

# PROGRAMMABLE COUNTER INF8

OPERATOR'S MANUAL



**NEWPORT ELECTRONICS, INC.**  
2229 SOUTH YALE ST.  
SANTA ANA, CA 92704-4426  
**Tel: 714-540-4914**  
**Fax: 203-968-7311**

E-Mail: [info@newportUS.com](mailto:info@newportUS.com)  
[www.newportUS.com](http://www.newportUS.com)



## Vor dem Einschalten

Überzeugen Sie sich, ob Ihre Sendung das richtige Gerät NEWPORT Modell INF8 beinhaltet, einschliesslich einer Betriebsanleitung INF8.

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 NEWPORT Kundendienst (Tel: 714-540-4914 oder Fax: 203-968-7311) 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:  
Model INF8 Programmable Counter.

Operator's Manual INF8.

If you have any questions about the shipment, please call NEWPORT Electronics, Inc. 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 NEWPORT Electronics, Inc. Customer Service, Phone 714-540-4914 or Fax 203-968-7311 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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# Programmable Counter INF8

- ✓ **Quadrature Counter**
- ✓ **Angular Counter**
- ✓ **Up - Down Counter**
- ✓ **Quadrature Tachometer**
- ✓ **Bi-Directional Tachometer**
- ✓ **Wide Range of SCALE**
- ✓ **Four Set Point Relay**
- ✓ **Last Reading Memory**
- ✓ **Two Analog Outputs**
- ✓ **RS232 or RS485**
- ✓ **Mains or DC Supply**



**Model INF8** is a 6-digit counter with programmable functions for Quadrature Counter, Up-Down Counter, Angular Counter, Bi-directional Tachometer, Quadrature Tachometer and Angular Tachometer. It is mainly designed for industrial applications in connection with incremental resolvers and other pulse sources. The INF8 is front-programmable with the keyboard and uses a high speed microcontroller. The standard features are fast floating point arithmetic, programmable scale multiplication and division with decimal point and sign, independent decimal point of display, averaging filter, preset, last reading memory, four set points, two analog outputs, two serial data ports, last reading memory and selectable measuring mode selection.

**Quadrature Counter** operates with two 90° phase-shifted signals A and B from linear or rotational resolvers. The counting direction is automatically derived from the phase of the input signals A and B. The counter is designed for very fast measuring and positioning applications and it counts every edge of the A and B signals.

**Up-Down Counter** is suitable for fast bi-directional counting applications. The input A is the counting input, the logic level at the input B determines the counting direction up or down.

**Angular Counter** operates with two 90° phase-shifted signals A and B from rotational resolvers and measures the angle from 0 to 360°. The resolution of the display depends on the number of pulses per revolution of the used resolver. The reference - zero - signal from the resolver might be used to set the display to zero.

**Quadrature Tachometer** operates with two 90° phase-shifted signals A and B from rotational resolvers. The display recognizes automatically the revolving direction and shows it with or without a minus sign.

**Up-Down Tachometer** has a signal input A and a direction input B which determinates the display polarity by illuminating a minus sign.

**Angular Tachometer** operates with two 90° phase-shifted signals A and B from rotational resolvers and measures the angular speed within the range 0 to 360°.

**Floating Point Arithmetic** allows practically unlimited display capacity. The programmed decimal point is automatically positioned when the display arrives at the full range. When, during counting, the decimal point has moved to the right position after the LSD and the display arrives at the maximal count, the display information changes to the exponential expression xxxxE6, xxxxE7 etc.

**Preset** with 6 digit, sign and decimal point can be programmed over the entire range of the display. Once programmed, the Preset can be entered into the display at any time with the keyboard or the external Preset Input. The display starts counting at the Preset.

**Scale** of the display permits the display to read in required process units such as mm, cm, inches etc. and can be programmed as multiplication and/or division. The multiplication has 6 digits with decimal point and sign, the division constants can be selected from :1 to :800 000.

**Average Filter** can be programmed for constants from 1 to 128. It is mainly suitable for applications where the resolver generates pulses in the motionless position due to vibrations of the equipment.

**Last Reading** of the display is automatically stored in a non- volatile memory when the power is switched-off. After the power is switched-on again, the stored value is inserted into the display.

**Four Set Points** SP1 ... SP4 can be adjusted over the entire display range from 0 ... ± 999999. The set points activate open collector output transistors or optionally four mechanical relay.

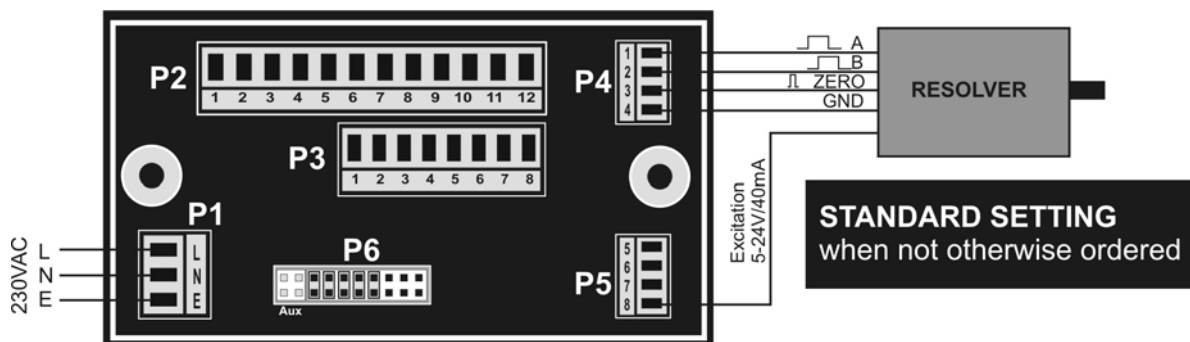
**Two serial communication ports** RS 232 and RS 485 are optically isolated. The parameters can be selected with the keyboard.

**Two analog outputs** -10V ... +10V and 0/4 ... 20mA are optically isolated and are present at the output terminals simultaneously. The analog outputs can be set for 0 ... 10V, -10V ... +10V, 0-20mA or 4-20mA. Both analog output limits -10V (0/4mA) and +10V (20mA) can be assigned with the keyboard to any two desired display values. The 12 bit DAC has a resolution of 4096 increments and a reaction time of 1.8ms.

**Excitation** for external sensors is provided and is adjustable from 5 to 24V with a potentiometer at the main board. It can be loaded by max. 40mA.

## STANDARD FACTORY SETTING

see § 6.2 page 19.



## FRONTPANEL KEYBOARD



With the five keys at the front the instrument's parameters can be set for the required operation and display mode. The menu steps can be scrolled at the display with the key MENU. The required parameter will be confirmed with SETPTS. The blinking cursor marks the digit which can be changed with MAX and positioned with MIN. To select the sign and the decimal point, the cursor has to be moved outside the display range so that none of the digits is blinking. The required decimal point and the sign can now be set with MAX.

The keys RESET and MIN have following functions:

**RESET** - terminates the programming mode and starts the measuring mode. If pressed during the measuring mode, the value selected in the menu step OFFSET will be entered into the display.

**MIN** - resets the display to zero when pressed during the measuring mode.

## 1 MENU

The instrument's software contains the *MENU* and the *HTEST*.

