EN

ELETTROTEST

ELETTROTEST

ELETTRONICA PROFESSIONALE
PROFESSIONAL ELECTRONICS

XPS PROTOCOL SCPI

EN USER MANUAL

READ AND SAVE THESE INSTRUCTIONS

LEGGI E CONSERVA QUESTE ISTRUZIONI

EN

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 service@elettrotestspa.it

INDEX

1. INTRODUCTION

SCPI (Standard Commands for Programmable Instruments) is a command language for controlling instruments that goes beyond IEEE488.2 to address a wide variety of instruments functions in a standard manner.

The aim of this document is to define the SCPI commands for XPS power supplies.

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.

1.1. VERSION

This manual is written for **XPS firmware version 10162** and higher.

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

1.2. COMMUNICATION INTERFACE

XPS communicates by means of RS-232C interface, with the following parameters:

Parameter	Value
Baud rate	9600
Number of start bits	1
Number of data bits	8
Number of stop bits	1
Parity	None

2. INTRODUCTION TO PROGRAMMING

2.1. CONVENTIONS

Symbol	Description	Meaning
< >	Angle Brackets	Items in the angle brackets are parameters that have to be replaced with a value.
|	Vertical bar	Vertical bar is used to separate alternative parameters.

2.2. NUMERICAL DATA FORMATS

All data programmed to or returned from XPS are ASCII. The data can be numerical or character string.

Symbol	Description	Esempio
NR1	Number without decimal point	123
NR2	Number with decimal point	12.3

Symbol	Description	Esempio
NR1	Number without decimal point	123
NR2	Number with decimal point	12.3

2.3. CHARACTER DATA FORMAT

Character strings returned by query command take the following form:

Symbol	Description	Meaning
<CRD>	Character Response Data	Character string.

2.4. BASIC DEFINITIONS

2.4.1. Command Tree:

The commands in SCPI protocols are based on a hierarchical structure, also known as command tree.

2.4.2. Program Headers:

Program headers are the keywords that identify the command. They follow the syntax described by SCPI standard.

2.4.3. Common Commands:

Common commands are implemented by all SCPI instruments. The commands with a leading “*” are common commands.

2.4.4. Instrument-Controlled Headers:

Instrument-Controlled headers are used for all other instrument commands. A long form and a short form is possible.

2.4.5. Program Message Terminator:

A program message terminator indicates the end of a program message. For RS-232C, the program message terminator is <NL> (New Line, ASCII hexadecimal code “0A”).

2.4.6. Program Header Separator:

If a command has one than more header, the user have to separate them with a colon (:). Data have to be separated from program header by one space.
Example:

FETC:CURR?

VOLT:DC 10

2.4.7. Program Message Unit:

A program message unit is a single command, programming data, or query.
Example:

FREQ?

OUTput ON

3. XPS COMMANDS

3.1. Instrument Command Dictionary

3.1.1. SYSTEM sub-system

SYSTem
:CONFigure
:NOUTput 1|3
:ERRor?
:LOCal
:REMote
:OPTions?

SYSTem:CONFigure:NOUTput

This command sets the power source to a single phase or to a three phases.

Command Syntax: SYSTem:CONFigure:NOUTput 1|3
Example: SYST:CONF:NOUT 1

Query Syntax: SYSTem:CONFigure:NOUTput?
Return parameter: 1|3

SYSTem:ERRor?

This command queries the next error number followed by its corresponding error message string from the error queue.

Query Syntax : SYSTem:ERRor?
Return parameter: <NR1>, <CRD>

SYSTem:LOCal

This command sets XPS in local state, which enables the front panel controls.

Command Syntax: SYSTem:LOCal
Example: SYST:LOC

Query Syntax: SYSTem:LOCal?
Return parameter: 0|1

SYSTem:REMote

This command sets the interface in remote state, which disables all front panel controls.

Command Syntax: SYSTem:REMote
Example: SYST:REM

Query Syntax: SYSTem:REMote?
Return parameter: 0|1

SYSTem:OPTions? ***Phase Selectable***

This command returns the options installed in XPS.

Installed Options						
Bit position	5-15	4	3	2	1	0
Bit name	Not used	Range	3-PHASE	DC	OUT	INRUSH

- INRUSH: Inrush mode.
- OUT: Output relay.
- DC : DC mode.
- 3-PHASE: 3-phase.
- RANGE: Range selection.

Query Syntax: SYSTem:OPTions?

