# ATAL ATD-07

**Digital thermometer-hygrometer and datalogger**

# Instruction manual

# *Manual for use of thermometer-hygrometer ATAL ATD07*

Instrument is designed for measurement and logging temperature and relative humidity with the possibility of displaying the dew point temperature. Measured values are displayed on a dual line LCD display and it is possible to store values into the non volatile memory. Then it is possible to transfer data to a personal computer. Temperature is measured by RTD sensor Ni1000/6180ppm. Instrument compares measured values of temperature, humidity and dew point with two adjustable levels for each measured quantity. Breaking the level is indicated by blinking the proper value on display and by audio indication (switchable). Instrument is equipped with minimum and maximum memory and Hold function. Minimum and maximum values and Hold value are possible to display on the LCD anytime.

*Technical parameters:*
*Parameters of measurement:*
*Temperature:*
*Range of measurement: -30 to +105 °C (temperature from +85 to +105°C with the limitation accordingly to the graph below)*
*Resolution: 0.1 °C*
*Accuracy: ±0.4 °C*
*Humidity: Range measurement: 0 to 100 %RH*
*Resolution: 0.1 %RH*
*Accuracy: ±2.5 % RH at the range of 5 to 95 %RH at 23°C*
*Dew point temperature (calculated from temperature and humidity):*
*Range: -50 to +80 °C*
*Resolution: 0.1 °C*
*Accuracy: ±0.5 °C at the range of 30 to 95 % RH*
*Response time with plastic sensor cover (air flow approximately 1 m/s):*
*air temperature: $t63 < 30$ s, $t90 < 75$ s (temperature step 20 °C)*
*relative humidity: $t63 < 30$ s, $t90 < 60$ s (humidity step 30 %RH, constant temperature)*

*Measuring interval a display reading refresh: approximately 0.7 s in FAST mode*
*0.7 to 5 s in dynamic mode*
*Logging interval (only in automatic logging mode): 10 s to 24 h*
*Memory capacity: for manual logging              1000 sets of all input quantities*
*for non cyclic automatic logging   total 8124 values*
*for cyclic automatic logging      total 7644 values*
*The above specified numbers are maximum possible. Capacity is slightly lower if logging was interrupted by communication with computer, by stopping logging or switching OFF the instrument*
*Communication with computer: RS232 (serial port)*
*Real time clock: adjustable from computer, integrated calendar including leap years*
*Power: battery 9V or ac/dc adapter 12V with NiCd accumulator 9V*
*Average current consumption: 0.15 to 0.7 mA (depending on operation mode)*
***Operation conditions:***
*Ambient temperature range: -10 to +60 °C*
*Ambient relative humidity range: 5 to 95 %RH non condensing, probe 0 to 100% RH*
*Outer characteristics in accordance with EN 33-2000-3: normal environment with characteristics AD1, AE1, AF1, AG1, AH1, AK1, AL1, AN1, AP1, AQ1, AR1, AS1, BA1, BE1*
*Not allowed manipulation: it is not allowed to touch sensors under the cover to avoid sensors damaging or to effect calibration.*
*Dimensions: 141 x 71 x 27 mm*
*Weight including battery: approximately 150 g*

