

JUMO LOGOSCREEN nt
Paperless Recorder
with TFT display and
CompactFlash card

B 70.6580.0
Operating Manual

08.06/00453815

Menu structure of the paperless recorder



⇒ Chapter 8 “Device manager”



⇒ Chapter 7 “Memory manager”



⇒ Chapter 6 “Alarm and event lists”



⇒ Chapter 4 “Visualization”



⇒ Chapter 5 “Memory presentation (History)”

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1.1 Preface



Please read this manual before commissioning the instrument. Keep the manual in a place that is accessible to all users at all times.

Please assist us to improve this manual, where necessary.

Your comments will be appreciated.



If any difficulties should arise during commissioning, you are asked not to carry out any manipulations that could endanger your rights under the instrument warranty!

Please contact the nearest subsidiary or the head office in such a case.



When returning modules, assemblies or components, the regulations of EN 61340-5-1 and EN 61340-5-2 “Protection of electronic devices from electrostatic phenomena” must be observed. Use only the appropriate **ESD** packaging for transport.

Please note that we cannot accept any liability for damage caused by ESD.

ESD=Electro Static Discharge

1 Introduction

1.2 Arrangement of the documentation

The documentation for this instrument is addressed to equipment manufacturers (OEMs) and users with appropriate technical expertise. It consists of the following parts:

Instrument documentation in printed form

B 70.6580.1 Operating Instructions

The operating instructions are an extract from the operating manual and cover the basic operation of the paperless recorder.

B 70.6580.4 Installation Instructions

The installation instructions describe the installation of the recorder and the connection of the supply and signal cables. The instructions also contain a list of the technical data.

Instrument documentation in the form of PDF files

The “Instrument documentation in the form of PDF files” is on the CD that is included in the delivery.

B 70.6580.0 Operating Manual

It contains information about commissioning, operation and parameterization on the instrument, as well as about the setup program (available as an option).

B 70.6580.1 Operating Instructions

The operating instructions are an extract from the operating manual and cover the basic operation of the paperless recorder.

B 70.6580.2.0 Interface Description (serial interfaces)

This provides information on communication (RS232; RS485) with supervisory systems.

Interface Description (Ethernet interface)

This provides information on the connection of a paperless recorder to a company-internal network. This description is integrated into B 70.6580.2.0

B 70.6580.2.3 Interface Description (PROFIBUS-DP interface)

This provides information on the connection of a paperless recorder to a PROFIBUS-DP system.

B 70.6580.4 Installation Instructions

The installation instructions describe the installation of the recorder and the connection of the supply and signal cables. The instructions also contain a list of the technical data.

B 70.6580.6 Setup program

These instructions describe the functions of the setup program. The setup program is available as an accessory.

T 70.6580 Data Sheet

The data sheet contains general information, the order details and the technical data.

B 70.9701.0 PC Evaluation Software PCA3000

The operating manual describes the operation and the features of the PC evaluation software.

The PC evaluation software serves to visualize and evaluate process data (measurement data, batch data, messages ...). The process data can be read in via the CompactFlash memory card, or made available through the PCC software.

B 70.9702.0 PCA Communications Software PCC

The operating manual describes the operation and the features of the PCA Communications software.

The PCA Communications software is responsible for the data transfer from the paperless recorder to a PC, or across a network.



All documents are available for downloading at www.jumo.net

- * Start the product search on the home page.
- * Enter 70.6580 and start the search.
- * Select the paperless recorder
- * Select the download section
- * Download the PDF file.

1 Introduction

1.3 Typographical conventions

Warning signs

The signs for **Danger** and **Caution** are used in this manual under the following conditions:



Danger

This symbol is used when there may be **danger to personnel** if the instructions are ignored or not followed correctly!



Caution

This symbol is used when there may be **damage to equipment or data** if the instructions are ignored or not followed correctly!



Caution

This symbol is used where special care is required when handling **components liable to damage through electrostatic discharge**.

Note signs



Note

This symbol is used when your **special attention** is drawn to a remark.



Reference

This symbol refers to **further information** in other manuals, chapters or sections.

abc¹

Footnote

Footnotes are remarks that **refer to specific points** in the text. Footnotes consist of two parts:

A marker in the text, and the footnote text.

The markers in the text are arranged as continuous superscript numbers.

Action instruction

This symbol indicates that an **action to be performed** is described.

The individual steps are marked by this asterisk, e.g.

*

* Rotate control knob

* Press control knob

Presentation modes

Screen texts

*Program
Manager*

Texts that are displayed in the setup program are indicated by **italic script**.

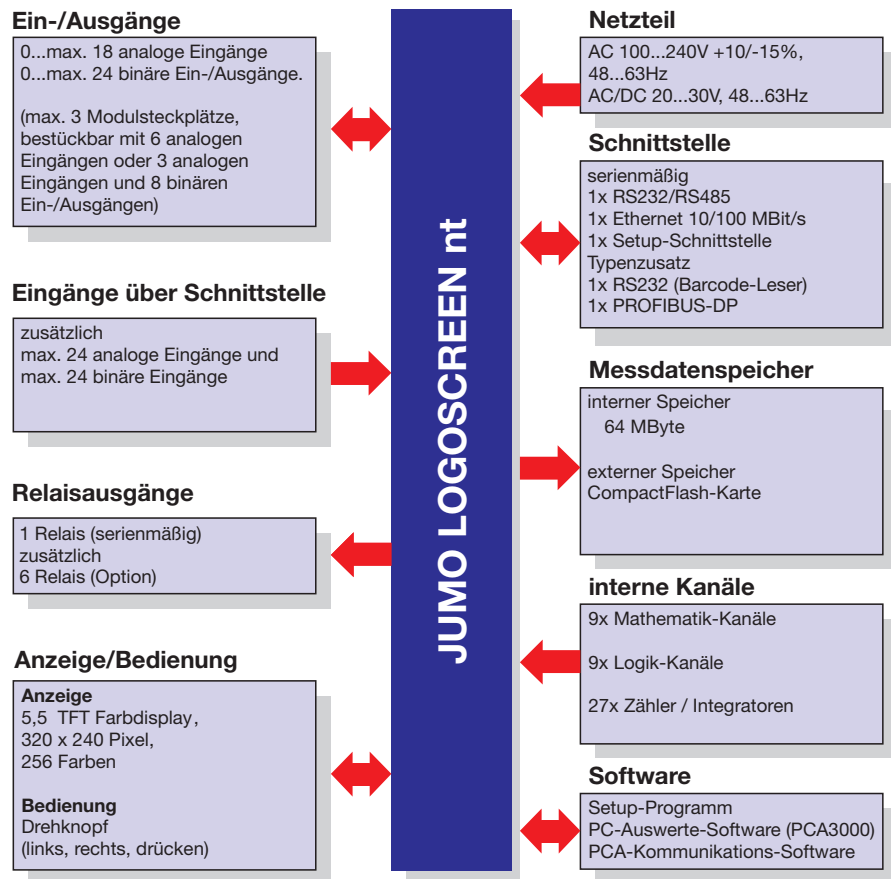
Menu items

*Edit →
Device data*

Menu items in the setup and instrument software referred to in this manual are shown in italics. Menu name, menu item and submenu item are separated from each other by “→”.

1 Introduction

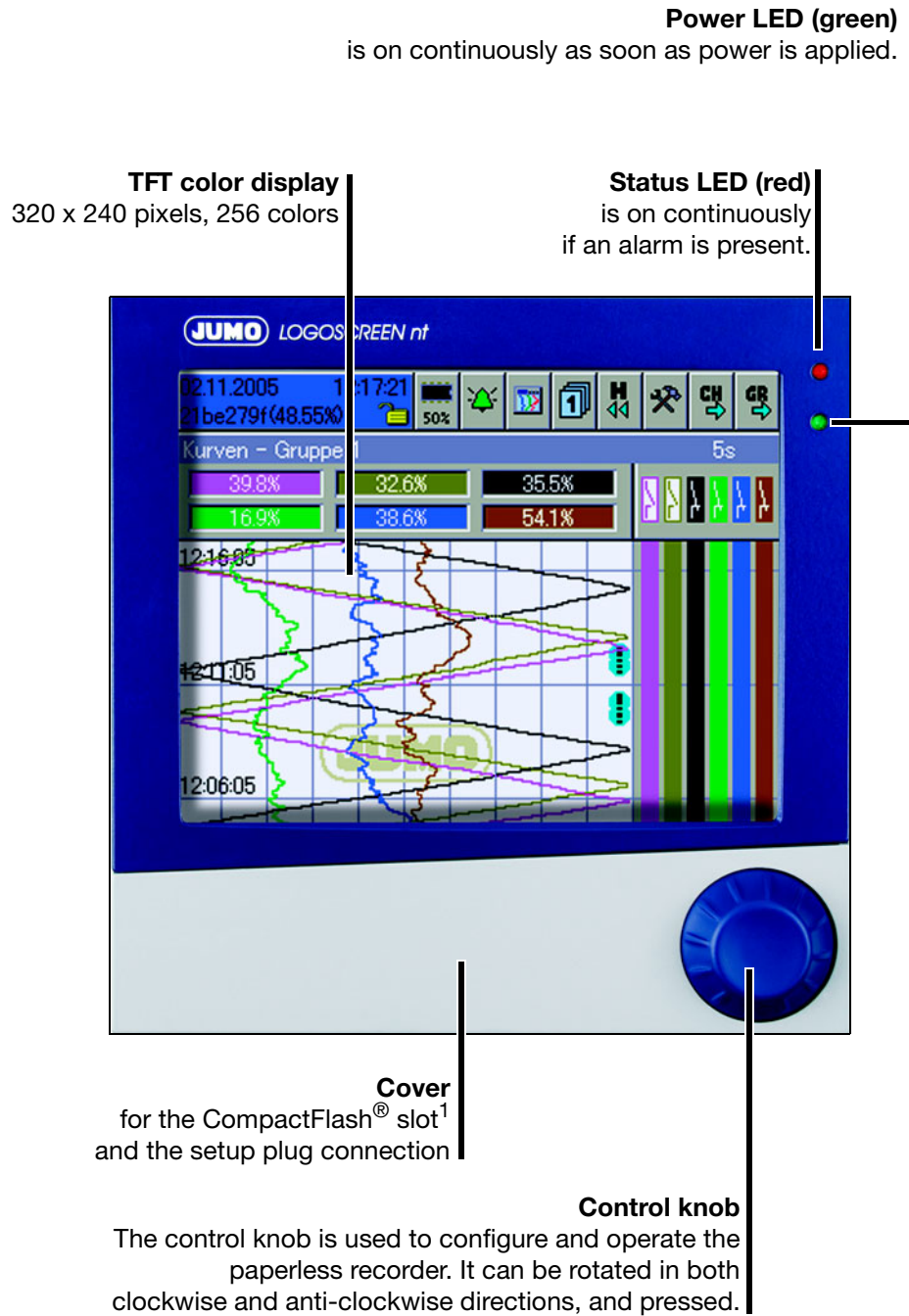
2 Instrument description



The connection diagram is described in the Installation Instructions B 70.6580.4. When the paperless recorder is delivered, a printed version of the installation instructions is included.

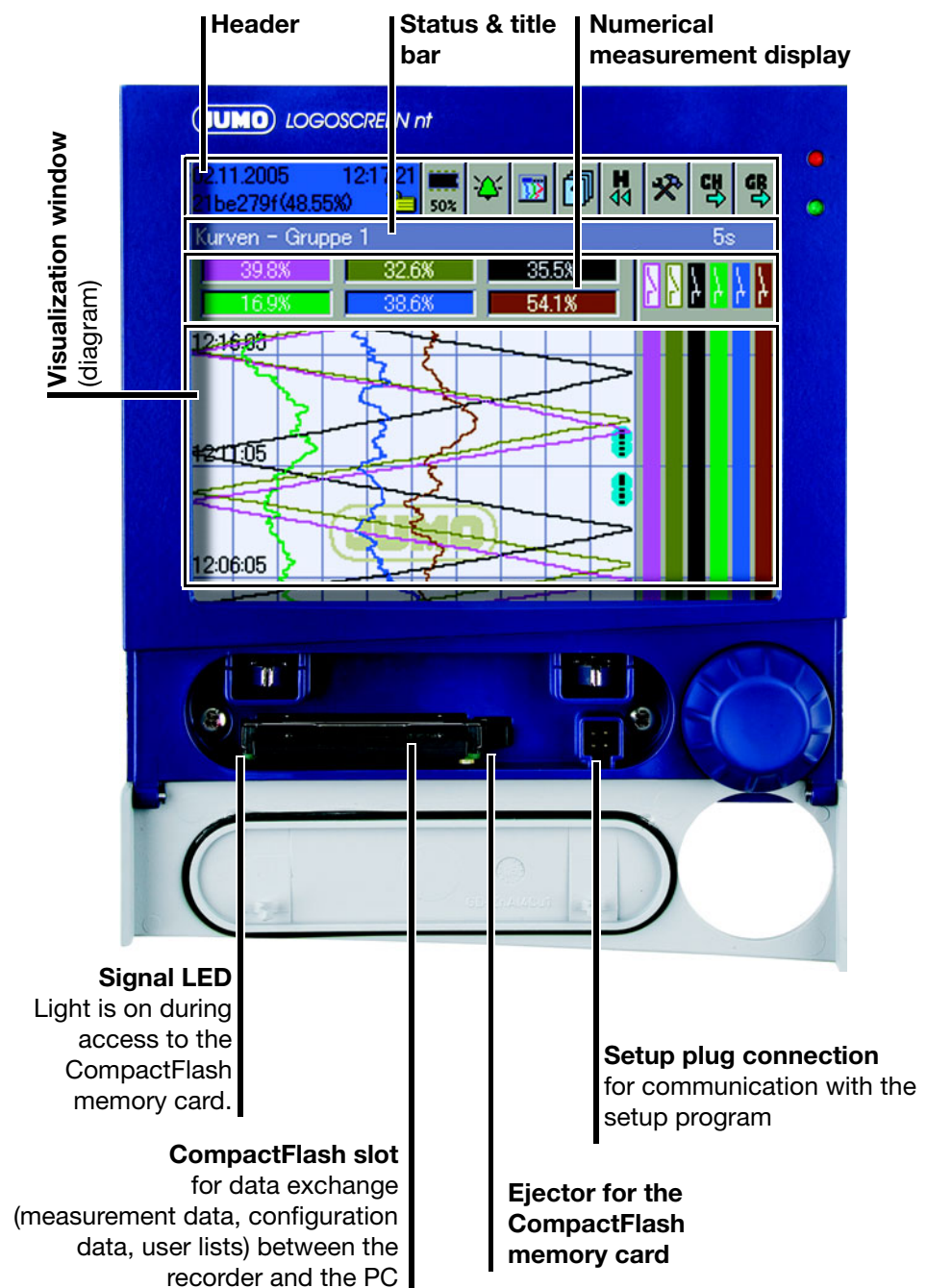
2 Instrument description

2.1 Displays and controls



¹. CompactFlash[®] is a registered trademark of the SanDisk Corporation.

2 Instrument description



The CompactFlash memory card must not be removed during access (signal LED is on).



The life of the background illumination can be prolonged by using the parameter "Screen off".

2 Instrument description

2.2 Analog inputs

Internal analog inputs

The paperless recorder can be equipped with 0 to 18 analog inputs. During configuration, they are designated **Analog input 1 – 18**.

There are two ways of finding out the exact number of analog inputs that have been integrated:

- Check the type code on the nameplate against the type designation. Please refer to the Installation Instructions B 70.6580.4 for an explanation of the nameplate and type designation.
- Read the information on the instrument, in the menu *Device manager* → *Device info* → *Hardw.*

In addition to the internal analog inputs, external analog inputs can also be connected to the recorder.

External analog inputs

External analog inputs can be connected to the recorder via three different interfaces. When configuring the external analog inputs, these are designated **External analog input 1 – 24**.

Serial interface RS232/RS485 (Modbus)

The measured values of the external inputs can be transmitted to the recorder via these two serial interfaces. The paperless recorder can be operated either as a Modbus slave or as a Modbus master.

Further information on using the serial interface can be found in the Interface Description B 70.6580.2.0.

Ethernet interface

Further information on using the serial interface can be found in the Interface Description B 70.6580.2.0.

PROFIBUS-DP

This requires the extra code PROFIBUS-DP interface.

Further information on using the PROFIBUS-DP interface can be found in the Interface Description B 70.6580.2.3.

2.3 Binary inputs/outputs

Internal binary inputs/outputs

The recorder can be equipped with 0, 8, 16 or 24 binary inputs/outputs. During configuration, they are designated **Binary input/output 1 – 24**. The function (input or output) can be configured.

There are two ways of finding out the exact number of binary inputs/outputs that have been implemented:

- Check the type code on the nameplate against the type designation. Please refer to the Installation Instructions B 70.6580.4 for an explanation of the nameplate and type designation.
- Read the information on the instrument, in the menu *Device manager* → *Device info* → *Hardw.*

In addition to the internal binary inputs/outputs, external binary inputs can also be connected to the recorder.



Only external binary inputs are supported, but no external binary outputs.

External binary inputs

External binary inputs can be connected to the recorder via three different interfaces. When configuring the external binary inputs, they are designated **External binary input 1 – 24**.

Serial interface RS232/RS485 (Modbus)

The states of the external inputs can be transmitted to the recorder via these two interfaces. The paperless recorder can be operated either as a Modbus slave or as a Modbus master.

Further information on using the serial interface can be found in the Interface Description B 70.6580.2.0.

Ethernet interface

Further information on using the serial interface can be found in the Interface Description B 70.6580.2.0.

PROFIBUS-DP

This requires the extra code PROFIBUS-DP interface.

Further information on using the PROFIBUS-DP interface can be found in the Interface Description B 70.3560.2.3.

2 Instrument description

2.4 Relay outputs

A maximum of 7 relays (1 as standard, 6 as an extra) is available to signal, for instance, alarms or limit infringements. The action can be configured as break (SPST-NC) or make (SPST-NO) contact.

There are two ways of finding out whether the 6 additional relays are available:

- Check the type code on the nameplate against the type designation.
Please refer to the Installation Instructions B 70.6580.4 for an explanation of the nameplate and type designation.
- Read the information on the instrument, in the menu *Device manager* → *Device info* → *Hardw.*

2.5 Counters/integrators/operating time counters



These are **not** electrical measurement inputs (hardware), but channels which are calculated by the paperless recorder (software).

2.5.1 Counters

Counter inputs

- binary inputs
- alarms
- errors
- ...

⇒ Chapter 2.7 “Binary signals”

Counter frequency

8Hz max.

Evaluation

The count pulses can be evaluated (weighted). A down counter can be implemented by entering a negative weighting (e.g. weighting factor -1).

2.5.2 Integrators

Integrator inputs	<ul style="list-style-type: none">- analog inputs
Integrator time base	<ul style="list-style-type: none">- sec, min, hr and day
Weighting	You can also enter a weighting for the integrators.
Weighting example	<ul style="list-style-type: none">- measurement of flow volume- input signal of 0 — 20mA (corresponds to 0 — 1000 liters/sec)- time base 1 sec- weighting 0.001- display of the integration value (volume) in m³
Minimum size of the input signal	Entering a threshold (amount of the threshold value) has the effect that integration takes place only when the value has been exceeded. No integration will occur on falling below this value. The advantage of integration with a threshold value larger than 0 is that possible noise from a transducer can be suppressed in this way.

2.5.3 Operating time counter

The operating time counter will count how long a selected binary input or one of the binary signals is closed. The time can be displayed in sec, min, hr and days.

2.5.4 Reporting period of the counts

After an adjustable time (reporting period), the counts are stored for all counters/integrators/operating time counters. The counts of the most recently completed reporting period can be numerically displayed. The following counter/integrator types are possible:

- Periodic
In addition, the time period (from 1 min to 12 hrs) must be selected in the parameter *configuration* → *Counters/Integrators* → *General settings* → *Period*.
- External
In this case, the counter/integrator is updated only when the selected control signal is active (e.g. binary input is closed). When the control signal is deactivated (e.g. binary input is opened), the counter/integrator value is saved and reset to 0.
- Daily
- Weekly
- Monthly
- Yearly

2 Instrument description

- Total

- Daily (start — end)

In addition, the time period must be selected through the two parameters
Configuration → Counters/Integrators → General settings → Start and
Configuration → Counters/Integrators → General settings → End.

The counter/integrator will then only be updated from the start time. When the end time has been reached, the counter/integrator value is saved and then reset to 0.

2.5.5 Resetting the counters/integrators/operating time counters

Periodic reset

There is a reporting period for each counter/integrator/operating time counter. At the end of this period, the current data (value and time) are saved and the value reset to 0. Subsequently, the next period can be recorded.

The overall and annual counters/integrators are an exception. These are saved whenever any count/integration has been completed, but not reset to 0. This means that they can be evaluated in the evaluation software PCA3000 as well.

External reset

You can configure one control signal for all counters/integrators together, with the result that the counters/integrators are reset to 0 **without** any **saving** of the previous values. The period for the counter/integrator summation will be restarted at this point. This means that after the test run of an installation, for instance, the recording can be freshly started; the test run values that are not required are eliminated.

⇒ See “Reset activation” on Page 140.

Reset from control knob

Another option for resetting the counter/integrator values is provided in the *Parameterization* menu. The precondition is that a user is logged in to the device. When the value is entered after editing, a message with the new and the old count value is entered in the event list.

The time period for the counter/integrator summation will not be restarted. The previous counter/integrator values will also not be saved.



If you wish to save the previous counter/integrator values, you must execute the function “Save all + update CF.” in the menu for the memory manager.

In this way, the recording can be freshly started for individual counters/integrators, e.g. after the test run of an installation; the test run values that are not required will be eliminated in the process.

2.5.6 Response to instrument reconfiguration

When the instrument is reconfigured, the current counter/integrator reporting periods remain unaffected. The counter/integrator values will not be reset to 0 and the reporting period will not be restarted.



The values can be deliberately reset, via the “Parameterization” menu.

2.5.7 Response to reconfiguration of the counters/integrators

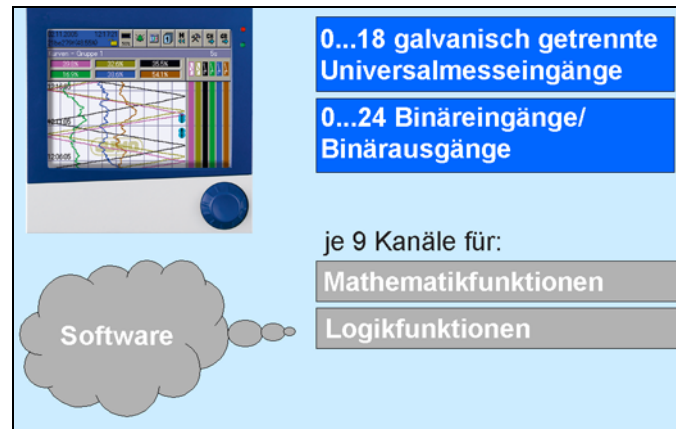
If a counter/integrator is reconfigured, then only the affected counter/integrator will be completed, saved, reset to 0 and have the reporting period restarted.

If anything is changed through reconfiguration in the menu *Configuration* → *Counters/integrators* → *General settings*, then all counters/integrators are concluded, saved, the values reset to 0, and the reporting period is restarted.

2 Instrument description

2.6 Math/logic module

The math and logic module is available as an extra. Like the counters/integrators/operating time counters, the math and logic module are channels that are not available as hardware but are calculated by the instrument software.



The math and logic module consists of two parts:

- the math module for calculating analog values and
- the logic module for linking Boolean values (0 or 1).

Math module

With the help of the math module, 9 measurement inputs can be used for the calculation of “virtual” channels.

For the calculated channels, separate math channels are provided in addition to the internal analog inputs. In configuration, you have to activate the required math channel in the group configuration and thus allocate it to a group.

Configuration → Group x → Analog channels → Channel x = Math x

Setup program

How a math channel is formed is determined through the setup program.

As variables for the formulae, the following may be available:

- analog inputs
- binary inputs
- counters/integrators
- alarms
- errors

If counter/integrator values are used for calculation, then please note that their accuracy is reduced, since, in this case, two different data formats will have to be used for calculation. The counters/integrators are calculated in the double-float format (8 bytes per value), whereas the math module employs a single-float format (4 bytes per value) according to the IEEE 754 standard. Nevertheless, it is possible to include these values in the math module.

2 Instrument description

The following fixed functions are available:

- difference
- ratio
- relative humidity
- moving average

For the moving average, the reference channel has to be entered (in most cases, the analog input) and the time (in minutes), which are to be used to calculate the moving average.

The following operators and functions are available for the formulae: +, -, *, /, (,), SQRT(), MIN(), MAX(), SIN(), COS(), TAN(), **, EXP(), ABS(), INT(), FRC(), LOG(), LN().

On going above or falling below the scalable values, the math channel is treated as for "out-of-range".

The formulae are entered in the PC, in the setup program. It is not possible to edit the math formulae on the instrument.



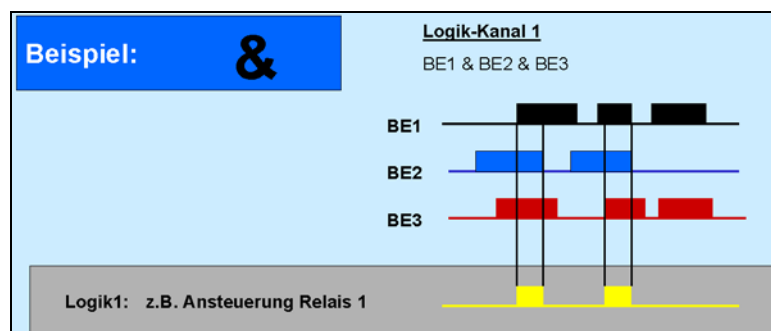
Further information can be obtained from the instructions on the setup program (B 70.6580.6).

Logic module

Up to 9 channels are available for the logic channels.

As is the case with all the other binary signals, the calculated digital (Boolean) values can be used for different functions:

- recording in the event traces,
- as a control signal for display switch-off,
- clock time synchronization,
- operating time counter,
- externally controlled counters/integrators
- counter/integr. reset
- event operation,
- for output to a relay and
- as count input for a counter.



2 Instrument description

As variables for the formulae, the following may be available:

- binary inputs
- logic channels
- alarms
- errors

These functions can be used for the formulae:

- ! (NOT)
- & (AND)
- | (OR)
- ^ (XOR)
- / (rising edge)
- \ (falling edge)
- ((open bracket)
-) (close bracket)



Further information can be obtained from the instructions on the setup program (B 70.6580.6).

2.7 Binary signals

Binary signals are used by the recorder, for example to

- operate a relay,
- activate the “Event” operating mode,
- start external reports and
- start batch reports.

Binary signals are made visible as binary traces or switch symbols and can be used as a basis for counters. The binary inputs (internal and external) are binary signals.

Binary I/O	<p>The switching states of the internal binary inputs/outputs are indicated by the binary signals. Depending on the instrument hardware level, 0, 8, 16 or 24 binary inputs/outputs are available.</p> <p>⇒ Chapter 14 “Configuration - Binary inputs/outputs”</p>
Binary I/O alarm	<p>If the alarm configuration of an internal binary input/output is active, the switching state is indicated through the corresponding binary signal. Please note that the <i>Alarm type</i> must be configured for “Alarm”, and not for “Event”.</p> <p>⇒ Chapter 14.2 “Alarm configuration”</p>
Relays	<p>The switching states of the internal relays (1 or 7) are indicated by the binary signals.</p>
Limits (limit monitoring)	<p>The result of the limit monitoring (limit 1 — 9) is indicated through the binary signals.</p> <p>⇒ Chapter 20 “Configuration - Limit monitoring”</p>
Limit alarms	<p>If the alarm configuration of a limit monitoring is active, the alarm is indicated through the corresponding binary signal. Please note that the <i>Alarm type</i> must be configured for “Alarm”, and not for “Event”.</p> <p>⇒ Chapter 20.2 “Alarm configuration”</p>
Batch	<p>The binary signals are used to indicate whether the corresponding batch report for plant 1 — 3 is active, i.e. whether a batch report is currently being run.</p>
Ext. binary input	<p>The switching states of the external binary inputs are indicated by the binary signals. Up to 24 external binary inputs are available.</p> <p>⇒ Chapter 17 “Configuration - External binary inputs”</p>
Alarms, ext. binary input	<p>If the alarm configuration of an external binary input is active, the switching state is indicated through the corresponding binary signal. Please note that the <i>Alarm type</i> must be configured for “Alarm”, and not for “Event”.</p> <p>⇒ Chapter 17.2 “Alarm configuration”</p>

2 Instrument description

Alarms, analog inputs

The alarm monitoring states of the internal analog inputs are indicated by the binary signals. Depending on the instrument hardware level, up to 18 internal analog inputs are available. There are two binary alarm signals for each analog input.

⇒ Chapter 13 “Configuration - Analog inputs”

Alarms, counters/integr.

The alarm monitoring states of the counters/integrators are indicated by the binary signals. 27 counters/integrators are available. There are two binary alarm signals for each counter/integrator.

Group alarms

The binary signals are used to indicate whether an infringement of the tolerance band is present within a group, or whether there is an alarm for an analog or binary channel. The individual channel alarms are OR-linked.

Infringement of tolerance band, group 1 — 9

There are two binary signals for each group:

- Alarm1 TL Group 1 — 9 = positive tolerance band infringement on a channel and
- Alarm2 TL Group 1 — 9 = negative tolerance band infringement on a channel and

⇒ Chapter 18.2 “Analog channels”

Alarm group 1 — 9

There is a binary signal for each group:

- Alarm Group 1 — 9 = alarm for an analog or binary channel in the corresponding group.

⇒ Chapter 13.4 “Alarm configuration”

Alarms, ext. analog inputs

The alarm monitoring states of the external analog inputs are indicated by the binary signals. 24 external analog inputs are available. There are two binary alarm signals for each external analog input.

⇒ Chapter 13 “Configuration - Analog inputs”

Combination alarm

“Combination alarm” includes the following signals:

Signal	Description
Device alarm	The signals is activated as soon as any alarm occurs.
Mem.al. Read CF	The signal is activated when the device-internal memory space available for data readout via CF card has fallen below the selected threshold value. ⇒ Chapter 2.10 “Reading out data” (Mem.al. = memory alarm)
CF card full	The signal is activated when the memory space of a CF card that has been inserted (external memory) has fallen below the selected threshold value. ⇒ Chapter 2.10 “Reading out data”

2 Instrument description

Signal	Description
Mem.al. interface	The signal is activated when the device-internal memory space available for data readout via interface has fallen below the selected threshold value. ⇒ Chapter 2.10 “Reading out data” (Mem.al. = memory alarm)
Login	The signal is activated as soon as a user is logged in to instrument. ⇒ Chapter 8.2 “Log-in and log-out”
Error	The signal “Error” (also referred to as system error) is activated when: <ul style="list-style-type: none">- the CF card is faulty or full,- the device battery is empty,- the internal memory is faulty and- a p.c.b in the device has not been calibrated.
Reserve 1	Currently not used.
Fieldbus error	The signal is activated when an error occurs during communication via PROFIBUS.
Reserve 2	Currently not used.
CF card inserted	The signal is activated when a CF card is inserted in the instrument.
CF card removed	The signal is activated when a CF card is removed from the instrument.

2 Instrument description

2.8 Operating modes

2.8.1 Normal/timed/event operation

The operating modes are used to determine the cycle in which measurement data are stored.

3 operating modes

The instrument has 3 operating modes:

- normal operation
- timed operation
- event operation

The following settings can, among others, be made for each of the three operating modes:

- stored value
- storage cycle

Stored value

The stored value setting determines what is stored: average, minimum, maximum or momentary value between two storage cycles, or the peak value (envelope). The setting “peak value” means that the maximum and minimum values from the last storage cycle are saved.

Another application for the parameter “Stored value” is in “Eco operation”. This is a special storage possibility, which is described separately in Chapter 2.8.2.