**MENU** is accessible with the keyboard during the instrument's operation.

**HTEST** can be activated when the power is applied to the instrument (see p. 8).

### 1.1 Menu Steps

Key	Display	Function
MENU	SP 1	Set Point 1 activates the output transistor OC1 or the output Relay SP1.
SETPTS	XXXXXX	Selection with MAX and MIN.
MENU	SP 2	Set Point 2 activates the output transistor OC2 or the output Relay SP2.
SETPTS	XXXXXX	Selection with MAX and MIN.
MENU	SP 3	Set Point 3 activates the output transistor OC3 or the output Relay SP3.
SETPTS	XXXXXX	Selection with MAX and MIN.
MENU	SP 4	Set Point 4 activates the output transistor OC4 or the output Relay SP4.
SETPTS	XXXXXX	Selection with MAX and MIN.
MENU	SCALE	Multiplicative - Scaling - Constant for the display.
SETPTS	XXXXXX	Selection with MAX and MIN.
MENU	dSCALE	Dividing constant for the display.
SETPTS	XXXXXX	Selection with MAX and MIN.
MENU	OFFSEt	Display Offset-Preset.
SETPTS	XXXXXX	Selection with MAX and MIN.
MENU	OrdEr	Display resolution.
SETPTS	XXXXXX	Selection with MAX and MIN from CCCCCC to C.ddddd. Selection in angular mode: hh.nn.SS, mm.SS, mm.SS.d, mm.SS.dd.

MENU SETPTS	Fn nul XXXXXX	<p>Display Reset and Preset Mode with external signal at P4-3 of P5-8.  <b>Instrument's functions: QuAd C, Updn C, Angle C</b> (see SEL InF).  Following menu steps are activated:  <b>OFF</b>           Function OFF  <b>nul-LO</b>       Reset with log. „0“at the external input P6 (ZERO Input)  <b>nul-Hi</b>       Reset with log. „1“at the external input P6 (ZERO Input)  <b>SET-LO</b>       Preset with log. „0“at the external input P6 (PRESET Input)  <b>SET-Hi</b>       Preset with log. „1“at the external input P6 (PRESET Input)</p> <p><b>Instrument's functions: QuAd SP, Updn SP, Angle SP</b> (see SEL InF).  Following menu steps are activated:  <b>OFF</b>           Function OFF  <b>F-bASE</b>       Measuring time in the Tachometer mode: 0.1 ... 9.00 sec.  <b>O-bASE</b>       Reset Time in the Tachometer mode: 0.2 ... 9.00 sec.  The O-bASE has to be set at least one step higher than the F-bASE.</p>
MENU SETPTS	Filter XXXXXX	Active Filter. Selection of the Filter Constant: Fil 1 .... Fil 128.
MENU SETPTS	Aout L XXXXXX	Display value for Analog Output -10V(0V) and 0/4mA. Selection with UP or DOWN.
MENU SETPTS	Aout H XXXXXX	Display value for Analog Output +10V und 20mA. Selection with UP or DOWN.
MENU SETPTS	bAud XXXXXX	Baud Rate. Selection from 1200 to 19200 bd with UP or DOWN.
MENU SETPTS	Addr rS 232	Address of the serial port. Address 0 activates automatically RS232. One of addresses 1-31activates RS485.
MENU SETPTS	rS Set XXXXXX	Communication Mode. <b>PC SOFT:</b> Request Mode for Orbcom, Terminal etc. <b>Con.PC:</b> Cont. transmission with all digits and decimal points as set in OrdEr. <b>One.PC:</b> One telegram only with all digits and decimal points as set in OrdEr. <b>Con.Inf:</b> Cont. Transmission with 6 digit as shown at the instruments display. <b>One.Inf:</b> One telegram only with 6 digit as shown at the instruments display.
MENU SETPTS	SEL InF XXXXXX	Selection of the measuring mode. <b>QuAd C</b> Quadrature Counter for two 90° phase shifted signals A and B. <b>UP dn C</b> Up-Down incremental counter with two inputs A and B. Input A:       Pulses to be counted Input B = "0"   Display incrementing Input B = "1"   Display decrementing <b>AnGL C</b> Angular Counter for A, B Signals. <b>QUAd SP</b> Tachometer for two 90° phase shifted signals A and B. <b>UP dn SP</b> Up-Down Frequency Counter with two inputs A and B Input A:       Frequency to be measured Input B = "0"   Positive display readings Input B = "1"   Negative display readings („-„ sign illuminated). <b>AnGL SP</b> Angular Frequency Counter with two 90° phase shifted signals A and B. Frequency representation in angular format 0-360°.
MENU MENU	CirCLE StArt	Number of resolver counts in the Angular Counter mode with A and B Signals. Measuring mode.



## 1.2 HTEST

**HtEst** is a submenu for testing and calibration purposes. It is activated only when the supply voltage to the instrument is switched-on while the key MENU is pressed. The key has to be kept pressed until the display shows *HtEst*. The key MENU scrolls the menu forward; the key RESET scrolls the menu backward. During the HTEST the display segments are tested, the Set Points activated and the LEDs illuminated. The Analog Outputs are generated and the Time Base of the frequency measurement can be precisely calibrated.

Key	Display	Function
MENU	8.8.8.8.8.8.	The display segments are tested
MENU	SP 1	Relay / Transistor and LED SP1 are activated
MENU	SP 2	Relay / Transistor and LED SP2 are activated
MENU	SP 3	Relay / Transistor and LED SP3 are activated
MENU	SP 4	Relay / Transistor and LED SP4 are activated
MENU	Out -10	-10V (0V)* und 0/4mA are generated at the outputs
MENU	Out -5	- 5V (2.5V)* und 8mA are generated at the outputs
MENU	Out -10	0V (5V)* und 12mA are generated at the outputs
MENU	Out -10	+ 5V (7.5V)* und 16mA are generated at the outputs
MENU	Out -10	+10V und 20mA are generated at the outputs
MENU	C XXX	Calibration Constant for frequency measurements can be selected from -128 to +128. This multiplicative constant scales the internal quartz time base for highest accuracy in the frequency and tachometer mode of operation. This calibration constant is set during the input is supplied by a frequency from precision frequency generator.
MENU	End	End of the HTEST submenu.

\* Voltage in ( ) is valid for the analog output selection 0-10V.

## 2 SCALE and DSCALE

**SCALE** Multiplication constant for the display readings.  
**dSCALE** Division constant for the SCALE.

$$\text{Display} = \text{Input Counts} \times \text{SCALE} : \text{dSCALE}$$

### 2.1 SCALE and dSCALE examples

**Task:** Quadrature resolver has 14400 pulses per revolution.  
A display reading of 2.000 is required after 1 revolution of the resolver.

**Solution:** Set the meter for Quadrature mode **quAd** in the menu step **SEL InF**.  
Switch-off the power and switch-on again after 2 sec to memorize the settings.  
Scale calculation:  $2.000 : 14400 = 0.000138888$   
Select 1.38888 in the menu step **SCALE**  
Display decimal point: Select the display decimal point at the required position  
CCC.ddd in the menu step **OrdEr**  
Scale division: Select 010000 in the menu step **dSCALE**  
Terminate the programming with the key RESET.

### 2.2 Angular measurements

The menu steps **AnGL C** and **AnGL SP** are for angular measurements.

**AnGL C** Angular Incremental Counter 0 ... 360° for two 90° phase shifted input signals A and B.

**AnGL SP** Angular Frequency Counter 0 ... 360° for two 90° phase shifted input signals A and B.  
Angular representation of the measured frequency.

#### 2.2.1 AnGL C – Angular Incremental Counter

##### Example

**Resolver:** 5000 pulses/revolution (internal automatically multiplied by 4) result in a display of 20000 after one revolution of the resolver.

