TCT101-4ABC-T USER MANUAL

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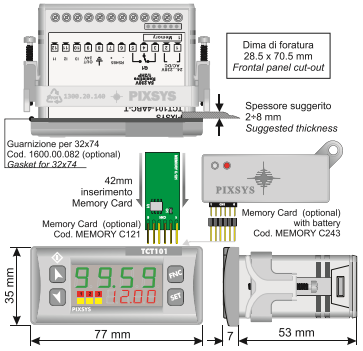
Software V 2.08
2300.10.140-RevH 240314

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 OUT 24V	*1 relays 5A resistive charge 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 availables (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.

⚠

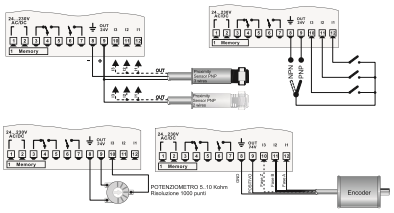
Read carefully the safety guidelines and programming instructions contained in this manual before using/connecting the device.

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 premere 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 car**d**.

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 Mmeory Card are correct).

By pressing the key display 2 shows

Confirm using the key .

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 PASS	
2	or	Modify blinking digit and pass to the next one pressing	Enter password 9999
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 PASS	
2	or	Modify blinking digit and pass to the next one pressing	Enter password 1234
3	to confirm	Display visualizes the first parameter of configuration table Func	
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

P-00 Mode	*TCT101 operating mode selection*	
Count	Counter	*TCT101 operating as counter*	
tAch	Tachometer	*TCT101 operating as tachometer*	
timE	Timer	*TCT101 operating as timer*	Default

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

SERIAL CONFIGURATION

P-50 Slave Address	*Device Modbus address*	
1	Slave n°1	*Modbus 1 address*	Default
...	...	...	
254	Slave n° 254	*Modbus 254 address*	
P-51 Baudrate	*Serial communication speed*	
110	110 baud	*110 b/s communication*	
150	150 baud	*150 b/s communication*	
300	300 baud	*300 b/s communication*	
600	600 baud	*600 b/s communication*	
1200	1200 baud	*1200 b/s communication*	
2400	2400 baud	*2400 b/s communication*	
4800	4800 baud	*4800 b/s communication*	
9600	9600 baud	*9600 b/s communication*	
19.2	19200 baud	*19200 b/s communication*	Default
28.8	28800 baud	*28800 b/s communication*	
38.4	38400 baud	*38400 b/s communication*	
57.6	57600 baud	*57600 b/s communication*	
P-52 Format Serial	*Serial data format*	
8n1	8 bit, parity none, 1 stop	*8 data bit, no parity, 1 stop bit*	Default
P-53 Serial Delay	*Serial delay*	
0	0 ms	*Slave answer after 0 ms*	
...	...	...	Default 2ms
100	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 SLAd (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 SEdE (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	? Data unknown at reset EEPROM Value stored on EEPROM Valore 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***	
tOn	Timer On	Activates output at count end	Default
toFF	Timer Off	Deactivates output at count end	
PAUS	Pause/Work	T1 and T2 start in sequency	
osc	Oscillator	T1 and T2 start in sequency repeatedly	
PWM	PWM	Percentage output activation on fixed time base	

BACKUP MEMORY CONFIGURATION

PoME	**P-02 Power-off Memory**	***Power-off memory***	
dis	Desabled	Desabled	Default
nE.t	Only Timer	Only timer value in memory	
ALL	Timer / State	Timer value and START/STOP status in memory	

