

## LOGOSCREEN nt



### Paperless recorder with TFT display and CompactFlash card

#### Brief description

The LOGOSCREEN nt represents a new generation of paperless recorders from that stand out through their modular design for the acquisition of measurement data (3 to 18 measurement inputs can be implemented internally), their innovative operating concept and high standards of security to prevent unauthorized access and manipulation of the stored data.

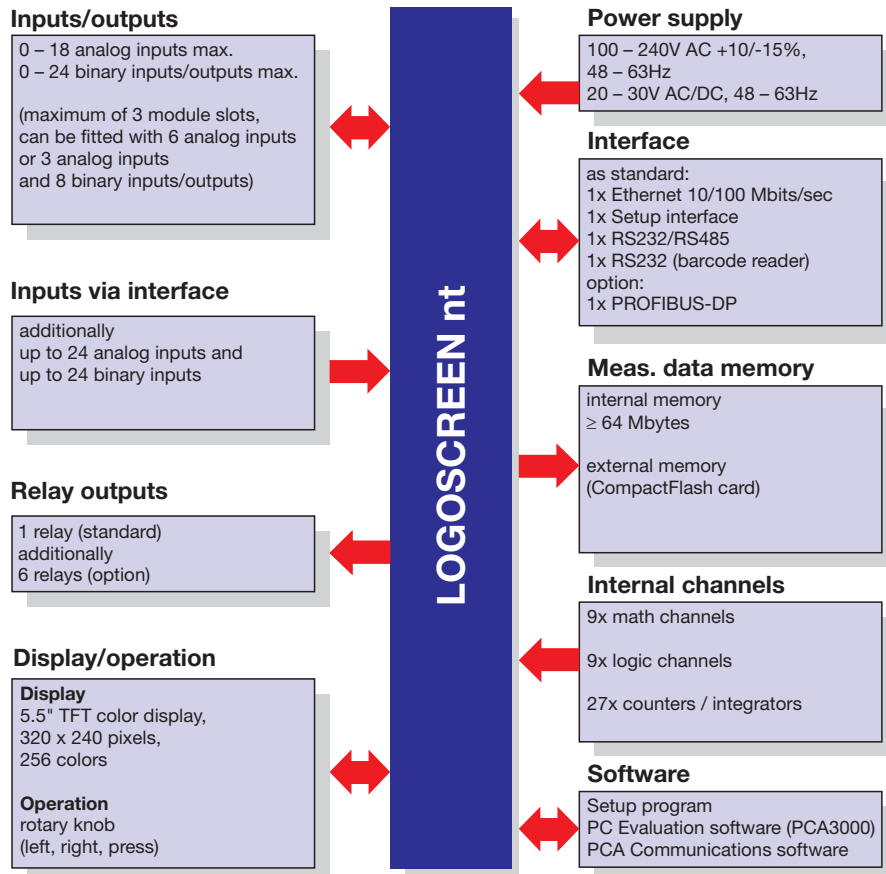
In the LOGOSCREEN nt, data can be visualized in process images as measurement curves, as a bar graph or in alphanumerical form.

Powerful PC programs are available for analyzing and evaluating the archived data, and for configuring the LOGOSCREEN nt.



Type 706580/...

#### Block structure



#### Key features

- Easy operation by control knob and through menu guidance
- Presentation of the measurements in various diagrams and process diagrams
- Visualization of alarms and events
- Measurement data storage on CompactFlash memory card
- Automatic read-out of data through the PCA Communications Software (PCC)
- Interface to SCADA systems, to PLC controls and PC systems
- Integrated web server
- Measurement display via web browser
- Simultaneous recording of up to 3 batch reports
- Batch control (start, stop, texts) through barcode reader
- MODbus master function
- Operator languages: English, German, French and Russian. Others on request.

## Technical data

### Analog inputs

#### Thermocouple

| Designation                          | Type  | Standard   | Meas. range     | Accuracy <sup>1</sup> |
|--------------------------------------|---|------------|-----------------|-----------------------|
| Fe-Con                               | L   | DIN 43 710 | -200 to +900°C  | ±0.1%                 |
| Fe-Con                               | J   | EN 60 584  | -200 to +1200°C | ±0.1% from -100°C     |
| Cu-Con                               | U   | DIN 43 710 | -200 to +600°C  | ±0.1% from -150°C     |
| Cu-Con                               | T   | EN 60 584  | -270 to +400°C  | ±0.1% from -150°C     |
| NiCr-Ni                              | K   | EN 60 584  | -200 to +1372°C | ±0.1% from -80°C      |
| NiCr-Con                             | E   | EN 60 584  | -200 to +1000°C | ±0.1% from -80°C      |
| NiCrSi-NiSi                          | N   | EN 60 584  | -100 to +1300°C | ±0.1% from -80°C      |
| Pt10Rh-Pt                            | S   | EN 60 584  | 0 to 1768°C     | ±0.15%                |
| Pt13Rh-Pt                            | R   | EN 60 584  | 0 to 1768°C     | ±0.15%                |
| Pt30Rh-Pt6Rh                         | B   | EN 60 584  | 0 to 1820°C     | ±0.15% from 400°C     |
| W3Re/W25Re                           | D   |            | 0 to 2495°C     | ±0.15% from 500°C     |
| W5Re/W26Re                           | C   |            | 0 to 2320°C     | ±0.15% from 500°C     |
| W3Re/W26Re                           |   |            | 0 to 2400°C     | ±0.15% from 500°C     |
| Chromel-alumel                       | GOST R 8.585-2001   |            | -200 to +1372°C | ±0.1% from -80°C      |
| Chromel-copel                        | GOST R 8.585-2001   |            | -200 to +800°C  | ±0.15% from -80°C     |
| PLII (Platinel II)                   |   |            | 0 to 1395°C     | ±0.15%                |
| Shortest span                        | Type L, J, U, T, K, E, N, chromel-alumel, PLII: 100°C<br>Type S, R, B, D, C, W3Re/W26Re, chromel-copel: 500°C |            |                 |                       |
| Range start/end                      | freely programmable within the limits, in 0.1°C steps   |            |                 |                       |
| Cold junction                        | Pt100 internal or thermostat external constant  |            |                 |                       |
| Cold junction accuracy (internal)    | ± 1°C   |            |                 |                       |
| Cold junction temperature (external) | -50 to +150°C adjustable  |            |                 |                       |
| Sampling cycle                       | channel 1 – 18: 125msec in total  |            |                 |                       |
| Input filter                         | 2nd order digital filter; filter constant adjustable from 0 to 10.0sec  |            |                 |                       |
| Electrical isolation                 | see "Electrical data" on page 5 and<br>"Overview of the electrical isolation" on page 15                      |            |                 |                       |
| Resolution                           | > 14 bit  |            |                 |                       |
| Features                             | also programmable in °F   |            |                 |                       |

1. The linearization accuracy refers to the maximum measuring range. The linearization accuracy is reduced with short spans.