**Required Display:** 0 ... 360°

1) **OrdEr** **CCCCC** **Decimal Representation 0 ... 359.99 (°, 1/100°)**

Scaling:  $360 : (4 \times 5000) = 0.018$

SCALE 1.8

dSCALE 100

OrdEr CCCC.dd

CirCLE 20000

2) **OrdEr** **nn.SS** **Angular Representation 0 ... 359.59 (°, min)**

Scaling:  $360 : (4 \times 5000) \times 60 = 1.08$

SCALE 1.08

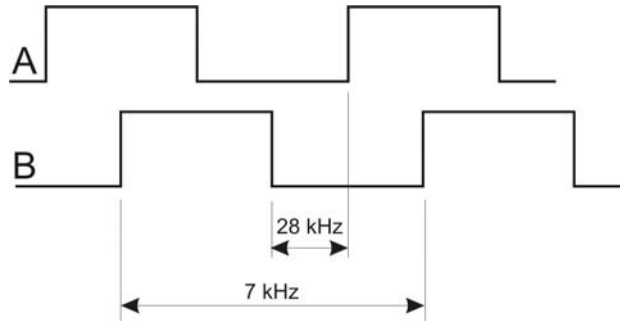
dSCALE 1

OrdEr nn.SS

CirCLE 20000

### 2.2.2 AnGL SP - Angular Frequency Counter

The instrument can be used as a standard Tachometer with quadrature inputs A and B. By using the scaling, the display can be programmed in desired process units such as UPM, m/sec, etc. or as a frequency meter with the display in angular format as shown in Example 2 below.



#### Example 1

Tachometer with input signals A and B, measuring the input frequency as shown above:

SCALE	1.	
dSCALE	1.	
OrdEr	CCCCC.d	one decimal point display resolution
F bASE	1.0	(free selectable 0.1 ... 9.00 sec.)
O bASE	2.0	(free selectable 0.1 ... 9.00 sec.)

The display shows e.g. 28000.0 for the input signals from above.

#### Example 2

Quadrature frequency input 0 ... 7 kHz has to be displayed in angular format 0 ... 360°. Since the microcontroller counts each edge of the input signals A and B, the edge to edge frequency is 28 kHz.

a) **OrdEr**      **CCCCC**      **Decimal Representation 0 ... 359.99 (°, 1/100°)**  
 Scaling:      360 : (4x7000) = 0.0128571  
 SCALE        1.28571  
 dSCALE       100  
 OrdEr        CCCC.dd  
 F bASE       1.0            (free selectable 0.1 ... 9.00 sec.)  
 O bASE       2.0            (free selectable 0.1 ... 9.00 sec.)

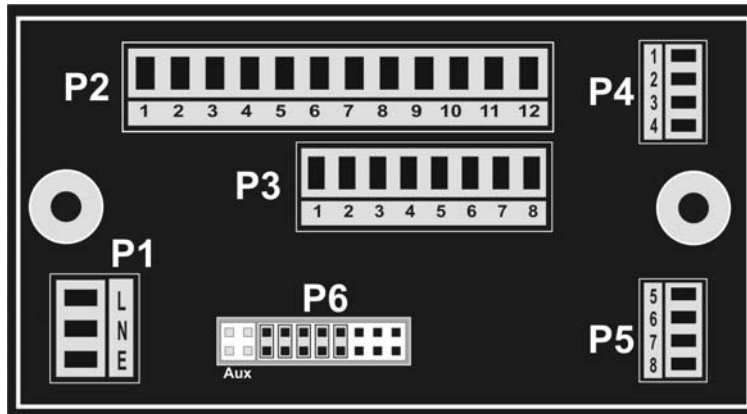
b) **OrdEr**      **nn.SS**      **Angular Representation 0 ... 359.59 (°, min)**  
 Scaling:      360 : (4x7000) x 60 = 0.771428  
 SCALE        7.71428  
 dSCALE       10  
 OrdEr        nn.SS  
 F bASE       1.0            (free selectable 0.1 ... 9.00 sec.)  
 O bASE       2.0            (free selectable 0.1 ... 9.00 sec.)

### 3 SPECIFICATIONS

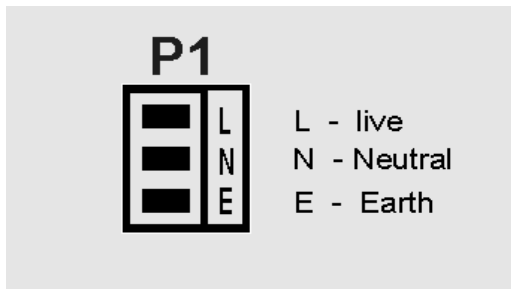
- DISPLAY:** 0 ...  $\pm$  999999, red, 7 segments, 14.7 mm. Free programmable decimal point and sign.
- INPUTS:** Terminals P4: - Positive Logic 5V CMOS, protected to 28V. Frequency range: 0...800 kHz.  
- Standard RS485 type of inputs. Internal selection with jumpers.
- Quadrature and Angular Counter: Inputs A and B. The counting direction is automatically controlled by the phase shift of signals A and B. The display increments with all edges A, B.
- Up-Down Counter and Tachometer: Input A: Pulses to count. DC - 800 kHz.  
Input B: Direction Up (log.0) or Down (log 1). The counting direction can change with max. 8 kHz of the input frequency.
- PRESET:** Display offset programmable from 0 to  $\pm$  999999 with decimal point. It can be inserted into the Display with the RESET key or the external signal at P4-3 with pulse duration of min. 1  $\mu$ s. The display starts counting at the OFFSET value. The external input is 5V positive, protected to 28V.
- ZERO:** Display is forced to zero with the MIN key or with an external signal at P4-3 with pulse duration of min. 1  $\mu$ s. The external input is 5V positive, protected to 28V.
- LOCKOUTS:** Three program lockouts are accessible at P6 terminal:  
Lockout 1: Inhibit of the Set Points SP1 ... SP4  
Lockout 2: Inhibit of the MENU  
Lockout 3: Inhibit of the PRESET  
The inserted jumpers activate the Lockouts. See Fig. 4.9, page 14.
- SCALE:** Multiplication by a 6-digit constant 0 ... 999999 with decimal point and sign.
- dSCALE:** Dividing 6 digit constant free programmable.
- ORDER:** Display resolution, selection of the decimal point.
- FILTER:** Averaging filter with programmable number of measurements from 1 to 128.
- SET POINTS:** Four Set Points with decimal point and sign can be programmed from 0 to  $\pm$  999999. They activate open collector transistors 60V/100mA, or optional four mechanical relay 5A-230VAC.
- ANALOG OUT:** Voltage and Current Analog Outputs with 12 bit resolution are generated simultaneously.  
Voltage Output: -10V ... +10V, Current Output: 0/4 - 20mA. Zero or 4mA can be selected inside the instrument. The outputs are optically isolated by 250V rms. The response time is 1.8 msec.
- DATA PORT:** RS232 and RS485 (4-wire connection). One telegram consists of 8 bits, no parity, 1 start and 1 stop. The baud rate can be selected from 600 to 19200 bd, the address from 0 to 31. Address 0 selects automatically RS232. The serial outputs are optically isolated by max. 250V rms.
- EXCITATION:** Mains powered instruments: The Excitation is potentiometer adjustable 5-24VDC-40mA.  
DC powered instruments: The Excitation is not available.
- TERMINALS:** Pluggable screw terminals and ribbon cable connector.
- MAINS:** 115/230V  $\pm$ 10%, 50-60Hz.
- CASE:** DIN 48 x 96 mm, depth behind bezel 150 mm. Panel cut-out 45x93 mm.  
IP65 protection from the front.

