



ELETRONICA PROFESSIONALE
PROFESSIONAL ELECTRONICS



XPS MODBUS PROTOCOL

EN

USER MANUAL

READ AND SAVE
THESE INSTRUCTIONS

LEGGI E CONSERVA
QUESTE ISTRUZIONI

XPS Models covered in this manual:

Model	Code
XPS/M/3KVA	99114053
XPS/M/6KVA	99114113
XPS/T/18KVA	99114513
XPS/T/30KVA	99114613
XPS/T/67KVA	99114813

***This manual is written from XPS/T firmware version 10162.
Please check the latest manual version at www.elettrotestspa.it
To consult older manual versions, please contact our support at
service@elettrotestspa.it***

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1. MODBUS RTU PROTOCOL

MODBUS RTU	
Start	1
Data	8
Parity	None
Stop	1
Retry	500ms
End message	3,5 tbyte
Baud Rate	1200-9600-19200 Programmable
Timeout	2s*

*) Except writings of Holding Register 0 ÷ 21 that requires 20s timeout

1.1.1. ACTIVE COMANDS

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

1.1.2. Maximum variables

COILS: **21**
 HOLDING REGISTER: **46**
 INPUT REGISTER: **38**

1.2. HOLDING REGISTER

Variable	N°	Range	Def	Ris	Description
Address Mod	1	1-250	1 (*)	1	Address Modbus
Address IP1	4	0-255	192 (*)		
Address IP2	5	0-255	168 (*)		
Address IP3	6	0-255	1 (*)		
Address IP4	7	0-255	1 (*)		
Subnet mask 1	8	0-255	255 (*)		
Subnet mask 2	9	0-255	255 (*)		
Subnet mask 3	10	0-255	255 (*)		
Subnet mask 4	11	0-255	0 (*)		
Gateway 1	12	0-255	192 (*)		
Gateway 2	13	0-255	168 (*)		
Gateway 3	14	0-255	1 (*)		
Gateway 4	15	0-255	0 (*)		
PORT SELECTION	17	0..2	0 (*)	1	<p>0= RS232 1= RS485 2= LAN</p> <p>The PROTOCOL = MODBUS TCP setting is only allowed if PORT SELECTION = LAN . If this last setting is changed (RS232 or RS485 with PROTOCOL = MODBUS TCP) the system imposes PROTOCOL = MODBUS RTU .</p>
LAN OPERATION	18	0..1	0 (*)	1	<p>0 = LAN – REAL COM MODE 1 = TCP SERVER MODE</p> <p>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.</p>
PROTOCOL	19	0..2	0 (*)	1	<p>0= ELETTROTEST 2 = MODBUS RTU 3 = MODBUS TCP</p> <p>The PROTOCOL = MODBUS TCP setting is allowed only if PORT SELECTION = LAN and LAN OPERATION = TCP SERVER MODE .</p>
BAUD	20	0 .. 2	1 (*)	1	<p>0 = 1200 1 = 9600 2 = 19200</p>
MODE	21		X	1	<p>Bit 0 REMOTE 0=Local / 1 = Remote Bit 1 OUT RELAY 0=Off /1 = On Bit 3 SENSE 0 = 2wire /1 = 4 wire Bit 4 Out 0 = Mono /1=Tri Bit 6 TYPE 0=AC /1=DC</p>
F _{SET}	22	100 .. 10000	500	1	Frequency settings (Hz * 10 – Es. 50Hz → 500)
VR _{SET} AC	23	0...3000	0	1	Phase R Voltage Setting (V * 10 – Es. 100V → 1000)
VR _{SET} DC	24	-4250...4250	0	1	Phase R Voltage Setting DC (V * 10 – Es. 400V → 4000) Bit 15: sign (range of settable values : -425.0V ÷ 425.0V)
PHR _{SET}	25	0 .. 359	0	1	Phase R Phase Angular Setting (°)
VS _{SET} AC	26	0...3000	0	1	Phase S Voltage Setting (V * 10 – Es. 100V → 1000)
VS _{SET} DC	27	-4250...4250	0	1	Phase S Voltage Setting DC (V * 10 – Es. 400V → 4000) Bit 15: segno (range valori impostabili: -425.0V ÷ 425.0V)
PHS _{SET}	28	0 .. 359	0	1	Phase S Phase Angular Setting (°)
VT _{SET} AC	29	0...3000	0	1	Phase T Voltage Setting (V * 10 – Es. 100V → 1000)
VS _{SET} DC	30	-4250...4250	0	1	Phase T Voltage Setting DC (V * 10 – Es. 400V → 4000) Bit 15: sign (range valori impostabili: -425.0V ÷ 425.0V)
PHT _{SET}	31	0 .. 359	0	1	Phase T Phase Angular Setting (°)
COMMAND	32	0..65535	0	1	<p>Bit 0 = Set Volt Bit 1 = Set Frequency Bit 2 = Set Phase Bit 8 = Auto Volt Bit 9 = Auto Freq Bit 10 = Auto Phase Bit 11 = Volt all</p> <p>Combination is possible –Voltage/frequency ramp</p>
TRAMP _{SET}	33	1..600	0	1	Ramp Time Setting (TRAMP 1=100ms)
I LIMIT _{SET}	35	0..65535	0	1	<p>Bit 0 = RMS Limit phase R Bit 1 = Peak limit phase R</p>