#### Resistance thermometers

| Designation | Standard  | Connection circuit | Meas. range     | Accuracy <sup>1</sup> | Meas. curr. |
|-------------|---|--------------------|-----------------|-----------------------|-------------|
| Pt100       | EN 60 751<br>(TC = 3.85*10 <sup>-3</sup> 1/°C)        | 2/3-wire           | -200 to +100°C  | ±0.5°C                | ≈ 250µA     |
|             |   | 2/3-wire           | -200 to +850°C  | ±0.8°C                | ≈ 250µA     |
|             |   | 4-wire             | -200 to +850°C  | ±0.5°C                | ≈ 250µA     |
| Pt100       | JIS 1604<br>(TC = 3.917*10 <sup>-3</sup> 1/°C)        | 2/3-wire           | -200 to +100°C  | ±0.5°C                | ≈ 250µA     |
|             |   | 2/3-wire           | -200 to +650°C  | ±0.8°C                | ≈ 250µA     |
|             |   | 4-wire             | -200 to +650°C  | ±0.5°C                | ≈ 250µA     |
| Pt100       | GOST 6651-94 A.1<br>(TC = 3.91*10 <sup>-3</sup> 1/°C) | 2/3-wire, 4-wire   | -200 to +100°C  | ±0.5°C                | ≈ 250µA     |
|             |   | 2/3-wire, 4-wire   | -200 to +850°C  | ±0.8°C                | ≈ 250µA     |
| Pt500       | EN 60 751<br>(TC = 3.85*10 <sup>-3</sup> 1/°C)        | 2/3-wire, 4-wire   | -200 to +100°C  | ±0.5°C                | ≈ 100µA     |
|             |   | 2/3-wire, 4-wire   | -200 to +850°C  | ±0.9°C                | ≈ 100µA     |
| Pt1000      | EN 60 751<br>(TC = 3.85*10 <sup>-3</sup> 1/°C)        | 2/3-wire           | -200 to +100°C  | ±0.5°C                | ≈ 100µA     |
|             |   | 2/3-wire           | -200 to +850°C  | ±0.8°C                | ≈ 100µA     |
|             |   | 4-wire             | -200 to +850°C  | ±0.5°C                | ≈ 100µA     |
| Ni 100      | DIN 43 760<br>(TC = 6.18*10 <sup>-3</sup> 1/°C)       | 2/3-wire, 4-wire   | -60 to +180°C   | ±0.4°C                | ≈ 250µA     |
| Pt50        | ST RGW 1057 1985<br>(TC = 3.91*10 <sup>-3</sup> 1/°C) | 2/3-wire           | -200 to +100°C  | ±0.5°C                | ≈ 250µA     |
|             |   | 2/3-wire           | -200 to +1100°C | ±0.9°C                | ≈ 250µA     |
|             |   | 4-wire             | -200 to +100°C  | ±0.5°C                | ≈ 250µA     |
|             |   | 4-wire             | -200 to +1100°C | ±0.6°C                | ≈ 250µA     |
| Cu 50       | (TC = 4.26*10 <sup>-3</sup> 1/°C)                     | 2/3-wire           | -50 to +100°C   | ±0.5°C                | ≈ 250µA     |
|             |   | 2/3-wire           | -50 to +200°C   | ±0.9°C                | ≈ 250µA     |
|             |   | 4-wire             | -50 to +100°C   | ±0.5°C                | ≈ 250µA     |
|             |   | 4-wire             | -50 to +200°C   | ±0.7°C                | ≈ 250µA     |

| Designation            | Standard  | Connection circuit  | Meas. range   | Accuracy <sup>1</sup> | Meas. curr. |
|------------------------|---|---|---------------|-----------------------|-------------|
| Cu 100                 | GOST 6651-94 A.1<br>(TC = $4.26 \cdot 10^{-3} 1/^{\circ}\text{C}$ ) | 2/3-wire  | -50 to +100°C | ±0.5°C                | ≈ 250µA     |
|                        |   | 2/3-wire  | -50 to +200°C | ±0.9°C                | ≈ 250µA     |
|                        |   | 4-wire  | -50 to +100°C | ±0.5°C                | ≈ 250µA     |
|                        |   | 4-wire  | -50 to +200°C | ±0.6°C                | ≈ 250µA     |
| Connection circuit     |   | 2-, 3-, or 4-wire circuit   |               |                       |             |
| Shortest span          |   | 15°C  |               |                       |             |
| Sensor lead resistance |   | max. 30 Ω per conductor for 3-wire/4-wire circuit<br>max. 10 Ω per conductor for 2-wire circuit |               |                       |             |
| Range start/end        |   | freely programmable within the limits in 0.1 °C steps   |               |                       |             |
| Sampling cycle         |   | channel 1 – 18: 125msec in total  |               |                       |             |
| Input filter           |   | 2nd order digital filter; filter constant adjustable from 0 to 10sec                            |               |                       |             |
| Electrical isolation   |   | see “Electrical data” on page 5 and<br>“Overview of the electrical isolation” on page 15        |               |                       |             |
| Resolution             |   | > 14bit   |               |                       |             |
| Features               |   | also programmable in °F   |               |                       |             |

1. The linearization accuracy refers to the maximum measuring range. The linearization accuracy is reduced with short spans.

#### Resistance transmitter and potentiometer

| Designation            | Meas. range     | Accuracy <sup>1</sup>  | Measuring current |
|------------------------|-----------------|--|-------------------|
| Resistance transmitter | up to 4000Ω     | ±4Ω  | ≈ 100µA           |
| Potentiometer          | < 400Ω          | ±400 mΩ  | ≈ 100µA           |
|                        | ≥ 400Ω to 4000Ω | ±4Ω  | ≈ 250µA           |
| Connection circuit     |                 | resistance transmitter: 3-wire circuit<br>potentiometer: 2-/3-/4-wire circuit              |                   |
| Shortest span          |                 | 60Ω  |                   |
| Sensor lead resistance |                 | max. 30Ω per conductor for 4-wire circuit<br>max. 10 Ω per conductor for 2-/3-wire circuit |                   |
| Resistance values      |                 | freely programmable within the limits, in 0.1Ω steps                                       |                   |
| Sampling cycle         |                 | channel 1 – 18: 125msec in total   |                   |
| Input filter           |                 | 2nd order digital filter; filter constant adjustable from 0 to 10.0sec                     |                   |
| Electrical isolation   |                 | see “Electrical data” on page 5 and<br>“Overview of the electrical isolation” on page 15   |                   |
| Resolution             |                 | > 14bit  |                   |

1. The linearization accuracy refers to the maximum measuring range. The linearization accuracy is reduced with short spans.

#### Input for DC voltage, DC current

| Basic range          | Accuracy <sup>1</sup> | Input resistance   |
|----------------------|-----------------------|--|
| -12 to +112mV        | ±100µV                | $R_{IN} \geq 1 \text{ M}\Omega$  |
| -10 to +210mV        | ±240µV                | $R_{IN} \geq 470 \text{ k}\Omega$  |
| -1.5 to +11.5V       | ±6mV                  | $R_{IN} \geq 470 \text{ k}\Omega$  |
| -0.12 to +1.12V      | ±1mV                  | $R_{IN} \geq 470 \text{ k}\Omega$  |
| -1.2 to +1.2V        | ±2mV                  | $R_{IN} \geq 470 \text{ k}\Omega$  |
| -11 to +12V          | ±12mV                 | $R_{IN} \geq 470 \text{ k}\Omega$  |
| Shortest span        |                       | 5mV  |
| Range start/end      |                       | freely programmable within the limits in 0.01 mV steps                                   |
| -1.3 to +22mA        | ±20µA                 | burden voltage ≤ 3V  |
| -22 to +22mA         | ±44µA                 | burden voltage ≤ 3V  |
| Shortest span        |                       | 0.5mA  |
| Range start/end      |                       | freely programmable within the limits in 0.01 mA steps                                   |
| Overrange/underrange |                       | according to NAMUR NE 43   |
| Sampling cycle       |                       | channel 1 – 18: 125msec in total   |
| Input filter         |                       | 2nd order digital filter; filter constant adjustable from 0 to 10.0sec                   |
| Electrical isolation |                       | see “Electrical data” on page 5 and<br>“Overview of the electrical isolation” on page 15 |
| Resolution           |                       | > 14bit  |

1. The linearization accuracy refers to the maximum measuring range. The linearization accuracy is reduced with short spans.

**Transducer short circuit/break**

|                                 | Short-circuit <sup>1</sup> | Break <sup>1</sup> |
|---------------------------------|----------------------------|--------------------|
| Thermocouple                    | not detected               | detected           |
| Resistance thermometer          | detected                   | detected           |
| Resistance transmitter          | not detected               | detected           |
| Potentiometer                   | not detected               | detected           |
| Voltage $\leq \pm 210\text{mV}$ | not detected               | detected           |
| Voltage $> \pm 210\text{mV}$    | not detected               | not detected       |
| Current                         | not detected               | not detected       |

1. Programmable reaction of device, e.g. triggering alarm

**Binary inputs/outputs (option)**

|   |  |
|---|--|
| Input or output   | configurable as input or output  |
| Number  | 8, 16 or 24, depending on the device version, to DIN VDE 0411, Part 500; max. 25Hz, max. 32V   |
| Input<br>- level<br>- pulse width<br>- sampling cycle (for recording) | logic "0": -3 to +5V (input current max. $\pm 1\text{mA}$ ),<br>logic "1": 12 – 30V ( $2.5\text{mA} \leq \text{input current} \leq 5\text{mA}$ )<br>min. 300msec<br>1Hz  |
| High-speed input<br>- task<br>- pulse width<br>- sampling cycle       | the first two binary inputs of each module (B1, B2, B9, B10, B17, B18), if the module is not fitted with relays or 6 analog inputs<br>count function, e.g. for flow measurement<br>min. 300 $\mu\text{s}$<br>10kHz   |
| Output<br>- type<br>- level<br><br>- sampling cycle                   | open-collector output, switches relative to positive voltage<br>logic "0": transistor is inhibited<br>(max. permissible voltage across switching transistor $\leq 30\text{V}$ , max. leakage current 0.1 mA)<br>logic "1": transistor is switched on<br>(max. voltage across switching transistor $\leq 1.6\text{V}$ , max. current 50mA)<br>at least 1 sec (1 Hz) |

**Outputs**

|                      |   |
|----------------------|---|
| 1 relay (ex-factory) | changeover (SPDT), 3A, 230V AC <sup>1</sup>   |
| 6 relays (option)    | changeover (SPDT), 3A, 230V AC <sup>1,2</sup> |

1. with resistive load. 2. It is not permissible to mix SELV circuits and supply circuits.