INPUT CONFIGURATION

In1	**P-03 Hardware Input 1**	***Input 1 configuration***	
nPn	NPN	NPN	
PnP	PNP	PNP	Default
tEL	TTL	TTL	
In2	**P-04 Hardware Input 2**	***Input 2 configuration***	
nPn	NPN	NPN	
PnP	PNP	PNP	Default
tEL	TTL	TTL	
In3	**P-05 Hardware Input 3**	***Input 3 configuration***	
PnP	PNP	PNP	Default
tEL	TTL	TTL	
Pot	Potent.	Potentiometer	
rIn1	**P-06 Active State Input 1**	***Input 1 activation***	
HIGH	High Level	High level	
LOW	Low Level	Low level	
r.SE	Rising edge	Transitory in rising	Default
rIn2	**P-07 Active State Input 2**	***Input 2 activation***	
HIGH	High Level	High level	
LOW	Low Level	Low level	
r.SE	Rising edge	Transitory in rising	Default
rIn3	**P-08 Active State Input 3**	***Input 3 activation***	
HIGH	High Level	High level	
LOW	Low Level	Low level	
r.SE	Rising edge	Transitory in rising	Default
FIn1	**P-09 Function Input 1**	***Input 1 function***	
dis	Disable	Desabled	
St.rS	Start / Stop	Start / Stop	Default
St.Pr	Start / Stop-Reset	Start / Stop-Reset	
rS.St	Reset-Start / Stop	Reset-Start / Stop	
rSt	Reset / Start / Stop	Reset / Start / Stop	
FIn2	**P-10 Function Input 2**	***Input 2 function***	
dis	Disable	Desabled	
rES	Reset	Reset	Default
FIn3	**P-11 Function Input 3**	***Input 3 function***	
dis	Disable	Desabled	
WAIt	Wait	Wait (count lock)	
HOLd	Hold	Hold (lock the display but count continues)	Default
Pot1	Potent. To SET1	Variation by potentiometer on SET1	
Pot2	Potent. To SET2	Variation by potentiometer on SET2	
FkeyP	**P-12 Function Key UP**	***Function on key***	
dis	Disable	Desabled	Default
St.rS	Start / Stop	Start / Stop	
St.Pr	Start / Stop-Reset	Start / Stop-Reset	
rS.St	Reset-Start / Stop	Reset-Start / Stop	
rSt	Reset / Start / Stop	Reset / Start / Stop	
rES	Reset	Reset	
WAIt	Wait	Wait (count lock)	
HOLd	Hold	Hold (lock the display but count continues)	

OUTPUT CONFIGURATION

out	**P-13 Output Q1 Setup**	***Output Q1 selection***	
dis	Disable	Disabled	
t.no	Out Timer 1 n.o.	Timer Output 1 n.o.	Default
t.nc	Out Timer 1 n.c.	Timer Output 1 n.c.	
t2no	Out Timer 2 n.o.	Timer Output 2 n.o.	
t2nc	Out Timer 2 n.c.	Timer Output 2 n.c.	
Strt	Start	Start	
Stop	Stop	Stop	
out2	**P-14 Output Q2 Setup**	***Output Q2 selection***	
dis	Disable	Desabled	Default
t.no	Out Timer 1 n.o.	Timer Output 1 n.o.	
t.nc	Out Timer 1 n.c.	Timer Output 1 n.c.	
t2no	Out Timer 2 n.o.	Timer Output 2 n.o.	
t2nc	Out Timer 2 n.c.	Timer Output 2 n.c.	
Strt	Start	Start	
Stop	Stop	Stop	

