User Manual
ECOCONTROL 1000

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Device Number

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Introduction

The ECOCONTROL 1000 is a precision measuring and controlling device made by

SIKORA AG
Bruchweide 2
28307 Bremen

Telephone: +49 (0)4 21 / 48 90 00
Fax: +49 (0)4 21 / 48 90 0 - 90
e-mail sales@sikora.net
Internet www.sikora.com

Service Department: +49 (0)4 21 / 48 90 0 - 50
e-mail service@sikora.net

Contents of delivery:

1 Display Unit ECOCONTROL 1000 with TFT Color Monitor and Touch Panel, desk-top version (optionally for 19" rack assembly)

Measuring Head(s) / Measuring Device(s):

_ Measuring Head CENTERVIEW 2000
_ Measuring Head LASER 2000 XY with / without stand (Option)
_ Measuring Head LUMP 2000 XY with / without stand (Option)
_ Measuring Device CAPACITANCE 2000
_ Testing Device SPARK 2000 with / without stand (Option)

1 Rotary Pulse Generator
1 Set of Plugs
1 Connection Cable, ready made, _____ m

Technical Documentation

Options:

- Report Printer
- Remote Display

The ECOCONTROL 1000 is a processor–based measuring and control system for the exact measurement and control of the wall thickness/diameter of cables in extrusion lines, offering a varied number of applications in combination with other ***SIKORA*** measuring devices like CENTERVIEW 2000, LASER 2000 XY etc. 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:

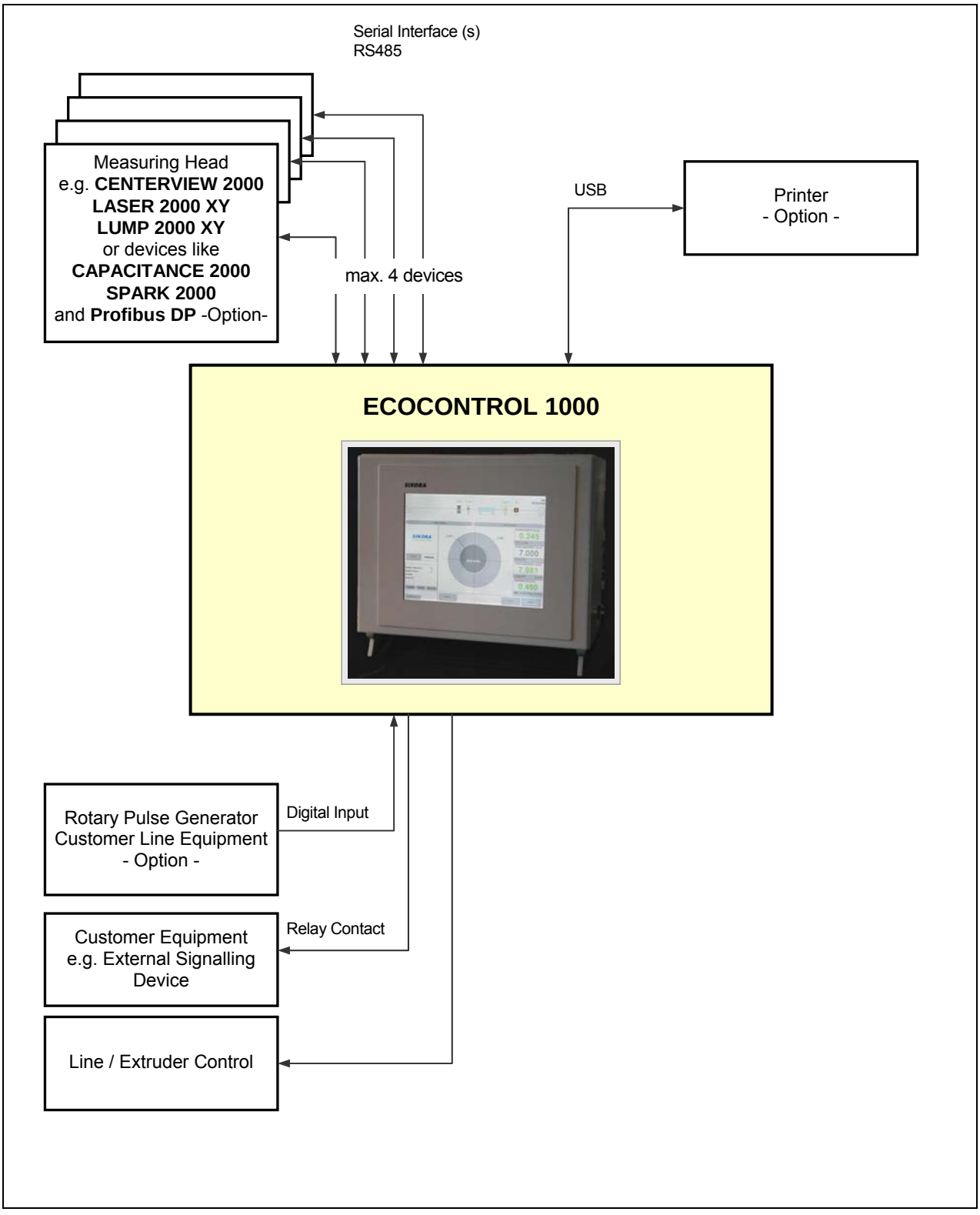
- round conductor cable

Up to four measuring and / or testing devices can be used, 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 for system operation.

Desk Version of ECOCONTROL 1000

The device has several interfaces for transfering measuring and operational data to and from the ECOCONTROL 1000. Its serial interfaces can be used to connect the ECOCONTROL 1000 to one or more of the ***SIKORA*** measuring heads like the CENTERVIEW 2000, LASER 2000 XY etc. or ***SIKORA*** devices like the CAPACITANCE 2000 or the SPARK 2000. 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 (option).
The ECOCONTROL relay contacts can be used to supply customer line equipment like for instance external signalling devices.
There is one controller output for either line or extruder automatic control.



ECOCONTROL 1000 / External Connections Overview

1. Installation and 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 1000 is 95% (without condensation).

1.1.2 Voltage Supply and Grounding

The ECOCONTROL 1000 can be supplied with 100 up to 245 V AC ± 15%, 50...60 Hz. The power consumption amounts to approximately 120 VA.

When designing the device, special attention has been laid on preventing power-line interferencess. 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 Ecocontrol Display Unit

Check carefully after unpacking. Install the display unit at its place as delivered, i.e. complete with housing.

Make sure the device is placed correctly and cannot tilt over when its door is being opened !

There is a special mounting frame available (Option) if you want to install the display unit in a 19″ rack, see Fig. 3. Mounting in a desk or cabinet is only recommended, when there are units without radiation interferences (e.g. printer, lump detector). Interferences may arise from Spark testers, as well as from motors, relais, contactors or magnetic valves.

1.2.2 Mounting the Measuring Head(s) / Testing Devices

Check carefully all parts after unpacking them. Refer to the manuals of the respective devices.

Please observe that a measuring head to be used for measuring the core diameter or hot diameter should be mounted just behind the extruder (about 300 mm). Measuring heads used for measuring the wall thickness should be placed about one to two meters apart from each other. For measuring heads at the end of the line, please take care that the cable is dry, because water drops may lead to faulty values.

For correct installation of LASER 2000 measuring heads, see separate manual *LASER 2000 XY*.

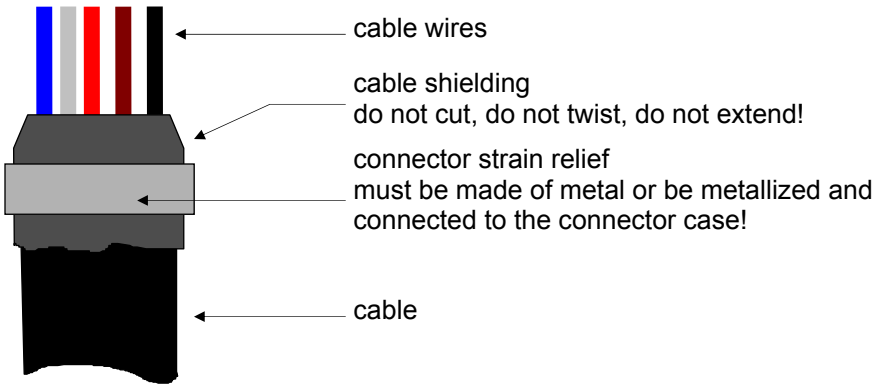
1.2.3 Connection of Cables and Signal Lines

We deliver ready made connecting cables, standard length 6 m. These are used for connecting the display unit to up to four measuring heads, measuring devices and / or testers.

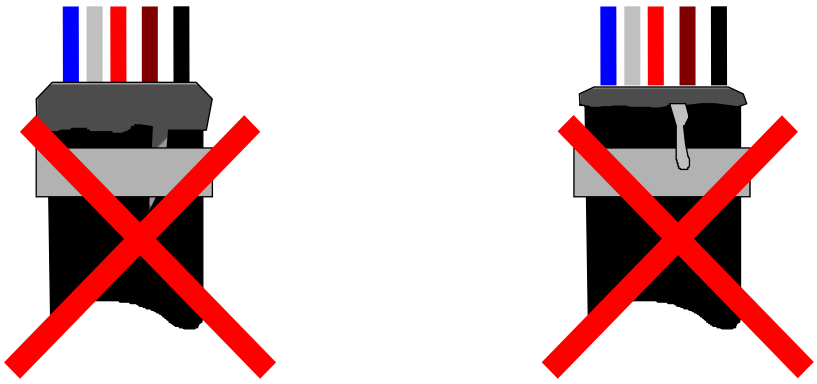
These cables carry data at a high transmission rate. Therefore the camera cables can be laid next to each other but should not be laid parallel to other cables which for instance are used for power supply. If however you decide upon a common path, keep a distance of at least 20 cm to other cables and 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.



Install the connections as required for your application. Refer also to Fig. 7 *External Wiring* for pin assignment and Fig. 2 where to find the respective connectors.

The digital inputs computer control mode (15 V*≙ only computer active), and the external start/stop signals (for functions TREND/STATISTICS) has to be connected to St 6 (SETUP-05 board).

The automatic control is connected to plug St 8 (also refer to Fig. 12 *Automatic Control*). The nominal value voltage U1 at the slider of the drive potentiometer must not exceed +10 V with maximum pull-off speed.

1.2.4 Rotary Pulse Generator

The speed information of the rotary pulse generator is used for the display of page TREND, the delay time memory and if the control is to work with consideration of line speed (very slow lines refer also to Chapter 2.2.2 *Automatic Control*).
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 to use a flexible coupling for perfect and permanent hold.
The output of the delivered rotary pulse generator is 25 pulses per revolution, connected to plug St. 7 (SETUP-05 board).

Refer to Fig. 7 *External Wiring* for pin assignment.

1.3 Configuration

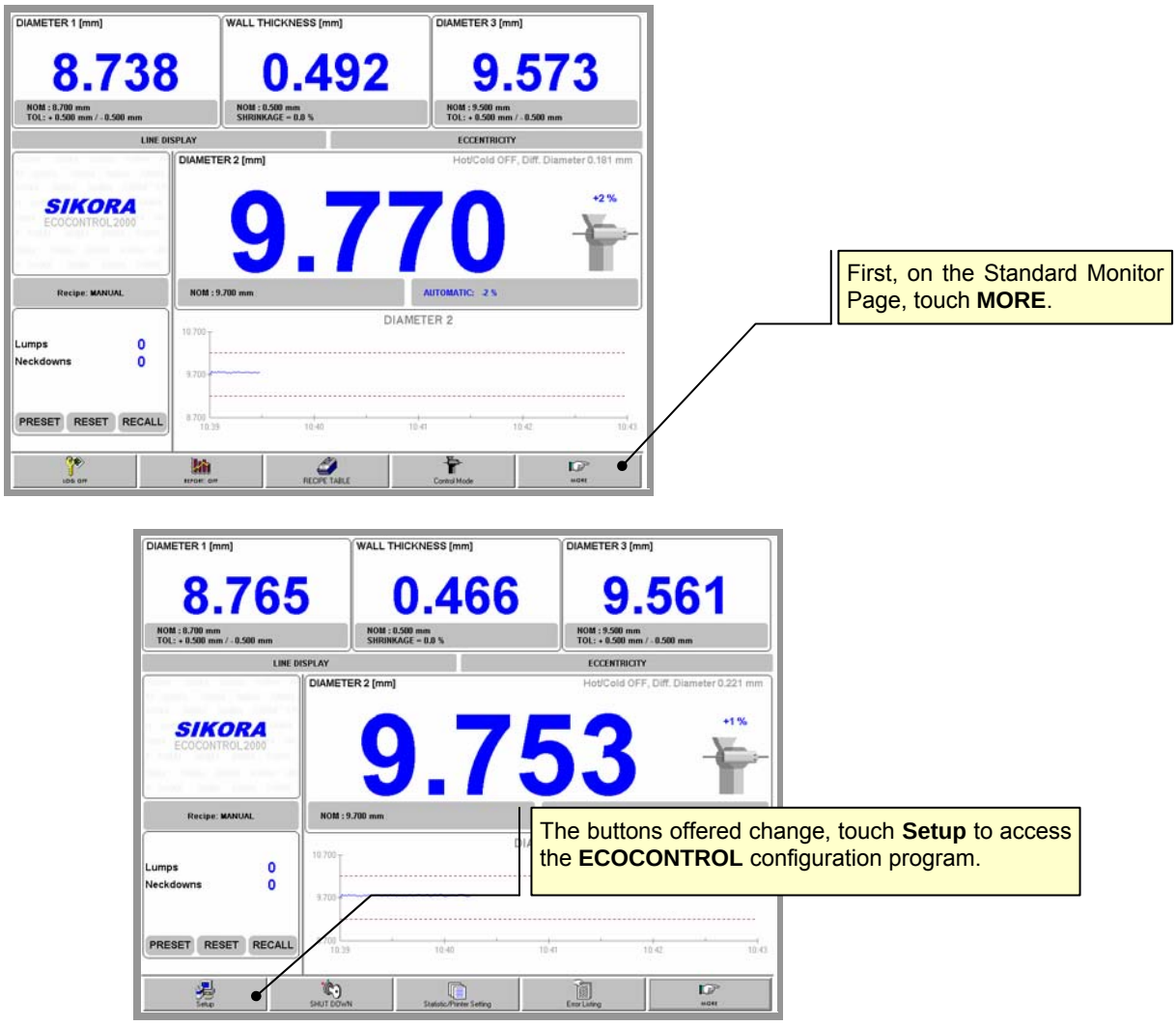
1.3.1 General

Before starting ECOCONTROL 1000 operation the application has to be configured as described below to adapt it to your production line. This should be done by an experienced ***SIKORA*** technician.

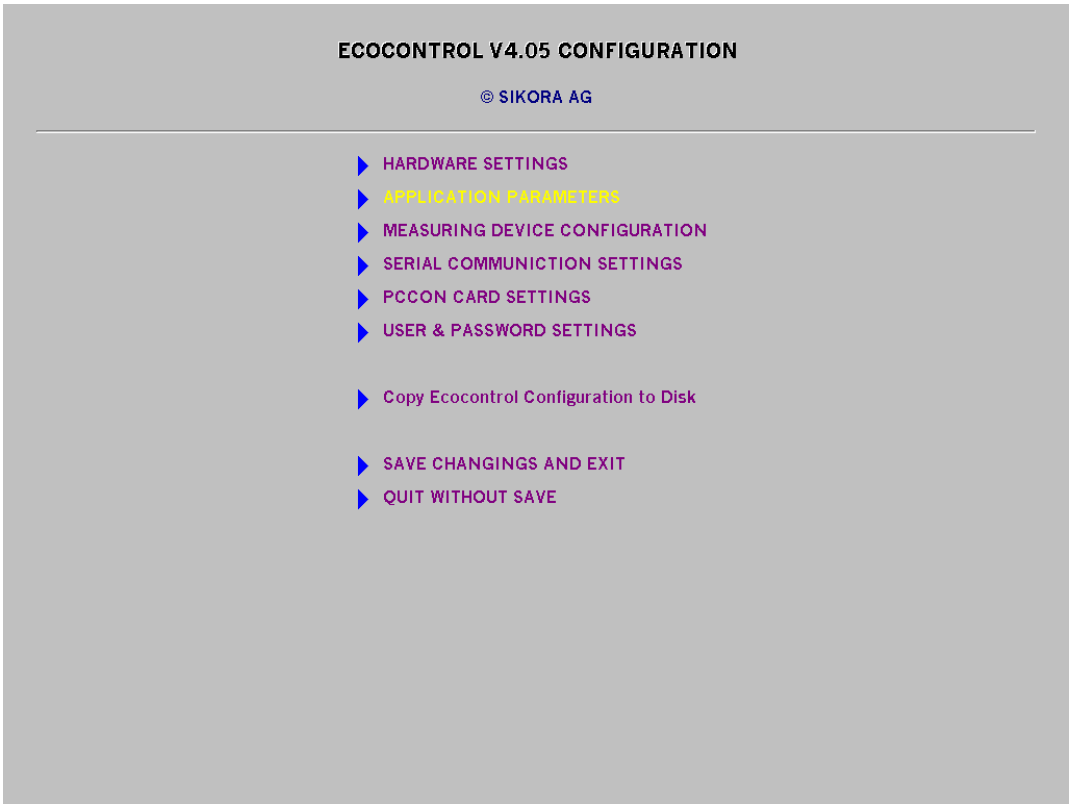
Use the configuration section of your ECOCONTROL 1000 software to set the specific parameters of your line. This is usually done once during the initial set-up and does not have to be changed later on. If however this becomes necessary, please contact our Service Department first.

Proceed as follows:

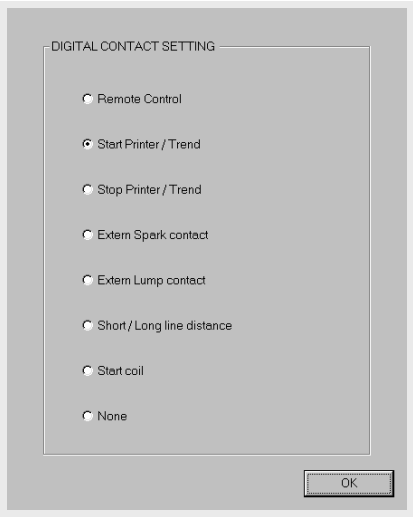
Switch on the device. On the monitor screen, the measuring software presents the Standard Monitor Page.

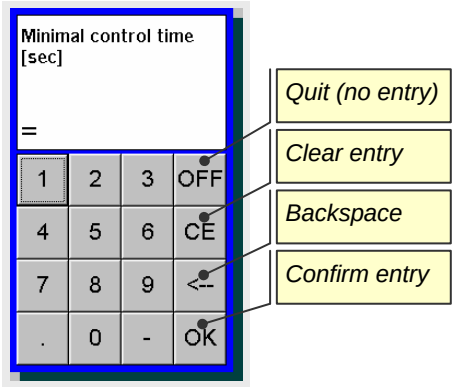


Then the configuration program main menu will appear.

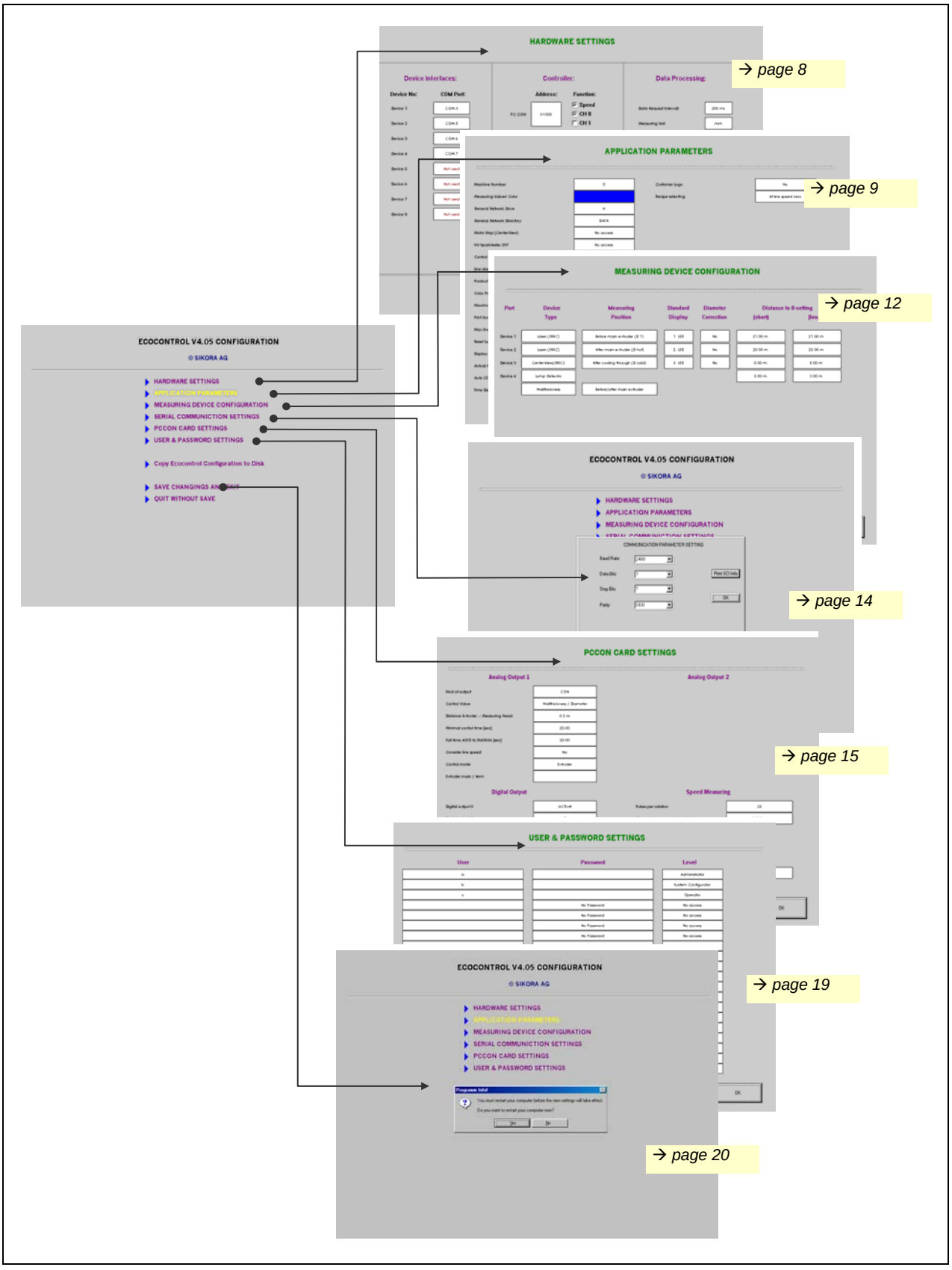


Choose from the menu and set your configuration parameters accordingly (see description and examples below).
Setting is done by touching the respective parameter text box and either selecting from the alternatives being offered or entering a value via a numeric keypad being presented.





Leave the configuration program with **SAVE ... AND EXIT** when you want the entries to become valid, otherwise use **QUIT WITHOUT SAVE**.



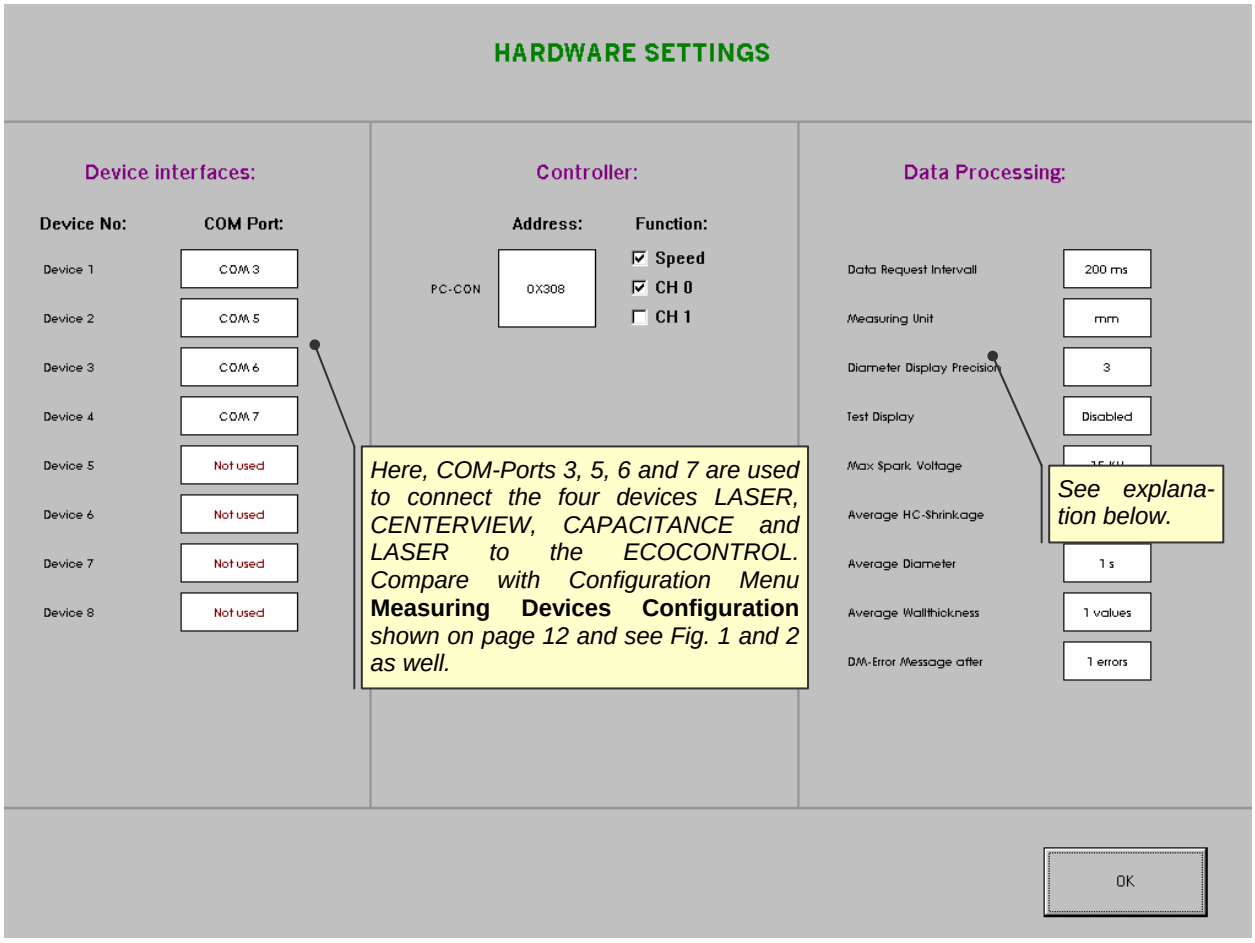
ECOCONTROL Configuration Program Structure

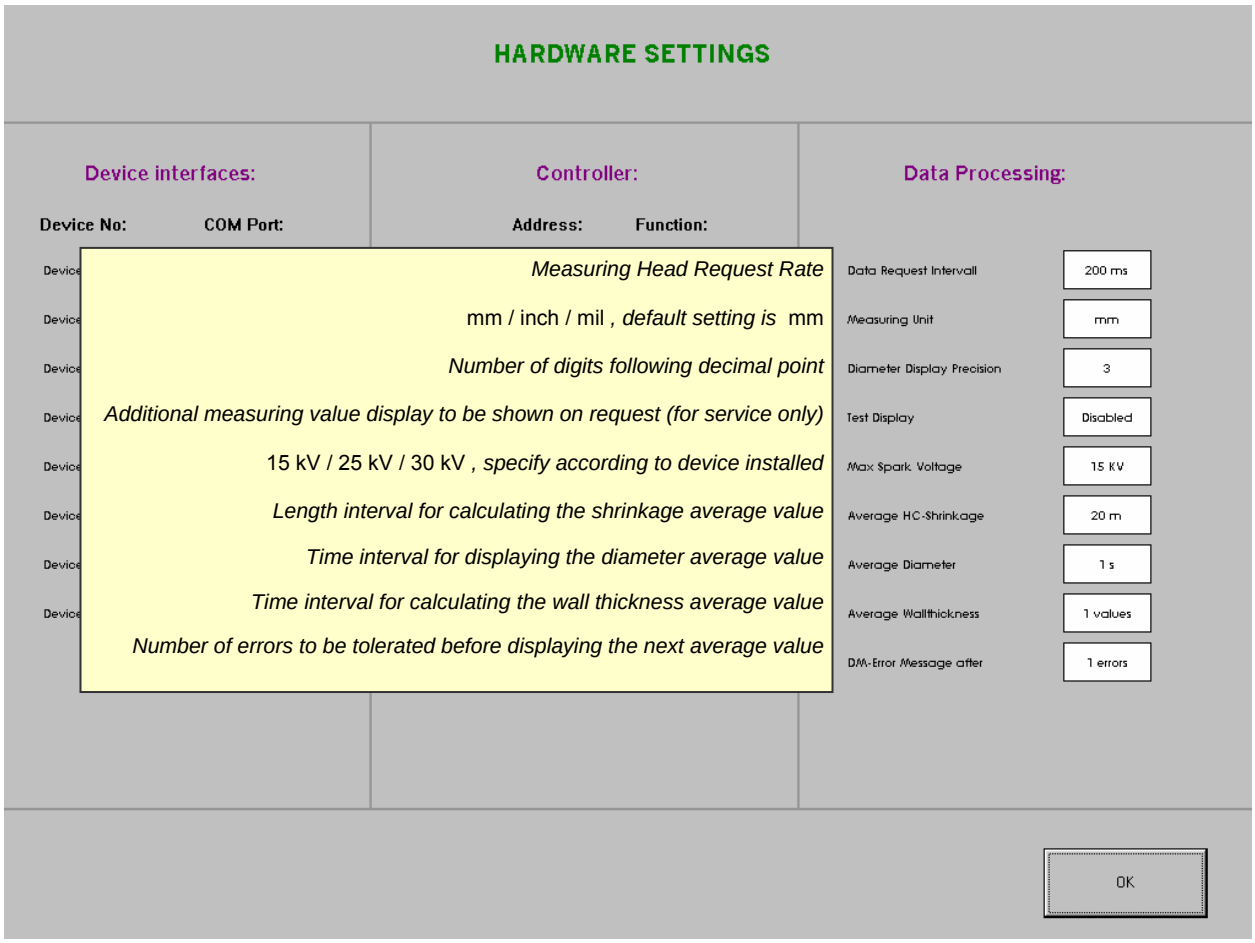
1.3.2 Configuration Menu HARDWARE SETTINGS

The three sections of this page define
- the interfaces used for communication between the ECOCONTROL and the devices connected, such as LASER, CENTERVIEW, CAPACITANCE etc.
- the PC-CON address
- parameters used for data processing, such as measuring unit used and limit values.