Return parameter: <NR1> (MSB), <NR1> (LSB)

3.1.3. INSTRUMENT sub-system

INSTrument
:SELect 1|2|3
:COUPle ALL|NONE

INSTrument:SELect

This command may be used to select a specific output phase in three phase mode.

Command Syntax: INSTrument:SEL 1|2|3
Example: INST:SEL 1

Query Syntax: INST:SEL?
Return parameter: 1|2|3

INSTrument:COUPle

This command may be used to couple all output phases in three phase mode. When the phases are coupled, output voltage and output phase can be programmed for all three phases using a single command and without the need to select each phase individually.
When uncoupled, use the INST:SEL command to select a specific output phase.

Command Syntax: INSTrument:COUPle ALL|NONE
Example: INST:COUP ALL

Query Syntax: INST:COUP?
Return parameter: ALL|NONE

3.1.4. MEASURE sub-system

MEASure
[:SCALar]
:CURRent
:AC?
[:DC]?
:VOLTage
:AC?
[:DC?]

MEASure[:SCALar]:CURRent:AC? ***Phase Selectable***

This query returns the mean of the rectified ac current being sourced at the output terminal of the power supply. This command should be used when the voltage mode of the source is set for AC.

Query Syntax: MEASure[:SCALar]:CURRent:AC?
Parameter: None
Example: MEAS:CURR:AC?
Return parameter: <NR2>

MEASure[:SCALar]:CURRent[:DC]? ***Phase Selectable***

This query returns the dc component of the current being sourced at the output terminal of the power supply. This command should be used when the voltage mode of the source is set for DC.

Query Syntax: MEASure[:SCALar]:CURRent[:DC]?
Parameter: None
Example: MEAS:CURR?
Return parameter: <NR2>

MEASure[:SCALar]:VOLTage:AC? ***Phase Selectable***

This query returns the ac rms voltage at the output terminal of the power supply. This command should be used when the voltage mode of the source is set for AC.

Query Syntax: MEASure[:SCALar]:VOLTage:AC?
Example: MEAS:VOLT:AC?
Return parameter: <NR2>

MEASure[:SCALar]:VOLTage[:DC]? ***Phase Selectable***

This query returns the dc component of the voltage at the output terminal of the power supply. This command should be used when the voltage mode of the source is set for DC.

Query Syntax: MEASure[:SCALar]:VOLTage[:DC]?
Example: MEAS:VOLT?
Return parameter: <NR2>

3.1.5. OUTPUT sub-system

OUTPut
[:STATe] <parameter>

OUTPut[:STATe]

This command enables or disables the XPS output.

Command Syntax: OUTPut[:STATe] 0|1
Example: OUTP 1

Query Syntax: OUTPut[:STATe]?
Return parameter: 0|1

3.1.6. SOURCE sub-system

[SOURce:]
- **CURRent**
  - **:INRush 0|1**
- **FREQuency**
  - **[:IMMediate] <NR2>**
- **RANGe 0|1|2|3**
  - **:SLEW**
  - **[:IMMediate] <NR1>|MAX**
- **MODE AC|DC**
- **PHASe**
- **[:IMMediate] <NR2>**
- **VOLTage**
  - **[:LEVel]**
    - **[:IMMediate]**
      - **[:AMPLitude]**
        - **:AC <NR2>**
        - **[:DC] <NR2>**
  - **:PROTection**
    - **:STATe** <bool>
    - **:DELay**
    - **:TYPe**
  - **:RANGE 150|300**
  - **:SENSe**
    - **[:SOURce] INT|EXT**
  - **:SLEW**
    - **[:IMMediate] <NR1>|MAX**

[SOURce:]FREQuency[:IMMediate]

This command sets the frequency of the output waveform. The frequency must be in the range programmed with [SOURce]:FREQuency:RANGe.

Command Syntax: [SOURce:]FREQuency[:IMMediate] <NR2>
Example: FREQ 50

Format allowed for parameter <NR2>
.
.N
.NN
N.
N.N
N.NN
NN.
NN.N
NN.NN
NNN.
NNN.N
N
NN
NNN

Query Syntax: [SOURce:]FREQuency[:IMMediate]?
Return parameter: <NR2>

[SOURce:]FREQuency:SLEW[:IMMediate]

This command sets the rate at which frequency changes for all programmed changes in output frequency. Istantaneous frequency changes can be obtained by sending MAX.

