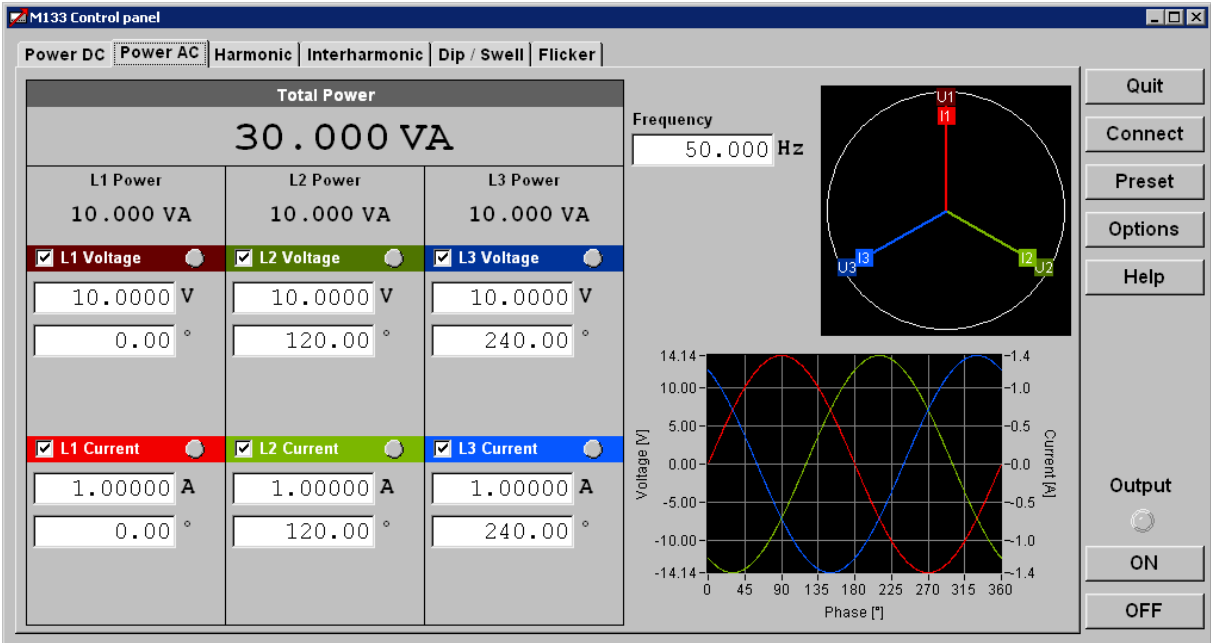


M133 Control panel

User's manual



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1. Basic informations

1.1. Introduction

„M133 Control panel“ software is intended for the remote control and configuration of power calibrators M133 and M133C. Program is intended for operating systems Windows XP/Vista/7.

Program can display graphs of harmonic signals and modulations. Calibrator's setting can be “saved/recalled” to/from the PC.

Program is freeware and can be downloaded from www.meatest.com.

1.2. System requirements

There are minimum hardware and software requirements that must be satisfied to ensure that the software functions properly. You must have:

- Personal computer Pentium 800 MHz or better, monitor XGA, RAM 512 MB.
- Operating system MS Windows XP/Vista/7.
- Program “M133 Control panel”
- RS232 or GPIB interface including appropriate cable

2. Program „M133 Control panel“

„M133 Control panel“ software is intended for the remote control and configuration of power calibrators M133 and M133C. Program can automatically recognize type of connected calibrator. Control panel can be operated with or without connected device. If the device is not connected Control panel allows parameters setting for all three voltage and current channels. After connecting the calibrator (Connect button in the main window) program automatically detects the number of channels and allows control of existing channels only.

