



ELETRONICA PROFESSIONALE
PROFESSIONAL ELECTRONICS



TPS/D PROTOCOL MODBUS

EN

USER MANUAL

**READ AND SAVE
THESE INSTRUCTIONS**

**LEGGI E CONSERVA
QUESTE ISTRUZIONI**

TPS/D Models covered in this manual:

Model	Code
TPS/M/D 1500	99111113
TPS/M/D 3000	99111263
TPS/M/D 6000	99111513
TPS/M/D 9000	99111663
TPS/T/D 10KVA	99116213
TPS/T/D 20KVA	99116313
TPS/T/D 40KVA	99116413
TPS/T/D 60KVA	99116513
TPS/T/D 90KVA	99116713

This manual is written from TPS/T/D firmware version 63 and TPS/M/D firmware version 96.

Please check the latest manual version at www.elettrotestspa.it

To consult older manual versions, please contact our support at service@elettrotestspa.it

INDEX

1.	INTRODUCTION	4
1.1.	VERSION	4
2.	SERIAL & LAN PARAMETERS	4
2.1.	MODBUS PARAMETERS.....	5
2.1.1.	MODBUS ACTIVE COMANDS	5
2.1.2.	Maximum variables TPS/M/D.....	5
2.1.3.	Maximum variables TPS/M/D.....	5
2.2.	HOLDING REGISTER	6
2.3.	INPUT REGISTER	8
2.4.	COILS.....	9
3.	REVISION INDEX	10

1. INTRODUCTION

This manual is written for both single-phase and three-phase generators. For machines that have only the single-phase version, or when using a three-phase machine in single-phase mode, consider only phase R and ignore the parts of this document that concern phases S and T. The red ✘ and the green ✔ in the tables, under TPS/M/D and TPS/T/D column, indicate if a register is enabled or not for that type of machine.

1.1. VERSION

This manual is written for the firmware version 96 of the TPS/M/D series and for the firmware revision version 63 of the TPS/T/D series.

To consult older manual versions, please contact our support at service@elettrotestspa.it

2. SERIAL & LAN PARAMETERS

SERIAL PARAMETERS	
Start	1
Data	8
Parity	None
Stop	1
Baud Rate	1200-9600-19200 Programmable
Timeout	2s*

LAN PARAMETERS	
IP Address	Programmable
IP Address Type	Static
Gateway	Programmable
Subnet Mask	Programmable
Port	502
Operation Mode	Real Com / TCP Server Programmable
Timeout	2s*

*) Except writings of Holding Register 0 ÷ 21 that requires 10s timeout

2.1. MODBUS PARAMETERS

2.1.1. MODBUS ACTIVE COMANDS

Comand	Function Code
Read coils	01
Read Holding Registers	03
Read Input Registers	04
Write Single Coil	05
Write Single Register	06