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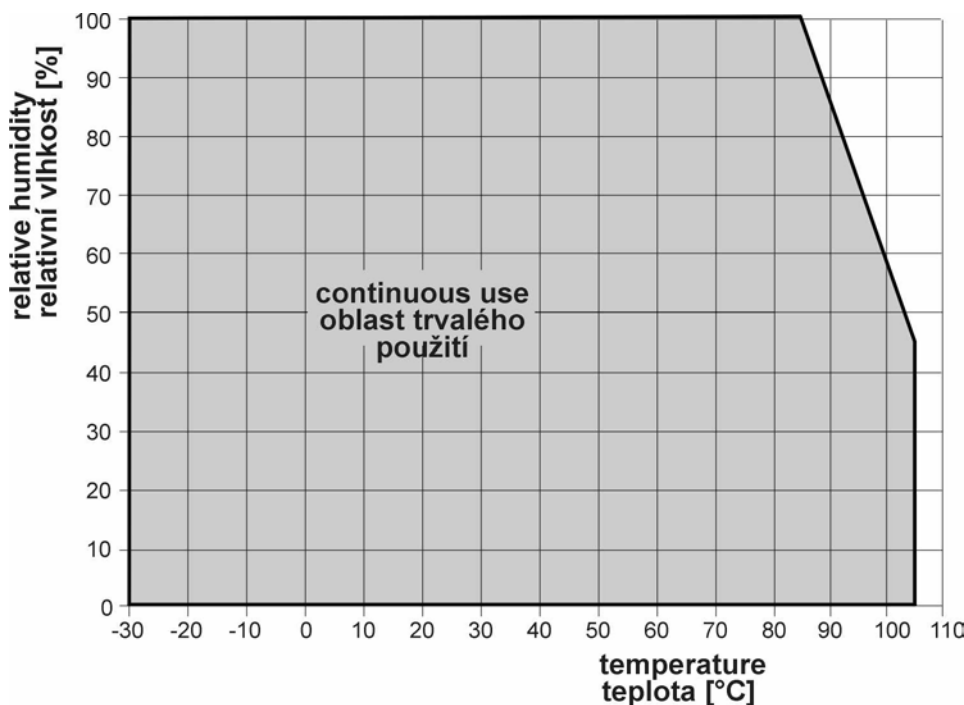
Battery life depends on selected display refresh mode (see below). In FAST mode display is refreshed in shortest possible interval with highest current consumption. In dynamic mode display is refreshed in interval up to 5 s in case measured values remain stable. Refresh interval is shortened to approximately 0.7 s only if measured values change. Current consumption in this mode in usual operation is lower, battery life is up to 4 times longer. The FAST mode is recommend to use only in cases, when slower display response is not acceptable.

Battery voltage drop below 7 V is indicated with blinking of "BAT" in default display mode (displaying of actual values) and FAST mode is automatically cancelled to save the battery. At the same time audio indication of alarms is automatically switched OFF.

If instrument is supplied from external ac/dc adapter, internal 9V battery should be replaced with rechargeable NiCd accumulator. In usual operation from adapter accumulator is charged only with small current. If accumulator is totally discharged, its full charging in instrument takes approximately 100 hours. Instrument with accumulator is not recommended for permanent operation without ac/dc adapter plugged. Accumulator works only as a standby source in case of power mains failure.

**Switching ON and OFF the instrument**
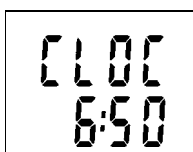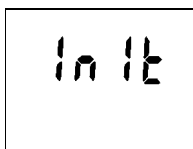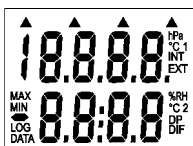


Switch ON the instrument by pressing ON/OFF key. After switching ON the instrument all symbols on the LCD are displayed. If the ON/OFF key is being held pressed, all LCD symbols are displayed till the key is released.
In usual operation instrument then starts the measurement mode and actual measured values are displayed.



If a voltage drop below critical limit occurred since last adjustment of internal real time clock or battery disconnection longer than approximately 1 min, new instrument initialisation is performed (reading INIT could be displayed up to 12 s !).



After initialisation is finished instrument starts to display internal time to warn to incorrect internal time. New time adjustment is performed by the computer. Press MENU key to switch instrument to actual measurement mode.

It is possible to switch OFF the instrument anytime, all instrument setting is kept saved. If

automatic logging was active before instrument is switched OFF, logging will continue with the same parameters after new switching ON.

## Displaying of actual measured values

In this mode is instrument anytime after switching ON. It is possible to enter this mode from other modes by pressing or by repeating pressing of MENU key.

**22.0** °C
**36.3** %RH
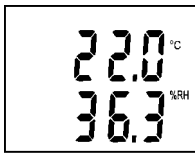
Temperature in °C is displayed on the upper LCD line and relative humidity in %RH is displayed on the lower LCD line.

↑ DISPLAY ↓

**22.0** °C
**6.3** °C DP
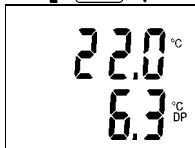
Press DISPLAY key to display other readings - temperature in °C on upper line and dew point temperature on lower line (°C DP).


## Function HOLD (storing of actual measured values) and minimum a maximum memory

Press HOLD key in the default mode (displaying of actual measured value) to store actual measured values to internal memory (indicated by short beep). Anytime it is possible to display stored values from MENU (see below). Each pressing of the HOLD key in the default mode causes values stored in HOLD memory are replaced with actual ones.