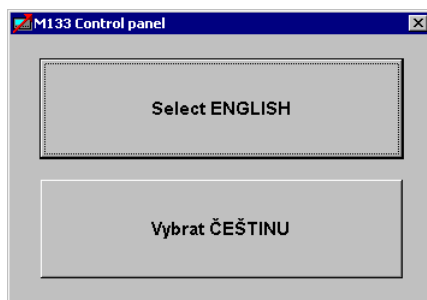
2.1. Installation information

2.1.1. Installation

Start installation from the CD ROM or start “Setup.exe” file from the installation package. Installation creates shortcut in the folder Program files.

2.1.2. Program initialization

Program requires selection of language after first start. The language can be changed also later from the menu “Options”. Available languages are English and Czech.



2.1.3. Uninstall „M133 Control panel“

The program can be removed from the computer through the Windows Control Panel or direct using the shortcut “Start->Programs->M133CP->Uninstall M133CP” from the menu Start.

2.2. Starting with „M133 Control panel“

Main program window consists of two basic parts:

1. **Button bar** – is located on the right side. It contains buttons for global program setting.
2. **Function pages** – main area for functions selection and for settings instrument's parameters.

2.3. Button bar

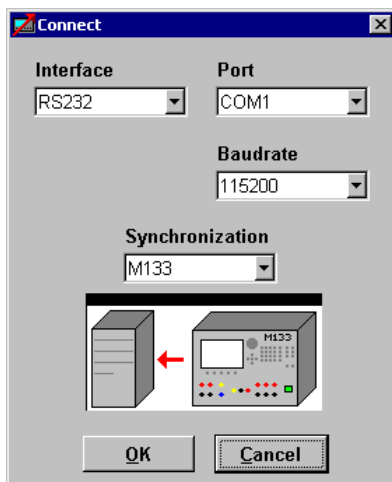
Button bar is common for all instrument's operation modes. There are buttons for settings communication parameters (Connect), global parameters (Options), save / recall (Preset) and Output On / Off. There is also located the Help button.

2.3.1. „Quit“ button

Quit button finishes the program. All setting will be saved.

2.3.2. „Connect/Disconnect“ button

Connect button opens window for connecting the instrument. There is green frame around the button if the calibrator is successfully connected.



Interface – type of communication bus:

- GPIB* communication via GPIB bus
- RS232* communication via RS232 bus

Port – number of COM port (only for RS232 bus)

Baudrate – transfer speed in Bd (only for RS232 bus)

Address – GPIB address (only for GPIB bus)

Synchronization – synchronization between instrument and PC after connection:

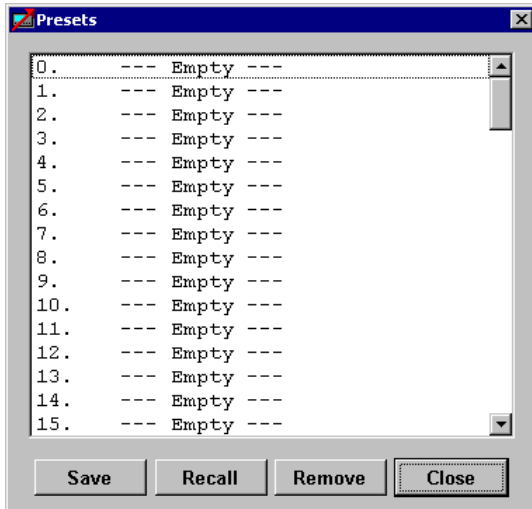
- Reset* program and calibrator will be set to default startup state (RESET)
(fastest connection)
- M133* actual setting of the calibrator will be read into the program
- PC* calibrator will be set according to the actual program setting

OK – program opens communication between PC and calibrator according to selected parameters and synchronizes setting between PC and calibrator.

Cancel – closes panel and discards changes

2.3.3. „Presets“ button

Presets button opens window for profiles management. Every profile contains all instruments setting that are available in the program. Profiles are stored in the computer. Maximum capacity is 100 profiles. Unused profiles are displayed as „--- Empty ---“.



Save – actual parameters are stored into selected profile. There must be defined the name of the profile in case of empty profile.

