

GEFRAN

2300

FAST INDICATOR / ALARM UNIT

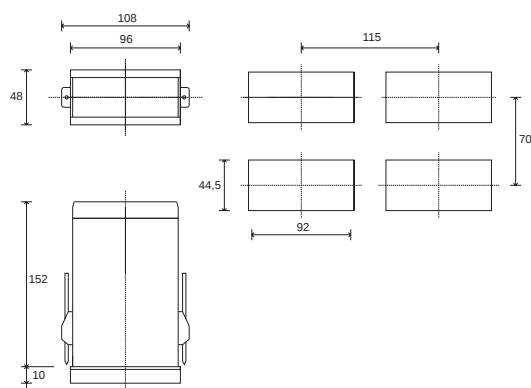


SOFTWARE 7.x

cod. **80284D** / Edit.15- 12/06 **ENGLISH**

1 • INSTALLATION

• Dimensions and cut-out



For correct installation, follow the instructions contained in this manual

Panel mounting.

Front panel dimensions: 96x48mm./3.78"x1.89" (1/8DIN); depth:152mm /5.98"

Cut-out dimensions: 92 (+0.8/-0)x45 (+0.6/0)mm/3.62" (+0.03/-0)x1.77" (+0.02/-0)".

To lock the instrument, insert the two blocks into the dovetail guides (split), diagonally (vertically) to one another and tighten with the screws. To install two or more instruments side by side or stacked, use the locking blocks and the following hole measurements:

side by side - Base (96 x n)-4 / (3.78 x n)-0.15" Height 45 (+0.6/-0) / 1.77" (+0.02/-0)

column - Base 92 (+0.8/-0) / 3.62" (+0.03/-0) Height (48 x n)-3 / (1.89" x n)-0.11" where "n" is the number of instruments.

CE MARKING: EMC (electromagnetic compatibility) conformity to EEC Directive 89/336 with reference to generic standards EN61000-6-2 (immunity in industrial environment) and EN50081-1 (emission in residential environment).

BT (low voltage) conformity to EEC Directive 73/23 modified by Directive 93/68.

MAINTENANCE: Repairs may be done only by trained and specialized personnel. Cut power to the instrument before accessing internal parts. Do not clean the case with hydrocarbon-based solvents (trichloroethylene, gasoline, etc.). The use of such solvents will compromise the instrument's mechanical reliability. Use a clean cloth moistened with ethyl alcohol or water to clean external plastic parts.

TECHNICAL SERVICE: GEFTRAN has a technical service department. Defects deriving from any use not conforming to this manual are excluded from the warranty.

2 • TECHNICAL DATA

INPUTS

Precision 0.2% f.s. ± 1 digit

Sampling time 2msec

Strain-gauge

350 Ω (for pressure, force, etc), sensitivity 1.5/2/2.5/3/3.3mV/V, positive polarization, symmetrical and negative.

Potentiometer

$\geq 350\Omega$, $R_i > 10 M\Omega$

DC - Linear

0...50mV / -25...25mV / -50...0mV / 0...60mV / -30...30mV / -60...0mV

0...100mV / -50...50mV / -100...0mV / 0...1V / -500...500mV / -1V...0V

0...10V / -5...5V / -10V...0V

For all inputs in voltage

$R_i \geq 1 M\Omega$ / 0...20mA / 4...20mA, $R_i = 50\Omega$

32-section custom linearization available.

Auxiliary inputs

Two remote analog trip setpoints, absolute or relative to local set.

0...10V, $R_i \geq 1M\Omega$ / 0...20mA, $R_i = 50\Omega$ / 4...20mA, $R_i = 50\Omega$

Digital

Optically isolated 1500V.

2 inputs with configurable function: tare zero, reset trip memory, reset peak memory, check calibration, enable remote setpoints, Hold function.

- NPN or PNP 24V/4mA

OUTPUTS

Relay

With 5A/250Vac contacts at $\cos\phi = 1$ (3.5A at $\cos\phi = 0,4$).

Spark suppression on NO contacts.

Logic

In voltage for static relay control (SSR)

23Vdc, $R_{out} = 470\Omega$ (20mA, max. 12V).

Retransmission

1500V isolation.

Retransmission output for input, peak values, remote sets, alarm setpoint, configurable scale settable from panel keys

0...10Vdc, -5...5Vdc, -10...10Vdc, $R_{load} > 500\Omega$

0...20mA, 4...20mA $R_{max} = 500\Omega$

Resolution 4000 points.

Response time 8 msec.

SERIAL LINE

Optically isolated 4 wires. The instrument is available with Current Loop (1200 baud) or RS485 (1200/2400/4800/9600 baud) interface.

Protocol: GEFTRAN CENCAL or MODBUS

SENSOR SUPPLY / TRANSMITTER

1500V isolation

5, 10 or 15Vdc/200mA or 24Vdc/100mA

POWER SUPPLY

100...240Vac/dc $\pm 10\%$ / 11...27Vac/dc $\pm 10\%$ 50...60Hz; 12VA max

Protected by internal fuse not serviceable by user.

AMBIENT CONDITIONS

Working temperature: 0...50°C

Storage temperature: -20...70°C

Humidity: 20...85%Ur non-condensing

Environmental conditions of use: for internal use only, altitude up to 2000m

ALARMS

3 (10) alarm setpoints settable in absolute value with functions completely configurable from panel keys

(Direct / Reverse / Relative / Symmetrical relative)

- Setting of setpoint along entire selected scale.

- Trip hysteresis settable from panel keys.

- Function: minimum or maximum trip points with saving of trip (LATCH) selectable during configuration.

Relays energized or de-energized in trip status: selected from panel keys.

Trip can be excluded during power-up phase until input variable exceeds set trip point.

Relay trips when variable drops below trip point. Output activation can be timed.

Trip response time:

for Out1 ... Out 2 = 2msec

for Out 3 ... Out 10 = 8msec

GEFRAN MD8 EXPANSION

replacing output 3

- with 8 additional alarm setpoints .

WEIGHT

450g

3 • DESCRIPTION OF FACEPLATE

G Display

5-digit display (-9999.... 9999). 12-bit resolution. Settable decimal point. Fixed zero can be set on least significant digit. In normal operation, the display shows the variable measured at input (process variable). Switching between net and gross values from keyboard. Display of gross value is indicated by flashing of units decimal point.

Positive (-HI-) or negative (-LO-) off-scale signal. If "Peak" function is on, the display shows the peak value according to ("Peak +" / "Peak -") configuration. Low (_Lo_ message) and high (_Hi_ message) off-scale indication.

Broken pressure probe and calibration error indication:

E_br: probe energizing interrupted

_Sbr: "+" wire broken or signal too high

L.sbr: "-" wire broken or signal too low

Er.CAL - calibration error

Display of local and remote setpoints.

Display of configuration and calibration messages/symbol/values.

Display of auxiliary input values.



H LED signal

LED signal (OUT1, OUT2) of energizing state of trip point relay (LED on = relay energized). Signal flashes during display and/or setting of trip point values.

Flashing signal of LEDs OUT1 and OUT2 respectively, with REM LED during display of auxiliary inputs.

I LED signal

Peak value display signal (PEAK).

Calibration active signal (CAL).

Serial communication or remote setpoints active signal (REM).

MD8 expansion enabled or energizing of third alarm relay signal (EXP).

J Self-sticking plate

Plate to identify unit of measurement (engineering).

CONTROLS

A "F" Function button

Gives access to trip point functions (Out1, Out2, Out3/Out1-Out10 if MD8 expansion is present) for reading and/or changing of values. Gives access to display of auxiliary analog inputs (remotes 1 and 2). If button **F** is not pushed to confirm a setpoint change, it will be saved automatically after 10 seconds. Use button **F** to confirm the set value. Keep button **F** pressed to access the various configuration and calibration phases.

B / C Raise and Lower Buttons

Let you increase or decrease displayed value for setting data or selecting an option. During calibration of repetition output **W** the Raise/Lower buttons let you change the minimum and maximum value. Increase/decrease speed is proportional to the time the button is kept pressed. The procedure is not cyclical: when the maximum (minimum) for the field is reached, the function stops even if the button is pressed. During configuration, the Raise/Lower buttons block mnemonic/value alternation to allow change of the displayed parameter.

D Special function button "♦"

Button available for special functions. Configurable function (phase CFG2 parameter button 3):

- tare zero
- automatic calibration control for pressure probe (♦)
- reset trip point memory
- reset peak memory (♦♦)
- enable remote set 1 and/or 2
- display **HOLD** function
- display **HOLD** of sampled input value
- **NET/GROSS** selection
- **MAIN INPUT/INPUTS SUM** selection

E "CAL/RST" button

Configurable function (see CFG2 butt.2 parameter):

- tare zero
- automatic calibration control for pressure probes (♦)
- reset trip memory
- reset peak memory (♦♦)
- enable remote set 1 and/or 2
- display **HOLD** function
- display **HOLD** of sampled input value

(♦) The calibration control function provides a known calibration signal from the unstressed transducer. In this condition, alarm relay status and the value of the analog input repetition signal are unchanged. The calibration function is signaled by lighting of the LED on the front panel (CAL).

(♦♦) When the peak memory reset function is enabled, the button updates the peak memory to the current value of the input signal. These functions are also available by means of configurable external contacts (see "Electrical connections" and "Configuration CFG2: d.i.F.1 and d.i.F.2).

F "PEAK" button

Pressing the **Peak** button displays the peak value, i.e., the data shown on display corresponds (depending on the type of peak selected) to (see CGF2 butt.1 parameter):

- "peak +" maximum value reached by variable
- "peak -" minimum value reached by variable
- "peak - peak" difference between "peak +" and "peak -"

The **PEAK** LED on the front panel indicates when this function is on. When the **PEAK** button is pressed again, the peak function deactivates and the **PEAK** LED turns off. The instrument again displays the process variable. The peak memory remains active internally and can be displayed at any time.

TRIP POINT CHARACTERISTICS

Main input sampling time is 2msec with no remote setpoints, and 4msec with at least one remote setpoint. The maximum trip point delay for OUT1 and OUT2 is the sampling period of the main input.

The maximum delay time for OUT3 is 8msec.

The maximum trip point delay for OUT3...10 on the MD8 expansion is 8msec.

The minimum time for controls from digital inputs (IN1 and IN2) is 8 msec.

4 • ELECTRICAL CONNECTIONS

The instrument consists of 2 basic boards and has 22 faston terminals (6.35 mm).

Signal inputs

Inputs for pressure probe signals and DC signals use fastons 1 (+) and 2 (-). Inputs for DC signals 0-20mA, 4-20mA use fastons 1 (+) and 2 (-) connected in parallel to fastons 22 and 21. For the potentiometer input, the max. end must be connected to faston 20 (+Exc), the min. end to fastons 2 and A3 (-), the cursor to faston 1 (+).

Remote setpoint inputs

Inputs 0-10V, 0-20mA, 4-20mA for any remote setpoints use fastons 8 (+), 9 (-), 10 (+), 11 (-) as alternative to digital communication (see HW configuration).

Digital inputs

NPN isolated digital inputs (from switch, relay, open collector) or PNP 4mA use faston 6 (IN1), 7 (IN2) and 4 (GND).

Calibration output

For input from pressure probe fastons 21 and 22 are available for calibration contacts.

Probe power output

Power for pressure probes, potentiometers, transmitters, available on fastons 20 (+Exc) and 3 (-Exc). Available voltages are: 5V/200mA, 10V/200mA, 15V/200mA, 24V/100mA (see hardware configuration). Any shielding on the probe connection cable must be connected to faston 3 (-Exc).

Repetition output W

Available at fastons 5 (+) and 4 (-) with output in voltage 0...10Vdc, -5...5Vdc, -10...10Vdc or 0...20mA, 4...20mA isolated. Minimum and maximum can be corrected from panel keys (see calibration of repetition output).

Output for MD8 expansion module

Can be available at fastons 19 (data), 18 (clock), 17 (gnd) as alternative to OUT3 alarm trip output (see HW configuration).

Digital communication

- Type C.L. interface: reception diode available at fastons 10(+Rx), 11(-Rx), transmission transistor at fastons 8 (+Tx) and 9 (-Tx).

Resistance in series to diode is 1K Ω , in series to transistor collector 100 Ω .

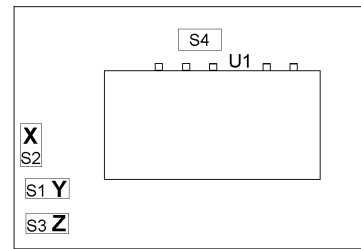
For connection in series, diode resistance is reduced to 100 Ω (see hardware configuration).

- Type RS485 2/4 wire interface (RS422 compatible), connect: (DATA +) faston 10; 8 (DATA -) faston 11, 9.