The values for all parameters have been set at our factory and should not be changed. Please contact our Service Department first if modifications become necessary.

Example:





Measuring Head Request Rate

mm / inch / mil , *default setting is* mm

Number of digits following decimal point

Additional measuring value display to be shown on request (for service only)

15 kV / 25 kV / 30 kV , *specify according to device installed*

Length interval for calculating the shrinkage average value

Time interval for displaying the diameter average value

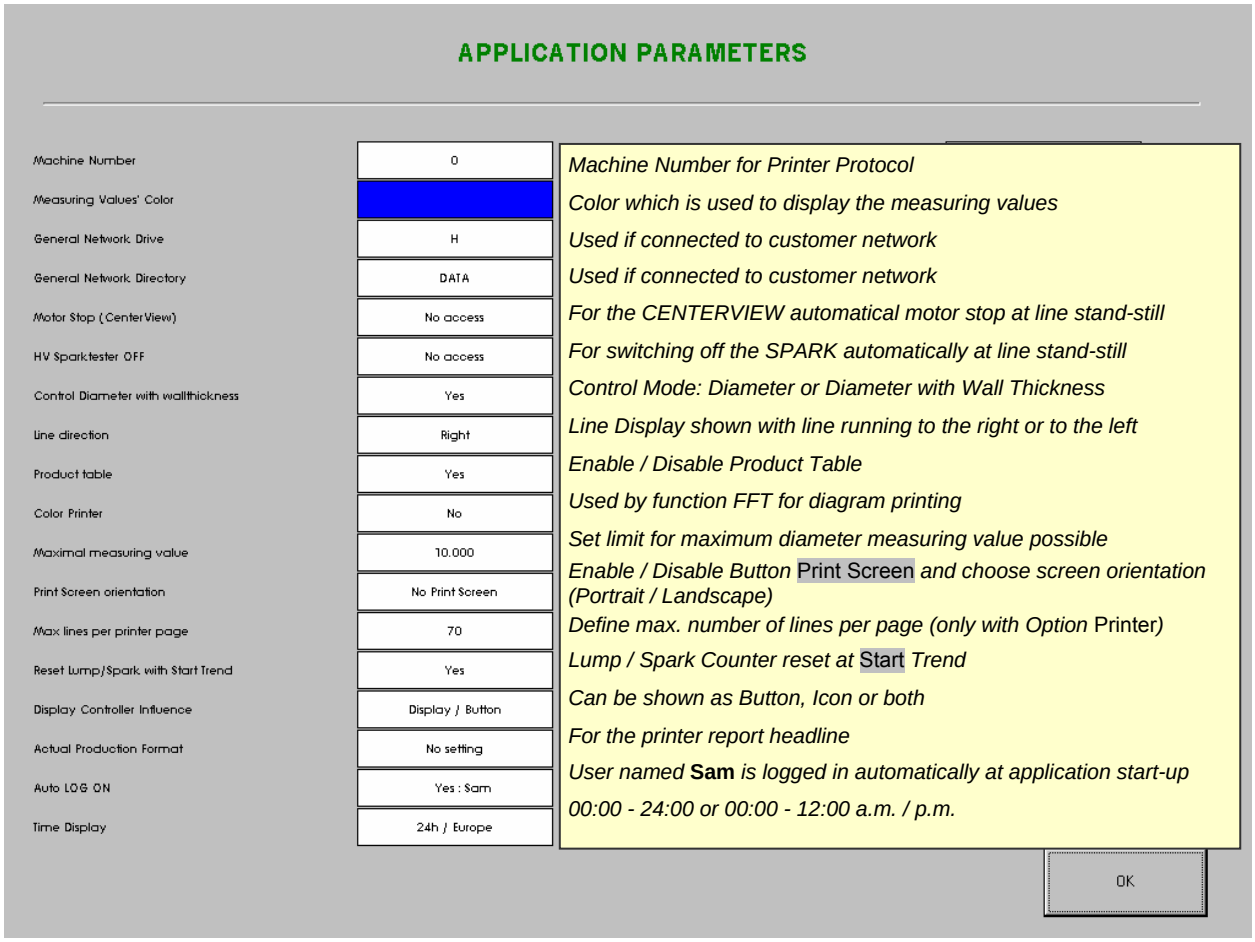
Time interval for calculating the wall thickness average value

Number of errors to be tolerated before displaying the next average value

1.3.3 Configuration Menu APPLICATION PARAMETERS

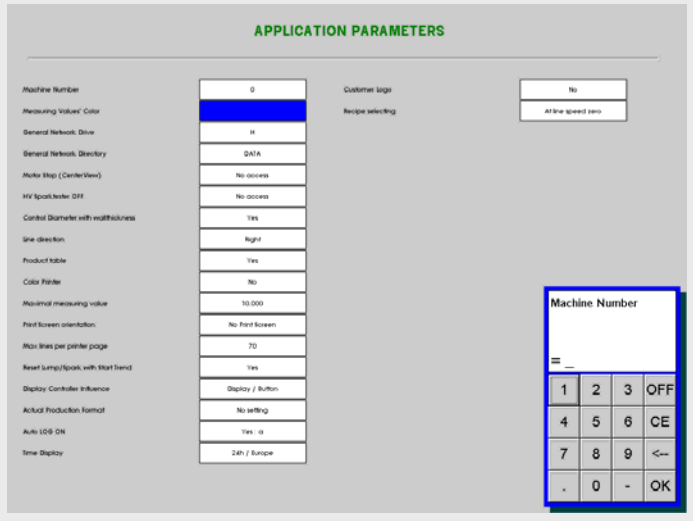
This menu defines certain application parameter. Return to the main menu page with button **EXIT**.
The values for all parameters have been set at our factory and should not be changed. Please contact our Service Department if necessary.

Example:



Example:
Parameter **Machine Number**

Touch the respective text box and enter the machine number via the numeric keypad appearing to the right of the page. This number is used for the printer report.

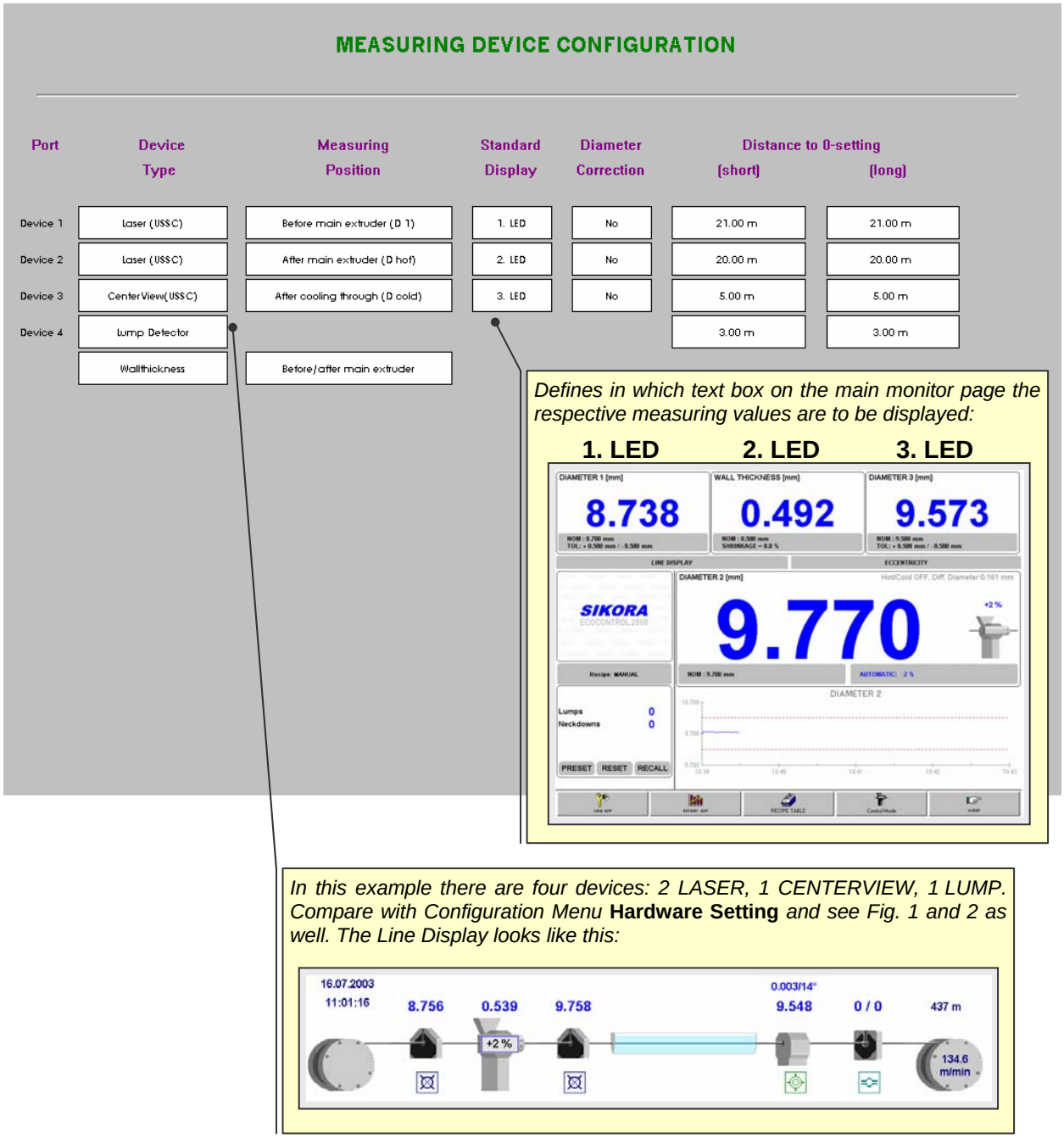


1.3.4 Configuration Menu MEASURING DEVICES CONFIGURATION

This menu is used for specifying which devices are being used in your application and at which position in your line they are to be found.

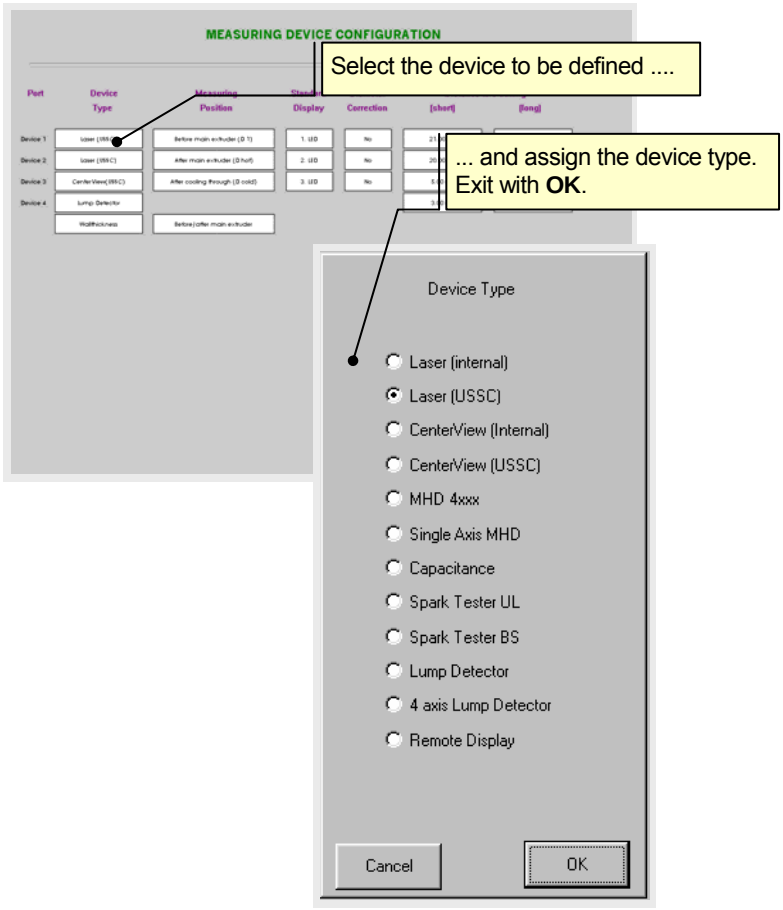
Please note: For your specific application, **all** measuring device configuration **parameters have been set** at our factory **and should not be changed**. However, if there are any changes to be made in your configuration, for example if a device is to be replaced or a new device is to be integrated into your line, always contact our Service Department first.

Example:



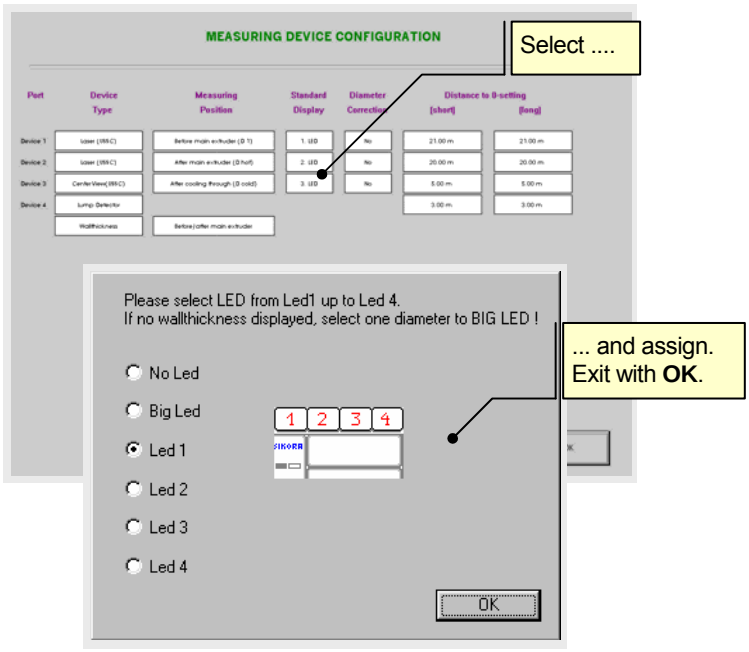
Example:
Parameter **Device Type**

Select the device to be defined by touching the appropriate text box. In the submenu appearing, assign the device type as desired.



Example:
Parameter **Standard Display**

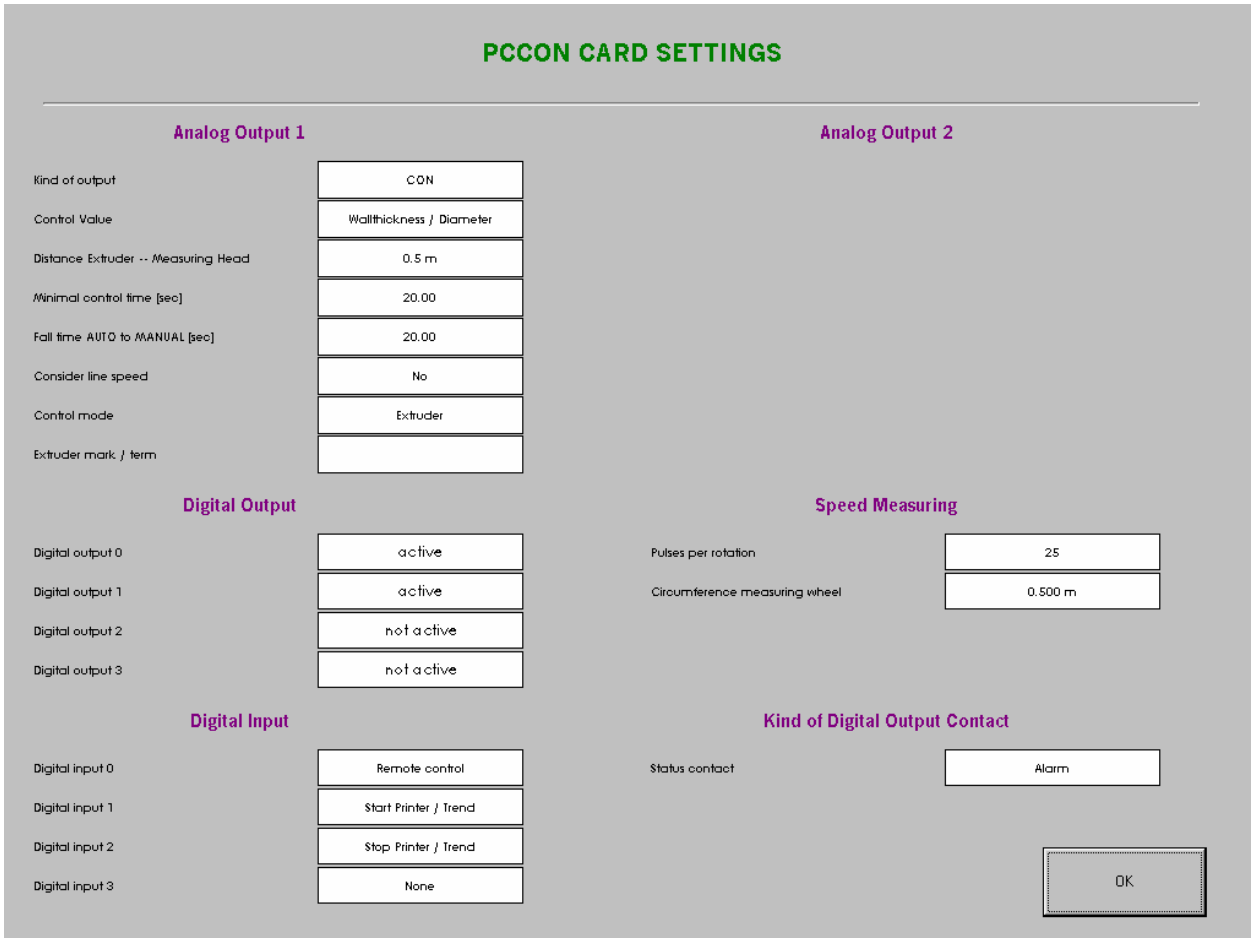
Touch the appropriate text box. In the submenu appearing, assign the main monitor page text box as desired.
BIG LED means the measuring value display in the middle of the main monitor page, which is usually reserved for displaying the controlled value (wall thickness or diameter).



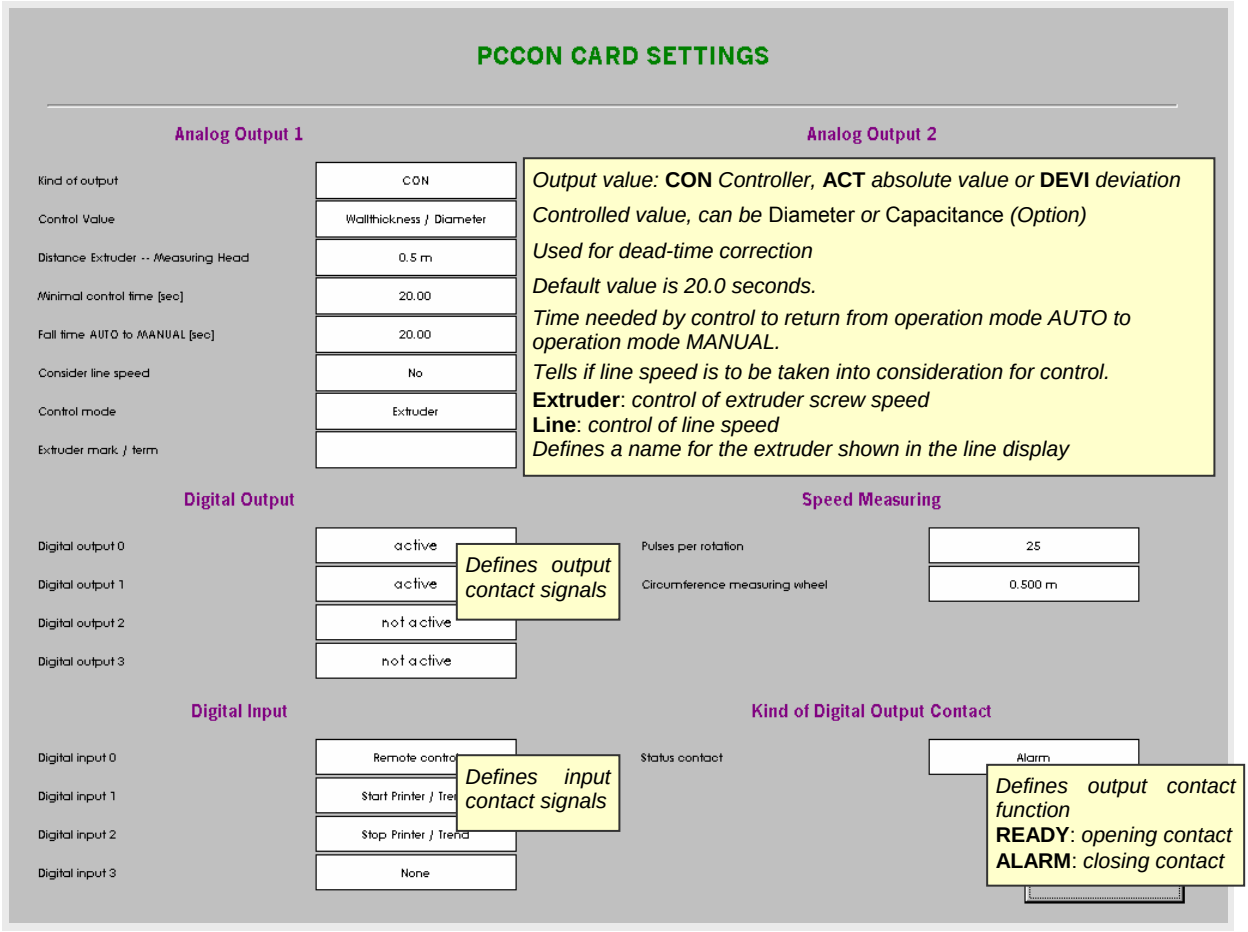
1.3.6 Configuration Menu SETUP 05 SETTINGS

This menu defines the input and output signals as well as the control parameter specific for your application. The values for all parameters have been set at our factory and should not be changed. Please contact our Service Department if necessary.

Example:

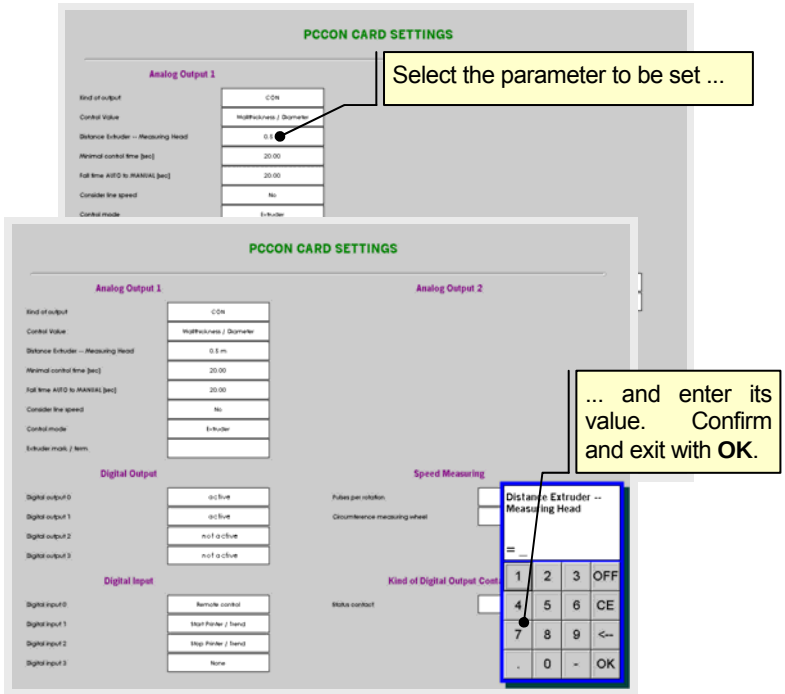


Input is done by selecting the respective text box and choosing from the drop down menu unfolding or entering a value via the keypad appearing.