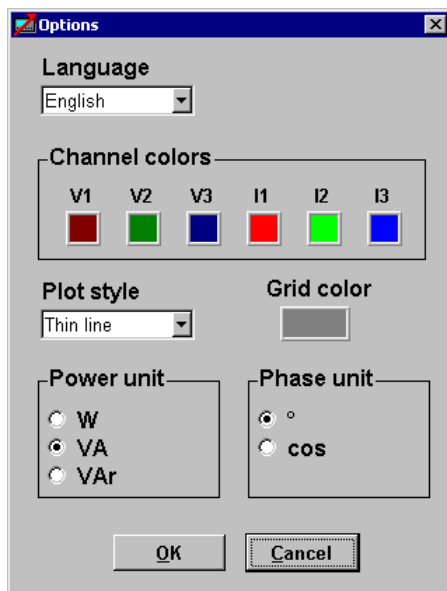
Recall – reads parameters from selected profile and writes them into the instrument (if connected).

Remove –removes profile from the list.

Close – closes panel.

2.3.4. „Options“ button

Options button opens window for global program settings



Language - language selection. Language will be used throughout the program. Options are:

English English language
Czech Czech language

Channel colors – definition of colors used for voltage and current channels. U1, U2, U3 are voltage channels, I1, I2, I3 are current channels. Color can be changed after pushing the right mouse button over the color field.

Plot style – definition of the lines thickness:

Thin line 1 pixel

Fat line 3 pixels

Grid color – definition of color used for grid in the graph.

Power unit – definition of unit used for power in the software. This setting doesn't have any influence to the unit used for power in the calibrator.

Phase unit - definition of unit used for phase shift in the software. This setting doesn't have any influence to the unit used for phase shift in the calibrator.

OK – closes panel and saves changes.

Cancel – closes panel and discards changes.

2.3.5., „Help“ button

Help button displays program help. The help is displayed also after pressing F1 key.

2.3.6. Output

Output button connects (disconnects) calibrator's output terminals.

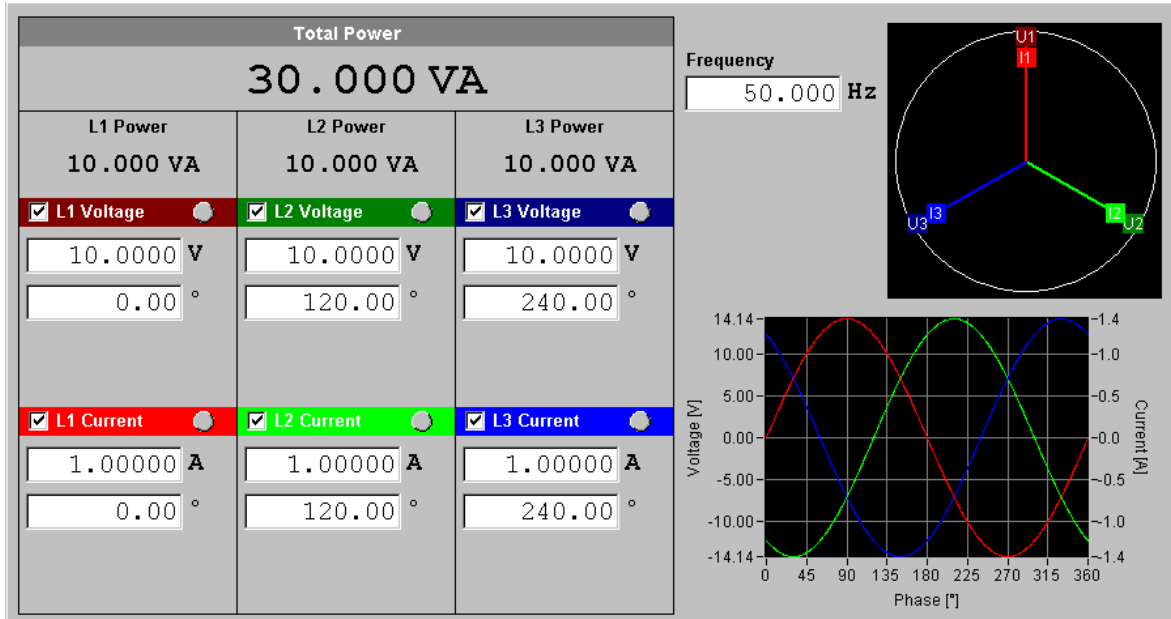
Output – green color indicates connected output terminals.