Command Syntax: [SOURce:]FREQuency:SLEW[:IMMediate] <NR1>
Parameter: 1 to 10000 Hz/s | MAX
Example: FREQ:SLEW:IMM 75
FREQ:SLEW MAX

Format allowed for parameter <NR1>
N
NN
NNN
NNNN
NNNNN
MAX

Sintassi Query: [SOURce:]FREQuency:SLEW?
Return parameter: <NR1> | MAX

[SOURce:]MODE

This command allows switching between the AC and DC output mode of the power source.

Command Syntax: [SOURce:]MODE AC|DC
Example: MODE AC

Query Syntax: [SOURce:]MODE?
Return parameter: AC|DC

[SOURce:]PHASe[IMMediate] ***Phase Selectable***

This command sets the phase of the output voltage waveform relative to an internal trigger.

Command Syntax: [SOURce:]PHASe[:IMMediate] <NR1>
Parameter: 0 to 360 deg
Example: PHAS 45

Format allowed for parameter <NR1>
.
N
NN
NNN

Query Syntax: [SOURce:]PHASe[:IMMediate]?
Return parameter: <NR2>

[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]:AC ***Phase Selectable***

This command programs the ac rms output voltage of the XPS. The voltage mode must be set to AC to accept an ac voltage.

Command Syntax: [SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]:AC <NR2>
Parameter: 0 to value programmed with [SOURce]:VOLTage:RANGe.
Example: VOLT:AC 250

Format allowed for parameter <NR2>
.
.N
N.
N.N
NN.
NN.N
NNN.
NNN.N
N
NN
NNN

Query Syntax: [SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]:AC?
Return parameter: <NR2>

[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude][:DC] ***Phase Selectable***

This command programs the dc output voltage of the XPS. The voltage mode must be set to DC to accept a dc voltage.

Command Syntax: [SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude][:DC] <NR2>
Parameter: 0 to ± value programmed with [SOURce]:VOLTage:RANGe.
Example: VOLT 250

Format allowed for parameter <NR2>
.
.N
N.
N.N
NN.
NN.N
NNN.
NNN.N
N
NN
NNN

Query Syntax: [SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude][:DC]?
Return parameter: <NR2>

[SOURce:]VOLTage:SENSe[:SOURce]

This command selects the source from which the output voltage is sensed. The following voltage sense sources can be selected: INT (2 wires) or EXT (4 wires).

Command Syntax: [SOURce:]VOLTage:SENSe[:SOURce] INT|EXT
Example: VOLT:SENS:SOUR INT

Query Syntax: [SOURce:]VOLTage:SENSe[:SOURce]?
Return parameter: INT|EXT

[SOURce:]VOLTage:SLEW[:IMMediate] ***Phase Selectable***

This command sets the slew rate for all programmed changes in the output voltage level of the source. Istantaneous voltage changes can be obtained by sending MAX.

Command Syntax: [SOURce:]VOLTage:SLEW[:IMMediate] <NR1>
Parameter: 1 to 3000 V/s | MAX
Example: VOLT:SLEW 1
VOLT:SLEW MAX

Format allowed for parameter <NR2>
N
NN
NNN
NNNN
NNNNN
MAX

Query Syntax: [SOURce:]VOLTage:SLEW[:IMMediate]?
Return parameter: <NR1>

[SOURce:]CURRent:[LEVel][:IMMediate][:AMPLitude]<NRf+> ***Phase Selectable***

This command sets the rms/peak current limit of the output. If the output current exceeds this limit, the output voltage amplitude is reduced until the rms/peak current is within the limit if the current protection mode is disabled and the current protection delay time is expired. The CL bit of the questionable status register indicates that the current limit control loop is active. If the current protection state is programmed on, the output latches into a disabled state when current limiting occurs and the current protection delay time is expired. Note that the CURRent command is coupled with the VOLTage:RANGe and SOURce:MODE commands. This means that the maximum current limit that can be programmed at a given time depends on the voltage range setting and the voltage mode (DC or AC) in which the unit is presently operating.

