

User Manual FOR Power Rider GUI



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Power Rider



User Manual FOR Power Rider GUI

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Author:

J. Haim/ A. Memtsev

Redler Technologies Ltd.

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Approved:

G. Natanson

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RECORD OF CHANGES

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2.0	25/11/2018	Added parameters description, bootloader process, error description. Updated some processes in GUI.	54	A.M.
3.0	12/08/2019	Add CAN Kvaser adapter connection. Add Ethernet connection. Update Logger section.	62	A.M.
3.1	26/10/2019	Add System Configuration Parameter Guide Add Ethernet configuration Guide.	77	A.M.
3.2	30/11/2019	Update Graph section 3.3	80	A.M.
3.3	24/03/2020	Add Find Unit Guide. Section 3.9.3	81	A.M.
3.4	12/10/2020	Add New Voltage protection events, communication timeout parameters, plot command and production/internal data.	85	A.M.

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Overview

The Power Rider is a single channel/multichannel Smart Circuit Breaker. The Power Rider, based on Redler Technologies' patent (PCT Pending), is an automatic, highly reliable, and fully redundant electronic circuit breaker that includes means for preventing short-circuit overcurrent.

The Power Rider is designed in a unique approach which will disclose a short within nanoseconds and enable a short current from a charge reservoir while disconnecting the switch transistors. This mode of operation protects the Power Rider circuit breaker switch transistors and connected power source from short-circuit overcurrent.



Figure 1 Power Rider Family Units

1. DRIVER INSTRUCTION INSTALLATION

1.1 SOFTWARE INSTALLATION

1.1.1 The installation is for Windows 7 (32-bit) SP1 or higher.

1.1.2 Insert the Disk in your computer.

1.1.3 Double click on \Volume\setup.exe (Figure 1).

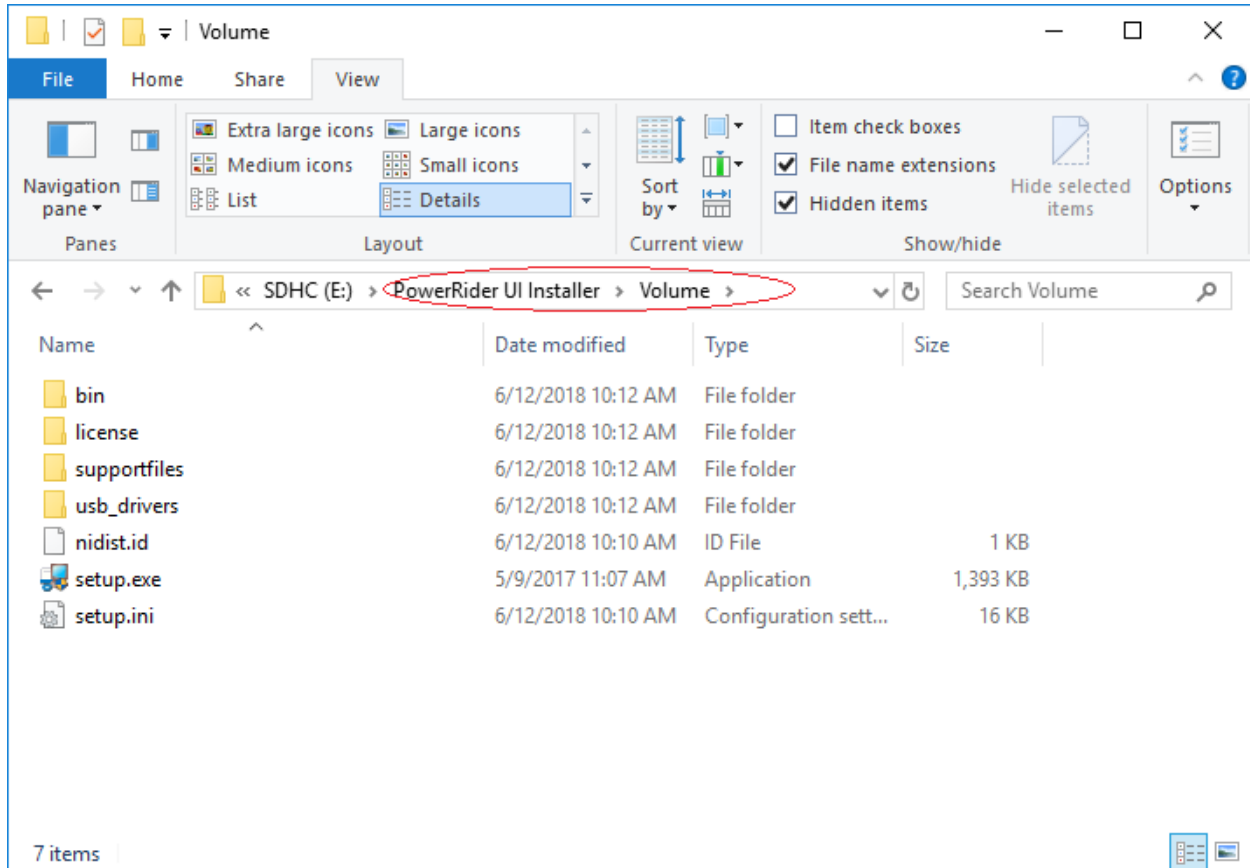


Figure 2 Installer Folder

Verify the following screen appears and click “Yes”:

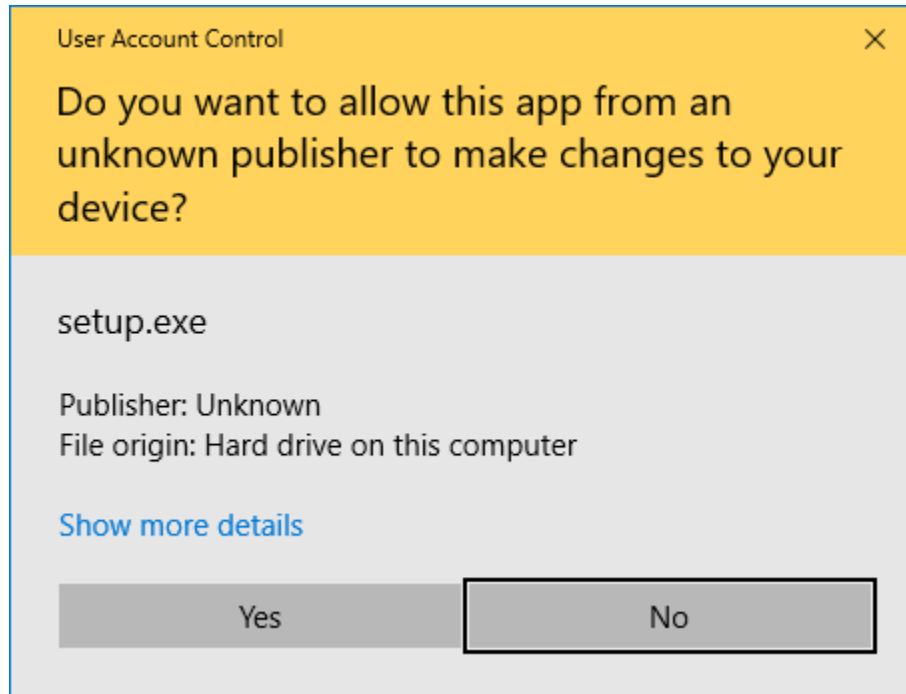


Figure 3 User Account Control window

1.1.4 After successful installation you will need to restart your computer.

1.1.5 Please wait while the installer initializes (Figure 2).
The installer initialization window will appear in shortly.

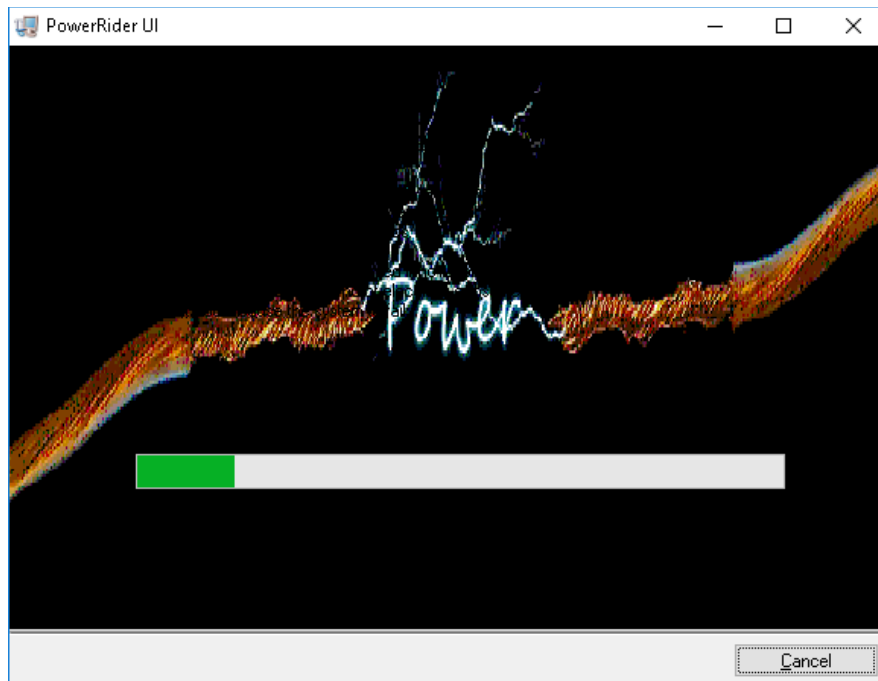


Figure 4 Installer initialization

1.1.6 Press Next in Destination Directory window (Figure3).

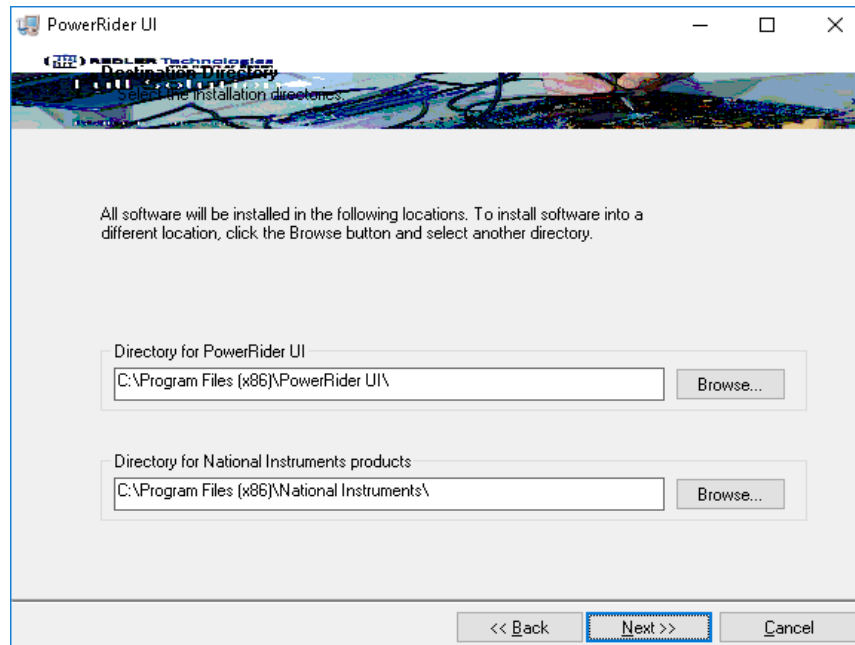


Figure 5 Destination Directory window

1.1.7 License Agreement

Please accept all License agreements, then press “Next”.

The license agreement window can be different between each computer.

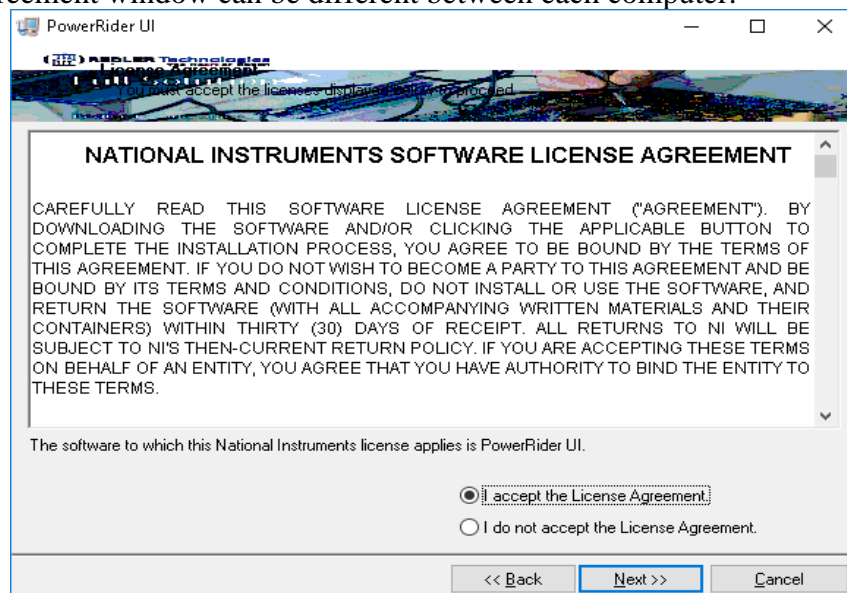


Figure 6 License agreement

*If you perform a reinstallation, the license agreement window may not appear.

1.1.8 The figure bellow can be different between computers, depends of the National Instrument program which are installed in your PC, press Next (Figure 5).

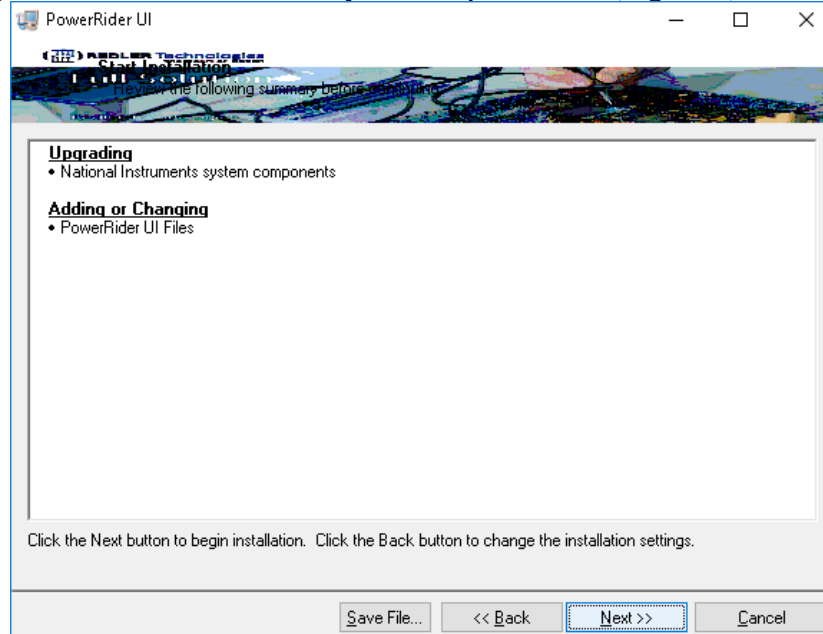


Figure 7 List of the new programs

*If you perform a reinstallation, the programs list window may be different. Please wait for end installation.

The loading process takes approximately half an hour, depending on the computer type.

