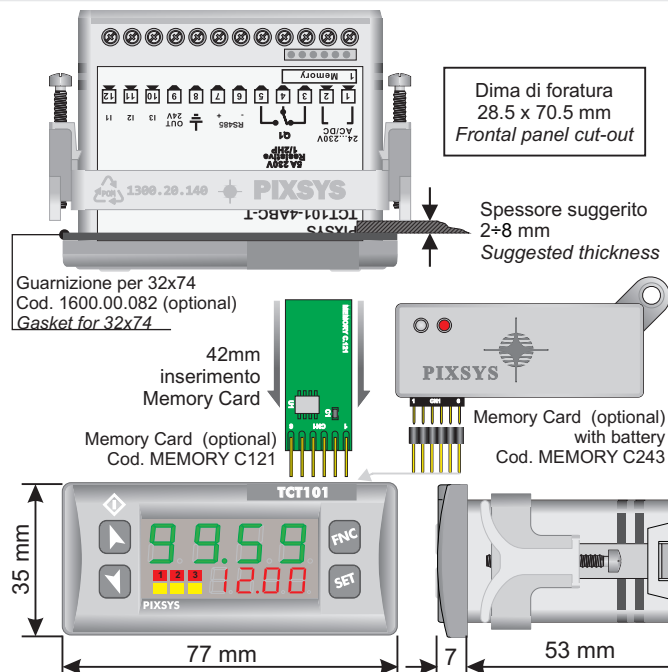




TCT101-4ABC-T USER MANUAL

PIXSYS www.pixsys.net
 e-mail: sales@pixsys.net - support@pixsys.net
 Software V 2.08
 2300.10.140-RevH 240314

SIZE AND INSTALLATION



LED	MEANING
	Report the activation of Q1
	Report the activation of Q2
	Report serial transmission by the TCT101

TECHNICAL DATA

Operating temperature Operating temperature 0-40°C, humidity 35...95uR%
Sealing Front panel IP65 (with optional gasket), Box IP30, Terminal blocks IP20

Material PC ABS UL94V0 self-extinguishing

Digital Inputs 3PNP/NPN configurable as analogue for potentiometers. (max 28 Vdc in PNP mode)

Outputs 1 relays 5A resistive charge
OUT 24V 30mA(24Vac), 40mA(24 Vdc), 60mA (110...230Vac)

Serial RS485

Back-UP Rechargeable battery, approx. 7days autonomy

Programming Software Labsoftview 2.6 or later

Power Supply 24...230Vac/Vdc +/-15% 50/60Hz / 2W

INTRODUCTION

Thanks for choosing a Pixsys device. TCT101-4ABC-T can be set in 3 different modes: **timer**, **counter** or **tachometer**. 3 universal digital inputs are available (NPN/PNP/Potential free contact) and can be used for reading external switches, proximity sensors and bidirectional encoders. One input is also analogue in order to allow setpoint modification by external potentiometer. Rs485 serial interface allows communication via Modbus RTU protocol.



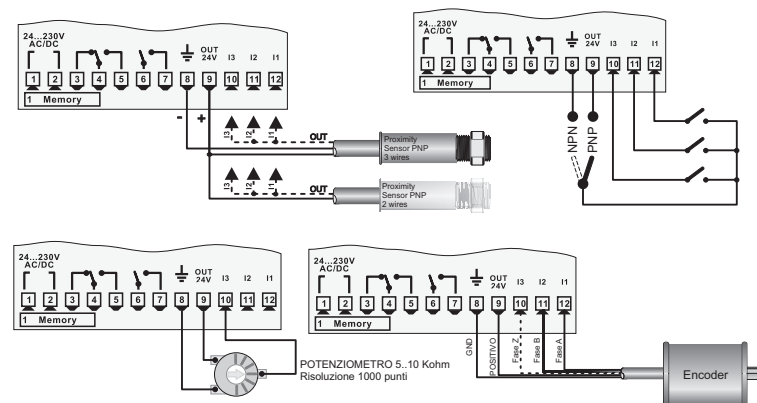
Read carefully the safety guidelines and programming instructions contained in this manual before using/connecting the device.

Disconnect power supply before proceeding to hardware settings or electrical wirings.

Only qualified personnel should be allowed to use the device and/or service it and in accordance to technical data and environmental conditions listed in this manual.

Do not dispose electric tools together with household waste materials in observance of European Directive 2002/96/CE

WIRING DIAGRAM



Potentiometer:

To modify Set1 or Set2 by external potentiometer follow the steps below:
 1- use potentiometers 5kOhm to 10kohm
 2- connect cursor to pin I3; a wrong connection may damage the potentiometer and lead to lock of the device.
 3- accuracy on input is max 1000 points, therefore set the parameters "Upper limit" and "Lower limit" with a max difference of 1000 units. (Ex.: LoS1 to 50,0 and uPS1 to 150,0 to modify time value related to Set1 between 50 and 150 seconds with steps of one tenth). Greater differences would make unstable the less significant digit.
 4- To calibrate the scale of potentiometer enter the configuration mode and select: Hin.3 as Pot Fin.3 as Set1 or Set2 P.tAr as Enable
 Exit configuration mode and place potentiometer at minimum level and press key, then place potentiometer at max level and press key: the device automatically exit the calibration procedure.
 N.B.: A switch-off of the device would interrupt the calibration.

MEMORY CARD (optional)

Parameters and setpoint values can be copied from one device to another using the Memory card.

There are two methods:

> **With the device connected to the power supply** insert the memory card **when the controller is off**.

On activation display 1 shows and display 2 shows (Only if the values stored on Memory Card are correct).

By pressing the key display 2 shows

Confirm using the .

The device loads the new data and starts again.

> **With the controller disconnected from the power supply:**

The memory card is equipped with an internal battery with a life of about 1000 uses.

Insert the memory card and press the programming button.

When writing the parameters, the LED turns red and on completing the procedure it changes to green. It is possible to repeat the procedure.

▲ UPDATING MEMORY CARD.

To **update** the memory card values, follow the procedure described in the first method, setting display 2 to so as not to load the parameters on controller.

Enter configuration and **change at least one parameter**. Exit configuration. Changes are saved automatically.

SETPOINT MODIFICATION

	PRESS	DISPLAY
1		Visualizes SETPOINT 1 / 2
2	or	Modifies selected SET
2a		Selects chosen digit
3a	or	Modifies blinking digit of selected SET

LOADING DEFAULT VALUES

	PRESS	DISPLAY	DO
1	for 3 seconds	Display 1 shows with 1st digit blinking, while Display 2 shows	
2	or	Modify blinking digit and pass to the next one pressing	Enter password
3	to confirm	Instrument loads default settings	Switch the device off and restart it

CONFIGURATION PARAMETER MODIFICATION

	PRESS	DISPLAY	DO
1	for 3 seconds	Display 1 shows with 1st digit blinking, while Display 2 shows	
2	or	Modify blinking digit and pass to the next one pressing	Enter password
3	to confirm	Display visualizes the first parameter of configuration table	
4	or	Scroll parameters	
5	+ or	Increase or decrease visualized parameter pressing and an arrow key	Enter new data that will be saved when releasing keys
6		End configuration, controller exits from configuration	

PARAMETERS LIST

TCT101-4ABC-T allows to select operating mode, modifying first configuration parameter. According to chosen mode, only the relevant parameters will be displayed. Refer to technical notes of each mode to find parameters list.

TCT101 MODE CONFIGURATION

Mode	P-00 Mode	TCT101 operating mode selection
Cont	Counter	TCT101 operating as counter
Tach	Tachometer	TCT101 operating as tachometer
Time	Timer	TCT101 operating as timer

Here below you can find parameters to set serial port and Modbus protocol, independently from selected operating mode.

SERIAL CONFIGURATION

SLAd	P-50 Slave Address	Device Modbus address
	Slave n°1	Modbus 1 address
	Slave n° 254	Modbus 254 address
bdrE	P-51 Baudrate	Serial communication speed
	110 baud	110 b/s communication
	150 baud	150 b/s communication
	300 baud	300 b/s communication
	600 baud	600 b/s communication
	1200 baud	1200 b/s communication
	2400 baud	2400 b/s communication
	4800 baud	4800 b/s communication
	9600 baud	9600 b/s communication
	19200 baud	19200 b/s communication
	28800 baud	28800 b/s communication
	38400 baud	38400 b/s communication
	57600 baud	57600 b/s communication
FoSE	P-52 Format Serial	Serial data format
	8 bit, parity none, 1 stop	8 data bit, no parity, 1 stop bit
SEdE	P-53 Serial Delay	Serial delay
	0 ms	Slave answer after 0 ms
	100 ms	Slave answer after 100 ms

SERIAL COMMUNICATION

TCT101-4ABC-T is provided with RS485 serial and can receive / transmit data via MODBUS RTU protocol. Device can be configured only as Slave. This function allows to control multiple controllers connected to a supervisory system (Master). Each instrument will answer to a Master query only if it contains some addresses as on parameter (Slave Address). Allowed addresses range are from 1 to 254 and there should not be controllers with the same address on the same line. Address 255 can be used by the Master to communicate with all connected equipments (all connected devices will answer Master query with this address), while with 0 all devices receive command, but no answer is expected (broadcast mode).

TCT101-4ABC-T can introduce an answer delay (in milliseconds) to Master request. This delay has to be set on parameter (Serial Delay).

At each parameter modification, instrument stores values in EEPROM memory (100000 writing cycles).

NB: Modifications made to Word different to those described in the following table can lead to instrument malfunction.