The transmission distance covered by the RS422/RS485 serial output reaches 500 meters with a maximum of 32 instruments connected.

For line lengths greater than 50 meters, and when a line termination impedance is required, solder jumpers X, Y, and Z on the Solder Side of board 45028X.

Make the termination on the instrument farthest away on the serial connection chain.



OUT1 alarm output

Relay output on fastons 16 (c) and 14 (n.c.); contact capacity is 5A / 250Vac at $\cos\phi = 1$; (see HW configuration for selection of NO/NC contacts)

isolated logic output (*) type D2 23Vdc Rout 470 Ω on fastons 16 (+) and 14 (-).

OUT2 alarm output

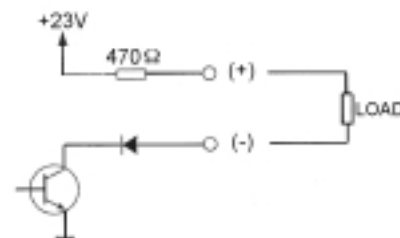
Relay output on fastons 16 (c.) and 15 (n.o./n.c.); contact capacity is 5A / 250Vac at $\cos\phi = 1$; (see HW configuration for selection of NO/NC contacts)

isolated logic output (*) type D2 23Vdc Rout 470 Ω on fastons 16 (+) and 15 (-).

OUT3 alarm output

Relay output on fastons 17 (n.c.), 18 (c.) and 19 (n.o.); contact capacity is 5A/250Vac at $\cos\phi = 1$;

isolated logic output (*) type D2 23Vdc Rout 470 Ω on fastons 19 (+) and 18 (-).



The OUT3 interface is an alternative to the output for MD8 (see hardware configuration).

(*) not isolation with respect to probe supply.

Instrument power supply

Power supply is applied to fastons 12 and 13.

Fuse

Located inside instrument; not replaceable by operator.

Power supply	Type	Current	Voltage
100...240Vac	T	0,5A	250V
11...27Vac/dc	T	1,25A	250V

5 • HARDWARE CONFIGURATION

To remove the electronic part of the case, turn the front screw until release, then remove manually. (Attention: high voltage due to residual loads on condensers!). Configure by making jumpers on electronic boards of instrument. Data and figures are given in the Appendix.

Configuration notes

Access to configuration and calibration depends on the position of jumpers on CPU board:

Jumper J3 ON (closed) = enable configuration.

Jumper S4 ON (closed) = enable calibration (*jumper S4 on solder side of CPU board*)

MD8 trip point expansion: (version 2R or 2D only)

Jumper J4 ON (closed) = enable expansion.

Power configuration for probe, transmitter or potentiometer

Based on the voltage level required, position the jumpers as follows:

POWER LEVEL	JUMPER			
	J5	J10	J15	J24
5V / 200mA	ON	OFF	OFF	OFF
10V / 200mA(*)	OFF	ON	OFF	OFF
15V / 200mA	OFF	OFF	ON	OFF
24V / 100mA	OFF	OFF	OFF	ON

Jumpers J5-J10-J15-J24 are on the components side of the power board (see Appendix)

Selection of NO/NC contacts for outputs OUT1 and OUT2

Normally, relay outputs OUT1 and OUT2 are supplied NO. To configure NC type, you have to manually remove the NO sealed jumpers and install the NC jumpers on the solder side power board.

The jumpers are positioned at their respective relays (Ref. T1 and T2, see Power board solder side)

Probe input configuration

Based on the input required, position the jumpers as follows:

INPUT TYPE	JUMPERS (*)			
	S3A	S3B	S3C	SI
0 - 1V	ON	ON	OFF	OFF
0 - 10V or transmitter 0-10V	OFF	OFF	OFF	OFF
Potentiometer	OFF	OFF	OFF	OFF
0-20mA / 4-20mA transmitter 0-20mA/4-20mA	ON	ON	OFF	ON
Strain gauge, 0-50mV, 0-60mV, 0-100mV (*)	OFF	OFF	ON	OFF

Configuration from panel keys is also necessary for all types of inputs (CGF.3, in.typ and In.cod parameters).

Input configuration for remote setpoints

Based on the input required, position the jumpers as follows:

REMOTE SETPOINT INPUT TYPE	JUMPERS (*)			
	S1A	S1B	S2A	S2B
Remote set 1 / 0-10V (*)	OFF	OFF		
Remote set 1 / 0-20mA / 4-20mA	ON	ON		
Remote set 2 / 0-10V (*)			OFF	OFF
Remote set 2 / 0-20mA / 4-20mA			ON	ON

Digital input configuration

Based on the input required, position the jumpers as follows:

DIGITAL INPUT TYPE	JUMPERS (*)			
	J1P	J1N	J2P	J2N
Input 1:NPN (*) voltage-free contact - open collector 24V/4mA	OFF	ON		
Input 1:PNP (24V/4mA)	ON	OFF		
Input 2:NPN (*) voltage-free contact - open collector 24V/4mA			OFF	ON
Input 2:PNP (24V/4mA)			ON	OFF

5 • CONFIGURAZIONE HARDWARE

Configuration of repetition output W

Based on the output required, position the jumpers as follows:

REPETITION OUTPUT TYPE	JUMPERS (♣)			Jumpers L.S.				
	J5V	J5I	J6	0V	5V/10V	S1	S10	S11
0 -10V or 2-10V	ON	OFF	ON	ON	OFF	ON	ON	OFF
0 -20mA or 4-20mA	OFF	ON	OFF	ON	OFF	ON	ON	OFF
± 5V (**)	ON	OFF	ON	OFF	ON	OFF	ON	ON
± 10V (**)	ON	OFF	ON	OFF	ON	ON	OFF	ON

N.B. with ± 5 and ± 10, JN2 = OFF / J2P = OFF. No digital input 2.

Configuration of serial communication or remote setpoints

Based on the output required, position the jumpers as follows:

TYPE OF FUNCTION	JUMPERS J7 - J8 - J9 - J10 (♣)
Serial communication	A
Remote setpoints	B

Configuration of C.L. (current loop) serial interface

Based on the type of connection required, position the jumpers as follows:

Jumpers S5, S6 are on the CPU board, solder side.

TYPE OF CONNECTION	JUMPERS	
	S5	S6
Parallel (*)	OFF	ON
Series	ON	OFF

(♣) The jumpers are on the CPU board, components side.

(*) Standard configuration

(**) In case of symmetrical signal, digital input IN2 is no longer available. Faston 7 is the (-) reference of IN1.

6 • PROGRAMMING

Setting alarm setpoints

Alarm setpoints are set with the Raise/Lower buttons within the maximum/minimum limits defined during the configuration phase (**Lo.AL** and **Hi.AL**) for absolute setpoints, and in the range -999/999 for deviation setpoints. If at least one of the two remote setpoints is configured as deviation to the local setpoint and simultaneously enabled, the setting limits for the absolute local setpoints become -9999...+9999.

The setpoints are selected by means of the F (function) key, which displays the LEDs in rotation. If the output expansion unit (MD8) is present, setpoint setting continues in the same way for setpoints 4-10. If **Remote setpoint 1** and/or **Remote setpoint 2** are enabled, their value is displayed only in scale points with flashing of the **Out1** and/or **Out2** LEDs.

Remote setpoints

If enabled, Remote setpoint 1 becomes alarm setpoint 1 (if absolute) and Remote setpoint 2 becomes alarm setpoint 2 (if absolute) with simultaneous flashing of LED REM + deviation LED OUT (1 and/or 2).

A remote setpoint configured as deviation to the local setpoint (local alarm setpoint) will be displayed as:

Local setpoint + remote setpoint (Algebraic sum of values).

When setting is finished, press key **F** to confirm the changes and return to normal operation. Press key **F** for a few seconds to access the instrument configuration phase

7 • INFORMATION DISPLAY

InFo

Access the display by keeping the **F** key pressed. The **InFo** message will appear on the display after a few seconds.

Release the **F** key to enter the information display phase:

- Press the **F** key: the display will show the message **Code** with the set serial communication code value;
- Press the **F** key: the display will show the message **UPdt** with the number of the software release used on the instrument;
- Press the **F** key: the display will show the message **Prot** with the set software protection level;
- Press the **F** key: you will return to the variable display.

Introduction

Configuration is performed in 4 steps:

- 1) Configuration 1 (CFG1)
- 2) Configuration 2 (CFG2)
- 3) Configuration 3 (CFG3)
- 4) Configuration4 (CFG4)

Access these steps by keeping the F key pressed until the message **_CFG** appears and alternates with the value 0. Use the **Raise** and **Lower** keys to set the number of the configuration step that you want to access (value 1-4); Then press the **F** key to go directly to the step selected. Press the **F** key to scroll the functions/parameters.

Access to the various configuration steps is subject to software protection (CFG.1) and hardware protection (CFG.2 / CFG.3 / CFG.4) according to the following table:

STEP	CONDITION FOR ENABLING
CFG.1	Prot= 0 (software protection level settable in CFG.2)
CFG.2	Jumper J3 closed
CFG.3	Jumper J3 closed
CFG.4	Jumper J3 closed

Jumper J3 on CPU board component side

If there is protection, you will leave the configuration step and the display returns to the variable display.

Configuration 1 (CFG.1)

Code Instrument code in range 0/9999

HY_1 Hysteresis for OUT1 in range -999/+999.

HY_2 Hysteresis for OUT2 in range -999/+999.

HY_3 Hysteresis for OUT3 in range -999/+999.

If the MD8 expansion unit is enabled, phase CFG.1 continues with the setting of hysteresis for setpoints 4-10.

HY_4 Hysteresis for OUT4 in range -999/+999.

HY_5 Hysteresis for OUT5 in range -999/+999.

HY_6 Hysteresis for OUT6 in range -999/+999.

HY_7 Hysteresis for OUT7 in range -999/+999.

HY_8 Hysteresis for OUT8 in range -999/+999.

HY_9 Hysteresis for OUT9 in range -999/+999.

HY_10 Hysteresis for OUT10 in range -999/+999.

A negative (or positive) number indicates a hysteresis range positioned under (or over) the selected limit, and is typical of a direct (or inverse) trip point. If the output function considers the trip delay instead of hysteresis, the setting is in the range 0/9999 msec. (resolution 2msec. for OUT1 and OUT2, resolution 8msec. for OUT3...10).

In case of outputs with "absolute window" function Code Out 6 and 7, symmetrical window width is set instead of hysteresis with respect to the absolute setpoint. Setting in scale points. The setpoint functions with a fixed hysteresis of 1 scale point (see CFG.2; Out1...Out10).

Configuration 2 (CFG.2)

Use the F key to confirm set values and go to setting of the next parameter

Prot Software protection level according to table:

"Prot"	DISPLAY	CHANGE
0	- read input - trip points - Step "INFO" - Step "CFG.1"	- trip points - Step "CFG.1"
1	- read input - trip points - Step "INFO"	- trip points
2	- read input - trip points - Step "INFO"	
3	- read input - Step "INFO"	
4	- read input	
+8	To disable access to calibration	
+16(*)	To save tare value after resetting zero	
+32	To save the peak enable state and remote setpoints (at power-up, the instrument returns to the state prior to shut-down).	

* The maximum zero reset number (tare zero) saved is linked to the number of non-volatile EEPROM memory cycles (approximately 8000 cycles during the instrument's life cycle). The standard protection level is 1. Remember that Jumper J3 = ON enables access to CFG2, CFG3 and CFG4.

8 • CONFIGURATIONS

Sr.P Serial interface protocol
0 CENCAL GEFRAN
1 MODBUS

bA.u Baudrate

bAu	Baudrate	Interface
0	1200	CL/485
1	2400	485
2	4800	485
3	9600	485
4	19200	485

(CL = Current Loop)

PA.r Parity
0 No parity
1 Odd parity
2 Even parity

butt.1 **PEAK** key function
0 no function (key not active)
1 activate "peak +" (maximum) (*)
2 activate "peak -" (minimum)
3 activate "peak-peak" (max. peak - min. peak)

butt.2 **CAL/RST** key function
0 no function (key not active)
1 reset trip memory
2 reset peak memory
3 reset trip memory + reset peak memory
4 tare reset
5 tare reset + setpoint memory reset
6 tare reset + peak memory reset
7 tare reset + setpoint memory reset + peak memory reset
8 calibration check
9 remote setpoint 1 on/off (•)
10 remote setpoint 2 on/off (•)
11 remote setpoint 1+2 on/off (•)
12 display **HOLD** function (the display remains "frozen" as long as the key is pressed); the process variable continues to be sampled and the setpoints function normally
13 **HOLD** function for sampled input value (the sampled input value and the setpoints remain "frozen" as long as the key is pressed)

butt.3 " * " key function
0 no function (key not active)
1 reset trip memory
2 reset peak memory
3 reset trip memory + reset peak memory
4 tare reset
5 tare reset + setpoint memory reset
6 tare reset + peak memory reset
7 tare reset + setpoint memory reset + peak memory reset
8 calibration check
9 remote setpoint 1 on/off (•)
10 remote setpoint 2 on/off (•)
11 remote setpoint 1+2 on/off (•)
12 display **HOLD** function (the display remains "frozen" as long as the key is pressed); the process variable continues to be sampled and the setpoints function normally
13 **HOLD** function for sampled input value (the sampled input value and the setpoints remain "frozen" as long as the key is pressed)
14 **NET/GROSS** selection function. The **GROSS** display is indicated by the flashing decimal point of the units. The set points always refer to the **NET** value. In case of **PV** configuration as sum of inputs, the key switches between main input and sum of inputs. The main variable is indicated by the flashing decimal point of the units. In this case, the setpoints refer to the sum of inputs.
 (•) Remote setpoint enabled; REM LED on, tYPr1 and/or tYPr2 must also be enabled in CFG3.