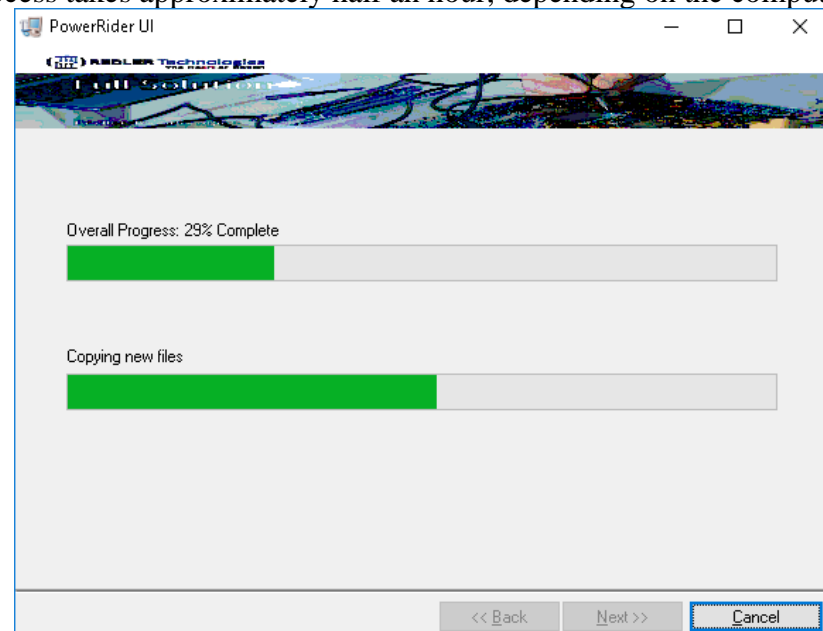


Figure 8 Installation window

1.1.9 Press Next in Installation Complete window.

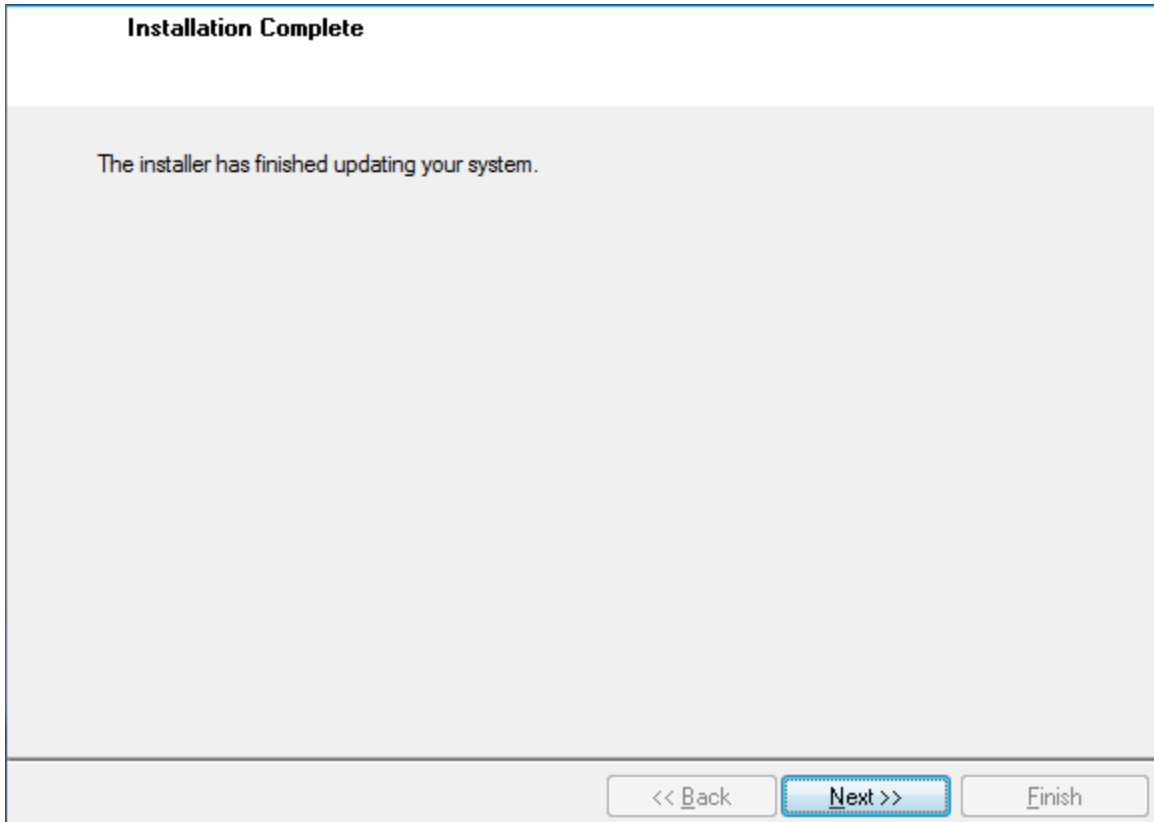


Figure 9 Installation Complete window

1.1.10 Even if there is no indication to restart your computer, you should restart your computer to ensure a proper installation of the new programs.

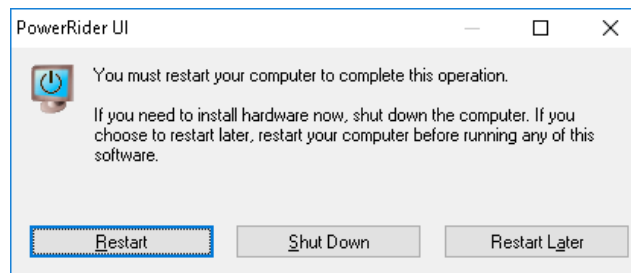


Figure 10 Restart window

2. INSTALLING COMMUNICATION DRIVERS INSTALLATION CANalyst-II CANBUS adapter

2.1 APPEARANCE OF THE PRODUCT.

The power indicator light of the CANalyst-II analyzer is blue.

When LED-CAN1 (Channel1) indicator light of the CANalyst-II analyzer is blue it indicates the transmitting or receiving state of the channel1.

When the CANalyst-II adapter is inserted into a USB interface, the power is turned on, and the LED-CAN1 indicator light flashes twice for system self-test.

When the LED-CAN2 (Channel2) indicator light of the CANalyst-II analyzer is blue it indicates the transmitting or receiving state of the channel2.

When the CANalyst-II adapter is inserted into a USB interface, the power is turned on, the LED-CAN2 indicator light flashes twice for system self-test.



Figure 11 CANalyst-II adapter

2.2 SIGNAL DEFINITION.

CANalyst-II pin number	CANalyst-II analyzer products	Power Rider pin number		
Name	Description	PR25A	PR150A	PRMC
R1	Terminal resistance R1, Down to the ON state, the internal 120 ohm resistor will be access to the bus.			
R2	Terminal resistance R2, in parallel with R1, same effect as R1			
H	CAN_H signal cable	4	11	21
S	Shielded wire interface, unconnected with the CAN transceiver directly, connected with resistors and capacitors.	S	S	S
L	CAN_L signal cable	3	6	9
PWR	Power indicator light			
SYS	System status indication, under normal circumstances are often off state			
CAN1	CAN1 channel signal			
CAN2	CAN2 channel signal			

Figure 12 CANalyst-II signal definition

2.3 FACTORY CONFIGURATION

- 1) CAN-bus Baud rate: 125Kbps-1Mbps;
- 2) Acceptance mask register: 0xFFFFFFFF, means to accept all CAN frame;
- 3) Termination resistor is selectable by dialing down the corresponding switch of CANalyst-II analyzer to 120 ohms internal resistor.

Note: Ensure that there are two 120-ohm termination resistors on the CAN-bus; otherwise the CAN-bus will function abnormally.

The above description is effective for each CAN channel.

- 4) Connect to adapter channel 1 (CAN1) only.
- 5)

2.4 CANALYST-II ANALYZER DRIVER INSTALLATION

Connect the CANalyst-II intelligent interface module to the PC with USB cable correctly.

Windows will then auto run an installation wizard called “new hardware is found” after the hardware is detected.

Select “Install the software automatically (Recommended)” and then click “Next” to continue;

If the windows do not run the wizard, type "Device Manager" in "search" menu and find the “other devices” in other devices list:

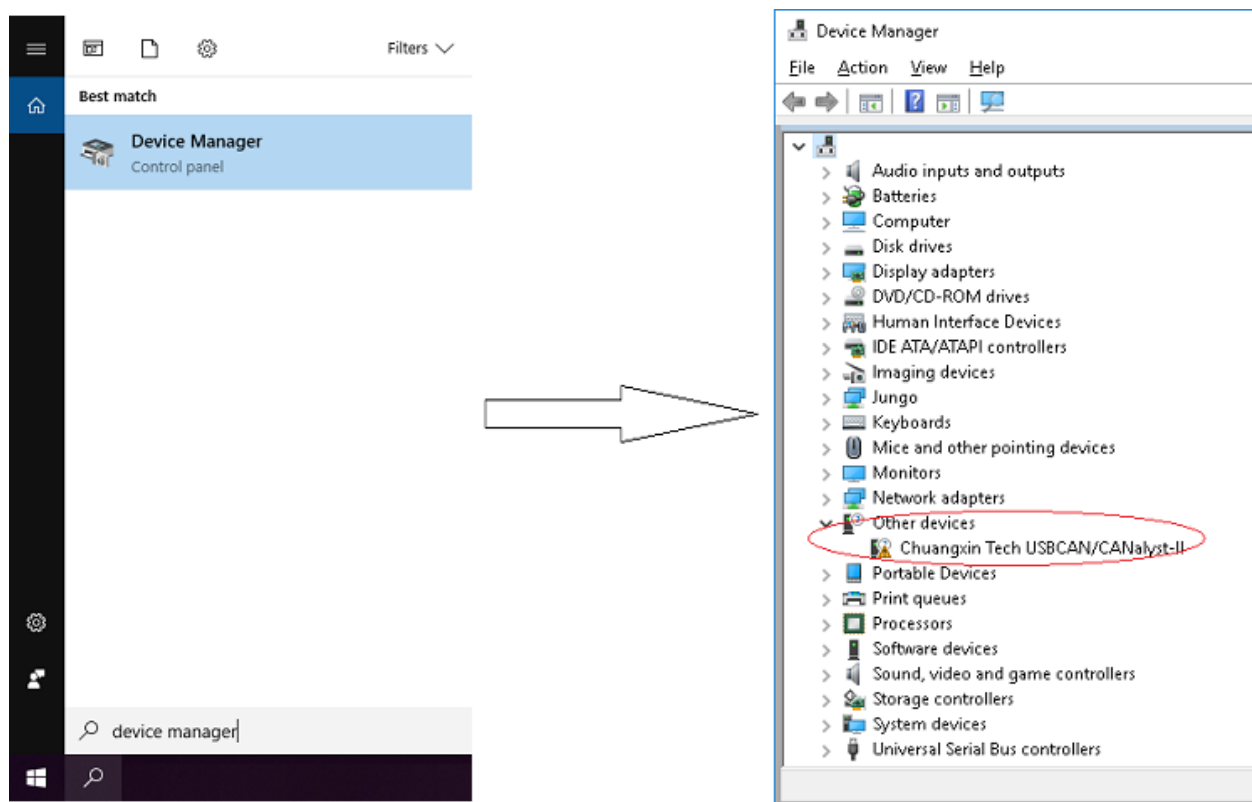


Figure 13 Driver Installation

Right-click “unknown device”, select “update driver software”, manually add the driver of the device. Select the driver for installation from directory as showed in picture below.

It will prompt a message said whether to confirm the installation, click confirm to continue.

Select “Browse the computer to find the driver software” and click next.

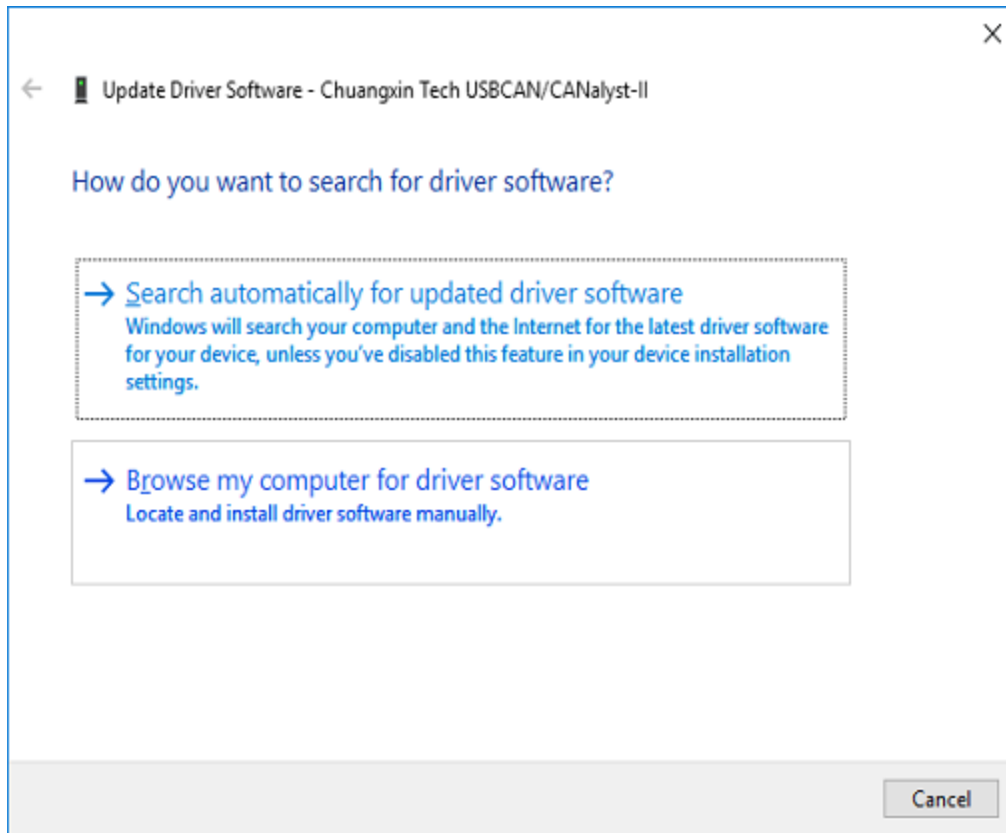


Figure 14 Update Driver Software

Select directory and install, the driver located in the directory of CD directory [\\PowerRider UI Installer\\Volume\\usb_drivers\\Windows].

Use the “Browse for Folder” window to select where the driver is then click "Next" to install.

In some cases, the system will prompt a message that the WinUSBCoInstaller2.dll cannot be found. Then, click "Browse", and select the WinUSBCoInstaller2.dll file from the i386 (for 32-bit system) or AMD64 (for 64-bit systems) folder in the directory of the driver program directory [PowerRider UI Installer\Volume\usb_drivers\Windows\win7 win8 win10 driver\inf].

After installation, "CANalyst-II" will be added to the directory of device manager.

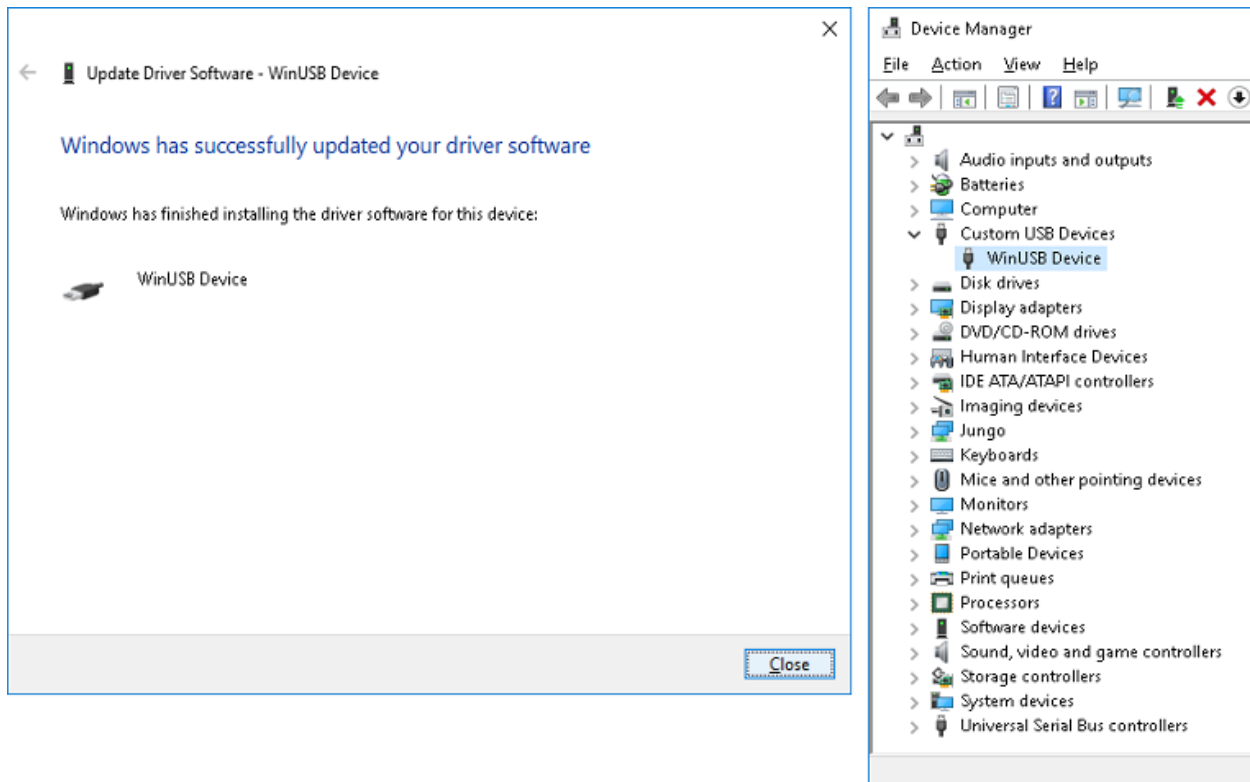


Figure 15 WinUSB Device Successfully Update windows

KVASER CANBUS adapter

2.5 CAN BUS KVASER INSTALLATION



Figure 16 The KVASER Leaf Light v2 adapter

Download a Kvaser Drivers for Windows

from the manufacturer's website : <https://www.kvaser.com/product/kvaser-leaf-light-hs-v2/>

Install a driver according to installation instructions.

