



## Table of contents

The ld100_tool utility.....	1
Recent document changes.....	1
System typical requirements.....	2
Installation.....	2
Initial set up and connection with the Platform over LAN.....	3
Diagnostics.....	3
FRU, SDR, SEL.....	5
BMC terminal.....	5
IPMI over serial.....	5
Serial Over LAN.....	6
LAN session inactivity timeouts.....	7
Keep connection checkbox options.....	7
LAN discovery.....	8
FRU flashing.....	9
LAN password options.....	10
BMC firmware updating.....	11
Auxiliary ld100_tool controls.....	12
Multi-BMC support.....	13
LD100 tool extensibility options.....	14
Running LD100 tool as a service.....	15
Glossary and abbreviations.....	16
Literature.....	16

## The ld100\_tool utility

The ld100\_tool utility controls IPMI-capable devices over an interface, and provides the external clients with the capability to control each device. The primary purpose of the ld100\_tool is to support the LD100 device programmed to control the device connected sensors. If connected with another device (not the ld100, or ld100 programmed to carry another function), the ld100\_tool is capable to discover that device and provide respective support possible. The device specific options are described in the respective documents [10, 11]. Below is general information on the ld100\_tool use.

## Recent document changes

- JSON/mosquito
- Fig.3 description (J20.2, J20.4 GPIO) fixed
- Running ld100\_tool as a service

## System typical requirements

1. Windows PC
2. LAN connection with the LD100 device
3. USB connection with the LD100 (recommended option) \*

\* USB to UART converter drivers (FTDI) must be installed [5]

The LD100 or other IPMI-capable device connected with the ld100\_tool over an interface is called below a **Platform**.

## Installation

- 1) find in the distribution package ld100\_tool.rar, unpack it in any directory;
- 2) run the Setup.exe from this directory;
- 3) Follow the instructions on your screen (Fig.1)

To uninstall the ld100\_tool, please use the Windows Control Panel.

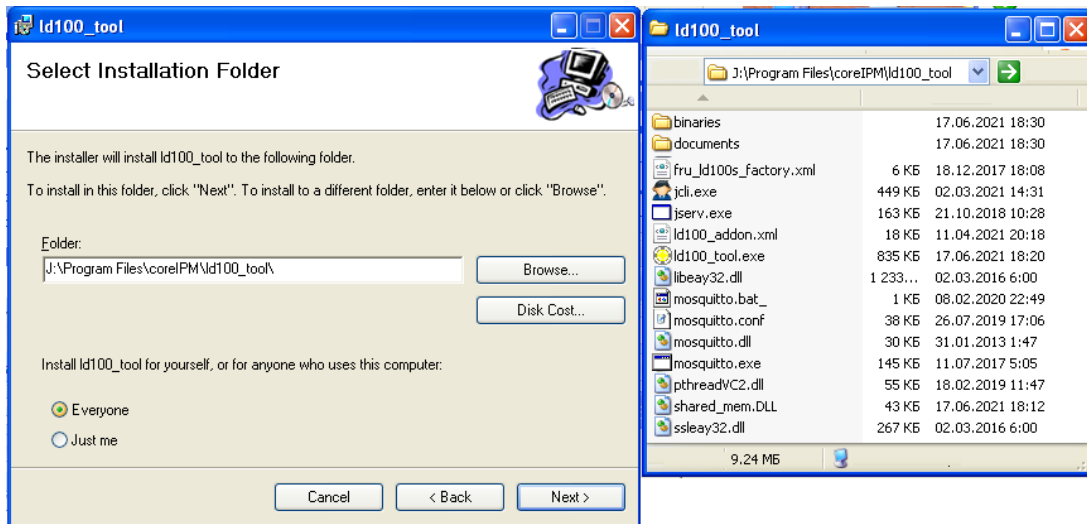


Fig.1 The ld100\_tool installer window, and the installation directory after install.

## Initial set up and connection with the Platform over LAN

Most ld100\_tool set up is done using the Connection tab shown on the Fig.2.

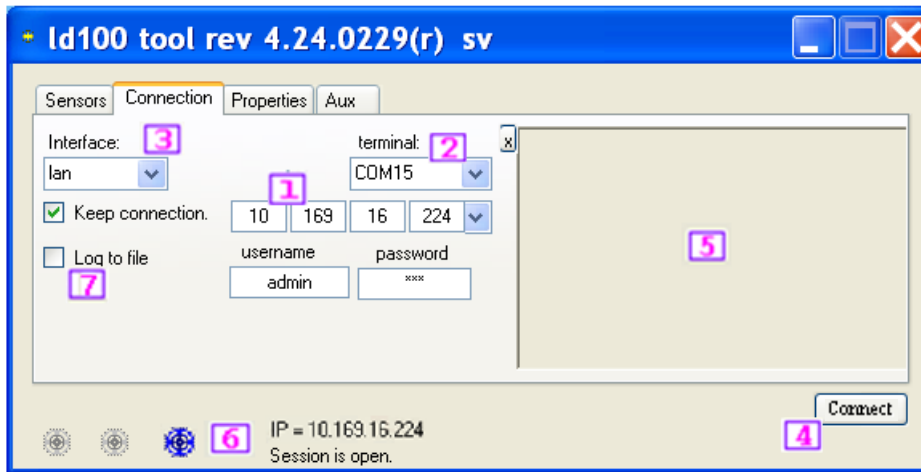


Fig.2 The “Connection” tab of the ld100\_tool GUI.

