User guide to EasyLoad Lite v2.03

Requirements and technical specifications:
- A PC with minimum 1.5GHz and minimum 512MB RAM
- Windows 2000/XP/Vista/7 (32&64bit)
- Compatible to the device series:
  - EL 9000, from firmware version 3.0
  - EL 9000 HP, from firmware version 4.0
  - EL 3000, from firmware version 3.0

- Compatible to the interface cards:
  - IF-U1 (USB)
  - IF-R1 (RS232)
  - IF-E1b (via the USB port)

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1.   Legal

This software is only compatible to above listed device series and interface cards and is distributed with them. Any changes to the software and its documentation is prohibited. Exceptions require permission of the owner. Resale or rent are prohibited. Propagation to third parties, if unchanged, is permitted.

2.   Introduction

EasyLoad Lite is a tool to remotely control one or multiple electronic loads with digital interface cards of type IF-U1 (USB), IF-E1b or IF-R1 (RS232). Other interface cards are not supported.

By using EasyLoad Lite it becomes possible to fully remotely control an electronic load. The main features at a glance:

1.   Visualisation of actual values in a plot graph over a time period of 60s
2.   Data logging of measured values in intervals of 0.5s up to 99h:59m:59s
3.   Run user-defined sequence files, also in combination with data logging
4.   Set all set values and status and read all actual values
5.   Define a user text, which can be used to identify an unit

The program is based on the development environment LabView and requires a runtime engine which is automatically installed. Once the runtime engine is installed, other tools from us that are dedicated to control, for example, an electronic load, can be run and updated, too.

3.   Installation

Important! When using the USB port of either interface card IF-U1 or IF-E1b, the so-called „virtual COM port" (VCP) of the particular interface card must be activated in order for the software to find the device (check the Windows device manager). To activate the VCP in the device manager, find a device „USB Serial Converter" in the section „USB controllers", double-click it, select tab "Advanced" and check the option "Load VCP". Then submit with OK, unplug the USB cable and plug it back again. The software should now be able to find device(s) with a new scan. Users with limited Windows accounts are perhaps required to contact the administrator in order to change these settings.

4.   Conditions for remote control

A unit that is going to be remotely controlled can have three different conditions:

1). The unit is remotely controlled via analogue interface ("extern") and can thus digitally controlled.
2). The is in local mode and can thus not be remotely controlled at all (i.e. "Setup").
3). Access to the unit is free and the PC can take over control.

In case item 3) is present, the digital remote control via interface card is possible and the unit can be accessed and controlled from a PC. Otherwise, is can only be monitored. If digital remote control is required, any other type of remote control or local mode has to be cancelled first. Button "Remote on" in the EasyLoad Lite surface activates remote control.
Further details about device status and conditions can be found in the instruction manual of the device.

5. Program start

After the start and submitting a start warning (if activated), it shows the start screen like below and the PC is scanned for connected electronic loads. Electronic loads can be connected via USB, RS232 or Ethernet port (since EasyLoad Lite version 2.03 and using IF-E1B interface, article number 33100227 only).

Note: After the first installation of the program, default program settings are set. Especially Ethernet users are requested to setup their IP configuration. Also see

