

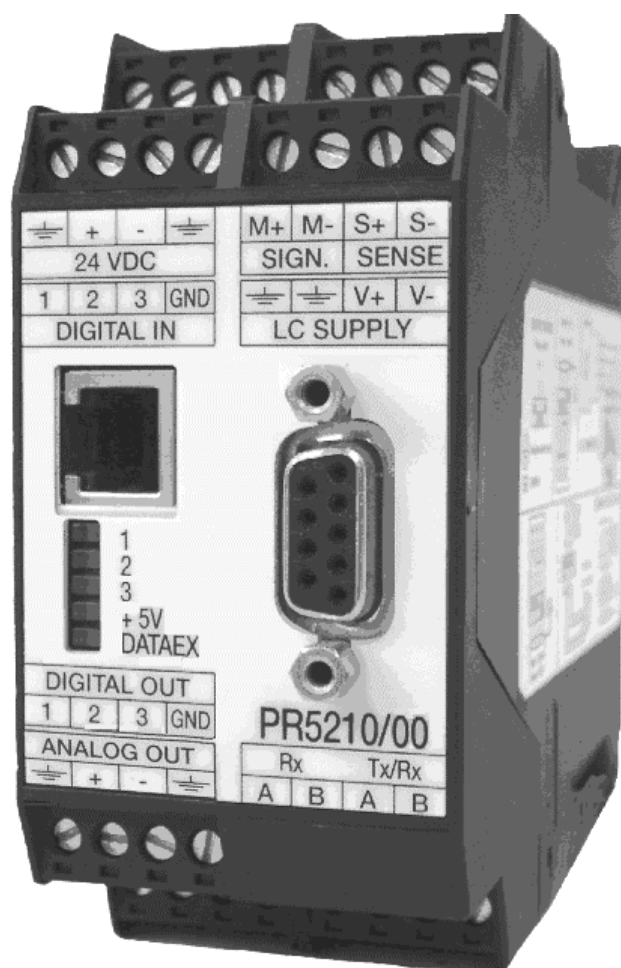
# PR 5210 Transmitter Series

PR 5210/00 Profibus Transmitter

PR 5210/10 Digital Process Transmitter

PR 5210/11 Profibus Transmitter (without Analog Output)

## Operating Manual



Operating manual

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for PR 5210

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# 1 SAFETY HINTS, ELECTRICAL PROTECTION CLASS



This instrument was built and tested in accordance with the safety regulations for measuring and control instrumentation. The instrument was delivered in safe condition. To maintain this condition and to ensure safe operation, the operator must follow the hints and warnings given in this documentation.

## 1.1 Application of the instrument

The instrument is intended for weighing installations and is particularly suitable for tank and hopper weighing and as a weight transmitter in intelligent control systems. Product operation, commissioning and maintenance must be done by well trained and qualified persons who know of the risks and avoid them, or take measures to protect themselves.

The instrument is latest state of the art. No warranty is taken that the product is free of errors, especially with reference to the software and hardware required for operation and supplied by third parties. The manufacturer does not take any liability for damage caused by incorrect use of this product. Using this product implies recognition of the above-mentioned regulations.

## 1.2 Initial inspection

Check the contents of the consignment for completeness and note whether any damage has occurred during transport. If the content is incomplete or damaged, a claim must be filed with the carrier immediately and the Sartorius Hamburg sales or service organization must be informed to permit repair or replacement of the unit.

## 1.3 Before commissioning



Before commissioning, after storage and transport, the instrument must be inspected visually to preclude mechanical damage.

### 1.3.1 Installation

The instrument is designed for mounting on standard rails (35 mm, acc. to DIN 46277).



When mounting on the rail, ensure that between the modules to the left and right of the transmitter 20mm space is kept.

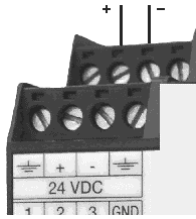
### 1.3.2 Electrostatically sensitive components

This instrument contains electrostatically sensitive components. Therefore, potential equalization must be provided when working at the instrument (antistatic protection).

### 1.3.3 Protective earth

The connection to protective earth is done via the mounting rail.

### 1.3.4 Supply voltage connection



The supply voltage is 24V DC +10% / -15%.  
The power consumption is 8.2 W maximum.  
For connection to 230 / 115 VAC an external power supply (e.g. PR 1624/00) is required.

### 1.3.5 Failure and excessive stress

If the instrument is suspected of being unsafe, shut it down and protect it against accidental operation. This is the case when the unit:

- is physically damaged,
- does not function any more,
- is stressed beyond the tolerable limits (e.g. during storage, transport).

### 1.3.6 Fuse

The instrument has got no fuse to be exchanged. The load cell supply is protected against short circuit by multifuse elements. If the load cell supply switches off, disconnect the device from power. Search for the reason and eliminate it. After a cooling down period of about 3 minutes the power can be switched on again.

## 1.4 Repair and maintenance

Repairs are subject to checking and can be carried out only at Sartorius Hamburg GmbH, Hamburg. In case of defect or functional trouble, please, contact your local Sartorius organization for repair. When returning the instrument for repair, an exact and complete fault description must be supplied. Maintenance work may be carried out only by a trained technician aware of the involved hazards, whereby the relevant precautions must be taken.

### 1.4.1 Soldering work

Carrying out any soldering work on the unit is not allowed, excepting the solder link (see chapter 2.5.1.4 and 2.5.1.5).

### 1.4.2 Cleaning

If necessary, the front panel can be cleaned using a damp, soft cloth. Use only little water or isopropyl alcohol for moisturizing.

### 1.4.3 Disposal



Electronics scrap is special waste.  
Please, follow your local disposal regulations.



## 2 PR 5210 TRANSMITTER SERIES

### 2.1 The Transmitter Versions

The transmitters of series 5210 are available in 3 models, a later extension to a different model is not possible. The respective version is clearly defined by the type number. The front foils are adapted to the version.



#### 2.1.1 PR 5210/00 Version

This version is the fully equipped model, containing Profibus and Analog Output.

#### 2.1.2 PR 5210/10 Version (without Profibus)

This version has got an Analog Output, but no Profibus connection, the respective menus in the operating tools are adapted to it.

#### 2.1.3 PR 5210/11 Version (without Analog Output)

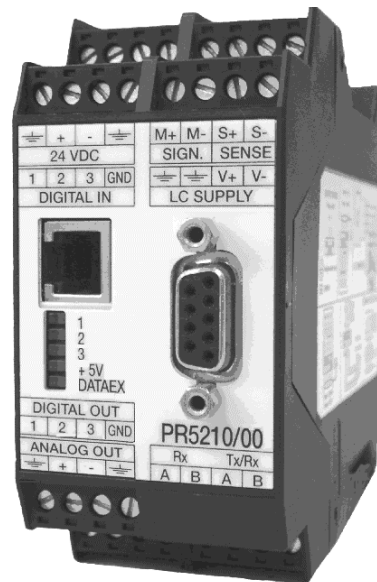
This version has got a Profibus connection, but no Analog Output, the respective menus in the operating tools are adapted to it.

## 2.2 Transmitter survey

- EC Type approval for NAWI: PTB D03-09-025
- Accuracy 6000 e @ 6 samples/sec
- Internal resolution 4.8 Mio counts
- Linearity < 0.002% (typ.)
- Sample rate selectable: 6 ... 100/sec
- Digital filter with selectable characteristic
- Interfaces are galvanically isolated
- 3 pairs of programmable limits
- 24 VDC Supply voltage
- Connections are made by 7 plug-in terminal blocks, except Profibus and RS 232 (RJ-12) connector
- The unit is suitable for snap-in mounting (rail)
- 5 status LEDs for power, communication, error detection

Calibration and configuration of the instrument are menu-guided via PC or via Profibus commands.

- Calibration by means of weights or by entry of the mV/V values without additional calculations
- Analog Output 0/4 ... 20 mA, configurable for gross / net (PR 5210/00 and PR 5210/10 only)
- Analog Output value defined by Profibus (PR 5210/00 only)
- Digital Input 3 channels, galvanically isolated
- Digital Output 3 channels, galvanically isolated

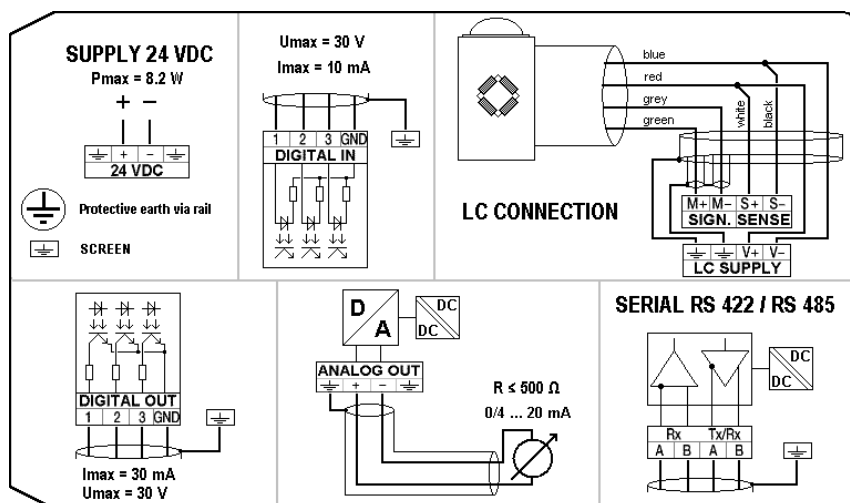


### Communication protocols:

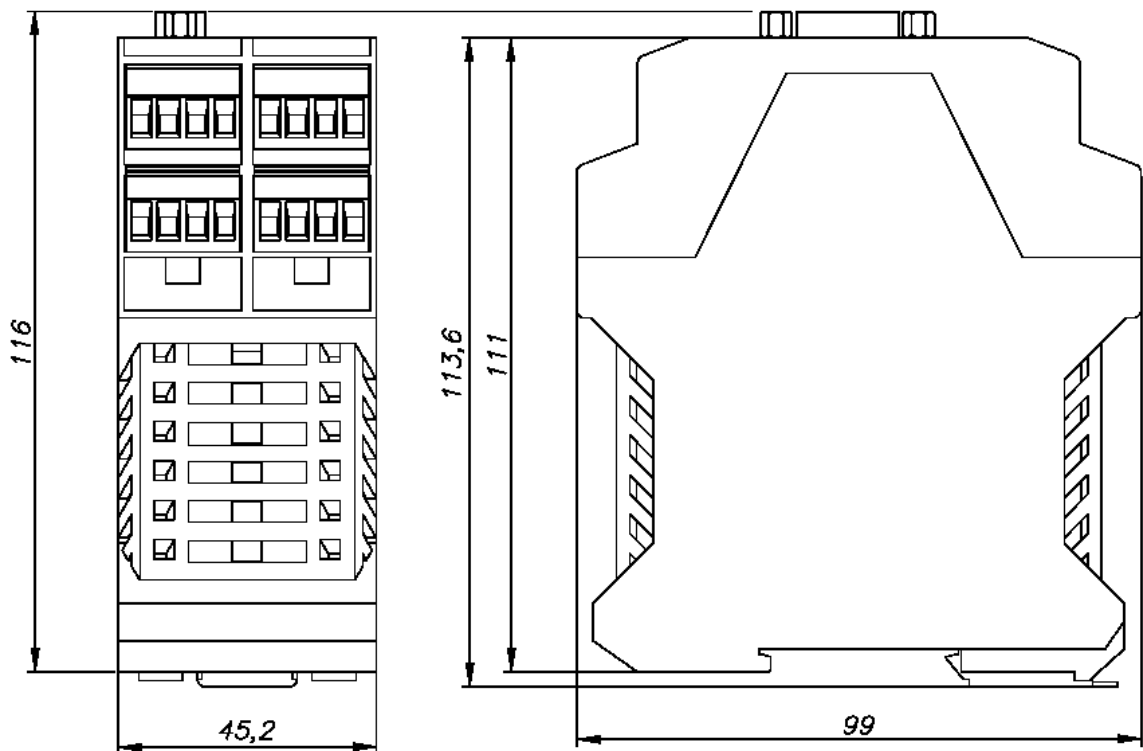
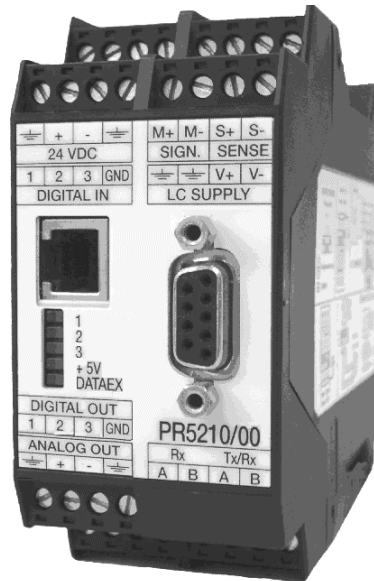
- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• RS 232 for PC</li> <li>• RS 485/ RS 422 for remote display</li> </ul> | <ul style="list-style-type: none"> <li>• Profibus-DP (PR 5210/00 and PR 5210/11 only)</li> </ul> |
|--|--|

## 2.3 Label on the housing

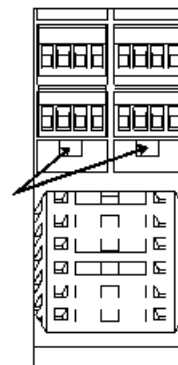
The wiring principle is located at the side of the housing:



## 2.4 Housing



To open the housing,  
press the four closings  
(two on each side).  
During assembly, take  
care of the earth  
connection in the bottom  
of the housing.



## 2.5 Connections

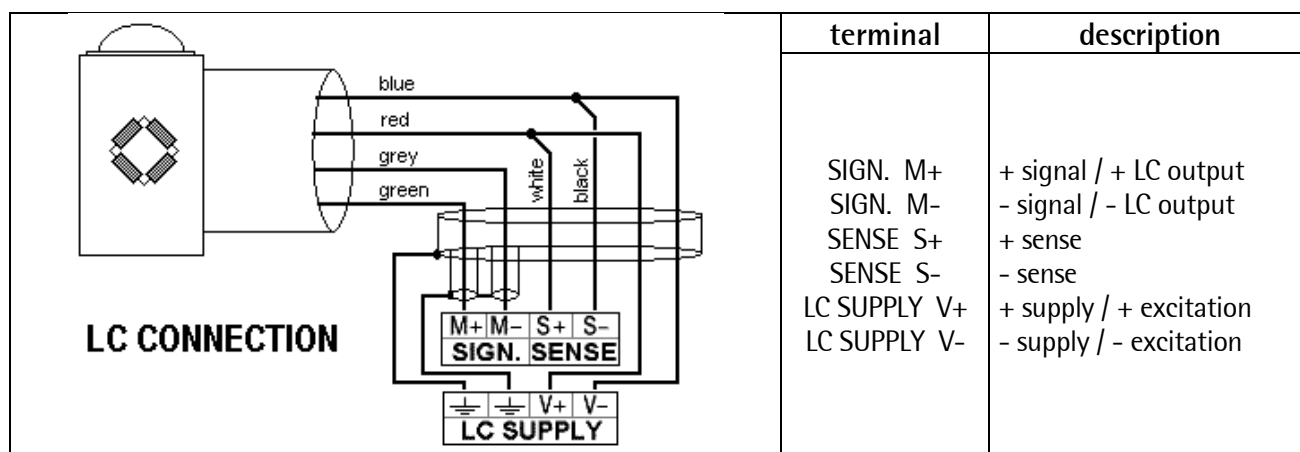
### 2.5.1 Load cell connection



The cable colours shown in this chapter are of Sartorius load cells series PR 62XX. Before connection of other types, carefully read the instructions concerning cable colours of the load cell / platform.

#### 2.5.1.1 Connection in 6-wire technique

See label on the housing (chapter 2.3) and the documentation for the cable junction box.



**Recommendation:**

- lay in steel tubes connected to earth potential
- min. 1 m distance to power cables

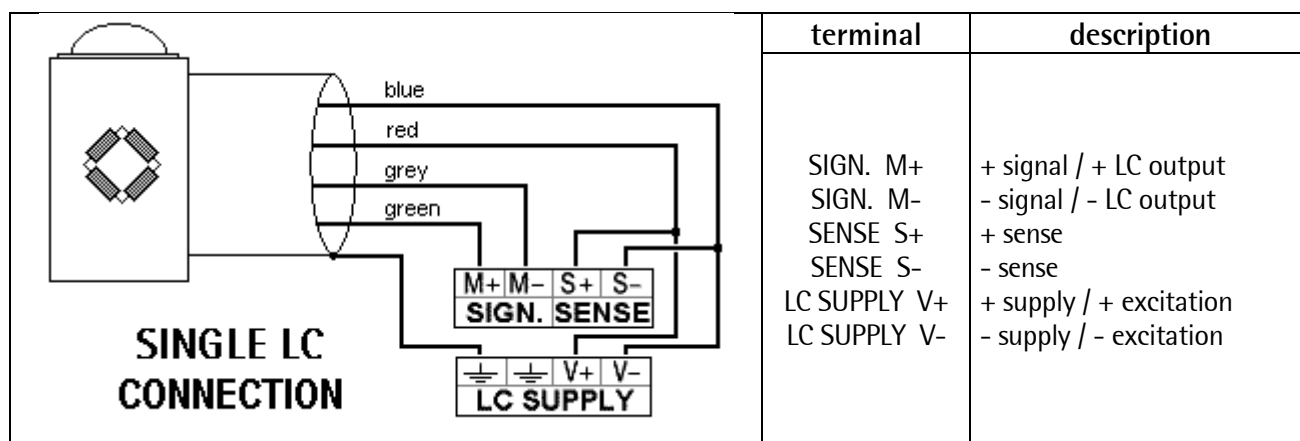
#### Load cell supply circuit:

The voltage for load cell supply is firmly adjusted to 12 VDC and protected by multifuse elements (see chapter 1.3.6)

Load cell resistance  $\geq 75 \text{ Ohm}$ ; e.g. 8 load cells, each with 650 Ohm

#### 2.5.1.2 Connection of one load cell in 4-wire technique

Pay attention, that SENSE S+ has to be connected to LC SUPPLY V+ and SENSE S- has to be connected to LC SUPPLY V- directly at the transmitter.