1. To communicate with the Platform, the platform’s LAN IP address must be specified;
2. If USB connection is used, the respective COM port should be selected;
3. If secure communication is used, the “Use secure IO” should be checked, and user name/password entered (see “LAN Password Options” below);
4. To reconnect the LD100 over LAN, press “Connect” button\*. The reconnection should be performed each time the IP address, or security settings are changed. Also reconnection is required if the connection with the Platform was closed due to time out, or if the Platform lost its power. Before the reconnection all the ld100\_tool settings are saved, then after successful LD100 discovery, settings are restored.
5. The BMC terminal is accessible at the terminal window. For details refer to the “BMC terminal” below.
6. Connection status, and client tool activity is shown on the status lines, and with “LED” indicators. Red LED (Fig.6) often means an error, Green– ld100\_tool activity, Blue – connection status. LEDs have tooltip labels which may show more information.
7. Log to file checkbox if checked enables ld100\_tool events logging to a file. More detail on logging, and status reporting is provided in the application note [6].

\*The “Reset” button (legacy name) is now renamed to “Connect”, not to be confused with ld100 hardware Reset button.

## Diagnostics

Before the LD100\_tool is fully operational, at start up it automatically discovers the Platform.

During the discovery, diagnostic messages are being output on the status line. After successful discovery, the status line should display: “Session is open” (if RMCP ping is disabled this text is not shown).

Any problems, if found, are shown with Windows error provider or with Red LED, on the GUI. In both cases additional information is accessible from the GUI tooltip (please hover the mouse over the control to see the tooltip).

Note: the Red LED example is shown on the Fig.4 below, the error provider icon is not shown.

Platform control

The LD100 device has an on board temperature sensor, and 18 user controllable GPIO lines. To refresh the screen, manual or automatic (periodic) polling should be used.

The GPIO lines correspond to pins of the Id100 J18, J19, J20 connectors, six pins per connector.

Pins J20.2, and J20.4 are connected to on-boards LEDs: LED\_ERR, and LED\_ACTIVITY respectively. They normally come up configured as outputs, at Id100 device power up (Fig.3). The user may reconfigure them to inputs if required using LD100\_tool.

Note: the “Main” tab shown on the Fig.3 reflects general LD100 controls. The GUI might have more controls shown if customized Id100 firmware is discovered on the Platform (Fig.4)

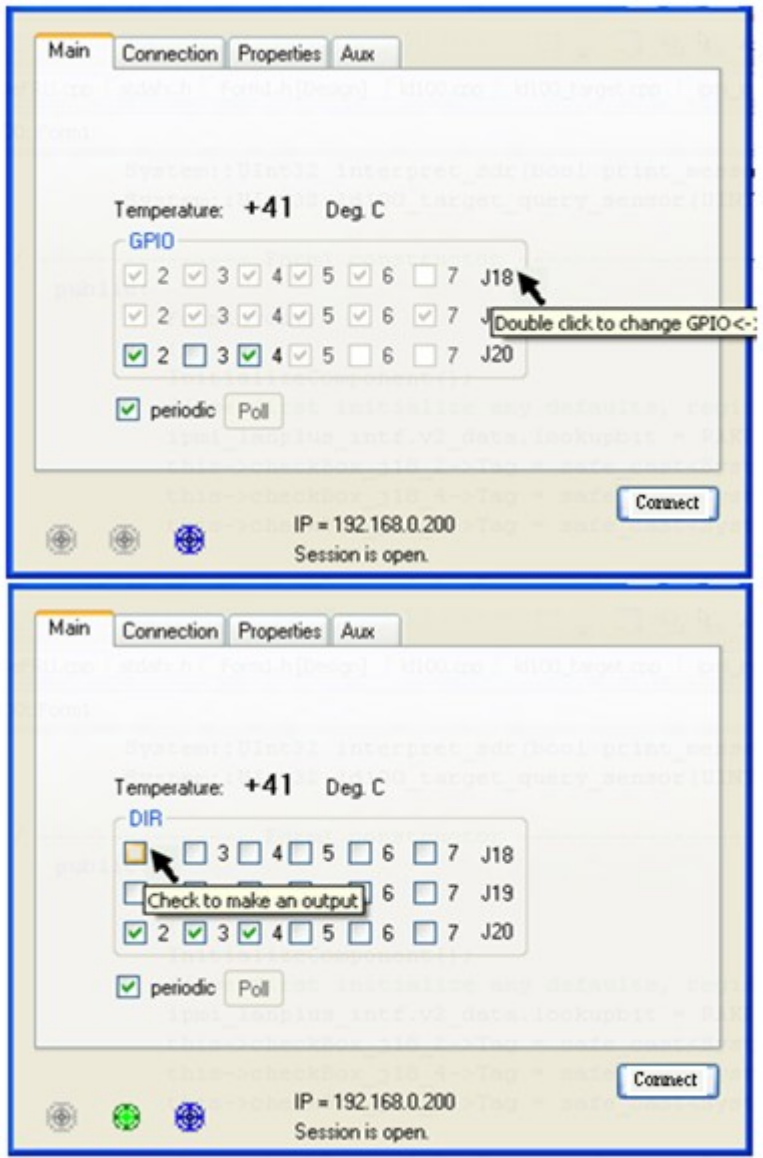


Fig.3 The “Main” Id100\_tool GUI tab.