Command Syntax: [SOURce:]CURRent:[LEVel][:IMMediate][:AMPLitude]<NR2>
Parameters: <NR2>
Unit: A (rms Amperes)
*RST: Defined by the PONSetup:CURRent
Examples CURR 5 CURR:LEV .5
Query Syntax [SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude]?
Returned Parameters: <NR2>
Related Commands: CURR:PROT:STAT VOLT:RANG MODE

CURRent:PROTection:STATe

This command selects overcurrent (OC) protection mode. If the overcurrent protection function is enabled and the load current exceeds the programmed level, then the output is disabled after a time delay specified by the CURRent:PROTection:DELay and the Questionable Condition status register OC bit is setAn overcurrent condition is cleared after the cause of the condition is removed. If the (OC) protection mode is disabled, the source operates in the Constant Current mode and the output voltage will be reduced after a time delay specified by the CURRent:PROTection:DELay and the Questionable Condition status register OC bit is set. An overcurrent condition is cleared after the cause of the condition is removed

Command Syntax:	[SOURce:]CURRent:PROTection:STATe <bool>
Parameters:	0|1|OFF|ON
*RST Value:	ON
Examples	CURR:PROT:STAT 0 CURR:PROT:STAT OFF
Query Syntax	[SOURce:]CURRent:PROTection:STATe?
Returned Parameters:	0 | 1
Related Commands:	OUTP:PROT:DEL

CURRent:PROTection:DELay

This command sets the delay time between over current limit condition and the response to this condition. At the end of the delay, if the over current condition still exists, the response will depend on the protection state. If the protection state is on, the output voltage will fault to zero voltage. If the protection state is off, the output voltage will reduced to a value that maintains a constant current defined by the setting of the current limit. Use CURRent:PROT:DEL to prevent momentary current limit conditions caused by programmed output changes or load changes from tripping the overcurrent protection

Command Syntax:	[SOURce:]CURRent:PROTection:DELay
Parameters:	0 to 65
Unit:	seconds
*RST:	100ms
Examples	CURR:PROT:DEL 1.5
Query Syntax	CURR:PROT:DEL?
Returned Parameters:	<NR2>
Related Commands:	OUTP:PROT:STATE

CURRent:PROTection:TYPe

You can select the type of the limit.

Command Syntax:	[***SOURCE:***] ***CURRent: PROTection:DELay***
Parameters:	RMS|PEAK|SOF
*RST Value:	RMS
Examples	CURR:PROT:TYP RMS
Query Syntax	CURR:PROT:TYP?
Returned Parameters:	<NR2>
Related Commands:	OUTP:PROT:DEL

3.1.8. STATUS sub-system

STATus
:OPERation
:CONDition?
:ENABle <NR1>
:EVENt?
:QUEStionable
:CONDition?
:ENABle <NR1>
:EVENt?
:INSTrument
:ISUMmary
:CONDition?
:ENABle <NR1>
:EVENt?

STATus:OPERation:CONDition?

This query returns the value of the “Operation Status Condition Register” (OSC).

Query Syntax:	STATus:OPERation:CONDition?
Return parameter:	<NR1>
Example:	STAT:OPER:COND?

STATus:OPERation:ENABle

This command sets the value of the “Operation Status Enable Register” (OSEN).

Command Syntax:	STATus:OPERation:ENABle <NR1>
Parameter:	0 ÷ 32767

Example: STAT:OPER:ENAB 32

Query Syntax: STATus:OPERation:ENABle?
Return parameter: <NR1>

STATus:OPERation:EVENt?

This query returns the value of the “Operation Status Event Register” (OSEV) and then clears the register.

Query Syntax: STATus:OPERation:EVENt?
Example: STAT:OPER:EVEN?
Return parameter: <NR1>

STATus:QUEStionable:CONDition?

This query returns the value of the “Questionable Status Condition Register” (QSC).

Query Syntax: STATus:QUEStionable:CONDition?
Example: STAT:QUES:COND?
Return parameter: <NR1>

STATus:QUEStionable:ENABle

This command sets the value of the “Questionable Status Enable Register” (QSEN).

Command Syntax: STATus:QUEStionable:ENABle <NR1>
Parameter: 0 ÷ 32767
Example: STAT:QUES:ENAB 18

Query Syntax: STATus:QUEStionable:ENABle?
Parametro restituito: <NR1>

STATus:QUEStionable:EVENt?

This query returns the value of the “Questionable Status Event Register” (QSEV) and then clears the register.

Query Syntax: STATus:QUEStionable:EVENt?
Return parameter: <NR1>
Example: STAT:QUES:EVEN?

STATus:QUEStionable:INSTrument:ISUMmary:CONDition? ***Phase selectable***

This query returns the value of the “Instrument Summary Questionable Status Condition Register” (IxSQSC) for a specific output of XPS.