**22.0** °C
MIN **36.3** %RH
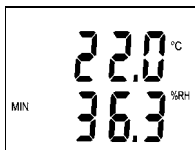
Switched ON instrument permanently updates minimum and maximum memory of each measured values. Press MIN key (resp. MAX key) in the default mode to display minimum (resp. maximum) reading. These minimum and maximum readings are indicated by MIN (MAX) symbols on the LCD. Press DISPLAY key to display minimum (resp. maximum) value of other values. Pressing MIN (MAX) or MENU key again to return to default mode. Minimum and maximum memory is cleared from menu after confirmation selection CLR (see below). Values in HOLD, MIN and MAX memories remain stored even after instrument is switched OFF.


## Functions and settings available from menu

Press MENU key to enter mode of viewing menu items one by one. Press arrow keys up and down to list all menu items. Press MENU key again to return to default mode (displaying of actual measured values).
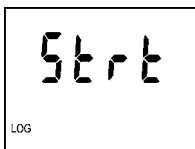
**Strt**
LOG

First selection is START/STOP logging. There are two possibilities: if logging is stopped, logging start is offered (symbol Strt = START), if logging is in progress already, logging stop is offered (reading STOP). Press ENTER key to confirm one of two possibilities. Notice: if battery voltage is low it is not possible to start logging.

▼MIN ▲MAX
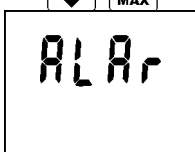
**ALAr**

Press ENTER key to enter alarm setting mode (see below).

▼MIN ▲
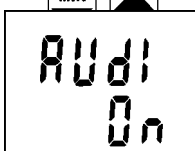
**AUdI**
**On**

This item indicates if audio signaling of alarm indication is switched on (On) or switched off (OFF). Press ENTER key to change actual setting.

▼MIN ▲MAX

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Notice: if the battery voltage is low, audio indication is out of operation to reduce current consumption independently on this selection.

**CLr**

Clearing of minimum and maximum memory of all values. Memory is cleared after pressing ENTER key. Clearing is confirmed by reading YES on the LCD lower display.

**HOLd**

Press ENTER key to display values stored in the HOLD memory. Press DISPLAY key to display other stored values (dew point temperature). Press MENU key to leave this mode.

**CLOC**
**6:50**

Time (hour and minute) in internal real time clock of the instrument. Press ENTER key to check date (day, month, year).

**bAt**
**9.0**
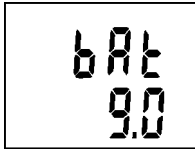
Battery voltage of partially loaded battery is displayed. This value illustrates battery condition.

**drEF.**
**dYn.**
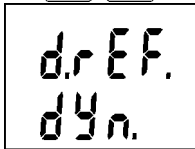
Display refresh mode is indicated. In the FAST mode refreshment is fastest with regular interval approximately 0.7 s. In the dynamic refresh mode (DYN.) each 15 s refresh interval of display is doubled to maximum 5 s if measured values are stable. If measured values change, refresh interval decreases to approximately 0.7 s. This dynamic mode prolongs battery life significantly. Select the desired mode by ENTER key. Notice: if battery voltage is low, the FAST mode is out of operation to reduce current consumption independently on this selection.
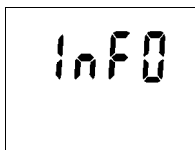
**InFO**

Each pressing of ENTER key causes displaying information on storing interval, actual logging mode (MODE), memory occupation (MEMO - in automatic logging mode memory occupation in % is displayed, in manual mode the number of logged values is displayed) and service information on software version (upper LCD line) together with instrument configuration on the LCD lower line.