**Interfaces**

|   |  |
|---|--|
| RS232/RS485 (connector 7)<br>- protocol<br>- baud rate<br>- modem<br>- connector<br>- external inputs   | Qty. 1, switchable between RS232 and RS485<br>MODbus master, MODbus slave and barcode reader<br>9600, 19200, 38400<br>can be connected<br>SUB-D<br>via the MODbus master/slave function, 24 analog and 24 binary |
| RS232 for barcode reader (connector 2)<br>- protocol<br>- baud rate<br>- connector<br>- external inputs | Qty. 1<br>MODbus master, MODbus slave and barcode reader<br>9600, 19200, 38400<br>SUB-D<br>via the MODbus master/slave function, 24 analog and 24 binary   |
| Ethernet (connector 6)<br>- quantity<br>- protocols<br>- baud rate<br>- connector<br>- data format      | max. 1<br>TCP, IP, HTTP, DHCP, SMTP, MODbusTCP<br>10Mbits/sec, 100Mbits/sec<br>RJ45<br>HTML  |

**Screen**

|                           |  |
|---------------------------|--|
| Resolution / size         | 320 x 240 pixels / 5.5"                |
| Type / number of colors   | TFT color screen / 256 colors          |
| Screen refresh rate       | > 150Hz                                |
| Brightness setting        | adjustable on instrument               |
| Screen saver (switch-off) | through waiting time or control signal |

**Electrical data**

|   |  |
|---|--|
| Supply voltage (switch-mode PSU)                                  | 100 – 240V AC +10/-15%, 48 – 63Hz or<br>20 – 30V AC/DC, 48 – 63Hz  |
| Electrical safety   | to EN 61 010, Part 1, August 2002<br>overvoltage category II, pollution degree 2<br>terminal for PE conductor  |
| Protection class I  |  |
| Test voltages (type test)   |  |
| - mains supply circuit to measuring circuit                       | with AC supply: 2.3kV/50Hz, 1 min,<br>with AC/DC supply: 510V/50Hz, 1 min  |
| - mains supply circuit to housing (protective conductor)          | with AC supply: 2.3kV/50Hz, 1 min,<br>with AC/DC supply: 510V/50Hz, 1 min  |
| - measuring current circuits to meas. current circuit and housing | 500V/50Hz, 1 min   |
| - electrical isolation between analog inputs                      | up to 30V AC and 50V DC  |
| Supply voltage error  | < 0.1% of range span   |
| Power consumption   | approx. 30VA   |
| Data backup   | CompactFlash memory card   |
| Electrical connection   |  |
| - mains supply and relays   | at rear through pluggable screw terminals, 5.08mm raster,<br>max. conductor cross-section $\leq 2.5\text{mm}^2$ or $2 \times 1.5\text{mm}^2$ with ferrules<br>or<br>at rear through pluggable and screwable terminal blocks (on request) |
| - analog and binary inputs  | at rear through pluggable screw terminals, 3.81 mm raster, max. conductor cross-section<br>$\leq 1.5\text{mm}^2$<br>or<br>at rear through pluggable and screwable terminal blocks (on request)   |

**Environmental influences**

|                            |  |
|----------------------------|--|
| Ambient temperature range  | 0 to +50°C                                     |
| Ambient temperature effect | 0.03%/°C                                       |
| Storage temperature range  | -20 to +60°C                                   |
| Climatic conditions        | $\leq 75\%$ relative humidity, no condensation |
| EMC                        | EN 61 326                                      |
| - interference emission    | Class A  |
| - immunity to interference | to industrial requirements                     |

**Housing**

|                      |  |
|----------------------|--|
| Housing front        | zinc die-casting, optionally in stainless steel  |
| Housing type         | housing for flush-panel mounting to DIN 43 700, in stainless steel   |
| Bezel size           | 144 mm x 144 mm  |
| Depth behind panel   | 192 mm (incl. terminals)   |
| Panel cut-out        | $138^{+1.0}$ mm x $138^{+1.0}$ mm  |
| Panel thickness      | 2 – 40 mm  |
| Housing mounting     | in panel to DIN 43 834   |
| Operating position   | unrestricted, but taking into account the viewing angle of the screen,<br>horizontally $\pm 65^\circ$ ,<br>vertically $+40^\circ$ to $-65^\circ$ |
| Enclosure protection | to EN 60 529 Category 2,<br>front IP65,<br>rear IP20   |
| Weight               | approx. 4 kg   |



Control knob, to rotate and press.

CompactFlash memory card and setup interface behind housing door.

## Instrument description

### Hardware

The paperless recorder is built to a modular design. The basic type consists of a PSU board (incl. relays) and a CPU board (incl. Ethernet and RS232/RS485 interfaces and a RS232 interface to connect a barcode reader).

The module slots 1, 2 and 3 can be fitted with input modules, each with 6 analog inputs or 3 analog inputs and 8 binary inputs/outputs. Alternatively, module slot 3 can be fitted with a relay module that has 6 relays.

Optionally, the PSU board can be equipped with a PROFIBUS-DP interface.

### 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, instantaneous value or economy mode).

The paperless recorder saves the data according to the groups, and an input can be assigned to several groups (maximum 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 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  $\geq 64$  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 can be used to transfer the data to a PC.

### Data security

The data are stored in coded form in a proprietary format. This ensures a high level of data security.

If the paperless recorder is disconnected from the supply, then:

- RAM and clock time are buffered by a lithium battery (ex-factory) for at least 10 years, with storage capacitor for at least 2 days (ambient temperature  $-40$  to  $+45^{\circ}\text{C}$ ),
- Measurement and configuration data in the internal memory will not be lost.

### Recording duration

Depending on the configuration of the instrument, the duration of the recording can vary over a considerable range (from a few days up to several months).

### Data transfer

Data transfer from the paperless recorder to a PC is made by means of the external CompactFlash memory card, via the serial interface, or via the Ethernet interface.

### Report

For each channel of a group, a report (maximum/minimum/average or integrator) can be run over defined periods.

### Batch reports

Up to three batch reports can be created simultaneously in the recorder. The measurement data, start, end and duration of each batch can be displayed together with a batch counter and freely definable texts, both on the recorder and within the PC Evaluation Software PCA3000.

On request, a barcode reader can be used to start batches and read in batch texts.

### Limit check/

### changeover of operating mode

Over/underlimit conditions trigger alarms. An alarm can be used, for instance, as a control signal for changing over the operating mode.

The storage cycle and stored value can be configured separately for all three operating modes.

With the help of the alarm delay function, brief occurrences of over/underlimit conditions can be filtered out, with the result that no alarm is generated.

### Normal operation

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

### Event operation

Event operation is activated/deactivated by a control signal (binary input, group/combo combination alarm...). As long as the control signal is active, the instrument is in event operation.

### Timed operation

Timed operation is active on a daily basis within a programmable time period. The operating modes have different priorities.

### Counters/integrators/ operating time counters/ high-speed counters

27 additional internal channels are available for use as counters, integrators or operating time counters.

