

DATALOGGER FOR ANALOG SIGNALS OC 7054 - FC

Owner's Manual

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Vor dem Einschalten

Überzeugen Sie sich, ob Ihre Sendung das richtige Gerät Orbit Controls Modell OC 7054-FC beinhaltet, einschliesslich einer Betriebsanleitung OC 7054-FC.

Vor dem Einschalten des Gerätes überprüfen Sie die Anschlüsse und die Versorgungsspannung. Ein falsch angeschlossenes Gerät kann beschädigt werden und damit auch die mitverbundene Folgeelektronik. Für falsche Handhabung wird jede Haftung abgelehnt.

ZU BEACHTEN

Dieses Gerät wurde sorgfältig verpackt. Falls es bei Ihnen in beschädigtem Zustand eintrifft, benachrichtigen Sie unverzüglich den Orbit Controls Kundendienst (Tel: +41 1 730 2753 oder Fax: +41 1 730 2783) und nehmen Sie einen Schadenrapport auf, welchen Sie auch von der Transportgesellschaft unterschreiben lassen. Bewahren Sie bitte das Verpackungsmaterial für eventuelle Reklamationen auf.

Unpacking Instructions

Remove the Packing List and verify that you have received all equipment, including the following:
Orbit Controls Model OC 7054-FC Datalogger.

Operator's Manual OC 7054-FC.

If you have any questions about the shipment, please call the Orbit Controls Customer Service Department.

NOTE

When you receive the shipment, inspect the container and equipment for signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the Orbit Controls customer service, Phone +411 730 2753 or Fax +411 730 2783 and to the shipping agent.

The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in event the reshipment is necessary.

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Datalogger for Analog Signals

OC 7054 FC

- ✓ 6 digit Display
- ✓ Inputs 0-1V, 10V, 100V, 0/4-20mA
- ✓ True RMS Measurements
- ✓ Pt-100 Thermometer
- ✓ DIN-Thermocouples
- ✓ Compact Flash™ Memory Card
- ✓ One Set Point Relay
- ✓ 115/230VAC or 9-36VDC
- ✓ RTC Real Time Clock



OC7054FC is a 6 digit programmable Datalogger for direct connection to process signals such as 0/4-20mA, 20mV...100V DC or true RMS, Temperature Sensors, Potentiometers and other signal sources. With the keyboard the display can be scaled in required process units. One Set Point Relay is available for controls applications.

The data are stored in a 32MB Compact Flash™ card together with the date of the day and the real time. This information is generated by internal RTC real time clock. The Flash Card can be read under Windows.

The inputs signal can be assigned with the keyboard to the required display reading, e.g. 0-20mV will be displayed as 0-1500.0. The display will overload with a signal 10% larger than the maximum display reading set in the menu.

Display resolution can be selected for up to 5 decimal points X.XXXXX to XXXXXX. with the keyboard.

One Set Point can be set within the entire display range. The Set Point activates an open collector transistor or a mechanical relay.

Display Reading Rate can be set for SLOW or FAST. The FAST rate corresponds to a measuring speed of 66ms, the SLOW rate is 200ms. The display can be refreshed after 1 up to 16 readings.

Display Count of the last significant digit LSD can be selected for 1,2,3...9,0 or 2,4,6,8,0 or 0,5,0,5.. or Dummy Zero.

Tara can be activated with the keyboard and force the display to zero. When deactivated, the display returns to follow the non-tare signal. The Tara remains stored when the instrument is switched-off.

Digital Filter has programmable constants from 1 to 99 and generates the average value reading for noisy signals or environments.

RTC Real Time Clock generates the Date of the day and the Time. The both values are added to the measured results during the datalogger operation.

Data Storage is a Compact Flash™ Card which can be inserted into the instrument from the front. The storing interval can be set from 1 second to 1 minute. Each memory cycle consist of 32 Bytes. With a Flash Card of e.g. 32MB and the storing rate of 1 second, up to 1 million data blocks can be stored. The beginning and the end of the data logging can be manually controlled from the keyboard or derived from a programmable Set Point.