CAN connectors

Kvaser Leaf Light v2 devices that use the 9-pin D-SUB connector (see Figure 8) have the pinning described in Table 4.

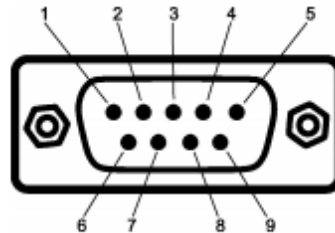


Figure 8: The D-SUB 9 connector pin numbers

Kvaser pin number	Function Function	Power Rider pin number		
		PR25A	PR150A	MC
1	Not connected			
2	CAN_L	3	6	9
3	GND	1	1	14
4	Not connected			
5	Shield	Shield	Shield	Shield
6	Not connected			
7	CAN_H	4	11	21
8	Not connected			
9	Not connected			

Figure 17 CAN KVASER Adapter signal definition.

Ethernet UDP Communication

See [appendix D](#).

3. POWER RIDER USER INTERFACE

The “Main” panel of the Power Rider User Interface simultaneously shows you the execution of three devices with three channels per device.

You can scroll between devices using the scroll-bar on the right side and scroll between channels of each device.

In this document we explain the properties of one device (blue square) and the properties of one channel (yellow square).

Device - It is a Power Rider unit that can contain multiple channels depending on the product's definition.

Channel - A controlled power channel that protects the load.

A device can contain one or more channels.

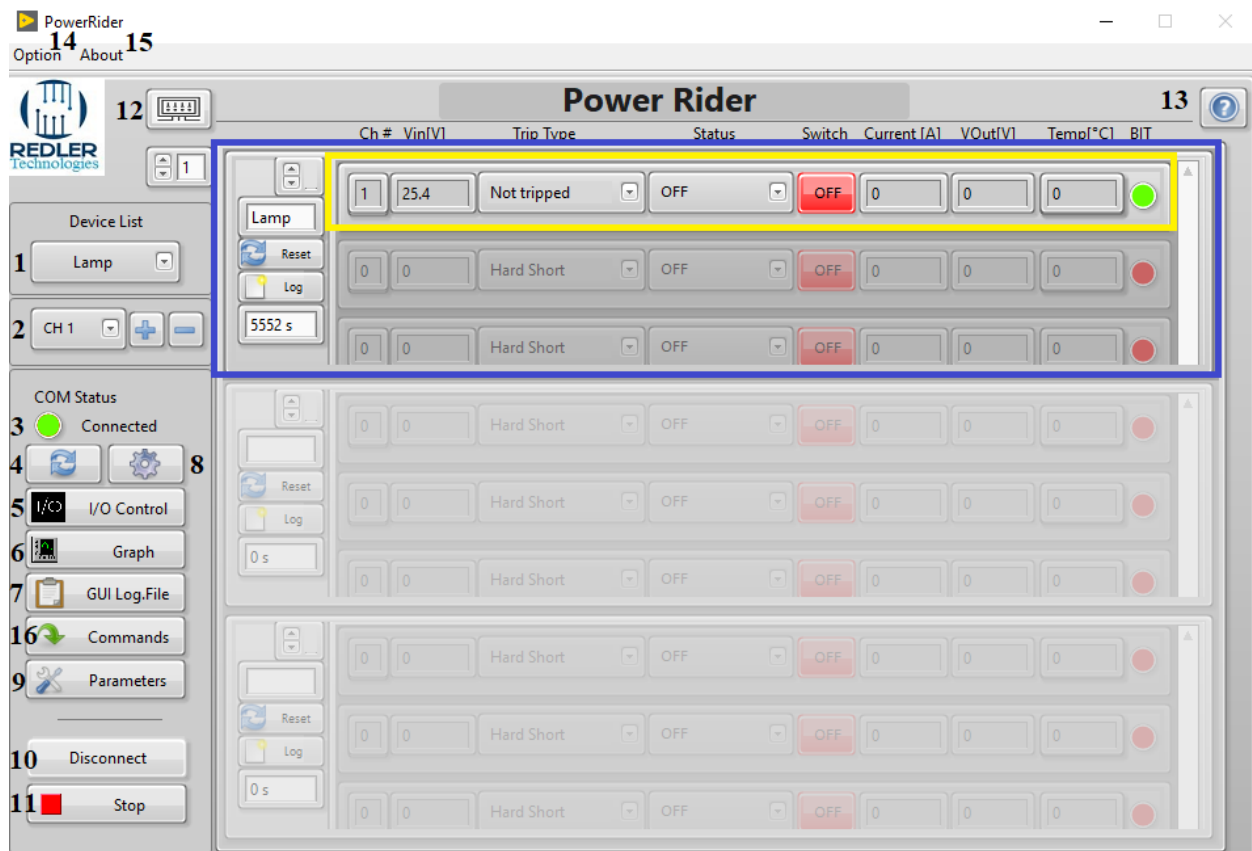


Figure 18 GUI Main panel

- 1 - The device name can be show in the "Dev List".
- 2 - Add and remove a channel by pressing the "+" or "-" button. Add/Remove all channels to be selected "All CH" and "+" or "-" button.
- 3 - The status of the CAN Bus: Green – Device/Devices Connected, Red - Device/Devices Not Connected.
- 4 - Refresh the acquired data for each device of the "Dev List".
- 5 - Open the "Discrete I/O control" panel (See " [3.2 Discrete I/O Control](#)").
- 6 - Display Graph of the selected device from the "Dev List" (See " [3.3 Graph](#)").
- 7 - Record all data to a text file (See " [3.4 Log. File](#)").
- 8 - Update the "Dev List" by adding devices by Name and CAN ID (See " [3.5 Devices](#)").
- 9 - Configure the "System" parameters and the "Channel" parameters of the selected device from the "Dev List" (See " [3.6 Preferences](#)" and " [4. Parameters description](#)").
- 10 - Connect or Disconnect the CAN Bus connection.
- 11 - Stop and Close the application.
- 12 - Fuse Map Interface (See " [3.7 Fuse Map](#)").
- 13 - Help window.
- 14 - Option Menu (See " [3.8 Option](#)").
- 15 - GUI About.
- 16 – Special Commands.

3.1 THE DEVICE AND CHANNEL PROPERTIES

This section explains the properties of one device (blue square) and the properties of one channel (yellow square).

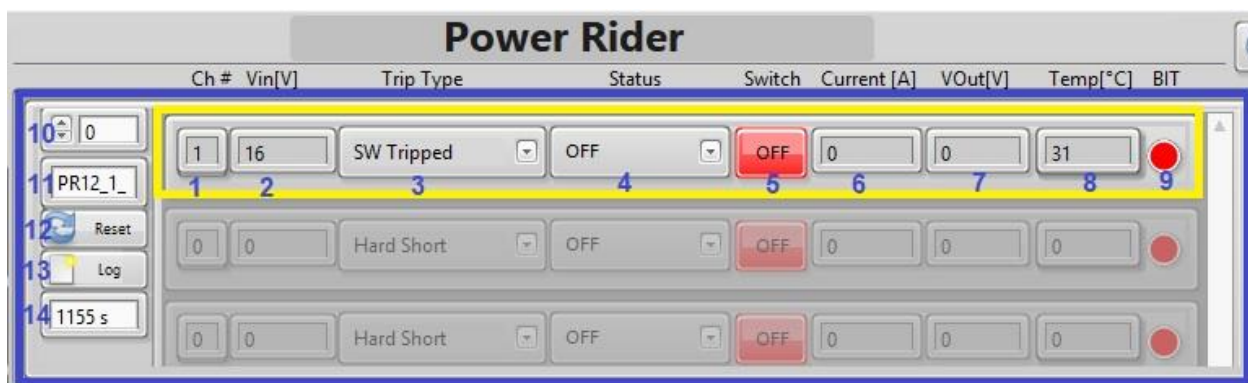
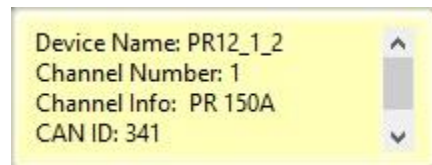


Figure 19 Device and channel window

3.1.1 Channel properties (yellow square):

1- Channel number.

- Channel properties like Channel Number, Channel information and CAN ID, can be shown when you click on the channel number (Ch #) indicator.

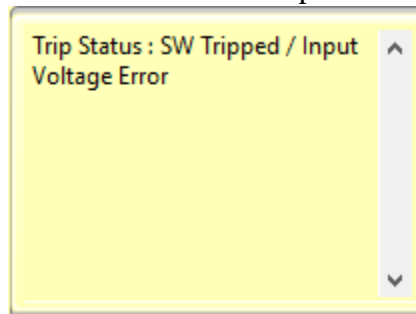


2- Channel Input Voltage [Volt.]

- Input voltage is shown in "Vin [V]" indicator.

3- Channel Trip Type, [None – No trip, SW Tripped – software trip (overload, I^2t), Hard Short – hardware trip (short circuit), MAX SW tripped - software trip (short circuit)].

- Channel trip is shown in "Trip Type" indicator, can be shown when you click on the channel trip indicator.



4- Channel status, [OFF – load disconnected, ON – load connected, ERROR – channel internal fail, FOREVER OFF – load unplugged due to permanent failure.]

- Channel status is shown in "Status" indicator.

5- Channel Control switch, [ON- Connect Load, OFF- Disconnect Load].

- Each channel of each device can be switched to ON or OFF via the "Switch" control.

6- Channel Current consumption, [Amp.].

- Channel drawn current is shown in "Current [A]" indicator.

7- Channel Output Voltage, [Volt.].

- Channel output voltage is shown in "Vout [A]" indicator.

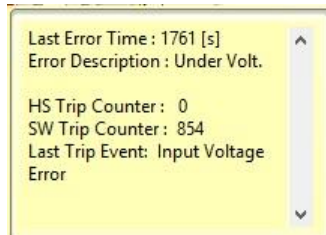
8- Device Internal Temperature [$^{\circ}$ C].

- Channel temperature is shown in "Temp [$^{\circ}$ C]" indicator.

9- Build in Test Status, [Red – Fail, Green – No errors].

- Channel bit status is shown by the "BIT" LED indicator.

- BIT Fail description like Time of last error, Error description, Hart Shot trip counter, Software trip counter and Last Trip event name can be shown when you click on the BIT indicator.



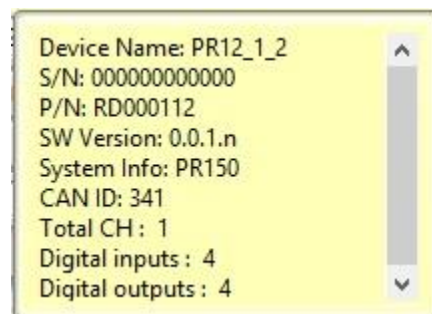
- If no errors are displayed, "no error"

3.1.2 Device properties (blue square):

10- Focus on particular channel.

11- Device Name.

- The name of the device is displayed on the left side (in the example bellow we see that the device name is "PR12_1_2").
- Device properties like Device Name, Serial Number, Part Number, Software Version, System information, CANBUS ID, Device total channel number, Digital inputs and outputs can be shown when you click on the device name indicator.

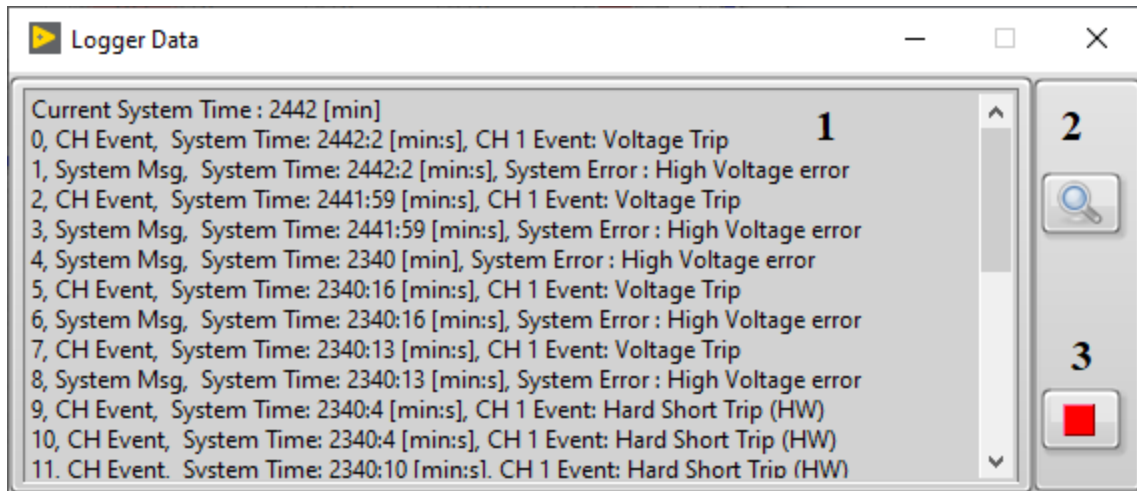


12- Device software reset.

- You can perform a reset software of the device when you click "Reset".

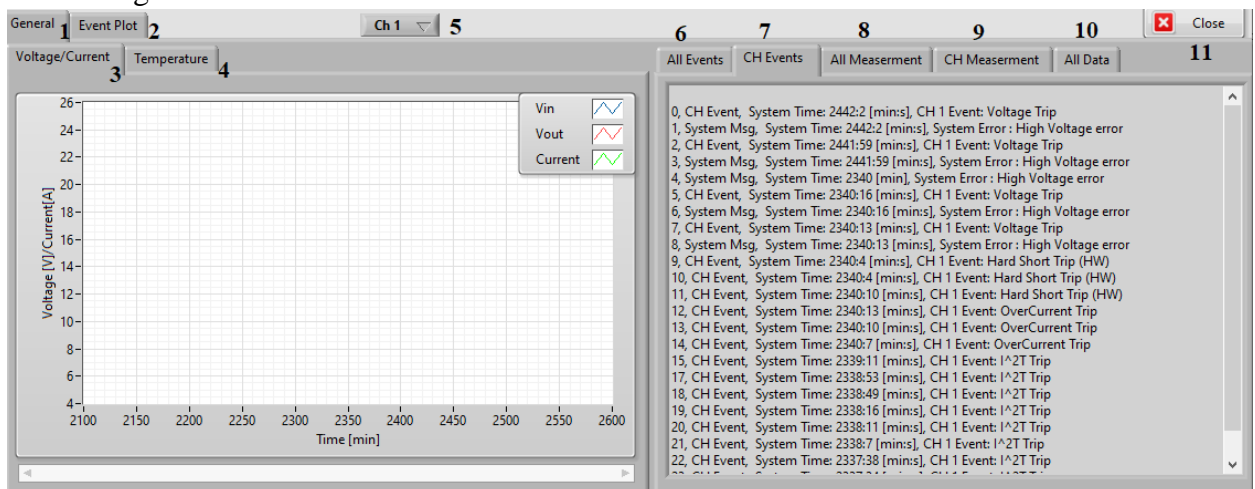
13- See device event Log. File.