- d.i.F.1** digital input 1 function
- 0 no function (key not active)
 - 1 reset trip memory
 - 2 reset peak memory
 - 3 reset trip memory + reset peak memory
 - 4 tare reset
 - 5 tare reset + setpoint memory reset
 - 6 tare reset + peak memory reset
 - 7 tare reset + setpoint memory reset + peak memory reset
 - 8 calibration check (only for 6-wires Strain-gauge probes)
 - 9 remote setpoint 1 on (•)
 - 10 remote setpoint 2 on (•)
 - 11 remote setpoint 1+2 on (•)
 - 12 display **HOLD** function (the display remains "frozen" as long as the key is pressed); the process variable continues to be sampled and the setpoints function normally
 - 13 **HOLD** function for sampled input value (the sampled input value and the setpoints remain "frozen" as long as the digital input is active). With the digital input active, a reset of the setpoint memory de-energizes all energized relays and resets all alarm memories.
 - 14 **FLASH** function for sampled input value (see section on setpoint function).
 - 15 probe feed check. Digital input 1 (IN1) used to check probe feed must be polarized (type PNP) (see configuration of digital inputs). The digital input has to be connected in parallel to the probe feed. Connect faston **4** to **-Exc**, faston **6** (diF1) to **+Exc**. If the probe receives no power, the display shows E.br; outputs (out) go to configuration state (rEL).
- Note:** the input **HOLD** and **FLASH** functions are mutually exclusive.
- (•) Remote setpoint enabled: REM LED on, tYPr1 and/or tYPr2 must also be enabled in CFG3.
- d.i.F.2** digital input 2 function
- 0 no function (key not active)
 - 1 reset trip memory
 - 2 reset peak memory
 - 3 reset trip memory + reset peak memory
 - 4 tare reset
 - 5 tare reset + setpoint memory reset
 - 6 tare reset + peak memory reset
 - 7 tare reset + setpoint memory reset + peak memory reset
 - 8 calibration check (only for 6-wires Strain-gauge probes)
 - 9 remote setpoint 1 on (•)
 - 10 remote setpoint 2 on (•)
 - 11 remote setpoint 1+2 on (•)
 - 12 display **HOLD** function (the display remains "frozen" as long as the key is pressed); the process variable continues to be sampled and the setpoints function normally
 - 13 **HOLD** function for sampled input value (the sampled input value and the setpoints remain "frozen" as long as the digital input is active). With the digital input active, a reset of the setpoint memory de-energizes all energized relays and resets all alarm memories.
 - 14 **FLASH** function for sampled input value (see section on setpoint function).
 - 15 probe feed check. Digital input 1 (IN1) used to check probe feed must be polarized (type PNP) (see configuration of digital inputs). The digital input has to be connected in parallel to the probe feed. Connect faston **4** to **-Exc**, faston **7** (diF1) to **+Exc**. If the probe receives no power, the display shows E.br; outputs (out) go to configuration state (rEL).
- Note:** the input **HOLD** and **FLASH** functions are mutually exclusive.
- (•) Remote setpoint enabled: REM LED on, tYPr1 and/or tYPr2 must also be enabled in CFG3.
- out_1** output 1 function (the out1 setpoint value can only be absolute. See section on trip point function).
- 0 direct absolute (**direct** function same as having an energized relay for values above set trip point).
 - 1 reverse absolute (**reverse** function same as having an energized relay for values below set trip point).
 - 6 absolute direct window (•)
 - 7 absolute reverse window (•)
 - +8 to code selected for action disabled at power-on until the first trip point (useful in case of inverse trip point due to minimum alarm).
 - +16 to code selected for trip point with memory.
 - +32 to code selected for probe interrupt or power failure alarm (In this case, you have to use DIGITAL INPUT 1 or DIGITAL INPUT 2 configured d.i.F.1 = 15, d.i.F.2 = 15). Relay state depends on parameter rEL. When the probe is not interrupted, the output functions normally. In case of probe error such as "energizing interrupted," the display shows message E_br.
 - +64 to code selected for timed trip point delay (in this case, hysteresis is set in msec. and becomes the delay time in activation of output compared to time of tripping).
 - +128 to selected code to not subject absolute alarm setpoints to tare zero.

8 • CONFIGURATIONS

- out_2** output 2 function (See also section on trip point function)
- 0** direct absolute (**direct** function same as having an energized relay for values above set trip point).
 - 1** reverse absolute (**reverse** function same as having an energized relay for values below set trip point).
 - 2** direct deviation referred to previous absolute
 - 3** reverse deviation referred to previous absolute
 - 4** symmetrical direct deviation (window) referred to previous absolute
 - 5** symmetrical reverse deviation (window) referred to previous absolute
 - 6** absolute direct window (♣)
 - 7** absolute reverse window (♣)
 - +8** to code selected for action disabled at power-on until the first trip point (useful in case of inverse trip point due to minimum alarm).
 - +16** to code selected for trip point with memory.
 - +32** to code selected for probe interrupt or power failure alarm (In this case, you have to use DIGITAL INPUT 1 or DIGITAL INPUT 2 configured d.i.F.1 = 15, d.i.F.2 = 15). Relay state depends on parameter rEL. When the probe is not interrupted, the output functions normally. In case of probe error such as "energizing interrupted," the display shows message E_br.
 - +64** to code selected for timed trip point delay (in this case, hysteresis is set in msec. and becomes the delay time in activation of output compared to time of tripping).
 - +128** to selected code to not subject absolute alarm setpoints to tare zero.

(♣) In this case, set HyS_1...HyS10 in CFG1 phase to define the window (see function notes/trip points).

- out_3** output 3 function: same as for out_2 above. If MD8 output expansion unit is enabled, the procedure continues with the function setting for choices 4-10.
- out_4** output 4 function: same as for out_2 above.
- out_5** output 5 function: same as for out_2 above.
- out_6** output 6 function: same as for out_2 above.
- out_7** output 7 function: same as for out_2 above.
- out_8** output 8 function: same as for out_2 above.
- out_9** output 9 function: same as for out_2 above.
- out_10** output 10 function: same as for out_2 above.

_rEL behavior of trip relays in case of broken probe (energizing and/or signal); setting according to following table:

Code rEL	Behavior of relay in case of:		
	Wire + broken or input signal too high. Message on display H_Sbr	Wire - broken or input signal too low. Message on display L_Sbr	Energizing interrupted: (wire+ or wire-) Message on display E_br
0	OFF	OFF	OFF
1	OFF	OFF	ON
2	OFF	ON	OFF
3	OFF	ON	ON
4	ON	OFF	OFF
5	ON	OFF	ON
6	ON	ON	OFF
7	ON	ON	ON

- Note:**
- the individual alarm relays assume the state defined by code "rEL" if the function is enabled. Enable by adding 32 to the output function code: see Out1...Out10 in CFG2 phase.)
 - in case of calibration error (message **Er.CAL** on display), all outputs are in OFF state with relays de-energized.
 - in case of input off scale high or low (message **_Lo_** and **_Hi_** respectively), the outputs behave as for start of scale and full scale values, respectively.
 - with the "**FLASH**" function enabled, the state of outputs from table rEL is updated when the FLASH on command is given.

8 • CONFIGURATIONS

Configuration 3 (CFG.3).

Use the **F** key to confirm set values and go to setting of next parameter.

In.tYP type of input e polarization:

In.tYP	Probe type	Signal polarization
0	Strain gauge (Pressure, force, etc)	Positive (ex: 0...10mV)
1		Symmetrical (ex: -10...10mV)
2		Negative (ex: -10...0mV)
4	Linear (V, I, Pot)	Positive (ex: 0...10V)
5		Symmetrical (ex: -5...5V)
6		Negative (ex: -10...0V)
+8	Custom linearization (*)	
+16	Inputs algebraic sum function (main input + remote input 1)	
+32	"Remote AD converter" function: acquisition of process variable directly from serial line (CENCAL only) (in range 0-16000 points) instead of from instrument's analog input.	
+64	To cancel messages _Lo_ (off scale low) and _Hi_ (off scale high) from display excluding custom linearization.	

(*) In this case, set the custom linearization table to 32 segments (see CFG.4)

In.Cod sensitivity identification code at input.

STRAIN GAUGE			LINEAR	
In.Cod	Sensitivity (mV/V)	Energizing (V)	In.Cod	Signal
0	1.5	5	0	0-50mV
1	2		1	0-60mV
2	2.5		2	0-100mV
3	2		3	0-1V
4	3.3		4	0-10V
			5	0-20mA
			6	4-20mA
5	1.5	10	7	Pot. ≥350Ω
6	2		Power 10V	
7	2.5			
8	3			
9	3.3			
10	1.5	15		Control
11	2			“Probe input”
12	2.5			configuration
13	3			as well
14	3.3			
15*	Trasmitter 0...10V			
16*	Trasmitter 0...20mA			
17*	Trasmitter 4...20mA			

(*) positive polarization only (In.tYP = 0). See also "Details on linear scales."

FiLt constant programming of digital filter time, settable in range 0-2.00 sec. It is advisable to turn on the filter at the limit of the admitted trip time. Set = 0 to turn off filter.

FiId constant programming of digital filter time on display. Value settable in range 0...9.9 sec. Set -0 to turn off filter. Does not affect trip time .

dEC.P position of decimal point or number of decimal digits in range 0/1/2/3/ +4 to display value multiplied by 10..

oFSEt offset of input in range -999/999 in scale units.

Lo.Lin Minimum linear scale value for input in range -9999/+9999. (*).

Hi.Lin Maximum linear scale value for input in range -9999/+9999. (*).

(*) If dEcP = n + 4 (display value multiplied by 10), the minimum limit becomes -1999 (displayed: -19990)

8 • CONFIGURATIONS

tYP.r1 type of linear scale for remote input 1 - see configuration table:

tYP.r1	Function enabled
0	Remote setpoint not enabled
1	0-10V Linear
2	0-20mA Linear
3	4-20mA Linear
+4	Set relative to local set; the set is the algebraic sum of remote set 1 and trip point 1

tYP.r2 type of linear scale for remote input 2 - see configuration table:

tYP.r2	Function enabled
0	Remote setpoint not enabled
1	0-10V Linear
2	0-20mA Linear
3	4-20mA Linear
+4	Set relative to local set; the set is the algebraic sum of remote set 2 and trip point 2

The enabled remote input (code other than 0) is read with simultaneous flashing of the OUT2 and REM LEDs.

Lo.SP lower limit for setpoints (locals or remotes) in scale range -1999/+9999 (may be higher than Hi.SP).(*)

Hi.SP upper limit for setpoints (locals or remotes) in scale range 1999/+9999 (may be lower than Lo.SP).(*)

out_tr type of signal in output **W** (analog retransmission) according to table:

	RETRANSMITTED VARIABLE	SIGNAL TYPE
0	Input (displayed value)	0-10V or 0-20mA
1	Peak + (maximum)	
2	Peak - (minimum)	
3	Peak - peak	
4	Trip point 1	
5	Trip point 2	
6	Trip point 3	
7	Trip point 4	
8	Trip point 5	
9	Trip point 6	
10	Trip point 7	
11	Trip point 8	
12	Trip point 9	
13	Trip point 10	
14	Remote setpoint 1	
15	Remote setpoint 2	
64	Main input value in case of process variable with inputs sum function	
65	GROSS value	
66	TARE value (Zero)	
67	Value managed directly from serial line (CENCAL only) in scale points	

Nota: Add **+16** to code 0-15 to obtain output type 2-10V or 4-20mA
Add **+32** to selected code to enable management of the output during alarm setpoint setting phase (function enabled only for codes (4....13).