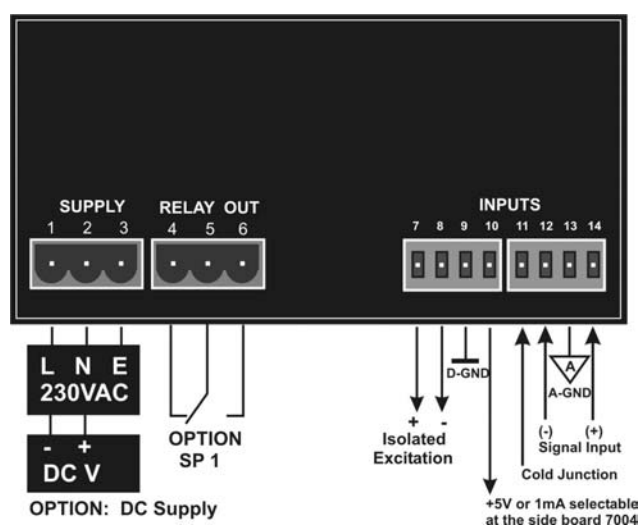
1 SPECIFICATIONS - OC 7054 FC

INPUT	DC or true RMS Signals:	$\pm 20\text{mV}$ to $\pm 100\text{V}$ DC or AC (Option). $0/4\text{-}20\text{mA}$ to 5A .
	Pt-100, Pt-200 Thermometer:	2 or 4 terminal connections. Range: $-200.0 \dots + 650.0 \text{ }^{\circ}\text{C}$.
	DIN Thermocouples:	E, J, K, S, B, T, C
	Cold Junction:	An automatic compensation for the ambient temperature from 0 to $60 \text{ }^{\circ}\text{C}$ or 0°C firm with external zero point.
A-D CONVERTOR	Selectable Rate	66ms (14 Bit), 133ms (17 Bit) or 200ms (17 Bit) .
	Linearity:	$\pm (1 \text{ LSB} + 1 \text{ Digit})$.
	Accuracy	DC: $\pm (0.01\% \text{ from value} + 1 \text{ digit})$ RMS: $\pm (0.1\% \text{ from value} + 1 \text{ digit})$ Temperature: $\pm (0.1\% \text{ from value} + 1 \text{ digit})$.
STORAGE	Compact Flash [™] Memory Card	
SET POINT CF	Display value at which the data logging starts. The value can be set in the menu step <i>SAUE</i> for Re Hi (the logging starts when the reading is larger than the set value) or RE Lo (the logging starts when the reading is bellow the set value). The data logging can be disabled (OFF) or enabled (On).	
INTERVAL	Selectable for 1, 2, 5, 10, 15, 20, 30, 45, 60 seconds.	
DISPLAY	6 digits, 7 segments red LED 14.7mm with decimal point and sign. The display can refresh after 1 up to 16 measurements.	
FILTER	Averaging filter with selectable constants from 1 to 99.	
TARA	The Tara force the display to read zero. The Tara can be deactivated in order to display the original signal.	
KEYBOARD	Five keys at the front for entering the menu and for setting of parameters.	
SET POINT REL	6 digit Set Point for activation of the alarm output.	
	Hystereze:	0 to 99 increments.
	Output:	NPN Transistor 60V-100mA or mechanical relay 5A-230VAC.
	Delay:	0 to 3600ms in 100ms steps selectable.
SUPPLY	$115\text{V}/230\text{V} \pm 15\%$, 48 - 60 Hz. Option: 9-36VDC, 4W.	
CABINET	DIN 48 x 96 x 150 mm (H x W x D). Panel cut-out 45 x 90 mm. Front coverage IP65.	
TERMINALS	Pluggable screw terminals.	
EXCITATION	5-24V adjustable with internal potentiometer. Rating: 5V/40mA, 24V/100mA.	