Any compatible device that was found is listed in the device selector. See figure 1. If no device was found, the list is empty, except for a note, that no device was found.
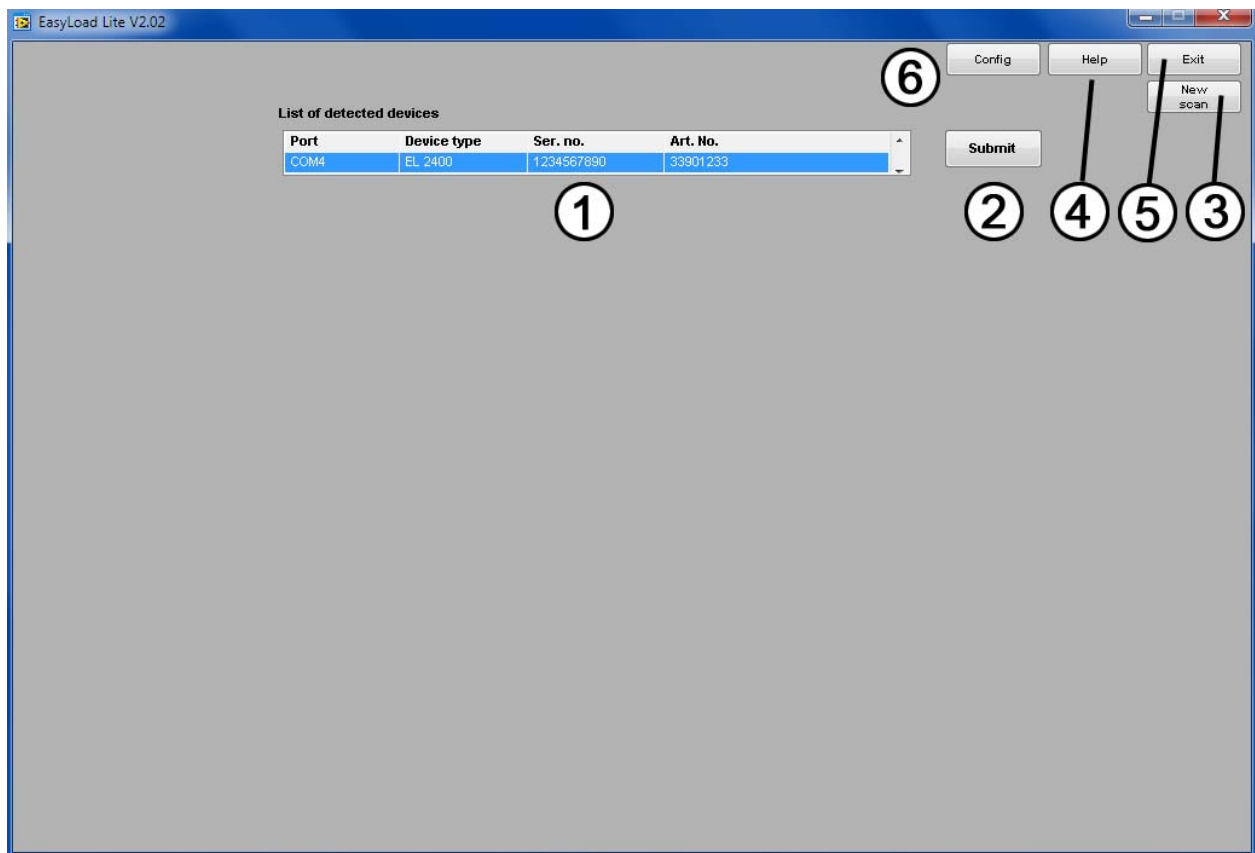

Figure 1. Device list

Nr. in Fig. 1	Description
1	List with all detected and compatible devices
2	Submits the selected device for remote control
3	Scans again for compatible devices
4	Opens this help file
5	Exits the program
6	Configure various settings here

Hint: Double-clicking an entry in the device list submits immediately.

5.1 Configuration

By clicking the button "Config" a configuration dialogue appears. Following settings can be made in the config dialogue:

Tab "User text"
Note: this tab is not available when the selected device is connected via Ethernet

The user can define an ASCII text of up to 15 characters here which is stored inside the device and which can be used to identify a unit by a certain name or code. The text, once written into the device, is also display in the main window of the program, in the device information box in the upper area.

Tab "Ethernet"

The settings here only apply to the Ethernet card IF-E1B.
The user can either set up one IP (from) or an IP range, in which the device(s) to detect are located. The IP of any electronic load has to be set up before, either by using the tool "IP-Config", which is included on the supplied CD, or via the web interface of the Ethernet card (access standard IP in browser).

Note: the TCP port, which is important for PC-to-device communication, can only be set via the web interface and is stored on the interface card

Note: there's a checkmark "Use IP range for scan" which has to be activated in order to make the device scan also work on Ethernet.

Note: depending in the given range and number of Ips, the scan may take a while. We recommend to narrow the IP range down to the minimum.

Tab "Misc"

The button here resets all requesters that may have been permanently deactivated before.