These counters are controlled through the binary inputs, the alarms, or via the logic channels. The analog channels can be used for the integrators. The numerical indication is shown in a separate window, with a maximum of 9 digits. The acquisition period can be selected as: periodic, daily, weekly, monthly, yearly as well as external, total (overall count) or daily from ... to. A maximum of 6 binary inputs are available as high-speed counters with a 10kHz sampling cycle rate.

### Math/logic module (extra code)




The module for math and logic (9 channels each) enables, for instance, the combination of analog channels with one another, and also the combination of analog channels with counters and binary inputs. The operators available for formulae are: +, -, \*, /, (, ), SQRT(), MIN(), MAX(), SIN(), COS(), TAN(), \*\*, EXP(), ABS(), INT(), FRC(), LOG(), LN(), humidity, moving average or !, &, |, ^, as well as ( and ).

The math and logic module can only be configured through the setup program.

## Operation and configuration

### On the recorder

The instrument is configured from the control knob on the front panel under menu guidance.


-  Shift current menu position (cursor) to the left or upwards.
-  Shift current menu position (cursor) to the right or downwards.
-  When the control knob is pressed, the current function is executed.

Example:

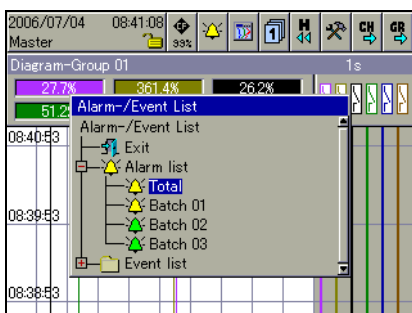


-  Rotate control knob to the left.

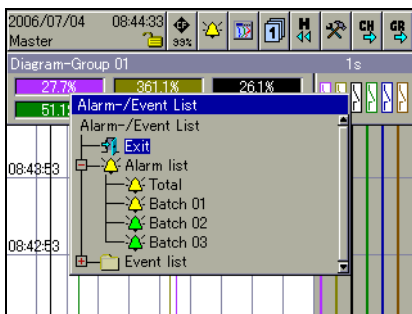



-  Press control knob.

Result: The menu for the alarm and event list is called up.




-  Rotate control knob to the left.



-  Press control knob.

Result: The menu for the alarm and event list is closed again.



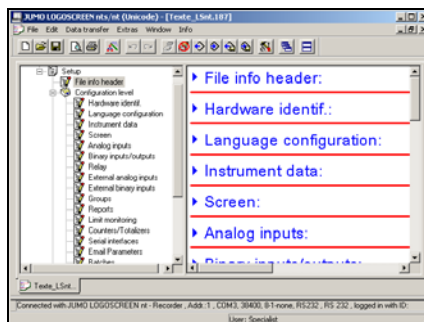
 Integrated user lists (different users with different authorizations) protect the recorder against unauthorized access.

### Through setup program

As an alternative to the configuration from the control knob on the recorder, the instrument can also be configured through the setup program.

The communication between the setup program and the paperless recorder is made through the:

- setup interface,
- serial interface,
- Ethernet interface or
- CompactFlash memory card



The configuration data can be archived on a data storage medium and output to the printer.

### Via the CompactFlash memory card

The configuration can be saved to the CompactFlash memory card and read into the recorder.

### Operating language

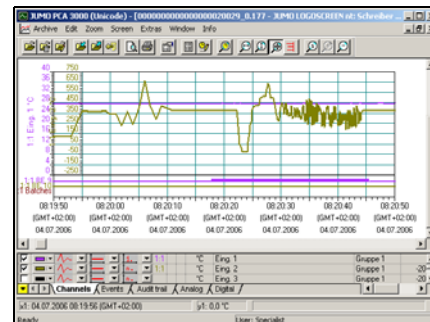
Two languages (see order details) are integrated in the instrument ex-factory. The setup program is used to exchange the operator language.

The languages available at the moment are: English, French, German and Russian. Other language versions (with Unicode capability) can be created.

## PC programs

### PC Evaluation Software (PCA3000)

The PC Evaluation Software (PCA3000) is a program which runs under Windows NT4.0/2000/XP, and is used to manage, archive, visualize and evaluate the recorder data.



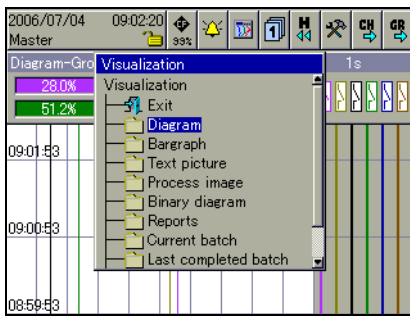
- The data from differently configured instruments are recognized by the PC Evaluation Software and stored in an archive database. The entire management is performed automatically. The user only has to manually allocate an identifier (supplementary description).
- The user can at any time gain access to certain data sets which can be distinguished by the identifier. In addition, it is possible to restrict the time periods to be evaluated.
- Any analog or binary channels of a paperless recorder (even from different groups) can subsequently be combined into PCA groups in PCA3000.
- Since each group is displayed in a separate window, several groups can be shown simultaneously on the screen and compared.
- Operation by mouse or keys.
- Using the export filter, it is possible to export the stored data, so that they can be processed in other programs, such as Excel.
- The PC Evaluation Software PCA3000 has network capability, i.e. several users can obtain data from the same database in the network independently of each other.

### PCA Communications software (PCC)

- The data can be read out from the recorder via the serial interface (RS232/RS485) or via the Ethernet interface. The data can be read manually or automatically (e.g. daily at 23.00 hrs).
- Data can also be retrieved via remote control, through a modem.

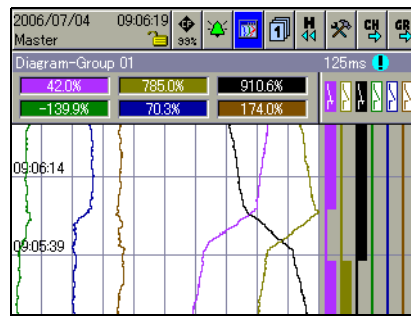
## Visualization on the instrument

### Operator level



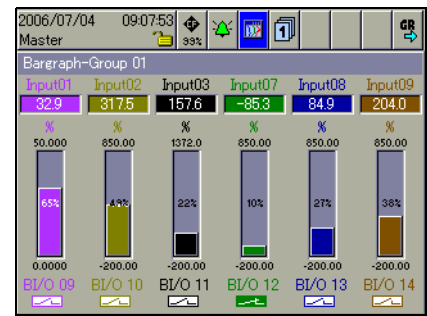
- Selection of visualization

### Vertical diagram



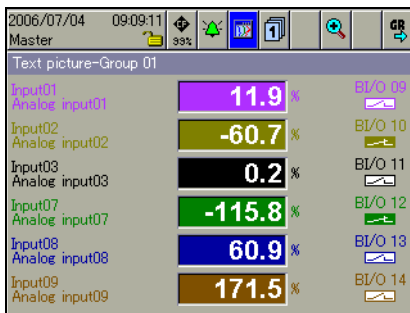
- Recorder chart presentation of the analog and binary channels
- Display of scaling and limit markers of a channel (can be switched on/off)
- Numerical display of the current analog channels

### Bar graph presentation



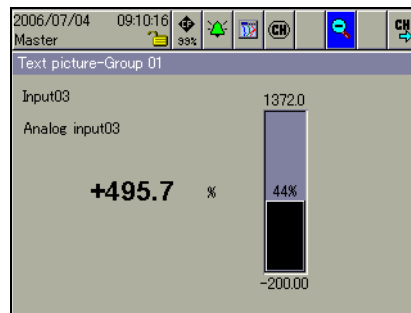
- Bar graph presentation of the analog channels
- On/Off presentation of the binary channels
- Display of the current analog channels with scaling and limit markers
- Color change of bar graph to red when limits are infringed

### Numerical presentation



- Large numerical presentation of the analog channels, including the channel name and description
- Each analog channel can be switched to the foreground
- On/Off presentation of the binary channels

### Numerical 1-channel presentation



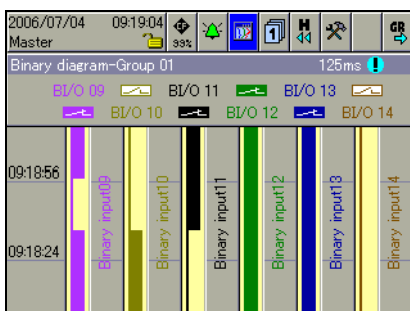
- Clear presentation of an analog channel
- An analog input is shown as a bar graph and a number simultaneously
- Display of the channel name and description
- Display of scaling and limit markers