2 DATA FORMAT

Time	Date	Measured Values	
16:46:02	10.09.03	POWER	ON
16:51:07	10.09.03		7302
16:56:12	10.09.03		9496
17:01:17	10.09.03		12221
17:06:22	10.09.03		14064
17:11:27	10.09.03		11384
17:16:32	10.09.03		9182
17:21:37	10.09.03		6584
17:26:42	10.09.03		2502

3 TERMINALS



4 KEYBOARD



-  MENU
-  ACK
-  UP
-  DOWN
-  SET

- 1 activated Set Point Relay
- P Program Mode

5 MENU

The key **MENU** opens the instruments menu. The required parameters will be confirmed with **ACK**.

With **UP** or **DOWN** the value of the selected parameter will be set.

The flashing digit - Cursor – can be positioned with **ACK**. The decimal point and the sign can be set only when the flashing digit is positioned outside the display range (no flashing digit appears).

The key **UP** sets the decimal point, **DOWN** sets the sign. The programming mode will be closed with **SET** and the display returns into the measuring mode.

KEY	DISPLAY	FUNCTION
MENU	SAUE	Save - Storing
ACK	Re Lo	The storing is initialized when the display is bellow the set Lo value
	Re Hi	The storing is initialized when the display is above the set Hi value
	On	The storing is continuously activated
	OFF	The storing is deactivated
MENU	ti CF	Storing interval
ACK	XXXXXX	1, 2, 5, 10, 15, 20, 30, 45, 60 seconds
MENU	SP CF	Set Point Store: Value at which the storing begins when large (rE Hi) or when smaller (rE Lo). The election is in the menu step SAUE.
ACK	XXXXXX	free selectable from -999999 to 999999
MENU	HSt CF	Hystereze of the SP CF
ACK	XXXXXX	free selectable from -999999 to 999999
MENU	FntArA	Function of the Tara
ACK	OFF	deactivated
	On	activated. The functions TARA and UNTARA change after pressing of the key SET
	OnLY	the display zeroes when the key SET is pressed
MENU	OrdEr	Display resolution, decimal point
ACK	CCC.ddd	Example: Resolution to three decimal points
MENU	FiLtEr	Averaging filter
ACK	XXXXXX	1, 2, 3, 5 99 measurements are used for the calculation of the average value
MENU	Count	Counting of the last display digit
ACK	cnt 0	Dummy Zero
	cnt 1	Incrementing 0,1,2,3.....9
	cnt 2	Incrementing 0, 2,4,6...8
	cnt 5	Incrementing 0,5,0,5,...
MENU	diSPL	Display refresh after the selected number of measurements
ACK	XXXXXX	dSP 1 dSP 50
MENU	SP rE	Set Point Relay: Alarm value activates the output transistor or the relay
ACK	XXXXXX	free selectable from -999999 to 999999
MENU	HSt rE	Hystereze of the SP rE
ACK	XXXXXX	free selectable from -999999 to 999999
MENU	Fn rE	Function of the relay
ACK	OPEn	Not activated in the alarm condition
	CLOSE	Activated in the alarm condition
MENU	SEnS	Sensor Selection
ACK	LinEAR	DC and AC voltage and currents, Process Signals
	Pt 100	RTD Thermometer
	TC E	Thermocouple E with automatic compensation of the cold junction
	TCC E	Thermocouple E without automatic compensation of the cold junction
	TC J	Thermocouple J with automatic compensation of the cold junction
	TCC J	Thermocouple J without automatic compensation of the cold junction
	TC L	Thermocouple K with automatic compensation of the cold junction
	TCC L	Thermocouple K without automatic compensation of the cold junction
	TC S	Thermocouple S with automatic compensation of the cold junction
	TCC S	Thermocouple S without automatic compensation of the cold junction
	TC b	Thermocouple B with automatic compensation of the cold junction
	TCC b	Thermocouple B without automatic compensation of the cold junction
	TC t	Thermocouple T with automatic compensation of the cold junction
	TCC t	Thermocouple T without automatic compensation of the cold junction
	Cold	Temperature of the cold junction measured by the sensor at the terminals