MODBUS RTU PROTOCOL MAIN FEATURES

Baudrate	Selectable by parameter
Format	8,N,1 (8 bit data, no parity, 1 stop bit)
Supported functions	WORD READING (0x03, 0x04) (max 20 word) SINGLE WORD WRITING (0x06) MULTIPLE WORDS WRITING (0x10) (max 20 word)
Read/Write	RO Read Only WO Write Only RW Read / Write
Reset Value	? EEPROM Valore Data unknown at reset Value stored on EEPROM Value indicated at reset

Modbus Address	Description	Read Write	Reset Value
0	Device type (ID TCT101-4ABC-T)	RO	153
1	Software version	RO	203
3	Slave address	RO	EEPROM
10	Setpoint storing delay	RW	0
11	Parameter storing delay	RW	0
100	Relay outputs status - bit 0 = relay Q1 - bit 1 = relay Q2	RO	?
101	Digital inputs status - bit 0 status I1 - bit 1 status I2 - bit 2 status I3	RO	?
102	Keys status - bit 0 UP key status - bit 1 DOWN key status - bit 2 SET key status - bit 3 FNC key status	RO	?
300	Loading default values - writing 9999 restores all default values - writing 9998 restores all default values keeping unchanged slave address - writing 9997 restores all default values keeping unchanged communication baudrate - writing 9996 restores all default values keeping unchanged slave address and communication baudrate	RO	153
400	Setpoint 1	RW	EEPROM
401	Setpoint 2	RW	EEPROM

PARAMETERS LIST

FUNCTION CONFIGURATION

Func	P-01 Timer Function	Timer functions	
top	Timer On	Activates output at count end	Default
topff	Timer Off	Deactivates output at count end	
PAWg	Pause/Work	T1 and T2 start in sequency	
osc	Oscillator	T1 and T2 start in sequency repeatedly	
PON	PWM	Percentage output activation on fixed time base	

BACKUP MEMORY CONFIGURATION

Func	P-02 Power-off Memory	Power-off memory	
d.s	Disabled	Disabled	Default
ot.t	Only Timer	Only timer value in memory	
ALL	Timer / State	Timer value and START/STOP status in memory	

INPUT CONFIGURATION

Func	P-03 Hardware Input 1	Input 1 configuration	
nPn	NPN	NPN	
pPn	PNP	PNP	Default
TTL	TTL	TTL	

Func	P-04 Hardware Input 2	Input 2 configuration	
nPn	NPN	NPN	
pPn	PNP	PNP	Default
TTL	TTL	TTL	

Func	P-05 Hardware Input 3	Input 3 configuration	
pPn	PNP	PNP	Default
TTL	TTL	TTL	
Pot.	Potent.	Potentiometer	

Func	P-06 Active State Input 1	Input 1 activation	
HLed	High Level	High level	
LEd	Low Level	Low level	
r.s	Rising edge	Transitory in rising	Default

Func	P-07 Active State Input 2	Input 2 activation	
HLed	High Level	High level	
LEd	Low Level	Low level	
r.s	Rising edge	Transitory in rising	Default

Func	P-08 Active State Input 3	Input 3 activation	
HLed	High Level	High level	
LEd	Low Level	Low level	
r.s	Rising edge	Transitory in rising	Default

Func	P-09 Function Input 1	Input 1 function	
d.s	Disable	Disabled	
SESE	Start / Stop	Start / Stop	Default
SESc	Start / Stop-Reset	Start / Stop-Reset	
rSSE	Reset-Start / Stop	Reset-Start / Stop	
rSS	Reset / Start / Stop	Reset / Start / Stop	

Func	P-10 Function Input 2	Input 2 function	
d.s	Disable	Disabled	
rES	Reset	Reset	Default

Func	P-11 Function Input 3	Input 3 function	
d.s	Disable	Disabled	
WA.t	Wait	Wait (count lock)	
Hold	Hold	Hold (lock the display but count continues)	Default
SET	Potent. To SET1	Variation by potentiometer on SET1	
SET2	Potent. To SET2	Variation by potentiometer on SET2	

Func	P-12 Function Key UP	Function on key	
d.s	Disable	Disabled	Default
SESE	Start / Stop	Start / Stop	
SESc	Start / Stop-Reset	Start / Stop-Reset	
rSSE	Reset-Start / Stop	Reset-Start / Stop	
rSS	Reset / Start / Stop	Reset / Start / Stop	
rES	Reset	Reset	
WA.t	Wait	Wait (count lock)	
Hold	Hold	Hold (lock the display but count continues)	

OUTPUT CONFIGURATION

Func	P-13 Output Q1 Setup	Output Q1 selection	
d.s	Disable	Disabled	
t.1n.o	Out Timer 1 n.o.	Timer Output 1 n.o.	Default
t.1n.c	Out Timer 1 n.c.	Timer Output 1 n.c.	
t.2n.o	Out Timer 2 n.o.	Timer Output 2 n.o.	
t.2n.c	Out Timer 2 n.c.	Timer Output 2 n.c.	
START	Start	Start	
STOP	Stop	Stop	

Func	P-14 Output Q2 Setup	Output Q2 selection	
d.s	Disable	Disabled	Default
t.1n.o	Out Timer 1 n.o.	Timer Output 1 n.o.	
t.1n.c	Out Timer 1 n.c.	Timer Output 1 n.c.	
t.2n.o	Out Timer 2 n.o.	Timer Output 2 n.o.	
t.2n.c	Out Timer 2 n.c.	Timer Output 2 n.c.	
START	Start	Start	
STOP	Stop	Stop	

DISPLAY CONFIGURATION

Func	P-15 Type of Timer	Count mode	
incr	Incremental	Incremental	Default
decr	Decremental	Decremental	

SETPOINT CONFIGURATION

Func	P-16 Format Set 1	Count format	
FoS1	Format Set 1	Count format	
FoS2	Format Set 2	Count format	
SScc	Second.Cent	Seconds, Cents	
SSSc	Second.Decimal	Seconds, Tenths	Default
SSSS	Second	Seconds	
MSSS	Minute.Second	Minutes, Seconds	
HMSS	Hour.Minute	Hours, Minutes	
HHH	Hour	Hours	

Func	P-18 Display Set 1	Set 1 visualization	
d.s	Disable	Disabled	
U.Su	Visualized	Visualized	
Mod	Modifiable	Visualized and modifiable	Default

Func	P-19 Display Set 2	Set 2 visualization	
d.s	Disable	Disabled	Default
U.Su	Visualized	Visualized	
Mod	Modifiable	Visualized and modifiable	

Func	P-20 Lower limit Set 1	Set 1 lower limit	
LoS1	Lower limit Set 1	Set 1 lower limit	0.0

Func	P-21 Upper limit Set 1	Set 1 upper limit	
UPs1	Upper limit Set 1	Set 1 upper limit	99.9

Func	P-22 Lower limit Set 2	Set 2 lower limit	
LoS2	Lower limit Set 2	Set 2 lower limit	0.0

Func	P-23 Upper limit Set 2	Set 2 upper limit	
UPs2	Upper limit Set 2	Set 2 upper limit	99.9

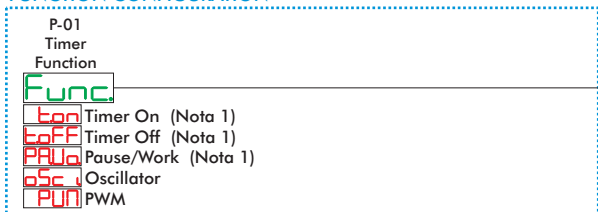
Func	P-24 Potent. tarature	Potentiometer calibration procedure	
d.s	Disable	Disabled	Default
En	Enable	Enabled	

MODBUS WORD ADDRESSES IN TIMER MODE

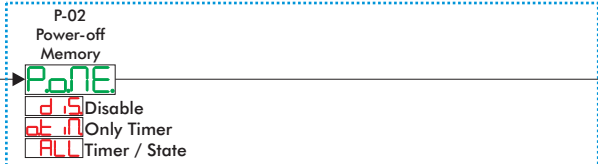
Modbus Address	Description	Read Write	Reset Value
500	Timer H value	RO	?
501	Timer L value	RO	?
502	Timer value / 60	RO	?
503	Module 60 timer value	RO	?
504	Timer status - 0 timer in stop - 1,2 timer in start	RO	?
505	Active timer - 0 no active timer - 1 timer 1 active - 2 timer 2 active	RO	?
506	Timer logic outputs - bit 0 timer 1 logic output - bit 1 timer 2 logic output	RO	?
507	Wait Hold timer status - bit 0 Wait status - bit 1 Hold status	RO	?
508	Timer serial command done	RO	?
509	Timer in Hold	RO	?
510	Hold H timer value	RO	?
511	Hold L timer value	RO	?
512	Hold / 60 timer value	RO	?
513	Hold module 60 timer value	RO	?
514	Partial minutes (only for timer in hours)	RO	?
530	Timer serial command - 0 no command - 1 start timer command - 2 stop timer command - 3 reset timer command - 4 reset start timer command - 5 stop reset timer command - 6 enables/ disables wait timer function command - 7 enables/ disables hold timer command function	WO	0
1000	Parameter P-00	RW	EEPROM
1001	Parameter P-01	RW	EEPROM
1002	Parameter P-02	RW	EEPROM
	...	RW	EEPROM
1052	Parameter P-52	RW	EEPROM
1053	Parameter P-53	RW	EEPROM