### Process image



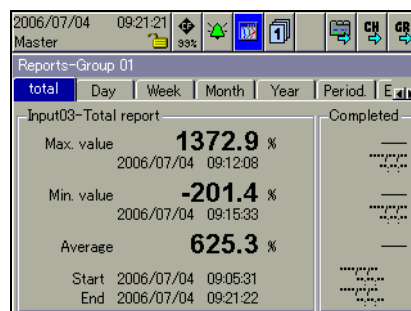
- Freely configurable presentation (through the setup program) of analog and binary signals with background pictures
- One process image for each group

### Binary presentation



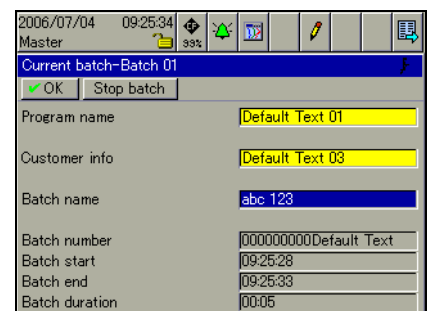
- On/Off presentation of the binary channels

### Report



- Display of different reports for the analog channels of a group
- Details of minimum/maximum/average/integral values and time period
- Display of the previous report

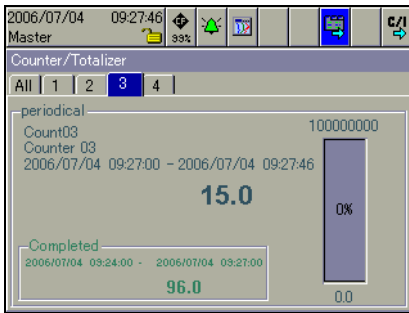
### Batch reports



- 3 batches documented simultaneously
- Changeover between current and completed batch reports
- Electronic signature is possible
- Batch texts via interface and barcode reader, among others

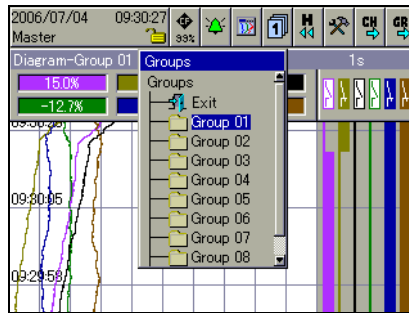


### Counter/integrator presentation



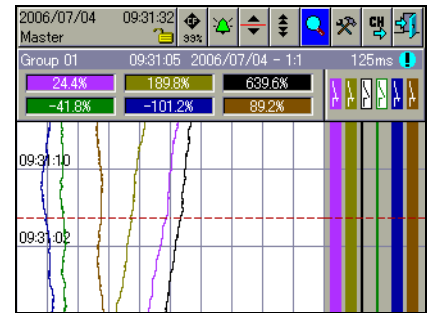
- Presentation of up to 27 counters or integrators
- Changeover between individual or overall display
- Display of the current and the most recently completed count

### Group selection



- Up to 9 groups are configurable
- Up to 6 analog and 6 binary channels can be shown for each group
- Measurement signals can be used in several groups

### History presentation



- All stored measurement data are shown as curves at different zoom levels
- Display of scaling and limit markers of a channel
- Numerical display of the measurements of the analog channels at the cursor position
- Shifting of the visible section within the stored measurement data

### Presentation of alarm lists

| Date       | Time     | Description          |
|------------|----------|----------------------|
| 2006/07/04 | 09:47:22 | Alarm Lim02          |
| 2006/07/04 | 09:47:15 | Alarm Lim01          |
| 2006/07/04 | 09:47:15 | I/O 9 not calibrated |
| 2006/07/04 | 09:47:15 | High Alarm AI08      |
| 2006/07/04 | 09:47:15 | I/O 8 not calibrated |
| 2006/07/04 | 09:47:15 | I/O 7 not calibrated |
| 2006/07/04 | 09:47:15 | High Alarm AI02      |

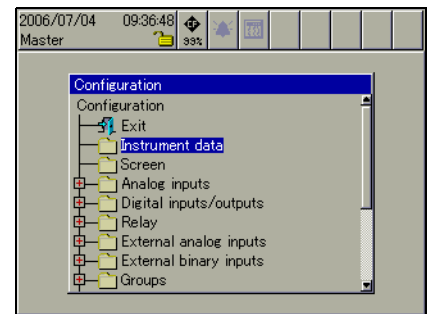
- Display of current alarms
- For the instrument as a whole or batch-related
- Up to 150 entries visible on the recorder

### Presentation of event lists

| Date       | Time     | Description       |
|------------|----------|-------------------|
| 2006/07/04 | 09:35:19 | CF card removed   |
| 2006/07/04 | 09:35:19 | CF card in place  |
| 2006/07/04 | 09:35:16 | CF card removed   |
| 2006/07/04 | 09:34:16 | POWER ON          |
| 2006/07/04 | 09:33:42 | POWER OFF         |
| 2006/07/04 | 09:26:29 | Batch 01 end      |
| 2006/07/04 | 09:25:28 | Batch 01 start    |
| 2006/07/04 | 09:05:31 | NEW CONFIGURATION |

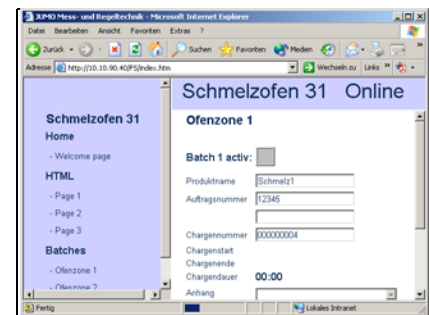
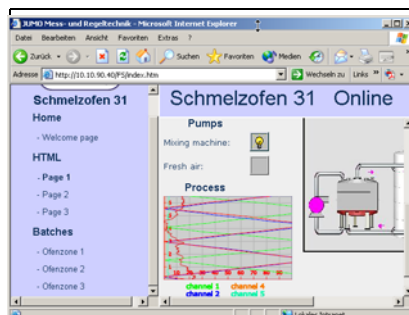
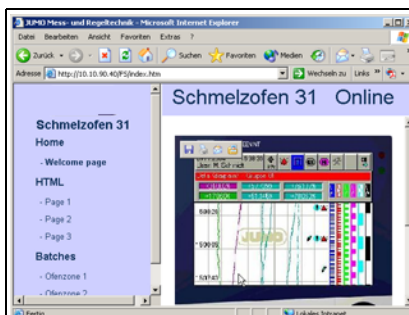
- Display and storage of events and alarms
- For the instrument as a whole or batch-related
- Up to 150 entries visible on the recorder

### Configuration



- Configuration on the recorder itself, by rotating and pressing the control knob
- Configuration through setup program

## Visualization through the web browser



- Freely configurable HTML pages

## Interfaces

- Setup interface (standard)
- RS232/RS485 interface (standard)
- Ethernet interface (standard)
- RS232 interface for barcode reader (standard)
- PROFIBUS-DP interface (extra code - in preparation)

|                                       | Setup interface | RS232 RS485 | Ethernet | PROFIBUS-DP | External CF card |
|---------------------------------------|-----------------|-------------|----------|-------------|------------------|
| Read / write current measurement data | yes             | yes         | yes      | yes         | no               |
| Read stored measurement data          | yes             | yes         | yes      | no          | yes              |
| Read / write configuration            | yes             | yes         | yes      | no          | yes              |
| Write user list                       | yes             | yes         | yes      | no          | yes              |

### Setup interface

The setup interface is used together with a PC interface for operating the setup program.

The recorder has one setup interface on the front panel and one on the back panel (connected in parallel). The two interfaces cannot both be operated at the same time. The available PC interfaces are:

- PC interface with TTL/RS232 converter and adapter (socket)  
Sales No. 70/00350260
- PC interface as USB/TTL converter, with adapter (socket) and adapter (plug)  
Sales No. 70/00456352

Further information on the PC interface can be found in data sheet 70.9700.