MENU	Set in	Signal polarity
ACK	0.0 1	Unipolar signals such as 0...20mA, 0-1V
	0.2 1	Signals with Offset such as 4-20mA
	-1 1	Bipolar signals such as -10 ... +10V
MENU	Set LO	Required display reading for the minimum input signal, e.g. for 4mA
ACK	XXXXXX	Example: Display reads 0 with 4mA at the input
MENU	Set HI	Required display reading for the maximum input signal, e.g. for 20mA
ACK	XXXXXX	Example: Display reads 1500.0 with 20mA at the input
MENU	tinE	Time
ACK	XX.XX.XX	Setting of the real time (clock)
MENU	dAtE	Data
ACK	XXXXXX	DD.MM.YY setting of the date
MENU	Start	Measuring mode

6 DATA LOGGING

6.1 Manual Start

After pressing the key MENU the display shows **SAUE**. After confirmation the menu offers:

Re Lo Data storing starts when the display is lower than the Lo value

Re Hi Data storing starts when the display is higher than the Hi value

On Data storing is continuously activated

OFF Data storing is deactivated

The selection **On** defines the manual mode of operation.

After the memory card is inserted and the key UP pressed, the display shows **CF run** followed by **-CF-** and **CrEAtE**. A text file will be created at the memory card and the measured results can be stored. The storing will be closed by pressing the key DOWN. The display shows **CF CLO** followed by **CF STP**.

To continue the memorizing, the key UP can be pressed. At the end memorizing the key DOWN has to be pressed to close the text file.

6.2 Start from a SET POINT STORE

After the memory card is inserted, the key UP has to be pressed to enable the card to create the text file. The display shows **CF run** followed by **-CF-** and **CrEAtE**. When in the menu step **rE Hi** a value is entered, the storing begins when the display is equal or larger than this value.

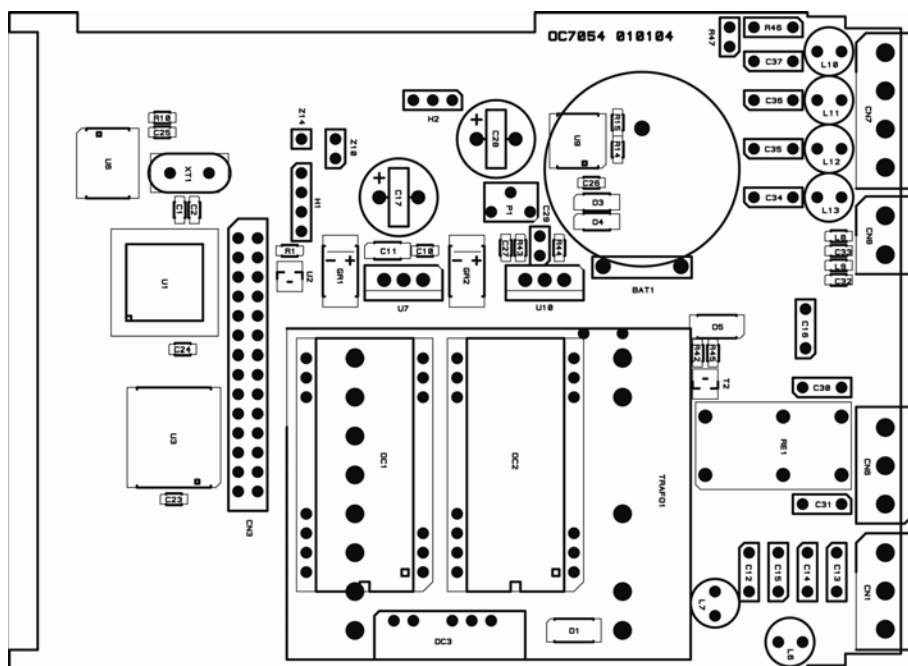
Example: **rE Hi** set for 1000. As soon as the display arrives at 1000 or more, the storing at the card begins. When the display returns below rE Hi, the storing stops.