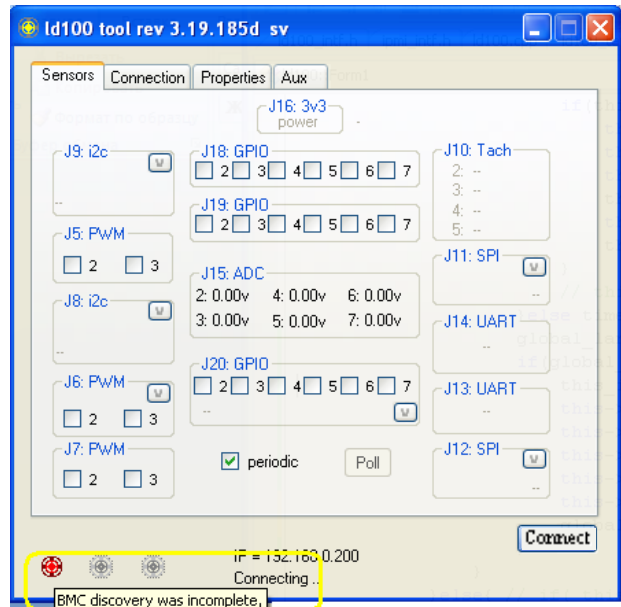


Fig.4 Customized LD100\_tool, the “Main” tab: “sea of sensors” firmware project (errors display is shown)

## FRU, SDR, SEL

If the device was successfully discovered, there are options to print FRU, SDR, or SEL contents. See Aux tab. Also available are options to clear SEL or set the SEL time (ld100 clock) equal to computer time. There is no battery on the ld100, therefore the SEL clock is volatile.

## BMC terminal

The BMC terminal [7] is the command line service accessible via BMC serial port – the same port used for IPMI interface, or from Serial Over LAN connection. Serial port selection options are illustrated on the Fig.5.

The BMC terminal is available for keyboard input from the terminal window if LAN interface is selected, or if the interface is closed (Fig.5.3). The appropriate port must be selected for the terminal, in this case (COM-port or SOL).

BMC terminal is not available if Serial interface is selected for IPMI communications (Fig.5.1), from the drop-list of interfaces. In this last case the terminal window is used for optional IPMI over serial display (Fig.5.2). See “IPMI over serial” below.

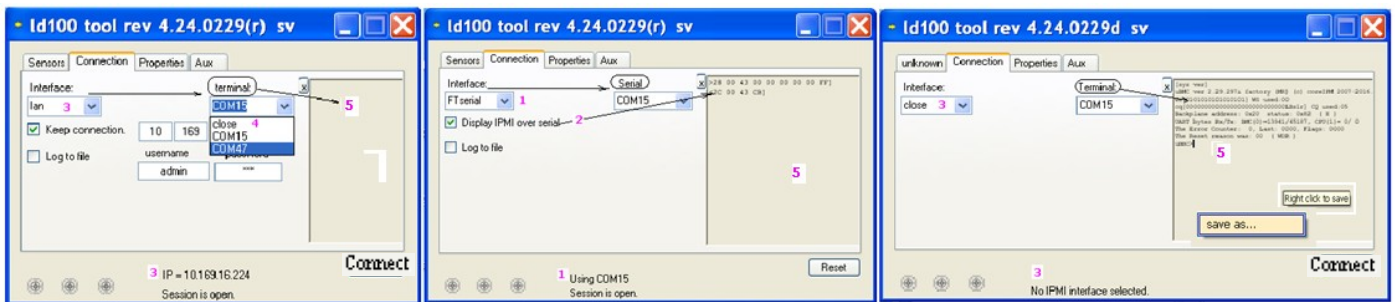


Fig.5 Serial port selection.

If “close” is selected from the list of serial ports (Fig.5.4) the currently open serial port is closed. Repeated selection from the list of currently open serial port (ex.: COM15 on Fig.5) closes this port and then reopens again.

The terminal window (Fig.5.5) contents are available for copy-pasting fragments, and also could be saved to a file. Mouse right click the terminal window brings the “Save as” file selection dialog, to write all the window contents to the file specified.

## IPMI over serial

The LD100 client supports communication with the Platform over serial interface in place of LAN interface. To use this option terminal echo should be turned off using [sys echo] terminal command[7], and serial interface should be selected (Fig.5.2). The communication will be performed via the COM port selected.