2.1.2. Maximum variables TPS/M/D

COILS: 21
HOLDING REGISTER: 46
INPUT REGISTER: 59

2.1.3. Maximum variables TPS/M/D

COILS: 22
HOLDING REGISTER: 50
INPUT REGISTER: 52

2.2. HOLDING REGISTER

Variable	N°	Range	Def	Ris	Description	TPS/M/D	TPS/T/D
Address Mod	1	1-250	1 (*)	1	Address ModBus	✓	✓
Address IP1	4	0-255	192 (*)		Address IP1	✓	✓
Address IP2	5	0-255	168 (*)		Address IP2	✓	✓
Address IP3	6	0-255	1 (*)		Address IP3	✓	✓
Address IP4	7	0-255	1 (*)		Address IP4	✓	✓
Subnet mask 1	8	0-255	255 (*)		Subnet mask 1	✓	✓
Subnet mask 2	9	0-255	255 (*)		Subnet mask 2	✓	✓
Subnet mask 3	10	0-255	255 (*)		Subnet mask 3	✓	✓
Subnet mask 4	11	0-255	0 (*)		Subnet mask 4	✓	✓
Gateway 1	12	0-255	192 (*)		Gateway 1	✓	✓
Gateway 2	13	0-255	168 (*)		Gateway 2	✓	✓
Gateway 3	14	0-255	1 (*)		Gateway 3	✓	✓
Gateway 4	15	0-255	0 (*)		Gateway 4	✓	✓
					0= RS232 1= RS485 2= LAN		
PORT SELECTION	17	0..2	0 (*)	1	The PROTOCOL = MODBUS TCP setting is only allowed if PORT SELECTION = LAN. If the latter is modified (RS232 or RS485 with PROTOCOL = MODBUS TCP) the PROTOCOL = MODBUS RTU system is used.	✓	✓
					0 = LAN – REAL COM MODE 1 = TCP SERVER MODE		
LAN OPERATION	18	0..1	0 (*)	1	The PROTOCOL = MODBUS TCP setting is allowed only if LAN OPERATION = TCP SERVER MODE. If this last setting is changed (REAL COM MODE with PROTOCOL = MODBUS TCP) the system forces PROTOCOL = MODBUS RTU.	✓	✓
					0= ELETTROTEST 1 = SCPI		
PROTOCOL	19	0..3	0 (*)	1	2 = MODBUS RTU 3 = MODBUS TCP The PROTOCOL = MODBUS TCP setting is allowed only if PORT SELECTION = LAN and LAN OPERATION = TCP SERVER MODE .	✓	✓
					0 = 1200 1 = 9600 2 = 19200		
BAUD	20	0..2	1 (*)	1		✓	✓
					Bit 0 REMOTE 0=Locale / 1 = Remoto	✓	✓
					Bit 1 OUT RELAY 0=Off / 1 = On	✓	✓
					Bit 2 RANGE 0= Low/1 = High	✓	✓
					Bit 3 SENSE 0 = 2wire / 1 = 4 wire	✓	✓
MODE	21	-	X	1	Bit 4 Out 0=Mono / 1= Three-phase	✗	✓
					Bit 5 Sync Reserved = 1	✗	✗
					Bit 6 TYPE ¹ 0=AC / 1=DC	✓	✗
					Bit 7 Inrush 0=Continuous / 1=inRush	✗	✓
					Bit 8 Ext trf enable 0=Disabled / 1=Enabled	✗	✓
F _{SET}	22	100 .. 3200	500	1	Frequency setting (Hz * 10 – Ex . 50Hz → 5000)	✓	✓
VR _{SET} AC	23	0..3000	0	1	Phase R Voltage Setting (V * 10 – Ex . 100V → 1000)	✓	✓
VR _{SET} DC	24	0..3000	0	1	Phase R Voltage Setting DC (V * 10 – Ex . 400V → 4000) Bit 15: sign (range of settable values : -425.0V ÷ 425.0V)	✓	✗
PHR _{SET}	25	0 .. 359	0	1	Angular Phase Setting Phase R (°)	✗	✓
VS _{SET} AC	26	0..3000	0	1	Phase S Voltage Setting (V * 10 – Ex . 100V → 1000)	✗	✓
VS _{SET} DC	27	0..3000	0	1	Phase S DC voltage setting (V * 10 – Ex . 400V → 4000) Bit 15: : sign (range of settable values : -425.0V ÷ 425.0V)	✗	✗
PHS _{SET}	28	0 .. 359	0	1	Angular Phase Setting Phase S (°)	✗	✓
VT _{SET} AC	29	0..3000	0	1	Phase T Voltage Setting (V * 10 – Ex . 100V → 1000)	✗	✓
VS _{SET} DC	30	0..3000	0	1	Phase T Voltage Setting DC (V * 10 – Ex . 400V → 4000) Bit 15: sign (range of settable values : -425.0V ÷ 425.0V)	✗	✗
PHT _{SET}	31	0 .. 359	0	1	Angular Phase Setting Phase T (°)	✗	✓
					Bit 0 = Set Volt	✓	✓
					Bit 1 = Set Frequency	✓	✓
					Bit 2 = Set Phase	✗	✓
					Bit 3÷Bit 7 = 0 (Reserved)	✗	✗
COMMAND	32		0	1	Bit 8 = Auto Volt	✓	✓
					Bit 9 = Auto Freq	✓	✓
					Bit 10 = Auto Phase	✗	✓
					Bit 11 = Volt ALL	✓	✓
					Bit 12÷Bit 15 = 0 (Reserved)	✗	✗

