

# HE 5820 DI

HIMOD® Function Module



## Operation manual

(English)

## Disclaimer

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# 1 General

The digital input module HE5820 provides HIMOD systems with eight digital inputs. The module communicates with the field bus coupler over an asynchronous serial RS485 connection (T-Bus). The module can be pulled out or plugged in during operation (Hot Swap).

The module supplies a sensor supply per input of 24 V DC with a maximum current of 25 mA for the direct connection of e.g. proximity- and position switches.

The device is available for PNP- and NPN output stages. A version switching potential-free is available.

## 1.1 Features

- 8 digital inputs 24 V DC
- For potential-free / non-isolated contacts or 3-wire sensors (NPN / PNP).
- Sensor supply 24 V DC with max. 25 mA per channel
- 8 LEDs for the status display of the channel overtemperature

## 1.2 HIMOD System



Fig. 1 HIMOD – Module Image

HIMOD is an intelligent I/O system for all common field bus standards. Every function module provides the field bus coupler with process values. Through the integrated module processor the field bus coupler is relieved of measured value calculations.

The parameter setting of the inputs and outputs of a module is carried out with the system software 'SmartControl', as well as the configuration of the module inside a field bus device i.e. a field bus coupler and the plugged function modules.

## 2 Safety Instructions

This device has been constructed and tested in accordance with VDE 0411-1 / EN 61010-1 and left our works in perfect safety-related condition.

The device is in complete conformity with the European Directive 89/336/EEC (EMC) and is provided with the CE marking.

The device was tested before shipment and has passed the tests prescribed in the test plan. In order to maintain this condition and ensure safe operation, the user must observe the instructions and warning signs contained in this operation manual and operate the device according to the operation manual.



**The device is intended exclusively for use as measuring and control device in technical installations.**



### Warning

**If the device has damage, which leads one to believe, that safe operation is not possible, then the device must not be set into operation.**

### ELECTRICAL CONNECTION

The electrical lines are to be installed in accordance with the respective national regulations (in Germany VDE 0100). The measuring circuits are to be installed separately from the signal lines and mains cables.

A switch or circuit breaker is to be provided for the device in the installation and marked as such. The switch or circuit breaker must be arranged close to the device and be easily accessible for the user.

### COMMISSIONING

It is to be ensured before switching the device on, that the following points have been observed:

- It is to be ensured, that the supply voltage corresponds with the details on the rating plate.
- All covers required for contact protection must be attached.
- If the device is connected together with other devices and / or equipment, then the consequences are to be considered and appropriate precautions are to be taken before switching on.
- The device may only be operated in the installed state.
- The temperature restrictions specified for the use of the device must be maintained before and during operation.



### Warning

The ventilation slits of the casing must not be covered during operation.

The measuring inputs are designed for the measurement of electric circuits, that are not directly connected with the supply network (CAT I). The measuring inputs are designed for transient overvoltage up to 800 V to PE.

## TAKING OUT OF OPERATION

If the device is to be taken out of operation, then the auxiliary energy is to be disconnected at all poles. The device is to be secured against unintentional operation.

If the device is connected together with other devices and / or equipment, then the consequences are to be considered and appropriate precautions are to be taken before switching off.

## 2.1 Maintenance, Repair, Converting

The device requires no special maintenance.

There are no operable elements attached inside the device, so that the user must not open the device. Conversions, maintenance and repair work may only be carried out by trained specialist and experienced personnel.



### Warning

**When opening the devices or removing covers and parts, parts conducting voltage that are hazardous to the touch may be exposed. Connection points may also be conducting voltage.**



### Caution

**When opening the devices, construction elements may be exposed that are sensitive to electrostatic discharge (ESD).**

## 2.2 Cleaning



The casing and the front of the device can be cleaned with a dry, lint-free cloth.