## LAN session inactivity timeouts

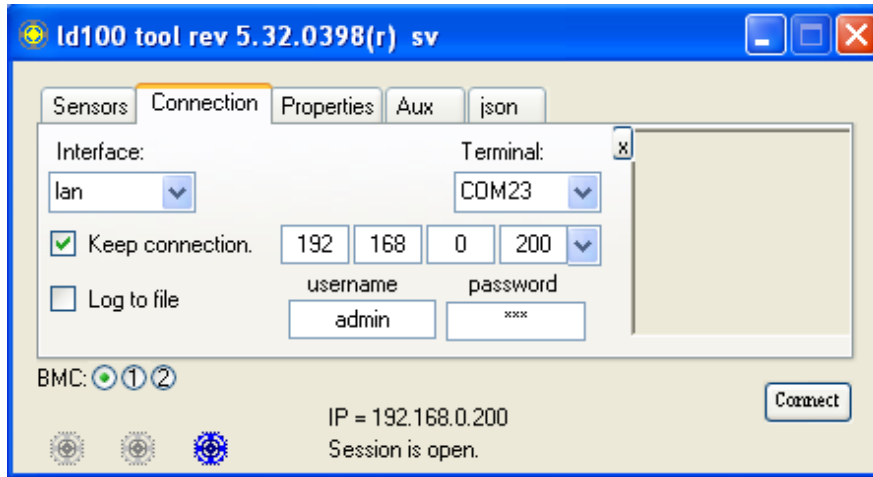


Fig.7 Keep connection to prevent session from closing.

If LAN session is open but no messages are received by the BMC, then after time-out time (about 60 seconds), the BMC closes this session automatically.

To prevent the session from closing, the Id100\_tool “Keep connection” checkbox (Fig.7) should be checked. This effectively maintains periodic polling of the remote BMC, with a period of several seconds, by sending a Get Device ID message to the remote BMC.

The “Keep connection” state is saved non-volatile: see “Auxiliary Id100\_tool controls”.

Note: if session activity is guaranteed (for example sensors are being polled periodically: Fig.4) then no additional activity to keep connection is required.

## Keep connection checkbox options

The “Keep connection” checkbox if right mouse clicked, brings up a menu of options (Fig.8).

You may:

1. Disable “Keep connection” of all the BMCs supported by the Id100\_tool; Fig8.1
2. Enable “Keep connection” of all the BMCs having LAN interface selected; Fig8.2
3. Disable or enable LAN discovery;
4. Specify the LAN discovery window size Fig8.4
5. Specify number of BMC devices supported by the Id100\_tool Fig8.5

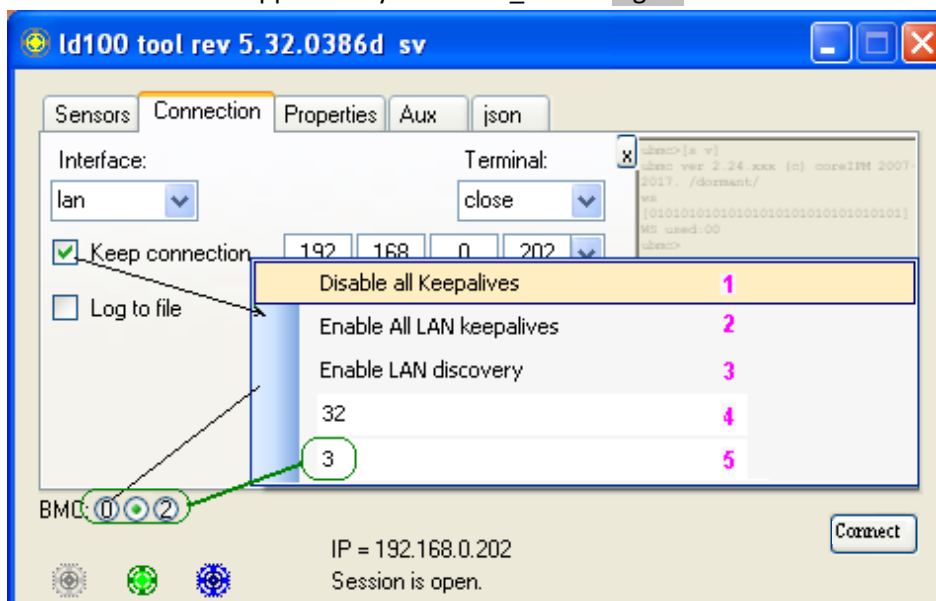


Fig.8 Keep connection checkbox options

See also the “Multi-BMC support”, “LAN discovery” paragraphs.

## LAN discovery

The Id100\_tool optionally performs cyclic scan of a window of IP addresses, to find Id100 devices, using RMCP ping messages. The scan window size is settable from the “Keep connection” checkbox options menu, and centered around the IP address of the BMC0 (Fig 8.3, Fig 8.4).

