Uprog

User manual

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General characteristics

Uprog – universal device programmers family – use parallel port (LPT) or USB for communication with PC and allow to program and test thousands of programmable devices: EPROMs, EEPROMs, Flash memories, Microcontrollers, PLDs and many other. Typically programmers are equipped with 40- or 48-pin ZIF socket. Additionally UprogHS 84 can be equipped with sockets other type, e.g. universal PLCC. Flexible hardware design allows setting on each pin wide range power supply (1.8V – 8V), programming voltage (0V – 30V), square clock or any logical level. Programmers Uprog programmers communicate with PC via parallel (LPT) or USB port and allow to program many devices quickly and easily. Programmers Uprog, thanks to small-size package and short programming times, can be used in many fields of activity: as production, service or development devices. Durable, made of metal, case keeps programmers interior save.

Software runs under Microsoft Windows environment, its user friendly, graphically designed interface with pup-up menus and clear operation status messages, ensures high comfort of operation. It reads and saves many generally accepted formats (hexadecimal, binary, Jedec) and provides buffer edition, quick and easy device selection, set up of all features (oscillator settings, code protection, etc.), chip insertion and pin contact test, project management. Programming and verification can be realized in two ways: single mode and automated production mode.

Technical specifications

	Uprog, UprogHS	UprogHS 84	UprogHS 48 portable
Dimensions (mm)	117 x 42 x 195	200 x 62 x 190	117 x 51 x 210
Weight (g)	750		

Power supply: external, 12V DC
Interface: parallel (EPP and SPP mode) or USB
Socket: DIP40 or DIP48
Supported devices: EPROM, EEPROM, Flash, Static RAM, PLD, Microcontrollers, serial EEPROM, etc.
Additional functions: digital IC tester, EPROM simulator*, logic analyzer*, in-system programming capability*

Package includes:

- programmer
- power supply
- data cable
- CD with software
- user manual
- optional equipment

* For selected models

Installation

Installing the hardware

Make sure that the PC has the following minimum requirements otherwise you may experience problems using the programmer:

1. IBM PC Compatible – Pentium II or higher
2. Approx. 40MB free hard disk space
3. Microsoft Windows 95/98/ME or Windows NT 4.0/2000/XP operating system
4. Parallel (EPP mode recommended) or USB port

Programmers with LPT interface

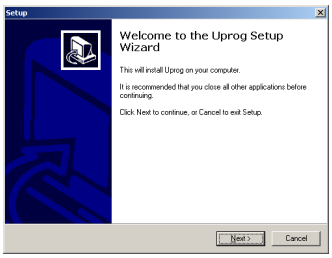
To install Uprog programmer with LPT interface connect one end of the parallel cable to the programmer and the other into the parallel port on the PC. Make sure the cable is properly attached to the LPT port. It is advisable to set of parallel port in EPP mode in computers BIOS for best programming speed achievement. Finally plug the power supply into the socket at back of the programmer. Correct connection of power supply indicates power LED.

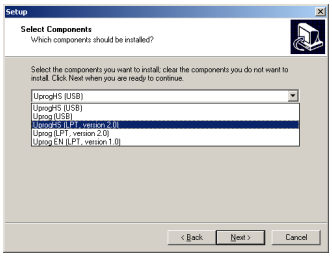
Programmers with USB interface

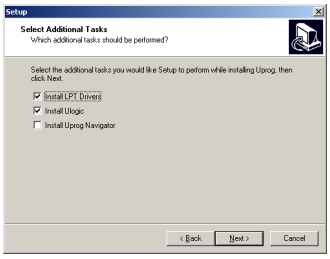
To install programmer with USB port connect data cable to the programmer and free USB socket and plug the power supply. Windows environment automatically detects connection of the programmer and will try to install proper drivers. The user should chose installation from specified source and browse directory *Drivers* present at included CD. Installation process can differ depend on version of environment.

If the user connect power supply socket as first programmer UprogHS 48 portable will work in stand-alone mode. The communication with PC will not be possible in this case.

Installation of the software







Software for Uprog programmers is shipped on a CD. RK-SYSTEM is continuously updating an adding new devices and features, so it is advisable to check for the latest version on our web site on the Internet, at www.rk-system.com.pl. In order to install Uprog software onto PC please insert disk into CD drive and run *setup2.exe*. Follow the on-screen instructions to complete installation process.

If the software is installed for first time and the programmer with LPT interface was chosen, the user should install LPT drivers and reboot the computer.

After installation a shortcut for Uprog software will be present at user's desktop.

Uprog usage

General principles

Operations of Uprog programmer don't call for a lot of complicated actions. Before start it is necessary to check only for correct connection of data and power cables. Two LEDs are indicating state of operation. Power led should shine if power supply was connected, the status LED indicates that programmer is executing an operation.

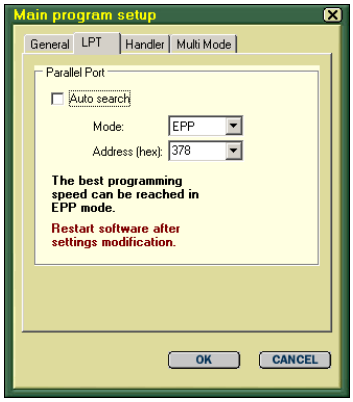
It is not advisable to put on or take out devices while status LED is turned on. In this case the device may irreversible damage.

The programmers are secured from consequences of insertion damaged device and shorts. However the user should not connect data cable while power is plugged in and power up the programmer if any device is inserted into socket.

The software automatically detects type of programmer connected. After running it by clicking on Uprog icon, the operation status should display type of connected programmer.

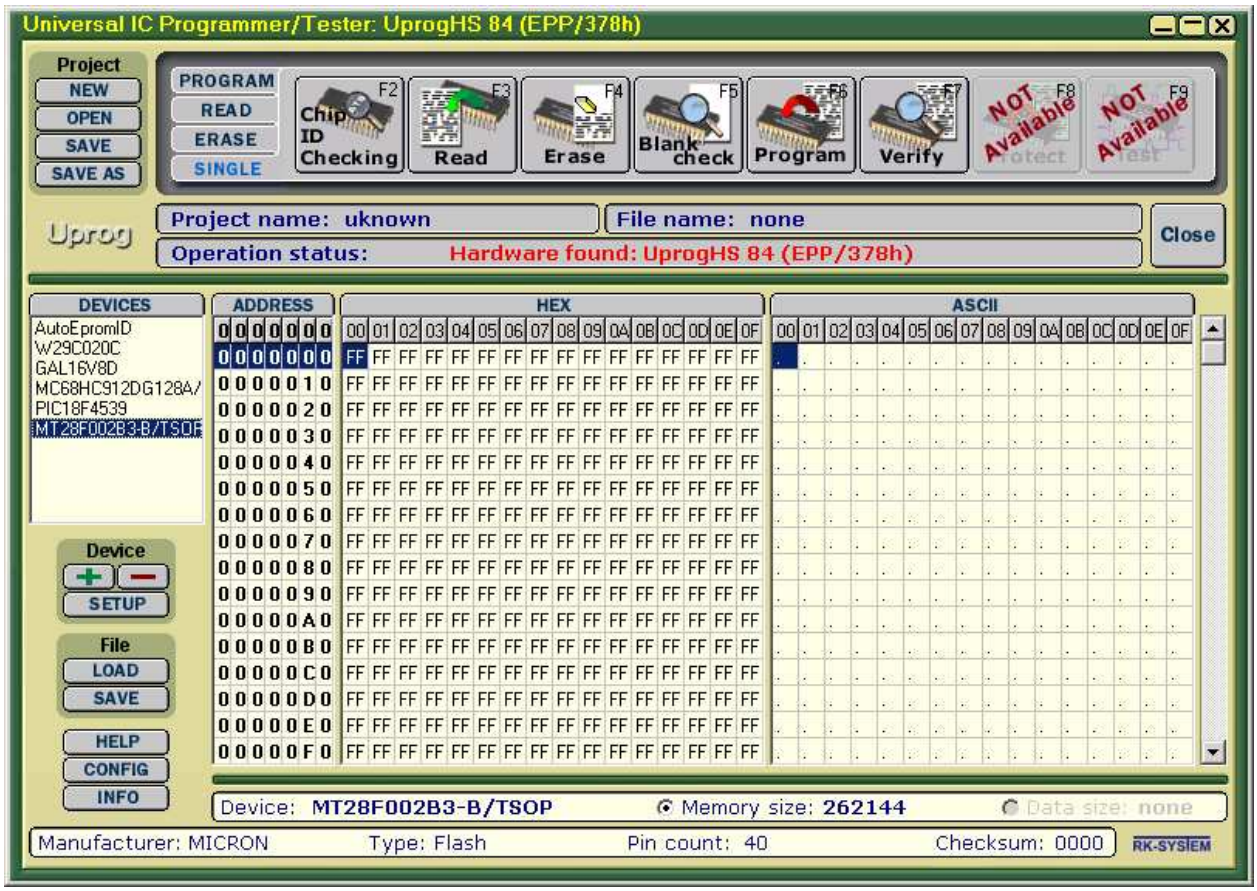






There is a possibility to set parameters of parallel port manually if communication error was found despite correct connection of programmer. This situation may occur on some portable PCs or when using extension card with parallel ports. To change this parameters press CONFIG. In section LPT settings uncheck *Auto Search* and set correct mode and address conforming settings in computers BIOS. After this restart of software is necessary. Address value can be chosen from list or entered manually.

Software description

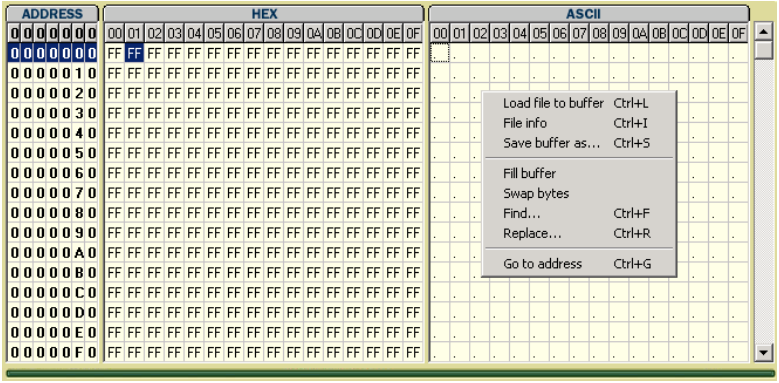


Easy to use Uprog software provides full functionality including:

- file load an save,
- buffer editing,
- verify Device ID, read device, erase device, blank check, program and verify operations,
- programming all microcontrollers features (options, security bytes, etc.),
- chip insertion and pin contact test,
- project management.