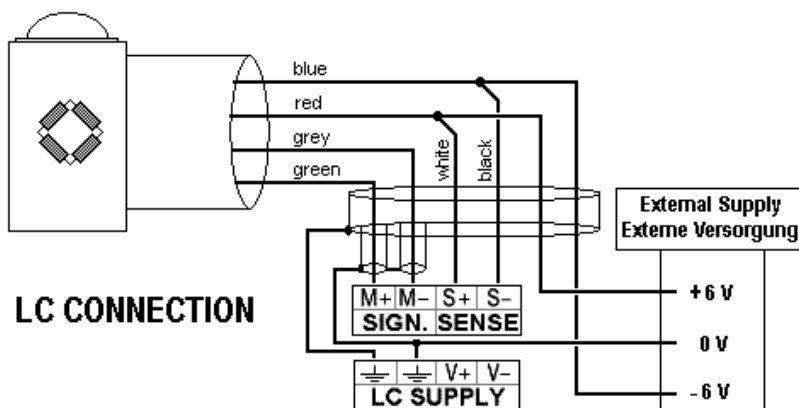
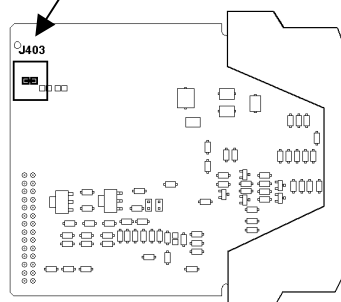
### 2.5.1.3 Connection of PR 6221 load cells

Please refer to the instruction manual PR 6021/08, -/68.

### 2.5.1.4 External load cell supply

If an external load cell supply is used, the solder jumper J403 on the power supply board has to be closed. (Factory setting: closed.) The common line of the symmetrical external supply has to be connected to the same terminal at PR 5210 as the screen of the load cell / extension cable.

For connection of external supply the solder jumper J403 has to be closed

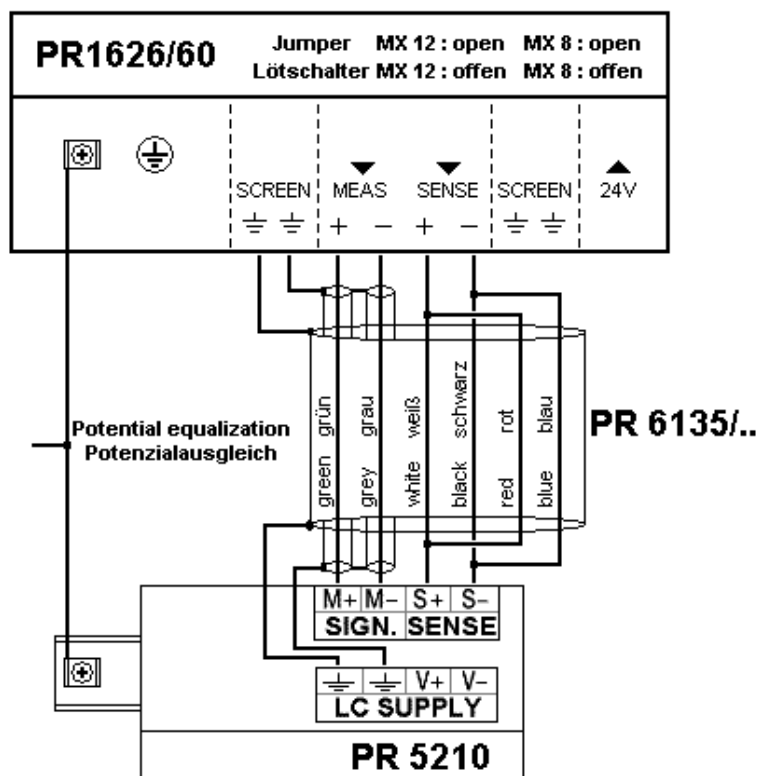
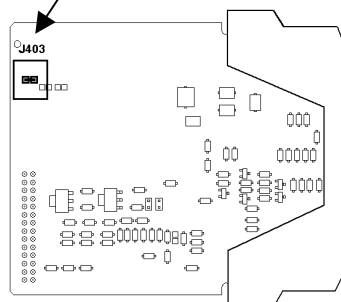


Specification external supply: 6 VDC + 5 %, - 30 %; ripple max. 50 mVpp; asymmetry max. +/- 3%.

### 2.5.1.5 Connection via PR 1626/60

If the PR 1626/60 is used, the solder jumper J403 on the power supply board has to be closed. (Factory setting: closed.) The connection to the PR 1626/60 has to be done as follows, for general connections please refer to the PR 1626/60 manual.

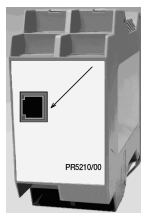
For connection via PR 1626/60 the solder jumper J403 has to be closed



If the PR 16126/ 60 has to be used with **MX 8 : closed**, please contact Sartorius Hamburg technical support for further INFO!

### 2.5.2 RS 232 Interface

The configuration and calibration can be carried out from the PC program (Windows 98, NT, 2000 or XP) via the RS 232 Interface.



Connecting method:	Western Modular RJ-12	No. of channels:	1
Type:	RS 232 full duplex	Speed:	9600 bits/sec
Data bits:	8 bit	Parity:	None
Stop bits:	1		
PC Cable (Standard):	Standard	Cable length:	2.0 m

### 2.5.3 RS 485 / 422 Interface

The RS 485 / 422 Interface is used to connect a remote display PR 1627, the remote terminal PR 1628 or PC.

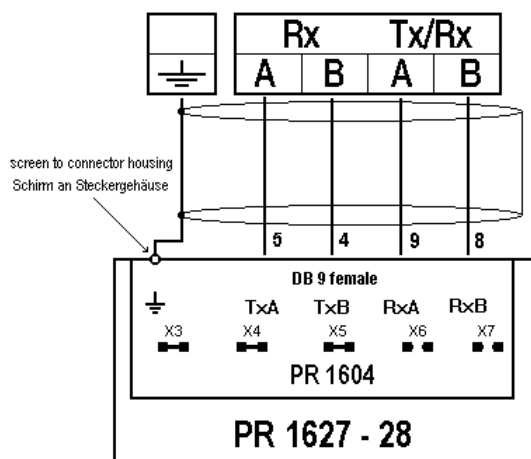
	Connecting method:	4-pin plug-in terminal block
	No. of channels:	1 RS 422/485
	Type:	full duplex
	Speed:	300, 600, 1200, 2400, 4800, <9600>, 19200 Bits/s
	Bits / Stopbits:	<8 / 1> or 7 / 1
	Parity:	<even>, <none>
	Signals RS 422/485:	RxA, RxB, TxA, TxB
	Potential isolation:	yes
	Cable length:	max. 1000m
	Cable type:	twisted pairs, screened (e.g. LifYCY 2x2x0.20)

<...> = default values (factory settings)

The RS422-transmitter (Tx) have an internal terminal resistance of 120 Ohm.

The RS422-receiver (Rx) have an internal terminal resistance of 120 Ohm and 1,6 kOhm to the internal bus supply voltage. (+ at RxA - at RxB)

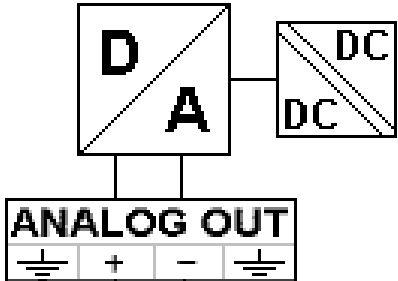
Connection remote display PR 1627 or remote terminal PR 1628/00, -/60 or -/24  
(with PR 1604 Interface)

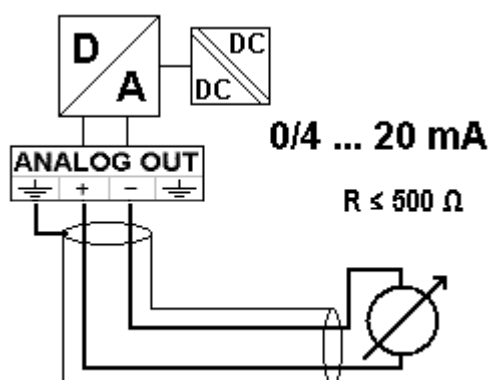


From the connected terminal / display the following operations are possible via pushbuttons:

Test  
Set tare  
Reset tare  
Set zero

## 2.5.4 Analog output (PR 5210/00 and PR 5210/10 only)

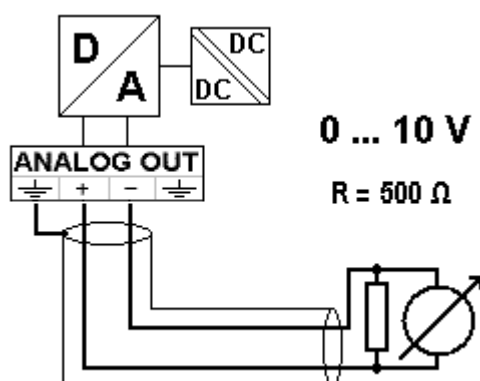
	Connecting method:	4-pin plug-in terminal block
	Number of outputs:	1 current output, output voltage by use of external resistor
	Output:	Gross, net weight or via profibus
	Range:	0/4 ... 20mA, configurable via setup
	Resolution:	e.g. 0 - 20 mA in max. 40.000 parts
	Linearity error:	@ 0 - 20mA: <0.05 % @ 4 - 20 mA: 0.025 %
	Temperature error:	< 100 ppm/K
	Error on zero	< 0.05 %
	Error on FSD:	< 0.1 %
	Load:	0 ... 500 Ohm max.
	Protected against short circ.:	yes
	Potential isolation:	yes
	Cable length (screened):	150 m (current output)



0/4 ... 20mA

Analogue signal,  
current output.

The current is  
supplied directly from  
the terminals.



0 ... 10V

Analogue signal,  
voltage output.

The voltage level corresponds  
to the voltage drop at the  
500 Ohm (10 ppm/K) resistor.

### 2.5.5 3 Opto inputs

The optocoupler inputs have one common potential (GND) for the input group, separated from the common potential of the output group.

	Connecting method:	4-pin plug-in terminal block
	Number of inputs:	3
	Input signal:	External supply required 10 ... 30 VDC for 'high' 0 ... 5 VDC for 'low'
	Input voltage	Max. 30 VDC
	Input current:	< 11 mA @ 24 VDC < 5 mA @ 12 VDC
	Potential isolation:	Yes, 3 inputs have got 1 common minus potential

### 2.5.6 3 Opto outputs

The optocoupler outputs have one common potential (GND) of the output group, separated from the common potential of the input group.

	Connecting method:	4-pin plug-in terminal block
	Number of outputs:	3
	Output signal:	External supply required
	Output current:	Max. 30 mA
	Output voltage:	Max. switching voltage: 30 V
	Potential isolation:	Yes, 3 outputs have got 1 common minus potential

### 2.5.7 Profibus (PR 5210/00 and PR 5210/11 only)

The profibus connection is done via the 9 pole female connector on the front.

Transmitter is the only or the last slave on the bus	Transmitter is not the only / not the last slave on the bus	PIN	Signal
<b>PR 5210</b> 9 pole-f  screen to connector housing Schirm an Steckergehäuse	<b>PR 5210</b> 9 pole-f  screen to connector housing Schirm an Steckergehäuse	3 4 5 6 8	RxD/TxD-P CNTR-P DGND VP RxD/TxD-N








### 3 OPERATING ELEMENTS

#### 3.1 Status LEDs






The instrument has got 5 green LEDs to display the operating or error status.

##### Power, Profibus






	Power on	Profibus activity*	Profibus conn. not established
 1			
 2			
 3			
 + 5V	on		
 DATAEX		on	Flash. 1Hz

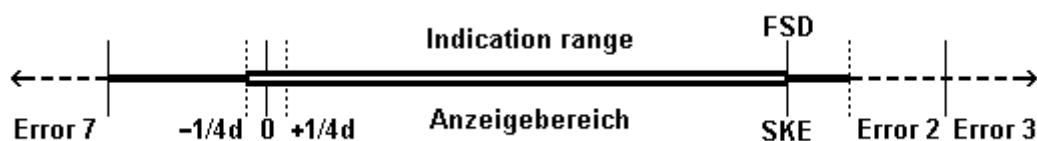
\* The LED for profibus activity (PR 5210/00 and PR 5210/11) is activated if a connection has been established. It remains on, even if the communication is not running or the physical connection is interrupted!

##### Weight status indication:

	Standstill	Center zero	Below zero or above FSD
 1	on		
 2		on	
 3			on
 + 5V			
 DATAEX			

##### Weight error status:

	Error 1 Arithmetic	Error 7 (negative)	Error 2 Overload	Error 3 (> 36 mV)	Error 6 Sense control
 1	Flash. 1Hz	Flash. 1Hz			Altern. flash 1 Hz
 2	Flash. 1Hz			Flash. 1Hz	Altern. flash 1 Hz
 3	Flash. 1Hz	Flash. 1Hz	Flash. 1Hz	Flash. 1Hz	Altern. flash 1 Hz
 + 5V					
 DATAEX					



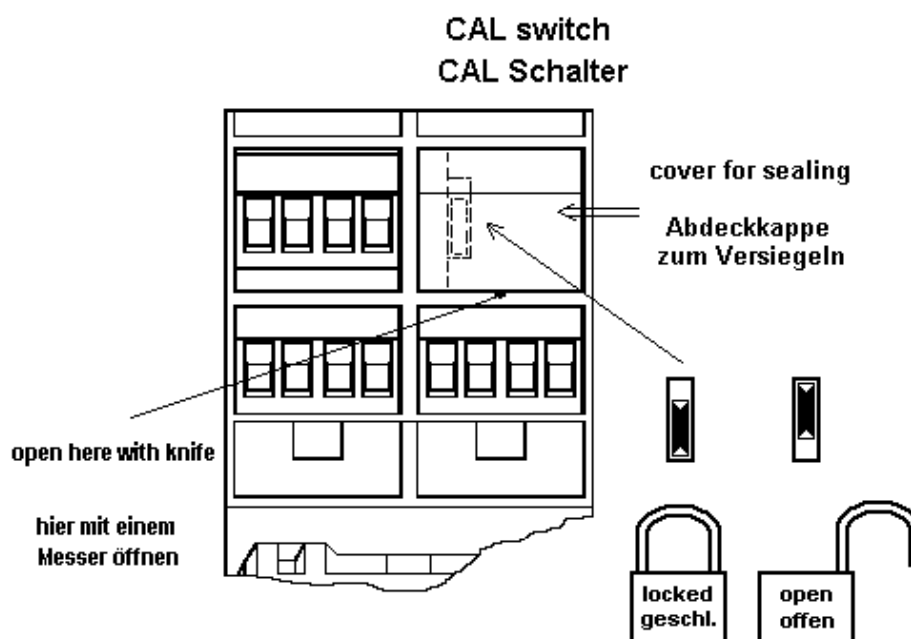
## 3.2 CAL Switch

The CAL switch is used to protect the calibration data / parameters from unauthorized access.

If the CAL switch is in the position 'open', the calibration data and parameters can be altered via the PC program or via the Profibus connection.

If the CAL switch is in the position 'locked', the calibration data (e.g. deadload, span) and the calibration parameters (e.g. measure time, zero tracking etc.) cannot be altered.

For 'legal for trade' (W&M) applications the CAL switch has to be closed and the cover has to be sealed.



### 3.2.1 Factory settings

Calibration data <default>	Calibration parameters <default>
Full scale (FSD) <3000> <Kg>	Measuring time (M) <320>ms
Step width <1>	Measuring rate <160>ms
Deadload <0.000000>mV/V	Standstill time <1>M
Span <1.000000>mV/V	Standstill range <1.00>d
	Standstill timeout <8>M
<b>Calibration parameters &lt;default&gt;</b>	Testmode <absolute>
Overload (range above FSD) <9>d	Zeraset range <50.00>d
* W&M mode <off>	Zero track range <0.25>d
Filter <off>	Zero track step <0.25>d
Frequency <1.56 Hz>	Zero track repeat <0>M

\* The W&M parameter has to be set to 'on' or 'off' before entering calibration data, see chapter 4.7.2.5.

At delivery the calibration data and parameters are set to default (factory settings).

If a new calibration is started, the calibration data are set to default (The parameters remain unchanged).

Calibration data and parameters are stored in EAROM and kept in case of power failure or if the instrument is disconnected from power supply.

## 4 SETUP AND CONFIGURATION

### 4.1 General

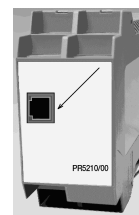
All setup and configuration will be done with the windows PC program ' PR 5210-WIN Configurator 03.00 Setup.exe '.

Via the profibus interface an additional access to each parameter is possible.

