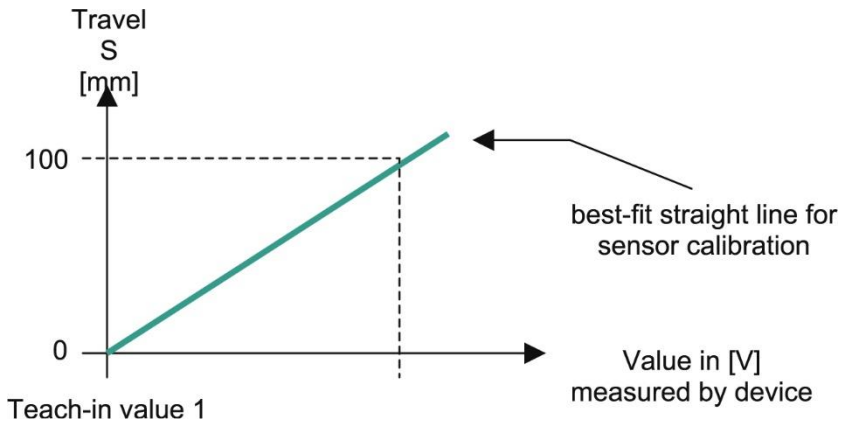


Figure 30 Characteristic sensor curve

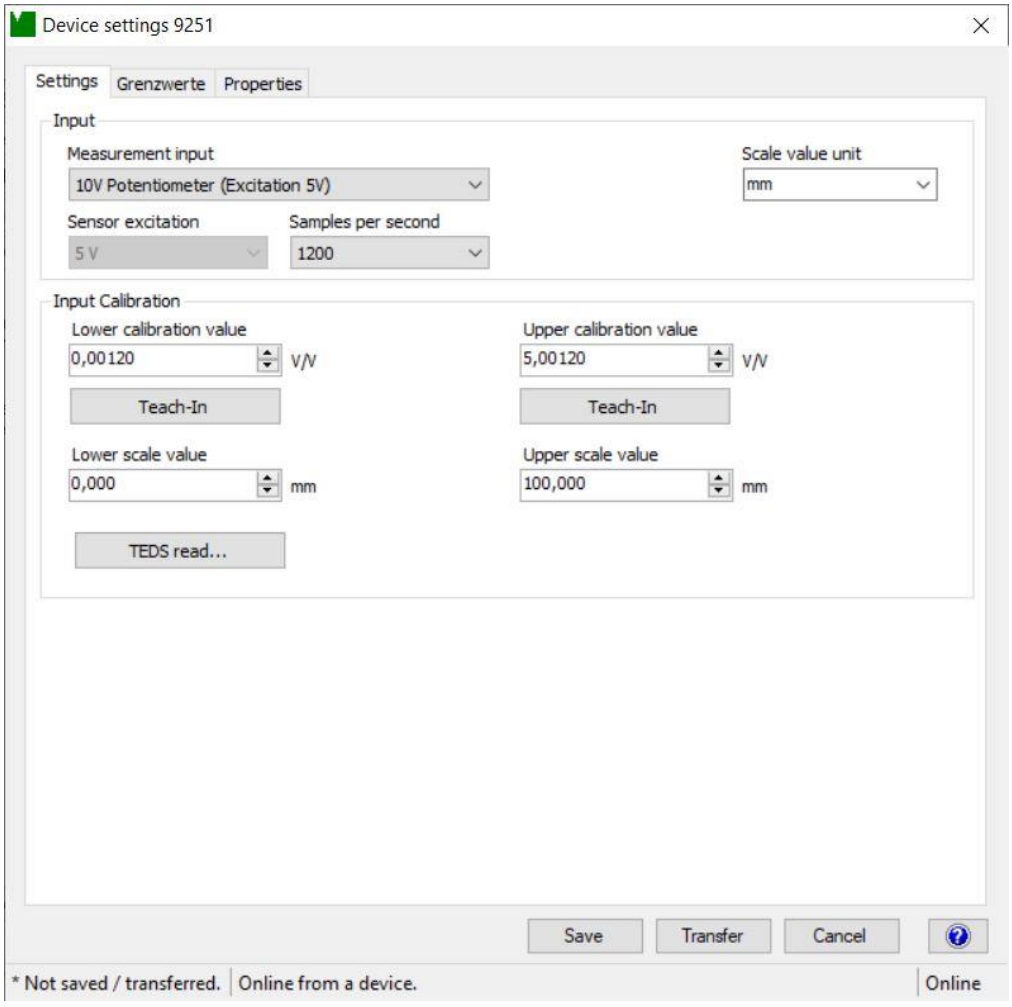
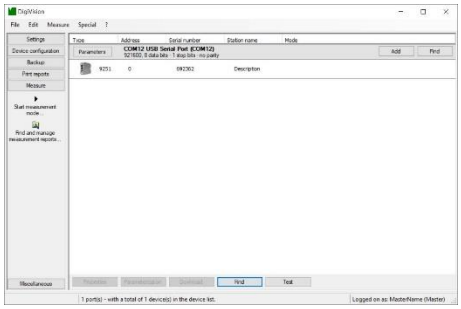


Figure 31 9251 device settings

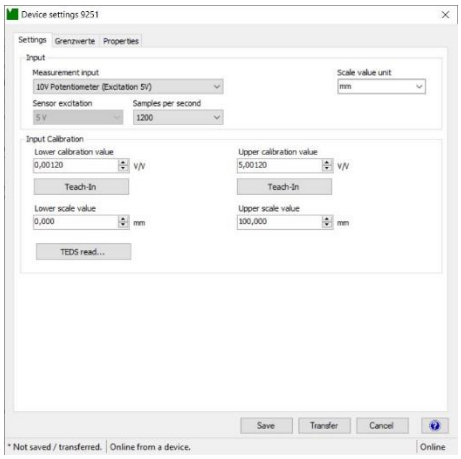
1. Start the DigiVision configuration and evaluation software and make sure that the controller is connected correctly and appears in the device list.

2. Click “Import parameters from device (online)” in the left-hand menu bar. When you do this, you import the parameter data of the potentiometric displacement sensor saved in the controller into the DigiVision configuration and evaluation software.
The parameter data of the potentiometric displacement sensor can be taught in (teach-in method).



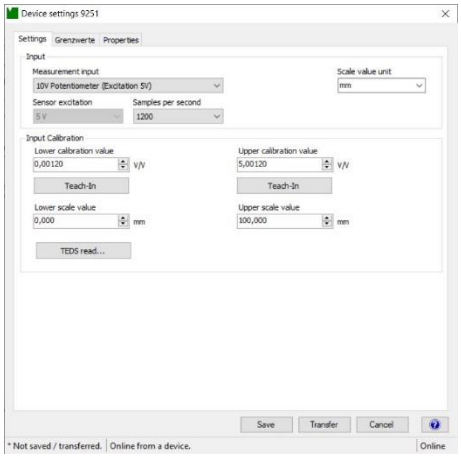
3. Position measurement using the example of a model 8712-100 potentiometric displacement sensor:
The potentiometric displacement sensor is set to the zero position (0.00 mm). This is normally when the sliding shaft of the sensor is fully retracted, but there may be slight differences between the mechanical and electrical zero points.

4. Enter the lower scale value or analog value of the measurement range of the potentiometric displacement sensor. This is normally the lower range value of the sensor, e.g. 0.00 mm.

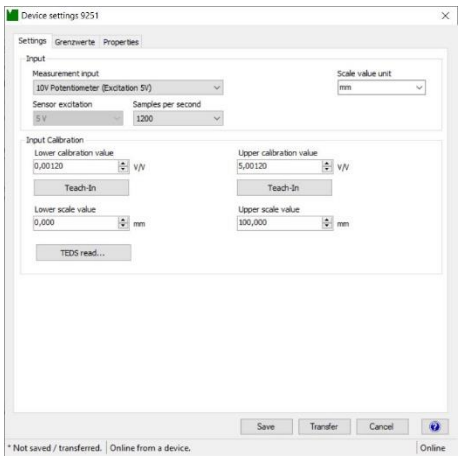


5. Click [Teach in] under “Lower calibration value” and confirm with “OK”.
The lower calibration value is entered.

6. Enter the upper scale value or analog value of the measurement range of the potentiometric displacement sensor, e.g. 100.00 mm.



7. Now move the sliding shaft with calibrated gage blocks to s = 100 mm and set the final value.

8. Click [Teach in] under “Upper calibration value” and confirm with “OK”. In our example we have specified “2” decimal places.	
9. Click “Transmit”. Teach-in is complete.	
10. If desired, you can also save the parameter data of the potentiometric displacement sensor in a file.	

Hinweis: The scale value and decimal place setting is only available in the bus version.