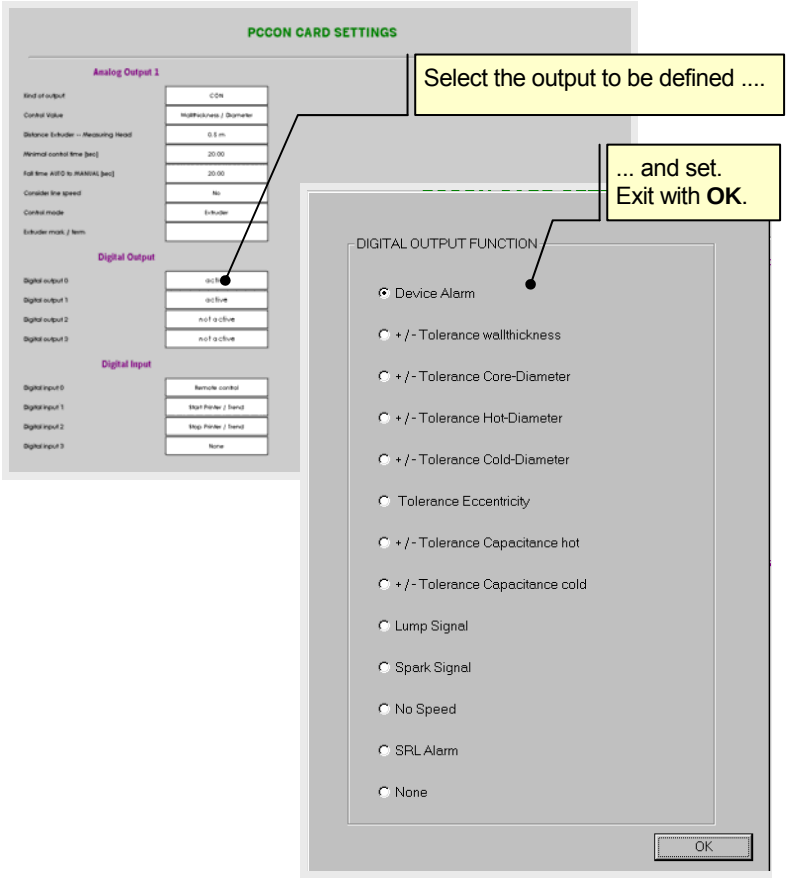
Example:
Parameter **Distance Extruder - Measuring Head**

The distance between the extruder and the measuring head is one of the control parameters. Select the parameter by touching its text box and enter the value of distance via the numeric keypad appearing.



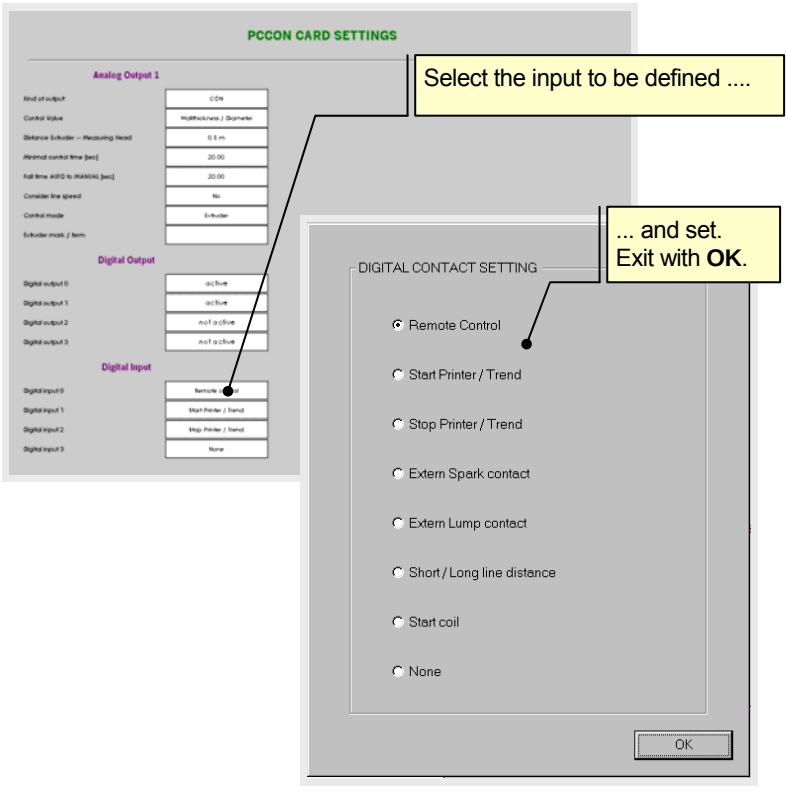
Example:
Parameter **Digital Output**

Select the output to be defined by touching the appropriate text box. In the submenu appearing, assign the digital output signal as desired.



Example:
Parameter **Digital Input**

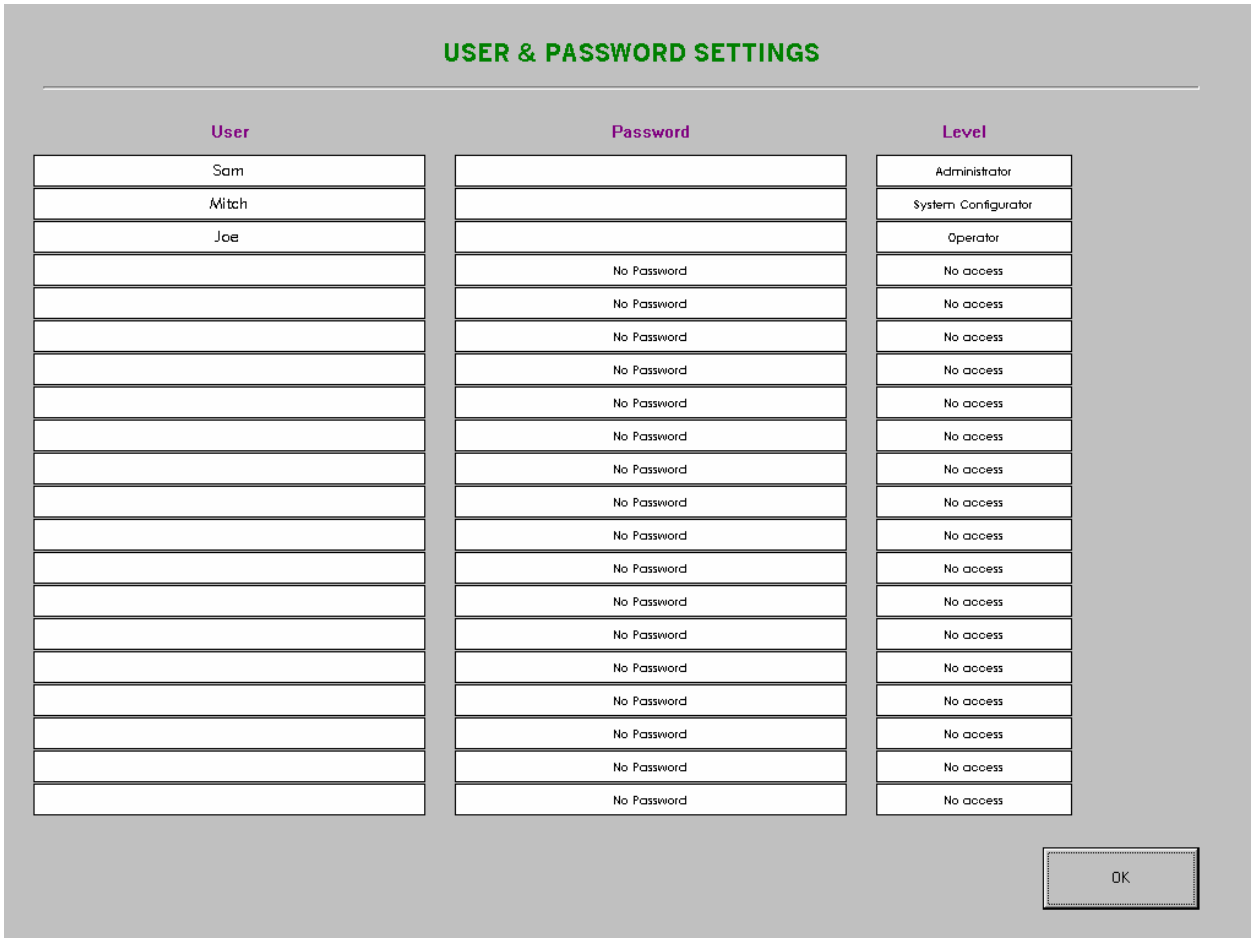
Select the input to be defined by touching the appropriate text box. In the submenu appearing, assign the digital input signal as desired.



1.3.7 Configuration Menu USER LEVEL & PASSWORD

Among the three existing user levels Operator / System Configurator / Administrator, the access to this table is limited to users registered with level **Administrator**. The table is preset at our factory as shown below.

Example: The illustration shows the default setting. Passwords have been omitted, which means you just confirm the according request during your logon procedure by striking the ENTER key.



Access authorization is as follows:

Level	Access to ... Operating Functions with Recipe Selecting and Manual Setting	System Configuration Recipe Setting and Modification	System Configuration including User & Password Setting
Administrator	✓	✓	✓
System Configurator	✓	✓	-
Operator	✓	-	-

If however your Administrator Access Entry has accidentally got lost and you are no longer able to log in to your ECOCONTROL measuring software please proceed as described below.

Repairing Administrator Access Registration

First, terminate the measuring software:
Connect a keyboard and close down the ECOCONTROL *application with keys* ALT F4 .

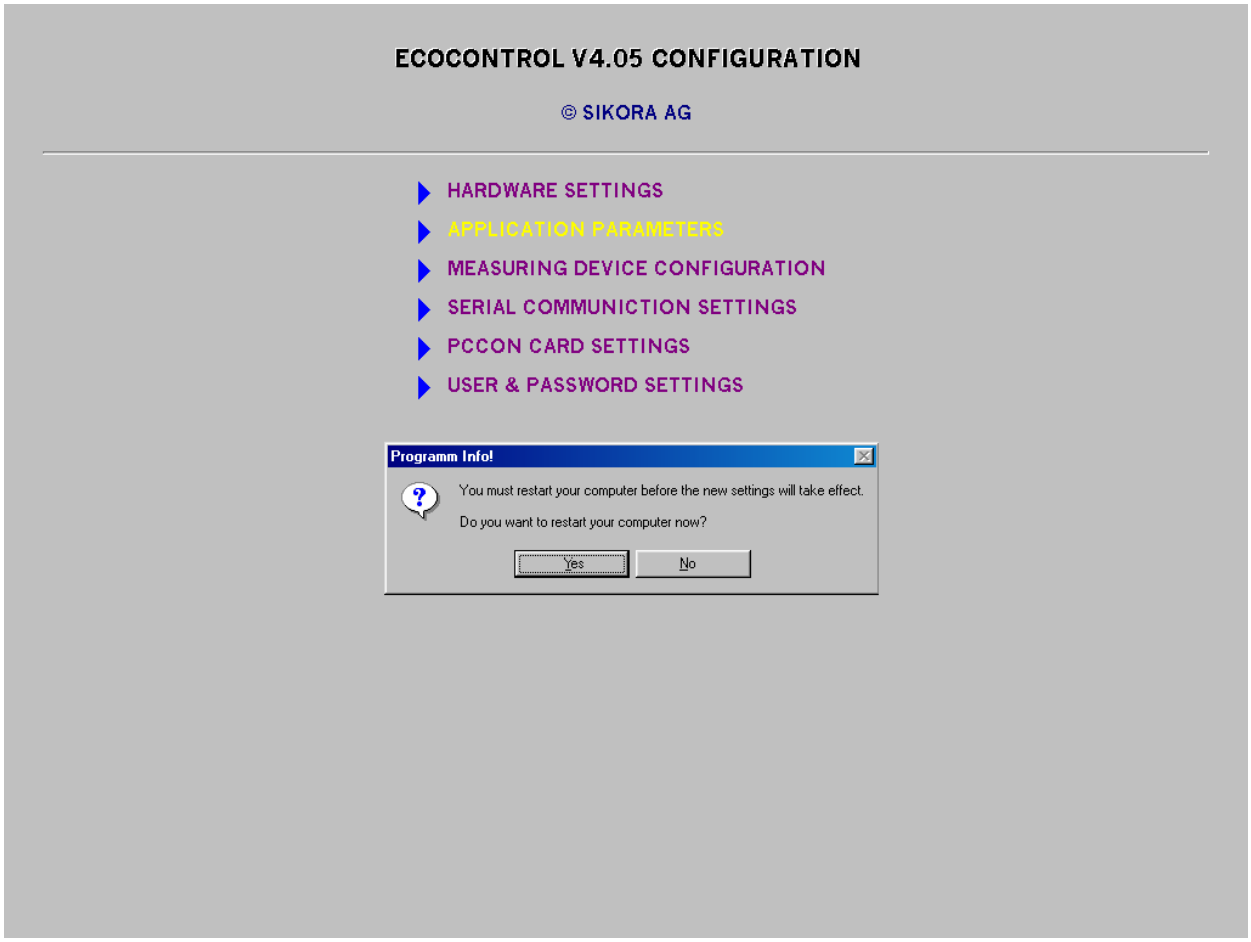
Start the ECOCONTROL *application as follows:*
Open **Start** *Menu and select* **Run**... . *In the* **Run** *submenu opening next, select* **Browse**.*Open the folder called* \ECOCONTROL, *and select the file named* Ecocontrol.exe. *In the* **Run** *submenu, complete the instruction by adding* [blank]-Administrator *and confirm with* **OK**.

Check the User and Password Settings:
Access the configuration program with buttons MORE *and* Setup , *and select* **USER & PASSWORD SETTINGS**. *Check the table and, if necessary, restore your settings.*

1.3.8 Configuration Menu SAVE AND EXIT

Use **SAVE AND EXIT** to terminate the configuration program. In certain cases (e.g. modification of device configuration), the ECOCONTROL application must be restarted and the message shown below will appear.

Example:



2. Operation

2.1 General

Switch the device on by connecting the supply voltage.

All operator input is done directly on the touch screen. The elements used for operation are Windows-like components like buttons, text boxes, drop-down menus etc. Input is done by slightly touching the monitor glass surface with the finger at the position where the appropriate input element is shown.

Before starting ECOCONTROL 1000 operation the device has to be configured using the Configuration Software described in Chapter 1.3 (page 5 ff.) of this manual to adapt it to your production line. This should be done by an experienced ***SIKORA*** technician.

ECOCONTROL Operation Mode:
The ECOCONTROL 1000 can be operated
- using the monitor touch screen

Monitor Operation:
Different pages are presented. The standard monitor page displays the diameter measuring values and the wall thickness, together with nominal value and deviation, as well as information about automatic control influence. Additional pages show the measuring value in graphical display, with a diagram of the measuring value, in relation to the nominal value, vs. length, or statistical information about the measuring values after the end of production.
The operator can set or modify the nominal values, tolerance limits etc. Additionally, the operator can create and manage a Recipe Table containing the settings for various types of cables in production.
All operator input is done using the Touch Panel.

Wall Thickness Measuring:
The insulation wall thickness is calculated by subtraction of the diameter values under consideration of the measured shrinkage and then displayed digitally. The values of the measured diameters are displayed as well. The calculated wall thickness is compared with the pre-set nominal value. Deviations of the wall thickness are sent to the analog output.
Tolerance limits can be set, separately for positive and negative deviations, any exceeding will be indicated by dry contacts switching over.

Each device is equipped with an internal validity check of measured values. It signalizes invalid values, which arise from a wrong position of the object to be measured or faulty exposure.

Diameter Measuring:
The diameters are measured optically. A light source (laser diode) serves as light background in relation to the dark cable. The cable covers the light beam partially, thus producing a shadow proportional to the diameter. Light and shadow are projected to the photodiode array of an electronic CCD-camera.
A delay time memory guarantees the evaluation of measured values at the same place. Then the wall thickness is calculated by subtraction, and under consideration of the shrinkage.

The actual value of wall thickness is compared with the tolerance limits. An exceeding causes a failure message by means of dry contacts.

2.2 Setting the Automatic Control

The multifunction control unit is a component for precise, automatic control of diameter or wall thickness. Either line speed or extruder screw r.p.m. can be controlled. The module is switched into the line of the drive (refer to Figure *Automatic*).

The control works with the warm diameter value. If a deviation occurs, the control changes infinitely variable the nominal value for the line speed or screw r.p.m. until the actual value is in accordance with the nominal value, the control display indicates the influence of the control signal.

If the automatic control is switched off, the nominal value of the line is connected through, thus enabling manual control.

The control module allows a continuous control of the line speed or of the extruder screw speed (rpm). In case of a deviation between the measuring value and the selected nominal value, the controller continuously increases or decreases the line speed or extruder rpm, till the deviation is zero.
To optimize the control, the line should run with the most common cable type and line speed. Start the line and set the nominal value of the wall thickness and the shrinkage.

The operator should now run the line with 3% oversize, before going in automatic mode. Switch the automatic "ON", within 20 seconds the control module reduces the oversize down to 1%, and within 1 minute down to zero. The control influence is shown on the monitor.

Select in the configuration program a shorter time for more control influence, i.e. the deviation is levelled out faster. Watch the display, if the influence is too fast the line starts to oscillate.
A longer time causes a slower influence, the time for levelling out is lengthen.

Very slow lines (speed less 10 times distance extruder - measuring head) or lines where the measuring head is mounted behind the cooling-trough require the additional SPEED influence function, the control works under consideration of line speed.
The speed of the line is automatically calculated using the pulses of the rotary pulse generator.

Run the line with a speed 10 times distance.

Example: Distance extruder - measuring head = 15 m
line speed = 150 m/min

The minimal control time constant must be adjusted to 20 seconds as done at delivery.
When the line runs with a speed higher 10 times distance, the control time constant is 20 seconds, as pre-adjusted. With a lower speed the control time constant is enlarged proportional to prevent an oscillation.

After connection of a line recorder you can observe and recognize the effects of the AUTOMATIC mode upon your line under different speeds (e.g. start-up, acceleration, production, delay) and which deviations arise, particularly during acceleration and delay. Analyze the recorded values and check if everything functions as expected.

2.3 Determination of Nominal Values

After adjusting the control you should take some samples. While production runs and AUTOMATIC is switched ON you mark the cable as soon as it leaves the measuring head. At the same time you mark the deviation which was written by the line printer and note the pre-set nominal value.

You need:

- for cables up to 8 mm Ø resp. line speed faster than 300 m/min: 5 samples à 20 m
- for cables from 8 up to 15 mm Ø resp. speed from 150 - 300 m/min: 4 samples à 10 m
- for cables bigger than 15 mm Ø resp. speed slower than 150 m/min: 3 samples à 5 m

Measure the diameter / wall thickness of the samples at regular intervals so that you will obtain at least 20 values. Enter the measured values in a diagram. Now you can make out which deviations depending on the system occur with the different types of cable.

These deviations may not and cannot be controlled by the AUTOMATIC of the measuring device. The average value of the samples (shrinkage added) shall correspond with the displayed values.

The diagram shows you, how to set the nominal value to obtain the smallest permissible diameter/wall thickness value under consideration of line system deviations.

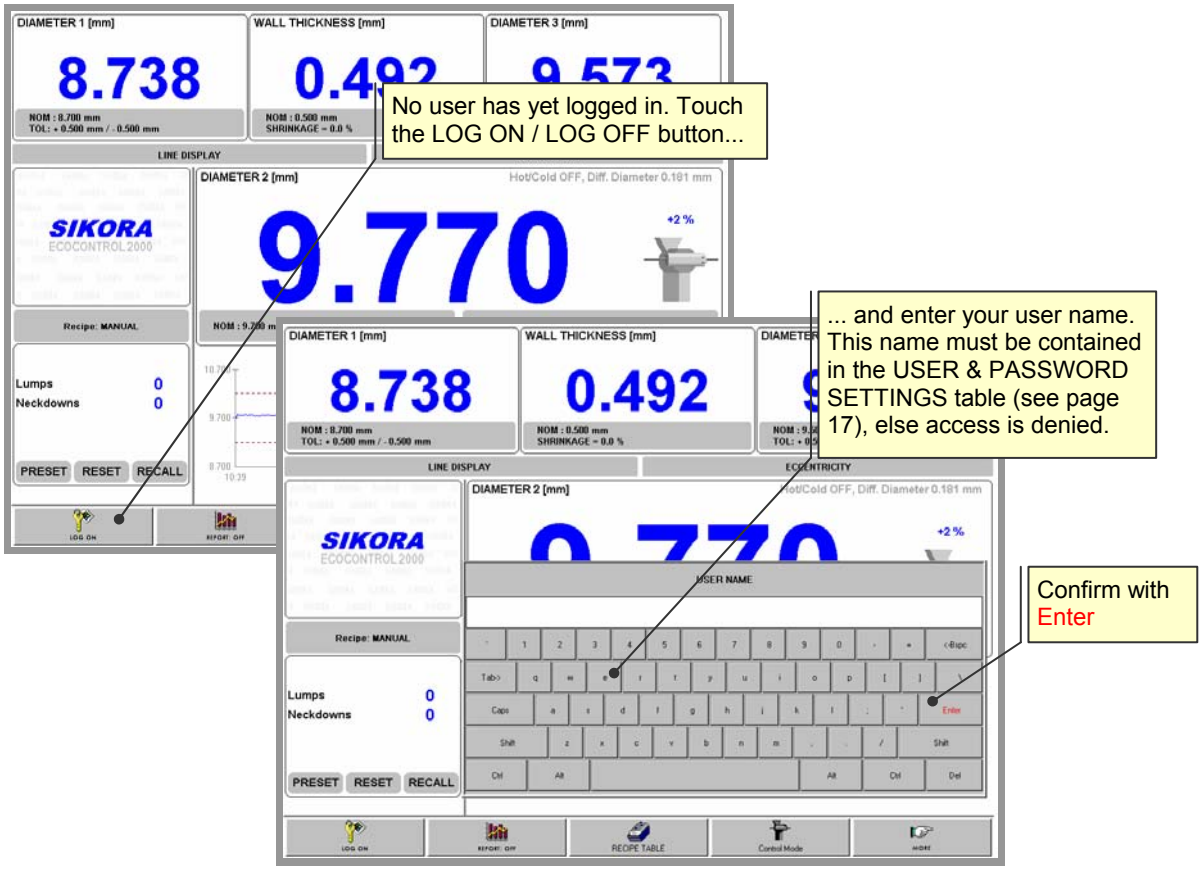
2.4 Monitor Operation

Switch the device on by connecting the supply voltage. First, the standard monitor display page appears, other pages can be accessed by touching the respective button. Remember that you have to log in first by entering your user name and -if specified- your password, as defined by the USER LEVEL & PASSWORD SETTINGS table described on page 16, unless your application has been configured to execute an automatic log in for a specified user (see description of configuration menu **APPLICATION PARAMETERS** on page 10).
Make sure all application settings are correct, see page 42 ff. for a description of monitor page **APPLICATION SETTINGS** and its functions.

User Log In / Log Off

At the bottom left of the monitor page appearing after starting the system, there is a button which is used for logging in to the ECOCONTROL Measuring Program resp. logging off from it.

Example:



Enter your password in the same way.

If your log in is successful, you will be able to access the application according to your user level. The inscription on the log in button changes to LOG OFF.

If your log in procedure fails, contact your administrator.

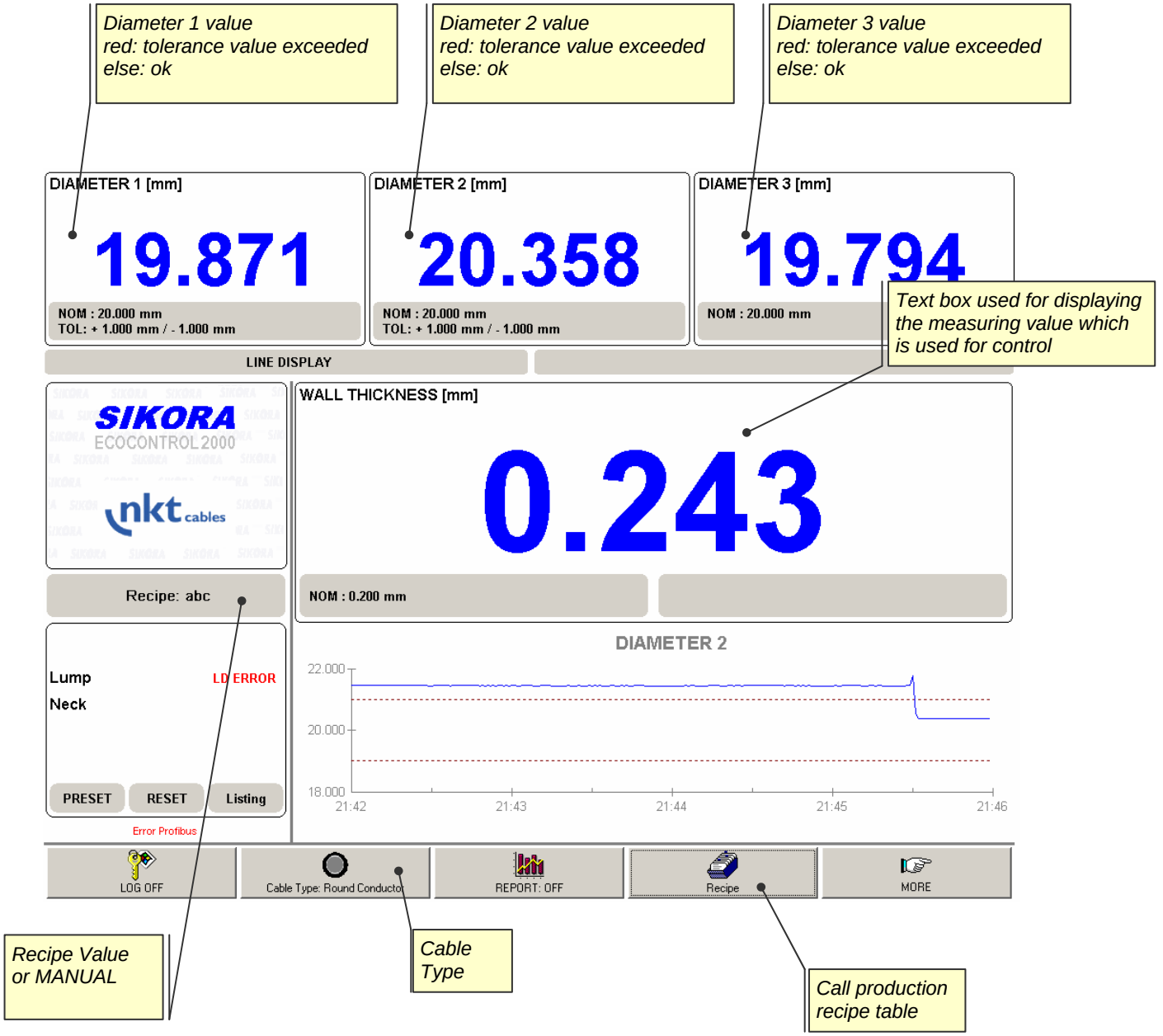
Standard Monitor Page / Measuring Value Display

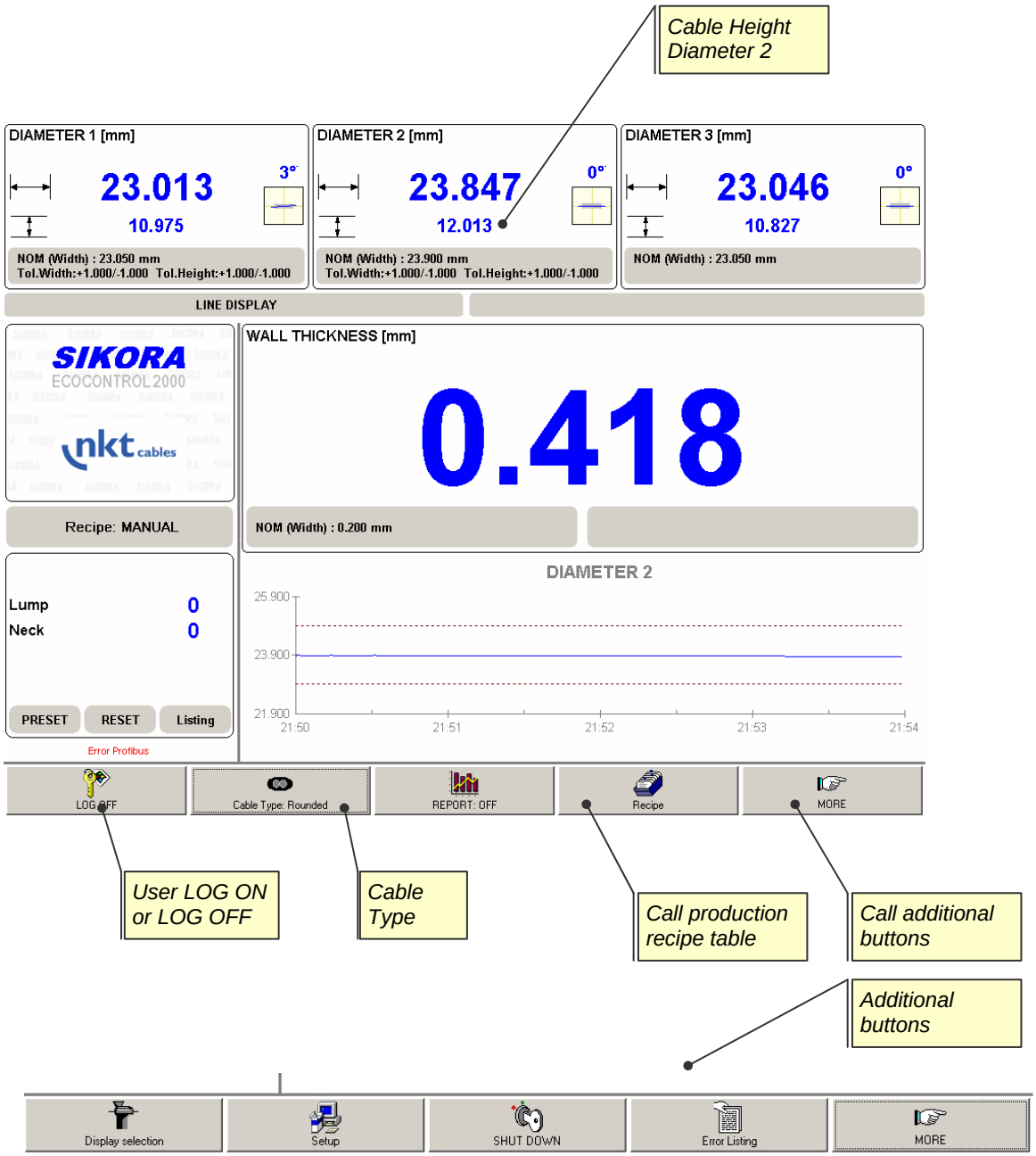
This is the standard measuring value display, which may vary in certain aspects according to your line configuration.