8 • CONFIGURATIONS

Lo_tr start scale limit for retransmission output in range -9999/9999.(*)

Hi_tr full scale limit for retransmission output in range -9999/9999. (Lo.tr may be higher than Hi.tr).(*)

Lo_AL Minimum limit for setting of absolute alarm setpoints in range -9999...+9999.(*)

Hi_AL Maximum limit for setting of absolute alarm setpoints in range -9999....+9999.(*)

(*) If $dEcP = n + 4$ (display value multiplied by 10), the minimum limit becomes -1999 (displayed: -19990)

Configuration 4 (CFG.4).

Setting custom linearization table in 32 segments.

ATTENTION: before setting, you must know the various corresponding values between the input signal and the engineering units scale (see example of linearization). Press **F** to scroll the 33 values of the linearization table in scale units:

St.0 Set starting point (scale start)

St.1 Set point 1

St.2 Set point 2

.....

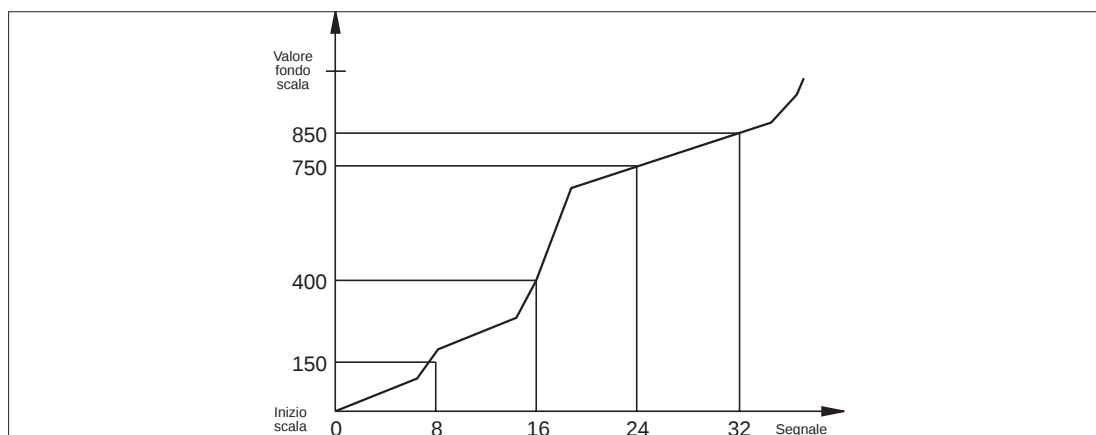
St.32 Set point 32 (full scale)

EXAMPLE OF LINEARIZATION

Note: Positive polarization signals (ex. 0-50mV); St.0 is value displayed for minimum input (ex. 0mV); St. 32 is value displayed for maximum input (ex. 50mV).

For signals with symmetrical polarization (ex. ± 25 mV); St.0 is value displayed for maximum negative input (ex. -25mV); St.32 is value displayed for maximum input (ex. +25mV).

EXAMPLE OF LINEARIZATION



9 • CALIBRATIONS

IMPORTANT: the instruments are supplied pre-calibrated, run the procedure only if absolutely necessary. Start calibration with the instrument on for at least 5-10 minutes. To access the calibration menu, keep the **F** key pressed until the message **_CAL** appears on the display in alternation with value 0. Access is subject to jumper **S4 = ON** and to software protection Prot in CFG2. The calibration menu can be accessed directly by pressing the F, Inc, Dec keys simultaneously; this access is subject only to software protection by means of the Prot parameter in configuration CFG.2. The calibration menu has 11 items:

- 1 Calibration 50mV, 60mV or 100mV (CAL.1)
- 2 Calibration 1V (CAL.2)
- 3 Calibration 10V (CAL.3)
- 4 Calibration 20mA (CAL.4)
- 5 Manual calibration of pressure probe (CAL.SG)
- 6 Automatic calibration of pressure probe (CAL.Au)
- 7 80% automatic calibration of pressure probe (CAL.80)

Direct access to the "CAL.80" procedure is also possible by simultaneously pressing the F and Raise keys; this access mode is subordinate only to software protection (Prot. parameter in CFG2) and to Strain Gauge or transmitter probe type (In.tYP = 0, 1, 2; In.Cod = 0...17).

9 • CALIBRATIONS

- 8 Calibration of potentiometer input (CAL.Po)
- 9 Calibration of remote input 1 (CAL.S1)
- 10 Calibration of remote input 2 (CAL.S2)
- 11 Calibration of repetition output (CAL.rt)

Use the "Raise" and "Lower" keys to set the key code for the calibration step to be accessed (value 1-11). Then press the **F** key to go directly to the step **ONLY** if the set code corresponds to a probe type conforming to instrument configuration (**tYP**); the display will show the message corresponding to the type of calibration selected. If protection is active, you will exit the calibration menu and return to display of the variable. By pressing the **F** key with key code = **0** you quit the calibration procedure and return to display of the variable. The calibration check function signals (with message **Er.CAL** on the display) incorrect signal values during calibration. The message is displayed when the difference between the maximum and minimum values of the signal is less than 15% of the set full scale. In this situation, the outputs are forced to OFF state (relays de-energized). You have to re-run the calibration procedure after removing the defect.

-CAL.L1 (per 0-50mV / 0-60mV / 0-100V linears)

Calibration (key code 1) for 50mV/60mV/100mV inputs. The display shows the message:

CAL.L1 Make electrical connections as instructed in specific section. Press the **F** key to continue.

CAL.0 Put a 0V signal between inputs of faston 1(+) and faston 2(-). Press the **F** key to continue.

CAL.50 Put a 50mV, 60mV or 100mV signal between inputs of faston 1(+) and faston 2(-). Press the **F** key to end the procedure. The message **_CAL** with value **0** will appear on the display. Press the **F** key to exit the calibration menu or set the code for a new calibration.

-CAL.L2 (for 0-1V linears)

Calibration (key code 2) for 1V input. The display shows the message:

CAL.L2 Make electrical connections as instructed in specific section. Press the **F** key to continue.

CAL.0 Put a 0V signal between inputs of faston 1(+) and faston 2(-). Press the **F** key to continue.

CAL.1 Put a 1V signal between inputs of faston 1(+) and faston 2(-). Press the **F** key to end the procedure. The message **_CAL** with value **0** will appear on the display. Press the **F** key to exit the calibration menu or set the code for a new calibration.

-CAL.L3 (for 0-1V linears)

Calibration (key code 3) for 0-10V input. The display shows the message:

CAL.L3 Make electrical connections as instructed in specific section. Press the **F** key to continue.

CAL.0 Put a 0V signal between inputs of faston 1(+) and faston 2(-). Press the **F** key to continue.

CAL.10 Put a 10V signal between inputs of faston 1(+) and faston 2(-). Press the **F** key to end the procedure. The message **_CAL** with value **0** will appear on the display. Press the **F** key to exit the calibration menu or set the code for a new calibration.

-CAL.L4 (for 0-20mA / 4-20mA linears)

Calibration (key code 4) for 0-20mA / 4-20mA input. The display shows the message:

CAL.L4 Make electrical connections as instructed in specific section. Press the **F** key to continue.

CAL.0 Put a 0mA signal between inputs of faston 1(+) and faston 2(-). Press the **F** key to continue.

CAL.20 Put a 20mA signal between inputs of faston 1(+) and faston 2(-). Press the **F** key to end the procedure. The message **_CAL** with value **0** will appear on the display. Press the **F** key to exit the calibration menu or set the code for a new calibration.

-CAL.S (for 6-4 wire strain gauge pressure probe)

Calibration (key code 5) for pressure input for 4 or 6-wire strain gauge probe with manual sequence.
The display shows the message:

CAL.SG Make electrical connections as instructed in specific section. Use the "Raise/Lower" keys to set the calibration value indicated on each probe, approximately 80% of full scale. Press the **F** key to continue.

PrS.1 Put a signal corresponding to minimum pressure (equivalent to probe drained) between inputs of faston 1(+) and faston 2(-). Press the **F** key to continue.

PrS.2 In case of 6-wire probe, the instrument will automatically unbalance the pressure probe and acquire the calibration value.
Attention: the probe must be drained.

In case of 4-wire probe, put a signal corresponding to the set calibration value at instrument input, or load the probe in an equivalent manner. Press the **F** key to end the procedure. The message **_CAL** with value **0** will appear on the display. Press the **F** key to exit the calibration menu or set the code for a new calibration.

9 • CALIBRATIONS

-CAL.Au (for 6- wire strain gauge pressure probe)

Calibration (key code 6) for pressure input for 6-wire strain gauge probe with automatic sequence.

Attention: the probe must be drained. The display shows the message:

CAL.Au Make electrical connections as instructed in specific section and check that the probe is drained. Use the "Raise/Lower" keys to set the calibration value indicated on each probe, approximately 80% of full scale. Press the **F** key to continue.

PrS.1 Wait for stabilization and acquisition of minimum value; automatically goes to next step.

PrS.2 Unbalancing of probe, wait for stabilization and acquisition of calibration value equal to value shown on probe (approximately 80% of full scale value); automatically goes to end of procedure and returns to normal functioning.

-CAL.80 (for 6- wire strain gauge pressure probe, 80% cal.)

Calibration (key code 7) for pressure input for 6-wire strain gauge probe, calibrated to exactly 80% of full scale with automatic sequence.

Attention: the probe must be drained. The display shows the message:

CAL.80 Make electrical connections as instructed in specific section and check that the probe is drained. Use the "Raise/Lower" keys to set the full scale value of the probe. Press the **F** key to start calibration.

PrS.1 Wait for stabilization and acquisition of minimum value; automatically goes to next step.

PrS.2 Unbalancing of probe, wait for stabilization and acquisition of calibration value equal to value shown on probe (approximately 80% of full scale value); automatically goes to end of procedure and returns to normal functioning.

-CAL.Po (for potentiometer input)

Calibration of potentiometer input (key code 8). The display shows the message:

CAL.Po Make electrical connections as instructed in specific section. Press the **F** key to continue.

Lo.Pot Position the potentiometer cursor at start of stroke. Press the **F** key to continue.

Hi.Pot Position the potentiometer cursor at end of stroke. Press the **F** key to end the procedure. The message **_CAL** with value **0** will appear on the display. Press the **F** key to exit the calibration menu or set the code for a new calibration.

-CAL.S1 (for remote input 1)

Calibration of remote input 1 (key code 9): for 0-10V/0-20mA inputs (see hardware configuration).

The display shows the message:

CAL.S1 Make electrical connections as instructed in specific section. Press the **F** key to continue.

LO_.Sr.1 Supply minimum value to remote input 1 (if input from potentiometer, position the potentiometer cursor at start of stroke). Press the **F** key to continue.

HI_.Sr.1 Supply maximum value to remote input 1 (if input from potentiometer, position the potentiometer cursor at end of stroke). Press the **F** key to end the procedure. The message **_CAL** with value **0** will appear on the display. Press the **F** key to exit the calibration menu or set the code for a new calibration.

-CAL.S2 (for remote input 2)

Calibration of remote input 2 (key code 10): for 0-10V/0-20mA inputs (see hardware configuration).

The display shows the message:

CAL.S2 Make electrical connections as instructed in specific section. Press the **F** key to continue.

LO_.Sr2 Supply minimum value to remote input 2 (if input from potentiometer, position the potentiometer cursor at start of stroke). Press the **F** key to continue.

HI_.Sr2 Supply maximum value to remote input 2 (if input from potentiometer, position the potentiometer cursor at end of stroke). Press the **F** key to end the procedure. The message **_CAL** with value **0** will appear on the display. Press the **F** key to exit the calibration menu or set the code for a new calibration.

-CAL.rt (for retransmission output)

Calibration of repetition output (key code 11): for 0-10mV/0-20 mA inputs (see hardware configuration).

The display shows the message:

CAL.rt Make electrical connections as instructed in specific section. Press the **F** key to continue.

Lo.out With the "Raise/Lower" keys, correct the offset of the minimum output signal in range -300/+1999, corresponds to the output minimum signal (0V, 0mA or 4mA). Press the **F** key to continue.

Hi.out With the "Raise/Lower" keys, correct the offset of the minimum output signal in range -300/+1999, corresponds to the output maximum signal (10V, 20mA). Press the **F** key to end the procedure. The message **_CAL** with value **0** will appear on the display. Press the **F** key to exit the calibration menu or set the code for a new calibration.