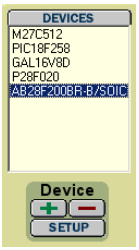
Data buffer

The majority of the screen is taken up with displaying the data buffer.

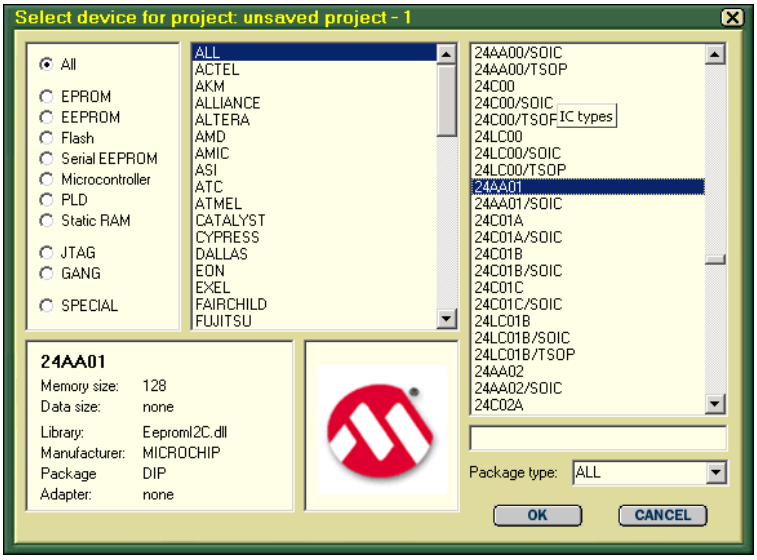


The buffer displays memory addresses and the data stored at each address in hexadecimal values and ASCII signs. Buffer can be loaded with data from file; it also holds information that has been read from device. Buffer can be edited so that the data can be changed. Fill, find, replace operations are allowed.

Device selection



Uprog software allows managing maximum 10 devices; every device has its own data buffer. To add a device, press [+] from Device group. New displayed window *Select device* allows finding wanted one quickly and easily. All devices can be filtered by type (EPROM, EEPROM, Micorontroller, etc.), manufacturers name, package type and part of name of device (*Search by name)*. To add a device click on its name and press **OK**. If Enter is pressed while typing device name in *Search by name* field, first device from list will be added to devices group. Clicking on DEVICES GROUP by right mouse button to show pop-up menu and choosing Add device can also open device selection window. To remove device, press [−] and confirm your decision. Device can be also removed from pop-up menu.



Projects

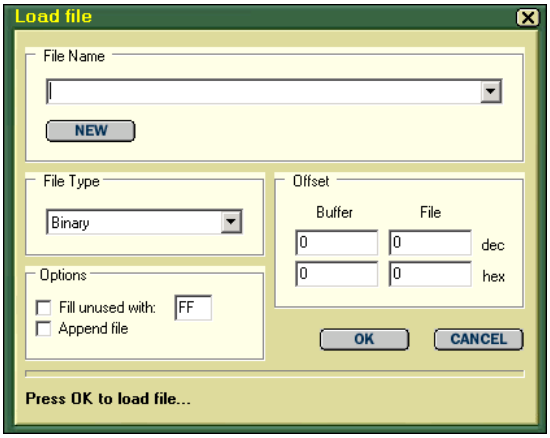


All settings including current devices, buffer contents and each device settings can be stored in project file for further use.
All buttons used to project management are placed at **Project** group.

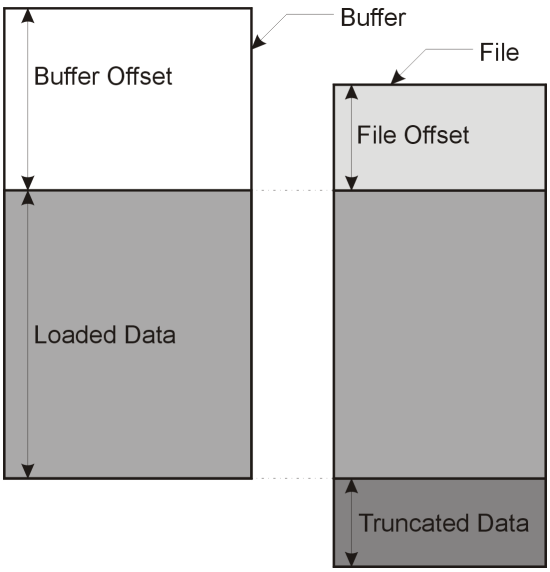
File management



The software allows loading file in many popular formats. To load a file press LOAD in order to open *Load File* window. Press NEW to browse file from disk. Ten last loaded files are remembered to facilitate reloading - just choose one from list.

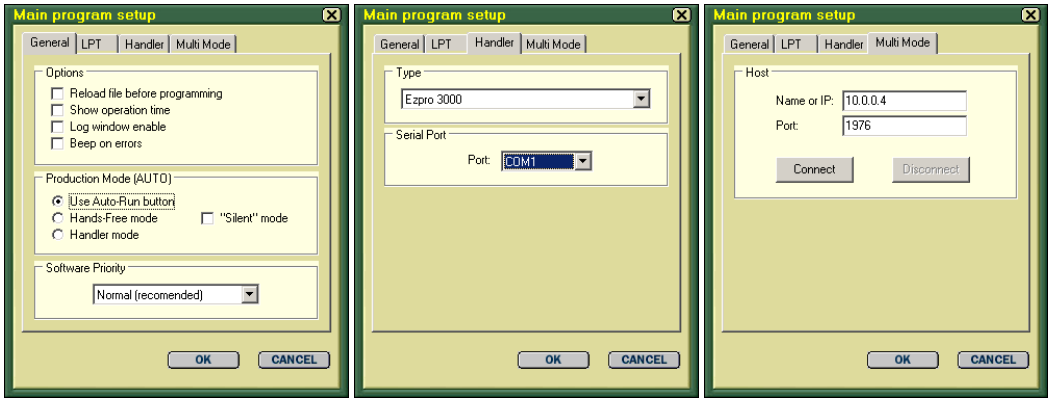


The file can be loaded with offset or appended to existing buffer contents. Buffer can be filled with constant value if buffer size is larger than file.



To save a file press SAVE, specify file format and press OK to enter file name.

Main program setup (CONFIG)

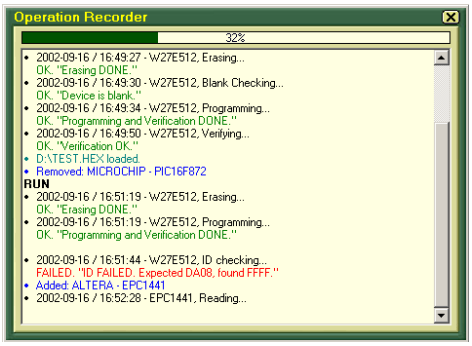


This window (Main program setup) is displayed after pressing CONFIG button and allows changing main program configuration.

If data needs to be reloaded before programming, check *Reload file* b*efore programming*.

Check *Show operation time* on in order to view amount of time taken by the operation.

Operation Recorder, displayed when *Log window enable* is checked, stores all operation results: loading of file, adding/removing device, and device operations. *Operation Recorder* is very helpful in case of using gang programmers. It displays then operation results separately for each device.

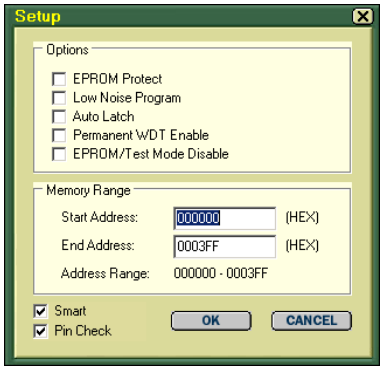


Contents of this window can be saved to file to **.rtf* file by choosing *Save file* from pop-up menu.

Production mode can be set into different modes: the programmer waits for pressing AUTO RUN button located on programmer to start operations (*Use Auto-Run button*), detects insertion of device and automatically starts operations (*Hands-Free mode*) or cooperates with the chip handler (*Handler mode*).

When *"Silent" mode* is checked the software will not display error alerts. In this case general message informs about result of executed operations. When using portable programmer, suitable message will be displayed on LCD, in other case red LED will indicate the error.

Device features setup

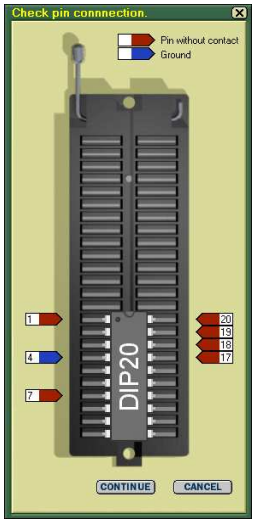


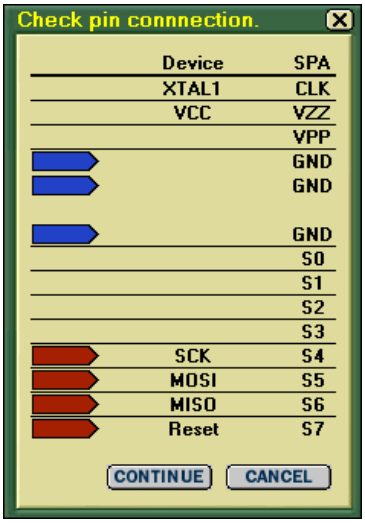
All device features are available in *Setup* window. It contains all device dependant settings (configuration, code protection, etc.) and algorithm options (Smart, Pin check). To set the configuration of the device, including configuration bits, protection, etc., pressing **Protect** icon is required.

The user can specify beginning and end adresses (*Memory ranges*), so only part of memory can be progammed. Use this option with care, espacially by programming microcontrollers.

Smart programming omits all empty cells while programming process. It should be used to erased devices only, in other case verification can fail.

