SIKORA
Technology To Perfection

User Manual

ECOCONTROL 600

SIKORA
Technology To Perfection

Edition July 2009 Version 1.02

All rights reserved. No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, for any purpose without the prior written permission of SIKORA AG.

This manual has been produced with the appropriate care. No warranty or representation, either expressed or implied, is made with respect to the quality, accuracy, or fitness for any particular purpose of this document. In no event will SIKORA AG be liable for direct, indirect, incidental, consequential or other damages resulting from the use or inability to use this document and the associated product(s). Information in this document is subject to change without notice and does not represent a commitment on the part of SIKORA AG.

SIKORA AG is not liable for damages or problems resulting from the use of options which are no original SIKORA products.

Product names appearing in this document are mentioned for identification purpose only. All trademarks, product names or brand names appearing in this document are registered property of their respective owners and should be treated so.

Contact **6**
Trouble-shooting 7

Delivery **8**

Device Introduction **9**

1. Installation & Start Up **10**

1.1 Requirements for Device Installation **10**
1.1.1 Place of Installation 10
1.1.2 Voltage Supply and Grounding 10
1.1.3 Signal Lines 10

1.2 Mounting **11**
1.2.1 Connection Cables / Signal Lines 11
1.2.2 Rotary Pulse Generator - Option - 12

2. ECOCONTROL Interface **13**

2.1 Input Options **13**

2.2 Main Screen **15**

2.3 Functions **19**
2.3.1 User Log In / Log Off 19
2.3.2 Trend Function 20
2.3.3 Online Statistic 21
2.3.4 Statistic / Printer 22
2.3.5 Recipe Function 24
2.3.6 Line Speed 26
2.3.7 Shutdown 27
2.3.8 Language Selection 27

2.4 Setup **28**
2.4.1 HARDWARE SETTINGS 28
2.4.2 APPLICATION PARAMETERS 28
2.4.3 SETPOINT08 Card Settings 31
2.4.4 DIGITAL CONTACT (LUMP 2000 / SPARK 2000) 32
2.4.5 ECC DISPLAY DESIGN 33
2.4.6 USER & PASSWORD SETTINGS 33

2.5 Diameter Controlling Screen – CENTERVIEW 8000 – **34**

3. Maintenance **36**

4. Schnittstellen **37**

4.1 Configuration Compatibility ECOCONTROL / REMOTE **38**

4.2 Serial Communication Telegram SC400 39
4.2.1 Request Telegram MASTER (Customer Computer) 41
4.2.2 Response Telegram SLAVE (Customer Computer) 42
4.2.3 Ask/Set Telegram Diameter Device 42
4.2.4 Ask/Set Telegram Wallthickness 43
4.2.5 Ask/Set Telegram Capacitance Device 44
4.2.6 Ask/Set Telegram Lump Detector 44
4.2.7 Ask/Set Telegram Spark Tester 45
4.2.8 Ask/Set Telegram Controller 45
4.2.9 Ask/Set Telegram CENTERVIEW 46
4.2.10 Ask/Set Telegram General Data 46

4.3 Ethernet Connection - Option - 47

5. SETPOINT 08 48

Technical Drawings 50
Automatic Control - Schematics 51
Rotary Pulse Generator 54

Symbol Explanation 60

IMPORTANT NOTICE

The ECOCONTROL is an Industrial-PC used and configured for the SIKORA measuring system operational software.

We strictly advise you not to use this PC to run any other software than the one designed for ECOCONTROL operation!

There is the danger of other software being virus infected or being of improper program design thus causing damage to your operational software resulting in system breakdown and software/data destruction.

Protect the operation software of your ECOCONTROL measuring system by keeping the internal PC for execution of licensed software only.

Installation of external software without usage for the ECOCONTROL measuring system expire every SIKORA guarantee or liability relating to the ECOCONTROL software immediately.

Additional software (like antivirus software for network) to support the operational usage need to confer with the SIKORA service before installation to licence its use.

SIKORA will deny all liability for damaging the ECOCONTROL measuring system or its software components, arouse through influences or faulty performances of external software.

Contact

The display unit

ECOCONTROL 600

Is a product of the company

SIKORA

Bruchweide 2

28307 Bremen

- Germany -

☎	**Phone :**	**+49 (0) 421 / 48 900 – 0**
	Fax :	**+49 (0) 421 / 48 900 – 90**
	E-Mail :	**sales@sikora.net**
	Internet :	**www.sikora.com**

Trouble-shooting

If you have a problem using our system, we recommend reading the ***Chapter Maintenance*** first. If this provides insufficient, please contact our service for assistance.

An actual overview for all sales and service settlements can be found on our website ***www.sikora.net*** under Sales & Service. Contact your country specific settlement for service advices. Most countries offer locally SIKORA service engineers.

If you couldn't found own sales and service settlements for your country or have no direct contact person, you can also refer to our service central office in Germany.

Your partner to contact:		
ⓘ	**Service :**	**+49 421 / 48 900 – 50**
	E-Mail :	**service@sikora.net / support@sikora.net**

Make sure you have the accordant device number when talking to your SIKORA contact person, to assure quick processing.

Delivery

Standard parts of delivery:

1 Display Unit ECOCONTROL 600

1 Main supply cable, ready made – 2m / 6.5 feet

1 Connection cable for accordant measuring head, ready made – 5m / 16.4 feet

1 Mating connector, 2x 8pol. / 2x 4pol.

1 CD with Set-up and Diagnosis-Software; User Manual

Optional Components:

O Case, installation version with 4 clamps, 19'' front panel

O protocol printer

The listing for measuring head / measuring system cables can be found at the accordant manual.

Device Introduction

The ECOCONTROL 600 is a processor–based measuring and control system for the exact measurement and control of the diameter of cables in extrusion lines, offering a varied number of applications in combination with different SIKORA measuring devices. Its TFT color monitor with touch screen offers a brilliant display together with easy operation.

The cables produced may be one of the following types:

- round conductor cable
- flat cable

One measuring and / or testing devices can be controlled with the ECOCONTROL 600, optional a LUMP- or SPARK-Tester. So the object to be measured can be supervised on a non-contact base before and behind the extrusion and at the end of the line.

The measuring data are evaluated by an integrated industrial PC and displayed on the TFT monitor, which is also used through touch screen for system operation.

The ECOCONTROL 600 has several interfaces for transferring measuring and operational data to and from the device. Its serial interface can be used to connect the ECOCONTROL 600 to one of the SIKORA measuring devices, resp. to an external computer. Its USB interface can be used to connect a printer (-Option-).

Also, there is a digital input which is used to connect the Rotary Pulse Generator.

The ECOCONTROL relay contacts can be used to supply customer line equipment like for instance external signalling devices.

A controller output is available for either line or extruder automatic control.

1. Installation & Start Up

1.1 Requirements for Device Installation

1.1.1 Place of Installation

At the installation site, temperature should be kept in a range from +5°C - +50°C (+40 °F - +125 °F), maximum air humidity for the ECOCONTROL is 95% (without condensation).

1.1.2 Voltage Supply and Grounding

The ECOCONTROL 600 can be supplied with 100…230 V AC ± 10%, 50...60 Hz.
The power consumption amounts to approximately 80 VA.

When designing the device, special attention has been laid on preventing power-line interferences. Additionally, when installing the device we recommend that you use only those power lines which correspond to radio interference regulations.

If in doubt, you better provide a separate power line from your main distributes directly to the device and do not connect any other loads to it. Only the additional grounding of the cabinet of the device can prevent disturbances on the non-fused earthed conductor of your power line. Use at least 10 mm² copper wire and connect them as short as possible with your collecting ground bar. The ground is considered good when the resistance is less than 1 Ω.

1.1.3 Signal Lines

When installing the signal lines, please note they can pick up interferences that can influence device performance. A separate installation away from power lines and at sufficient distance to magnetic stray fields will guarantee reliable device performance.

Please note that the reference potential of the electronics (GND*) is insulated from the protective earthing (earth, grounding, housing) and is connected to it in the right place.

1.2 Mounting

1.2.1 Connection Cables / Signal Lines

Pay attention to the right cable direction while connecting. It is only one way possible otherwise the device system won't work.

One side of the cable is sign for the ECOCONTROL 600, the other side is sign for the measuring device.

We deliver ready made connecting cables. These are used for connecting the display unit to up to the measuring.

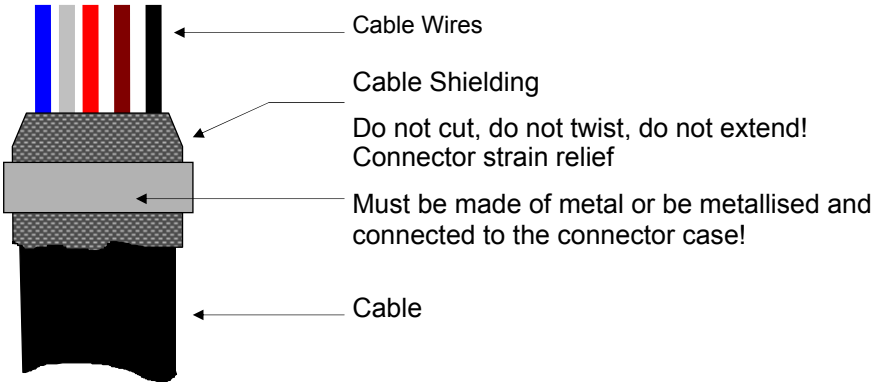
These cables carry data at a high transmission rate. Therefore the camera cables can be laid next to each other but should not be laid parallel to other cables which for instance are used for power supply. If however you decide upon a common path, keep a distance of at least 20 cm to other cables and avoid placing them near switched inductive loads (relay coils, motors, transformers, spark testers etc.) as far as their stray magnetic field is of importance.

Other signal and measuring conductors which carry no inductive loads are not dangerous.

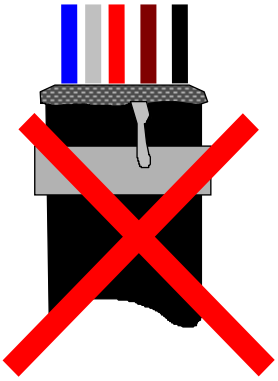
Note that with a longer cable the effect of the interference which affects the connection cable will increase.

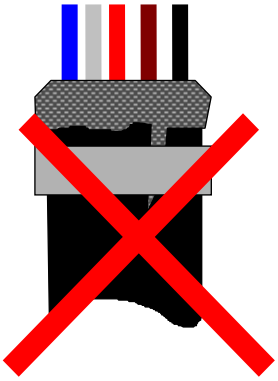
The outer sheath of these cables should be connected to the cabinet (earth, safety earth) at one end.
Inner shields, which serve as signal return lines must be connected according to our guide lines, usually with the reference potential of the electronic (GND*).

Clamp the shielding under the cable grip and always take care to connect the cable shielding completely as shown in the sketch below.



Do not
- Cut the shielding.
- Connect it only partly.
- Extend it.





Make the connections, necessary for your application.

1.2.2 Rotary Pulse Generator - Option -

The speed information of the rotary pulse generator is used for the display of page TREND and if the control is to work with consideration of line.

Install the rotary pulse generator at a meter wheel or a separate measuring wheel, which may be mounted on the caterpillar-ribbon. As the mechanical connection is critical we recommend using a flexible coupling for perfect and permanent hold.

The output of the delivered rotary pulse generator is 25 pulses per revolution.

2. ECOCONTROL Interface

2.1 Input Options

Parameter Input and Selection normally be done via the ECOCONTROL Touch Pad, no other input units are needed. The input will result from touching the display at the appropriate position and the mouse pointer will rest at the last position, where the last input happened.

Optionally an external keyboard and mouse could be connected at the ECOCONTROL to work with it from different places.

The following input options are available in the menus and configurations:

A. Selection Box

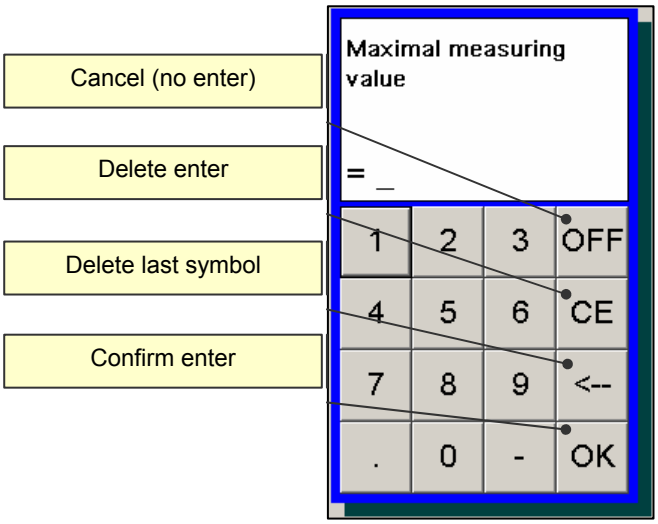
Some configurations need to select a specific criterion/selection.

Choose your selection by pressing the appropriate button and confirm your choice by pressing the button [OK].

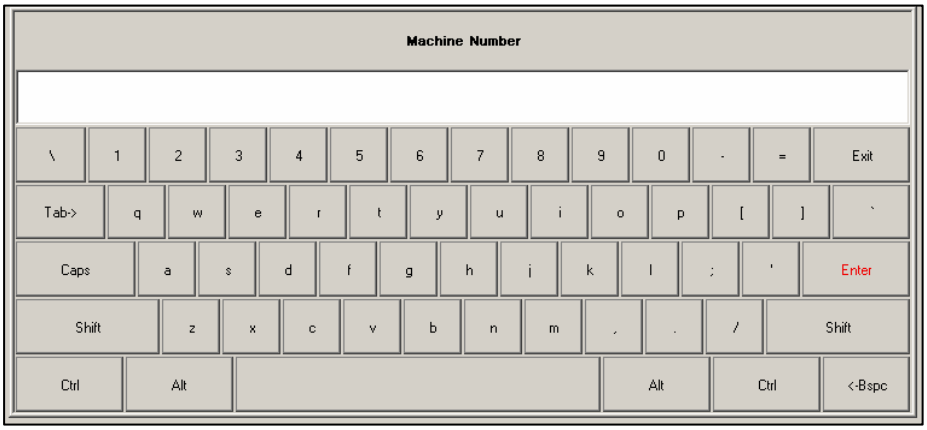
If no selection was chosen, the window will close automatically after a couple of time.

B. Number Pad [NUM]

For enter a value press appropriate number or function button.



C. Alphanumeric Pad [KEY]

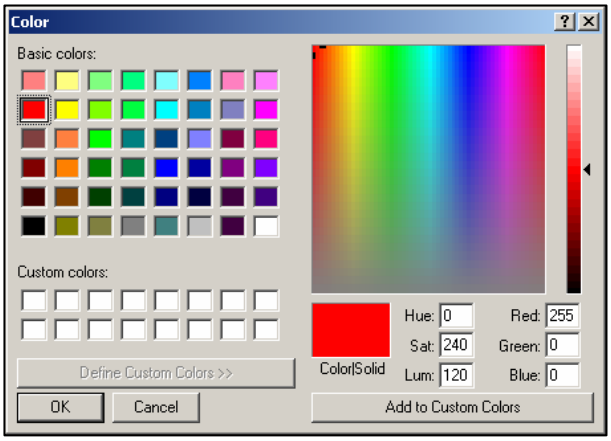


Using this keypad is he same as an external keypad.

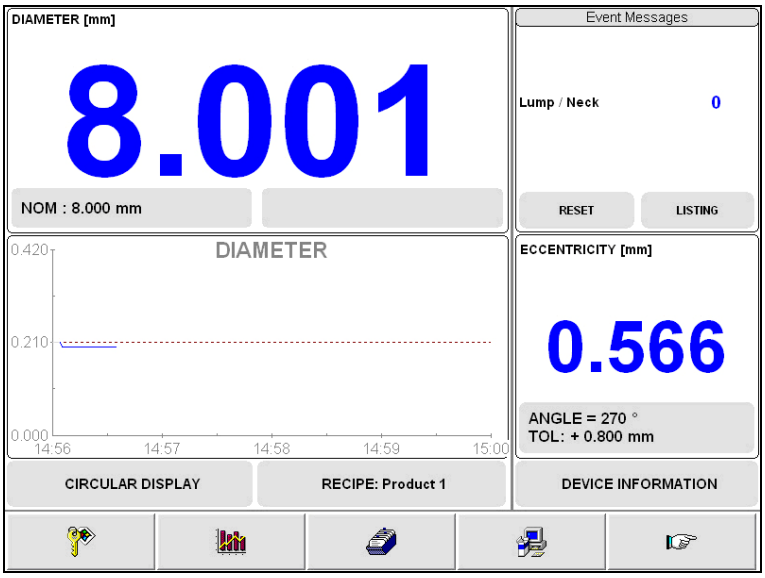
D. Color Pad [COLOR]

For enter the different colours, this color pad will open.