This page is split into several areas containing various elements like text boxes, text buttons, function buttons, toggle bars and a diagram viewport.

Operation is done by touching the buttons and bars presented as well as by touching the short-time diagram area.
The parameters being displayed in the text bars can be selected and their nominal values can be set by striking the respective bar and choosing from the submenu unfolding. To enter a nominal value, use the numerical keyboard appearing accordingly. See the examples given below.

General Operation:

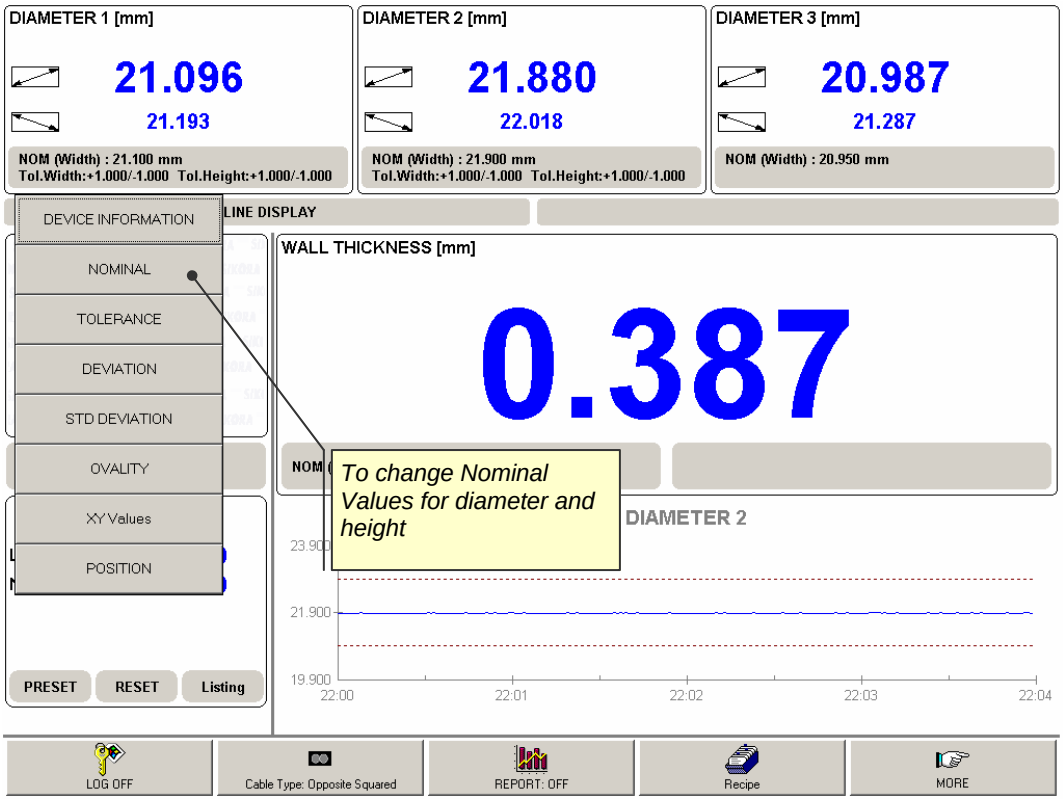


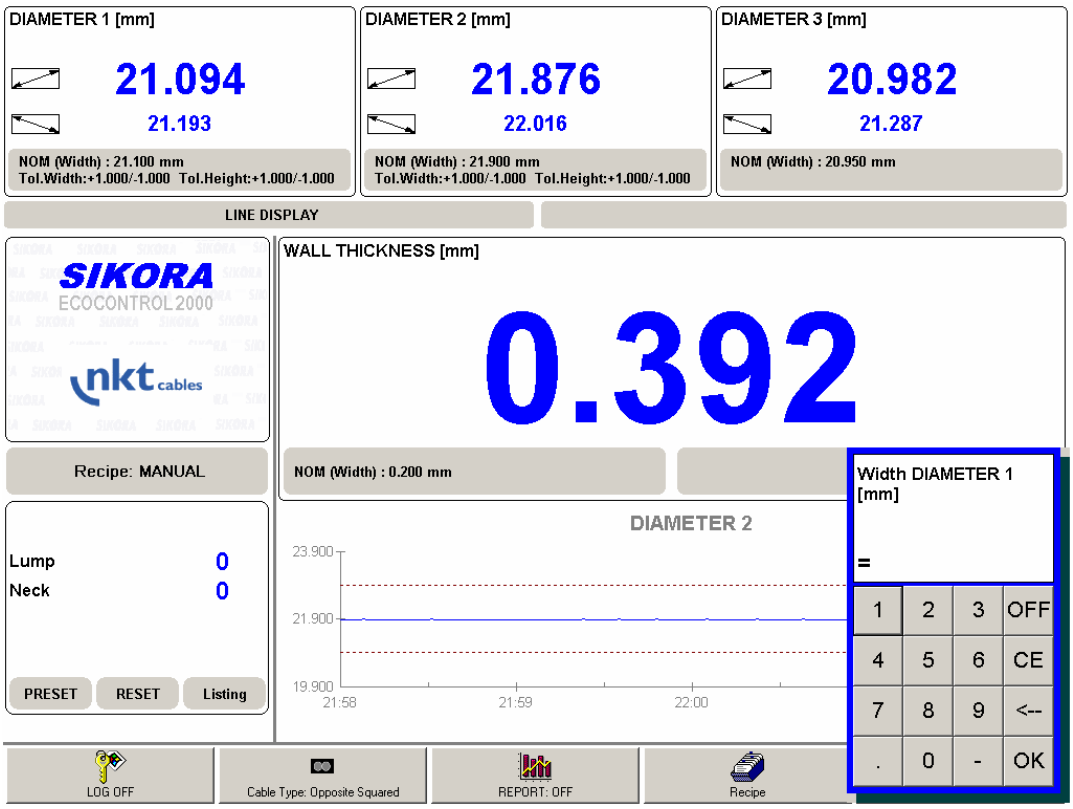


Explanation concerning **Recipe** function:
For different cables in production, their production parameters like nominal values of diameters and wall thickness and cable type can be kept as a set of data in a so-called recipe table. Each set of data is identified by its name, the recipe code. The desired recipe code is called by entering the appropriate name. If a recipe code has been selected, its parameters become valid for the production running immediately. They cannot be modified by operator entries on the standard monitor page, i.e. by manual input. This remains disabled until you leave the recipe mode by entering MANUAL instead of a recipe code.

Recipe Table

Manual Mode



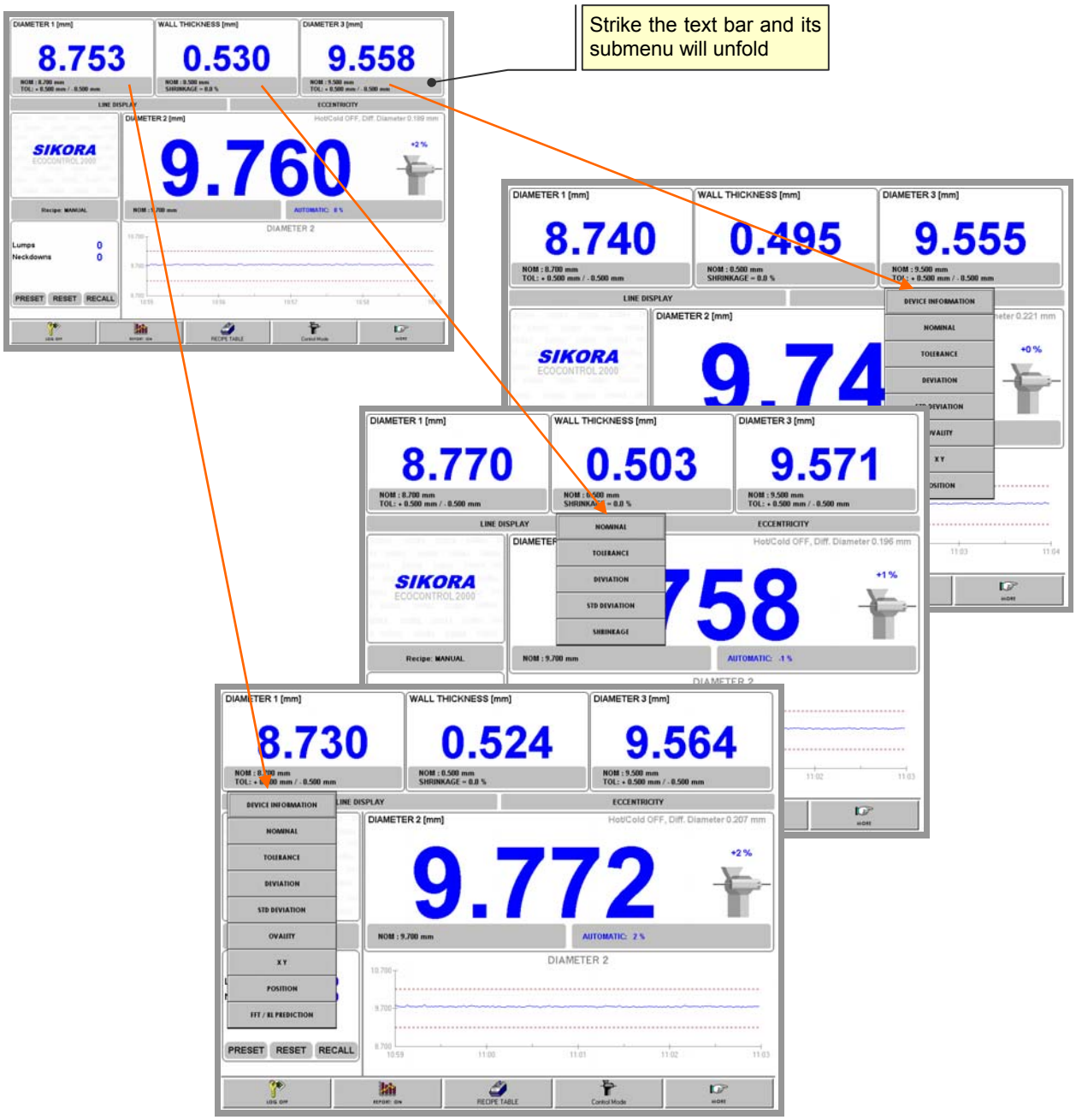


Use the keypad to enter the values: Touch the according numbers and confirm with OK.

Standard Monitor Page / Measuring Value Display / Text Bar Operation

Upon touching one of the mesuring value text bars, a submenu will unfold offering a selection of various functions, such as
- choosing the parameter whose value is to be shown in the text bar besides the nominal value
- setting the nominal value and tolerance values for the measuring value selected
- call device information
- switching the automatic mode

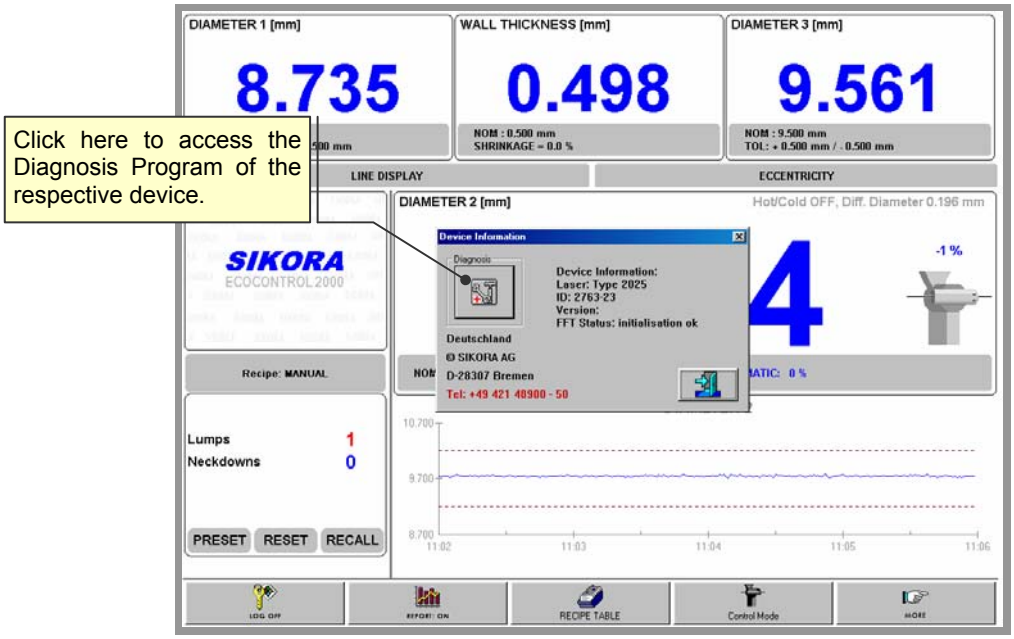
Depending on which measuring value has been chosen, and which options are contained in your application, the range of functions offered will be different. The following illustrations show some examples.



Explanation of submenu concerning the **Diameter 1** text bar:

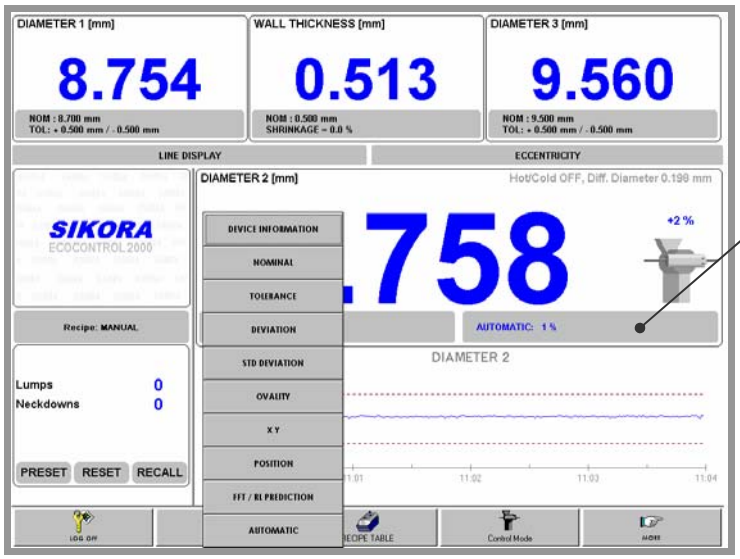
DEVICE INFORMATION	*Display* Diameter 1 *Measuring Device Information, see example below.*
NOMINAL	*Set* Diameter 1 *Nominal Value, enter via numerical keypad appearing. The actual nominal value is always displayed in upper half of text bar.*
TOLERANCE	*Set upper and lower tolerance limit for* Diameter 1*, enter values via numerical keypad appearing. Parameter is selected for display in text bar.*
DEVIATION	*Select this parameter for display in text bar.*
STD Deviation	*Select Standard Deviation* Diameter 1 *for display in bar (for this function, recording of production data must have been started, see pages 43ff).*
OVALITY	*Select Ovality* Diameter 1 *for display in text bar.*
XY	*Select* Diameter 1 *Value X /* Diameter 1 *Value Y for display in text bar.*
POSITION	*Select Horizontal/Vertical Pos. (only with sector measurement)* Diameter 1 *for display in text bar.*
FFT / RL PREDICTION	

Example
of Measuring Device Information shown:



Example: Using the text bars contained in the big measuring value text box

Use the text bars to choose the parameter to be displayed in the right bar and / or to set various nominal values for certain parameters. The left text bar will always display the nominal value, however this can be used for selecting and setting as well.



Strike one of the text bars and choose from the submenu unfolding

Explanation of submenu:

DEVICE INFORMATION	*Display* Diameter 2 *Measuring Device Information, see example below.*
NOMINAL	*Set* Diameter 2 *Nominal Value, enter via numerical keypad appearing. The actual nominal value is always displayed in upper half of text bar.*
TOLERANCE	*Set upper and lower tolerance limit for* Diameter 2*, enter values via numerical keypad appearing. Parameter is selected for display in text bar.*
DEVIATION	*Select this parameter for display in text bar.*
STD DEVIATION	*Select Standard Deviation* Diameter 2 *for display in bar (for this function, recording of production data must have been started, see pages 43ff).*
OVALITY	*Select Ovality* Diameter 2 *for display in text bar.*
X Y	*Select* Diameter 2 *Value X* / Diameter 2 *Value Y for display in text bar.*
POSITION	*Select Horizontal/Vertical Pos. (only with sector measurement)* Diameter 2 *for display in text bar.*
FFT / RL PREDICTION	*Call functions FFT/RL (Option)*
AUTOMATIC	*Access additional dialog box for switching the automatic mode* **ON** Switch AUTOMATIC on **OFF** Switch AUTOMATIC off **HOLD** AUTOMATIC mode is "frozen", i.e. the control operates using the last valid value. Prompt accordingly.

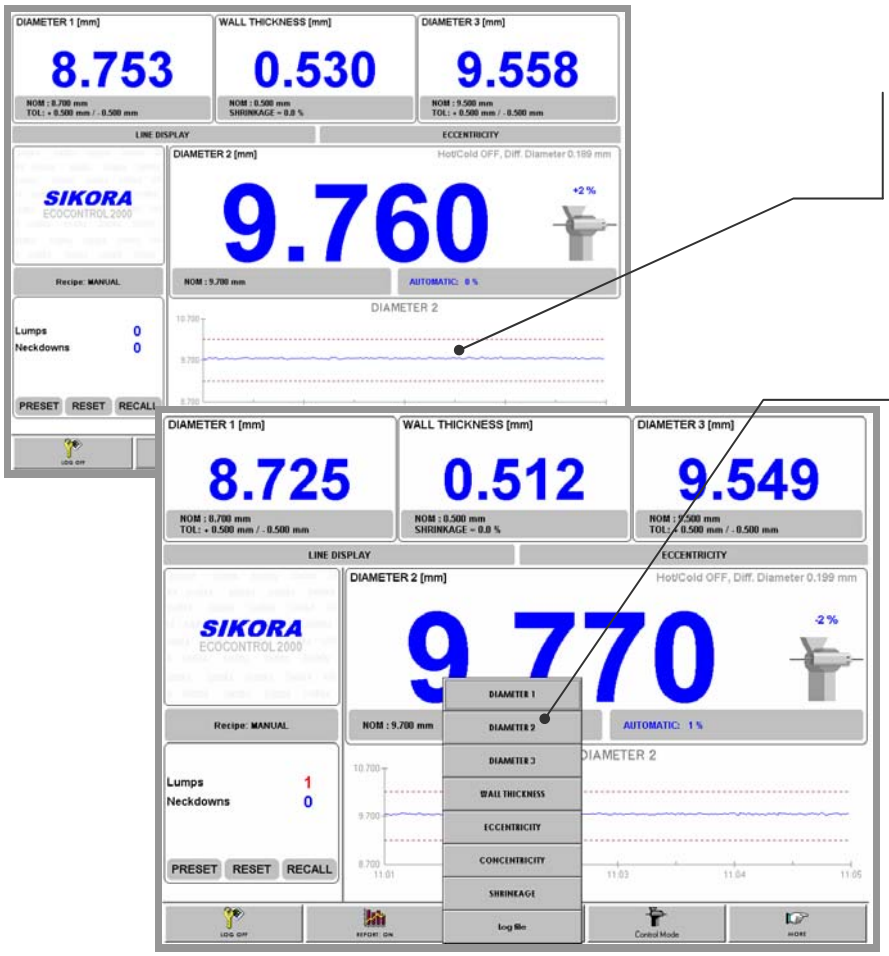
Explanation concerning switching the AUTOMATIC mode:

Check set nominal value wall thickness, the shrinkage for the cable type and the control mode. Touch button **AUTOMATIC**, and confirm switching **AUTOMATIC** **ON** or **OFF** .
The deviation between automatic control and manual adjustment (in percent) can be seen in the respective text bar, if selected (see description of text bar operation above). When the value becomes negative, the manual adjustment of wall thickness has been too big. When the value becomes positive, a switch-over to manual operation would lead to a wall thickness which is too thin. Note : control influence is limited (±50%), the drive should be corrected before the value of deviation increases too much.

When the device or the automatic is switched off the nominal value of the line is connected through to the output. (CAUTION, if the device is switched off during automatic control, there might be an undefined state during switch-over which may lead to lumps.)
If the camera supervision finds a fault, the automatic is "frozen", i.e. the control works with the last valid value.

Standard Monitor Page / Measuring Value Display / Diagram Viewport Operation

Example: Choosing of Short-Time Trend Parameter



Open the respective submenu by touching the short-time trend diagram area

From the submenu, choose the parameter which is to be shown in the short-time trend diagram.

