

Supplement to UPD Manual

The current UPD software version 3.09 has been upgraded to 3.10.
The modifications are described below.

Short Overview

GENERATOR Panel:

Previously ...	Now ...
... the generator frequency response of the sine and DFD signals, only, could be equalized.	... the equalizer can be switched on with sine burst , also. Manual operation see 2.5.4.1.3 Common Param. for SINE SINE BURST DFD MULTI RANDOM IEC/IEEE-bus commands see 3.10.1.5.3 SINE BURST
... the upper limit of the digital generator was 45.7% of the selected sampling rate f_s	... the upper frequency limit of the digital-generator can be increased to $f_s/2$ by the call parameter "-tdig .
...the worst case of in-phase superposition was taken as basis for the voltage input, thus allowing only a fraction of the available total voltage to be used for each single sine. The total level can be increased subsequently by means of post- amplifying the overall signal via the menu line "TOTAL GAIN" thus preventing any dynamic loss.	... the total voltage is provided for the level input of each single sine with the MULTISINE function Overranging is avoided by automatically reducing the post-amplification ("TOTAL GAIN").
... the setting of a new dwell value was not effective until modification of another sweep parameter.	... this error has been remedied.

ANALYZER Panel:

Previously ...	Now ...
... the rms mode GEN TRACK could not be selected, when the ARBITRARY function was switched on in the generator.	... it is possible to synchronize the rms integration time to an ARBITRARY signal selected in the generator. To this end, the rms mode GEN TRACK has been extended for ARBITRARY signals . The integration time of the rms measurement then corresponds to the length of the loaded ARBITRARY file such that each measurement comprises a complete period of the repeatedly output ARBITRARY signal.
... undefined, varying sampling rates were measured in the digital analyzer when no clock was applied. If the "Sample Frq" AUTO was selected, the analyzer was continuously initialized by these apparently modified sampling rates. The analyzer panel then had to be set up again and this rendered operation inconvenient.	... the measurement of the sampling rate includes a check whether a clock is applied and, if not, the result is rendered invalid ("press show I/O" message). If AUTO is selected as "Sample Frq", the sampling rate is not updated in the analyzer until a valid clock rate has been measured.
... the use of the user-definable filters and selection of the FFT was permitted by means of the call "-tthdn" for the THD+N measurement.	... the call parameter "-tthdn" has no function since the user-definable filters are available as a standard. A new call parameter "-tthdnwin" is provided, instead, for selection of the FFT window, only.
... operation of the monitoring option (e.g., volume) restarted the measurement.	... the measurement continues with operation of the speaker menu lines.
... THD+N measurement results on low frequency signals could appear unsettled in precision mode.	... this error has been remedied.
... measuring the impedance was not possible.	... a BASIC macro is provided in the USER directory IMPEDANC.BAS which graphically displays the frequency in relation to the impedance.

FILE-Panel:

Previously ...	Now ...
<p>... images in the PCX format which were generated by the UPD as hardcopy could be displayed on the UPD, however, they could not be output to a connected printer - subsequently.</p>	<p>... images in the PCX format (4-bit color depth) can be displayed on the UPD and printed out, if a printer is connected and "PRINTER/SPC" is set as "hardcopy destination" in the OPTIONS panel.</p> <p>As soon as a PCX image has been loaded under LOAD INSTRUMENT STATE, VIEW PCX mode, printing can be initiated by pressing the HCOPY key. Pressing any other key continues the measurement process.</p> <p>No IEC/IEEE bus command is available for this action..</p>
<p>... with loading an application setup the working dir entered there became effective, ie., the directory where this setup had been stored in</p> <p>This procedure is desired, if the application setup is loaded in order to change settings and, then, store the setups again at their original location.</p> <p>It is, however, disturbing for using this setup (subsequently), since the current "working dir" change with each loading of an application setup.</p>	<p>... the working dir is entered in the setup with loading the application setup; it, thus, does <i>not</i> change.</p> <p>This behaviour is optimal for <i>using</i> the application setup.</p> <p>For (once) <i>preconfiguring</i> the application setup and storing the setups at their original location with retaining the original working dir, there is a new call parameter "-tappl", which reactivates the previous behaviour.</p>
<p>... only sweep traces could be saved in the EXPORT format, apart from the REAL and ASCII formats, whereas traces of line charts and FFTs could not.</p> <p>Thus, these traces could only be read in other software (e.g., EXCEL) after manual revision (e.g., removal of additional information).</p>	<p>... FFTs and line charts can be saved in the EXPORT format, too</p> <p>EXPORT creates text files without additional information, which can be read and edited by any text editor (e.g., EDIT) or the EXCEL program. Data are provided in the displayed unit. Files can <i>not</i> be read by the UPL/UPD software.</p>

