Portable colour
graphic multimeters
ASYC IV

100,000 cts
MTX 3292 - MTX 3293
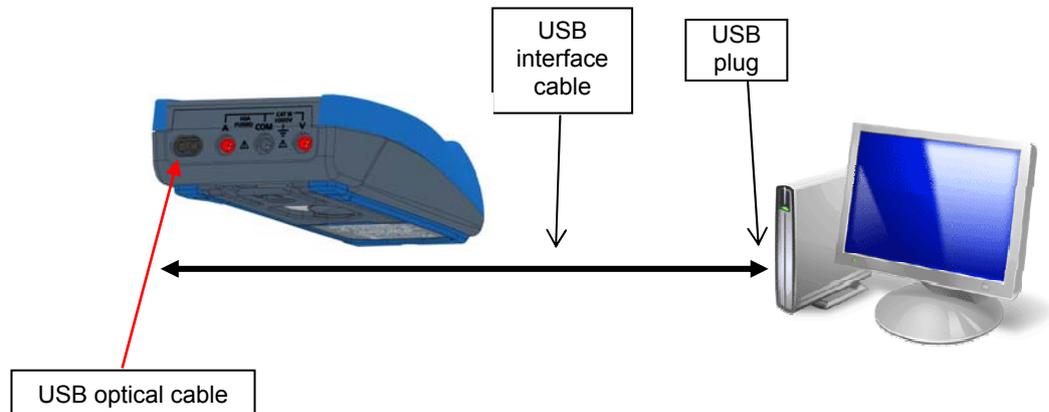
Remote programming

Pôle Test et Mesure CHAUVIN-ARNOUX

Remote programming

Connection of USB cable

The multimeter can be remotely programmed using a computer or PC with the programming kit.

1. Connect the USB cable at the rear panel to the USB input.

2. Connect the USB connector to one of the « USB » entries of the PC.

USB interface cable

USB plug

USB optical cable

Configuration

- Communication : 9600, 19200, 34800 baud
- 8 data bits,
- 1 stopbit,
- no parity,
- no flow control

Remote control

The programming instructions comply with standard IEEE488.2, protocol SCPI.

They provide the user with the possibility of checking the instrument remotely from simple standard controls.

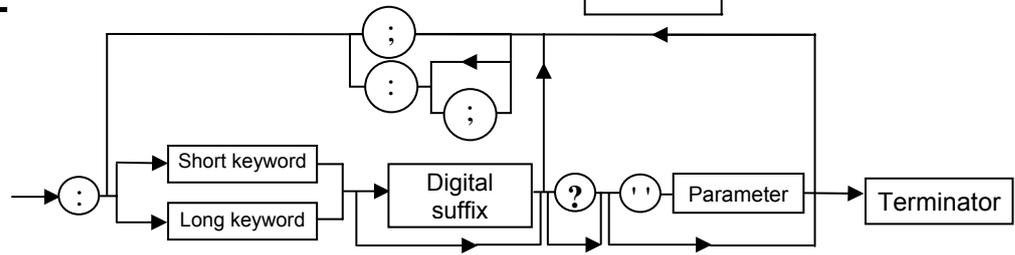Communication between a controller and a generator enables users to:

- Configure the instrument
- Perform measurements campaign
- Receive information (configuration)

Command syntax

<table>
<tr><td>***Common commands***</td><td></td></tr>
</table>
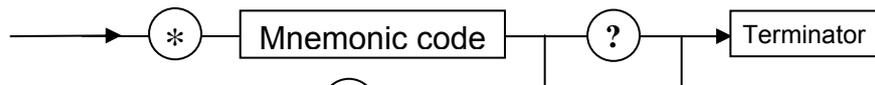
Common commands	
Specific commands	

Keywords The brackets ([ ]) are used to frame a keyword which is optional during programming; i.e. the instrument will execute the command whether the keyword is optional or not. Uppercase and lowercase are used to differentiate the short form of the keyword (uppercase letters) and the long form (whole word).

The instrument accepts the uppercase or lowercase letters without distinction.

✎ FUNC:SIN is equivalent to **SOURCE:FUNCTION:SHAPE SINUSOID**

Parameters The parameters, if any, are separated from the keyword by a space (' '). A command can accept parameters of a defined type, a literal expression or a combination of both.

The defined-type parameters are marked by the characters < >.

The brackets ([ ]) mean that the parameters are optional.

The vertical bar (|) may be read as an "or", it is used to separate the various possible parameters.