TCT101-4ABC-T "TIMER" MODE

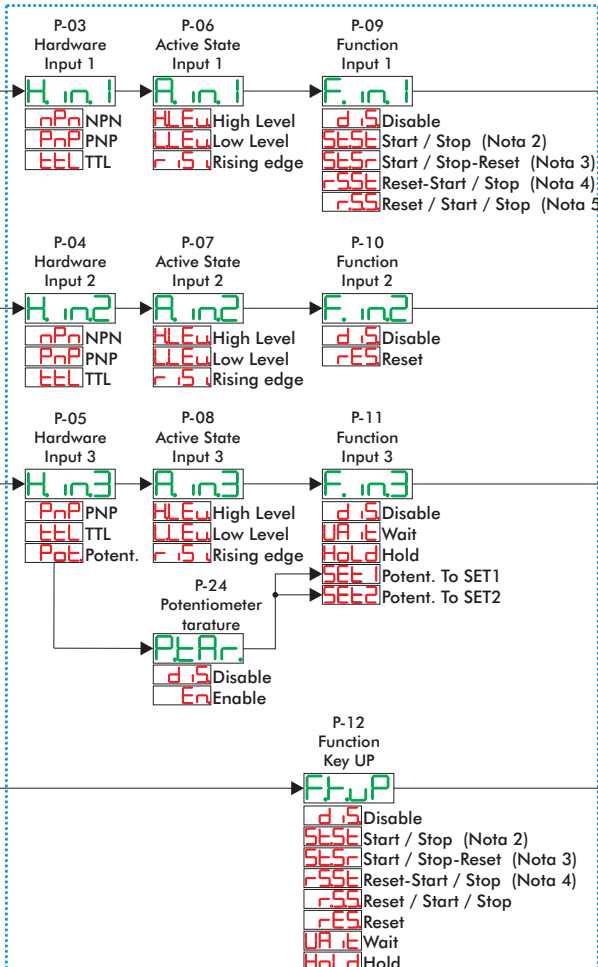
FUNCTION CONFIGURATION



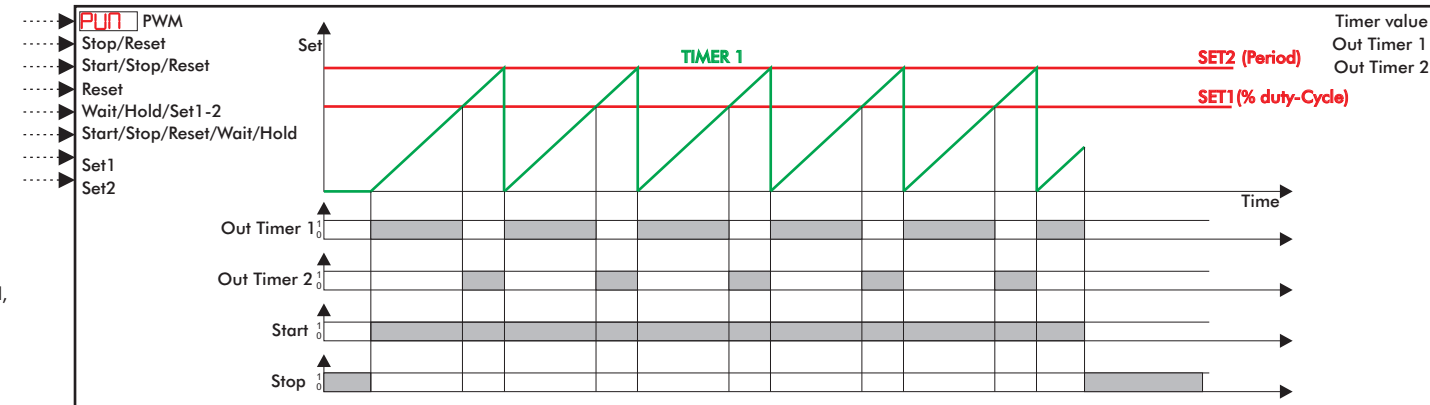
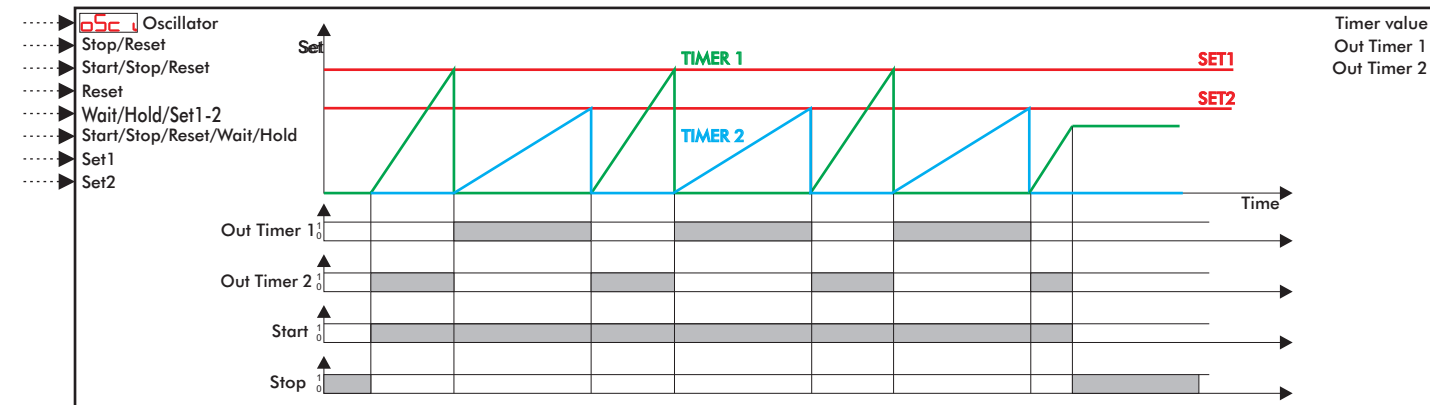
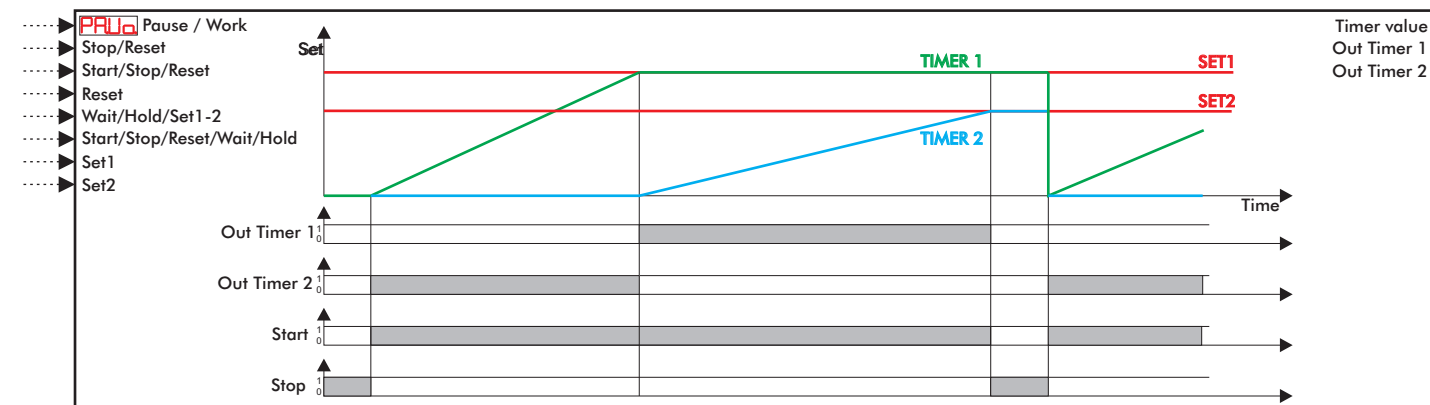
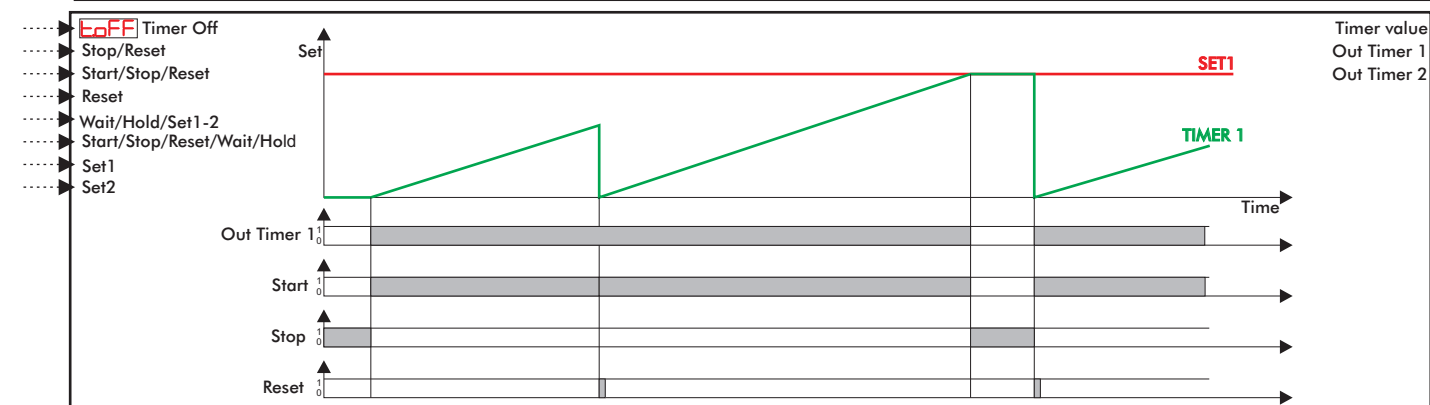
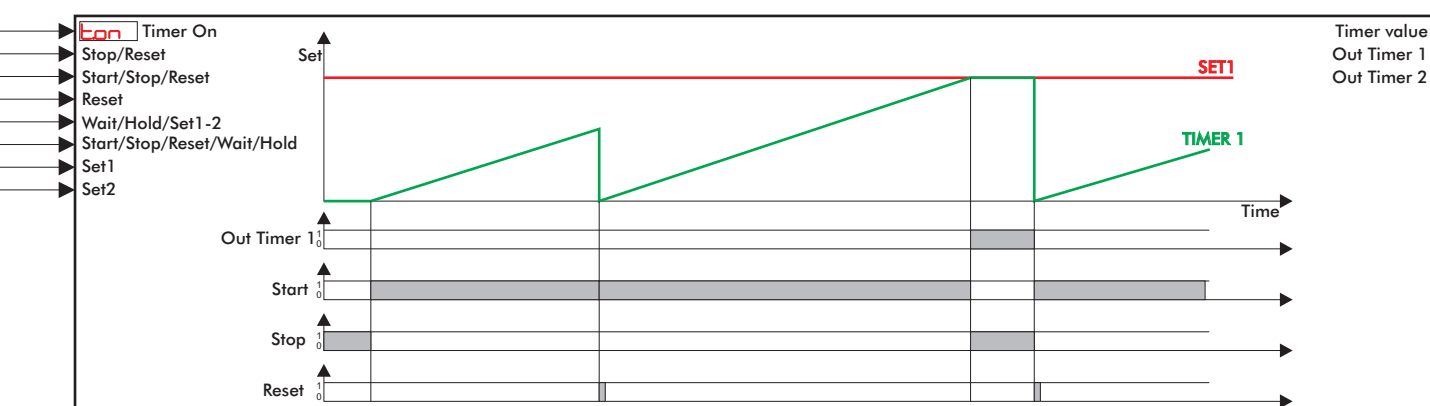
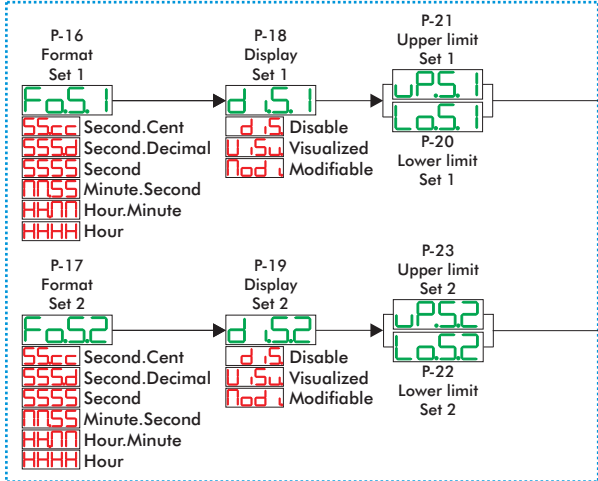
BACKUP MEMORY CONFIGURATION