Combination is possible – Voltage/Frequency Ramp							
TRAMP _{SET}	33	1..600	0	1	Ramp Time Setting (TRAMP 1=100ms)	✓	✓
					Bit 0 = RMS Limit Phase R	✓	✓
					Bit 1 = Peak limit Phase R	✓	✓
					Bit 2 = 0 (Reserved)	✗	✗
					Bit 3 = RMS limit Phase S	✗	✓
I LIMIT _{SET}	35		0	1	Bit 4 = Peak limit Phase S	✗	✓
					Bit 5 = 0 (Reserved)	✗	✗
					Bit 6 = RMS limit Phase T	✗	✓
					Bit 7 = Peak limit Phase T	✗	✓
					Bit 8–Bit 15 = 0 (Reserved)	✗	✗
I RMS R _{SET}	36	IR32..IR26	0	1	RMS Current limit in [A * 10] Phase R	✓	✓
I DELAY R	37	0..65535	0	1	I RMS limit delay phase R [s]	✓	✓
I PEAK R _{SET}	38	IR33..IR27	0	1	Peak Current limit in [A * 10] Phase R	✓	✓
I RMS S _{SET}	39	IR34..IR28	0	1	RMS Current limit in [A * 10] Phase S	✗	✓
I DELAY S	40	0..65535	0	1	I RMS limit delay phase S [s]	✗	✓
I PEAK S _{SET}	41	IR35..IR29	0	1	Peak Current limit in [A * 10] Phase S	✗	✓
I RMS T _{SET}	42	IR36..IR30	0	1	RMS Current limit in [A * 10] Phase T	✗	✓
I DELAY T	43	0..65535	0	1	I RMS limit delay phase T [s]	✗	✓
I PEAK T _{SET}	44	IR37..IR31	0	1	Peak Current limit in [A * 10] Phase T	✗	✓
KEY	45	0..65535	0	1	Key for programming machine parameters (30s for changing options - follow-up reg.)	✓	✓
F _{SET} x100	46	0 .. 32000	5000	1	Frequency setting (Hz x 100 – Ex . 50Hz → 5000)	✓	✓
PHR _{SET} x10	47	0 .. 3599	0	1	Angular Phase Setting Phase R (° x 10 – Ex . 100° → 1000)	✗	✓
PHS _{SET} x10	48	0 .. 3599	1200	1	Angular Phase Setting Phase S (° x 10 – Ex . 100° → 1000)	✗	✓
PHT _{SET} x10	49	0 .. 3599	2400	1	Angular Phase Setting Phase T (° x 10 – Ex . 100° → 1000)	✗	✓
External trafo full scale	50	0 ..65536	3000	1	Set the external transformer full scale value [Vx10]	✗	✓