Separators The separator ' : ' descends in the next directory or returns under the root, if preceded by a ' ; '.

The separator ' ; ' separates two commands in the same directory or marks the end of a directory command, enabling a return to the root level by adding the separator ' ; '.

The separator ' ' (space) separates the keyword from the following parameter.

Terminators <T> used as a general term designating a terminator.

T is the character CR (ASCII code 13 or 0x0D) or the CR character followed by the LF character (ASCII code 10 or 0x0D)

A command line must not exceed 80 characters; it is ended by a terminator.

Programming Convention

Tree structure The command tree diagram includes all the commands specific to the instrument.

Common commands (standard IEEE 488.2) are listed separately, since they do not affect the position of the syntax analyzer in the tree.

When the terminator <NL> is sent to the instrument, the analyzer is positioned at root level.

When the analyzer is in a directory, both separators ' ;: ' are necessary to return to the root.

IEEE 488.2 common commands

Commands	Functions
*CLS	erases the event, status registers and the error list.
*ESE[?]	reads or sets the event authorization.
*ESR?	reads the event status register.
*IDN?	reads the identifier.
*OPC[?]	reads or sets the command synchronizing.
*RST	re-initializes the instrument.
*SRE[?]	reads or sets the authorization of service demand.
*STB?	reads the status byte.
*TST?	reads the autoset result.
*WAI	waits until all running commands have ended their execution

	Directory	Command	Function
Multimeter specific commands	CALCulate		
		:AVERage:AVERage?	reads the last average value stored in monitoring mode.
		:AVERage:CLEar	resets the minimum and maximum average values memorized in monitoring mode.
		:AVERage:DATE:MAX?	reads the date and time when the maximum has been stored in monitoring mode.
		:AVERage:DATE:MIN?	reads the date and time when the minimum has been stored in monitoring mode.
		:AVERage:DATE:START?	reads the date and time that the monitoring mode was started.
		:AVERage:DATE:STOP?	reads the date and time that the monitoring mode was stopped.
		:AVERage:MAX?	reads the last stored maximum value in monitoring mode.
		:AVERage:MIN?	reads the last stored minimum value in monitoring mode.
		:AVERage:Status[?]	reads or sets the status of the monitoring mode.
		:FUNCtion[?]	reads or sets the function of the secondary display.
		:FUNCtion:LIST?	reads the list of authorized functions of the secondary display.
		:MATH:MAFactor[?]	reads or sets the A coefficient of the mathematical function of the running measurement.
		:MATH:MBFactor[?]	reads or sets the B coefficient of the mathematical function of the running measurement.
		:MATH:MUNit[?]	reads or sets the unit of the mathematical function of the running measurement.
		:REFerence[?]	reads or sets the reference measurement.
		:REFerence:ABSDIFFerence?	reads relative value.
		:REFerence:RELDIFFerence?	reads the relative percentage value.
		:REFerence:Status[?]	reads or sets the status for the relative mode.
		:SPEC:DIGITs?	reads the value of the specification in digits for the running measurement.
		:SPEC:PERCent?	reads the value of the specification in percent for the running measurement.
		:SPEC:SMAX?	reads the value of the upper specification limit for the running measurement.
		:SPEC:SMIN?	reads the value of the lower specification limit for the running measurement.
		:SPEC:Status[?]	reads or sets the status for the specified mode.

Multimeter specific commands (cont'd)	DATA		
		:CATalog?	reads the list of stored measurement campaigns.
		:[DATA]:VALue?	reads the values stored in a measurement campaign.
		:DELete:ALL	erases all stored measurement campaigns.
		:DELete[:NAME]	clears a stored measurement campaign.
		:POINts[?]	reads or sets the size of the buffer memory of the device.
		:RATE[?]	reads or sets the logging interval.
		:STOre:Status[?]	reads or sets the status for the recording mode.
	DISPlay		
		:LUMInosity[?]	reads or sets the brightness of the display.
	HELP[?]		reads the list of commands.
	HCOPy		
		:DEVice:CMAP?	reads the color of the display.
		:SDUMp[:IMMediate?]	reads the contents of the bitmap of the display.
	INPut		
		:COUPling[?]	reads or sets the type of running coupling volt or ampere measurement.
		:IMPedance?	reads or sets the value of the input impedance.
	MEASure?		reads the measurement result without units.
	READ?		reads the measurement result with units.