ON – connects the output terminals.

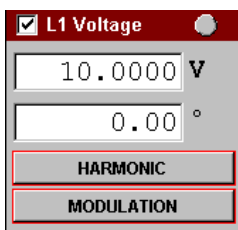
OFF - disconnects the output terminals.

2.4. Function pages

Function pages are organized as bookmarks with selected calibrator's functions. Functions are selected by the left mouse button. Every bookmark contains parameters of selected function. If the calibrator is connected selected function is activated also in the calibrator. All bookmarks have similar design.



There are displayed channels of the calibrator in the left side - L1, L2, L3. Power is displayed independent for each channel and also as Total power. Each channel contains parameters of voltage and current outputs:

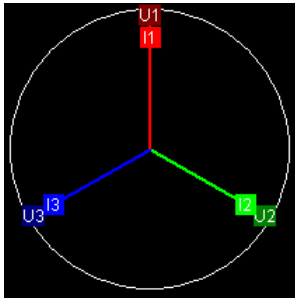


Head line of the output contains name of the output („L1 Voltage“), check box that enables (disables) this output and green (grey) indication of connected channel. Below the head line are located fields for amplitude and phase shift of the output signal. Phase shift displayed in degrees means phase shift between selected output and the internal reference signal. Phase shift displayed as power factor (available only for current outputs) means

power factor for selected voltage/current channel. Below the amplitude field can be fields for additional settings (depends of selected function). Red frame around these additional parameters button means that parameters were changed.

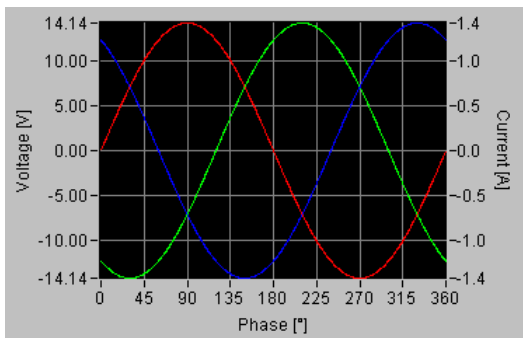
Note: Phase unit for current channels can be changed after pressing Options button.

Note: Color of channels can be changed after pressing Options button.



In the upper right corner is displayed vector diagram. There are displayed or current (I1, I2, I3) and voltage (U1, U2, U3) outputs. North pointing vector (position on the twelve o'clock) shows angle 0° . South pointing vector (position on the six o'clock) shows angle 180° . The picture shows outputs I1, U1 (angle 0°), outputs I2, U2 (angle 120°) and outputs I3, U3 (angle 240°).

Below the vector diagram is displayed waveform window.



Waveform window displays amplitude, shape and phase shift for each output. Waveform window doesn't display modulation nor interharmonic components. Window displays one period of generated signal.

Note: Thickness and color can be changed after pressing Options button.

2.4.1. Power DC mode

Bookmark Power DC selects the PDC extended calibrator's mode and enables to set individual parameters of this function mode.