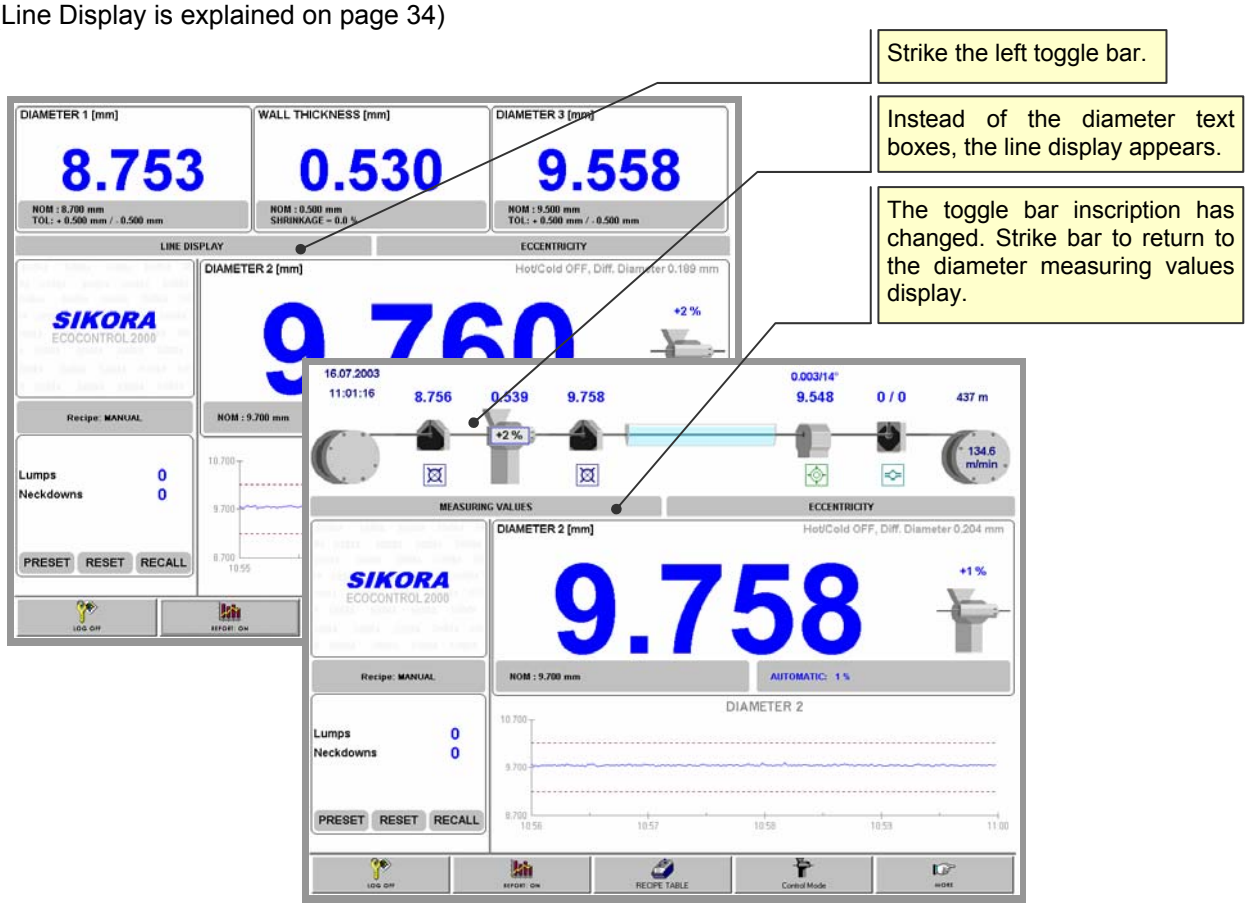
DIAMETER 1	*Show short-time trend diagram of parameter* Diameter 1.
DIAMETER 2	*Show short-time trend diagram of parameter* Diameter 2.
DIAMETER 3	*Show short-time trend diagram of parameter* Diameter 3.
WALL THICKNESS	*Show short-time trend diagram of parameter* Wall Thickness.
ECCENTRICITY	*Show short-time trend diagram of parameter* Eccentricity.
CONCENTRICITY	*Show short-time trend diagram of parameter* Concentricity.
SHRINKAGE	*Show short-time trend diagram of parameter* Shrinkage.
log file	*Select log file (only if* **Test Display** **Enabled** *, see p. 8)*

Standard Monitor Page / Using the Toggle Bars

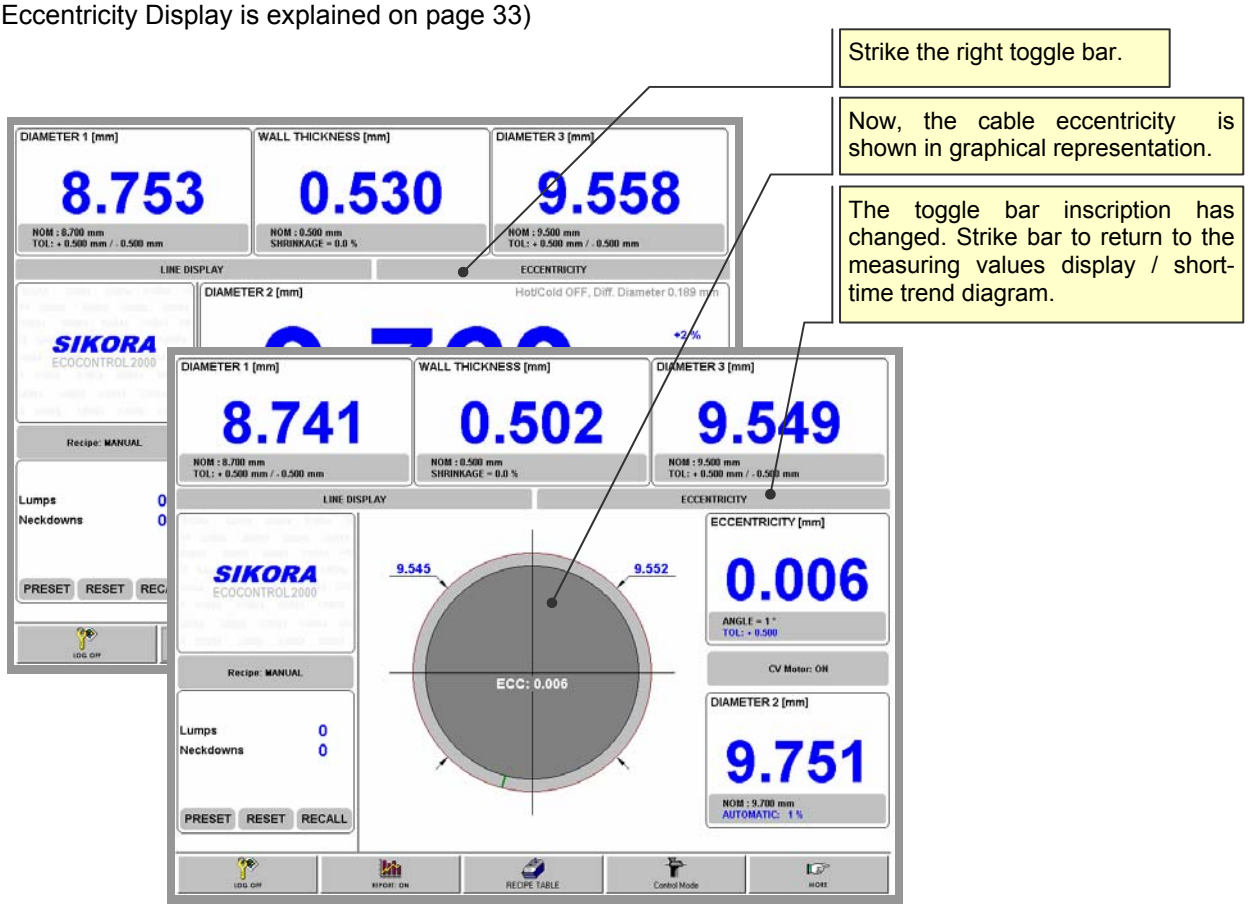
There are two toggle bars. Use the

- left one to toggle between the display of diameter measuring values (**DIAMETER 1** etc.) and the line diagram in the upper part of the standard monitor page and the
- right one to toggle between the measuring value display with trend window and the eccentricity display.

Example: Calling the Line Display
(Line Display is explained on page 34)

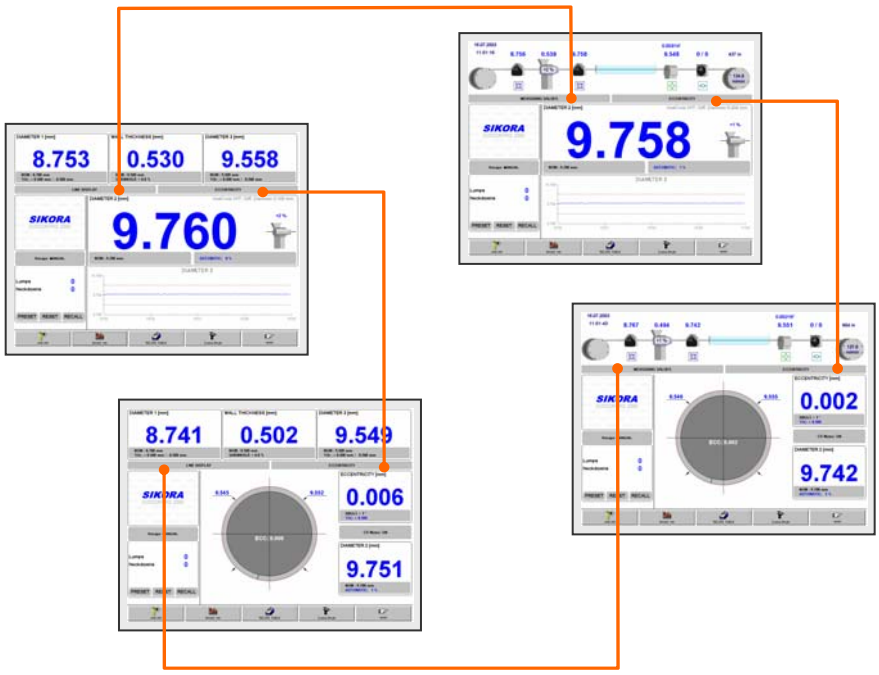


Example: Calling the Eccentricity Display
(Eccentricity Display is explained on page 33)



You may also use the left toggle bar to call the line representation.

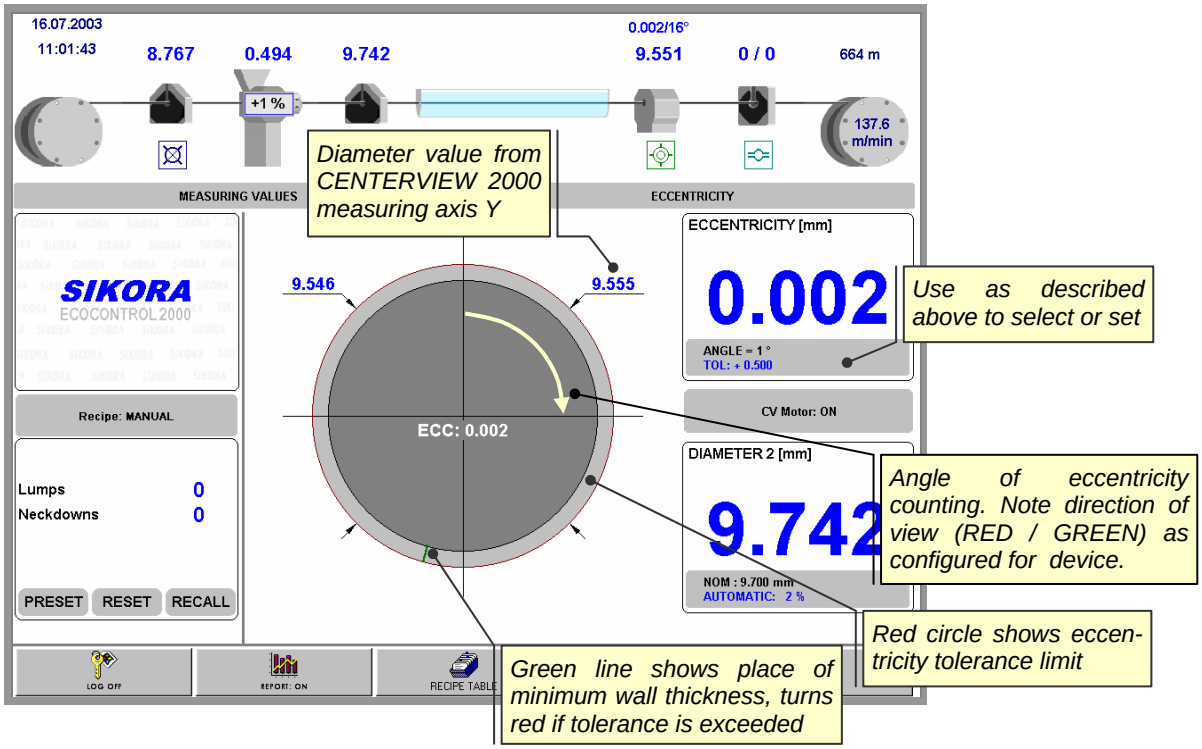
Switching the display:



Standard Monitor Page / Eccentricity Display

This page shows the cable eccentricity in graphical representation and as numerical value.

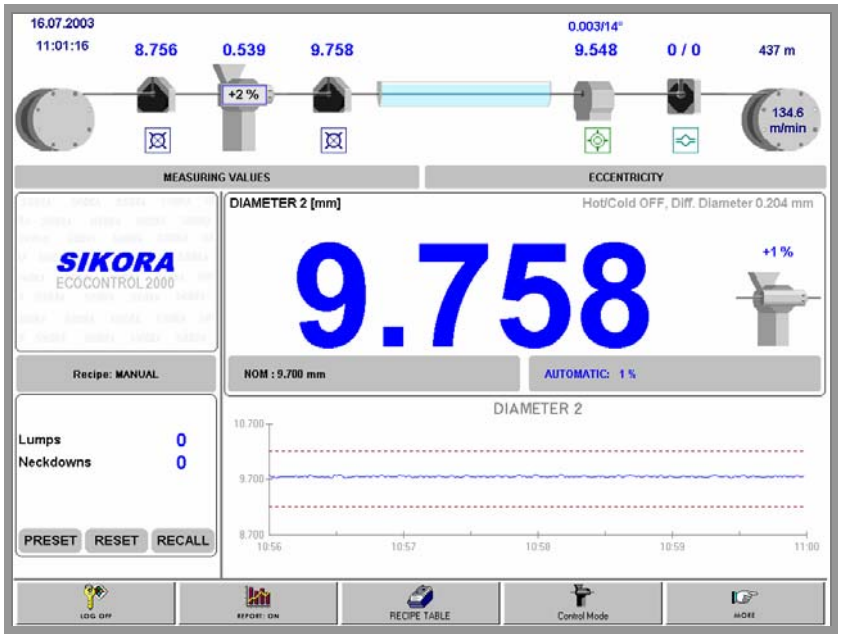
Example: Explanation of Eccentricity Display



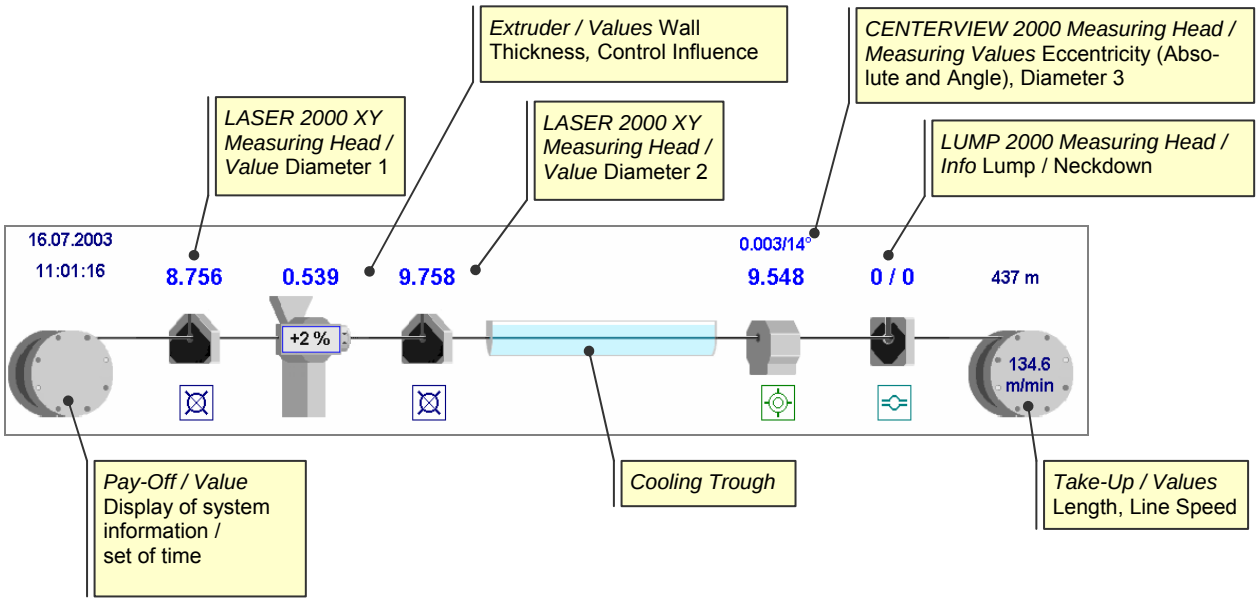
Standard Monitor Page / Line Display

Please remember, the line configuration shown here serves as an example. As each line is configured individually, this may look different according to your line equipment.
Above the illustrations representing the line equipment their respective measuring or test result or status information is displayed.

Example: Line Display



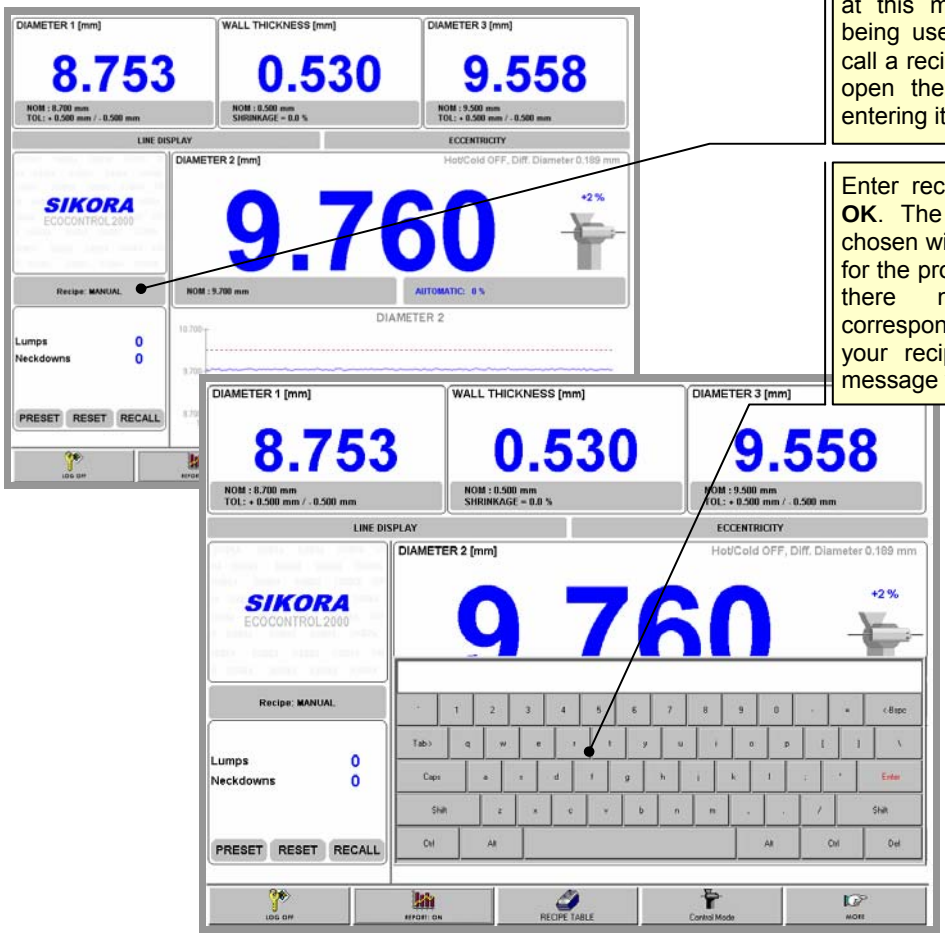
Explanation:



Standard Monitor Page / Button RECIPE CODE

A recipe code is a name for a set of data containing specific values like nominal and tolerance values as well as other specific cable parameters used for the production of a certain cable. You can keep several of these in a recipe table (this is described on pages 44ff). If you want to apply a certain recipe during production, enter its name using button **RECIPE**.

Example: Calling a recipe code



As indicated by the text string shown, at this moment there is no recipe being used but manual settings. To call a recipe, strike button **RECIPE** to open the alphanumeric keypad for entering its code.

Enter recipe code and confirm with **OK**. The data of the recipe code chosen will become valid immediately for the production running. Of course, there must exist an entry corresponding to the code entered in your recipe table. If not, an error message will appear.

Standard Monitor Page / Button REPORT

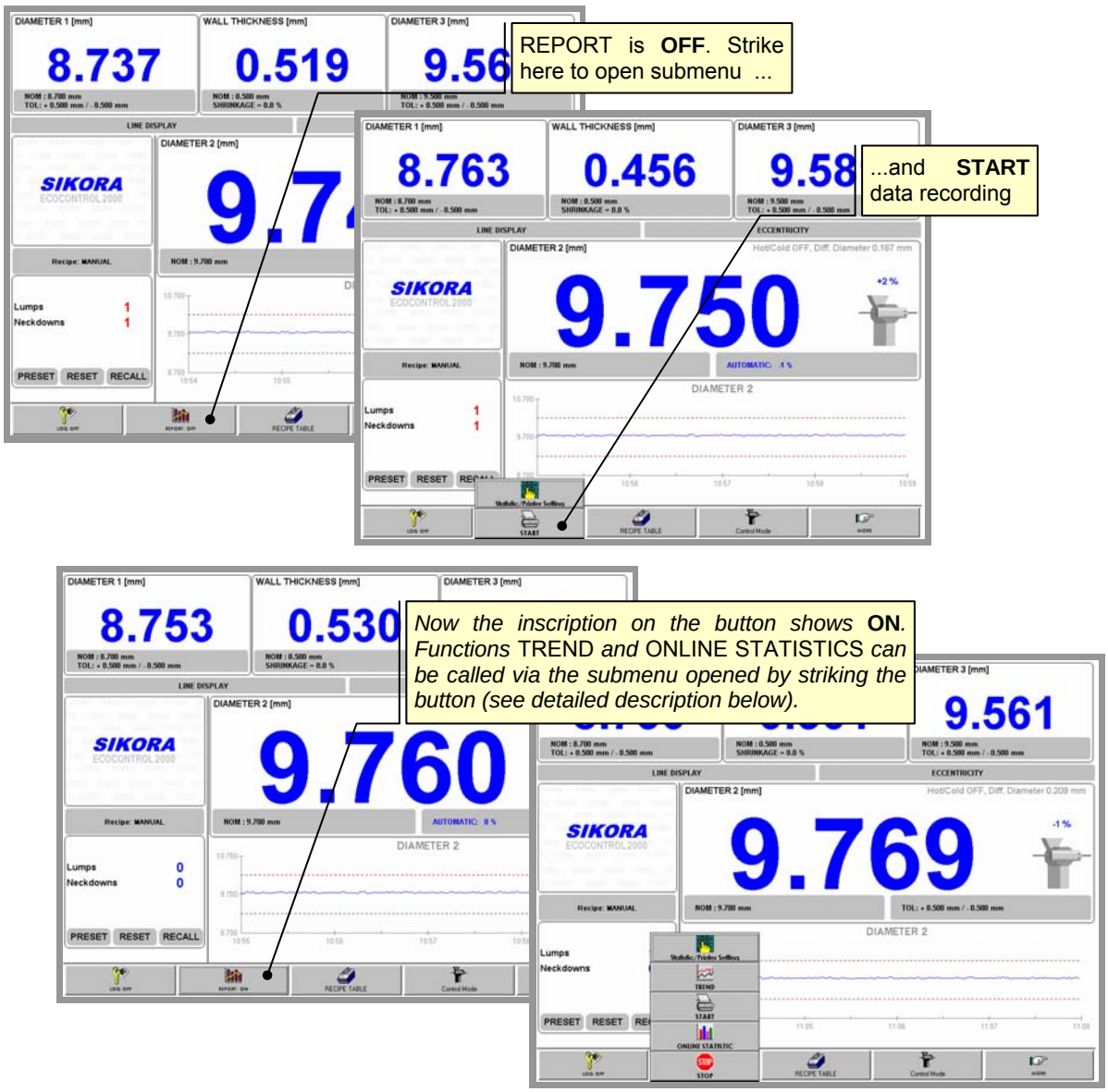
With button **REPORT,** open the submenu to

- start and terminate the recording of production data which are evaluated and displayed by functions TREND, STATISTICS and the printer report, and
- call the monitor pages for functions TREND and STATISTICS.

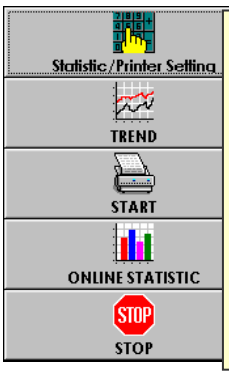
The inscription shown on button **REPORT** indicates if recording is ON or OFF.

Production data can only be recorded if this activity has been started with **REPORT** / **START**, which is usually done at the beginning of a production.
As long as recording is **ON**, functions TREND and ONLINE STATISTICS can be called using the respective buttons. At the end of a production, data recording is stopped with **REPORT** / **STOP**. Now, the production data recorded are evaluated statistically and you can call function STATISTICS with **REPORT** / **STATISTICS**. In case a new production is to follow immediately, you can also proceed with **REPORT** / **START** which will be interpreted as **REPORT** / **STOP** followed directly by **REPORT** / **START**.

Example: At the beginning of production, start data recording with **REPORT** and **START**



As long as **REPORT** is **ON**, the submenu bar contains these buttons .



Set additional parameters for data recording (see below).

Strike button to call monitor page TREND (see p. 43). Only enabled if recording of production data has been started.

Use at beginning of production to start data recording for functions TREND / STATISTICS and to start the printer report (Option). Button REPORT *indicates* ***ON****.*

Show online statistical diagram on monitor page STATISTICS. Only enabled if recording of production data has been started.

Use at production stop to close production data recording. These are evaluated, see p. 45. The printer report (Option) is terminated. Button REPORT *indicates* ***OFF****.*

Once a production has been completed and data recording has been stopped (**REPORT** / **STOP**), the button for calling the production statistics appears as well.

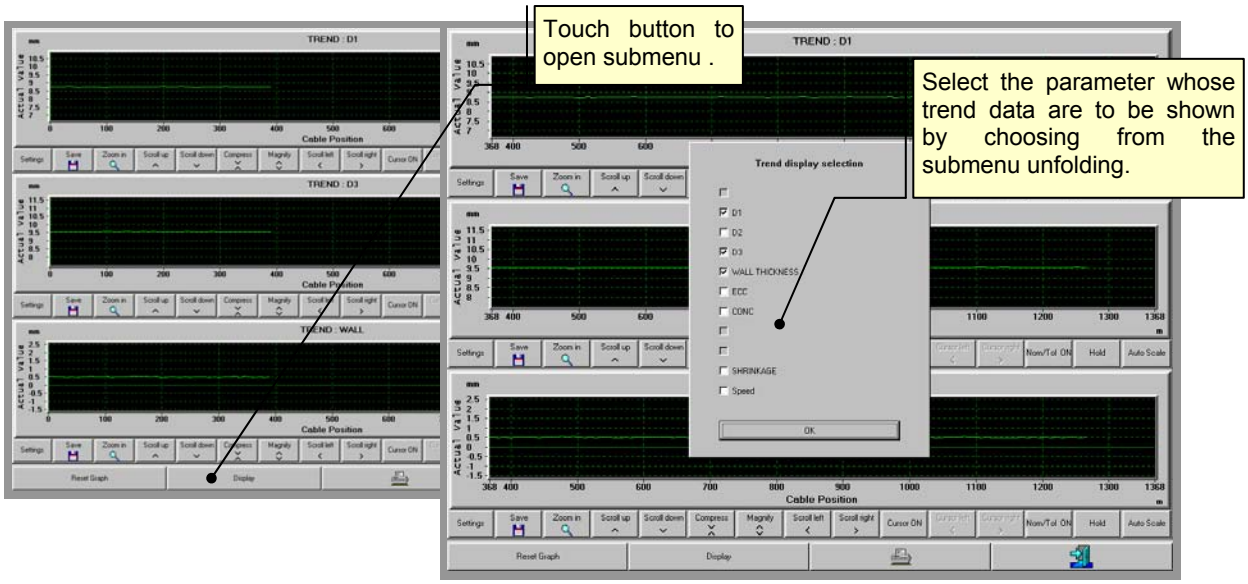
Explanation concerning button **Statistic/Printer Setting**
Touching this button opens a page used for setting data recording parameters.

Monitor Page TREND

Access this page with buttons **REPORT**, **TREND** on the main monitor page. It shows the process of various measuring values according to the length.
Please note that for this function data recording must have been started before by using buttons **REPORT** and **START** (button REPORT indicates ON), see page 36.