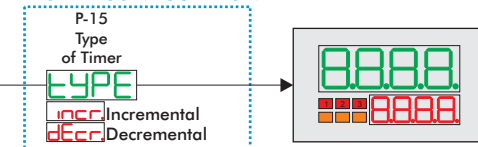
INPUT CONFIGURATION



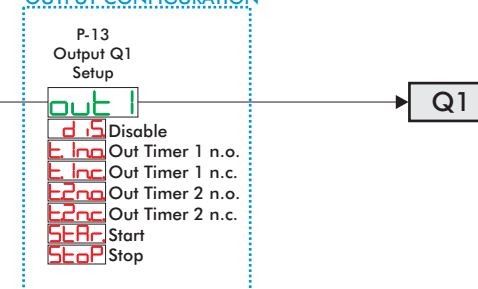
SETPOINT CONFIGURATION



DISPLAY CONFIGURATION



OUTPUT CONFIGURATION



Type of input	NPN input	PNP input	TTL input
H	< 4,7 v	> 5,7 v (I1, I2) > 12,4 v (I3)	> 2,5 v
L	> 5,7 v	< 4,7 v (I1, I2) < 10,2 v (I3)	< 2,0 v

TABLE OF ERROR MESSAGES

- E-01** ERROR IN WRITING OF EEPROM MEMORY (Note 6)
 - E-02** ERROR IN READING OF EEPROM MEMORY (Note 6)
 - E-03** INCORRECT PARAMETERS (Note 6)
 - E-04** INCORRECT CALIBRATION DATA (Note 6)
 - E-05** INCORRECT STATUS DATA (Note 6)
 - E-06** INCORRECT BACKUP REGISTERS (Note 7)
- Note 6: SWITCH THE DEVICE OFF AND RESTART IT; IF ERROR IS STILL NOTIFIED, CONTACT TECHNICAL SERVICE.
 Note 7: DISCHARGED BATTERY. KEEP THE DEVICE CONNECTED TO THE POWER SUPPLY IN ORDER TO RECHARGE THE BATTERY.

! In PWM mode, selection of parameters 16 **Func1** and 17 **Func2** (SET1 and SET2) is limited at **5555** (seconds).
 Min. and Max. SET1 limit (lied to working percentage or Duty Cycle) is limited into a range from 0 to 100 (%).

Note 1: In this timer functioning, if P-06 Active State Input 1 = Rising Edge or P-09 Function Input 1 = Disabled, at count end (reaching of set), timer automatically STOP.
 Note 2: This function doesn't reset timer value and needs an input for the reset.
 Note 3: This function resets timer at STOP.
 Note 4: This function resets timer at START.
 Note 5: This function is active only if P-06 Active State Input 1 = Rising Edge

PARAMETERS LIST

FUNCTION CONFIGURATION

Func	P-01 Counter Function	Counter functions	
Single (1 Counter)	1 counter functioning		Default
Double (2 Counters)	2 counters functioning		
BACKUP MEMORY CONFIGURATION			
Power	P-02 Power-off Memory	Power-off memory	
Disable	No counter stored at switch-off		Default
Counter 1	Counter 1 stored at switch-off		
Counter 2	Counter 2 stored at switch-off		
All	All counters stored at switch-off		
INPUT CONFIGURATION			
H.in1	P-03 Hardware input 1	Input 1 hardware configuration	
H.in2	P-04 Hardware input 2	Input 2 hardware configuration	
H.in3	P-05 Hardware input 3	Input 3 hardware configuration	
NPN	NPN (not available on input 3)		
PNP	PNP		Default
TTL	TTL		
Potent.	Potentiometro (available only on input 3)		
F.L1	P-06 Filter Delay Input 1	Digital input 1 filter configuration	
F.L2	P-07 Filter Delay Input 2	Digital input 2 filter configuration	
F.L3	P-08 Filter Delay Input 3	Digital input 2 filter configuration	
No delay	Input filter disabled		Default
0,5 ms	0,5 ms filter		
...	...(Step 0,5 ms)		
100,0 ms	100,0 ms filter		
A.in1	P-09 Active State Input 1	Input 1 active state	
A.in2	P-10 Active State Input 2	Input 2 active state	
A.in3	P-11 Active State Input 3	Input 3 active state	
High Level	High level (only for input 2)		
Low Level	Low level (only for input 2)		
Rising edge	Rising edge		Default
Falling edge	Falling edge		
F.in3	P-12 Function Input 3	Input 3 related function	
Disable	Disabled		
Encoder Z	Phase Z encoder loading		
Load Counter 1	Counter 1 loading		Default
Load Counter 2	Counter 2 loading		
Load Counter 1&2	Counters 1 and 2 loading		
Set1	Set 1 setting by potentiometer		
Set2	Set 2 setting by potentiometer		
F.Up	P-13 Function Key UP	UP (up arrow key)	
Disable	Disabled		Default
Load Counter 1	Counter 1 loading		
Load Counter 2	Counter 2 loading		
Load Counter 1&2	Counters 1 and 2 loading		
PtAr	P-14 Potentiom. Tarature	Potentiometer calibration procedure	
Disable	Disabled		Default
Enable	Enabled		
COUNTER CLOCK CONFIGURATION			
CLC1	P-15 Clock Counter 1	Counter 1 count mode selection	
CLC2	P-33 Clock Counter 2	Counter 2 count mode selection	
Disable	Disabled		Default C2
Encoder	Bidirectional encoder (I1) phase A, (I2) phase B		
UP--	I1 Up, I2 Off	UP mode (I1)	Default C1
da--	I1 Down, I2 Off	DOWN mode (I1)	
--UP	I1 Off, I2 Up	UP mode (I2)	
--da	I1 Off, I2 Down	DOWN mode (I2)	
UPda	I1 Up, I2 Down	UP (I1) - DOWN mode (I2)	
UP.d	I1 Up, I2 Incr./Decr.	UP mode (I1) with reverse direction (I2)	
UPEL	I1 Up, I2 En./Lock	UP mode (I1) with count lock (I2)	
UPEH	I1 Up, I2 En./Hold	UP mode (I1) with keeping value on display (I2)	
daEL	I1 Down, I2 En./Lock	DOWN mode (I1) with count lock (I2)	
daEH	I1 Down, I2 En./Hold	DOWN mode (I1) with keeping value on display (I2)	
ac2	Output Counter 2/1	UP count on rising edge of counter 2/1 output	
COUNTER DISPLAY CONFIGURATION			
d.C1	P-16 Display Counter 1	Counter 1 visualization selection	
d.C2	P-34 Display Counter 2	Counter 2 visualization selection	
Disable	Counter value not visualized		Default C2
Visualized	Counter value visualized		Default C1
dPC1	P-17 Decimal Point Counter 1	Counter 1 visualization format	
dPC2	P-35 Decimal Point Counter 2	Counter 2 visualization format	
0	Visualization with no decimal digit		Default
0.0	Visualization with 1 decimal digit		
0.00	Visualization with 2 decimal digits		
0.000	Visualization with 3 decimal digits		
inC1	P-18 Counter 1 input counts	Counter 1 input counts (1...9999)	Default 1
inC2	P-36 Counter 2 input counts	Counter 2 input counts (1...9999)	Default 1
u.C1	P-19 Counter 1 Visualized Counts	Counter 1 visualized counts (1...9999)	Default 1
u.C2	P-37 Counter 2 Visualized Counts	Counter 2 visualized counts (1...9999)	Default 1