DETAILS ON LINEAR SCALES 0...10V, 0...20mA, 4...20mA

The instrument provides two different modes to manage 0...10V, 0...20mA, 4...20mA linear signals, selectable with parameters **InTyP** and **InCod** in phase CFG3:

a) *Generic linear signal mode, "Minimum Maximum" scale type*

InTyP = 4, InCod = 4,5,6

The scales are factory-calibrated. In case of need, calibration in the field is performed with procedures CAL.L3, CAL.L4. The 4...20mA scale is calibrated with a 0...20mA signal. The calibration check is not available with the CAL/RST key.

b) *Signal from pressure transmitter or amplified load cell mode, "Zero-Span" type scale:*

InTyP = 0, InCod = 15,16,17

Calibration is performed together with the sensor, following procedures CAL.SG, CAL.AU, CAL.80 (as for strain gauges). The scale minimum (normally = 0) is set in CGG3 with parameter LO_LIN; Span (normally about 80% of full scale) is set during calibration phase. Parameter HI_LIN causes the _Hi_ message on the display.

You can also run the calibration check with one of the CAL/RST" or "*" keys enabled for this procedure. The calibration check requires that the sensor have the calibration input (2 CAL wires connected to fastons 21 and 22 on the instrument).

TRIP POINTS

Absolute trip point

Setpoint set with absolute value with respect to 0. (ex. Out1=450, Out2=350, Out3=500, Out4=600). The setting range assumes maximum values of selected scale.

Deviation trip point

Setpoint set with reference to setpoint value

ex1. Out1 absolute, the others deviation:

Out1=400, Out2=50 (trip point at 450)

Out3=80, (trip point at 480)

Out4=100, (trip point at 300)

e2. Out1, Out3 absolute, the others deviation:

Out1=400, Out2=50 (trip point at 450)

Out3=300, Out4=100 (trip point at 200)

The setting range assumes values -999/999. The set value is added algebraically to the previous absolute alarm limit value (the limit value may exceed the scale limits).

Direct trip point

Relay energized with variable above value of set trip point for both absolute and deviation type.

Reverse trip point

Relay energized with variable below value of set trip point for both absolute and deviation type.

Symmetrical deviation trip point

Value set relative to setpoint is both added and subtracted to create a trip window. This is defined direct (inverse) symmetrical deviation with relay energized for values outside (inside) the window.

Calibration control function

Activated by key or by specifically configured digital input. It involves:

- blocking of trip points
- closing of calibration contact (fastons 21 and 22)
- lighting of CAL LED
- display of input corresponding to value supplied by probe or transmitter for activation time of key or of digital input.

HOLD Function

The input value and the trip points remain "frozen" as long as the logic input is active. With the input active, a reset of the setpoint memory de-energizes all energized relays and resets all alarm memories

FLASH Function

The input value is sampled and trip points are "frozen." When the logic input becomes active, the input value is "frozen" and the trip points are updated in base to the last acquired value.

PROGRAMMING BY P.C.

All configuration and calibration procedures can be run with an IBM * Personal Computer (or compatible), with suitable management software and interface (CL, RS485)

* IBM is a registered trademark of International Business Machines.

11 • ORDER CODE

2300 ☐ ☐ ☐ ☐

VERSION	
Alarm outputs + 2SPR	SI
Alarm outputs + 2SPR + W	SW
Alarm outputs + Serial CL	SX1
Alarm outputs + Serial 485	SX2
Complete Serial CL	CC1
Complete Serial 485	CC2

OUTPUTS	
3 relay outputs	3R
3 logic outputs	3D
2 relay outputs + Out MD8	2R
2 logic outputs + Out MD8	2D

POWER SUPPLY	
11...27Vac/dc	0
100...240Vac	1

CONFIGURATION	
None configuration: Standard	S
Custom configuration	C

Please, contact GEFRA sales people for the codes availability.

• WARNINGS



WARNING: this symbol indicates danger.

It is placed near the power supply circuit and near high-voltage relay contacts.

Read the following warnings before installing, connecting or using the device:

- follow instructions precisely when connecting the device.
- always use cables that are suitable for the voltage and current levels indicated in the technical specifications.
- the device has NO ON/OFF switch: it switches on immediately when power is turned on. For safety reasons, devices permanently connected to the power supply require a two-phase disconnecting switch with proper marking. Such switch must be located near the device and must be easily reachable by the user. A single switch can control several units.
- if the device is connected to electrically NON-ISOLATED equipment (e.g. thermocouples), a grounding wire must be applied to assure that this connection is not made directly through the machine structure.
- if the device is used in applications where there is risk of injury to persons and/or damage to machines or materials, it MUST be used with auxiliary alarm units. You should be able to check the correct operation of such units during normal operation of the device.
- before using the device, the user must check that all device parameters are correctly set in order to avoid injury to persons and/or damage to property.
- the device must NOT be used in inflammable or explosive environments. It may be connected to units operating in such environments only by means of suitable interfaces in conformity to local safety regulations.
- the device contains components that are sensitive to static electrical discharges. Therefore, take appropriate precautions when handling electronic circuit boards in order to prevent permanent damage to these components.

Installation: installation category II, pollution level 2, double isolation

- power supply lines must be separated from device input and output lines; always check that the supply voltage matches the voltage indicated on the device label.

- install the instrumentation separately from the relays and power switching devices
- do not install high-power remote switches, contactors, relays, thyristor power units (particularly if "phase angle" type), motors, etc... in the same cabinet.
- avoid dust, humidity, corrosive gases and heat sources

- do not close the ventilation holes; working temperature must be in the range of 0...50°C

If the device has faston terminals, they must be protected and isolated; if the device has screw terminals, wires should be attached at least in pairs.

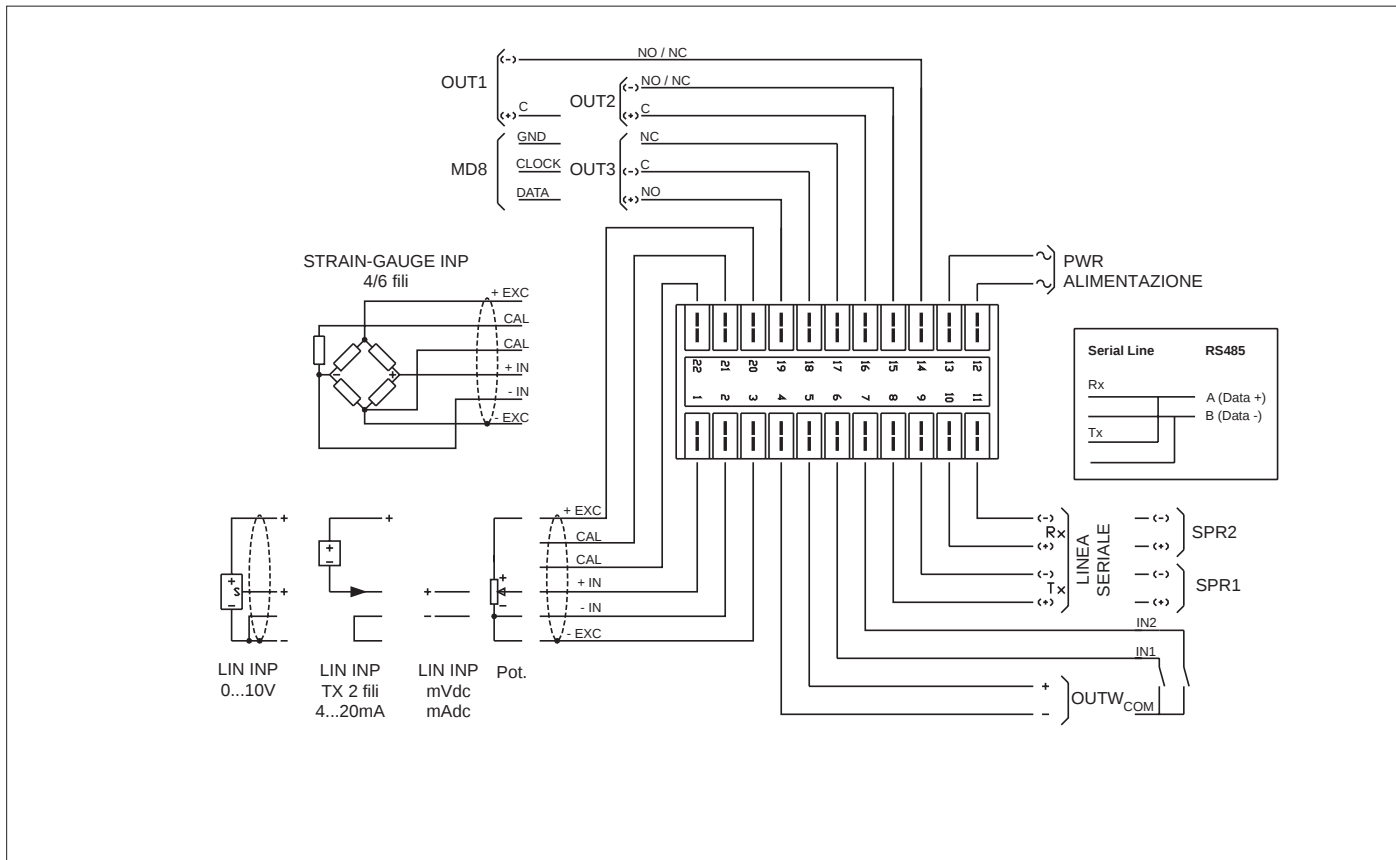
- **power:** supplied from a disconnecting switch with fuse for the device section; path of wires from switch to devices should be as straight as possible; the same supply should not be used to power relays, contactors, solenoid valves, etc.; if the voltage waveform is strongly distorted by thyristor switching units or by electric motors, it is recommended that an isolation transformer be used only for the devices, connecting the screen to ground; it is important for the electrical system to have a good ground connection; voltage between neutral and ground must not exceed 1V and resistance must be less than 60Ω; if the supply voltage is highly variable, use a voltage stabilizer for the device; use line filters in the vicinity of high frequency generators or arc welders; power supply lines must be separated from device input and output lines; always check that the supply voltage matches the voltage indicated on the device label.

- **Input and output connections:** external connected circuits must have double insulation; to connect analog inputs (TC, RTD) you have to: physically separate input wiring from power supply wiring, from output wiring, and from power connections; use twisted and screened cables, with screen connected to ground at only one point; to connect adjustment and alarm outputs (contactors, solenoid valves, motors, fans, etc.), install RC groups (resistor and capacitor in series) in parallel with inductive loads that work in AC (*Note: all capacitors must conform to VDE standards (class x2) and support at least 220 VAC. Resistors must be at least 2W*); fit a 1N4007 diode in parallel with the coil of inductive loads that operate in DC

GEFRA spa will not be held liable for any injury to persons and/or damage to property deriving from tampering, from any incorrect or erroneous use, or from any use not conforming to the device specifications.

CONNESSIONI CONNECTIONS VERBINDUNGEN

CONNEXIONS CONEXIONES CONEXÕES



Ingresso 0- 20mA o 4-20mA
0- 20mA or 4-20mA input

Eingang 0- 20mA oder 4-20mA
Entrée 0- 20mA ou 4-20mA

Entrada 0- 20mA o 4-20mA
Entrada 0- 20mA ou 4-20mA

Configurazione
Configuration

Konfiguration
Configuration

Configuración
Configuração

Ingresso sonda:
Probe input:

Sensoreingang:
Entrée capteur:

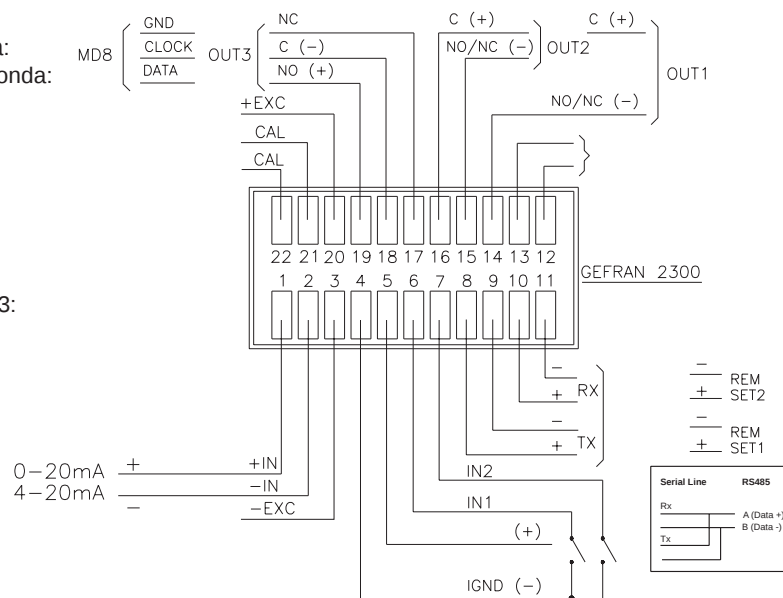
Entrada sonda:
Entrada para sonda:

S3A (ON)
S3B (ON)
S3C (OFF)
SI (ON)

Tipo di ingresso in CFG3:
Input type in CFG3 :
Eingangstyp in CFG3 :