If *Pin check* is selected the programmer executes pin check process prior any operation. If any pin loses its contact with socket, user will be informed about.





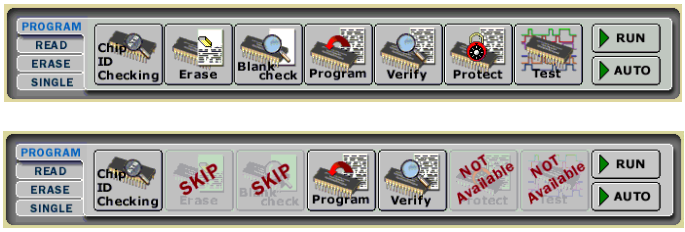
Programming and reading the device

All programmer actions are invoked using buttons located in four tabs: PROGRAM, READ, ERASE and SINGLE. Selection of this buttons can be done using a mouse or keyboard.

1. **Chip ID Checking** veryfies device signature. This electronic signature identifies manufacturer and type of device.
2. **Read**. This operation reads data already programmed into the device in socket. All data is displayed in buffer.
3. **Erase**. This operation will clear data held in the currently selected device. Empty address locations are usually represented with FF. This operation will only work on erasable devices, e.g. Flash memories.
4. **Blank Check**. This operation checks every address and will report if any memory cell is not completely blank
5. **Program**. Programs currently selected device with the data from buffer.
6. **Verify**. This operation will verify all of the data in buffer with data that has been programmed into the device.
7. **Protect** writes all on-chip features (e.g. code protection, oscillator settings) previously set in device SETUP.
8. **Test**. This operation allows to apply the test vectors for currently selected Programmable Logic Device (if included in Jedec file). Test vectors are used to check that the logic implemented in PLD is correct.

There are two types of programming modes depending on which tab currently selected: SINGLE – normal programming: all operations are executed immediately after click on the button; PROGRAM, READ, ERASE - operations are executed in stream after click on RUN or pressing AUTO RUN button placed on programmer.

Tab PROGRAM



If this tab is selected all operations available and selected are executed in a stream. User can configure which operations needs to be skipped. To exclude Erase from stream, click on Erase icon. If operation is not available for selected device the icon is disabled (**NOT available**).

Press RUN or Enter key to execute all available operations, or AUTO to start **Production Mode**. In this mode stream executes after pressing AUTO RUN button or inserting the device into socket. Press AUTO again to exit Production Mode.

Tab READ



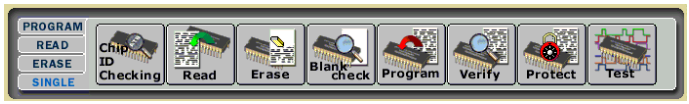
Select this tab if you need to read and verify device contents.

Tab ERASE



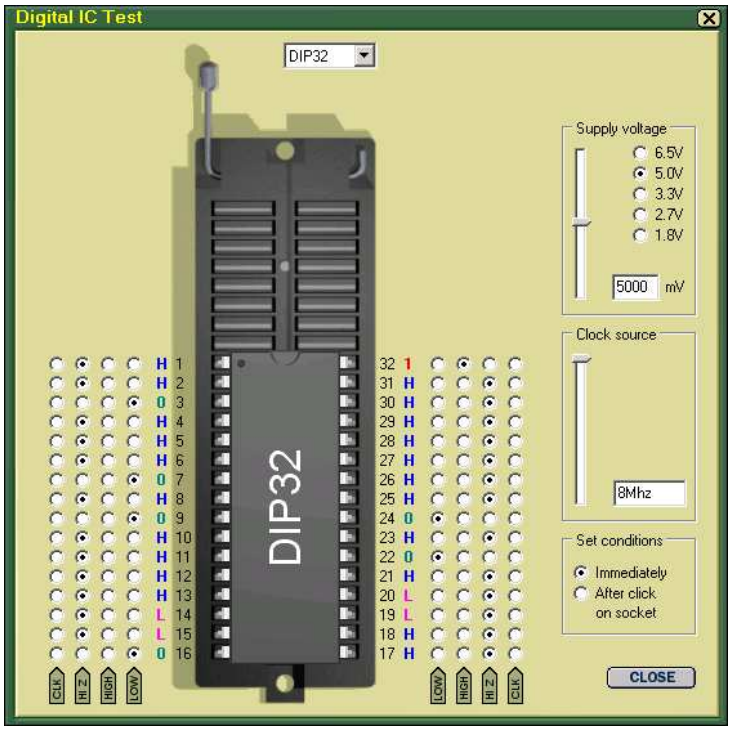
Select this tab to quickly erase series of devices.

Tab SINGLE



If this tab is selected, all operations are executed immediately after click on icon.

Universal digital IC tester



Universal IC tester tool can be used to test any digital device. It allows setting on any pin of device any logical level and reading its state. To use tester the user should select a device named **ChipTester** from group SPECIAL, manufacturer RK-SYSTEM and press Test button.

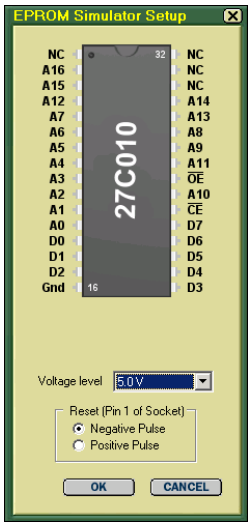
Pins state can be controlled by selecting adequate buttons from left and right side of chip at presented window *Digital IC Test*. If option "Immediately" located at group "Set conditions" is checked, state of pin is set instantly or "After click on socket". The user can set on pin one of following states:

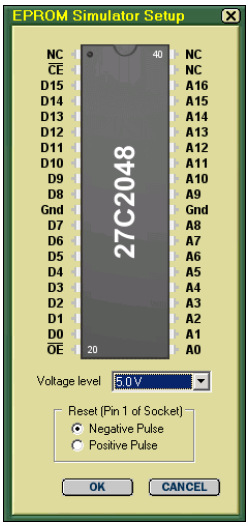
- **LOW** – logic **0** or ground,
- **HIGH** – logic **1** or power supply,
- **HI Z** – high impedance (pull-up 4,7kΩ),
- **CLK** – square clock (X).

Supply voltage can vary between 1.8V and 8V, clock frequency can be chosen among frequencies: 8MHz, 4MHz, 2MHz, 1MHz, 500kHz, 250KHz, ..., 244Hz.

Current state can be read, only if pin is set to high impedance, and is indicated by **H** or **L**.

EPROM simulator



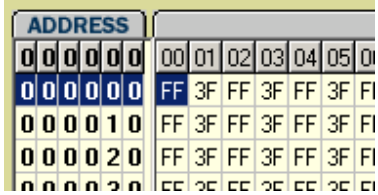


Universal programmer UprogHS can be additionally equipped with 8-bit (~10ns) or 16-bit (~70ns) EPROM simulator. This tool can simulate memories up to 128KB (65KW) or optionally up to 512KB (256KW). Emulation cable is shipped as standard equipment. One socket of this cable should be placed in programmers socket, other in target observing position of pin no. 1. Finally device buffer should be loaded with data. After pressing **Program** simulator generates negative or positive reset on first pin of socket.

EPROM Simulator is ready to use in low voltage targets, it is necessary to change *Voltage level* to value adequate to the target.

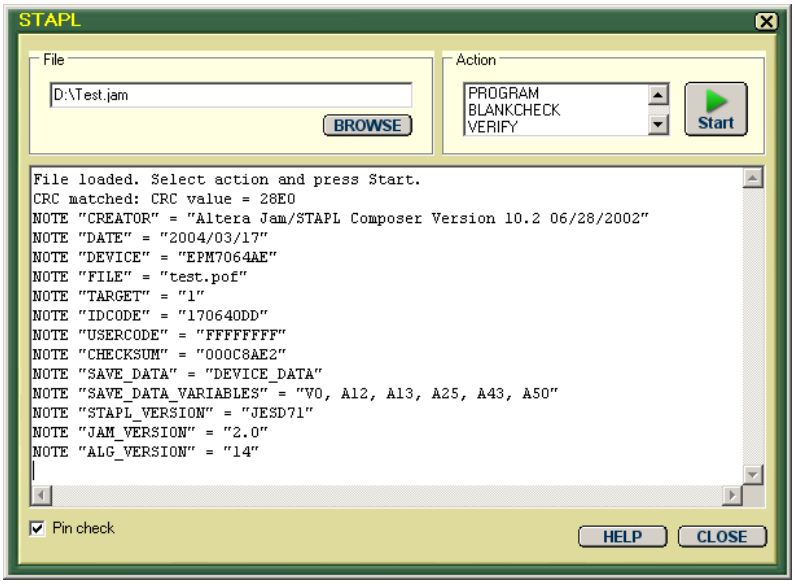
12- and 14-bit PIC microcontrollers

After read operation contents of odd cells is displayed as **0F** or **3F**. Unused, the most significant bits of word are cleared to 0.

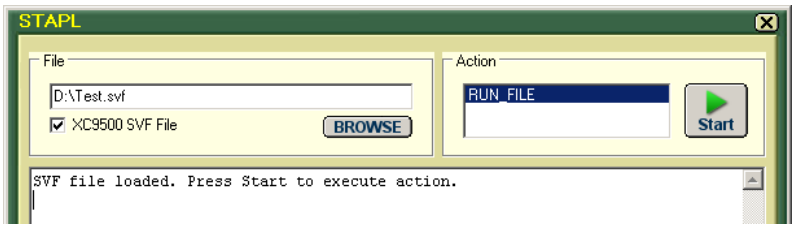


Programming via JTAG interface

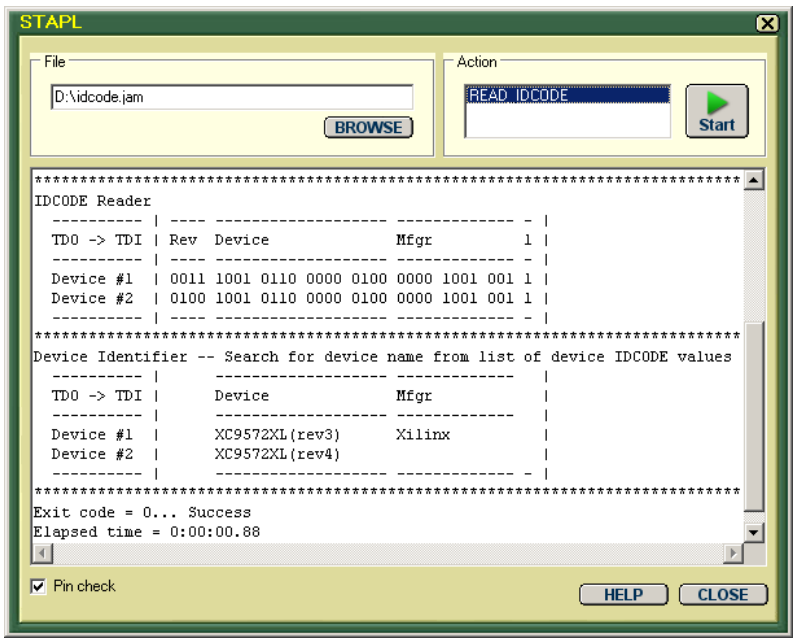
In order to use JTAG programmer the user should proper device from the list. If required chip cannot be found there is a possibility to select universal device: JTAG-5.0V, JTAG-3.3V or JTAG-2.7V. Next press **Program** to open new window, which allow loading a file and executing selected actions.