Live IP addresses (an addresses the RMCP ping reply message is received from) are reported on the Properties Id100\_tool tab, and on the log window:

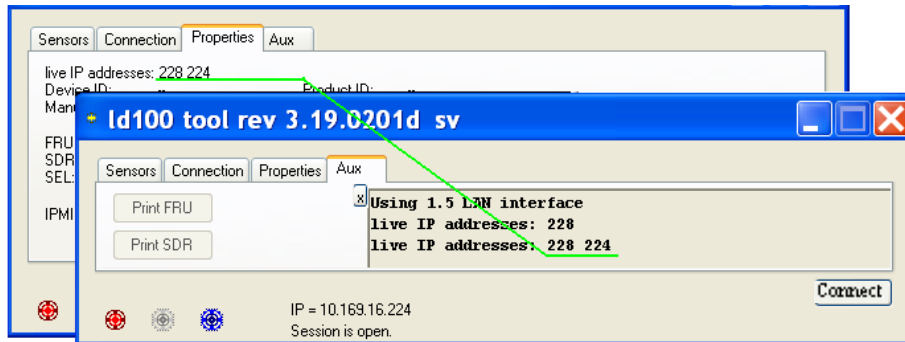


Fig. 9 LAN discovery

Note: The BMC IP address set could be any IPv4 address, while LAN discovery window is limited to the network class address range not including the broadcast address.

For example if BMC0 has IP address = “192.168.0.221”, and LAN window size is set to 100 then scanned will be a window: “192.168.0.171”..“192.168.0.254”

## FRU flashing

The Id100\_tool distribution comes with the FRU description sample file included: fru\_sample.xml

You may use it as a template for updating the FRU/SDR/SEL.

FRU flashing is performed from the “Aux” tab:

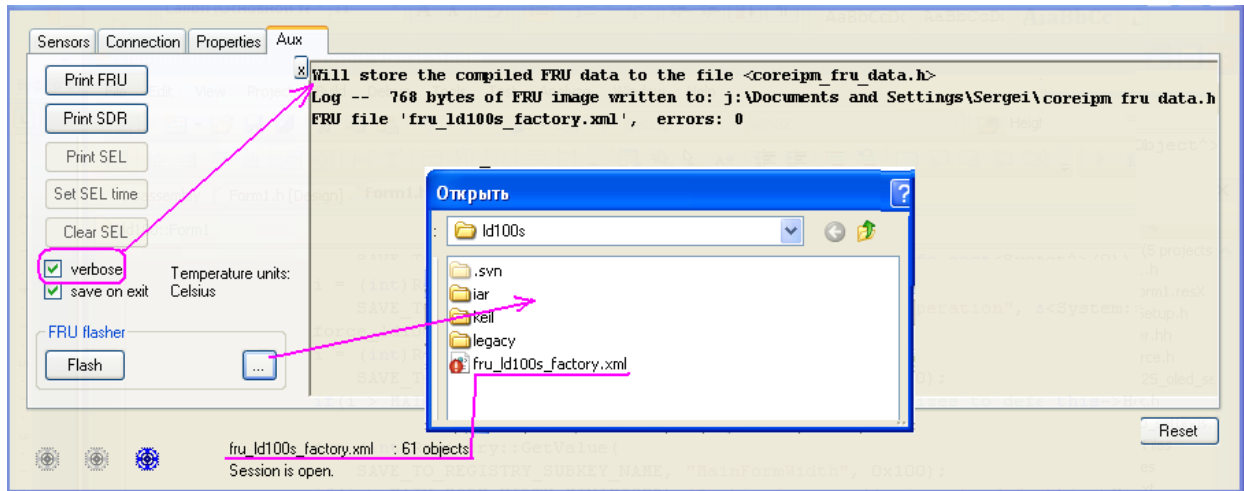


Fig.10 FRU flashing controls.

1. Select the xml-file
2. Press “Flash”
3. Wait until the process is finished.
4. Reboot or repower the Platform.

### Notes:

- FRU normally need not be re-flashed if the BMC firmware is updated (BMC flashing below).
- “Flash” button (Fig.10) is disabled by default, it is enabled after the file is read, no errors, and if the Platform supports flashing (discovered Manufacturer=coreIPM).
- If “Log to file” is enabled (a checkbox on Fig.10a) during flashing then FRU image will be written to a coreIPM\_fru\_data.h file used at the BMC firmware generation, for “factory” FRU data.

## LAN password options

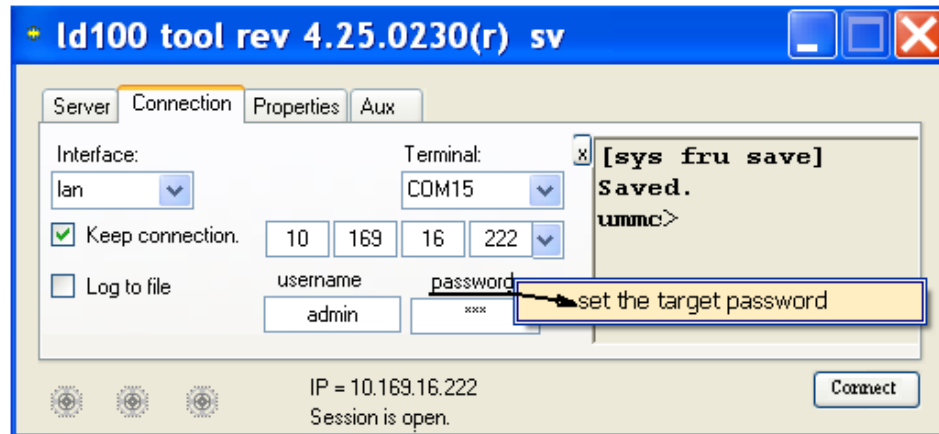


Fig.10a Password setting.