Storage cycle

The storage cycle determines the interval between two stored values. The diagram speed corresponds to the storage cycle, which means that with a storage cycle of 5sec, for example, the stored value is entered in the diagram every 5sec.

Normal operation

If the instrument is **not** in event or timed operation, then normal operation is active.

Timed operation

For timed operation, a period of time can be defined (up to 24 hrs) within which a specific stored value and a specific storage cycle are active.

Event operation

Event operation is activated by a control signal that is assigned to an event or alarm. Event operation can be used, for example, to shorten the storage cycle when an alarm is present.

Priority



The respective priorities of the operating modes are allocated as follows:

Operating mode	Priority
Normal operation	low
Timed operation	average
Event operation	high

2 Instrument description

Active operating mode

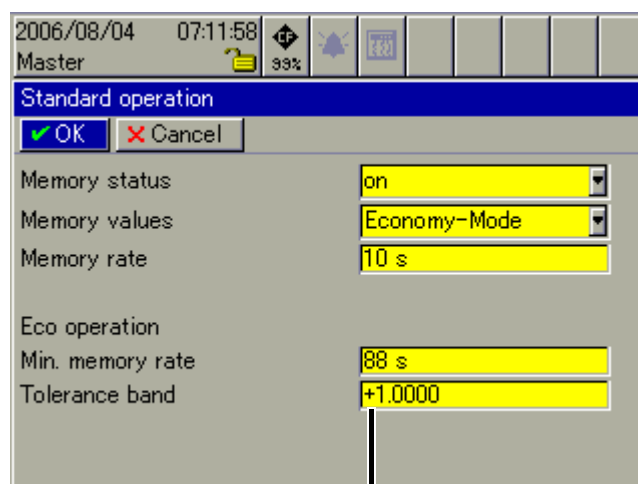
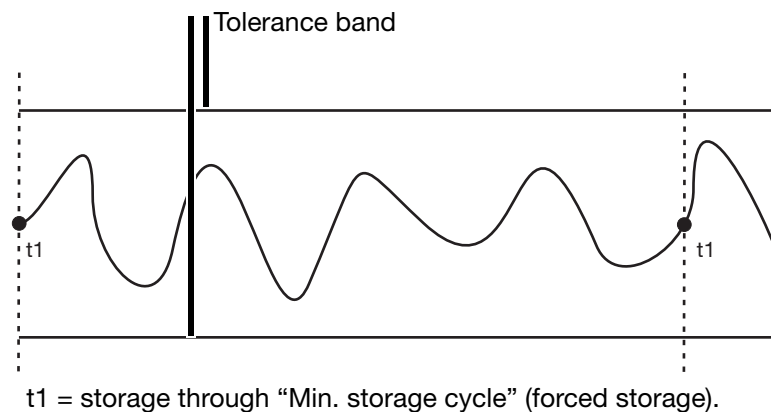
The active operating mode is shown in the diagram by different symbols behind the current display for the diagram speed:

Operating mode	Symbol
Normal operation	5s
Timed operation	1s 
Event operation	1s 

2.8.2 Economy (Eco) operation

The parameters for Eco operation are set in the menu for normal operation. Eco operation can be used for all three operating modes.

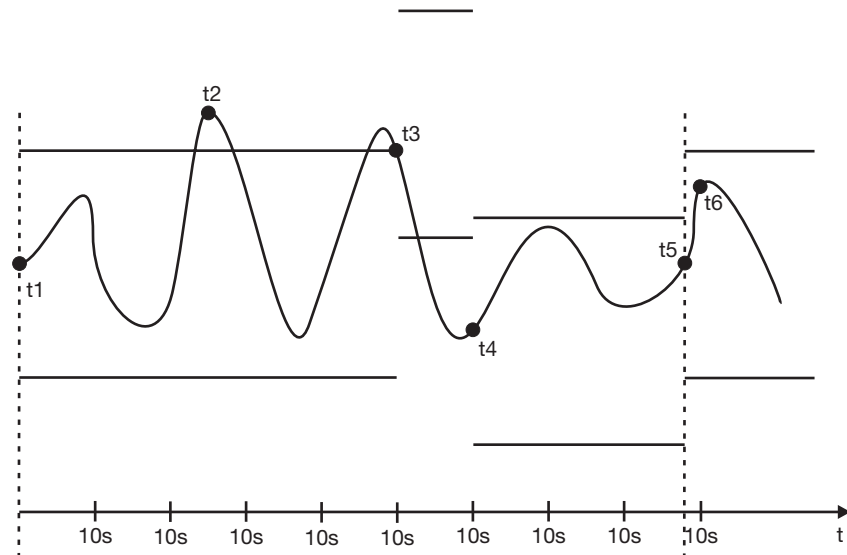
In Eco operation, the momentary values (current values) are recorded in a predefined minimum storage cycle (independent of the tolerance band).



The tolerance band is specified with regard to the unit of the analog channels (e.g. $\pm 1\text{ }^{\circ}\text{C}$).

2 Instrument description

If the measurements go outside the tolerance band, and the new measurement, which is outside the tolerance band, is present for at least the duration of the storage cycle that was set in the active operating mode, then it is acquired and stored and a new tolerance band is applied.



- t1 = storage through "Min. storage cycle" (forced storage) and application of a new tolerance band.
- t2 = no storage, since the measurement is again within the tolerance at the end of the storage cycle (10sec).
- t3 = storage and application of a new tolerance band, since the measurement has gone outside the tolerance band at the end of the storage cycle.
- t4 = storage and application of a new tolerance band, since the measurement has gone outside the tolerance band at the end of the storage cycle.
- t5 = storage through "Min. storage cycle" (forced storage) and application of a new tolerance band.
- t6 = no storage, since the measurement is again within the tolerance at the end of the storage cycle (10sec).

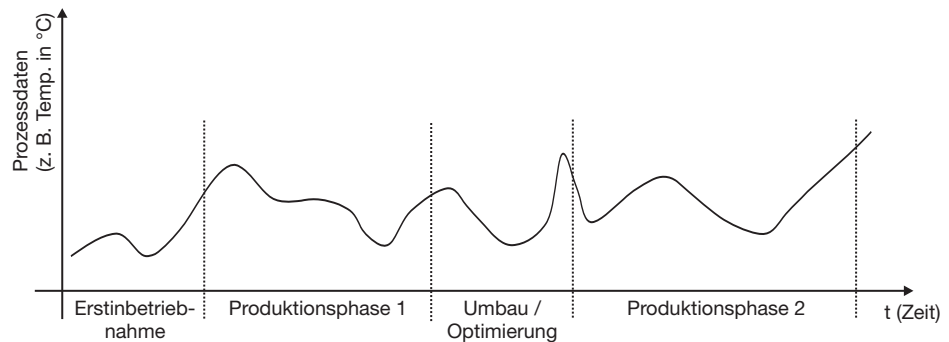


Going outside the tolerance band is not necessarily recorded. If the measurements return inside the tolerance band within the storage cycle (t2), then there will be no recording, "Min. storage cycle" is always active.

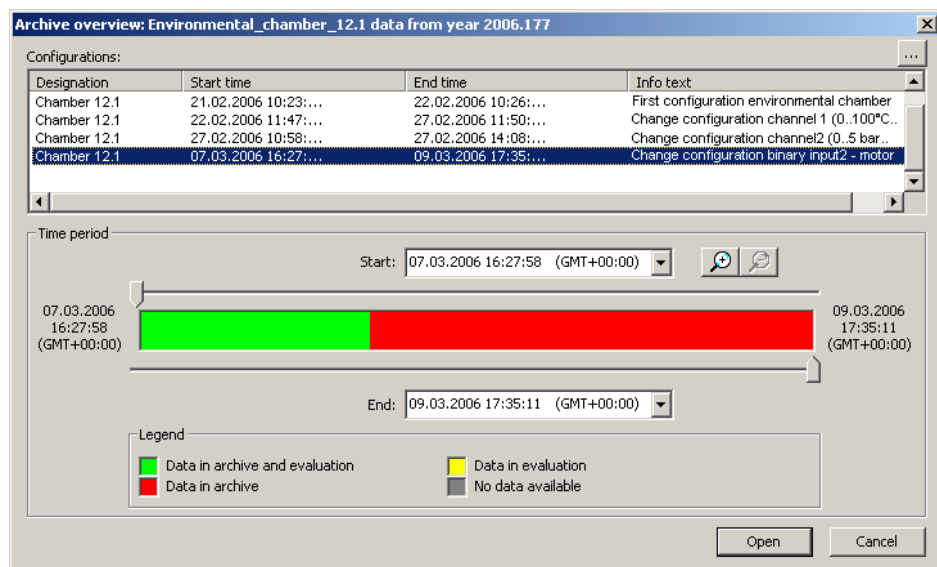
2.9 Data storage

Life-cycle data management

The integrated life-cycle data management puts users in the position of being able to save all the process data from the system that is being monitored in an archive file on their PCs or a server system.

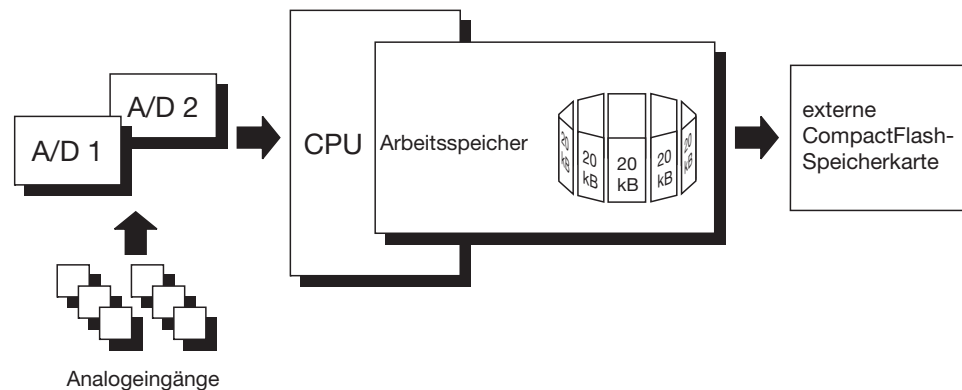


The recovery of configuration-dependent plant/system data, which may be required for commissioning, maintenance or optimization during the life-cycle of a plant/system, is enabled by the associated PC Evaluation software PCA3000 in a dialog window.



2 Instrument description

Operating principle



Data recording

The measurements are acquired continuously in a 125msec sampling cycle. Based on these measurements, reports are compiled and limits checked. The measurements are transferred to the main memory of the instrument, according to the programmable storage cycle and stored value (maximum, minimum, average, Min&Max, momentary value or economy mode). The paperless recorder saves the data according to groups, and the input can be assigned to several groups (up to 9).

Main memory (RAM)

The data stored in the RAM are regularly copied to the internal memory in 20 kbyte blocks. This is written to as a ring memory, i.e. when the memory is full, the oldest data will automatically be overwritten by new data. The data from the main memory (RAM) can be shown as a history presentation on the recorder. The size of the history memory can be configured.

Internal memory

When a block in the main memory has been filled, it is copied to the internal memory. The internal memory has a capacity of ≥ 64 Mbytes. Every write action is monitored, so that any errors in saving data can be immediately identified. The instrument monitors the capacity of the internal memory and activates one of the "Memory alarm" signals when the capacity has fallen below the configurable residual capacity level. These signals can be used, for instance, to operate the alarm relay.

CompactFlash memory card (external)

The external (replaceable) CompactFlash memory card (industrial grade) can be used to transfer data to a PC.

The instrument monitors the capacity of the CompactFlash card, and activates the "Memory alarm (CF card)" signal if the level falls below a configurable residual capacity. This signals can be used, for instance, to operate a relay (warning signal "Swap CF card").

2 Instrument description

Data security	<p>The data are stored in coded form in a proprietary format. This ensures a high level of data security. If the CompactFlash card is removed from the instrument, no data will be lost immediately, as these data are still stored in the internal memory. A loss of data will only occur if, after the CompactFlash card has been removed, the internal memory is completely rewritten as well, and no data have been read out through the interface.</p> <p>If the paperless recorder is disconnected from the supply, then:</p> <ul style="list-style-type: none">- RAM and clock time are buffered by a lithium battery (ex-factory) for at least 10 years, with a storage capacitor for at least 2 days (ambient temperature -40 to +45°C),- Measurement and configuration data in the backup memory will not be lost.
Storage cycle	<p>Different storage cycles, ranging from 125msec to 32767sec can be configured for normal, event and timed operation under "Configuration".</p> <p>The storage cycle determines the time intervals at which the measurements are stored.</p>
Stored value	<p>Under this parameter, separate configurations are made for normal, event and timed operation, to decide which value is to be stored (average, momentary, minimum, maximum, peak values or Eco operation).</p>
Recording format	<p>Data are recorded encoded in a proprietary format.</p>
Recording duration	<p>The recording duration depends on various factors:</p> <ul style="list-style-type: none">- number of analog channels and event traces being recorded- storage cycle- number of events in the event list
Optimization of recording duration	<p>The recording duration can be optimized by process-oriented selection of the storage cycle and stored value.</p> <p>In normal operation (no error, no alarm, ...) a storage cycle that is as long as possible (e.g. 60sec, 180sec, ...) should be selected, depending on the particular application.</p> <p>In the event of an alarm or error, the storage cycle can be shortened via event operation, with the effect that the measurement data are recorded with a high time resolution.</p>

2 Instrument description

2.10 Reading out data

In addition to automatic read-out via the CompactFlash memory card, measurement data can also be read out through one of the interfaces (RS232, RS485, setup, Ethernet).

Both read-out options (card/interface) work in parallel. For this reason, there are also two “binary signals”, which indicate when the available storage space has fallen below a certain configurable value.

Memory alarm

The limit for alarms can be set by the parameter *Configuration → Device data → Memory alarm* in the configuration level.

The parameter *Configuration → Device data → Read out data via...* can be used to determine which storage space indication should be shown in the status bar. The “binary signals” for storage space detection function independently of this parameter.

Binary signals

“Mem.al. CF readout”

If this signal is set, this means that no data have been fetched via the CF card for a prolonged period, and the available capacity of the internal memory has fallen below the configured level (this only applies if the parameter *Configuration → Device data → Read out data via...* is set to “CF card”).

“Mem.al. interface”

If this signal is set, this means that no data have been fetched via the interface for a prolonged period, and the available capacity of the internal memory has fallen below the configured level (this only applies if the parameter *Configuration → Device data → Read out data via...* is set to “Interface”).

“CF card full”

If this signal is set, it means that not enough space is available on the CF card. The PCA3000 program can help here. Use PCA3000 to read in the data, save them to the hard disk or on a network, and free up the space on the CF card. Alternatively, you can use a new CF card.

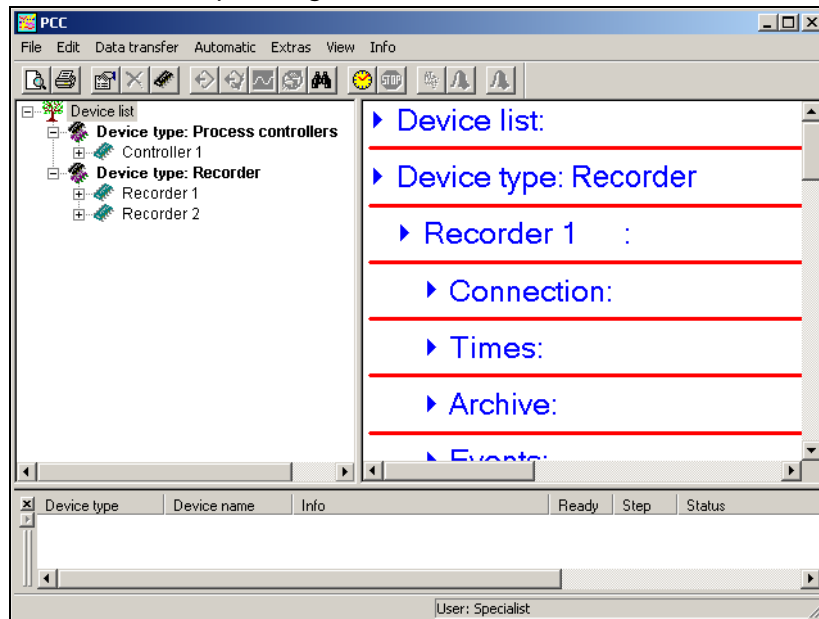
⇒ See “Binary signals” on Page 27.

2 Instrument description

Readout via interface

Use the PCA Communications software PCC to read out measurement data via the serial, setup or Ethernet interface. The software has been developed especially for the paperless recorder.

⇒ Please refer to the Operating Manual B 70.9702.0 for further information.

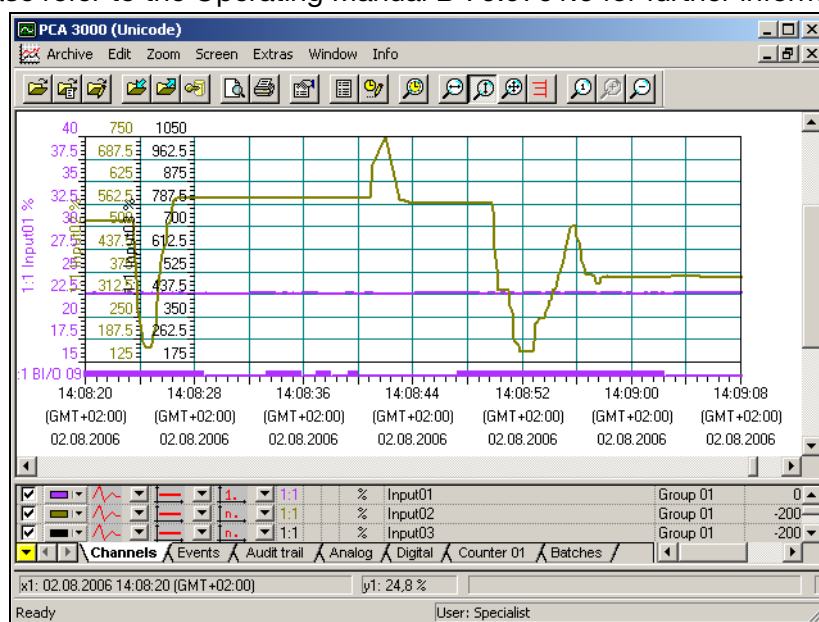


Use the same archive (in the PC) for reading out data via the interface as for a readout via the CF card. This saves having to put together data from different files at a later date.

2.11 Evaluating data

Please use the PC Evaluation software PCA3000 for evaluating the data on the PC. The software has been developed especially for the paperless recorder.

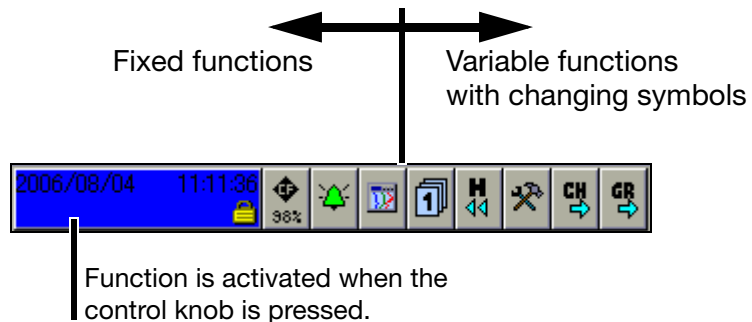
⇒ Please refer to the Operating Manual B 70.9701.0 for further information.



2 Instrument description

3.1 Operating principle and graphic elements

Header



The functions of the paperless recorder are selected in the header. The selected function is indicated by a blue background.



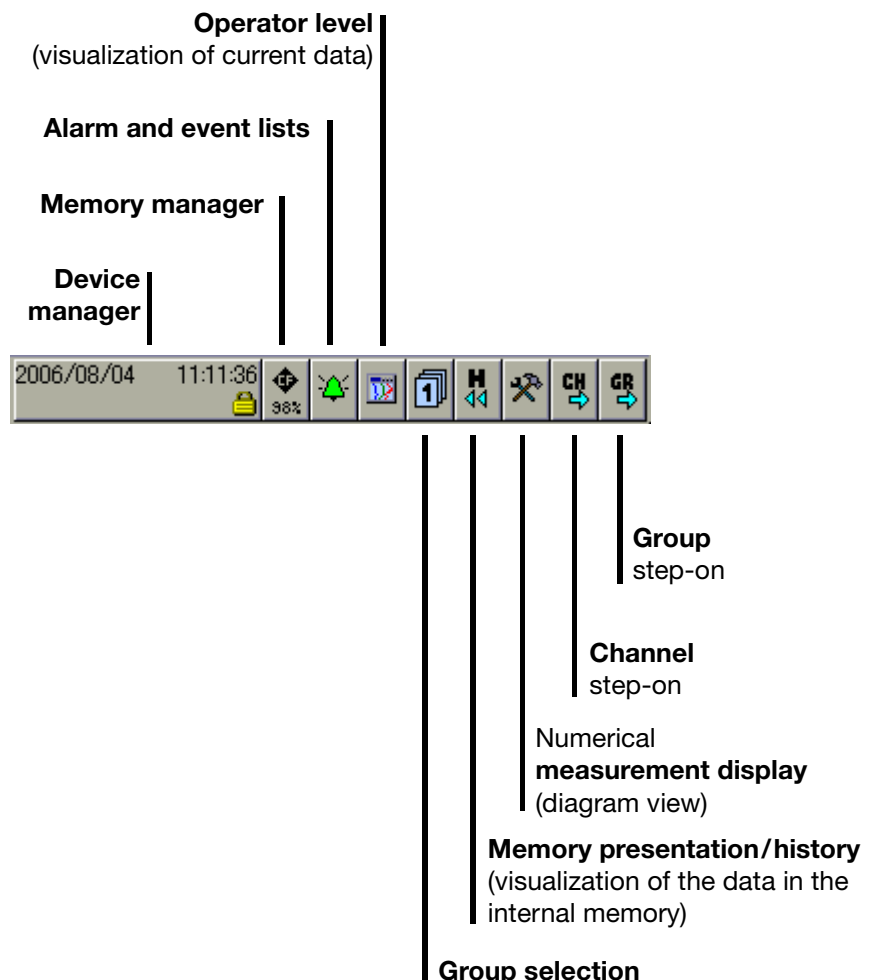
- Function selection by rotating the control knob (to right or left).



- Function is activated by pressing the control knob.

The symbols (for the variable functions) alter according to the function that is currently active.

The following diagram shows the header for normal display when the vertical diagram (curve display) has been selected.



3 Operating principle

Device manager	⇒ Chapter 8
Memory manager	⇒ Chapter 7
Alarm and event lists	⇒ Chapter 6
Operator level (visualization)	⇒ Chapter 4
Group selection	⇒ See “Group selection” on Page 49.
Memory presentation (History)	⇒ Chapter 5
Numerical measurement display	⇒ See “Numerical measurement display (diagram view)” on Page 41. ⇒ See “Numerical measurement display” on Page 49.
Channel step-on	⇒ See “Channel step-on” on Page 53.
Group step-on	⇒ See “Group step-on” on Page 53.

Status & title bar

This line (bar) shows alarm and error messages, as well as general information, and information about the active representation mode (e.g. sampling rate). It is automatically blanked out by the system, if necessary.

If the text is shown in red, this indicates an error message.

This is a alarm text 1s

Sampling rate and operating mode

5s = normal mode

1s ! = event mode

1s ⏸ = timed mode

Diagram-Group 01 1s

Data are currently being read by the PCA Communications software PCC.

Diagram-Group 01 1s

Data are currently being transferred to the CF card.

Caution: Do not remove CF card!

3 Operating principle

Numerical measurement display (diagram view)

The numerical measurement display is available for the presentation modes:

- curves,
- history (of the curve presentation) and
- digital diagram.

In the **curve presentation**, the numerical display can be switched on or off. This switching on or off also applies to the history presentation.



An alarm for a channel is shown in red (HIGH alarm) or orange (LOW alarm). The colors can be configured in the setup program.

If the numerical measurement display is switched on in the **history (of the curve presentation)**, you can switch between MIN and MAX display. Whether or not MIN and MAX values are both available at the same time, depends on the settings for the group operating mode.

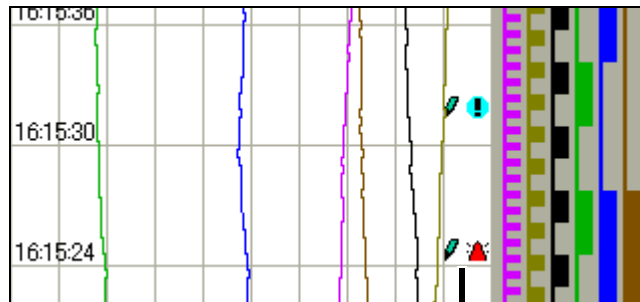


In the **digital presentation**, the diagram header can be switched on and off.







3 Operating principle

Visualization window (diagram)



Symbols for data acquisition:

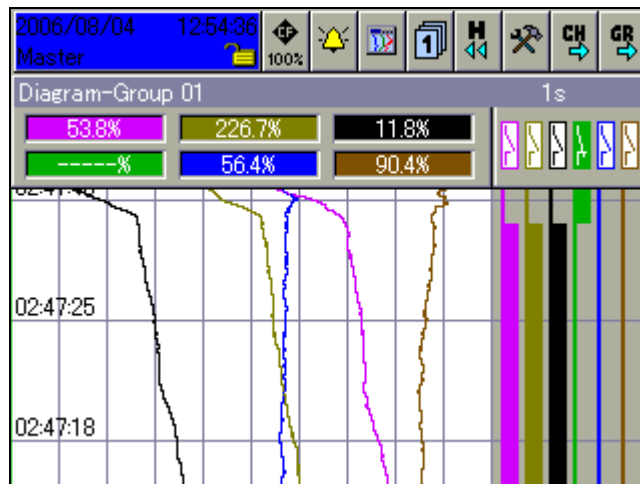
-  Comment has been entered
-  Event occurred
-  Alarm is no longer present
-  Alarm has been signaled

In the visualization window, the measurement data are shown in graphical form. Alarms are indicated by a red or orange color for the curve (can be configured in the setup program).

Communication with the operator (device configuration, checking alarm and event lists etc.) also takes place via the visualization window.

3.2 Operating example

Start The normal display is active.



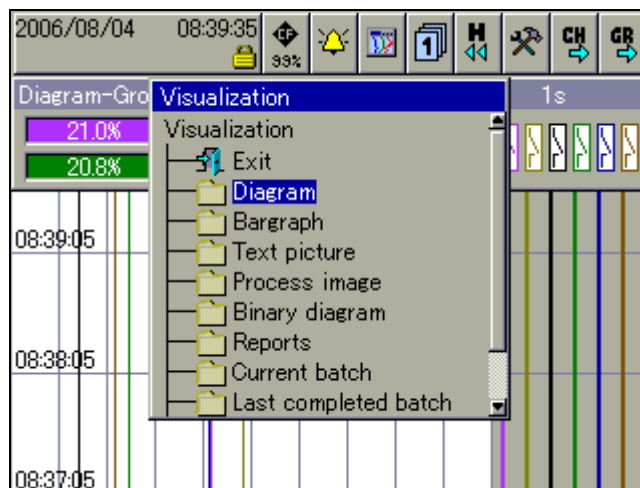
Operation



- * Select the operator level by rotating the control knob.



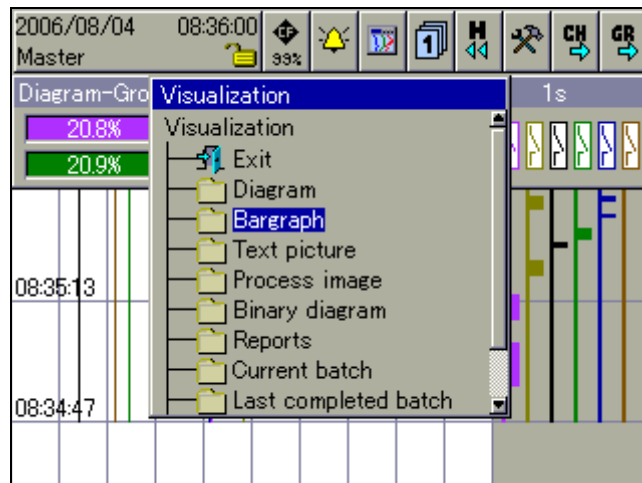
- * Activate the operator level by pressing the control knob.



3 Operating principle



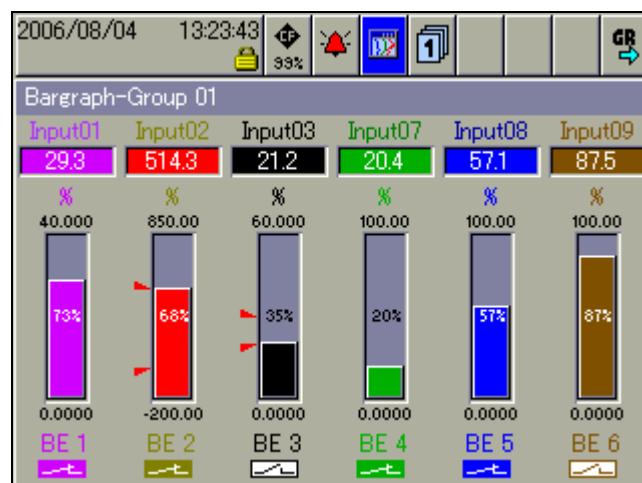
- * Select bar graph presentation by rotating the control knob.



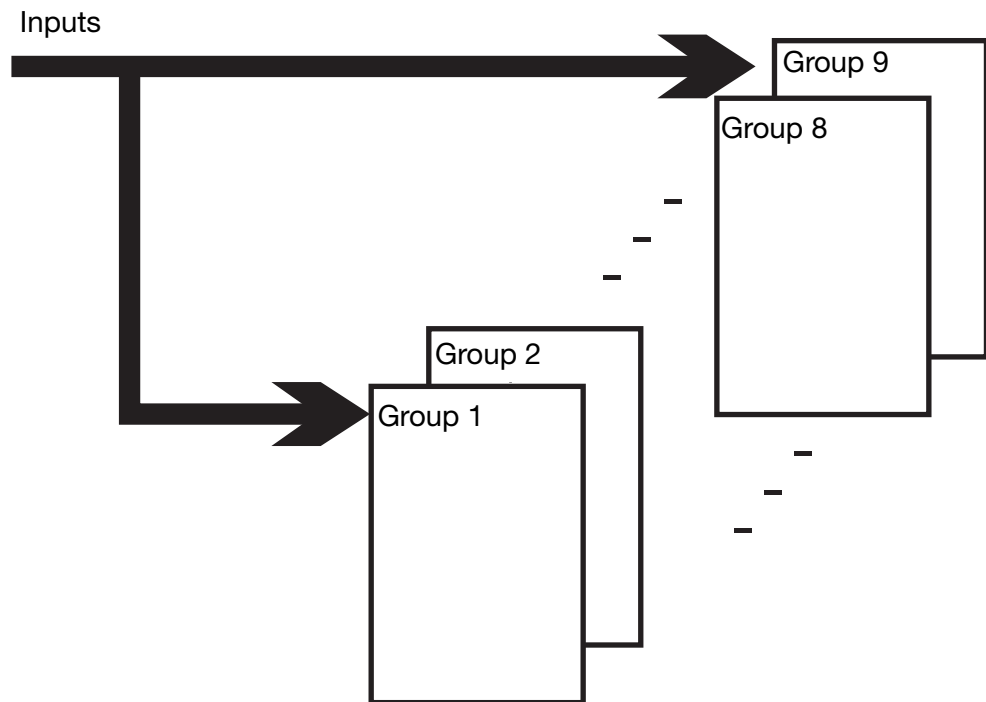
- * Activate bar graph presentation by pressing the control knob.

Result

Bar graph presentation is now active.