SETPOINT CONFIGURATION

d.S1	P-20 Display Set 1	Counter 1 setpoint visualization selection	
d.S2	P-38 Display Set 2	Counter 2 setpoint visualization selection	
Disable	Setpoint value not visualized		Default C2
Visualized	Setpoint value visualized		
Modifiable	Setpoint value visualized and modifiable		Default C1
LoS1	P-21 Lower Limit Set 1	Set 1 minimum value (0...9999)	Default 0
LoS2	P-39 Lower Limit Set 2	Set 2 minimum value (0...9999)	Default 0
UP.S1	P-22 Upper Limit Set 1	Set 1 maximum value (0...9999)	Default 999
UP.S2	P-40 Upper Limit Set 2	Set 2 maximum value (0...9999)	Default 999
AUTOMATIC LOAD CONFIGURATION			
ALC1	P-23 Automatic Load Counter 1	Counter 1 automatic loading	
ALC2	P-41 Automatic Load Counter 2	Counter 2 automatic loading	
Disable	Automatic loading disabled		Default
Counter = Set 1	Loading if counter = Set1		
Counter = Set 2	Loading if counter = Set2		
Counter = Set 1+Output Duration 1	Loading if counter = Set1 + "Output Duration 1"		
Counter = Set 2+Output Duration 2	Loading if counter = Set2 + "Output Duration 2"		
Counter = Visualized counts	Loading if counter = "Visualized Counts"		
Counter = Set 1-Output Duration 1	Loading if counter = Set1 - "Output Duration 1"		
Counter = Set 2-Output Duration 2	Loading if counter = Set2 - "Output Duration 2"		
Counter = Set 1 after Out. Dur. 1(time)	Loading if counter = Set1 "Output Duration 1"		
Counter = Set 2 after Out. Dur. 2(time)	Loading if counter = Set2 "Output Duration 2"		
COUNTER LOAD VALUE CONFIGURATION			
CLd1	P-24 Counter Load Value 1	Counter 1 loading value	Default 0
CLd2	P-42 Counter Load Value 2	Counter 2 loading value	Default 0
COUNTER OUTPUT MODE CONFIGURATION			
CoN1	P-25 Counter 1 Output Mode	Counter 1 output mode	
CoN2	P-43 Counter 2 Output Mode	Counter 2 output mode	
Counter ≥Set	Output active if Counter ≥Set		Default
Counter ≥Set * Output Duration (time)	Output active for "Output Duration" time if Counter ≥Set		
Counter ≥Set * Output Duration (counts)	Output active for "Output Duration" counts if Counter ≥Set		
Counter ≥Set1+Set2	Output active if Counter ≥Set1+Set2		
Counter ≤Set	Output active if Counter ≤Set		Default
Counter ≤Set * Output Duration (time)	Output active for "Output Duration" time if Counter ≤Set		
Counter ≤Set * Output Duration (counts)	Output active for "Output Duration" counts if Counter ≤Set		
Counter ≤Set1 + Set2	Output active if Counter ≤Set1+Set2		
OUTPUT DURATION CONFIGURATION			
odL1	P-26 Output 1 Duration	Counter 1 output duration	Default 10
odL2	P-44 Output 2 Duration	Counter 2 output duration	Default 10
Output Duration Input by User	Value modifiable by user		Default
Latch output (clear only by load)	Latch output, resettable by counter loading		
Min output duration	Output duration minimum value		
Max output duration	Output duration maximum value		
COUNTER FREQUENCY DISPLAY CONFIGURATION			
d.F1	P-27 Display Frequency Counter 1	Counter 1 frequency visualization	
d.F2	P-45 Display Frequency Counter 2	Counter 2 frequency visualization	
Disable	Counter frequency value not visualized		Default
Visualized	Counter frequency value visualized		
dPF1	P-28 Decimal Point Frequency Counter 1	Counter 1 frequency format	
dPF2	P-46 Decimal Point Frequency Counter 2	Counter 1 frequency format	
0	Visualization with no decimal digit		Default
0.0	Visualization with 1 decimal digit		
0.00	Visualization with 2 decimal digits		
0.000	Visualization with 3 decimal digits		
inF1	P-29 Counter 1 Input frequency	Counter 1 input frequency (1...9999Hz)	Default 1
inF2	P-47 Counter 2 Input frequency	Counter 2 input frequency (1...9999Hz)	Default 1
u.F1	P-30 Counter 1 Visualized Frequency	Counter 1 visualized frequency	Default 1
u.F2	P-48 Counter 2 Visualized Frequency	Counter 2 visualized frequency	Default 1
out1	P-31 Output Q1 Setup	Output Q1 setting	
out2	P-32 Output Q2 Setup	Output Q2 setting	
Disable	Disabled output		Default C2
Out Counter 1 n.o.	Counter 1 output on n.o. contact		Default C1
Out Counter 1 n.c.	Counter 1 output on n.c. contact		
Out Counter 2 n.o.	Counter 2 output on n.o. contact		
Out Counter 2 n.c.	Counter 2 output on n.c. contact		

MODBUS WORD ADDRESSES IN COUNTER MODE

Modbus Address	Description	Read Write	Reset Value
600	Counter 1 H value	RO	?
601	Counter 1 L value	RO	?
602	Counter 1 H counts	RO	?
603	Counter 1 L counts	RO	?
604	Counter 1 logic output - bit 0 Counter 1 logic output	RO	?
605	Counter 1 Lock Hold status - bit 0 lock function status - bit 1 hold function status	RO	?
606	Counter 1 count direction - 0 normal count direction - 1 reverse count direction	RO	?
607	Counter 1 serial command done Shows value of the last serial command done	RO	0
608	Counter 1 H hold value	RO	?
609	Counter 1 L value	RO	?
610	Counter 1 H frequency (Hz)	RO	?
611	Counter 1 L frequency (Hz)	RO	?
612	Counter 1 H frequency value	RO	?
613	Counter 1 L frequency value	RO	?
620	Counter 1 serial command - 0 no command - 1 load command - 2 enable/disable lock function - 3 enable/disable hold function - 4 reverse count direction - 5 Enter onward count - 6 Enter backward count	WO	0
630	Counter 2 H value	RO	?
631	Counter 2 L value	RO	?
632	Counter 2 H counts	RO	?
633	Counter 2 L counts	RO	?
634	Counter 2 logic output	RO	?
635	Counter 2 Lock Hold status	RO	?
636	Counter 2 count direction	RO	?
637	Counter 2 serial command done	RO	0
638	Counter 2 H Hold value	RO	?
639	Counter 2 L Hold value	RO	?
640	Counter 2 H frequency (Hz)	RO	?
641	Counter 2 L frequency (Hz)	RO	?
642	Counter 2 H frequency value	RO	?
643	Counter 2 L frequency value	RO	?
650	Counter 2 serial command	WO	0
2000	Parameter P-00	RW	EEPROM
2001	Parameter P-01	RW	EEPROM
2002	Parameter P-02	RW	EEPROM
...		RW	EEPROM
2052	Parameter P-52	RW	EEPROM
2053	Parameter P-53	RW	EEPROM

TCT101-4ABC-T "COUNTER"

COUNTER FUNCTION

P-01 Counter Function

Func

- Sing** Single (1 Counter)
- Double** Double (2 Counters)

COUNTER CLOCK CONFIGURATION

P-15 Clock Counter 1

Enc Encoder

d.s Disable

uP-- I1 Up, I2 Off

da-- I1 Off, I2 Up

uPd I1 Up, I2 Down

uPEL I1 Up, I2 En./Lock

uPEH I1 Up, I2 En./Hold

daEL I1 Down, I2 En./Lock

daEH I1 Down, I2 En./Hold

oc2 Output Counter 2

BACKUP MEMORY CONFIGURATION

P-02 Power-off Memory

PaNE

d.s Disable

cnt1 Counter 1

cnt2 Counter 2

ALL All Counter

INPUT CONFIGURATION

P-03 Hardware Input 1

H.in1

nPn NPN

PnP PNP

TTL TTL

P-04 Hardware Input 2

H.in2

nPn NPN

PnP PNP

TTL TTL

P-05 Hardware Input 3

H.in3

PnP PNP

TTL TTL

Pot. Potent.

Key UP

P-06 Filter Delay Input 1

FiL1

00 No delay

05 0,5 ms

1000 100,0 ms

P-07 Filter Delay Input 2

FiL2

00 No delay

05 0,5 ms

1000 100,0 ms

P-08 Filter Delay Input 3

FiL3

00 No delay

05 0,5 ms

1000 100,0 ms

P-09 Active State Input 1

Rs1 Rising edge

FALL Falling edge

P-10 Active State Input 2

ALeW High Level

LEW Low Level

RS Rising edge

FALL Falling edge

P-11 Active State Input 3

Rs3 Rising edge

FALL Falling edge

P-12 Function Input 3

d.s Disable

EncZ Encoder Z

Ld1 Load Counter 1

Ld2 Load Counter 2

Ld12 Load Counter 1&2

SET1 Set1

SET2 Set2

P-13 Function Key UP

d.s Disable

Ld1 Load Counter 1

Ld2 Load Counter 2

Ld12 Load Counter 1&2

AUTOMATIC LOAD CONFIGURATION

P-23 Automatic Load Counter 1

ALC1

d.s Disable

SET1 Counter 1 = Set 1

SET2 Counter 1 = Set 2

Sod1 Counter 1 = Set 1 + Output Duration 1 (counts)

Sod2 Counter 1 = Set 2 + Output Duration 2 (counts)

u.C1 Counter 1 = Visualized counts 1

S-d1 Counter 1 = Set 1 - Output Duration 1 (counts)

S-d2 Counter 1 = Set 2 - Output Duration 2 (counts)

Sdt1 Counter 1 = Set 1 after Output Duration 1 (time)

Sdt2 Counter 1 = Set 2 after Output Duration 2 (time)