You may preview the password or set the remote password by clicking the “password” label on the Connection tab. To make the remote password permanently changed, please use the [sys fru save] ipmi terminal command [7].

Note:

- the default factory set user name is “admin”, password is “000” [8].

## BMC firmware updating

The LD100 BMC firmware is factory flashed and never needs be changed during device life time (Factory firmware). For LD100 device upgrade, flashing of Update firmware option exists.

Flashing of the Update firmware is performed using the ld100\_tool utility the same way the FRU flashing is done. The difference is in the file selected: the Update firmware comes in an Intel HEX format (Fig.11).

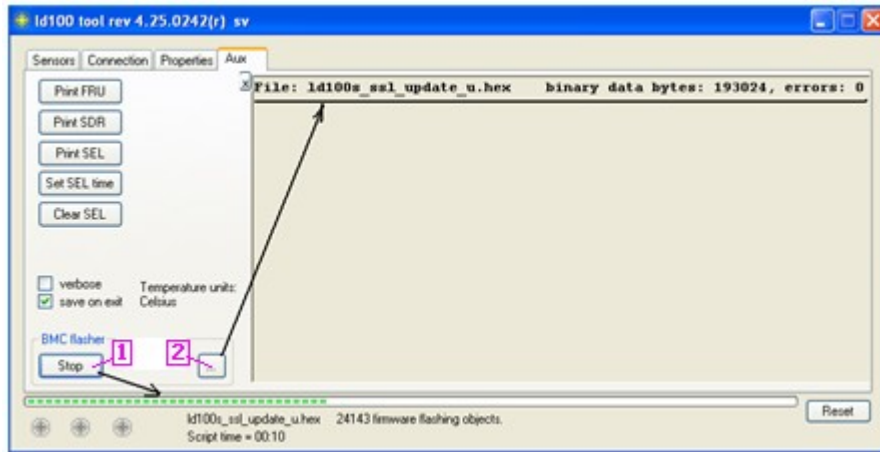


Fig.11 Update BMC firmware flashing

Before Update firmware flashing, the user shall force the BMC running the Factory firmware. Two options exists to run Factory firmware: BMC terminal command [sys wd trig], and J20.4 grounding.

Grounding of the J20.4 pin should for safety reasons be done using 1kOhm resistor (or by connecting a dedicated cable to J20 connector), then Reset HW button of the LD100 should be pressed.

To ensure the BMC is running Factory code [sys version] terminal command could be used (see the “BMC terminal” paragraph above).

After the Factory firmware is run the ld100\_tool user should:

- 1) Press the ld100\_tool “Connect” button to reconnect with the BMC (Fig 2.4)
- 2) Select firmware HEX file (Fig 11.2)
- 3) Press start and wait until the progress indicator is gone (Fig 11.1)

After flashing ends, the BMC is automatically reboots to the Update firmware. The user must press Connect again to reconnect with the newly flashed BMC.

For more details about BMC firmware flashing please refer to [9].

## Auxiliary ld100\_tool controls

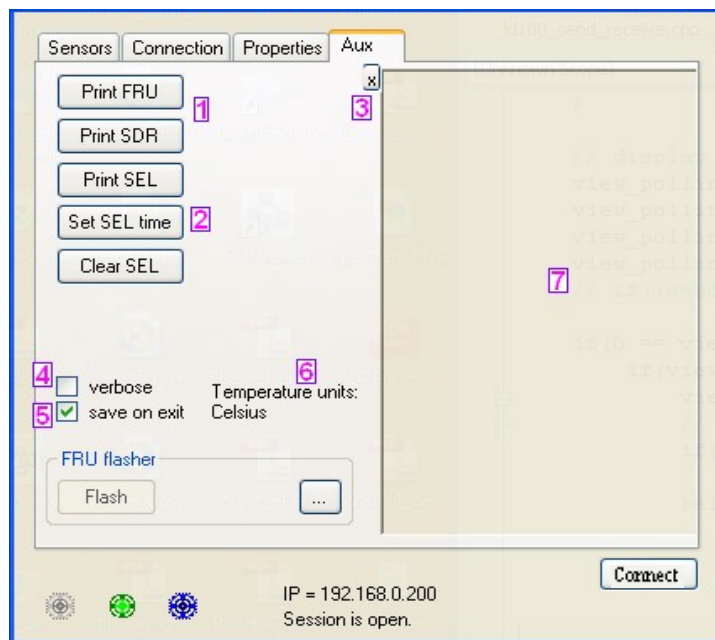


Fig.12 Auxiliary controls.

On the Fig.12 enumerated are following ld100\_tool auxiliary controls:

1. Buttons to Print FRU, and SDR contents [2] on the Auxiliary text box. \*
2. Print SEL contents, set SEL Time, and Clear SEL buttons \*
3. Button: press to clear the Auxiliary textbox(7)
4. Verbose checkbox: if checked, more information text is output to the Auxiliary textbox(7)
5. If Save On Exit checkbox is checked then ld100\_tool user made setup is saved to registry, and subsequently restored at start-up or Connect. Uncheck if this Save is undesirable. \*\*, \*\*\*
6. Label: units used for temperature display. Click to change Celsius <-> Fahrenheit.
7. Auxiliary textbox. An area for diagnostic messages output.