DISPLAY CONFIGURATION

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

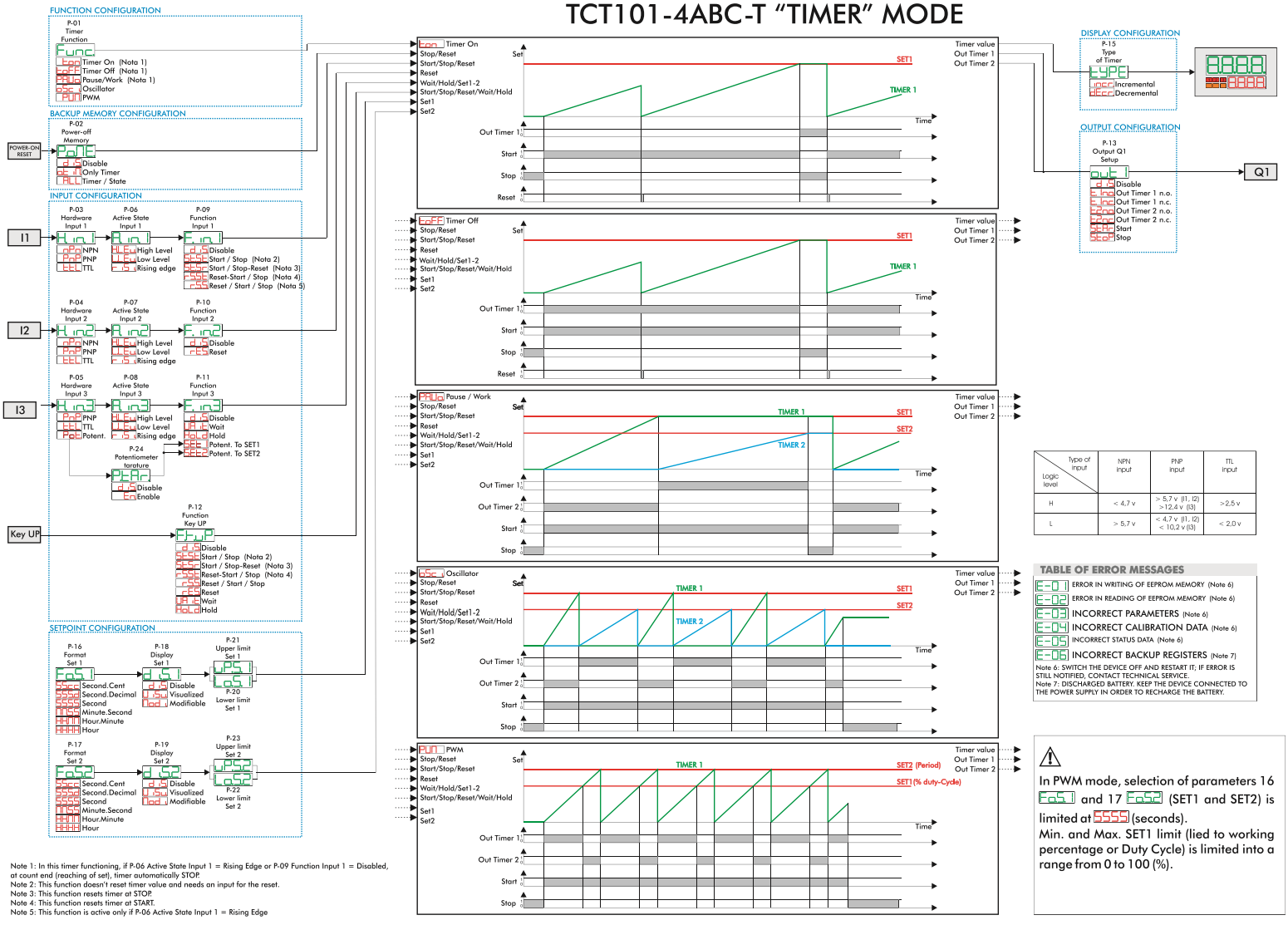
SETPOINT CONFIGURATION

FoS1	**P-16 Format Set 1**	***Count format***	
FoS2	**P-17 Format Set 2**	***Count format***	
SS.cE	Second.Cent	Seconds, Cents	
SS.dE	Second.Decimal	Seconds, Tenths	Default
SSSS	Second	Seconds	
MM.SS	Minute.Second	Minutes, Seconds	
HH.MM	Hour.Minute	Hours, Minutes	
HHHH	Hour	Hours	
dS1	**P-18 Display Set 1**	***Set 1 visualization***	
dis	Disable	Disabled	
VISu	Visualized	Visualized	
Mod	Modifiable	Visualized and modifiable	Default
dS2	**P-19 Display Set 2**	***Set 2 visualization***	
dis	Disable	Disabled	Default
VISu	Visualized	Visualized	
Mod	Modifiable	Visualized and modifiable	
LoS1	**P-20 Lower limit Set 1**	***Set 1 lower limit***	0.0
uPS1	**P-21 Upper limit Set 1**	***Set 1 upper limit***	99.9
LoS2	**P-22 Lower limit Set 2**	***Set 2 lower limit***	0.0
uPS2	**P-23 Upper limit Set 2**	***Set 2 upper limit***	99.9
PtAr	**P-24 Potent. tarature**	***Potentiometer calibration procedure***	
dis	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/ desables wait timer function command - 7 enables/ desables 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