	[SENSe:]		
Multimeter specific commands (cont'd)		CLAMP:CAMP1Ratio[?]	reads or sets the numerator of the ratio used in measuring amps on the clamp function.
		CLAMP:CAMP2Ratio[?]	reads or sets the denominator of the coefficient used in measuring amps on the clamp function.
		CLAMP:CUNit[?]	reads or sets the unit displayed in clamp measurement.
		CLAMP:CVOLT2Ratio[?]	reads or sets the numerator of the ratio used to measure volt in clamp function.
		CLAMP:CVOLT1Ratio[?]	reads or sets the denominator of the ratio used to measure volt-ampere in clamp function.
		CLAMP:MEASure[?]	reads or sets the measurement used in clamp function.
		CLAMP:Status[?]	reads or sets the activity status of the clamp mode.
		FILTer[:LPASs][:Status][?]	reads or sets the activity status of the meter filter.
		FREQuency:MODe[?]	reads or sets the measurement range of the frequency.
		FREQuency:THReshold:VOLTage:RANGe[?]	reads or sets the voltage range for frequency measurement.
		FUNCtion[?]	reads or sets the type of main measurem.
		HOLD:Status[?]	reads or sets the status of HOLD mode.
		MENU:DBM:IMPedance[?]	reads or sets the dBm impedance calculation.
		MENU:WATT:IMPedance[?]	reads or sets the calculation impedance of power measurement.
		RANGe:AUTO[?]	reads or sets the activity status of the multimeter autorange mode.
		RANGe:AUTO:PEAK[?]	reads or sets the status of the multimeter autoranging mode on peak values .
		RANGe[:UPPer] [?]	reads or selects the range of the main measurement.
		SECondary[?]	reads or sets the group of second. meas.
		TEMPerature:TRANsducer[?]	reads or sets the type of sensor used for measuring temperature.
	SYSTem		
		:BEEPer:Status[?]	reads/sets the activation status of the beeper.
		:COMMunicate:SERial[:RECeive]:BAUD[?]	reads or sets the communication speed of the serial link.
		:DATE[?]	reads or sets the date.
		:ERRor[:NEXT]?	reads the error number.
		:LANGuage[?]	reads or sets the language of the menus.
		:LOCal	sets the meter in local mode.
		:PROTocole	selects the MODBUS protocol.
		:TIME[?]	reads or sets the time.
		:VERSion?	reads the SCPI release.
	TRACe		
		:CATalog?	see DATA command: CATalog
		[:DATA]:VALue?	see DATA command: [DATA:] VALue?
		:DELete:ALL	see DATA command: DELete: ALL
		:DELete[NAME]	see DATA command: DELete [NAME]
		:POINts[?]	see DATA command: POINts [?]
		:RATE[?]	see command DATA: RATE [?]
		:STOre:Status[?]	see DATA command: STOre: Status [?]
	UNIT		
		:TEMPerature[?]	reads or sets the unit of meas. of temp.

Detailed description of commands

IEEE 488.2 common commands

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*CLS
(Clear Status)

(Command)

The ***CLS** command resets the event registries in all registry groups. It also resets the error queue.

Command syntax : *CLS

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*ESE[?]
(Standard Event Status Enable)

(Command/Query)

To the query ***ESE?**, the instrument returns the event validation registry value.

Query syntax : *ESE?

Response format :
<value><T>

The ***ESE** command sets the event validation registry.

Command syntax: *ESE <value>

<value>: decimal number between 0 and 255 which represents the event validation registry value.

---

*ESR?
(Standard Event Status Register)

(Query)

To the ***ESR?** question, the instrument returns the event status registry value.

Query syntax : *ESR?

Response format :
<value><T>

<value>: Decimal number between 0 and 255 which represents the event validation registry value.

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*IDN?
(Identification Number)

(Query)

To the ***IDN?** question, the instrument returns the type of instrument and the soft version.

Query syntax : *IDN?

Response format :
"model", HV < hard version >, FV < soft version ><T>

"model"	Instrument name (ex: "MTX 3292").
< hard version >	Version of the electronic board (a letter between 'A' and 'H'.
< soft version >	Embedded soft version such as x.xx (ex: 1.01).

OPC[?]	*(Command/Query)*
(Operation complete)	To the **OPC?** question, the instrument returns the value 1 once all pending commands have been executed.
	Query syntax : *OPC?
	Response format :
	<1><T>
	The **OPC** command places the message « Operation complete » (bit 0) in the standard event registry at the end of the running operation.
	Command syntax : *OPC
	<value>: Decimal number between 0 and 255 which represents the event validation registry value.