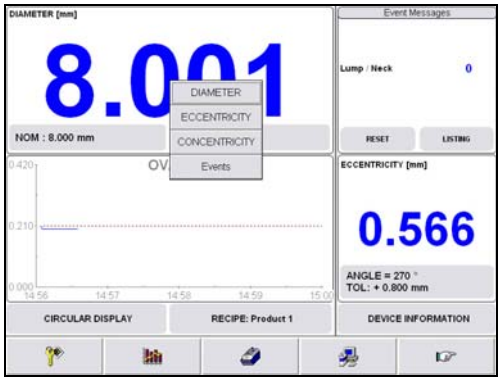
By pressing the appropriate colour symbol (or enter the value) and the button [OK] the chosen colour will be selected.

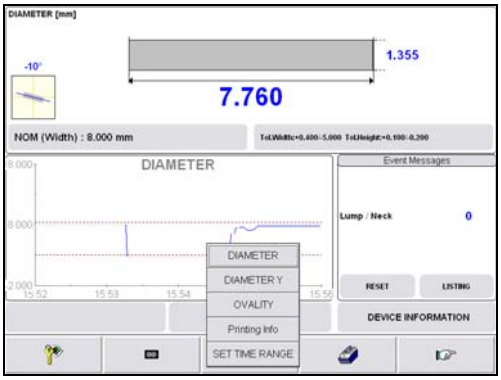


2.2 Main Screen



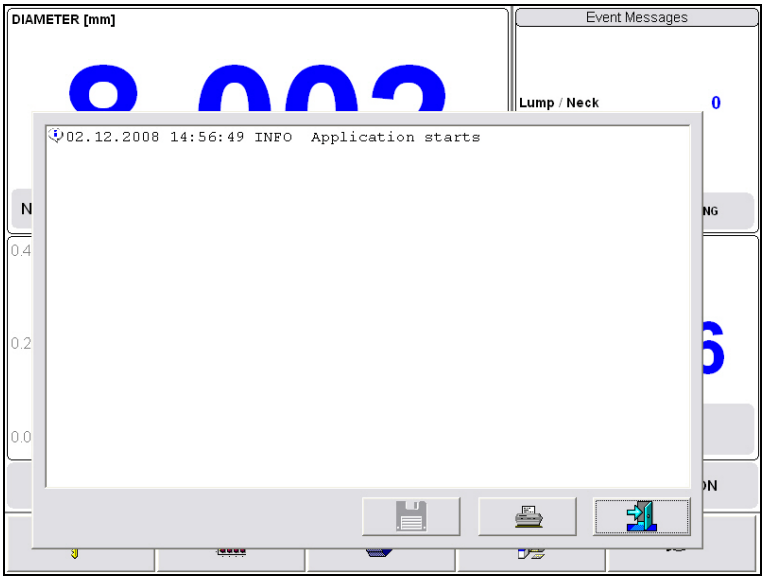
Pressing a LED will open the accordant pop-up-menu for value display, shown at wanted position. This is available for value display as for trend display also.





The button [SYSTEM STATUS] will open a list with all events during ECOCONTROL application operation.

SYSTEM STATUS

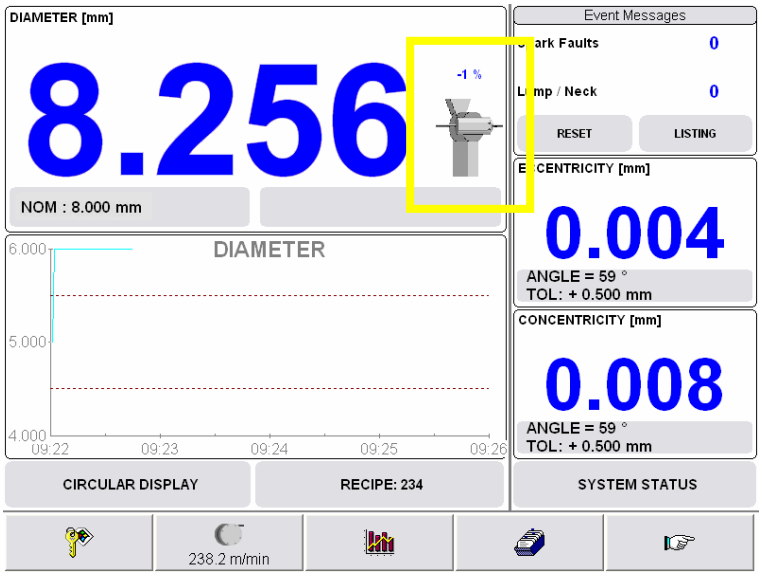


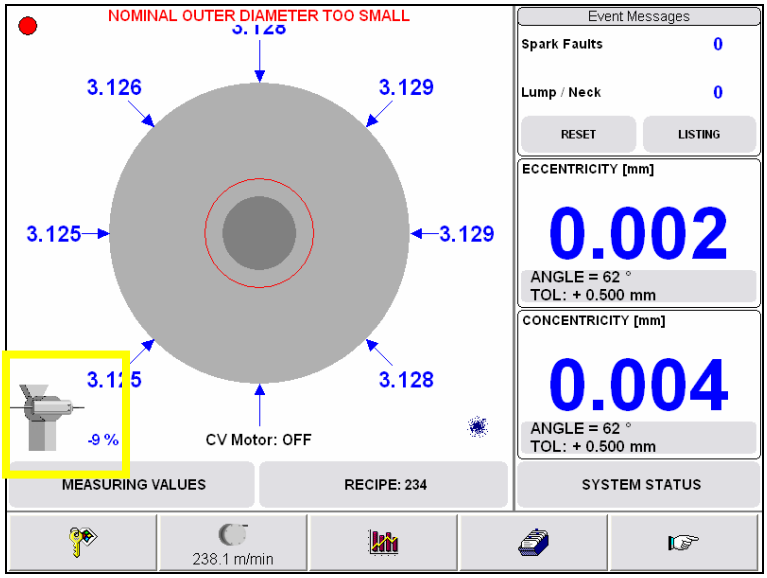
The Events differ in following domains:

- "Info" – Information messages
- "Warning" – Warning messages
- "Error" – Error messages
- "Fatal" – Critical error messages
- "System" – system messages
- "Quit" – Message about process / application finish

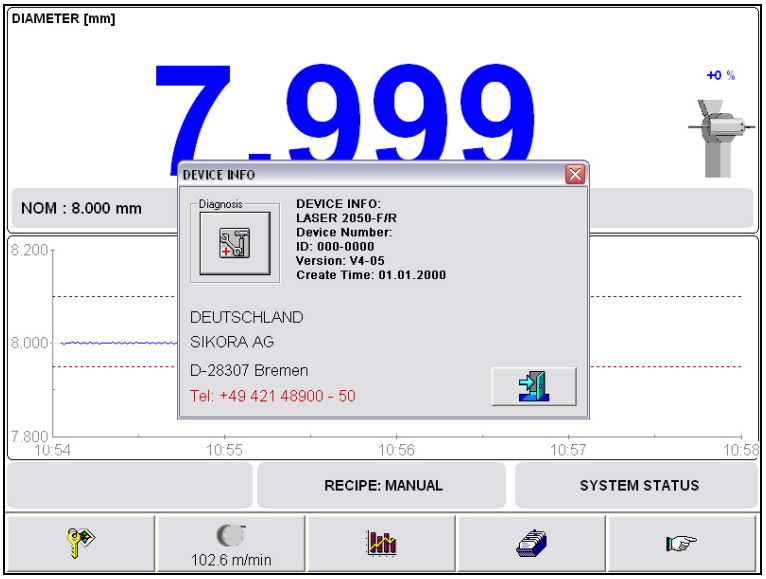
During critical error message the event list will open automatically. Through leaving the list via "Exit" button the user will accept the error (error message).
The corresponding shown error must be fixed to fulfill further trouble-free working process.

When shown (corresponding to connected measuring device), touching the [Extruder Symbol] starts or ends the configured automatic control.

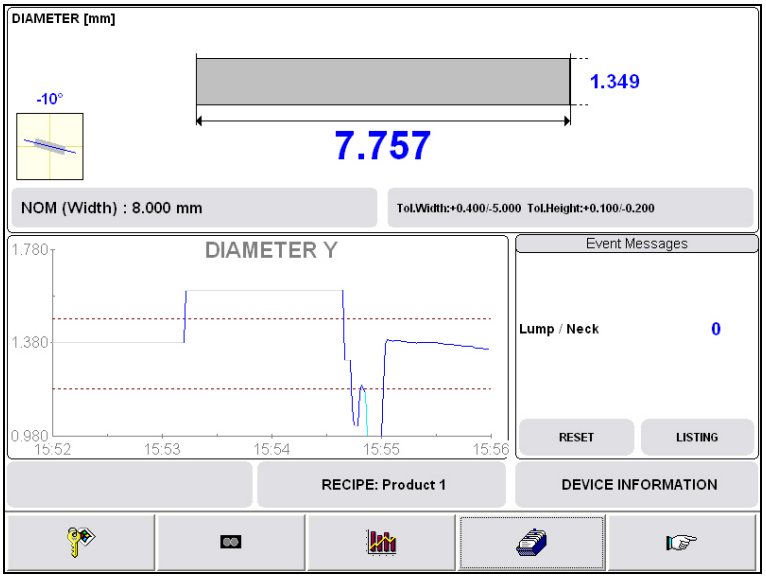




You can get to the diagnosis program via the device information window.



Using a LASER F/R measuring head:

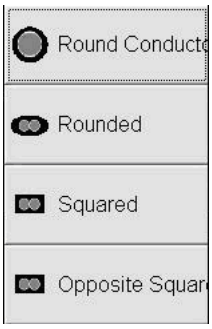


By using a LASER F/R measuring head the circle diagram would be replaced through a profile display from the flat product.

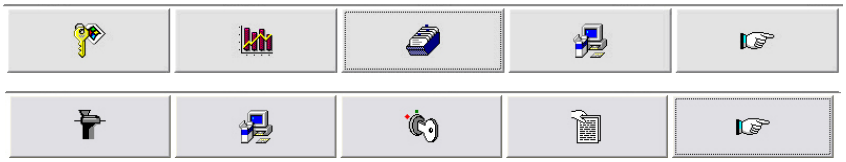
The left, lower corner of the profile display shows the torsion angle.

Via the accordant button in lower menu, you can switch the different cable types.

Separate configurable parameter necessary for F/R measuring are availbable in the recipe.



2.3 Functions

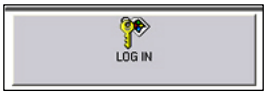


Following functions are available at the ECOCONTROL 600 menu:

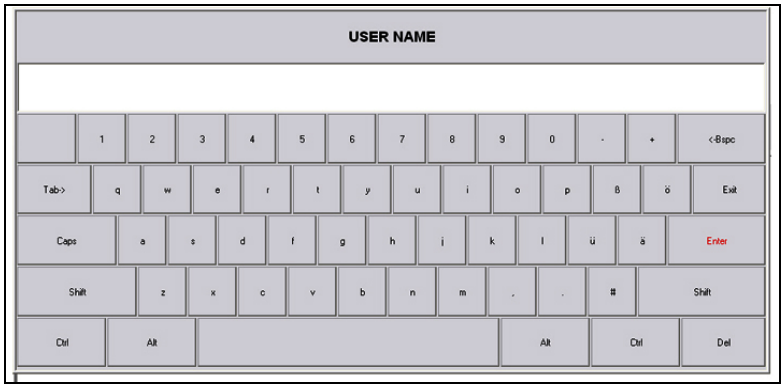
.3.1 Benutzer Log IN / Log Off
.3.2 Trend Funktion
.3.3 Online Statistik
.3.4 Statistik / Drucker
.3.5 Rezept Funktion
.3.6 Liniengeschwindigkeit
.3.7 Shutdown (System runterfahren)
.3.8 Sprachauswahl

2.3.1 User Log In / Log Off

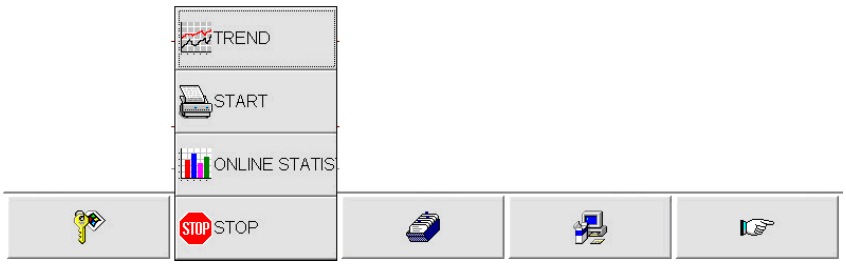
After system start you have to Log In. Therefore, press the [LOG IN] Button.



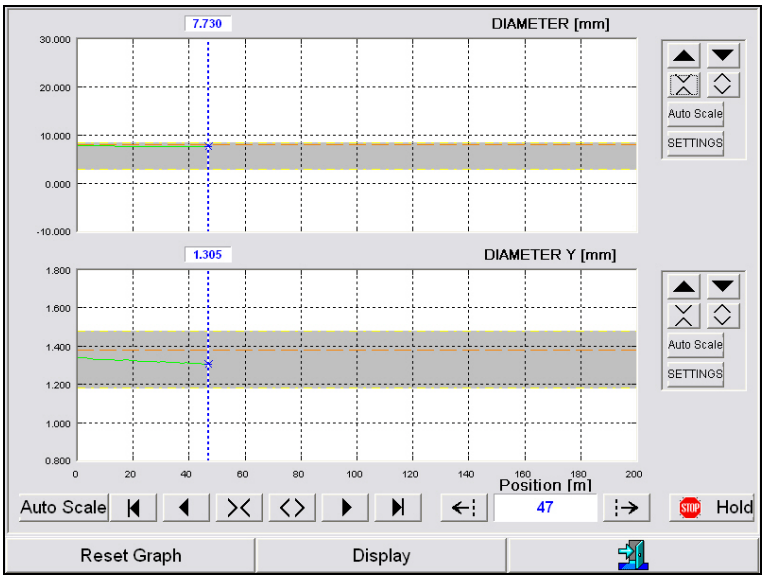
An input panel will open, where you can enter the user and password. The appropriate user has to be registered in the configuration menu USER & PASSWORD SETTINGS.



2.3.2 Trend Function



To start the Trend, you have to press the button [START] for activation first. The button [STOP] will end the actual Trend progress.



Every Trend has its own configuration and scale for Y-axis.
The X-axis is same for all trend displays.

Change to your individual configured scale via [Origin Scale] button.

With the button [Auto Scale] you may change to a scale optimized for display.

You can individual configure every axis scale with the arrow buttons, resp. zoom the display (thin arrows).

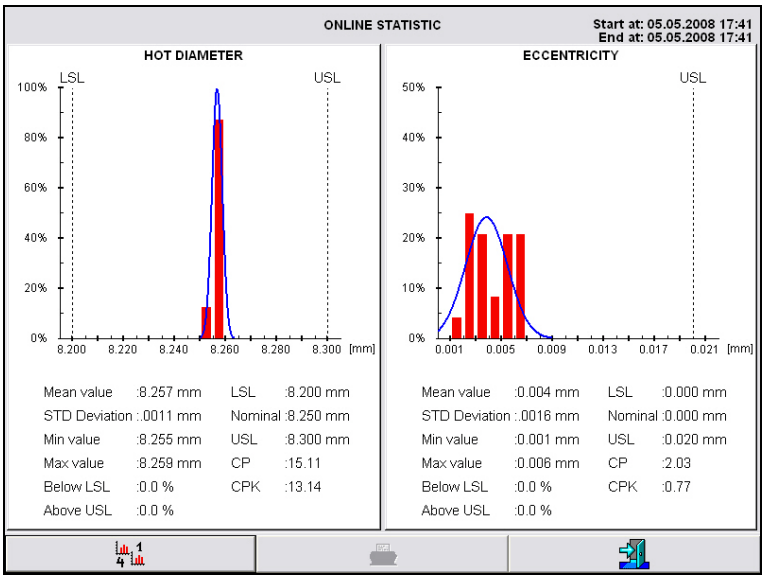
To zoom into a certain section, touch and mark the accordant position in the trend display with your finger.

The button [Hold] stops the further X-axis trend. This symbolized either production time or production length. Configuration for this are made in the [Hardware Settings].

Via the button [Settings] you can settle further display configurations like scale, coloring and grid display for the corresponding Trend.

2.3.3 Online Statistic

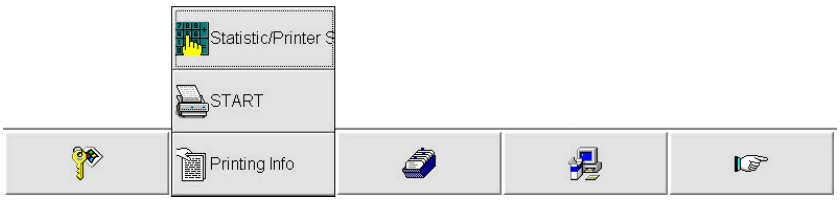
You can switch between one to four Online Statistics with corresponding values on your display.