COUNTER LOAD VALUE CONFIGURATION

P-24 Counter 1 Load Value

CLd1

0 Min value

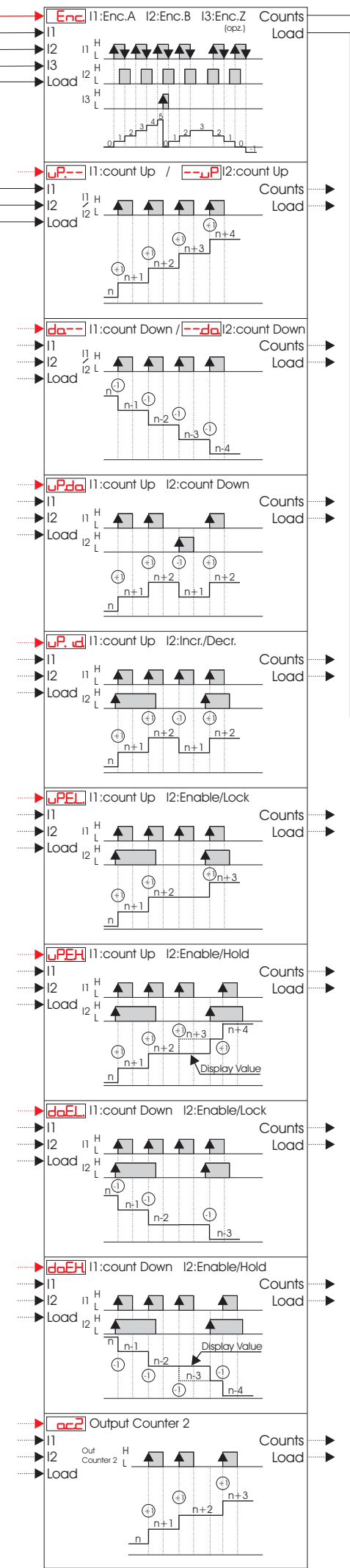
9999 Max value

TABLE OF ERROR MESSAGES

E-01	ERROR IN WRITING OF EEPROM
E-02	ERROR IN READING OF EEPROM
E-03	INCORRECT PARAMETERS (Note 1)
E-04	INCORRECT CALIBRATION DATA (Note 1)
E-05	INCORRECT STATUS DATA (Note 1)
E-06	INCORRECT BACKUP REGISTERS (Note 2)

Note 1: Switch the device off and restart it, if error is still notified contact technical service.

Note 2: Discharged battery, keep the device connected to the power supply in order to recharge the battery.



COUNTER OUTPUT MODE CONFIGURATION

P-25 Counter 1 Output Mode

Co1

SET1 Counter \geq Set

ETNE Counter \geq Set * Output Duration (time)

COun Counter \geq Set * Output Duration (counts)

SE12 Counter \geq Set1 + Set2

-SE1 Counter \leq Set

-ETN Counter \leq Set * Output Duration (time)

-COu Counter \leq Set * Output Duration (counts)

-S12 Counter \leq Set1 + Set2

OUTPUT DURATION CONFIGURATION

P-26 Output 1 Duration

odU1

USEr Output Duration Input by User

LARc Latch output (clear only by load)

999 Min output duration

999 Max output duration

SETPOINT CONFIGURATION

P-20 Display Set 1

d.s1 Disable

U.Su Visualized

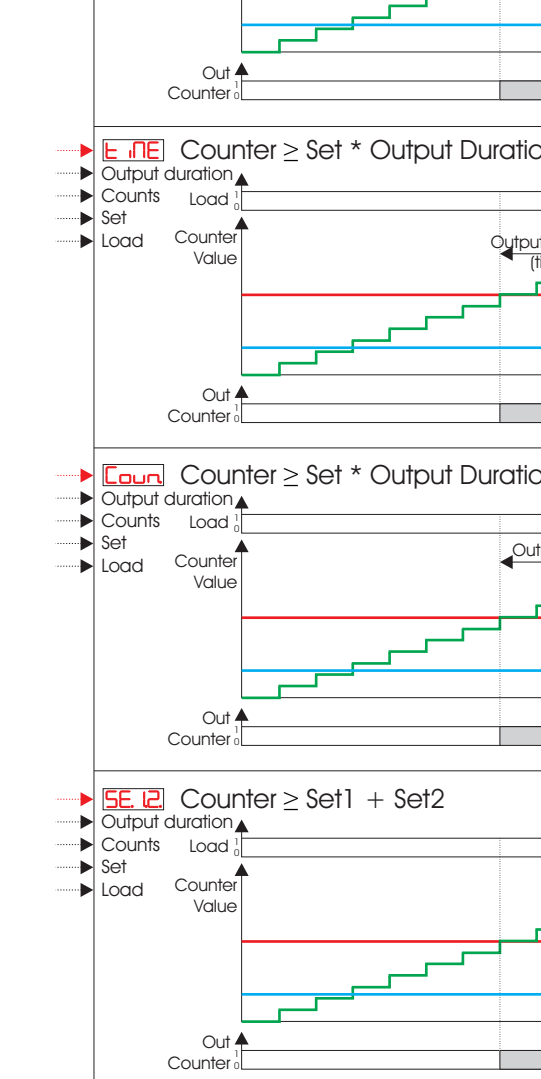
Mod Modifiable

P-22 Upper limit Set 1

UPS1

P-21 Lower limit Set 1

LOS1



COUNTERS DISPLAY CONFIGURATION

P-16 Display Counter 1

d.C1

d.s Disable

U.Su Visualized

P-17 Decimal Point Counter 1

d.PC1

00 0.0

000 0.00

0000 0.000

P-18 Counter 1 Input counts

in.C1

P-19 Counter 1 Visualized counts

u.C1

COUNTERS FREQUENCY DISPLAY CONFIGURATION

P-27 Display Frequency 1

d.F1

d.s Disable

U.Su Visualized

P-28 Decimal Point Frequency 1

d.PF1

00 0.0

000 0.00

0000 0.000

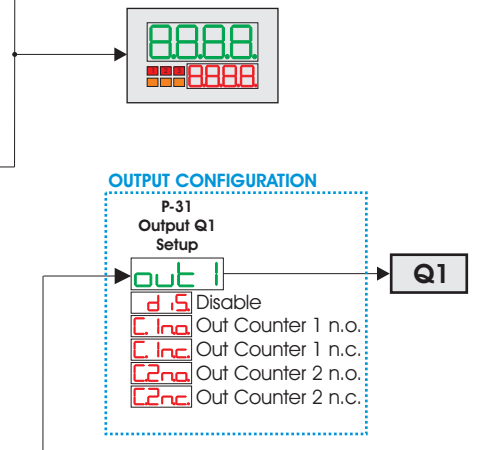
P-29 Counter 1 Input Frequency

in.F1

P-30 Counter 1 Visualized Frequency

u.F1

Logic level	NPN input	PNP input	TTL input
H	< 4,7 v	> 5,7 v (I1, I2) > 12,4 v (I3)	> 2,5 v
L	> 5,7 v	< 4,7 v (I1, I2) < 10,2 v (I3)	< 2,0 v



OUTPUT CONFIGURATION

P-31 Output Q1 Setup

out1

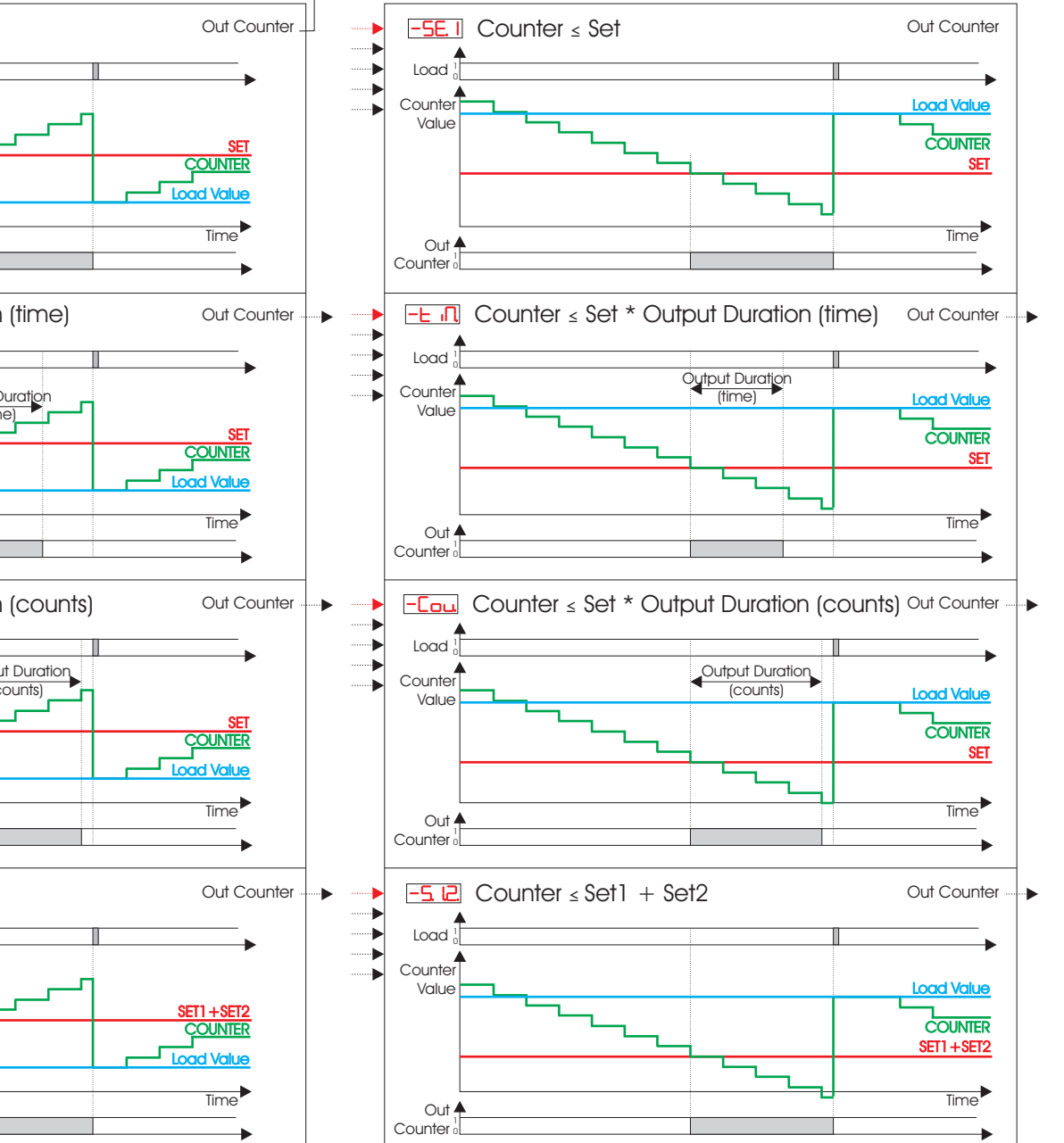
d.s Disable

C1nc Out Counter 1 n.o.c.