RST	*(Command)*
(Reset)	The **RST** command resets the instrument in the default factory status.

SRE[?]	*(Command/Query)*
(Service Request Enable)	To the **SRE?** question, the instrument returns the register value of the service request activation.
	Query syntax : *SRE?
	Response format :
	<value><T>
	The **SRE** command sets the service request activation registry.
	Command syntax : *SRE <value>
	<value>: Decimal number between 0 and 255 which represents the value of the service request activation register.

STB?	*(Query)*
(Read Status byte)	To the **STB?** question, the instrument returns the value of the status byte.
	Query syntax : *STB?
	Response format :
	<value><T>
	<value>: Decimal number between 0 and 255 which represents the value of the status byte.

TRG	*(Command)*
(Trigger)	The **TRG** command sends a trigger demand.
	Command syntax : *TRG

TST?	*(Query)*
(Self-Test)	To the **TST?** question, the instrument sends a full autoset procedure and returns the result.
	Query syntax : *TST?
	Response format :
	<value><T>
	<value>: 0 if successful, 1 if failed.

WAI	*(Command)*
(Wait-to-Continue)	The **WAI** command prevents the instrument from performing further commands as long as the current command has not been terminated.
	Command syntax : *WAI

Detailed description of commands	*Commands specific to the instrument*

CALCulate commands

:AVERage:AVERage?   *(Query)*

To the question **CALC:AVER:AVER?**, the instrument returns the average value last memorized in SURV mode.

Response format :   005.26 mV

:AVERage:CLEar   *(Command)*

The command **CALC:AVER:CLE** resets the minimum and maximum average values memorized in surveillance mode (the surveillance mode has to be activated).

:AVERage:DATE:MAX?   *(Query)*

To the question **CALC:AVER:DATE:MAX?**, the instrument returns the date and time when the maximum value has been memorized in surveillance mode.

Response format :   2014,08,24 3,23,49

:AVERage:DATE:MIN?   *(Query)*

To the question **CALC:AVER:DATE:MIN?**, the instrument returns the date and time when the minimum value has been memorized in surv. mode.

Response format :   2014,08,24 3,23,49

AVERage:DATE:STAR?   *(Query)*

To the question **CALC:AVER:DATE:START?**, the instrument returns the date and time when the surveillance mode has started.

Response format :   2014,08,24 3,23,49

AVERage:DATE:STOP?   *(Query)*

To the question **CALC:AVER:DATE:STOP?**, the instrument returns the date and time when the surveillance mode has stopped.

Response format :   2014,08,24 3,23,49

:AVERage:MAX?   *(Query)*

To the question **CALC:AVER:MAX?**, the instrument returns the last maximum value memorized in surveillance mode.

Response format :   005.47 mV

:AVERage:MIN?   *(Query)*

To the question **CALC:AVER:MIN?**, the instrument returns the last minimum value memorized in surveillance mode..

Response format :   005.18 mV

AVERage:Status[?]   *(Command/Query)*

The command **CALC:AVER:STAT <0|1|OFF|ON>,** activates or de-activates the surveillance mode.

Values are 0 or OFF to de-activate and 1 or ON to activate.

To the question **CALC:AVER:STAT?,** the instrument returns the activation status of the surveillance mode.

FUNCtion[?]	*(Command/Query)*

The command **CALC:FUNC <function>** sets the function of the secondary display.

To the question **CALC:FUNC?**, the instrument returns the function of the secondary display.

The authorized values of the parameter function <function> depend on the selected main measurement.

They can be identified using the command **CALC:FUNC:LIST?**

FUNCtion:LIST?	*(Query)*

To the question **CALC:FUNC:LIST?**, the instrument returns the list of functions authorized for the secondary display.

MATH:MAFactor[?]	*(Command/Query)*

The command **CALC:MATH:MAF <factor>** sets the A coefficient of the mathematical function of the running measurement.

To the question **CALC:MATH:MAF?**, the instrument returns the A coefficient of the mathematical function of the running measurement.

The <factor> parameter is a decimal numeric value between -9.9999^{e+99} and $+9.9999^{e+99}$.

MATH:MBFactor[?]	*(Command/Query)*

The command **CALC:MATH:MAF <factor>** sets the B coefficient of the mathematical function of the running measurement.

To the question **CALC:MATH:MAF?**, the instrument returns the B coefficient of the mathematical function of the running measurement.