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 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 FnS1 and 17 FnS2 (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*	
Sing	Single (1 Counter)	*1 counter functioning*	Default
doub	Double (2 Counters)	*2 counters functioning*	

BACKUP MEMORY CONFIGURATION

PoME	**P-02 Power-off Memory**	*Power-off memory*	
dS	Disable	*No counter stored at switch-off*	Default
cnt1	Counter 1	*Counter 1 stored at switch-off*	
cnt2	Counter 2	*Counter 2 stored at switch-off*	
ALL	All Counters	*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	*NPN (not available on input 3)*	
PnP	PNP	*PNP*	Default
tEL	TTL	*TTL*	
Pot	Potent.	*Potenziometro (available only on input 3)*	
F iL1	**P-06 Filter Delay Input 1**	*Digital input 1 filter configuration*	
F iL2	**P-07 Filter Delay Input 2**	*Digital input 2 filter configuration*	
F iL3	**P-08 Filter Delay Input 3**	*Digital input 2 filter configuration*	
00	No delay	*Input filter disabled*	Default
05	0,5 ms	*0,5 ms filter*	
...	...	*...(Step 0,5 ms)*	
1000	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*	
HiEv	High Level	*High level (only for input 2)*	
LiEv	Low Level	*Low level (only for input 2)*	
r.Su	Rising edge	*Rising edge*	Default
FALL	Falling edge	*Falling edge*	
F.in3	**P-12 Function Input 3**	*Input 3 related function*	
dS	Disable	*Disabled*	
Enc2	Encoder Z	*Phase Z encoder loading*	
Ld 1	Load Counter 1	*Counter 1 loading*	Default
Ld 2	Load Counter 2	*Counter 2 loading*	
Ld 12	Load Counter 1&2	*Counters 1 and 2 loading*	
SEt1	Set1	*Set 1 setting by potentiometer*	
SEt2	Set2	*Set 2 setting by potentiometer*	
FunP	**P-13 Function Key UP**	*UP (up arrow key)*	
dS	Disable	*Disabled*	Default
Ld 1	Load Counter 1	*Counter 1 loading*	
Ld 2	Load Counter 2	*Counter 2 loading*	
Ld 12	Load Counter 1&2	*Counters 1 and 2 loading*	
PtAr	P-14 Potentiom. Tarature	*Potentiometer calibration procedure*	
dS	Disable	*Disabled*	Default
En	Enable	*Enabled*	

COUNTER CLOCK CONFIGURATION

CLC 1	**P-15 Clock Counter 1**	*Counter 1 count mode selection*	
CLC2	**P-33 Clock Counter 2**	*Counter 2 count mode selection*	
dS	Disable	*Disabled*	Default C2
Enc	Encoder	*Bidirectional encoder (I1) phase A, (I2) phase B*	
UP--	I1 Up, I2 Off	*UP mode (I1)*	Default C1
do--	I1 Down, I2 Off	*DOWN mode (I1)*	
--UP	I1 Off, I2 Up	*UP mode (I2)*	
--do	I1 Off, I2 Down	*DOWN mode (I2)*	
UPdo	I1 Up, I2 Down	*UP (I1) - DOWN mode (I2)*	
UP rd	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)*	
doEL	I1 Down, I2 En./Lock	*DOWN mode (I1) with count lock (I2)*	
doEH	I1 Down, I2 En./Hold	*DOWN mode (I1) with keeping value on display (I2)*	
oc2	Output Counter 2/1	*UP count on rising edge of counter 2/1 output*	

COUNTER DISPLAY CONFIGURATION

d fC 1	**P-16 Display Counter 1**	*Counter 1 visualization selection*	
d fC2	**P-34 Display Counter 2**	*Counter 2 visualization selection*	
dS	Disable	*Counter value not visualized*	Default C2
USu	Visualized	*Counter value visualized*	Default C1
dPC 1	**P-17 Decimal Point Counter 1**	*Counter 1 visualization format*	
dPC2	**P-35 Decimal Point Counter 2**	*Counter 2 visualization format*	
0	0	*Visualization with no decimal digit*	Default
00	0.0	*Visualization with 1 decimal digit*	
000	0.00	*Visualization with 2 decimal digits*	
0000	0.000	*Visualization with 3 decimal digits*	
inC 1	**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 fC 1	**P-19 Counter 1 Visualized Counts**	*Counter 1 visualized counts (1...9999)*	Default 1
u fC2	**P-37 Counter 2 Visualized Counts**	*Counter 2 visualized counts (1...9999)*	Default 1