## 4 TERMINALS

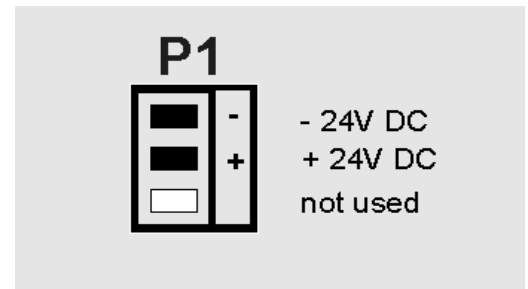
### 4.1 Rear Side of the Instrument



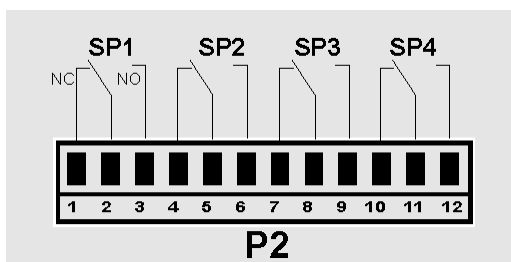
### 4.2 Terminals P1: Mains Supply



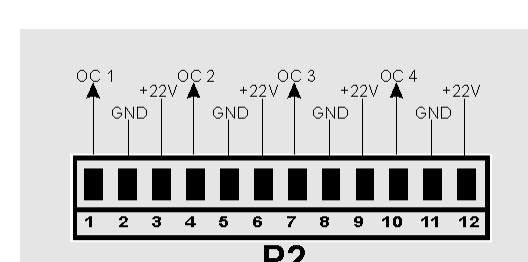
### Terminals P1: DC Supply



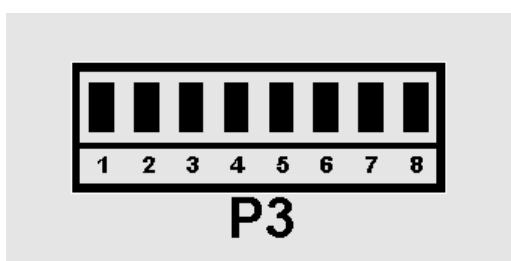
### 4.3 Terminals P2: Output Relay



### Terminals P2: Transistors

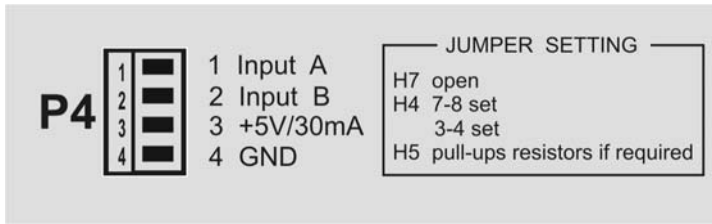


### 4.4 Terminals P3: Serial Data Ports



1	RxD	RS232
2	TxD	RS232
3	GND	
4	GND	
5	Non Inverting TxD	RS485
6	Inverting TxD	RS485
7	Non Inverting RxD	RS485
8	Inverting RxD	RS485

#### 4.5 Terminals P4: Quadrature Inputs and Resolver Excitation



See page 16 for jumper settings

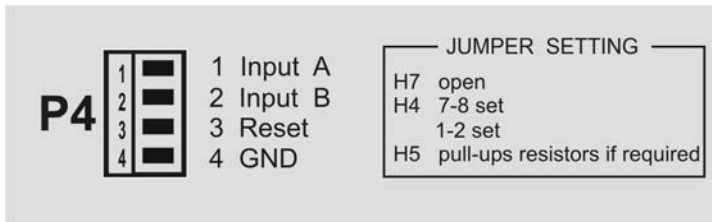
**Attention!**

+5V/30mA is an unprotected voltage of the microprocessor logic at the main board.

*It will be damaged when overloaded or short circuit.*

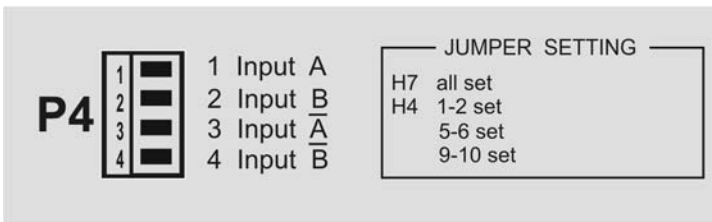


#### 4.6 Terminals P4: Quadrature Inputs and ZERO - Reset Input



See page 16 for jumper settings

#### 4.7 Terminals P4: Inputs for RS 485 - Resolver Type

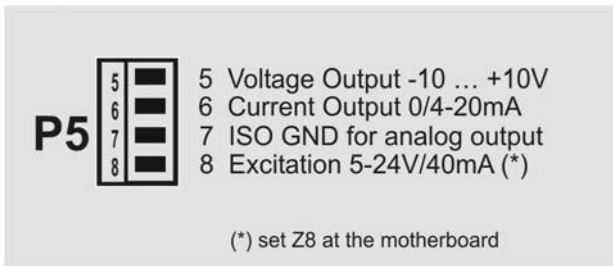


See page 16 for jumper settings

**ATTENTION**

By using the RS485 type of encoder inputs, the P4-4 is using the  $\bar{B}$  signal. For this reason the excitation P5-8 can not be used and the encoder has to be supplied from an external power supply.

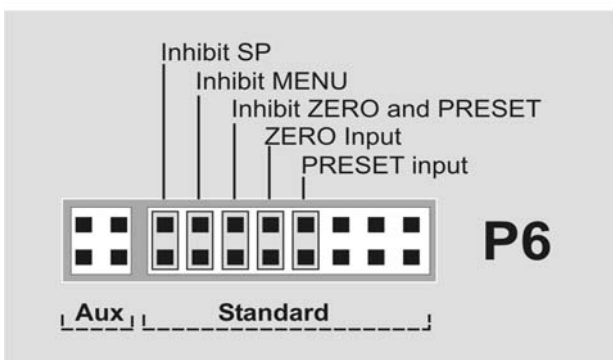
## 4.8 Terminals P5: Analog Outputs



**Voltage Output** can be set for 0...+10V or -10...+10V  
**Current Output** can be set for 0-20mA or 4-20mA

**EXCITATION** against digital GND P4-4 is adjustable from 5V to 24V with a potentiometer P6 at the main board and can be loaded with max. 40mA (see 6.2 at page 19). Jumper Z8 at the main board has to be set.

## 4.9 Terminals P6: LOCKOUTS and External Inputs



### LOCKOUTS

#### **Inhibit SP**

Set Points SP1...SP4 can not be accessed when the jumper is removed.

#### **Inhibit MENU**

The menu can not be accessed when the jumper is removed.

#### **Inhibit ZERO and PRESET**

ZERO (key MIN) and PRESET (key RESET) is disabled when the jumper is removed.

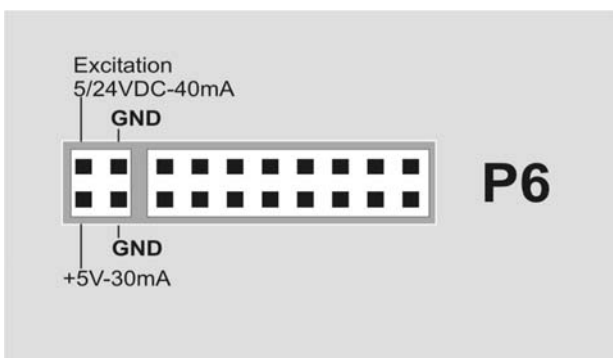
### EXTERNAL INPUTS

Display resets to zero when *ZERO input* is open.