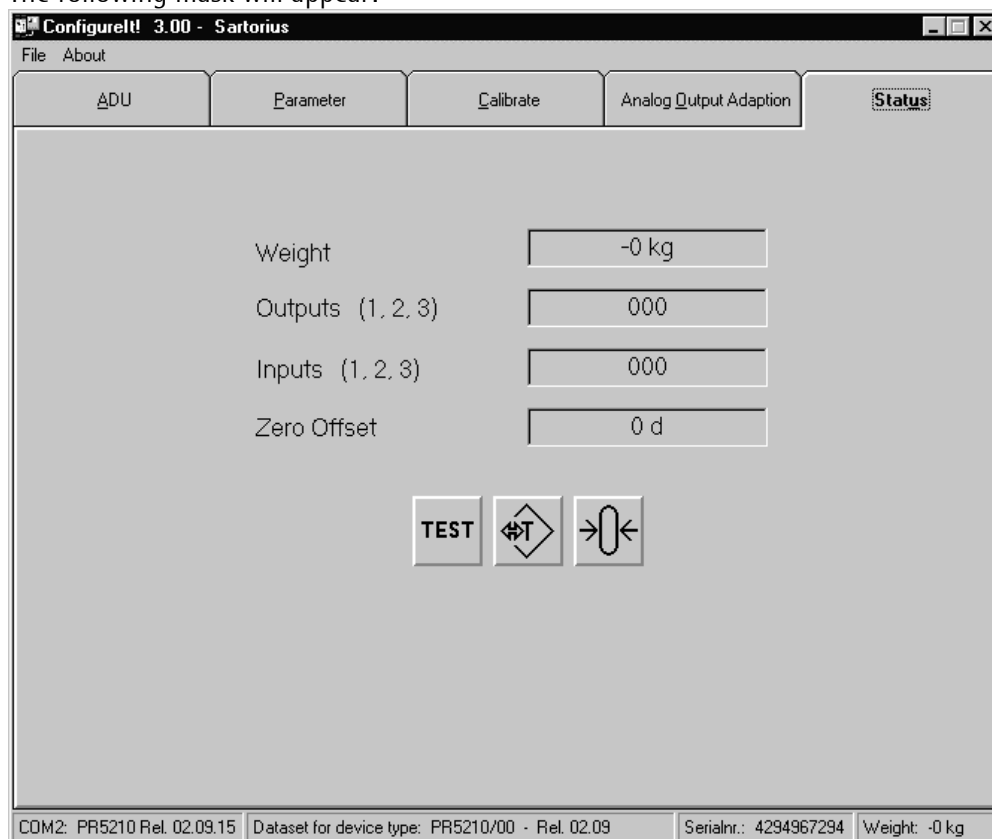
### 4.2 Installation Windows tool

The Windows tool to operate/configure the transmitter is contained on the CD-ROM, it can run under Windows 98, -NT, - 2000 or - XP.

- Switch off the PC and connect the RS 232 cable from transmitter (RJ-12) to a free COM port (e.g. COM1) with the DB9-f plug
- Start the PC
- Ensure that the necessary administrator rights are given to install executable programs
- Start the program PR 5210-WIN Configurator 03.00 Setup.exe
- Follow the instructions given
- Select the destination directory (e.g. C:\Programs\Sartorius\PR 5210)
- After successful installation the message: Installation finished will appear
- Start the program in the previously defined directory: ConfigureIt!.exe
- The program will automatically look for the COM port where the PR 5210 is connected to



The following mask will appear:



## 4.3 Load and store setup and configuration

### 4.3.1 Data in the PR5210

The current data can be loaded from the PR5210 to the configurations-tool, edited and save back to the PR5210.

In the menu 'ADU' and 'Parameter' the data sets can be loaded and stored.

Each time all data are loaded or stored.

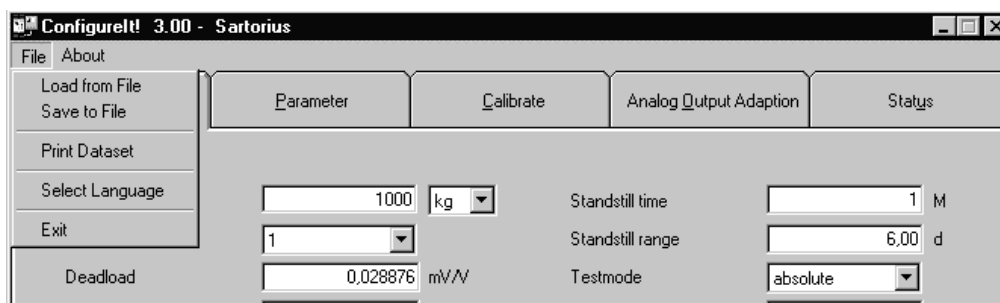


If the data are changed, the program asks when a page is changed or the program will be quit, if the changes should be stored or aborted.

If an access code is set, it will be asked now.

### 4.3.2 Archive data in the PC

The actual data set in the configuration tool could be stored as a file on the PC and reloaded again. So, all configuration data could be archived on the PC.



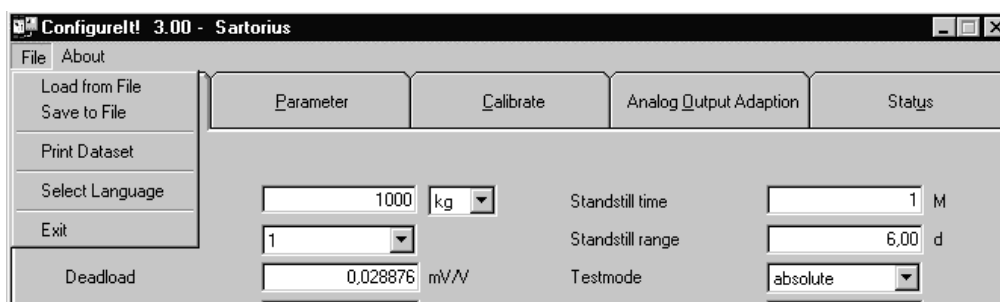
#### Load Dataset

Load the default values (factory delivery) contained in the file DEFAULT.DAT for the WIN tool. The default dataset cannot be overwritten. If a new configuration has to be stored, change the name.

#### Save Dataset

Store the modified data under a name different from DEFAULT.DAT

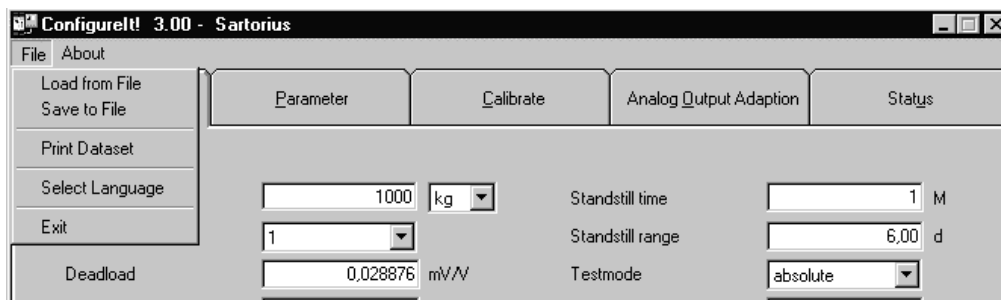
## 4.4 Print data set



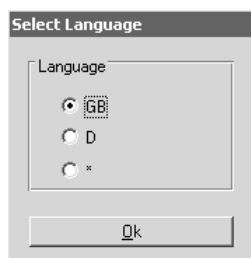
#### Print Dataset

The current calibration data and all parameters are printed on the printer assigned as standard printer. See example in chapter 8.4.

## 4.5 Select language



### Select Language

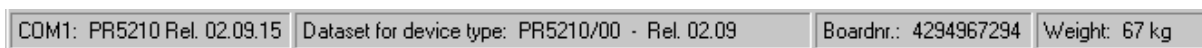


The language can be selected between D, GB and \*. The \* is used for user defined (translated) definitions. That means all language items can appear as user defined text.

At the first start of the program it will wake up with GB as default and will show the language selection mask.

## 4.6 Status line

The bottom line of ConfigureIt is the status line.



The program could establish a communication connection over COM1 with a PR5210 with the version 2.09.15.

A data set for the device type PR5210/00 is loaded.

The transmitter PR5210 had the boardnumber 4294967294.

The actual weight is 67 kg.

## 4.7 ADU

**ConfigureIt! 3.00 - Sartorius**

File About

**ADU** Parameter Calibrate Analog Output Adaption Status

FSD	1000	kg	Standstill time	1	M
Stepwidth	1		Standstill range	6.00	d
Deadload	0.028876	mV/V	Testmode	absolute	
Span	2.000002	mV/V	Standstill timeout	60	M
Overload	100	d	Zeroset range	500.00	d
Filter	none		Zerotrack range	2.00	d
Frequency	0.53	Hz	Zerotrack step	0.25	d
Measuring time	1920 msec		Zerotrack repeat	0	M
Weight & Measure	off				

Upload from PR5210 Download to PR5210

COM2: PR5210 Rel. 02.09.15 Dataset for device type: PR5210/00 - Rel. 02.09 Serial no.: 4294967294 Weight: -7 kg

### 4.7.1 Weighing point calibration

Before the calibration data are entered, the W&M mode has to be set to 'on' (for legal for trade applications) or 'off', see chapter 4.7.2.5.



With this menu calibration data could be read and write. But the calibration of the scale is done with the menu 'Calibrate'!

See chapter 4.9.

#### 4.7.1.1 FSD (Weighing range)

The full scale deflection (FSD) determines the maximum weight which can be measured.

overall weight range

within 0.100 and 9999900

in mg, g, kg, t or lb.

The value must be divisible by the step width and can have max. 5 digits behind the decimal point/comma.

The default value is 3000kg.

#### 4.7.1.2 Stepwidth

The stepwidth (scale interval) which is valid for the total scale range has to be selected: 1, 2, 5, 10, 20, 50, default is 1.

#### 4.7.1.3 Resolution magnifier: \*10

During calibration the display resolution (scale interval) can be increased by factor 10.

4.7.1.4      Deadload

The value of the unloaded scale / empty hopper is the deadload. The input voltage equivalent to this weight value is displayed/ stored in mV/V. For calculating the voltage for deadload the same formula is applied as for span (Full scale has to be replaced by dead load), see chapter 4.7.1.5.  
Default is 0.000000 mV/V  
During calibration it has to be decided:

- To use the empty scale as deadload (normal case)
- To enter the deadload in mV/V (if the scale cannot be unloaded, or the value is known from previous calibration)

If the deadload has to be changed later (due to weight decrease or increase of the empty scale), it can be done without influence on the other data like span.

4.7.1.5      Span

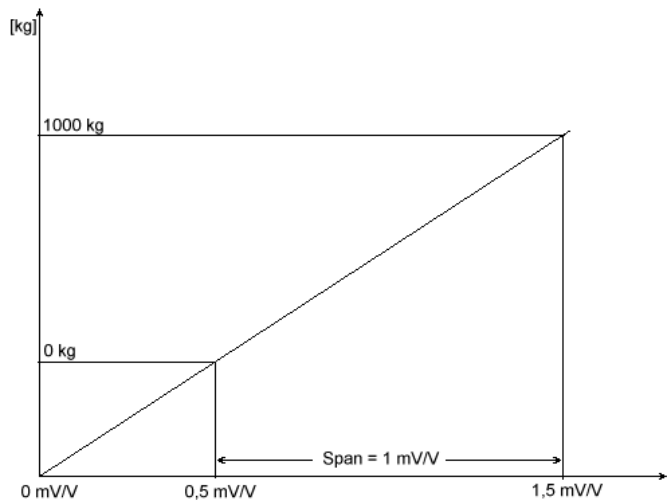
The span indicates the equivalent input voltage in mV/V related between deadload and the scale FSD (full scale).

$span [mV/V] = \frac{full\ scale \cdot load\ cell\ sensitivity\ C [mV/V]}{load\ cell\ capacity\ (sum\ of\ all\ load\ cells)}$	Span in [mV/V] Full scale as a weight value Load cell sensitivity C [mV/V] Load cell capacity (= sum of all load cells) as a weight value
---	--

Default is 1.000000 mV/V  
During calibration it has to be decided:

- Set span by weight (load the scale with the calibration weight and enter the value of the calibration weight)
- Enter the span in mV/V (from calculation of above formula or if the value is known from previous calibration)

Example of a scale with a load cell capacity of 2t, 2mV/V load cell sensibility and a full scale deflection of 1000 kg:



After the calibration a value of 0,5 mV/V had been generated for the deadload.  
The Span value is determined to 1 mV/V.  
With 12 Volt supply a measuring signal of 6 mV could be calculated for deadload.  
This measuring signal could be measured directly with a voltage meter at the measuring inputs (M+, M-).  
For the Span a measuring signal of 12 mV could be calculated. At full scale deflection the measuring signal is deadload value + Span = 18 mV (M+, M-)

## 4.7.2 Weighing point configuration

### 4.7.2.1 Overload

Entry is in d, maximum permissible range 0d to 9999999d, default = 9d

Weight values above FSD + overload are generating an error message. The overload range prevents the scale from going into error condition in case that the weight is only some digits above the FSD range.

For 'legal for trade' applications this value must not be greater than 9e.

### 4.7.2.2 Filter

Select between none or Bessel, Aperiodic, Butterworth. The digital filter (low-pass, 4-th order) is located behind the ADC, in intervals of the measuring rate a new value is calculated.

With digital filter activated, the cutoff frequency (see chapter 4.7.2.3 ) has to be defined. Weight values to be displayed are generated behind the digital filter.

- After changing the filter parameters, the maximum accuracy should be reestablished by re-calibration.

### 4.7.2.3 Frequency

The range of the filter cutoff frequency is depending on the measuring rate (see table), it is only used if the filter is not set to none!

Measuring rate	Min. frequency	Max. frequency
10 ms	0.25 Hz	1.84 Hz
20 ms	0.12 Hz	1.98 Hz
40 ms	0.06 Hz	1.83 Hz
80 ms	0.03 Hz	1.97 Hz
160 ms	0.02 Hz	1.56 Hz
over 160 ms	0.02 Hz	1.56 Hz

### 4.7.2.4 Measuring time

The measuring time is the time at which a weight value is measured.

Enter 10 to 1920ms, default = 320 ms.

Up to 160 ms the measuring time equates the conversion time for the internal ADC.

Over 160 ms the conversion time for the internal ADC remains on 160 ms, but the average weight is presented in the given time.

### 4.7.2.5 Weight & Measure

Select Weight & Measure: 'off' or 'on' = OIML.

If Weight & Measure ('legal for trade') is set to on, parameters are not automatically set to fulfill the requirements! Please refer to the EN 45501 and the Type-approval Certificate.

The Weight & Measure mode has to be set before a calibration is started.

Default is off.



#### 4.7.2.6 Standstill time

The standstill detection requires two parameters to determine the mechanical standstill of the scale. During a defined period of time (Standstill time expressed in multiples of measuring time = Standstill time), the weight value of the scale must be within defined limits (Standstill range). In this case, the scale is in standstill condition.

Entry 'Number of measuring times', permissible range 1 ... 9, default = 1.

#### 4.7.2.7 Standstill range

Permissible range 0.00d to 50.00d, default = 1.00d.

#### 4.7.2.8 Test mode

Determination, whether the test measurement displays *FullScale* (absolute) or the deviation related to *FullScale* (relative) is made. Example: FSD = 3000, result: Should be 3000 for absolute, should be 0 for relative.

Calibration (with/ without weights) is completed with a test measurement and the result is scaled so that FullScale is displayed.

Default = absolute.

#### 4.7.2.9 Standstill time-out

Unless a tare- or Zero-set-command can be executed within time n (n = multiples of measuring times), e.g. because the scale does not fulfill the standstill condition, the transmitter generates a message (e.g. no standstill) and the command is aborted.

Enter the time in multiples of measuring time, 1 to 100 , default = 8.

#### 4.7.2.10 Zero set range

Definition of a +/- range around the calibration zero, within which

- the displayed gross weight can be set to zero (by a corresponding external command), or
- automatic zero tracking is active, see chapter 4.7.2.13

Permissible range: 0.00d to 500.00d, default = 50.00d

#### 4.7.2.11 Zero track range

Permissible range 0.00d to 500.00d, default = 0.25d.

This function is only valid, if Zerotrack repeat is not set to 0!, see chapter 4.7.2.13.

The zero tracking does only work as long as the weight signal is still in the zero set range.

#### 4.7.2.12 Zero track step

Permissible range 0.00d to 10.00d, default= 0.25d

- For W&M applications, the correction must not be above 0.5 d/sec.
- The automatic zero tracking stepwidth must be smaller than the standstill range also for non W&M applications.

This function is only valid, if Zerotrack repeat is not set to 0!, see chapter 4.7.2.13.

#### 4.7.2.13 Zero track repeat

With the scale in standstill condition and the gross weight within the zero set range (Zeraset range), automatic zero tracking is stepwisely done (Zerotrack step) at defined intervals (Zerotrack repeat).

Entry is in multiples of measuring time, permissible range 0 to 100, default = 0 (Automatic zero tracking = off)

- Switching off the automatic zero tracking is by setting Zerotrack repeat to = 0.

### 4.8 Parameter

**ConfigureIt! 3.00 - Sartorius**

File About

ADU **Parameter** Calibrate Analog Output Adaption Status

Analog mode	off	Output 1	Limit 1
Analog range	0...20 mA	Output 2	Limit 2
Analog error	20 mA	Output 3	Limit 3
Analog < 0	4 mA	Input 1	Set tare
Analog > FSD	20 mA	Input 2	Reset tare
Analog value	0,000 mA	Input 3	Set zero
Weight 0/4 mA	0 kg	Limit 1 on	92100 kg
Weight 20 mA	400000 kg	Limit 1 off	92100 kg
Profibus address	10	Limit 2 on	100000 kg
Bus size	8 Bytes	Limit 2 off	100000 kg
Communication	off	Limit 3 on	110000 kg
Baud Rate	19200	Limit 3 off	110000 kg
Access	*		

Upload from PR5210 Download to PR5210

COM2: PR5210 Rel. 02.09.15 Dataset for device type: PR5210/00 - Rel. 02.09 Serialnr.: 4294967294 Weight: -0 kg

#### 4.8.1 Analog output

For PR 5210/00 und PR 5210/10 only.