C1nc Out Counter 1 n.c.

C2nc Out Counter 2 n.o.c.

C2nc Out Counter 2 n.c.



PARAMETERS LIST

CLOCK INPUT CONFIGURATION

CL_{in}	P-01 Clock Input	Input signal selection	
in1	I1	Input signal on I1	Default
Enc	Encoder	Input signal on I1 and I2 (bidirectional encoder)	

INPUT CONFIGURATION

H_{in1}	P-02 Hardware input 1	Input 1 hardware configuration	
H_{in2}	P-03 Hardware input 2	Input 2 hardware configuration	
H_{in3}	P-04 Hardware input 3	Input 3 hardware configuration	
nPn	NPN	NPN (not available on input 3)	
PnP	PNP	PNP	Default
TTL	TTL	TTL	
Pot	Potent.	Potentiometer (available only on input 3)	

FL_I	P-05 Filter Input 1	Input 1 hardware filter configuration	
off	Off	Input hardware filter disabled	Default
on	On	Input hardware filter enabled (22nF)	

A_{in2}	P-06 Active State Input 2	Input 2 active status	
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A_{in3}	P-07 Active State Input 3	Input 3 active status	
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HLE_w	High Level	High level	Default
LE_w	Low Level	Low level	

F_{in2}	P-08 Function Input 2	Function associated to input 2	
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F_{in3}	P-09 Function Input 3	Function associated to input 3	
------------------------	------------------------------	---------------------------------------	--

d.S	Disable	Disabled	Default
outE	Out Enable/Disable	Tachometer outputs enabled	
Hold	Hold (solo per I3)	Hold of visualized tachometer value	
SEt1	Set1 (solo per I3)	Set1 setting by potentiometer	
SEt2	Set2 (solo per I3)	Set2 setting by potentiometer	

PtAr_r	P-10 Potentiom. Tarature	Potentiometer calibration function	
d.S	Disable	Disabled	Default
En	Enable	Enabled	

FtUp	P-11 Function Key UP	Function associated to UP key (up arrow)	
d.S	Disable	Disabled	Default
NAHP	Display max peak	Max. registered peak visualization (reset with UP+DOWN key)	

FtDn	P-12 Function Key DOWN	Function associated to DOWN key (down arrow)	
d.S	Disable	Disabled	Default
n.inP	Display min peak	Min. registered peak visualization (reset with UP+DOWN key)	

BACKUP MEMORY CONFIGURATION

PaNE	P-13 Power-off Memory	Power-off memory	
d.S	Disable	No peak value stored at power-off	Default
NAHP	Max Peak	Max. peak stored at power-off	
n.inP	Min Peak	Min. peak stored at power-off	
ALL	All Peak	Max. and Min. peaks stored at power-off	

CLOCK INPUT CONFIGURATION

n.inF	P-14 Minimun Input Frequency	Minimum visualized frequency	
001	0.01 Hz	For lower frequency values 0 is visualized on display. This parameter changes maximum display update time from 100 to 0.1 sec.	
009	0.09Hz		
01	0.1 Hz		Default
100	10.0Hz		

SFL_E	P-15 Software Filter	Sampling frequency software filter	
off	off	No software filter used for reading.	Default
001	0.01 sec	Mean realized on samplings done within the time set in this parameter. Display will be update at max. with this time interval.	
100	1.00 sec		

DISPLAY CONFIGURATION

bASE	P-16 Timebase	Visualization time base	
SEc	sec	Visualized value refered to second	Default
min	min	Visualized value refered to minute	
Hour	hour	Visualized value refered to hour	

PuLS	P-17 Pulse in Unit	Number of impulses on single unit. Revolution	
9999	99.99 pulse	counter indicates how many impulses corresponds at a complete revolution.	
001	0.01 pulse		
1	1 pulse		Default
9999	9999 pulse		

dP_r	P-18 Decimal Point	Tachometer value visualization format	
0	0	No decimal digit visualization	Default
00	0.0	1 decimal digit visualization	
000	0.00	2 decimal digits visualization	
0000	0.000	3 decimal digits visualization	

MEASURE UNIT CONFIGURATION

Num1	P-19 Measure Unit 1	Setting digit 1 of visualized measure unit	
Num2	P-20 Measure Unit 2	Setting digit 2 of visualized measure unit	
Num3	P-21 Measure Unit 3	Setting digit 3 of visualized measure unit	
Num4	P-22 Measure Unit 4	Setting digit 4 of visualized measure unit	
8888	Edit digits	Set as chosen each of 4 digits	Default ----

SETPOINT CONFIGURATION

d.S1	P-23 Display Set 1	Setpoint 1 visualization selection	
d.S2	P-26 Display Set 2	Setpoint 2 visualization selection	
d.S	Disable	Setpoint value not visualized	Default Set2
U.S	Visualized	Setpoint value visualized	
Mod	Modifiable	Setpoint value visualized and modifiable	Default Set1
LoS1	P-24 Lower Limit Set 1	Set 1 lower limit (0...9999)	Default 0
LoS2	P-27 Lower Limit Set 2	Set 2 lower limit (0...9999)	Default 0
UPs1	P-25 Upper Limit Set 1	Set 1 upper limit (0...9999)	Default 999
UPs2	P-28 Upper Limit Set 2	Set 2 upper limit (0...9999)	Default 999

OUTPUT ENABLE CONFIGURATION

outE	P-29 Output Enable	Enabled outputs	
EnAb	Always enable	Tachometer outputs always enabled	Default
Auto	Automati enable	Outputs enabled automatically	
inP	Enable by input	Tachometer outputs enabled by digital inputs	

TACHOMETER LOGIC OUTPUT MODE CONFIGURATION

LoL1	P-30 Logic Output Mode1	Tachometer logic output 1 mode	
LoL2	P-34 Logic Output Mode2	Tachometer logic output 2 mode	
HdEU	High Deviation	Output active with upward deviation	Default
LdEU	Low Deviation	Output active with downward deviation	
inSb	Inside Band	Output active inside band	
outb	Out of Band	Output active out of band	

AdE1	P-31 Activation Delay 1	Logic output 1 activation delay	
AdE2	P-35 Activation Delay 2	Logic output 2 activation delay	
00	0.0 sec	Defines logic output activation delay. Setting range from 0.0 sec to 999.9 sec.	Default
9999	999.9 sec		

ddE1	P-32 Deactivation Delay 1	Logic output 1 deactivation delay	
ddE2	P-35 Deactivation Delay 2	Logic output 2 deactivation delay	
00	0.0 sec	Defines logic output deactivation delay. Setting range from 0.0 sec to 999.9 sec.	Default
9999	999.9 sec		

odL1	P-33 Output 1 Duration	Tachometer logic output 1 duration	
odL2	P-37 Output 2 Duration	Tachometer logic output 2 duration	
Auto	Automatic	Automatic output duration	Default
LAte	Latch output (clear by FNC key)	Latch output, reset from FNC key	
01	Pulse 0.1 sec	Output impulse duration 0,1 sec	
999	Pulse 99.9 sec	Output impulse duration 99,9 sec	

OUTPUT CONFIGURATION

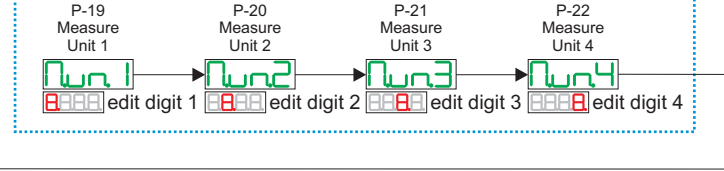
out1	P-38 Output Q1 Setup	Relay Q1 output setting	
out2	P-39 Output Q2 Setup	Relay Q2 output setting	
d.S	Disable	Disabled output	Default 2
L1no	Logica Out 1 n.o.	Logic output 1 on n.o. contact	Default 1
L1nc	Logica Out 1 n.c.	Logic output 1 on n.c. contact	
L2no	Logica Out 2 n.o.	Logic output 2 on n.o. contact	
L2nc	Logica Out 2 n.c.	Logic output 2 on n.c. contact	

MODBUS WORD ADDRESSES IN TACHOMETER MODE

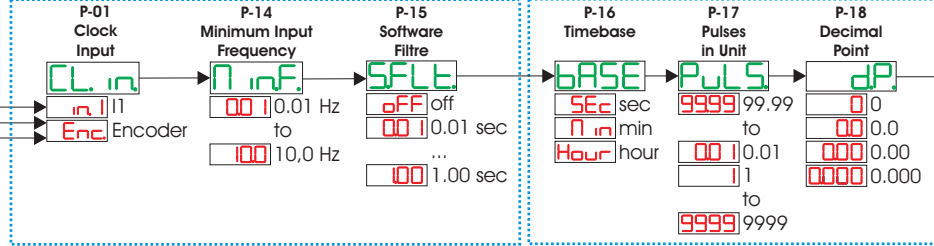
Modbus Address	Description	Read Write	Reset Value
700	Tachometer H value	RO	?
701	Tachometer L value	RO	?
702	Tachometer H minimum peak value	RO	?
703	Tachometer L minimum peak value	RO	?
704	Tachometer H maximum peak value	RO	?
705	Tachometer L maximum peak value	RO	?
706	Tachometer logic outputs - bit 0 logic output 1 - bit 1 logic output 2	RO	?
707	Tachometer serial command done Shows value of the last serial command done	RO	0
708	Tachometer word Out-Enable - bit 0 out enable output 1 - bit 1 out enable output 2	RO	?
709	Tachometer Hold - bit 0 tachometer hold status	RO	?
710	Hold H tachometer value	RO	?
711	Hold L tachometer value	RO	?
720	Tachometer serial command - 0 no command - 1 command - 2 command enable / disable output - 3 command enable / disable hold function - 4 command reset max. and min. peak - 5 command clear output (if in latch)	WO	0
3000	Parameter P-00	RW	EEPROM
3001	Parameter P-01	RW	EEPROM
3002	Parameter P-02	RW	EEPROM
	...	RW	EEPROM
3052	Parameter P-52	RW	EEPROM
3053	Parameter P-53	RW	EEPROM