## Alarm indication and setting

It is possible to set lower and upper limit for each measured quantity. Breaking of the limit is indicated by blinking of the appropriate value on the display. If a new alarm was indicated (i.e. it was not active in the previous measurement), display starts to display the value out of limits. If at least one alarm is active, audio indication can be activated, if menu AUDI "On" is selected (see setting described above). Alarm activation of each value can be disabled by setting lower alarm limit of the desired value up to its maximum. This is indicated by OFF reading at the position of numeric value. Value of upper limit of the same alarm is indifferent.
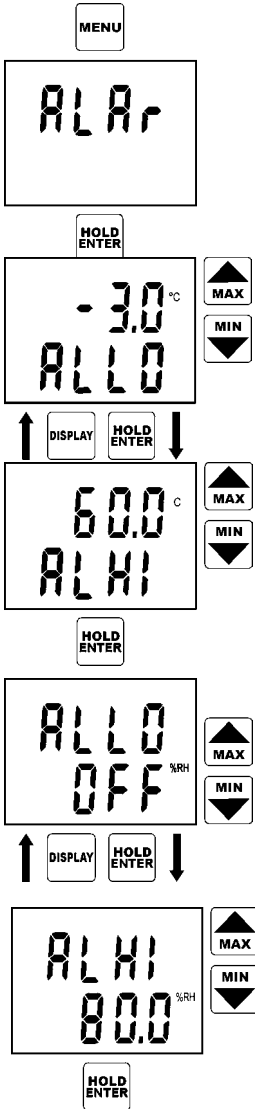
To set alarms press MENU key, select ALAR from menu items and confirm by pressing ENTER key.

Reading ALLO indicates adjusted lower alarm limit (here air temperature). Set the desired value by means of the arrow keys. Press and hold the arrow key UP to make value increase fast. Press and hold the arrow key DOWN to make value decrease fast. Release the arrow key and press ENTER to confirm new limit

Reading ALHI indicates adjusted upper limit of the same alarm (here air temperature). Set the desired value in the same way as in above lower limit. If needed it is possible to get back to lower limit setting of the same alarm by pressing DISPLAY key. Press ENTER key to confirm new upper limit.

Then you are offered to set alarm of other input value (here relative humidity). The procedure is the same as the above temperature limit setting. Alarm activation of each value can be disabled by setting lower alarm limit of the desired value up to its maximum. This is indicated by OFF reading at the position of numeric value. Value of upper limit of the same alarm is indifferent.
It is possible to leave the alarm setting mode by pressing MENU key. New adjusted limits up to pressing MENU key are stored in memory.
After pressing ENTER key it is possible to set alarm limits for dew point temperature.

## Logging mode

In logging mode measured values are stored to instrument internal memory. Memory is non volatile, i.e. if battery voltage drops or battery is disconnected, stored data will not be lost.
Instrument can work in two logging modes:

*automatic mode* - actual measured values are stored to memory in adjustable time interval. Storing of the first value is synchronised with internal real time clock , so the memorizing is performed at sharp multiples of minutes, hours and days. E.g. if the storing interval is 15 minutes value will be stored each 15., 30., 45. a 00. minute and zero second in each hour, if interval is 3 hours values will be stored in 00:00:00, 03:00:00, 06:00:00. etc. It means after starting automatic logging instrument waits for the nearest integer multiple of time and then stores the first value.

*manual mode* - actual measured value is stored after pressing ENTER key (instrument should be in default mode of displaying actual measured values). Each storing is indicated by a short beep and position of the record in memory is displayed (reading MEMO with the record serial number). In this mode it is possible to store max. 1000 set of records.

It is possible to select one of the three logging modes (MODE):
- automatic non cyclic logging, when logging stops after fulfilling the memory. Reading MEMO FULL is displayed (reading disappears after pressing any key)
- automatic cyclic logging, when after fulfilling the memory oldest data are replaced with new values
- manual logging, designed for manual storing of measured values by ENTER key

Logging modes are not mutually compatible and after changing logging mode memory of the instrument should be cleared.

Logging in progress will always be interrupted by instrument connection to the computer or switching OFF the instrument by ON/OFF key. Logging in progress will be automatically stopped if battery voltage below 7 V is indicated by the instrument. This prevents to log values effected by low battery voltage.