\* If wrong FRU structure, the ld100 device might fail the BMC discovery.

\*\* The state of the "Save On Exit" checkbox is never saved: this checkbox is always checked at start-up.

\*\*\* If the Connect button is pressed, then current ld100\_tool settings are saved, then the LD100 device is discovered and at last saved settings are restored. To avoid the settings being saved (so that to restore last saved BMC settings, right click the Connect button)

## Multi-BMC support

The Id100\_tool version 4.28 or higher supports several BMCs.

On the Fig.13 shown are property tabs of two BMCs connected with the Id100\_tool via respective interfaces.

Each BMC could be independently configured, and all the settings are automatically saved/restored as described in the above paragraphs.

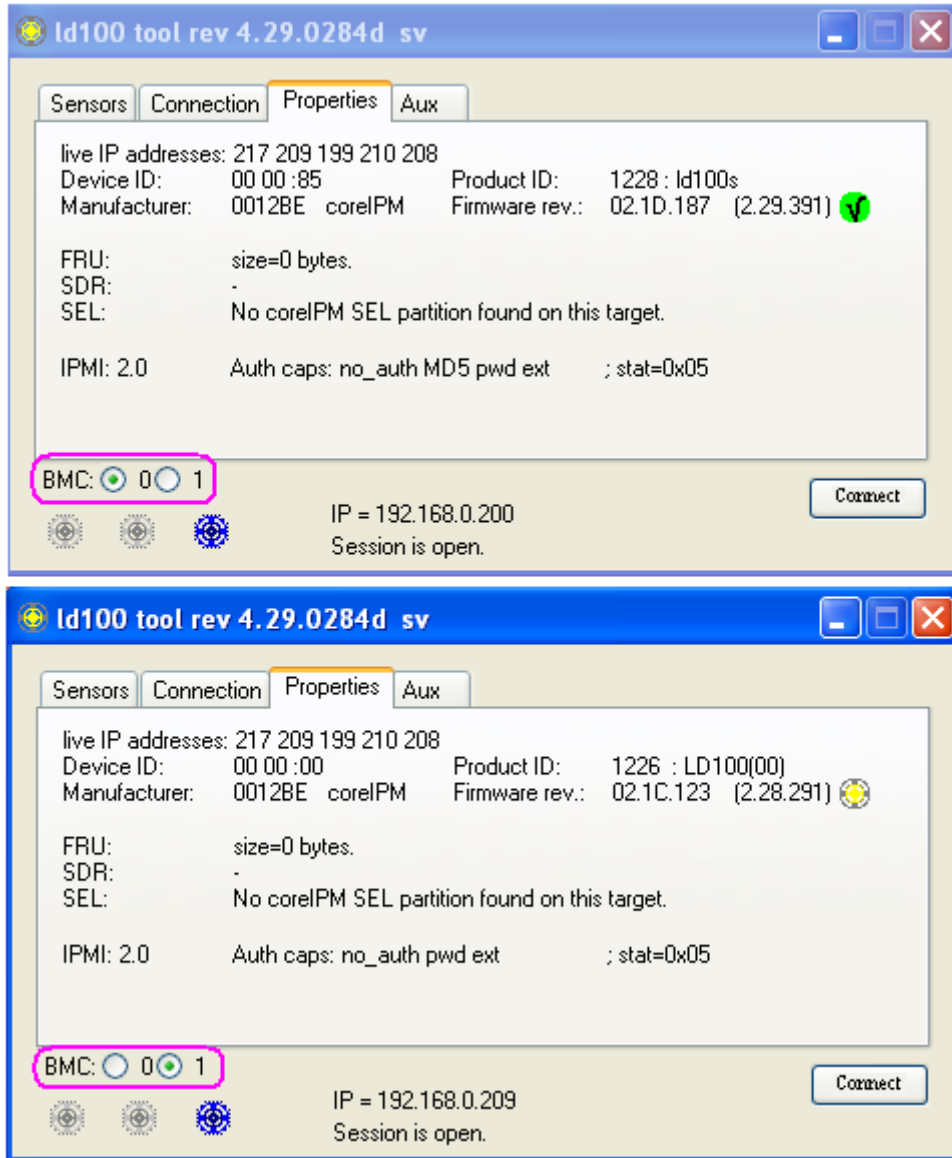


Fig.13 Two BMCs' properties.

Currently up to 16 BMCs support is implemented in the Id100\_tool.

A drop-down menu is accessible, if the BMC0 radiobutton (Fig.13) is right clicked, a drop-down menu pops-up with the following setup options:

1. Disable keepalives
2. Enable all LAN keepalives
3. Enable/disable LAN discovery
4. Set the LAN discovery window width
5. Set the maximum BMCs quantity handled

This same menu is available from the "Keep connection options" described above.