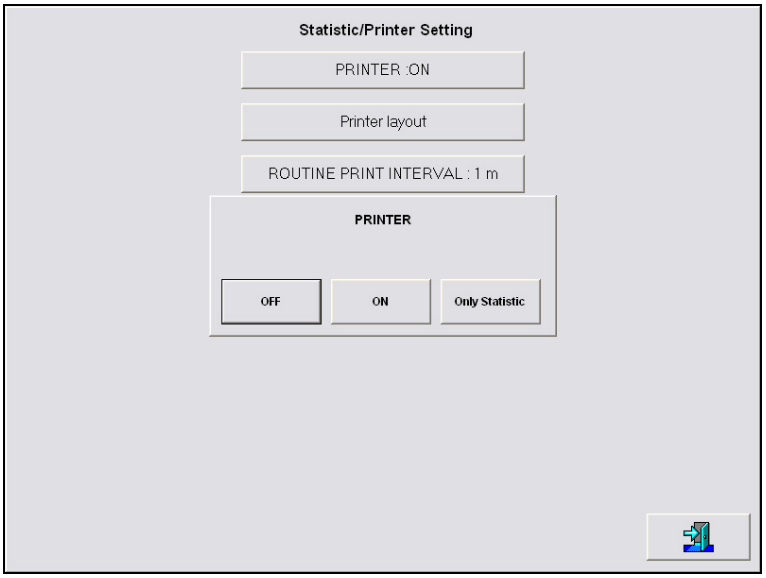
LSL =	Lower Specification Limit
Nominal =	Nominal Value
USL =	Upper Specification Limit
CP =	Process Capability
CPK =	Critical Process Capability

To change measuring value display, press the corresponding statistic and choose the wanted measuring value from the pop-up window.

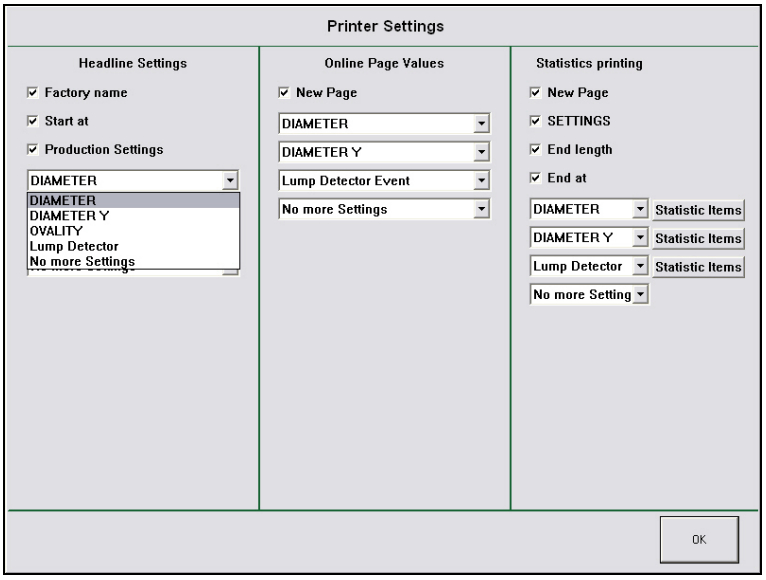
2.3.4 Statistic / Printer



After connecting and activating a printer, you can open the printer setting page to configure. There are different parameters for the print.



Settings for the distance of printable values could be configured via
[ROUTINE PRINT INTERVAL] button.

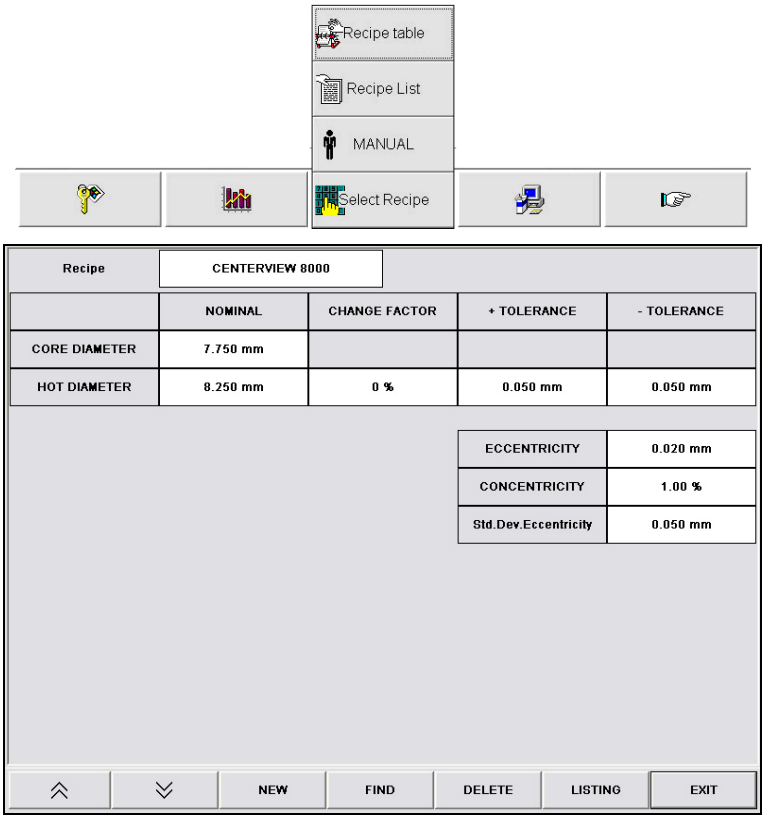


At the rubric [Headline Settings] all information can be set for the headline of the protocol print,

At the rubric [Online Page Values] you can configure all actual measuring values for printing.

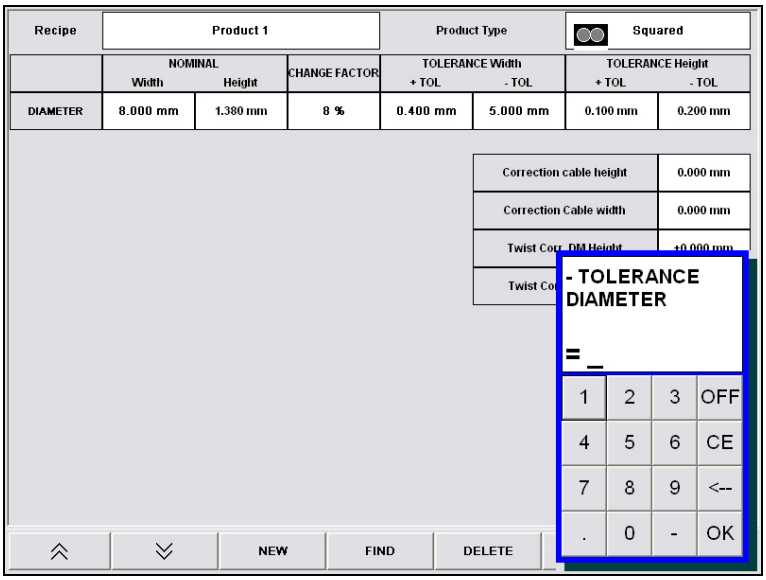
The rubric [Statistic printing] consists the concluding statistic data for printing. The corresponding measuring values can be set via the button [Statistic Items].

2.3.5 Recipe Function



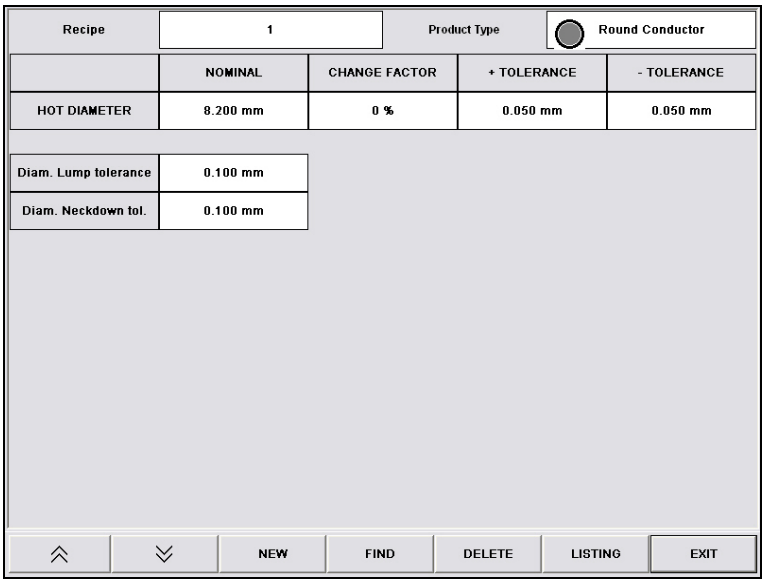
At the Recipe page you can save all data of given products.
The core diameter is no measurable value. It has to be given in the recipe page to calculate the wall thickness.

Using a LASER F/R measuring head:



Using a LASER F/R gives you the option to configure the tolerances as minimum and maximum in detail.

Using a LASER with option Lump/Neck:



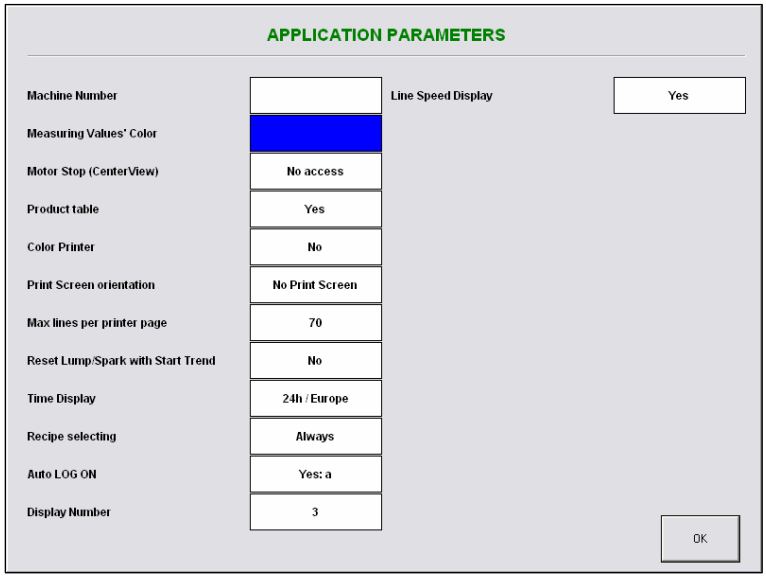
In addition to normal recipe values you can define the tolerance values for lump/neck identification.

2.3.6 Line Speed

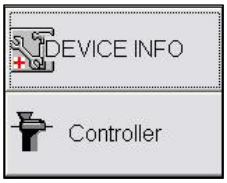
You can activate the function for line speed display via the “Application Parameters” page in the configuration menu.

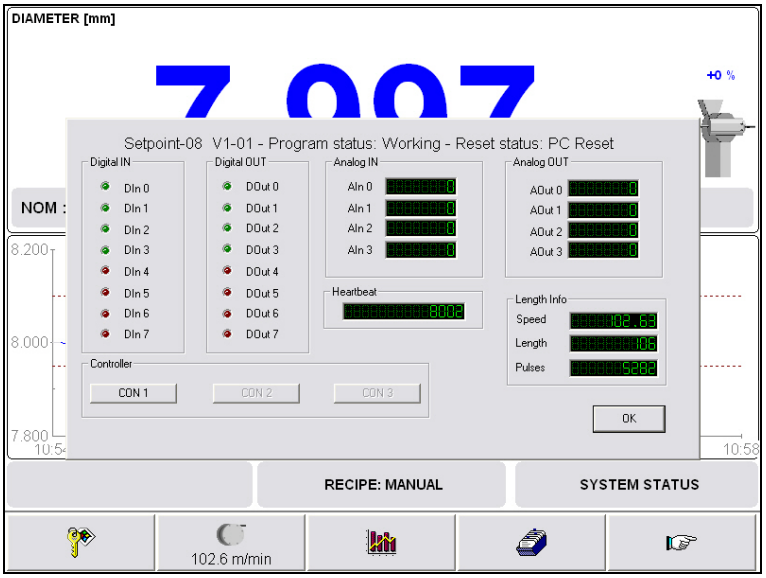
By activating, a symbol with actual line speed information will display on the main screen

The line speed refers to the rotary pulse generator.

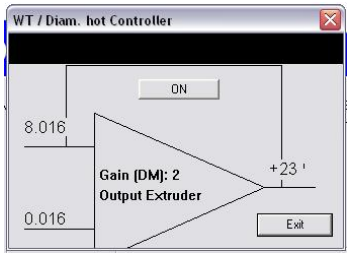


Beside the display of measuring device information, you can open a overview for the SETPOINT and detailed information to actual line speed, length and general impulse via the button [Controller] beginning with program start.





Button [CON 1] will open an window with further information.



2.3.7 Shutdown

To shutdown the ECOCONTROL system, press this button. The ECOCONTROL will save all relevant data and close all applications.

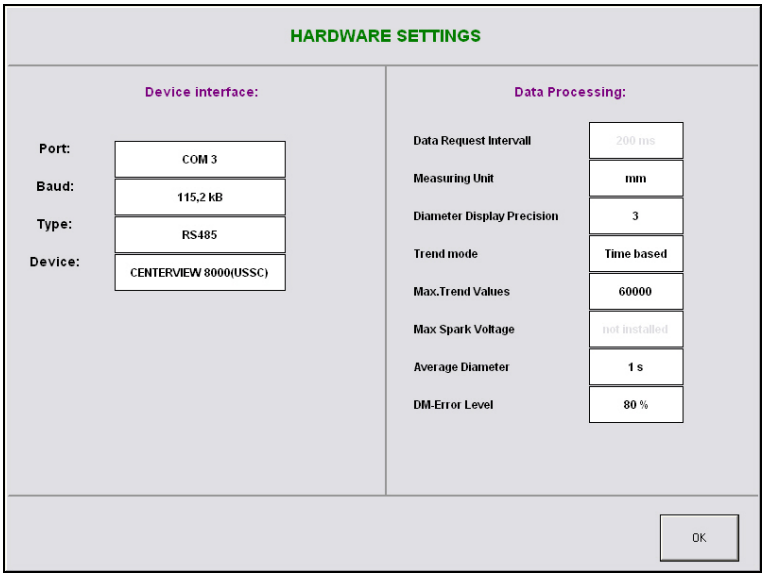
2.3.8 Language Selection

The ECOCONTROL 600 has some defined languages to select. Press the flag symbol for the specific language.

(Further languages, depending on ECOCONTROL 600 version, are possible. This picture is an example only.)

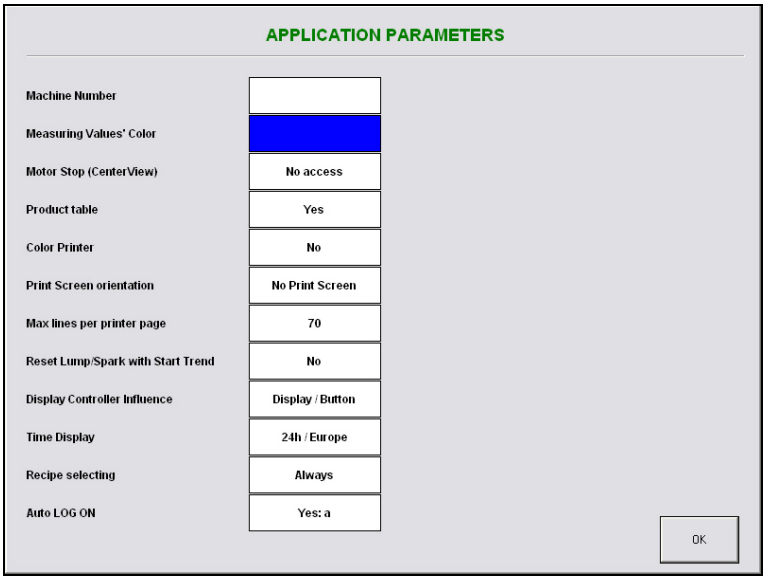
2.4 Setup

2.4.1 HARDWARE SETTINGS

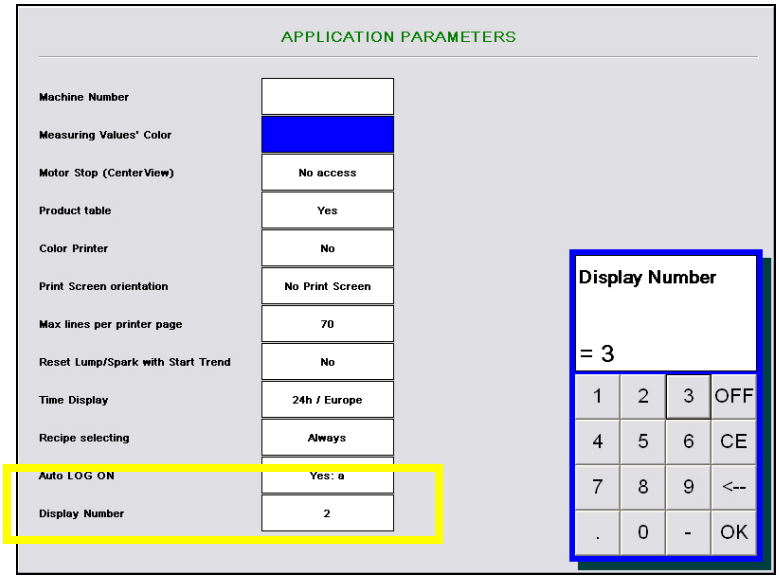


The hardware setting page contains the data processing and device interface settings.
At the device interface you can configure the hardware interface and the selection of the device.