The <factor> parameter is a decimal numeric value between -9.9999^{e+99} and $+9.9999^{e+99}$.

MATH:MUNit[?]	*(Command/Query)*

The command **CALC:MATH:MUN <unit>** sets the unit of the mathematical function of the running measurement.

To the question **CALC:MATH:MUN?**, the instrument returns sets the unit of the mathematical function of the running measurement.

The <unit> parameter is a chain of 3 characters maximum.

If the character chain is "OHM", the unit displays the symbol "Ω".

REFerence[?]	*(Command/Query)*

The command **CALC:REF <reference>** sets the reference of the relative measurement.

To the question **CALC:REF?**, the instrument returns the relative measurement reference.

The <reference> parameter is a decimal numeric value.

REFerence: ABSDIFFerence?	*(Query)*

To the question **CALC:REF:ABSDIFF?**, the instrument returns the relative value.

REFerence: RELDIFFerence?	*(Query)*

To the question **CALC:REF:RELDIFF?**, the instrument returns the percentage relative value.

REFerence:Status[?]	*(Command/Query)*

The command **CALC:REF:STAT <0|1|OFF|ON>,** activates or de-activates the relative mode.

The values are 0 or OFF to de-activate and 1 or ON to de-activate.

To the question **CALC:REF:STAT?,** the instrument returns the activation status of the relative mode.

SPEC:DIGITs?	*(Query)*

To the question **CALC:SPEC:DIGIT?**, the instrument returns the specification value in digit of the running measurement.

SPEC:PERCent?	*(Query)*

To the question **CALC:SPEC:PERC?**, the instrument returns the specification value in percentage of the running measurement.

SPEC:SMAX?	*(Query)*

To the question **CALC:SPEC:SMAX?**, the instrument returns the value of the upper limit of the specification for the running measurement.

SPEC:SMIN?	*(Query)*

To the question **CALC:SPEC:SMIN?**, the instrument returns the value of the lower limit of the specification for the running measurement.

SPEC:Status[?]	*(Command/Query)*

The command **CALC:SPEC:STAT <0|1|OFF|ON>,** activates or de-activates the specification mode.

The values are 0 or OFF to de-activate and 1 or ON to activate.

To the question **CALC:SPEC:STAT?,** the instrument returns the activation status of the specification mode.

Commands DATA

CATalog? *(Query)*

To the question **DATA:CAT?**, the instrument returns the list of the memorized measurement campaigns.

[DATA:]VALue? *(Query)*

To the question **DATA:VAL? <campaign>**, the instrument returns the values memorized in a measurement campaign.

The parameter <campaign> is a mnemonic representing the name of the measurement campaign.

Names of available measurement campaigns can be known using the **DATA:CAT?** command.

:DELete:ALL *(Command)*

The command **DATA:DEL:ALL** deletes all memorized measurement campaigns.

:DELete[:NAME] *(Command)*

The command **DATA:DEL <campaign>** deletes a memorized measurement campaign.

The parameter <campaign> is a mnemonic representing the name of the measurement campaign.

Names of available measurement campaigns can be known using the **DATA:CAT?** command.

POINts[?] *(Command/Query)*

The command **DATA:POIN <points>** sets the buffer size of the memorization unit.

To the question **DATA:POIN?**, the instrument returns the buffer size of the memorization unit.

The parameter <points> is an integer value.

RATE[?] *(Command/Query)*

The command **DATA:RATE <cadence>** sets the recording cadence.

To the question **DATA:RATE?**, the instrument returns the recording cadence.

The parameter <cadence> is a numerical value in second from 1000 and 86399000 representing a measurement interval from 1 second to 23 hours, 59 minutes and 59 seconds.

STOre:Status[?] *(Command/Query)*

The command **DATA:STO:STAT <0|1|OFF|ON>,** activates or de-activates the recording mode.

The values are 0 or OFF to de-activate and 1 or ON to activate.

To the question **DATA:STO:STAT?,** the instrument returns the activation status of the recording mode.

Commands DISPlay

LUMInosity

(Command/Query)

The command **DISP:LUMI <luminosity>** selects the brightness of the LCD display.

To the question **DISP:LUMI?**, the instrument returns the brightness of the LCD.

The parameter <luminosity> is a mnemonic code among following : ECO2, ECO, NORM, MAX.

Command HELP

(Query)

To the question **HELP?**, the instrument returns the directory list of SCPI command tree.