## LD100 tool extensibility options

All the LD100\_tool utility versions support basic functionality provided by the IPMI, and configure themselves (including GUI) for maximum compatibility with the Platform discovered.

The utility supports several customized platform versions and may display the respective specific options [10, 11].

The ld100\_tool supports interfacing to external (user's) utilities through shared memory, to control each LD100 Platform the session is opened with [10]. Communication via shared memory is implemented with the LD100 device only.

The ld100\_tool implements LAN/TCP external interface using JSON formatted messages [14].

JSON text messages could be sent to ld100\_tool directly or indirectly via mosquitto broker [15].

The mosquitto broker binaries come with the ld100\_tool installation package. The mosquitto server (broker) could be run manually, from the installation directory, or from the ld100\_tool automatically (Fig.14).

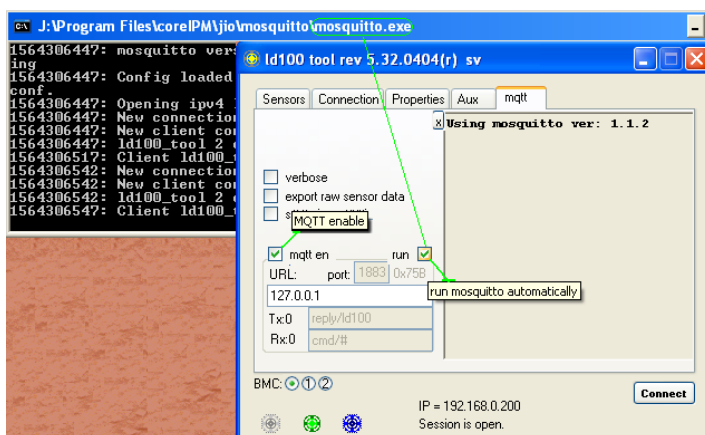


Fig.14 ld100\_tool mosquitto broker, and JSON interface controls.

## Running LD100 tool as a service.

The ld100\_tool could be run GUI-less, “minimized to tray” (Fig.15) to consume minimum processor resources. In this case all the ld100\_tool configuration, including BMCs and sensors, will be restored to last saved values, at startup. From this (“service”) state, the ld100\_tool could be quit or restored to normal state, with GUI form. To have that, the tray ld100\_tool icon should be mouse right clicked or double clicked, respectively. To switch the ld100\_tool to “service” state, from the normal state, the “minimize” button should be clicked on the main ld100\_tool form.



Fig.15 Running ld100\_tool as a service.

The ld100\_tool could be started automatically, at Windows start, at the user logon. Different Windows versions have several options for that. For Windows XP, -7, and -8 the following method is recommended:

- Create a link to the “\Program Files\coreipm\ld100\_tool\ ld100\_tool.exe”;
- Place this link in the “\Documents and Settings\User\Main Menu\Programs\Startup” directory (Fig.16);
- Right click this link , select “Properties”, and set the Window State (“Link” tab) to “Run Minimized”.

The ld100\_tool will be started in “service” state the next time the Windows user will log in.

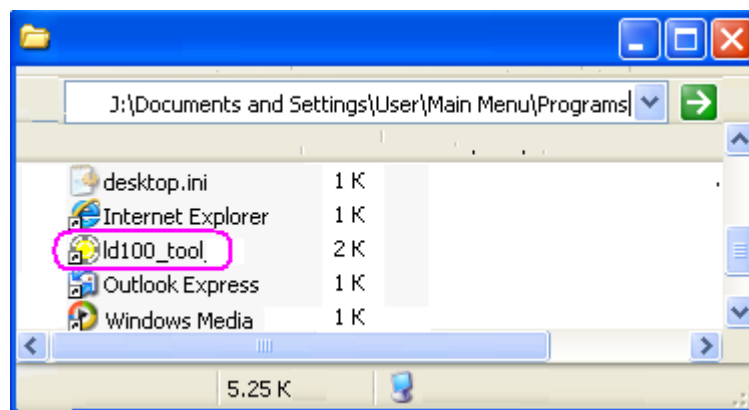


Fig.16 Running ld100\_tool at the user log on.

## Glossary and abbreviations

Platform	– the Id100 device;
Client	– this Id100_tool utility;
Secure communication	– LAN communication using RMCP+/IPMI 2.0 protocols;
IPMI terminal	– serial UART connection with the Platform, with command line support [1];
GPIO	– general purpose IO line, user settable to the “1” state, “0” state output, or an “input” state;
FRU, SDR, SEL	– Platform’s non-volatile data structures [2];
GUI	- Graphics User Interface (ex: fig.2);
BMC	- Baseboard Management Controller [2].
Id100	- BMC of the Id100 module having appropriate firmware
Factory firmware	- the BMC firmware factory flashed to the device. Not user changeable and could be forcedly run for Update firmware flashing.
Update firmware	- the user flashed BMC firmware from downloadable “.HEX” files, using the Id100_tool
SOL	- Serial over LAN [2], [12]
LAN discovery	- periodic scanning of LAN addresses window using RMCP ping to find live BMC devices
Device discovery	- reading properties from the BMC device
JSON	- text stream format for external Id100_tool communications