TCT101-4ABC-T "TACHOMETER" MODE

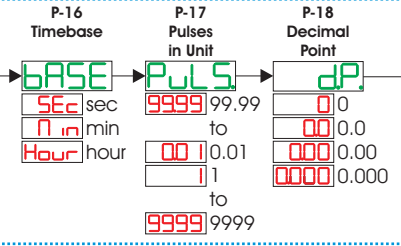
MEASURE UNIT CONFIGURATION



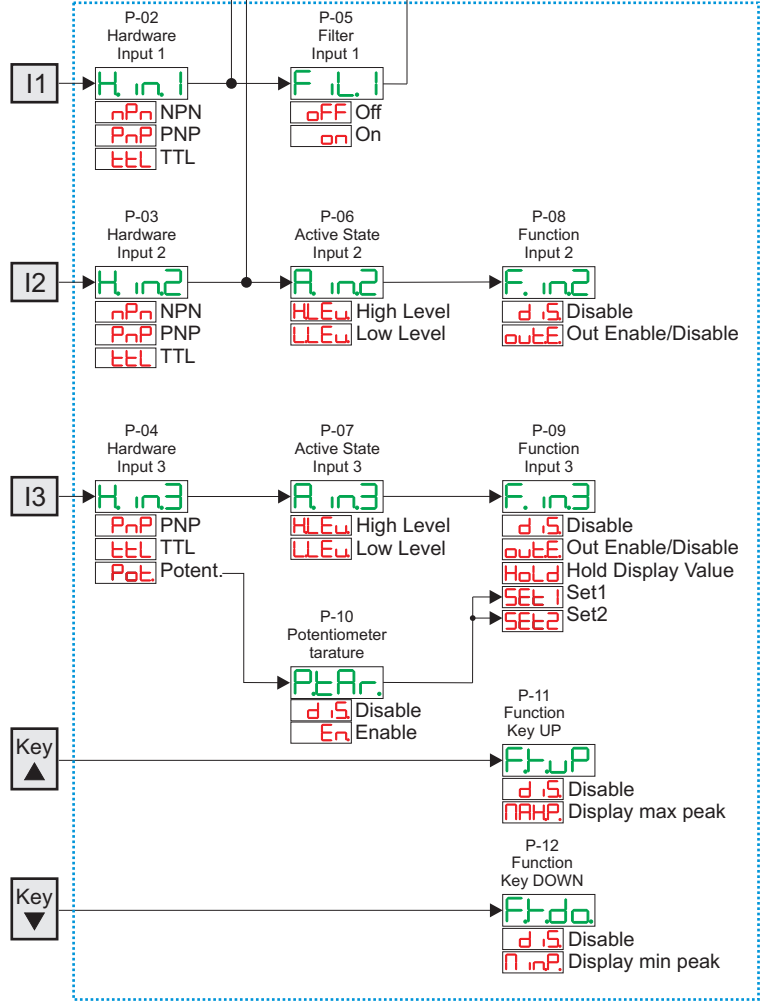
CLOCK INPUT CONFIGURATION



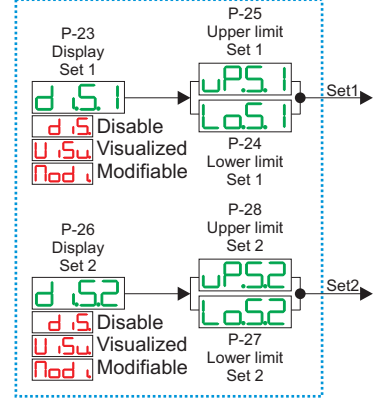
DISPLAY CONFIGURATION



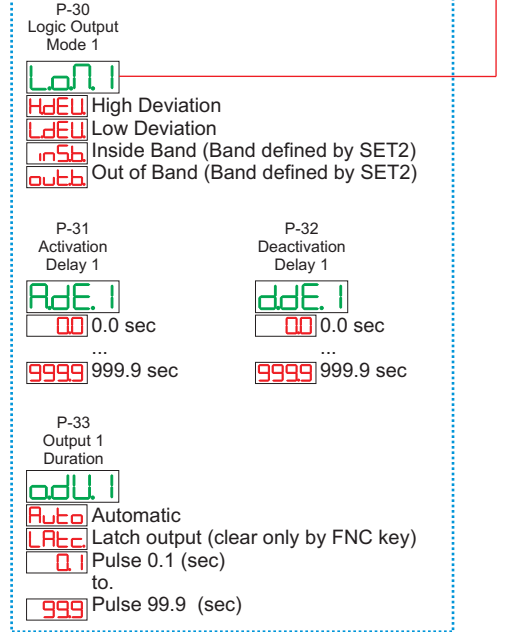
INPUT CONFIGURATION



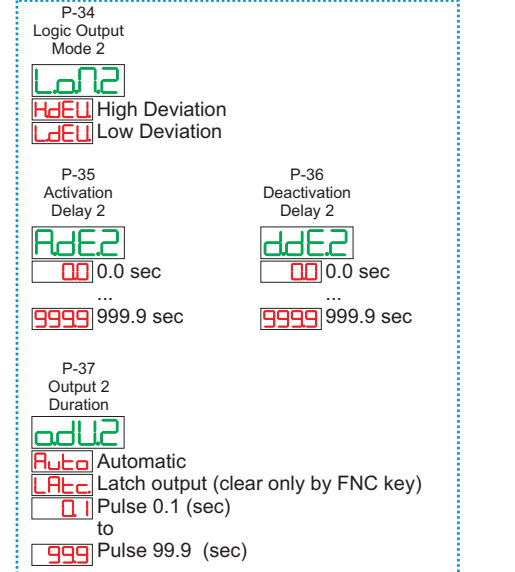
SETPOINT CONFIGURATION



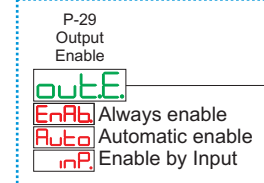
TACHOMETER LOGIC OUTPUT MODE CONFIGURATION



TACHOMETER LOGIC OUTPUT MODE CONFIGURATION

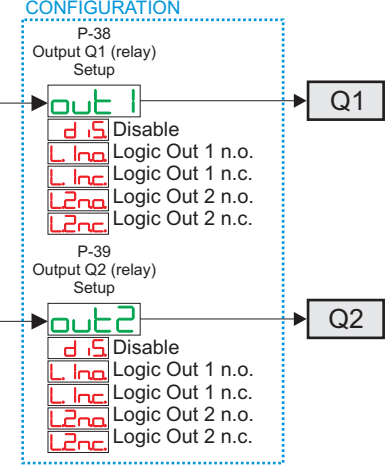


OUTPUT ENABLE CONFIGURATION



EnAb Always enable	TACHOMETER OUTPUTS ARE ALWAYS ENABLED.
Auto Automatic enable	DEPENDENT ON LOGIC OUTPUT MODE PARAMETER, THERE ARE DIFFERENT OPERATING MODES: - High Deviation : OUTPUTS ARE ALWAYS ENABLED - Low Deviation : AT STARTING, OUTPUTS ARE DISABLED; THEY CAN BE ENABLED WHEN TACHOMETER VALUE OVERCOMES SETPOINT VALUE AND KEPT ENABLED UNTIL INPUT SIGNAL FALLS BELOW VALUE SET ON PARAMETER «MINIMUM INPUT FREQUENCY» (P-14); - Inside Band : OUTPUTS ARE ALWAYS ENABLED - Out of Band : AT STARTING OUTPUTS ARE DISABLED, THEY CAN BE ENABLED WHEN TACHOMETER VALUE OVERCOMES SET1-SET2 VALUE, AND KEPT UNTIL INPUT SIGNAL FREQUENCY FALLS BELOW VALUE SET ON PARAMETER «MINIMUM INPUT FREQUENCY» (P-14);
inP Enable by input	TACHOMETER OUTPUTS ARE ENABLED TO OPERATE ONLY IF: - INPUT 2 FUNCTION IS SET ON OUT ENABLE/DISABLE AND INPUT IS ACTIVE - INPUT 3 FUNCTION IS SET ON Out Enable/Disable AND INPUT IS ACTIVE

OUTPUT RELAYS CONFIGURATION



Logic level	Type of input	NPN Input	PNP Input	TTL Input
H	< 4,7 v	> 5,7 v (I1, I2) > 12,4 v (I3)	> 2,5 v	
L	> 5,7 v	< 4,7 v (I1, I2) < 10,2 v (I3)	< 2,0 v	

TABLE OF ERROR MESSAGES

E-01	ERROR IN WRITING OF EEPROM MEMORY (Note 1)
E-02	ERROR IN READING OF EEPROM MEMORY (Note 1)
E-03	INCORRECT PARAMETERS (Note 1)
E-04	INCORRECT CALIBRATION DATA (Note 1)
E-05	INCORRECT STATUS DATA (Note 1)
E-06	INCORRECT BACKUP REGISTERS (Note 2)

Note 1: SWITCH THE DEVICE OFF AND RESTART IT; IF ERROR IS STILL NOTIFIED, CONTACT TECHNICAL SERVICE.

Note 2: DISCHARGED BATTERY. KEEP THE DEVICE CONNECTED TO THE POWER SUPPLY IN ORDER TO RECHARGE THE BATTERY.