- You can see the device log when you click "Log"



1. Main logger data window.
2. Sorting data button.
3. Exit

Sorting data window:

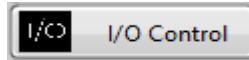


1. General Data.
2. Event Plot of particular channel (5).
3. Voltage / Current plot of particular channel (5).
4. Temperature plot of particular channel (5).
5. Select active channel number.
6. List of all events.
7. List of particular channel events (5).
8. List of measurements of all channels.
9. List of measurements of particular channel (5).
10. List of all Logger data.
11. Exit.

14- Device Time from startup [sec.]

- The device time is displayed on the left side.

3.2 DISCRETE I/O CONTROL



Select a device source from the Device list the top of the panel to see the digital input and output status.

To set an output port to "ON" or "OFF", go to the relevant tab (Digital Output) and click ON or OFF in the "Status" column cells, and click "Set".

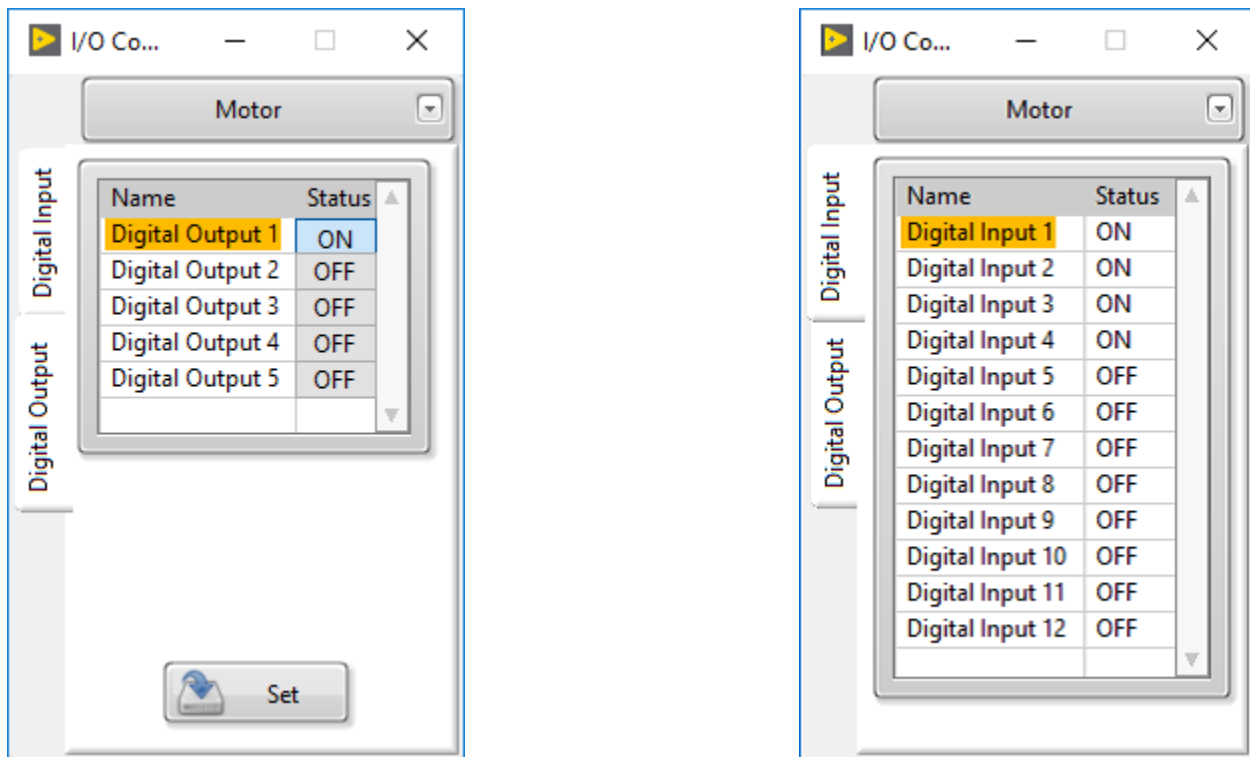
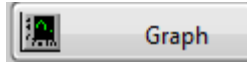


Figure 20 Digital Inputs/Output Interface

3.3 GRAPH INDICATOR



Select Device in main window and press “Graph” button.

The graph window allows you to see channels Voltage input, Voltage output, Current and Temperature values.

There are two windows: graph window and graph configuration window.

The graph configuration window defines graph channels and control the graph.

- 1- Select Device name from the list.
- 2- Select a channel of Graph.
- 3- To select the source, you must select the signal from the list.
- 4- Select the channel number being tested.
- 5- Press Add button to added selected channel to Graph.
- 6- Selected device indicator.
- 7- Selected channel indicator.
- 8- Clear Graph.
- 9- Play/Pause acquiring data.
- 10- Control of tested channel.
- 11- Stop Graph.
- 12- Length of the section being tested.
- 13- Close the window.

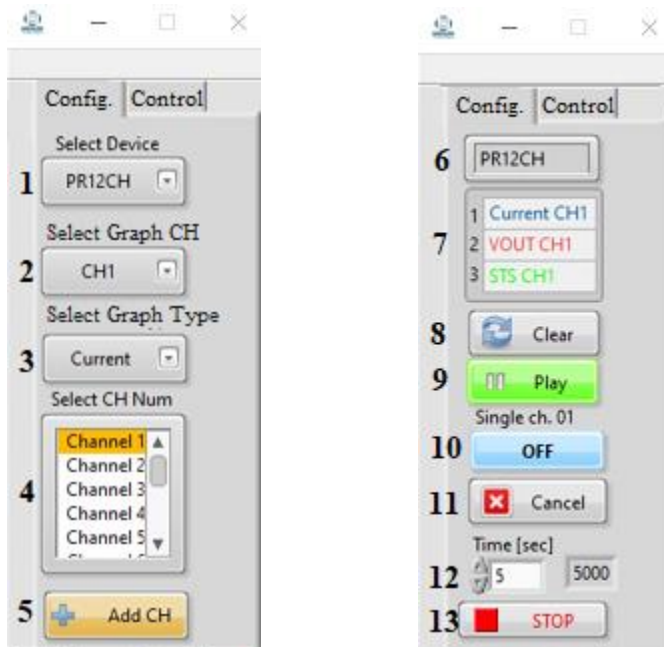


Figure 21 Graph Configuration

Graph Window - display the acquiring data.

- 1- Rollover- Display of points on the axis.
- 2- Pause acquiring data.
- 3- Clear acquiring data.
- 4- Graph view window length.
- 5- Graph channels name.

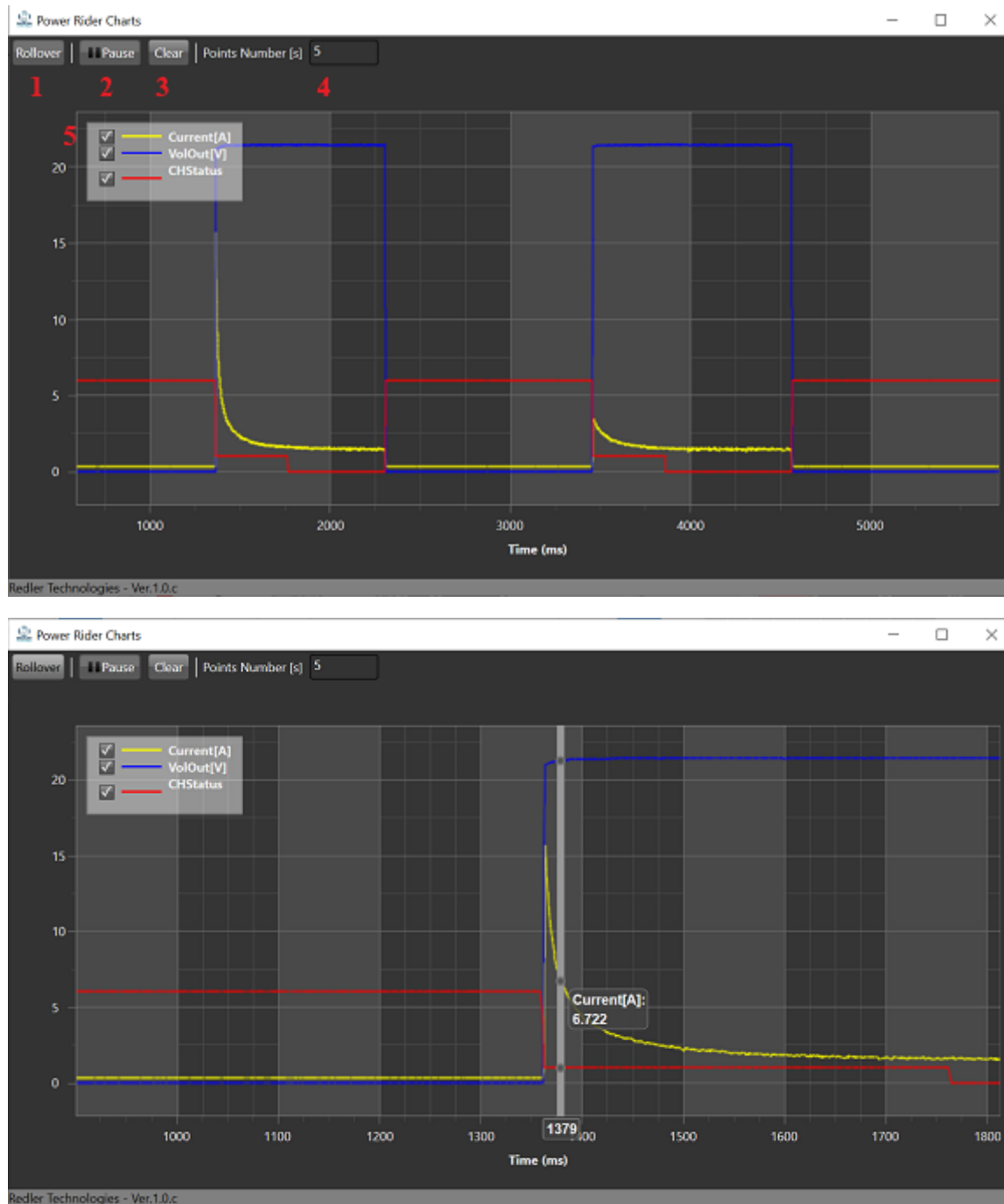
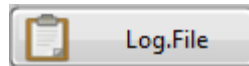


Figure 22 Graph window

3.4 LOG. FILE



You can save all the data in a text file.

All data defined in the main window is recorded into the log. File.

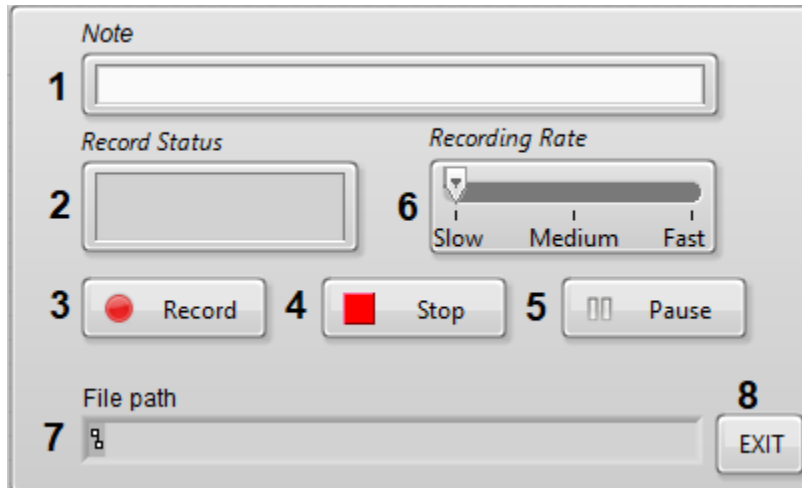


Figure 23 Log.File Window

- 1- Log. File Note
- 2- Record Status
- 3- Start record.
- 4- Stop record.
- 5- Pause record.
- 6- Recording Data Rate.
- 7- Log. File path.
- 8- Exit Record window.
 - Data saved in the LogReport folder.
 - While recording a Log. File button in Main Window starts blinking.

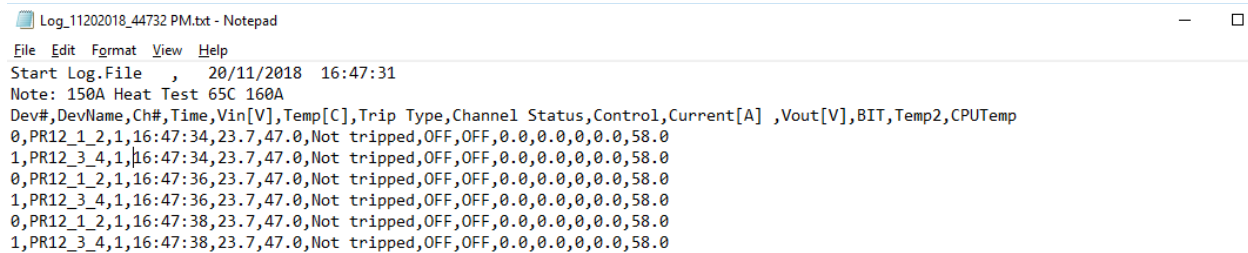


Figure 24 Example of Record file

3.5 DEVICES LIST



The picture bellow shows you the devices list panel.
From this window you can add or remove devices.

1. To add a device, you must enter a name for the device in the "DeviceName" column, and a valid CAN Bus ID in the "DeviceID" column.

You can add more than one device at time.

To remove a device, you have to click on the device row and delete the name and CAN Bus ID.
You can remove more than one device at time.

2. Select Communication type: CANalystII – CANBUS CANalyst-II adapter, CANKvaser – CANBUS Kvaser adapter, UDP – Ethernet UDP connection.

3. Select CANBUS baud rate (in CANBUS connection only).

4. Select Host address.

5. Click "Save & Quit" button when you finish, to save the new devices.

You will be prompted by a window asking you to click on the "Refresh" button on the left side pane of the "Main" panel.