This application accepts JAM (STAPL), JBC or SVF files, which should be generated in development software. Sample file *idcode.jam* is provided. This file, typically located at *C:\Program Files\Uprog\Tools*, can analyze device chain and provide information about number of devices connected to the programmer and its types.
In order to load a file press **BROWSE** and select required one. Next select one action and press **Start** to execute it.
In case of using XC9500 family devices from Xilinx and loading SVF files the user should select option: XC9500 SVF File. Generally SVF files should be converted to STAPL before using. The software is able to do it automatically, however the conversion utility is also provided.



The user will be informed about correct or erroneous end of process. Execution of other action or loading of next file is possible without closing STAPL window.



Scheme of connection is available after pressing HELP.

Automatic memory type recognition

Programmer Uprog can automatically recognize type of memory inserted into socket. To use this detector select device **AutoEpromID** from group SPECIAL, manufacturer RK-SYSTEM, insert unknown device and press "**Chip ID Checking**". Recognized device will be automatically added to the list.

This tool can be used to detect following memories:

- 8-bit EPROMs in 28- or 32-pin DIP packages,
- 8-bit Flash memories in 32-pin DIP or PLCC packages,
- 16-bit EPROMs in 40-pin DIP packages.
-

Using this tool in case of other devices may cause device damage.

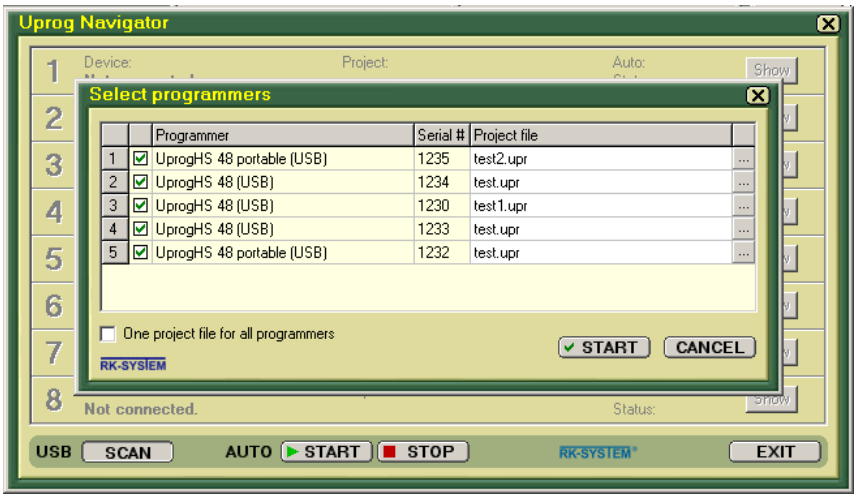
Working with many programmers

In case of to small programming productivity, there is a possibility to improve it by connecting many programmers to the PC. Realized in this way "gang" programmer is more universal than classic solutions. It provides a possibility of independent programming – different devices can be programmed with different files. User can replace programmed device while all other stay in programming process.
To compose this "gang" programmer the user can use different types of programmers with USB or LPT interface.



In order to prepare programming environment the user should execute control application – *Uprog Navigator*, which monitors work of every programmer included into group.

In order to list devices connected to USB ports press *SCAN*. Now the user has a possibility to determine which programmers should be used and choose project files.



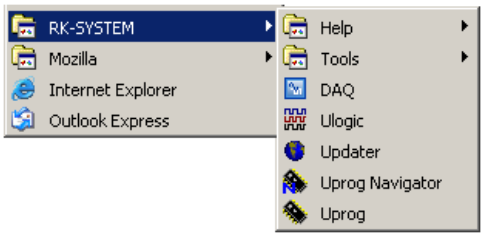
After pressing *START* selected applications will be executed and set into minimized state. Every application will get a number for the identification purpose. At any moment the user can restore selected application by pressing *Show*. Pressing *Close* at will not close the Uprog's application, it will be set back to minimized state.
Next buttons: AUTO START STOP execute and stop AUTO mode in every device.

In order to add next device to controlled programmers, for example Uprog with LPT interface or connected to other PC in local network, the user should execute programmer's application and prepare it to work (select device, load project, etc.). Next press *CONFIG*, select *Multi Mode* tab and provide name or IP number of PC with executed *Uprog Navigator*. Press *Connect* to establish a connection with *Navigator*.

Warning! *Uprog Navigator* requires TCP/IP protocol and proper configuration of "firewall" software.

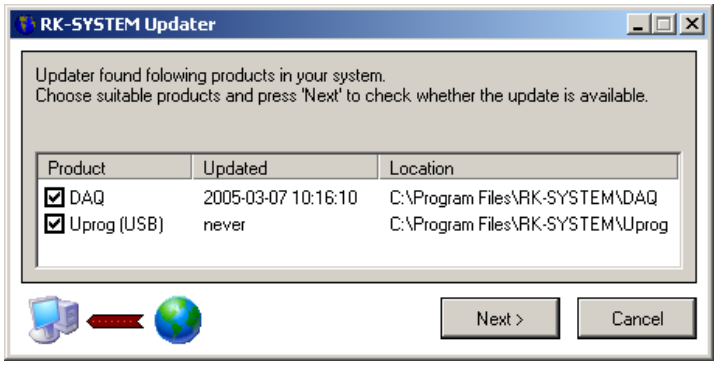
Updater – easy software updates

The **Updater** application is delivered together with software for programmers. It will be available if only *Install Updater* is selected during software installation. The Updater icon is located in Windows menu: Start, Programs, RK-SYSTEM, Updater.

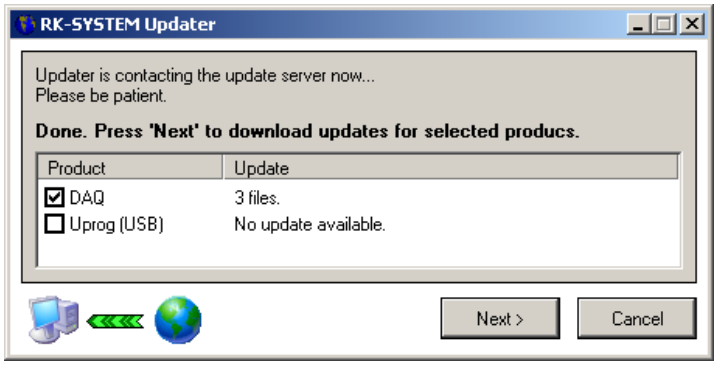


The Updater can also be started from Uprog application – after pressing INFO button and click on c*heck for update*.

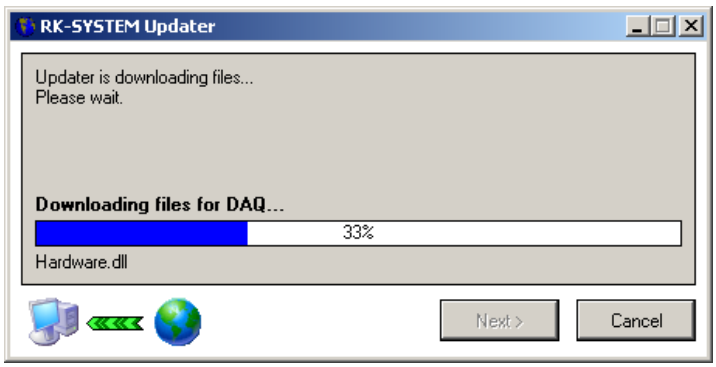
After execution the Updater will display list of installed RK-SYSTEM applications



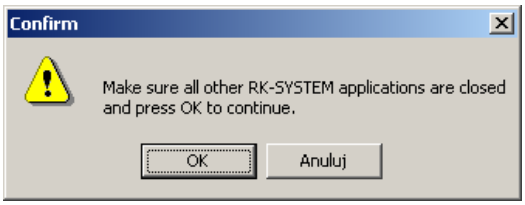
Press *Next* to check whether the update is available for selected applications. Updater will connect to update server.



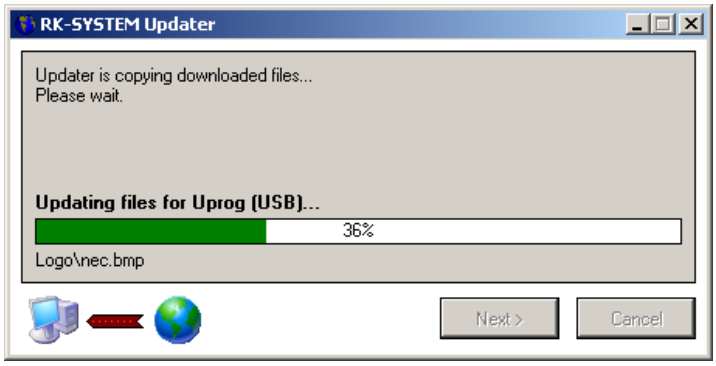
If update is available the Updater will show amount of files to download. In case of large amount of files downloading may take a lot of time. During downloading use of Uprog software is permitted.



When Updater finishes downloading files is asks the user for closing other RK-SYSTEM applications (Uprog, DAQ)



And starts updating files.