To the question **HELP[?] <"*" | "INPut" | "TRACe" | "CALCulate" | "MEASure" | "UNIT" | "DISPlay" | "SENSe" | "HELP" | "SYSTem" >**, the instrument returns the command list of the directory in parameter.

Commands HCOPy

DEVice:CMAP?

(Query)

To the question **HCOP:DEV:CMAP?**, the instrument returns the colors of the display in following format :

The first character is '#'.

The second character is the size of the next field which itself contains the number of binary bytes that are transmitted.

SDUMp[:IMMediate]?

(Query)

To the question **HCOP:SDUM?**, the instrument returns the content of the display bitmap.

The first character is '#'.

The second character is the size of the next field which itself contains the number of binary bytes that are transmitted.

Commands INPut

COUPling[?]

(Command/Query)

The command **INP:COUP <DC|AC|ACDC>** selects the coupling type of the running volt, amp or clamp measurement.

To the question **INP:COUP?**, the instrument returns the active coupling type.

IMPedance[?]

(Command/Query)

The command **INP:IMP <impedance>** selects the value of the input impedance.

To the question **INP:IMP?**, the instrument returns the value of the input impedance.

The parameter <impedance> is a numeric value which equals 1^{e+7} or 1^{e+9}.

Command MEASure?

(Query)

To the question **MEAS?**, the instrument returns the result of the running measurement, without units.

Response format :   2.7691e-01

Command READ?	*(Query)*
	To the question **READ?**, the instrument returns the result of the running measurement.
	Response format : +276.91 mVAC

Commands [SENSe:]

CLAMP:CAMP1Ratio[?] *(Command/Query)*

The command **CLAMP:CAMP1 <numerator>** selects the numerator of the ratio used in amp measurement in the clamp function.

To the question **CLAMP:CAMP1?**, the instrument returns the ratio numerator used in amp measurement in the clamp function.

The parameter <numerator> is a numeric decimal value from $+0.1^{e-6}$ to $+9999.0^{e+6}$.

CLAMP:CAMP2Ratio[?] *(Command/Query)*

The command **CLAMP:CAMP2 <denominator>** selects the denominator of the ratio used in amp measurement in the clamp function.
To the question **CLAMP:CAMP2?**, the instrument returns the denominator of the ratio used in amp measurement in the clamp function.

The parameter <numerator> is a numeric decimal value from $+0.1^{e-6}$ to $+9999.0^{e+6}$.

CLAMP:CUNit[?] *(Command/Query)*

The command **CLAMP:CUN <unit>** sets the unit of the clamp function.

To the question **CLAMP:CUN?**, the instrument returns the unit of the clamp function.

The parameter <unit> is a chain of 3 characters maximum.

If the character chain is "OHM", the unit displayed is the symbol "Ω".

CLAMP:CVOLT1Ratio[?] *(Command/Query)*

The command **CLAMP:CVOLT1 <numerator>** selects the numerator of the ratio used in volt measurement in clamp function.
To the question **CLAMP:CVOLT1?**, the instrument returns the numerator of the ratio used in volt measurement in the clamp function.

The parameter <numerator> is a numeric decimal value from +0 to $+9999.0^{e+6}$.

CLAMP:CVOLT2Ratio[?] *(Command/Query)*

The command **CLAMP:CVOLT2 <denominator>** selects the denominator of the ratio used in volt measurement in clamp function.

To the question **CLAMP:CVOLT2?**, the instrument returns the denominator of the ratio used in volt measurement in clamp function.

The parameter <numerator> is a numeric decimal value from +0 to $+9999.0^{e+6}$.