other:

Previously ...	Now ...
... the limit traces for limit-value check were correctly interpolated on the interpolation points on the x-axis with loading, the graphical display was, however, made without interpolation. Thus, measured values which were out of tolerance could be displayed inside the tolerance traces and vice versa.	... the limit traces are correctly interpolated for the graphical display, too

Remote control / Universal sequence control:

Previously ...	Now ...
... the IEC/IEEE-bus command "SYSTem:COMMunicate:GTL" was exclusively provided for remote switchover to LOCAL. This command can be issued via IEC/IEEE-bus as well as via the serial interface.	... the line message *GTL can be sent via the IEC/IEEE bus, alternatively. see section New or modified IEC/IEEE-bus commands
... the roll key had no function with the "Universal Sequence Control" (UPD-K2) or with macro operation.	... the roll key supplies the following information (in BASIC) with "Universal Sequence Control" selected: "cursor left" (with counterclockwise rotation) or "cursor right" (with clockwise rotation). This can be useful for the following functions: <ul style="list-style-type: none"> • Positioning of the cursor (left/right inside one line of a BASIC program). • within a running BASIC program via the INKEY function: rotation to the left (counterclockwise) supplies code 180, rotation to the right supplies code 182.
... the IEC/IEEE bus communication could be aborted with binary file transfer from the host computer to the UPD, if files of rather different lengths were transferred this error has been eliminated.
... the operating manual could be interpreted such that IEC-bus commands of any length could be processed	... the documentation explicitly hints at the maximum length of 240 characters . See section 3.5.3

Previously ...	Now...
<p>... the last note in the operator guidance line which was displayed prior to switchover to REMOTE was not deleted with remote control.</p>	<p>... the operator guidance line is deleted with switchover to remote control and the following note is displayed: "REMOTE; press LOCAL to return to manual operation". This note is deleted, when returning to LOCAL.</p>
<p>... the command DISP:ACT OFF issued <i>with remote control</i> causes the graphics displayed upon DISP:ACT ON was frozen.. It was not quite evident for the user whether the graphics was still valid or not.</p>	<p>... the command DISP:ACT OFF causes the graphics to be deleted when issued <i>with remote control</i>.</p> <p>Note: <i>Following DISP:ACT OFF the red REMOTE-box is no longer displayed in order not to reduce the speed. The REMOTE mode can, however, still be identified by the red REMOTE LED and from the operator guidance line..</i></p> <p>See Section "New or modified IEC/IEEE bus commands 3.10.8.7 Setting off the Displays.</p>

Detailed Description of Manual Operation

In the following, the new characteristics and functions are described in detail. These pages can be inserted into the manual. Alternatively, a new manual can be ordered under the Order Number 1030.7551.11 (German) or 1030.7551.12 (English).

1.4 Start Options of the UPD

This section addresses to the well-trained user. Basic knowledge of the MS-DOS operating system is assumed, thus allowing for additionally optimizing the UPD for special applications.

1.4.1 Restarting the UPD Software

The software is automatically started with switch-on of the UPD. Usually, a restart of the UPD software is not required, but it may be performed at any time. There are various possibilities:

1. If *no external keyboard is connected* the UPD must be switched off and on again using the power switch ("Coldboot"). Wait at least 10 seconds before switching the instrument on again in order to prevent the hard disk from being damaged.
2. If *an external keyboard is connected*, the UPD can be restarted using the key combination Ctrl + Alt + Del (or Strg + Alt + Entf) ("Warmboot"). This procedure is considerably faster.
3. The UPD software can be quit via the "SYSTEM" key (Ctrl F9 on the external keyboard). The UPD assumes the operating system level, then, the DOS prompt is "C:Pathname>", the path name indicating the current directory. Here, the UPD software can be restarted by entering "UPD" and pressing the ENTER key, which is even faster than the above-mentioned "Warmboot".