6. Select unit IP address.

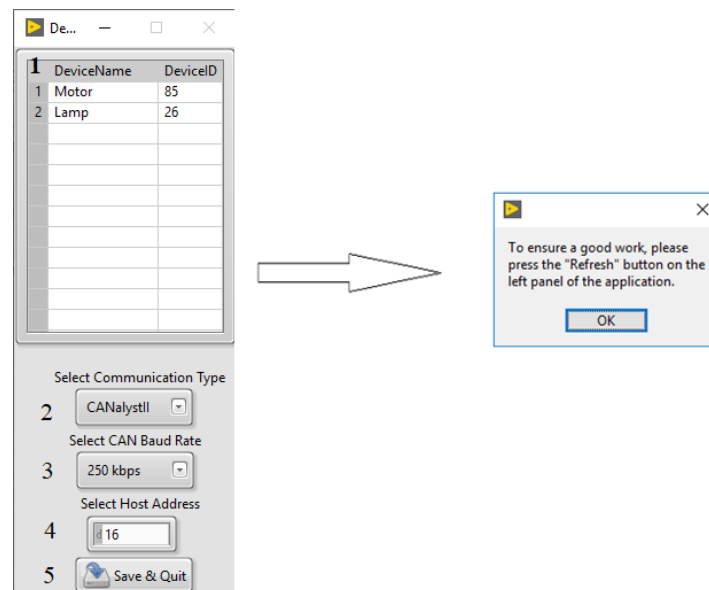


Figure 25 Power Rider CANBUS devices window

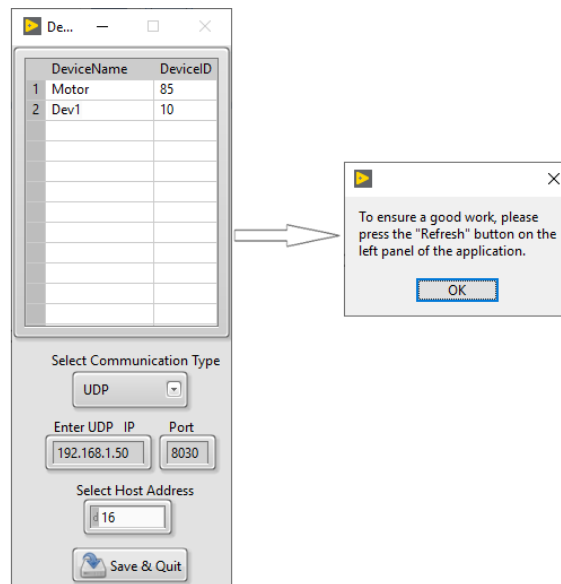
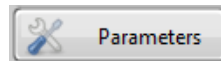
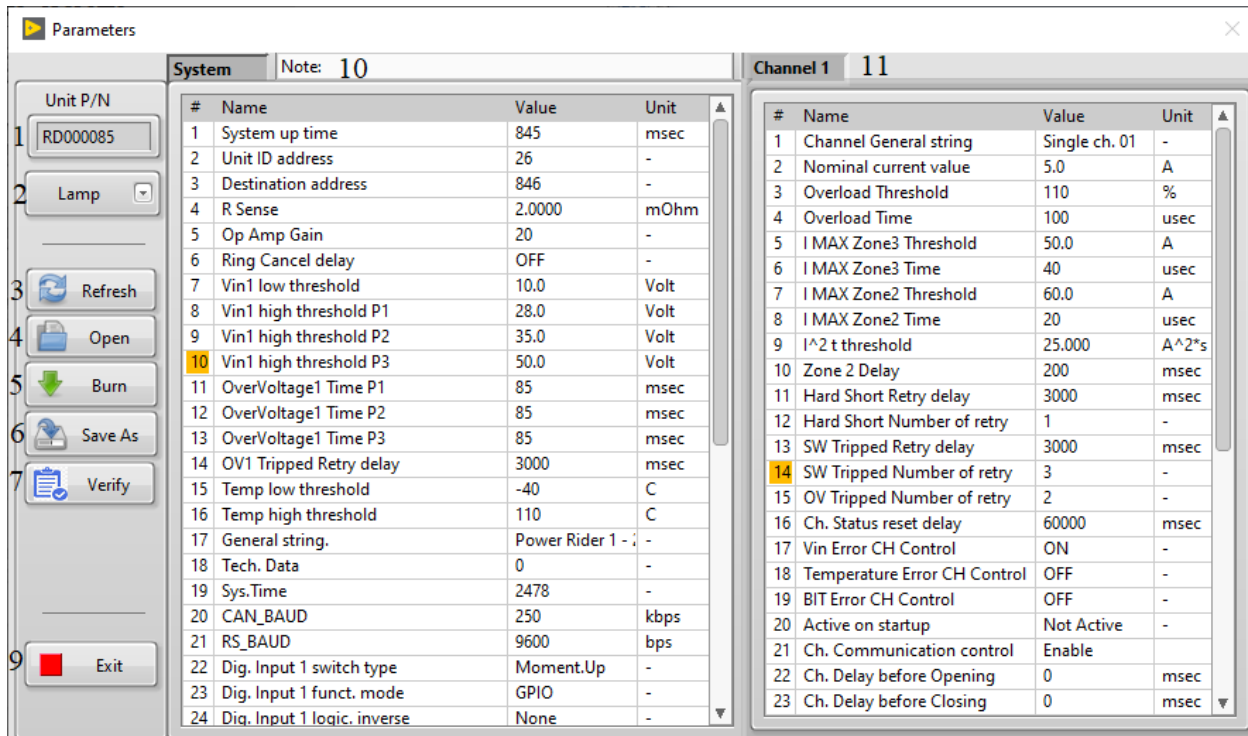


Figure 26 Power Rider UDP devices window

Device Name	Power Rider 25A	Power Rider 80A	Power Rider 150A	Power Rider 12CH	Power Rider 16CH
Device P/N	RD000085	RD000087	RD000112	RD000050	RD000137
Default Device ID	10	85	20	85	85
Default Host Address	16	16	16	16	16
Default CANBUS baud rate	250 kbps	250 kbps	250 kbps	250 kbps	250 kbps
Default UDP IP (device)	-	-	-	192.168.1.50	192.168.1.50
Default UDP Server IP	-	-	-	192.168.1.3	192.168.1.3
Default Server IP	-	-	-	8030	8030

Table 1 Default communication parameters

3.6 PARAMETERS

The Parameters Window is divided into two main sections: System and Channel 1. The System section is currently selected, showing a list of parameters with their values and units. The Channel 1 section is also visible, showing a list of parameters for the selected channel.

#	Name	Value	Unit
1	System up time	845	msec
2	Unit ID address	26	-
3	Destination address	846	-
4	R Sense	2.0000	mOhm
5	Op Amp Gain	20	-
6	Ring Cancel delay	OFF	-
7	Vin1 low threshold	10.0	Volt
8	Vin1 high threshold P1	28.0	Volt
9	Vin1 high threshold P2	35.0	Volt
10	Vin1 high threshold P3	50.0	Volt
11	OverVoltage1 Time P1	85	msec
12	OverVoltage1 Time P2	85	msec
13	OverVoltage1 Time P3	85	msec
14	OV1 Tripped Retry delay	3000	msec
15	Temp low threshold	-40	C
16	Temp high threshold	110	C
17	General string.	Power Rider 1 -	-
18	Tech. Data	0	-
19	Sys.Time	2478	-
20	CAN_BAUD	250	kbps
21	RS_BAUD	9600	bps
22	Dig. Input 1 switch type	Moment.Up	-
23	Dig. Input 1 funct. mode	GPIO	-
24	Dig. Input 1 logic. inverse	None	-

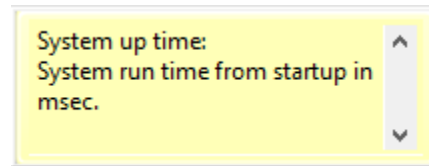
#	Name	Value	Unit
1	Channel General string	Single ch. 01	-
2	Nominal current value	5.0	A
3	Overload Threshold	110	%
4	Overload Time	100	usec
5	I MAX Zone3 Threshold	50.0	A
6	I MAX Zone3 Time	40	usec
7	I MAX Zone2 Threshold	60.0	A
8	I MAX Zone2 Time	20	usec
9	I^2 t threshold	25.000	A^2*s
10	Zone 2 Delay	200	msec
11	Hard Short Retry delay	3000	msec
12	Hard Short Number of retry	1	-
13	SW Tripped Retry delay	3000	msec
14	SW Tripped Number of retry	3	-
15	OV Tripped Number of retry	2	-
16	Ch. Status reset delay	60000	msec
17	Vin Error CH Control	ON	-
18	Temperature Error CH Control	OFF	-
19	BIT Error CH Control	OFF	-
20	Active on startup	Not Active	-
21	Ch. Communication control	Enable	-
22	Ch. Delay before Opening	0	msec
23	Ch. Delay before Closing	0	msec

Figure 27 Parameters Window

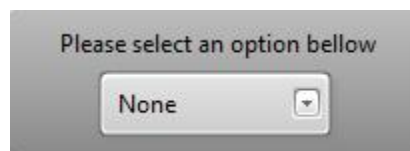
This window allows you to see the device (blue square) and channels (green square) parameters, you can also modify each of them by clicking on the "Value" column and writing the new value you want to insert, then click "Burn" to save the new parameters.

- 1 - The shown device part number.
- 2 - The selected device.
- 3 - Refresh the acquired data of the device.
- 4 - Open a configuration file, from which you can see device and channel parameters and burn them to the current connected device.
- 5 - Burn the present parameters to the device.
- 6 - Save the present parameters to a file.
- 7 - Verify parameters with data from a configuration file.
- 9 - Exit button.
- 10 - Add Configuration file notes.
- 11 - The Select Channel of the selected device.

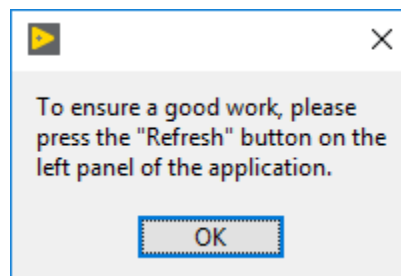
Clicking on the parameter number column "#", you can see the parameter information and the available value you can enter.



When clicking on part of a parameter you are prompted to select a value from a list.



After you quit the parameters window by pressing "Stop" you will be prompted by a window asking you to click on the "Refresh" button on the left side pane of the "Main" panel.



3.7 SPECIAL CONFIGURATION COMMAND

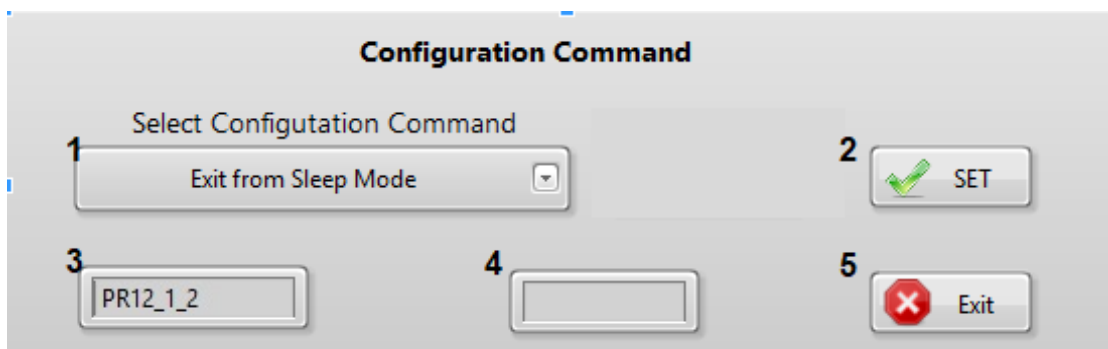
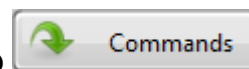


Figure 28 Configuration Command

- 1- Select special Device command from command list.

Command list:

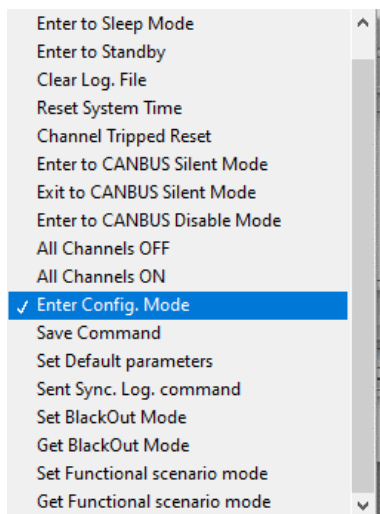


Figure 29 Special device commands list

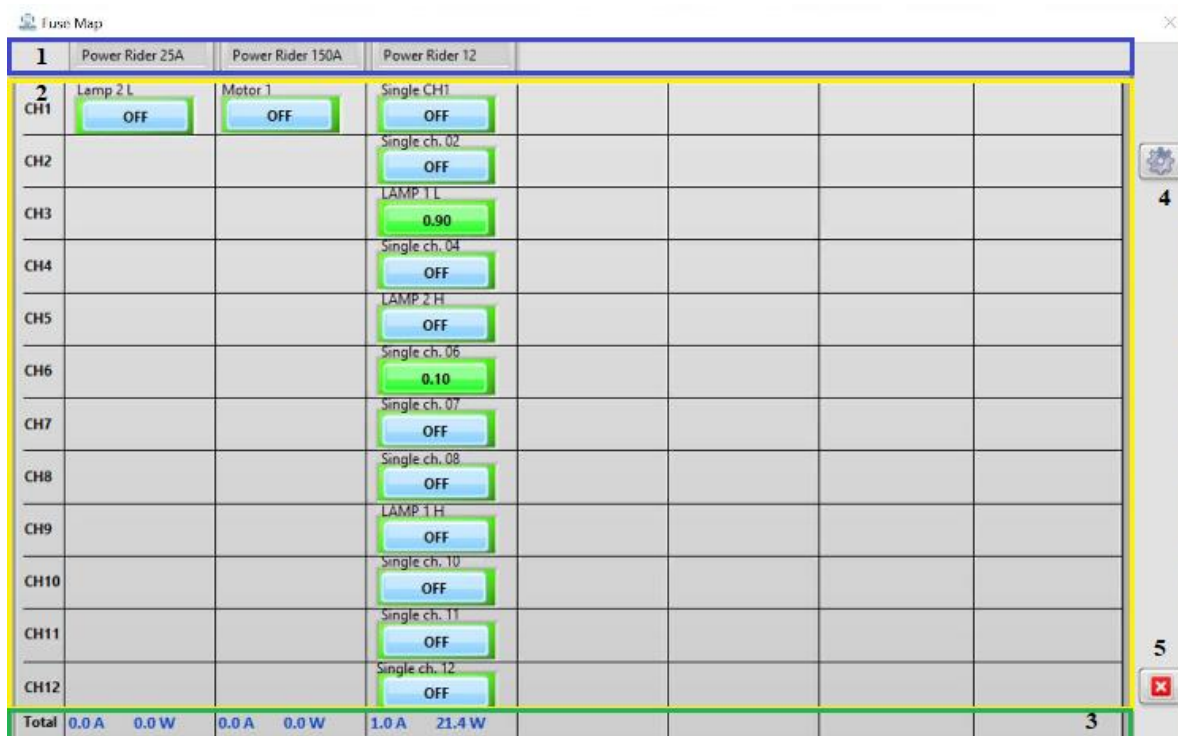
- 2- Click “SET” button to send the command.
- 3- Device Name
- 4- Device response.
- 5- Exit.

3.8 FUSE MAP



The Fuse Map window allows to centralize the data from all devices defined in the Main window.

A window divided into columns (Devices) and rows (Channels).



1		Power Rider 25A	Power Rider 150A	Power Rider 12				
2	CH1	Lamp 2 L OFF	Motor 1 OFF	Single CH1 OFF				
	CH2			Single ch. 02 OFF				
	CH3			LAMP 1 L 0.90				
	CH4			Single ch. 04 OFF				
	CH5			LAMP 2 H OFF				
	CH6			Single ch. 06 0.10				
	CH7			Single ch. 07 OFF				
	CH8			Single ch. 08 OFF				
	CH9			LAMP 1 H OFF				
	CH10			Single ch. 10 OFF				
	CH11			Single ch. 11 OFF				
	CH12			Single ch. 12 OFF				
Total		0.0 A 0.0 W	0.0 A 0.0 W	1.0 A 21.4 W				3

Figure 30 Fuse Map Window

1 – Device Name (blue square).

- Device properties like Device Name, Serial Number, Part Number, Software Version, System information, CANBUS ID, Device total channel number, Digital inputs and outputs can be shown when you click on the device name indicator.

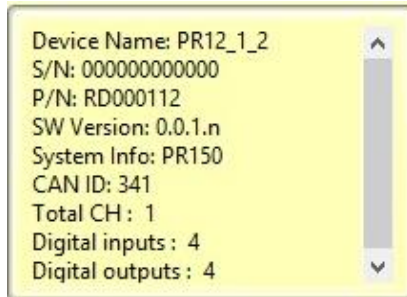


Figure 31 Device Description

2- Channel Data (Yellow square).

- Name of the channel indicator changed according to parameter channel string.
- Channel Background indicates a channel error, Green-No Error, Red-Any BIT Error , Blinking – Trip Event.
- The Information inside the channel indicator divided into two modes: Disconnect Load - “OFF” and Load Connected - Information indicates current consumption by a Load.
- The Indicators Color varies depending on the channel status. (see channel states indicator table).