After update the software is ready to use.

UprogHS 48 portable

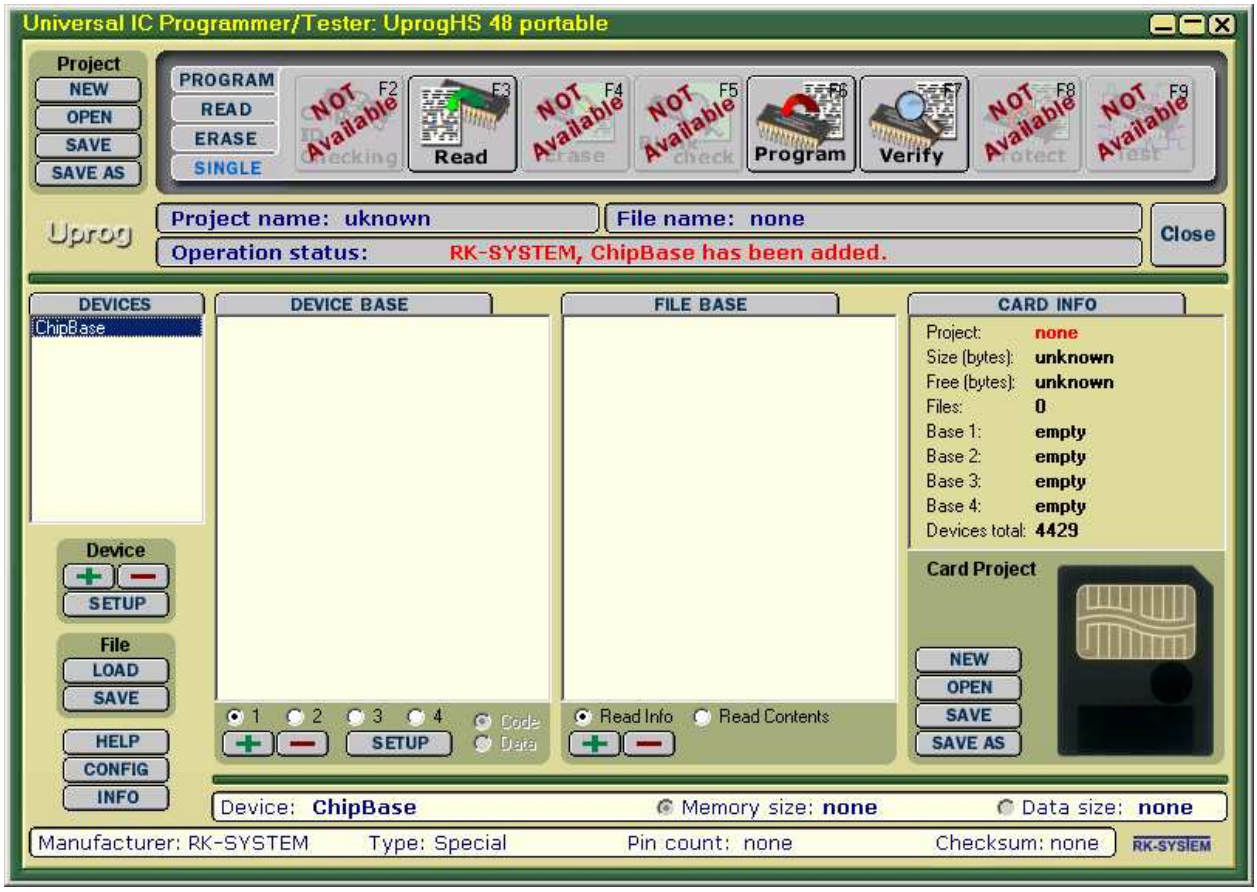
General characteristics

Programmer **UprogHS 48 portable** can operate in two modes: standard PC hosted and stand-alone. Second mode offers all basic options: device selection, programming and reading of its contents. In stand-alone mode built-in keyboard and LCD display allows easy operation management. This mode requires memory card to store data files and devices in four databases. Device databases can contain any device from list with assigned data file.

Stand-alone mode requires card preparation. The user should select all devices, which he intends to use, assign files to them and save this project onto card.

Software description

File and device management is possible thanks to special tool, which transform main software to device and file manager. To execute this tool add device **ChipBase** from group SPECIAL, manufacturer RK-SYSTEM.



Software area is divided into three groups:

- DEVICE BASE,
- FILE BASE,
- CARD INFO and Card Project,

New **Card Project** needs to be created prior adding files or devices. To create project press NEW located on Card Project group.
Three operations are available for ChipBase: readout of card content, programming and verification.

Device base

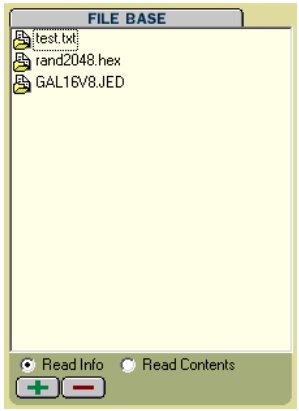


Device base stores devices in four handy bases, these devices are available to use in stand-alone mode. One of these devices can be set as active. To add a device to one of bases press button [+] located under Device Base and select one from *Select device* window. Every base can store up to 40 devices. Device can be removed by click on button [−].

Close to these buttons another is located: [SETUP]. This button opens configuration widow. Each device can be configured; its configuration will be stored on card. This configuration will be programmed in stand-alone mode. In this mode there is no possibility to change configuration of device.

Last selected device will be active in stand-alone mode.

File base



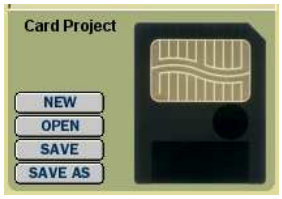
File base stores data files used for programming devices in stand-alone mode. Adding a file to File Base is similar to loading file into buffer. Press [+] located under File Base to choose and load one. User can add maximum 256 files.

To program device assignment of file is necessary. For that purpose select one of devices and click twice on selected file or choose "*Assign file to selected IC*" from pop-up menu. Assignment of file will be stated by appropriate status message. File assignment can be changed in stand-alone mode.

If selected device contains two types of memory (e.g. code and data) assignment a files separately for both types of memory is possible. In this case options **Code** and **Data** in Chip Base are enabled. To make an assignment first select the device, then select type of memory and finally double-click on selected file.

Card projects

Card project can be saved on disk for further use. Content of Device and File Base, file assignments and all other settings can be restored at any time.



Card programming and reading

When bases are complete and all assignments and settings are done, data card can be programmed. For that purpose press **Program** button. Time of programming depends on quantity of files in File Base and can reach a few minutes.

Readout of card content can be realized in two ways: quick and full.

To read card quickly select option Read Info and press "**Read**". After circa 1 second, device base will be filled with devices stored on this card, file base will contain names of files. Each file name will be denoted by "empty page" icon. It means that this is only information about a file. To read content of this file from card click with right mouse button on it and select "**Read file from card from**" menu. Icon changes to "filled page". Now content of file can be saved on disk with "**Save file to disk**".

Complete readout of files content is realized with selected option Read Contents, but this operation lasts much longer.

If file base contains files with "empty" or "filled page" icon, Card project cannot be saved.

Stand-alone mode

To enable stand-alone mode insert card into connector and connect supply cable to the programmer, data cable leave unconnected. Device will initialize hardware and display following text:

```
** UprogHS 48 **
portable USB:off
```

Press any key to enter main menu.

Menu operation



User can look over menu using keyboard: four direction buttons and two control buttons (OK and Esc). Buttons “Up” and “Down” change state of menu. OK means acceptance or enters submenu, ESC - cancel.

Main menu is composed of five states: **Card info**, **Chip info**, **File info**, **Run** and **Programmer**.

Card info

This state displays all information about card: size, free space, project name, amount of files and devices stored in databases.

```
Uprog main menu
>Card info
```

For example:

```
Card size:
34603008
```

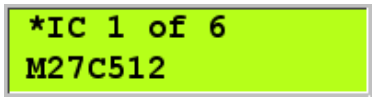
```
Number of ICs:
base1: 6
```

Chip info

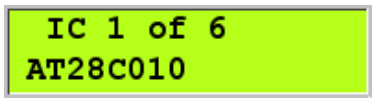
```
Uprog main menu
>Chip info
```

```
Chip info
>Base 1
```

This state contain information about available and allows to change active device. Asterisk sign (*) marks active device.



Active device.



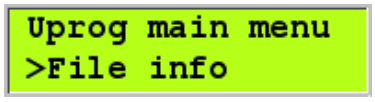
Inactive device.

To activate other device, select one and press OK. User will be asked for acknowledgement by leaving “Chip info”. Press OK to save changes, ESC to cancel save.

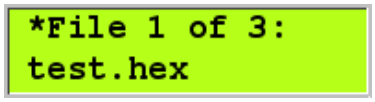


File info

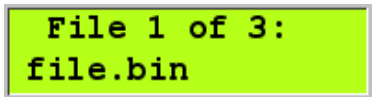
File info contain list of files stored on card.



This state allows changing assignment of file. This assignment is marked by asterisk by file name.

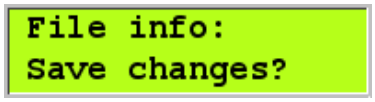


File assigned to active file.



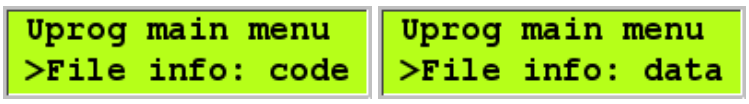
File unassigned.

To change file assignment press OK by selected file. After that user is asked for acknowledgement for saving changes.

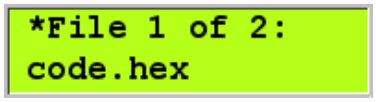


One file can be assigned to many devices.

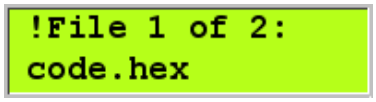
If device contain two memories (e.g. code and data in AVRs from Atmel), state **File info** consists of two items:



File can be assigned independently for each memory type. Browsing **File info: code**, file assigned to code memory is marked by asterisk (*). If exclamation sign (!) marks file name this file is assigned to other memory. Assignment of one file to both memories is possible.