6. The GUI

After the communication with the device is successfully established, a screen as depicted in figure 2 will show up.
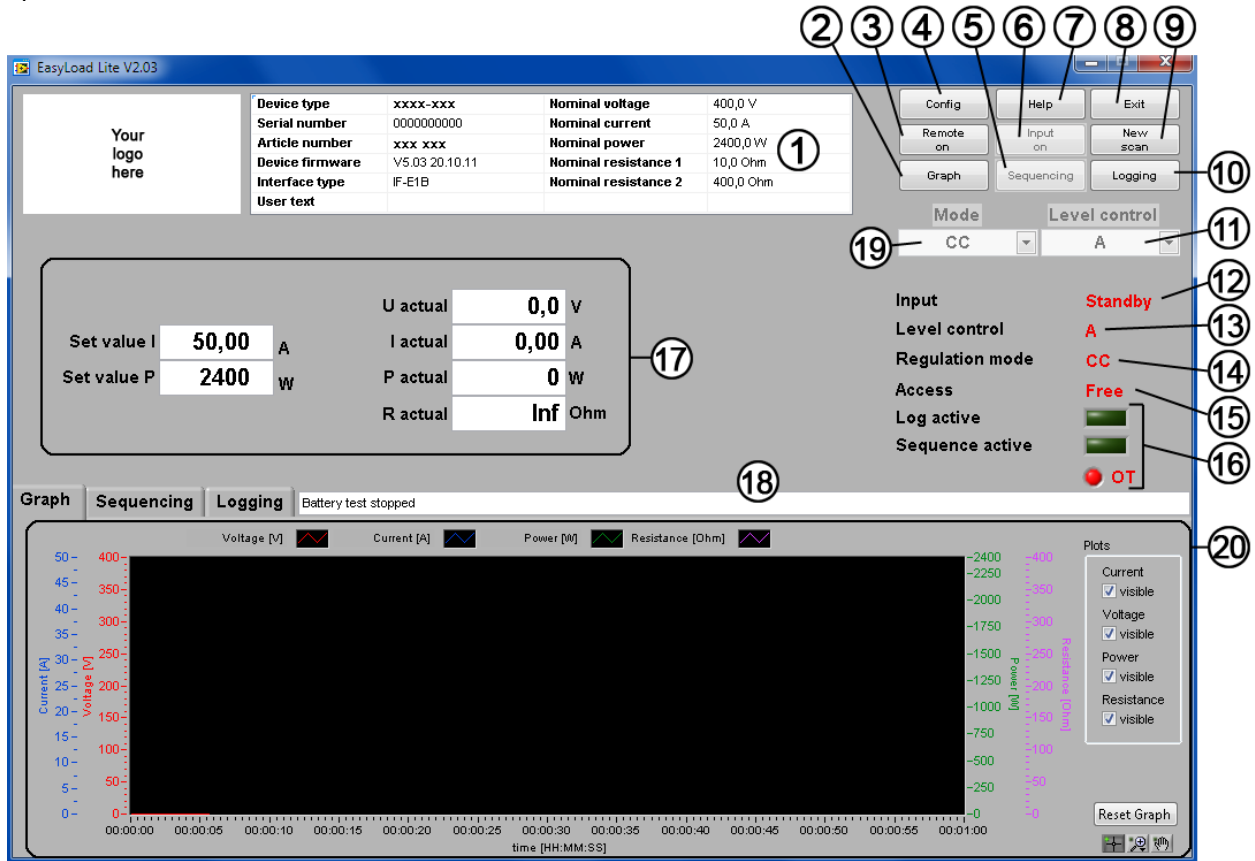

Figure 2. Main screen

No. in fig. 2	Description
1	Device information area. Shows device type, serial number, article number, nominal values etc. of the selected unit
2	Switches to graph tab
3	Switches remote control on or off. The button can only be used if the device is not locked
4	Opens a windows where various settings can be done
5	Switches to sequencing tab
6	Switches device input on or off. Requires remote control to be active
7	Opens this help file
8	Exits the program immediately.
9	In order to switch to a different device, press „New scan". This will open the device selection screen and list all available devices. Here you can select another unit.
10	Switches to logging tab.
11	Selects the level control, like with the rotary switch „Level control" on the device. Possible selections: A, B, A/B and Battery
12	DC input status: On → input is switched on, Standby → input is switched off
13	Shows the currently selected level control
14	Shows the actual regulation mode the load is working in
15	Device access status (free, extern or remote)
16	Shows alarms (red LEDs) and sequencing/logging status (green LEDs)
17	Interactive display of actual values and text boxes to define set values. Set values can be adjusted by the little arrow buttons or directly entered as numbers and submitted by hitting Enter. Then they are sent to the device
18	Status box. Displays various status messages
19	Preselection of the load's regulation mode (CC, CV, CP, CR1, CR2)
20	Lower part of the screen with graph, sequencing and logging tabs

Note: Electronic load specific terms and features are explained in the instruction manual that belongs to the device.