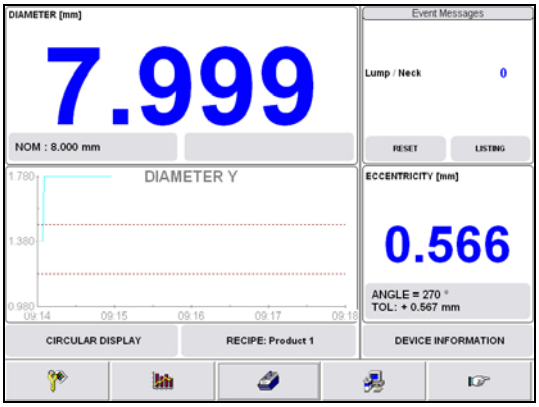
2.4.2 APPLICATION PARAMETERS

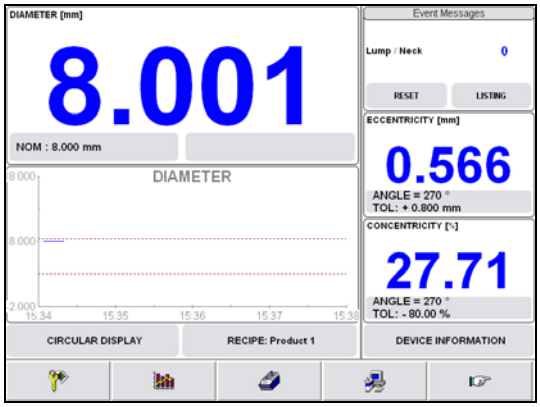


On the application parameters page you can set all specific application parameters.



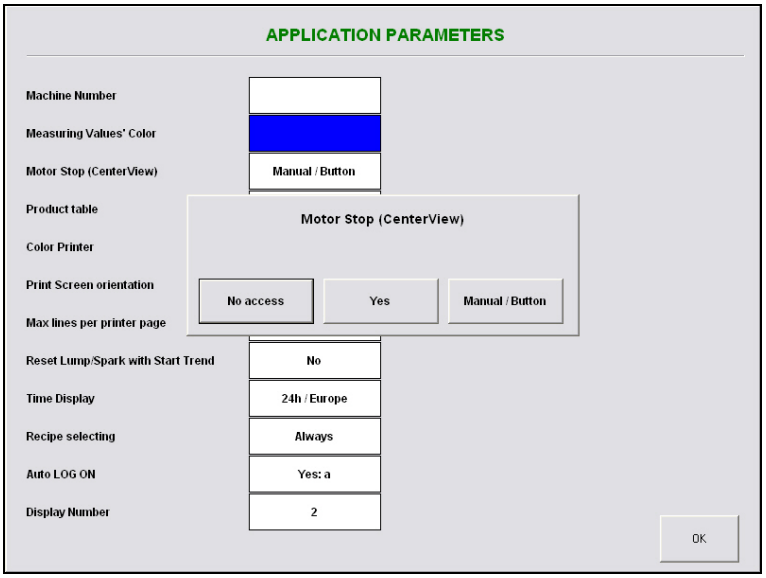
In input field [Display Number] you can choose the number of shown LEDs on main screen.
A selection between 2 and 3 LEDs is possible.





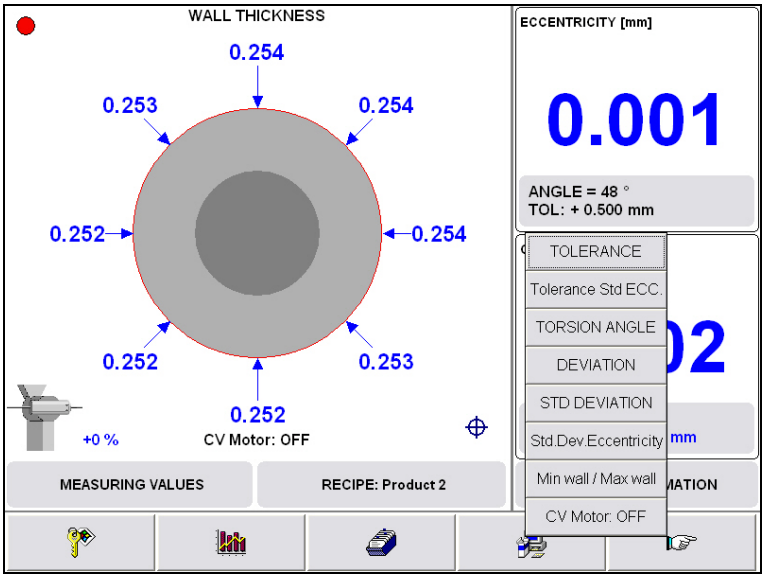
Using a CENTERVIEW 8000 measuring head:

There is an additional function named “Motor Stop” available for the CENTERVIEW 8000.



Choosing [Yes] gives the possibility to input the minimal line speed manually.
If the line speed falls below this value, the motor will stop automatically.

The “Motor Stop” status will be shown on the main screen below the circular display. Activation / deactivation of this function is possible via the LED selection on the right side and will incur the configured parameters.



If a current activation isn’t possible, an corresponding message will be shown in a separate window on main screen.

2.4.3 SETPOINT08 Card Settings

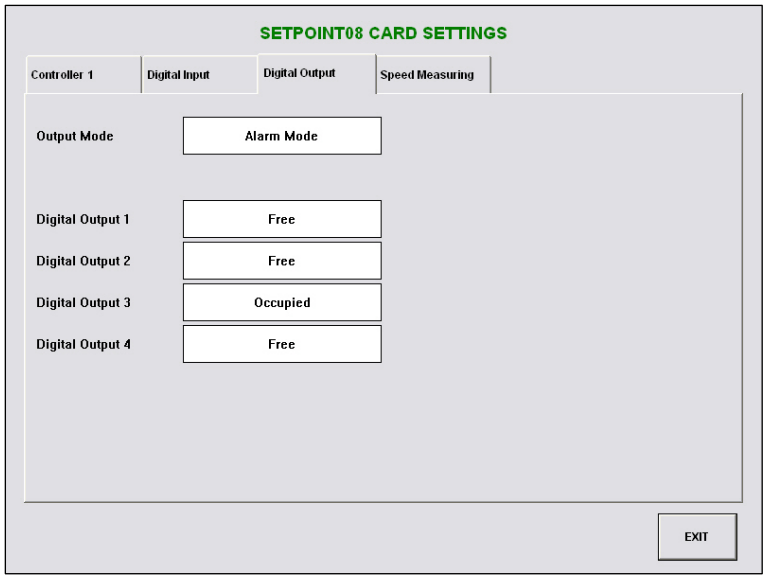
Via the tab [Controller 1] you can configure all controlling adjustments.

Via the tabs [Digital Input] and [Digital Output] all relevant adjustments concerning the SETPOINT08 card are configurable.

The tab [Speed Measuring] on page “SETPOINT08 Card Settings“ gives possibility to input all specific values for the measuring speed.

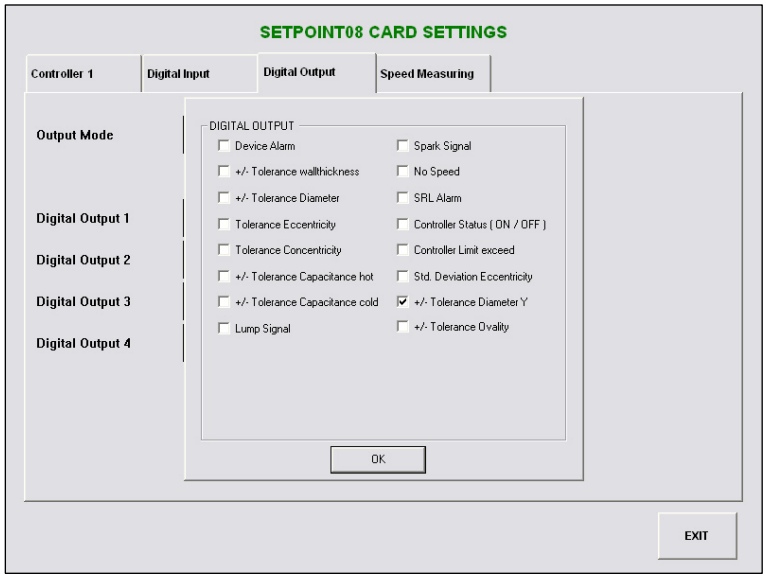
ALARM Sound:

The acustic / visual alarm during tolerance exceeding can be configured at [Digital Input].



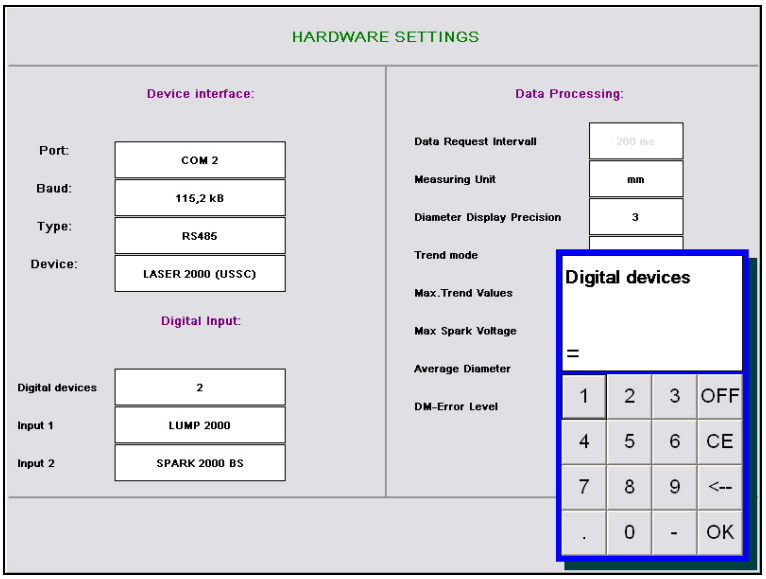
Tolerance signal:

The signals for tolerances can be configured at [Digital Output].

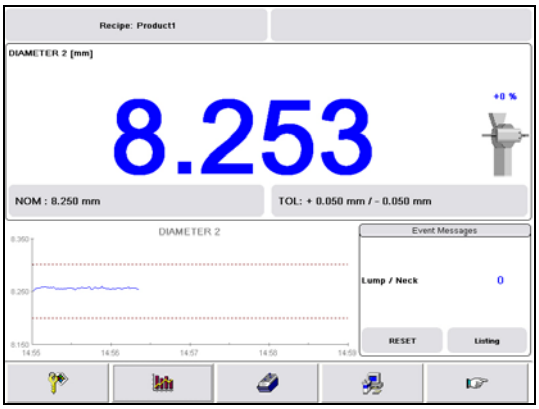


2.4.4 DIGITAL CONTACT (LUMP 2000 / SPARK 2000)

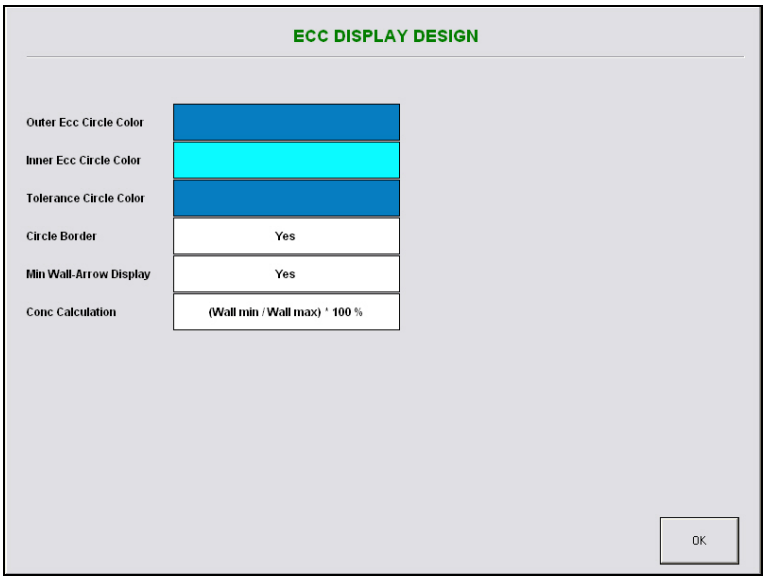
To shown up the event window for connected LUMP 2000 or SPARK 2000 on main screen, you have to configure the digital contacts first. Thereby up to 2 devices are configurable.



Input the number of devices and corresponding event devices also as configure all necessary parameters. After configuration the event window will be shown on main screen. Furthermore you can reset the event window to zero (button [RESET]) or a list with accordant events (button [Listing]).

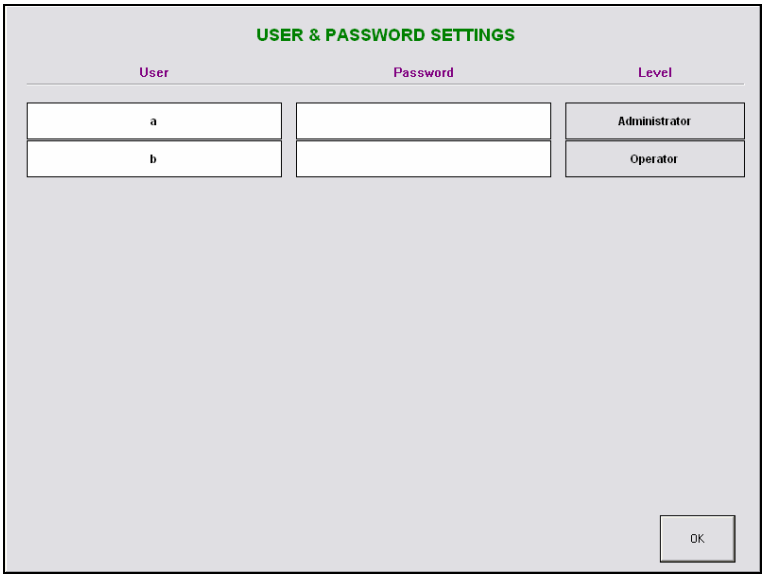


2.4.5 ECC DISPLAY DESIGN



To change the eccentricity design colours use the [ECC Display Design] page.

2.4.6 USER & PASSWORD SETTINGS



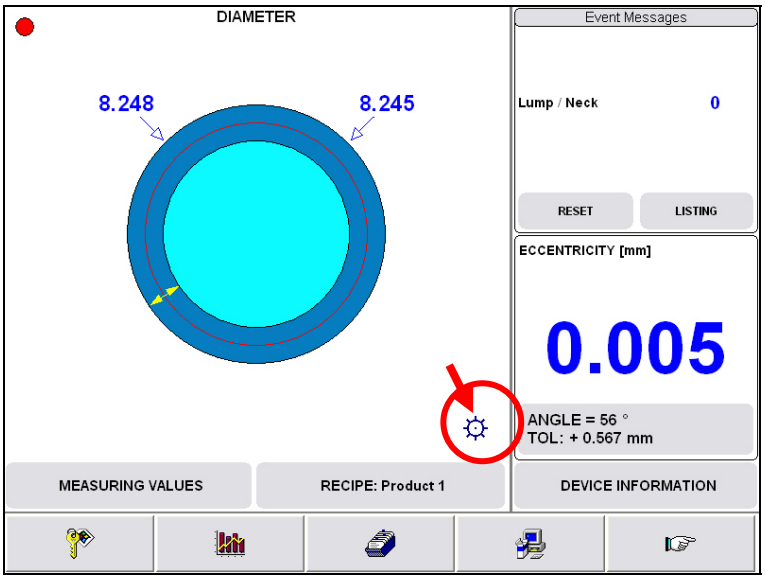
To log in you have first register specific user. While the normal user (Operator) can only use the ECOCONTROL for normal procedure, the Administrator has all rights to change configurations or create new recipes in the recipe table

For the ECOCONTROL 600 only to user (one administrator and one operator) can be registered at same time.

2.5 Diameter Controlling Screen – CENTERVIEW 8000 –

You can switch the screen by pressing the according display button at the right, lower corner of the circular display.

The direction of CENTERVIEW 8000 will be symbolized with a green/red dot at the left, upper corner of the circular display.
(Green = in product direction; Red = against product direction)

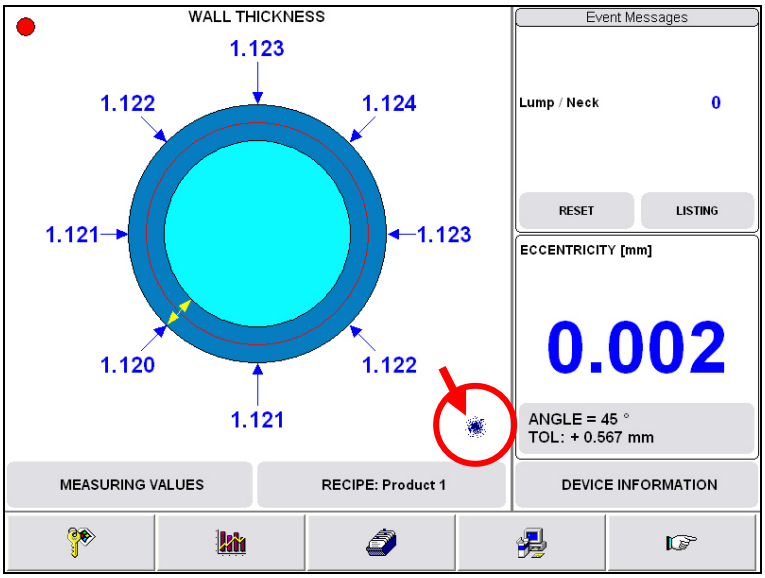


The graphical version of diameter will be shown also as the chosen values at the right side.