##### 4.8.1.1 Analog mode

The following selections are possible:

- off** Analog output is not used
- transparent** Analog output is controlled via PLC (e.g. to set the mixer speed)
- gross** Gross weight value is linked to the output
- net** Net weight value is linked to the output (if not tared : gross)

#### 4.8.1.2 Analog range

The following selections are possible:

0-20 mA      Analog output range

4-20 mA      Analog output range

#### 4.8.1.3 Analog error

The following selections are possible:

hold          In case of error the analog output keeps the last value

0 mA          In case of error the analog output goes to 0 mA

4 mA          In case of error the analog output goes to 4 mA

20 mA        In case of error the analog output goes to 20 mA

#### 4.8.1.4 Analog < 0

Behaviour when the weight value is below zero. The following selections are possible:

linear        In case of negative weight the analog output continues (only possible if the output value for zero weight is larger than 0 mA)

0 mA        In case of negative weight the analog output goes to 0 mA

4 mA        In case of negative weight the analog output goes to 4 mA

20 mA       In case of negative weight the analog output goes to 20 mA

#### 4.8.1.5 Analog > FSD

Behaviour when the weight value is above FSD. The following selections are possible:

linear        In case of weight above end of the scale the analog output continues (only possible if the output value for FSD is smaller than 20 mA)

0 mA        In case of weight above end of the scale the analog output goes to 0 mA

4 mA        In case of weight above end of the scale the analog output goes to 4 mA

20 mA       In case of weight above end of the scale the analog output goes to 20 mA

#### 4.8.1.6 Analog value

A fixed analog value can be entered to set the analog output. The analog mode has to be set to: transparent. If the PLC has written the analog value it is displayed in the configuration tool.

#### 4.8.1.7 Weight for 0/4 mA

Enter the weight value at which the analog output shall show 0 mA (or 4 mA, if analog range is set to 4 – 20 mA)

#### 4.8.1.8 Weight for 20 mA

Enter the weight value at which the analog output shall show 20 mA.

#### 4.8.2 Profibus Address

The address on the profibus has to be defined here, valid addresses are in the range 1, 2 ... 126. Default is 10.

### 4.8.3 Bus size

The normal bus size is 8.

10 byte bus size is used for a coded data transfer.

Default is 8.

### 4.8.4 Communication

The serial line could be used for data communication with a remote display (e.g. PR1627 or PR1628) or a SMA data protocol.

Default is 'off'. See chapter 2.5.3.

### 4.8.5 Baudrate

The baudrate can be selected between 300, 600 ..... and 19.200, care has to be taken that the same transfer speed is set at the remote display / terminal. Default is 9600.

See chapter 2.5.3.

### 4.8.6 Access

The access code can consist of 9 decimal digits at maximum. If the access code is set to 0, no check on the code is done. If an access code has been set (has to be entered twice for security reason), data and parameters cannot be altered, without entering the code. As long as the user has got access, he is allowed to change the access code.

Default is 0.

### 4.8.7 Outputs

The following selections are possible per each of the 3 digital outputs:

<b>transparent</b>	The PLC is controlling the output
<b>ADU error</b>	Output is set if ADU is in error state
<b>Limit1</b>	Result of comparison of limit 1 values with actual weight (see chapter 4.8.9)
<b>Limit2</b>	Result of comparison of limit 2 values with actual weight (see chapter 4.8.9)
<b>Limit3</b>	Result of comparison of limit 3 values with actual weight (see chapter 4.8.9)
<b>Tare active</b>	Output is set, if transmitter is in net mode

### 4.8.8 Inputs

The following selections are possible per each of the 3 digital inputs:

<b>none</b>	Input is not used for transmitter control
<b>set zero</b>	The transmitter will be set to zero (see chapter 4.7.2.10). (standstill has to be fulfilled, else standstilltimeout will be given, see chapter 4.7.2.5 , 4.7.2.7 and 4.7.2.9)
<b>set tare</b>	The transmitter will be switched to net mode. (standstill has to be fulfilled, else standstilltimeout will be given, see chapter 4.7.2.5 , 4.7.2.7 and 4.7.2.9)
<b>reset tare</b>	The transmitter will be switched to gross mode

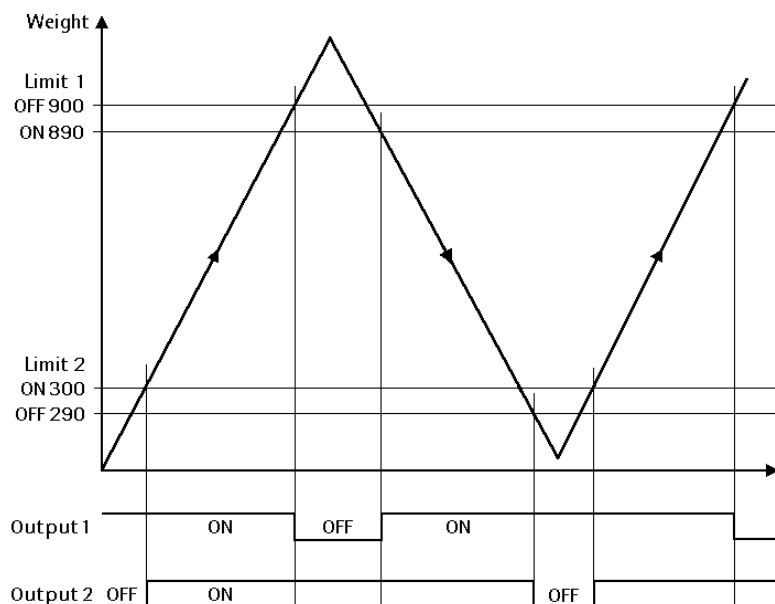
### 4.8.9 Limits

3 pairs of limits can be set to get e.g. information on the filling status of a hopper and to generate a signal.

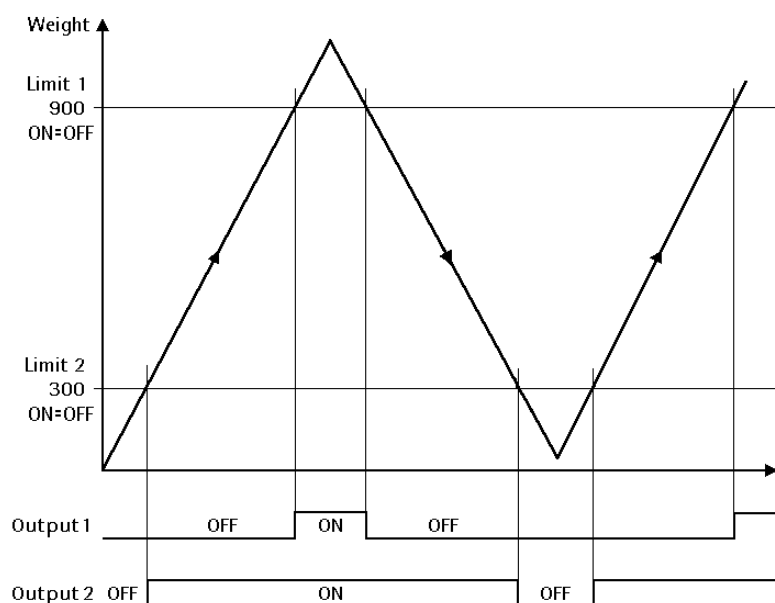
Each limit has got two weight data: The limit on and the limit off value. These two values are compared with the actual weight and in case of coincidence an output signal is generated which can be linked to one of the 3 outputs.

**Example (detection of filling status, low and high limit):**

The output signal of limit1 (linked to output 1) shall switch OFF above 900 kg and switch ON below 890 kg. Limit2 (linked to output 2) shall switch OFF below 290 kg and switch ON above 300 kg. In case of power down (both limit outputs are set to OFF).



If the limit values for ON and OFF are equal, the limit output switches on, if the weight increases over the value and switches off, if the weight decreases below the value.



Default values for Limit1 – Limit 3 are 0 kg.

## 4.9 Calibrate

The screenshot shows the 'ConfigureIt! 3.00 - Sartorius' application window with the 'Calibrate' tab selected. The interface includes the following elements:

- Tabs:** ADU, Parameter, **Calibrate**, Analog Output Adaption, Status.
- Weight:** A text box containing '-0 kg' and a multiplier dropdown set to '\*10'.
- FSD:** A text box containing '3000' and a unit dropdown set to 'kg'.
- Stepwidth:** A text box containing '1'.
- Deadload:** A dropdown menu set to 'by weight' and a 'Set Deadload' button.
- Span:** A dropdown menu set to 'by weight', a text box containing '3000', a unit dropdown set to 'kg', and a 'Set Span' button.
- Buttons:** 'Start Calibration' and 'Modify Calibration' at the bottom right.
- Status Bar:** Displays 'COM2: PR5210 Rel. 02.09.15', 'Dataset for device type: PR5210/00 - Rel. 02.09', 'Serialnr.: 4294967294', and 'Weight: -0 kg'.

Über dieses Menü wird die Kalibrierung des Wägebunktes vorgenommen.

[Start Calibration]	A new calibration will be done.
[Modify Calibration]	An existing calibration should be changed. E.g. only the deadload should be recalibrated..

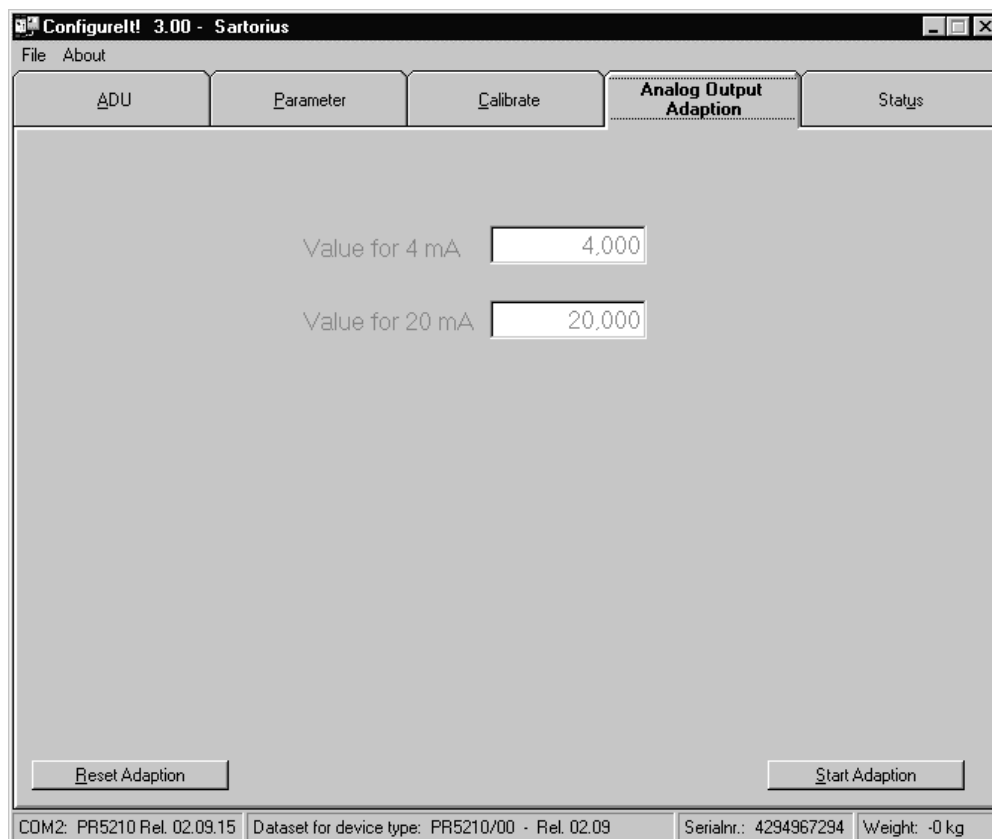
The calibration is done in several steps.

During calibration the display resolution (scale interval) can be increased by factor 10.

1. step: Enter the full scale deflection value (FSD). Maximum weight on the scale.
2. step: Enter the stepwidth.
3. step: Enter the deadload. The deadload is the weight of the empty scale.  
By entering by weight the scale must be completely emptied.. Press [Set deadload].  
By entering by mV/V, enter the mV/V value which corresponds to the weight of the empty scale..
4. step: Enter a calibration weight or the span in mV/V.  
By entering by weight the scale is loaded with a known calibration weight. This weight could be smaller as the full scale deflection value (FSD) and will be entered. Press [Set Span].  
By entering by mV/V, enter the mV/V value for the full span (zero to full scale deflection value (FSD)).
5. step: Save calibration.

## 4.10 Analog Output Adaption

For PR 5210/00 und PR 5210/10 only.



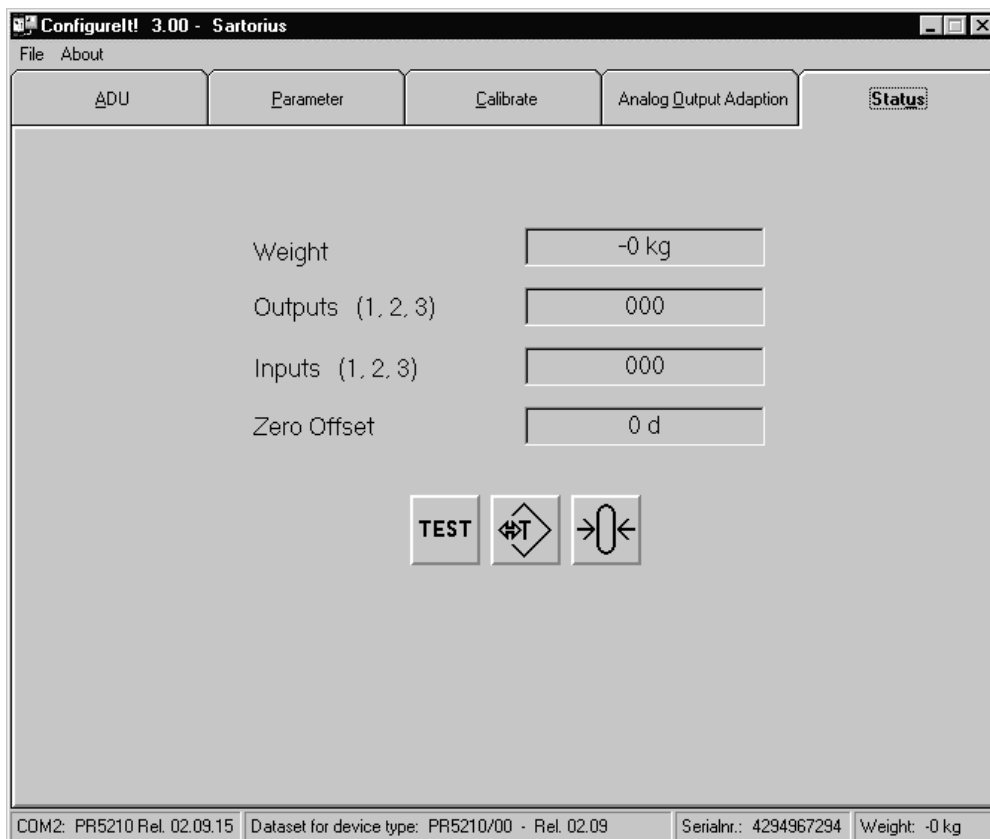
The analog output current is at the receiver side usually routed over a resistor, measured as voltage and the digitalised. The errors of this transfer chain could be compensated at the transmitter side. With this menu the points for 4 and 20 mA could be individually adapted, so that they are precise again at the receiver side.

The adaption is done in several steps:

1. step: Press [Start Adaption].
2. step: The analog output is set to 4mA. Measure the current at the receiver side and enter the value of the measured current. E.g. 4.002mA.. Press [next].
3. step: The analog output is set to 20mA. Measure the current at the receiver side and enter the value of the measured current. E.g. 20.003mA.. Press [next].

The current is now corrected to 4.000mA and 20.000mA.

## 4.11 Status



In this menu the actual status of the weight and the digital inputs and outputs is displayed. The scale could be tared, set to zero and switched to the test mode.

Weight	actual weight
Outputs	Status of the digital outputs
Inputs	Status of the digital inputs
Zero offset	Zero offset from calibrated zero point. By using the set zero function the new zero point differs from the calibrated zero point.



Switch test mode on- and off.

Tare and reset tare

Set zero

### 4.11.1 Analog part weight status

Display	Error 3	Error 7	negative	0 ↓	positive	FSD (SKE) ↓		Error 2	Error 3
				←±0,25d→			←overload→		
Bit	E3	E7	Below0	CZERO			aboveFSD	E2	E3
InZSR	←DeadLd±InsideZSR→								
ADUERR	ADUERR								ADUERR
W&M off	-		-		-		DIMM		
W&M on	-		DIMM		-		DIMM		



## 5 SMA PROTOCOL

### 5.1 General

The Scale Manufacturers Association (SMA) protocol provides an simple access to the scale. Data could be read and functions could be executed.

The RS485 interface is used. The setting of the interface is fixed to 8 bit, no parity and 1 stop bit.

The scale commands are printable ASCII characters and start with a <LF> (0A hex) and end with a <CR> (0D hex).

On each received command the transmitter sends after about 100ms an answer.

### 5.2 Key to Symbols Used

All characters used in this standard are printable ASCII except <CR> <LF> <SPACE> and <ESC>.