CLAMP:MEASure[?]	*(Command/Query)*
	The command **CLAMP:MEAS <measure>** selects the measure used by the clamp function.
	To the question **CLAMP:MEAS?**, the instrument returns the mesure used by the clamp function.
	The parameter <measure> is a chain of characters which is either "VOLTAGE", or "CURRENT".
CLAMP:Status[?]	*(Command/Query)*
	The command **CLAMP:STAT <0|1|OFF|ON>,** activates or de-activates the clamp function.
	The values are 0 or OFF to de-activate and 1 or ON to activate.
	To the question **CLAMP:STAT?,** the instrument returns the activation status of the clamp function.
FILTer[:LPASs][:Status][?]	*(Command/Query)*
	The command **FILT <0|1|OFF|ON>,** activates or inhibits the instrument filter.
	The values are 0 or OFF to de-activate and 1 or ON to activate.
	To the question **FILT?,** the instrument returns the filter activation status.
FREQuency:MODe[?]	*(Command/Query)*
	The command **FREQ:MOD <INF200KHZ|SUP200KHZ>,** selects the frequency measurement range.
	To the question **FREQ:MOD?,** the instrument returns used frequency measurement range.
FREQuency:THReshold: VOLTage:RANGe[?]	*(Command/Query)*
	The command **FREQ:THR:VOLT:RANG <range>,** selects the voltage range of the frequency measurement.
	To the question **FREQ:THR:VOLT:RANG?,** the instrument returns the voltage range used for the frequency measurement.
	The parameter <range> is a decimal numeric value which defines the range.
	If the parameter <range> has a negative value, the range change in frequency measurement is automatic.
FUNCtion[?]	*(Command/Query)*
	The command **FUNC <"VOLTage"	" CURRent "	" RESistance "	" FREQuency "	" CONTinuity "	" DIODe "	"50 ohm"	" CAPAcitor "	" TEMPerature "	"LOWZvoltage"	"DIODEZ"	"PREF">** selects the main measurement type.
	To the question **FUNC?,** the instrument returns the active main measurement type.

HOLD:Status[?]	*(Command/Query)*

The command **HOLD:STAT <OFF|ON|AUTO>,** sets the HOLD mode of the instrument.
To the question **HOLD:STAT?,** the instrument returns the HOLD mode status.

MENU:DBM:IMPedance[?]	*(Command/Query)*

The command **MENU:DBM:IMP <impedance>,** sets the calculation impedance of the dBm measurement.

To the question **MENU:DBM:IMP?**, the instrument returns the value of the selected calculation impedance for the dBm measurement.

The parametere <impedance> is an integer value from 1 to 10000.

MENU:WATT:IMPedance[?]	*(Command/Query)*

The command **MENU:WATT:IMP <impedance>,** sets the calculation impedance of the power measurement.

To the question **MENU:WATT:IMP?**, the instrument returns the value of the selected calculation impedance for the power measurement.

The parameter <impedance> is an integer value from 1 to 10000.

RANGe:AUTO[?]	*(Command/Query)*

The command **RANG:AUTO <0|1|OFF|ON>** activates or deactivates the autorange of the active main measurement.
The values are 0 or OFF to de-activate and 1 or ON to activate.
To the question **RANG:AUTO?**, the instrument returns the activation status of the autorange.

RANGe:AUTO:PEAK[?]	*(Command/Query)*

The command **RANG:AUTO:PEAK <0|1|OFF|ON>** activates or de-activates the autorange on peak values of the active main measurement.
The values are 0 or OFF to de-activate and 1 or ON to activate.
To the question **RANG:AUTO?**, the instrument returns the activation status of autoranging on peak values.

RANGe[:UPPER][?]	*(Command/Query)*

The command **RANG <range>** selects the range of the active main measurement.

To the question **RANG ?,** the instrument returns the number of the range of the active main measurement.

The parameter <range> is a numeric decimal value that defines the range.

SECondary[?]   *(Command/Query)*

The command **SEC <group>** selects the group of secondary measurement.

ATTENTION: All groups of secondary measurements are not valid for each primary measure.
If the selected group is not valid for the running main measurement, an error "-221, Settings conflict" is generated.

To the question **SEC?**, the instrument returns the group number of secondary measurement displayed.

The parameter <group> is an integer numeric value between 0 and 14 that corresponds to the group of secondary measurement described below:

0: No secondary measure, graph display.
1: Frequency, period, mathematical function.
2: Frequency, dB, mathematical function.
3: dBm, dBm reference, mathematical function.
4: Peak positive, negative peak, crest factor.
5: Power, reference power, mathematical function.
6: VA, current, mathematical function.
7: Period, positive duty cycle, mathematical function.
8: Period, negative duty cycle, mathematical function.
9: Positive pulse time, positive pulse counter, mathematical function.
10: Negative pulse time, negative pulse counter, mathematical function.
11: Mathematical function.
12: Frequency, period.
13: Period, positive duty cycle.
14: Period, negative duty cycle.

TEMPerature:TRANsducer[?]   *(Command/Query)*

The command **TEMP:TRAN <PT100|PT1000|TCJ|TCK>** selects the type of transducer used for the temperature measurement.

To the question **TEMP:TRAN?**, the instrument returns the type of transducer used for the temperature measurement.