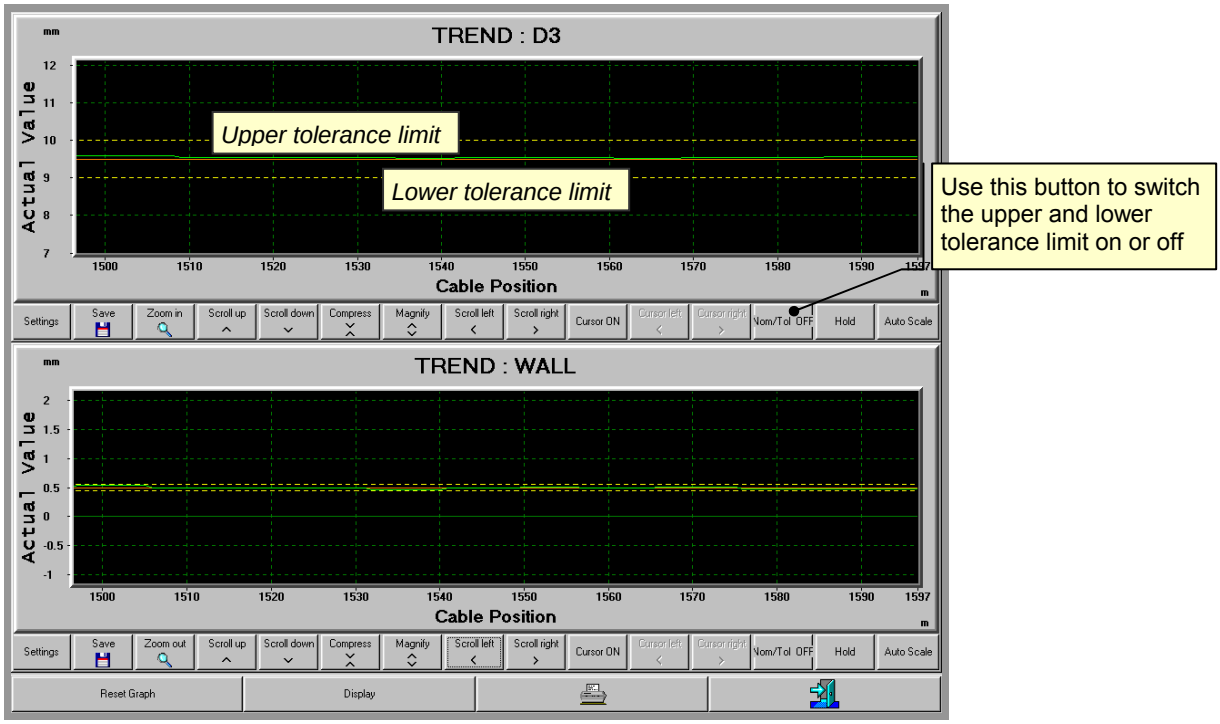
Example:

Example: Selecting a parameter for the Trend Diagram

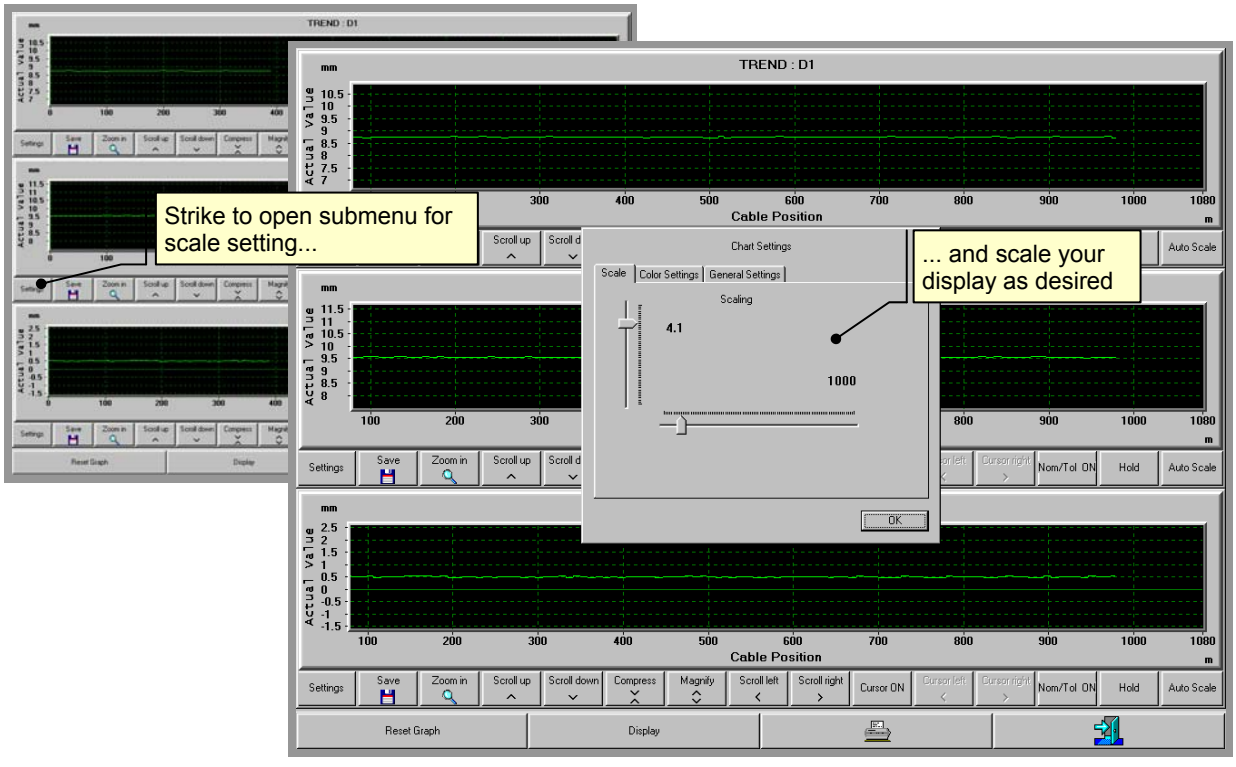


Example: Trend Display Buttons

Use the buttons below each trend display for modifiying the axis resolution, for scrolling and to mark the upper and lower tolerance limit. Also, you may save the data displayed on diskette.
In the example shown here, the trend display has been set to show the two parameter **Diameter 3** and **Wall Thickness**. For each parameter, the upper and lower tolerance limit are displayed as well.



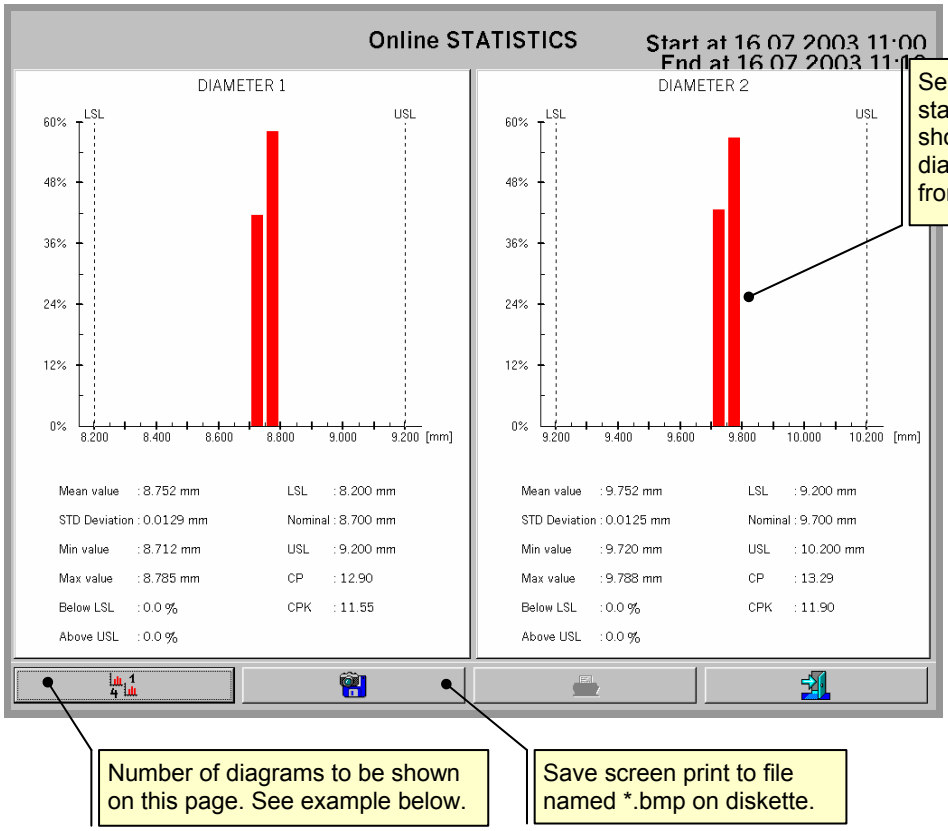
Example: Scaling the Trend Display



Monitor Page STATISTICS

After a production has been closed or also during production (ONLINE STATISTICS) use this function for statistical evaluation and display of the production data recorded. The parameter to be shown here can be selected by the operator.
A bar diagram shows the deviation classified in up to 12 percentual parts, e.g. 97% of all values differed between -0.45 and 0.45 mm from the nominal value, or 3% of all values exceeded the tolerance.
Please note that for this function data recording must have been started with buttons **REPORT / START** (refer to description of button **REPORT** on page 36).

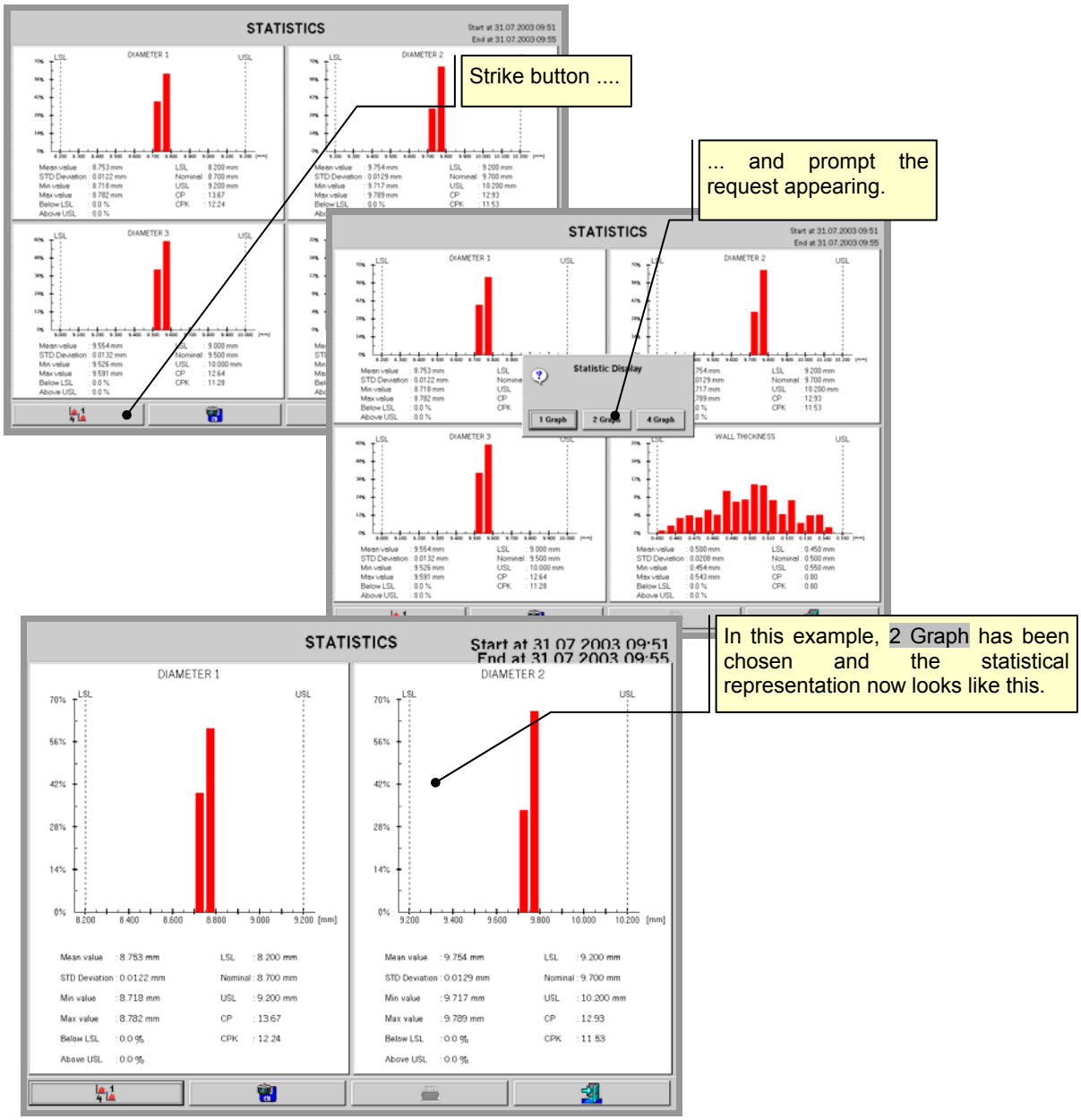
Example:
Below the diagram, the evaluated data of the last production are listed, e.g. mean value, smallest value, the indices CP, CPK, etc.



Abbreviations:

LSL	lower specification limit
USL	upper specification limit
CP	process capability
CPK	critical process capability

Example: Setting the number of diagrams to be shown

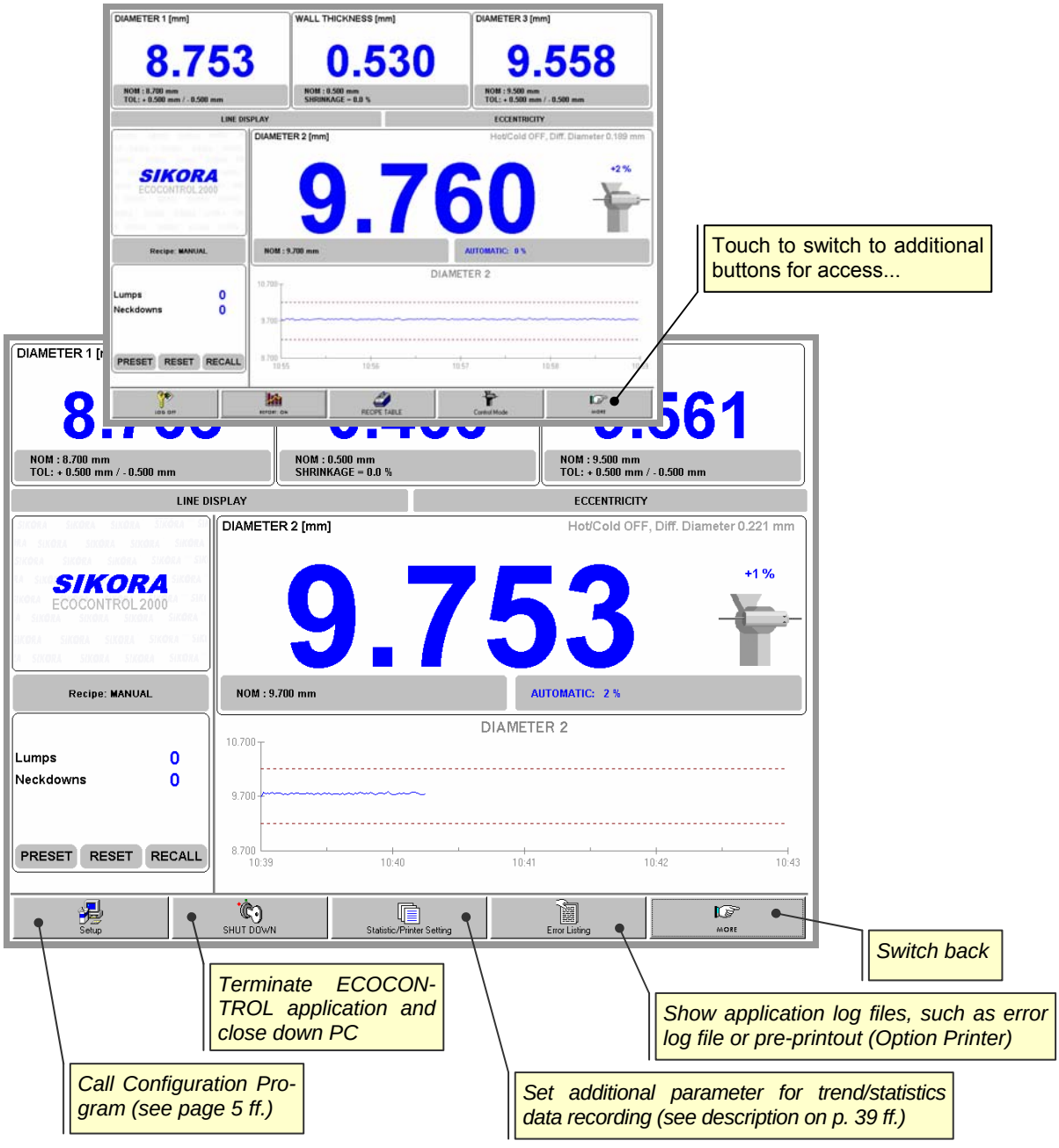


Additional Application Settings

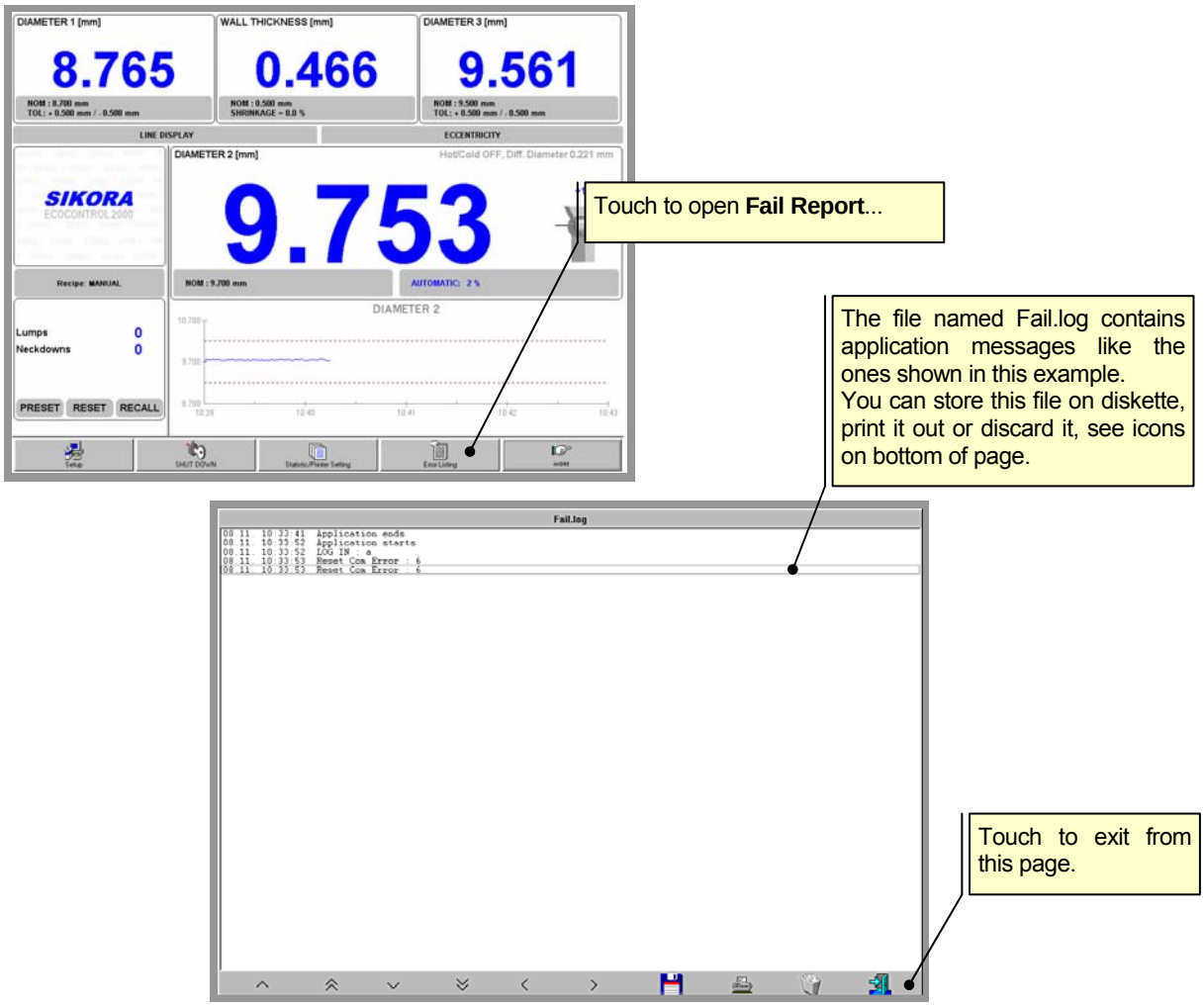
Access with button **MORE** on the standard monitor page.

Use the additional buttons to set the control mode, select the cable type and to access the recipe table (see page 35ff.). The actual settings are displayed in the according text boxes.

Please note that the monitor pages shown here are merely examples used for explanation. They may vary according to your line configuration and the setting chosen.



Example: Checking the Log File



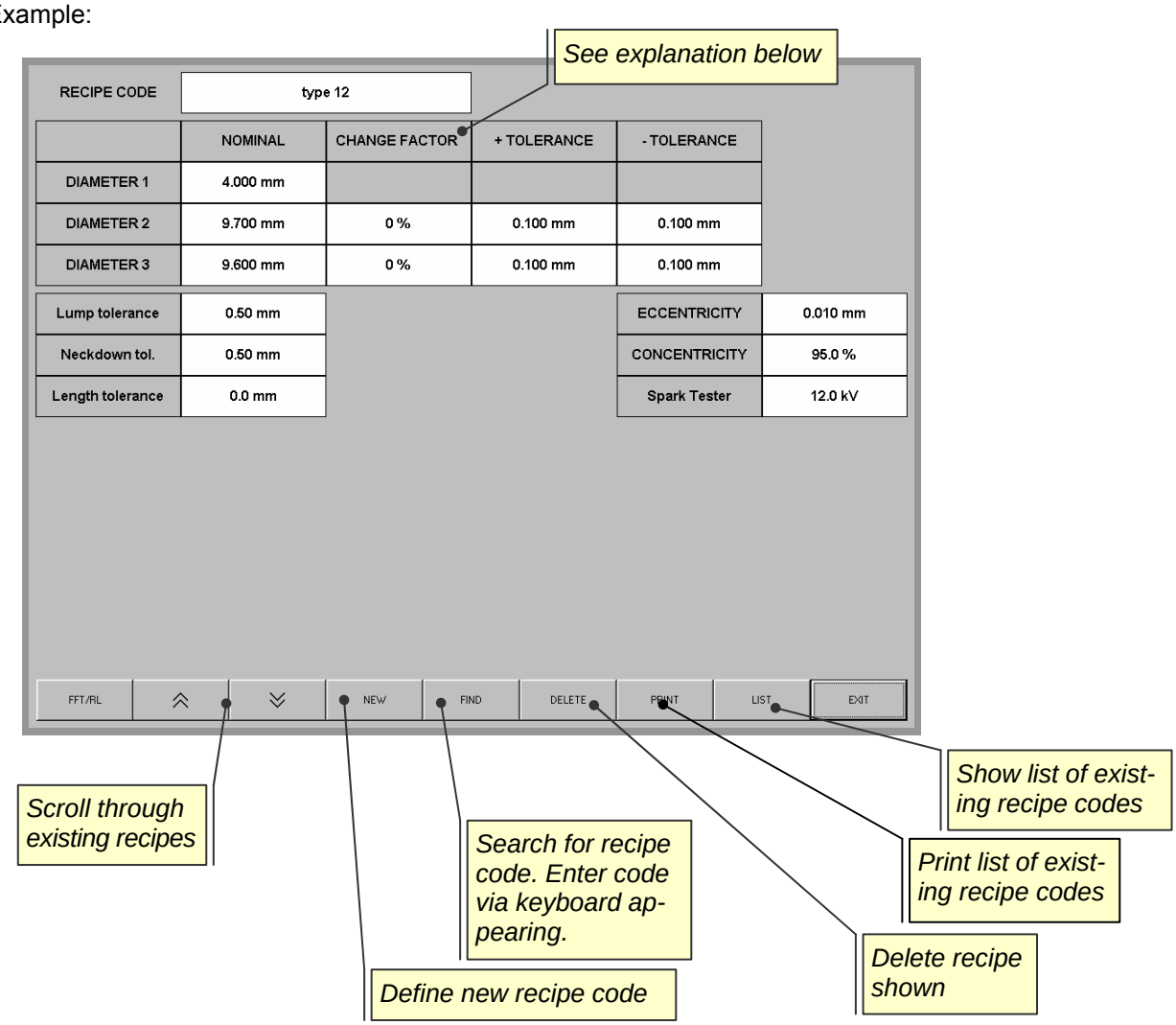
Monitor Page RECIPE TABLE

Access this page with button **RECIPE TABLE** on the bottom of monitor page **Application Settings**.

The recipe table is a list containing data sets of the nominal and tolerance values as well as other specific cable parameters for various cable products. Each data set is identified by its RECIPE CODE. You may define new recipe codes by entering their specific data, search for existing recipe codes or delete them. A LIST function shows a table of all existing recipe codes.

The recipe code being used in production is indicated on the standard monitor page on button **RECIPE**.

Example:



Explanation concerning parameter **CHANGE FACTOR**:
This factor defines to which amount the diameter nominal settings given here can be varied manually when this recipe is used for the production running.
For instance, in the example given above, a **CHANGE FACTOR** set to 10 % for parameter **DIAMETER 2** allows the nominal settings for **DIAMETER 2** to be modified manually during production in a range of 8.730 mm to 10.670 mm. A value of 0 % means that no changes are allowed.

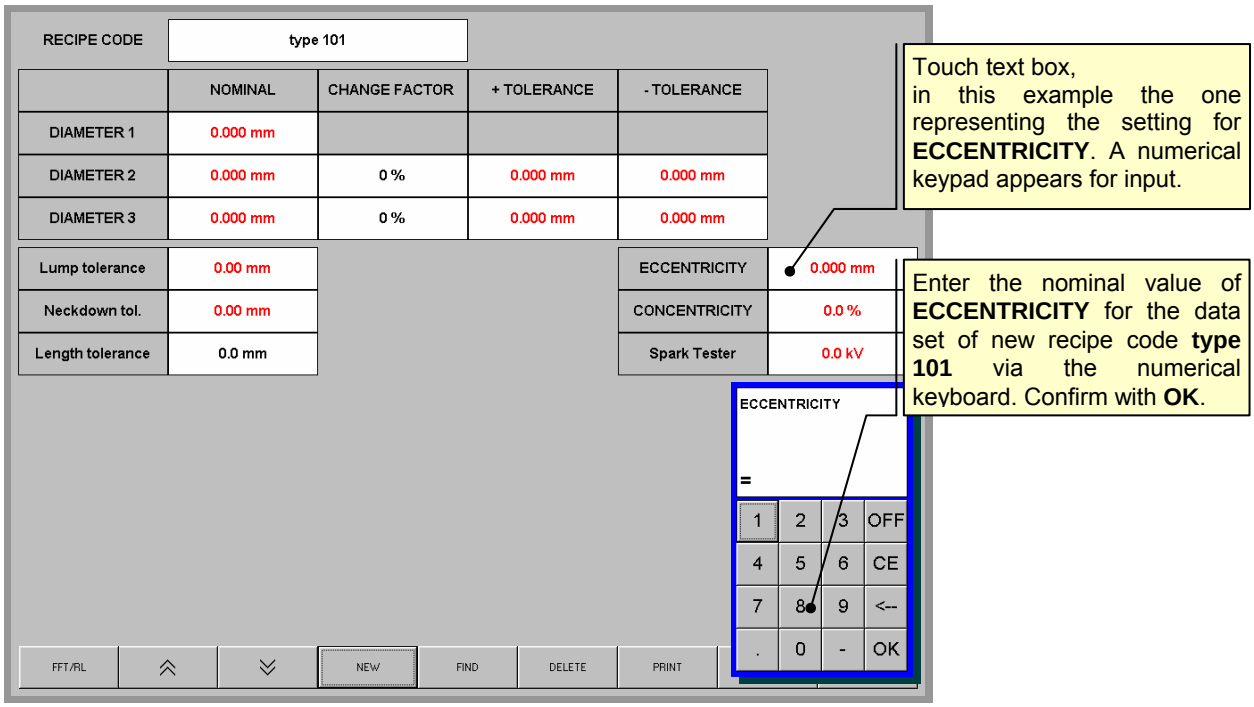
Monitor Page RECIPE TABLE / Button NEW

A keyboard is presented for entering the new recipe code.

Example: A new recipe with code **type 101** is to be created

Enter the new recipe code and confirm with ENTER. The keyboard disappears. Then, define the new set of data for this code: select the respective parameter by touching one of the text boxes shown white and enter its value via the keyboard appearing. Characters shown in red mark mandatory values.