2.4.2. Power AC mode

Bookmark Power AC selects the PAC extended calibrator's mode and enables to set individual parameters of this function mode. There is located an additional field:

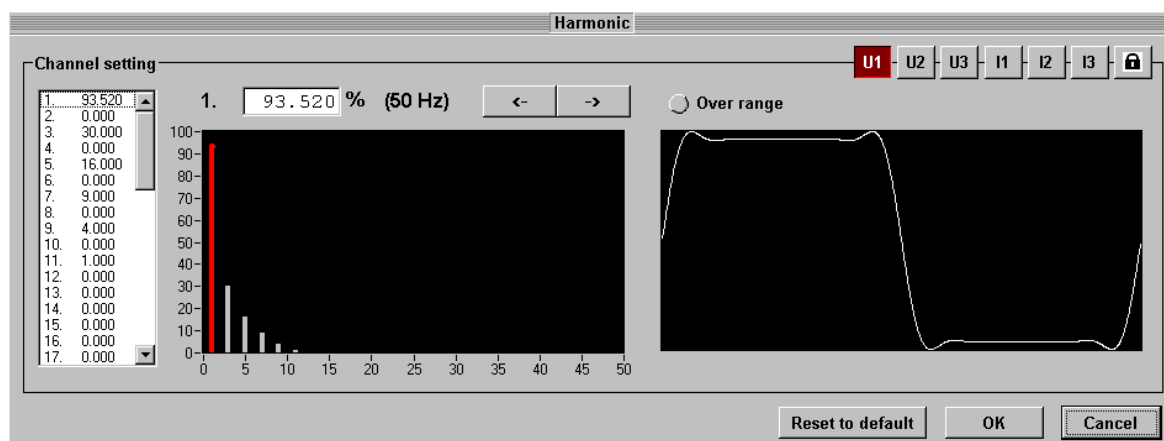
Frequency [Hz] – frequency of fundamental harmonic signal

2.4.3. Harmonic mode

Bookmark harmonic mode selects the P Harmonic calibrator's mode and enables to set individual parameters of this function mode. There are located additional fields:

Frequency [Hz] – frequency of fundamental harmonic signal

HARMONIC – button for entering the harmonic window:



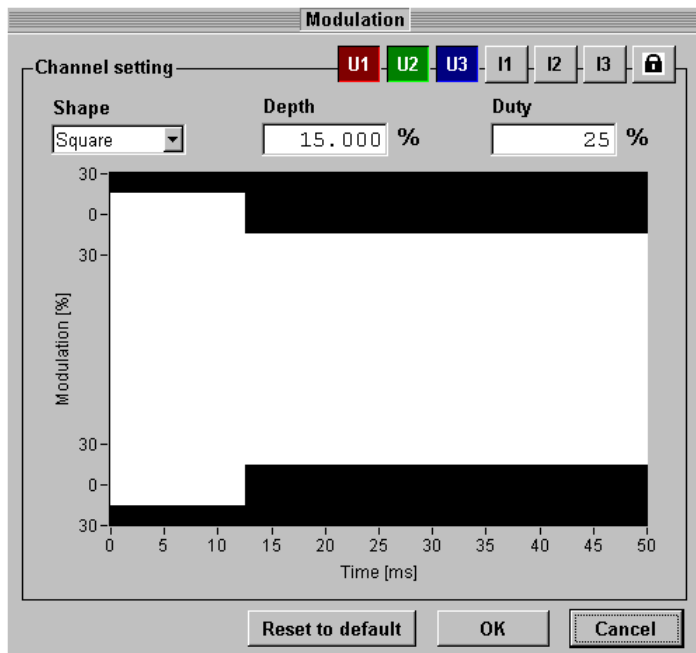
There is selection of calibrator's outputs in the upper right corner. Only selected output will be changed. Button "Lock" allows selecting more outputs. It is possible to select one channel, but it is also possible to combine several channels together and make adjustments at once. Individual channels are selected by pressing the U1, U2, U3, I1, I2, I3 buttons. Connection and disconnection of channels is done using the same buttons, but it is first necessary to activate the key lock. Harmonic can be selected from the list on the left panel, use "<-", "->" or using the cursor keys (arrow "Left", "Right") as was previously activated left graph by left clicking in the field. In a chart, you can use the arrow keys to choose not only harmonics but also change their values (arrow "UP", "Down"). Above left graph is the selected harmonic, the value (value can be changed in the field), information about the selected harmonic frequency. In the right graph shows the shape of the signal as it will also look at the output of the calibrator. Harmonics can be set only to a certain limit. Indicator "Over range" shows crossing this limit.