< >	Greater then and less then symbols are used to bracket communication fields and identify non-printable ASCII characters. They are never a part of any actual communication message.
<LF>	Line Feed character used for start of data frame (0A hex).
<CR>	Carriage Return character used for end of data frame (0D hex).
'_' <space>	The underscore or <space> are used to denote an ASCII space character (20 Hex).
<ESC>	Escape character used as an abort command (1B hex).
'!'	ASCII exclamation mark character is used for a data communication error. (21 hex).
':'	ASCII colon used as a field delimiter (3A hex)
'_'	ASCII center dash character (2D hex)
'?'	ASCII question mark character is used for unrecognized or unsupported commands (3F hex).
'c'	Command characters all printable ASCII characters.
<s><r><n>	Scale status indicators; ASCII letter characters or space
<m><f>	See chapter '5.4.1 Standard Scale Response Message' for exact status details.
<r><e>	Scale diagnostic indicators; ASCII uppercase characters or space
<c><m>	See chapter '5.4.4 Diagnostics Command Response' for exact status details
<xxxxxx.xxx>	Weight data including minus sign (right justified when needed) and decimal point (if needed). Leading spaces are used with a leading zero to the left of the decimal point if needed. This field is always fixed at 10 characters in length. During some error condition this field is filled with '-' dashes. Examples: <_ _ _ _ 0.000>; <_ _ _ 11.120>; <_ _ _ -1.000>; <- - - - - - - - - ->
<yyyyyy>	Text field of printable ASCII characters used to convey scale information. This field will not exceed a maximum of 25 characters.
<uuu>	Unit-of-Measure abbreviation. This field is always 3 characters long with a trailing space(s) when appropriate.

## 5.3 Scale Command Set

The following section defines the host commands that are used to command the scale to either send information or perform operations as directed.

All scale commands start with a <LF> and end with a <CR> to ensure proper handling by the scale.

Format: <LF>c<CR>

### 5.3.1 Request Displayed Weight

Command: <LF>W<CR>

Response: Scale returns Weight and status information immediately: gross weight if not tared, net weight if tared.

<LF><s><r><n><m><f><xxxxxx.xxx><uuu><CR>

For detail see chapter 5.4.1 Standard Scale Response Message

### 5.3.2 Request High-Resolution Weight

Command: <LF>H<CR>

Response: Scale returns High-resolution (10x) weight and status information immediately: gross weight if not tared, net weight if tared.

Note: the gross/net status indicator <n> will be in lower case during highresolution weight transmission.

<LF><s><r><n><m><f><xxxxxx.xxx><uuu><CR>

For detail see chapter 5.4.1 Standard Scale Response Message

### 5.3.3 Request Displayed Weight after Stability

Command: <LF>P<CR>

Response: Scale returns displayed weight and status information only after scale has achieved a stable weight: gross weight if not tared, net weight if tared.

For this function the standstill condition of the scale must be fulfilled. The maximum wait time for standstill could set with the 'Standstill time-out'. See 4.7.2.9

<LF><s><r><n><m><f><xxxxxx.xxx><uuu><CR>

After the standstill wait time without reaching a standsill, the following respond is send:

<LF><\_><1><n><\_><f><-----><\_\_><CR>

For detail see chapter 5.4.1 Standard Scale Response Message

See chapter 4.7.2.9 Standstill time-out

### 5.3.4 Request Scale to Zero

Command: <LF>Z<CR>

Response: Scale attempts to zero itself and reports zero status in the <s> status indicator.

For this function the standstill condition of the scale must be fulfilled. The maximum wait time for standstill could set with the 'Standstill time-out'. See 4.7.2.9

<LF><Z><r><n><m><f><xxxxxx.xxx><uuu><CR>

For detail see chapter 5.4.1 Standard Scale Response Message

If the scale is not inside the zero set range, an error message is generated.

### 5.3.5 Request Scale to Tare

Command: <LF>T<CR>

Response: Scale attempts to tare itself using the weight on the scale display and reports the tare status in the <s> and <n> status indicators.

For this function the standstill condition of the scale must be fulfilled. The maximum wait time for standstill could set with the 'Standstill time-out'. See 4.7.2.9

<LF><s><r><N><m><f><xxxxxx.xxx><uuu><CR>

For detail see chapter 5.4.1 Standard Scale Response Message

### 5.3.6 Set Scale Tare Weight

Command: <LF>T<xxxxxx.xxx><CR>

Response: Scale attempts to take the <xxxxxx.xxx> data as the tare weight and reports the tare status in the <s> and <n> status indicators.

<LF><s><r><N><m><f><xxxxxx.xxx><uuu><CR>

For detail see chapter 5.4.1 Standard Scale Response Message

### 5.3.7 Return Tare Weight

Command: <LF>M<CR>

Response: Scale returns tare weight stored in scale Memory and identifies the weight as tare in the <n> status indicator.

<LF><s><r><T><m><f><xxxxxx.xxx><uuu><CR>

For detail see chapter 5.4.1 Standard Scale Response Message

### 5.3.8 Clear Scale Tare Weight

Command: <LF>C<CR>

Response: Scale Clears tare weight and reports the tare status in the <n> status indicator. The tare of scale is reset.

<LF><s><r><G><m><f><xxxxxx.xxx><uuu><CR>

For detail see chapter 5.4.1 Standard Scale Response Message

### 5.3.9 Invoke Scale Diagnostics

Command: <LF>D<CR>

Response: The scale runs scale diagnostics and sends a diagnostic response message with the results of the tests.

<LF><r><e><c><m><CR>

For detail see chapter 5.4.4 Diagnostics Command Response

### 5.3.10 About Scale First Line

Command: <LF>A<CR>

Response: The scale will send the first line of the About scale data.

<LF><SMA>:<yyyyyy><CR>

For detail see chapter 5.4.5 About 'A' and 'B' Command Response

### 5.3.11 About Scale Scroll

Command: <LF>B<CR>

Response: The scale will send the rest of the ABout the scale data.

<LF><MFG>:<yyyyyy><CR>

For detail see chapter 5.4.5 About 'A' and 'B' Command Response

### 5.3.12 Scale Information

Command: <LF>I<CR>

Response: The scale will send the first line of the scale Information data.

<LF><SMA>:<yyyyyy><CR>

For detail see chapter 5.4.6 Scale Information 'I' and 'N' Command Response

### 5.3.13 Scale Information Scroll

Command: <LF>N<CR>

Response: The scale will send the rest of the scale INformation data.

<LF><TYP>:<yyyyyy><CR>

For detail see chapter 5.4.6 Scale Information 'I' and 'N' Command Response

### 5.3.14 Abort Command

Command: <ESC>

Response: This is the only command that the scale receives which does not follow the <LF>c<CR> protocol and does not have a response. The <ESC> character can be detected at any time and any command is aborted.

### 5.3.15 Repeat Displayed Weight Continuously

This is a command with Unsolicited Response. It defines a host command that is not considered strictly command/ response. This is because the scale will respond continuously as commanded to do so by the host.

Command: <LF>R<CR>

Response: Scale Repeats weight and status information continuously until another command is received.

<LF><s><r><n><m><f><xxxxxx.xxx><uuu><CR>

For detail see chapter 5.4.1 Standard Scale Response Message

Depending on the used baud rate, the following approximately repetition times of response messages are possible:

19200 Bd   ⇒ 100ms

9600 Bd    ⇒ 110ms

4800 Bd    ⇒ 170ms

## 5.4 Scale Response Messages

This section details each scale response to host-scale commands. Each response has a "fixed field" data format. Every response is deterministic with only a scale communication error being the exception. The host can parse the scale response message with explicit rules because each field of each response message is in a fixed position format.

### 5.4.1 Standard Scale Response Message

Most of the host commands are responded to in the following message format.

The only host commands that do not are the: Diagnostic, ABout and INformation commands

<LF> <s> <r> <n> <m> <f> <xxxxxx.xxx> <uuu> <CR>

where:

<LF>	Start of response message	
<s>	scale status	definition / example
	'Z'	Center of Zero <xxxxxx.xxx>= 0.000
	'O'	Over Capacity <xxxxxx.xxx>= +weight
	'U'	Under Capacity <xxxxxx.xxx>= -weight
	'E'	Zero Error (clears when condition clears)
	'T'	Tare Error (clears after being read)
	<space>	None of the above conditions
		Note: For 'E', 'I', 'T' error conditions
		<xxxxxx.xxx>= ----- (center dashes)
		and 'Z', 'O', 'U' are overridden.
<r>	range	('1', '2', '3', etc.) always '1' for single range
<n>	gross/net	status
	'G'	Gross normal weight
	'T'	Tare weight (in response to 'M' command)
	'N'	Net normal weight
	'g'	gross weight in high-resolution
	'n'	net weight in high-resolution
<m>	motion status	
	'M'	scale in Motion
	<space>	scale not in Motion
<f>	future reserved for future or custom use	
<xxxxxx.xxx>	weight data	this field is fixed at 10 characters
<uuu>	Unit of Measure	
<CR>	End of response message	

Examples:

Command	Response
<LF>W<CR>	<LF> <_> <1> <G> <_> <_> <_ _ _ _ 5.025> <lb_> <CR>
<LF>W<CR>	<LF> <_> <1> <N> <_> <_> <_ _ _ _ 100000> <lb_> <CR>
<LF>H<CR>	<LF> <_> <1> <g> <_> <_> <_ _ _ _ 5.0025> <lb_> <CR>
<LF>Z<CR>	<LF> <Z> <1> <G> <_> <_> <_ _ _ _ 0.000> <lb_> <CR>

```

<LF>R<CR>      <LF> <_> <1> <G> <_> <_> <_ _ _ _ 7.025> <kg_> <CR>
                  <LF> <_> <1> <G> <M> <_> <_> <_ _ _ _ 7.650> <kg_> <CR>
                  ... repeat...
                  <LF> <_> <1> <G> <_> <_> <_ _ _ _ 7.650> <kg_> <CR>
                  The scale will repeat weight until next command is received.

```

### 5.4.2 Unrecognized Command Response

Any host command that the scale does not recognize either because it is not supported by the implemented SMA level or because it is simply not a recognized command will be responded to by the scale with an ASCII '?' question mark.

```
<LF> ? <CR>
```

### 5.4.3 Communication Error Response

Any host command that the scale does not recognize due to a communication error will be responded to by the scale with an ASCII '!' exclamation mark. This would include a parity error (if used) or data framing error.

```
<LF> ! <CR>
```

### 5.4.4 Diagnostics Command Response

When the scale is commanded to perform internal diagnostics, a the test is performed and the following response is returned with the appropriate error indicators set or cleared.

```
<LF> <r> <e> <c> <m> <CR>
```

where:

```

<LF>      Start of diagnostic response
<r>       'R' = RAM or ROM error, '_' = OK,
<e>       'E' = EEPROM error, '_' = OK
<c>       'C' = Calibration error, '_' = OK
<m>       Always: '_' = OK
<CR>     End of diagnostic message

```

Example: With no errors!

```

Command      Response
<LF>D<CR>    <LF> <_> <_> <_> <_> <CR>

```

### 5.4.5 About 'A' and 'B' Command Response

Response Format for 'About' commands A, B (variable length):

```
<LF><xxx>:<yyyyyy><CR>
```

where:

```

<LF>      Start of About response
<xxx>     About field descriptor is fixed at 3 characters, is left justified, filled with blanks on the
           right side.
           Following fields are send:
           "SMA" compliance level/revision
           (response of 'A' command)
           "MFG" manufacturer
           (response of 1st 'B' command)

```

	"MOD" product model identification (response of 2nd 'B' command)
	"REV" software revision (response of 3rd 'B' command)
	"SN_" serial number (response of 4th 'B' command)
	"END" this is always the last About field (response of the last 'B' command)
':'	Separator between field name and field contents.
<yyyyyy>	Data field contain 25 characters maximum. SMA field contents <level/revision> where: level= (1, 2, etc.); revision= (1.0, 1.1, etc.)
<CR>	End of About response

Example:

Command	Response
<LF> A <CR>	<LF>SMA:1/1.0 <CR>
<LF> B <CR>	<LF>MFG:Sartorius <CR>
<LF> B <CR>	<LF>MOD:PR5210 <CR>
<LF> B <CR>	<LF>REV:02.09.9 <CR>
<LF> B <CR>	<LF>SN_:148388723 <CR>
<LF> B <CR>	<LF>END: <CR>

Note: if the host should ask for additional 'B' status then.

<LF> B <CR>      <LF> ? <CR>

#### 5.4.6 Scale Information 'I' and 'N' Command Response

Response Format for Information commands 'I', 'N' (variable length):

<LF><xxx>:<yyyyyy><CR>

where:

<LF>              Start of Information response

<xxx>            About field descriptor is fixed at 3 characters, is left justified, filled with blanks on the right side.

Following fields are required:

"SMA"            compliance level/revision  
(response of 'I' command)

"TYP"            Scale type: 'S'= Scale  
(response 1st 'N' command)

"CAP"            capacity of range, unit-of-measure, count-by and decimal position,  
each delimited by ':'

where: yyyyyy= uu:c:c:n:d

uuu= unit-of-measure

c.c= full scale capacity of this range  
(may include decimal point)

n= least significant count-by digit  
(e.g. 1, 2, 5,10,20...) no decimal point

d= decimal point position

'0'= none

'1'= xxxx.x

'2'= xxx.xx

'3'= xx.xxx .. etc.

	(response of 2nd 'N' command)
"CMD"	supported SMA commands
	(response of 3rd 'N' command)
"END"	this is the last INformation field
	(response of the last 'N' command)
','	Separator between field name and field contents.
<yyyyyy>	About fields contain 25 characters maximum. SMA field contents <level/revision> where: level= (1, 2, etc.); revision= (1.0, 1.1, etc.)
<CR>	End of Information response

Example: 6000kg x 1kg platform scale

Command	Response
<LF> I <CR>	<LF>SMA:2/1.0 <CR>
<LF>N<CR>	<LF>TYP:S <CR>
<LF>N<CR>	<LF>CAP:kg_:6000:1:0 <CR>
<LF>N<CR>	<LF>CMD:HPTMCR <CR>
<LF>N<CR>	<LF>END: <CR>

## 5.5 Communication Error Handling

If a communication error is detected by the scale either through parity bit (optional) or a data framing error the scale will respond with an ASCII '!'. The only other error mechanism that has been incorporated into the scale is the unrecognized or unsupported command response message, in this case the scale responds with an ASCII '?'. Upon error discovery the host can then decide which course of action to take to re-affirm or re-establish proper communications with the scale.



## 6 PROFIBUS INTERFACE

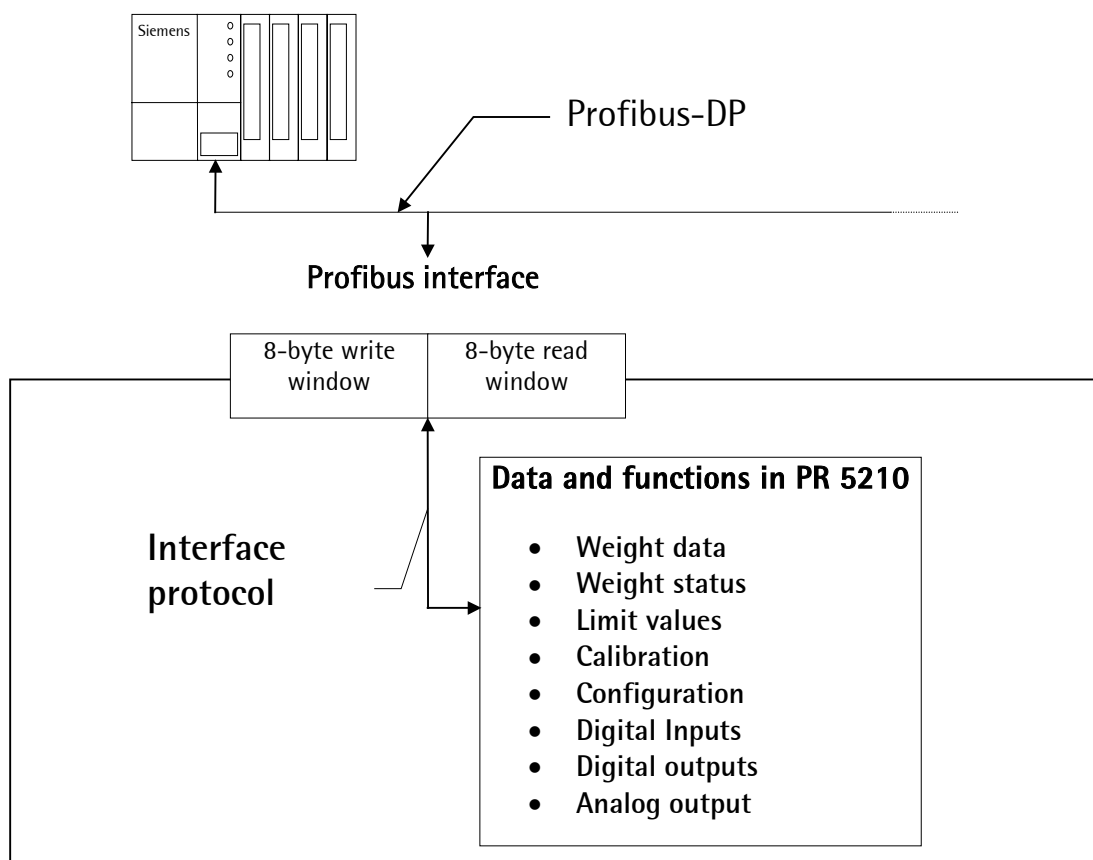
For PR 5210/00 and PR 5210/11 only.

### 6.1 Profibus interface protocol

The interface works with an 8-byte write window and an 8-byte read window. The profibus exchanges its data cyclically from each slave. This means: in each cycle, 8 bytes are written and 8 bytes are read also if the data contents are unchanged.

The profibus protocol ensures the data transport between profibus master and the 2\*8-byte data windows.

The interface protocol is below the profibus level and manages the access to a large variety of data via the eight byte wide read and write windows.



### 6.1.1 Write window (Input area)

In this window, data are transmitted from master to slave (PR 5210).