Commands SYSTem

BEEPer:Status[?]   *(Command/Query)*

The command **SYST:BEEP:STAT <0|1|OFF|ON>,** activate or de-activate the beeper of the instrument.

The values are 0 or OFF to de-activate and 1 or ON to activate.

To the question **SYST:BEEP:STAT?**, the instrument returns the activation status of the beeper.

COMMunicate:SERial   *(Command/Query)*
[:RECeive]:BAUD[?]
The command **SYST:COMM:SER:BAUD <9600|19200|38400>,** selects the communication speed of the serial link device.

To the question **SYST:COMM:SER:BAUD?**, the instrument returns the communication speed of the serial link device.

DATE[?]   *(Command/Query)*

The command **SYST:DATE <year,month,day>,** sets the date.
To the question **SYST:DATE?**, the instrument returns the date.
The parameter <year> is an integer numeric value from 1 to 36.
The parameter <month> is an integer numeric value from 1 to 12.
The parameter <year> is an integer numeric value from 1 to 31.

ERRor[:NEXT]?   *(Query)*
To the **SYST:ERR?** question, the instrument returns the error number positioned at the top of the queue. The queue may have up to 10 numbers and it is managed according to the principle of first in, first out.

As the **SYST:ERR?** questions progress**,** the multimeter returns the error numbers in the order of their arrival, until the queue is empty.
Any additional **SYST:ERR?** question will cause a negative response:
"0,No error".
If the queue is full, the box located at the top of the queue takes the –350 value (queue saturated).

The queue is emptied :

- on powering on
- on receipt of a *CLS
- on reading the last error

Response format :   <error,message><T>
                with: error = integer negative or null.
                         message = corresponding error message

Error list   * Command errors : (-199 to –100)

They indicate that a syntax error has been detected by the syntax analyzer and caused event register bit 5, called CME, CoMmand Error, to be set to 1

-101	:	Invalid character
-103	:	Invalid separator
-104	:	Data type error
-108	:	Parameter not allowed
-109	:	Missing parameter
-111	:	Header separator error
-112	:	Program mnemonic too long
-113	:	Undefined header
-114	:	Header suffix out of range
-121	:	Invalid character in number
-128	:	Numeric data not allowed
-141	:	Invalid character data
-148	:	Character data not allowed
-151	:	Invalid string data
-154	:	String data too long

* Execution error : (-299 to –200)

They indicate that an error has been detected at the moment of command execution, and causes event register bit 4, called EXE, Execution Error, to be set to 1.

-200	:	Execution error
-203	:	Command protected
-221	:	Settings conflict
-222	:	Data out of range

* Instrument specific errors : (-399 to –300)

They indicate that an abnormal error has been detected during execution of a task, and causes event registry bit 3, called DDE, Device Dependent Error to be set to 1.

-300	:	Device specific error
-350	:	Queue overflow
-360	:	Communication error

* Query errors : (-499 to –400)

They indicate that an anomaly in the information exchange protocol has occurred and causes event register bit 2, called QYE, QuerY Error, to be set to 1.

-400	:	Query error

LANGuage[?] *(Command/Query)*

The command **SYST:LANG <ENG|FRE>,** selects the menu language.

To the question **SYST:LANG?**, the instrument returns the language of the used menu.

LOCal *(Command)*

The command **SYST:LOC**, sets the instrument in local mode.

Recall: the instrument switches to REMOTE mode when it receives a SCPI command other than **SYST:LOC**.

PROTocol *(Command)*

The command **SYST:PROT**, selects the protocol of MODBUS communication, the device will then any longer respond to SCPI queries.

TIME[?] *(Command/Query)*

The command **SYST:TIME <hour,minute,second>,** sets the time.
To the question **SYST:TIME**, the instrument returns the time.
The parameter <time> is an integer value from 0 to 23.
The parameter <minute> is an integer value from 0 to 59.
The parameter <second> is an integer value from 0 to 59.

VERSion? *(Query)*

To the question **SYST:VERS?**, the instrument returns the SCPI version it supports. Response includes the year and the revision index.

Response format :   <YYYY.V><T>
with Y = year and V = version.

Commands TRACe   TRACe commands are the same as DATA commands.

Command UNIT

TEMPerature[?] *(Command/Query)*

The command **UNIT:TEMP <C|F|K>**, selects the unit of the temperature measurement (Celsius, Farenheit, Kelvin).

To the question **UNIT:TEMP?**, the instrument returns the unit of the selected temperature unit (Celsius, Farenheit, Kelvin).

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