Hinweis: The maximum applicable sensor excitation voltage for the potentiometric displacement sensors can be found on the test and calibration certificate. To enable practical measurements, choose the
5 V excitation voltage. The maximum measurement signal output from potentiometric displacement sensors is always the excitation voltage.

8.3 Calibration with transmitters or sensors with standard signal output

8.3.1 Calibration with transmitters with voltage output by teach-in method

The teach-in method involves the two-stage online teach-in of sensor data to the controller, where two states are taught in sequentially. The first state is the zero point under no load (lower scale value or analog value), and the second state is the final value (upper scale value or analog value).

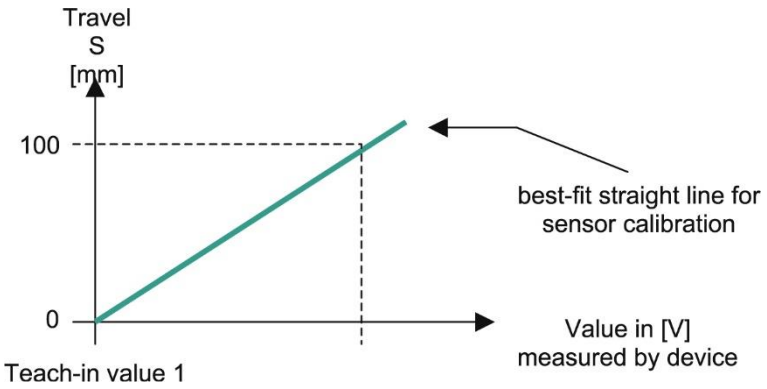


Figure 32 Characteristic sensor curve

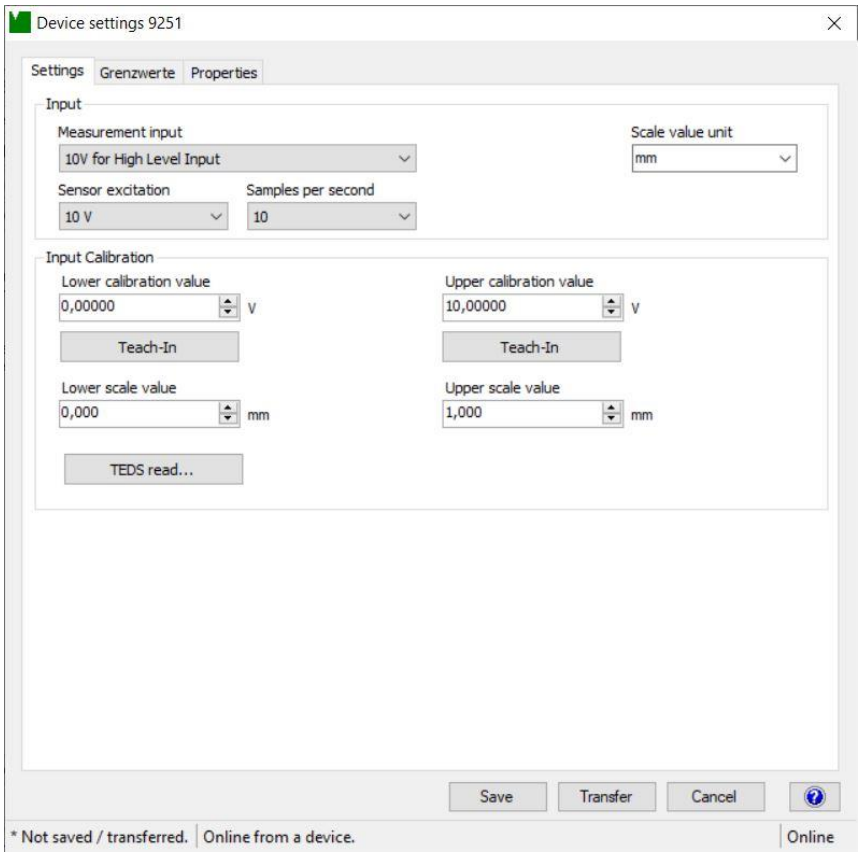
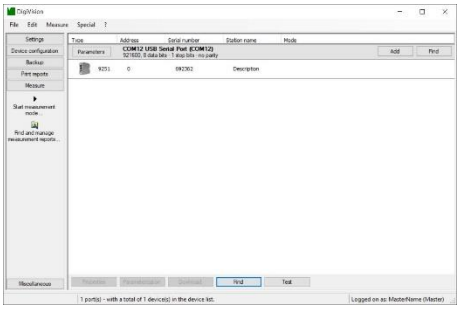


Figure 33 9251 device settings

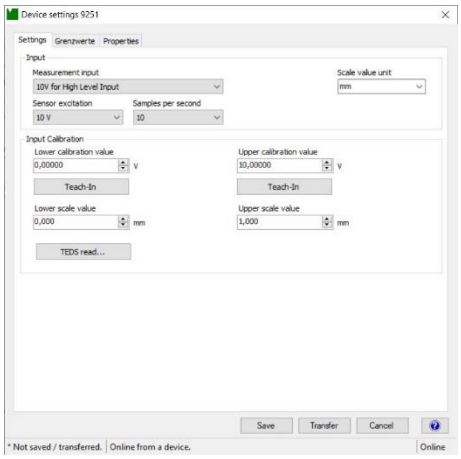
1. Start the DigiVision configuration and evaluation software and make sure that the controller is connected correctly and appears in the device list.

2. Click “Import parameters from device (online)” in the left-hand menu bar. When you do this, you import the parameter data of the sensor saved in the controller into the DigiVision configuration and evaluation software.
The parameter data of the sensor can be taught in.



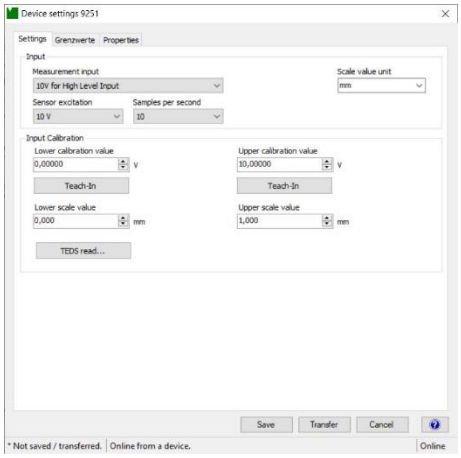
3. Position measurement using the example of a model 8740-5001 inductive displacement sensor:
The displacement sensor is calibrated to the zero position (0.00 mm). This is normally when the sliding shaft is fully extended, but there may be slight differences between the mechanical and electrical zero points.

4. Enter the lower scale value or analog value of the measurement range of the inductive displacement sensor. This is normally the lower range value of the sensor, e.g. 0.00 mm.

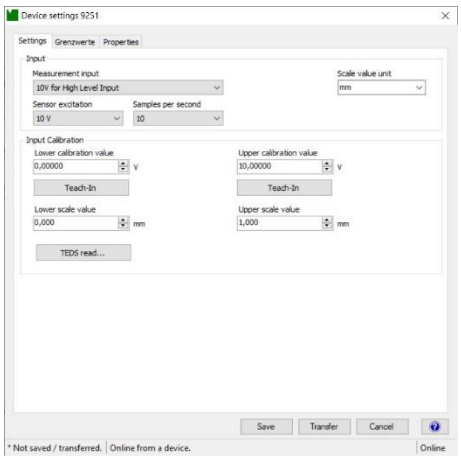


5. Click [Teach in] under “Lower calibration value” and confirm with “OK”.
The lower calibration value is entered.

6. Enter the upper scale value or analog value of the measurement range of the inductive displacement sensor, e.g. 1.00 mm.