Type d'entrée dans la CFG3:
Tipo de entrada en CFG3:
Tipo de entrada na CFG3:

In TyP = 4,5,6
In Cod = 5,6



**Ingresso da trasmettitore 0- 20mA,
4-20mA 2 fili**

**Transmittereingang 0- 20mA,
4-20mA 2-Leiter**

**Entrada desde transmisor 0- 20mA,
4-20mA 2 hilos**

**0- 20mA4-20mA 2-wires input from
transmitter**

**Entrée par transmetteur 0- 20mA,
4-20mA 2 fils**

**Entrada do transmissor 0- 20mA,
4-20mA 2 fios**

Configurazione
Configuration

Konfiguration
Configuration

Configuración
Configuração

Ingresso sonda:
Probe input:

Sensoreingang:
Entrée capteur:

Entrada sonda:
Entrada para sonda:

S3A (ON)
S3B (ON)
S3C (OFF)
SI (ON)

Tipo di ingresso in CFG3: Type d'entrée dans la CFG3:
Input type in CFG3: Tipo de entrada en CFG3:
Eingangstyp in CFG3: Tipo de entrada na CFG3:

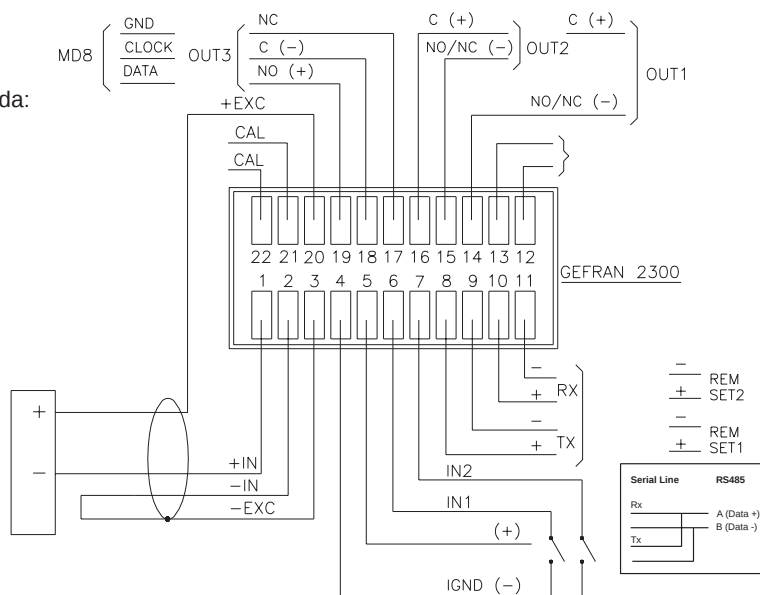
In TyP = 0
In Cod = 16,17

Alimentazione trasmettitore: 24V
Transmitter power: 24V
Transmitterspeisung: 24V
Alimentation transmetteur: 24V
Alimentación transmisor: 24V
Alimentação do transmissor: 24V

(J24 ON, J5 = J10 = J15 = OFF)

Calibrazione: Procedura (vedi calibrazioni)
Calibration: Procedure (see calibrations)
Kalibrierung: Prozedur (siehe Kalibrationen)
Calibration: Procédure (cf. calibration)
Calibración: Procedimiento (véase calibraciones)
Calibração: Processo (ver calibrações)

CAL.SG



**Ingresso 0- 10V
0- 10V input**

**Eingang 0- 10V
Entrée 0- 10V**

**Entrada 0- 10V
Entrada 0- 10V**

Configurazione
Configuration

Konfiguration
Configuration

Configuración
Configuração

Ingresso sonda:
Probe input:

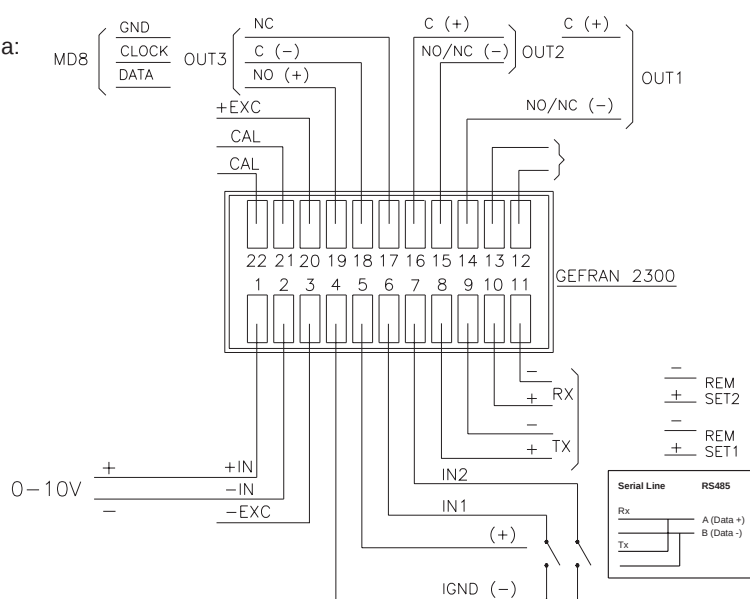
Sensoreingang:
Entrée capteur:

Entrada sonda:
Entrada para sonda:

S3A (OFF)
S3B (OFF)
S3C (OFF)
SI (OFF)

Tipo di ingresso in CFG3: Type d'entrée dans la CFG3:
Input type in CFG3: Tipo de entrada en CFG3:
Eingangstyp in CFG3: Tipo de entrada na CFG3:

In TyP = 4
In Cod = 4



**Ingresso da trasmettitore 0- 20mA,
4-20mA 4 fili**

**0- 20mA, 4-20mA 4-wires input from
transmitter**

Configurazione
Configuration

Konfiguration
Configuration

Configuración
Configuração

Ingresso sonda:
Probe input:

Sensoreingang:
Entrée capteur:

Entrada sonda:
Entrada para sonda:

S3A (ON)
S3B (ON)
S3C (OFF)
SI (ON)

Tipo di ingresso in CFG3: Type d'entrée dans laCFG3:
Input type in CFG3: Tipo de entrada en CFG3:
Eingangstyp in CFG3: Tipo de entrada na CFG3:

In TyP = 0
In Cod = 16,17

Alimentazione trasmettitore: 24V
Transmitter power: 24V
Transmitterspeisung: 24V
Alimentation transmetteur: 24V
Alimentación transmisor: 24V
Alimentação do transmissor: 24V

(J24 ON, J5 = J10 = J15 = OFF)

Calibrazione: Procedura (vedi calibrazioni)
Calibration: Procedure (see calibrations)
Kalibrierung: Prozedur (siehe Kalibrationen)

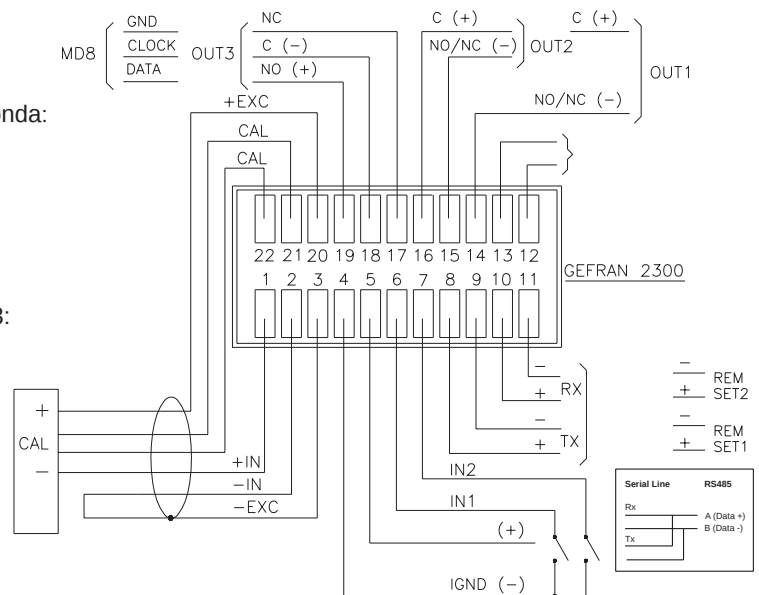
CAL.SG
CAL.Au
CAL.80

**Transmittereingang 0- 20mA,
4-20mA 4-Leiter**

**Entrée par transmetteur 0- 20mA,
4-20mA 4 fils**

**Entrada desde transmisor 0- 20mA,
4-20mA 4 hilos**

**Entrada do transmissor 0- 20mA,
4-20mA 4 fios**



Calibration: Procédure (cf. calibration)
Calibración: Procedimiento (véase calibraciones)
Calibração: Processo (ver calibrações)

**Ingresso 0- 1V
0- 1V input**

**Eingang 0- 1V
Entrée 0- 1V**

**Entrada 0- 1V
Entrada 0- 1V**

Configurazione
Configuration

Konfiguration
Configuration

Configuración
Configuração

Ingresso sonda:
Probe input:

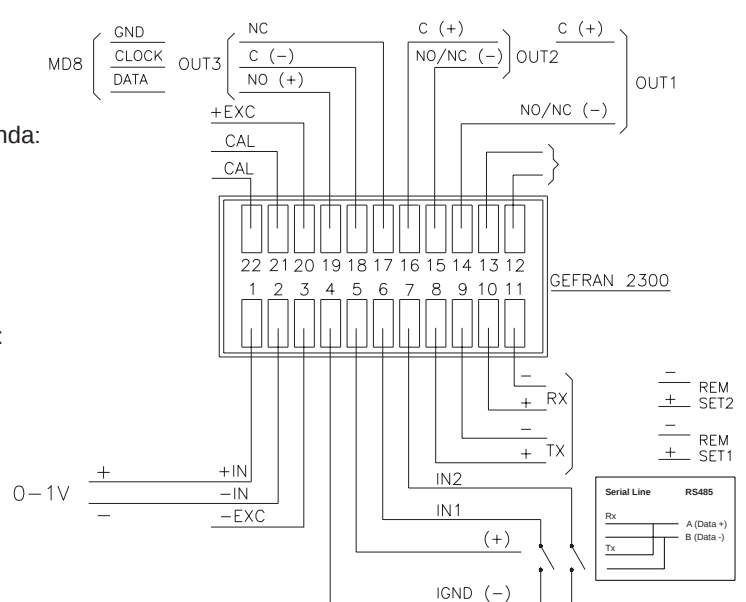
Sensoreingang:
Entrée capteur:

Entrada sonda:
Entrada para sonda:

S3A (ON)
S3B (ON)
S3C (OFF)
SI (OFF)

Tipo di ingresso in CFG3: Type d'entrée dans laCFG3:
Input type in CFG3: Tipo de entrada en CFG3:
Eingangstyp in CFG3: Tipo de entrada na CFG3:

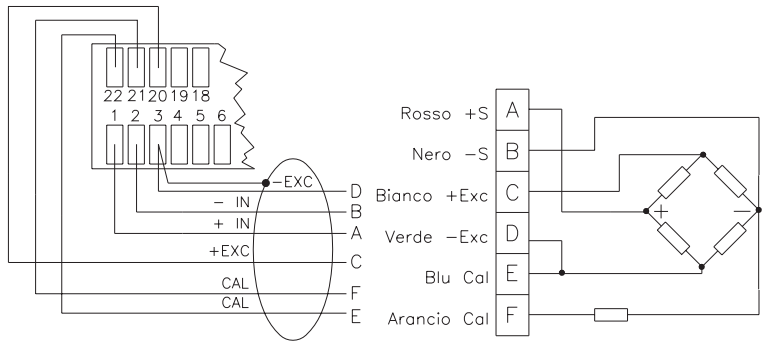
In TyP = 4
In Cod = 3



Ingresso da trasmettitore 0-10V 0-10V input from transmitter	Transmittereingang 0-10V Entrée par transmetteur 0-10V	Entrada desde transmisor 0-10V Entrada do transmissor 0-10V
Configurazione Configuration	Konfiguration Configuration	Configuración Configuração
Ingresso sonda: Probe input:	Sensoreingang: Entrée capteur:	Entrada sonda: Entrada para sonda:
S3A (OFF) S3B (OFF) S3C (OFF) SI (OFF)		
Tipo di ingresso in CFG3: Input type in CFG3: Eingangstyp in CFG3:	Type d'entrée dans la CFG3: Tipo de entrada enCFG3: Tipo de entrada na CFG3	
In TyP = 0 In Cod = 15		
Alimentazione trasmettitore: 24V Transmitter power: 24V Transmitterspeisung: 24V Alimentation transmetteur: 24V Alimentación transmisor: 24V Alimentação do transmissor: 24V		
(J24 ON, J5 = J10 = J15 = OFF)		
Calibrazione: Procedura (vedi calibrazioni) Calibration: Procedure (see calibrations) Kalibrierung: Prozedur (siehe Kalibrationen)		Calibration: Procédure (cf. calibration) Calibración: Procedimiento (véase calibraciones) Calibração: Processo (ver calibrações)
CAL.SG		