3.3 Group and plant management (batches)



Within the recorder, all analog inputs, binary inputs, counters and integrators, are collected together into groups. A maximum of nine groups is available as a total. Each group can consist of a maximum of 6 analog inputs, 6 binary inputs/outputs, and 4 counters/integrators.

The visualization and storage of the analog inputs and binary inputs (outputs) is always made on a group basis.

If plants (batches) are used, the groups have fixed assignments to the plants (batches).

Plant number	Group	Plant (batch)
0	1 – 9	none
1	1 – 9	1
2	1 – 3 4 – 6 7 – 9	1 2 not assigned
3	1 – 3 4 – 6 7 – 9	1 2 3

3 Operating principle



In order for a batch to be usable, its main group must be active (status = “Display” or “Display, save”) and at least one analog channel in the group must be assigned.

Batch for plant	Main group
1	1
2	4
3	7

The number of plants is configured through the parameter *Device manager* → *Configuration* → *Batches/plants* → *Gen. plant parameters* → *Number of plants*.

4.1 Activating the operator level

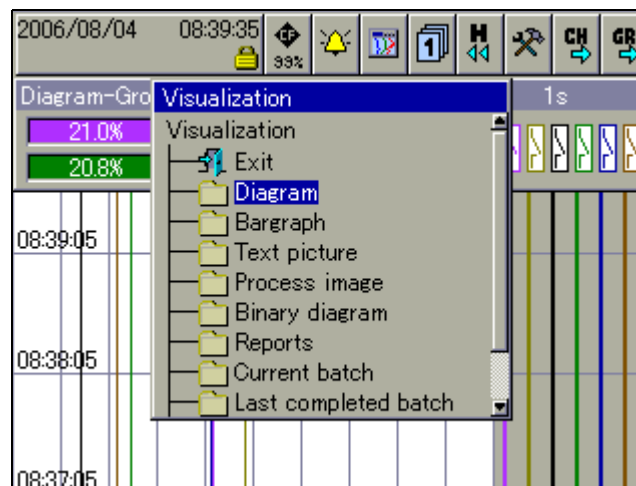
The type of visualization (curve presentation, bar graph etc.) is selected at the operator level. Note that the appearance of the operator level can be influenced by the configuration.

- * Select the operator level by rotating the control knob.
- * Activate the operator level by pressing the control knob.



Operator level

You can alter the visualization after activating the operator level.



The functions in the header line will change, depending on the visualization. The following types of visualization are available:

Curves (Diagram)	⇒ Chapter 4.3
Bar graph	⇒ Chapter 4.4
Text picture	⇒ Chapter 4.5
Process image	⇒ Chapter 4.6
Binary diagram	⇒ Chapter 4.7
Reports	⇒ Chapter 4.8
Batches	⇒ Chapter 4.9
Counters and integrators	⇒ Chapter 4.10
Comment entry	⇒ Chapter 4.11

4 Visualization

4.2 Overview of header lines

**Curve
presentation
(diagram)**



**Bar graph
presentation**



**Text picture
presentation**



**Process image
presentation**



**Digital
presentation**



Report



**Batches
(current)**



**Batches
(completed)**



**Counters and
integrators**



Comment entry

The comment entry does not have its own header. The current header will remain when this function is activated. The comment that has been input is entered in the event list.

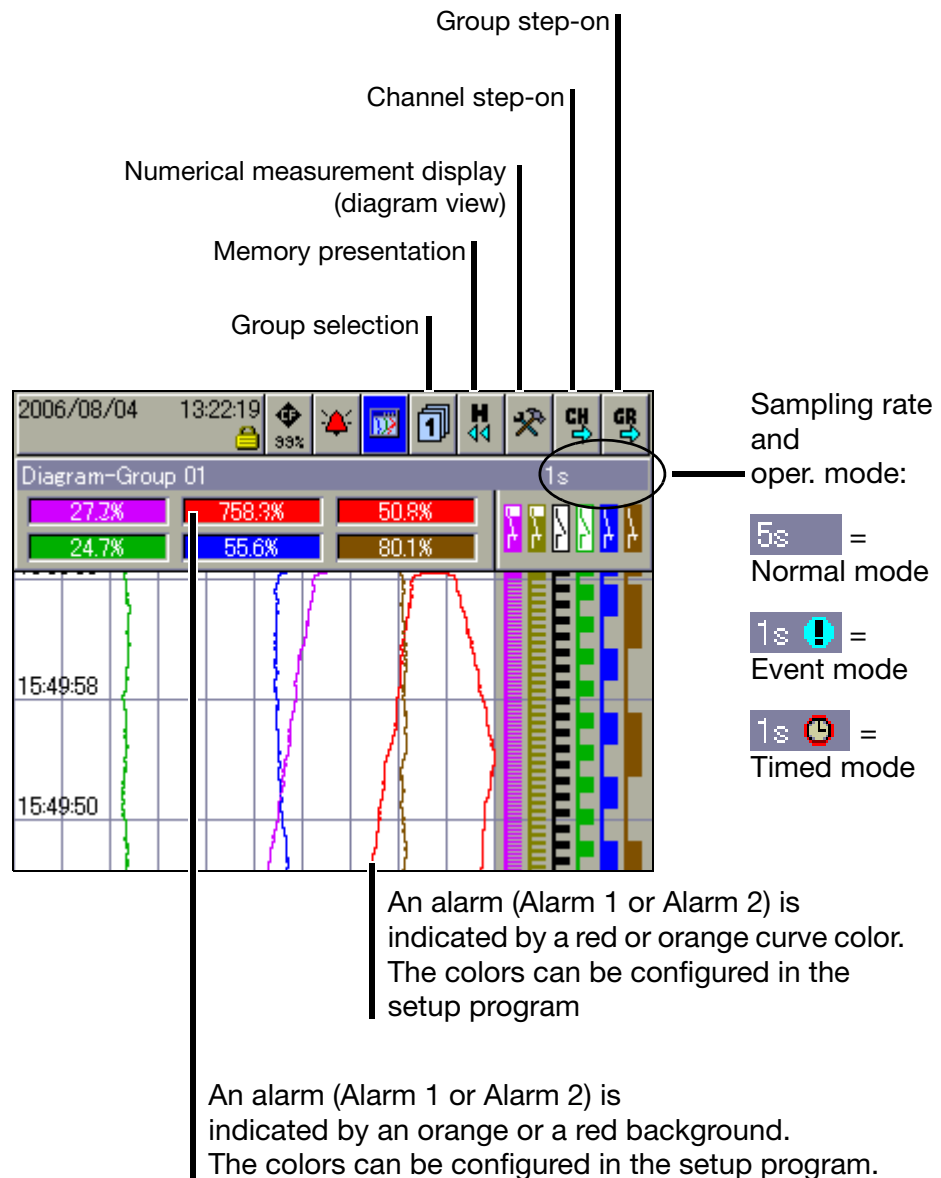


The first four functions in the header are identical for all visualizations. These are supervisory functions (see “Header” on Page 39).

Differences only arise in the last five functions.

4.3 Curve presentation

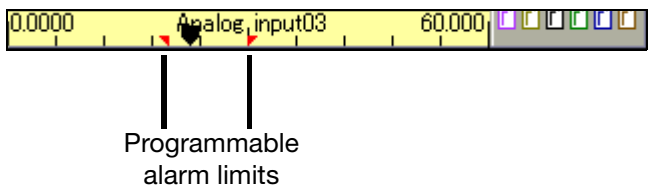
In this presentation, the individual signal traces run from top to bottom of the display (vertical presentation).



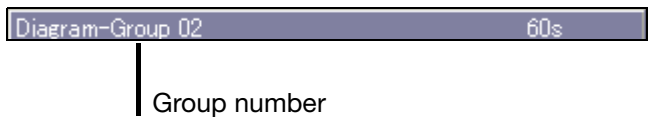
Group selection	You can use this function to directly select and display any one of the groups.
Memory presentation	<p>This function starts the presentation of the data that are available in the history memory.</p> <p>⇒ Chapter 5 “Memory presentation (History)”</p>
Numerical measurement display	This function is used to switch the numerical measurement display (diagram header) and binary traces on or off, as well as to activate the envelope display.

4 Visualization

Channel step-on This function activates the scaling display. Repeated activation steps through the scaling for the channels within the group, and then blanks it out again.

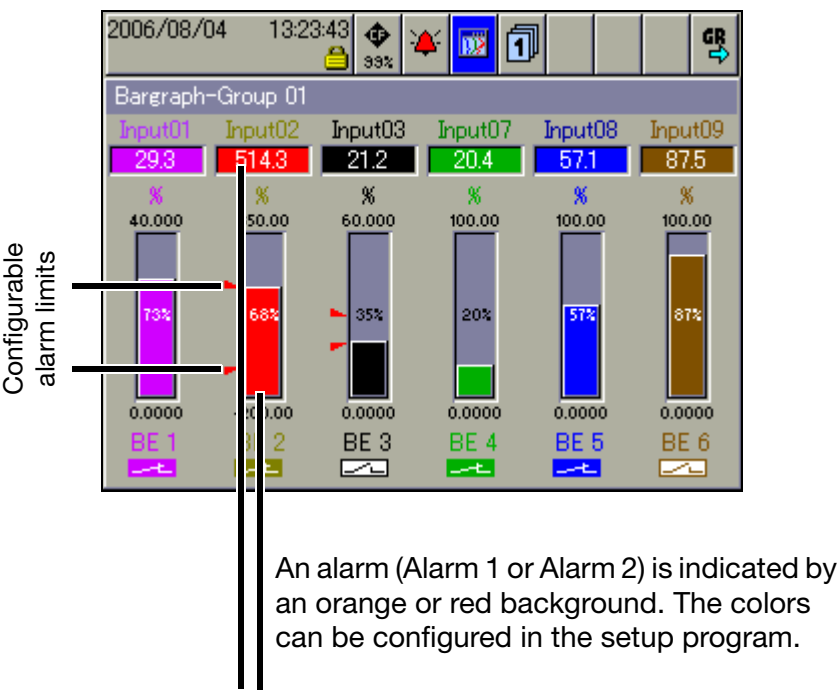


Group step-on Unlike “Group selection”, where any group can be selected, this function is used to select the groups one after another.



4.4 Bar graph presentation

In this visualization mode, the analog inputs are presented both numerically and in bar graph form. In addition to the analog channels, the digital inputs can also be visualized at the bottom of the display.

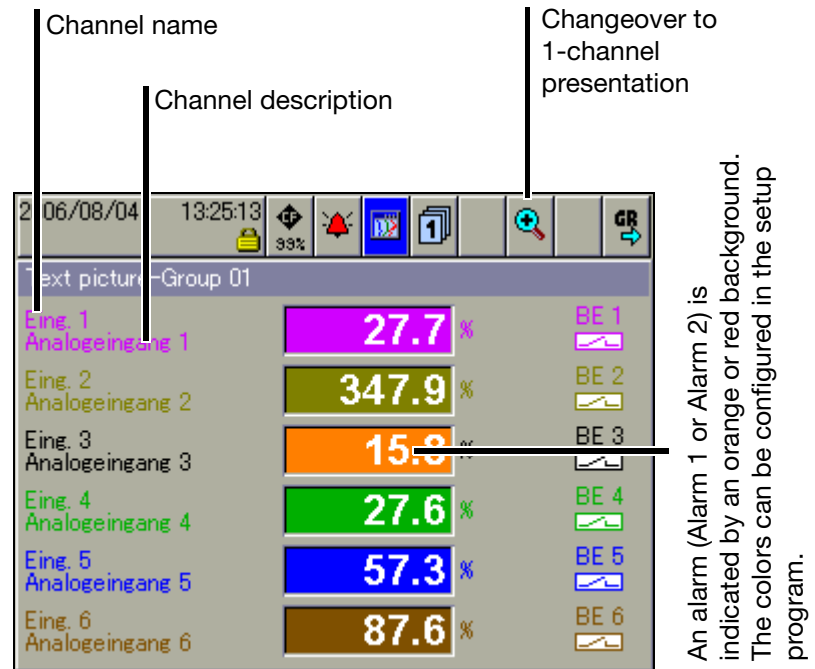


If only digital channels are to be presented, then Chapter 4.7 “Binary diagram presentation” is recommended.

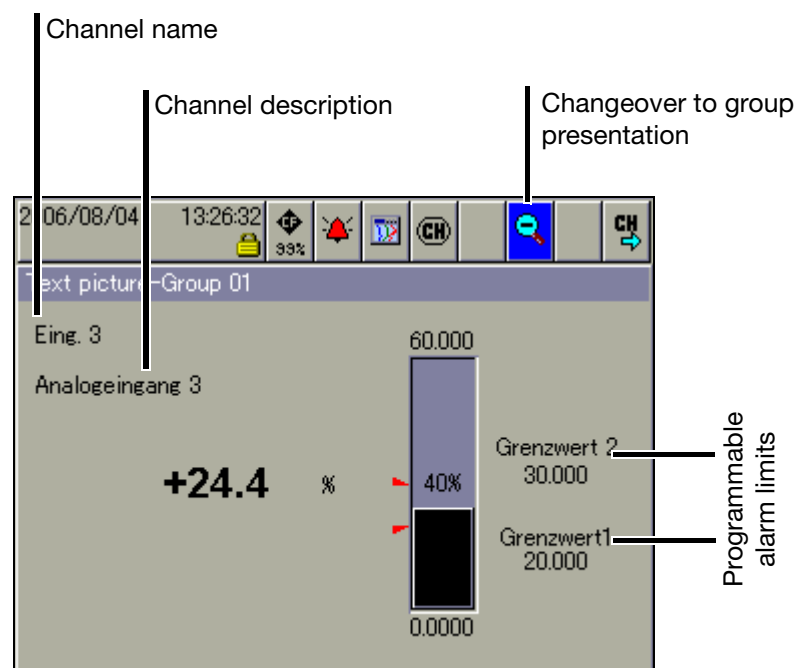
4.5 Text picture presentation

In the presentation, the analog channels are presented numerically, together with the channel name and the channel description. In addition to the analog channels, the digital inputs can also be visualized at the right-hand edge of the display.

Group presentation



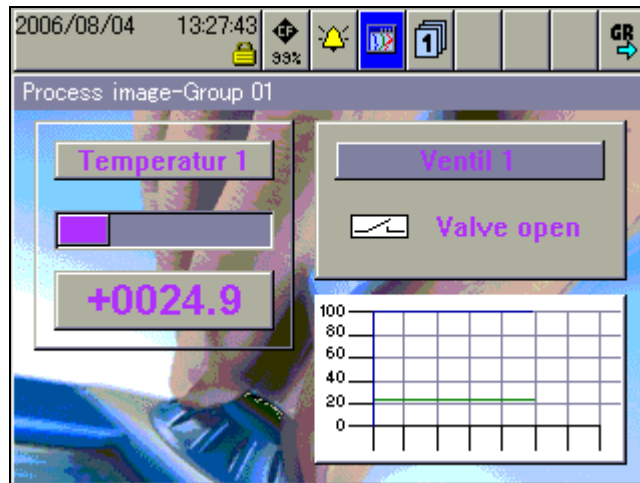
1-channel presentation



4 Visualization

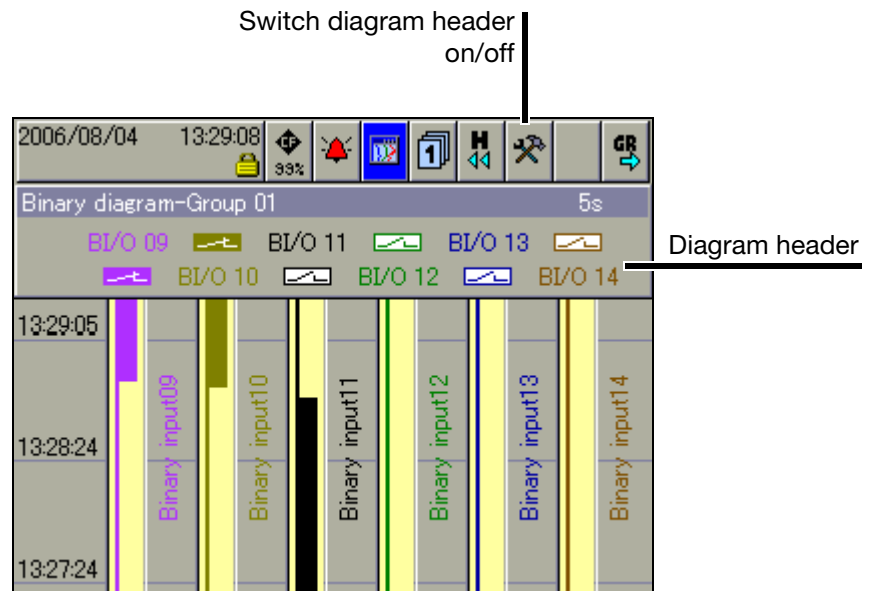
4.6 Process image presentation

In this presentation, selected measurement signals and background pictures are made visible in a process image (one process image for each group). The preparation and configuration of the diagram can only be carried out by the device manufacturer.



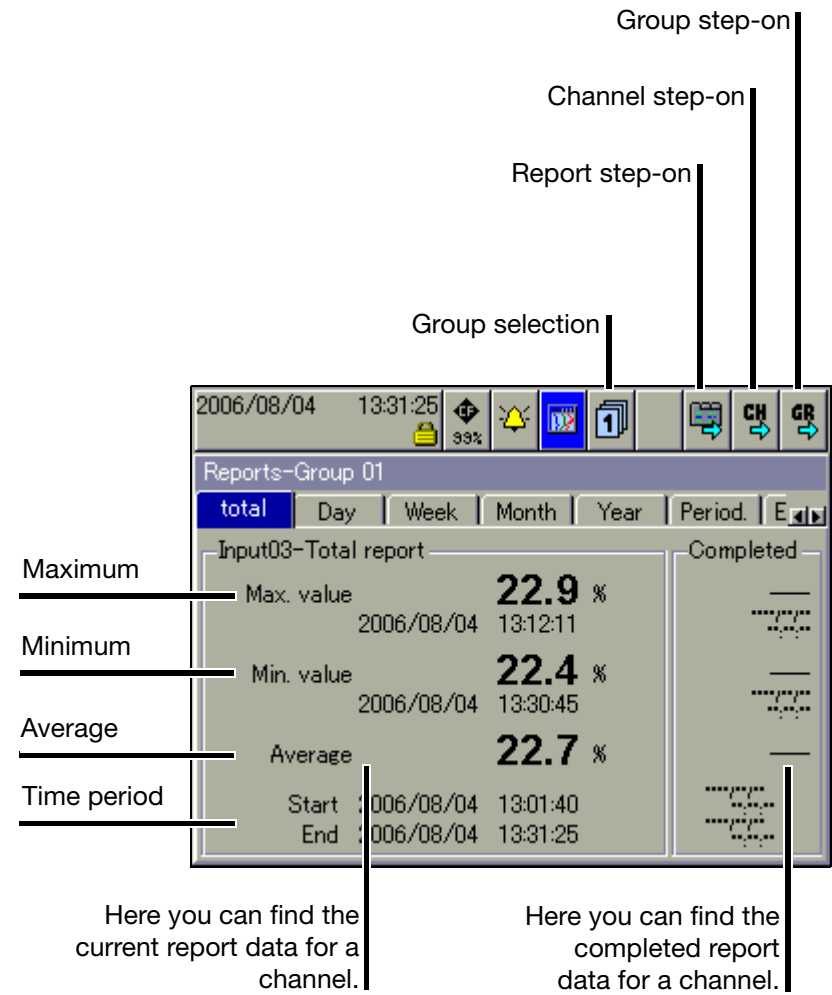
4.7 Binary diagram presentation

In this presentation, the analog channels are left out and only the binary channels and signals are visualized.



4.8 Reports

Each one of the reports covers all the analog channels in a group. An individual and configurable report is provided for each group. The current reports are visualized in the presentation.



- Group selection** You can use this function to directly select any one of the groups and display the report data.
- Report step-on** This function is used to switch between the various types of report for the current channel.
- Channel step-on** This function can be used to switch between the individual channels of the group that is currently active.
- Group step-on** Unlike “Group selection”, where any group can be selected, this function is used to select the groups one after another.

4 Visualization

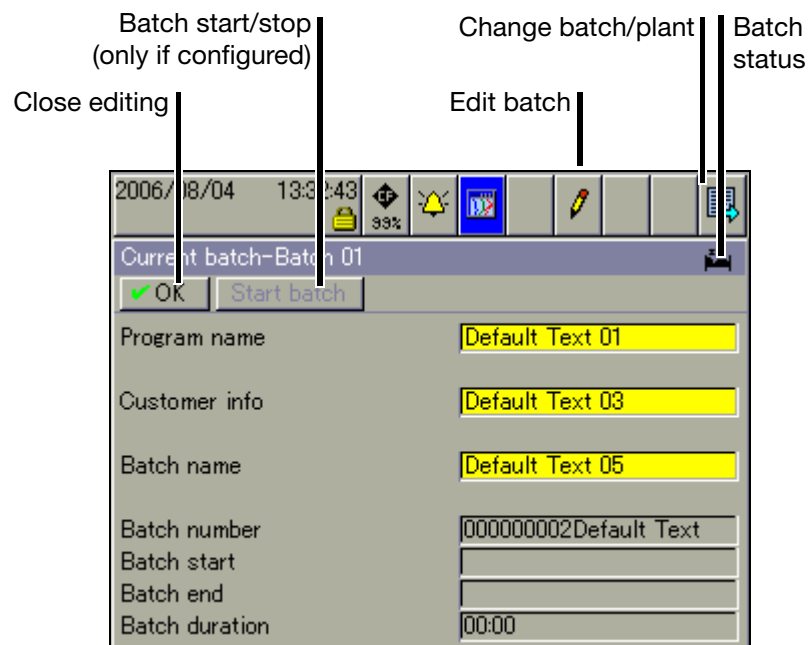
4.9 Batches/plants

When recording batch processes, a distinction is made between the plant and the batch.

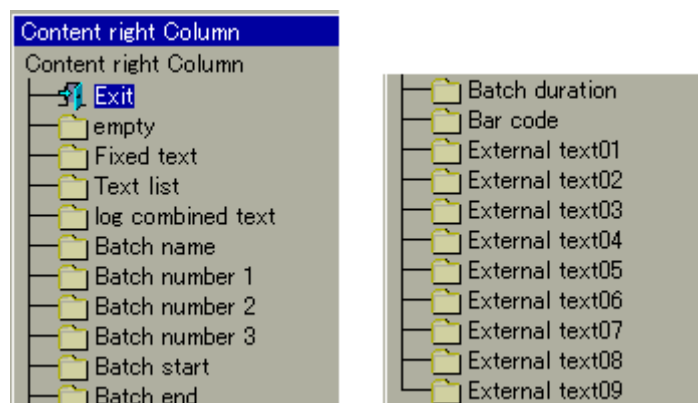
The instrument can combine and record the data from up to 3 plants as a batch (batch report). The number of batches for a plant is not limited. The instrument distinguishes between “current batch” and the most recently “completed batch” for a plant. The number of plants that are used and the texts in the batch template can be configured on the instrument or in the setup program.

4.9.1 Current batches

⇒ This display shows the current data for the batch(es). Further information about entering the texts in the left and right columns can be found in Chapter 23 “Configuration – Batches/plants”.



The batch texts on the right-hand side can be entered with one of the following options:



Edit batch

This function can be used to edit the batch text fields that are available (configured for this purpose). When the function has been called up, the first editable field in the screen template will be activated.



- * Press the control knob to start editing.
- * Enter the text (Chapter 26 “Entering text and values”).



- * Rotate the control knob to select a new field or button, and activate it by pressing the control knob.

Change batch/ plant

Changeover between the individual batches/plants. A maximum of 3 plants can be configured.

Start/stop batch

Use the parameter *Device manager* → *Configuration* → *Batches/plants* → *Plant X* → *General* → *Batch start* to configure how a batch starts and stops. The following are available:

- start/stop by a binary signal (control signal),
- start/stop by a barcode reader, and
- manual start/stop by control knob



At least 5 seconds must elapse between the stop of a batch (batch end) and the next start (batch start). A new batch can only be started when this time has elapsed.

Batch status



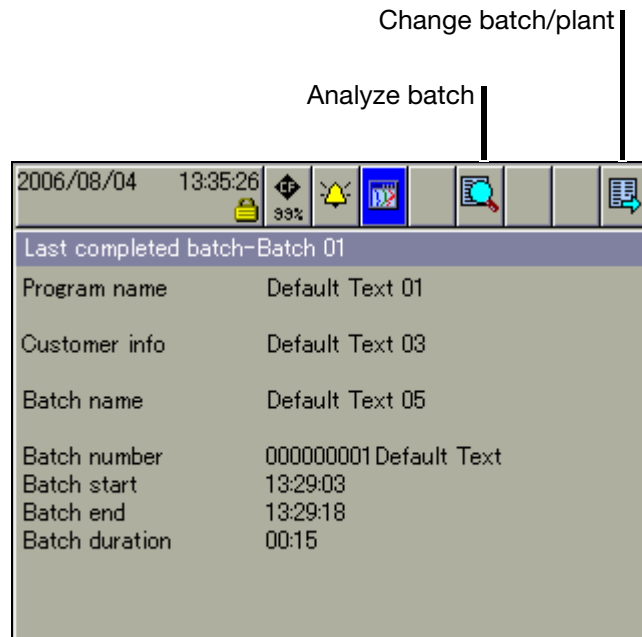
The batch report that is displayed is active.



The batch report that is displayed is **not** active.

4 Visualization

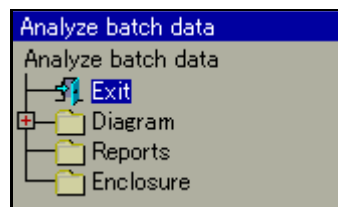
4.9.2 Completed batches



Batch evaluation

Completed batches can be evaluated in three different ways:

- batch data (graphical presentation)
- report (numerical presentation)
- attachments (e.g. recipes)



- * Rotate the control knob to select a type of presentation, then press the knob to activate this type.



Activating the door symbol in the header closes the selected presentation, and the batch data will be displayed again.

Change batch/plant

The corresponding batch data will be shown in its own batch screen template, depending on how many plants have been configured.

4.9.3 Batch control through barcode reader

If a barcode reader is connected to the interface “RS232 for barcode reader” (connector 2) or “RS232/RS485” (connector 7), then the batch start, batch stop, and input of batch texts in a current batch report, can be controlled by the barcode reader. The bar codes that are used all correspond to the type “Code39”.

Preconditions

- The interface must be configured for bar code operation.
Example:
Configuration → Interface → RS232 for barcode reader → General → Protocol = bar code.
- The batch start (= batch stop) must be configured.
Example for batch start/stop:
Configuration → Batch/plant → Batch (Plant) 1 → General → Batch start = bar code.
- Every line that is to be set by the bar code must be configured.
Example for plant 1, line 1 (program name):
Configuration → Batch/plant → Batch (Plant) 1 → Line 1 → Content of right column = bar code.

Activate batch



Before entering commands through a barcode reader, the corresponding batch/plant 1 — 3 must be prepared by scanning in “BATCH1 — 3” for the bar code commands, regardless of whether or not they are automatically displayed.

Show batch report

If one of the visualizations is active, and nothing is being entered or edited at the moment, then the current batch report can be inserted via the barcode reader. The precondition is that the batch is active and the parameter is set to *Configuration → Screen → Bar code -> current batch = Yes*.

Activate and display (if required) batch report for batch (plant) 1:



Activate and display (if required) batch report for batch (plant) 2:



4 Visualization

Activate and display (if required) batch report for batch (plant) 3:



Start and stop batch report

If the batch report is configured for start/stop via barcode reader, then it will be started and stopped as follows.

Start batch:

- * Scan bar code for “Batch report for batch (plant) 1 — 3”.
- * Scan start.



Stop batch:

- * Scan bar code for “Batch report for batch (plant) 1 — 3”.
- * Scan stop.



If a batch report is stopped, then texts that have been activated by a bar code will be reset to the standard text in the currently active batch report.

In the completed batch report, the texts will be saved.

Activate batch texts

If a line in a batch report is configured for barcode activation, the activation proceeds as follows.

Activate text:

- * Scan bar code for “Batch report for batch (plant) 1 — 3”.

Scan text.



The first line of the activated batch report that has been configured for text input via bar code will automatically be filled with the text that corresponds to the bar code. If several line have been configured for barcode activation, then they will be processed one after another, from top to bottom.

Reset entry

Execution of the following bar code will reset the activation of the batch texts. The standard texts (parameter *Factory setting*) will be displayed, and the first line will be prepared for input.



Summary of the bar codes

All the bar codes that are required are also collected together in Chapter 27.1 "Bar code".



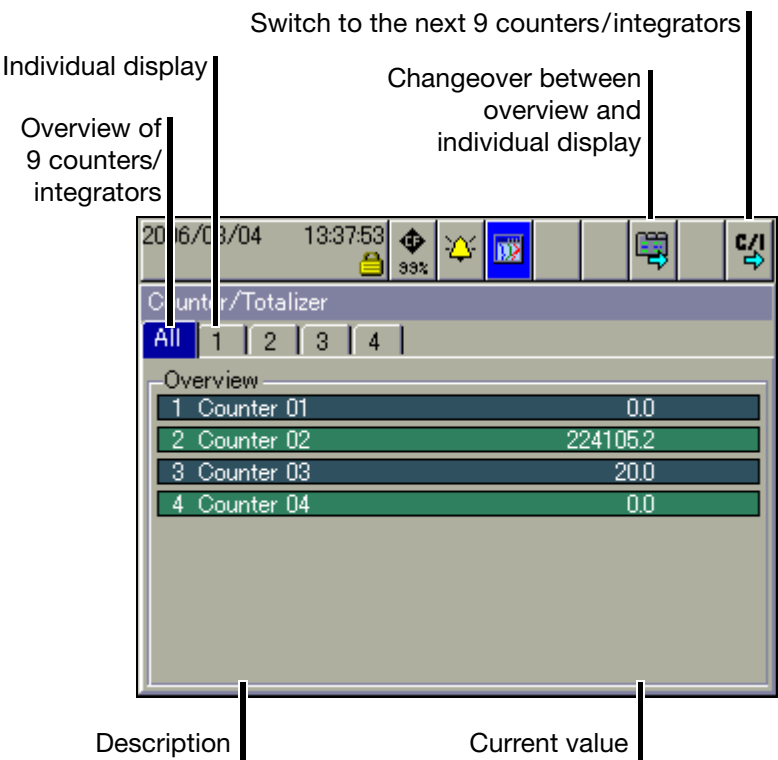
The codes for batch control (BATCH1, BATCH2, BATCH3, START, STOP, RESET) cannot be used for setting batch texts.

4 Visualization

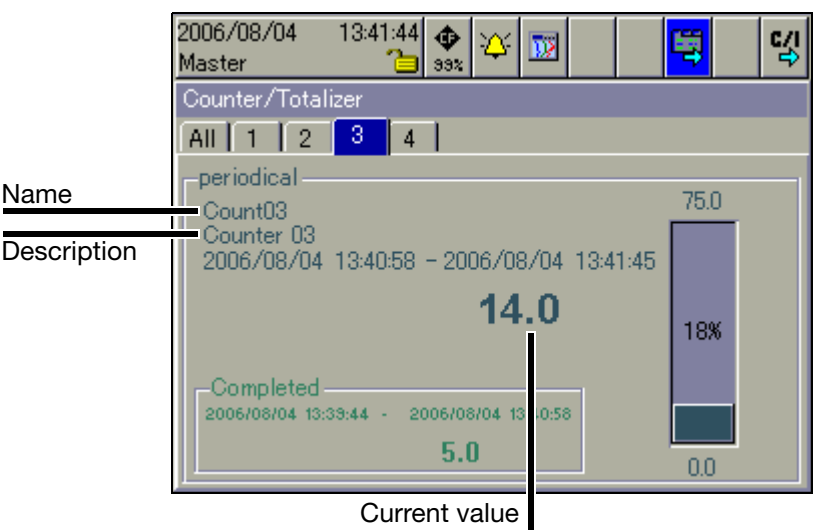
4.10 Counters and integrators

In this presentation, the current states of the counters and integrators (totalizers) are displayed, as well as the operating hours counter. Up to 9 counters and integrators can be shown in one screen template. The functional characteristics, as counter, integrator or operating hours counter, are defined in the device configuration.