1.4.2 Starting Supplementary Programs

It may be desirable for certain applications to install supplementary programs on the UPD and start them with switch-on, prior to starting the UPD software. Such supplementary programs may be hardware drivers (e.g., mouse drivers, keyboard drivers for special external keyboards) but also batch files or programs tailored for special applications.

Usually, programs of this kind are entered in the AUTOEXEC.BAT file. This is, however, no suitable solution for the UPD, since the AUTOEXEC.BAT file is overwritten with each new installation of the software (e.g., with software update) as well as with calling the configuration program BOOTSET.

All additional applications should be called in a batch file USERKEYB.BAT which can be created and edited by a text editor like any other batch file. USERKEYB.BAT must be located in the UPD root directory (C:\UPD) where it is called while AUTOEXEC.BAT is being executed. USERKEYB.BAT is controlled exclusively by the user and is neither modified by the UPD software nor by the installation programs.

Similar to AUTOEXEC.BAT, USERKEYB.BAT is only executed once with (re-) start of the internal computer. Calling "UPD" from the operating system level (see 1.4.1.3) does *not* process the two batch files.

1.4.3 Command Line Parameters of the UPD Software

The (start) behaviour of the UPD can be individualized by means of command line parameters. Moreover, particular command line parameters, the so-called t-switches allow for configuration of the UPD for very special functions which are not documented in the manual.

If the UPD is called using an invalid command line parameter, a list of valid parameters is displayed and the program is aborted.

UPD**Manual Operation**

The command line parameters of the UPD are described in extracts in the following. Further parameters, particularly those beginning with "-t", should only be used if the function is known exactly, since the UPD deviates more or less from the usual and described functionality

The complete list containing all command line parameters is displayed in the UPD, when the UPD software is called using the "-t?" parameter.

Display settings:

Command parameter	line	Value	Description
-c			Colored display on LCD <i>and</i> external monitor
-m			Monochrome display on LCD <i>and</i> external monitor
-i			Monochrome display on LCD, only; external monitor is <i>not</i> addressed

Used setup:

Command parameter	line	Value	Description
-d			UPD always starts with the default setting
-sfilename.xxx			UPD always starts with the setting of the given "filename.xxx". "filename.xxx" must be a "complete" setup.

Configuration of the sequence control (BASIC options):

Command parameter	line	Value	Description
-bpx			Explicit data of the memory space of the BASIC program in Kbytes. Values permitted for x: 8 to 64, the standard setting is 32 or 64 kbytes depending on the selected configuration.
-bdx			Explicit data of the size of the BASIC data memory in kbytes. Permitted values for x: 4 to 64; the standard setting is 32 or 64 kbytes depending on the selected configuration
-bnfilename			BASIC program (macro), which is to be loaded and started automatically upon program start.
-r			Suppresses the operator's delay during the UPD start. Thus, the UPD starts up faster. This parameter is also recommended with remote control of the UPD.

Other:

Command parameter	line	Value	Description
-ax			Analyzer options:
		x=1	With switching off the analog channels, the outputs are switched to high impedance (high Z).
-ox			Parameter for compatibility with earlier software versions.
		x=1	Digital FS is <i>not</i> treated according to standard AES-17: a sine signal with the amplitude 1 FS makes an rms value of 0.7071 FS; a square-wave signal with the amplitude 1 FS makes an rms value of 1.0 FS.
		x=2	With S/N measurements the wanted signal is also measured using the selected filters.
		x=4	Waveform can be represented on a logarithmic scale.
		x=5	Modification of the roll key function in the operating panels. The roll key cannot be used for navigating in the panel, but opens the selection window at the cursor position in the panel, instead.