SETPOINT CONFIGURATION

d SI 1	**P-20 Display Set 1**	*Counter 1 setpoint visualization selection*	
d SI2	**P-38 Display Set 2**	*Counter 2 setpoint visualization selection*	
dSA	Disable	*Setpoint value not visualized*	Default C2
USu	Visualized	*Setpoint value visualized*	
Mod	Modifiable	*Setpoint value visualized and modifiable*	Default C1
LoS 1	**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
uPS 1	**P-22 Upper Limit Set 1**	*Set 1 maximum value (0...9999)*	Default 999
uPS2	**P-40 Upper Limit Set 2**	*Set 2 maximum value (0...9999)*	Default 999

AUTOMATIC LOAD CONFIGURATION

ALC 1	**P-23 Automatic Load Counter 1**	*Counter 1 automatic loading*	
ALC2	**P-41 Automatic Load Counter 2**	*Counter 2 automatic loading*	
dS	Disable	*Automatic loading disabled*	Default
SEt1	Counter = Set 1	*Loading if counter = Set1*	
SEt2	Counter = Set 2	*Loading if counter = Set2*	
Sod 1	Counter = Set 1+Output Duration 1	*Loading if counter = Set1 + "Output Duration 1"*	
Sod2	Counter = Set 2+Output Duration 2	*Loading if counter = Set2 + "Output Duration 2"*	
vC 1	Counter = Visualized counts	*Loading if counter = "Visualized Counts"*	
S-d1	Counter = Set 1-Output Duration 1	*Loading if counter = Set1 - "Output Duration 1"*	
S-d2	Counter = Set 2-Output Duration 2	*Loading if counter = Set2 - "Output Duration 2"*	
SdE 1	Counter = Set 1 after Out. Dur. 1(time)	*Loading if counter= Set1 "Output Duration 1"*	
SdE2	Counter = Set 2 after Out. Dur. 2(time)	*Loading if counter = Set2 "Output Duration 2"*	

COUNTER LOAD VALUE CONFIGURATION

CLd 1	**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

CoM 1	**P-25 Counter 1 Output Mode**	*Counter 1 output mode*	
CoM2	**P-43 Counter 2 Output Mode**	*Counter 2 output mode*	
SEt	Counter ≥Set	*Output active if Counter ≥Set*	Default
t dC	Counter ≥Set * Output Duration (time)	*Output active for "Output Duration" time if Counter ≥Set*	
Cou	Counter ≥Set * Output Duration (counts)	*Output active for "Output Duration" counts if Counter ≥Set*	
SE2	Counter ≥Set1+Set2	*Output active if Counter ≥Set1+Set2*	
-SE	Counter ≤Set	*Output active if Counter ≤Set*	Default
-t dC	Counter ≤Set * Output Duration (time)	*Output active for "Output Duration" time if Counter ≤Set*	
-Cou	Counter ≤Set * Output Duration (counts)	*Output active for "Output Duration" counts if Counter ≤Set*	
-S12	Counter ≤Set1 +Set2	*Output active if Counter ≤Set1+Set2*	

OUTPUT DURATION CONFIGURATION

odU 1	**P-26 Output 1 Duration**	*Counter 1 output duration*	Default 10
odU2	**P-44 Output 2 Duration**	*Counter 2 output duration*	Default 10
USEr	Output Duration Input by User	*Value modifiable by user*	Default
LAtc	Latch output (clear only by load)	*Latch output, resettable by counter loading*	
	Min output duration	*Output duration minimum value*	
999	Max output duration	*Output duration maximum value*	