Overview presentation

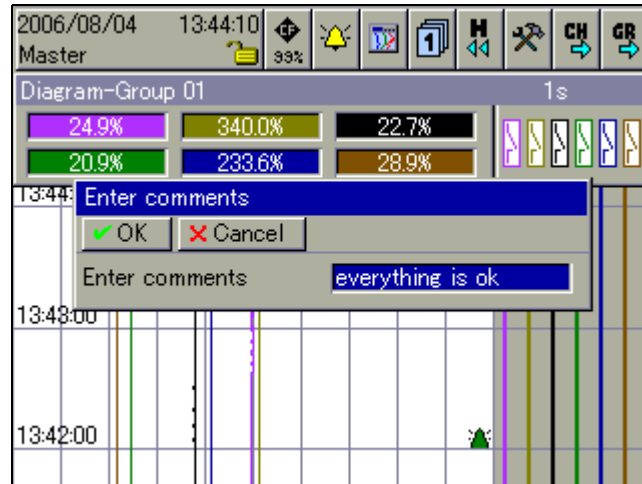


Individual presentation



4.11 Comment entry

This function can be used to enter a text (max. length 31 characters) that is entered in the event list when the input is completed.



In curve presentation (in the displayed group), the text entry is marked by a pencil symbol.



⇒ Chapter 6 “Alarm and event lists”

⇒ Chapter 4.3 “Curve presentation”

⇒ Chapter 4.11 “Comment entry”

The text can now be found in the event list, under the heading “All events”, but also under the corresponding batch.



If batches are used (parameter: *Device manager* → *Configuration* → *Batches/plants* → *Gen. plant parameters* → *Number of plants* is larger than 0), then the groups have a fixed assignment to the batches.

Plant number	Group	Plant (batch)
0	1 – 9	none
1	1 – 9	1
2	1 – 3 4 – 6 7 – 9	1 2 not assigned
3	1 – 3 4 – 6 7 – 9	1 2 3

5 Memory presentation (History)

The Memory presentation function can be used to display and check data from the internal main memory of the instrument. The size of the memory for memory presentation can be configured.

The memory presentation can be activated in the visualization modes “Curve presentation” and “Binary presentation”, and is also used for the display of completed batches.

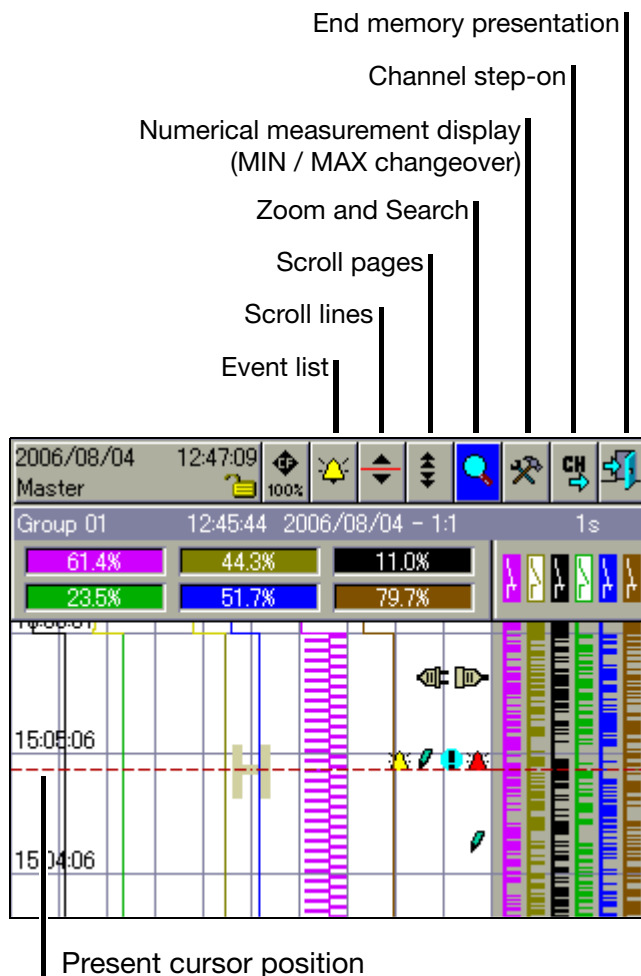


The memory presentation can only be called up if the parameter *Configuration* → *Groups* → *Group x* → *Parameters* → *Status* is set to “Display, save” in the configuration for the group.

Activate memory presentation (History)



- * In “Curve presentation” or “Digital presentation”, rotate and press the “H” symbol to select and activate the History presentation.

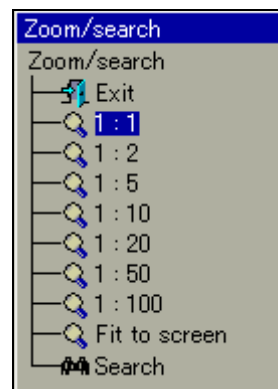


A cursor is now shown in the center of the visualization window. The corresponding measurements are shown in the line for “Numerical measurement display”. The status and title bar shows the time corresponding to the present cursor position, storage cycle that was used, and the scaling for the presentation.

5 Memory presentation (History)

- Event list** This function is used to present the event list for the group that is visible. The message that is closest to the cursor is shown in the list.
⇒ Chapter 6 “Alarm and event lists”
- Scroll lines** Rotating the control knob moves the cursor through the visualization window. The data in the “Numerical measurement display” are updated every time there is a shift. If you move right up to the edge of the window, the measurement curve will automatically be shifted and the required data will be presented.
“Scroll lines” is ended by pressing the control knob.
- Scroll pages** Rotating the control knob moves the cursor an entire screen (=page) at a time. The data in the “Numerical measurement display” are updated every time there is a shift. The system automatically positions the cursor at the end of the page, as required.
“Scroll pages” is ended by pressing the control knob.
- Zoom and search** This function affects how many measurements are used to calculate a point in the diagram, and to search for measurements according to date and time.

Zoom



The factory setting is “1:1”, which means that every measurement in the History memory will be displayed. “1:2” means that every second measurements is displayed, and so on.

- * Select the zoom factor by rotating the control knob.
- * Close the dialog window and activate the new zoom factor by pressing the control knob.
- * Selecting “Exit” closes the dialog window, and the presentation remains unchanged.

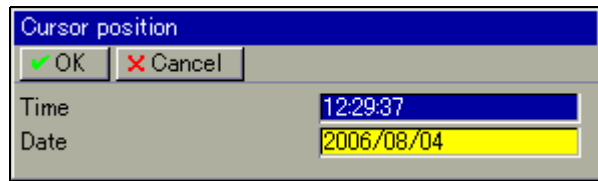
Fit to screen

This function is only available for presenting the data for a completed batch. If this function is selected, the zoom factor will automatically be adjusted so that the measurement curve for the completed batch is shown in one window. However, 1:1 presentation should be used for evaluating a batch.

5 Memory presentation (History)

Search

If you select “Search”, the dialog window for entering the date will be shown.



* Select the date and time, and use OK to close the dialog.

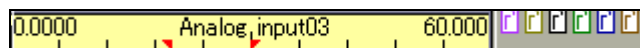
If the date that was entered is in the History memory, the cursor will move to this position and the data will be shown.

Numerical measurement display

This function decides whether the MAX or MIN values are shown in the “Numerical measurement display”. MIN or MAX values arise when more measurements are recorded than are displayed. This will be the case if “MIN/MAX recording” is activated in the operating mode for a group.

Channel step-on

This function activates the scaling display. Repeatedly activating the function steps through the scaling for the channels within the group, and then blanks it out again.



Close memory presentation

This function starts the presentation of the data that are available in the internal main memory of the instrument.

5 Memory presentation (History)

6 Alarm and event lists

The alarm and event lists can be called up in two ways:

- a call from one of the visualization modes, e.g. curve presentation (diagram) (Chapter 4.2 “Overview of header lines”)

and

- a call from the memory presentation (Chapter 5 “Memory presentation (History)”).

Alarm lists

Alarm lists contain only the alarms and errors that are currently present.



The alarm list will not be updated as long as the window is open.
Remedy: close once, and open again. This will update the alarms.

Event lists

Events list contain all the events that have occurred, including all alarms and errors.



A maximum of 150 entries can be fitted into the two lists. The lists will be deleted if a reconfiguration takes place.



The following description assumes that three batches are being used. The number of batches may vary, because it can be configured by the user.

6 Alarm and event lists

6.1 Call from one of the visualization modes

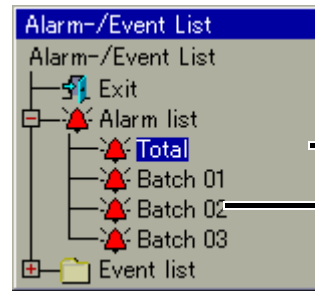


- * In the header line, rotate and press the control knob to select and activate the bell symbol.



- * Select the required list.

Activate alarm list



Complete list of alarms

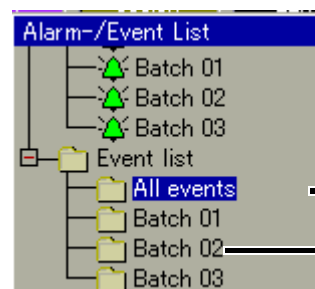
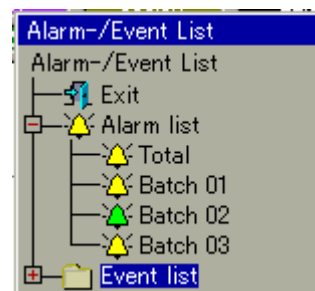
Batch-related alarm lists if the number of batches is reduced, then fewer entries will be displayed.

- * Rotate the control knob to select a list, then press the knob to activate the list.

Activate event list

First, it is necessary to “fold down” the directory tree for the event lists.

- * Rotate the control knob to select an event list, then press the knob to activate the list.



Complete list of events

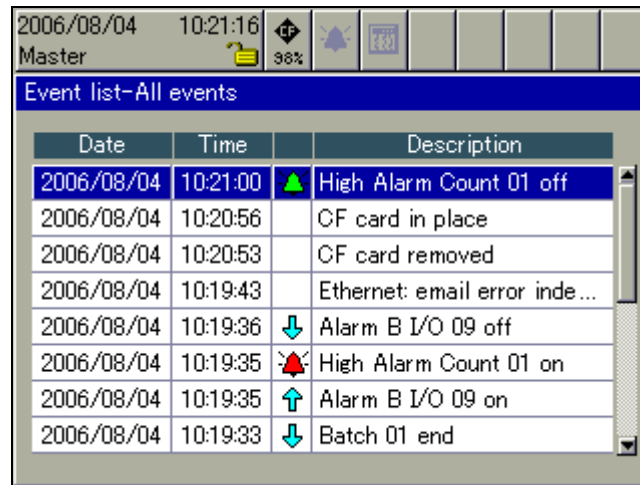
Batch-related event lists

6 Alarm and event lists

- * Rotate the control knob to select a list, then press the knob to activate the list.

Example

In the example, you can see a complete event list.



Date	Time	Description
2006/08/04	10:21:00	High Alarm Count 01 off
2006/08/04	10:20:56	CF card in place
2006/08/04	10:20:53	CF card removed
2006/08/04	10:19:43	Ethernet: email error inde...
2006/08/04	10:19:36	Alarm B I/O 09 off
2006/08/04	10:19:35	High Alarm Count 01 on
2006/08/04	10:19:35	Alarm B I/O 09 on
2006/08/04	10:19:33	Batch 01 end

Close list

- * Close the event list by pressing the control knob.

The visualization that was active before the list was called up will now be displayed again.

6 Alarm and event lists

6.2 Call from the memory presentation



- * In the header line, rotate and press the the control knob to select and activate the bell symbol.











In memory presentation only the event list for the active group will be shown. The message that is closest to the cursor is shown in the list.

Close list

- * Close the event list by pressing the control knob.

The memory presentation that was active before the list was called up will now be displayed again.

6.3 Symbols

	Power on (instrument has been switched on)
	Power off (instrument has been switched off)
	Error
	Alarm disappears (alarm is no longer present)
	Alarm occurs (an alarm is present)
	Comment
	Event occurs (e.g. binary input has been closed)
	Event disappears (e.g. binary input has been opened)
(no symbol)	other messages

7 Memory manager

The symbol for the Memory manager (menu: Memory manager) can be shown in different ways.



This shows the available memory of the CompactFlash memory card that has been inserted.

If no CF card has been inserted, then one of the following symbols will be shown, depending on the type of data read-out that was configured.



This shows the available internal memory for reading out data via the CompactFlash memory card.



This shows the available internal memory for reading out data via the interface.



The memory manager can only be accessed when a CF card has been plugged into the instrument.

If one of the visualization modes, see Chapter 4.3 Curve presentation, is active when a CF card is inserted in the instrument, then the menu appears automatically. Otherwise, the

menu can be accessed through the



symbol.

If not all functions are available, then you have to log in to the device first, in order to obtain the required access rights.

⇒ Chapter 8.2 “Log-in and log-out”



The CF card must not be removed while a data transfer to or from the card is in progress.

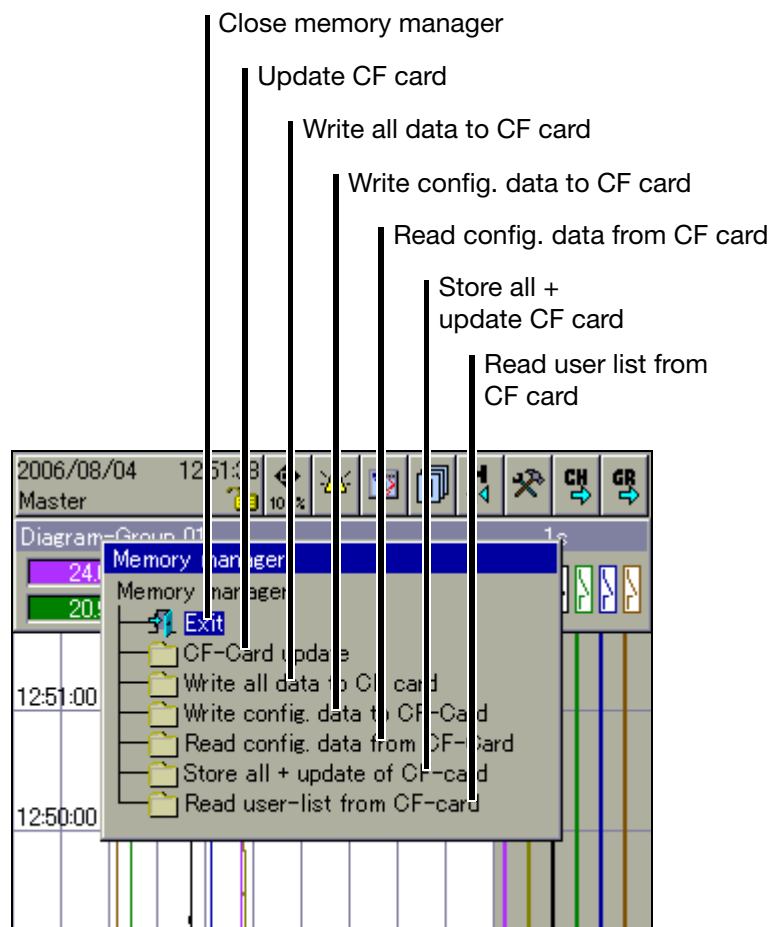
Diagram-Group 01 1s

If this symbol appears in the status and title bar, do **not** remove the CF card!



- * Select the memory manager by rotating the control knob, and then press it to activate the function.

7 Memory manager



Close memory manager (Exit)

Close the memory manager and reactivate the previous visualization.

Update CF card

Measurement data that have not yet been saved to a CF card will be written onto the CompactFlash memory card.

Write all data to CF card

All measurement data in the memory (also those which have already been fetched) are written to the CompactFlash memory card.

Write config. data to CF card

The configuration data and the user list (for password management) are written to the CompactFlash memory card.

Read config. data from CF card

The configuration data are read in to the instrument from the CompactFlash memory card.



This will give the recorder a new configuration.
Subsequently, the data recording will be started again.

Store all + update CF card

All current reports will be concluded and written to the CompactFlash memory card, together with the measurement data that have not yet been saved. The present counter and integrator states will also be saved.

Read user list from CF card

The user list is read in from the CompactFlash memory card.

General note



The function *CF card update* reads out data that have not yet been read out. After readout, the data will be marked as read in the instrument, but not deleted.

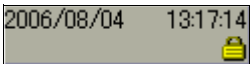
The function *Write all data to CF card* reads out all the data from the internal memory, including those that have already been read out. After read-out, the data are **not** marked as read in the recorder. This means that they remain available for the function *CF card update*. The function *Write all data to CF card* is therefore ideal for test and service work.

7 Memory manager

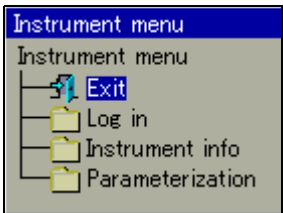
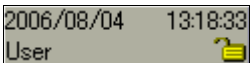
8 Device manager

The functions of the Device manager vary, depending on whether a user is logged in or not.

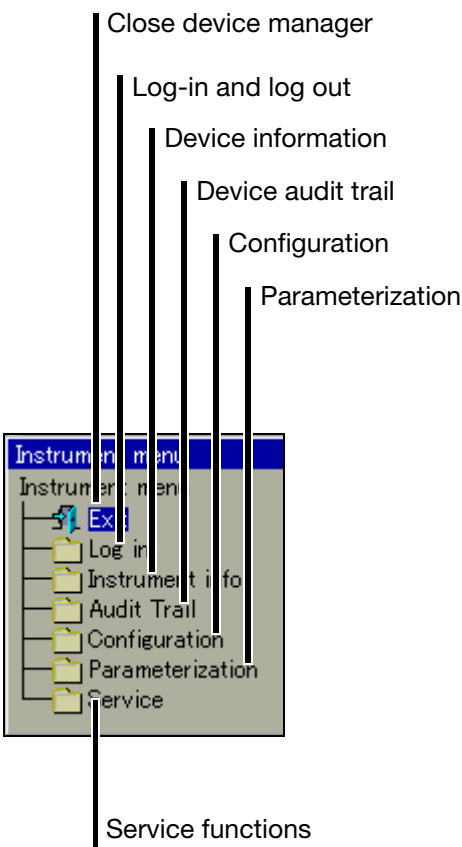
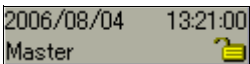
No user
logged in



“User”
logged in



“Master”
logged in



The differences between “No user logged in” and “User logged in” only become visible in the submenu “Parameterization”.

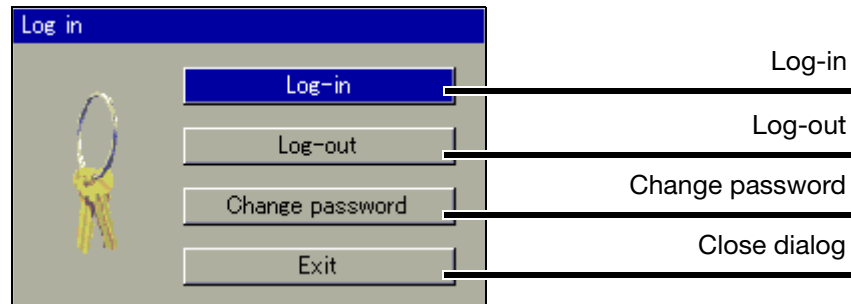
8 Device manager

8.1 Close device manager

Close the device manager and reactivate the previous visualization.

8.2 Log-in and log-out

- * Select the *Device manager* in the header, by rotating the control knob.
- * Activate the *Device manager* by pressing the control knob.
- * In *Device manager* activate the function *Log in*.



Default users



The paperless recorder is delivered ex-factory with an internal user list which contains two users.

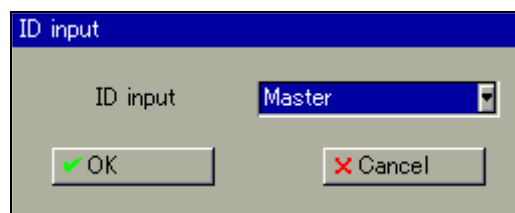
User 1: Master password: 9200

User 2: User password: 0

The setup program can be used to alter the two user names and their passwords and access rights, and transfer this information to the device.

Log-in

- * In the menu *Device manager* → *Log-in*, activate the function *Log-in*.



- * Select the user. The user name can be changed by rotating the control knob.

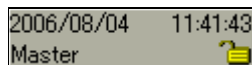
8 Device manager

- * Select “OK” with the control knob, and press the control knob.



- * Enter the password by rotating and pressing the control knob, and finish the entry with “OK”.

You are now logged in to the system.



8 Device manager

8.3 Device information

This function provides you with information on the hardware and software components of the instrument. The momentary values of all the internal and external inputs can also be checked.

The control knob can be rotated to display every single table. The function is terminated by pressing the control knob.

Version

Device name (configurable)

Version of device software (firmware)

2006/08/04 10:23:47 38%

Master

Instrument info

Version Info Hardware Module 1 Modul

Instrument name	Recorder
SW-Version	187.01.01 -62
VDN-Version	
Serial no. device	000000000000000000000000
Serial no. CPU	0000000000000000000000020044
Serial no. module 1	30.09.2005-14:02:22
Serial no module 2	
Serial no. module 3	
Service info	

Module 1 = bottom module slot
Module 2 = middle module slot
Module 3 = top module slot

Info

Module 1 = bottom module slot
Module 2 = middle module slot
Module 3 = top module slot

2006/08/04 10:24:49 38%

Instrument info

Version Info Hardw. Module 1 Modul

SW-Vers. module 1	198.00.26
SW-Vers. module 2	198.00.26
SW-Vers. module 3	202.00.03
SW-Vers. Profibus	
SW-Vers. 1. boot loader	
SW-Vers. 2. boot loader	204.00.20
Configuration changed	2006/08/04 10:19:29
Relay01	0

Date and time of last reconfiguration

Switching state of relay 1 (fitted as standard); 0= not switched

Hardware

Bottom module slot
Middle module slot
Top module slot

2006/08/07 11:04:33 33%

Instrument info

Version Info Hardw. Module 1 Modul

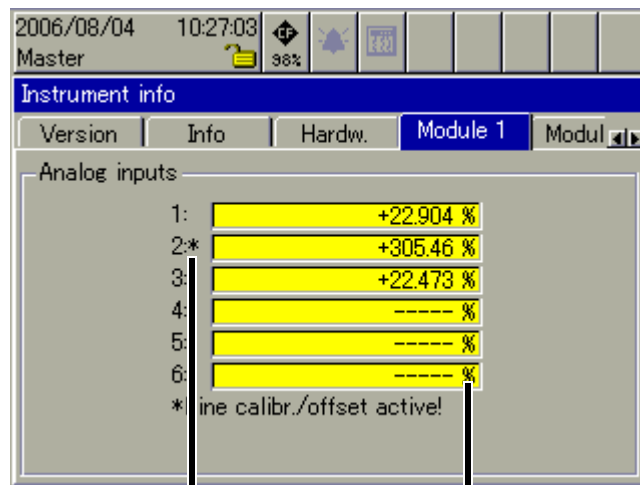
Module type	6 AI module
Module type	3 Analog /8 bin. /0
Module type	6 Relay
Profibus	No
RS232	Yes
internal memory	64MB Card
Mathematic	Yes

RS232 for barcode reader

8 Device manager

Module 1

The picture below shows a module that has been fitted with 6 analog inputs. Depending on the hardware level, the picture may look different. Module 1 is in the bottom module slot.

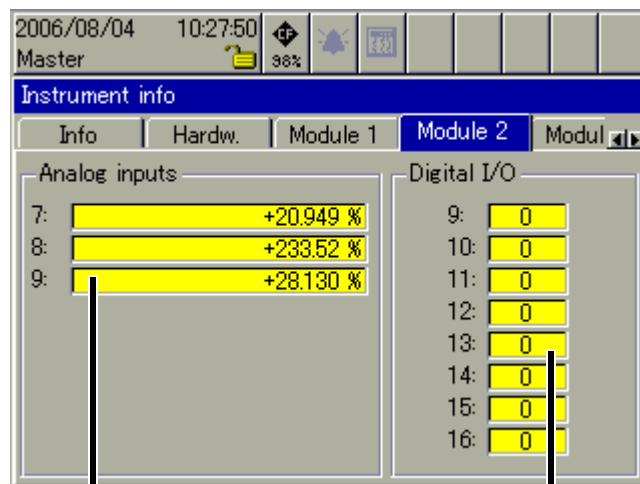


The * indicates that an offset or fine calibration is active on this channel.

Display of the current analog values from module 1

Module 2

The picture below shows a module that has been fitted with 3 analog inputs and 8 binary inputs/outputs. Depending on the hardware level, the picture may look different. Module 2 is in the middle slot.

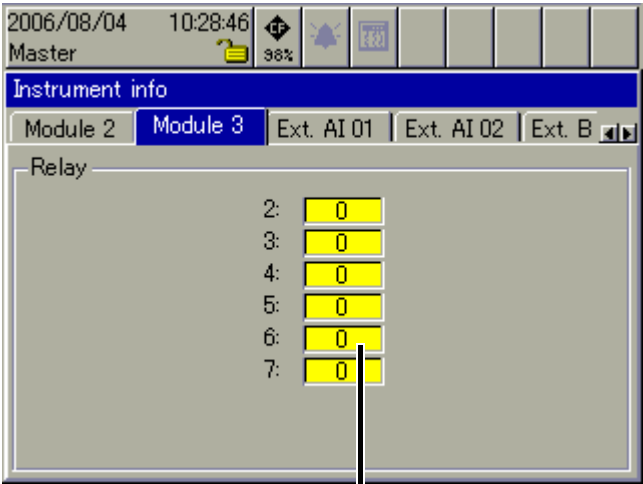


Display of the current analog values from module 2

States of the binary inputs/outputs (0 = not active).

Module 3

The picture below shows a module that has been fitted with a relay card (6 relays). Depending on the hardware level, the picture may look different. Module 3 is in the top slot.



Switching state of relays
(0 = not switched).

Ext. analog input (AE) 1 – 2

The two pictures show the current external analog inputs. External analog inputs are read into the recorder via one of the interfaces (e.g. through the Modbus Master function).

Ext. binary input (BE)

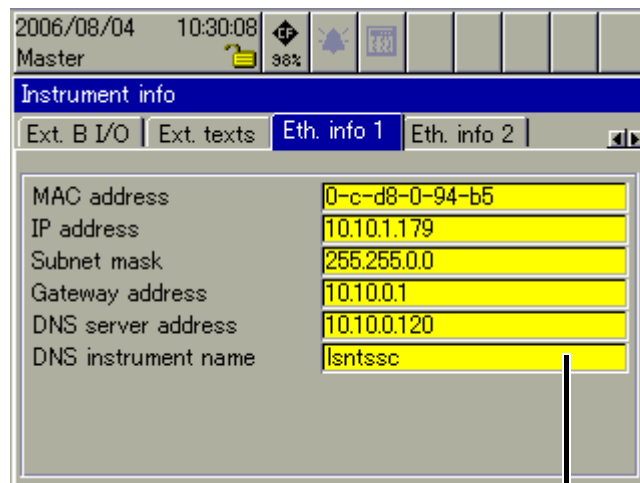
The picture shows the current external binary inputs. External binary inputs are read into the recorder via one of the interfaces (e.g. through the Modbus Master function). Unlike the internal binary inputs/outputs, external binary outputs are not available.

Ext. texts

The picture shows the current external texts, which can be integrated into the batch reports as label or information text. External texts are read into the recorder via one of the interfaces (e.g. through the Modbus Master function).

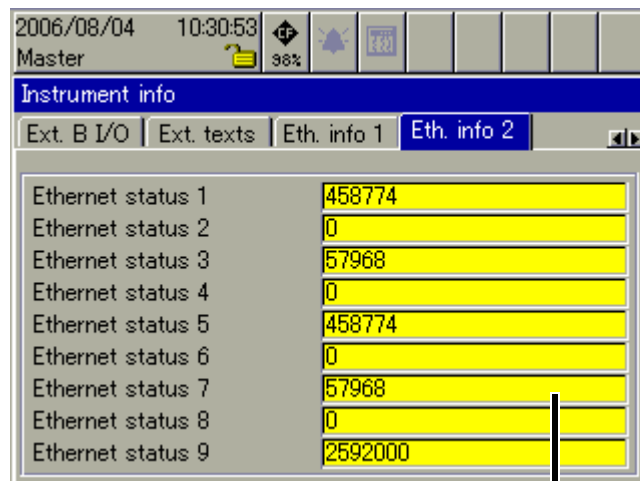
8 Device manager

Eth. info 1



Information about the current Ethernet configuration

Eth. info 2



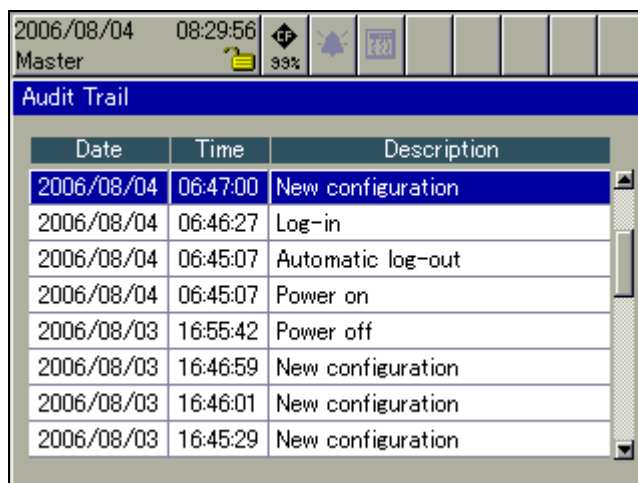
Information about the current Ethernet communication

Parameter	Description
Ethernet status 1	received Ethernet packets
Ethernet status 2	received Ethernet packets with errors
Ethernet status 3	transmitted Ethernet packets
Ethernet status 4	transmitted Ethernet packets with errors

Parameter	Description
Ethernet status 5	received TCP packets
Ethernet status 6	received TCP packets with errors
Ethernet status 7	transmitted TCP packets
Ethernet status 8	transmitted TCP packets with errors
Ethernet status 9	received lease time, in seconds

8.4 Device audit trail

All user actions on the recorder are logged in the audit trail.



The screenshot shows a software window titled "Audit Trail". At the top, it displays the date "2006/08/04", time "08:29:56", and the user "Master". Below this is a status bar with "33%" and several icons. The main area is a table with three columns: "Date", "Time", and "Description". The table contains the following entries:

Date	Time	Description
2006/08/04	06:47:00	New configuration
2006/08/04	06:46:27	Log-in
2006/08/04	06:45:07	Automatic log-out
2006/08/04	06:45:07	Power on
2006/08/03	16:55:42	Power off
2006/08/03	16:46:59	New configuration
2006/08/03	16:46:01	New configuration
2006/08/03	16:45:29	New configuration

The function is terminated by pressing the control knob.

8.5 Configuration

This function can be used to alter the configuration of the recorder.

⇒ Several chapters in this operating manual deal with the configuration, which starts in Chapter 10 "Configuration - General".



An alteration of the configuration results in the current recording being closed down and the new data being recorded in a separate time frame from the "old" data. It is not possible to present the data before reconfiguration and the data after reconfiguration as a single entity.