Reset to default – clears all harmonic components for selected outputs.

OK – confirms all changes and sends new setting into the calibrator.

Cancel – reverts changes and restore previous setting.

MODULATION – button for entering the modulation window:



The modulation window allows setting modulation of the output signal. Selection of calibrator's output is described in previous paragraph (Harmonic window).

Shape – type of modulation envelope

Off – modulation is no active

Sinus – sine modulation envelope

Square – square modulation envelope

Depth – modulation depth (0...30%).

Duty – duty cycle (valid only for square modulation envelope).

Reset to default – deactivates modulation for selected channels.

OK – confirms all changes and sends new setting into the calibrator.

Cancel – reverts changes and restore previous setting.

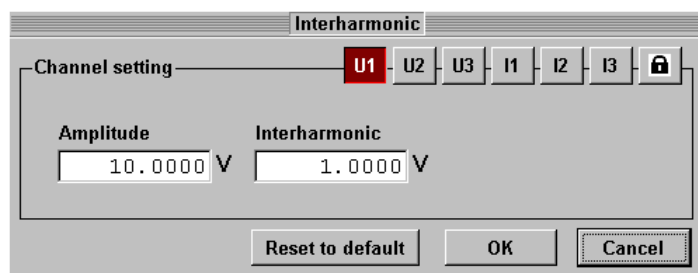
2.4.4. Interharmonic mode

Bookmark interharmonic mode selects the P Iharmonic calibrator's mode and enables to set individual parameters of this function mode. There are located additional fields:

Frequency [Hz] – frequency of fundamental harmonic signal

Interharmonic [Hz] – frequency of interharmonic signal

INTERHARMONIC - button for entering the interharmonic window:



The interharmonic window allows setting of interharmonic component in the output signal. Selection of calibrator's output is described in previous paragraph (Harmonic window).

Amplitude – amplitude of fundamental harmonic

Interharmonic – amplitude of interharmonic component

Reset to default – clears interharmonic component for selected outputs

OK – confirms all changes and sends new setting into the calibrator.

Cancel – reverts changes and restore previous setting.