					Bit 2 = Cont phase R
					Bit 3 = RMS Limit phase S
					Bit 4 = Peak limit phase S
					Bit 5 = Cont phase S
					Bit 6 = RMS Limit phase T
					Bit 7 = Peak limit phase T
					Bit 8 = Cont phase T
I RMS R SET	36	0..I RMS R FS	0	1	RMS current limit in [A * 10] phase R
I PEAK R SET	37	0..I PEAK R FS	0	1	Peak current limit [A * 10] phase R
DELAY R SET	38	0..65000	0	1	DELAY [ms] Phase R
I RMS S SET	39	0..I RMS S FS	0	1	Peak current limit [A * 10] phase S
I PEAK S SET	40	0..I PEAK S FS	0	1	Limite corrente di picco [A * 10] fase S
DELAY S SET	41	0..65000	0	1	DELAY [ms] Phase S
I RMS T SET	42	0..I RMS T FS	0	1	RMS current limit in [A * 10] phase T
I PEAK T SET	43	0..I PEAK T FS	0	1	Peak current limit [A * 10] phase T
DELAY T SET	44	0..65000	0	1	DELAY [ms] Phase T
KEY	45	0..65535	0	1	Key for parameters programming (30s to change options – reg seg. -)
					Bit 0 = Option INRUSH/CONTINUOUS Commutable
					Bit 1 = Out C Commutable option
					Bit 2 = DC
					Bit 3 = Single-phase option on three-phase machine
					Bit 4 = Range CHANGE option
OPTION	46	0..65535	0	1	