### 3 Assembly

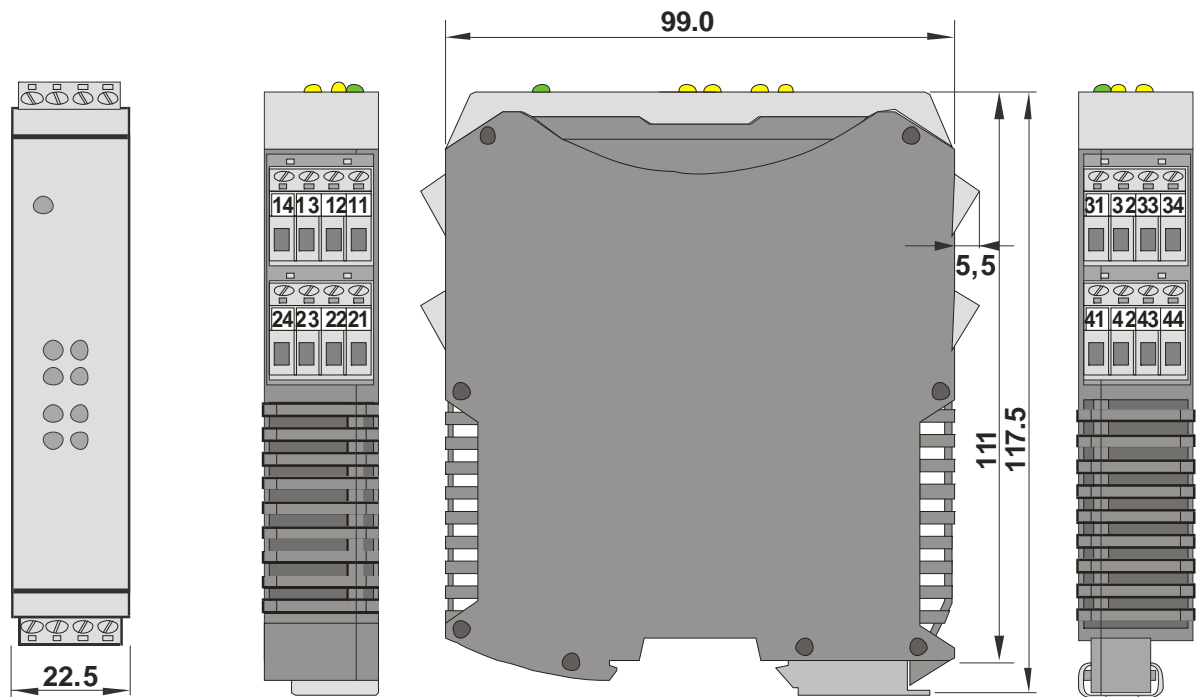


Fig. 2 Dimensions

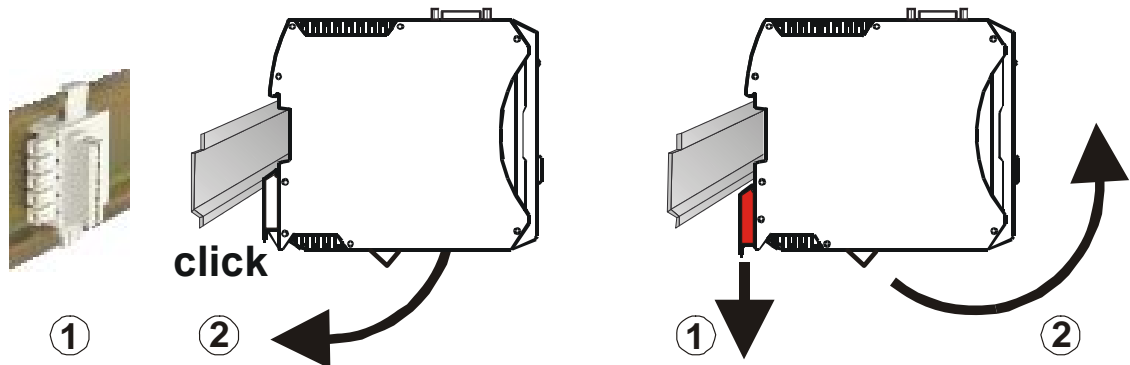


Fig. 3 Assembly / Disassembly

The device is intended for vertical assembly on 35 mm top-hat rails according to EN 50022. Devices of the HIMOD – family can be mounted directly next to each other. A distance of at least 8 cm is to be maintained above and below the device for assembly and disassembly.

For assembly, the device is simply to be swung in onto the top-hat rail from above and audibly engaged. For disassembly, the foot bar is to be pulled down with a screw driver and the device swung out upwards.