## Logging start from instrument keyboard
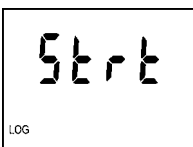
Start logging by confirmation of the menu item START (symbol Strt) by pressing ENTER key.
Notice: it is not possible to start logging if low battery voltage is indicated.
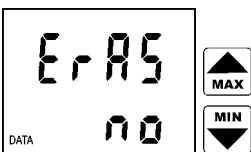
Instrument offers the possibility to clearing the instrument memory (ERAS). If you do not wish to clear the memory before new logging start, confirm selection ERAS NO by pressing the ENTER key
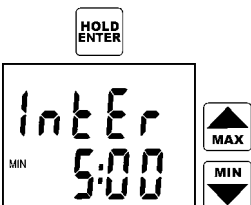
Now instrument displays adjusted storing interval. To modify the storing interval use arrow keys. Interval 10 sec is displayed as **MIN 0:10**, minute intervals are displayed as **MIN x:00** and hour intervals as **x:Ho**. Confirm adjusted interval by pressing ENTER key. Notice: if manual logging mode is selected, this menu item is skipped (there is no interval adjustment).
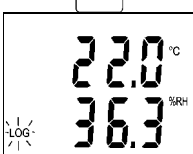
Logging is started and instrument returns to default mode displaying actual values. Logging in progress is in default mode indicated with reading LOG on display. If memory is filled over 90 %, symbol LOG is blinking (only in automatic logging).

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**Logging start with clearing memory and logging mode selection**

It is possible to clear memory only if logging is stopped. Modification of logging mode is enabled only after memory is cleared. Clearing of memory is optional part of the above procedure logging START. Notice: there is no way to "undelete" the cleared data!
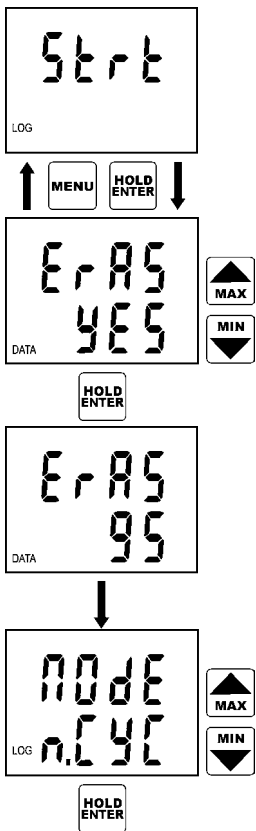
If it is needed to clear the memory before logging start, first it is necessary to select menu item logging START (symbol Strt) and confirm by pressing ENTER key.
Notice: if low battery voltage is indicated, it is not enabled to start logging nor to clear the memory

Now instrument offers possibility to clear the memory (ERAS). Default is selection ERAS NO. If clearing of the memory is needed use the arrow keys to select ERAS YES and confirm by pressing ENTER key..

Clearing procedure is in progress. It takes approximately 16 s and the duration is indicated by displaying of already cleared memory in % (digits 0 to 100).

After memory is cleared it is possible to select one of three logging modes (MODE) by using arrow keys (non cyclic logging is indicated by symbol n.CYC, cyclic logging by symbol CYCL and manual logging by symbol Man). If manual logging mode is selected, after confirmation by ENTER key logging is active. In automatic logging mode (i.e. cyclic or non cyclic) last applied storing interval is offered to confirm or modify. See above procedure.

**Logging stop from keyboard**
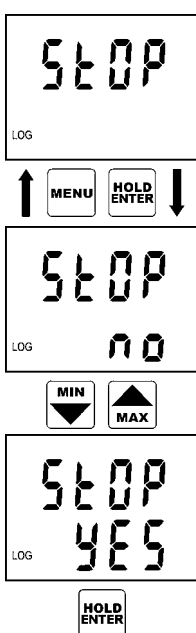
Logging stop is enabled by confirmation of menu item STOP by pressing ENTER key.

Reading STOP NO is displayed to enable logging stop. Use arrow keys to modify to STOP YES. Logging is still in progress.

Logging is stopped after confirmation selection STOP YES by pressing ENTER key. Instrument then returns to default mode of displaying actual values.

## Connection of the instrument to a personal computer

For connection of the instrument to a personal computer is designed the communication cable (included in delivery). Connect the cable with 9pin connector Canon to computer serial port (COM1 or COM2). Connect cable other side (JACK 3.5mm) to the instrument. During time instrument is connected to the computer, there is a reading PC on the LCD display and measurement nor logging is interrupted. Keyboard of the instrument is disabled with the exception of ON/OFF key.

Result of reading data to the computer is a protocol of measurement including instrument serial number and a table of logged values with date and time.

After disconnection of the communication cable reading PC disappears and instrument is in the default mode as after switching on by the ON/OFF key. If logging was in progress before connection to the computer, logging will continue with the same parameters after disconnection of the cable (if new setting of logging was not performed during communication - including logging stop).