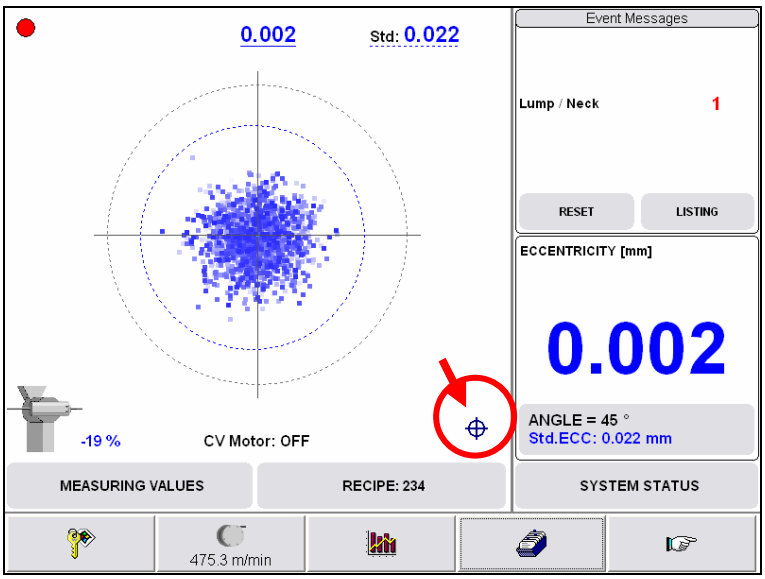
Changing the view between circular display and value display is possible via pressing the button
[Measuring Values].

To use another predefined recipe, press the button [RECIPE] and chose from the actual list the desired recipe.

Pressing the wall thickness symbol will show the calculated wall thickness. The values based on the given core diameter from the recipe table.



By pressing the eccentricity cloud symbol you can switch between circular display and eccentricity cloud.



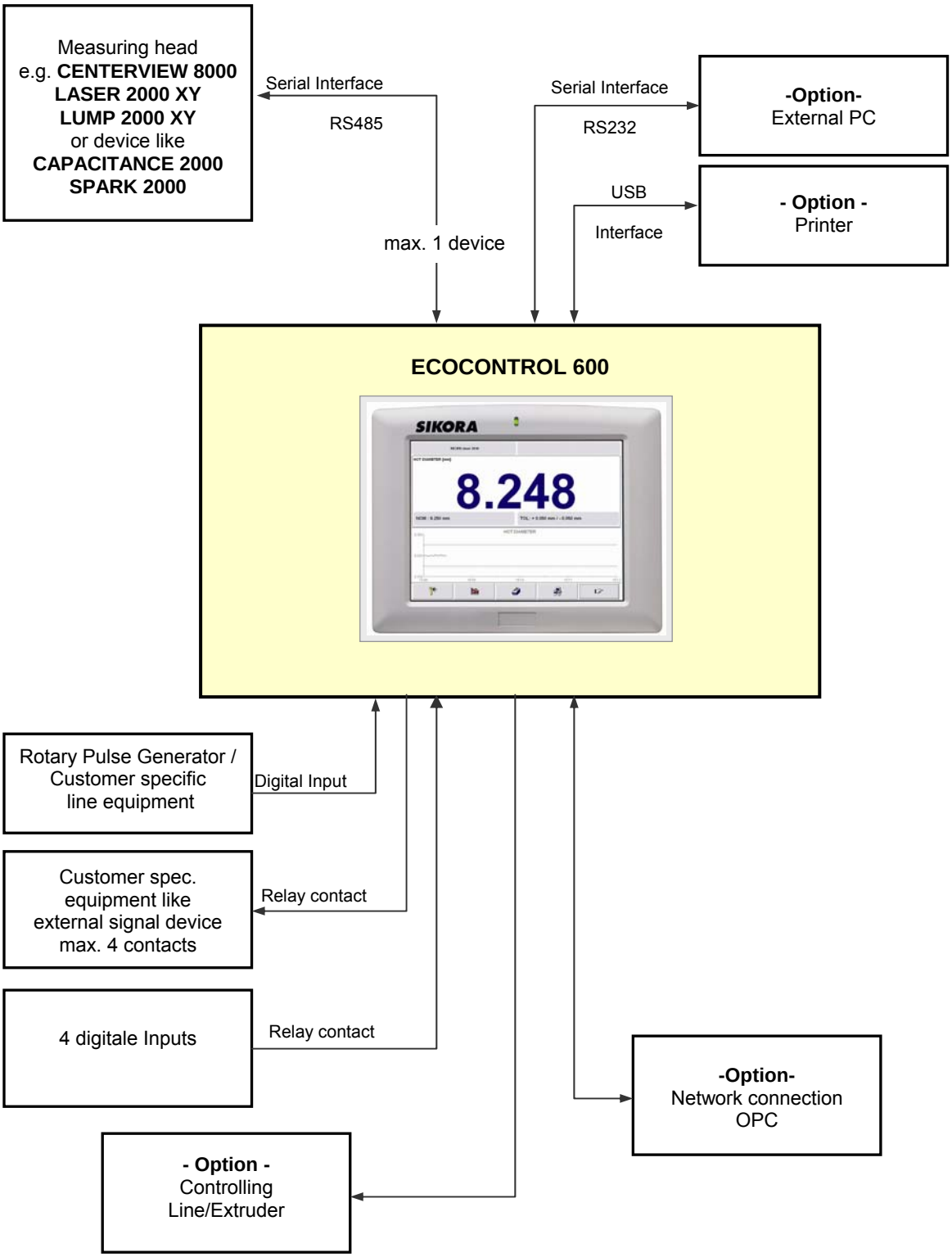
3. Maintenance

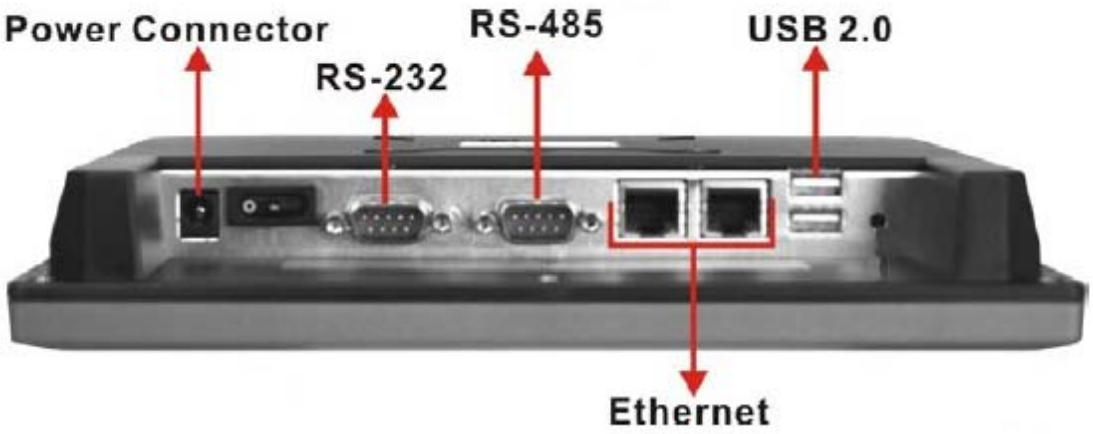
For maintenance of the used measuring device, read the respective user manual!

Clean up the display glass as soften as necessary. Therefore, use a soft handkerchief and a mild cleanser.

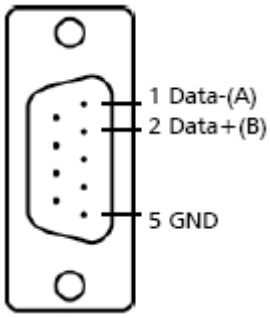
To clean up, first shut off the device to prevent malfunction or unwilled input.

4. Schnittstellen



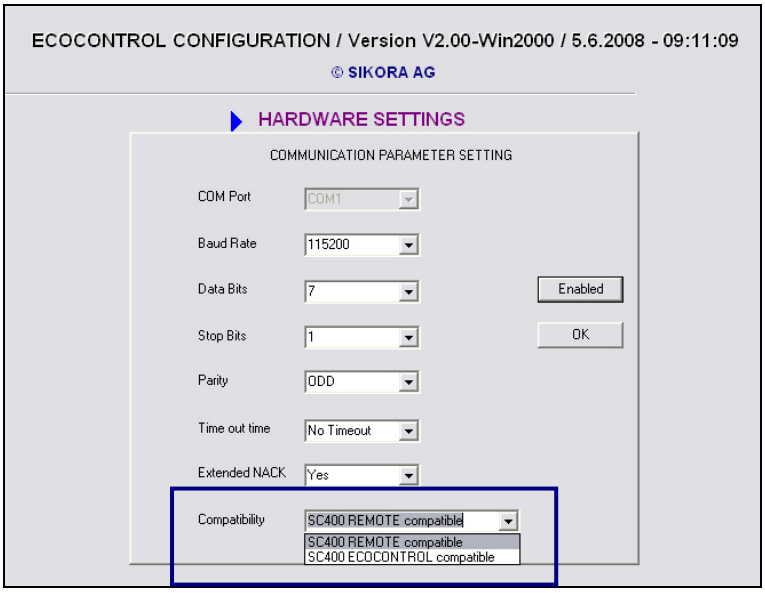


RS 485 pin assignment :



4.1 Configuration Compatibility ECOCONTROL / REMOTE

Normally the Standard *SC400 ECOCONTROL* protocol is active, to use the ECOCONTROL 600 with the accordant measuring device. To use the ECOCONTROL 600 as REMOTE device you have to change the protocol first manually to *SC400 REMOTE*.



4.2 Serial Communication Telegram SC400

- Master-slave bidirectional ASCII-coded protocol
- For remote-computer

ECOCONTROL 2000 ↔ Serial Interface RS232

Transmission Mode	START-STOP asynchronous without Hardware-Handshake
Transmission Range	Max. 15 m (RS232)
Connection Cable	DUE 4503 Li2Y(St)+CY or LIFYCY
Access	MASTER-SLAVE (ECO acting as SLAVE)
Data Security	Parity Bit, Checksum Sign
Format	ASCII Code

1	2 ..... n	x	z

1 = Start bit
2 = 1st Data Bit LSB
n = last Data Bit MSB
x = Parity Bit
z = Stop Bit

The following parameter can be set:

Number of Data Bit	7 / 8
Parity Bit	EVEN / ODD / NO
Stop Bit	1 / 2
Transmission Speed	2400 / 4800 / 9600 / 19200 Baud (bit/s)

STX	START OF TEXT	02_{hex}
ACK	ACKNOWLEDGE	06_{hex}
NAK	NEGATIVE ACKNOWLEDGE	15_{hex}
ETX	END OF TEXT	03_{hex}
SUB	SUBSTITUTE	$1A_{hex}$
BCC	BLOCK CHECK CHARACTER	

Checksum byte is calculated as follows (xor = Exclusive OR):

Checksum =		
IDB1 xor IDB2 ... xor DB1 ... xor DBn xor ETX		with setting sent by MASTER
e.g.	IDB1 xor IDB2 xor IDB3 xor ETX	with request sent by MASTER
	IDB1 xor IDB2 ... xor NAK xor ETX	with reaction on setting or if ID is missing (sent by SLAVE)
	DB1 ... xor DBn xor ETX	with reaction on request (sent by SLAVE)

Checksum < 20H?

(yes) → BCC = Checksum + 20H

(no) → BCC = Checksum

Responsible: Disabling of checksum calculation by transmitting SUB instead of BCC.

Data transmission as subject fort wo time out criteria:

1. Maximum allowed dead time between two telegram characters: 200ms
   If this criterion is fulfilled, receiver awaits new telegram start.
2. Maximum allowed dead time between last character arrived from request telegram and first character send from corresponding respond: 500ms
   If this criterion is fulfilled, transmitter will send new request telegram.

4.2.1 Request Telegram MASTER (Customer Computer)

<STX	<ID1…ID3	<ETX>	<BCC>	ask-telegram

<STX	<ID1…ID3	<DB1…DBn	<ETX	<BCC	set-telegram

STX	START OF TEXT	02_{hex}
ACK	ACKNOWLEDGE	06_{hex}
NAK	NEGATIVE ACKNOWLEDGE	15_{hex}
ETX	END OF TEXT	03_{hex}
SUB	SUBSTITUTE	$1A_{hex}$
BCC	BLOCK CHECK CHARACTER	

ID1 .. ID3 Description (Function body)

ID1	= Device / Measuring Value Selection
‘0’	= Diameter Device
‘1’	= Capacitance Device
‘2’	= Walltickness
‘3’	= Lump Detector
‘4’	= Spark Tester
‘5’	= Controller
‘6’	= General Data
‘7’	= CENTERVIEW

ID2 = Device Number selection

ID2 = 0

Constant Value without changing option

ID3 = Related action

‘0’	= Reading actual values
‘1’	= Reading / writing nominal values

Checksum:

BCC = ID1 xor ... xor ETX

if BCC < 20_h than BCC = BCC + 20_h

BCC = SUB: no BCC-check in the slave

4.2.2 Response Telegram SLAVE (Customer Computer)

<STX	<ID1…ID3	<DB1…DBn	<ETX	<BCC

ask-response
ID1...ID3 response from request
for DB1..DBn content see ID-list

<STX	<ID1…ID3	<ACK>	<ETX	<BCC

successful set
nominal response

<STX	<ID1…ID3	<NACK	<ETX	<BCC

unsuccessful set
nominal response

<STX	<ID1…ID3	<NACK	<DB1>	<ETX>	<BCC>

unsuccessful
set nominal response with
extended error information

DB1 = ’0’	– Time Out
DB1 = ’1’	– End char not found
DB1 = ’2’	– BCC wrong
DB1 = ’3’	– No ASCII char
DB1 = ’4’	– Buffer overflow
DB1 = ’5’	– ID not supported
DB1 = ’6’	– Device not present
DB1 = ’7’	– Wrong Data length
DB1 = ’8’	– Wrong Data value

4.2.3 Ask/Set Telegram Diameter Device

Actual Values Diameter Devices

<STX	<ID1…ID3	<DB1…DB16	<ETX	<BCC

DB1...DB5:	DM-X	(5 digits in display format, 00123 -> 1.23 mm/ft)
DB6…DB8:	Status DM-X	(3 digits, see error code table)
DB9...DB13:	DM-Y	(5 digits in display format, 00123 -> 1.23 mm/ft)
DB14…DB16 :	Status DM-Y	(3 digits, see error code table)

Nominal Values Diameter Devices

<STX	<ID1…ID3	<DB1…DB13	<ETX	<BCC

DB1...DB5:	Nominal	(5 digits in display format, 1.23 mm/ft -> 00123)
DB6...DB9:	Plus Tolerance	(4 digits in display format, 1.23 mm/ft -> 0123)
DB10...DB13 :	Minus Tolerance	(4 digits in display format, 1.23 mm/ft -> 0123)

4.2.4 Ask/Set Telegram Wallthickness

Actual Values Wallthickness

<STX	<ID1…ID3	<DB1…DB8	<ETX	<BCC

DB1…DB5:	Left Wallthickness	(5 digits in display format, 00123 -> .23 mm/ft)
DB6…DB8:	Status Left Wallthickness	(3 digits, see error code table)
DB9...DB13:	Right Wallthickness	(5 digits in display format, 00123 -> .23 mm/ft)
DB14…DB16:	Status Right Wallthickness	(3 digits, see error code table)
DB17…DB21:	Upper Wallthickness	(5 digits in display format, 00123 -> .23 mm/ft)
DB22…DB24:	Status Upper Wallthickness	(3 digits, see error code table)
DB25...DB29:	Lower Wallthickness	(5 digits in display format, 00123 -> .23 mm/ft)
DB30…DB32:	Status Lower Wallthickness	(3 digits, see error code table)
DB33...DB37:	Eccentricity	(5 digits in display format, 00123 -> .23 mm/ft)
DB38…DB40:	Angle Eccentricity	(3 digits, in Degree)
DB41…DB43:	Status Eccentricity	(3 digits, see error code table)
DB44…DB48:	Concentricity	(5 digits in display format, 00123 -> .23 mm/ft, or in %, as configured)
DB49…DB51:	Status Concentricity	(3 digits, see error code table)
DB52…DB56:	Max. Wallthickness	(5 digits in display format, 00123 -> .23 mm/ft)
DB57…DB59:	Angle Max. Wallthickness	(3 digits, in Degree)
DB60…DB62:	Status Max. Wallthickness	(3 digits, see error code table)
DB63…DB67:	Min. Wallthickness	(5 digits in display format, 00123 -> .23 mm/ft)
DB68…DB70:	Angle Min. Wallthickness	(3 digits, in Degree)
DB71…DB73:	Status Min. Wallthickness	(3 digits, see error code table)

Nominal Values Wallthickness

<STX	<ID1…ID3	<DB1…DB13	<ETX	<BCC

DB1...DB5:	Nominal	(5 digits in display format, 1.23 mm/ft -> 00123)
DB6...DB9:	Plus Tolerance Wallthickness	(4 digits in display format, 1.23 mm/ft -> 0123)
DB10...DB13:	Minus Tolerance Wallthickness	(4 digits in display format, 1.23 mm/ft -> 0123)
DB14…DB16:	Shrinkage	(3 digits in display format, 1.23 mm/ft -> 123)