8 Device manager

8.6 Parameterization

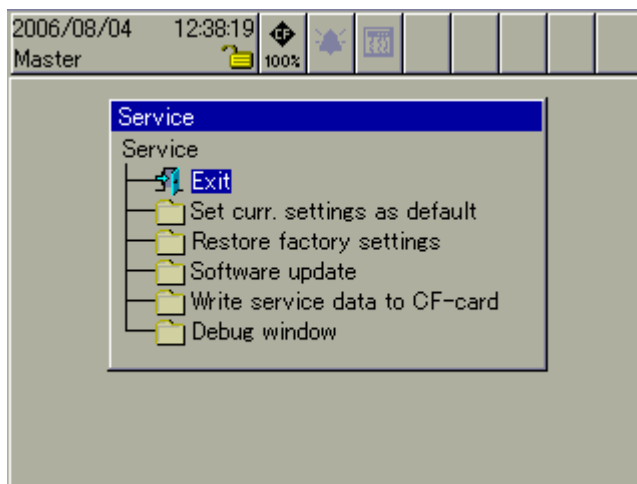
For parameterization, some functions will not be available if no user is logged in, or the user who is logged in does not have the access rights for these functions.

Only the setting of individual current batch numbers is enabled in the factory (default) setting.

⇒ Additional information can be found in Chapter 9 “Parameterization”.

8.7 Service

The “Service” functions will also not be available if no user is logged in, or the user who is logged in does not possess access rights for these functions.



**Set curr.
settings as
default**

The current configuration can be saved within the device as the new factory setting.

**Restore factory
settings**

The factory setting, e.g. created by “Set curr. settings as default”, is called up and the instrument is reset.

**Software
update**

This function serves for reading in a new device software (firmware). To do this, a special CF card is required. Only a service engineer from the instrument manufacturer may perform the update.

**Write service
data to CF card**

Special data are saved to the CF card. The function may only be carried out if the user has been asked to do so by a service engineer from the instrument manufacturer.

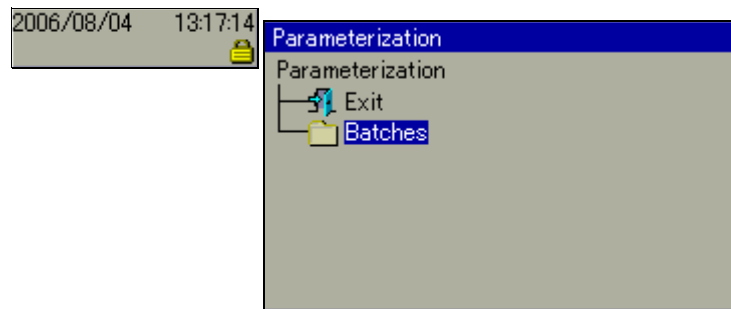
Debug window

Only a service engineer from the instrument manufacturer may use this function.

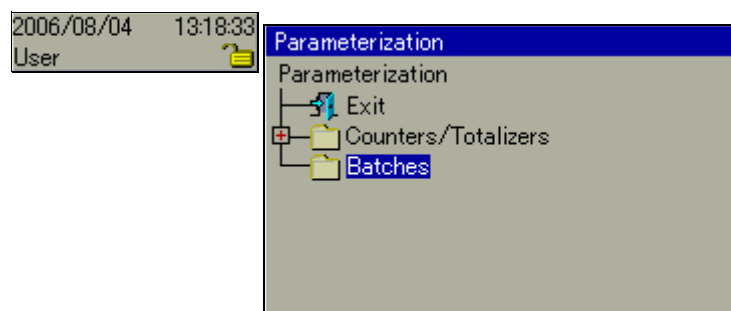
9 Parameterization

The functions in the Parameterization menu vary, depending on whether a user is logged in or not.

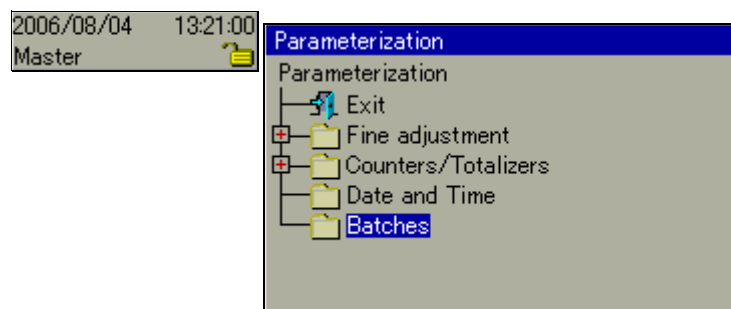
No user logged in



**“User”
logged in**



**“Master”
logged in**



9 Parameterization

9.1 Fine calibration

Using “Fine calibration”, an adjustment (correction) of the internal analog measurements can be activated. The adjustment is carried out using a linear equation.

Example

Systematic errors, such as those caused by an unsuitable probe mounting, have occurred in a plant. A probe provides measurements that cover a temperature range from 200 to 300 °C. It has been installed in a tunnel oven so unfavorably as to always indicate 10 °C less than the temperature of the charge. The incorrect measurement can be corrected through fine calibration.

Parameterization → Fine calibration → Analog input 1 → Actual start val. : 200 °C

Parameterization → Fine calibration → Analog input 1 → Target start val. : 210 °C

Parameterization → Fine calibration → Analog input 1 → Actual end val. : 300 °C

Parameterization → Fine calibration → Analog input 1 → Target end val. : 310 °C

9.2 Counters/integrators

With the aid of this function, the present counter, integrator and operating time counts can be altered (for instance, to 0 or any start value). The alteration is documented in the event list whereby the old and the new values are specified. It is effective only once.

9.3 Date and time

Using this function, the current date and current time are set for the recorder. Additional functions for configuring date and time functions (e.g. summer time) can be found in the menu *Configuration → Date and time*.

⇒ Chapter 24 “Configuration - Date and time”

9.4 Batches/plants

Irrespective of the number of batches (plants) used, this function is available for configuring the start numbers of up to three batch numbers. The batch numbers can be switched into display when recording batches in the batch report. At the end of a batch, the value is incremented by one.

Example:

Batch numbers

The screenshot shows a dialog box titled 'Batches' with a status bar at the top displaying '2006/08/04 09:31:35' and '33%'. Below the title bar are 'OK' and 'Cancel' buttons. The main area contains three rows of configuration:

Batch no.	Value
Batch no. 1	7
Batch no. 2	17
Batch no. 3	10

Current batch for plant 1

The screenshot shows a dialog box titled 'Current batch-Batch 01' with a status bar at the top displaying '2006/08/04 09:46:06' and '33%'. Below the title bar are 'OK' and 'Start batch' buttons. The main area contains several fields for batch configuration:

Program name	Default Text 01
Customer info	Default Text 03
Batch name	Default Text 05
Batch number	000000007
Batch start	
Batch end	
Batch duration	00:00

Batch number 1

Batch numbers are assigned to a currently present batch in the menu *Configuration* → *Batches/plants*.

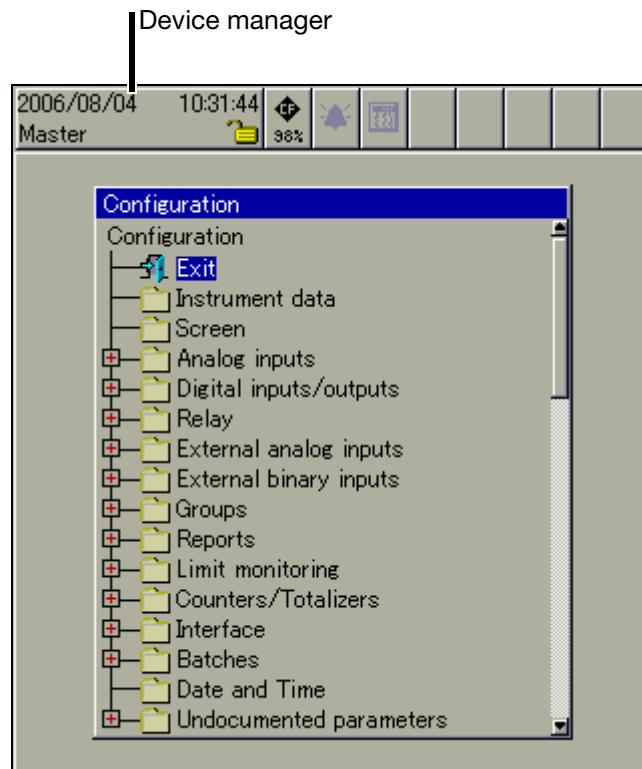
⇒ Chapter 23 “Configuration – Batches/plants”

10 Configuration - General

The menu *Device manager* → *Configuration* can only be called up if a user is logged in who is authorized to perform the configuration.



With the aid of the setup program, the user rights can be altered and transferred to the paperless recorder via the interface or CF card.



- * Select the submenu by rotating the control knob.
- * Activate the submenu by pressing the control knob.

For clarity, the description of the individual submenus has been divided among the following chapters.

10 Configuration - General

11 Configuration - Instrument data

Overview

2006/08/04 07:20:31
Master 33%

Instrument data

✓ OK ✗ Cancel

Instrument name: Recorder

Language: Language 2

Supply frequency: 50 Hz

Temperature unit: °C

Action on totalizer end: stop

Memory warning: 20 %

Data memory: 2 MB

Display CF capacity: CF card

Device (instrument) name

The device name (up to 15 characters) is used for the identification of the paperless recorder in the instrument (Device info menu), in the setup program or in the PCA Communications software PCC.

Language

First choose between the two instrument languages. All texts (fixed and variable ones) can be altered through the setup program. Individual texts in any language can be implemented in this way.

Supply frequency

Set the frequency of the supply voltage used.

Temperature unit

Set the temperature unit of your choice. When configuring the analog channels, the measurement range limits are shown in the chosen unit.

Action on integrator (totalizer) end

The response of the integrator (totalizer) channels is set here if the value of the input signal for an integrator is invalid.

Stop	Integration is stopped.
Invalid	Integration is set to invalid ("-----").

Memory alarm (warning)

The memory alarm (warning) is triggered when the available measurement data memory has fallen below the configured value. With regard to the memory alarms, a distinction is made between

- "readout via CF card",
- "readout via interface" and
- "internal memory".



If the memory alarms are set, there is a danger of a data loss. The data must be read out of the recorder without delay.

11 Configuration - Instrument data

History (data) memory

Here you can determine the size of the History memory. The memory is used to show stored measurement data that are outside the present curve view.















The History presentation is started through the History function in the header.



⇒ Chapter 5 “Memory presentation (History)”

Read data via ... (Display CF capacity)

The memory readout type of your choice is selected here. The parameter only affects the header, and when there is no CF card in the slot.

Interface	<div><div>2006/08/04 11:11:36  73%</div><div>     </div></div> <p>This shows the available memory for reading out data via one of the interfaces (RS232/RS485, setup interface or Ethernet). The data readout can, for instance, be implemented via the PCA Communications software PCC.</p>
CF card	<div><div>2006/08/04 11:11:36  93%</div><div>     </div></div> <p>This shows the available memory for reading out data via the CF memory card.</p>

If the symbol is shown in red, a memory alarm for the corresponding type of readout is present.

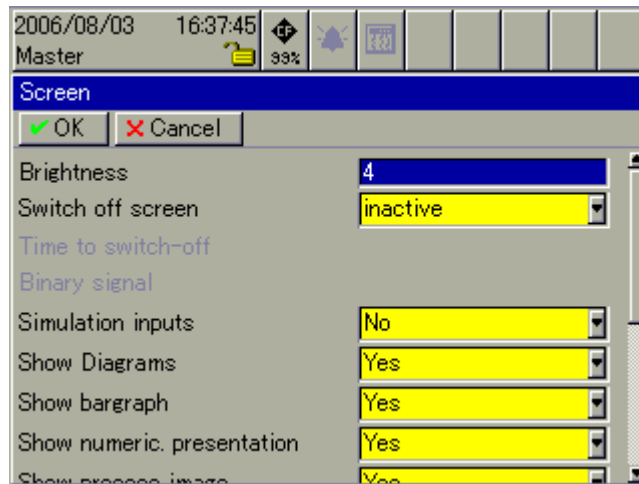
If the CF card is inserted, the available memory of the CF card is displayed. The parameter “Read data via ... (Display CF capacity)” is irrelevant at this point.



The minimum size of available storage space (in %) is determined through the parameter *Configuration* → *Device data* → *Memory alarm*. If less memory space is available than has been set, there will be an entry in the event list.

12.1 Brightness ... Show text screen

Overview



Brightness

With the aid of this function, the brightness of the screen can be altered in four stages (1 = darker; 4 = brighter). Any alteration to this parameter will become effective when the *Instrument (device) data* menu is closed.

Switch off screen

For screen saving, a screen switch-off (screen saver) can be activated here.

The switch-off can be activated by means of a waiting time or a control signal.

Waiting time

If the control knob is not operated within a period from 10 to 32767 seconds, screen saving will become active and the screen goes dark.

Control signal

The switch-off is initiated by one of the control signals. A control signal may, for instance, be a binary input, a relay state, or a batch activation.

Simulate inputs

If the parameter is activated ("Yes"), all recorder inputs and outputs will be ignored and pseudo data will be displayed on the screen.



The inputs and outputs move to a non-defined state. This parameter should only be activated for test purposes, and only if the relays and binary outputs are not wired up.

12 Configuration - Screen

Show curves (diagrams) This parameter determines whether curve presentation may be called up in the Visualization menu.

Yes	Curve presentation can be called up.
-----	--------------------------------------

Show bar graph This parameter determines whether bar graph presentation may be called up in the Visualization menu.

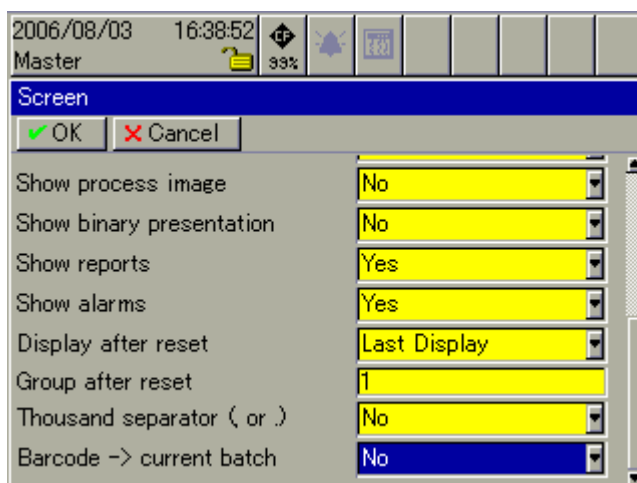
Yes	Bar graph presentation can be called up.
-----	--

Show text picture This parameter determines whether textual presentation may be called up in the Visualization menu.

Yes	Textual presentation can be called up.
-----	--

12.2 Show process image ... Bar code ->current batch

Overview



Show process image This parameter determines whether process image presentation may be called up in the Visualization menu.

Yes	Process image presentation can be called up.
-----	--

The display shows selected measurement signals and background pictures in one process screen (one process screen for each group). The preparation and configuration of the screen can only be carried out by the instrument manufacturer.

12 Configuration - Screen

Show binary presentation

This parameter determines whether binary screen presentation may be called up in the Visualization menu.

Yes	Binary screen presentation can be called up.
-----	--

In the presentation, the analog channels are dispensed with, only the binary channels are made visible.

Show reports

This parameter determines whether report presentation may be called up in the Visualization menu.

Yes	Report presentation can be called up.
-----	---------------------------------------

Each report is run on all analog channels of a group. An individual and configurable report is provided for each group.

Show alarms

This parameter determines whether alarm messages are displayed in the “status & title bar”.

Yes	Alarms are displayed. 
-----	---

Display after reset

This parameter determines which visualization or representation is shown on the screen after switch-on (connecting the supply voltage).

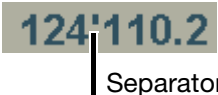
Last display	The display that was active before switch-off is restarted.
Curve diagram ... Batch diagram	A specific visualization is to be displayed.

Group after reset

This parameter determines which group is displayed on the screen in “Display after a reset” (visualization after switch-on).

Thousands separator

This parameter determines whether a thousands separator is inserted for the visualization of the counter and integrator counts.

Yes	Thousands separator is inserted.  Separator
-----	---

Bar code -> current batch

This parameter determines whether the visualization of the current batch data will be started automatically when acquiring a bar code with a connected barcode reader.

Yes	The data for the current batch will be switched into display automatically.
-----	---

12 Configuration - Screen

13 Configuration - Analog inputs

The analog inputs of the recorder are configured in this menu. How to connect the inputs to the recorder is described in the Installation Instructions B 70.6580.4 (connectors 8 to 13, depending on the equipment level of the individual module slots).

13.1 Sensor ... Offset

Overview

2006/08/03 16:34:40
Master 33%

Analog input 1

OK Cancel

Sensor Resistor 3L

Linearization Pt100

Cold junction

Constant temperature

Measure. range start -200.00 °C

Measure. range end +850.00 °C

Scale / range start +0.0000

Scale / range end +50.0000

Offset +0.0000

Sensor

Type of the connected sensor (e.g. RTD in 3-wire circuit). The setting “Inactive” means that the channel is not connected.



An analog channel can be used in a group, even though its sensor is set to “Inactive”. The channel is marked as invalid “-----” in the curve display.

Linearization

In addition to the usual linearizations (e.g. Pt100), four customer-specific linearizations are available. The associated linearization tables have to be created using the setup program.

Cold junction

The settings for the cold junction are only available if “thermocouple” has been selected as the sensor.

Internal Pt100	The Pt100 resistance thermometers within the instrument are used for the comparison measurement.
Ext. const.	A constant temperature is selected for comparison.

Ext. CJ temp.

The cold-junction temperature is entered here if “thermocouple” has been configured as the sensor and “Ext. const.” as the cold junction.

Range start/ range end

The limits for the range are determined by the sensor type that has been connected and automatically entered. The start and end can be altered for these sensor types: current, voltage, potentiometer and resistance transmitter.

If the limits can be altered, a free scaling function is activated within the instrument, i.e. the value “range start” is transformed to the value “scaling

13 Configuration - Analog inputs

start” and the value “range end” to the value “scaling end”.

If the limits are not alterable, the predefined range can only be restricted via “scaling start” and “scaling end”.

Scale/ range start Scale/ range end

Visualization on the recorder screen takes place within the limits configured here.

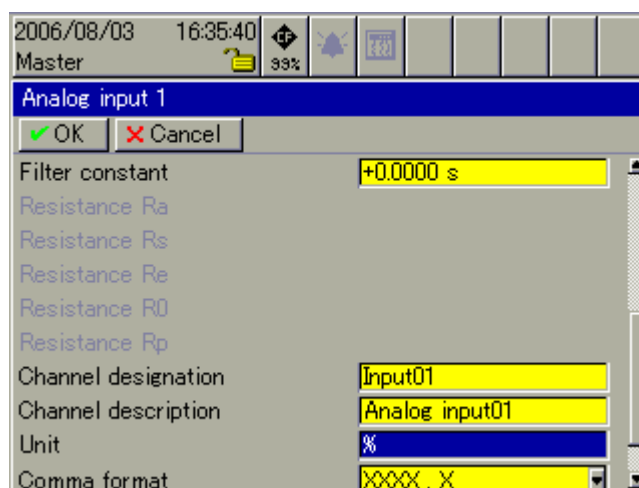
If the measurement goes outside the limits configured here, the error constant for overrange or underrange is written to the measurement variable. When the data are visualized, “>>>>” appears for overrange and “<<<<” for underrange.

Offset

This function serves for the parallel shifting of the measurement curve in the range of ± 100 referred to the scaling limits.

13.2 Filter constant ... Unit

Overview

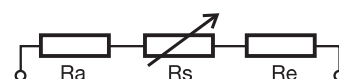
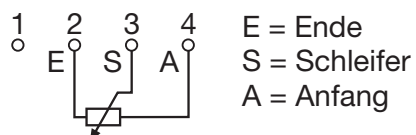


Filter constant

All analog inputs are equipped with a 2nd order digital filter. The filter ensures that the noise of the input signal is reduced, it is “smoothed”. The larger the filter constant, the larger the smoothing will be.

Resistance Ra – Re

The resistance values can only be entered with the sensor type “resistance transmitter”.



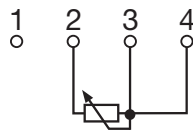
13 Configuration - Analog inputs

Ra	Resistance between slider and start, if the slider is at the start.
Re	Resistance between slider and end, if the slider is at the end.
Rs	Total resistance minus Ra and Re.

The sum of the resistances ($R_a + R_e + R_s$) must not exceed 4000 Ohm.

Resistance R0 – Rp

The resistance values can only be entered with the sensor type “potentiometer”.



R0	Resistance between slider and start, if the slider is at the start.
Rp	Total resistance minus R0.

The sum of the resistances ($R_0 + R_p$) must not exceed 4000 Ohm.

Channel name

Short designation for the analog input, up to 7 characters. The channel name is displayed in the individual visualization modes, together with the channel designation.

Channel description

Description of the analog input, up to 21 characters. The channel description is displayed in the individual visualization modes, together with the channel name.

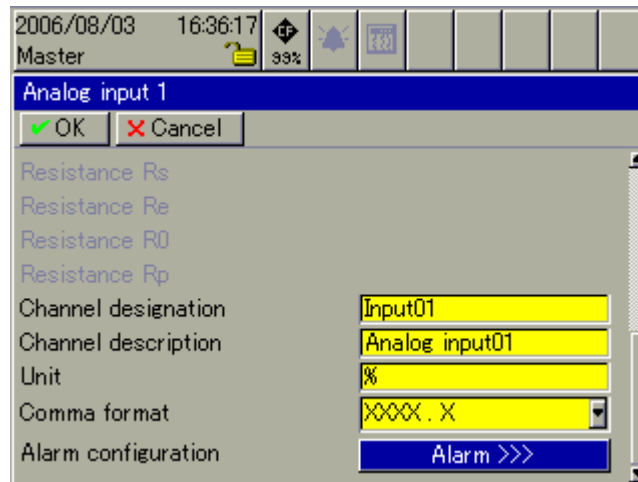
Unit

Unit in which the acquired measurement signal is to be displayed, up to 5 characters. The unit is displayed wherever the measurement is presented numerically.

13 Configuration - Analog inputs

13.3 Decimal place ... Alarm configuration

Overview



Decimal place

The decimal place serves to determine the number of integer and decimal places for the numerical presentation of the measurements. If required, the instrument will automatically switch to a different format, in order to be able to show all the integer places. As a rule: all integer places must be displayed.

Alarm configuration

Opens the submenu for the configuration of both alarms.

13 Configuration - Analog inputs

13.4 Alarm configuration

Overview

2006/08/03 16:37:07
Master 99%

Alarm configuration

OK Cancel

Status: On

Alarm type 1: Low alarm

Alarm type 2: High alarm

Limit value 1: +0.0000

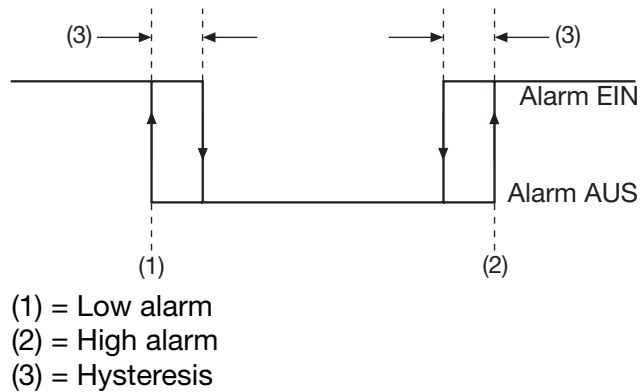
Limit value 2: +0.0000

Hysteresis: +0.0000

Alarm delay: 0 s

Alarm text1: Low Alarm AI01

Alarm text2: High Alarm AI01



Status

Status activates alarm monitoring.

On	Alarm monitoring is active.
----	-----------------------------

Alarm type 1/ alarm type 2

“Low alarm” and “High alarm” are available for each alarm type.

Low alarm	Alarm is initiated if the value has fallen below the limit.
High alarm	Alarm is initiated if the value has gone above the limit.

Limit value 1/ limit value 2

Limit at which the alarm is raised.

13 Configuration - Analog inputs

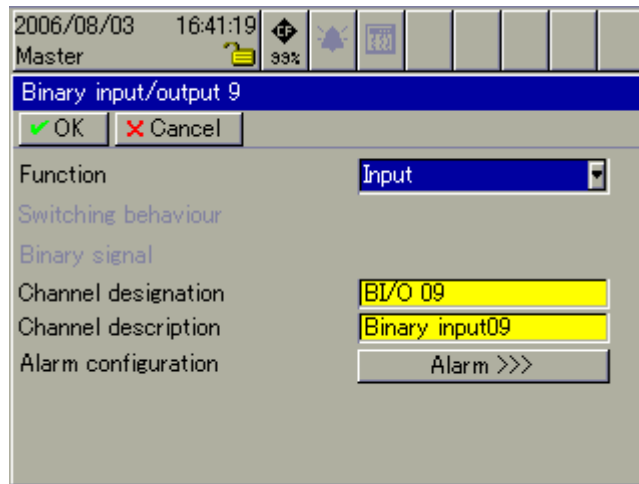
Hysteresis	The hysteresis serves to prevent an unsteady (flickering) alarm state (repeated, brief switching on and off due to the noise of the input signal). The higher the value, the larger the amount by which the present measurement must go above or below the limit in order to cancel the alarm.
Alarm delay	This parameter delays the reporting of an alarm. If the alarm is no longer present after the alarm delay time has elapsed, it will not be triggered.
Alarm text 1/ alarm text 2	There is an alarm text for each type of alarm, which, in the event of an alarm, is displayed in the “status & title bar” and entered in the event list.

14 Configuration - Binary inputs/outputs

The binary inputs and outputs of the recorder are configured in this menu. How to connect the inputs and outputs to the recorder is described in the Installation Instructions B 70.6580.4 (connectors 9, 11 or 13, depending on the equipment level of the individual module slots).

14.1 Function ... Alarm configuration

Overview



Function

This parameter determines whether a binary input or a binary output is to be used.

Switching action

Switching action is only available if a binary output is used and determines whether to output is to operate as a make (SPST-NO) or break (SPST-NC) contact.

Make (SPST-NO)	The binary output is not switched (open) when the operating signal is inactive, and closed when the operating signal is active.
Break (SPST-NC)	The binary output is closed when the operating signal is inactive, and not switched (open) when the operating signal is active.

Binary signal

This parameter determines which binary signal is to be used as an operating signal for the binary output.



If a binary input/output has been configured for the output, the same signal may not be used as the operating signal.

Channel name

Short designation for the input or output, up to 7 characters. The channel name is displayed in the individual visualization modes, together with the channel designation.

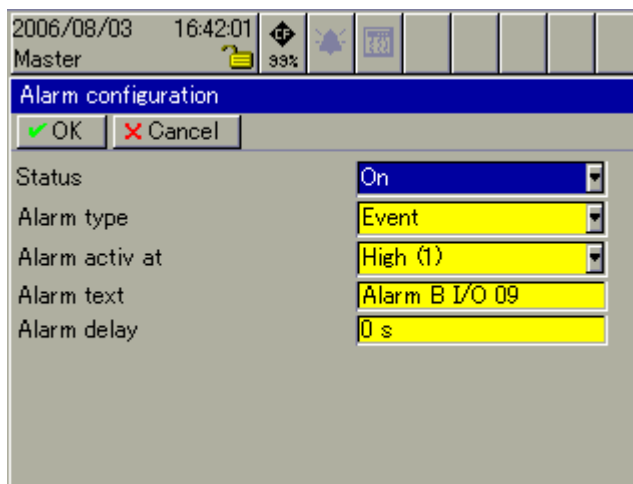
14 Configuration - Binary inputs/outputs

Channel description Description of the input or output, up to 21 characters. The channel description is displayed in the individual visualization modes, together with the channel name.

Alarm configuration Opens the submenu for the configuration of the alarm monitoring.

14.2 Alarm configuration

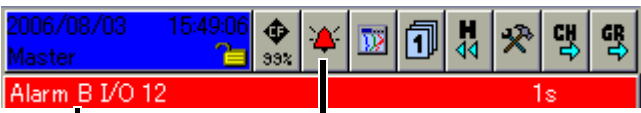
Overview



Status Status activates alarm monitoring.

On	Alarm monitoring is active.
----	-----------------------------

Alarm type The alarm type determines whether the activating/inactivating of an input or output is to be evaluated as a genuine alarm or only as an event.

Event	The alarm text is entered in the event list only.
Alarm	<div>The alarm text is entered in alarm list and the event list. In addition, the alarm text appears in the “status & title bar”, and the alarm bell in the header is shown in red.  Alarm text Alarm bell</div>

Alarm active on Determines whether the alarm is present with active or inactive input/output.

High (1)	Alarm with active input/output
Low (0)	Alarm with inactive input/output

14 Configuration - Binary inputs/outputs

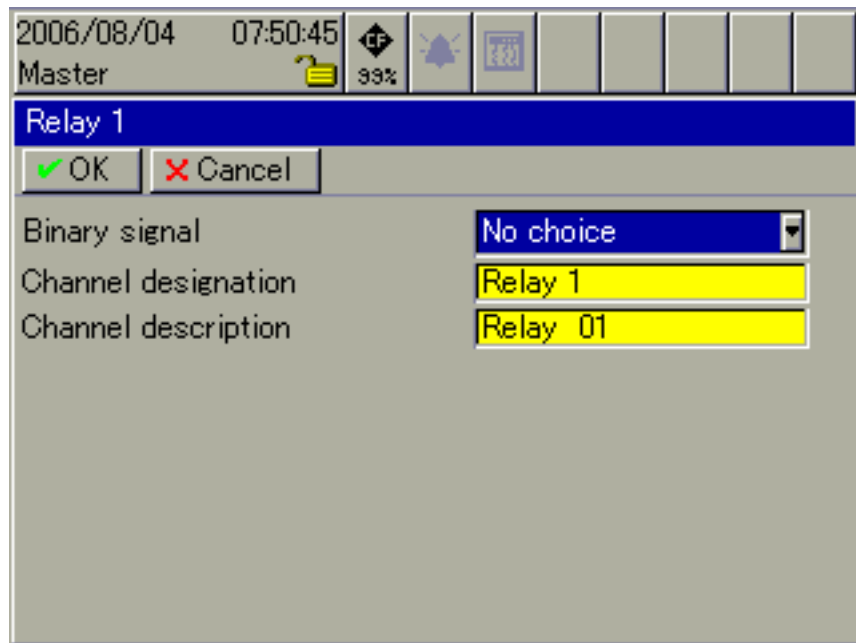
Alarm text	Text that is entered in the event or alarm list and displayed in the “status & title bar”, with the alarm type “Alarm” .
Alarm delay	This parameter delays the reporting of an alarm. If the alarm is no longer present after the alarm delay time has elapsed, it will not be triggered.

14 Configuration - Binary inputs/outputs

15 Configuration - Relay

The response of the relay(s) of the recorder are configured in this menu. How to connect the relay(s) is described in the Installation Instructions B 70.6580.4 (connectors 1 and 14, depending on the equipment level of the individual module slots).

Overview



Binary signal

Selection of the signal the chosen relay is to switch

Channel name (designation)

Short designation for the relay, up to 7 characters. The channel name is displayed in the individual visualization modes, together with the channel designation.

Channel description

Description of the relay, up to 21 characters. The channel description is displayed in the individual visualization modes, together with the channel name.

16 Configuration - External analog inputs

The external analog inputs that are connected to the recorder are configured in this menu. The external inputs are connected via

- one of the two serial interfaces (connector 2 or 7),
- the PROFIBUS-DP interface (connector 3 - extra code),
- the setup interface (connector 5) or
- the Ethernet interface (connector 6).

In the case of the two serial interfaces (connector 2 or 7), external inputs can be connected as a Modbus slave and as a Modbus master. Please take note of the parameters when configuring the serial interface.



Please avoid connecting the external inputs to the recorder via two interfaces. The interfaces will overwrite each other.

16.1 Range start ... Alarm configuration

Overview

Range start/ range end

Start and end of scaling in the recorder.