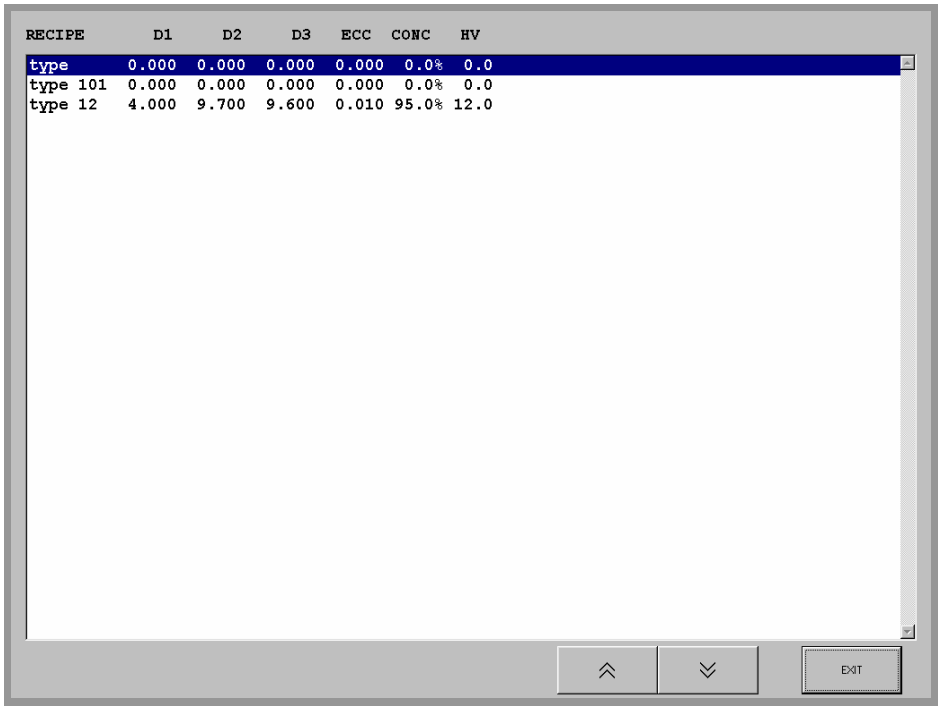
Example: Parameter Setting for the new recipe code named **type 101**



Monitor Page RECIPE TABLE / Button LIST

This function displays a list of the existing recipe codes and their parameters. The blue bar marks the recipe code which has been chosen for the production running.

Example:



2.5 Maintenance and Trouble Shooting

2.5.1 Maintenance

Ecocontrol Monitor:
Clean the outer glass screen of the monitor with a soft cloth and use a mild detergent as often as necessary. However, always switch OFF the device first to prevent faulty operation.

Measuring Head(s) LASER 2000 XY / LUMP 2000 XY:
The measuring head does not need any maintenance. What we recommend is that you take care the openings for the light are kept clean and free of any kind of dirt. To make sure, check the openings regularly, for instance after each production.
Refer to the respective manual supplied and proceed as described.

2.6.2 Trouble Shooting

If the self diagnostic system detects a malfunction, the display will indicate an information about the type of fault, the diameter display shows HELP and additionally the dry contact ALARM switches over (closes).

The following alarm messages may appear:

GLASS DIRTY	The device cannot clearly recognize a measuring object, because f.e. dirt or similar is interrupting the light beam and the device makes out several objects. **NOTE:** Please contact our service if the cleaning of the glasses is not successful, i.e the message will not disappear.
CABLE TOO LOW	The wire leaves the measuring range towards the bottom. Check the height adjustment.
CABLE TOO HIGH	The wire leaves the measuring range towards the top. Check the height adjustment.
UNDEREXPOSED	The light is not sufficient for measurement, clean the lenses.
COMMUNICATION ERROR	A fault on the interface card to the measuring head or no measuring values, interface to measuring head interrupted, i.e. interface connection cable defect or pulled off.
Time Out	Device cannot be accessed. Check device interface, or check Program Version of LASER or ECOCONTROL application software, check error log file
Initialization	Communication to device is being started.

These messages are shown at the diameter display, the corresponding measuring head or device has to be checked. The wall thickness display always shows HELP when a fault is indicated.

There is a three-coloured diode in the cover of most measuring heads (light source side, accessible without opening the measuring head!) which can be used for diagnosis:

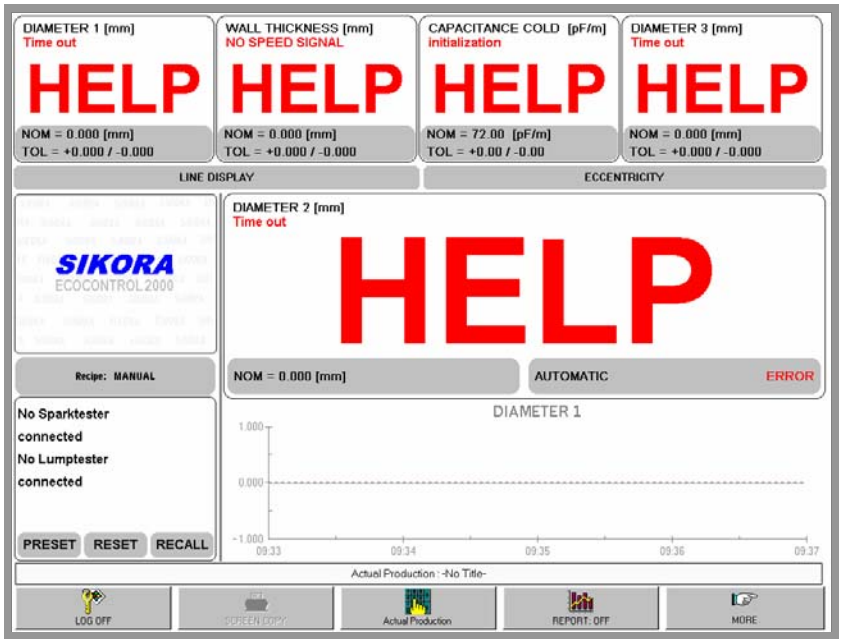
Example: LASER 2010 XY Measuring Head LED signals

green light :	measuring value is valid
red light :	camera fault
yellow light :	when the device is switched on
yellow light, flashing :	no measuring value, standby or cable disconnected

The monitor display shows HELP, when the validity check of the camera supervision detects a fault, text information is displayed in the corresponding diameter window, the contact ALARM switches.

Example: Message during Start-Up

Example: Error Messages

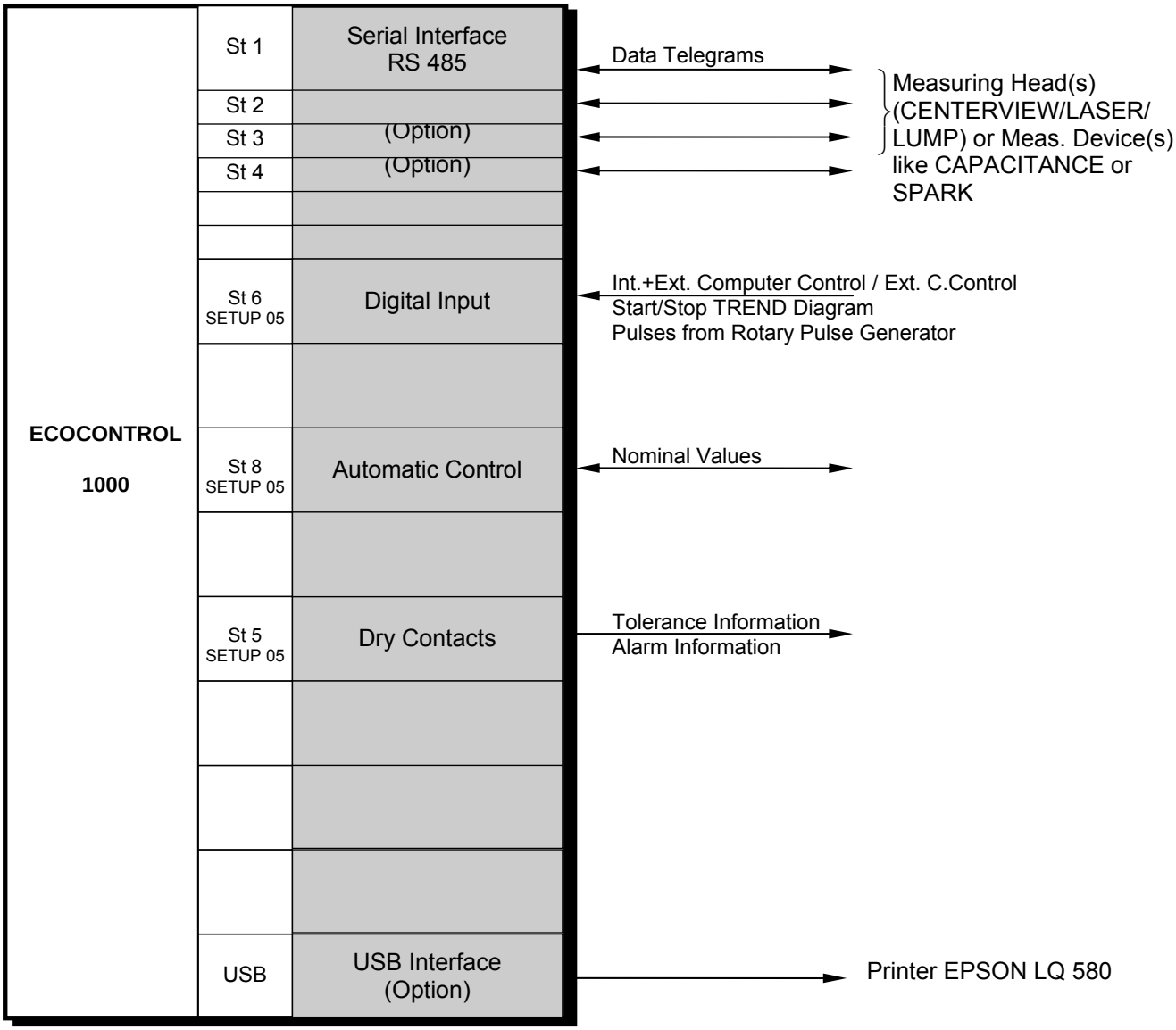


3. Technical Information

3.1 Specification

	ECOCONTROL 1000
Dimension Display Unit	400 x 520 x 254 mm (16 x 20 7/8 x 10 2/8 “)
Dimension Mounting Frame	355 x 483 (14 3/16 x 19 5/16 “) for 19 “ rack assembly
Voltage Supply	115 .. 230 V AC ± 15%, 50...60 Hz (selectable)
Power Consumption	120 VA
Temperature Range	+5...+50 °C (+40...+125 °F)
Air Humidity	max. 90 % (without condensation)
Weight	approximately 10.0 kg
Interfaces	2 Serial Interfaces RS485 (optionally up to 4 additional interfaces) Digital Input Relay Contacts ALARM, ±TOL (max. load 24 V DC, 0.5A) 1 Extruder/Line Control Interfaces

*) for service only



*) for service only

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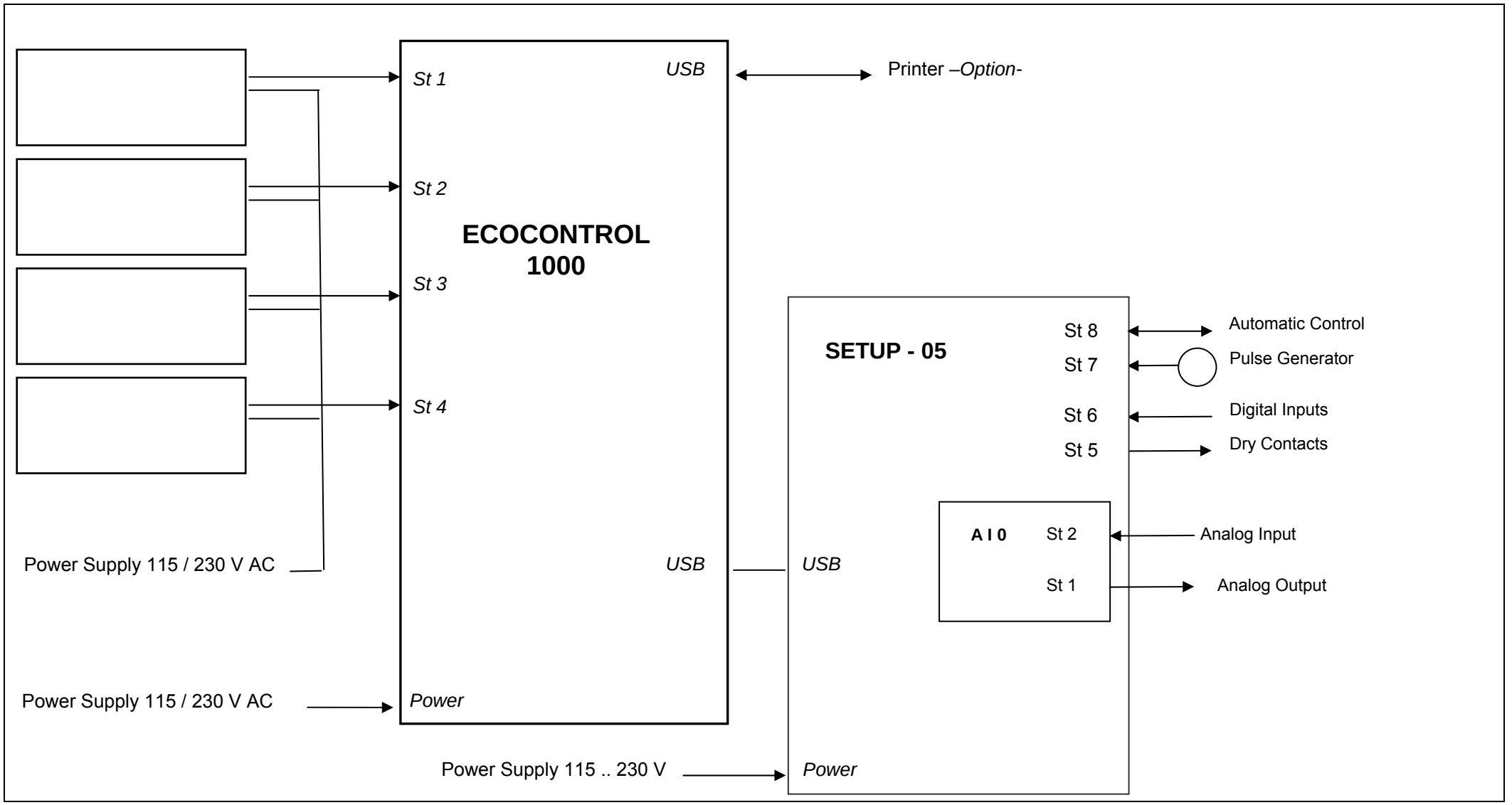

St 1
USB
Printer –Option-
St 2
ECOCONTROL
1000
St 3
St 4
SETUP - 05
St 8
Automatic Control
St 7
Pulse Generator
St 6
Digital Inputs
St 5
Dry Contacts
A I 0
St 2
Analog Input
St 1
Analog Output
Power Supply 115 / 230 V AC
USB
USB
Power Supply 115 / 230 V AC
Power
Power Supply 115 .. 230 V
Power

External Wiring ECOCONTROL 1000

Plug/St1 Serial Interface RS485	9-pol D-Sub Connector (Interface to Measuring Head / Measuring Device / Tester)
	not connected / connected to

Plug/St2 Serial Interface RS485	9-pol D-Sub Connector (Interface to Measuring Head / Measuring Device / Tester)
	not connected / connected to

Plug/St3 Serial Interface RS485 (Option)	9-pol D-Sub Connector (Interface to Measuring Head / Measuring Device / Tester)
	not connected / connected to

Plug/St4 Serial Interface RS485 (Option)	9-pol D-Sub Connector (Interface to Measuring Head / Measuring Device / Tester)
	not connected / connected to

USB Printer (Option)	USB (Interface to parallel port printer EPSON LQ 590)

POWER SUPPLY	Device Connector (Mains Supply 230 .. 115 V AC –selectable or automatic, can be set at the device power unit)

External Wiring SETUP - 05

Plug/St1 Power Supply	3 – pol. Screw terminal (Voltage feed)		
	1	AC – L	115 / 230 V Long-Range-Input
	2	AC – N	
	3	PE	

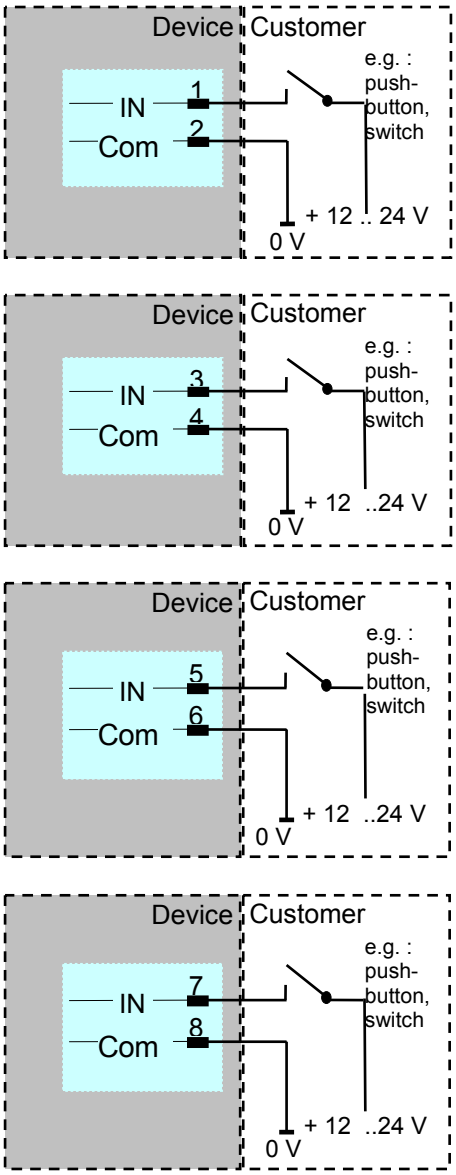
Plug/St2 External Power Supply (Option)	4 – pol. Screw terminal (external voltage feed)		Not used
	1 2 }	+ 5 V	5 V external voltage feed
	3 4 }	GND	External ground

Plug/St3 USB – Interface	USB (Interface to Ecocontrol / Panel PC)		Only for Internal use

Plug/St4 Ser. Interface RS 232 (Option)	9 –pol. D-Sub Connector (Programming Interface)		Not used
	2	R x D	
	3	T x D	
	5	GND	

Plug/St5 Digital Output (Relay Contact)	8 – pol. Screw terminal (4 Digital outputs - programmable / potential-free contacts, max. contact load 24 V DC and 0,5 A)			
	1 2 }	OUT 1	Digital Output 1	Preset e.g.: Contact closed: ALARM, error of the camera
	3 4 }	OUT 2	Digital Output 2	Preset e.g.: Tolerance limit exceeded
	5 6 }	OUT 3	Digital Output 3	Preset e.g.: Tolerance limit exceeded
	7 8 }	OUT 4	Digital Output 4	Preset e.g.: Tolerance limit exceeded

Plug/St6 Digital Input	8 – pol. Screw terminal (4 Digital inputs - programmable)



Digital Input 1	Preset e.g.: Contact closed: External computer control only Contact open: Internal and external computer control
Digital Input 2	Preset e.g.: Contact closed for minimum 1 second: Start TREND diagram
Digital Input 3	Preset e.g.: Contact closed for minimum 1 second: Stop TREND diagram
Digital Input 4	Not preset

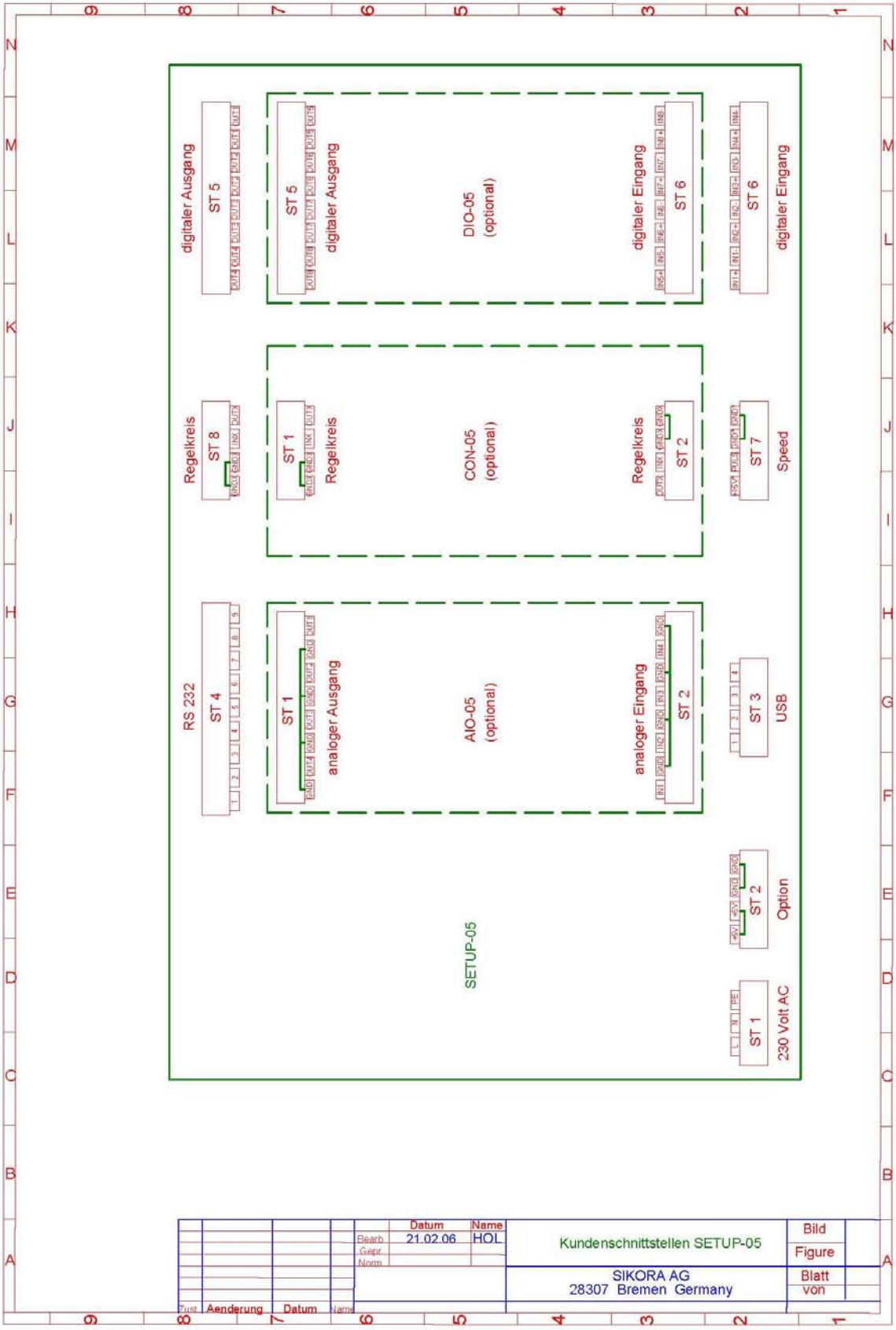
Plug/St7 SPEED	4 – pol. Screw terminal Potential-free Input for Pulses from the Rotary Pulse Generator Note: Clamp cable shield under cable grip!	
	1	+ 15 V Supply for Rotary Pulse Generator
	2	Pulse from the Rotary Pulse Generator
	3 4 }	GND Ground Rotary Pulse Generator

Plug/St8 Automatic Control Analog Output	4 – pol. Screw terminal (Automatic Control System 1)		
	Automatic Control Influence: ± 50 %		
	2	Input Nominal Value	max. + 10 V, $R_j \geq 100$ kΩ
	3	GND Ground Input Nominal Value	
	1	Output Nominal Value	max. + 15 V, max. 5 mA
	4	GND Output Nominal Value	

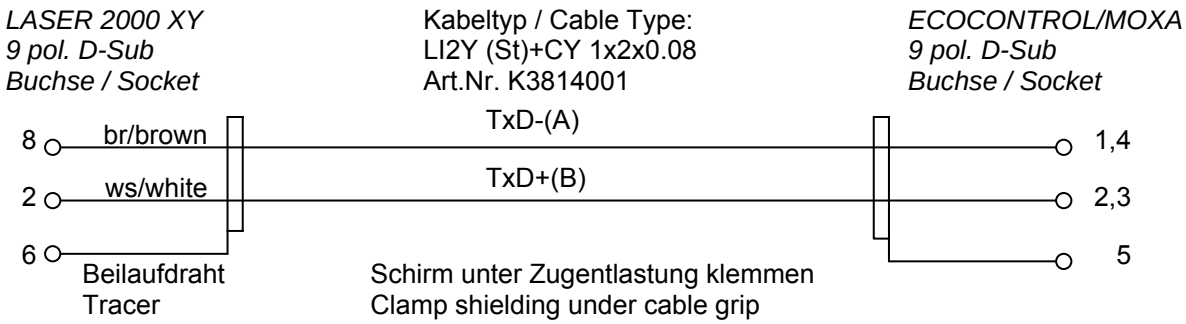
External Wiring AIO (Option)

Plug/St1	8 – pol. Screw terminal (Analog Output 1..4)
	OUT 1 0 .. 10 V GND OUT 2 0 .. 10 V GND OUT 3 0 .. 10 V GND OUT 4 0 .. 10 V GND

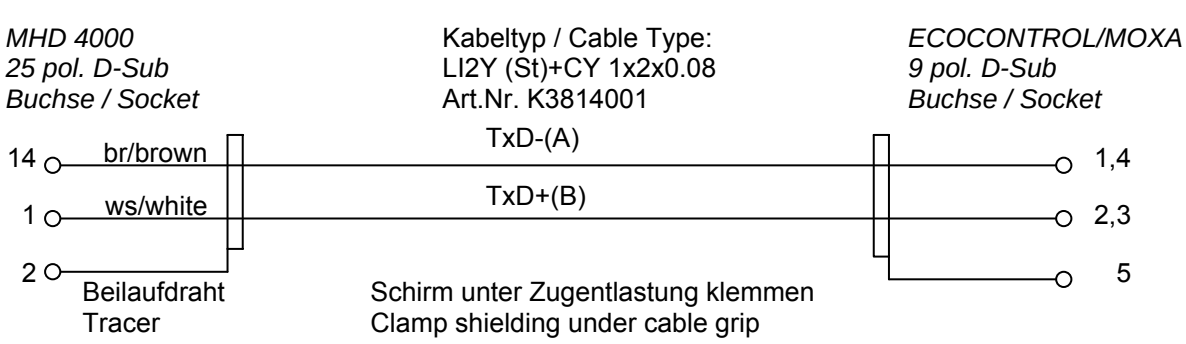
Plug/St2	8 – pol. Screw terminal (Analog Input)
	IN 1 0 .. 10 V GND IN 2 0 .. 10 V GND IN 3 0 .. 10 V GND IN 4 0 .. 10 V GND


digitaler Ausgang
ST 5
ST 5
digitaler Ausgang
DIO-05
(optional)
digitaler Eingang
ST 6
ST 6
digitaler Eingang
Regelkreis
ST 8
ST 1
Regelkreis
CON-05
(optional)
Regelkreis
ST 2
ST 7
Speed
RS 232
ST 4
ST 1
analoger Ausgang
AIO-05
(optional)
analoger Eingang
ST 2
ST 3
USB
SETUP-05
ST 2
Option
ST 1
230 Volt AC
Datum
Name
Bearb.
21.02.06
HOL
Gepr.
Norm
Kundenschnittstellen SETUP-05
Bild
Figure
SIKORA AG
28307 Bremen Germany
Blatt
von
Zust.
Aenderung
Datum
Name