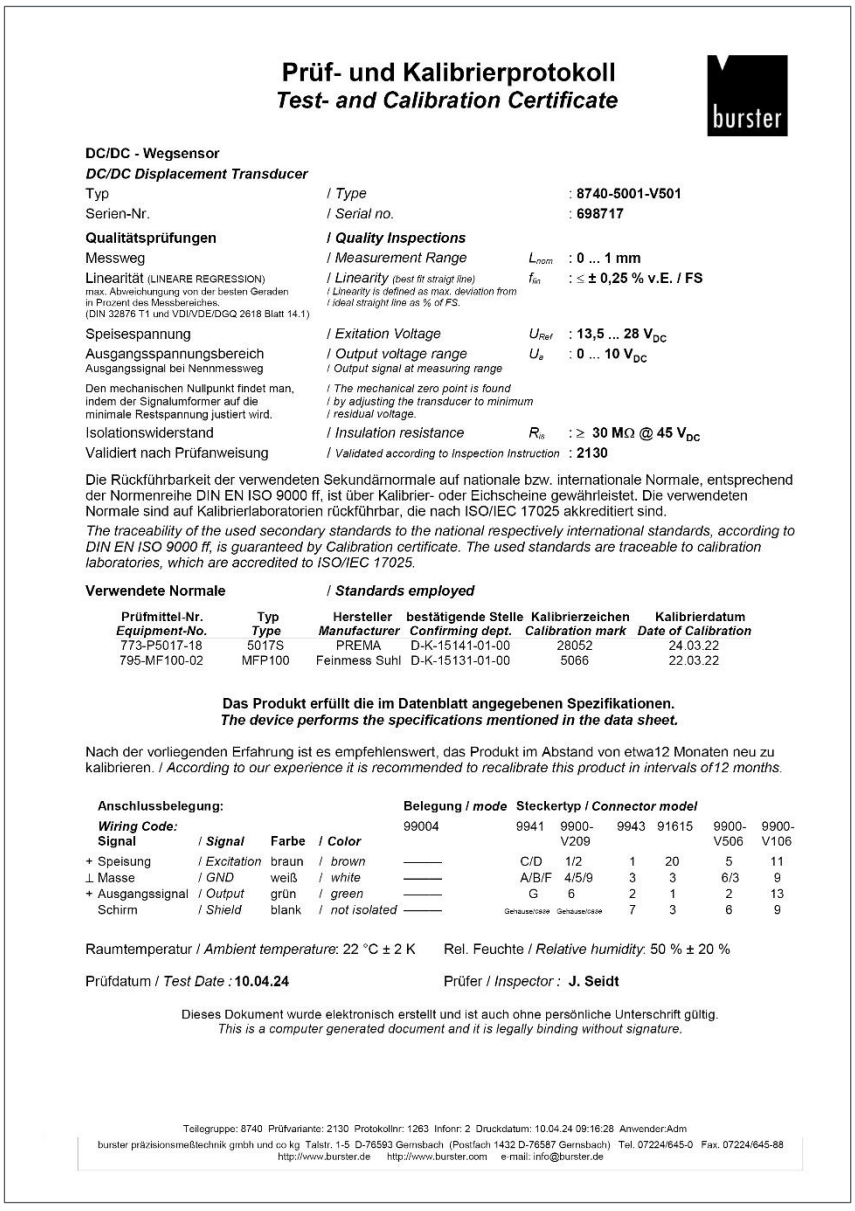
7. Now move the sliding shaft with calibrated gage blocks to s = 1.00 mm and set the final value.

8. Click [Teach in] under “Upper calibration value” and confirm with “OK”. In our example we have specified “2” decimal places.	
9. Click “Transmit”. Teach-in is complete.	
10. If desired, you can also save the parameter data of the sensor to a file.	

Hinweis: The scale value and decimal place setting is only available in the bus version.

8.3.2 Calibration using the test and calibration certificate

This procedure is a two-point calibration in which you enter the required data directly into the controller. All necessary calibration data can be found on the test and calibration certificate of the transmitter or sensor with standard signal output.



Prüf- und Kalibrierprotokoll
Test- and Calibration Certificate

DC/DC - Wegsensor
DC/DC Displacement Transducer

Typ	/ *Type*		: **8740-5001-V501**
Serien-Nr.	/ *Serial no.*		: **698717**
Qualitätsprüfungen	***/ Quality Inspections***		
Messweg	/ *Measurement Range*	L_{nom}	: **0 ... 1 mm**
Linearität (LINEARE REGRESSION) max. Abweichungung von der besten Geraden in Prozent des Messbereiches. (DIN 32876 T1 und VDI/VDE/DGQ 2618 Blatt 14.1)	/ *Linearity (best fit straigt line) / Linearity is defined as max. deviation from / ideal straight line as % of FS.*	f_{lin}	: ≤ **± 0,25 % v.E. / FS**
Speisespannung	/ *Exitation Voltage*	U_{Ref}	: **13,5 ... 28 V_{DC}**
Ausgangsspannungsbereich Ausgangssignal bei Nennmessweg	/ *Output voltage range / Output signal at measuring range*	U_a	: **0 ... 10 V_{DC}**
Den mechanischen Nullpunkt findet man, indem der Signalumformer auf die minimale Restspannung justiert wird.	*/ The mechanical zero point is found / by adjusting the transducer to minimum / residual voltage.*		
Isolationswiderstand	/ *Insulation resistance*	R_{is}	: ≥ **30 MΩ @ 45 V_{DC}**
Validiert nach Prüfanweisung	/ *Validated according to Inspection Instruction*		: **2130**

Die Rückführbarkeit der verwendeten Sekundärnormale auf nationale bzw. internationale Normale, entsprechend der Normenreihe DIN EN ISO 9000 ff, ist über Kalibrier- oder Eichscheine gewährleistet. Die verwendeten Normale sind auf Kalibrierlaboratorien rückführbar, die nach ISO/IEC 17025 akkreditiert sind.
The traceability of the used secondary standards to the national respectively international standards, according to DIN EN ISO 9000 ff, is guaranteed by Calibration certificate. The used standards are traceable to calibration laboratories, which are accredited to ISO/IEC 17025.

Verwendete Normale / ***Standards employed***

Prüfmittel-Nr. *Equipment-No.*	Typ *Type*	Hersteller *Manufacturer*	bestätigende Stelle *Confirming dept.*	Kalibrierzeichen *Calibration mark*	Kalibrierdatum *Date of Calibration*
773-P5017-18	5017S	PREMA	D-K-15141-01-00	28052	24.03.22
795-MF100-02	MFP100	Feinmess Suhl	D-K-15131-01-00	5066	22.03.22

Das Produkt erfüllt die im Datenblatt angegebenen Spezifikationen.
The device performs the specifications mentioned in the data sheet.

Nach der vorliegenden Erfahrung ist es empfehlenswert, das Produkt im Abstand von etwa12 Monaten neu zu kalibrieren. / *According to our experience it is recommended to recalibrate this product in intervals of12 months.*

Anschlussbelegung:				**Belegung / *mode***	**Steckertyp / *Connector model***					
Wiring Code:				99004	9941	9900-V209	9943	91615	9900-V506	9900-V106
Signal	/ ***Signal***	**Farbe**	/ ***Color***							
+ Speisung	/ *Excitation*	braun	/ *brown*	———	C/D	1/2	1	20	5	11
⊥ Masse	/ *GND*	weiß	/ *white*	———	A/B/F	4/5/9	3	3	6/3	9
+ Ausgangssignal	/ *Output*	grün	/ *green*	———	G	6	2	1	2	13
Schirm	/ *Shield*	blank	/ *not isolated*	———	Gehäuse/case	Gehäuse/case	7	3	6	9

Raumtemperatur / *Ambient temperature*: 22 °C ± 2 K Rel. Feuchte / *Relative humidity*: 50 % ± 20 %

Prüfdatum / *Test Date* : **10.04.24** Prüfer / *Inspector* : **J. Seidt**

Dieses Dokument wurde elektronisch erstellt und ist auch ohne persönliche Unterschrift gültig.
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Teilegruppe: 8740 Prüfvariante: 2130 Protokollnr: 1263 Infonr: 2 Druckdatum: 10.04.24 09:16:28 Anwender:Adm
burster präzisionsmeßtechnik gmbh und co kg Talstr. 1-5 D-76593 Gernsbach (Postfach 1432 D-76587 Gernsbach) Tel. 07224/645-0 Fax. 07224/645-88
http://www.burster.de http://www.burster.com e-mail: info@burster.de

Figure: 38 Test and calibration certificate (example)

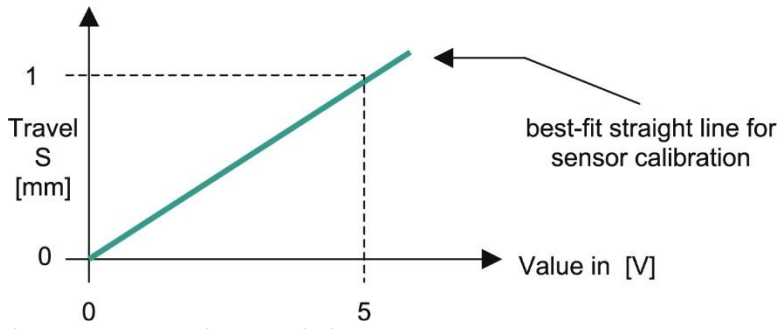


Figure 34 Characteristic sensor curve

For two-point calibration, enter two points in succession. The first point is the zero point under no load (lower scale value or analog value), and the second point is the final value (upper scale value or analog value).