Display presets to the OFFSET value programmed in the menu when *PRESET input* is open.

### **AUX**

Auxiliary excitation is available with customized instruments only.



### **AUX OUTPUTS** - Customized instruments only.

Z7 and Z8 on mainboard are closed to enable the excitation. This is adjustable from 5V to 24V with a potentiometer P6 at the main board. Max. permitted load is 40mA, see page 15.

### **Attention!**

+5V/30mA is an unprotected voltage of the micro-processor logic at the main board.

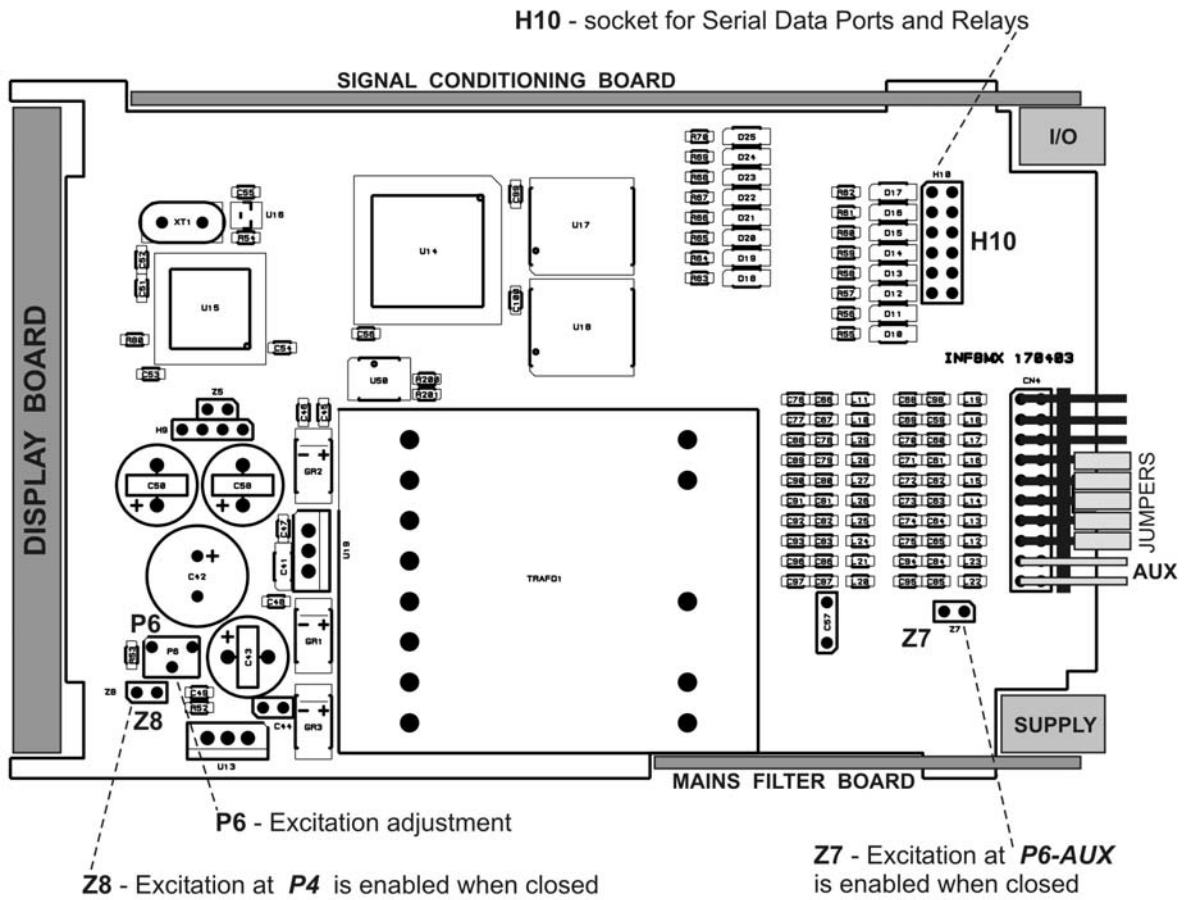
***It will be damaged when overloaded or short circuit.***



## 5 BOARDS

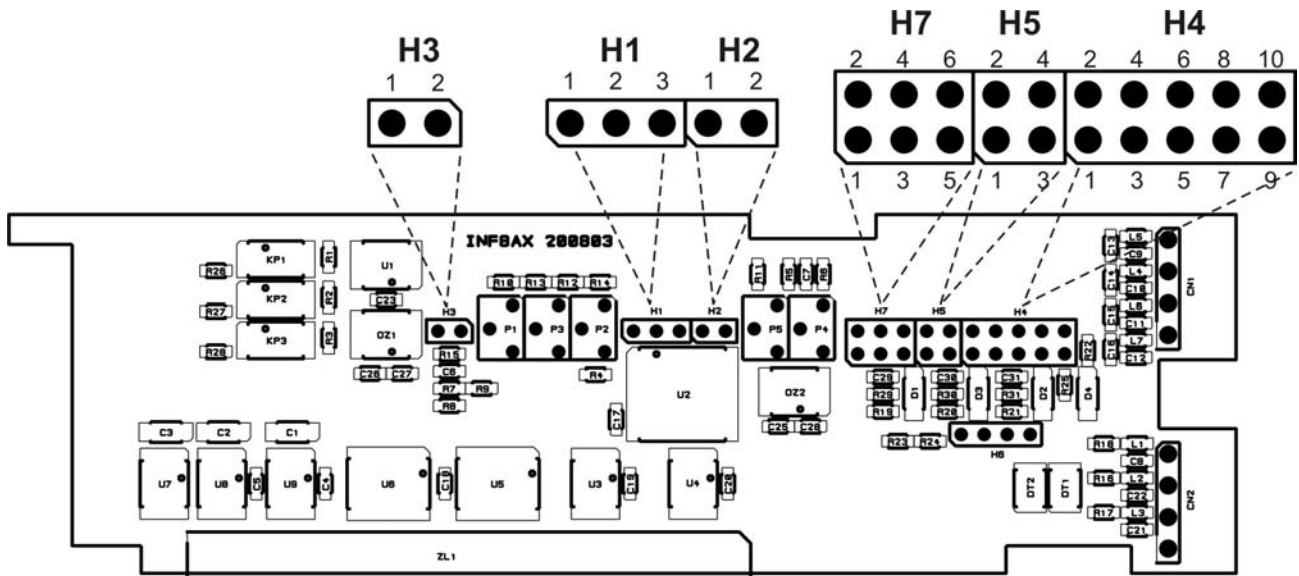
### 5.1 Main Board

The microcontroller logic, the power supply and the auxiliary components are located on the main board. The signal conditioning board, the mains filter and the display are vertically placed and firmly fixed to the main board. The excitation can be adjusted between 5 and 24V with a potentiometer P6. The jumper Z8 has to be inserted for connecting the excitation to the P4-3 connector. Customized instruments have the excitation available at P6 connector with Z7 jumper inserted. Optional board with serial data ports and relay outputs is plugged into H10 socket.





## 5.2 Signal Conditioning Board



### 5.2.1 Type of the Signal Input

The input signals are connected to P4 terminals, as shown at page 13. The type of the input can be selected with jumpers in headers H4, H5, H7. Some connection types are shown at page 19.