When **rE Lo** is selected, the data are stored automatically when the display is equal or lower than the value set in rE Lo.

IMPORTANT

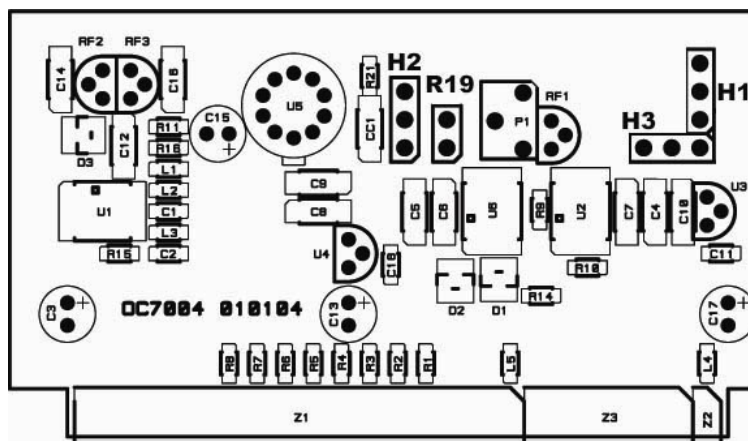
At the storing end, before the Compact Flash Card is removed from the slot, the memorizing has to be terminated with the key DOWN. The display shortly shows **CF CLO** followed by **CF STP**. The storing cycle is ordinary terminated and the Compact Flash can be removed from the slot.

7 MOTHERBOARD



8 MEASURING RANGES - Side Board

8.1 DC and AC Ranges



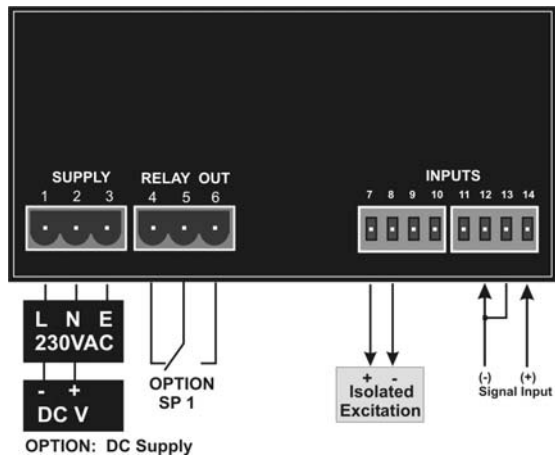
Jumper	20mA	1V	10V	100V	10mV 1V
H1	1+2	1+2	2+3	2+3	1+2
H2	1+2 = DC 2+3 = AC	1+2 = DC 2+3 = AC	1+2 = DC 2+3 = AC	1+2 = DC 2+3 = AC	1+2 = DC 2+3 = AC
H3	1+2	---	---	2+3	---
R19 (see page 12)	open	open	open	open	R19=50k/G-1
Input single ended	(+)15, (-)12,13	(+)15, (-)12,13	(+)15, (-)12,13	(+)15, (-)12,13	(+)15, (-)12,13
Input differential	---	(+)15, (-)12	---	---	(+)15, (-)12

For AC ranges **U5** has to be assembled.