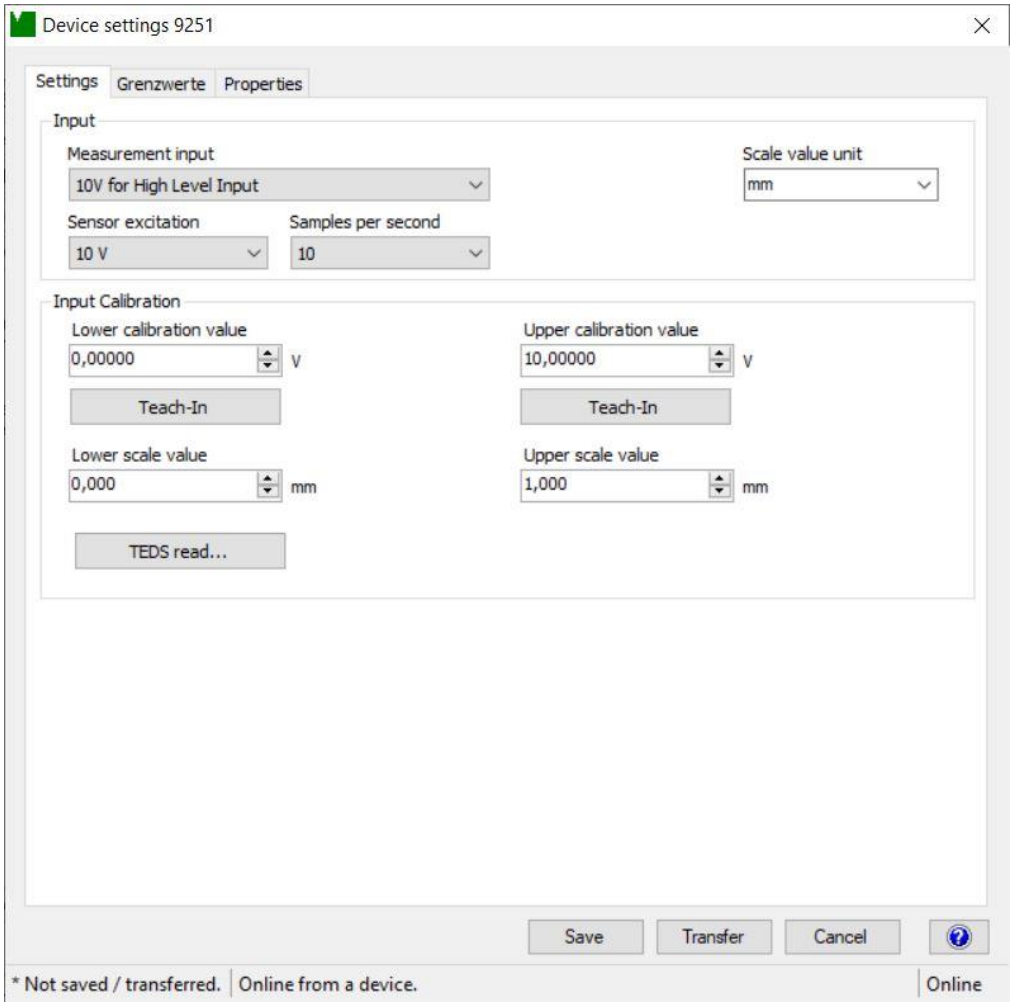
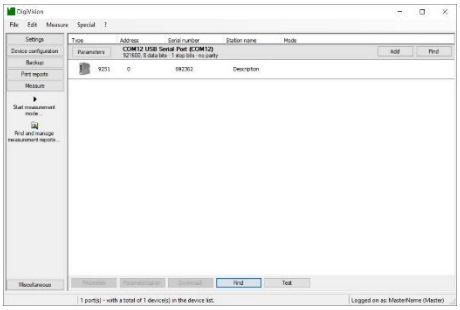
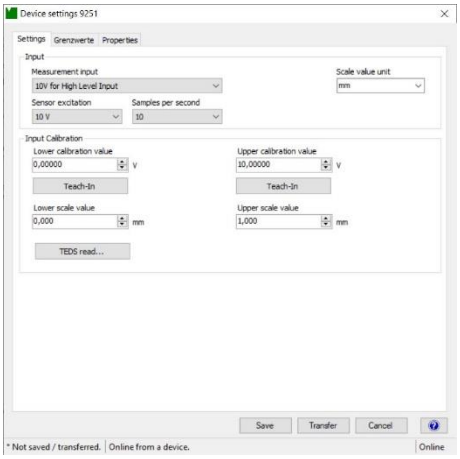


Figure 35 9251 device settings

The calibration was performed as follows:

Output voltage range from 0 to 10 V ≙ **Measuring range** 0 to 1 mm.

These calibration data must be transmitted to the controller and saved if necessary.

1. Start the DigiVision configuration and evaluation software and make sure that the controller is connected correctly and appears in the device list.	
2. Click “Import parameters from device (online)” in the left-hand menu bar. When you do this, you import the parameter data of the sensor saved in the controller into the DigiVision configuration and evaluation software. The parameter data of the sensor can be entered.	
3. Enter the lower scale value, the lower calibration value, the upper scale value and the upper calibration value from the sensor’s test and calibration certificate.	
Hinweis: The scale value setting is only available in the bus version.	
4. Click “Transmit”. Calibration using the test and calibration certificate is complete.	
5. If desired, you can also save the parameter data of the sensor to a file.	

9 PROFINET

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, the status LED on the model 9250 instrumentation amplifiers flashes continuously with 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, it is necessary during the configuration phase 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 these device description data are standardized, which allows the model 9251 fieldbus controller to be configured using common configuration tools. Please consult this manual for details on how to program the model 9251 fieldbus controller.

Hinweis: 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 eight model 9250 instrumentation amplifier modules:

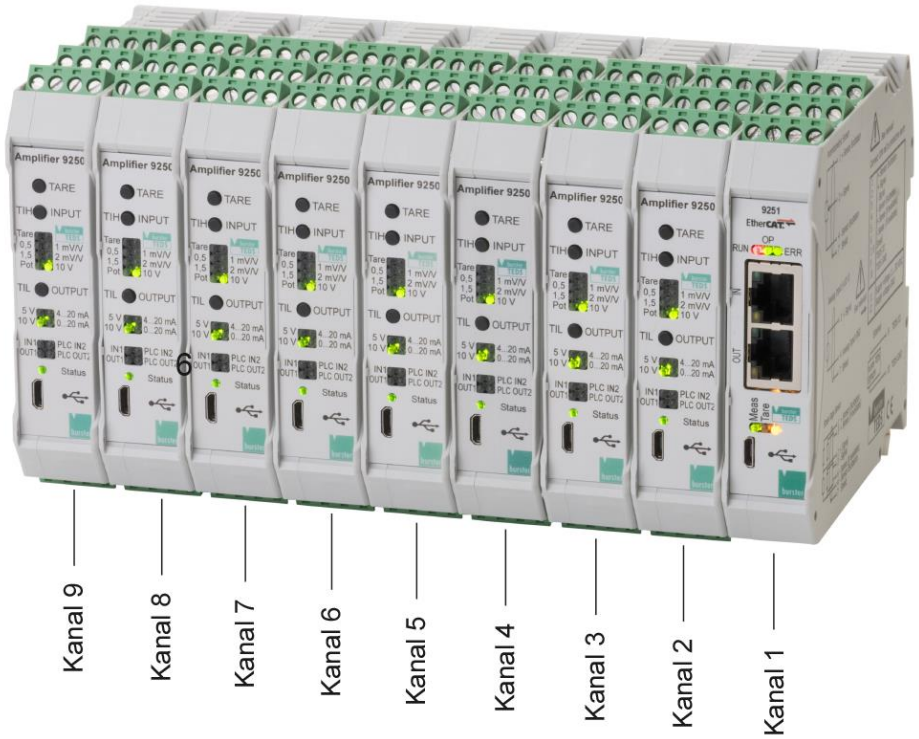


Figure 36 Example setup

9.1 Port identification

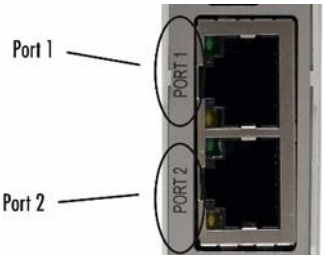


Figure 37 Ports on model 9251 fieldbus controller

9.2 Planning a PROFINET network

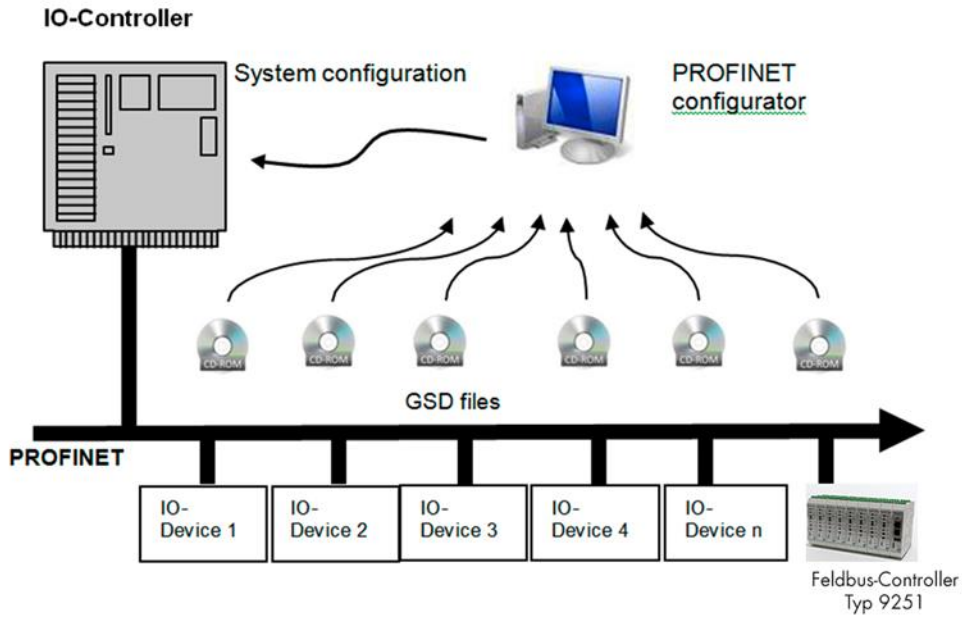


Figure 38 Planning a PROFINET network

9.3 PROFINET fieldbus-specific LED functions

Figure 39 Fieldbus-specific LEDs on model 9251 fieldbus controller

LED	Status	Description
NET	Off	There is no connection between the controller and the master, or no power supply is connected.
	Green	The controller is in the RUN state, and the connection to the master is established.
	Green, single flashes	The 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	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 controller is not ready for operation, or the power supply is not connected.
	Green	The controller is ready for use.
MOD	Off	The controller is in the NW_INIT state, or there is no power supply.
	Green	The controller is ready for use.
	Green, brief flashes	Diagnostics for the controller are active.
	Red, on	The controller is in an exceptional state, or a system error has occurred. Please contact us.
	Alternating red/green	The controller is performing a firmware update. Notice: Please do not disconnect the power supply. Switching off during a firmware update may cause serious permanent damage.

9.4 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 measurement channel. Each measurement 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 measurement channel from the first model 9250 instrumentation amplifier, the third data block represents the second measurement 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 measurement channels is represented by five data blocks. The first data block is the 9251 fieldbus controller, and 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.

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

Hinweis: 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.

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

9251 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	

	Content	Length/Bytes	∑ bytes
9250 Channel 8	Device status	2	Sum: 8 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	reserved	1	
	Content	**Length/Bytes**	**∑ bytes**
9250 Channel 9	Device status	2	Sum: 8 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	reserved	1	

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

9251 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	
9250 Channel 6	**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 7	Device status	2	Sum: 136 bytes
	Measurement value (real)	4	
	Measurement counter	1	
	Measurement array counter	1	
	Measurement value array (real)	128	
9250 Channel 8	**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 9	**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	

9.4.3 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	

9.4.4 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	

9.4.5 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)

9.4.6 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)	

Address offset	Length (bytes)	Description
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)

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

As already described in Section 9.4, all cyclical data of the model 9251 fieldbus controller and model 9250 instrumentation amplifier are 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.

Hinweis: 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, and the remaining four correspond to the respective measurement channels of the model 9250 instrumentation amplifiers.

9.5.1 Controlling the device functions

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

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

Cyclic commands

Float values such as “tare” and “limit values” can be written in address offset 2. To do this, the command “idle” has to be sent first. In the next cycle, the desired command must be sent, e.g. “tare”, and the new float value for offset 4. When the “cyclic command” entry (offset 2) changes to e.g. 0x01 for “tare”, the value transmitted for 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 the next command.

9.5.2 Data protocol of 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: Read TEDS settings! (0->1 Edge triggered)
		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!)

Address offset	Length (bytes)	Description
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 [User Unit] 0x02 Write “New Value” to Lower Limit A in [User Unit] 0x03 reserved 0x04 Write “New Value” to Upper Limit A in [User Unit] 0x05 reserved 0x06 Write “New Value” to Lower Limit B in [User Unit] 0x07 reserved 0x08 Write “New Value” to Upper Limit B in [User Unit] 0x09 reserved
4	4	New Real Value 1 (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

9.5.3 Data protocol of 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 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: Read TEDS settings! (0->1 Edge triggered)
		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!)
4	4	New Real Value 1 (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	

9.6 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).

Hinweis: 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.

9.6.1 Data protocol of acyclical data of 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

9.6.2 Data protocol of acyclical data of 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

10 EtherCAT

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, the status LED on the model 9250 instrumentation amplifiers flashes continuously with 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 CoE (CANopen over EtherCAT) EtherCAT technology for data transmission. There are two different types of data object that are transmitted with each cycle: PDO (Process Data Objects) and data that is only transmitted on demand, SDO (Service Data Objects). SDO data are addressed by a combination of index and subindex. A description of the data objects is provided in the following tables in this operation manual.

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

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

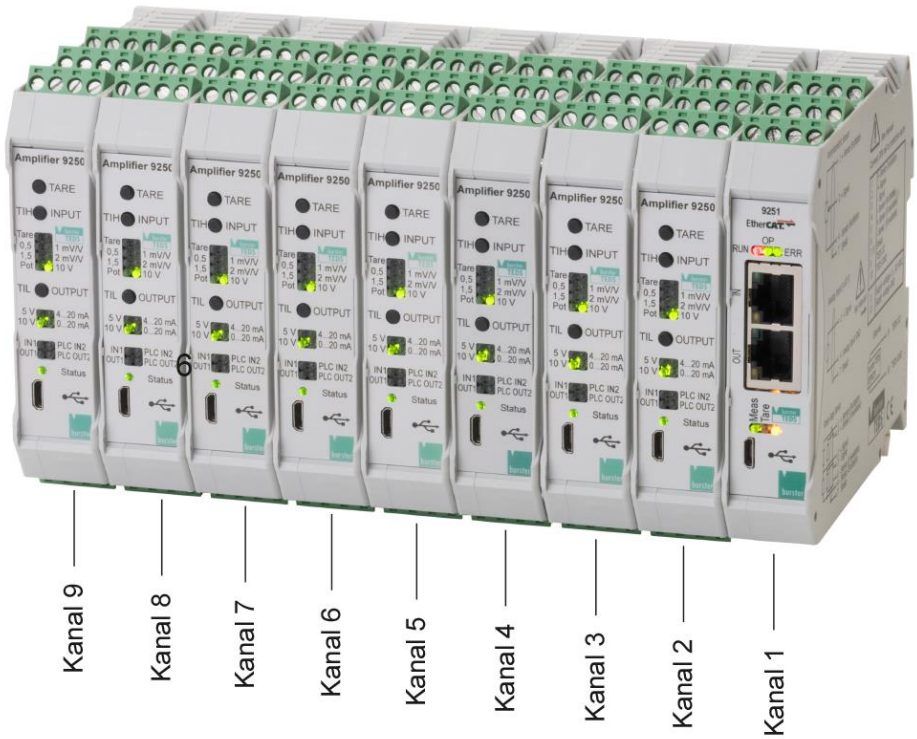


Figure 40 Example setup

10.1 Port identification

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

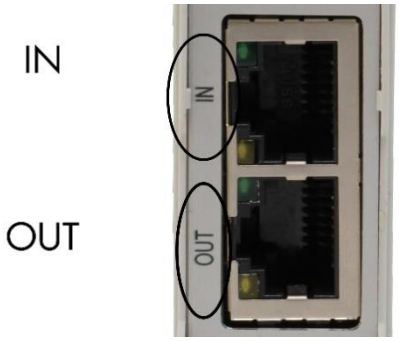


Figure 41 Port assignment on the model 9251 fieldbus controller

10.2 EtherCAT fieldbus-specific LED functions

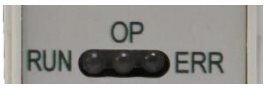


Figure 42 EtherCAT LED functions

LED	Status	Description
RUN	Off	The controller is in the INIT state, or a power supply is not connected.
	Green, flashing	The controller is in the PRE-OPERATIONAL state.
	Green, brief flashes	The controller is in the SAFE-OPERATIONAL state.
	Green, on	The 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 state 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 controller is ready for use.
	Flashing	Booting error. An error occurred during startup.
	Red	The Application Controller has encountered an error.
MOD	Green, flashing rapidly	Booting: System is starting.
	Green, flashing slowly	System is operating normally.
	Red	The analog input of the 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

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").

10.3 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 measurement channel. Each measurement 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 measurement channel from the first model 9250 instrumentation amplifier, the third data block represents the second measurement 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 measurement channels is represented by five data blocks. The first data block is the 9251 fieldbus controller, and 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.