1) DC mode is available only with Range = High

2.3. INPUT REGISTER

Variable	N°	Range	Def	Ris	Description	TPS/M/D	TPS/T/D
HW	1	0..65535	R	1	DSP Firmware revision	✓	✓
SW	2	0..65535	R	1	Display Firmware revision	✓	✓
SN	4	0..65535	R	1	Serial number	✓	✓
Machine_code	8	0..255	R	1	Machine code	✓	✓
Power_code	9	0..255	R	1	Power code	✓	✓
F _{READ}	10	1000 .. 32000	R	1	Frequency Reading (Hz= F _{READ} / 100 – Ex . 5000 → 50 Hz)	✓	✓
VR _{SET}	11	0...3000	R	1	Voltage reading Phase R (V * 10 – Ex . 1000 → 100V)	✓	✓
VR _{READ}	12	0...3150	R	1	Voltage reading Phase R (V * 10 – Ex . 1000 → 100V)	✓	✓
PHR _{READ}	13	0 .. 359	R	1	Reading Angular Phase Phase R (°)	✗	✓
IR _{READ}	14	0..5000	R	1	Current Reading Phase R (A * 10 – Ex . 100 → 10A)	✓	✓
VS _{SET}	15	0...3000	R	1	Voltage reading Phase R (V * 10 – Ex . 1000 → 100V)	✗	✓
VS _{READ}	16	0...3150	R	1	Voltage reading Phase S (V * 10 – Ex . 1000 → 100V)	✗	✓
PHS _{READ}	17	0 .. 359	R	1	Reading Angular Phase Phase S (°)	✗	✓
IS _{READ}	18	0..6000	R	1	Current Reading Phase S (A * 10 – Ex . 100 → 10A)	✗	✓
VT _{SET}	19	0...3000	R	1	Voltage reading Phase T (V * 10 – Ex . 1000 → 100V)	✗	✓
VT _{READ}	20	0...3150	R	1	Voltage reading Phase T (V * 10 – Ex . 1000 → 100V)	✗	✓
PHT _{READ}	21	0 .. 359	R	1	Reading Angular Phase Phase T (°)	✗	✓
IT _{READ}	22	0..6000	R	1	Current Reading Phase T (A * 10 – Ex . 100 → 10A)	✗	✓
ALARM R	23	0..65535	R	1	Bit 0 Remote settings	✓	✓
ALARM S	24	0..65535	R	1	Bit 1 Inverter communication	✗	✓
ALARM T	25	0..65535	R	1	Bit 2 Inverter sequence Bit 3 Bus overvoltage Bit 4 Bus undervoltage Bit 5 Overtemperature Bit 6 Inverter alarm Bit 7 Eeprom error Bit 8 Output voltage error Bit 9 Current limitation	✗	✓
I RMS f.s. R	26	0..65535	0	1	Full Scale RMS [A * 10] Phase R	✓	✓
I PEAK f.s. R	27	0..65535	0	1	Full scale PEAK [A * 10] Phase R	✓	✓
I RMS f.s. S	28	0..65535	0	1	Full Scale RMS [A * 10] Phase S	✗	✓
I PEAK f.s. S	29	0..65535	0	1	Full Scale PEAK [A * 10] Phase S	✗	✓
I RMS f.s. T	30	0..65535	0	1	Full Scale RMS [A * 10] Phase T	✗	✓
I PEAK f.s. T	31	0..65535	0	1	Full Scale PEAK [A * 10] Phase T	✗	✓
I RMS MIN R	32	0..65535	0	1	Min. value RMS limit [A * 10] Phase R	✓	✓
I PEAK MIN R	33	0..65535	0	1	Min. value PEAK limit [A * 10] Phase R	✓	✓
I RMS MIN S	34	0..65535	0	1	Min. value RMS limit [A * 10] Phase S	✗	✓
I PEAK MIN S	35	0..65535	0	1	Min. value PEAK limit [A * 10] Phase S	✗	✓
I RMS MIN T	36	0..65535	0	1	Min. value RMS limit [A * 10] Phase S	✗	✓
I PEAK MIN T	37	0..65535	0	1	Min. value PEAK limit [A * 10] Phase S	✗	✓
I RMS R SET bit	38	0..65535	0	1	RMS limit set [bit] phase R	✓	✓
I PEAK R SET bit	39	0..65535	0	1	PEAK limit set [bit] phase R	✓	✓
I RMS S SET bit	40	0..65535	0	1	RMS limit set [bit] phase S	✗	✓
I PEAK S SET bit	41	0..65535	0	1	PEAK limit set [bit] phase S	✗	✓
I RMS T SET bit	42	0..65535	0	1	RMS limit set [bit] phase T	✗	✓
I PEAK T SET bit	43	0..65535	0	1	PEAK limit set [bit] phase T	✗	✓
DELAY MAX	44		0	1	Maximum Settable Delay time	✓	✓
DELAY MIN	45		0	1	Minimum Settable Delay time	✓	✓