9 CONNECTION EXAMPLES

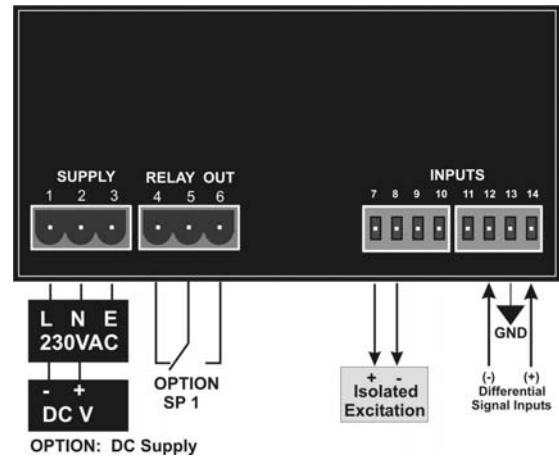
9.1 Single ended input signal

OC7054FC - Standard



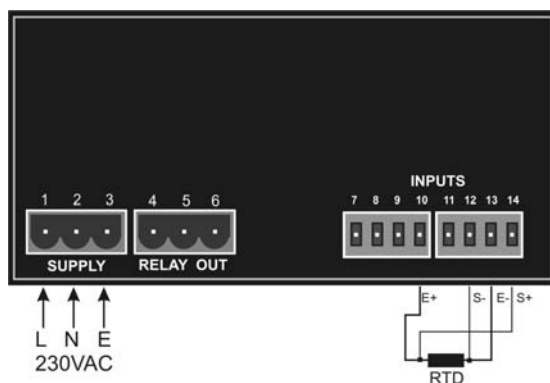
9.2 Differential Input

OC7054FC - Standard



9.3 Pt-100 Four Terminal connection

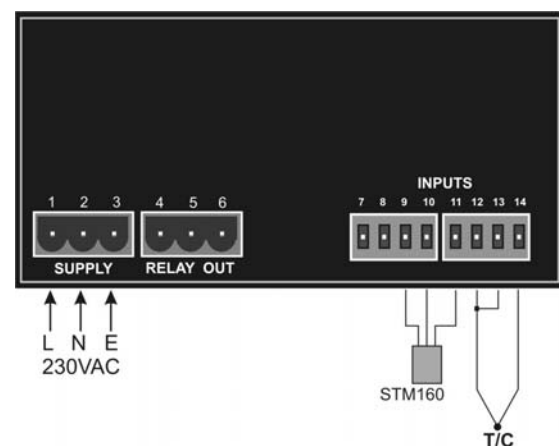
OC7054FC - Option factory installed



When two terminals connection is used, tie E+ with S+ and E- with S-. Connect the sensor between S+ and S-.

9.4 Thermocouples with compensation

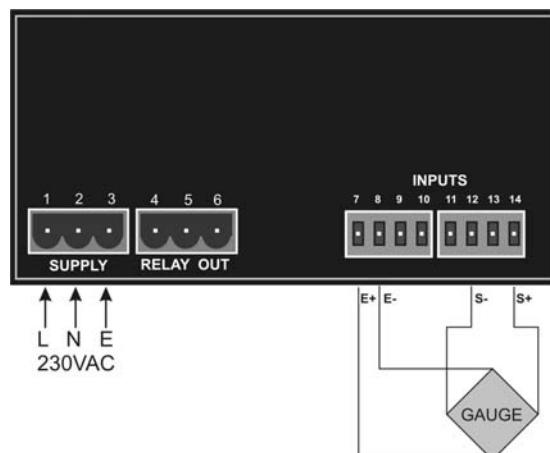
OC7054FC - Option factory installed



The Cold Junction is compensated with SMT160 for ambient temperature range 0 to 60°C.

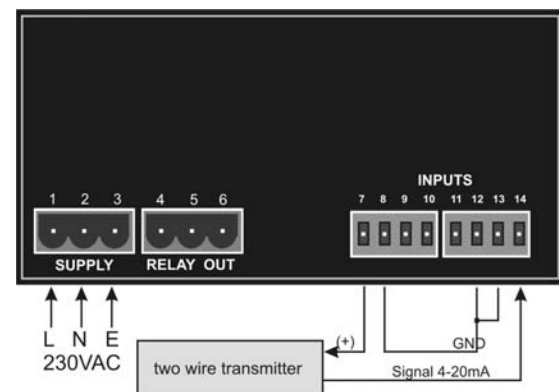
9.5 Gauge Bridge with Voltage Excitation

OC7054FC - Option factory installed



9.6 Sensor with two Terminals

OC7054FC - Option factory installed



10 SERVICE MENU - *HtES*t

The Service Menu *HtES*t permits fast check of the instrument's performance and offers the software calibration via the keyboard. To enter the Service menu, keep the key **MENU** pressed while the instrument is switched-on. Release the key when the display shows *HtES*t. The service menu steps are incremented forward with the key **MENU**, decremented backward with **SET**.