Query Syntax: STATus:QUEStionable:INSTrument:ISUMmary:CONDition?
Example: STAT:QUES:INST:ISUM:COND?
Return parameter: <NR1>

STATus:QUEStionable:INSTrument:ISUMmary:ENABle ***Phase selectable***

This command sets the value of the “Instrument Summary Questionable Status Enable Register” (IxSQSEN) for a specific output of XPS.

Command Syntax: STATus:QUEStionable:INSTrument:ISUMmary:ENABle <NR1>
Parameter: 0÷32767
Example: STAT:QUES:INST:ISUM:ENAB 18

Query Syntax: STATus:QUEStionable:INSTrument:ISUMmary:ENABle?
Return parameter: <NR1>

STATus:QUEStionable:INSTrument:ISUMmary:EVENt? ***Phase selectable***

This query returns the value of the “Instrument Summary Questionable Status Event Register” (IxSQSEV) and then clears the register.

Query Syntax: STATus:QUEStionable:INSTrumeny:ISUMmary:EVENt?
Return parameter: <NR1>
Example: STAT:QUES:INST:ISUM:EVEN?

3.2. Common Command Dictionary

Common commands begin with a “*” and consist of three letters and/or one “?” (query).

***CLS**

Clear Status.

This command clears the following registers:
1. All Event Registers (IxSQSEV, QSEV, OSEV, SESEV)
2. Status Byte Register (SB)
3. Error Queue

Command Syntax: *CLS
Parameter: None.

***ESE**

This command programs the Standard Event Status Enable Register (SESEN).

Command Syntax: *ESE <NR1>
Parameter: 0 ÷ 255
Reset value: 0
Example: *ESE 129

Query Syntax: *ESE?
Return parameter: <NR1> (Value of Standard Event Status Enable Register).

***IDN**

Returns the AC source identification string. It returns the data in four fields separated by commas (,).

Query Syntax: *IDN?
Return parameter: 0,<Model code>,0,<Firmware version>
Example: 0,0,0,001

Model Code	Model Name
0	Millennium series three phase
1	Compact series three phase
2	High power series three phase
6	New series
7	Compact series single phase

***RST**

Reset.

This command resets the AC source.

Command Syntax: *RST
Parameter: None

***SRE**

This command programs the Service Request Enable Register (SRE)

Command Syntax: *SRE <NR1>
Parameter: 0 ÷ 255
Example: *SRE 255

Query Syntax: *SRE?
Return parameter: <NR1>

***STB?**

Query the Status Byte Register (SB).

This query reads the Status Byte Register but does not clear it; returns MSS in bit 6.

Query Syntax: *STB?
Return parameter: <NR1>

***ESR?**

Query the Standard Event Status Event Register (SESEV) and then clears it.

Query Syntax: *ESR?
Return parameter: <NR1>

3.3. Status Registers

Status registers contain the operating condition of XPS at any time (see the following diagram).

3.3.1. Instrument Summary Questionable Status

Because the ac source could be three-phase, each phase is organized in a questionable group of registers that record information specific to each particular phase. These registers are called Instrument Summary Questionable Status Registers (IxSQSC).

Name	Instrument Summary Questionable Status Register (1 identical register for each phase)	Command	Description
IxSQSC *(x = 1, 2, 3)*	Condition	STAT:QUES:INST:ISUM:COND?	This is a read-only register which contains the real-time status of the circuits being monitored.
IxSQSEV *(x = 1, 2, 3)*	Event	STAT:QUES:INST:ISUM:EVEN?	This is a read-only register that latches any condition. It is identical to IxSQSC, but it is cleared when read.
IxSQSEN *(x = 1, 2, 3)*	Enable	STAT:QUES:INST:ISUM:ENAB <NR1>	This is a register that functions as a mask for enabling specific bits of the IxSQSC registers.

IxSQSC									
Bit position	11	10	9	5-8	4	3	2	1	0
Bit Name	INVERTER	UNDERVOLT	OVERVOLT	--	OVERTEMP	---	REMOTE	INV SEQ	INV COM

IxSQSC				
Bit position	15	14	13	12
Bit name	---	PE OVERVOLTAGE	ILIMIT	DV/DT

INV COM	Inverter communication problems
INV SEQ	Inverter sequence problems
REMOTE	Set when remote communication problems
OVERTEMP	Set when over temperature
OVERVOLT	Set when over voltage
UNDERVOLT	Set when under voltage
INVERTER	Set when inverter alarm
DV/DT	Set when dV/dT (rate of rise of output voltage) is too high
ILIMIT	Set when current limit alarm
PE OVERVOLTAGE	Set when there is an overvoltage in the PE

3.3.2. Questionable Status Registers

The Questionable Status Registers summarizes the IxSQSC and IxSQSEV registers.