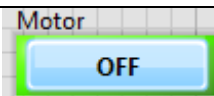
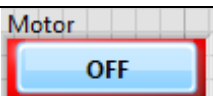
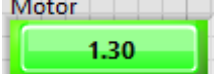
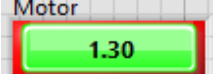
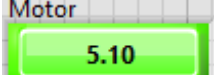


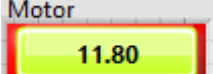
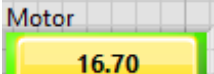
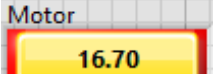
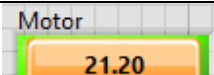
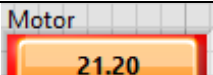
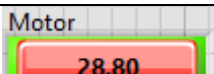
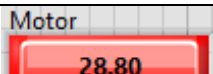
Channel Status	Current [A]	BIT OK	BIT Fail	Trip Event
OFF	0			Background LED is blinking
ON	1.3			Background LED is blinking
ON	5.1			Background LED is blinking
ON	11.8			Background LED is blinking
ON	16.7			Background LED is blinking
ON	21.2			Background LED is blinking
ON	28.8			Background LED is blinking

Figure 32 Fuse Map Channel indicators interface

* Map Fuse Window current display full scale value is 30 Amp.

- Each channel for each device can be switched to ON or OFF via the channel control button.
- Channel data like Channel Number, Channel number, Channel information, CANBUS ID, BIT, Trip Status, Voltage Input, Voltage Output and Temperature can be shown when you right mouse button click on the channel indicator.

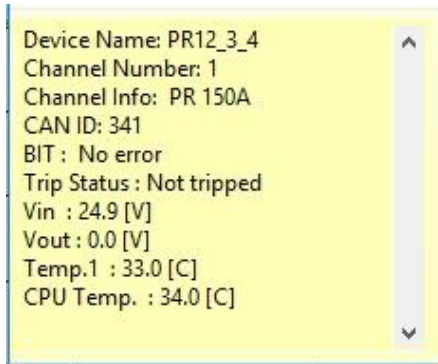


Figure 33 Channel Description

3- Total Current and Power consumption (Green square).

4- Full scale current color display window.

5- Exit.

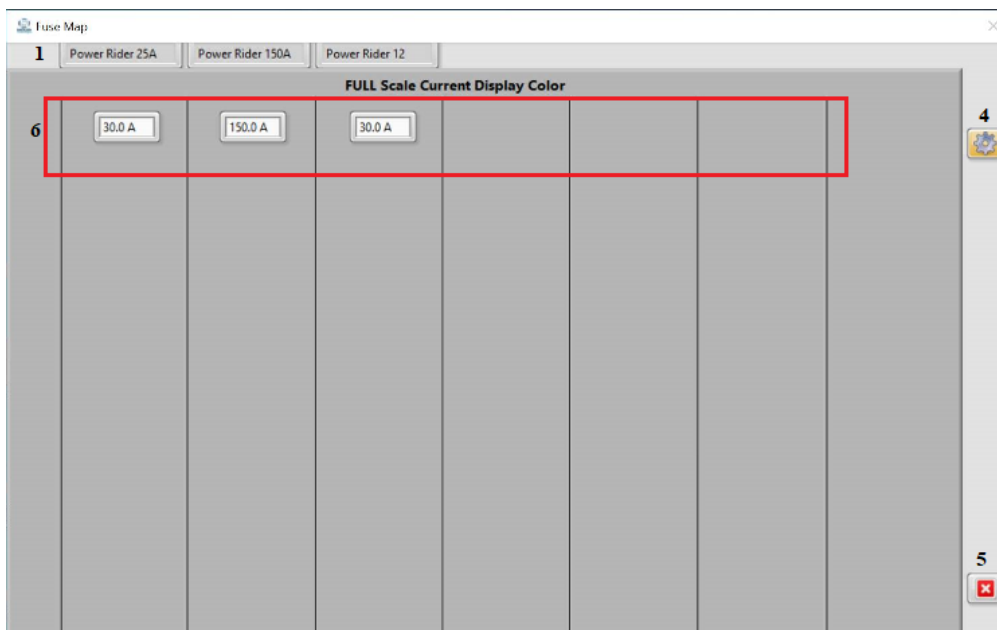


Figure 34 Full Scale Current Display Color Window

6- Full scale current color display value (Red square). Press (4) to return to main window.

3.9 OPTIONS

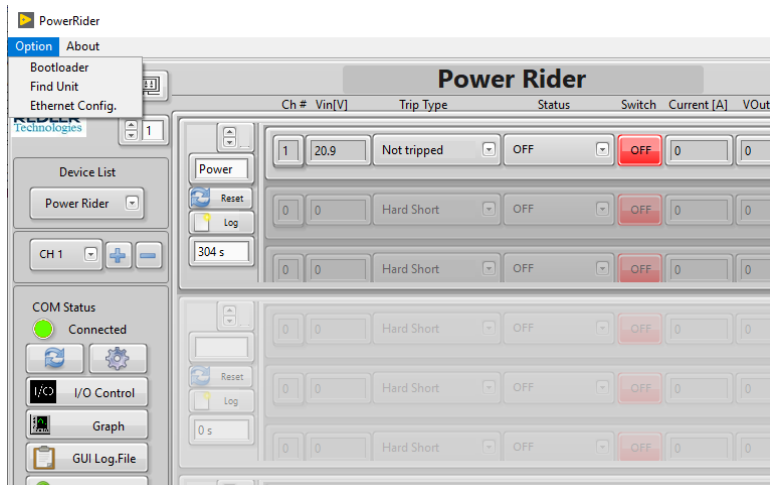


Figure 35 Option menu

3.9.1 Bootloader

The purpose of the Bootloader process is to update the software version (Embedded) within the Power Rider unit. To update the software version, the unit needs to enter a special mode that is Bootloader Mode.

In a Bootloader mode, the unit does not function as a Smart Circuit Breaker.

In this state a Pilot LED flashes green and orange color.

If there are other units that are connected to a common bus, disconnect them or put them into CANBUS Silent mode (for exit from CANBUS Silent mode do power reset).

Only after the successful completion of the bootloader process unit can return to normal functionality.

Software update requires CAN communication connection.

Press Option>>Bootloader

3.9.2 Loading software process

1. Press "Connect" Button (see fig. 35 / 1)
2. Connect icon changed to green (see fig. 35 / 2)

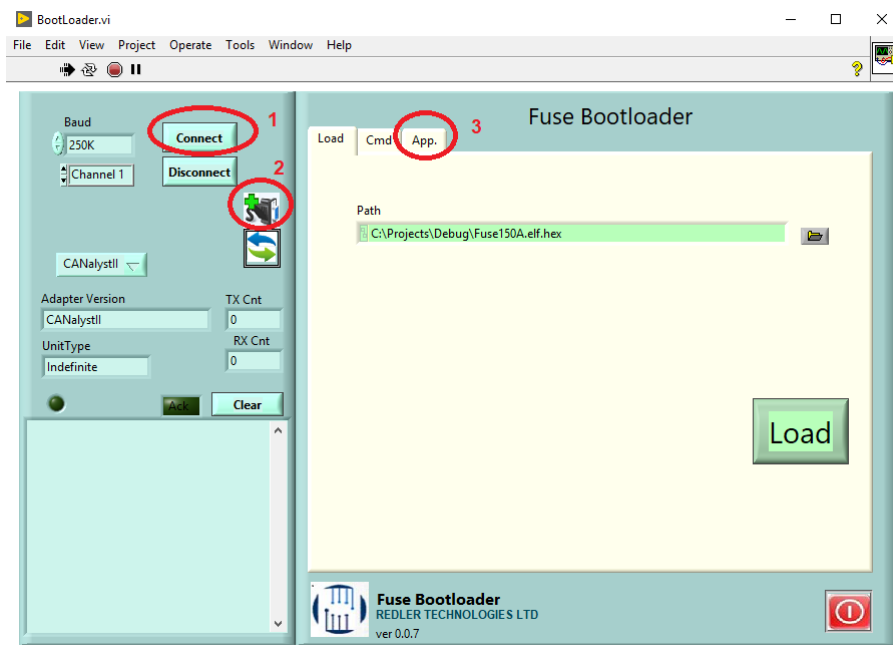


Figure 36 Bootloader GUI Step 1

3. Move to Load Tab (see fig. 36 / 7)
4. Select an appropriate hex file (see fig. 36 / 8)
5. Press “Load” (see fig. 36 / 9)

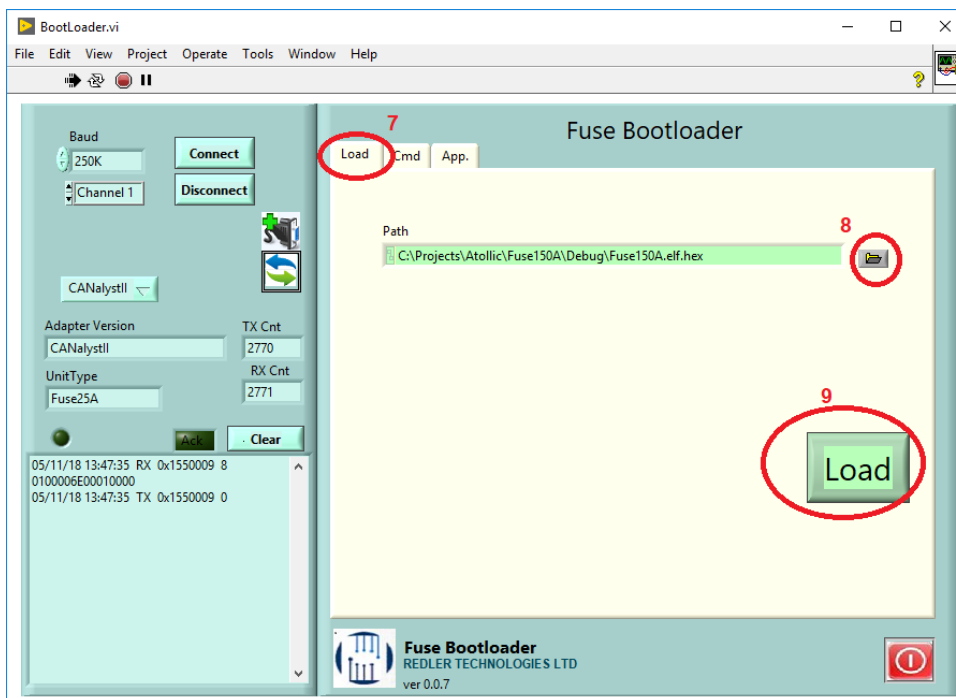


Figure 37 Bootloader GUI Step 3

6. The load process is starting.

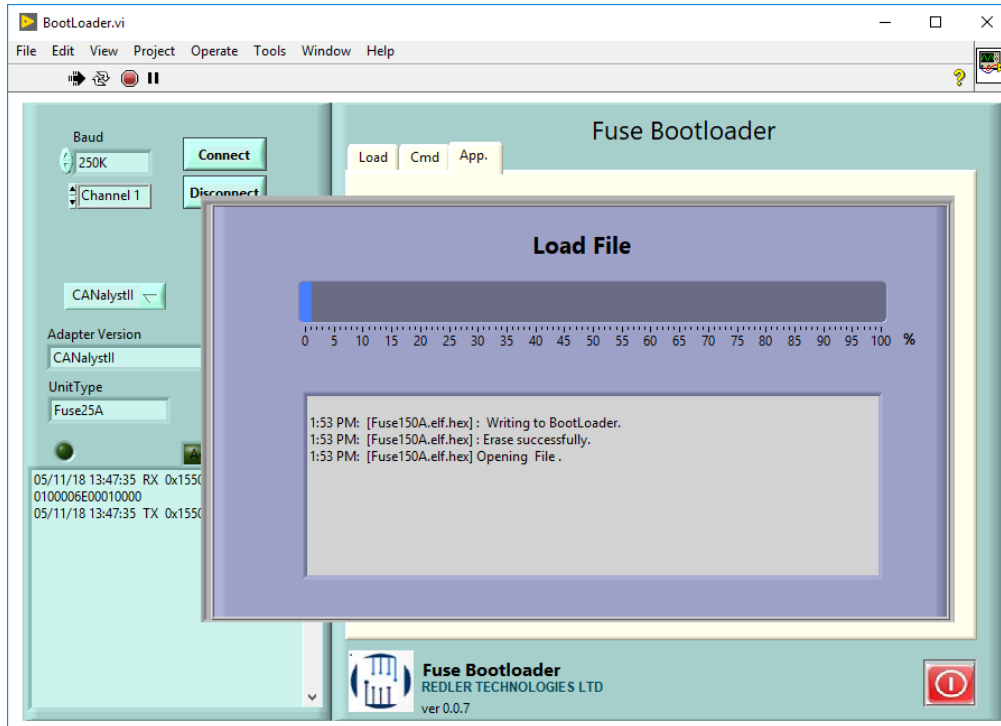


Figure 38 Bootloader GUI Step 4

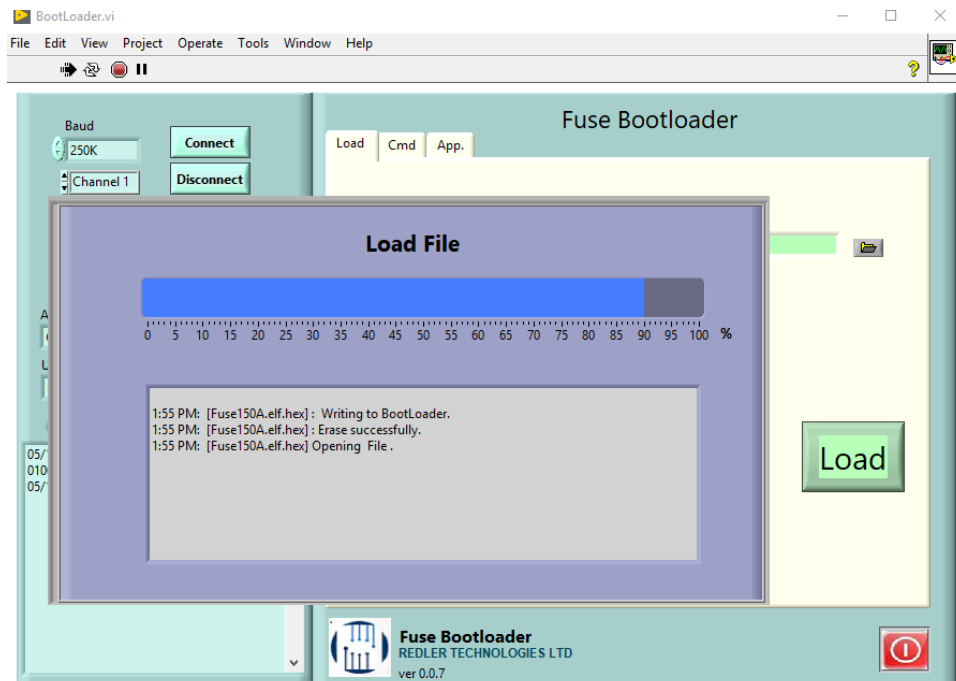


Figure 39 Bootloader GUI step 5

7. Wait for the process to finish (fig pic. 38)

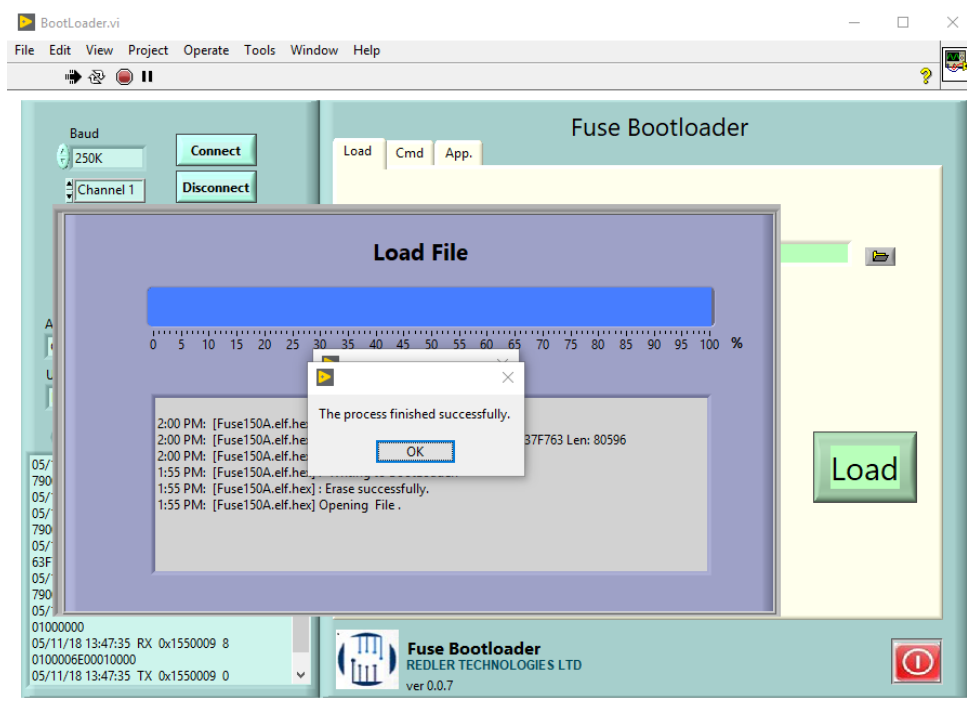


Figure 40 Bootloader GUI Step 6

8. Load process finished successfully (see fig. 39).
9. Press OK and close the bootloader GUI (see fig. 40).
10. GO to the Main Power Rider GUI and press Refresh icon.
11. Press Commands and select Set Default parameters and press SEND.
12. Select Enter Config. Mode and press SEND.
13. Select Save Command and press SEND.
14. Perform a power reset.