The first four bytes are used only for writing a data value. The register number is written in byte 5.

Bytes 6 and 7 contain bits in direct access independent of the write data.

After a 0-1 transition of the relevant bit, the command is executed.

Byte 0	Write data: MSB
Byte 1	"
Byte 2	"
Byte 3	Write data: LSB
Byte 4	Read_Value_Select
Byte 5	Write_Value_Select
Byte 6	Direct control bits
Byte 7	Direct control bits

### 6.1.2 Read window (Output area)

In this window, data are transmitted from slave (PR 5210) to master.

The first four bytes are used for reading a data value.

The register number is mirrored by the write window in byte 4, when the data are available.

Bytes 5, 6 and 7 contain status bits independent of the read data.

Byte 0	Read data: MSB
Byte 1	"
Byte 2	"
Byte 3	Read data: LSB
Byte 4	Read_Value_Selected
Byte 5	General system bits: - Write_Active - Power_fail - ADU_Error ....
Byte 6	Status bits
Byte 7	Status bits

### 6.1.3 Data reading and writing

The number of data exceeds the size of the write/read windows by far. Therefore, the data are addressed with *Write\_Value\_Select* and *Read\_Value\_Select*. For this purpose, the first six bytes of the write window and the first five bytes of the read window are required. Thus the master can describe data in PR 5210: e.g. a limit value shall be set to 100kg. Weight values or other data can also be read out of the PR 5210 by the master. For this, the write and the read window are always required. Thereby, safe data exchange is ensured by a write and a read procedure.

For reading status bits and writing direct control bits, however, no procedure is required. The general system bits and the status bits are always present and need not be requested. The direct control bits are also continuously available.

#### Procedure for data reading:

1. Write the register number into byte 4 of the write window (e.g. net weight) as a Read\_Value\_Select.
2. Wait, until in the byte 4 of the read window, the Read\_Value\_Selected is equal to the Read\_Value\_Select in the byte 4 of the write window.
3. Now, the value is available in byte 0 to 3.

#### Procedure for writing data:

1. Wait, until *Write\_Active* = 0 in the read window (ready to receive new data).
2. Write value in byte 0 to 3.
3. Write register number in byte 5 (*Write\_Value\_Select*)
4. Wait, until *Write\_Active* = 1 (acknowledges data reception)
5. Write 0 into byte 5 (*Write\_Value\_Select*) -> *Write\_Active* will go to 0.

## 6.1.4 Description of I/O area (read/ write window)

### 6.1.4.1 Output area

Data are transferred from PR 5210 to the master via the output area. The PR 5210 has writing access, the master has reading access.

Byte	Name								Description
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	Read_Value (MSB)								e.g. gross value
1	...								"
2	...								"
3	Read_Value (LSB)								"
4	Read_Value_Selected								e.g. gross
5	Write Active	Power Fail	Out 3	Out 2	Out 1	Limit 3	Limit 2	Limit 1	Status
6	Cmd Busy	Cmd Error	Inp.3	Inp.2	Inp.1	Tare Active	Cal Changed	Test Active	Command status
7	Dimmed	Stand-Still	Inside ZSR	Center Zero	Below Zero	Over-load	Above FSD	Adu Error	Transmitter status

Variable	Function
Read_Value	The weight value is transferred as 32bit binary number with sign. Datatype: DINT
Read_Value_Selected	Acknowledgement of transferred value.
Write_Active	The function selected with Write_Value_Select is executed once. This bit is erased if Write_Value_Select is set to 0.
Power_Fail	Will be set at power on of the transmitter. Will be reset at 0→1 transition of ResPower.
Cmd_Busy	The transmitter is busy with executing a command. (e.g. the transmitter got a taring command and is waiting for StandStill)
Cmd_Error	The transmitter has interrupted the execution of a command (e.g. within the defined StandstillTimeout duration StandStill could not be reached) The error number can be read at Lasterror. It is only set if an action is executed!
Tare_Active	The transmitter has been tared.
Cal_Changed	The transmitter is/has been configured. If this bit is 1, the scale parameters (Expo/Unit/Step) have to be read again. Will be set after Power on and reset after reading of FSD .
Test_Active	The transmitter is executing the ADU-Test. The weight value read is not the gross value but the testvalue.
Dimmed	Above-FSD or Below-Zero
StandStill	The transmitter is in stand still
InsideZSR	The weight value is within zero set range
CenterZero	The weight value is within center zero ( $ABS(Gross) \leq 0,25d$ )
BelowZero	The weight value is negative ( $Gross < -0,25d$ )
Overload	The weight value has exceeded the measuring range, no valid weight data are given ( $Gross > FSD + Overload$ )
AboveFSD	The weight value has exceeded FSD, but is still within $FSD + Overload$ . ( $Gross \leq FSD + Overload$ )
AduError	Error in AD conversion.(Details are available at register 1, Read_Value_Select = 1)

### 6.1.4.2 Input area

Data are transferred via the input area from the master to the PR 5210 (slave).

The master has got writing access, the slave has got reading access.

Byte	Name								Description
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
0	Write_Value (MSB)								e.g. limit value
1	...								"
2	...								"
3	Write_Value (LSB)								"
4	Read_Value_Select								e.g. Gross
5	Write_Value_Select								write: Limit 1 On
6	free	free	free	free	free	outp. 3	outp. 2	outp. 1	digital outputs
7	Get FixTare	Set FixTare	Res Power	Res Test	Set Test	Res Tare	Set Tare	Set Zero	<b>Transmitter Control Byte,</b> reaction on 0->1 transition

The Transmitter control byte is triggering with a set bit the related action in the transmitter.

After execution of the action the bit should be reset.

Variable	Function
Write_Value	The weight value is transferred as 32bit binary number with sign. Datatype: DINT
Read_Value_Select	To select the value, which has to be sent from the transmitter.
Write_Value_Select	To select the function to be carried out by the transmitter.
GetFixTare	Gross will be copied to the fixtare memory
SetFixTare	Taring is done with the value stored in the fixtare memory
ResPower	The bit Power_Fail in the output area will be erased
ResTest	The Test mode will be finished
SetTest	The Test mode will be started. Now the test number is shown, by reading the gross weight.
ResTare	Tare will be reset
SetTare	The transmitter will be tared
SetZero	The transmitter will be set to zero

## 6.1.5 Register read and write via Profibus

### 6.1.5.1 Data read: Read\_Value, Read\_Value\_Select, Read\_Value\_Selected

If the master shall read from the transmitter, then the register number is transferred in `Read_Value_Select` in the input area. The result will be indicated in the output area with `Read_Value_Selected`.

Master	Transmitter
Write register no. to <code>Read_Value_Select</code>	
	Write selected register in <code>Read_Value</code>
	Copy <code>Read_Value_Select</code> to <code>Read_Value_Selected</code>
Wait until <code>Read_Value_Selected = Read_Value_Select</code>	
Read <code>Read_Value</code>	

### 6.1.5.2 Write data: Write\_Value, Write\_Value\_Select, Write\_Active

If the master shall write to the transmitter, then the required action will be transferred with `Write_Value_Select` together with the data in the input area. The execution will be indicated with the bit `Write_Active` in the output area.

Master action	Transmitter action
Write value in <code>Write_Value</code>	
Register number in <code>Write_Value_Select</code>	
	Write <code>Write_Value</code> to selected register
	Set bit <code>Write_Active</code>
Wait until <code>Write_Active</code> is set	
Write 0 in <code>Write_Value_Select</code>	
	Reset bit <code>Write_Active</code>

### 6.1.5.3 Set / reset bit: Write\_Value\_Select, Write\_Active

Single bits can be set or reset directly with `Write_Value_Select`.

To set, the bit number (80.. 127) is written to `Write_Value_Select`.

To reset, the bit number + 128 (208..255) is written to `Write_Value_Select`.

The `Write_Value` itself is not relevant.

Master	Transmitter
Register number in <code>Write_Value_Select</code>	
	Write <code>Write_Value</code> to selected register
	Set bit <code>Write_Active</code>
Wait until <code>Write_Active</code> is set	
Write 0 in <code>Write_Value_Select</code>	
	Reset bit <code>Write_Active</code>

#### 6.1.5.4 Read bit

Reading of single bits is only possible by reading a register. The sequence is the same as in chapter 6.1.5.1.

#### 6.1.5.5 Transmitter Control Byte

Some transmitter functions can be executed by directly setting bits in the input area.

Master	Transmitter
Set bits in TransmitterControl Byte	
	Action is executed
Reset bits in TransmitterControl Byte	

#### 6.1.5.6 Waiting for result of action

If an action which takes longer time has been triggered, the end of execution can be waited for after the triggering (see chapter 6.1.5.3 and chapter 6.1.5.5).

Master	Transmitter
Set bit as in chapter 6.1.5.3 or 6.1.5.5	Acknowledges set-bit as in chapter 6.1.5.3
	Set bit CmdBusy
	Action is executed
	If error occurs: Set bit CmdError and byte LastError
	Reset bit CmdBusy
Wait until CmdBusy is reset	
Test bit CmdError: If set, read LastError (see chapter 6.1.5.1)	

This is valid for taring, standstill, zero setting, calibrating, reading and writing of parameters via Profibus

### 6.1.5.7 Example: Read out of gross value

The Master writes a 8 to the 'Read\_Value\_Select' (Byte 4) of the input area.

#### Input area

Byte	Value								Description
0									
1									
2									
3									
4	8								gross
5									
6									
7									

The Master waits until a 8 in 'Read\_Value\_Selected' (Byte 4) is reflected of the output area.

#### Output area

Byte	Value								Description
0	00								gross value
1	00								"
2	4								"
3	D2								"
4	8								gross request detected
5									Status
6								<b>Test Active</b>	Command status
7		Stand-Still	Inside ZSR	Center Zero	Below Zero	<b>Over-load</b>	Above FSD	<b>Adu Error</b>	Transmitter-Status

The gross value (hex:000004D2 <=> 1234) could be read out from Bytes 0...3. If the status-Bits 'Overload', 'Test Active' or 'Adu Error' is set, the read out value is not valid.

Negative values are given in two's complement.

## 6.1.6 Parameter read and write via Profibus

### 6.1.6.1 Parameter writing

The following is done subsequently:

Master	Transmitter
Write parameter value in register 20 (method see chapter 6.1.5.2)	The value is stored intermediately
Write parameter index in register 21 (method see chapter 6.1.5.2)	The value is stored intermediately.
Set bit 123, set parameter (method see chapter 6.1.5.3)	The parameter is taken over. The bit is reset immediately

### 6.1.6.2 Parameter reading

The following is done subsequently:

Master	Transmitter
Write parameter index in register 21 (method see chapter 6.1.5.2)	The value is stored intermediately
Set Bit 124, get parameter (method see chapter 6.1.5.3)	The parameter is copied to register 20. The bit is reset immediately
Read parameter value in register 20 (method see chapter 6.1.5.1)	

### 6.1.6.3 Calibration procedure

The calibration is controlled by writing parameters subsequently:

Master	Transmitter
Set parameter P20 to 1 (start Cal) (method see chapter 6.1.6.1)	The CAL switch is tested, the calibration procedure is started. If the CAL switch is 'locked', an error code is stored in <code>LastError</code> , see chapter 6.2.5.
Proceed with calibration (parameter see chapter 6.3.2) (method see chapter 6.1.6.1)	<code>CmdBusy</code> and <code>CmdError</code> as in chapter 6.1.5.6 If a parameter is not within the valid value range, an error code is stored in <code>LastError</code> . The cause can be detected by reading register 4, byte 3.
Set parameter P20 to 3 (SaveAndExit) (method see chapter 6.1.6.1)	Data are stored in the non-volatile EARAM
Set parameter P20 to 4 (UndoAndQuitCal) (method see chapter 6.1.6.1)	All modified data are erased, continue with the previously stored data.



#### 6.1.6.4 Reset transmitter to default (factory) data

Master	Transmitter
Set parameter P20 to 1 (Start Cal) (method see chapter 6.1.6.1)	The CAL switch is tested, if the switch is not in the 'locked' position, the procedure is started.
Set parameter P20 to 2 (default = factory data) (method see chapter 6.1.6.1)	Default data are taken as calibration data. All ADU data will be reset. See chapter 4.7
Set parameter P20 to 3 (SaveAndExit) (method see chapter 6.1.6.1)	Data are stored in the non-volatile EARAM

## 6.2 Profibus Register

### 6.2.1 Register 0: IO-Status bits for reading

(dynamic status), only reading is allowed

	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
byte 0						Input 3	Input 2	Input 1
byte 1						Output 3	Output 2	Output 1
byte 2						Limit 3	Limit 2	Limit 1
byte 3								

### 6.2.2 Register 1: Scale status

(dynamic status), only reading is allowed

	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
byte 0	DIM	STND	INZSR	CZERO	BELOW0	OVL	>FSD	ADUERR
byte 1						E1	E3	E7
byte 2						PowerFail	ActionActiv	CmdError
byte 3						TareActiv	CalChanged	TestActiv

Byte 0 corresponds to byte 7 in the output area, for weight errors see table in chapter 4.11.1 Analog part weight status.

ADUERR	Error in analog conversion/ load cell circuitry (OR-function of bits E1,E3,E7)
>FSD	gross value larger FSD (german SKE), scale range exceeded
OVL	scale overloaded, gross > FSD + Overload, Error 2
BELOW0	Gross weight negative (< 0-1/4 d)
CZERO	Center of zero, weight within 1/4d range
INZSR	Gross weight is within zeroset range
STND	Scale is in stand still
DIM	Gross weight has exceeded the scale range (0-1/4 d > weight > FSD+overload), (OR-function of bits BELOW0, OVL).
E7	Measuring signal is negative (inverse conversion), Error 7
E6	Sense voltage missing / too low, Error 6
E3	Measuring signal is > 36mV (no end of conversion), Error 3
E1	Arithmetic error (overflow), Error 1
CmdError	Error during execution (cmdError), e.g. action 'taring' is not executed as there is no standstill. In LastError (register 4) the error is specified. With ResetError register 89 / 89+128 or register 121 the bit is reset again.
ActionActiv	Action will be executed, is still processed
PowerFail	Power failure, will be set at each power-on. With bit ResetPWF register 85 / 85+128 or register 117) 'Power failure reset' the bit PowerFail is reset.
TestActiv	Analog test is aktive
CalChanged	Calibration mode is active or calibration data have been changed.
	FSD has to be read again to reset this bit.
TareActiv	Transmitter has been tared

### 6.2.3 Register 2: Status of state controlled action bits

Only reading is allowed, the status of signals is shown

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2	87: GetFixTare	86: SetFixTare	85: ResetPWF	84: ResetTest	83: SetTest	82: ResetTare	81: SetTare	80: SetZero
Byte 3			93: SaveConfig	92: GetParam	91: SetParam	90: SaveProcess	89: ResetError	

### 6.2.4 Register 3: Status of transition controlled action bits

Only reading is allowed, it is always 0

## 6.2.5 Register 4: Calibration information, error byte

Only reading is allowed

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	EXPO							
Byte 1	UNIT							
Byte 2	STEP							
Byte 3	LASTERROR							

**EXPO** One byte for position of decimal comma/point (Exponent), content in decimal representation 0 ... 255.

0 = 0000

1 = 000.0

2 = 00.00

3 = 0.000

**UNIT** One byte for the weight unit, content in decimal representation: 0 ...255

1 = mg milligram      2 = g    gram

3 = kg kilogram      4 = t    ton

5 = lb pound      6 = l    liter

**STEP** One byte for the stepwidth, content in decimal representation: 0 ...255

1 = stepwidth '1'      2 = stepwidth '2'      5 = stepwidth '5'

10 = stepwidth '10'      20 = stepwidth '20'      50 = stepwidth '50'

**LASTERROR** Last Error Byte, see also bit CmdError ,number of 'last error':

31 = stand still not reached (e.g. at taring, calibrating)

33 = negative weight at taring and W&M on

35 = weight exceeds allowed range

40 = CAL switch 'locked'

41 = transmitter not in calibration mode

42 = calibration active, transmitter is in calibration mode

46 = tare active (can occur at start calibration)

47 = zero set not executed, weight is not within zero set range

50 = invalid step width

51 = not enough counts/d

53 = FSD < calibration weight

55 = arithmetic overflow

57 = entered unit does not comply with FSD weight unit

58 = span above maximum

59 = Fullscale cannot be divided by stepwidth

30 = weight smaller than deadload

102, 103 = EARM error (command SaveProcess, register 2)

104 = wrong access code

106 = baudrate of remote display cannot be altered

107 = no standstill at Getfixtare

108 = parameter not valid (at entering via PLC)

## 6.2.6 Register 5: Transmitter type and version

Only reading is allowed

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	TYPE MSB							
Byte 1	TYPE LSB							
Byte 2	MAINVERSION							
Byte 3	SUBVERSION							

e.g. 5210 Rel 1.23 = 52100123<sub>hex</sub>

## 6.2.7 Register 6: Board number

Only reading is allowed

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Board number MSB							
Byte 1	""							
Byte 2	""							
Byte 3	Board number LSB							

e.g. 148388723 = 08D83B73<sub>hex</sub>

## 6.2.8 Register 7: (Reserved)

## 6.2.9 Register 8 ...14: Weight data

Only reading is allowed

Gross, net, tare

Are stored as DINT-fixed point. The real datavalue is derived from DINT and EXPO as follows:

$$\text{Value}_{\text{Real}} = \text{Readout}_{\text{DINT}} * 10^{(-\text{EXPO})}$$

Register 8	Actual gross value
Register 9	Actual net value, if tared, else gross
Register10	Actual tare value, if tared, else 0
Register11	Reserved
Register12	Reserved
Register13	Reserved
Register14	Full scale deflection FSD
Register15	Reserved (free)

## 6.2.10 Register 20 and 21: Parameter channel (read/write)

Register 20	Parameter value
Register 21	Parameter index

**6.2.11 Register 22 ... 27: Limit values (read/write)**

Register 22	limit 1 on
Register 23	limit 1 off
Register 24	limit 2 on
Register 25	limit 2 off
Register 26	limit 3 on
Register 27	limit 3 off

**6.2.12 Register 30: Analog output (read/write)**

Register 30	Fixed value for analog output. Value(num) 0... 40000 entspricht 20mA
-------------	--

**6.2.13 Register 31: Fixtare (read/write)**

Register 31	Fixed value for fixtare, see also SetFixTare, GetFixTare ( see chapter 6.2.3)
-------------	--

**6.2.14 Register 80 ... 93: Action bits state controlled (write)**

Set bits, see chapter 6.1.5.3

Only setting and resetting of single bits are possible.