### 5.2.2 Analog Outputs

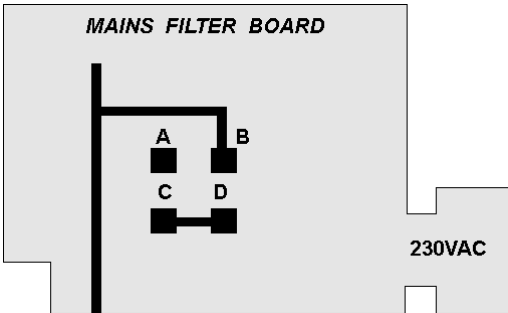
Two analog outputs are generated simultaneously, -10 ... +10V (or 0 ... 10V) and 0/4-20mA. The required output type is selected with jumpers in H1, H2 and H3 headers at the signal conditioning board INF8AX.

#### Analog Output Selection and adjusting Potentiometers

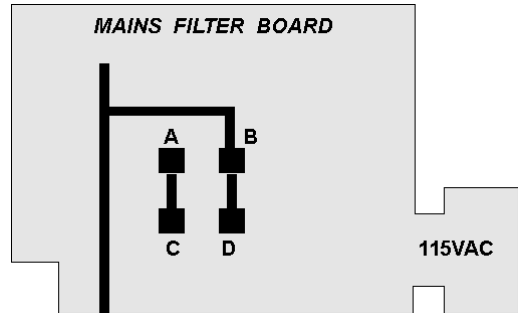
Output	H1	H2	H3	P1	P2	P3	P4	P5
0...10V, 4-20mA	1-2	open	open	4.00mA	20.00mA	+10.00V	---	0.00V fine
0...10V, 0-20mA	2-3	open	closed	0.00mA	20.00mA	+10.00V	---	0.00V fine
-10...+10V, 4-20mA	1-2	closed	open	4.00mA	20.00mA	+10.00V	-10.00V	---
-10...+10V, 0-20mA	2-3	closed	closed	0.00mA	20.00mA	+10.00V	-10.00V	---

### 5.3 Mains Filter Board

The power supply has been set for 115V AC operation. To change the voltage to 230VAC, change the position of the two jumpers at the Mains Filter side board, as shown below:



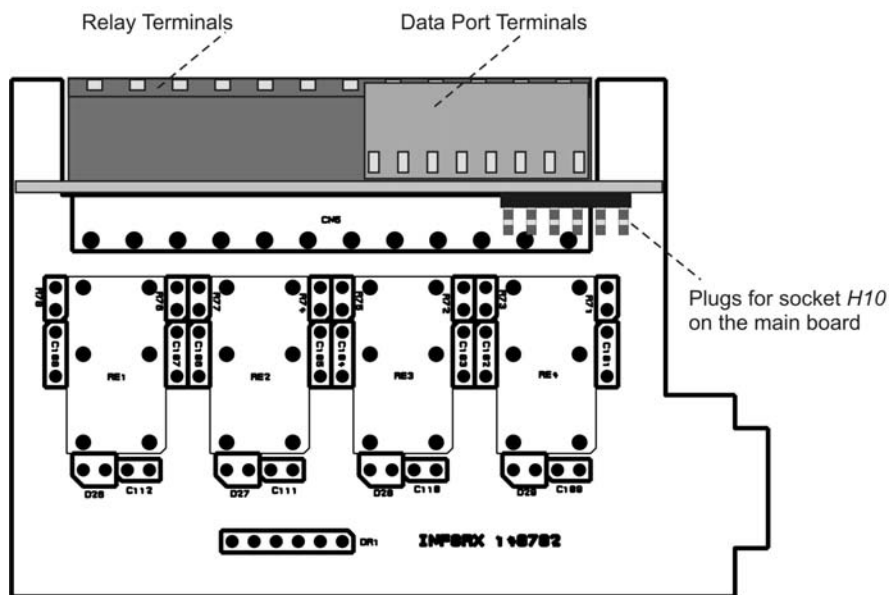
Mains 230VAC: C and D connected



Mains 115VAC: A with C and B with D connected

### 5.4 Relay Output and Serial Data Port

Serial Data Port and Output Relay build one optional unit which is pluggable into the main board.



#### 5.4.1 Relay Outputs

The output relays have contacts for 5A-230VAC. They are activated when the display is equal or larger than the value set in the menu steps SP1, SP2, SP3, and SP4.

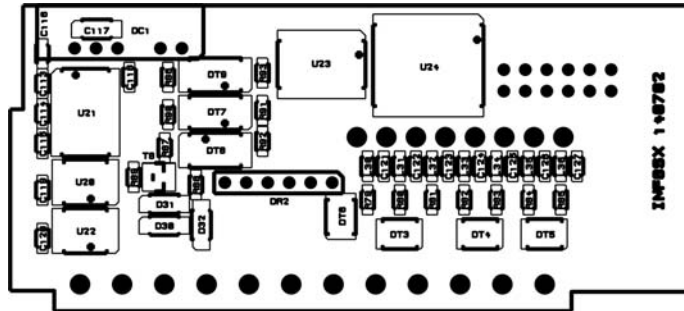
### 5.4.2 Serial Data Ports

Two data ports are available at the P3 connector: RS 232 and RS 485 (4-wire connection). One telegram consists of 8 bits, no parity, 1 start and 1 stop.

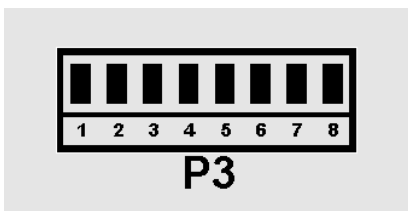
**Baud Rate:** 600 to 19200 bd

**Isolation:** 250V rms.

**Address:** 0 to 31. The address 0 activates RS 232.  
One of addresses 01 to 31 activates RS 485.



### Serial Port Terminals P3

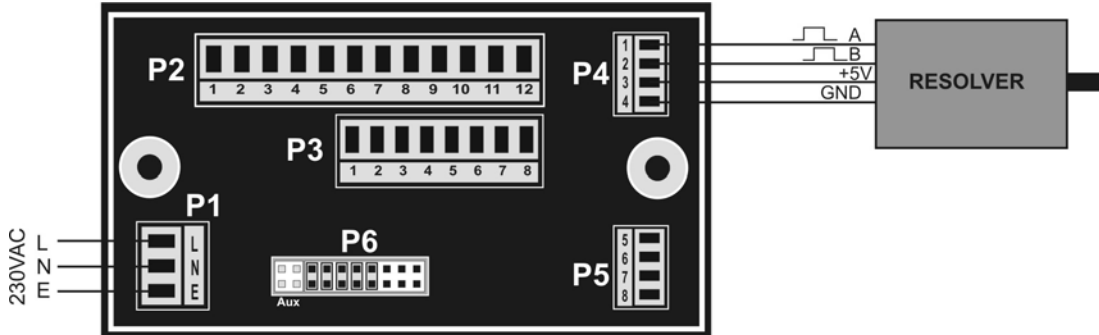


1	RxD	RS232
2	TxD	RS232
3	GND	
4	GND	
5	Non Inverting TxD	RS485
6	Inverting TxD	RS485
7	Non Inverting RxD	RS485
8	Inverting RxD	RS485