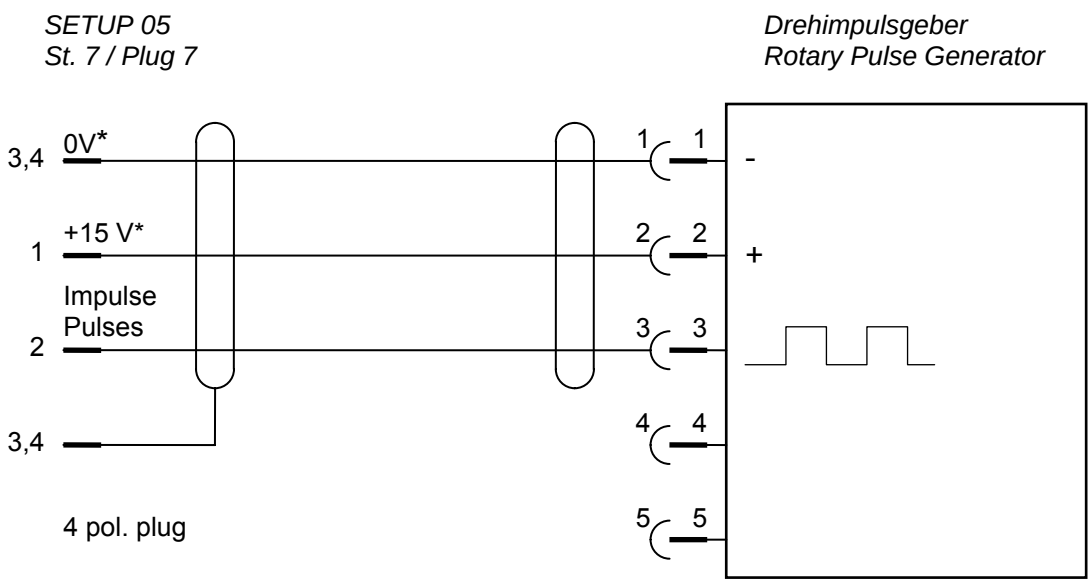
KSMOLA - _____



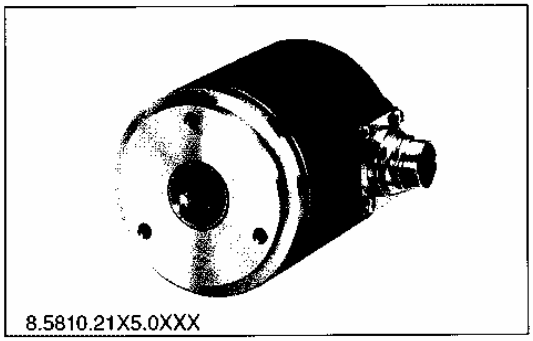
KSMOMHD - _____



9 pol D-Sub Buchse/Socket	Art Nr. V76020
9 pol D-Sub Haube/Cap	Art Nr. V76022
25 pol D-Sub Buchse/Socket	Art Nr. V7601
25 pol D-Sub Haube/Cap	Art Nr. V7602
LI2Y (St) +CY 1x2x0.08	Art Nr. KS3814001


SETUP 05
St. 7 / Plug 7
Drehimpulsgeber
Rotary Pulse Generator
3,4
0V*
1
+15 V*
Impulse
Pulses
2
3,4
4 pol. plug
1
2
3
4
5
-
+

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:	$0{,}6 \times 10^{-6}$ kgm²
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:

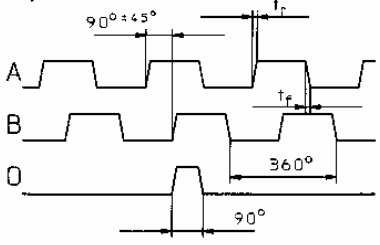
Ausgangsschaltung:	Gegentaktschaltung
Versorgungsspannung U_B:	10 – 30 VDC
Stromaufnahme:	max. 80 mA
Zul. Last / Kanal:	max. +/– 30 mA
Impulsfrequenz:	max. 20 kHz
Signalpegel high:	min. U_B – 2,5 V
Signalpegel low:	max. 1,5 V
Anstiegszeit t_r:	max. 1 µs
Abfallzeit t_f:	max. 1 µs
Kurzschlußfeste Ausgänge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

Kurzfristig lieferbare Impulszahlen:

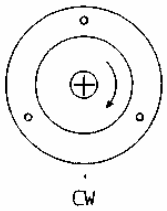
1, 2, 4, 5, 6, 10, 15, 20, 25, 30, 35, 36, 40, 50, 57, 60, 70, 80, 86, 90, 96, 100, 120, 125, 127, 142, 150, 180, 200, 216, 220, 240, 250, 254, 256, 280, 300, 314, 360, 377, 393, 400, 420, 450, 500, 512.

Andere Impulszahlen auf Anfrage.

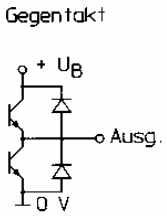
Impulsbild:



Drehsinn:



Ausgangsschaltung:

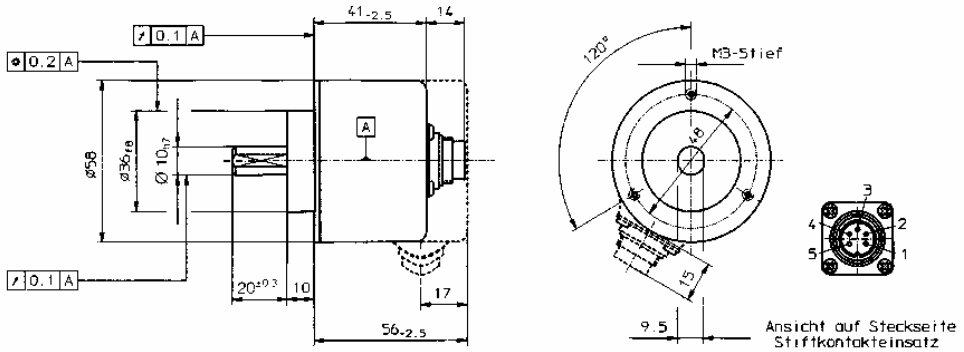


- Welle im Uhrzeigersinn drehend, mit Blick auf die Welle.
- Invertiertes Nullsignal optional erhältlich.
- Der 0-Impuls ist mit den Kanälen A und B UND-verknüpft.

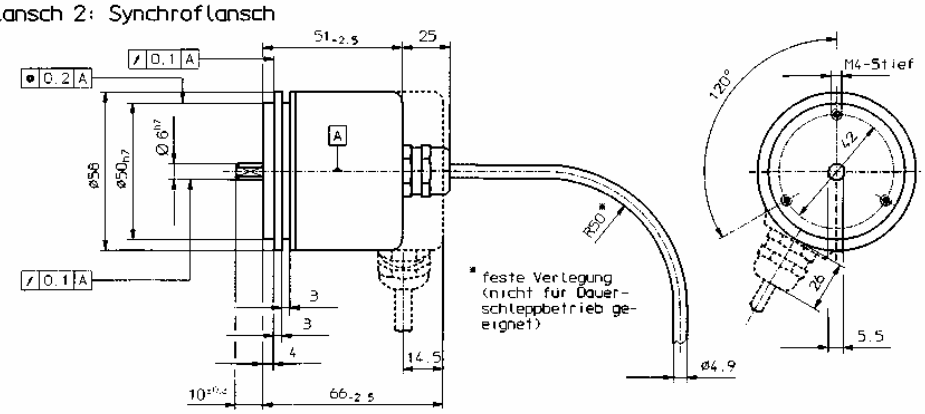
– Änderungen vorbehalten –

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

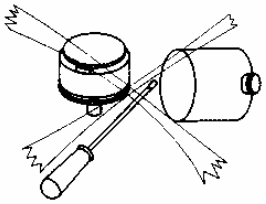
Wichtig!

Vor Inbetriebnahme des Gebers unbedingt lesen.

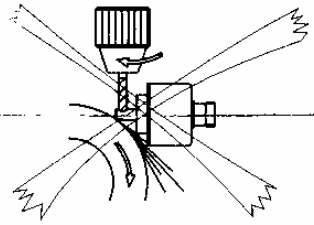
Mit diesem Geber haben Sie ein Präzisionsmeßgerät erworben. Beachten Sie stets die Angaben und Hinweise des Datenblattes, um eine problemlose Funktion des Gebers zu gewährleisten und um die Garantieleistung aufrecht zu erhalten. Falls im Datenblatt nichts anderes angegeben ist, bitte folgendes unbedingt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

Mechanisch:

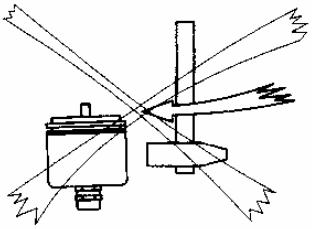
– Der Drehgeber darf weder teilweise noch ganz zerlegt oder modifiziert werden.



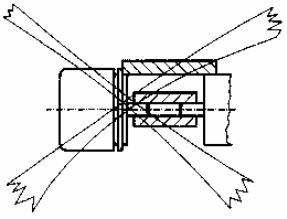
– Die Welle nicht nachträglich bearbeiten (schleifen, sägen, bohren, usw.). Die Genauigkeit des Gebers und die Zuverlässigkeit von Lager und Dichtung nehmen sonst Schaden. Wir sind gerne bereit, auf Ihre Kundenwünsche einzugehen.



– 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!

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:

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).

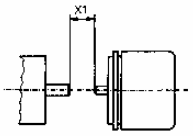
We recommend that you use our assembly aids and couplings to install the transducer (see accessory data sheets).

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

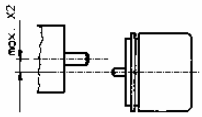
–Änderungen vorbehalten / *Subject to changes without prior notice* –

Montagehinweise für Geber mit Welle:

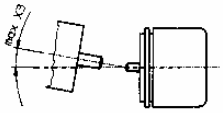
① Wellen auf Versatz überprüfen.



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.

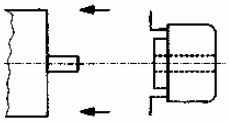
Refer to the coupling data sheet for the values x1, x2 and x3.

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

③ Align coupling on the shafts.

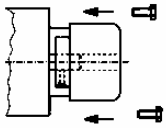
④ Carefully tighten pulling or clamping bolts.

Montagehinweise für Hohlwellengeber mit Kupplung:



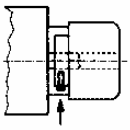
Geber mit Kupplung auf Welle montieren.

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.

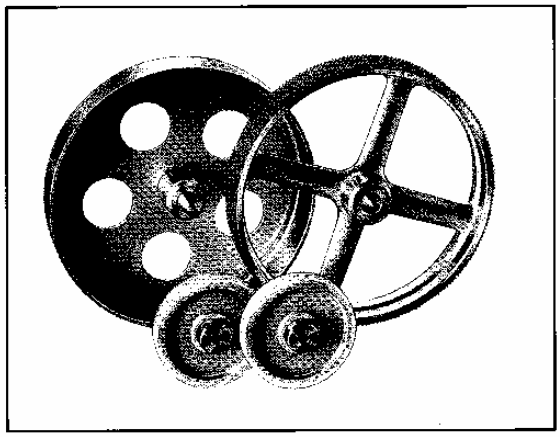
TECHNISCHE INFORMATION

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:

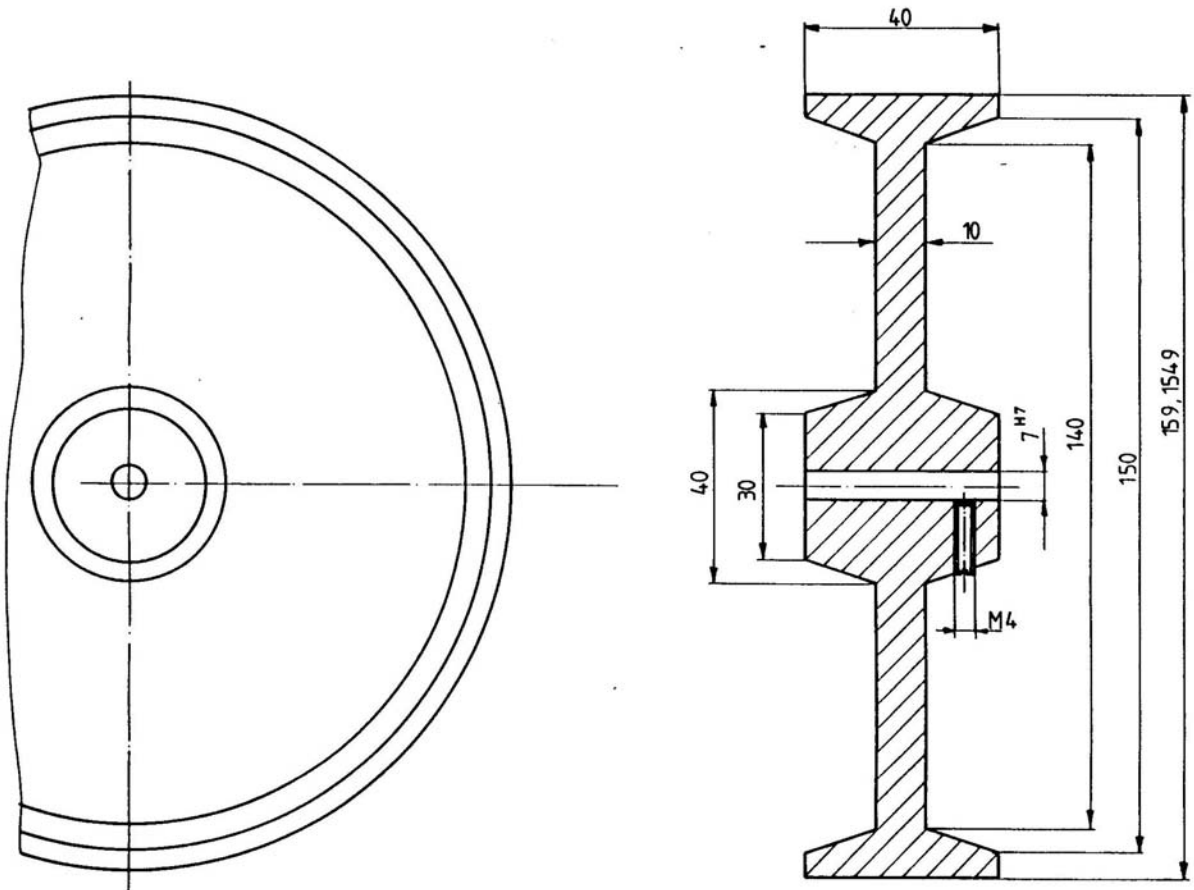
8.0000.3 XXX.00XX

- XXX.00XX — Bohrungsdurchmesser
- XXX — Meßrad-Nr.

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 –

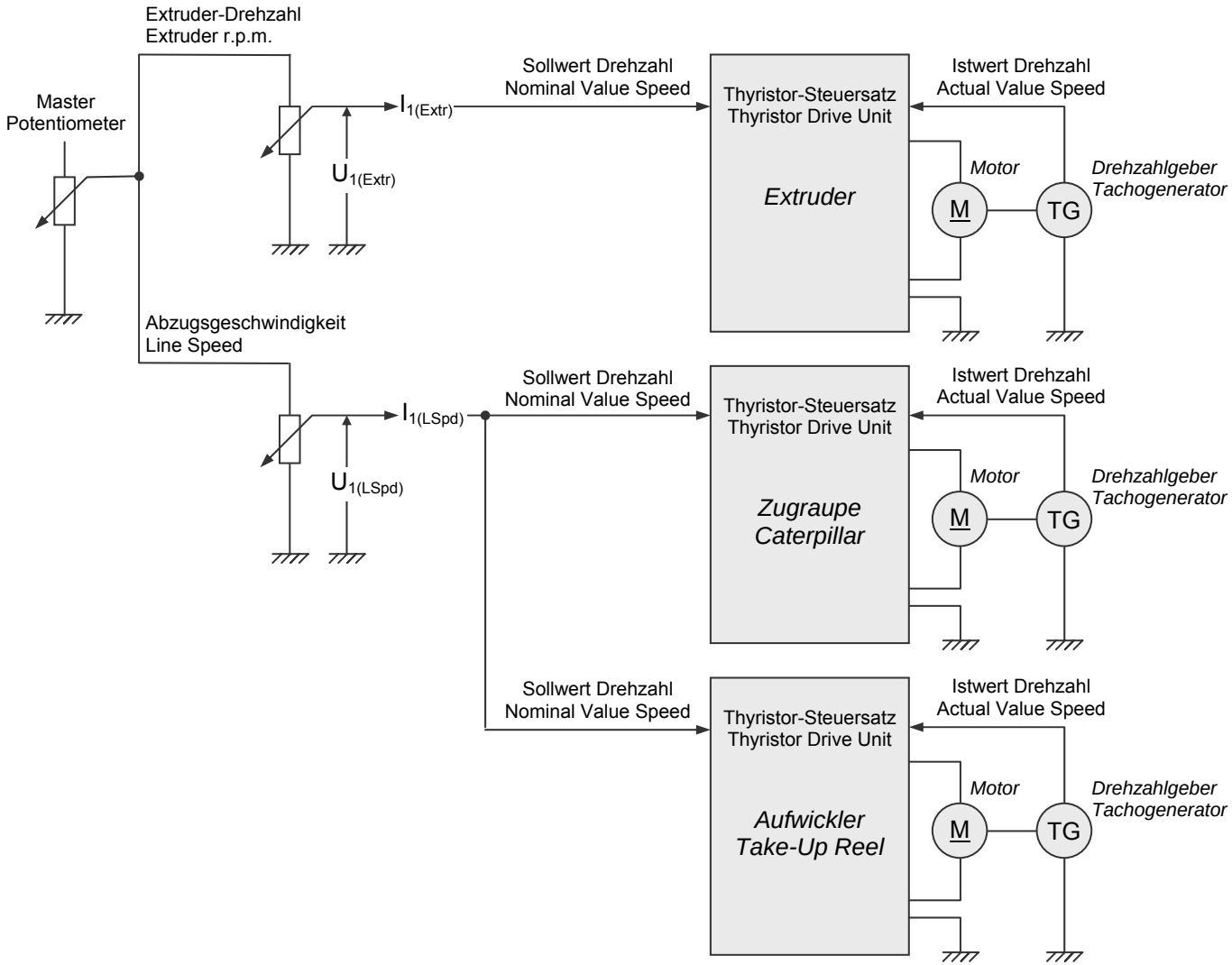


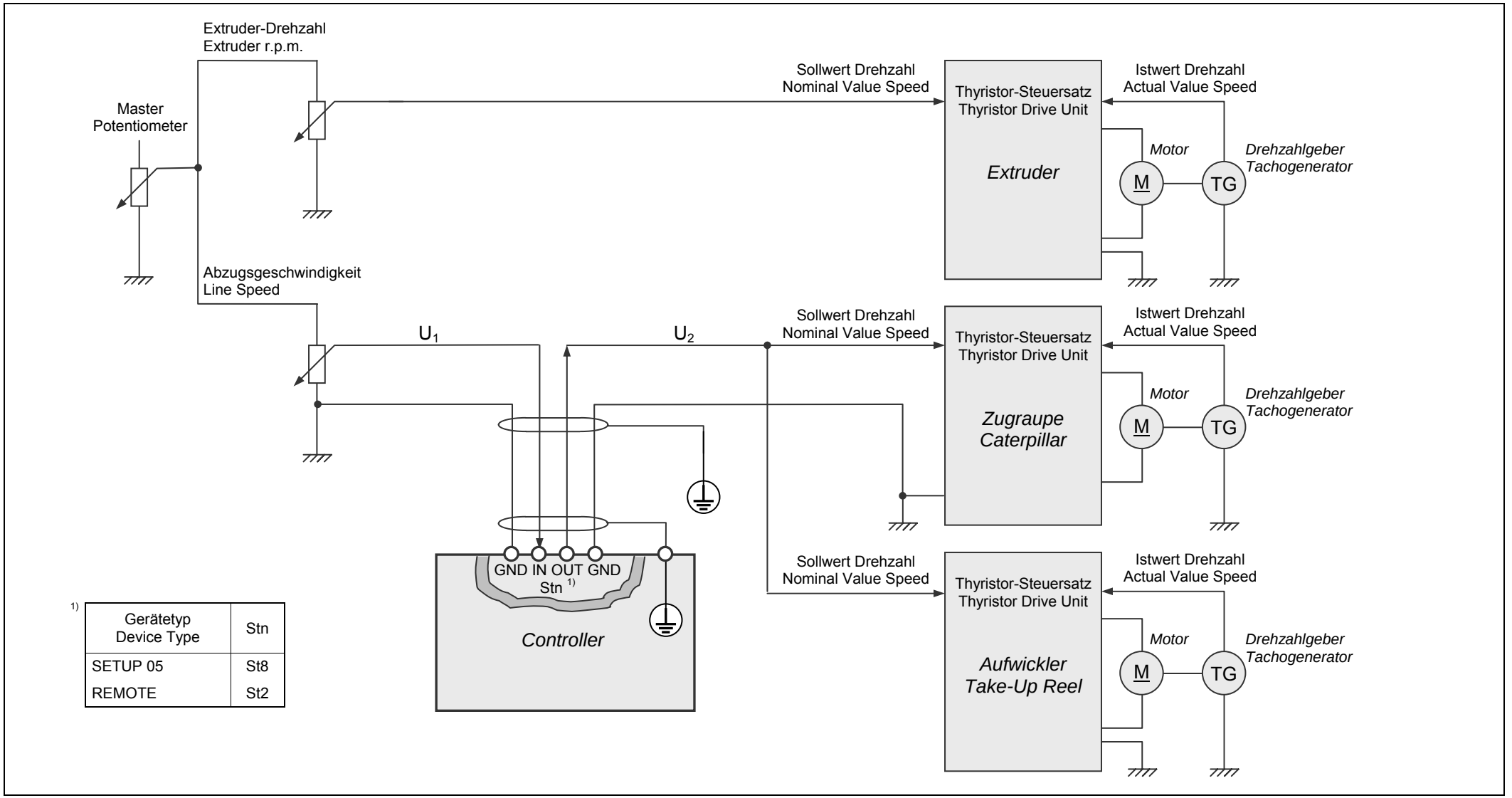
Material: AlMgSi 0,5

Drehimpulsgeber
Rotary Pulse Generator
Vorschlag Messrad
Example Metering Wheel

Bild / Fig. 11
Blatt / Page 1/1

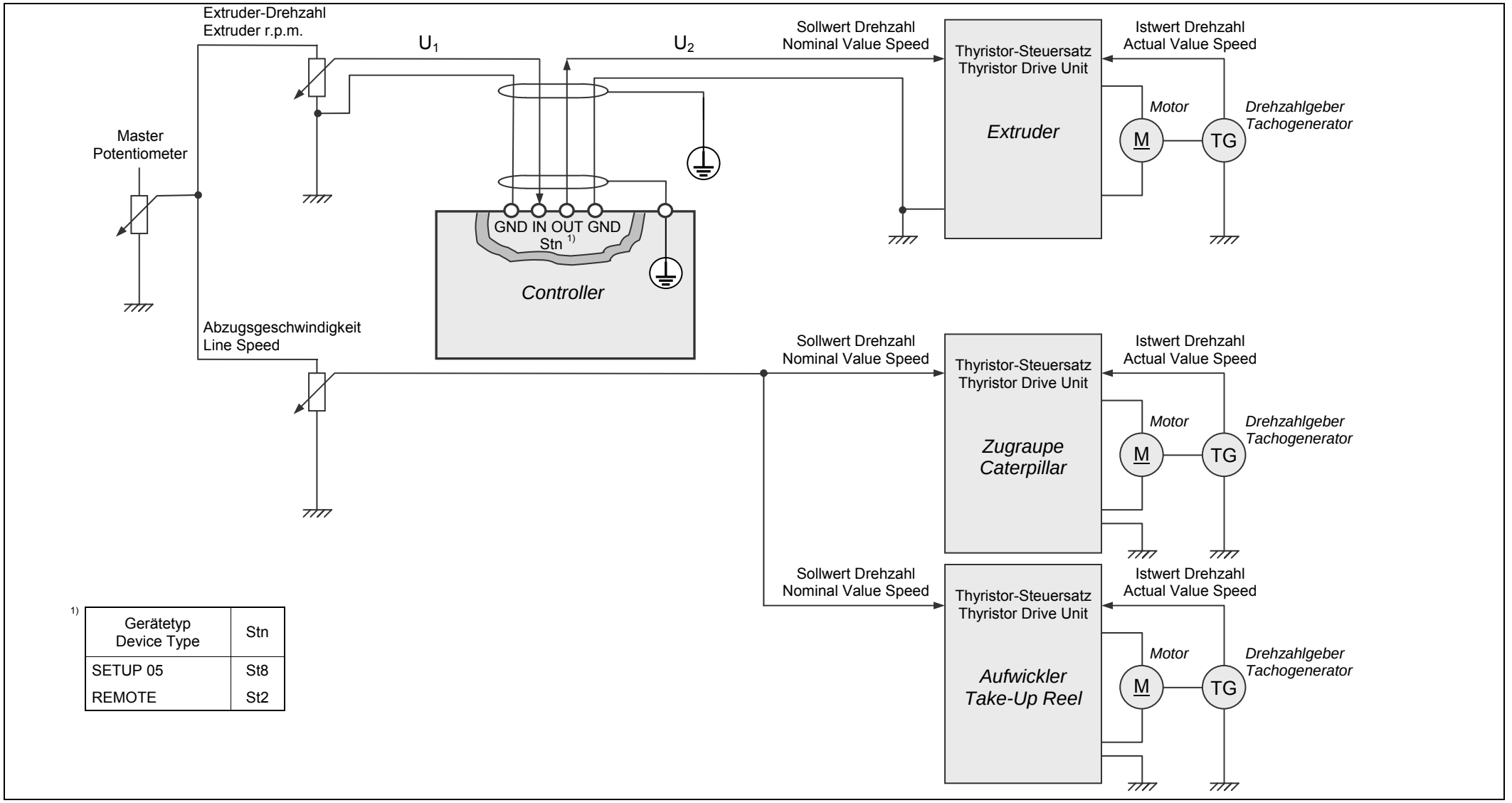
SIKORA AG
Bruchweide 2 · D-28307 Bremen · Germany
16.08.2007


Extruder-Drehzahl
Extruder r.p.m.
Master
Potentiometer
$I_{1(Extr)}$
$U_{1(Extr)}$
Sollwert Drehzahl
Nominal Value Speed
Thyristor-Steuersatz
Thyristor Drive Unit
Extruder
Istwert Drehzahl
Actual Value Speed
Motor
Drehzahlgeber
Tachogenerator
M
TG
Abzugsgeschwindigkeit
Line Speed
$I_{1(LSpd)}$
$U_{1(LSpd)}$
Sollwert Drehzahl
Nominal Value Speed
Thyristor-Steuersatz
Thyristor Drive Unit
Zugraupe
Caterpillar
Istwert Drehzahl
Actual Value Speed
Motor
Drehzahlgeber
Tachogenerator
M
TG
Sollwert Drehzahl
Nominal Value Speed
Thyristor-Steuersatz
Thyristor Drive Unit
Aufwickler
Take-Up Reel
Istwert Drehzahl
Actual Value Speed
Motor
Drehzahlgeber
Tachogenerator
M
TG



1)

Gerätetyp Device Type	Stn
SETUP 05	St8
REMOTE	St2



1)

Gerätetyp Device Type	Stn
SETUP 05	St8
REMOTE	St2