7. The lower operation panel

7.1 The graph

The graph draws the chronological run of the actual values of voltage, current, power and resistance. It is just for visualisation. It is not accurate and does not measure. The X axis has a fixed range of 60s. The whole graph can be configured. However, these settings are not permanent and can be reset by button RESET or a new start.
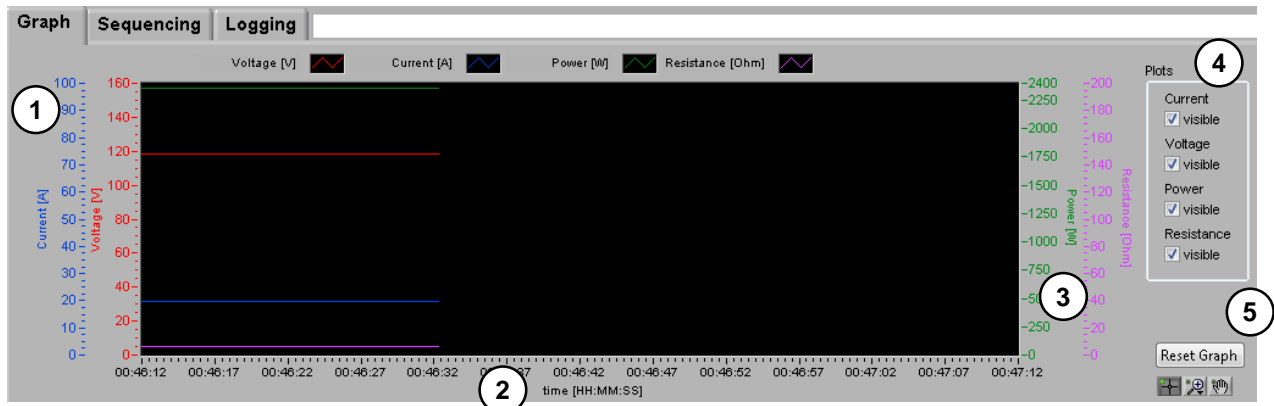

Figure 3. Graph

1	**Plots**	Color and related value. By clicking on the plot legend above the drawing aread, the plots can be configured.
2	**X axis**	Time axis, counting in HH:MM:SS.
3	**Y axes**	Outer left: Current axis (default: blue) in [A]. Inner left: Voltage axis (default: red) in [V]. Inner right: Power axis (default: green) in [W]. Outer right: Resistance axis (default: lilac) in [Ω].
4	**Plot switch**	Used to switch on/off single plots
5	**Reset graph**	This buttons resets the Y and X axes of the graph and clears the drawing area

The Y axes are formatted to match the nominal values of the electronic load. By right-clicking the scales, you can activate "Automatic scaling", which is just a temporary setting. Alternatively, the end value of the scale can be edited by clicking it, entering a new value and submitting with enter key.
Example: for an EL 3160-60 with 400Ω max. resistance, the scale is by default set to 400Ω. But if the actual resistance is currently just 1Ω, it would be almost invisible on the graph. To change this slick the upper end value of the resistance scale, set it to 2 and submit. The plot will now be shown in the middle of the graph, between 0Ω and 2Ω.

Note: The config menus of the plots are in german by default. It can be changed by installing the english version of the LabView RTE. Check Google for "labview rte" in order to find the download.

The small buttons below button "Reset graph" can be used to zoom/pinch or move the plot(s) in the drawing area.

The so-called plot legends above the graph's drawing area can used to modify the plots's appearance. This modification is only temporary.