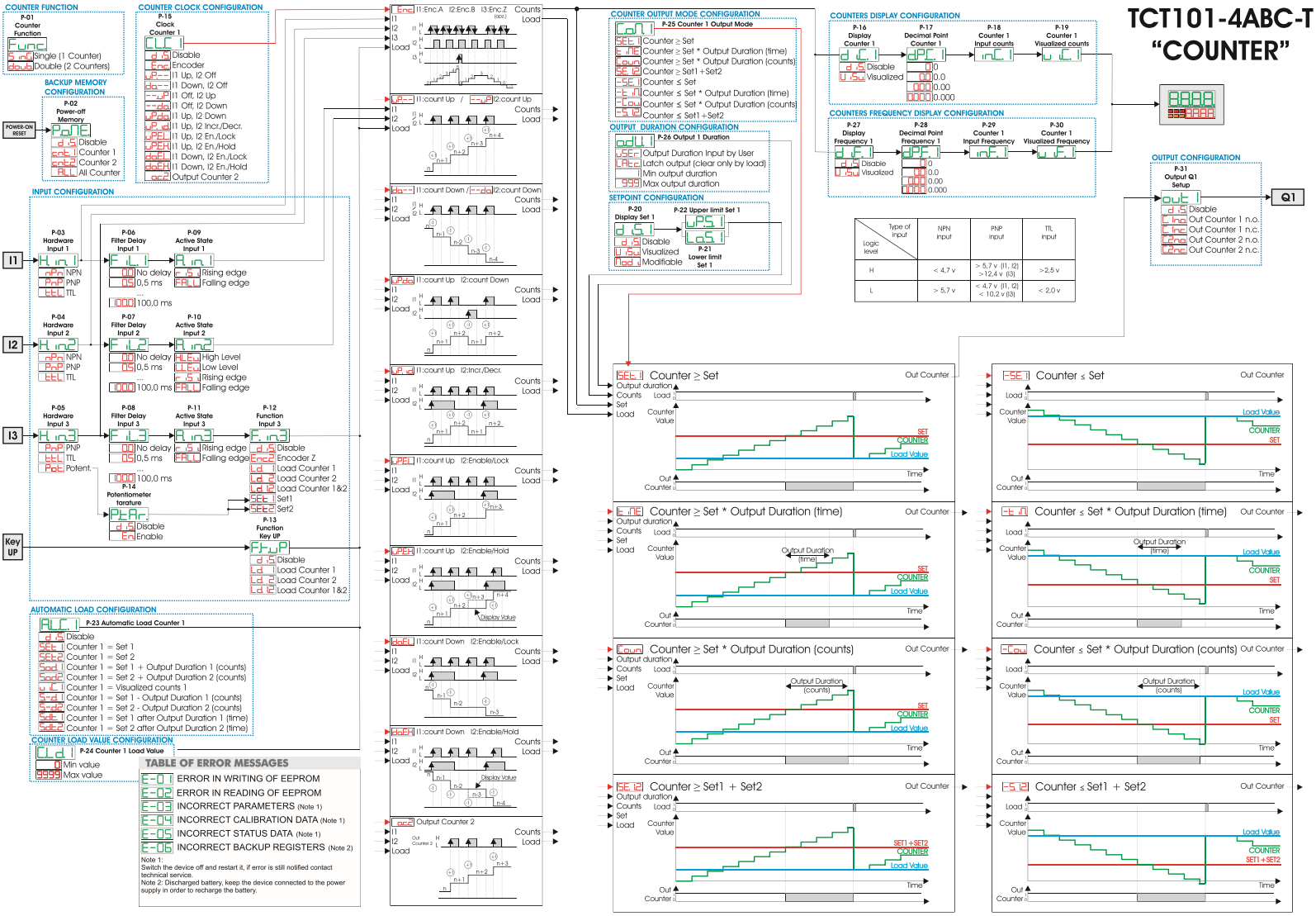
COUNTER FREQUENCY DISPLAY CONFIGURATION

d fr 1	**P-27 Display Frequency Counter 1**	*Counter 1 frequency visualization*	
d fr2	**P-45 Display Frequency Counter 2**	*Counter 2 frequency visualization*	
dS	Disable	*Counter frequency value not visualized*	Default
USu	Visualized	*Counter frequency value visualized*	
dPF 1	**P-28 Decimal Point Frequency Counter 1**	*Counter 1 frequency format*	
dPF2	**P-46 Decimal Point Frequency Counter 2**	*Counter 1 frequency format*	
0	0	*Visualization with no decimal digit*	Default
00	0.0	*Visualization with 1 decimal digit*	
000	0.00	*Visualization with 2 decimal digits*	
0000	0.000	*Visualization with 3 decimal digits*	
inF 1	**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 fr1	**P-30** Counter 2 Visualized Frequency	*Counter 1 visualized frequency*	Default 1
u fr2	**P-48** Counter 2 Visualized Frequency	*Counter 2 visualized frequency*	Default 1
out 1	**P-31 Output Q1 Setup**	*Output Q1 setting*	
out2	**P-32 Output Q2 Setup**	*Output Q2 setting*	
dS	Disable	*Disabled output*	Default C2
C1no	Out Counter 1 n.o.	*Counter 1 output on n.o. contact*	Default C1
C1nc	Out Counter 1 n.c.	*Counter 1 output on n.c. contact*	
C2no	Out Counter 2 n.o.	*Counter 2 output on n.o. contact*	
C2nc	Out Counter 2 n.c.	*Counter 2 output on n.c. contact*	

MODBUS WORD ADDRESSES IN COUNTER MODE

Modbus Address	Descrtiption	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"



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)*	
F iL1	**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*	
A in3	**P-07 Active State Input 3**	*Input 3 active status*	
HLEv	High Level	*High level*	Default
LLEv	Low Level	*Low level*	
F. in2	**P-08 Function Input 2**	*Function associated to input 2*	
F. in3	**P-09 Function Input 3**	*Function associated to input 3*	
d iS	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*	
PtArc	**P-10 Potentiom. Tarature**	*Potentiometer calibration function*	
d iS	Disable	*Disabled*	Default
En	Enable	*Enabled*	
FFuP	**P-11 Function Key UP**	*Function associated to UP key (up arrow)*	
d iS	Disable	*Disabled*	Default