Name	Questionable Status Register	Command	Description
QSC	Condition	STAT:QUES:COND?	This is a read-only register which is the logical OR of the enabled bit of the IxSQSC registers.
QSEV	Event	STAT:QUES:EVEN?	This is a read-only register that latches any condition. It is identical to QSC, but it is cleared when read.
QSEN	Enable	STAT:QUES:ENAB <NR1>	This is a register that functions as a mask for enabling specific bits from QSEV register.

QSEC			
Bit position	15-14	13	12-0
Bit name	---	INSTRUMENT SUMMARY	---

INSTRUMENT SUMMARY The logical OR of the enabled bits of IxSQSC

3.3.3. Operation Status Registers

The Operation Status Registers records signal that occurs during normal operation.

Name	Operation Status Register	Command	Description
OSC	Condition	STAT:OPER:COND?	This is a read-only register which contains the real-time status of the circuits being monitored.
OSEV	Event	STAT:OPER:EVEN?	This is a read-only register that latches any condition. It is identical to OSC, but it is cleared when read.
OSEN	Enable	STAT:OPER:ENAB <NR1>	This is a register that functions as a mask for enabling specific bits from OSEV.

OSC					
Bit position	15-9	10	9	8	7-0
Condition	---	BLOCKING ALARM	BUSY	RAMP IN PROGRESS	---

RAMP IN PROGRESS Set when a ramp is in progress.

BUSY Set when the power source receives a command before the execution of the previous command is completed.

BLOCKING ALARM Set when an alarm disables the XPS.

3.3.4. Standard Event Status Registers

This group consists of an Event Register and an Enable Register that are programmed by common commands.

Name	Standard Event Status Register	Command	Description
SESEV	Event	*ESR?	This is a read-only register that latches any condition. It is cleared when read.
SESEN	Enable	*ESE <NR1>	This is a register that functions as a mask for enabling specific bits from the SESEV register.

STANDARD EVENT STATUS EVENT REGISTER								
Bit position	7	6	5	4	3	2	1	0
Bit name	---	---	CME	EXE	DDE	---	---	---

DDE Device Dependent Error: set when error code is in the range [-399, -300]

EXE Execution Error: set when error code is in the range [-299, -200]

CME Command Error: set when error code is in the range [-199, -100]

3.3.5. Error Queue

The Error Queue is a First-In, First-Out buffer that stores errors as they occur. As it is read, each error is removed from the queue. When all errors have been read, the query returns “0, No Error”. If more errors are accumulated than the queue can hold, the last error queue is “-350, Queue Overflow”.

Status Byte Register

Name	Register	Command	Description
SB	Status Byte	*STB?	This register summarizes the information from all other status groups.
SRE	Service Request Enable	*SRE? *SRE <NR1>	This is a register that functions as a mask for enabling specific bits from the SB register (Bit MSS not affected)

SB						
Bit position	7	6	5	4	3	2-0
Bit name	OPER	MSS	ESB	MAV	QUES	---

QUES Questionable Status Summary

MAV Message Available.
It is set whenever the Error Queue holds one or more error.

ESB Standard Event Status Summary

MSS Master Status Summary
The MSS bit is a real-time summary of all Status Byte Register bits that are enabled by the Service
Request Enable Register.
Command *STB? Reads the data in the register but does not clear it; returns MSS in bit 6.

OPR Operation Status Summary

INSTRUMENT R SUMMARY QUESTIONABLE STATUS

CONDITION (I1SQSC)	EVENT (I1SQSEV)	ENABLE (I1SQSEN)
0. INV COM		
1. INV SEQ		
2. REMOTE		
3. Not used		
4. OVERTEMP		
5. Not used		
6. Not used		
7. Not used		
8. Not used		
9. OVERVOLT		
10. UNDERVOLT		
11. INVERTER		
12. DV		
13. ILIMIT		
14. PE OVERVOLT		
15. Not used		

INSTRUMENT S SUMMARY QUESTIONABLE STATUS

CONDITION (I2SQSC)	EVENT (I2SQSEV)	ENABLE (I2SQSEN)
0. INV COM		
1. INV SEQ		
2. REMOTE		
3. Not used		
4. OVERTEMP		
5. Not used		
6. Not used		
7. Not used		
8. Not used		
9. OVERVOLT		
10. UNDERVOLT		
11. INVERTER		
12. DV		
13. ILIMIT		
14. PE OVERVOLT		
15. Not used		