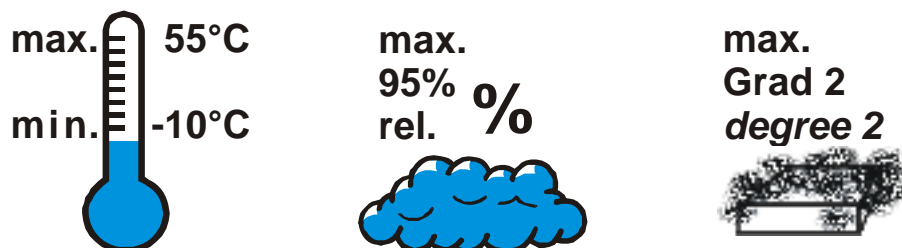


Fig. 4 Environmental Conditions



The place of installation should be as free of vibrations, aggressive media (such as acids, caustic solutions), liquids, dust or other suspended matter as possible.



**The module contains no parts subject to maintenance and does not need to be opened by the customer.**



**The device may only be used in environments with the approved level of protection.**



**The ventilation slits of the casing must not be covered.**



**In installations in which transient overvoltages can occur, for protection the devices are to be fitted with additional surge suppressors or limiters.**



**Caution! The device contains ESD-endangered components.**



**Please observe the safety instructions (section 2).**



**To obtain contamination level 2 according to EN 61010-1, the device must not be mounted below contactors or similar equipment, from which conductive dusts or parts could trickle out.**

### 3.1 Plug Connectors

The up to four-device connection terminals are designed pluggable. They are to be plugged into the casing from above or below (audible locking). The connectors are released by levering out with a screw driver. There are two types available:

- Screwed terminals for conductor cross-sections up to 2.5 mm<sup>2</sup>
- Spring clamp terminals for conductor cross-sections up to 2.5 mm<sup>2</sup>



**The connectors are only to be actuated with no load.**

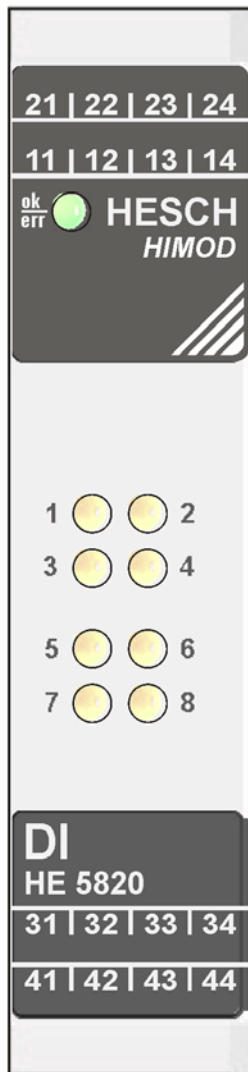
Screwed terminals are to be tightened with a tightening torque of 0.5 – 0.6 Nm.

With spring clamp terminals, rigid conductors and flexible conductors with ferrules can be inserted directly into the terminal point. The (orange) lever opener is to be actuated to release.



**Contact protection: Terminal blocks not connected are to be left in the slot.**

### 3.2 Front View and Indications



LED ok/err On green Flashing green Flashing red Off	Module OK Configuration error No voltage supply of the outputs Voltage supply interrupted
LED 1 – 8 yellow On Off	Input 'ON'* Input 'OFF'*

\* with 'logical' 'ON'.  
If the inputs have been inverted,  
the inputs are not actively connected.

Fig. 5 HE5820 Front View

# 4 Electrical Connection

## 4.1 Connection Diagram

The 4-pole device plug connectors are used for the module function.