Ingresso Potenzimetro Potentiometer input	Potentiometereingang Entrée potentiomètre	Entrada potenciómetro Entrada potenciômetro
Configurazione Configuration	Konfiguration Configuration	Configuración Configuração
Ingresso sonda: Probe input:	Sensoreingang: Entrée capteur:	Entrada sonda: Entrada para sonda:
S3A (OFF) S3B (OFF) S3C (OFF) SI (OFF)		
Tipo di ingresso in CFG3: Input type in CFG3: Eingangstyp inCFG3:	Type d'entrée dans la CFG3: Tipo de entrada enCFG3: Tipo de entrada na CFG3	
In TyP = 4 In Cod = 7		
Alimentazione potenziometro: 10V Potentiometer power: 10V Potentiometerspeisung: 10V Alimentation potentiomètre: 10V Alimentación potenciómetro: 10V Alimentação potenciômetro: 10V		
(J10 ON, J5 = J15 = J24 = OFF)		
Calibrazione: Procedura (vedi calibrazioni) Calibration: Procedure (see calibrations) Kalibrierung: Prozedur (siehe Kalibrationen)		Calibration: Procédure (cf. calibration) Calibración: Procedimiento (véase calibraciones) Calibração: Processo (ver calibrações)
CAL.Po		

Sonda tipo Strain-gauge 4/6 fili 4/6-wires strain-gauge probe		Dehnungsmessstreifen 4/6-Leiter Capteur type Pont de jauges 4/6 fils	Sonda de tipo Strain-gauge 4/6 hilos Sonda do tipo Strain-gauge de 4/6 fios
Configurazione Configuration	Konfiguration Configuration	Configuración Configuração	
Ingresso sonda: Probe input:	Sensoreingang: Entrée capteur:	Entrada sonda: Entrada para sonda:	
S3A (OFF) S3B (OFF) S3C (ON) SI (OFF)			
Tipo ingresso (vedi tab. per tre tipi di polarizzazione) Input type (see table for three types of polarization) Eingangstyp (siehe die Tabelle für die drei Arten von Polarisierung) Type d'entrée (cf. tableau pour trois types de polarisation) Tipo de entrada (véase tabla para tres tipos de polarización) Tipo de entrada (ver tabela para três tipos de polarização)			
CFG3: In TyP = 0 - 2			
Sensibilità ingresso (vedi tabella per varie sensibilità) Input sensitivity (see table) Eingangsempfindlichkeit (siehe die Tabelle für die verschiedenen Empfindlichkeiten) Sensibilité d'entrée (cf. tableau pour diverses sensibilité) Sensibilidad de entrada (véase tabla para varias sensibilidades) Sensibilidade de entrada (ver tabela para várias sensibilidades)			
CFG3: In Cod = 0 - 14			
Limiti di scala Scale limits	Skalengrenzwerte Limites d'échelle	Límites de escala Limites de escala	
CFG3: Lo.Lin e Hi.Lin			



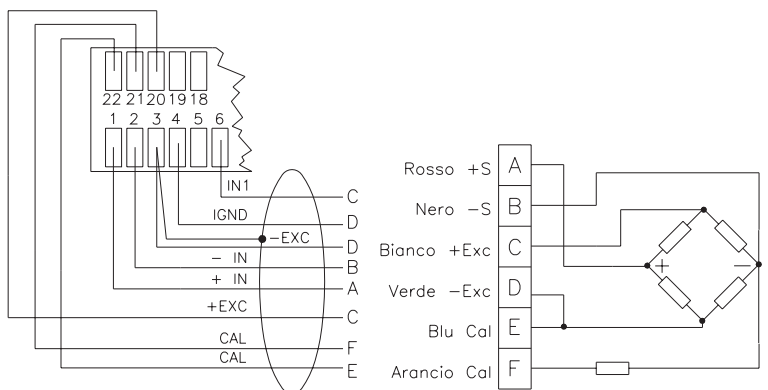
Calibrazione: Procedura (vedi calibrazioni)
Calibration: Procedure (see calibrations)
Kalibrierung: Prozedur (siehe Kalibrationen)
Calibration: Procédure (cf. calibration)
Calibración: Procedimiento (véase calibraciones)
Calibração: Processo (ver calibrações)

CAL.SG

Alimentazione sonda vedi configurazione:
Probe power see configuration:
Sensorspeisung, siehe Konfiguration:
Alimentation capteur cf. configuration:
Alimentación sonda véase configuración:
Alimentação da sonda ver configuração:

J5 , J10 , J15 , J24

Sonda tipo Strain-gauge 4/6 fili con controllo alimentazione 4/6-wires strain-gauge probe with power control		Dehnungsmessstreifen 4/6-Leiter mit Überwachung der Spannungsversorgung Capteur type Pont de jauges 4/6 fils avec contrôle alimentation	Sonda de tipo Strain-gauge 4/6 hilos con control alimentación Sonda do tipo Strain-gauge de 4/6 fios com controle de alimentação
Configurazione Configuration	Konfiguration Configuration	Configuración Configuração	
Ingresso sonda: Probe input:	Sensoreingang: Entrée capteur:	Entrada sonda: Entrada para sonda:	
S3A (OFF) S3B (OFF) S3C (ON) SI (OFF)			
Tipo ingresso (vedi tab. per tre tipi di polarizzazione) Input type (see table for three types of polarization) Eingangstyp (siehe die Tabelle für die drei Arten von Polarisierung) Type d'entrée (cf. tableau pour trois types de polarisation) Tipo de entrada (véase tabla para tres tipos de polarización) Tipo de entrada (ver tabela para três tipos de polarização)			
CFG3: In TyP = 0 - 2			
Sensibilità ingresso (vedi tabella per varie sensibilità) Input sensitivity (see table) Eingangsempfindlichkeit (siehe die Tabelle für die verschiedenen Empfindlichkeiten) Sensibilité d'entrée (cf. tableau pour diverses sensibilité) Sensibilidad de entrada (véase tabla para varias sensibilidades) Sensibilidade de entrada (ver tabela para várias sensibilidades)			
CFG3: In Cod = 0 - 14			
Limiti di scala Scale limits	Skalengrenzwerte Limites d'échelle	Límites de escala Limites de escala	
CFG3: Lo.Lin e Hi.Lin			



Calibrazione: Procedura (vedi calibrazioni)
Calibration: Procedure (see calibrations)
Kalibrierung: Prozedur (siehe Kalibrationen)
Calibration: Procédure (cf. calibration)
Calibración: Procedimiento (véase calibraciones)
Calibração: Processo (ver calibrações)

CAL.SG

Alimentazione sonda vedi configurazione:
Probe power see configuration:
Sensorspeisung, siehe Konfiguration:
Alimentation capteur cf. configuration:
Alimentación sonda véase configuración:
Alimentação da sonda ver configuração:

J5 , J10 , J15 , J24

Funzionalità ingresso digitale 1 Digital input 1 functions	Funktionen Digitaleingang 1 Fonctionnalité entrée logique 1	Funciones entrada digital 1 Funcionalidade da entrada digital 1
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CFG2: d.i.F.1 = 15 (J1P=ON, J1N=OFF)

Schema di collegamento per modulo espansione intercettazioni: 2300 + MD8

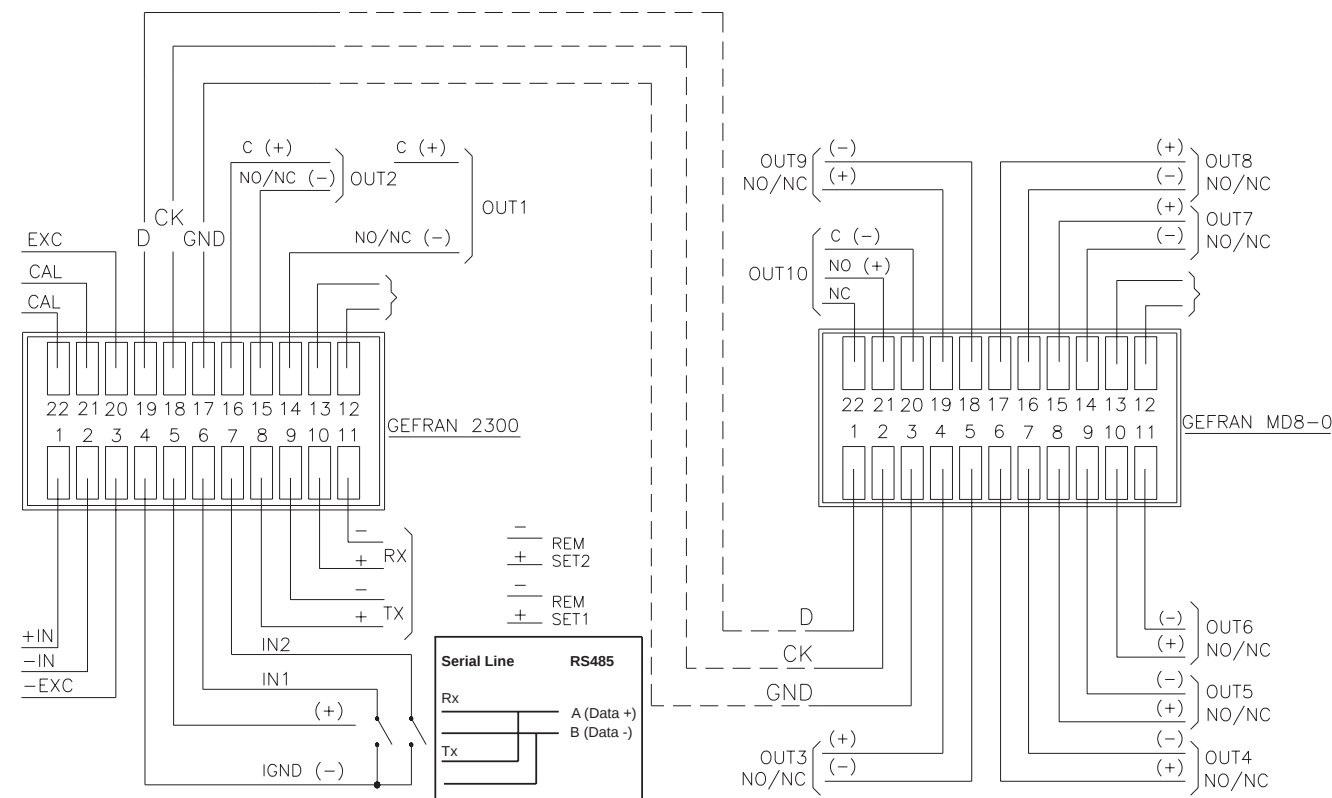
Connection scheme for trip point expansion module: 2300 + MDB

Anschlussbild für Ausgangserweiterungsmodul: 2300 + MD8

Schéma de raccordement pour module extension alarmes: 2300 + MD8

Esquema de enlace para módulo expansión interceptaciones: 2300 + MDB

Schema di collegamento per modulo espansione intercettazioni: 2300 + MD8



Lo strumento 2300 deve essere richiesto specificando (vedi sigla di ordinazione)

The 2300 instrument must be requested specifying (see order code)

Bei Bestellung des Geräts 2300 muss angegeben werden (siehe Bestellkode)

L'appareil 2300 doit être demandé en spécifiant (cf. référence de commande)

Para pedir el instrumento 2300 debe especificarse (véase sigla de pedido)

Lo strumento 2300 deve essere richiesto specificando (vedi sigla di ordinazione)

Uscita allarmi = 2R o 2D.

Alarms output = 2R or 2D.

Alarmausgang = 2R o 2D.

Sortie alarmes = 2R ou 2D.

Salida alarmas = 2R o 2D.