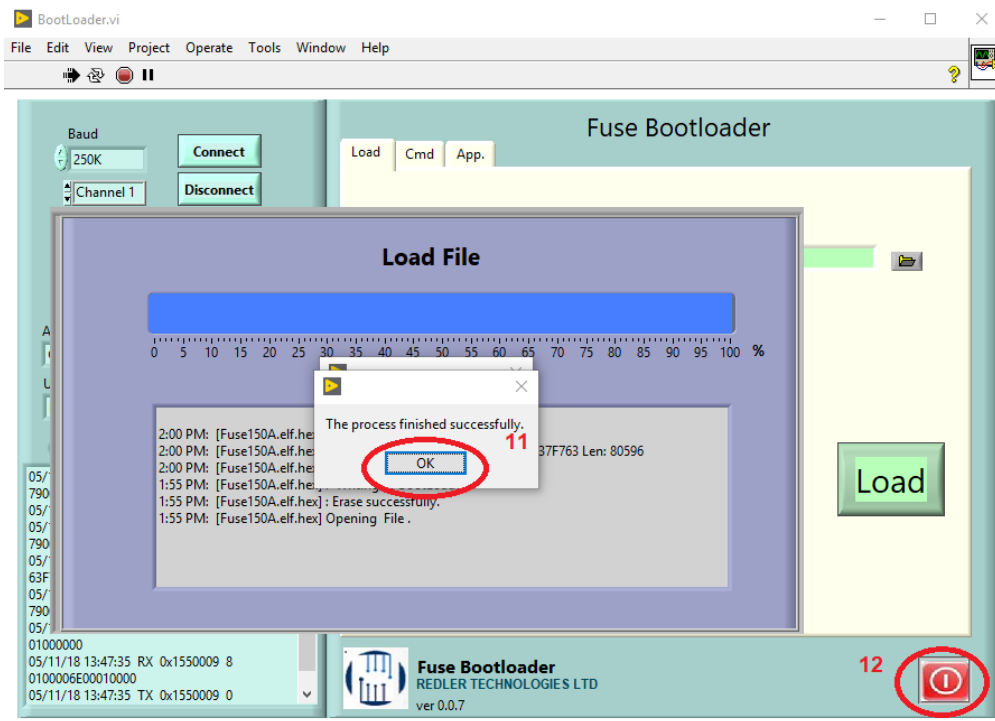


Figure 41 Bootloader GUI Step 17

- If you receive an error in the software loading process: Do reset to the device and go to step 3.

3.9.3 Find Unit

This application allows you to find any Power Rider's device identification connected to the GUI. Go over panel instruction to get Power Rider's devices list.

*Only for products supporting CANBUS communication.

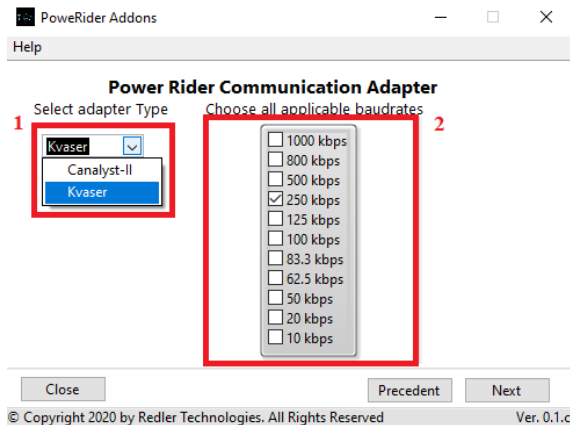


Figure 42 Power Rider Addons Communication parameters

1. Select CANBUS adapter type (see fig. 42).
2. You can select a specific baud rate or all applicable baud rates (see fig. 42).

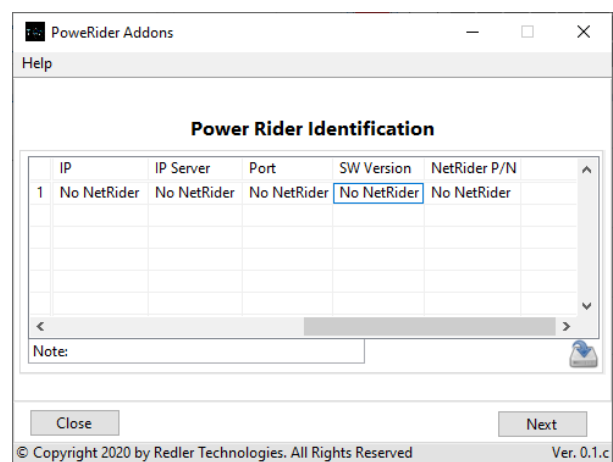
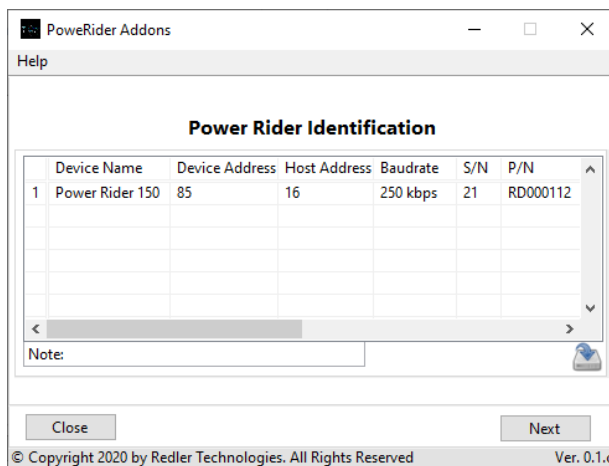


Figure 43 Power Rider's device list

* Move the right scrollbar to see all the data.

3.9.4 Ethernet Configuration

*Only for products supporting Ethernet communication.

The purpose of the Ethernet configuration process is update Ethernet parameters and update the software version (Embedded) within the Ethernet unit. To update the software version, the unit needs to enter a special mode that is Bootloader Mode.

Selec Option>> Ethernet Config.

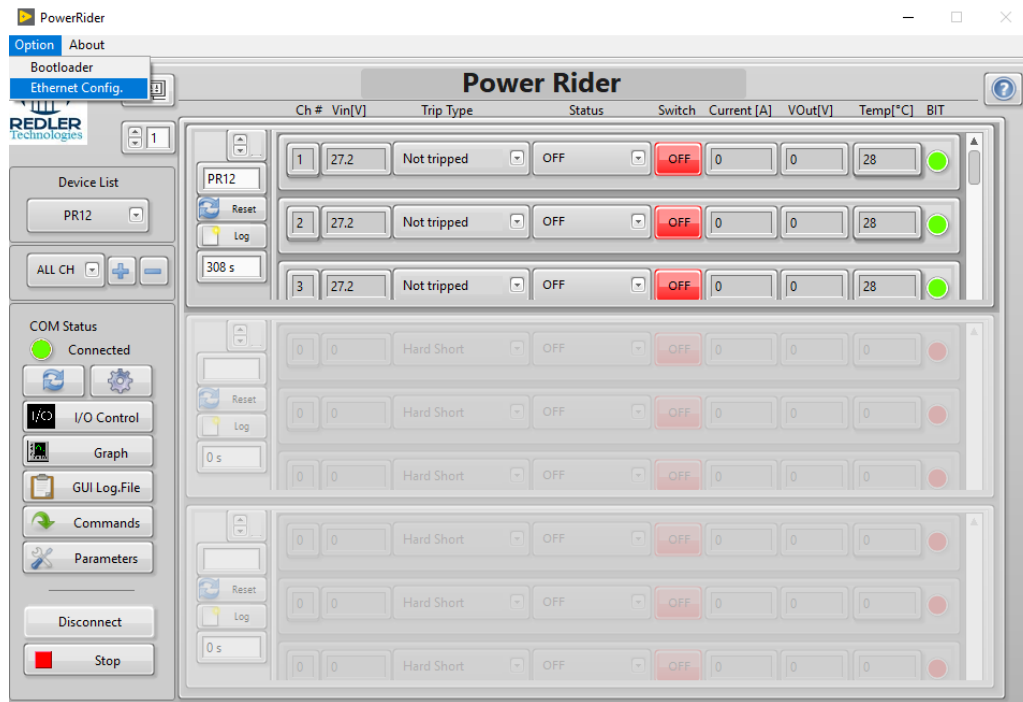


Figure 44 Main window

Press **Bootloader** button.

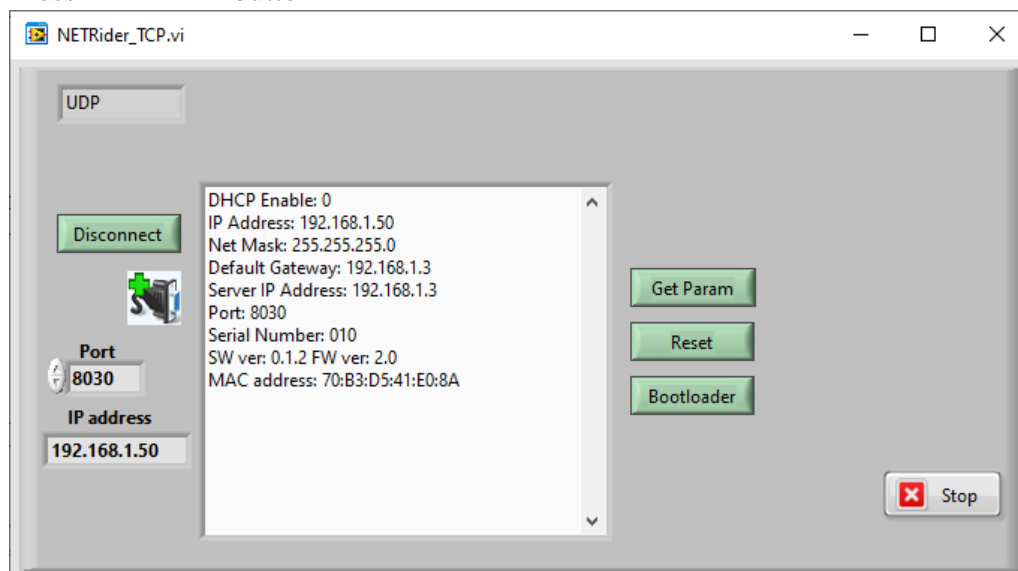


Figure 45 Ethernet parameters window

Press  button

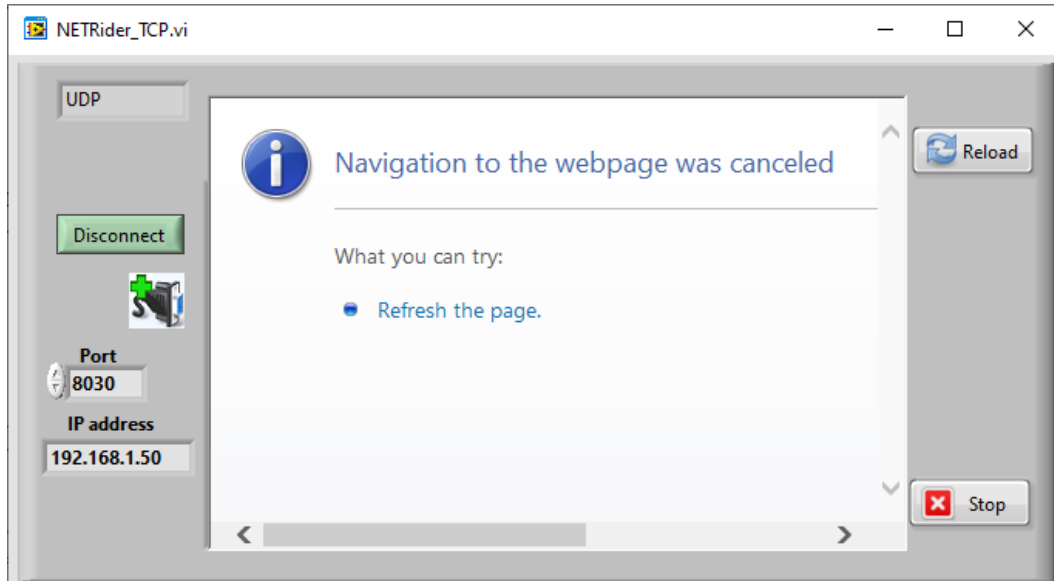


Figure 46 Configuration window

Enter User ID: admin and Password: 1234.

Press Login.