Hidden command line parameters:

Command parameter	line	Value	Description
-tsk			PCX images are printed using the softkeys.
-tlog			Activates logging of IEC/IEEE bus commands as BASIC commands. It is thus possible (with UPD-K2 option installed) to check which IEC/IEEE bus commands were sent from the host computer to the UPD.
-ttimo			Deactivates the timeout check with measurements.
-trest			Prevents the current measurement to be restarted with settings of generator frequency and level.
-tthdnwin			THD+N mesurement: window can be set for the FFT.
-tpanel			Automatically creates a text file of like name (TXT-file) with the contents of all panels when storing an "actual setup" (SAC- files).
-tquot			Permits the vertical line () instead of the inverted commas (') in IEC/IEEE bus commands.
-tappl			Causes the working dir of the application setup to remain unchanged even with loading from the application level, i.e., not to be overwritten by the current working dir thus facilitating the adaptation of the application setup with subsequent back-storing at the same location.
-tkeyb			Permits the connection of an external keyboard even after starting the UPD. Deactivates the so-called "virtual keyboard"; an external keyboard <i>must</i> be connected to enter letters.
-tsinad			SINAD/THDN measurement: the weighting filter influences the rms measurement result.

1.4.4 Immediate Effect of the Command Line Parameters with Start-up

If command line parameters are to be effective with each start of the UPD, it is desirable to enter them as fixed data. The method of writing them into the AUTOEXEC.BAT – as described in Section 1.4.2 is not a useful long-term solution

The USERKEYB.BAT is to be used preferably for this application, too. The dos UPDCFG can be defined in this file with the desired list of arguments, which is then transferred to the UPD program. The correct syntax is as follows:

```
set UPDCFG=list of arguments
```

the list of arguments containing all desired command line parameters - separated by space characters.

Example:

```
set UPDCFG==r -d
```

The UPD is always started in the default setting (-d) without waiting for any keystroke. (-r).

Note: *The generator is briefly stopped with change of function. The output signal is then set to 0 V or 0 FS.*

2.5.4.1.3 Equalization of the Signals SINE, SINE BURST, DFD, MULTISINE, RANDOM (modified header)

2.5.4.4 MULTISINE (Multisine)

Note:

- The generator is interrupted while calculating a new multi-tone signal. The output signal is definitely set to 0 V or 0 FS.

Volt No (i)

Entry of the sine amplitude i ($i = 1$ to 17)

Range of values: the total voltage V_{\max} reduced by the dc voltage is available for each of n single sines ($n =$ "No of sin", 1 to 17). To avoid overranging the (phase-optimized) overall signal may be reduced by reducing the post-amplification.

digital: (audio data or phase mode):

$$V_{\max} = 1 \text{ FS}$$

(jitter mode): $V_{\max} = 2.5 \text{ UI}$

(common mode): $V_{\max} = 7.071 V_{\text{rms}}$

analog: $V_{\max} = 12 V_{\text{rms}}$ for UNBAL

$V_{\max} = 24 V_{\text{rms}}$ for BAL

Caution: Voltage limitation of the rms value via menu item "Max Volt", see 2.5.2 Configuration of the Analog Generator, 2.5.3 Configuration of the Digital Generator.

Units:

digital (audio data or phase mode):

FS | %FS | dBFS | LSBs | bits | $\Delta\%$ | dBr

digital (jitter mode):

UI | %UI | dBUI | ppm | ns | UIr | dBr

analog and digital common mode:

V | mV | μV | V_{pp} | mV_{pp} | μV_{pp} | V/V_r |

dBu | dBV | dBr | dBm |

$\Delta\%V$ | ΔV | ΔmV | $\Delta\mu\text{V}$

peak-to-peak-amplitude (analog):

$$V_{\text{pp}} = V_{\text{rms}} \times 2 \times \sqrt{2};$$

Total Gain

Entry of a gain factor (in dB), which allows to vary the rms value resulting from superimposition of the individual voltages. To avoid overranging the permitted range of values is varied such that the resulting overall signal does not exceed the permitted (or possible) generator output level.

Unit: dB

2.5.4.5 SINE BURST

Sine alternating periodically between high and low level. Like the normal sine, the signal can optionally be equalized.