7.2 Data logging

Note: Only supported in modes Level A, Level B and Battery

The data logging is used to store measured values and status into a log file. Here the actual values, set values, date, time, device condition and errors are written into a text file of type CSV (Comma Seperated Values). The interval can be defined from 0.5s…99h59m59s.

If no log file is specified, it will be generated automatically. In case a previous log file has been selected for writing, the new data is either attached, if option "Attach" is activated, or old data will be overwritten with option "Overwrite" selected. See item (8) below. A log file can contain up to 65500 lines (this is due to Excel's limitation and in order to allow proper import and processing). If all lines are used up, a new file will be created by the given name and with an appendix of _(001) etc. The amount of data to be logged is thus only limited by the storage media capacity.

Logging is configured in the tab that shows up after using button „Logging":

Figure 4. Logging configuration tab

No. in fig. 4	Description
1	Defines path for the log file. A dialogue opens when clicking on button OPEN. Path and file should be given. Else the logging will start with an automatically generated file.
2	Log file name
3	The log interval. It defines the interval time for the log file entries. Range: 0.5s…99h59m59s
4	Starts/stop logging manually.
5	If this option is activated, the logging is only started after hitting button START LOGGING as soon as the input of the electronic load is switched on, either manually at the device or with button INPUT ON.
6	Indicates when logging is active
7	Counter for the total logged steps. If option "Attach" is activated, it counts possible log entries in the selected file and continues counting them in the next logging session. With option "Overwrite", it starts at 0 with every new logging session.
8	Log file write mode: overwrite = overwrites data in the selected log file everytime a new logging is started, Attach = logged data is attached/appended to the selected log file

7.3 Sequencing

Note: Only supported and available in the modes Level A, Level B and Battery

7.3.1 General

Sequencing is an important feature of EasyLoad Lite. It can process rows in a text file of CSV format (Comma Seperated Values), where the rows are considered as sequence points, defined by all necessary set values, the regulation mode to be used and a time. The time value defines how long the set values of the row remain unchanged. The software will check the file for errors and display them or process the file row by row. Sequencing can be combined with data logging (see 7.2 Data logging), which will automatically start as soons as sequencing is started. The option can be ticked in the sequencing tab.

Note: even if CSV means comma seperated values, the program won't accept comma seperated value or even misinterprete them, because many countries use the comma as number seperator for decimal places. Thus MS Excel uses the semicolon to seperate values by default and this is what the program expects, too.

7.3.2 Conditions

A sample sequence is installed with the software and can be found in the installation folder, subfolder \data. It depicts how the sequence file format is defined. In case the sequence file contains parameters that don't match the device nominal values, it will also be reported.

Following limitations and requirements apply:

1. Set values for U, I, P and R must not exceed the device's nominal values
2. The column headers must remain untouched so the first row is not used for sequencing and the columns must not be rearranged
3. The regulation mode can not change within a sequence file. It must be **the same** for every row. *Note: the selection of the regulation mode is just a preset. The set values, together with the voltage source will finally decide the actual regulation. Setting the mode is but necessary for CV (constant voltage) or CR (constant resistance) operation, because it enables these regulation modes*
4. Sequencing is only possible for **Level A**, **Level B** or **Battery mode**
5. The minimum interval time per row is 0.5 seconds
6. The maximum interval time per row is 99h59m59s
7. There must be no blank rows between sequence points
8. Columns for set values which are required for the selected regulation mode must contain a value
9. Columns for set values which are not required for the selected regulation mode can be left empty

Note: when processing the next line, the set values are instantly set. There is no ramp generated from the last set value to the next one.

Note about battery test*: the sequence file has no extra column for the "Ulow" value. This value has to be entered in column "U set" instead. This is used because "U set" is for constant voltage (CV), which is not supported in battery mode anyway.*

7.3.3 Layout of a sequence file

The following examples will explain how to use the sequence file for different purposes:

Mode CC (Current regulation)

U set	I set	P set	R set	Mode	Hours	Minutes	Seconds	Millisec
0	1	10	0	CC	0	0	2	0
0	2	20	0	CC	0	0	4	0
0	3	30	0	CC	0	0	6	0
0	4	40	0	CC	0	0	8	0

In current regulation it is not required to define the set values for voltage and resistance. The load will only use power and current set values.
Important: Power limitation has priority over current limitation.