INSTRUMENT T SUMMARY QUESTIONABLE STATUS

CONDITION (I3SQSC)	EVENT (I3SQSEN)	ENABLE (I3SQSEN)
0. INV COM		
1. INV SEQ		
2. REMOTE		
3. Not used		
4. OVERTEMP		
5. Not used		
6. Not used		
7. Not used		
8. Not used		
9. OVERVOLT		
10. UNDERVOLT		
11. INVERTER		
12. DV		
13. ILIMIT		
14. PE OVERVOLT		
15. Not used		

ERROR QUEUE

OUTPUT MESSAGE 0
OUTPUT MESSAGE 1
OUTPUT MESSAGE 2
…
OUTPUT MESSAGE 7

Message available?

STATUS BYTE (SB)	SERVICE REQUEST ENABLE (SRE)
0. Not used	
1. Not used	
2. Not used	
3. QUES	
4. MAV	
5. ESB	
6. MSS	X
7. OPER	

*STB? *SRE *SRE?

QUESTIONABLE STATUS

CONDITION (QSC)	EVENT (QSEV)	ENABLE (QSEN)
0. Not used		
1. Not used		
2. Not used		
3. Not used		
4. Not used		
5. Not used		
6. Not used		
7. Not used		
8. Not used		
9. Not used		
10. Not used		
11. Not used		
12. Not used		
13. INSTR. SUM.		
14. Not used		
15. Not used		

QUES

OPERATION STATUS

CONDITION (OSC)	EVENT (OSEV)	ENABLE (OSEN)
0. Not used		
1. Not used		
2. Not used		
3. Not used		
4. Not used		
5. Not used		
6. Not used		
7. Not used		
8. RAMP IN PROGRESS		
9. BUSY		
10. BLOCKING ALARM		
11. Not used		
12. Not used		
13. Not used		
14. Not used		
15. Not used		

OPER

STANDARD EVENT STATUS

EVENT (SESEV)	ENABLE (SESEN)
0. Not used	
1. Not used	
2. Not used	
3. DDE	
4. EXE	
5. CME	
6. Not used	
7. Not used	

ESB

*ESR? *ESE *ESE?

4. ERROR MESSAGES

Error Number	Error String
0	No Error
-100	Command Error
-102	Syntax Error
-200	Execution Error
-220	Parameter Error
-350	Queue Overflow

Warning: after a command that changes the configuration of the XPS (local/remote, range high/low, 1-phase/3-phase), it is necessary to wait at least 10 s before sending another command, otherwise the machine may be busy when executing the second command and an error may occurs.

5. SCPI CONFORMANCE INFORMATION

5.1. SCPI Version

SCPI version 1999.0.

5.2. SCPI Confirmed Commands

SYSTem:ERRor?

INSTrument:SEL 1|2|3
INSTrument:SEL?
INSTrument:COUPle ALL|NONE
INSTrument:COUPle?

MEASure[:SCALar]:CURRent:AC?
MEASure[:SCALar]:CURRent[:DC]?
MEASure[:SCALar]:VOLTage:AC?
MEASure[:SCALar]:VOLTage[:DC]?

OUTPut[:STATe] 0|1
OUTPut[:STATe]?

[SOURce:]FREQuency[:IMMediate] <NR2>
[SOURce:]FREQuency[:IMMediate]?
[SOURce:]MODE AC|DC
[SOURce:]MODE?
[SOURce:]PHASe[:IMMediate] <NR2>
[SOURce:]PHASe[:IMMediate]?
[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]:AC <NR2>
[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]:AC?
[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude][:DC] <NR2>
[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude][:DC]?
[SOURce:]VOLTage:SENSe[:SOURce] INT|EXT
[SOURce:]VOLTage:SENSe[:SOURce]?
[SOURce:]VOLTage:SLEW[:IMMediate] <NR1>
[SOURce:]VOLTage:SLEW[:IMMediate]?
TRIGger:[SEQuence]:SOURce LINE|INT
TRIGger:[SEQuence]:SOURce?
STATus:OPERation:CONDition?
STATus:OPERation:ENABle <NR1>
STATus:OPERation:ENABle?
STATus:OPERation:EVENt?
STATus:QUEStionable:CONDition?
STATus:QUEStionable:ENABle <NR1>
STATus:QUEStionable:ENABle?
STATus:QUEStionable:EVENt?
STATus:QUEStionable:INSTrument:ISUMmary:CONDition?