Equalizer

ON
OFF

see 2.5.4.1.3 Common Param. for SINE SINE BURST DFD MULTI
RANDOM

The sine voltage is equalized.

Equalizer is switched on. The menu "Equal. file" is activated,
i.e., the file indicated there is loaded.

output voltage is not influenced

Equal. file

(Equalizer file) only, if equalizer → ON
see 2.5.4.1.3 Common Param. for SINE SINE BURST DFD MULTI
RANDOM.

2.6.5.2 RMS (RMS Value incl. S/N)

Meas Time
AUTO FAST AUTO

(Measure Time)

The measuring time of the rms measurement is used for adaptation of the measuring speed to the signal frequency. Either a short measuring time or high accuracy assume priority as required by the measurement.

Automatic adaptation of the measuring time to the signal frequency with consideration of the signal period. The measuring time is adapted to the input signal as far as possible; with AUTO FAST, a maximum algorithmic error of 1% may occur, with AUTO it is 1‰. The measuring time is limited to 1 period corresponding to "Min Freq" with very weak signals.

Notes:

1. *In case of very noisy or distorted signals or with multi-tone signals, the automatic measuring modes - particularly AUTO FAST - cannot detect the signal period unambiguously. Such signals should therefore preferably be measured using GEN TRACK or - when using an external generator - in the VALUE mode in order to avoid measurement errors.*
2. *The minimum measuring time is optimized in order to enable measurement of the signals described under 1 by the automatic measurement modes without renouncing the high measuring speed: a short measuring time is only selected for the 1st measurement and only with POST-FFT switched off. The measuring time is increased to approx. 100 ms or the measuring time of the POST-FFT is increased with the other measurements in order to increase accuracy. Thus, the first triggered measurement result (e.g. with sweep) is always supplied very soon, whereas the subsequent measured values stand out for high accuracy.*

Meas Time

TRIGGERED

Special measuring mode, which performs an individual measurement (with selectable measuring time) as soon as the signal exceeds a trigger threshold (which can be selected, too). This mode, in conjunction with a burst generator signal allows for measurement of the *first period* of a signal.

Application: *Echo-free speaker measurements, measurement of short signal pulses.*

Notes:

1. *Single-channel measurement should be performed.*
2. *A specified voltage range should be set in the analog analyzer; response of the auto-ranger would delay the beginning of the measurement.*
3. *Selection of filters, post-FFT or settling is not possible*
4. *Triggering of the level threshold can also be selected via "START CONDition LEV TRG CH1/2". **Any** measurement function (e.g. "WAVEFORM") can thus be triggered. The measurement mode which is described here applies, however, only for rms measurements which can begin **without delay**.*

GEN TRACK

Measurement over (at least) 1 whole period of the generator signal; if necessary, the generator frequency is adapted to the sampling rate of the analyzer. With high frequencies, the measuring time is extended such that it comprises several periods in order to increase the measuring accuracy.

This measurement mode is particularly suited for very noisy or distorted signals and for extremely fast sweeps.

The period length is calculated from the signal frequency set in the generator panel; therefore, this measurement mode should only be used with the UPD *universal* generator

Notes:

1. *If the MODDIST signal is used as generator signal, the measuring time is referred to the 'LOWER Frequency' normally dominating.*
2. *If the ARBITRARY signal is used, the measuring time is synchronized to the number of samples in the loaded file. Thus, the measurement is always performed across a complete period of the (repeatedly output) ARB signal.*
3. *Small frequency offsets may occur when using the low-distortion generator, which may lead to inaccurate measurements with fixed coupling to the measuring time to the rated frequency. Select the measuring speed AUTO in such cases.*

2.6.5.7 THD+N/SINAD Measurement (Distortion + Noise)

Window

fixed to RIFE VINC 2 (analog) or RIVE VINC 3 (digital)

Note: *For special applications the FFT window may be selected arbitrarily with the THD+N measurement using the command line parameter "-tthdnwin" ; the "-tthdn" parameter which can be used up to software version 3.09 has no function any more with 3.10.*

2.9.1.1 Loading and Storing Instrument Setups and Complete Setups

Setups are loaded and stored by entering a file name under menu item "Filename". If the desired file name is already in the menu line you simply have to open and close the appertaining selection box (see 2.3.1 Panels)

LOAD INSTRUMENT STATE Loading an instrument setup

An instrument state can be loaded either user-specific or application-specific. The untrained user is advised to start with the application level which provides a large number of predefined measurement setups. The default setup or user-defined setups can only be loaded via USER DEF.