If the measurement goes outside the limits configured here, the error constant for overrange or underrange is written to the measurement variable. When the data are visualized, ">>>>" appears for overrange and "<<<<" for underrange.

Channel name (designation)

Short designation for the external analog input, up to 7 characters. The channel name is displayed in the individual visualization modes, together with the channel designation.

Channel description

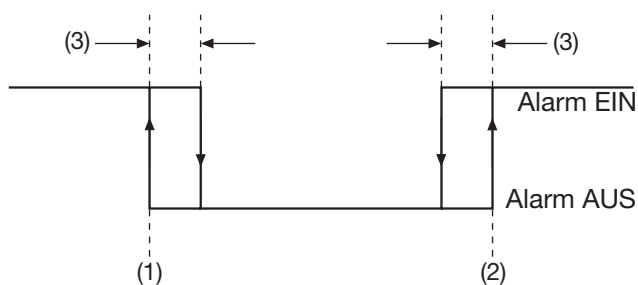
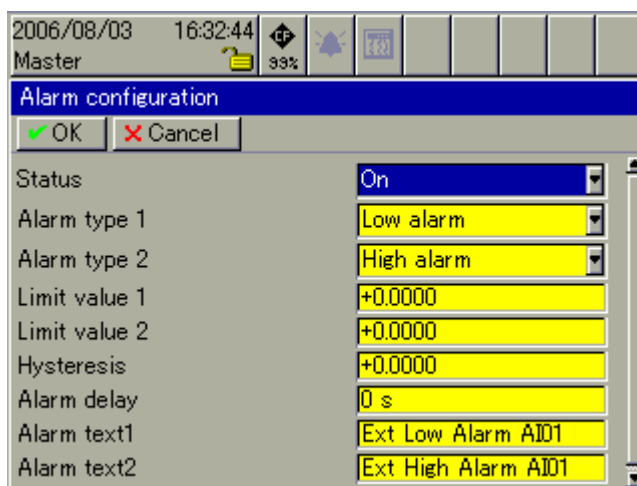
Description of the external analog input, up to 21 characters. The channel description is displayed in the individual visualization modes, together with the channel name.

16 Configuration - External analog inputs

Unit	Unit in which the acquired measurement signal is to be displayed, up to 5 characters. The unit is displayed wherever the measurement is presented numerically.
Decimal place	The decimal place serves to determine the number of integer and decimal places for the numerical presentation of the measurements. If required, the instrument will automatically switch to a different format, in order to be able to show all the integer places. As a rule: all integer places must be displayed.
Alarm configuration	Opens the submenu for the configuration of both alarms.

16.2 Alarm configuration

Overview



16 Configuration - External analog inputs

Status

Status activates alarm monitoring.

On	Alarm monitoring is active.
----	-----------------------------

**Alarm type 1/
alarm type 2**

“Low alarm” and “High alarm” are available for each alarm type.

Low alarm	Alarm is initiated if the value has fallen below the limit.
High alarm	Alarm is initiated if the value has gone above the limit.

**Limit value 1/
limit value 2**

Limit at which the alarm is initiated.

Hysteresis

The hysteresis serves to prevent an unsteady alarm state (repeated, brief switching on and off due to the noise of the input signal). The higher the value, the larger the amount by which the present measurement must go above or below the limit in order to cancel the alarm.

Alarm delay

This parameter delays the reporting of an alarm. If the alarm is no longer present after the alarm delay time has elapsed, it will not be triggered.

**Alarm text 1/
alarm text 2**

There is an alarm text for each type of alarm, which, in the event of an alarm, is displayed in the “status & title bar” and entered in the event list.

16 Configuration - External analog inputs

17 Configuration - External binary inputs

The external binary inputs that are connected to the recorder are configured in this menu. The external inputs are connected via

- one of the two serial interfaces (connector 2 or 7),
- the PROFIBUS-DP interface (connector 3 - extra code),
- the setup interface (connector 5) or
- the Ethernet interface (connector 6).

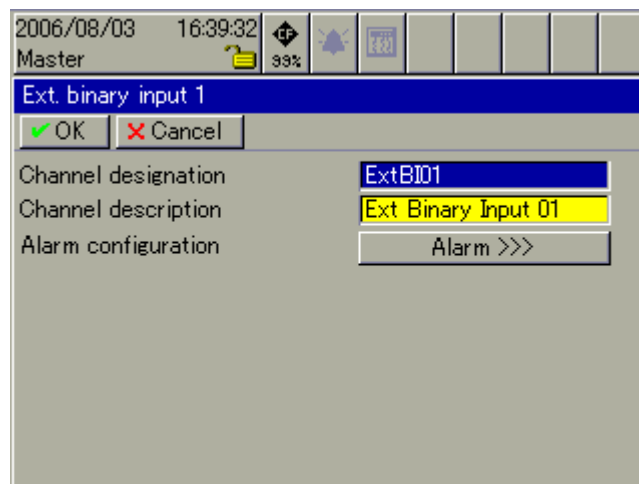
In the case of the two serial interfaces (connector 2 or 7), external inputs can be connected as a Modbus slave and as a Modbus master. Please take note of the parameters when configuring the serial interface.



Please avoid connecting the external inputs to the recorder via two interfaces. The interfaces will overwrite each other.

17.1 Channel name ... Alarm configuration

Overview



Channel name (designation)

Short designation for the external binary input, up to 7 characters. The channel name is displayed in the individual visualization modes, together with the channel designation.

Channel description

Description of the external binary input, up to 21 characters. The channel description is displayed in the individual visualization modes, together with the channel name.

Alarm configuration

Opens the submenu for the configuration of both alarms.

17 Configuration - External binary inputs

17.2 Alarm configuration

Overview

2006/08/03 16:40:19 Master 99%

Alarm configuration

✓ OK ✗ Cancel

Status: On

Alarm type: Event

Alarm active at: High (1)

Alarm text: Ext Alarm B I/O 01

Alarm delay: 0 s

Status

Status activates alarm monitoring.

On	Alarm monitoring is active.
----	-----------------------------

Alarm type

The alarm type determines whether the activating/inactivating of an input is to be evaluated as a genuine alarm or only as an event.

Event	The alarm text is entered in the event list only.
Alarm	<p>The alarm text is entered in the alarm list and the event list. In addition, the alarm text appears in the “status & title bar”, and the alarm bell is shown in red.</p> <p>30.03.2006 13:44:59 Master 75%</p> <p>Ext Alarm B I/O 01 1s</p> <p>Alarm text Alarm bell</p>

Alarm active on

Determines whether the alarm is present with an active or inactive input.

High (1)	Alarm with active input.
Low (0)	Alarm with inactive input.

Alarm text

Text that is entered in the event or alarm list and displayed in the “status & title bar”, with the alarm type “Alarm” .

Alarm delay

This parameter delays the reporting of an alarm. If the alarm is no longer present after the alarm delay time has elapsed, it will not be triggered.

18 Configuration - Groups

In the Groups menu you can determine which channels (analog or binary, math, internal or external, counters and integrators) are to be displayed and/or recorded. Furthermore, you can decide here how data are to be recorded (storage cycle, storage procedure, economy operation).

If batches are used, then these have a fixed assignments to the groups.

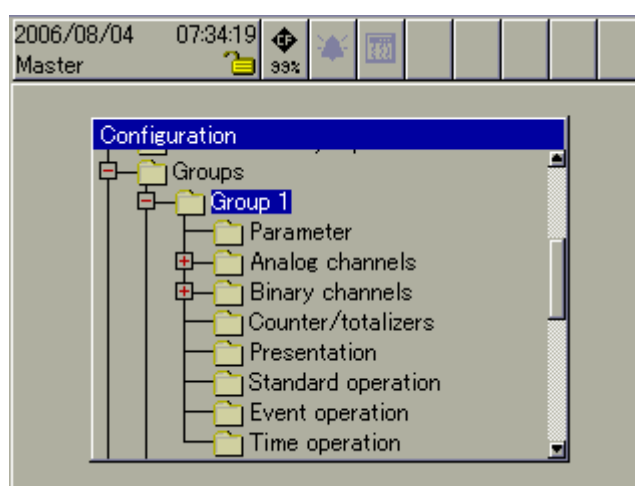
Plant number	Group	Plant (batch)
0	1 – 9	none
1	1 – 9	1
2	1 – 3 4 – 6 7 – 9	1 2 not assigned
3	1 – 3 4 – 6 7 – 9	1 2 3



In order for a batch to be usable, its main group must be active (status = “Display” or “Display, save”) and at least one analog channel in the group must be assigned.

Batch for plant	Main group
1	1
2	4
3	7

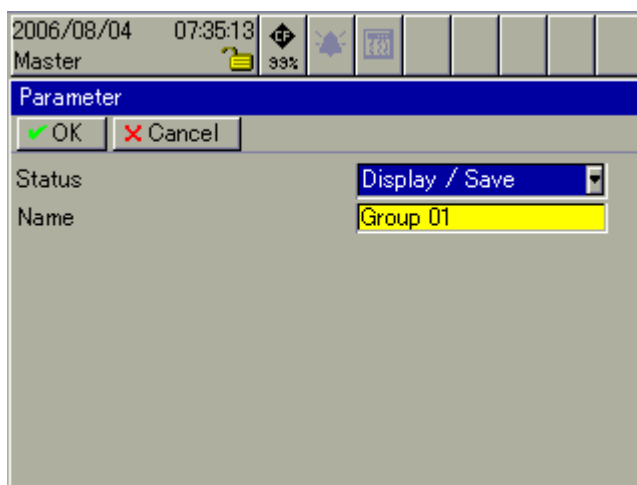
Overview



18 Configuration - Groups

18.1 Parameter

Overview



Status

This parameter determines what happens to the group.

Inactive	The data for the group will neither be displayed nor stored. This setting is only available from Group 2 on. If Group 4 or 7 is inactive, then the batch cannot be recorded for Plant 2 or 3.
Display only	The data for the group are displayed on the screen.
Display and save	The data for the group are displayed on the screen and stored. The group data can only be evaluated from a PC if they are stored.

Name


Description of the group, up to 21 characters. The description is displayed in the individual visualization modes.

18.2 Analog channels

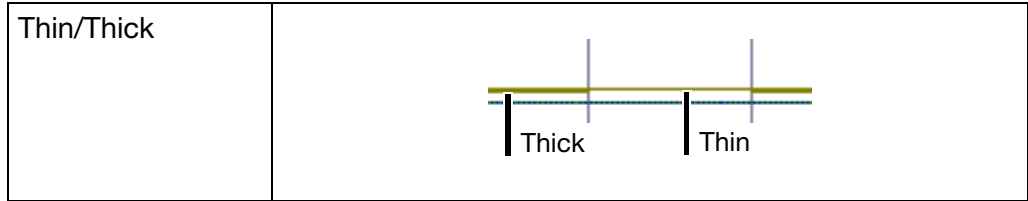
Overview Channel 1

Input signal The input (or input signal) selected here will be used as channel no. 1 for the group. All internal or external analog channels, as well as math channels (available as an extra), can be chosen.

Channel 1 has been assigned a special task: it is used as a reference curve for the other channels of the group. All the other channels of the group can be compared with Channel 1, independently of each other. On leaving the configured tolerance band, an alarm will be initiated, an alarm text will appear in the “status & title bar” and will be entered in the alarm or event list.

 A comparison of the tolerance band is only possible within the scaling limits. In the event of overrange/underrange on a channel, there will be LOW as well as HIGH alarm for all the other functions (in this particular case: positive and negative tolerance).

Line width Determines the width of the graphical measurement display.



Positive tolerance “Positive tolerance” and the present measurement from Channel 1 form the upper limit for the tolerance band. The value can only be entered as positive value.

Negative tolerance “Negative tolerance” and the present measurement from Channel 1 form the lower limit for the tolerance band. The value can only be entered as negative value.

Positive hysteresis If a positive tolerance infringement has occurred, then the present measurement from Channel 2 — 6 must first fall below the measurement from

18 Configuration - Groups

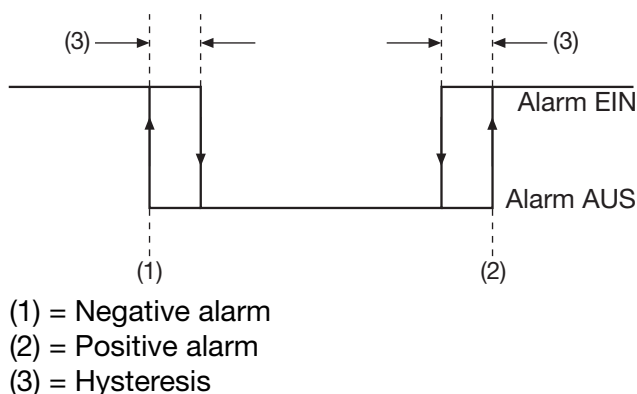
Channel 1 plus the positive tolerance and minus the positive hysteresis for the alarm to be canceled again. The value for the “positive hysteresis” can only be entered as a positive value.

Negative hysteresis

If a negative tolerance infringement has occurred, the present measurement from Channel 2 — 6 first has to rise above the measurement from Channel 1 plus the negative tolerance and plus the negative hysteresis for the alarm to be canceled again. The value for the “negative hysteresis” can only be entered as a positive value.

Example

The principle of initiating an alarm is the same as for the alarm configuration of the individual analog channels.



Measurement (Channel 1) = 21 °C

Measurement (Channel 2) = 21 °C, tolerance band comparison is active.

Positive tolerance = 10 °C

Positive hysteresis = 2 °C

An alarm occurs if the present measurement (Channel 2) goes above 31 °C.

The alarm is canceled if the present measurement (Channel 2) falls below 29 °C.

Measurement (Channel 1) = 21 °C

Measurement (Channel 2) = 21 °C, tolerance band comparison is active.

Negative tolerance = -10 °C

Negative hysteresis = 2 °C

An alarm occurs if the present measurement (Channel 2) falls below 11 °C.

The alarm is canceled if the present measurement (Channel 2) goes above 13 °C.

In the example illustrated, Channel 1 is constant and Channel 2 alters its measurement. However, this must not necessarily be so. It can also happen that Channel 1 changes, or even that both channels change.

18 Configuration - Groups

Overview

Channel 2 — Channel 6

2006/08/04 07:37:42
Master

Channel 2

OK Cancel

Input signal: Analog input 2

Line width: thin

Reference curve

Tolerance band active: No

Pos. ref. alarm text: Tol.(+) Gr. 1 Chann.2

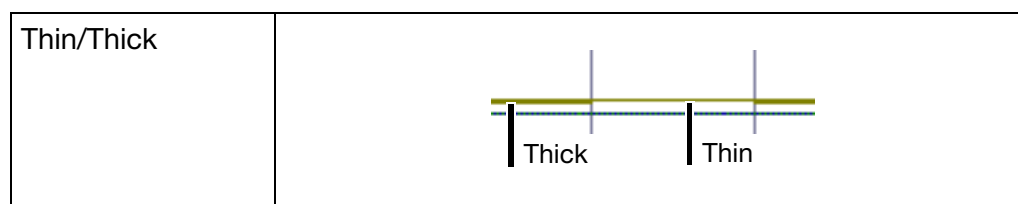
Neg. ref. alarm text: Tol.(-) Gr. 1 Chann.2

Input signal

The input (or input signal) selected here will be used as channel no. 2 — 6 for the group. All internal or external analog channels, as well as math channels (available as an extra), can be chosen.

Line width

Determines the width of the graphical measurement display.



Tolerance band active

If this function is active, the channel is compared with Channel 1 of the group.

Yes	Tolerance band comparison is active. Please note that Channel 1 of the group must be active (Input signal <> Inactive).
-----	--

Pos. ref. alarm text

The text that was entered (up to 21 characters) is displayed in the “status & title bar” and entered in the alarm or event list if the selected channel leaves the tolerance in the positive direction.

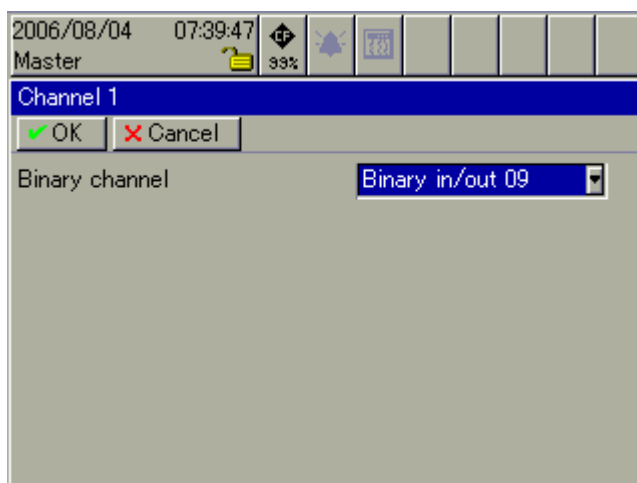
Neg. ref. alarm text

The text that was entered (up to 21 characters) is displayed in the “status & title bar” and entered in the alarm or event list if the selected channel leaves the tolerance in the negative direction.

18 Configuration - Groups

18.3 Binary channels

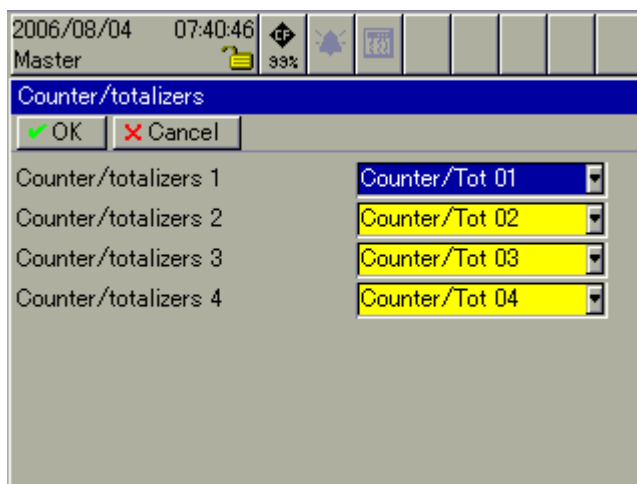
Overview



Input signal The binary input/1 output or signal selected here will be used as a binary channel and visualized. Up to 6 binary channels can be visualized in a group and acquired.

18.4 Counters/integrators

Overview



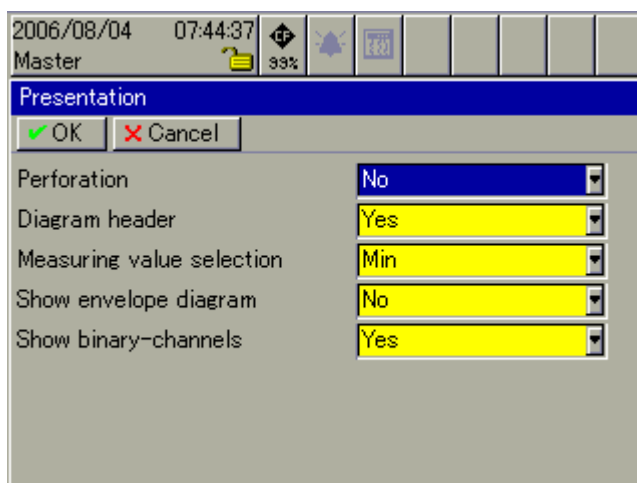
Counters/ integrators (totalizers) Up to 4 out of a total of 27 available counters/integrators can be assigned to the group. As a result of the assignment of the counters to a group, it is possible to allocate the counter and integrator alarms to the batches (plants) and to enter them in the corresponding alarm and event lists.

⇒ Chapter 3.3 “Group and plant management (batches)”

All 27 counters can be read off in each group in the PCA3000 Evaluation software. The four that have been allocated here are normally visible, the remaining ones can be switched into display as required.

18.5 Diagram view

Overview



It is also possible to alter some parameters in the visualization


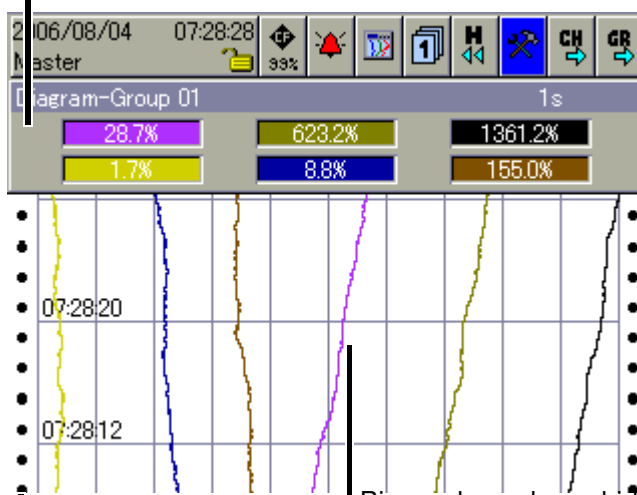
Curves or *Binary* using the  symbol, without having to alter the configuration.

Diagram header is switched on.



Perforation/punched edges is switched on.

Perforation

If the perforation is switched on, then the perforated margin – familiar from chart recorders – appears in the curve display, on the left-hand and right-hand edges of the screen. A precondition for this is, however, that the display of the binary traces is switched out of display.

18 Configuration - Groups

Diagram header With the help of this parameter, the diagram header can be switched on or off. The diagram header (numerical presentation of the measurements or switch symbols for the binary channels) is available in the visualization mode *Curves* and *Binary*.

Measurement selection The parameter Measurement selection enables you to choose between MIN and MAX. This setting exclusively affects the numerical measurement presentation in the visualization mode *Curves*, but only if MIN and MAX values are recorded at the same time. In the case of MIN and MAX value recording, the recorder operates internally at the maximum sampling rate and stores both the measured minimum and measured maximum within the active storage cycle. Measurement selection determines which value is shown in the diagram header.

MIN	The minimum values are displayed in the diagram header.
MAX	The maximum values are displayed in the diagram header.

MIN/MAX value recording is set through the parameter *Stored values* of the operating modes (normal, event and timed operation).

Show envelope diagram This parameter determines whether the measurement curves (only with activated MIN/MAX value recording) are presented as an envelope or as a line in the curve presentation. If the data are not recorded in the MIN/MAX value recording mode, the parameter has no effect.

MIN/MAX value recording is set through the parameter „*Stored values = MIN/MAX values*” of the operating modes (normal, event and timed operation).

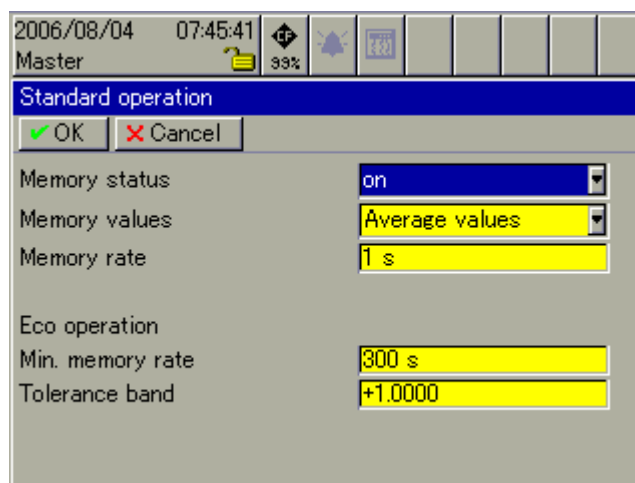
Yes	MIN/MAX values are presented as an envelope.
No	MIN/MAX values are presented as a line.

Show binary traces This parameter determines whether the binary traces (binary signals) are presented together with the analog signals in the curve display.

Yes	Binary and analog signals are shown.
No	The binary signals are not shown.

18.6 Normal operation

Overview



Memory status

Only if Memory status is switched on, is the operating mode “Normal operation” available.

With activated normal operation, the measurement data will be recorded at the storage cycle that was configured, unless

- event operation is active,
- timed operation is active or
- the parameter Stored values is configured for Eco operation.





If Memory status is switched off and neither event nor timed operation is active, only events are acquired but no measurement data stored.

Stored values

This parameter determines how measurement data are recorded.

Average values	The average value of the storage cycle that was set is calculated and stored.
Present values	The present value is stored at the storage cycle that was set.
MIN values	The minimum value is stored at the storage cycle that was set.
MAX values	The maximum value is stored at the storage cycle that was set.
MIN/MAX values	The minimum and maximum values (envelope) is stored at the storage cycle that was set.

18 Configuration - Groups

Eco operation	<p>Using this method, the value is stored if the measurement differs by a certain amount from the value that was last stored, or if a binary channel belonging to the group alters its state.</p> <p>In Eco operation, the configured storage cycle is regarded as the maximum storage rate. In no case will values be stored any faster, even if they change faster. The momentary value is always used for investigating the tolerance band, and only at the instances of time of the storage rate that was configured.</p> <p>⇒ Chapter 2.8.2 “Economy (Eco) operation”</p> <p>If a measurement is saved in Eco operation, it will, at the same time, be used as the new reference.</p> <p> If the storage cycle is set to 0 (= 125 msec), then not 1 measurement but 8 will be stored.</p> <p> If the “Min. storage cycle” is smaller than the “storage cycle”, Eco operation will become ineffective, i.e. the momentary values are stored.</p>
---------------	--

Storage cycle

The storage cycle is set here. Depending on the setting for the parameter *Stored values*, the measurement data are saved after the set time has elapsed. The smaller the storage cycle, the more data must be saved.



If 0 is set, the recorder uses the fastest possible rate, i.e. it saves the measurements every 125msec (high-speed mode).

Min. storage cycle (Eco operation)

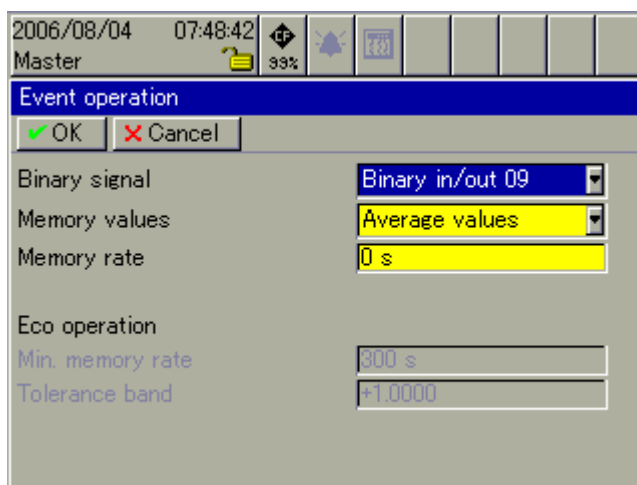
The storage cycle is set here, that will only be used if Eco operation is active. If no signal changes occur in Eco operation, no measurement data will be saved. This parameter is used for forced storage at the rate that was set. This provides the additional security that the connected sensing system is functioning.

Tolerance band (Eco operation)

The tolerance for Eco operation is specified here. If, in Eco operation, the deviation of the present value from the value that was last stored is larger than the tolerance entered here, the present value will be stored (if the storage cycle has elapsed at the same time). The tolerance always refers to the current scaling of an analog channel within the current group.

18.7 Event operation

Overview



- | | |
|--|--|
| Binary signal | Select which signal should start or terminate event operation. |
| Stored values
(memory
values) | ⇒ Chapter 18.6 “Normal operation” - Page 125 |
| Storage cycle
(memory rate) | ⇒ Chapter 18.6 “Normal operation” - Page 126 |
| Eco operation | The parameters for Eco operation are set in the menu <i>Normal operation</i> . |

18 Configuration - Groups

18.8 Timed operation

Overview

2006/08/04 07:49:39
Master 33%

Time operation

✓ OK ✗ Cancel

Start 00:00:00
End 00:00:00

Memory values
Memory rate

Eco operation
Min. memory rate 300 s
Tolerance band +1.0000

Start	Start time for initiating timed operation. If start = end, then timed operation is not active.
End	Stop time for terminating timed operation. If start = end, then timed operation is not active.
Stored values (memory values)	⇒ Chapter 18.6 “Normal operation” - Page 125
Storage cycle (memory rate)	⇒ Chapter 18.6 “Normal operation” - Page 126
Eco operation	The parameters for Eco operation are set in the menu <i>Normal operation</i> .

19 Configuration - Report

A report can be generated for each of the 9 groups . You can store the MAX/ MIN or average value for each analog channel in a report.



Procedure if the configuration is altered

All reports are concluded, saved and restarted. The values of the concluded reports are set to “----” in the instrument. In this case, the result of the concluded reports can only be made visible through the PCA3000 software.



Procedure in the *Memory manager*

The function “*Save all + update CF*” saves all reports, but does not conclude them. They keep on running.



Automatic interim status of the reports “Total” and “Yearly”

The reports “Total” and “Yearly” are saved once a month, always at the turn of the month, independently of the other reports. They are not concluded, but keep on running.

19.1 Total ... Period

Overview

2006/08/04 07:52:01 33%	
Group 1	
OK Cancel	
Total report	On
Daily report	On
Weekly report	On
Weekday	Monday
Monthly report	On
Yearly report	On
Periodically report	On
Period	3 min

19 Configuration - Report

Total *Total* determines whether a report is run over the entire duration of the current recorder configuration.

On	The total report is run.
----	--------------------------

Daily *Daily* determines whether a report is run over one day (24 hours). Conclusion and restart are determined by the parameter *Synchronization time*.

On	The daily report is run.
----	--------------------------

Weekly *Weekly* determines whether a report is run over one week. Conclusion and restart are determined by the parameter *Weekday* and *Synchronization time*.

On	The weekly report is run.
----	---------------------------

Weekday *Weekday* is used for the weekly report, together with the parameter *Synchronization time*, for the report end and restart.

Monthly *Monthly* determines whether a report is run over one month. Conclusion and restart will occur on the first day of the month at 00:00 hours.

On	The monthly report is run.
----	----------------------------

Yearly *Yearly* determines whether a report is run over a whole year. Conclusion and restart will occur on the first day of the year at 00:00 hours.

On	The yearly report is run.
----	---------------------------

Periodic *Periodic* determines whether a periodic report is run. Conclusion and restart are determined by the parameter *Period* and *Synchronization time*.

On	The periodic report is run.
----	-----------------------------

Period *Period* is used for the periodic report, for the report end and restart.

19.2 External, External start

Overview

2006/08/04 07:53:14
Master 99%

Group 1

OK Cancel

Monthly report	On
Yearly report	On
Periodically report	On
Period	3 min
External	On
Ext. start	Binary in/out 09
Synchronizat. time	12:00:00
Out of range	stop

External

External determines whether an external report is run while the external signal (*External start*) is set (HIGH).

On	The external report is run.
----	-----------------------------



Only one external report will be started in a group within 5 seconds, i. e. any external restart before the 5 seconds have elapsed will be ignored. If the start signal is still present after 5 seconds, the external report will be started at once. If the start signal is no longer present, the report will not be restarted.

External start

External start defines the start signal for the external report.

19 Configuration - Report

19.3 Synchronization time

Overview

2006/08/04 07:53:14 33%

Master

Group 1

OK Cancel

Monthly report	On
Yearly report	On
Periodically report	On
Period	3 min
External	On
Ext. start	Binary in/out 09
Synchronizat. time	12:00:00
Out of range	stop

Synchronization time

Synchronization time is used for the daily, weekly and periodic report, for the report end and restart.

The parameter *Synchronization time* is explained below, using a period report as an example.

Stop and restart will occur at the next instant of time which fits into the time grid, dependent on the *Synchronization time* and *Period*.

Example:

Period	= 2 hours
Synchronization time	= 11:30:00
Power ON	= 09:11:00

1. Period from 09:11 to 09:30 = 19 minutes
 2. Period from 09:30 to 11:30 = 2 hours
 3. Period from 11:30 to 13:30 = 2 hours
- etc.