DB17…DB20 :	Tolerance Eccentricity	(4 digits in display format, 1.23 mm/ft -> 0123)
DB21…DB24 :	Tolerance Concentricity	(4 digits in display format, 1.23 mm/ft -> 0123, or in %, as configured)

4.2.5 Ask/Set Telegram Capacitance Device

Actual Values Capacitance Devices

<STX	<ID1…ID3	<DB1…DB6	<ETX	<BCC

DB1...DB5:	Capacitance	(5 digits in display format, 00123 -> 1.23 pf/m -pf/ft)
DB6:	Status Capacitance	(3 digits, see error code table)

Nominal Values Capacitance Devices

<STX	<ID1…ID3	<DB1…DB13	<ETX	<BCC

DB1...DB5:	Nominal	(5 digits in display format, 1.23 mm/ft -> 00123)
DB6...DB9:	Plus Tolerance	(4 digits in display format, 1.23 mm/ft -> 0123)
DB10...DB13 :	Minus Tolerance	(4 digits in display format, 1.23 mm/ft -> 0123)

4.2.6 Ask/Set Telegram Lump Detector

Actual Values Lumpdetector

<STX	<ID1…ID3	<DB1…DB9	<ETX	<BCC

DB1...DB4:	Count of Lumps	(4 digits)
DB5...DB8:	Count of Necks	(4 digits)
DB9:	Status Lump Detector	(3 digits, see error code table)

Nominal Values Lump Detector

<STX	<ID1…ID3	<DB1…DB12	<ETX	<BCC

DB1...DB4:	Lump Tolerance	(4 digits in Lump Detector resolution)
DB5...DB8:	Neck Tolerance	(4 digits in Lump Detector resolution)
DB9…DB12:	Min. Fault Length	(4 digits in Lump Detector Length resolution)

4.2.7 Ask/Set Telegram Spark Tester

Actual Values Spark Tester

<STX	<ID1…ID3	<DB1…DB10	<ETX	<BCC

DB1...DB4:	Count of Sparks	(4 digits)
DB5...DB7:	Actual Voltage	(3 digits, 105 -> 10.5 kV)
DB8…DB10:	Status Spark Tester	(3 digits, see error code table)

Nominal Values Spark Tester

<STX	<ID1…ID3	<DB1…DB3	<ETX	<BCC

DB1...DB3:	Spark Tester Nominal Voltage	(3 digits, 105 -> 10.5 kV)

4.2.8 Ask/Set Telegram Controller

Actual Values Controller

<STX	<ID1…ID3	<DB1…DB6	<ETX	<BCC

DB1:	Automatic Status	‘0’ = Auto OFF
		‘1’ = Auto ON
		‘2’ = Auto HOLD
		‘3’ = Auto STOPPED
DB2...DB5:	Controller Influence in Digits	0 digits = -50%
		2048 digits = 0%
		4096 digits = + 50 %
DB6:	Hardware Status Controller Card	‘0’ = Hardware ok
		> ‘0’ = Hardware Error

Nominal Values Controller

<STX	<ID1…ID3	<DB1>	<ETX>	<BCC>

DB1:	Automatic Status	‘0’ = Auto OFF
		‘1’ = Auto ON
		‘2’ = Auto HOLD

4.2.9 Ask/Set Telegram CENTERVIEW

Actual Values CENTERVIEW

<STX	<ID1…ID3	<DB1…DB20	<ETX	<BCC

DB1…DB5:	Eccentricity	(5 digits in display format, 00123 -> .23 mm/ft)
DB6…DB8:	Status Eccentricity	(3 digits, see error code table)
DB9…DB13:	Concentricity	(5 digits in display format, 00123 -> .23 mm/ft)
DB14…DB16 :	Status Concentricity	(3 digits, see error code table)
DB17…DB20 :	Angle	(4 digits in display format, 00123 -> .23 mm/ft)

Nominal Values CENTERVIEW

<STX	<ID1…ID3	<DB1…DB10	<ETX	<BCC

DB1...DB5:	Nominal + Tolerance Eccentricity	(5 digits in display format, 1.23 mm/ft -> 00123)
DB6...DB10:	Nominal + Tolerance Concentricity	(5 digits in display format, 1.23 mm/ft -> 0123)

4.2.10 Ask/Set Telegram General Data

Recipe Code

<STX	<'6' '0' '0'>	<DB1…DBx>	<ETX>	<BCC>

DB1...DBx: Recipe Code

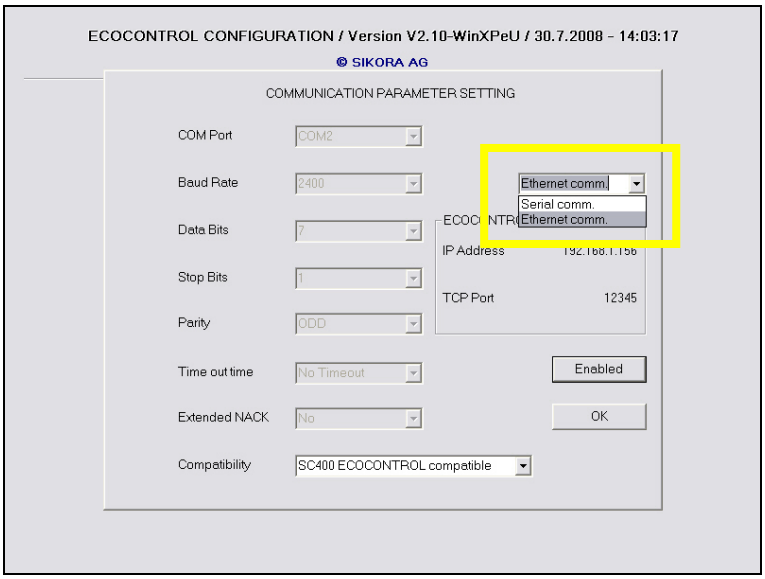
Nominal Value Tape und Analyse Number

<STX	<'6' '0' '0'>	<DB1…DB13	<ETX>	<BCC>

DB1...DB8: Analyse Number
DB9…DB13: Nominal Value Tape

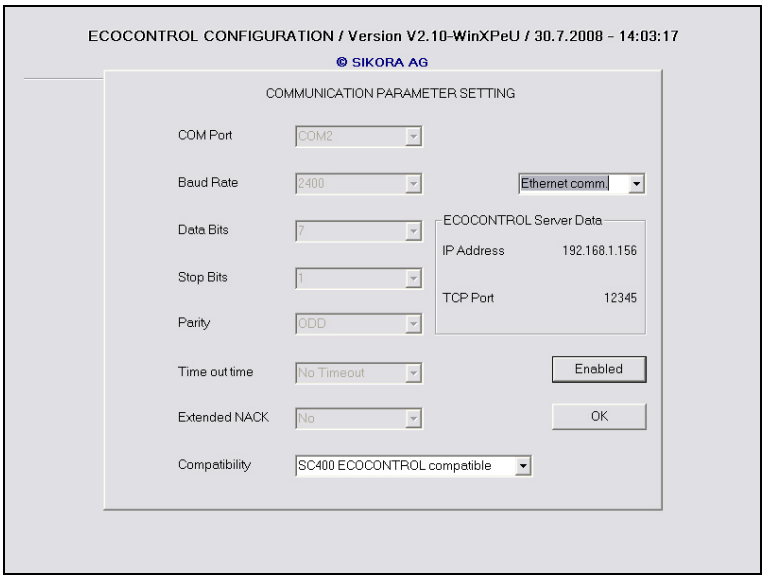
4.3 Ethernet Connection - Option -

To connect to Ethernet, you have to activate it in the configuration menu first.



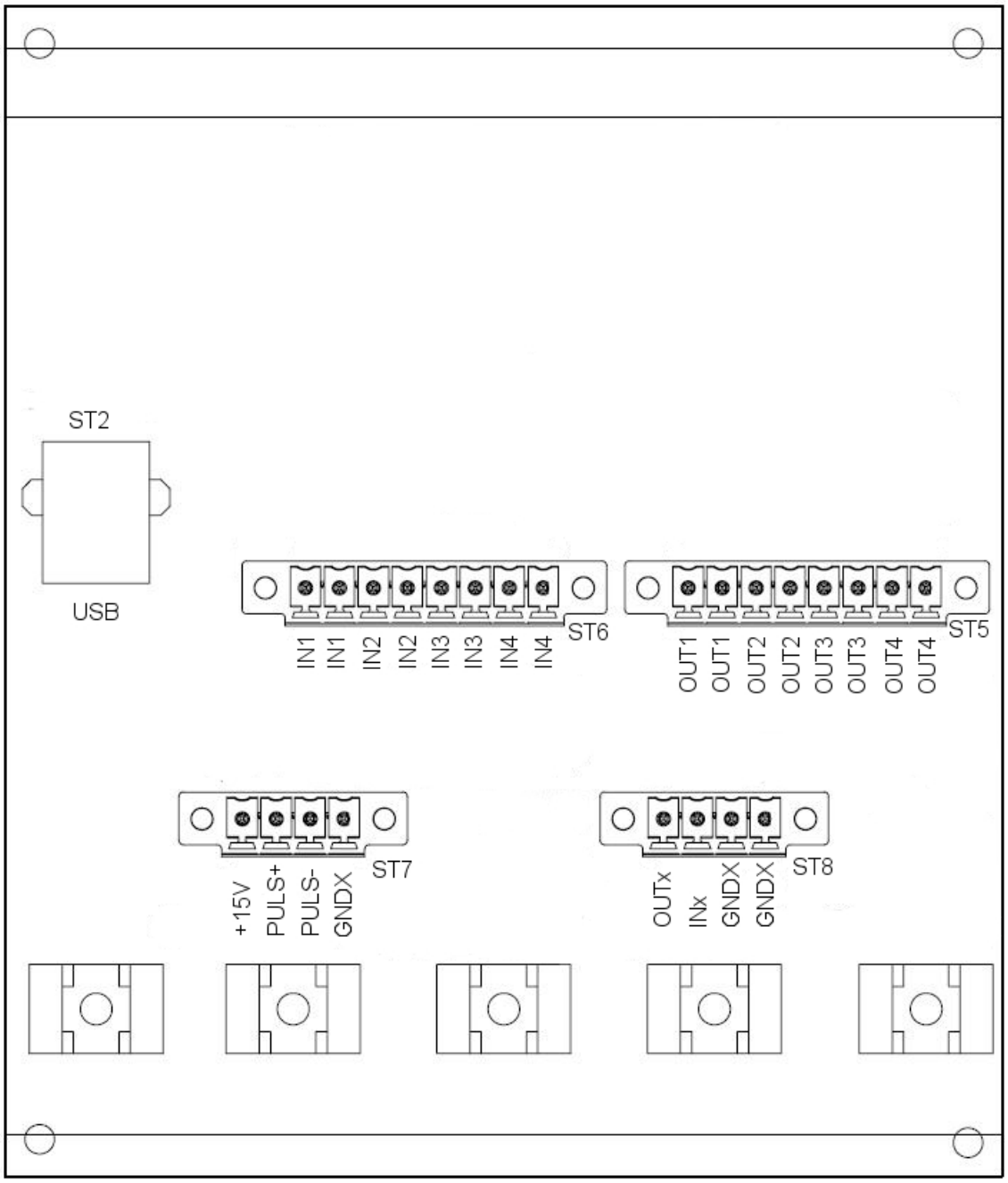
If this is first time of configuration, there will be no valid IP number and TCP port number. Restart the system to actualize these data.

After restart the valid IP number and TCP port number will be shown in the corresponding menu.



Using the data protocol is same like the RS232 serial communication.

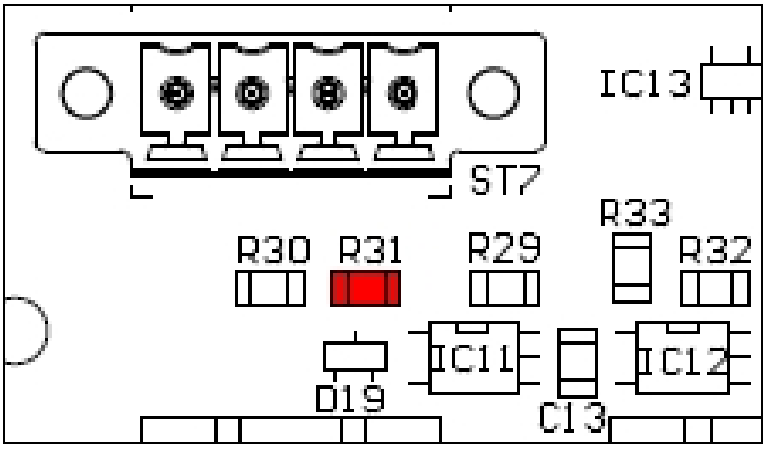
5. SETPOINT 08

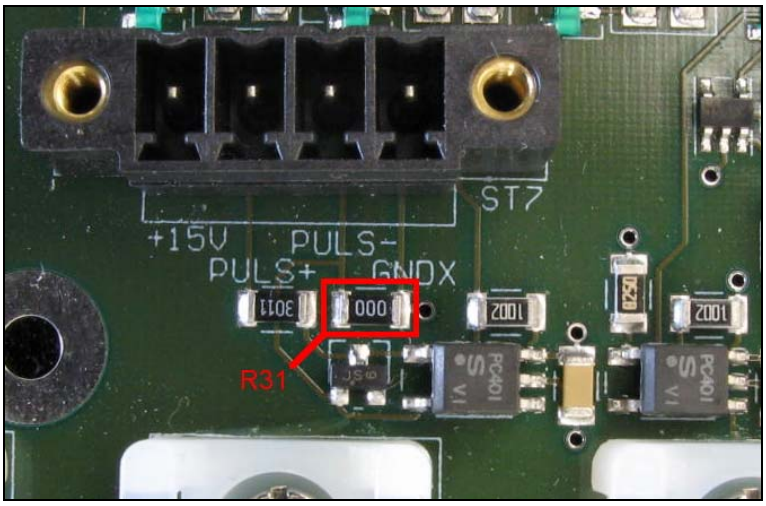


Digital Output (OUT1 – OUT4, ST5):		max. +24 V; 0,5 A
Digital Input (IN1 – IN4, ST6):		+12 V - +24 V; 3mA
Rotary Pulse Generator (ST7):	1:	+15 V Output
	2:	Pulse+; max. 3 kHz; +12 V - +24 V; 8mA
	3:	Pulse- for external Pulse Generator
	4:	Ground
Controller interface (ST8):	1:	Nominal Value Output / 0 – 15 V, max. 5mA
	2:	Nominal Value Input / 0 – 10 V, Ri = 10 kΩ
	3+4:	Ground

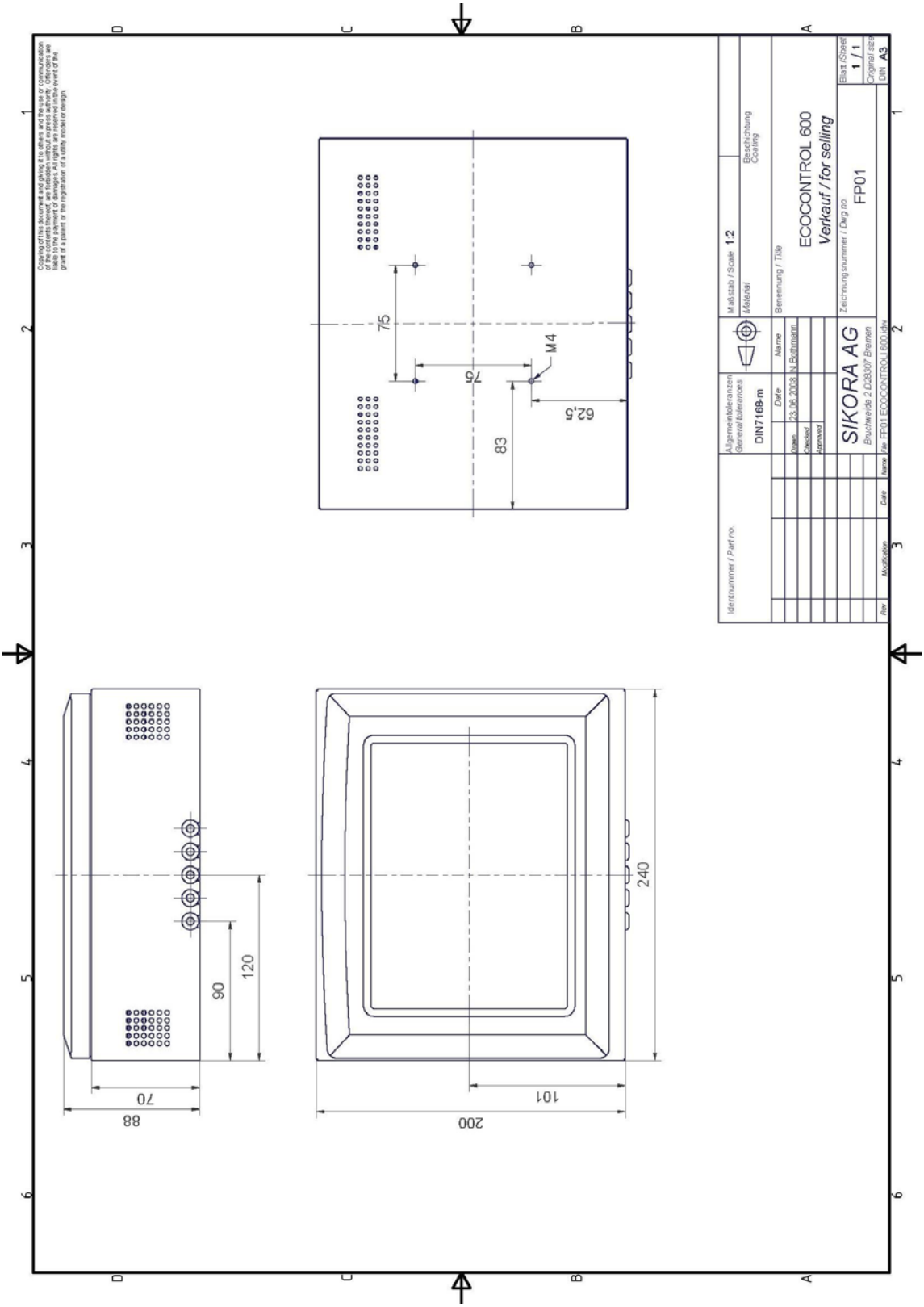
Pin 3 and 4 are connected with a 0 Ω resistor (R31).
If a pulse generator with external voltage supply is connected, you have to remove this resistor first (see lower picture).