The working directory of the setup is loaded together with the instrument setup, i.e., the current working directory is modified. This is usually useful in order for the file names in the setup to be referred to correctly (if they were stored without path name).

When loading a setup from the application level the *current* working directory is entered in the application setup and, thus, remains valid. It is therefore easier to *use* the application setups. (Pathless) file names are not used in the application setups.

The working directory entered in the application setup will, however, preferably *not be overwritten* for preconfiguring the application setups (once) when the setups are to be stored at their original location and the original working directory is to be retained. This can be achieved using two methods:

- Do not load the application setups from the application level but directly via USER DEF.
- Start the UPD using the **command line parameter "-tappi"**; the application setups will not be modified even when being loaded from the application level, then.

Mode	
DEFAULT	<p>(only available, when 'Applicat USER DEF' was selected) Defines. what is to be loaded or monitored</p> <p>(Default setup) Rohde&Schwarz <i>default</i> setup (see 3.5) is to be loaded. This includes all presently inactive functions and instruments. A change of this setup is not recommended but possible by overwriting the DEFAULT.SET file with a setup stored under COMPL SETUP mode.</p>
COMPLETE	<p>(Complete Setup)</p> <p>The complete instrument setup is to be loaded. This includes all presently inactive functions and instruments as well as the comments that can be entered for a hardcopy (see 2.14). Under this item only complete setups (with any file extension, for instance *.SET) can be loaded.</p>
ACTUAL	<p>(Actual Setup)</p> <p>The <i>actual</i> instrument setup (with or without measured values or traces) is to be loaded. Loading a current setup does <i>not</i> affect inactive instruments and functions. Under this item only actual setups and actual+data setups (with any file extension) can be loaded. The latter contain in addition measured values and traces and therefore require a longer total loading time especially when the traces are to be displayed.</p>
SETUP	<p>The <i>actual</i> instrument setup (with or without measured values or traces) is to be loaded. Loading a current setup does <i>not</i> affect inactive instruments and functions. Under this item only actual setups and actual+data setups (with any file extension) can be loaded. The latter contain in addition measured values and traces and therefore require a longer total loading time especially when the traces are to be displayed.</p>
VIEW PCX	<p>This item allows to display and print (4-bit) PCX images at a 1:1 scale. PCX files recorded in the UPD can thus be subsequently displayed on the UPD and printed. The PCX image is displayed until any key is pressed. The PCX image can be output to a connected printer by pressing the HCOPY key, if PRINTER/SPC is set under Hardcopy Destination in the OPTIONS panel.</p>

Note: *The PCX pictures do not contain softkeys. The current (unlabelled) softkeys are therefore displayed.*

Measuring

(available only when Applicat USER DEF is *not* selected). Opens a dialog box where the measurements pertaining to the selected application are listed in alphabetical order. The name of the (SAC) file loaded when a measurement is selected is indicated in addition. From this information the experienced user can see the files to be modified to suit his specific requirements.

When loading a setup from the application level the *current* working directory is entered in the application setup and, thus, remains valid. It is therefore easier to *use* the application setups.

Refer to the notes at the beginning of this section for modification of the application setups.

New or modified IEC/IEEE-bus commands

3.5.3 Structure of a Command Line

The UPD can process IEC/IEEE-bus commands containing up to 240 characters. If this length is exceeded, an error message is output.

A command line may require more than one line on the screen of the controller, since the end of the command line is defined by the end character, only

⋮

Sequencing of commands:

Commands may be lined up unless they exceed 240 characters in length.

Several commands in one command line are separated by a semicolon ";". If the next command belongs to another command system (e.g., SOUR:... and SYST:...), the semicolon is subceded by a colon ":".