1.3. INPUT REGISTER

Variable	N°	Range	Def	Ris	Description
SW	2	0..255	R	1	FW REvision
SN1	4	0..255	R	1	Serial number byte1
SN2	5	0..255	R	1	Serial number byte2
SN3	6	0..255	R	1	Serial number byte3
SN4	7	0..255	R	1	Serial number byte4
F _{READ}	10	100 .. 10000	R	1	Frequency Reading (Hz= F _{READ} / 10 – Es. 500 → 50 Hz)
VR _{SET}	11	-4250...4250	R	1	Phase R voltage Setting (V * 10 – Es. 1000 → 100V)
VR _{READ}	12	0..3150	R	1	Phase R voltage reading (V * 10 – Es. 1000 → 100V)
PHR _{READ}	13	0 .. 359	R	1	Reading Angular Phase Phase R(°)
IR _{READ}	14	0..5000	R	1	Phase R Current Reading (A * 10 – Es. 100 → 10A)
VS _{SET}	15	-4250...4250	R	1	Phase S voltage Setting (V * 10 – Es. 1000 → 100V)
VS _{READ}	16	0..3150	R	1	Phase S voltage reading (V * 10 – Es. 1000 → 100V)
PHS _{READ}	17	0 .. 359	R	1	Reading Angular Phase Phase S (°)
IS _{READ}	18	0..6000	R	1	Phase S Current Reading (A * 10 – Es. 100 → 10A)
VT _{SET}	19	-4250...4250	R	1	Phase T Voltage Setting (V * 10 – Es. 1000 → 100V)
VT _{READ}	20	0..3150	R	1	Phase T voltage reading (V * 10 – Es. 1000 → 100V)
PHT _{READ}	21	0 .. 359	R	1	Reading Angular Phase Phase T (°)
IT _{READ}	22	0..6000	R	1	Phase T Current Reading (A * 10 – Es. 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 Current limitation
					Bit 8 PE Overvoltage
					-
					-
					-
					-
					-
I RMS FS R	26	0..65535	0	1	Full Scale RMS [A * 10] Phase R
I PICCO FS R	27	0..65535	0	1	Full Scale Peak [A * 10] Phase R
I RMS FS S	28	0..65535	0	1	Full Scale RMS [A * 10] Phase S
I PICCO FS S	29	0..65535	0	1	Full Scale Peak [A * 10] Phase S
I RMS FS T	30	0..65535	0	1	Full Scale RMS [A * 10] Phase T
I PICCO FS T	31	0..65535	0	1	Full Scale Peak [A * 10] Phase T
I RMS MIN R	32	0..65535	0	1	Valore min limite RMS [A * 10] Phase R
I PICCO MIN R	33	0..65535	0	1	PEAK minimum limit value [A * 10] Phase R
I RMS MIN S	34	0..65535	0	1	RMS minimum limit value [A * 10] Phase S
I PICCO MIN S	35	0..65535	0	1	PEAK minimum limit value [A * 10] Phase S
I RMS MIN T	36	0..65535	0	1	RMS minimum limit value [A * 10] Phase T
I PICCO MIN T	37	0..65535	0	1	PEAK minimum limit value [A * 10] Phase T
I RMS R SET bit	38	0..4095	0	1	Limit RMS Phase R [bit]
I PEAK R SET bit	39	0..4095	0	1	R phase peak limit [bit]
I RMS S SET bit	40	0..4095	0	1	Limite RMS fase S [bit]
I PEAK S SET bit	41	0..4095	0	1	S phase peak limit [bit]
I RMS T SET bit	42	0..4095	0	1	Limite RMS fase T [bit]
I PEAK T SET bit	43	0..4095	0	1	T phase peak limit [bit]

1.4. COILS (OPTIONAL)

Variable	N°	Range	Def	Ris	Description	
REMOTE	4	0/1	0	1	0 = Local / 1 Remote	= HR.21 Bit 0
OUT RELAY	6	0/1	0	1	0 =Off / 1 On	= HR.21 Bit 1
VR_I	8	0/1	0	1	0 = 2 wire /1 = 4 wires	= HR.21 Bit 3
TYPE	10	0/1	0	1	0 = AC / 1 DC	= HR.21 Bit 6
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
CONT R	15	0/1	0	1	0 = Disabled / 1 Enabled	= HR.35 Bit 2
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
CONT S	18	0/1	0	1	0 = Disabled / 1 Enabled	= HR.35 Bit 5
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
CONT T	21	0/1	0	1	0 = Disabled / 1 Enabled	= HR.35 Bit 8

2. REVISION INDEX

00_	First emission (UT001.19)	29/09/22	A.Ferro	A.Ferro	
<i>Rev.</i>	<i>Description</i>	<i>Date</i>	<i>Author</i>	<i>Verified</i>	<i>Approved</i>