## 6 CONNECTION EXAMPLES

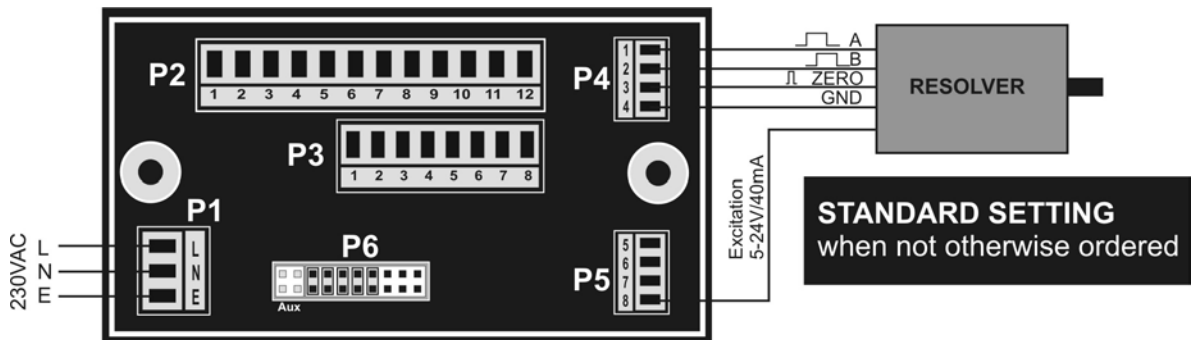
### 6.1 Resolver with A, B signals powered from internal supply 5V/30mA

Input selection: 4.5 page 13



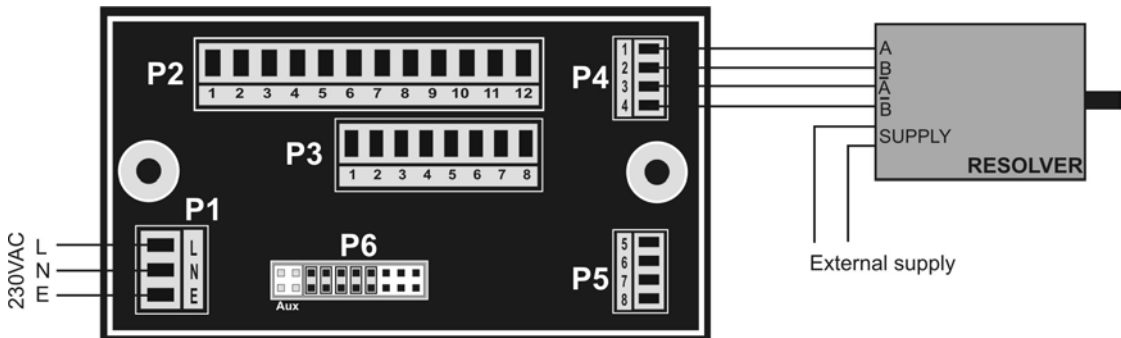
### 6.2 Resolver with A, B and ZERO signals powered from excitation 5-24V/40mA

Input selection: 4.6 page 13

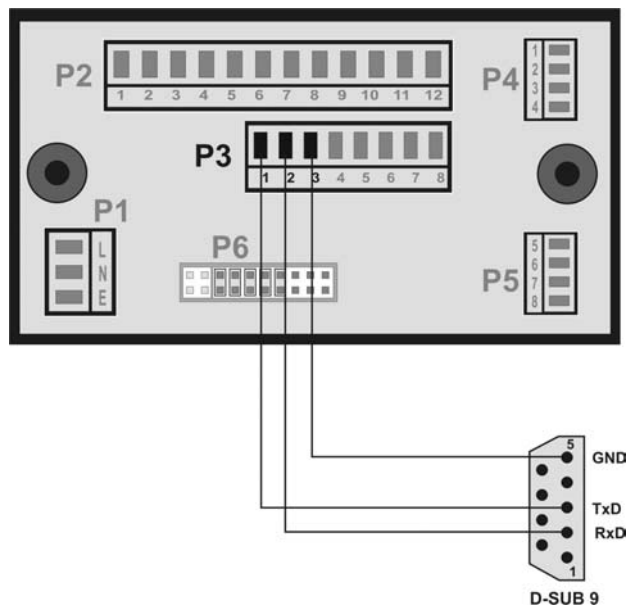


### 6.3 Resolver with RS485 signals

Input selection: 4.7 page 13



## 6.4 INF8 connected via RS 232 to a PC



## 7 COMMUNICATION

The measured results at the display can be send via the serial data port to a PC, large display, remote display, data acquisition unit or any other type of data receiver. Continuous or Request Transmission can be selected in the menu step *rS Set*.

### 7.1 Request Transmission

Set *PCSOft* in the menu step *rS SEt*.

The bi-directional serial interface RS232/RS485 permits the transmission of both, the displayed data from the INF8 to the PC and the control commands from the PC to the INF8. To enable the communication, the serial interface card has to be installed inside INF8. The data transmission from INF8 is initiated with the command <CR> <LF> sent from the PC to the INF8.

### 7.1 Continuous Transmission

The menu step *rS Set* has following possible settings:

- Con.PC** Continuous transmission with all digits and decimal points as set in OrdEr.  
P3-Pin 1 (Rx) has to be set to +10V.
- One.PC** One telegram only with all digits and decimal points as set in OrdEr.  
P3-Pin 1 (Rx) has to receive +10V pulse.
- Con.Inf** Continuous transmission of only 6 digits as shownt at the instruments display.  
P3-Pin 1 (Rx) has to be set to +10V.
- One.Inf** One telegram only with 6 digits as show at the instruments display.  
P3-Pin 1 (Rx) has to receive +10V pulse.

### 7.3 INF8 Soft Manager for Windows

This software package is optionally available at a disk. It permits programming of the INF8 from a PC, setting the operating parameters and transmitting of the displayed results to the PC.

## 8 INF8 PROGRAMMING via the SERIAL DATA PORT

Operating.

### 1. Open IFACE

IFACE mode is set after downloading

'P' + <CR> + <LF> 3 Byte for RS232

or

addr+'P' + <CR> + <LF> 3 Byte for RS485

Inf8 return

IFACE#aa<CR>LF>

Notice 1:

#aa is a string of an integer number, which represent the address of INF8.

For RS232 equal zero, for RS 485 between 01 and 32

If downloading, addr represent the address of INF8, which communicate on RS485.

addr is 1 byte, which is computed as #aa+128.

For RS232 no addr byte is send.

### 2. Close IFACE

Meas mode is set after downloading

'E' + <CR> + <LF> 3 Byte

Inf8 return

MEAS#aa<CR>LF>

#aa is a string of an integer number, which represent the address of INF8.

For RS232 equal zero, for RS485 between 01 and 32

### 3. Up load number (In IFACE mode only)

Send command and numbers from Tab1.

INF8 sends the answer immediately after <LF> (see Tab1):

PROM#aa #bb #num<CR>LF>

#aa is a string of an integer number, which represent the address of INF8.

For RS232 equal zero, for RS485 between 01 and 32

and #num is a string of the requested real number such as 1.23456 etc.

### 4. Down load number (In IFACE mode only)

Send command and numbers from Tab1.

INF8 sends the answer immediately after <LF> (see Tab1):

PROM#aa #bb #num<CR>LF>

#aa is a string of an integer number, which represent the address of INF8.

For RS232 equal zero, for RS485 between 01 and 32

and #num is a string of downloaded number such as 1.23456 etc.

### 5. Up load select (In IFACE mode only)

Send command and select from Tab1.

INF8 sends the answer immediately after <LF> (see Tab1):

MENU#aa #bb #sel<CR>LF>

#aa is a string of an integer number, which represent the address of INF8.

For RS232 equal zero, for RS485 between 01 and 32

and #sel is a string of requested integer number such as 12 etc.