### RS232/RS485 interface

The current process data as well as specific device data can be read out via the RS232 or RS485 interface.

The data saved to the internal memory can also be read out in conjunction with the PC Evaluation Software PCA3000 and the PCA Communications Software (PCC).

The RS232 interface permits a maximum lead length of 15m, the RS485 interface 1.2km.

Connection is by a 9-pin SUB-D connector at the back of the instrument. The MODbus (master and slave) protocols are available, and the transmission mode used is RTU (Remote Terminal Unit).

### RS232 for barcode reader

A barcode reader can be attached to the interface. The barcode reader can be used to start or stop the batch reporting, and to set batch texts (customer information, batch number...).

The barcode reader can also be operated via the RS232/RS485 interface, and the RS232 interface for the barcode reader can also be used as a Modbus master or slave.

### Ethernet interface

The Ethernet interface can be used in local networks for the communication between the recorder and the setup program and the PCA Communications Software. The IP address is set permanently through the configuration on the instrument or in the setup program, or can be automatically received from a DHCP server.

The integrated web server allows simultaneous access by several PCs to 3 HTML and 3 batch pages.

Transmission protocol: TCP/IP  
Network type: 10BaseT, 100BaseT

### PROFIBUS-DP interface

The recorder can be integrated into a fieldbus system according to the PROFIBUS-DP standard via the PROFIBUS-DP interface. This PROFIBUS version is especially designed for the communication between automation systems and distributed peripheral devices at the field level.

Data are transmitted serially according to the RS485 standard, with a maximum of 12 Mbits/sec.

Using the project design tool that is included in the delivery (GSD generator; GSD = device master file), an application-specific GSD file is created, which is used to integrate the recorder into the fieldbus system.

### External CompactFlash memory card (CF)

The external CompactFlash memory card (CF) is used to transfer the data from the internal memory to the PC. Configuration data can be created on the PC and then transferred to the recorder by means of the memory card.

On the PC side, data on the card is accessed using a read/write device (CompactFlash reader/writer).

### External inputs via interface

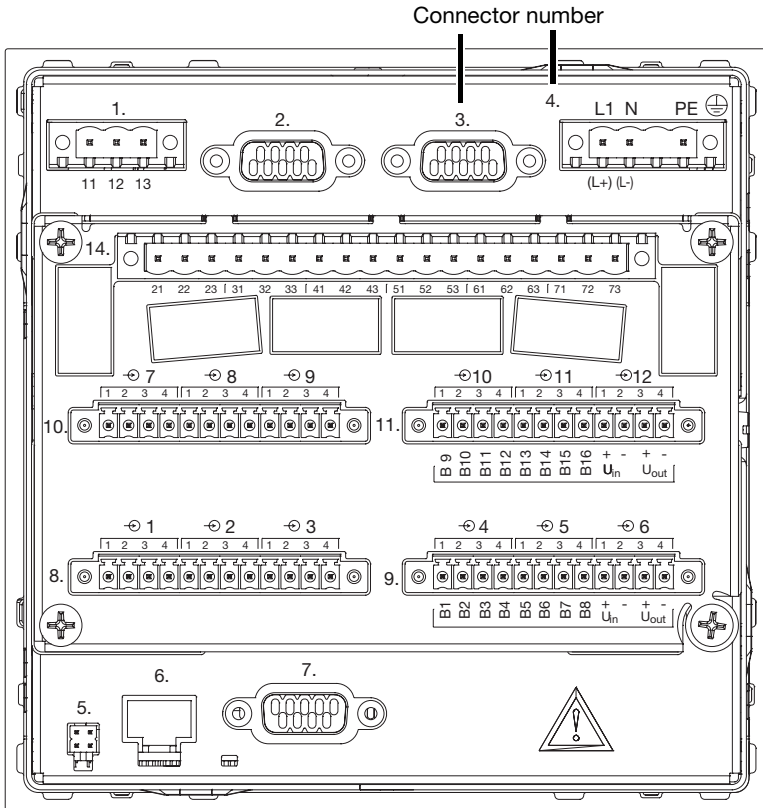
The paperless recorder can acquire and store up to 24 analog inputs and 24 binary inputs.

Furthermore, the interfaces can be used to enter comments in the event list of the recorder.

# Connection diagram

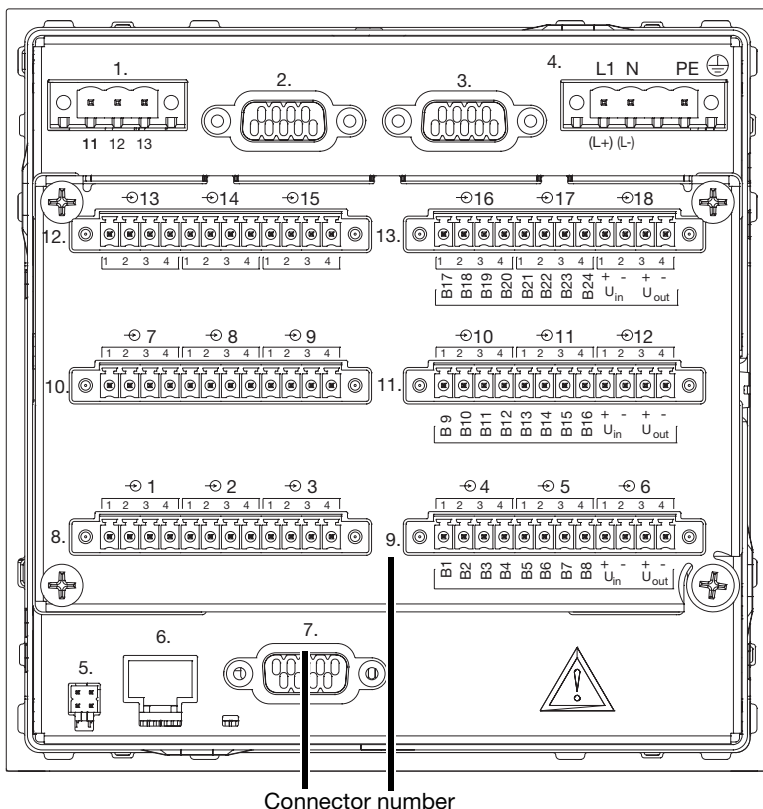
Rear view with pluggable screw terminals

Instrument variant 1




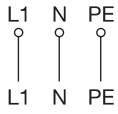
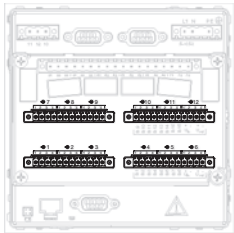
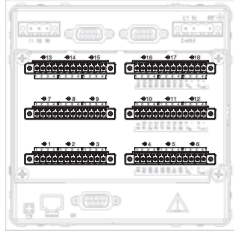
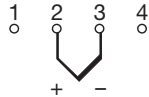
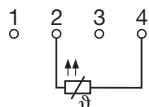
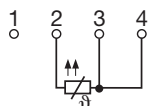
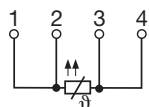
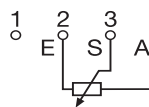
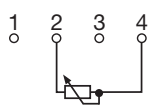
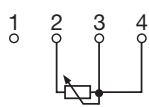
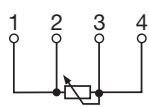
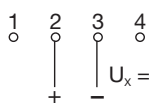
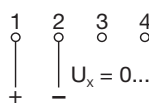
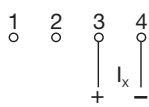
- Module slot 3 (top)**  
fitted with one relay card.
- Module slot 2 (middle)**  
fitted with 6 analog channels or  
3 analog channels and  
8 binary inputs/outputs.
- Module slot 1 (bottom)**  
fitted with 6 analog channels or  
3 analog channels and  
8 binary inputs/outputs.