**The most power from the battery is needed during communication with the PC - let the communication cable plugged-in the instrument only for time necessary for data transfer! If you let instrument plugged-in the computer longer than approximately 5 minutes with no communication, instrument will be automatically switched OFF.**

## Battery replacement

If battery voltage is low logging mode of the instrument is disabled. Low battery voltage is indicated on the display with blinking reading "BAT". It is necessary to replace it with new one as soon as possible. Battery is located under small cover on the instrument lower side. It is absolutely necessary to replace battery with instrument switched OFF, otherwise internal time and setting of d.REF. and AUDI (from menu selections) and data in memory HOLD, MIN and MAX will be lost. For the same reason do not disconnect the battery for longer than 1 minute even if instrument is switched OFF. If it happens (or if battery is totally discharged), it is necessary to set time from the computer and in appropriate menu selection set again LCD refreshment mode (d.REF.), alarm audio indication (AUDI) and clear the minimum and maximum memory (CLR).

# The PC software for the instrument

### Installation of Windows software

Software is designed for computer with operational system Windows, version Windows 98 or newer. There is approximately 5MB free space required on the hard disk. A free serial port is required for communication with the instrument.

Start the installation from Control Panel of Windows (Start - Settings - Control panel) - Add/Remove programs, button Install. You will be suggested by Windows to insert first installation diskette. After pressing Next button installation of software for ATAL will start.

After installator start a window with License agreement occurs. Read the license agreement carefully please. All text is possible to view by cursor movement keys up and down or PageUp, PageDown keys. If you agree with the License agreement, press the Yes button. If you do not agree, press No and installation will be cancelled.

In next step of installation it is possible to select path, where software will be install to. If you agree with offered path, press Next, otherwise change the path by button Browse.

In the next window you can select folder in Start menu where software will be enable to run from. If you agree with offered folder, press Next.

Now installation itself of software to hard disk will be carried out. Wait please for installator to perform all necessary steps. During installation you will be invited to insert second diskette.

In the end message of successful installation will occur. Quit the Installator by button Cancel. Now it is possible to run software from menu Start - Programs - ATAL - ATD.

### Software for Windows - instruction manual

#### *Communication with the instrument*

First connect communication cable to computer serial port. Plug second connector of communication cable to the instrument and start data transfer to the computer (selection from menu File - from datalogger, key F4 or button on the toolbar). Software will find connection with the instrument and transfer data. Computer offers name of the file with measurement to be created on disk. Implicitly files are stored to files with extension *.msb. File name is generated from year, month and day of file creation and serial number in the day of creation. It is possible to use different file name and path. After name confirmation it is possible to insert short description with e.g. conditions or location of measurement, which is stored together with measured values.

#### *Viewing of measured values*

Measured values can be read directly from datalogger or from formerly created file on disk (command File - From disk, key F3). After reading a table of measured values occurs. Detailed information on file is available from context menu - menu occurs after clicking right mouse button on the position of table. In context menu function export to text or database format is available.

Graph with measured curves it is possible to by command Display - Graph or button on the toolbar. Graph mode enables to modify setting of axis, color of curves etc. Detailed information on software functions is available in help.

***Buttons on tool bars (left to right)***



| | |
|---|---|
| **From disk** | opens file with measured values stored on disk |
| **From instrument** | reads measured values from instrument and store them to disk |
| **Table** | displays table of measured values |
| **Graph** | displays time graph of measured values |
| **Print** | prints table or graph to printer |
| **Exit** | quits work with software |



| | |
|---|---|
| **Information** | reads and display actual information on instrument setting |



| | |
|---|---|
| **Display of file segments** | if file contains more segments of measured values, it is possible to view those segments one by one |
| **Previous segment** | moves to previous segment |
| *Next segment* | moves next segment |
| **Curve setting** | color modification, vertical axis assignment |
| **Graph setting** | setting of graph parameters - axis, description etc. |



| | |
|---|---|
| **Graph-channels one by one** | enables/disables displaying of curves one by one (i.e. there is only one curve on the screen at a time) |
| **Graph-channel name** | in the Graph-channels one by one mode displays actual channel name |
| **Graph-next channel** | in the Graph-channels one by one mode switches to next channel |
| **Graph-previous channel** | in the Graph-channels one by one mode switches to previous channel |