tMxP	Display max peak	*Max. registered peak visualization (reset with UP+DOWN key)*	
FFdo	**P-12 Function Key DOWN**	*Function associated to DOWN key (down arrow)*	
d iS	Disable	*Disabled*	Default
tmP	Display min peak	*Min. registered peak visualization (reset with UP+DOWN key)*	

BACKUP MEMORY CONFIGURATION

PoME	**P-13 Power-off Memory**	*Power-off memory*	
d iS	Disable	*No peak value stored at power-off*	Default
tMxP	Max Peak	*Max. peak stored at power-off*	
tmP	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*	
009	0.09Hz	*update time from 100 to 0.1 sec.*	
01	0.1 Hz		Default
...			
100	10.0Hz		
SFLt	**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.*	
100	1.00 sec	*with this time interval.*	

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	**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

Un1	**P-19 Measure Unit 1**	*Setting digit 1 of visualized measure unit*	
Un2	**P-20 Measure Unit 2**	*Setting digit 2 of visualized measure unit*	
Un3	**P-21 Measure Unit 3**	*Setting digit 3 of visualized measure unit*	
Un4	**P-22 Measure Unit 4**	*Setting digit 4 of visualized measure unit*	
AAAA	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*	
diS	Disable	*Setpoint value not visualized*	Default Set2
Usu	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

LoM1	**P-30 Logic Output Mode1**	*Tachometer logic output 1 mode*	
LoM2	**P-34 Logic Output Mode2**	*Tachometer logic output 2 mode*	
HdEv	High Deviation	*Output active with upward deviation*	**Default**
LdEv	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.*	Default
...	to	*Setting range from 0.0 sec*	
9999	999.9 sec	*to 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.*	Default
...	to	*Setting range from 0.0 sec*	
9999	999.9 sec	*to 999.9 sec.*	
odU1	**P-33 Output 1 Duration**	*Tachometer logic output 1 duration*	
odU2	**P-37 Output 2 Duration**	*Tachometer logic output 2 duration*	
Auto	Automatic	*Automatic output duration*	Default
LAtc	Latch output (clear by FNC key)	*Latch output, reset from FNC key*	
01	Pulse 0.1 sec	*Output impulse duration 0,1 sec*	
...	to		
999	Pulse 99.9 sec	*Output impulse duration 99,9 sec*	