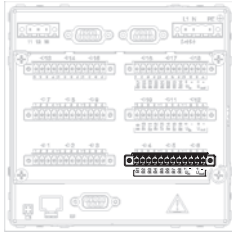
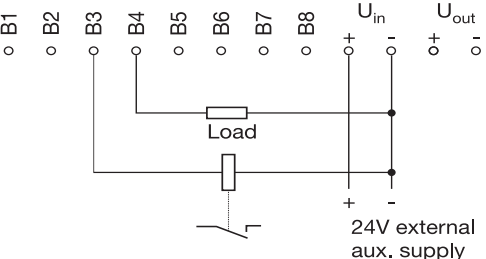
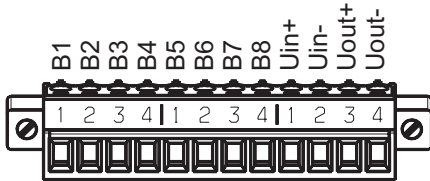
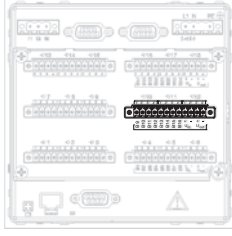

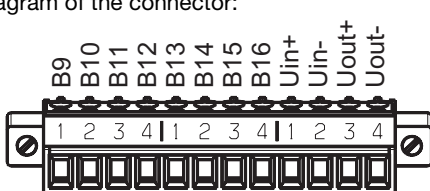
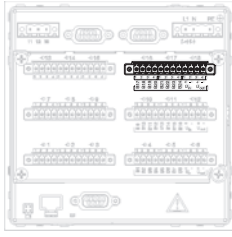
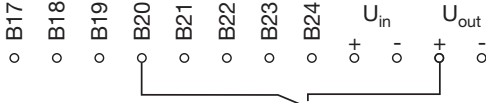
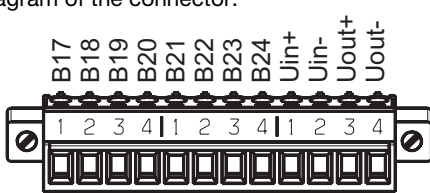
Instrument variant 2


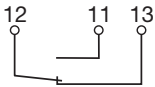
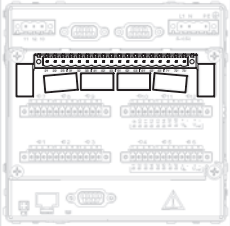
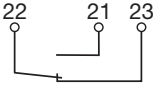
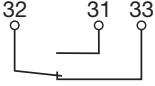
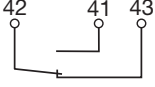
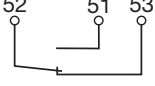
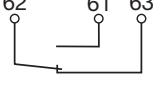
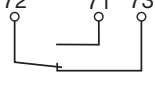








- Module slot 3 (top)**  
fitted with 6 analog channels or  
3 analog channels and  
8 binary inputs/outputs.
- Module slot 2 (middle)**  
fitted with 6 analog channels or  
3 analog channels and  
8 binary inputs/outputs.
- Module slot 1 (bottom)**  
fitted with 6 analog channels or  
3 analog channels and  
8 binary inputs/outputs.

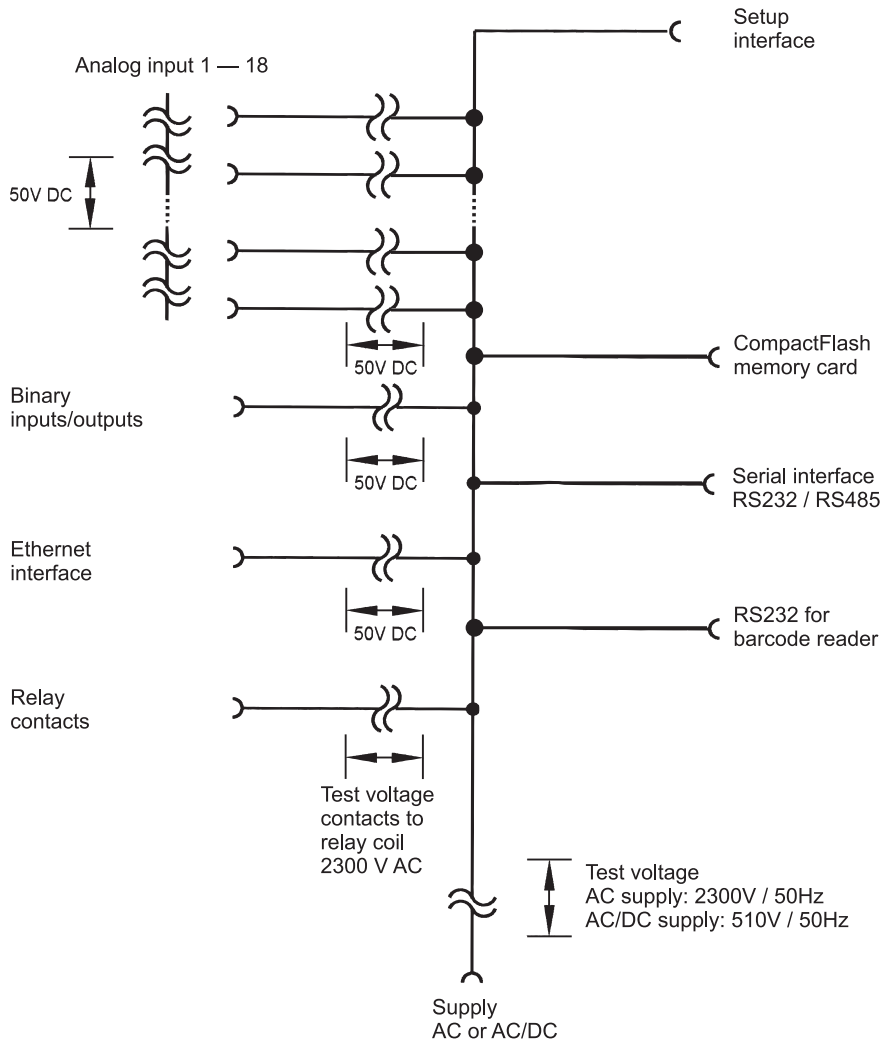
Connector number

| Terminal assignment             | Connector  | Diagram   |
|---------------------------------|--|---|
| <b>Supply</b>                   |  |   |
| Supply<br>as on nameplate       | Connector 4<br>L1 (L+)<br>N (L-)<br>PE<br>  |    |
| <b>Analog inputs</b>            |  |   |
| Thermocouple                    | Connectors 8 to 11<br>(input 1 to 12)<br>for instrument variant 1<br><br><br><br>or<br><br>connectors 8 to 13<br>(input 1 to 18)<br>for instrument variant 2<br><br> |    |
| RTD in 2-wire circuit           |  |    |
| RTD in 3-wire circuit           |  |    |
| RTD in 4-wire circuit           |  |   |
| Resistance transmitter          |  |  <p>E = End<br/>S = Slider<br/>A = Start</p> |
| Potentiometer in 2-wire circuit |  |    |
| Potentiometer in 3-wire circuit |  |    |
| Potentiometer in 4-wire circuit |  |    |
| Voltage input 0 – 1V            |  |  <p><math>U_x = 0...1V</math></p>            |
| Voltage input 0 – 10V           |  |  <p><math>U_x = 0...10V</math></p>           |
| Current input                   |  <p><math>I_x</math></p>  |   |