10.3.1 Overview of data packets for data transmission from the 9251 fieldbus controller to the control system

	Content	Length/Bytes	∑ bytes
9251 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	

9250 Channel 7	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 8	**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 9	**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	

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

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 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)

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

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	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)

10.3.4 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: Read TEDS settings! (0->1 Edge triggered)
		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 [User Unit] 0x02 Write "New Value" to Lower Limit A in [User Unit] 0x03 reserved 0x04 Write "New Value" to Upper Limit A in [User Unit] 0x05 reserved 0x06 Write "New Value" to Lower Limit B in [User Unit] 0x07 reserved 0x08 Write "New Value" to Upper Limit B in [User Unit] 0x09 reserved	
4	4	New Real Value 1 (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	

10.3.5 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: Read TEDS settings! (0->1 Edge triggered)
		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 [User Unit] 0x02 Write "New Value" to Lower Limit A in [User Unit] 0x03 Write "New Value" to Lower Limit A in [Volt] 0x04 Write "New Value" to Upper Limit A in [User Unit] 0x05 Write "New Value" to Upper Limit A in [Volt] 0x06 Write "New Value" to Lower Limit B in [User Unit] 0x07 Write "New Value" to lower Limit B in [Volt] 0x08 Write "New Value" to Upper Limit B in [User Unit] 0x09 Write "New Value" to Upper Limit B in [Volt]	
4	4	New Real Value 1 (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	

10.4 EtherCAT SDO – Service Data Objects

The Service Data Objects (SDO) are described from the master's point of view.

Hinweis: 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

10.4.1 Acyclical data of 9251 fieldbus controller, channel 1

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

10.4.2 Acyclical data of 9250 instrumentation amplifier, channel 2

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

10.4.3 Acyclical data of 9250 instrumentation amplifier, channel 3

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

10.4.4 Acyclical data of 9250 instrumentation amplifier, channel 4

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

10.4.5 Acyclical data of 9250 instrumentation amplifier, channel 5

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

10.4.6 Acyclical data of 9250 instrumentation amplifier, channel 6

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

10.4.7 Acyclical data of 9250 instrumentation amplifier, channel 7

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

10.4.8 Acyclical data of 9250 instrumentation amplifier, channel 8

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

10.4.9 Acyclical data of 9250 instrumentation amplifier, channel 9

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

10.5 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

11 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, the status LED on the model 9250 instrumentation amplifiers flashes continuously with 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 bytes to be transmitted between the 9251 fieldbus controller (referred to in the following as the adapter) and the control system (referred to in the following as the scanner) are defined in the configuration phase. The EPS file describes the properties of the model 9251 fieldbus controller. The structure, content and coding of this device data is standardized, which allows the model 9251 fieldbus controller to be integrated into the control system environment using common configuration tools. Information on 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).

Hinweis: Further documents, such as installation manuals and specifications for EtherNet/IP, are available from http://www.odva.org.

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

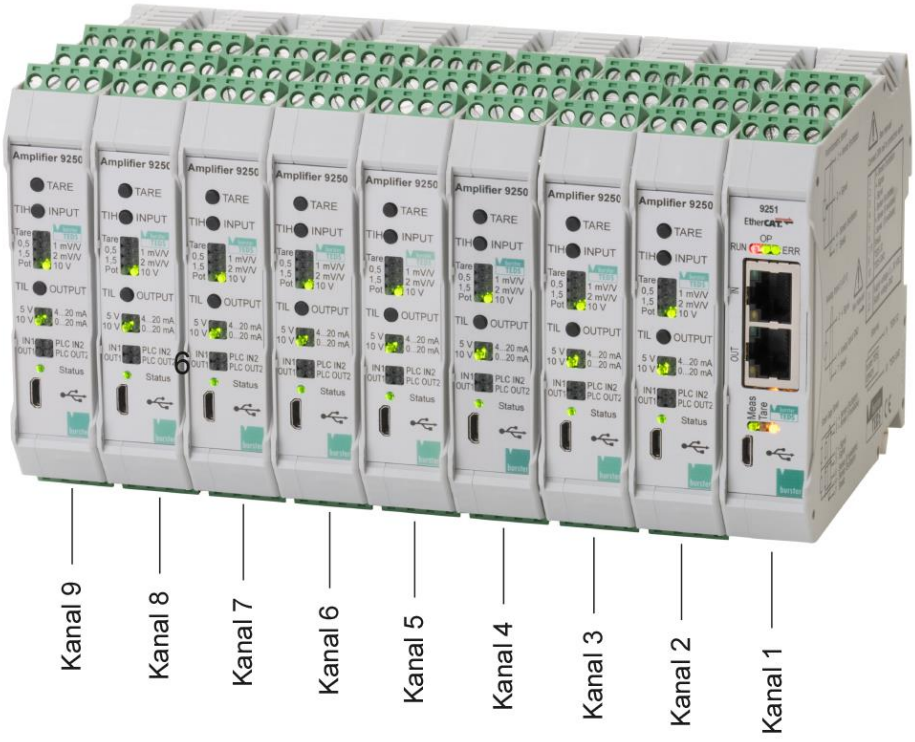


Figure 43 Example setup

11.1 Port identification

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

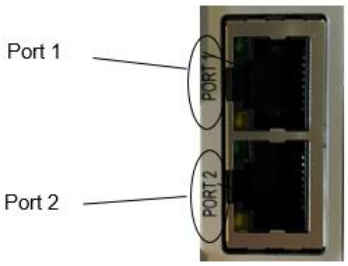


Figure 44 Port assignment on the model 9251 fieldbus controller

11.2 EtherNet/IP fieldbus-specific LED functions

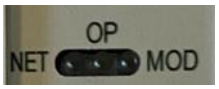


Figure 45 EtherNet/IP LED functions

LED	Status	Description
LNK	Off	No connection, no activity or no power
	Green	Connection (100 Mbit/s) established
	Green, brief flashes	Activity (100 Mbit/s)
	Yellow	Connection (10 Mbit/s) established
	Yellow, brief flashes	Activity (10 Mbit/s)
NET	Off	No power or no IP address
	Green, flashing	Online, no connections established
	Green	Online, connections established
	Red	Duplicate IP address or FATAL error
	Red, flashing	One or more connections timed out
MOD	Off	No power
	Green, flashing	Not configured, scanner in idle state. If CIP Sync is enabled, the time is synchronised
	Green	Controlled by a scanner in the run state. If CIP Sync is enabled, the time is synchronised
	Red	Fatal error (EXCEPTION state, FATAL error etc.)
	Red, flashing	Remediable error. Module is configured, but the saved parameters differ from those currently used
OP	Green	Internal setup completed, module running
STATUS	Green, flashing rapidly	Booting: System is starting.
	Green, flashing slowly	System is operating normally.
	Red	The analog input of the 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

11.3 General information on EtherNet/IP data transmission

With EtherNet/IP (implicit messaging) it is necessary during the configuration phase to define how many bytes are transmitted between the controller (scanner) and device (adapter) during each cyclical access.

The device is controlled via the data transmitted from the controller (scanner) to the device (adapter). With the 9251 EtherNet/IP device, these data always consist of 16 bytes. The function of these 16 bytes is explained in Section 11.7.

NOTICE

- The amount of data to be transmitted must be configured depending on how many modules are actually connected. Each module sends 8 bytes to the EIP scanner and receives 16 bytes from it. For a complete configuration consisting of 1x 9251 fieldbus controller and 8x 9250 instrumentation amplifiers, the output size must be set to 16 bytes x 9 modules = 144 bytes and the input size to 8 bytes x 9 modules = 72 bytes.