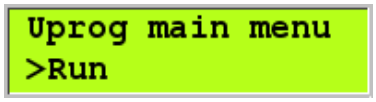
File *code.hex* from **File info: code**.



File *code.hex* from **File info: data**.

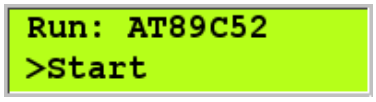
Run

Using functions from this state the user can execute programming process, read memory content and save it onto card and change parameters of programming process.



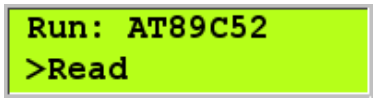
This position of menu contains three states:

1. **Start** – executes programming process.

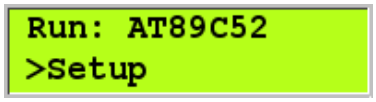
   

   For sample device AT89C52 programming process is composed of: device ID check, erasing, blank check, programming, verification and configuration set up. Exact description of this process is located in chapter "**Programming the device**".

2. **Read** – reads device and saves its memory content onto card.
   Content of this file can be read later in PC hosted mode and saved to disk. More about reading can be found in chapter "**Reading the device**".

3. **Setup** – can change parameters of programming process.

   This menu state allows determining which elements of programming process will be executed or skipped and changing parameters of process. In some situations there is no necessity to execute all elements of process, for example there is no need to erase and blank check brand-new memories.

To exclude **Erase** from programming process find position Erase and press OK.

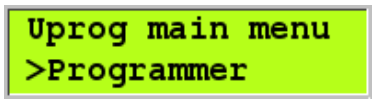


Some operation can be unavailable, for example “Test” for sample device AT89C52. In this case **N/A** marks such operation.

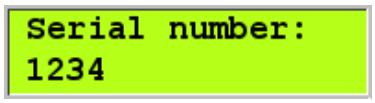


Programmer

This state of menu contains information about programmer and allows changing its parameters.

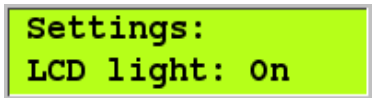


Information about programmer (Uprog info) – displays type, version and serial number:



Settings – user can set up following options:

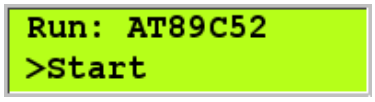
- display backlight



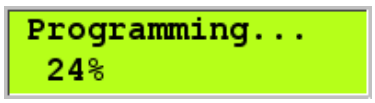
- operation progress
- buzzer

Programming the device

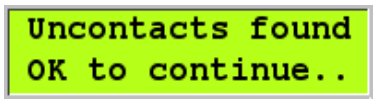
Programming cycle starts after pressing OK in menu state **Start**.

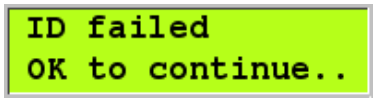


The programmer executes all available operations, starting from pin contact check, through chip ID checking, erasing, blank check, programming with assigned file, verification, configuration set up, till device test (for PLDs).

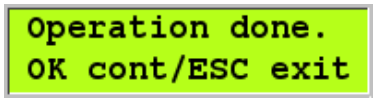


If any operation fails the user will be informed with suitable message:





Press OK to continue interrupted process or ESC to exit.
Correct process execution will display following message:



The user can press OK to execute process again or ESC to exit.

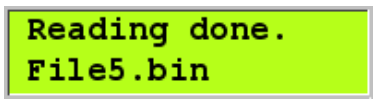
Reading the device



During **Read** operation content of the devices memory is written onto card. Press OK to start reading.



When this operation ends correctly, the programmer will display name of created file. This file can be read from card in PC hosted mode. Press ESC to return to menu.



Menu structure

Card info	Card size	
	Free space	
	Project name	
	Number of files	
	Number of ICs (total)	
	Number of ICs (base 1)	
	Number of ICs (base 2)	
	Number of ICs (base 3)	
	Number of ICs (base 4)	
Chip info	Base 1	IC 1 of X
		IC 2 of X
		...
	Base 2	IC 1 of X
		IC 2 of X
		...
	Base 3	IC 1 of X
		IC 2 of X
		...
	Base 4	IC 1 of X
		IC 2 of X
		...
File info	File 1 of X	
	File 2 of X	
	...	
Run	Start	
	Read	
	Setup	Run setup – Check ID
		Run setup – Erase
		Run setup – Blank check
		Run setup – Program
		Run setup – Verify
		Run setup – Protect
		Run setup – Test
		Run setup – Smart
		Run setup – Pin check
Programmer	Uprog test	
	Uprog info	Programmer type
		Hardware version
		Serial number
		Manufacturer
	Settings	LCD light
		Progress
		Buzzer

Ulogic – logic analyzer

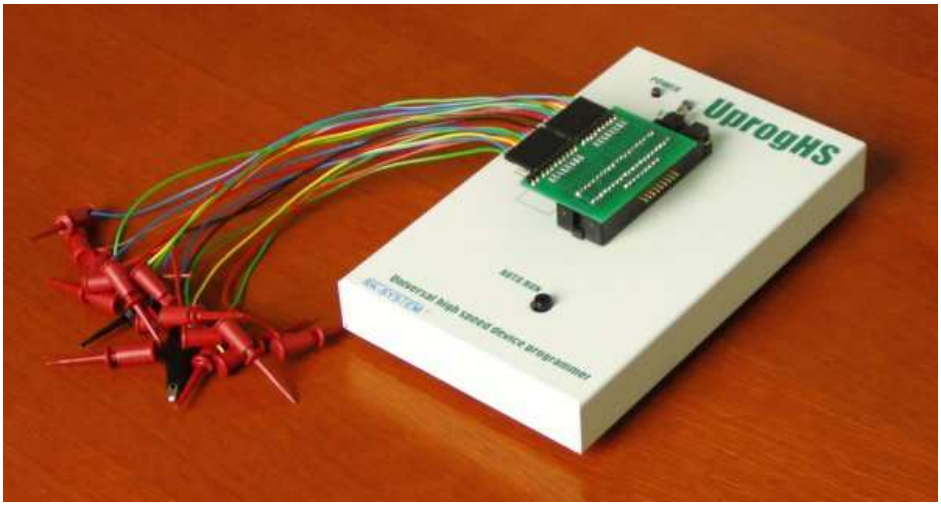
Main features

Universal programmer **UprogHS** can optionally operate as logic analyzer with following features:

- sampling rate: 100MHz for 8 channels or 50MHz for 16 (for UprogHS portable: 80MHz/40Mhz)
- samples per channel: 128K or 512K
- external sampling clock input
- variable threshold
- flexible trigger options
- pre- and post-trigger buffer
- capture delay and edge counter
- input impedance: 470kΩ

Hardware installation

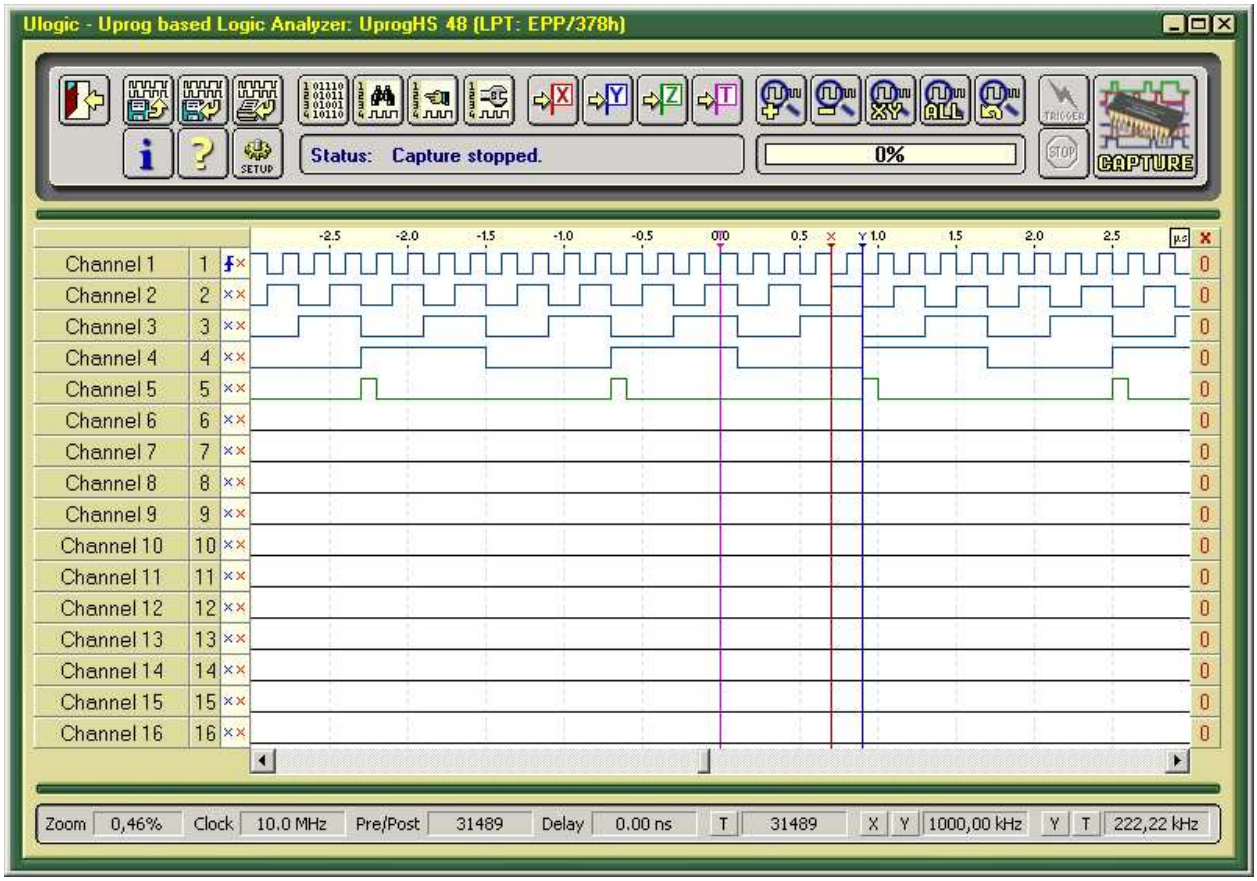
To use logic analyzer mounting of small-size board – **Ulogic Adapter** – is required. Connectors, located at left side of the board (input impedance: 470kΩ), are used to register signals up to 30V. Connect probes to the adapter observing position of ground cable (black).