If a bit is changed from 0 to 1, the corresponding action is started. After execution of the command the bit has to be reset. Application : Master is writing cyclically.

The bit is set with the shown number as Write\_Value\_Select (See chapter 6.1.5.3), with the shown number+128 the bit is reset.

Register 80	SetZero	Set gross to zero
Register 81	SetTare	Execute taring
Register 82	ResetTare	Reset tare
Register 83	SetTest	Start ADU test
Register 84	ResetTest	Terminate ADU test
Register 85	ResetPwf	Reset bit PowerFail (register 1, bit has been set after power-on)
Register 86	SetFixTare	Taring with weight in numerical address D 31 'Fixtare'
Register 87	GetFixTare	The actual gross weight is copied to the numerical address D31
Register 89	ResetError	The error bit CmdError will be reset
Register 90	SaveProcess	The process data will be stored to EARAM limit values (register 22...27) fixed analog output value (register 30) fixtare (register 31)
Register 91	SetParam	Write parameter (value R20 to parameter R21)
Register 92	GetParam	Read parameter (parameter R21 to R20)
Register 93	SaveConfig	The configuration parameter will be stored to EARAM analog output (parameter 1...3) I/O parameter (parameter 4, 6) input/output configuration (parameter 5, 7) access control parameter (parameter 99)

### 6.2.15 Register 112 ... 125: Action bits transition controlled (write)

Set bits, see chapter 6.1.5.3

As soon as the bit is set, it is reset internally and the action is executed, it is transition triggered (for writing once).

The bit is set with the shown number as `Write_Value_Select` (See chapter 6.1.5.3).

Register 112	SetZero
Register 113	SetTare
Register 114	ResetTare
Register 115	SetTest
Register 116	ResetTest
Register 117	ResetPwf
Register 118	SetFixTare
Register 119	GetFixTare
Register 121	ResetError
Register 122	SaveProcess
Register 123	SetParam
Register 124	GetParam
Register 125	SaveConfig

To prevent the EARAM from being written too often, the writing rate for taring and zero setting should not be shorter than 15 seconds, for configuration data not shorter than 5 minutes.

## 6.3 Profibus Parameter Numbers

With the following parameters all configuration and calibration data can be written to or read from the transmitter.

All other parameters belong to the class extended configuration, which can be found on separate pages.

Values which are marked with **(factory setting)** represent the factory delivery data.

A parameter uses always 4 bytes (format DINT).

### 6.3.1 Configuration parameter

#### 6.3.1.1 Parameter 1: Analog output

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2	Range				Output mode			
Byte 3			ADU in error state		ADU below zero		ADU above FSD	

Analog output			
Description	Range / signal	factory setting	
Output mode	off, (reg. 30)*, gross, net	0, 1, 8, 9	0
Analog range	0...20 mA	0	1
	4...20 mA	1	
ADU in error state**	hold	0	1
	0 mA	1	
	4 mA	2	
	20 mA	3	
ADU below zero	Linear ***	0	0
	0 mA	1	
	4 mA	2	
	20 mA	3	
ADU above FSD	Linear***	0	3
	0 mA	1	
	4 mA	2	
	20 mA	3	

\* Output value 1 means that the value contained in register 30 is written to the analog output.

\*\* The ADU error state is only valid if output value is set to gross (8) or net (9).

\*\*\* The linear selection can be used to get a proportional output signal outside the range 0 to FSD.

#### 6.3.1.2 Parameter 2: Scaling weight value for 0/4 mA output

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	WEIGHT MSB							
Byte 1	""							
Byte 2	""							
Byte 3	WEIGHT LSB							

The WEIGHT value is stored at which the analog output is giving 0 or 4 mA.

Default = 0



**6.3.1.3 Parameter 3: Scaling weight value for 20 mA output**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	WEIGHT MSB							
Byte 1	""							
Byte 2	""							
Byte 3	WEIGHT LSB							

The weight value is stored at which the analog output is giving 20 mA.  
Default = 3000

**6.3.1.4 Parameter 4: Communication**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3							COM 2 <sup>1</sup>	COM 2 <sup>0</sup>

The transmission to a remote terminal (e.g. PR 1628) or the SMA protocol can be switched on or off.  
COM = 0: switched off,  
COM = 1: a remote terminal (e.g. PR 1628) switched on,  
COM = 2: SMA protocol switched on,  
default = 1.

**6.3.1.5 Parameter 5: Digital outputs**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1					Output 1 , default = 0			
Byte 2					Output 2 , default = 0			
Byte 3					Output 3 , default = 0			

Description	Value
transparent*	0
aduerr	1
Limit1	2
Limit2	3
Limit3	4
tare active	5

\* Transparent mode means, that the PLC is writing to the outputs directly.  
Limit(x) means, that the transmitter is writing the limit result to the outputs directly.

### 6.3.1.6 Parameter 6: RS485 interface

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2					Baudrate			
Byte 3					Parity		Stopbits	Bits

Baudrate 0=300, 600, 1200, 2400, 4800, 9600, 6=19200 default = 9600

Bits 0 = 7 bit, 1 = 8 bit default = 0

Stopbits 0 = 1 Stopbit 1 = 2 Stopbits default = 0

Parity 0 = no, 1 = odd, 2 = even default = 2

Invalid parameters are not taken. E.G. the SMA protocol has always 8 bit and no parity.

### 6.3.1.7 Parameter 7: Digital inputs

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1							Input 1 default 0	
Byte 2							Input 2 default 0	
Byte 3							Input 3 default 0	

Description	Value
none	0
set Zero	1
set Tare	2
reset Tare	3

The PLC can read the status of the inputs at any time.

## 6.3.2 Calibration

### 6.3.2.1 Procedure

To change the calibration-data and calibration-parameters (parameters 21...53), P20 has to be set to Start previously, afterwards the P20 has to be set to Save (to store) or Undo (to indicate that the changes are not valid).

The access to parameter 21...53 will deliver an error message, if CalActiv is not set.

P21 - P24 and P27 can only be written. Reading will result in an error code 108.

The calibration data (parameters 21...27) must be written in a specific sequence.

The calibration parameter (parameters 40...53) can be written in any sequence.

#### 1. Example for a new calibration with mV/V:

- Parameter 20 = 1
- All parameter writing (P40 .. P53)
- Parameter 20 = 5 ⇒ set span = 1.000000 mV/V, deadload = 0.000000 mV/V, FSD=3000kg, step = 1
- Parameter 21 = 0x000FA013 ⇔ 400,0kg
- Parameter 22 = 2 ⇔ 2 stepwidth
- Parameter 25 = 5670 ⇔ 0.00567 mV/V
- Parameter 26 = 1234500 ⇔ 1.23450 mV/V
- Parameter 20 = 3 save and exit calibration

After each step, the error has to be tested under each circumstance.

#### 2. Example for a new calibration with weights:

- Parameter 20 = 1
- All parameter writing (P40 .. P53)
- Parameter 20 = 5 ⇒ set span = 1.000000 mV/V, deadload = 0.000000 mV/V, FSD=3000kg, step = 1
- Parameter 21 = 0x000FA013 ⇔ 400,0kg
- Parameter 22 = 2 ⇔ 2 stepwidth
- unload the scale
- Parameter 23 = 1 ⇔ the actual weight is taken for the deadload
- load the scale with a known calibration weight (e.g. 250,0kg)
- Parameter 24 = 2500 ⇔ 250,0kg
- Parameter 20 = 3 save and exit calibration

After each step, the error has to be tested under each circumstance.

### 6.3.2.2 Parameter 20: Calibration Start/Stop

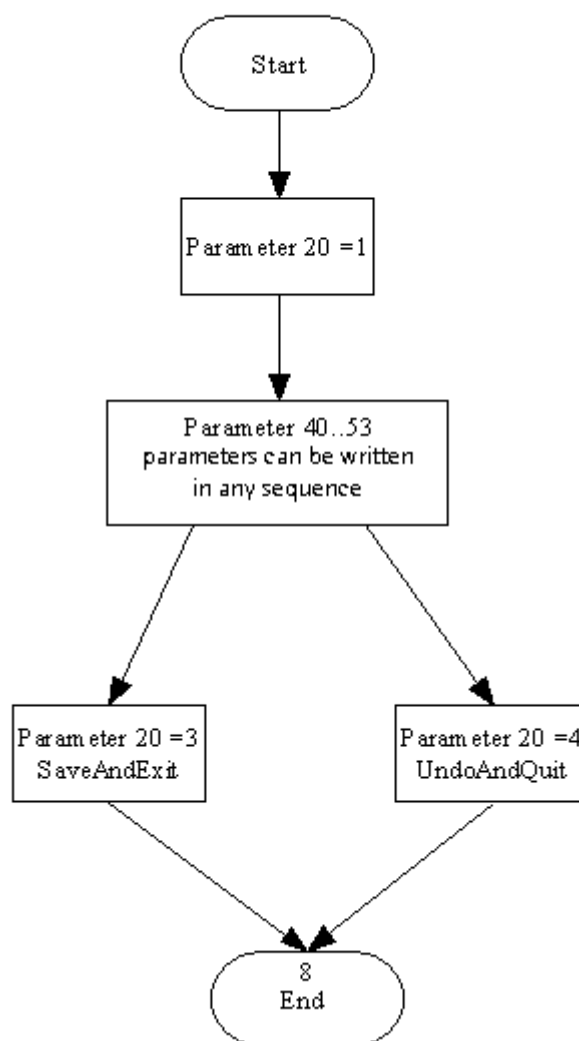
Write only

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3					Function			

#### Function

1	StartCal Test the CAL switch, set CalActiv
2	Factory standard Calibration data and paramters are reset to factory delivery status (see chapter 3.2)
3	SaveAndExit The calibration data and parameters 21...53 are stored in EAROM. CalActiv is reset
4	UndoAndQuitCal All changes since start calibration are not valid. CalActiv is reset.
5	SetDefaultSpan To be used to start a calibration: All calibration data are reset, scale in status not calibrated FSD = 3000 kg, stepwidth = 1, span = 1.000000 mV/V, deadload = 0.000000 mV/V.

#### Writing parameters for analog part



### 6.3.3 ADU parameter

#### 6.3.3.1 Parameter P21: SetFullScale

Write only

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	FSD MSB							
Byte 1	""							
Byte 2	FSD LSB							
Byte 3	EXPONENT				UNIT			

FSD                    3 bytes for the full scale deflection  
 EXPONENT            (4 bit) Number of digits behind the decimal comma/point  
 UNIT                    (4 bit) weight unit (as in register 4)

#### 6.3.3.2 Parameter P22: Stepwidth

Write only

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3	Stepwidth							

Step width:        1, 2, 5, 10, 20, 50

#### 6.3.3.3 Parameter P23: SetDeadload with weight

Write only

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3								1

At writing to this parameter, the actual weight will be stored as deadload.

### 6.3.3.4 Parameter P24: SetSpan

Write only

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Weight MSB							
Byte 1	""							
Byte 2	Weight LSB							
Byte 3	Exponent				Unit			

Calibrating with weights

Weight 3 Bytes for the weight value

Exponent Number of digits behind the decimal comma/point

Unit Weight unit (as in register 4)

### 6.3.3.5 Parameter P25: Set/GetDeadloadMvpv

Write and read

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	DEADLOAD MSB							
Byte 1	""							
Byte 2	""							
Byte 3	DEADLOAD LSB							

DEADLOAD in mV/V (value in mV/V)\*10<sup>6</sup>

### 6.3.3.6 Parameter P26: Set/GetSpanMvpv

Write and read

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	SPAN MSB							
Byte 1	""							
Byte 2	""							
Byte 3	SPAN LSB							

SPAN in mV/V (value in mV/V)\*10<sup>6</sup>

### 6.3.3.7 Parameter P27: CalcTest

Write only

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3								

Calculate testvalue

**6.3.3.8 Parameter P40: Digital filter**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3						Filter		

Filter 0 = off, 1 = Bessel, 2 = Aperiodic, 3 = Butterworth, default = off

**6.3.3.9 Parameter P41: Filter frequency**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3	FREQ							

FREQ Value has to be entered in frequency\*100. Example: for 1.56 Hz enter 156. Frequency range depends on the measuring time, see table in chapter 4.7.2.3

Only valid if the digital filter is not set to on

**6.3.3.10 Parameter P42: Measuring time**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2	TIME MSB							
Byte 3	TIME LSB							

TIME measuring time in ms 10 ... 1920, default = 320 ms  
Only valid if the digital filter is switched to off.

Parameter P53 will be set accordingly.

10...160ms -> P53: 4...0

320...1920ms -> P53: 0

**6.3.3.11 Parameter P43: Test mode**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3								MODE

MODE 0 = absolute, 1 = relative, default = 0

**6.3.3.12 Parameter P44: Standstill time**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3					STIME			

Time expressed in multiples of measuring time at which a standstill is detected.

STIME 1... 9 times measuring time, default = 1

**6.3.3.13 Parameter P45: Standstill range**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2	SRANGE MSB							
Byte 3	SRANGE LSB							

Limit to define the weight to be in standstill.

SRANGE 0 ... 10.00d default = 1d  
value = d\*100

**6.3.3.14 Parameter P46: Standstill timeout**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3	TIME							

Number of measuring times during the standstill condition should be reached.

TIME 0 ... 100 M (measuring times), default = 8

If the standstill timeout is exceeded by a function, which needed the standstill condition, the function is aborted (Taring, set zero, calibrate, 'P'-command of the SMA-protocol). Additional the error code 31 and the 'CmdError' bit is set.

**6.3.3.15 Parameter P47: Zeroset range**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2	RANGE MSB							
Byte 3	RANGE LSB							

RANGE 0 ... 500.00 d default = 50 d  
Value = d\*100



**6.3.3.16 Parameter P48: Zerotrack range**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2	RANGE MSB							
Byte 3	RANGE LSB							

RANGE 0 ... 500.00 d                      default = 0.25 d  
 Value = d\*100

**6.3.3.17 Parameter P49: Zerotrack step**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2	STEP MSB							
Byte 3	STEP LSB							

STEP 0 ... 10.00 d                      default = 0.25 d  
 Value = d\*100

**6.3.3.18 Parameter P50: Zerotrack repeat**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3	REPEAT							

REPEAT 0 ... 100 measuring times default = 0 (Zero tracking is off)

**6.3.3.19 Parameter P51: Overload**

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	OVL MSB							
Byte 1	""							
Byte 2	""							
Byte 3	OVL LSB							

OVL      Overload in d 0..9999999                      default = 9 d

### 6.3.3.20 Parameter P52: Weight & Measuresmode

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3								W&M

W&M mode    0 = off, 1= on = OIML, has to be set before start of calibration

### 6.3.3.21 Parameter P53: A/D converter sample time (measuring rate)

Read only

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0								
Byte 1								
Byte 2								
Byte 3						SAMPLETIME		

SAMPLETIME    0:    6.25 Hz == 160 ms = default  
                   1:    12.5 Hz == 80 ms  
                   2:    25 Hz == 40 ms  
                   3:    50 Hz == 20 ms  
                   4:    100 Hz == 10 ms

### 6.3.4 Parameter P99: Access code

Write only

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	CODE MSB							
Byte 1	""							
Byte 2	""							
Byte 3	CODE LSB							

CODE    If an access code was entered in the configuration tool, parameters and the registers for limits can only be written if the access code is contained in register P99. Parameter P99 can always be written. To activate the protection P99 has to be set to -1 again. If CODE is set to 0, no access check is done.

## 7 TECHNICAL DATA

The characteristic data are valid after a min. warm-up time of 30 minutes (reference temperature 23° C).  
Values specified without tolerances are average values and are only used for information.

### 7.1 Analog part, A/D conversion

Principle	DC voltage, Delta-Sigma conversion, ratiometric to the load cell supply voltage
Measuring time	Min. 10 ms to max 1920 ms)
Analog filter	1 <sup>st</sup> order low-pass filter, cut-off frequency 70Hz
Digital filter	Active 4 <sup>th</sup> order (low-pass) Bessel, Aperiodic or Butterworth filter, cut-off frequency adjustable (max. 0.25/measuring rate or approx.1.56 Hz)

#### 7.1.1 Accuracy and stability

Accuracy class	$\leq 6000$ d according to OIML R76 / EN 45501
Min. meas. signal (W&M)	$\geq 0.25$ mV/V or $\geq 3$ mV for 6000 e $\geq 0.125$ mV/V or $\geq 1.5$ mV for 3000 e
Linearity error	$< 0.002$ %
Zero stability error	$TK_0 < 0.02$ $\mu$ V/K RTI
SPAN stability error	$TK_{spn} < \pm 2$ ppm/K

#### 7.1.2 Sensitivity

Sensitivity	0.5 $\mu$ V/d @ 6000e according to OIML R76 / EN 45501 0.5 $\mu$ V/d @ 3000e according to OIML R76 / EN 45501 0.2 $\mu$ V/d, not for W&M
Resolution internal	Approx 4.8 Mio steps for 36 mV
Min. meas. Signal	$> 0.05$ mV/V for 3000 d, not for W&M
Input voltage (meas.-signal + deadload)	0 ... max. 36 mV
Deadload range	36 mV - (max. meas. signal); entry/ calibration via software

#### 7.1.3 Load cells

Load cell connection	all strain gauge cells, 6 or 4-wire connection possible.
Load cell supply	$U = \pm 6$ VDC for $I_{max} = 160$ mA, protected by multifuses
Load cell supply circuit	12V DC for max. 8 load cells each with 650 $\Omega$ for max. 4 load cells each with 350 $\Omega$
Max. load	$\geq 75$ $\Omega$

## 7.2 RS 232 interface

RJ 12 connector, functions: Calibration, configuration, operation via WIN-tool on PC.  
See chapter 2.5.2

## 7.3 RS 422 / 485 interface

Terminal block to connect a remote display / PC for SMA protocol.  
See chapter 2.5.3.