Voltage supply will be same like data transfer via USB connector (ST2).

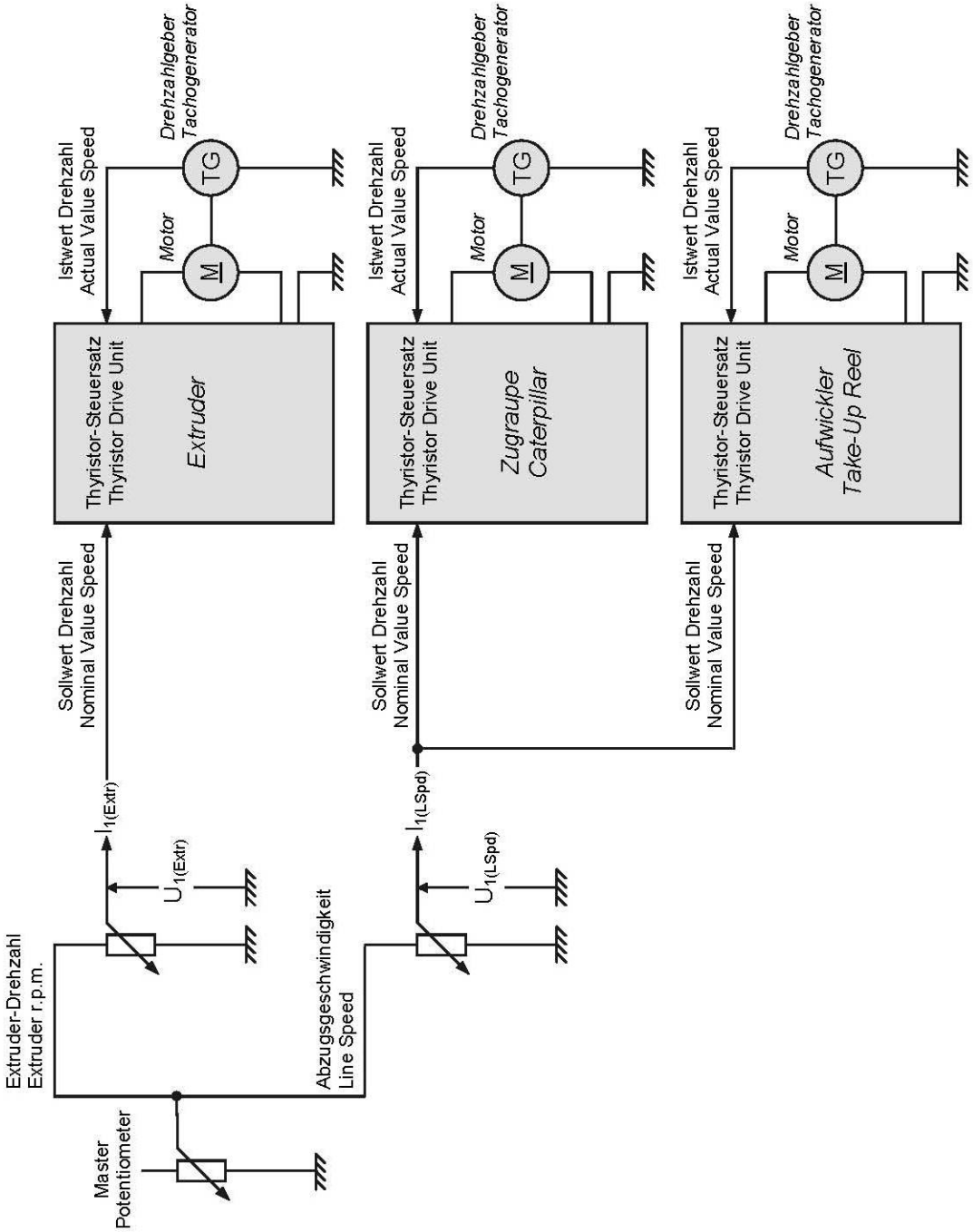




Technical Drawings

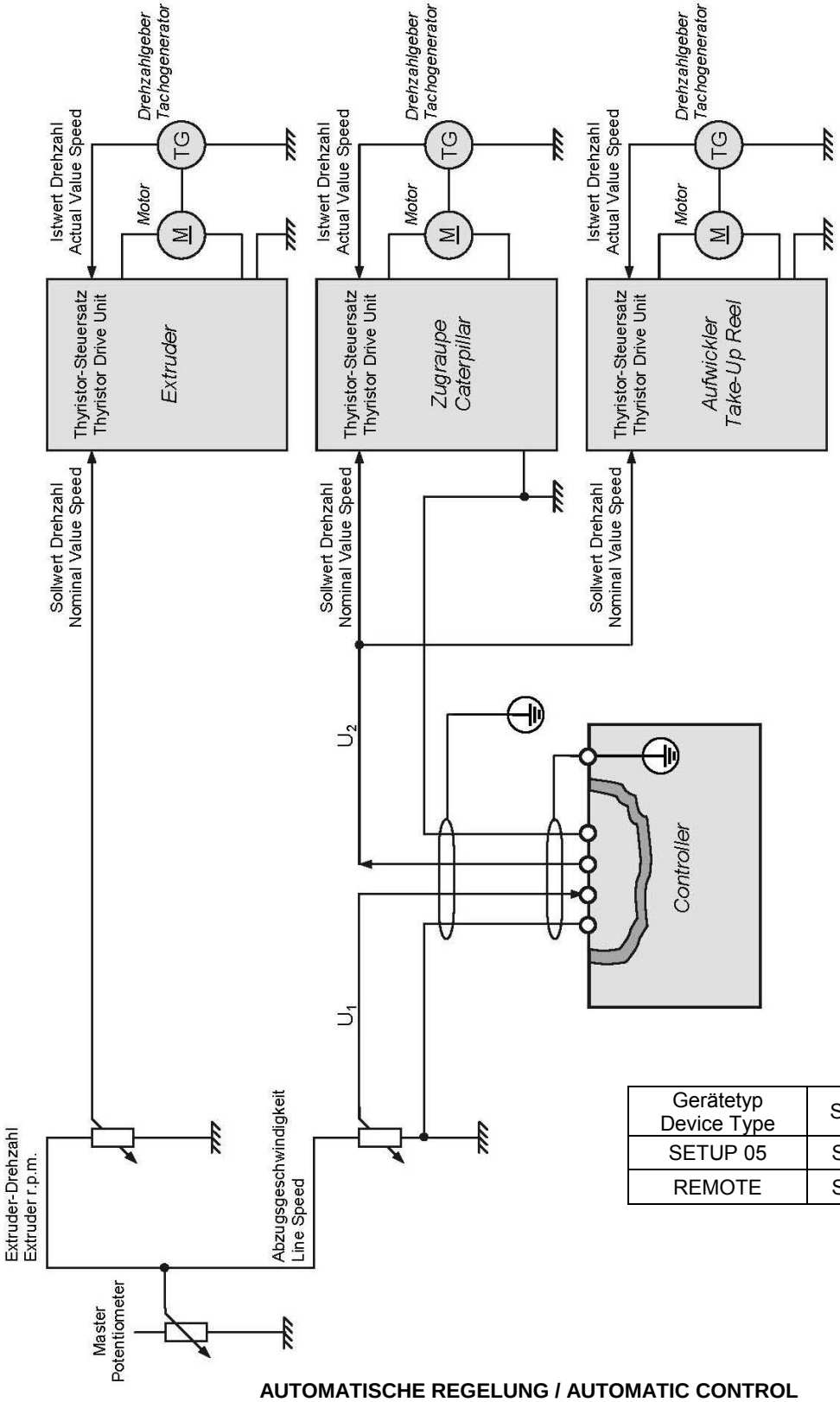


Automatic Control - Schematics



AUTOMATISCHE REGELUNG / AUTOMATIC CONTROL

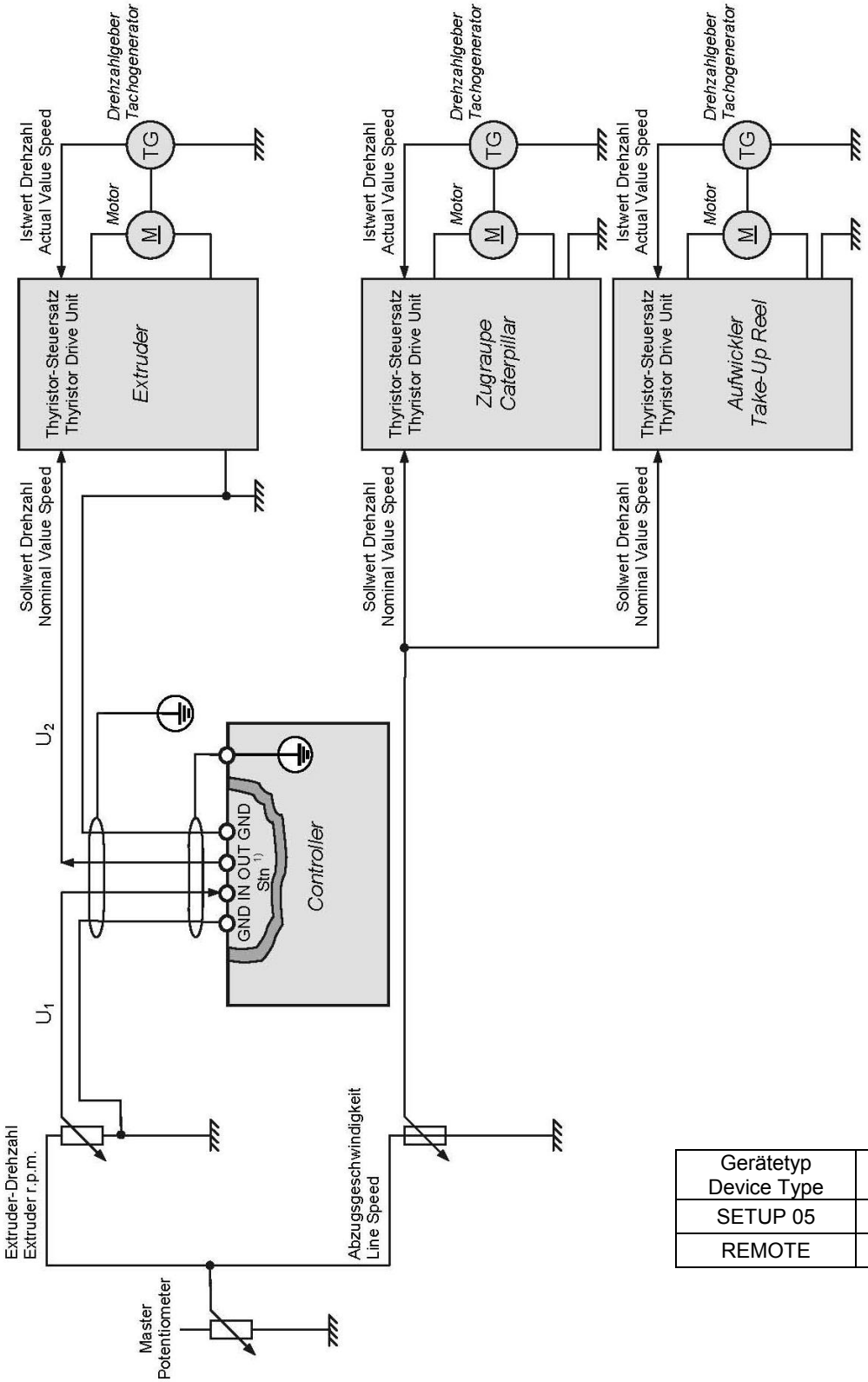
Beispiel: Anlagensteuerung vor Einbau der Automatischen Regelung
Example: Line Control before Installation of Automatic Control



Gerätetyp Device Type	StN
SETUP 05	St8
REMOTE	St2

AUTOMATISCHE REGELUNG / AUTOMATIC CONTROL

Beispiel: Regelung der Abzugsgeschwindigkeit
Example: Automatic Control of Line Speed



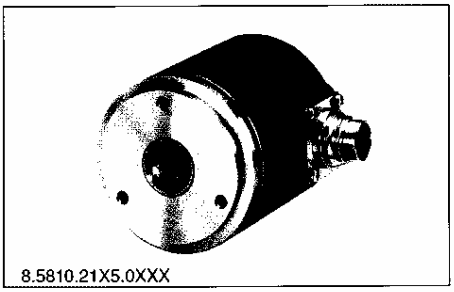
Gerätetyp Device Type	StN
SETUP 05	St8
REMOTE	St2

AUTOMATISCHE REGELUNG / AUTOMATIC CONTROL

Beispiel: Regelung der Extruderdrehzahl
Example: Automatic Extruder Control

Rotary Pulse Generator

TECHNISCHE INFORMATION



8.5810.21X5.0XXX

Spezifikation:

- preisgünstig
- kuzschlußfeste Ausgänge
- in vielen Varianten lieferbar
- robuste Ausführung nach Industriestandard
- hohe mechanische Schutzart
- niedriger Stromverbrauch
- Kunststoff- bzw. Metallteilung mit hoher Schockfestigkeit

Mechanische Kennwerte:

Drehzahl:	max. 6000 U/min.
Trägheitsmoment des Rotors:	$0{,}6 \times 10^{-6}$ kgm^2
Drehmoment:	< 0,01 Nm
Wellenbelastbarkeit radial:	20 N (am Wellenende)
Wellenbelastbarkeit axial:	10 N
Gewicht:	ca. 0,4 kg
Schutzart nach DIN 40.050:	Welle IP 64, Deckel (IP 67 mit Kabel, IP 50 mit Stecker)
Arbeitstemperaturbereich:	0°C bis + 50°C
Welle:	nichtrostender Stahl

Elektrische Kennwerte:

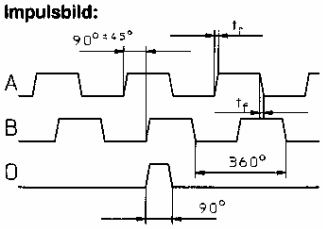
Ausgangsschaltung:	Gegentaktschaltung
Versorgungsspannung U_B:	10 – 30 VDC
Stromaufnahme:	max. 80 mA
Zul. Last / Kanal:	max. +/– 30 mA
Impulsfrequenz:	max. 20 kHz
Signalpegel high:	min. $U_B - 2{,}5$ V
Signalpegel low:	max. 1,5 V
Anstiegszeit t_r:	max. 1 µs
Abfallzeit t_f:	max. 1 µs
Kurzschlußfeste Ausgänge bei korrekter Spannungsversorgung:	ja
Verpolschutz der Spannungsversorgung:	ja

Kurzfristig lieferbare Impulszahlen:

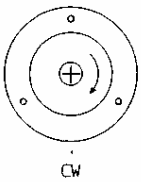
1, 2, 4, 5, 6, 10, 15, 20, 25, 30, 35, 36, 40, 50, 57, 60, 70, 80, 86, 90, 96, 100, 120, 125, 127, 142, 150, 180, 200, 216, 220, 240, 250, 254, 256, 280, 300, 314, 360, 377, 393, 400, 420, 450, 500, 512.

Andere Impulszahlen auf Anfrage.