Software description

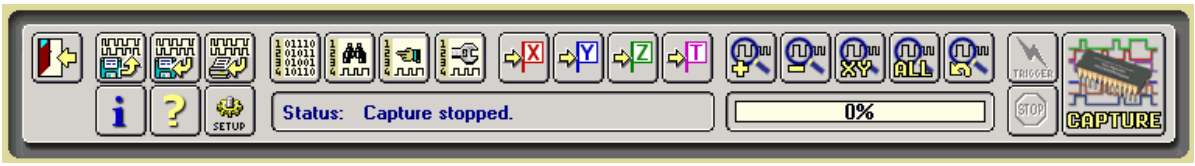
Easy to use Ulogic software, which can be executed by click at icon Ulogic.exe located at desktop, provides full functionality including:

- displaying captured data,
- data analyzing: time/frequency measure (four cursors), pattern search, text display,
- channel renaming,
- saving the data



Below follows a short description of each of the main window areas.

Menu bar



Buttons located at main menu bar provides quick access to frequently used functions.



- execute data capture process (Enter)



- force trigger when Ulogic is waiting for a trigger (Space)



- stop data capture process (Backspace)


- increase/decrease the data magnification (+, – at numeric keyboard)



- zoom the data between cursors **X** and **Y**



- display whole data buffer (Ctrl + A)


- display the data with previously set zoom factor



- move the data display to trigger position: cursor **T** (Ctrl + T)



- move the data display to cursor **X**, **Y**, **Z** (Ctrl + X, Ctrl + Y, Ctrl + Z)


- display *Digital Setup*, which is used to set capture parameters (Ctrl + S)


- use to set channels parameters: name, color, etc. – *Channels* (Ctrl + C)


- use to search for bit combinations (patterns) - *Search Pattern* (Ctrl +P)


- display signals in text fashion: binary and hexadecimal - *Text Display* (Ctrl + T)


- save signals to file


- print signals


- open previously saved signals

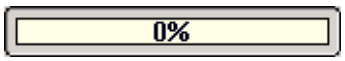


- main program configuration


- display help (Ctrl + H)


- give information about software and manufacturer (Ctrl + I)


- close application (Ctrl + Q)

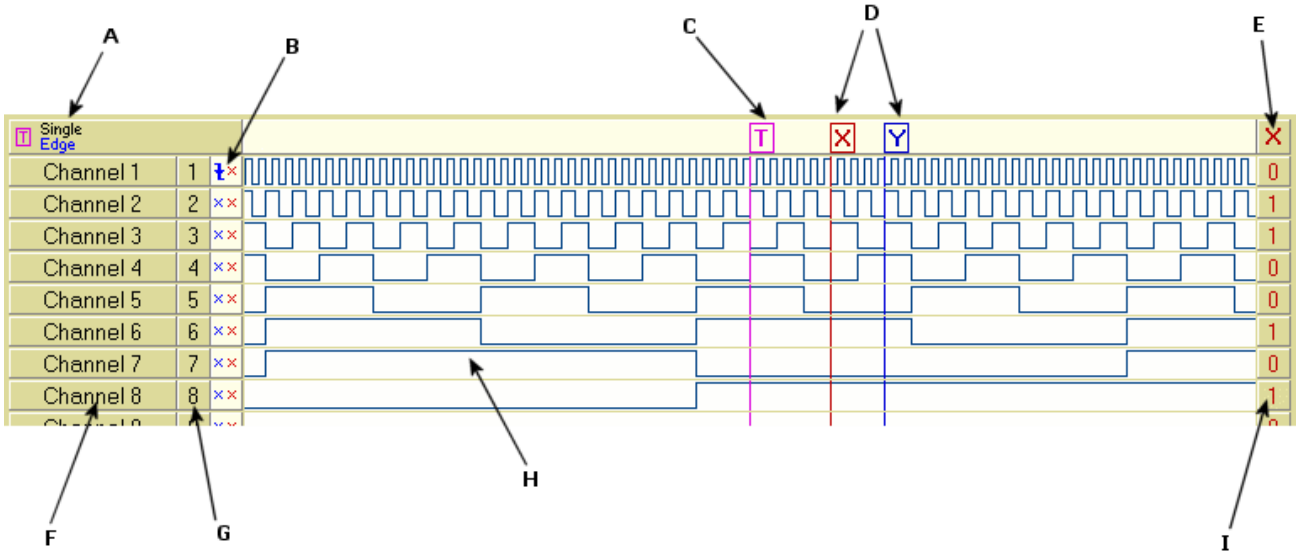


- data transfer progress indicator



- display current status of analyzer

Signal display



This area diplays captured data in graphical form. Data may be scrolled and zoomed by clicking on one of zoom icons. Time differencies or frequency can be measured using four cursors.

A – Information about type and condition of trigger
B – Information about cause of trigger (here: falling edge on channel 1)
C – Cursor **T**, that points trigger, put automatically
D – User cursors, put by click in data display area: **X** – left mouse button, **Y** – right, **Z** – middle or Ctrl + left
E – Type of cursor for which values are displayed
F – Channel name
G – Number of channel
H – Data display
I – Signal values at cursor position

Information bar

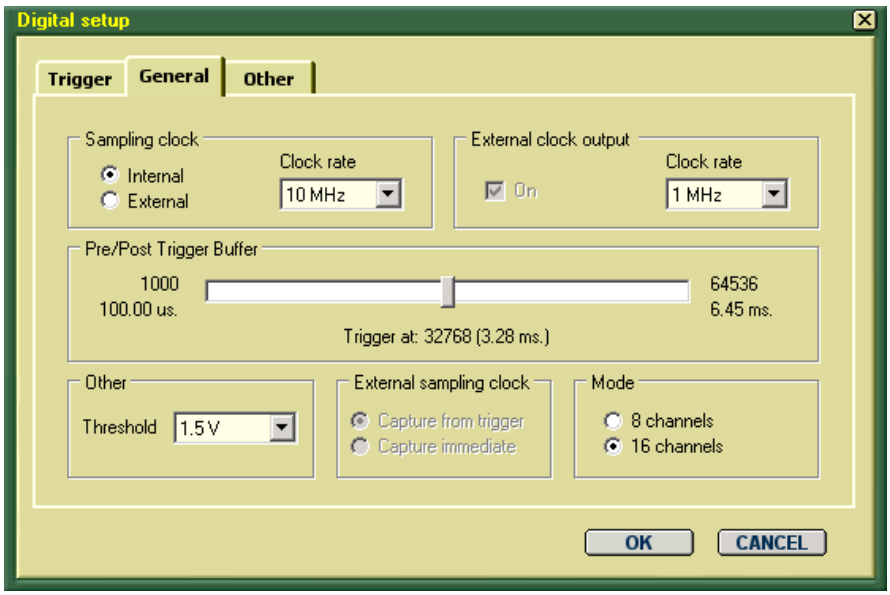


A – Magnification factor.
B – Cursor position in samples, click to change type of cursor.
C – Sampling rate.
D – Frequency measured between cursors **X** and **Y**. Click value to change display mode to time period.
E – Time period between cursors **Y** and **Z**.
F – Pre-/Post-Trigger buffer divider position in samples or time period.
G – Capture delay value.

Digital Setup

Digital Setup consists of three tabs *General*, *Trigger* and *Other* and allows setting all parameters of trigger and data capture process.

General



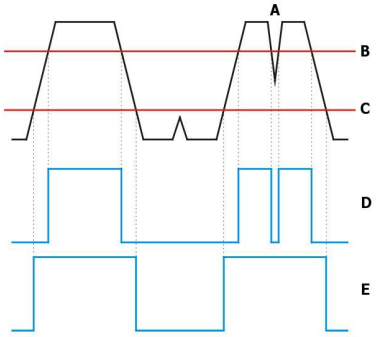
Options grouped in **Sampling clock** define source of clock used for data capturing. If *Internal* is selected sampling signal is generated internally. Its frequency can be selected among 16 values. High clock rates provide higher sampling resolution and should be used for capturing quickly varying signals.
If *External* is selected sampling clock must be provided by the user to EXT_CLKIN input. In this case data is captured on rising edge.

Output EXT_CLKOUT can be used as simple square clock generator. Its frequency, selectable in **External clock output** group, can vary from 100MHz down to 1kHz. (80MHz down to 1kHz for UprogHS portable).

The data buffer is divided into two parts: Pre-Trigger and Post-Trigger. While the logic analyzer is waiting for trigger condition occurrence it is continuously capturing data into buffer. When the trigger occurs it captures data into Post-Trigger part and displays the data. Pre-Trigger buffer contains data captured before the trigger; Post-Trigger buffer is filled

with data captured after trigger. To capture more data before trigger occurrence slide the bar **Pre/Post Trigger Buffer** to the right and vice versa.

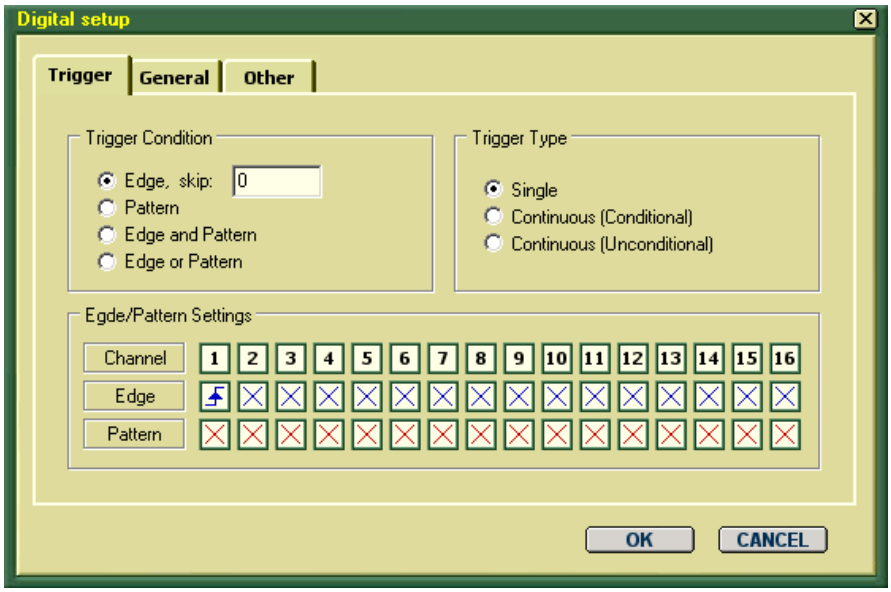
The threshold voltage, located in group **Other**, is used to determine logic level of the signal. If signal value is higher than this voltage it will be captured as “high”.