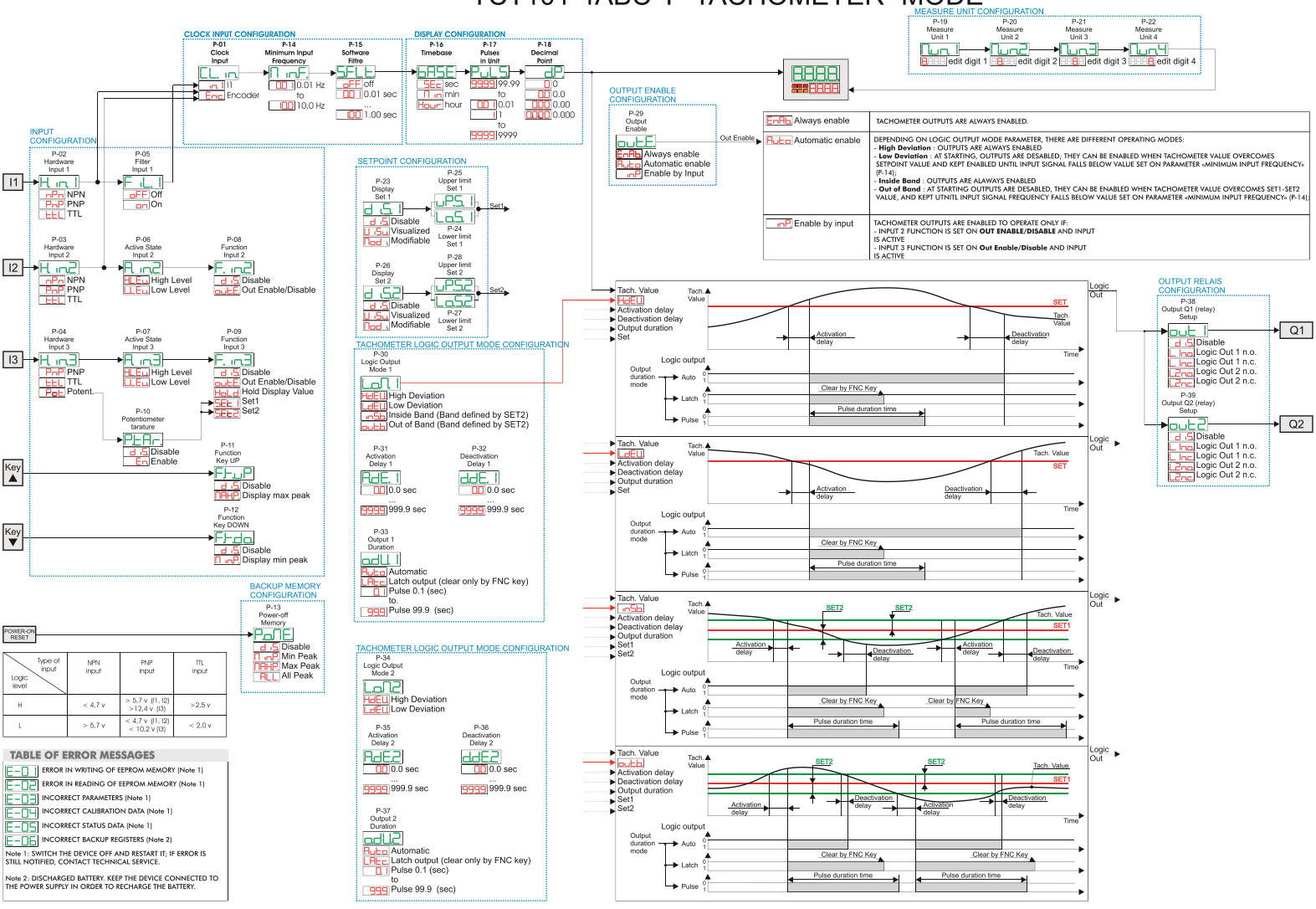
OUTPUT CONFIGURATION

out1	**P-38 Output Q1 Setup**	*Relay Q1 output setting*	
out2	**P-39 Output Q2 Setup**	*Relay Q2 output setting*	
diS	Disable	*Disabled output*	Default 2
Lno	Logica Out 1 n.o.	*Logic output 1 on n.o. contact*	Default 1
Lnc	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



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.