## 6. Down load select (In IFACE mode only)

Send the command and the numbers from Tab1.

INF8 sends the answer immediately after <LF> (see Tab. 1):

MENU#aa #bb #sel<CR><LF>

#aa is a string of an integer number, which represent the address of INF8.

For RS232 equal zero, for RS485 between 01 and 32

and #sel is a string of requested integer number such as 12 etc.

Tab. 1.

PCSETTAB	Up Load to INF8	Down Load to PC
SCALE	'N'+0+'1'+<CR>+<LF>	'N'+0+'1'+ '#num'+<CR>+<LF>
OFFSET	'N'+0+'2'+<CR>+<LF>	'N'+0+'2'+ '#num'+<CR>+<LF>
SP 1	'N'+0+'3'+<CR>+<LF>	'N'+0+'3'+ '#num'+<CR>+<LF>
SP 2	'N'+0+'4'+<CR>+<LF>	'N'+0+'4'+ '#num'+<CR>+<LF>
SP 3	'N'+0+'5'+<CR>+<LF>	'N'+0+'5'+ '#num'+<CR>+<LF>
SP 4	'N'+0+'6'+<CR>+<LF>	'N'+0+'6'+ '#num'+<CR>+<LF>
AOUT L	'N'+0+'7'+<CR>+<LF>	'N'+0+'7'+ '#num'+<CR>+<LF>
AOUT H	'N'+0+'8'+<CR>+<LF>	'N'+0+'8'+ '#num'+<CR>+<LF>
BAUD	'M'+0+'9'+<CR>+<LF>	'M'+0+'9'+ '#sel'+<CR>+<LF>
ADDR	'M'+1+'0'+<CR>+<LF>	'M'+1+'0'+ '#sel'+<CR>+<LF>
ORDER	'M'+1+'1'+<CR>+<LF>	'M'+1+'1'+ '#sel'+<CR>+<LF>
DSCALE	'N'+1+'2'+<CR>+<LF>	'N'+1+'2'+ '#num'+<CR>+<LF>
FILTER	'M'+1+'3'+<CR>+<LF>	'M'+1+'3'+ '#sel'+<CR>+<LF>
SELINF	'M'+1+'4'+<CR>+<LF>	'M'+1+'4'+ '#sel'+<CR>+<LF>
RSSET	'M'+1+'5'+<CR>+<LF>	'M'+1+'5'+ '#sel'+<CR>+<LF>
CIRCLE	'N'+1+'6'+<CR>+<LF>	'N'+1+'6'+ '#num'+<CR>+<LF>
FBASE	'M'+1+'7'+<CR>+<LF>	'M'+1+'7'+ '#sel'+<CR>+<LF>
OBASE	'M'+1+'8'+<CR>+<LF>	'M'+1+'8'+ '#sel'+<CR>+<LF>
FNUL	'M'+1+'9'+<CR>+<LF>	'M'+1+'9'+ '#sel'+<CR>+<LF>

Notice 2: #num is a string of real numbers such as 1.23456 etc.

Notice 3: #sel is a string of integer numbers which correspond to the table bellow Tab. 2....Tab 10.

Tab. 2 #sel	BAUD
0	1200
1	2400
2	4800
3	9600
4	19200
5	39400

Tab. 3 #sel	ADDR
0	RS232
1	01
2	02
..	..
30	30
31	31

Tab. 4 #sel	ORDER
0	C.DDDDD
1	CC.DDDD
2	CCC.DDD
3	CCCC.DD
4	CCCCC.D
5	CCCCCC.

Tab. 5 #sel	FILTER
00	OFF
01	FIL 1
02	FIL 2
03	FIL 4
04	FIL 8
05	FIL 16
06	FIL 24
07	FIL 32
08	FIL 48
09	FIL 64
10	FIL 80
11	FIL 96
12	FIL112
13	FIL128

Tab. 6 #sel	selINF
00	QUAD C
01	UPDN C
02	ANGL C
03	QUADSP
04	UPDNSP
05	ANGLSP

Tab. 7 #sel	RSSET
00	PCSOFT
01	RS232



Tab. 8 #sel	FBASE
00	T .100
01	T .200
02	T .500
03	T 1.00
04	T 2.00
05	T 3.00
06	T 5.00
07	T 9.00

Tab. 9 #sel	OBASE
00	T .100
01	T .200
02	T .500
03	T 1.00
04	T 2.00
05	T 3.00
06	T 5.00
07	T 9.00

Tab. 10 #sel	FNNUL
00	OFF
01	NUL-LO
02	NUL-HI
03	SET-LO
04	SET-HI

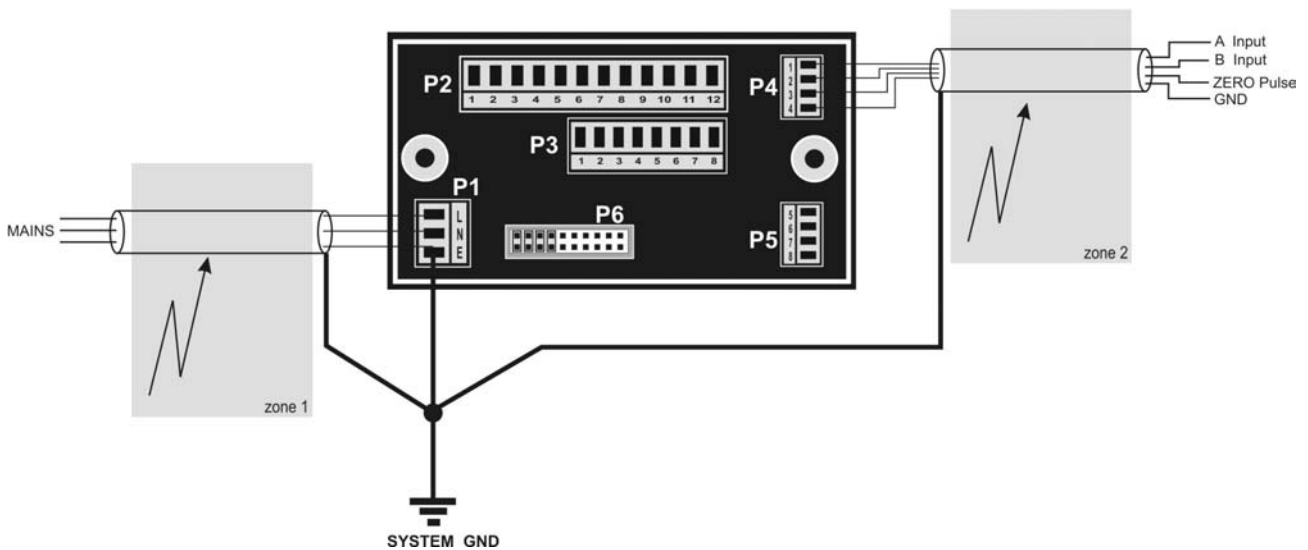
## 9 BURST TEST and recommended connections

**Tester:** Burst-Surge Generator HILO, Model CE-Tester  
**Datum:** 15. June 2000  
**E.U.T.:** INF8, SN: 200606, Supply 230VA  
Mode: Quadrature Counter

### 9.1 Test Conditions

IEC Norms: IEC 801-4  
IEC 1000-4-4  
EN 50052-1

### 9.2 Test Set - Up



### 9.3 Test Results

Zone 1:	2kV Burst	Display not disturbed
Zone 2:	2kV Burst	Display not disturbed

Technician: Oliver Matthews      15. June 2000