In the service menu the digit segments are tested first. After the HCF value can be entered (see below). Then the signal channel can be calibrated. The set point relays and the display LEDs are activated. At the end the analog outputs are generated.

Segments	all segments are activated
HCF.128	HCF parameter defines the range of the menu. The menu without options Analog Output, Set Points and RS data ports is determined with HCF = 128. Each option is activated in the menu with binary value added to the HCF 128: 1 SP1 2 SP2 4 SP3 8 SP4 16 Analog output 32 Baud rate 64 Address of the data port Combinations define the menu range: HCF.144 Menu (128) and Analog Output (16). HCF.240 Menu (128), Analog Output (16), Baud rate (32) and Address (64).
AdC	ADC internal DC value of the converter. ATTENTION! <u>The input signal has to be set to ZERO before this Step is entered!</u>
1.25XXX	Apply the zero signal value. The display shows the internal voltage reference 1.25V. <u>The Zero Value</u> will be calibrated when the key DOWN is pressed. The display shows Ac LO . Press the key ACK and keep it pressed until the display shows EE StO . The Zero Signal Value has been calibrated.
2.2XXXX	<u>The Maximum Signal Value</u> will be calibrated when the full range signal is applied and the key UP is pressed. The display shows AC HI . Press the key ACK and keep it pressed until the display shows EE StO . The maximum signal value has been calibrated.
rES	The Display shortly shows rES and switches into the measuring mode. The display corresponds to the SEt HI programmed value in the main menu.
SP1	Set Point 1 and the Relays 1 are activated.
SP2	Set Point 2 and the Relays 2 are activated.
SP3	Set Point 3 and the Relays 3 are activated.
SP4	Set Point 4 and the Relays 4 are activated.
An - 10	Analog Output -10V and 0/4 mA are generated (0 or 4mA selectable).
An - 5	Analog Output -5V and 5/8 mA are generated.
An 0	Analog Output 0V and 10/12 mA are generated.
An 5	Analog Output 5V and 15/16 mA are generated.
An 10	Analog Output 10V and 20 mA are generated.
StArt	Measuring Mode

11 CALIBRATION

11.1 Calibration of linear signals DC and AC

The calibration steps are described in §6, Service Menu and *HtEst*. Linear signals such as 4-20mA, 0-1V can be calibrated as described.

11.2 Calibration of non-linear signals (Tables)

Input signals such as RTD Thermometer and Thermocouples will be linearized as follows:

11.2.1 Calibration of Pt-100 Thermometer

Jumper	Pt-100
H1	1 + 2
H2	1 + 2
H3	---
R19	26k7 Resistor 1%

SEnS LinEAr
Set LO 0
Set HI 313.65 (313.65 Ohm = 600°C)

In the *HtEst* calibrate with 0 and 313,65Ohm. After the calibration is finished, switch OFF and ON again.

SEnS select Pt 100 in the Menu.

Switch into the measuring mode with ACK. The Display follows the temperature of Pt-100 in a range from -200 to 600°C.

11.2.2 Calibration of Thermocouples

Jumper	Thermocouples
H1	1 + 2
H2	1 + 2
H3	---
R19	5k6 Resistor 1%

SEnS LinEAr
Set LO 0
Set HI 100 (100 = 100 mV)

In the *HtEst* calibrate with 0 und 100mV. After the calibration is finished, switch OFF and ON again.

SEnS Select the required T/C in the Menu. Switch into the measuring mode with ACK. The Display follows the temperature of the selected T/C within its defined range.

The cold junction is compensated with SMT160 connected to the terminal block.