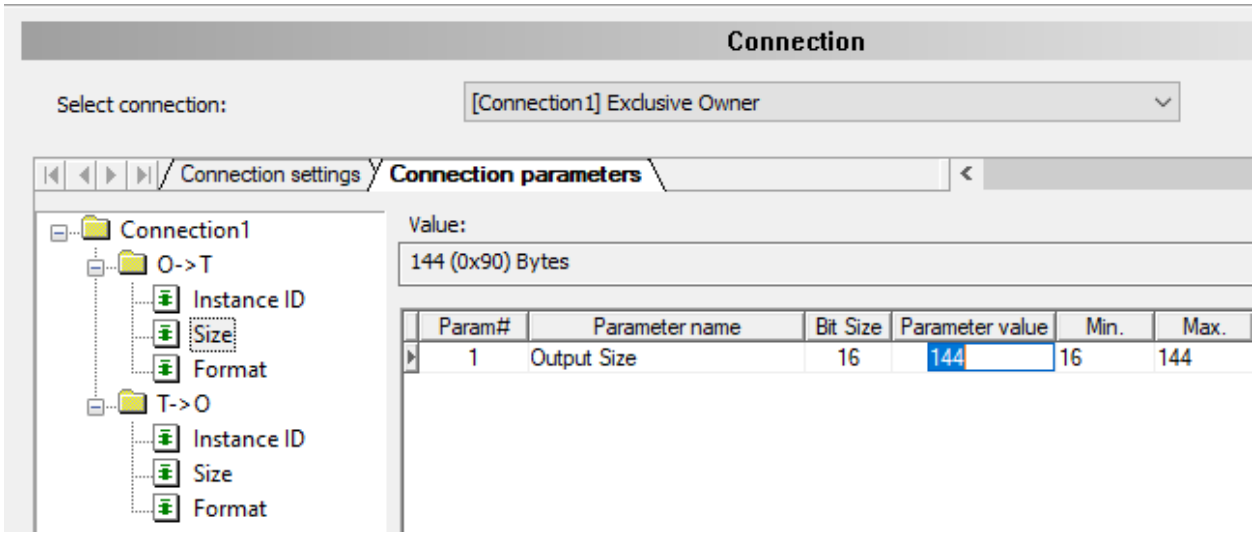


Figure 46 Configuration of the output size

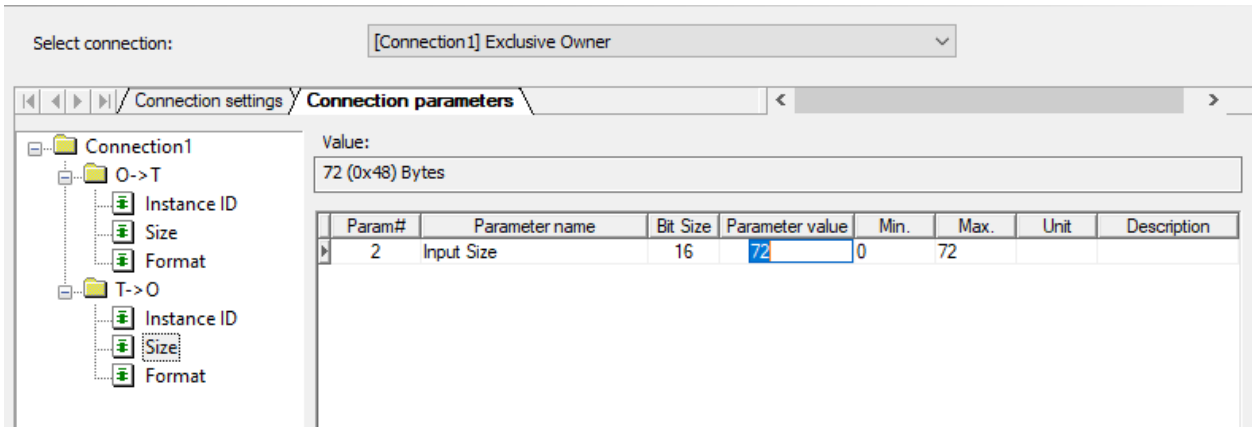


Figure 47 Configuration of the input size

11.4 EDS file

The current EDS file can be downloaded from the burster website: www.burster.de. The EDS file contains the EtherNet/IP configuration information for the model 9251 fieldbus controller. The structure, content and coding of these device description data are standardised so that any EtherNet/IP devices can be configured with configuration tools from different manufacturers.

The EDS file does not specify which data are transmitted and how these data are to be interpreted. The user must refer to the operation manual for this information and programme their control system accordingly.

11.5 Data conversion

11.5.1 Description of the data formats in this operation manual

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

Numbers that are not specially marked or are marked with "d" or "dec" are decimal numbers (examples: 1234, 1234dec, dec1234, 1234d).

Numbers marked with "0x" or "hex" are hexadecimal numbers (examples: 0x1234, hex1234, 1234hex, 1234h).

Numbers labelled with "b" or "bin" are binary numbers (examples: b1100, bin1100, 1100b, 1100bin).

11.5.2 Dealing with problems that occur when reading floating point numbers

This only applies to cases in which floating point numbers have to be read from the 9251.

Floating point numbers (data type REAL) are coded in four bytes for transmission in accordance with IEEE 754. This can lead to problems, depending on the type of PLC used.

Cause

With the 9251 fieldbus controller, the sign bit is transmitted last. Some PLCs expect this byte in the highest of the four addresses, not in the lowest one. This inevitably leads to a misinterpretation of the numerical value. In this case, the order of the four bytes must be changed by the PLC as shown in the following figure.

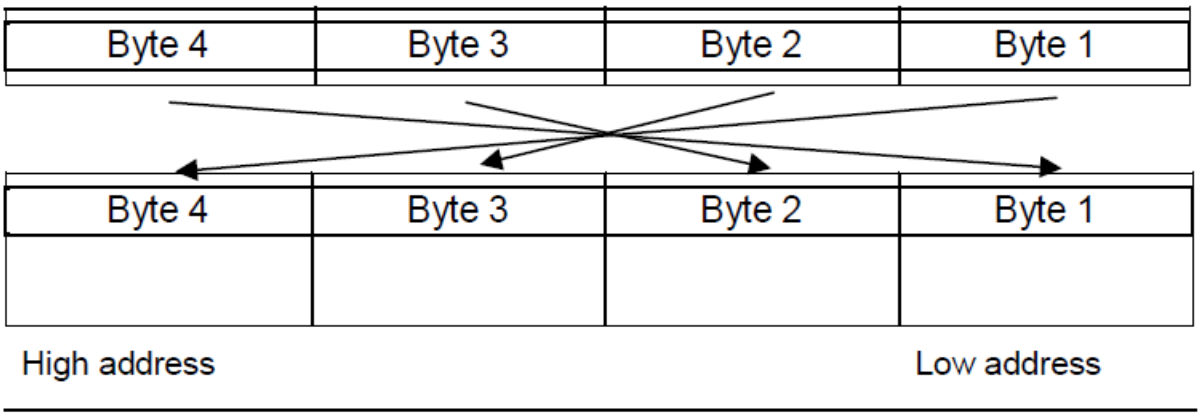


Figure 48 Swapping of the byte order due to misinterpretation of the numerical value

11.6 PLC outputs – Data transmission from the adapter (9251) to the scanner (control system)

11.6.1 Introduction

The cyclical data of the 9251/9250 instrumentation amplifiers are divided into data blocks per hardware module. Each hardware module (measurement channel) has the same data structure and length, including the 9251 fieldbus controller. The first data block is always the 9251 fieldbus controller, the second data block is the first 9250 measurement channel on the left-hand side and the third data block represents the second 9250 measurement channel on the left-hand side of the fieldbus controller (see Figure 43 on Page 98).

Hinweis: Please note that there are only as many data blocks as there are connected modules, e.g. a 9251/9250 combination with four measurement channels is displayed with five data blocks: the first for the 9251 fieldbus controller and the other four for the four 9250 measurement channels.

Individual measured value display

The latest measured value is written to offset address 2 in the structure. Every time a new value is available, the old entry is overwritten. To see whether there is a new entry or to recognise whether a measured value was overlooked during readout, there is a so-called live counter at offset address 6. This counter is incremented with each new measured value. At 255, there is an overflow to 0 and then the count is incremented again.

11.6.2 Data protocol for cyclical data transmission from the controller to the scanner

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 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	

11.6.3 Data protocol for cyclical data transmission from the 9250 instrumentation amplifier to the scanner

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 over-load, 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)	

11.7 PLC inputs – Transmission from the scanner (control system) to the adapter (9251)

As described in Section 11.6, Cyclical input data, all cyclical data of the 9251/9250 measuring device is structured in data blocks. Each measurement channel has the same data structure and length, including the bus coupler. The first data block is always the 9251 fieldbus controller, the second data block is the first 9250 measurement channel on the left-hand side and the third data block represents the second 9250 measurement channel on the left-hand side of the bus coupler etc. Please note that there are only as many data blocks as there are devices, e.g. a 9251/9250 combination with four measurement channels is displayed with five data blocks: the first for the 9251 fieldbus controller and the other four for the four 9250 measurement channels.

The first two bytes of the cyclical output data are bit-coded and can control various functions of the device. Please note that the MSB of control byte B must be set in order to activate the entire control function. If this bit is not set, all other entries are ignored.

There is a 16-bit short entry at address offset 2. This entry can be used to write float values, e.g. for tare or new limit values. To do this, the "Idle" command must first be sent to this entry. In the next cycle, the desired command must then be sent, e.g. "Tare" (and of course the new float value to offset 4). Each time the "Cyclic Command" entry at offset 2 changes from "Idle" to something else (e.g. 0x01 for "Tare"), the value sent to offset 4 is read and used as the new value (in this example, as the tare value). Once the write command has been completed, the "Cyclic Command" must be set to "Idle" again. This transition does not lead to any action, but serves to prepare for the next command.

11.7.1 Data protocol for cyclical data transmission from the scanner 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! (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: Read TEDS settings! (0->1 Edge triggered)
		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 [User Unit] 0x02 Write “New Value” to Lower Limit A in [User Unit] 0x03 Write “New Value” to Lower Limit A in [Volt] 0x04 Write “New Value” to Upper Limit A in [User Unit] 0x05 Write “New Value” to Upper Limit A in [Volt] 0x06 Write “New Value” to Lower Limit B in [User Unit] 0x07 Write “New Value” to lower Limit B in [Volt] 0x08 Write “New Value” to Upper Limit B in [User Unit] 0x09 Write “New Value” to Upper Limit B in [Volt]	
4	4	New Real Value 1 (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	

11.8 Unconnected explicit messaging (acyclical services)

The services are described from the perspective of the controller.