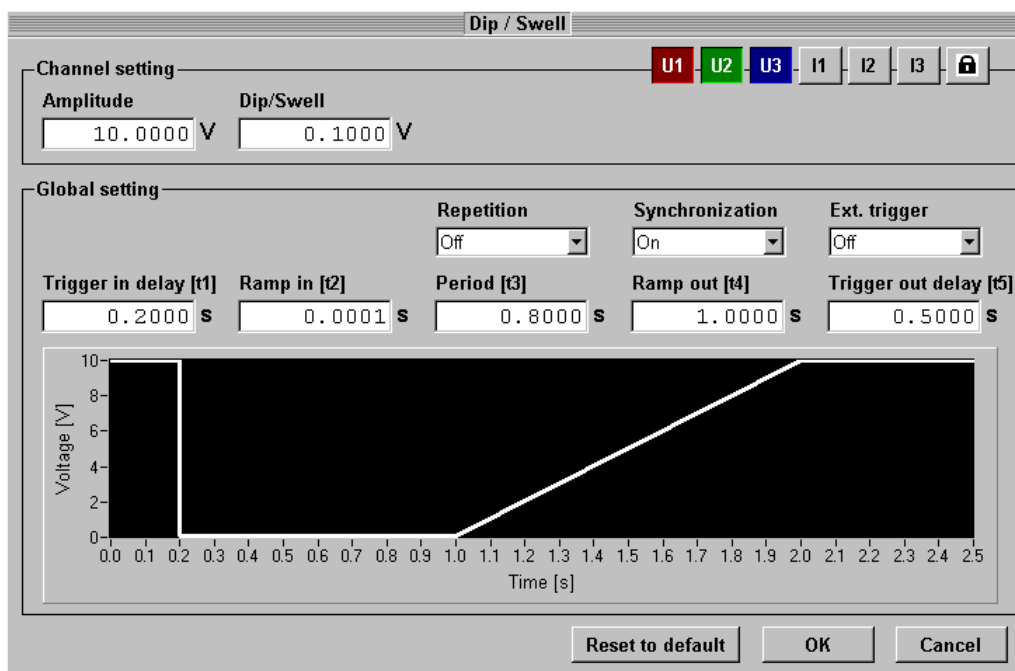
2.4.5. Dip/swell mode

Bookmark Dip/swell mode selects the P Dip/Swell calibrator's mode and enables to set individual parameters of this function mode. There are located additional fields:

Frequency [Hz] – frequency of fundamental harmonic signal

Trigger – starts generation of Dip/Swell shape. The shape will be repeated (if repetition is enabled) until output off.

DIP/SWELL – button for entering the Dip/Swell window:



The interharmonic window allows setting of interharmonic component in the output signal. Selection of calibrator's output is described in previous paragraph (Harmonic window).

Amplitude – fundamental harmonic amplitude

Dip/Swell – Dip/Swell amplitude

Other settings are valid for all channels – Global setting:

Trigger in delay (t1) – time delay between trigger and starting ramp in

Ramp in (t2) – ramp in period

Period (t3) – Dip/Swell time period

Ramp out (t4) – ramp out period

Trigger out delay (t5) – time delay after ramp out – new trigger can't be start before this delay

Repetition – sets automatic repetition of generated Dip/Swell shape:

Off – trigger starts generation of one Dip/Swell shape
On – trigger starts repeated generation of Dip/Swell shapes

Synchronization – enables (disables) synchronization of Dip/Swell shape with the internal phase 0°:

Off – Dip/Swell shape starts immediately after trigger
On – start of Dip/Swell shape is synchronized with the phase 0°

Ext. trigger – enables (disables) external trigger for Dip/Swell mode:

Off – disables external trigger for Dip/Swell function
Input IN3 – enables external trigger for Dip/Swell function (TTL falling edge applied to input IN3)

Reset to default – resets Dip/Swell amplitude to the Amplitude value for selected outputs

OK – confirms all changes and sends new setting into the calibrator.

Cancel – reverts changes and restore previous setting.

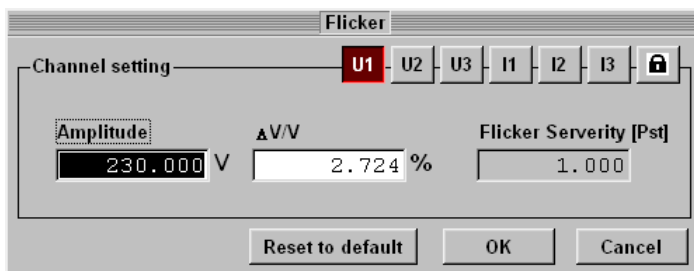
2.4.6. Flicker

Bookmark Flicker selects the Flicker mode and enables to set individual parameters of this function mode. In this mode output amplitude is periodically changed between two levels to simulate flickering. There are located additional fields:

Frequency [Hz] – frequency of output signal.

Change rate [CPM] – number of amplitude changes per minute.

FLICKER – button for entering the Flicker window:



The Flicker window allows setting of the output signal amplitude and modulation. Selection of calibrator's channels is described in previous paragraph.

Amplitude – amplitude of the output signal. This amplitude is the same as on the main panel and allows multiple amplitude settings at a time.

ΔV/V [%] – amplitude modulation depth.

Flicker Severity – information field - calculated value of the Flicker Pst. This value is affected by all parameters of the Flicker function.

Reset to default – resets modulation to the zero.

OK – confirms all changes and sends new setting into the calibrator.

Cancel – reverts changes and restore previous setting.