Impulsbild:

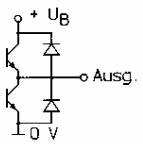


Drehsinn:



Ausgangsschaltung:

Gegentakt

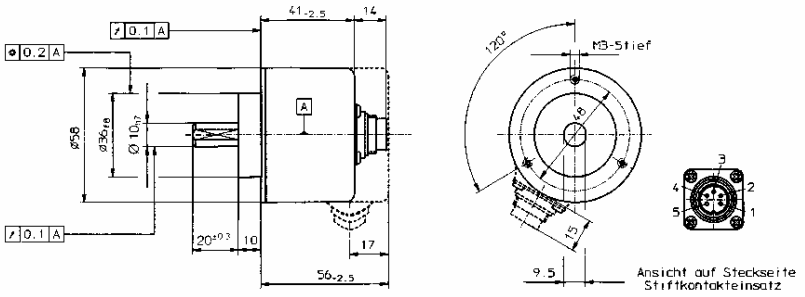


- Welle im Uhrzeigersinn drehend, mit Blick auf die Welle.
- Invertiertes Nullsignal optional erhältlich.
- Der 0-Impuls ist mit den Kanälen A und B UND-verknüpft.

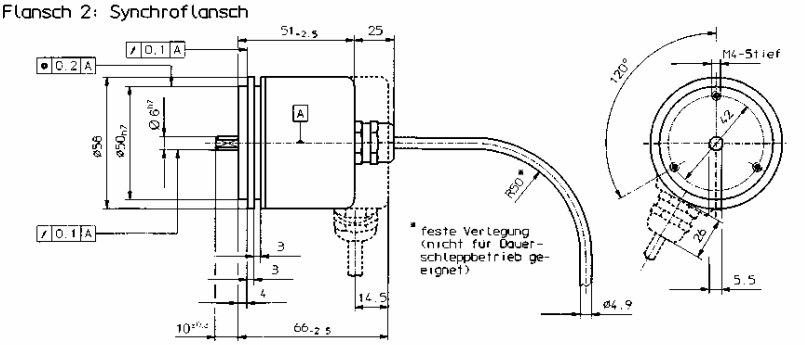
– Änderungen vorbehalten –

Maßbilder:

Flansch 1: Klemmflansch



Flansch 2: Synchroflansch



Anschlußbelegung:

Signal:	0 V	$+U_B$	A	B	O bzw. $\overline{O}$	Schirm
Pin:	1	2	3	4	5	*
Farbe:	weiß	braun	grün	gelb	grau	schwarz

* Schirm liegt am Steckergehäuse an.
– Unbenutzte Ausgänge sind vor Inbetriebnahme zu isolieren

Bestellschlüssel:

8.5810.X X X X.0XXX

Baureihe

Flansch

1 = Klemmflansch
2 = Synchroflansch

Welle (D x L)

1 = Ø 6 mm x 10 mm
2 = Ø 10 mm x 20 mm

Ausführung:

1 = Kanal A
2 = Kanäle A + O
3 = Kanäle A + B
4 = Kanäle A + B + O
5 = Kanäle A + $\overline{O}$
6 = Kanäle A + B + $\overline{O}$

Impulszahl
(z. B. 250 Impulse => **0250**)

Anschlußart:

1 = Kabel axial (1 m)
2 = Kabel radial (1 m)
3 = Stecker axial ohne Gegenstecker
4 = Stecker axial mit Gegenstecker
5 = Stecker radial ohne Gegenstecker
6 = Stecker radial mit Gegenstecker

– Zubehörteile siehe Technische Information Zubehör
– Andere Ausführungen auf Anfrage

Montageanleitung Drehgeber

Wichtig!

Vor Inbetriebnahme des Gebers unbedingt lesen.

Mit diesem Geber haben Sie ein Präzisionsmeßgerät erworben. Beachten Sie stets die Angaben und Hinweise des Datenblattes, um eine problemlose Funktion des Gebers zu gewährleisten und um die Garantieleistung aufrecht zu erhalten. Falls im Datenblatt nichts anderes angegeben ist, bitte folgendes unbedingt beachten:

Instructions for installing rotary transducer

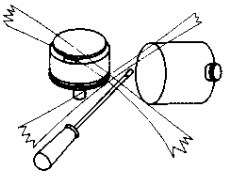
Important!

It is imperative that you read these instructions before putting the transducer into service.

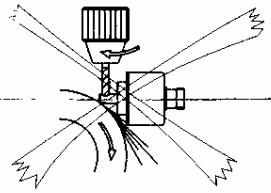
The transducer is a precision measuring instrument. Always comply with the information and instructions on the data sheet to ensure trouble-free transducer function and to maintain the guarantee. Barring instructions to the contrary on the data sheet, compliance with the following is imperative:

Mechanisch:

– Der Drehgeber darf weder teilweise noch ganz zerlegt oder modifiziert werden.



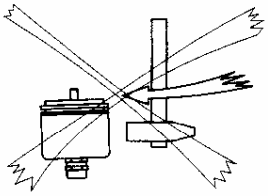
– Die Welle nicht nachträglich bearbeiten (schleifen, sägen, bohren, usw.). Die Genauigkeit des Gebers und die Zuverlässigkeit von Lager und Dichtung nehmen sonst Schaden. Wir sind gerne bereit, auf Ihre Kundenwünsche einzugehen.



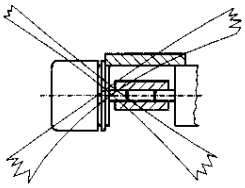
– Das Gerät niemals mit dem Hammer ausrichten.

– Schlagbelastungen unbedingt vermeiden.

– Drehgeberwelle nicht über die im Datenblatt angegebenen Werte belasten (weder axial noch radial).



– Drehgeber und Antriebsgerät nicht an Wellen und Flanschen starr miteinander verbinden. Benützen Sie grundsätzlich eine Kupplung (zwischen Antriebswelle und Geberwelle, bzw. zwischen Hohlwellen-Geber-Flansch und Antriebsflansch).



Für die Gebermontage empfehlen wir Ihnen den Einsatz unserer Montagehilfen und Kupplungen (siehe Zubehör-Datenblätter).

Bitte beachten Sie die umseitig stehenden Montagehinweise!

Mechanical:

– It ist not permissible to dismantle the transducer entirely or in part or to modify it.

– Do not alter the shaft (by grinding, sawing, drilling, etc.), otherwise the accuracy of the transducer and the dependability of bearing and gasket will suffer. We are always happy to take your wishes into account.

– Never align the instrument with a hammer.

– It is imperative to avoid impact loads.

– Never subject the shaft of the transcuder to loads higher than those indicated on the data sheet (axially or radially).

– Do not connect tranducer and drive rigidly to one another at shafts and flanges. Always use a coupling (between drive shaft and transducer shaft, or between hollow-shaft transducer flange and drive flange).

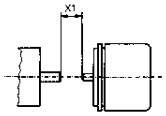
We recommend that you use our assembly aids and couplings to install the transducer (see accessory data sheets).

Please read the installation instructions on the back of this page.

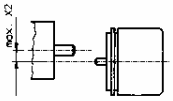
–Änderungen vorbehalten / Subject to changes without prior notice –

Montagehinweise für Geber mit Welle:

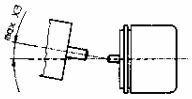
① Wellen auf Versatz überprüfen.



Axialversatz / *Axial offset*



Radialversatz / *Radial offset*



Winkelfehler / *Angle error*

Entnehmen Sie die Werte x1, x2 und x3 dem Datenblatt der Kupplungen.

② Kupplung während der Montage vor zu starker Biegung sowie Beschädigung schützen.

③ Kupplung auf den Wellen ausrichten.

④ Spann- oder Klemmschrauben vorsichtig anziehen.

Installation instructions for tranducer with shaft:

① Check shafts for offset.

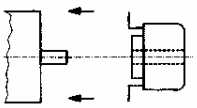
Refer to the coupling data sheet for the values x1, x2 and x3.

② During assembly, protect coupling against excessive bending or damage.

③ Align coupling on the shafts.

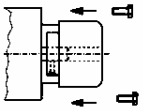
④ Carefully tighten pulling or clamping bolts.

Montagehinweise für Hohlwellengeber mit Kupplung:



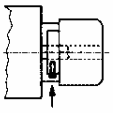
Geber mit Kupplung auf Welle montieren.

Mount transducer with coupling on shaft.



Kupplung mit Antriebflansch verschrauben.

Bolt coupling to drive flange.



Klemmnabe vorsichtig anziehen.

Carefully tighten clamping hub.

Instructions for installation of hollow-shaft transducer with coupling:

Elektrisch:

- Vor Inbetriebnahme sind alle benötigten Kabeladern laut Datenblatt anzuschließen! Isolieren Sie alle nicht benötigten Enden sauber, um Kurzschlüsse zu vermeiden.
- Bei der Konfektionierung des Gegensteckers ist eine, evtl. dem Stecker beigelegte, Anleitung zu beachten.
- Das Anschlußkabel des Gebers möglichst nicht parallel zu einem Netzkabel verlegen, um Störungen zu vermeiden.
- An Leitungslängen empfehlen wir:
  - bei asymmetrischer Übertragung, d.h. invertierte Signale werden nicht verwendet, max. 10 m Leitungslänge.
  - bei symmetrischer Übertragung (z.B. nach RS 422) max. 50 m Leitungslänge.
- Achten Sie auf eine gute Schirmung.
- Gegenstecker am Geber nur im spannungslosen Zustand ziehen oder stecken.
- Die richtige Betriebsspannung und den maximal zulässigen Ausgangsstrom berücksichtigen (siehe Datenblatt)!
- Ein- bzw. Ausschalten der Betriebsspannung für den Geber und das Folgegerät muß gemeinsam erfolgen.

Electrical:

- Before putting into service, connect all required strands as per data sheet. To prevent short-circuits, neatly insulate the ends of all strands which are not required.
- When preassembling the mating connector, comply with any instructions accompanying the connector.
- To avoid interference, do not lay the cable set for the transducer parallel to a mains cable if at all possible.
- Our recommendations regarding cable lengths:
  - in case of asymmetrical transmission, i.e. inverted signals are not used, cable length max. 10 m
  - in case of symmetrical transmission (e.g. to RS 422), cable length max. 50 m
- Make certain that shielding is good.
- Plug in or pull out mating connector on the transducer only when transducer is de-energized.
- Make certain that the operating voltage is correct and the max. permissible output current is not exceeded (see data sheet).
- The operating voltage for transducer and succeeding device must be turned on and off together.

Sicherheitshinweise:

1. Wenn anzunehmen ist, daß ein gefahrloser Betrieb nicht mehr gewährleistet ist, muß das Gerät außer Betrieb gesetzt und gegen unbeabsichtigtes Einschalten gesichert werden.
2. Wenn durch den Ausfall oder eine Fehlfunktion des Gebers eine Gefährdung von Menschen oder eine Beschädigung von Betriebseinrichtungen nicht auszuschließen ist, so muß dies durch geeignete Sicherheitsmaßnahmen wie Schutzvorrichtungen oder Endschalter usw. verhindert werden.

Bei Mißachtung der obigen Richtlinien können wir keine Garantie gewähren. Wir bitten um Verständnis.

Safety precautions:

1. If operation without danger can no longer be assured at some point, the unit must be shut down and secured against accidental activation.
2. If personal injury or damage to equipment is possible should the transducer fail or malfunction, this must be prevented by suitable safety precautions such as protective devices or limit switches, etc.

We can assume no guarantee if the above directives are disregarded. We ask for your understanding.

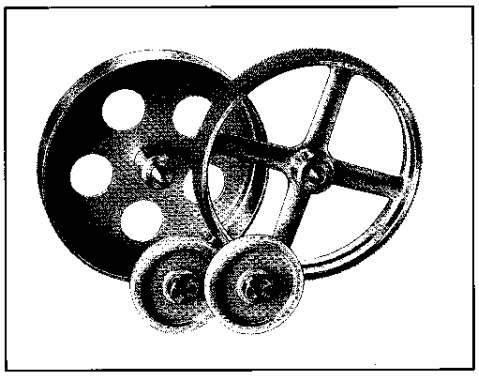
TECHNISCHE INFORMATION

Zubehör für Drehgeber
Meßräder

11.91.2

Beschreibung und Anwendung

Meßräder dienen, in Verbindung mit Impulsgebern, zur Längenmessung von laufendem Meßgut in der Holz-, Papier-, Metall-, Textil- oder Kunststoffindustrie. Bei der Auswahl eines Meßrades ist zunächst die Art der zu messenden Ware zu berücksichtigen, um danach die Oberfläche bzw. den Belag des Meßrades zu bestimmen.



Ausführungen:

Meßrad Umfang	Profil-Nr.	Belag	Belaghärte Shore A	Standard-bohrung mm [1]	Meßbreite mm	Werkstoff Radkörper	Gewicht (ca.) g	Meßrad Nr.
Meßräder für metrisches Maßsystem:								
0,2 Meter	1	Kreuzrändel		6	12	Aluminium	40	211
	3	flache Nut mit Querrändel		6	10	Aluminium	50	231
	3	flache Nut mit Querrändel		6	4	Aluminium	25	234
	4	Kunststoff (Hytrel) glatt	85...90	6	12	Kunststoff	35	241
	9	Kunststoff (Hytrel) geriffelt	85...90	6	12	Kunststoff	35	291
0,5 Meter	1	Kreuzrändel		10	25	Aluminium	350	512
	3	flache Nut mit Querrändel		10	16	Aluminium	350	536
	4	Kunststoff (Hytrel) glatt	85...90	10	25	Kunststoff	260	542
	5	Kunststoff (Vulkollan) glatt	90...95	10	25	Aluminium	320	552
	6	Noppengummi		10	25	Aluminium	320	562
	9	Kunststoff (Hytrel) geriffelt	85...90	10	25	Kunststoff	260	592
1 Meter	5	Gummi glatt	70...75	10	25	Aluminium	780	052
Meßräder für englisches Maßsystem								
1 Fuß	1	Kreuzrändel		6	13	Aluminium	110	711
	1	Gummi glatt	70...75	6	13	Aluminium	100	751

[1] = Andere Bohrungsdurchmesser auf Anfrage

Bestellschlüssel:

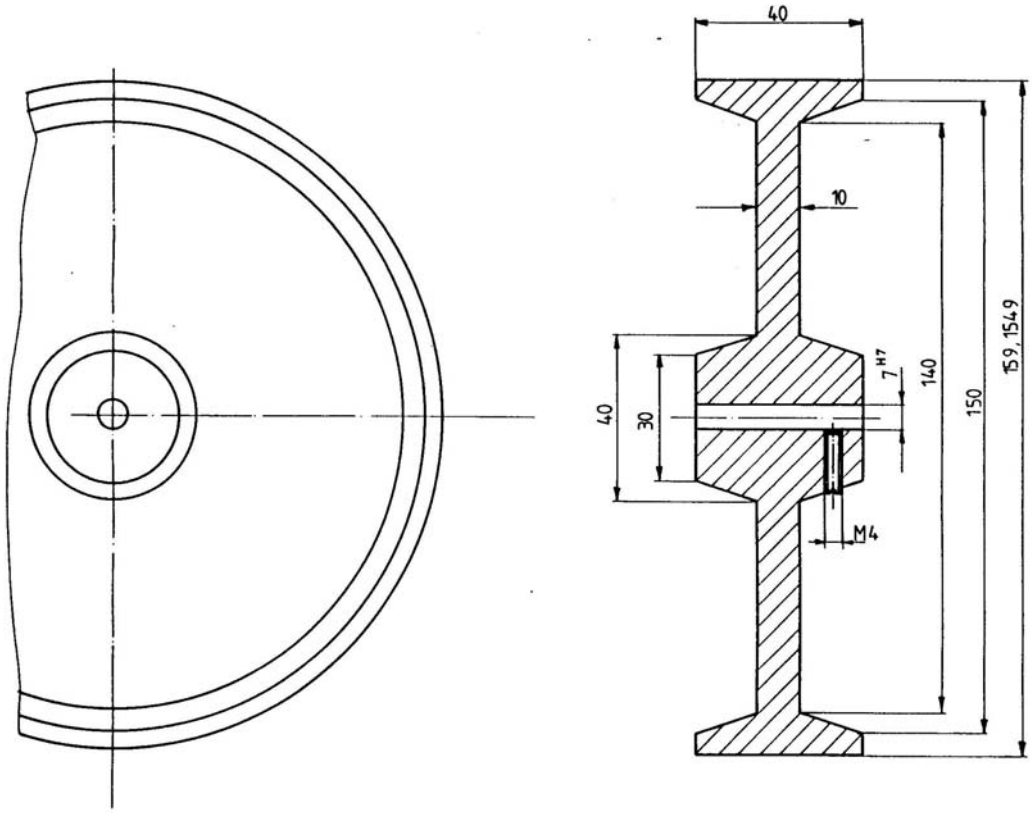
8.0000.3 XXX.00XX

- XXX: Meßrad-Nr.
- XX: Bohrungsdurchmesser

Bitte beachten Sie:
Wird ein Meßrad direkt auf der Drehgeberwelle befestigt, darf die Andruckkraft zwischen Meßrad und Meßgut die im Datenblatt des Drehgebers angegebene, radiale Wellenbelastung nicht überschreiten.

Wir weisen außerdem darauf hin, daß die Meßräder nur für innerbetriebliche Zwecke verwendet werden können, die nicht den Bestimmungen des Eichgesetzes unterliegen.

– Änderungen vorbehalten –



Material: AlMgSi 0,5

Symbol Explanation

⚠	**(Important) safety information or warning notices about a dangerous procedure, occurrence or object.**
☞	**Information about an optional component or installation / module.**
☝	**Special notice to the appropriate chapter / theme.**
ⓘ	**Reference to another chapter or separate manual / video for further information.**