Mode CV (Voltage regulation)

U set	I set	P set	R set	Mode	Hours	Minutes	Seconds	Millisec
2	2	10	0	CV	0	0	2	0
4	2	20	0	CV	0	0	4	0
6	2	30	0	CV	0	0	6	0
8	2	40	0	CV	0	0	8	0

In voltage regulation it is not required to define the set value for resistance. The load will only use voltage, current and power set values.
*Attention! CV is not accepted for **battery** test --> error requester*

Mode CP (Power regulation)

U set	I set	P set	R set	Mode	Hours	Minutes	Seconds	Millisec
0	1	10	0	CP	0	0	2	0
0	2	20	0	CP	0	0	4	0
0	3	30	0	CP	0	0	6	0
0	4	40	0	CP	0	0	8	0

In power regulation it is not required to define the set values for voltage and resistance. The load will only current and power set values. The CP mode is thus identical to CC.
Important: Power limitation has priority over current limitation.

Mode CR (Resistance regulation)

U set	I set	P set	R set	Mode	Hours	Minutes	Seconds	Millisec
0	2	100	10	CR	0	0	2	0
0	2	100	20	CR	0	0	4	0
0	2	100	30	CR	0	0	6	0
0	2	100	40	CR	0	0	8	0

Resistance regulation requires to define three set values (P, I and R).
Important: Power limitation has priority over current limitation.

7.3.4 Handling

In order to use a sequence file in the software, it is required to set the load to Level A, Level B or Battery mode first and then switch to sequencing tab with the "Sequencing" button. The display will change to:
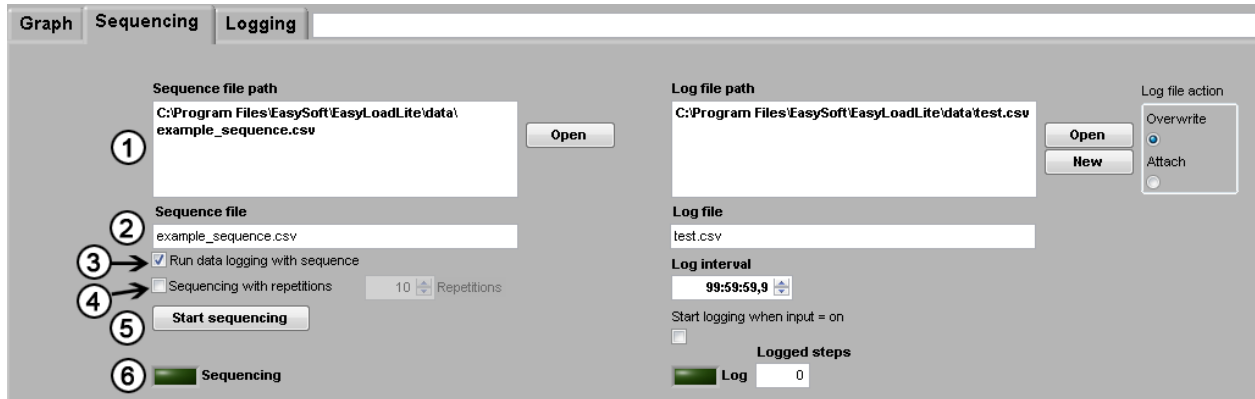

Figure 5. Sequencing tab

No. in fig. 5	Description
1	Shows the path where the sequence file is located. Use the folder icon next to the box to open a file selection dialogue
2	Sequence file name
3	If this option is not activated, the right part (Logging) is hidden and there will be automatic logging when sequencing is started. But logging can still be started manually
4	Activates/deactivates sequence file repetition. The number of repetitions is set in the input box next to this option.
5	Starts or stops processing of the sequence.
6	Indicates a running sequence

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8. Alarms

Device errors, which may occasionally happen, are indicated in the GUI by a red LED and a red text (see item 16 in 6.The GUI).

OT = Overtemperature shutdown due to overheating, the electronic load will continue to work after cooling down
OV = Overvoltage on the input, the load will switch the input off, which has then switched on again manually on the device or in the GUI.
PF = AC input failure, input voltage too low