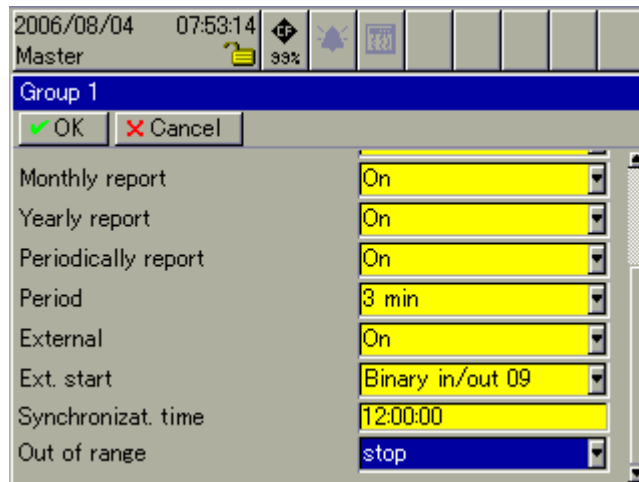


The principle is identical for all reports that are dependent on the *Synchronization time* (daily, weekly and periodic report).

As a rule, in the case of the daily report, the first report will not be run for 24 hours, and, in case of the weekly report, not for 7 days.

19.4 Out-of-range

Overview



Out-of-range

Out-of-range determines what happens when an internal or external analog input, or an allocated math channel, is outside the valid measurement range (scaling).

Stop	The channel reports are stopped. When the measurements are within the range limits again, they will continue to be run.
Delete	The reports are set to invalid ("-----") and will be restarted only after the configured report end has elapsed.

19 Configuration - Report

20 Configuration - Limit monitoring

Nine limit values are available for limit monitoring, in addition to the alarms at channel level.

For a description of the alarms at channel level, see Chapter 13.4 “Alarm configuration”.

20.1 Function ... Alarm configuration

Overview

2006/08/04 07:30:43
Master 33%

Limit value 1

OK Cancel

Function: High alarm

Analog value: No choice

Limit value: +0.0000

Hysteresis: +0.0000

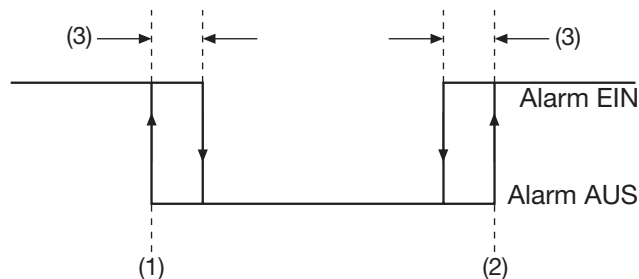
Switch-On Delay: 0 s

Behavior upon sensor break: Unchanged

Channel designation: Lim01

Channel description: Lim01

Alarm configuration: Alarm >>>



- (1) = Low alarm (limit value)
(2) = High alarm (limit value)
(3) = Hysteresis

Function

“Low alarm” and “High alarm” are available for each limit value.

Inactive	Limit monitoring is switched off.
Low alarm	Binary signal “Limit monitoring 1 – 9” is activated when the value falls below the limit.
High alarm	Binary signal “Limit monitoring 1 – 9” is activated when the value goes above the limit.

Analog value

Analog value determines the internal or external analog input that is to be monitored.

Limit value

Limit at which the binary signal is activated.

20 Configuration - Limit monitoring

Hysteresis The hysteresis serves to prevent an unsteady (flickering) binary signal (repeated, brief switching on or off due to the noise of the input signal). The higher the value, the larger the amount by which the present measurement must go above or below the limit in order to cancel the alarm.

Switch-on delay This parameter delays the setting of the binary signal. If the limit infringement is no longer present after the alarm delay time has elapsed, the binary signals will not be triggered.

Response to probe break This parameter defines what will happen to the binary signal in the event of a probe break.

Off	The binary signal is inactivated, irrespective of the present state.
On	The binary signal is activated, irrespective of the present state.
Unchanged	The binary signal retains its present state.

Channel name Short designation for the binary signal, up to 7 characters. The channel name is displayed in the individual visualization modes, together with the channel designation.

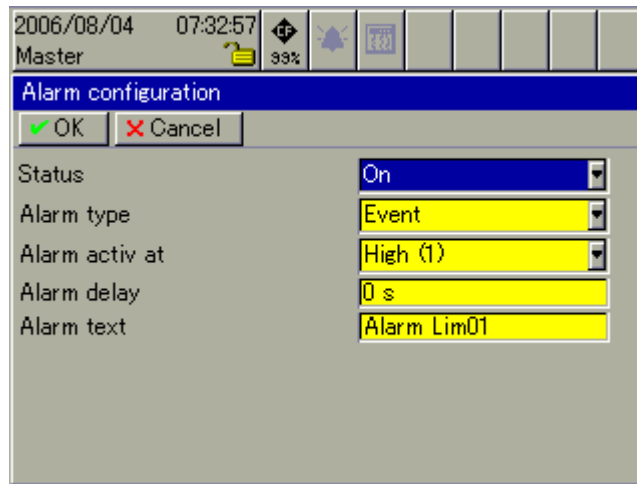
Channel description Description of the binary signal, up to 21 characters. The channel description is displayed in the individual visualization modes, together with the channel name.

Alarm configuration Opens the submenu for the configuration of the alarm.

20 Configuration - Limit monitoring

20.2 Alarm configuration

Overview



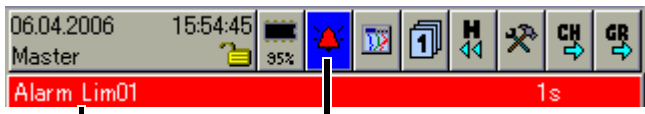
Status

Status activates alarm monitoring.

Off	Alarm monitoring is not active.
On	Alarm monitoring is active. In the event of an alarm, the binary signal “Alarm Limit 1 – 9” is set in addition to the binary signal “Limit monitoring 1 – 9”.

Alarm type

The alarm type determines whether the activating/inactivating of a binary signal is to be evaluated as a genuine alarm or only as an event.

Event	The alarm text is entered in the event list only.
Alarm	<div>The alarm text is entered in the alarm list and the event list. In addition, the alarm text appears in the “status & title bar”, and the alarm bell in the header is shown in red.  Alarm text Alarm bell</div>

Alarm active on

Determines whether the alarm is present with active or inactive limit infringement.

High (1)	Alarm with active limit infringement.
Low (0)	Alarm with inactive limit infringement.

Alarm text

Text that is entered in the event or alarm list and displayed in the “status & title bar”, with the alarm type “Alarm” .

20 Configuration - Limit monitoring

Alarm delay This parameter delays the reporting of an alarm. If the alarm is no longer present after the alarm delay time has elapsed, it will not be triggered.

21 Configuration - Counters/integrators

Each of the 27 channels can be configured as counter, integrator, operating time counter, or as high-speed counter.

- Counters (sampling rate 8Hz) are used to count binary signals.
- Integrators are used to integrate analog inputs.
- Operating time counters are used to measure the time in which binary signals are active.
- High-speed counters (sampling rate 10kHz) are used to count the first two binary inputs of a module (B1, B2, B9, B10, B17, B18). If a module has not been fitted with binary inputs, then the high-speed counters cannot be used for this module.

Stored counter and integrator counts can be evaluated on a PC using the PCA3000 Evaluation software. The counter/integrator count that was last stored can be displayed in the menu *Visualization* by means of the function *Counters/integrators*.



Please observe the notes in Chapter 2.5.

21.1 General setting

Overview

The screenshot shows a software window titled 'Gen. adjustment'. At the top, there is a status bar with the date '2006/08/04', time '08:00:38', and a battery level indicator at '33%'. Below the status bar, there are several icons. The main area of the window contains a table of settings:

Gen. adjustment	
<input checked="" type="checkbox"/> OK <input type="checkbox"/> Cancel	
Synch. time	00:00:00
Start time	00:00:00
End time	00:00:00
Period	3 min
Weekday	Monday
Reset activation	No choice

Synch. time

Synchronization time is used for daily, weekly and periodic counters and integrators, for termination and restart. When the synchronization time has been reached, all counts are stored, and the function is restarted with the start value 0.

For the “weekly” type, the parameter *Weekday* is also relevant.

The parameter *Synchronization time* is explained below, using a periodic counter by way of example.

21 Configuration - Counters/integrators

Stop and restart will occur at the next point in time which fits into the time grid, dependent on the *Synchronization time (Synch. time)* and *Period*.

Example:

Period	= 2 hours
Synchronization time	= 11:30:00
Power ON	= 09:11:00

Period 1 from 09:11 to 09:30 = 19 minutes

Period 2 from 09:30 to 11:30 = 2 hours

Period 3 from 11:30 to 13:30 = 2 hours

etc.

Start	<i>Start</i> is the start time for counters or integrators which have the parameter <i>Type</i> configured for “Daily (start...end)”.
End	<i>End</i> is the end time for counters or integrators which have the parameter <i>Type</i> configured for “Daily (start...end)”.
Period	<i>Period</i> is the period length for counters and integrators which have the parameter <i>Type</i> configured for “Periodic”.
Weekday	On <i>Weekday</i> at the <i>Synchronization time</i> , counters and integrators which have the parameter <i>Type</i> configured for “Weekly” are stored and restarted with the start value 0.
Reset activation	In addition to the normal end, a signal can be determined here with which the counter/integrator counts can be set to 0.

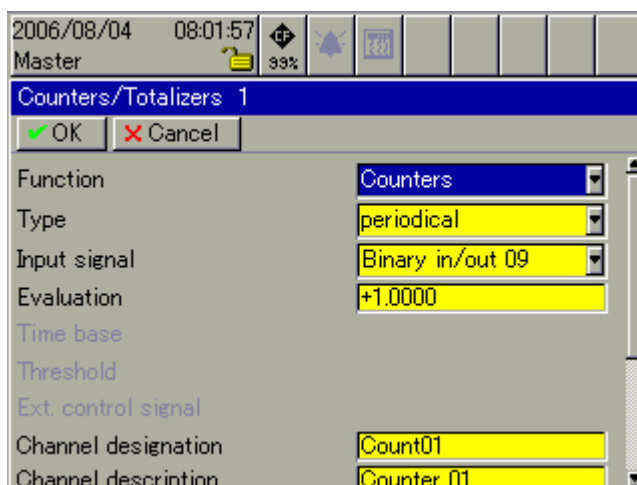


The current counts are not stored. This function proves useful for setting up a plant (test run), for instance.

21 Configuration - Counters/integrators

21.2 Function ... Channel description

Overview



Function

Function determines whether the channel that was selected is to be used as a counter/integrator, operating time counter, or as a high-speed counter.

Counter	The binary signal is to be counted.
Integrator	The analog signal is to be integrated.
Operating time	The operating time is to be acquired via a binary signal that was set.
High-speed counters B1 — B18	One of up to 6 fast binary inputs is to be acquired (B1, B2, B9, B10, B17, B18). Depending on the module equipment level, not all high-speed counters may be available.

Type

Type determines when the current count is stored. According to the setting, the parameters from Chapter 21.1 “General setting” must also be taken into account.

Type	Description
Periodic	Conclusion and restart are determined by the parameters <i>Period</i> and <i>Synch. time</i> .
External	Conclusion and restart are determined by an <i>Ext. control signal</i> . The counters/integrators operate when the external signal is set (HIGH).
Daily	<i>Daily</i> defines that the counters/integrators are counted/integrated over one day (24 hours). Conclusion and restart are determined by the parameter <i>Synch. time</i> .
Weekly	<i>Weekly</i> defines that the counters/integrators are counted/integrated over one week. Conclusion and restart are determined by the parameters <i>Weekday</i> and <i>Synch. time</i> .

21 Configuration - Counters/integrators

Type	Description
Monthly	<i>Monthly</i> defines that the counters/integrators are counted/integrated over one month. Conclusion and restart will occur on the first day of the month at 00:00 hours.
Yearly	<i>Yearly</i> defines that the counters/integrators are counted/integrated over one year. Conclusion and restart will occur on the first day of the year at 00:00 hours.
Total	<i>Total</i> defines that the counters/integrators are counted/integrated for the entire duration of the current recorder configuration.
Daily (start — end)	<i>Daily (start...end)</i> defines that the counters/integrators are counted/integrated over a period within one day. Conclusion and restart are determined by the parameters <i>Start</i> and <i>End</i> .

Input signal *Input signal* which has to be counted or integrated. If High-speed counter was set for the *Function* setting, *Input signal* is not available, the assignment is fixed.

Weighting With binary signals (counter), the result is increased by the factor *Weighting* whenever the signal is set, with analog signals (integrator), the present measurement is multiplied by *Weighting*. A down-counter can be formed by a negative weighting. Weighting is not available for the *Function* “Operating time”.

Time base *Time base* is only available for the *Function* “Integrator and operating time”. The present measurement (taking the weighting into account) is integrated according to the time base, or taken into account with the operating time.

Second	The measurement is divided by 1 and totalized every second.
Minute	The measurement is divided by 60 and totalized every second.
Hour	The measurement is divided by 3600 and totalized every second.
Day	The measurement is divided by 86400 and totalized every second.

Example: Time base = minute

⇒ An operating time counter (weighting = 1) is indicated in the Minutes unit.

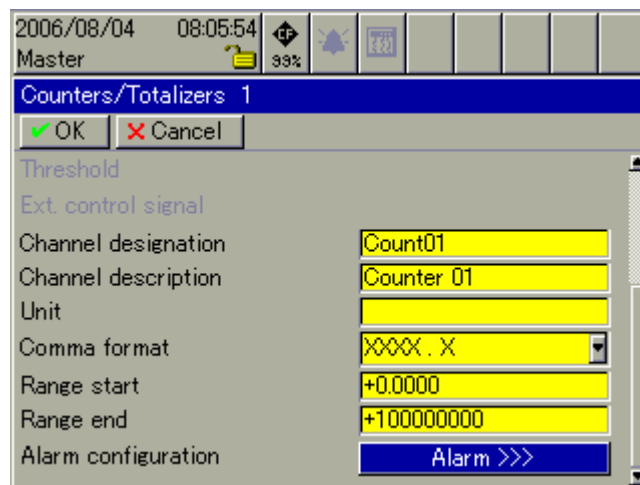
Threshold *Threshold value* is only available for the *Function* “Integrator”. An integration can only be made if the present measurement is larger than the threshold value. Time base and weighting do not come into the threshold value comparison.

21 Configuration - Counters/integrators

Ext. control signal	Selection of the control signal if <i>Type</i> “External” has been configured.
Channel name (designation)	Short designation for the analog input, up to 7 characters. The channel name is displayed in the individual visualization modes, together with the channel designation.
Channel description	Description of the analog input, up to 21 characters. The channel description is displayed in the individual visualization modes, together with the channel name.

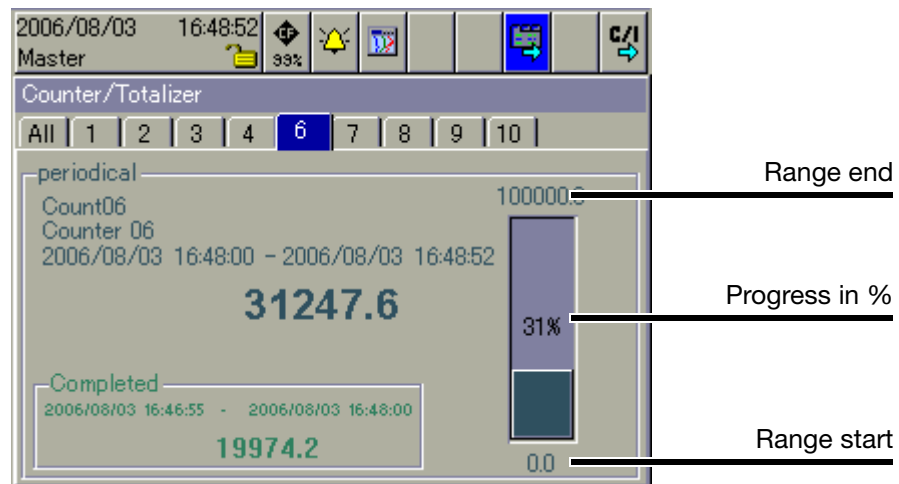
21.3 Unit ... Alarm configuration

Overview



Unit	Unit in which the counter or integrator count is to be displayed, up to 5 characters. The unit is displayed wherever the count is presented numerically.
Decimal place	The decimal place serves to determine the number of integer and decimal places for the numerical presentation of the measurements. If required, the instrument will automatically switch to a different format, in order to be able to show all the integer places. As a rule, all integer places must be displayed.
Range start and range end	<i>Range start</i> and <i>Range end</i> constitute the limits for integration. Underrange is indicated by “<<<<<<<<<”, overrange by “>>>>>>>>”. In the individual display in the “Counters/integrators” visualization mode, the range limits are the upper and lower limit of the bar graph display.

21 Configuration - Counters/integrators



Underrange and overrange are subject to tolerances, which are calculated as follows:

Underrange =
 $\text{range start} - (\text{range end} - \text{range start}) * 0.0125$

Overrange =
 $\text{range end} + (\text{range end} - \text{range start}) * 0.03125$

If the present count is outside these limits, then an overrange/underrange condition has occurred.

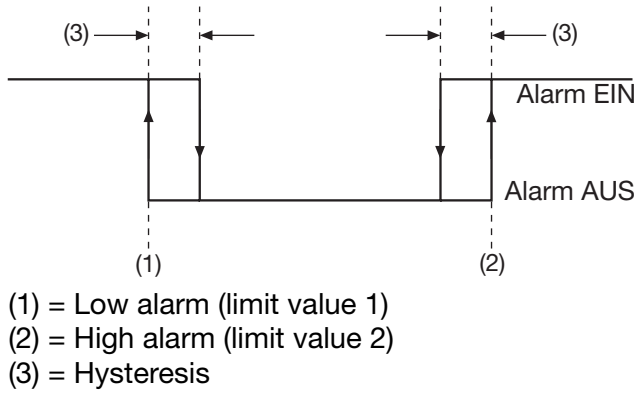
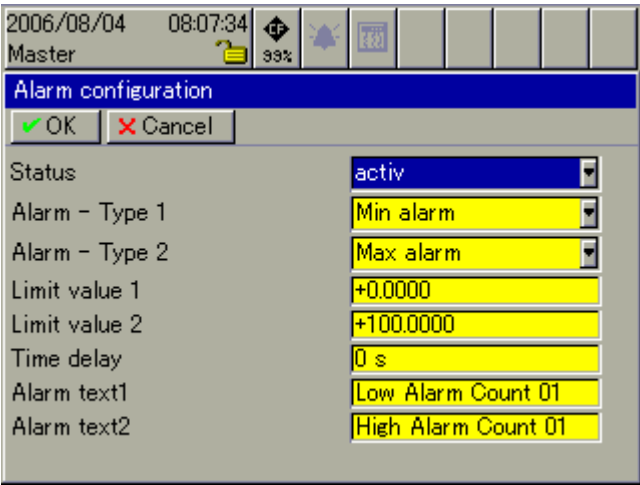
Alarm configuration

Opens the submenu for the configuration of both alarms.

21 Configuration - Counters/integrators

21.4 Alarm configuration

Overview



Status

Status activates alarm monitoring.

Off	Alarm monitoring is not active.
On	Alarm monitoring is active.

Alarm type 1/ alarm type 2

“Low alarm” and “High alarm” are available for each alarm type.

Low alarm	Alarm is initiated if the value has fallen below the limit.
High alarm	Alarm is initiated if the value has gone above the limit.

Limit 1/ limit 2

Limit at which the alarm is initiated.

21 Configuration - Counters/integrators

Hysteresis	The hysteresis serves to prevent an unsteady (flickering) alarm state (repeated, brief switching on and off due to the noise of the input signal). The higher the value, the larger the amount by which the present measurement must go above or below the limit in order to cancel the alarm.
Time delay	This parameter delays the reporting of an alarm. If the alarm is no longer present after the time delay has elapsed, it will not be triggered.
Alarm text 1/ alarm text 2	There is an alarm text for each alarm type, which, in the event of an alarm, is displayed in the “status & title bar” and entered in the alarm and event list.

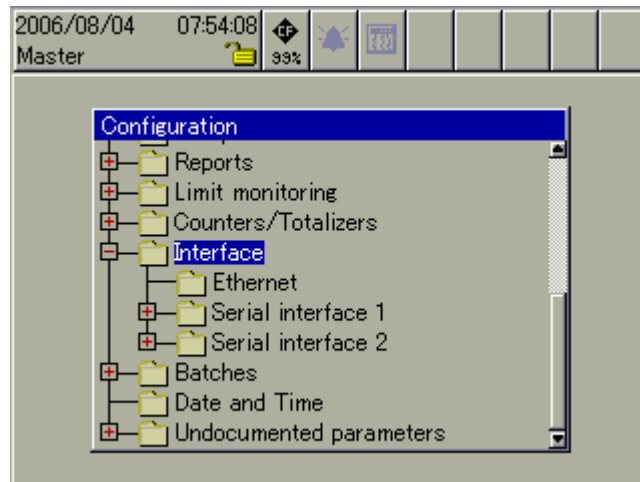
22 Configuration - Interface

The interfaces are used by the paperless recorder to communicate with other systems (e. g. a PC that is running the setup program or the PCA communications software).



A detailed description of the entire range of interface functions and protocols can be found in the separate interface description B 70.6580.2.0.

Overview



The interfaces for Ethernet (connector 6) and RS232/RS485 (connector 7) and the “RS232 for barcode reader” (connector 2) are provided as standard in the recorder.



- A barcode reader can also be connected to the RS232/RS485 interface.
- The “RS232 for barcode reader” interface can also be used for the transfer of data between the PC and a paperless recorder.
- Two barcode readers can be connected to 2 interfaces. The strings that are read in are fed to the same evaluation function. So it is conceivable that, for instance, one reader is used to start a batch report, and another reader to stop it.
- Only one modem can be connected.



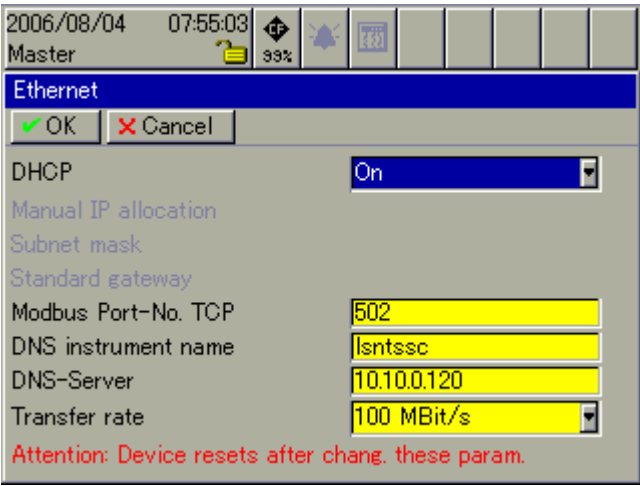
In addition to the configurable interfaces described in this chapter, the paperless recorder is also fitted with a special setup interface. It is also possible to run the setup program and the PCA communications software through these setup interfaces. There is one on the back panel (connector 5) and one on the front panel of the instrument (but not on the stainless steel version). The connection between the PC and the recorder is made via a PC interface with a TTL/RS232 converter, or a PC interface with an USB/TTL converter.

22 Configuration - Interface

22.1 Ethernet

The Ethernet interface can be used to connect the paperless recorder to a network. Communication is designed for 10Mbit/sec and 100Mbit/sec, and the network connection is made through an RJ45 socket.

Overview



All the settings concerning the Ethernet must be agreed up on with the network administrator. Up to 4 users can access a recorder simultaneously via Ethernet.

If alterations are made to the settings for Ethernet parameters, then the instrument will automatically carry out a reset (restart).

DHCP

DHCP (Dynamic Host Configuration Protocol) is used so that the paperless recorder can automatically receive an IP address and other communication parameters from a DHCP server.

On	DHCP is switched on, the recorder receives its IP address from the DHCP server
----	--

The other communication parameters that the paperless recorder usually receives from the DHCP server include the subnet mask, gateway address, and the lease time.

When the lease time (user time) has expired, the IP address loses its validity. In order that the paperless recorder may always have a valid IP address, it sends a query to its DHCP server whether the address is still valid when 50% of the lease time has expired. If the DHCP server is not available, the recorder repeats the query until 87.5% of the lease time has expired. After that, the recorder sends the query not only to the DHCP server, but to the entire network. If the lease time expires without the IP address being confirmed, the recorder declares the address as invalid and is no longer accessible in the network.

22 Configuration - Interface



An assigned address can be altered by the DHCP server. If, for example, the PCA communication software is used for the automatic collection of data, then the address must be altered within the software.

The automatically assigned IP address can be read in the menu *Device manager* → *Device info* → *Eth. Info* (Chapter 8.3 “Device information”).

IP address	If automatic IP address assignment is not used (DHCP = OFF), then the IP address for the paperless recorder is set here.
Subnet mask	<p>If automatic IP address assignment is not used (DHCP = OFF), then the subnet mask is set here.</p> <p>The subnet mask is used to gather devices (PC, recorders etc.) together to form subnets. All devices that have an IP address that is AND linked to the subnet mask belong to one subnet and can communicate with one another.</p> <p>If it is necessary to access devices outside the subnet, then the communication must be handled by a gateway (standard gateway).</p>
Standard gateway	<p>If automatic IP address assignment is not used (DHCP = OFF), then the address of the standard gateway is set here.</p> <p>The standard gateway is used for communication with devices that do not belong to the subnet.</p>
Port Modbus TCP	<p>The port address must be set if the paperless recorder needs to be accessed by visualization software, and the Modbus TCP protocol (Modbus tunneling: outer frame: Ethernet, inner frame: Modbus) is to be used.</p> <p>⇒ Further information can be obtained from the Operating Manual B 70.6580.0</p>
DNS device name	The DNS device name is set here. This makes it possible to access the device not only through its IP address, but also through its name.
DNS server	This is used to set up the IP address for a DNS server that is installed in the network. The DNS server is required to resolve the name for e-mail transfer via Ethernet.
Transfer rate	Here you can configure the transfer rate that is used for communication between the paperless recorder and the DHCP server or other computers.

22 Configuration - Interface

22.2 RS232/RS485

22.2.1 General

Overview

The screenshot shows a configuration window titled 'General' with a blue header bar. Below the header are 'OK' and 'Cancel' buttons. The window contains several labeled fields with corresponding input controls:

- Instrument address: A text box containing the value '1'.
- Type: A dropdown menu showing 'RS232'.
- Protocol: A dropdown menu showing 'Modbus slave'.
- Baud rate: A dropdown menu showing '38400'.
- Data format: A dropdown menu showing '8 - 1 - no Parity'.
- Min response time: A text box containing '40 ms'.



In order for communication to take place – e. g. with the setup program – the interface parameters for the PC and the recorder must be identical at both ends of the connection.

Device address For the RS485 type of interface, the *device address* for the paperless recorder must only occur once within a group of connected instruments on the same bus. This has little significance for an RS232 interface, since only one device can be connected to the serial interface.

Type The type of interface that is to be used.

Protocol The protocol that is to be used.

Modbus slave	The paperless recorder operates as a Modbus slave.
Modbus master	The paperless recorder operates as a Modbus master. Additional parameters must be set up in the menu <i>Device manager</i> → <i>Configuration</i> → <i>Interface</i> → <i>RS232/RS485</i> → <i>Modbus master</i> .
Bar code	A barcode reader is to be connected to the interface.

⇒ Further information can be obtained from the Operating Manual B 70.6580.0

Baud rate The transmission rate that is to be used for operating the interface.

22 Configuration - Interface

Data format

The data format that is to be used for operating the interface.

8 - 1 - no parity	8 data bits, 1 stop bit, no parity
8 - 1 - odd parity	8 data bits, 1 stop bit, odd parity
8 - 1 - even parity	8 data bits, 1 stop bit, even parity

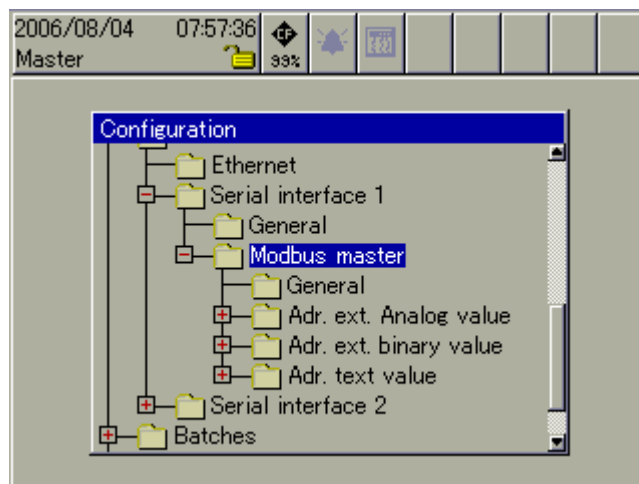
Min. response time

The *minimum response time* is the minimum time that the recorder will take before it sends a response to a data request.

The minimum response time is required by the RS 485 interface in the master, in order to switch over the interface driver from transmit to receive. This parameter is not required for the RS 232 interface.

22.2.2 Modbus master

Overview



The parameters found under *Modbus master* can only be set up if the Modbus master was selected as the protocol in the RS232/RS485 interface settings.

General

The *timeout* and *polling cycle* are set here. The *timeout* defines that time after which the master will declare that an initiated request has an error. The *polling cycle* defines the interval between requests for reading data from a slave device.

Addr. ext. analog value

A maximum of 24 external analog inputs can be read into the paperless recorder. The following parameters must be configured for each analog variable.

Device address	The address of the slave device from which data are to be fetched.
Modbus address	Address within the instrument. The entry is made in decimal format. ⇒ See the instrument documentation for the slave device.

22 Configuration - Interface

Number of measurements	The number of measurements to be read. The number “1” means that one measurement is made at every cyclical interval. If a number larger than 1 is entered, then (commencing at the Modbus address) several measurements will be read and automatically distributed to the following external inputs (analog values). The entry template will be locked for subsequent values. Example: From “Ext. analog value 1” on, three measurements are read. In the menu, the settings for “Ext. Analog value 2” and “Ext. analog value 3” will be locked. From “Ext. analog value 4” on, a new arrangement can be configured.
Data format	<p>Selection of the format in which data are to be received.</p> <p>For the float format, you can define whether the LSB (least significant bit) or MSB (most significant bit) is transmitted first.</p> <p>In the unsigned integer format (UInt: 0 — 65535) and the integer format (Int: -32768 — 32767) you can define a divisor for the division of the data that are received. The purpose of the division is to make it possible for floating point values to be transmitted in integer format. So the sender must multiply the data by the corresponding factor before transmission.</p>

Addr. ext. binary value

A maximum of 24 external binary tracks (binary values) can be read into the paperless recorder. The following parameters must be configured for each binary variable.

Device address	The address of the slave device from which data are to be fetched.
Modbus address	<p>Address within the instrument.</p> <p>⇒ See the instrument documentation for the slave device.</p>
Bit number	<p>The bit (b0 — b15) that is to be read.</p> <p>⇒ See the instrument documentation for the slave device.</p>

22 Configuration - Interface

Bit quantity	<p>The number of bits to be read. The number “1” means that one bit is read at every cyclical interval. If a number larger than 1 is entered, then (commencing at the Modbus address) several bits will be read and automatically distributed to the following external binary values. The entry template will be locked for subsequent values.</p> <p>Example: From “Ext. binary value 1”, 16 bits will be read. In the menu, the settings for “Ext. binary value 2” to “Ext. binary value 16” will be locked. From “Ext. binary value 17” on, a new arrangement can be configured.</p>
--------------	--

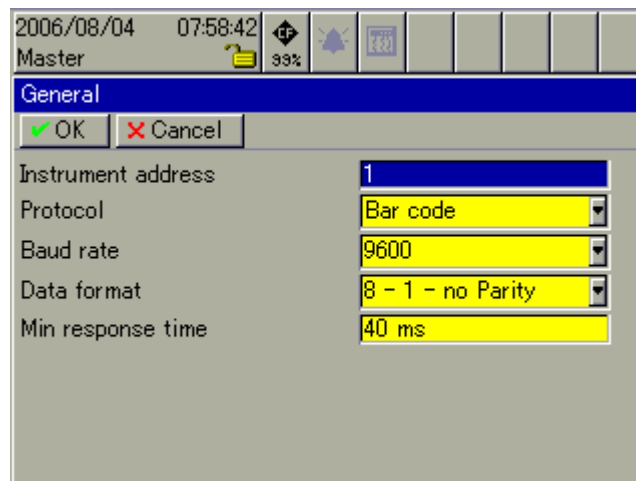
Addr. ext. text

A maximum of 9 texts can be read into the paperless recorder.