A – Measured signal
B – Threshold value 1
C – Threshold value 2
D – Sampled data for threshold value 1
E – Sampled data for threshold value 2

Two modes of operation are available, grouped in **External sampling clock,** if *External* clock source is used. If *Capture from trigger* is selected, capture process is realized like with internal clock source, except that the sampling clock is taken from EXT_CLKIN. This mode can be used to capture data with other frequency than listed, e.g. 33MHz.
If *Capture immediate* is selected will start immediately after pressing CAPTURE [similar to *Continuous (Unconditional)*]. This mode can be used to analyze bus transmissions when specified count of clock pulses is provided. In this case connect EXT_CLKIN to bus strobe signal and use *Text display* to analyze captured data. If number of clock pulses if not enough to fill the buffer, STOP button can be pressed to interrupt capture and display data. Cursor **T** will be put at last data in buffer showing number of captured samples.

Trigger



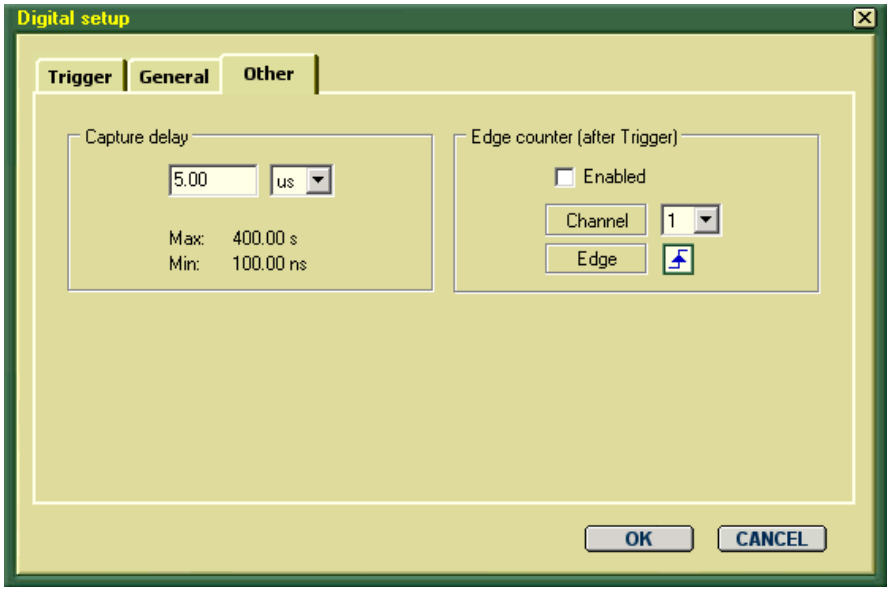
User can define **Trigger Type**. *Single* type is used for single captures. To capture data again user should press CAPTURE. If *Continuous (Conditional)* is selected the logic analyzer after data capturing and displaying will wait for next trigger occurrence. In *Continuous (Unconditional)* the analyzer will continuously capture and display data without waiting for trigger till user presses STOP.

To specify **Trigger Condition** user should choose one of following options: *Edge*, *Pattern*, *Edge or Pattern*, *Edge and Pattern*. Selected condition occurrence will trigger the capture process. Last group **Edge/Pattern Settings** is used

to configure the cause of trigger. Clicking on square icon changes the configuration of each channel. Edge type (rising: , falling: , change of state – any edge: , disabled:) can be enabled for one channel. Pattern will be defined if one or more icons will be different than "don't care": – low: 0 or high: 1. Clicking right mouse button on any icon will open pop-up menu that allows resetting edge and pattern to default values.
If *Edge* is selected as trigger condition and "skip" value is set to non-zero, the analyzer will count the edges (rising or falling) before the trigger can occur. Thanks that e.g. sixth rising edge on channel 1 can cause the trigger:



Other

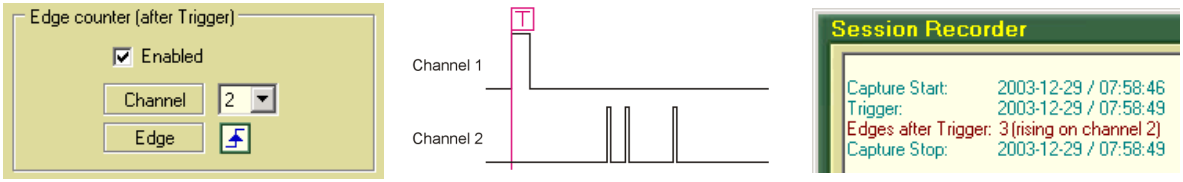


Capture delay is useful when specified time delay is required between trigger occurrence and start of capture. Setting *Capture delay* value to non-zero allows to analyze events a time after the trigger has occurred without reducing the sampling rate. Minimum and maximum values depend on sampling rate; *Capture delay* value should be a multiple of minimum.



Other tool: **Edge counter (after Trigger)** counts number of edges (falling or rising) on specified channel after occurrence of trigger, till end of capture process (full buffer). It can be used for example, to detect "glitches" or to analyze serial transmissions. Tool can't be used together with "skip edge" from *Trigger Condition*. Number of detected edges is shown in *Session recorder*.

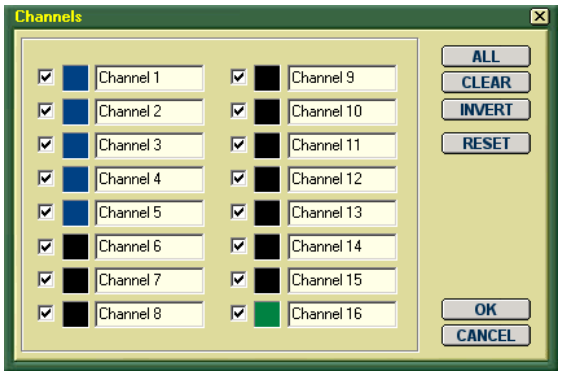
In example bellow tool will count three rising edges on channel 2:



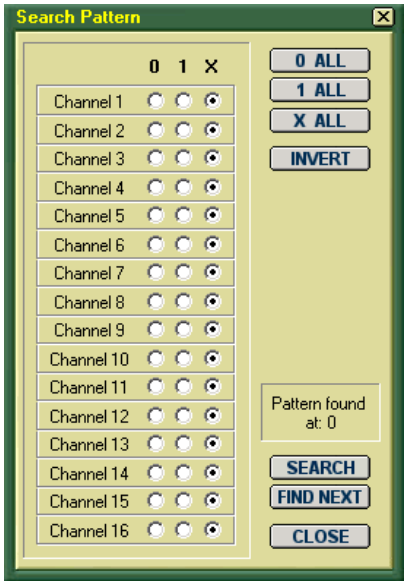
Channels

In *Channels* window user can define own channel names, hide unused and change its colors. To hide selected channel unselect proper check box. Hidden channel will capture the data and may be simply unhidden to see captured data. Click a square near channel name to change its display color.

Buttons located at right window side perform following functions: ALL – selects all channels to display, CLEAR – hides all channels, INVERT – inverts channel selection, RESET – restores default channel names and colors.



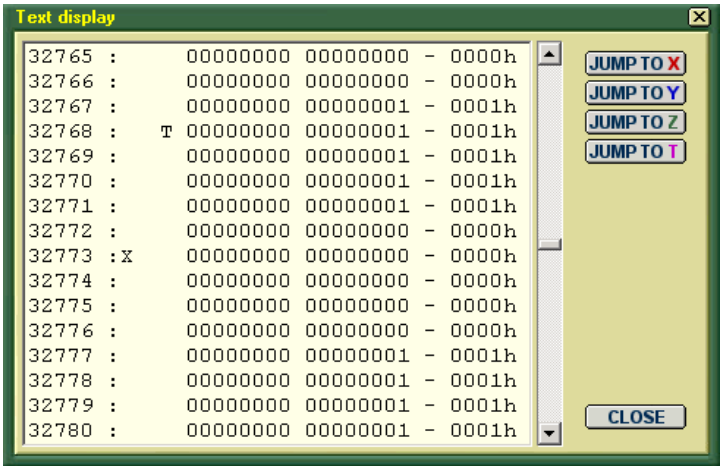
Search Pattern



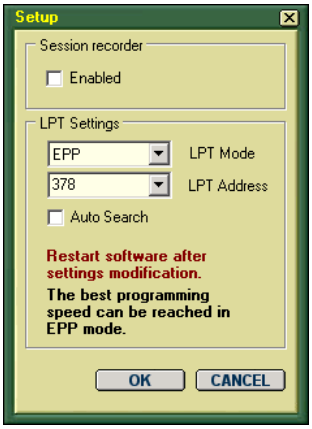
Search Pattern tool is used to search pattern combinations in captured data. To specify pattern select proper radio buttons and press SEARCH. If specified pattern exists cursor **X** will indicate first occurrence of it. Press FIND NEXT button to find other occurrences of selected pattern. Other buttons: 0 ALL, 1 ALL and X ALL allows setting identical state on all channels: low, high and “don’t care”. Button INVERT interchanges “zeroes” and “ones”.

Text Display

This option is used to display captured data in text fashion: binary and hexadecimal. A data sample is represented by each word: channel 1 by the least significant bit, channel 16 (8) by the most significant bit. Buttons “JUMP TO” allow locating position of cursors.



Main program configuration



This window contain configuration of main program.

Option **Session recorder** enables additional window that displays current configuration of analyzer and all information concerning capture process, e.g. value of the *Edge counter (after Trigger).*

LPT Settings group is visible in case of programmers that communicate with PC via parallel port. Description of this group is present in chapter *Uprog usage*, *General principles*

Appendix

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