⋮

New or modified commands are printed in bold-type letters in the following command lists and additionally identified by the hint <new>

3.10.1.5.3 SINE BURST

Command	Parameter	Basic unit	Meaning	Section
SOURce:FUNCtion [:SHAPE]	<i>BURSt</i>		→ Sine burst	2.5.4.5 GEN panel FUNCTION → SINE BURST
SOURce:VOLTage[:LEVel AMPLitude]:OFFSet:STATe	OFF ON		DC offset permitting a DC voltage to be superimposed at the generator output. → Hardly any DC voltage at the output → DC voltage can be set with the next command. <i>Note:</i> <i>This setting cannot be made in the analog generator when a low-distortion generator is used.</i>	2.5.4.1.1 GEN panel DC Offset → OFF → ON
SOURce:VOLTage[:LEVel AMPLitude]:OFFSet	<n> -5 V to 5 V -10 V to 10 V -1FS to 1FS	V FS	DC amplitude Analog instrument (OUTP:TYPE UNB) Analog instrument (OUTP:TYPE BAL) Digital instrument	2.5.4.1.1 GEN panel DC Offset
SOURce:VOLTage:EQUalize:STATe <new>	ON OFF		Equalization of the sine voltage of the bursted sinewave → Equalizer on → Equalizer off	2.5.4.1.1 GEN-Panel Equalizer → ON → OFF
MMEMory:LOAD:LIST <new>	EQUalize, 'filename' Query form: MMEM:LOAD:LIST? EQU		File containing eqlizer data	2.5.4.1.1 GEN-Panel Equal.File

Command	Parameter	Basic unit	Meaning	Section
SOURce:SWEep ...			For sweep commands see 3.10.1.4 Generator Sweeps	
SOURce:FREQUency[:CW FIXed]	<nu> Voltage range determined by instrument or function	Hz	Sine frequency Can be used as sweep parameter	2.5.4.5 GEN panel FREQUENCY
SOURce:VOLTage[:LEVel AMPLitude]	<nu> 0 to 12 V 0 to 24 V 0 to 1 FS	V FS	Burst amplitude (amplitude during HIGH phase of signal) Can be used as sweep parameter Analog instrument (OUTPUP:TYPE UNB) Analog instrument(OUTP:TYPE BAL) Digital instrument Is voltage-limited by SOUR:VOLT:LIM see 3.10.1.2 and 3.10.1.3	2.5.4.5 GEN panel VOLTAGE
SOURce:VOLTage:LOWLevel	<nu> 0 to SOUR:VOLT	V %on FS %on	Amplitude during LOW phase of signal Analog instrument Digital instrument	2.5.4.5 GEN panel Low Level
SOURce:ONTime[:CW FIXed]	<nu> 0 to 60 s Value range determined by instrument or function	s, cyc	Burst time Can be used as sweep parameter	2.5.4.5 GEN panel ON TIME
SOURce:INTerval[:CW FIXed]	<nu> Value range determined by instrument or function	s	Interval time Can be used as sweep parameter	2.5.4.5 GEN panel INTERVAL
SOURce:ONTime:DELay	<nu> 0 to 60 s		Sets a start delay for SINE BURST and SINE2 BURST.	2.5.4.5 2.5.4.6 GEN panel BurstOnDel

3.10.8.6 Parameters of COM2 Interface

Command	Parameter	Basic unit	Meaning	Section
SYSTem:COMMunication:GTL			Return to manual operation. This command is only required in the case of remote-control via the RS-232 interface but can also be used for IEC/IEEE-bus operation and Universal Sequence Controller UPD-K2.	LACAL keystroke

3.10.8.8 Display Settings

Command	Parameter	Basic unit	Meaning	Section
DISPlay:ACTualize	ON OFF		This command may be called from Universal Autorun Control UPD-K1 or via the IEC/IEEE bus or by means of RS232 remote control. → Updates the graphics panel and repeats the update every time commands are output which change the graphics display in the UPD, eg DISPlay[:WINDow]:TRACe[]:X[:SCALE]:AUTO ON. → The graphics panel is not updated not even after commands changing the graphics display in the UPD. Note: <i>To enhance speed, it is best to turn off the graphic when the remote-control mode is selected. Graphics should only be activated when traces are to be displayed.</i>	No manual control