11.3 Calculation of R19

When the individual measuring range by using R19 is selected, following has to be considered:

The AD-C type LT2400 is designed for bipolar operation. Its zero reference point is set to +1.25V. Since R19 determines the gain of the input amplifier INA118, its output signal (Pin 6) has to be within 0 and 2.500V for the full range of the input signal. For Zero input is Pin 6 = 1.25V. For maximum negative input is Pin 6 = 2.500V. For maximum positive input is Pin 6 = 0V. It is important to calculate R19 such that the signal swing at the output of INA118 (Pin 6) never goes below 0V and above 2.500V.

The calibration mode in the *HtEst* shows the range of the input signal (§ 6). When zero signal is applied, the display shows the reference voltage of 1.25xx V. With a maximum signal the display will show 2.500V. It is recommended to set R19 such that the display arrives at 2.2xxx with the maximum value if the input signal. This will permit 10% overload of the input.

$$R19 = \frac{50kOhm}{G - 1}$$

G = Gain

12 BURST TEST and recommended GROUNDING

Tester: Burst-Surge Generator HILO, Model CE-Tester
E.U.T.: OC7040, SN: 980315, Supply 230VA
Mode: Linear, Set LO = 000000, Set HI = 10000
Input: 4-20mA
Display: 10 000

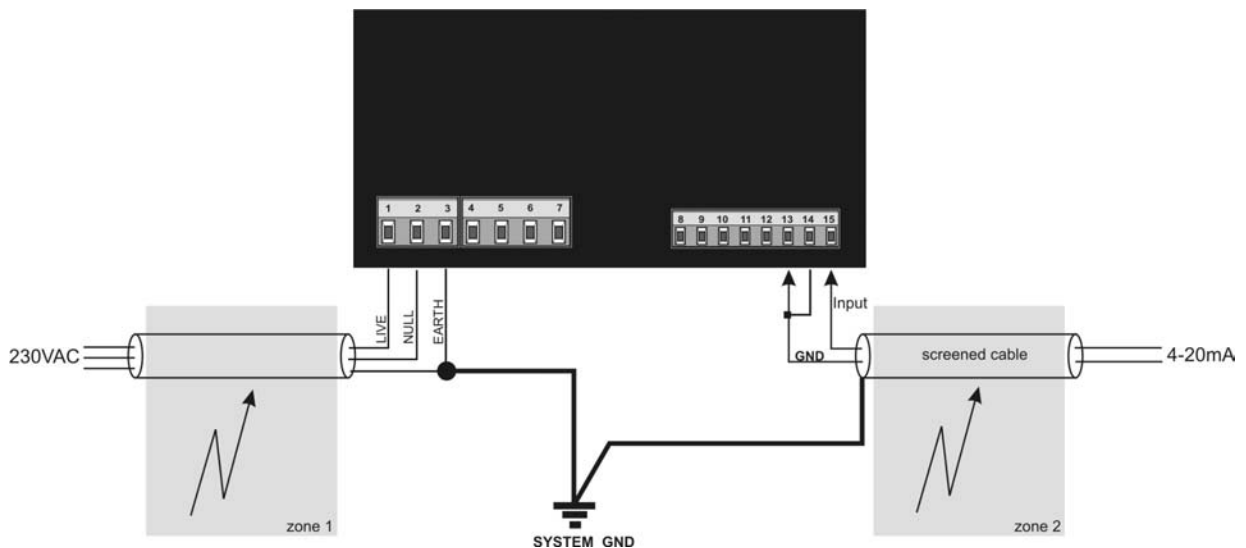
12.1 Test Conditions

According to: IEC 801-4

IEC 1000-4-4

EN 50052-1

12.2 Test Set - Up



12.3 Test Results

Zone 1:	2kV Burst	Display 10 000 without change
Zone 2:	2kV Burst	Display 10 000 without change

CE Approval No: 321/30-3/539, c.j. 9004/69 from 15.6.1998 VTUE Praque