					Bit 0 = INRUSH / CONTINUOUS option Commutable	✓	✓
					Bit 1 = Option OUT Commutable	✓	✓
OPTIONS	46	0..65535	0	1	Bit 2 = DC	✓	✓
					Bit 3 = Single-phase option on three-phase machine	✗	✓
					Bit 4 = RANGE CHANGE option	✓	✓
BUSY_STATE	47		0	1	Bit 0 = BUSY state (0=Not Busy, 1 = Machine Busy)	✓	✓
					Bit 1 = Ramp in progress state (0 = No Ramp, 1 = Ramp in progress)	✓	✓
Not used	48	..	0	1	Not used	✗	✗
F _{READ} X100	49	..	0	1	Reads the set frequency (Hz x 100 – Ex . 50Hz → 5000)	✓	✓
PHR _{READ} X10	50	..	0	1	Reads Angular Phase Setting Phase R (° x 10 – Ex . 100° → 1000)	✗	✓
PHS _{READ} X10	51	..	0	1	Reads Angular Phase Setting Phase S (° x 10 – Ex . 100° → 1000)	✗	✓
PHT _{READ} X10	52	..	0	1	Reads Angular Phase Setting Phase T (° x 10 – Ex . 100° → 1000)	✗	✓

2.4. COILS

Variable	N°	Range	Def	Ris	Description	TPS/M/D	TPS/T/D
Not used	0	0	0	1	Elettrotest use	✗	✗
REMOTE	4	0/1	0	1	0 = Locale / 1 Remoto = HR.21 Bit 0	✓	✓
RANGE	5	0/1	0	1	0 = Low / 1 High = HR.21 Bit 2	✓	✓
OUT RELAY	6	0/1	0	1	0=Off / 1 On = HR.21 Bit 1	✓	✓
SENSE	7	0/1	0	1	Not Used	✗	✗
VR_I	8	0/1	0	1	0 = 2 wire / 1 = 4 wires = HR.21 Bit 3	✓	✓
SYNC	9	0/1	0	1	Not Used	✗	✗
TYPE ¹	10	0/1	0	1	0 = AC / 1 DC = HR.21 Bit 6	✓	✗
INRUSH	11	0/1	0	1	0=Continuous / 1=inRush = HR.21 Bit 7	✗	✓
MONO	12	0/1	0	1	0 = 3PH / 1 = 1PH = HR.21 Bit 4	✗	✓
RMS LIMIT R	13	0/1	0	1	0 = Disabled / 1 Enabled = HR.35 Bit 0	✓	✓
PEAK LIMIT R	14	0/1	0	1	0 = Disabled / 1 Enabled = HR.35 Bit 1	✓	✓
SOF R	15	0/1	0	1	Not Used	✗	✗
RMS LIMIT S	16	0/1	0	1	0 = Disabled / 1 Enabled = HR.35 Bit 3	✓	✗
PEAK LIMIT S	17	0/1	0	1	0 = Disabled / 1 Enabled = HR.35 Bit 4	✓	✗
SOF S	18	0/1	0	1	Not Used	✗	✗
RMS LIMIT T	19	0/1	0	1	0 = Disabled / 1 Enabled = HR.35 Bit 6	✓	✗
PEAK LIMIT T	20	0/1	0	1	0 = Disabled / 1 Enabled = HR.35 Bit 7	✓	✗
SOF T	21	0/1	0	1	Not Used	✗	✗
Enable external transformer	22	0/1	0	1	0 = Disabled / 1 Enabled = HR.21 Bit 8	✗	✗

1) DC is available only with Range = High.

3. REVISION INDEX

Elettrotest Spa is committed to a program of continuous improvement of products and information to the customer.

Therefore, the company reserves the right to make changes to the documentation and specifications without notice and assumes no responsibility for any incorrect information.

04_	Changes for trafo out implementation (RP010.24)	16/09/24	A.Ferro	A.Ferro	R.Veronese
03A	Changes on IR.04 ÷ IR.07 (IR.04 only S.N) HR.046 ÷ HR.049 & IR.049 ÷ IR.052 added (RP010.24 – RP014.24)	08/04/24	A.Ferro	A.Ferro	R.Veronese
03_	Machine code & Power code implementation on Input register	24/08/23	A.Ferro	M.Rigobello	R.Veronese
02_	Changes for TPS/T/D implementation (DPP001.21) and TPS/M/D FW update v.069 (UT003.22)	07/06/23	A.Ferro	M.Rigobello	R.Veronese
01_	Changes related to I _{PEAK} ed I _{RMS} management (UT005.20)	09/06/22	A.Ferro	M.Rigobello	R.Veronese
00_	First Emission	01/03/22	A.Ferro	M.Rigobello	R.Veronese
Rev.	Descrizione	Data	Autore	Verificato	Approvato