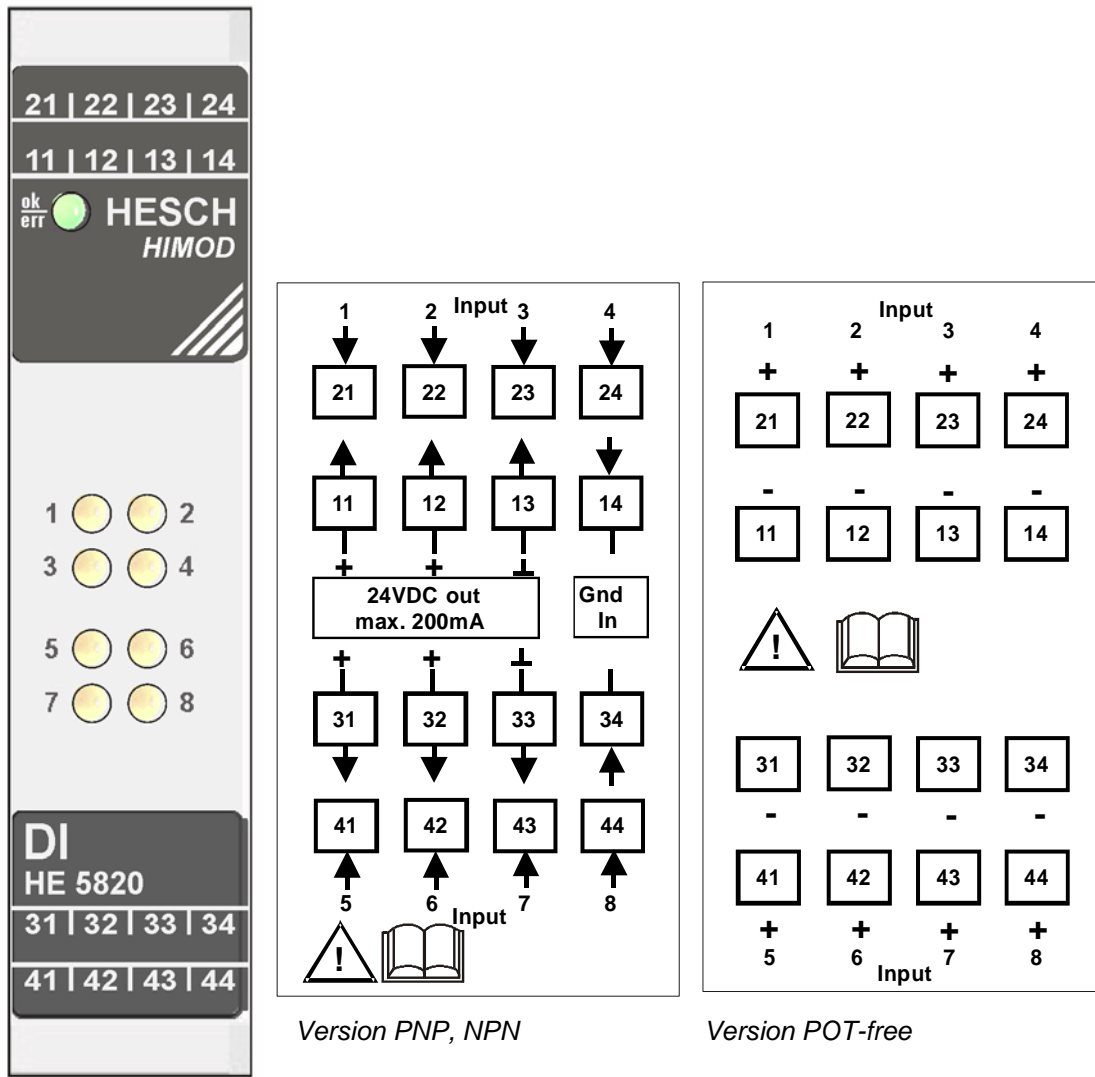


Fig. 6 Front View and Connector Pin Assignment

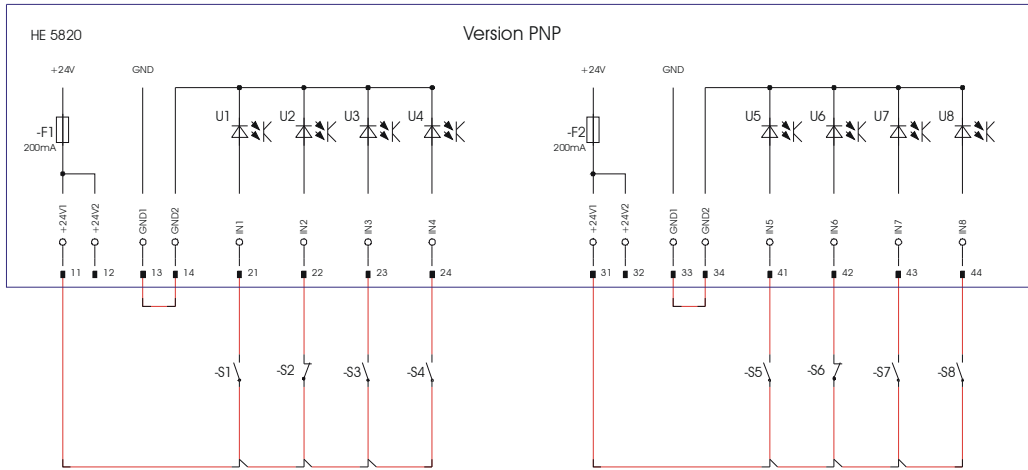


**A faulty connection can lead to the destruction of the device!**

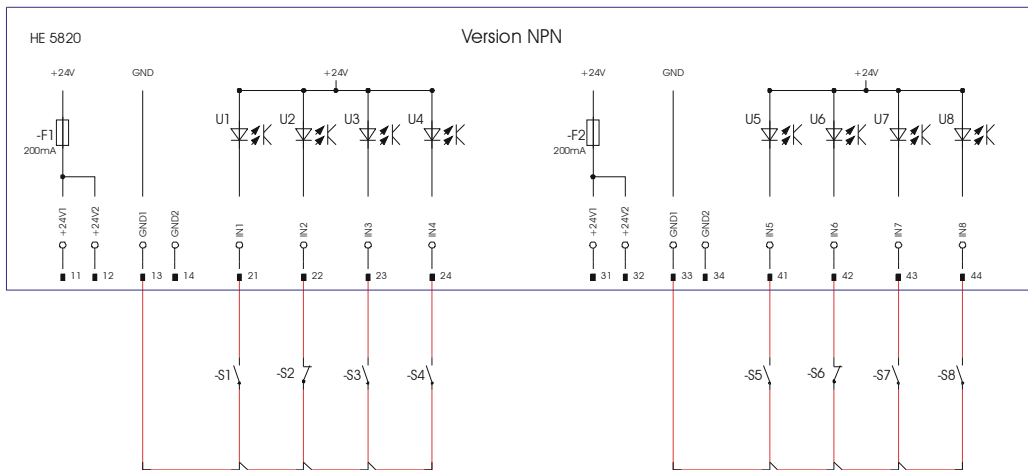
## 4.2 Connection Specification

The HE 5820 module exists with various internal circuits.

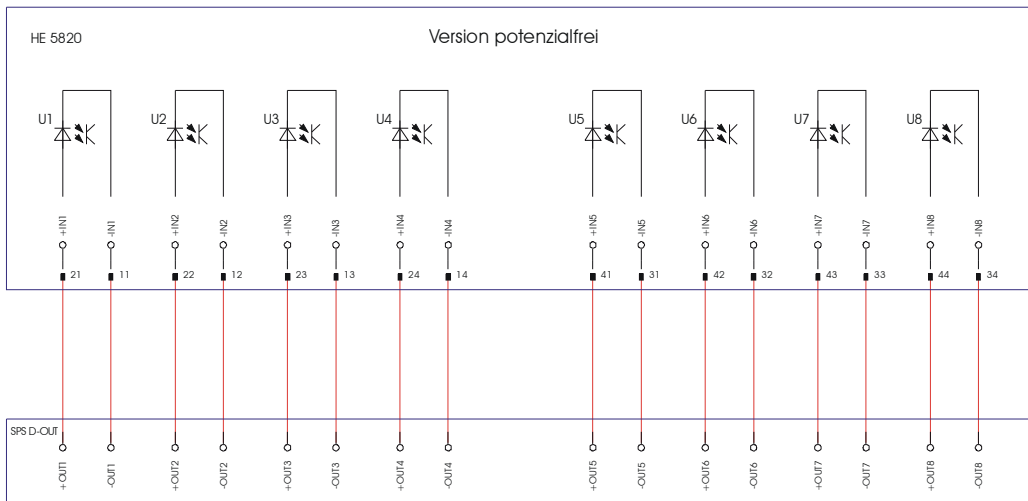
### 4.2.1 HE 5820 PNP Art. No.: HE58200000



### 4.2.2 HE 5820 NPN Art. No.: HE58201000



### 4.2.3 HE 5820 POT Art. No.: HE58203000



The input impedance of 6.8 kΩ is not shown in the examples.

## 5 Functional Description

The HE 5820 module provides the HIMOD bus coupler with eight inputs. The functions of the module are parameterised in the device with the software tool 'SmartControl'.