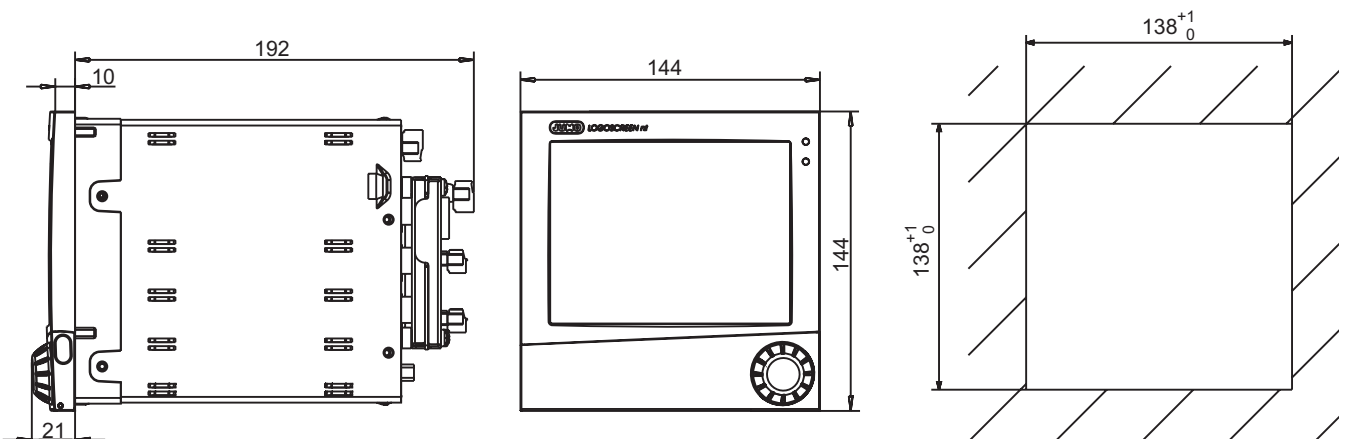
| Terminal assignment  | Connector  | Diagram  |
|--|--|--|
| <p><b>Binary inputs/outputs</b></p> <p> Configuration (through the setup program or on the instrument) defines which are binary inputs and which are outputs.</p> |  |  |
| <p>B1 ... B8</p> <p>voltage-controlled<br/>LOW = -3 to +5V DC<br/>HIGH = 12 to 30V DC</p> <p>Supply voltage 24V/60mA</p>    | <p>Connector 9<br/>only on modules with<br/>3 analog inputs</p> <p>B1 binary input/<br/>output 1</p> <p>...</p> <p>B8 binary input/<br/>output 8</p> <p><math>U_{in+}</math> external aux.<br/>supply</p> <p><math>U_{in-}</math> ground for ext.<br/>auxiliary supply</p> <p><math>U_{out+}</math> +24V aux.<br/>supply</p> <p><math>U_{out-}</math> ground<br/>aux. supply</p>                                   |  <p>Example:<br/>Connecting a load to binary output 4 (B4) and a solid-state relay to binary output 3 (B3) requires an external auxiliary supply.</p> <p>Diagram of the connector:</p>  |
| <p>B9 ... B16</p> <p>voltage-controlled<br/>LOW = -3 to +5V DC<br/>HIGH = 12 to 30V DC</p> <p>Supply voltage 24V/60mA</p>                                       | <p>Connector 11<br/>only on modules with<br/>3 analog inputs</p> <p>B9 binary input/<br/>output 9</p> <p>...</p> <p>B16 binary input/<br/>output 16</p> <p><math>U_{in+}</math> external aux.<br/>supply</p> <p><math>U_{in-}</math> ground for ext.<br/>auxiliary supply</p> <p><math>U_{out+}</math> +24V aux.<br/>supply</p> <p><math>U_{out-}</math> ground<br/>aux. supply</p>                                |  <p>Example:<br/>Binary input 12 (B12) is operated from the internal power supply.</p> <p>Diagram of the connector:</p>    |
| <p>B17 ... B24</p> <p>voltage-controlled<br/>LOW = -3 to +5V DC<br/>HIGH = 12 to 30V DC</p> <p>Supply voltage 24V/60mA</p>                                      | <p>Connector 13<br/>only for instr. variant 2<br/>and on modules with<br/>3 analog inputs</p> <p>B17 binary input/<br/>output 17</p> <p>...</p> <p>B24 binary input/<br/>output 24</p> <p><math>U_{in+}</math> external aux.<br/>supply</p> <p><math>U_{in-}</math> ground for ext.<br/>auxiliary supply</p> <p><math>U_{out+}</math> +24V aux.<br/>supply</p> <p><math>U_{out-}</math> ground<br/>aux. supply</p> |  <p>Example:<br/>Binary input 20 (B20) is operated from the internal power supply.</p> <p>Diagram of the connector:</p>   |

| Connector assignments   | Connector  | Diagram   |
|---|--|---|
| <b>Relay outputs</b>  |  |   |
| Relay 1<br>changeover (SPDT)  | Connector 1<br>                               |    |
| Relay 2<br>changeover (SPDT)  | <br>Connector 14<br>only for instr. variant 1 |    |
| Relay 3<br>changeover (SPDT)  |  |    |
| Relay 4<br>changeover (SPDT)  |  |    |
| Relay 5<br>changeover (SPDT)  |  |    |
| Relay 6<br>changeover (SPDT)  |  |   |
| Relay 7<br>changeover (SPDT)  |  |    |
| <b>Interfaces</b>   |  |   |
| RS232C for barcode reader<br>9-pin SUB-D socket connector           | Connector 2<br>                             | 2 RxD      Receive Data<br>3 TxD      Transmit Data<br>5 GND      Ground  |
| PROFIBUS-DP<br>9-pin SUB-D socket connector<br>(extra code)         | Connector 3<br>                             | 3 RxD/TxD-P      Receive/Transmit Data-Pos.<br>B conductor<br>5 DGND      Ground for data transmission<br>6 VP      Supply voltage-Pos.<br>8 RxD/TxD-N      Receive/Transmit Data-Neg.<br>A conductor |
| Setup interface   | Connector 5<br>                             | The recorder also has a setup interface on the front panel, connected in parallel. The two interfaces cannot both be operated at the same time.   |
| Ethernet<br>RJ45 socket connector                                   | Connector 6<br>                             | 1 TX+      Transmit Data +<br>2 TX-      Transmit Data -<br>3 RX+      Receive Data +<br>6 RX-      Receive Data -  |
| RS232C<br>9-pin SUB-D socket connector<br><br>(switchable to RS485) | Connector 7<br>                             | 2 RxD      Receive Data<br>3 TxD      Transmit Data<br>5 GND      Ground  |
| RS485<br>9-pin SUB-D socket connector<br><br>(switchable to RS232)  | Connector 7<br>                             | 3 TxD+/RxD+      Transmit/Receive Data +<br>5 GND      Ground<br>8 TxD-/RxD-      Transmit/Receive Data -   |

## Overview of the electrical isolation



## Dimensions



## Order details

|         |   |
|---------|---|
|         | <b>Basic type</b>   |
| 706580/ | Paperless recorder with Ethernet, Setup and RS232/RS485 interface and RS232 interface (to connect a barcode reader) and one relay |

|   |  |
|---|--|
|   | <b>Basic type extensions</b>   |
|   | <b>Software</b>  |
| 0 | No software package  |
| 1 | With software package (setup program, PC Evaluation software PCA3000, PCA Communications software PCC) |
|   | <b>Language for instrument texts</b>   |
| 8 | Factory setting (English/German)   |
| 9 | Set to customer specification  |

|          |          |          |   |
|----------|----------|----------|---|
| <b>1</b> | <b>2</b> | <b>3</b> | <b>Module slots</b>                         |
|          |          |          | <b>Slot 1 (bottom)</b>                      |
| 0        |          |          | not used                                    |
| 2        |          |          | 3 analog inputs and 8 binary inputs/outputs |
| 3        |          |          | 6 analog inputs                             |
|          |          |          | <b>Slot 2 (middle)</b>                      |
| 0        |          |          | not used                                    |
| 2        |          |          | 3 analog inputs and 8 binary inputs/outputs |
| 3        |          |          | 6 analog inputs                             |
|          |          |          | <b>Slot 3 (top)</b>                         |
|          |          | 0        | not used                                    |
|          |          | 1        | 6 relay outputs                             |
|          |          | 2        | 3 analog inputs and 8 binary inputs/outputs |
|          |          | 3        | 6 analog inputs                             |

|    |   |
|----|---|
|    | <b>Supply</b>                                 |
| 33 | 100 – 240V AC +10/-15%, 48 – 63Hz             |
| 25 | 20 – 30V AC/DC, 48 – 63Hz (under development) |

|     |   |
|-----|---|
|     | <b>Extra codes</b>                            |
| 020 | Lithium battery for memory buffering          |
| 021 | Storage capacitor (instead of extra code 020) |
| 260 | Math and logic module                         |
| 267 | Profibus-DP interface (under development)     |
| 350 | Universal carrying case TG-35                 |

706580/ [ ] - [ ] - [ ] / [ ] ....<sup>1</sup> (Order code)  
 706580/ 1 8 - 3 2 1 - 33 / 020 (Order example)

<sup>1</sup>. List extra codes in sequence, separated by commas.

## Standard accessories

- 1 Installation instructions B 70.6580.4
- 1 Operating instructions B 70.6580.1
- 4 mounting brackets
- 1 control panel seal
- 1 CD with detailed operating instructions and additional documentation