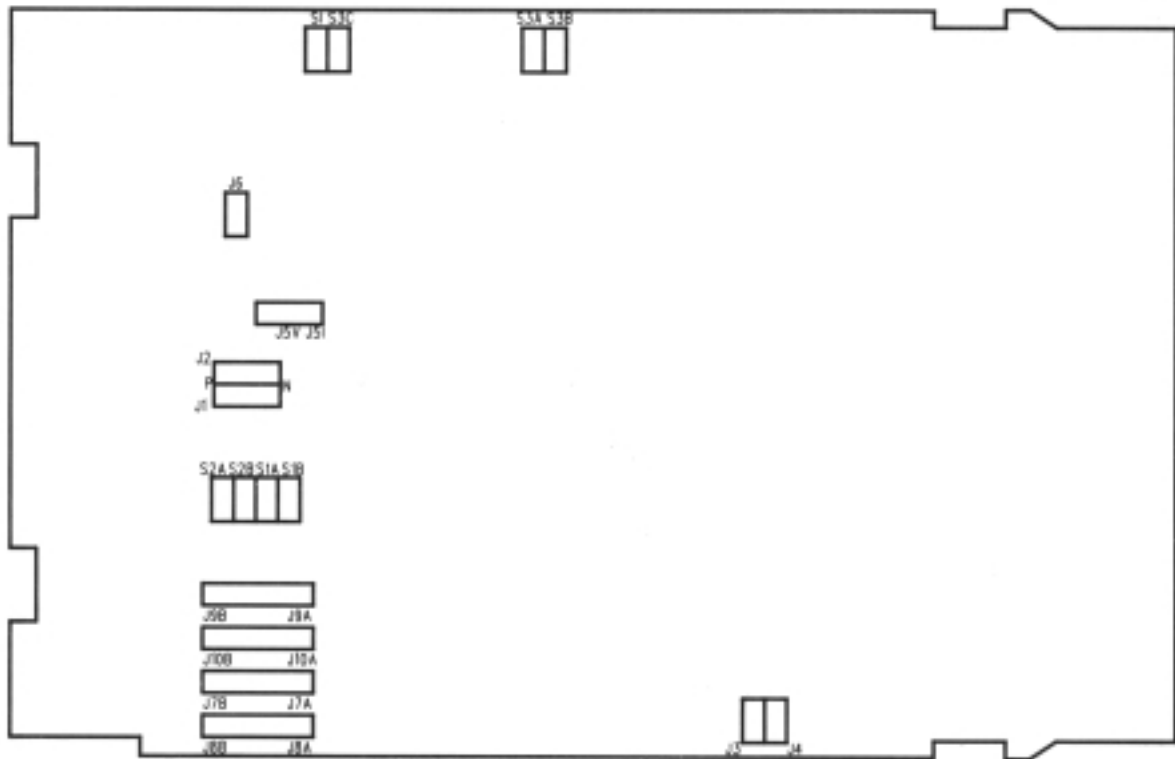
Uscita allarmi = 2R o 2D.

CONFIGURAZIONE HARDWARE HARDWARE CONFIGURATION HARDWARE-KONFIGURATION

SCHEDA CPU LATO COMPONENTI
CPU BOARD COMPONENTS SIDE
CPU-KARTE, BESTÜCKUNGSSEITE

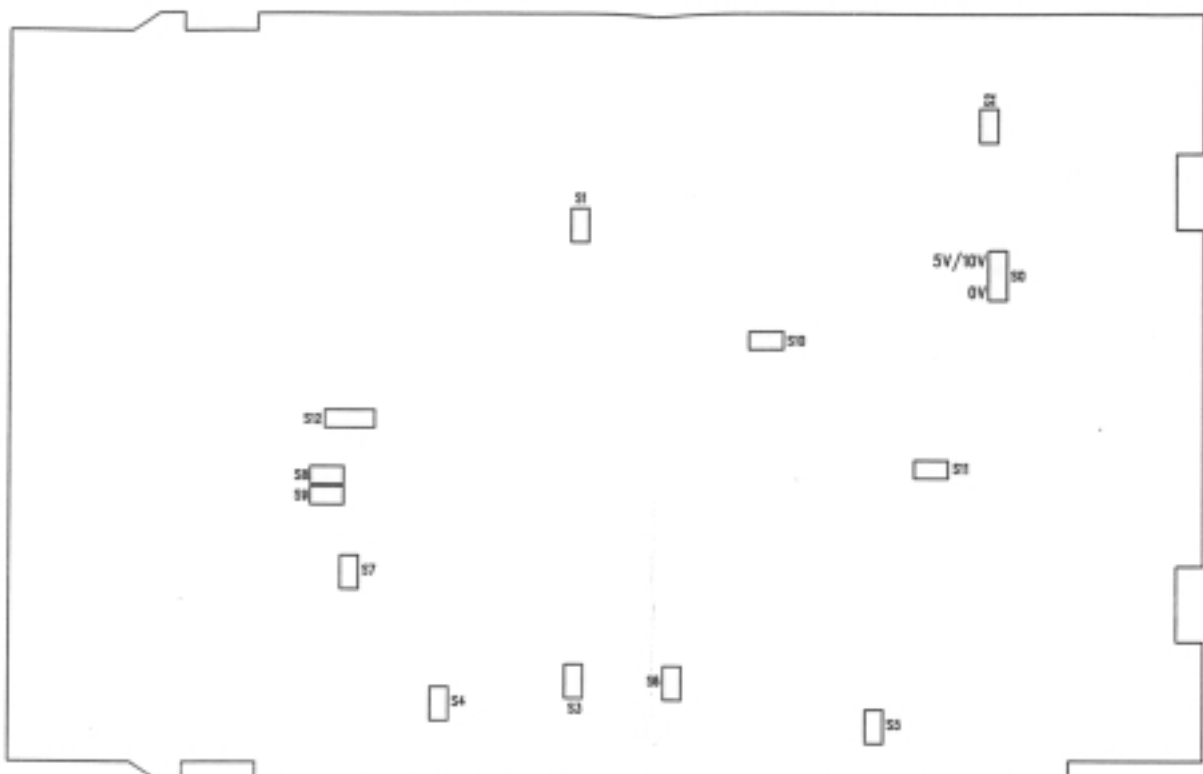
CONFIGURATION MATÉRIELLE CONFIGURACIÓN HARDWARE CONFIGURAÇÃO DO HARDWARE

CARTE CPU CÔTÉ COMPOSANTS
FICHA CPU LADO COMPONENTES
PLACA CPU LADO DOS COMPONENTES



SCHEDA CPU LATO SALDATURE
CPU BOARD SOLDER SIDE
CPU-KARTE, LÖTSEITE

CARTE CPU CÔTÉ SOUDURES
FICHA CPU LADO SOLDADURAS
PLACA CPU LADO DAS SOLDAS

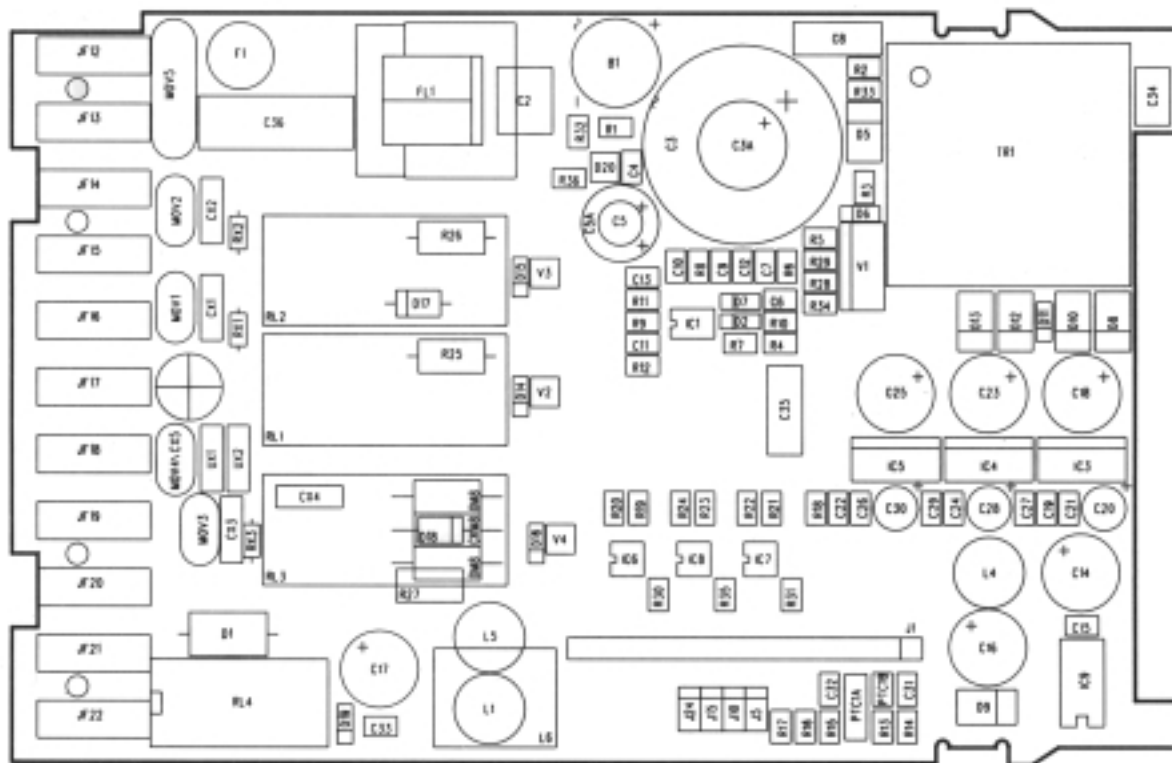


CONFIGURAZIONE HARDWARE HARDWARE CONFIGURATION HARDWARE-KONFIGURATION

SCHEDA ALIMENTAZIONE LATO COMPONENTI
POWER BOARD COMPONENTS SIDE
NETZTEIL-KARTE BESTÜCKUNGSSEITE

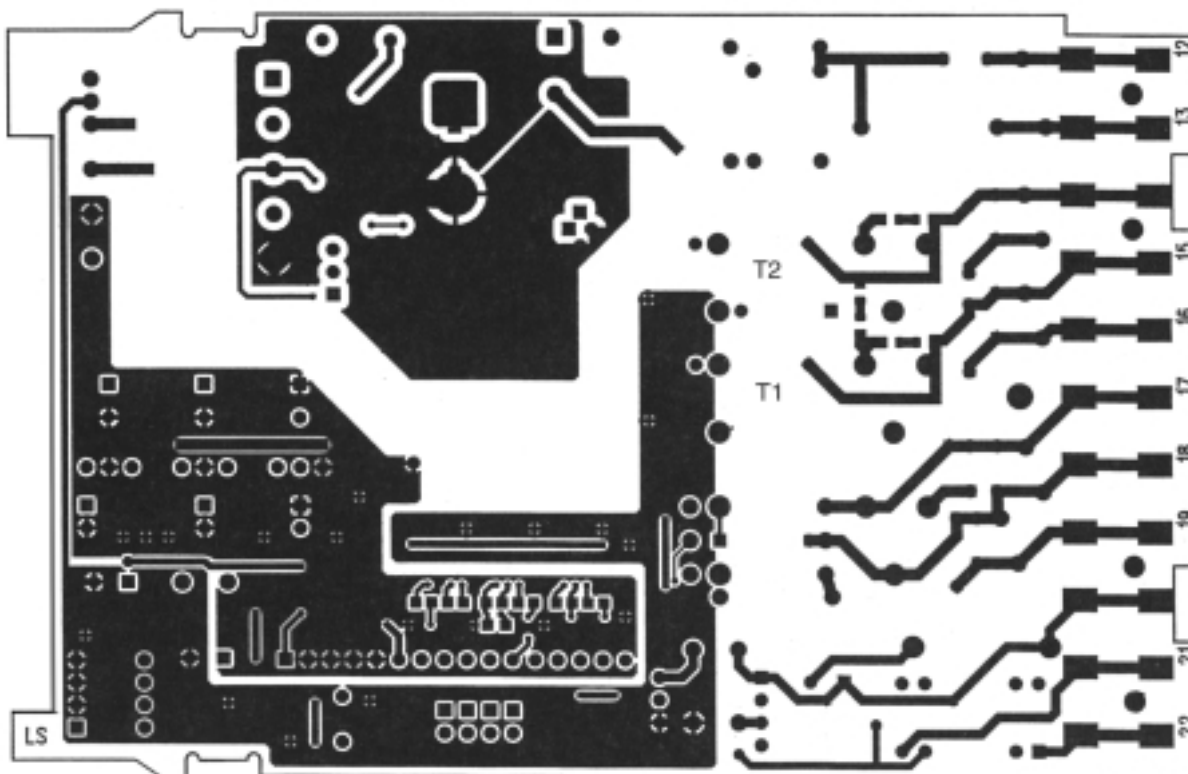
CONFIGURATION MATÉRIELLE CONFIGURACIÓN HARDWARE CONFIGURAÇÃO DO HARDWARE

CARTE ALIMENTATION CÔTÉ COMPOSANTS
FICHA DE ALIMENTACIÓN LADO COMPONENTES
PLACA DE ALIMENTAÇÃO LADO DOS COMPONENTES



SCHEDA ALIMENTAZIONE LATO SALDATURE
POWER BOARD SOLDER SIDE
NETZTEIL-KARTE LÖTSEITE

CARTE ALIMENTATION CÔTÉ SOUDURES
FICHA DE ALIMENTACIÓN LADO SOLDADURAS
PLACA DE ALIMENTAÇÃO LADO DAS SOLDAS



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ISO 9001

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