STATus:QUEStionable:INSTrument:ISUMmary:ENABle <NR1>

STATus:QUEStionable:INSTrument:ISUMmary:ENABle?
STATus:QUEStionable:INSTrumeny:ISUMmary:EVENt?

*CLS

*ESE <parameter>
*ESE?

*IDN?

*RST

*SRE <parameter>
*SRE?

*STB?

*ESR?

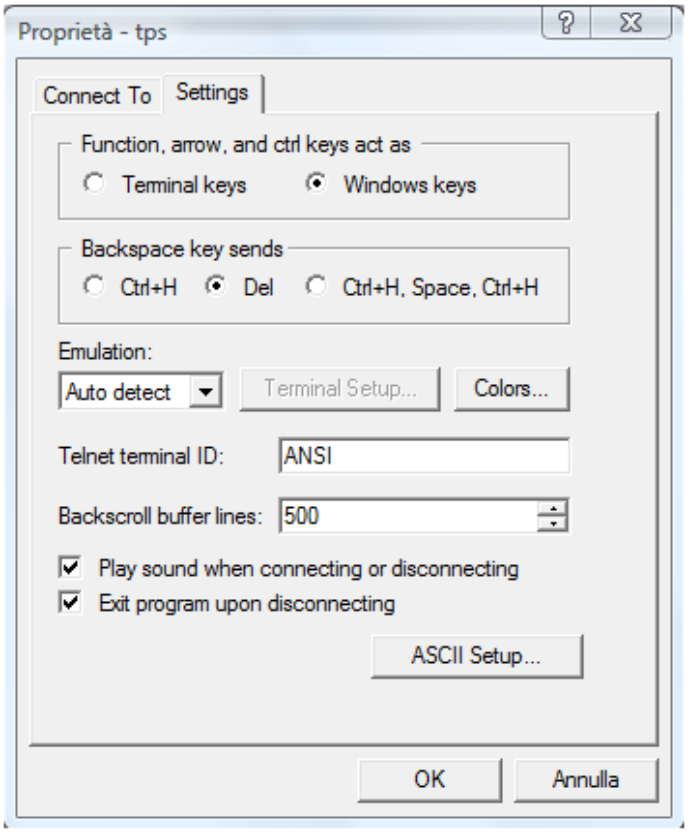
5.3. Non-SCPI Commands

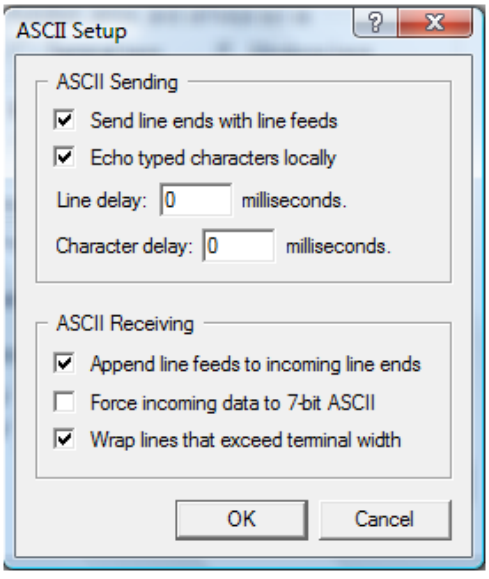
SYSTem:CONFigure:NOUTput
SYSTem:CONFigure:NOUTput?
SYSTem:LOCal
SYSTem:LOCal?
SYSTem:REMote
SYSTem:REMote?
SYSTem:OPTions?

[SOURce:]CURRent:INRush 0|1
[SOURce:]CURRent:INRush?
[SOURce:]FREQuency:RANGe 0|1|2|3
[SOURce:]FREQuency:RANGe?

6. HYPER TERMINAL CONFIGURATION

Configure Hyper Terminal as follows for use with XPS.
To enter a command, the ENTER key has to be pressed within 20 s from last character input, otherwise a timeout occurs and user has to type command followed by ENTER again.





7. REFERENCES

Number	Title	Version	Date	Author
1	Standard Commands for Programmable Instruments (SCPI)	1999.0	May-99	SCPI Consortium

8. 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.

00_	First Emission (UT001.19)	26/09/22	A.Ferro	A.Ferro	
Rev.	***Descrizione***	***Data***	***Autore***	***Verificato***	***Approvato***