## 7.4 Analog output

See chapter Fehler! Verweisquelle konnte nicht gefunden werden.

## 7.5 Digital inputs

See chapter 2.5.5

## 7.6 Digital outputs

See chapter 2.5.6

## 7.7 Profibus DP

Standard	EN 50 179 volume 2, PROFIBUS DIN 19245: PROFIBUS, Process Field Bus (part 1 and 3)
Baudrates	9.6, 19.2, 93.75, 187.5, 500 [kBps], 1.5, 3.0, 6.0, 12.0 [MBps], automatic detection
Buffer size	8 bytes
I/O data	8 bytes
UserPrm	No
Sync	YES
Freeze	YES
Clear	YES
Set-Slave-Add	No

## 7.8 Power supply

Power voltage	24 VDC	+10% / -15%
Power consumption	8.2 W	

## 7.9 Environmental effects

### 7.9.1 Environmental conditions

Temperature range	
Reference temperature	23 °C
Ambient temperature operation	-10... +55 °C ( -10°C... +40 °C for 'legal for trade' application)
Switch-on temperature	0... +55 °C ( 0 °C... +40 °C for 'legal for trade' application)
Storage/ transport	-40... +70 °C
Humidity	< 95 %, without condensation, (acc. to IEC 68-2)
Protection type	IP 20
Vibration	to IEC 68-2-6, test Fc

### 7.9.2 Electromagnetic compatibility (EMC)

All data comply to NAMUR NE 21 and EN 45501

Housing	Radio frequency electromagnetic field (80 – 1000 MHz)	EN 61000-4-3	10 V/m
	Radio frequency electromagnetic field (900 MHz pulse mod.)	EN 61000-4-3	10 V/m
	Electrostatic discharge (ESD)	EN 61000-4-2	6/8 kV
Signal and control lines	Electrical fast transients (Burst)	EN 61000-4-4	1 kV
	Peak voltage (surge) 1.2/50 µs	EN 61000-4-5	0.5/1 kV
	Conducted disturbances by radio-frequency (0.15 – 80 MHz)	EN 61000-4-6	10 V
	Conducted common mode disturbance (0 – 150 kHz)	EN 61000-4-16	10 V
DC input power port	Electrical fast transients (Burst)	EN 61000-4-4	2 kV
	Peak voltage (surge) 1.2/50 µs	EN 61000-4-5	0.5/1 kV
	Conducted disturbances by radio-frequency (0.15 – 80 MHz)	EN 61000-4-6	10 V
	Conducted common mode disturbance (0 – 150 kHz)	EN 61000-4-16	10 V
	Ripple on DC input voltage	EN 61000-4-17	+20 / -15%. 5% ripple
	Voltage variations	EN 61000-4-11	40% / 0%
	Voltage dips	EN 61000-4-11	20 ms

### 7.9.3 RF interference suppression

Electromagnetic emission acc. To EN 55011 group 1, limit value class B

## 7.10 Mechanical data

### 7.10.1 Construction type

Polyamid housing, black, flammability class V0 (UL 94).  
Protection class according to DIN 40050: IP 20.

### 7.10.2 Dimensions

Housing	Dimensions
Width	45 mm
Height	99 mm
Depth	116 mm

### 7.10.3 Connections

Via plug-in screw terminals, cross-section max. 2.5 mm<sup>2</sup>,  
DB 9 female for profibus, RJ-12 for PC.

### 7.10.4 Weight

Net weight	0.3 kg
Shipping weight	0.45 kg

## 7.11 Accessories

Operation manual in English and German on CD-ROM.  
WIN tool to configure/operate the transmitter from PC (Windows 98, \_NT, - 2000, -XP) on CD-ROM  
Cable PC (DB9 f) to PR 5210 (RJ-12 m), length 2.0 m.

## 7.12 Options

Operation manual on paper (English), order no. 9499 050 52103.  
Operation manual on paper (German), order no. 9499 050 52183.

## 8 APPENDIX

### 8.1 EC Declaration of Conformity



#### EG-Konformitätserklärung *EC-Declaration of Conformity*

Monat/Jahr: 02/2003  
*month/year:*

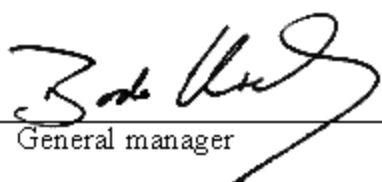
Hersteller: Sartorius Hamburg GmbH  
*Manufacturer:*

Anschrift: Meiendorfer Str. 205  
*Address:* D-22145 Hamburg  
 Deutschland

Produktbezeichnung: PR 5210/00  
*Product name:* Profibustransmitter

Das bezeichnete Produkt stimmt mit folgenden Vorschriften der Europäischen Richtlinien überein:  
*This product confirms with the following regulations of the Directives of the European Community:*

<p><b>Elektromagnetische Verträglichkeit</b>  <b>(89/336/EWG mit den Änderungen 91/263/EWG, 92/31/EWG und 93/68/EWG)</b></p> <p><b>EN 55011 (DIN VDE 0875 Teil11) 05/2000</b>          Funkentstörung von elektrischen Betriebsmitteln und Anlagen, Grenzwerte und Messverfahren für Funkstörungen von industriellen, wissenschaftlichen und medizinischen Hochfrequenzgeräten (ISM Geräte), Gruppe1, Grenzwertklasse B</p> <p><u>DIN EN 45501 10/1992</u>          Metrologische Aspekte der nicht selbsttätigen Waagen, normativer Anhang B: Grenzwerte der Störfestigkeit          normativer Anhang C: Verfahren für die Prüfung der Störfestigkeit gegen hochfrequente elektromagnetische Felder.</p>	<p><b><i>Electromagnetic Compatibility</i></b>  <b><i>(89/336/EEC with changes 91/263/EEC, 92/31/EEC and 93/68/EEC)</i></b></p> <p><b>EN 55011 (DIN VDE 0875 part11) 05/2000</b>  <i>Industrial, scientific and medical (ISM) radio-frequency equipment - Radio disturbance characteristics - Limits and methods of measurement, group1, limits class B</i></p> <p><u><i>DIN EN 45501 10/1992</i></u>  <i>Metrological aspects of non- automatic weighing instruments,</i>  <i>Normative appendix B: limits of immunity</i>  <i>Normative appendix C: methods for testing of immunity against high frequent electromagnetic fields.</i></p>
--	---

  
 General manager





## EG-Konformitätserklärung *EC-Declaration of Conformity*

Monat/Jahr: 02/2003  
*month/year:*

Hersteller: Sartorius Hamburg GmbH  
*Manufacturer:*

Anschrift: Meiendorfer Str. 205  
*Address:* D-22145 Hamburg  
 Deutschland

Produktbezeichnung: PR 5210/10  
*Product name:* Process Transmitter , Analog Output

Das bezeichnete Produkt stimmt mit folgenden Vorschriften der Europäischen Richtlinien überein:  
*This product confirms with the following regulations of the Directives of the European Community:*

**Elektromagnetische Verträglichkeit**  
**(89/336/EWG mit den Änderungen 91/263/EWG, 92/31/EWG und 93/68/EWG)**

**EN 55011 (DIN VDE 0875 Teil11) 05/2000**

Funkentstörung von elektrischen Betriebsmitteln und Anlagen, Grenzwerte und Messverfahren für Funkstörungen von industriellen, wissenschaftlichen und medizinischen Hochfrequenzgeräten (ISM Geräte), Gruppe1, Grenzwertklasse B

DIN EN 45501 10/1992

Metrologische Aspekte der nicht selbsttätigen Waagen, normativer Anhang B: Grenzwerte der Störfestigkeit  
 normativer Anhang C: Verfahren für die Prüfung der Störfestigkeit gegen hochfrequente elektromagnetische Felder.

***Electromagnetic Compatibility***  
***(89/336/EEC with changes 91/263/EEC, 92/31/EEC and 93/68/EEC)***

**EN 55011 (DIN VDE 0875 part11) 05/2000**

*Industrial, scientific and medical (ISM) radio-frequency equipment - Radio disturbance characteristics - Limits and methods of measurement, group1, limits class B*

*DIN EN 45501 10/1992*

*Metrological aspects of non- automatic weighing instruments,  
 Normative appendix B: limits of immunity  
 Normative appendix C: methods for testing of immunity against high frequent electromagnetic fields.*

  
 General manager







## EG-Konformitätserklärung *EC-Declaration of Conformity*

Monat/Jahr: 02/2003  
*month/year:*

Hersteller: Sartorius Hamburg GmbH  
*Manufacturer:*

Anschrift: Meiendorfer Str. 205  
*Address:* D-22145 Hamburg  
 Deutschland

Produktbezeichnung: PR 5210/11  
*Product name:* Process Transmitter , Profibus

Das bezeichnete Produkt stimmt mit folgenden Vorschriften der Europäischen Richtlinien überein:  
*This product confirms with the following regulations of the Directives of the European Community:*

**Elektromagnetische Verträglichkeit**  
**(89/336/EWG mit den Änderungen 91/263/EWG, 92/31/EWG und 93/68/EWG)**

**EN 55011 (DIN VDE 0875 Teil11) 05/2000**

Funkentstörung von elektrischen Betriebsmitteln und Anlagen, Grenzwerte und Messverfahren für Funkstörungen von industriellen, wissenschaftlichen und medizinischen Hochfrequenzgeräten (ISM Geräte), Gruppe 1, Grenzwertklasse B

DIN EN 45501 10/1992

Metrologische Aspekte der nicht selbsttätigen Waagen, normativer Anhang B: Grenzwerte der Störfestigkeit  
 normativer Anhang C: Verfahren für die Prüfung der Störfestigkeit gegen hochfrequente elektromagnetische Felder.

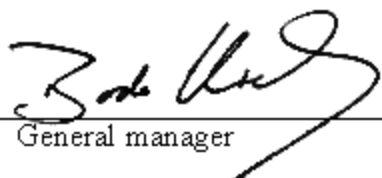
***Electromagnetic Compatibility***  
***(89/336/EEC with changes 91/263/EEC, 92/31/EEC and 93/68/EEC)***

**EN 55011 (DIN VDE 0875 part11) 05/2000**

*Industrial, scientific and medical (ISM) radio-frequency equipment - Radio disturbance characteristics - Limits and methods of measurement, group 1, limits class B*

*DIN EN 45501 10/1992*

*Metrological aspects of non- automatic weighing instruments,  
 Normative appendix B: limits of immunity  
 Normative appendix C: methods for testing of immunity against high frequent electromagnetic fields.*


  
 General manager






## 8.2 EC Type-approval Certificate PTB D03-09-025

PTB

**Physikalisch-Technische Bundesanstalt**  
Braunschweig und Berlin



**EG-Bauartzulassung**  
*EC Type-approval Certificate*

Zulassungsinhaber: <i>Issued to:</i>	GWT GLOBAL Weighing Technologies GmbH Meiendorfer Straße 205 22145 Hamburg Deutschland
Rechtsbezug: <i>In accordance with:</i>	§ 13 des Gesetzes über das Mess- und Eichwesen / <i>Verification Act</i> vom / <i>dated</i> 23. März 1992 (BGBl. I S. 711) in Verbindung mit der Richtlinie / <i>in conjunction with Council Directive</i> 90/384/EWG / 90/384/EEC, geändert durch / <i>amended by</i> 93/68/EWG / 93/68/EEC
Bauart: <i>In respect of:</i>	Nichtselbsttätige elektromechanische Waage als Brücken-, Fahrzeug- oder Behälterwaage mit oder ohne Hebelwerk <i>Nonautomatic electromechanical weighing instrument as platform, vehicle or hopper scale with or without leverwork system</i>  Type / <i>Type</i> : PR 5210/00, PR 5210/10, PR 5210/11 Max 1 kg ... 500 t  Genauigkeitsklasse / <i>accuracy class</i> : <div style="display: inline-block; vertical-align: middle;">  n ≤ 6000   n ≤ 1000 </div>
Zulassungsnummer: <i>Approval number:</i>	<b>D03-09-025</b>
Gültig bis: <i>Valid until:</i>	2013-08-27
Anzahl der Seiten: <i>Number of pages:</i>	14
Geschäftszeichen: <i>Reference No.:</i>	1.14 - 03000575
Benannte Stelle: <i>Notified Body:</i>	0102
Im Auftrag <i>By order:</i>  Mack	<div style="text-align: right;">Braunschweig, 2003-09-24</div> <div style="text-align: right;">Siegel <i>Seal</i></div> <div style="text-align: center;">  </div>

Die Hauptmerkmale, Zulassungsbedingungen und Auflagen sind in der Anlage enthalten, die Bestandteil der EG-Bauartzulassung ist. Hinweise und eine Rechtsbehelfsbelehrung befinden sich auf der ersten Seite der Anlage.  
*The principal characteristics, approval conditions and special conditions, if any, are set out in the Annex which forms an integral part of the EC Type-approval Certificate. For notes and information on legal remedies, see first page of the Annex.*

304 06 b-b

### 8.3 Spare parts

Order number	Description	Beschreibung
5312 264 48012	Connector 4-pol.	Stecker 4-pol.
5312 321 28046	PC-connection cable 2m	PC-Anschlusskabel 2m
5312 447 98005	Blind cap	Blindkappe

### 8.4 Example print out configuration and calibration data / parameters

#### Configuration / Calibration Data

Data set for device: PR 5210/00 - Rel.3.00  
 Serialnr: 4294967294 06.10.2004 11:55:03

FSD	3000 kg
Stepwidth	1
Deadload	0,000000 mV/V
Span	1,000000 mV/V
Overload	9 d
Filter	none
Frequency	1,56 Hz
Measuring time	320 msec
Weight & Measure	off
Standstill time	1 M
Standstill range	1,00 d
Testmode	absolute
Standstilltimeout	8 M
Zeroset range	50,00 d
Zerotrack range	0,25 d
Zerotrack step	0,25 d
Zerotrack repeat	0 M
Analog mode	off
Analog range	4...20 mA
Analog error	0 mA
Analog < 0	linear
Analog > FSD	20 mA
Analog value	0,000 mA
Weight 0/4 mA	0 kg
Weight 20 mA	3000 kg
Profibus address	10
Bus size	8
Remote display	on
Baudrate	9600
Access	0
Output 1	transparent
Output 2	transparent
Output 3	transparent
Input 1	none
Input 2	none
Input 3	none
Limit 1 on	0 kg
Limit 1 off	0 kg
Limit 2 on	0 kg
Limit 2 off	0 kg
Limit 3 on	0 kg
Limit 3 off	0 kg
Value for 4 mA	4,000
Value for 20 mA	20,000

## 8.5 GSD file for Profibus DP

```

;
;=====
;GSD-Datei für den Profibus Transmitter PR5210
;Stand 03.08.2004 - Sartorius Hamburg Version:V1.11
;=====
;
;#Profibus_DP
Vendor_Name = "Sartorius Hamburg GmbH"
Model_Name = "PR5210 Profibus Transmitter"
Revision = "Version 1.1"
Ident_Number = 0x5210
Protocol_Ident = 0 ;Nur DP-Gerät
Station_Type = 0 ;Kompakt Station
FMS_supp = 0 ;FMS wird nicht unterstützt
Hardware_Release = "1.0"
Software_Release = "3.0"
Max_Diag_Data_Len=6
;
9.6_supp = 1 ;unterstützte Baudraten
19.2_supp = 1
93.75_supp = 1
187.5_supp = 1
500_supp = 1
1.5M_supp = 1
3M_supp = 1
6M_supp = 1
12M_supp = 1
;
MaxTsdr_9.6 = 60 ;max. Antwortzeiten bei den unterschiedlichen
Baudraten
MaxTsdr_19.2 = 60
MaxTsdr_93.75 = 60
MaxTsdr_187.5 = 60
MaxTsdr_500 = 100
MaxTsdr_1.5M = 150
MaxTsdr_3M = 250
MaxTsdr_6M = 450
MaxTsdr_12M = 800
;
Redundancy = 0 ;keine redundante Übertragung
Repeater_Ctrl_Sig = 0 ;kein RTS Signal
24V_Pins = 0 ;keine 24V für den Anschluß eines Wartungsgerätes
Freeze_Mode_supp = 1 ;Freeze Modus wird unterstützt
Sync_Mode_supp = 1 ;Sync Modus wird unterstützt
Auto_Baud_supp = 1
Set_Slave_Add_supp = 0
User_Prm_Data_Len = 0
Min_Slave_Intervall = 50 ; 50x100uS->5ms. min. Slave intervall

Modular_Station = 1
Max_Module = 1
Max_Output_Len = 10
Max_Input_Len = 10
Max_Data_Len = 20

Module = "8 Byte Out, 8 Byte In" 0xA7, 0x97
EndModule
Module = "10 Byte Out, 10 Byte In" 0xA9, 0x99
EndModule

```

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