Hinweis: The class number must always be set to 0xA2 (162d), and the attribute number to 0x05 (5d).

The acyclical EtherNet/IP services enable access to the following functions of the 9251 fieldbus controller:

- Complete device configuration
- Reading of minimum and maximum values

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

11.8.1 Acyclical data of 9251 fieldbus controller, channel 1

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 indices to read complete configuration Index 1 – 135: Complete configuration in 4-byte pieces

11.8.2 Acyclical data of 9250 instrumentation amplifier, channel 2

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 Gage 99: Bus Coupler More channel types in preparation 2: Piezoelectric 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 indices to read complete configuration Index 1 – 166: Complete configuration in 4-byte pieces

11.8.3 Acyclical data of 9250 instrumentation amplifier, channel 3

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 Gage 99: Bus Coupler More channel types in preparation 2: Piezoelectric 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 indices to read complete configuration Index 1 – 166: Complete configuration in 4-byte pieces

11.8.4 Acyclical data of 9250 instrumentation amplifier, channel 4

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 Gage 99: Bus Coupler More channel types in preparation 2: Piezoelectric 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 indices to read complete configuration Index 1 – 166: Complete configuration in 4-byte pieces

11.8.5 Acyclical data of 9250 instrumentation amplifier, channel 5

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 Gage 99: Bus Coupler More channel types in preparation 2: Piezoelectric 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 indices to read complete configuration Index 1 – 166: Complete configuration in 4-byte pieces

11.8.6 Acyclical data of 9250 instrumentation amplifier, channel 6

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 Gage 99: Bus Coupler More channel types in preparation 2: Piezoelectric 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 indices to read complete configuration Index 1 – 166: Complete configuration in 4-byte pieces

11.8.7 Acyclical data of 9250 instrumentation amplifier, channel 7

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 Gage 99: Bus Coupler More channel types in preparation 2: Piezoelectric 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 indices to read complete configuration Index 1 – 166: Complete configuration in 4-byte pieces

11.8.8 Acyclical data of 9250 instrumentation amplifier, channel 8

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 Gage 99: Bus Coupler More channel types in preparation 2: Piezoelectric 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 indices to read complete configuration Index 1 – 166: Complete configuration in 4-byte pieces

11.8.9 Acyclical data of 9250 instrumentation amplifier, channel 9

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 Gage 99: Bus Coupler More channel types in preparation 2: Piezoelectric 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 indices to read complete configuration Index 1 – 166: Complete configuration in 4-byte pieces

11.9 EtherNet/IP error codes

Error code	ID of operant
0x00	SUCCESS No error, write/read successful.
0x02	RESOURCE_UNAVAILABLE
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.

12 Cleaning

DANGER

Electric shock hazard!

Disconnect the device from the power supply before cleaning.

NOTICE

- Do not immerse the device in water or hold it under running water. Do not use strong cleaning agents, as they may damage the device. Use a slightly damp cloth to clean the device.

- Disconnect the controller from the power supply and use a slightly damp cloth to clean it.

13 Technical data

Refer to the data sheet for the technical specifications of the controller. You can obtain the latest data sheet and additional information on the controller at www.burster.com or simply use the QR code below:

Figure 49 QR code for the model 9251 fieldbus controller product page

13.1 Operating conditions

The following requirements must be met when operating the controller:

- Indoor operation only
- Maximum altitude of 2,000 m
- Operating temperatures between 0 °C and 50 °C
- Humidity: 80% up to +31 °C, decreasing linearly above that temperature to 50% at Tmax, non-condensing
- Protection class: 3
- Transient overvoltage category: CAT II
- Supply voltage 11 to 30 V DC
- The mounting rail must be grounded (PE)

Hinweis: Avoid condensation after transportation or storage.

13.2 Electromagnetic compatibility

13.2.1 Interference immunity

Interference immunity as per EN 61326-1:2013

Industrial environment

13.2.2 Interference emission

Interference emission as per EN 61326-1:2013

14 Accessories

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

Figure 50 QR code for the model 9251 fieldbus controller product page

15 Customer service

15.1 Customer service department

For repair inquiries, please call our service department on
(+49) 07224-645-53 or email: service@burster.de (Germany only) or, if you are outside Germany, your local representative (see also www.burster.com).

Please have the serial number to hand. The serial number is the only way to clearly identify the technical status of the device so that we can provide help quickly. You will find the serial number on the type plate of the device.

15.2 Contact person

If you have any questions relating to the controller, please go directly to burster präzisionsmesstechnik gmbh & co. kg or, if you are outside Germany, your local representative (see also www.burster.com).

Headquarters

burster präzisionsmesstechnik gmbh & co kg
Talstr. 1 – 5
76593 Gernsbach, Germany

Telephone: (+49) 07224 645-0
Fax: (+49) 07224 645-88
Email: info@burster.de

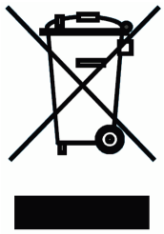
15.3 Service offering for the 9251 fieldbus controller

In addition to the controller package, burster präzisionsmesstechnik gmbh & co kg offer the following 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

For customer service inquiries relating to the controller, please call our customer service department on (+49) 07224 645-53 or email: service@burster.de (in Germany only) or, if you are outside Germany, please contact your local representative (see also www.burster.com).

16 Disposal



Battery disposal

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

Disposal of the device

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

17 Declaration of Conformity

THE MEASUREMENT SOLUTION. burster

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): 9251 *Model number / type:*
	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*

Dieses Dokument ist entsprechend EN ISO/IEC 17050-1:2010 Abs. 6.1g **ohne Unterschrift** gültig /
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.

burster präzisionsmesstechnik gmbh & co kg

Talstr. 1–5 · DE-76593 Gernsbach
Tel. (+49) 07224-6450
info@burster.com

Geschäftsführer/Managing Director: Matthias Burster
Handelsregister/Trade Register: Gernsbach
Registergericht/Register Court: Mannheim HRA 530170

Kompl./Gen. Partn.: burster präzisionsmesstechnik Verwaltungs-GmbH
Handelsregister/Trade Register: Gernsbach
Registergericht/Register Court: Mannheim HRB 530130

DECLARATION OF CONFORMITY

Declaration of Conformity (DOC) Reference Information

File Number: 12231.01 Part 1 of 1 Year Last Issued: 2022

Length of Validity: Continues in effect so long as the named entity (i) remains an ODVA Licensed Vendor for the ODVA technology(ies) defined by the above specification(s); (ii) continues to fulfill its user responsibilities as defined in its Terms of Usage Agreement with ODVA; and (iii) the CIP Identity for the Product(s) remains identical to those enumerated in this Declaration of Conformity.

ODVA Licensed Vendor to Whom this DOC Has Been Issued

Entity Name: burster gmbh & co kg Vendor ID: 1381

Overview of Compliant Product(s) Covered by This DOC

(The list of product(s) covered by this DOC begins on page 2.)

Networks(s) Supported:	EtherNet/IP
Distinctive CIP Services Supported:	None
CIP Device Profile Supported:	Generic Device (keyable)
Test Date:	April 21, 2022
Classification of Declaration:	Single Product

Trademark(s) Approved for Use in the Labeling and Promotion of the Products Named Herein

(Color variations of logo marks allowed pursuant to ODVA Brand Standards + Identity Guidelines. No abbreviation of word marks allowed.)

	Logo Marks	Word Marks
ODVA Certification Marks	ODVA CONFORMANT	ODVA CONFORMANT™
ODVA Technology Marks	EtherNet/IP	EtherNet/IP™

This Declaration of Conformity, and approval of the use of ODVA's trademarks as shown above, has been granted by ODVA, Inc. based on its determination that the Product(s) identified herein fulfill(s) ODVA's standards for compliance with ODVA's specifications listed below at the ODVA composite Conformance Test (CT) level shown in parentheses:

The EtherNet/IP™ Specification (CT18)

This Declaration of Conformity issued on June 25, 2022 on behalf of ODVA by:

Dr. Al Beydoun, President and Executive Director

Applicable Adjunct test certifications and list of product(s) covered by this DOC begin on page 2.

ODVA

DECLARATION OF CONFORMITY

Declaration of Conformity (DOC) Reference Information

File Number: 12231.01 Part 1 of 1 Year Last Issued: 2022

Identity for Product(s) Covered Under this Declaration of Conformity

No.	Product Code	Product Name	Product Revision
1	3	9251 EtherNet/IP ™	20.001

Page 2 of 2