Device address	The address of the slave device from which data are to be fetched.
Modbus address	Address within the instrument. ⇒ See the instrument documentation for the slave device.
Word number	The read-in is always made as words, i. e. there will always be at least two characters read.

22.3 RS232 for barcode reader

Overview



The settings correspond to those for the interface „RS232/RS485“.

⇒ Chapter 22.2 “RS232/RS485”

22 Configuration - Interface

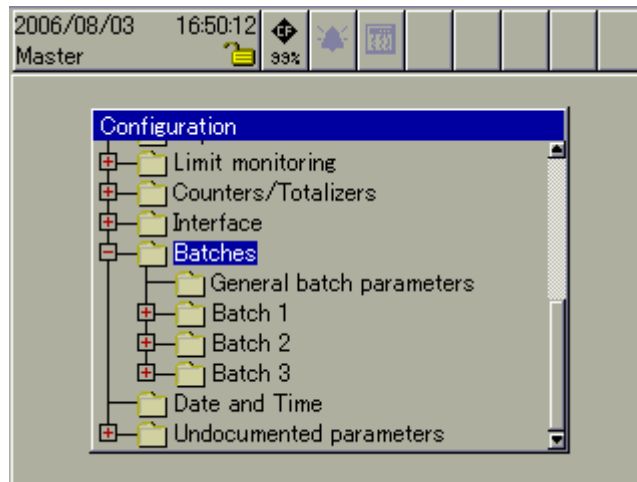


The transmission rate at which the barcode reader operates can be found in the operating instructions for the barcode reader. In many cases, the maximum transmission rate will be 9600 bps.

The barcode reader can be used to start batches and for the automatic entry of batch data.

⇒ Chapter 23 “Configuration – Batches/plants”

23 Configuration – Batches/plants



Please note the relationship between group and plant (batch).

⇒ Chapter 3.3 “Group and plant management (batches)”



⇒ The visualization of batches (in progress and completed) is described in Chapter 4.9 “Batches/plants”.

23.1 General info on batches

Batch reporting enables the creation of a flexible form to describe a batch process within the paperless recorder. A maximum of three batches (for 3 plants) can be recorder at the same time.

The control (start, stop) of the batch reports can be performed by one of the binary signals (control signals), by the control knob, or by a barcode reader.

For additional information on the digital signals, see

⇒ Chapter 2.7 “Binary signals”

For additional information on control by a barcode reader, see

⇒ Chapter 4.9.3 “Batch control through barcode reader”

Two different screen presentations are available for batch reporting: The following are available:

- current batch report and
- completed batch report

23 Configuration – Batches/plants

Batch texts

How can something be edited?

Die Texte sind am Gerät und mit der Setup-Software editierbar. Sie können mit der Setup-Software auch online an ein Gerät gesendet werden.

Gerät:

- Konfiguration
- Chargen/Anlagen
- Anlage 1...3
- Zeile 1...10
- Inhalt rechte Spalte und Werkseinstellung

Gerät:¹

- Visualisierung
- aktuelle Charge
- Charge auswählen
- Editieren aktivieren
- Feld mit Bedienknopf auswählen
- Bedienknopf betätigen



Setup-Software:

- Chargen/Anlagen
- Chargen/Anlagen 1...3
- Chargeninfo
- Zeile auswählen
- Editieren

Setup-Software

(online):^{1,2}

- Verbindung aufbauen
- Extras
- Schnittstellentexte schreiben
- Text(e) editieren
- Senden

Die Texte sind am Gerät und mit dem Setup-Programm editierbar.

Gerät:

- Konfiguration
- Chargen/Anlagen
- Allg. Anlagenparameter
- Text linke Spalte 1...10

Setup-Software:

- Chargen/Anlagen
- Chargen/Anlagen 1
- Chargeninfo
- Zeile 1...10
- Editieren

Werden Chargenbeginn, -ende und -dauer verwendet, sind die Zeilen nicht editierbar.

Die Chargennummer lässt sich dauerhaft ausschließlich am Gerät ändern (Menü Parametrierung).

Sie kann am Gerät oder mit dem Setup-Programm temporär geändert¹ werden; am Ende einer Charge wird die geräteinterne Chargennummer wieder aktiviert.

¹. Nur verfügbar, wenn der jeweilige Chargen-Parameter Text editierbar? auf Ja steht.

². Sollte das Schreiben der Schnittstellen Texte nicht funktionieren, hat der Benutzer, der mit dem Gerät verbunden ist, nicht die notwendigen Rechte.

23 Configuration – Batches/plants

23.2 General plant parameters

Overview

Number of plants

The parameter defines the number of plants for which a batch report is to be created.

0	Batch reporting is not active.
1 – 3	A batch report is created for each active plant.

Comment

For concluded batches, the text that is entered is shown a header for a text of maximum length 400 characters, which is used to describe the batches (recipe or similar). The description can only be entered through the setup program, not on the instrument.

Text left column 01 – 10

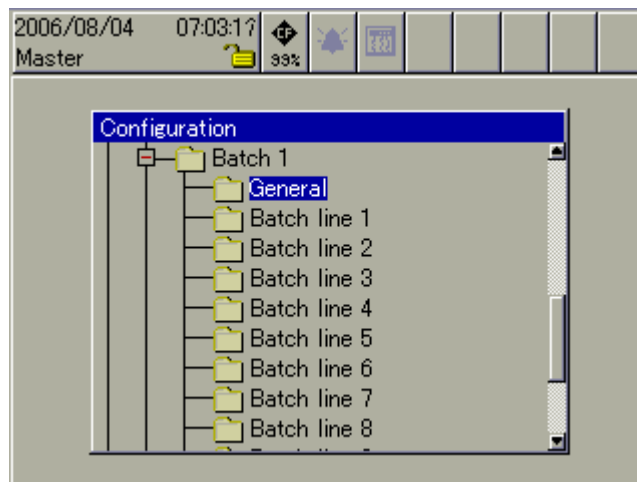
The parameters define the text in the left-hand column of the batch protocol. The text is the same for all plants (batch reports).

⇒ Chapter 4.9 “Batches/plants”

23 Configuration – Batches/plants

23.3 Plant 1 – 3

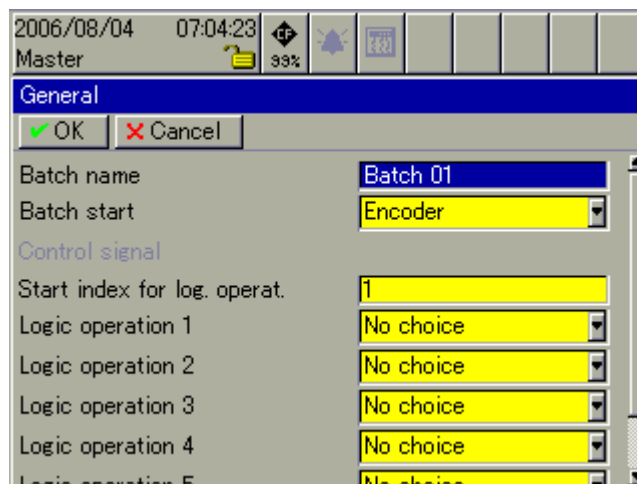
Overview



For each plant/batch, in addition to the “general plant parameters”, there are also some “general parameters” and the management of the contents in the right-hand column of the batch reports.

23.3.1 General

Overview



Plant name

The plant name (maximum length 15 characters) is displayed in the status and title bar for the display of a current or concluded batch report, and can be used as a batch text in the right-hand column of a batch report. It is also used in the *Alarm and event lists* menu.

- ⇒ Chapter 4.9 “Batches/plants”
- ⇒ Chapter 6 “Alarm and event lists”

23 Configuration – Batches/plants

Batch start This parameter defines how the batch report for a plant is to be started and stopped.

Inactive	Batch reporting cannot be started.
Control knob	Batch reporting can be started and stopped by the operator, using the control knob on the instrument.
Binary signal	Batch reporting is started and stopped by one of the binary signals.
Bar code	Batch reporting is started and stopped by a barcode reader.

Control signal The control signal can only be activated if batch reporting is set to be started by a binary signal.



If the “Batch start” parameter is set to “Binary signal”, and the “Control signal” parameter is set to “inactive”, then batch reporting cannot be started. If “Control signal” is active, then a binary signal must be selected.

Start at text This parameter is used as the start marker for the binary linking. If binary linking is active for a batch text, then one of the 128 device-internal batch texts can be inserted into a current batch report immediately after the “Start at text” position.



Batch text used = Start at text + logic combination

Logic operation (binary linking)
1 – 6

Depending on the settings, binary linking allows up to 64 different texts to be incorporated into the batch report under control of the binary signals.

Up to 128 batch texts are available, which can be defined in the setup program. The batch text that is used is defined by the “Start at text” parameter and the “Logic operation”.

23 Configuration – Batches/plants

23.3.2 Lines 1 – 10

Overview

2006/08/04 07:06:00 Master 33%

Batch line 1

OK Cancel

Content right Column Text list

From text number 1

To text number 17

Default Text Default Text 01

Editable text Yes

Right column contents

This determines how the text is formed in the right-hand column of a batch report.

Empty	The field remains empty.
Fixed text	A fixed text is used, defined by the factory default parameter.
Text list	One of 128 device-internal batch texts is used. After a new configuration, the factory default text will be shown at first. The user has to select the required text from the list in the “Current batch” visualization. The batch texts can be defined in the setup program.

23 Configuration – Batches/plants


Log. combined text	<p>One of 128 device-internal batch texts is used. The selection is made through up to 6 binary signals.</p> <p>Chapter 23.3.1 “General”</p> <p>If, for instance, 2 binary signals are active, then 4 texts can be inserted. If all 6 binary signals are active, then 64 different texts can be inserted. Binary linkage 1 has the value 2^0, binary linkage 2 has the value 2^1, and so on.</p> <table><tr><th>B6</th><th>B5</th><th>B4</th><th>B3</th><th>B2</th><th>B1</th><th>Text</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>2</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>3</td></tr><tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr><tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr><tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr><tr><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>60</td></tr><tr><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>1</td><td>61</td></tr><tr><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>62</td></tr><tr><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>63</td></tr></table> <p>0 = set to inactive, or no active signal 1 = not set to inactive, and signal is active</p> <p>The “Start at text” parameter is added to the text column for the output of the batch text.</p>	B6	B5	B4	B3	B2	B1	Text	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	2	0	0	0	0	1	1	3	1	1	1	1	0	0	60	1	1	1	1	0	1	61	1	1	1	1	1	0	62	1	1	1	1	1	1	63
B6	B5	B4	B3	B2	B1	Text																																																																															
0	0	0	0	0	0	0																																																																															
0	0	0	0	0	1	1																																																																															
0	0	0	0	1	0	2																																																																															
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1	1	1	1	0	1	61																																																																															
1	1	1	1	1	0	62																																																																															
1	1	1	1	1	1	63																																																																															
Plant name	<p>The plant name is shown.</p> <p>⇒ Chapter 23.3.1 “General”</p>																																																																																				
Batch No. plant 1 — 3	<p>One of three batch numbers is used. The batch number is increased by one at the end of a batch. It can be preset in the <i>Parameterization</i> menu.</p>																																																																																				
Batch start	<p>Start (date and time) of a batch report.</p>																																																																																				
Batch end	<p>End (date and time) of a batch report.</p>																																																																																				
Batch duration	<p>The time difference between batch start and batch end.</p>																																																																																				
Bar code	<p>The text in the selected line will be loaded from by a barcode reader.</p> <p>⇒ Chapter 4.9.3</p>																																																																																				

23 Configuration – Batches/plants

External text 1 – 9	The text in the selected line will be loaded with one out of a maximum of nine interface texts.
------------------------	---

From Text No. This parameter is available if the text in the right-hand column is created from the internal text list, and is the first text from the list that is available for selection by the user.

To Text No. This parameter is available if the text in the right-hand column is created from the internal text list, and is the last text from the list that is available for selection by the user.

Factory setting The factory setting (default text) is inserted into the current batch report if the text in the right-hand column is formed from “Fixed text”, “Text list” or “Bar code”. If the factory setting needs to be altered, then the data must be edited in the current batch report (). To do this, the “Edit text” parameter must be active.

Editable text This parameter enables the alteration of a text within the current batch report.

No	The text can only be altered through the settings “Right column contents” and “Factory setting”.
Yes	The text can additionally be altered for the current batch report. After the batch report has been concluded, the configured text will be active.

23 Configuration – Batches/plants

23.4 Final remarks

The table below provides information again on the aids for configuring the individual text fields.

Text field	Setup program	Text editor	Automatic	Interface
Texts in the left column	yes	yes		yes
Fixed text, text list, log. combined text, plant name, barcode texts, ext. text	yes	yes		yes
Batch No.		yes	yes	
Batch start, batch stop			yes	

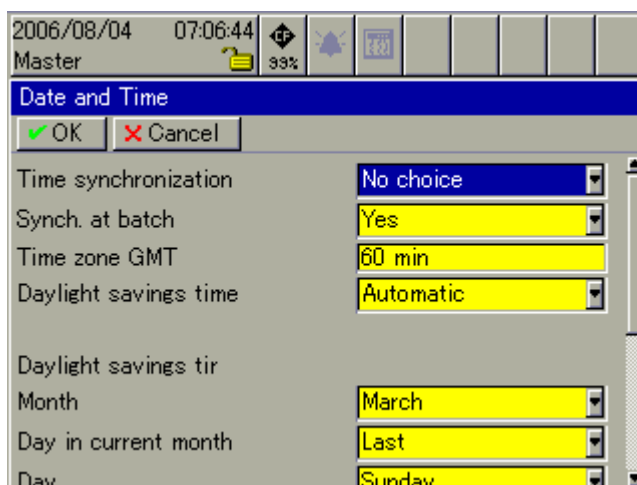


Each one of the 10 lines is freely selectable and positionable.

24 Configuration - Date and time

24.1 Time synchronization ... Summer time

Overview



Time synch.

This parameter can be used to influence the time setting for the paperless recorder. When used in conjunction with a binary signal it can thus ensure that several recorders are synchronized to the same time.

Inactive	No synchronization takes place.
Binary I/O	<p>Select the signal that is to be used to activate the synchronization.</p> <p>The time is synchronized with the transition from Low to High.</p> <p>The seconds are decisive when changing the time. The time is advanced or retarded by a maximum of ± 30 seconds.</p> <p>Example: 12:55:29 -> 12:55:00 12:55:30 -> 12:56:00</p>

Synch. for batch

This parameter determines whether the time synchronization can also be activated while batch reporting is in progress.

No	No synchronization will take place while a batch report is active.
Yes	Time synchronization will be carried out, even if a batch report is active.

24 Configuration - Date and time

Time zone (GMT)

The GMT parameter (Greenwich Mean Time) defines the time zone (ignoring any summer time shift) in which the recorder is being operated. This setting is important for evaluating data with the PC Evaluation Software PCA3000.

Germany, France ...	1 h = 60 min
England	0
Ukraine	2 h = 120 min
Russia (Moscow)	3 h = 180 min

Summer time (daylight saving time)

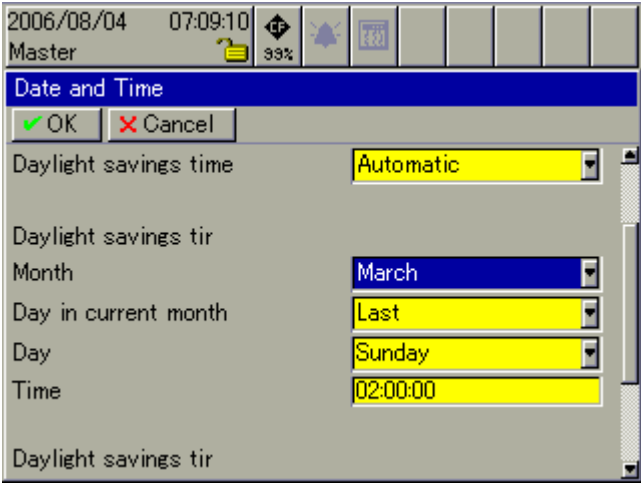
This parameter determines whether the summer time change is active or inactive.

Off	No summer time change takes place. The parameters - described in Chapter 24.2 and Chapter 24.3 - will be blanked out, and cannot be configured.
Automatic	The summer time change is active. The parameters - described in Chapter 24.2 and Chapter 24.3 - will determine the times of the changes.

24.2 Summer time start

When summer time starts, the time is brought forwards by one hour.

Overview



Month The month in which summer time starts is selected here.

Day of the month This parameter is only available if a weekday has been configured in the “Day” parameter. In conjunction with “Day”, this sets which weekday in that month starts the summer time.

Example:

Month = March
Day of the month = last
Day = Sunday
Time = 02:00

So the changeover to summer time takes place at 02:00 on the last Sunday in March.

Day This parameter defines the day of the month on which summer time starts.

Sunday ... Saturday	The weekday on which summer time starts. The “Day of the month” parameter also has an effect.
1 — 31	The day (date) on which summer time starts.

Time The time at which summer time starts is set here.



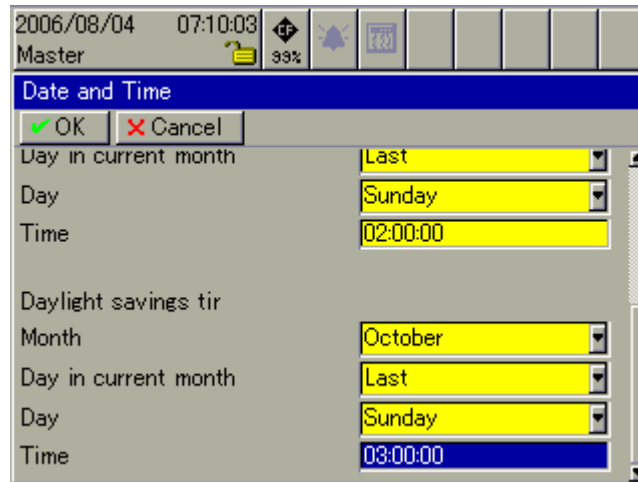
There is no validity check for the summer time setting. Please check that the entry is correct.

24 Configuration - Date and time

24.3 Summer time end

When summer time ends, the time is put back one hour.

Overview



Month

The month in which summer time ends is selected here.

Day of the month

This parameter is only available if a weekday has been configured in the “Day” parameter. In conjunction with “Day”, this sets which weekday in that month ends the summer time.

Example:

Month = October

Day of the month = fourth

Day = Sunday

Time = 03:00:00 AM

So summer time will end at 03:00 on the fourth Sunday in October.

Day

This parameter defines the day of the month on which summer time ends.

Monday – Sunday	The weekday on which summer time ends. The “Day of the month” parameter also has an effect.
1 – 31	The day (date) on which summer time ends.

Time

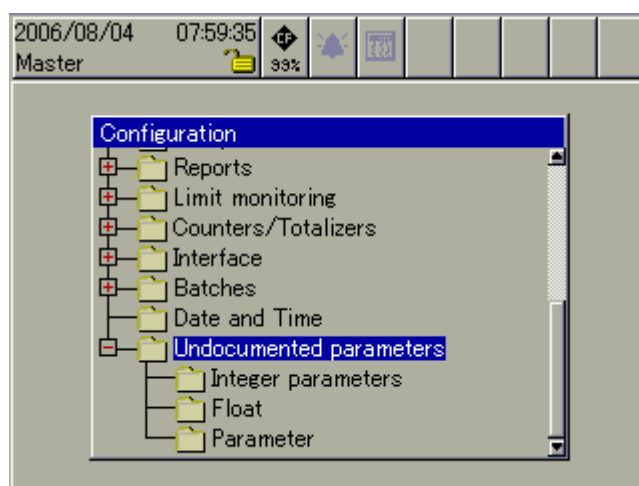
The time at which summer time ends is set here.



There is no validity check for the summer time setting. Please check that the entry is correct.

25 Configuration - Undocumented parameters

Overview



Undocumented parameters are used for extending the functionality of the paperless recorder. They should only be altered on express instruction from the manufacturer.

26 Entering text and values

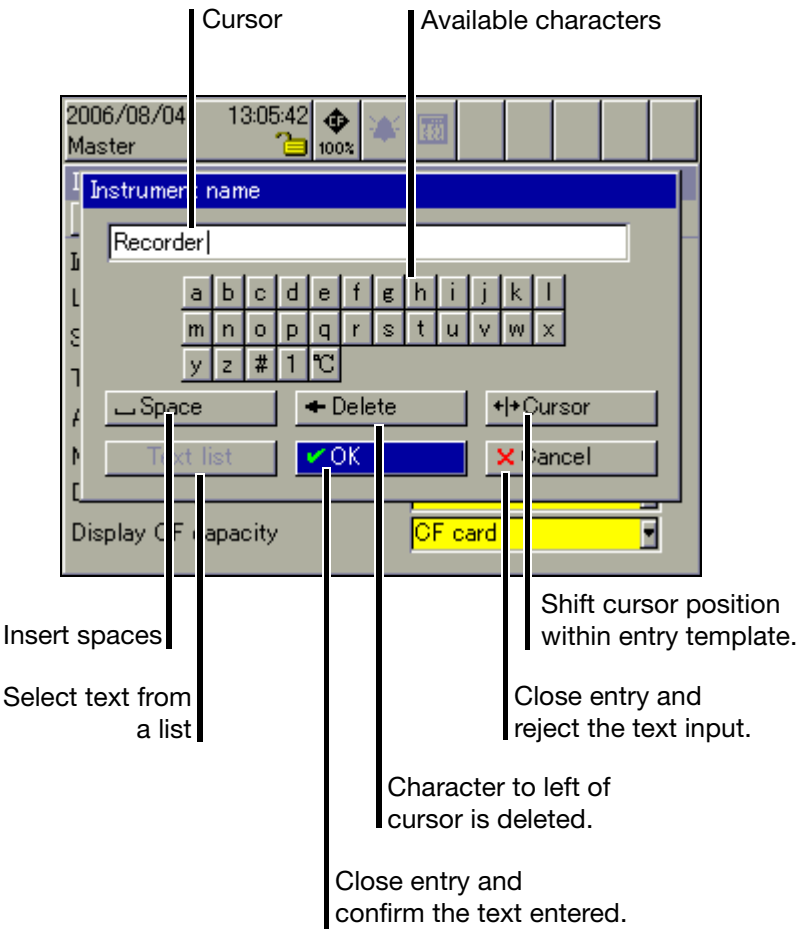
26.1 Text entry

26.1.1 Entering characters

If a Text entry field is selected, and then activated by pressing the control knob, then a text can be entered or altered.



The cursor (position marker) is at the end of the current setting. The active key or function that will be performed when the control knob is pressed is shown in blue.



Available characters



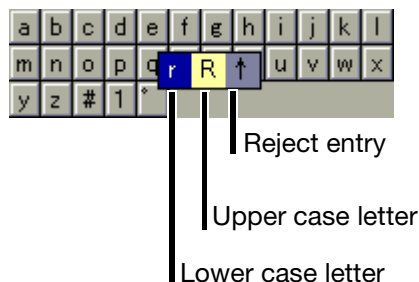
The characters that are shown as available are just an example. They can be adjusted to suit your needs through the setup program.

26 Entering text and values

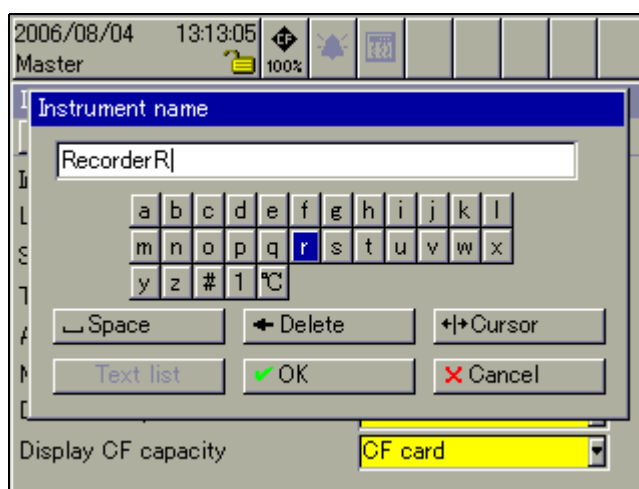
Character entry

- * Move the cursor onto the required character, and press the control knob.

Another selection window will open.



- * Rotate the control knob to select upper case (capital) or lower case (small) letters, or reject an entry, and activate/confirm the choice by pressing the control knob.

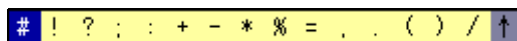


Entering special characters

Special characters are entered as text.

- * Select the # symbol, and press the control knob.

All the special characters that can be selected will now be shown.

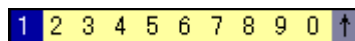


Here, too, the selection and confirmation of the characters are made by rotating and pressing the control knob.

Number entry

- * Select number "1", and press the control knob.

All the numbers that can be selected will now be shown.



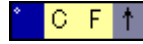
The selection and confirmation of the numbers are made by rotating and pressing the control knob.

26 Entering text and values

Select temperature unit


- * Select “ ° ”, and press the control knob.

All the temperature units that can be selected will now be shown. For better legibility, the degree sign (°) and the unit (C or F) are separated, and must be individually selected.



The selection and confirmation of the symbol is made by rotating and pressing the control knob.

26.1.2 Insert spaces

- * Select the space button () and press the control knob.

The space character will be inserted to the right of the cursor.

26.1.3 Delete character

- * Select the delete button () and press the control knob.

The character to the left of the cursor will be deleted.

26.1.4 Move cursor

- * Select the cursor positioning button () and press the control knob.

The cursor can now be moved. The shifting is ended by operating the control knob again.

26.1.5 Enter text from text list

The last 20 texts that were entered (confirmed by OK) will be stored in the recorder, in an internal text list. This function can be used to call up the list and select a text for current application.

- * Call text list ().

The selection and confirmation of the required text are made by rotating and pressing the control knob.

26.1.6 Finish entry

- * Select the “OK” button () and press the control knob.

Character entry will now be ended. The text that was entered is accepted, and the dialog window is closed.

26 Entering text and values

26.1.7 Reject entry

- * Select the “Cancel” button () and press the control knob.

Character entry will now be ended. The text that was entered is **not** accepted, and the dialog window is closed. The previously active setting is retained.

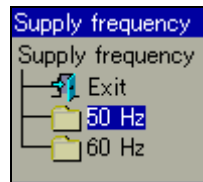
26.2 Entry via selection field

If a selection field is selected, and then activated by pressing the control knob, then the text (value) can be entered from a previously defined list.



The cursor (position marker) is on the current setting.

- * Make the selection by rotating and pressing the control knob.



26.3 Entering values

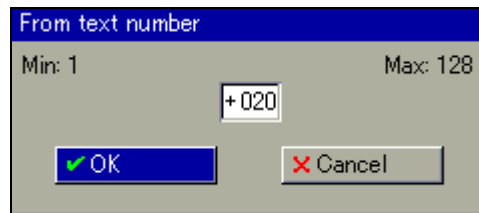
26.3.1 Whole numbers (integers)

There are two possibilities for entering integer numbers:

- selection by altering the individual digits of a number, or
- selection by incrementing and decrementing.

Digit-by-digit entry of an integer

For this entry, each digit of the number (units, tens, ...) and the sign are selected with the control knob.



Example

- * Select "2" (the tens digit) by rotating the control knob (**+020**).
- * Press the control knob.

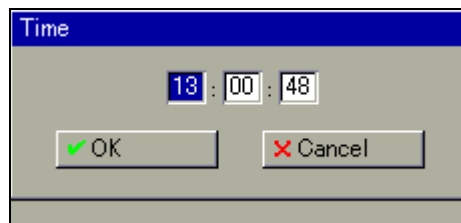
The tens digit is now shown in red, to indicate that this digit can now be altered (**+020**).

- * Rotate the control knob to alter the tens digits, and then confirm the entry by pressing the control knob.

The tens digit has now been altered, and is shown in blue again (**+030**).

Selection by incrementing and decrementing

For this entry, the complete number is reduced by 1 (decremented) or increased by 1 (incremented) with the control knob.



Example

- * Select the hour by rotating the control knob (**13**).
- * Press the control knob.

The number is now shown in red, to indicate that it can now be altered (**13**).

- * Rotate the control knob to alter the number, and then confirm the entry by pressing the control knob.

The number has now been altered, and is shown in blue again (**14**).

26 Entering text and values

26.3.2 Real numbers (floating point)

To enter real numbers (with a decimal point), each digit of the number (units, tens, ...) the decimal point position and the sign are selected with the control knob.

Sequence

- Position the cursor.
- Enter the number, or define the decimal point position.

For number entry, the number is inserted at the right of the cursor.

Cursor positioning

- * Select "Cursor" and press the control knob.

The real number is indicated by a blue background.

- * Rotate the control knob to move the cursor to the required position, and then press the control knob.

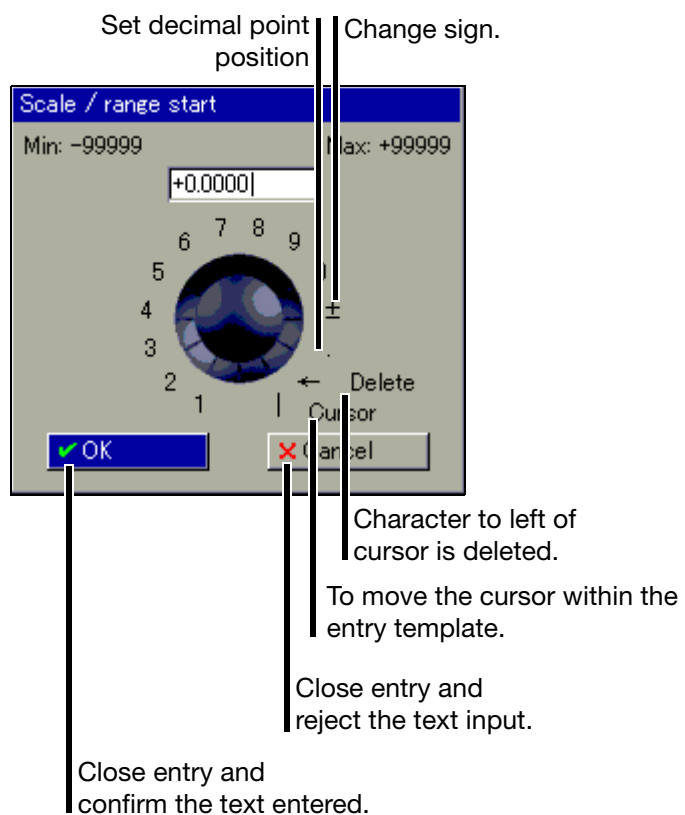


When a number is entered, it is inserted at the right of the cursor.
When deleting, the digit to the left of the cursor is deleted.

Character deletion

- * Position the cursor.
- * Select "Delete" and press the control knob.

The character to the left of the cursor will be deleted.



27.1 Bar code

27.1.1 Batch control

Plant 1



Plant 2



Plant 3



Start



Stop



Reset entry



27 Appendix

27.1.2 Batch texts

Product name SUPER PRODUCT



SUPER PRODUCT

NORMAL PRODUCT



NORMAL PRODUCT

TOOTHED DISK 34



TOOTHED DISK 34

AXIS ROD 45



AXIS ROD 45

Product numbers 645736



645736

012876



012876

345435



345435

Job numbers A83737



A83737

A4555455



A4555455

A455445



A455445

**Personnel
number** 4576



4576

7665



7665

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