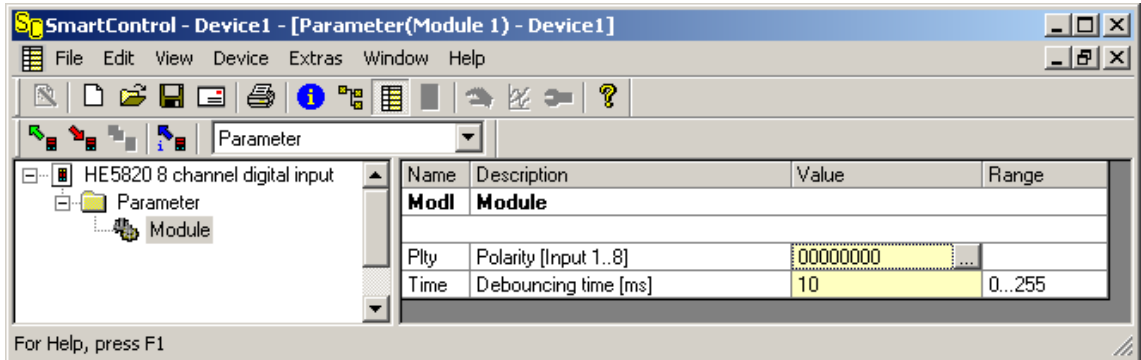


Fig. 9 Screenshot Parameterisation of Module Functions

### 5.1 Module Functions Parameterisation Table

Abbr.	Description	Mod Addr.	Value default	Meaning	Range
Ply	Polarity [Input 1 ..8]	32	00000000	0 normal logic	1 bit per input
				1 inverted logic	1 bit per input
Time	Debouncing time [ms]	33	10	Waiting time for value change	Valid for all inputs

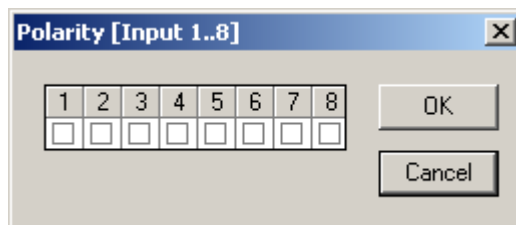
Fig. 10 Table of Module Parameters HE 5820

The parameters are the same for all variants of the HE 5820. The module address is specified as Hex number.

#### 5.1.1 Polarity and Debounce Time



With the parameter **Ply**, 'Polarity' individual inputs are assigned inverted logic. That means, that for process value 'On' the channel LED is lit, but the input is not actively switched on.



The debounce time is used for the safe forwarding of signals through mechanical contacts and can also be used as interference suppression measure in networks with interference signals.

## 5.2 Meaning of the Module Status Information

The module status is depicted in the status byte. Every bit represents one item of information. The meaning of the individual bits is to be taken from the table.

Bit	Meaning	Remark
0	Bit is not used	Is taken from the module
1	Bit is not used	
2	Bit is set, if an EEPROM error is detected.	
3	Bit is not used	
4	No communication with the module (module has failed)	Is set by coupler
5	Module does not match configuration	
6	Reserve	
7	Reserve	

## 6 SmartControl – Engineering Tool

The engineering tool 'SmartTool' parameterises the function modules of an HIMOD device and configures the system of the device. The physical connection is established from a PC with RS232 port and a special cord to the front port 'SmartPort' on the field bus coupling module:

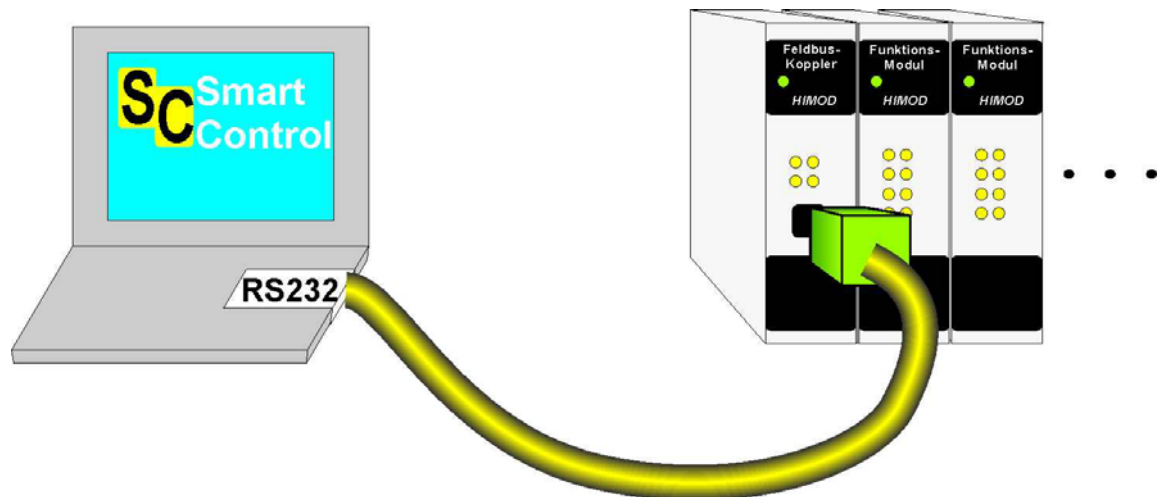


Fig. 11 'SmartControl' Connection

### 6.1 Order Numbers for SmartControl Components

SmartControlExpert Software	58510000
HIMOD Programming Adapter	58511000

### 6.2 Functionality of the 'SmartControl' Software

- Setting of the parameters and configuration parameters
- Download: Transmission of engineering to the module
- Online Mode / Visualisation
- Basic diagnostic function
- Saving files, parameter setting
- Print function
- Online documentation / Help
- Data acquisition and trend recording
- Network- / multiple license
- Assistant function

## 7 Technical Data

### 7.1 Module Function

<b>Module type:</b>	Input module for HIMOD systems 8 x 24 V DC in 2 switching groups	
<b>Version:</b>	Design as PNP, NPN or potential-free version direct connection of 3-wire sensors input specification according to IEC 1131	
<b>Sensor supply:</b>	Per channel there is a sensor supply of 24 V DC ( $\pm 10\%$ ) available with a maximum current of 25 mA. 4 channels of a group are protected together against short circuit with a 200 mA multifuse.	
<b>Protection mechanisms:</b>	The inputs are protected against overvoltage with varistors	
<b>Input impedance:</b>	The input impedance per channel is 6.8 k $\Omega$	
<b>Indications:</b>	1 LED green/red	Module function and configuration
	8 LED yellow	Input status

### 7.2 Environmental Conditions

<b>Ambient temperature:</b>	Operation: -10 .. 55°C Storage: -25 .. 60°C Transport: -25 .. 85°C Influence: $\leq 0.05\%$ / 10K
<b>Humidity:</b>	KUF acc. to DIN 40040, max $\leq 95\%$ rel. humidity 75% rel. humidity for yearly average, no dew formation
<b>Ice formation:</b>	Not permitted
<b>Air pressure:</b>	Operation and storage: 80 kPa to 106 kPa Transport: 70 kPa to 106 kPa
<b>Electrical isolation:</b>	The areas of supply voltage, field bus, logics and inputs are each safely isolated galvanically from each other according to EN 61010-1: working voltage: 50 V overvoltage category II contamination level 2
<b>Vibration:</b>	according to EN 60068-2-6, sinusoidal vibrations Load: 5 g, 2 h per spatial direction
<b>Impact:</b>	according to EN 60068-2-7 Load: 25 g over 11 ms, half sine wave
<b>EMC:</b>	Emission: DIN EN 61000-6-3



Immision: DIN EN 61000-6-2

**Type of protection:** Casing front: IP 20  
 Casing: IP 20  
 Connections: IP 20

## 7.3 Assembly and Connection

**Assembly:** on 35 mm top-hat rails according to EN 50022  
 locking with metal foot bar  
 position for use: vertical

**Casing:** material: polyamide PA 6.6  
 flammability class: V0 (UL 94)  
 dimensions: 22.5 x 99 x 117.5 mm (W x H x D)  
 weight: 125 g

**Wiring technique:** plug connectors, pluggable alternative can be ordered:  
 screwed terminals for conductor cross-sections of 0.2 to 2.5 mm<sup>2</sup>  
 (AWG 24–12)  
 spring clamp terminals for conductor cross-sections of 0.2 to 2.5  
 mm<sup>2</sup> (AWG 24–12)

**Connection** Supply and communications bus through T-Bus connector fitted  
 in the mounting rail.  
 Power consumption 7.5 V: 55 mA  
 Power consumption 24 V: 50 mA

**Technical modifications reserved**