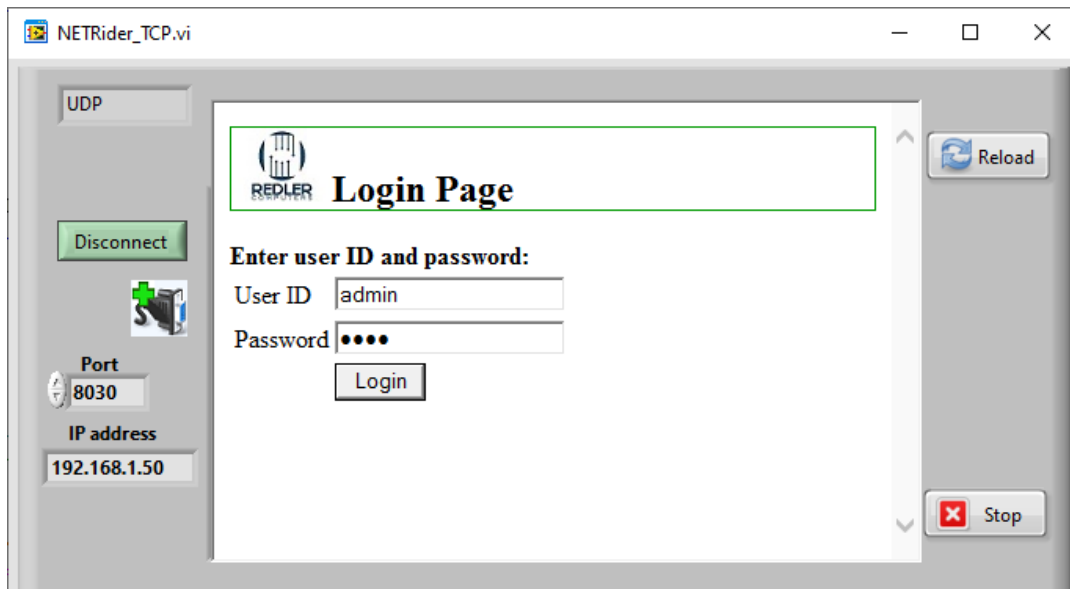


Figure 47 Enter to Configuration mode

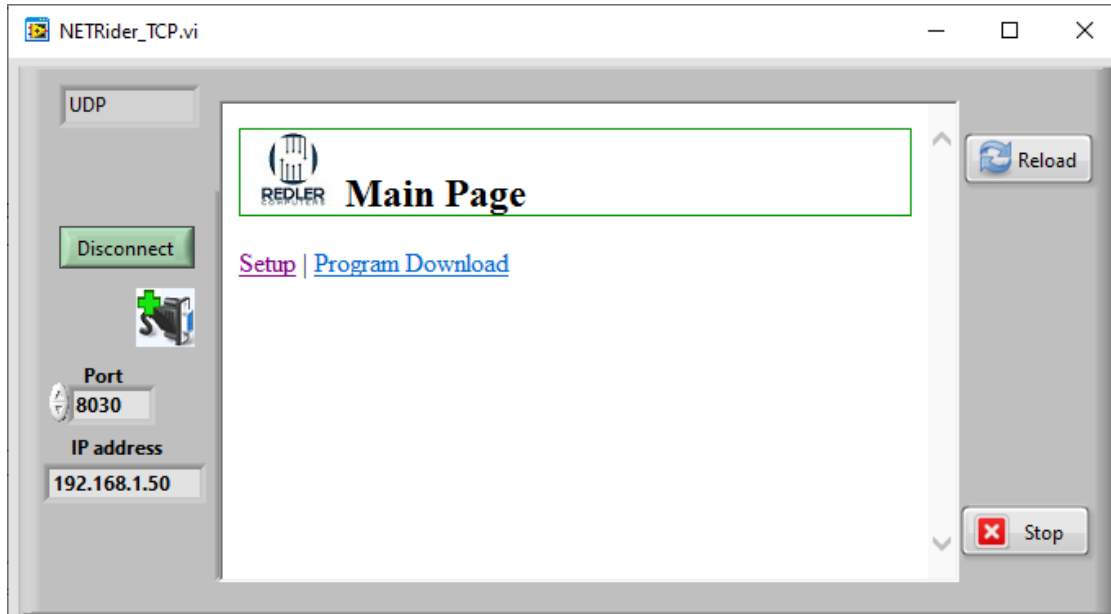


Figure 48 Main configuration page

Press **Program Download** for update software version or **Setup** for updatet Ethernet parameters.

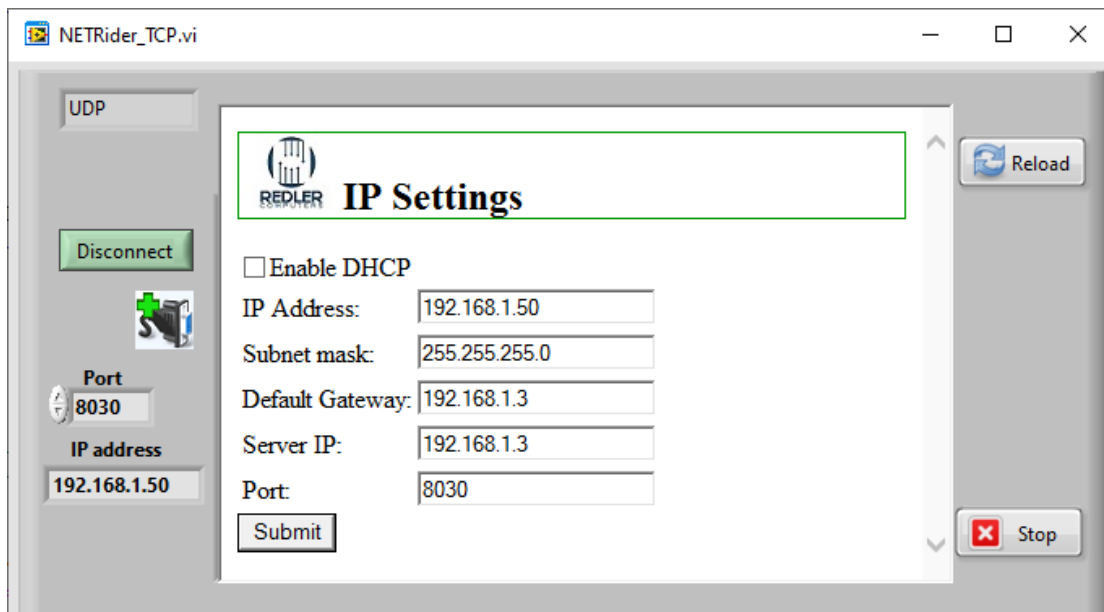


Figure 49 Ethernet parameters page

Program Download process

Select NetRider.hex file and press download.

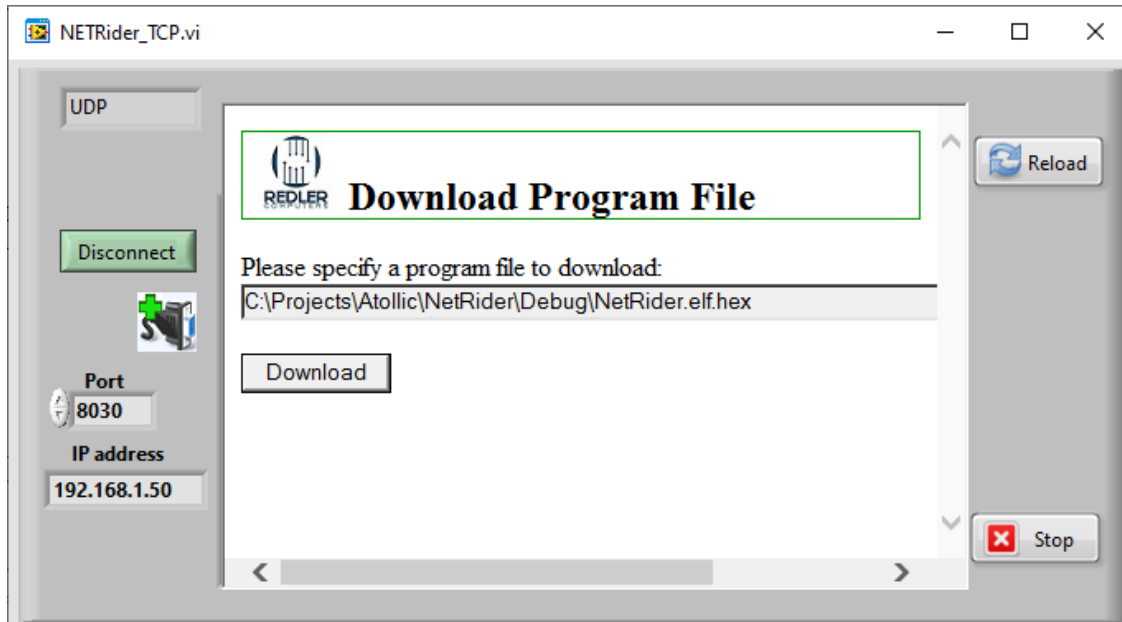


Figure 50 Select program file

Press **Reset** and  button.

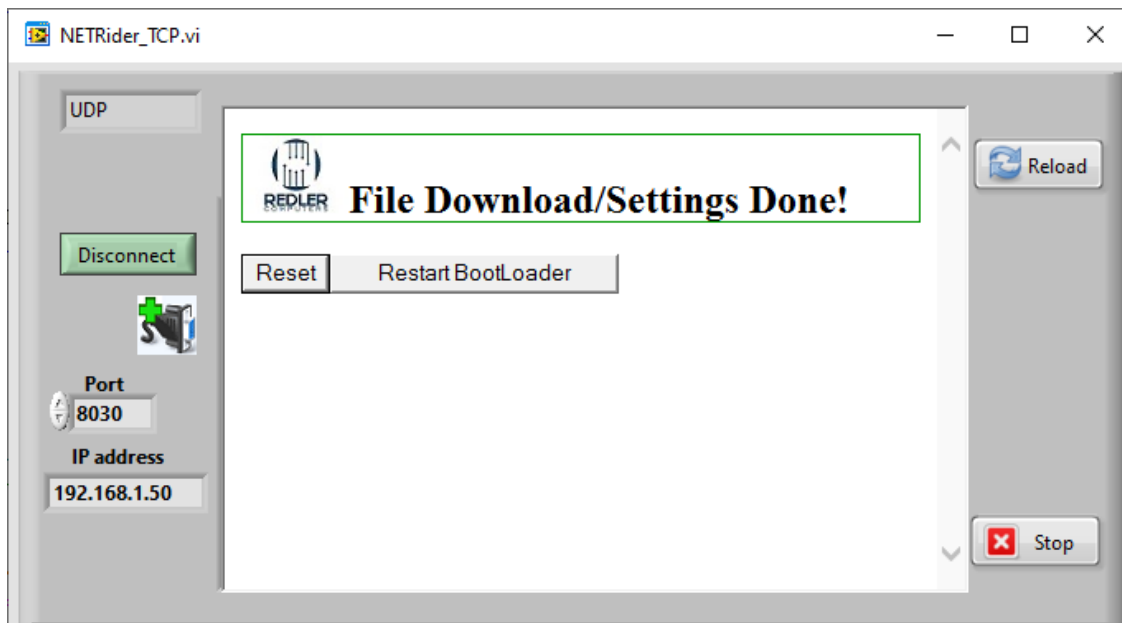


Figure 51 Reset window

4. APPENDIX A - CONFIGURATION PARAMETERS

4.1 SYSTEM PARAMETERS TABLE:

Parameter Name	Parameter Description
Unit ID address	CANbus address (Decimal).
R Sense	Current sense resistance in uohm.
Op Amp Gain	Current measurement gain.
Vin low threshold	Voltage low threshold, Vol[V].
Vin high threshold Pn	Voltage high threshold (3 point), Vol[V].
Vin low hysteresis	Voltage Input low threshold hysteresis
Vin high hysteresis	Voltage Input high threshold hysteresis
OverVoltage Time Pn	Over Voltage time (3 point), [msec].
OVn Tripped Retry delay	The number of attempts to open the channel after Over Voltage trip. (range: 0-254,255 - Infinity).
Temp low threshold	Temperature low threshold, Temp[C].
Temp high threshold	Temperature high threshold, Temp[C].
General string.	General system information. ASCII string max 20 byte.
Status message	Sending automatic status messages.
CAN_BAUD	Baud Rate of CAN BUS in kbps.
RS_BAUD	Baud Rate of RS485 in kbps.
Dig. Out n Delay before Active	Time delay before active the digital Output, [msec].
Dig. Out n Delay before Deactivating	Time delay before deactivating the Digital Output, [msec].
Dig. Out n OFF Timeout	Digital Output timeout for deactivate Output, [msec].
Dig. Out n control	"&"-AND logic, " " -OR logic, "!"-NOT; "In1" - Digital input 1, "SCH1"-Channel state, OUT1-Digital Output 1 status...
Dig. Out n logic inverse	Digital Output logic. None / Invers logic. or blinking
Output n startup state	Startup Output n state. On/Off
Dig. Input type n	Definition of Digital Input type. None, Toggle, Momentary Up, Momentary Down.
Dig. Input n funct. mode	Digital Input functionality mode
Dig. Input n logic inverse	Digital Input logic. None or Invers logic.
MAX Current LED scale	Pilot LED Current Indicator Full scale, [Amp.]
J1939 Status message	Activate unit status reports
Log. Update data time	Logger Measurement update time
MAX Total current Sn	Limit unit total current depending on the scenario (only for MC)
Scenario mode	Scenario mode number 1..3 (only for MC)
Communication Timeout	Communication Timeout

4.2 CHANNEL PARAMETERS TABLE

Parameter Name	Parameter Description
Channel General string	General ASCII string max 20 bytes.
Nominal current value	Channel nominal current value, Amp [A].
Overload Threshold	Cutoff current threshold, [% of Nominal Current].
Overload Time	Time in usec that the current will be over Current threshold parameter for close the channel. [usec]
I MAX Zone3 Threshold	Cutoff current threshold in Zone 3 (Steady-state zone), Amp [A].
I MAX Zone3 Time	Time in usec that the current will be over Cutoff Current threshold Zone 3. (Steady-state zone) for close the channel. [usec].
I MAX Zone2 Threshold	Cutoff current threshold in Zone 2 (inrush current zone), Amp [A].
I MAX Zone2 Time	Time in usec that the current will be over Cutoff Current threshold Zone 2 (inrush current zone) for close the channel. [usec].
I ² t threshold	Melting Integral (I ² T) value, Amp [A ² /s].
Zone 2 Delay	Delay of Zone 2 (inrush current zone), [msec].
Hard Short Retry delay	Delay between the retry the opening of the channel after Hard Short event, [msec]. Range: 1-255.
Hard Short Number of retry	The number of attempts to open the channel after Hard Short. (range: 0-254,255 - Infinity).
SW Tripped Retry delay	Delay between the retry the opening of the channel after SW Tripped event, [msec]. Range: 1-255.
SW Tripped Number of retry	The number of attempts to open the channel after SW Tripped. (range: 0-254,255 - Infinity).
Ch. Status reset delay	Value of timeout delay for clean tripped status. (msec)
OV Tripped Number of retry	The number of attempts to open the channel after Over Voltage Tripped. (range: 0-254,255 - Infinity).
Vin Low Error	Closing a channel in an input power low failure.
Vin High Error	Closing a channel in an input power high failure.
Temperature Error	Closing a channel in a temperature failure.
BIT Error	Closing a channel in an any BIT failure.
Group channel control	Simultaneously Channel group control. (Group # Master, Group # Slave). Group range: 1..6. (only for MC)
Active on startup	Automatic channel opening in the system startup.
Ch. Communication control	Control the channel through communication (Disable /Enable/ Enable&Timeout).
Ch. Delay before Opening	Delay before Opening the channel, [msec].
Ch. Delay before Closing	Delay before Closing the channel, [msec].
Ch. OFF Timeout	Close channel Timeout, [msec].

Logic CH Cnt	An expression that defines the logic of a channel. "&"-AND logic, " " -OR logic, "!"-NOT; "In1" - Digital input 1,..., "SCH1"-Channel state,..., OUT1-Digital Output 1 status...
Log. I TH event	Logger Current threshold event, [% of Nominal Current].
Log. write I/V data	Enables writing Voltage and Current to Logger.
Log. write control cmd	Enables writing a channel control commands to the Logger.
CH Priority Sn	Channel priority number depending on the scenario n. (only for MC)

4.3 OPERATIONS

Description of the operation channel's parameters:

Param. Name	Zone 1	Zone 2	Zone 3	Description
I MAX Zone2 Threshold	inactive	active	inactive	Current MAX Threshold in Zone 2 [A]
I MAX Zone3 Time	inactive	active	inactive	Current Pulse Width in Zone 2 [usec]
I MAX Zone3 Threshold	inactive	inactive	active	Current MAX Threshold in Zone 2 [A]
I MAX Zone2 Time	inactive	inactive	active	Current Pulse Width in Zone 2 [usec]
Overload Threshold	inactive	inactive	active	Overload Threshold in Zone 2 [A], Percentages relative to Nominal Current. [%]
Overload Time	inactive	inactive	active	Overload Width in Zone 2 [usec]
I ² t threshold	inactive	inactive	active	I ² T, Nominal melting [A ² s]
Tripped Retry Delay	inactive	active	active	Delay between the retry the opening of the channel after Tripped event. [mSec.]
Hard Short/ SW Tripped Number of retry	inactive	active	active	The number of attempts to open the channel after the trip.
Ch. Status reset delay	inactive	active	active	Timeout for clean channel tripped status counter. [mSec.]
Zone 2 Delay	inactive	active	inactive	Delay of zone 2 [mSec.]
Over Voltage Time Pn	active	active	active	Over Voltage time (3 points) [mse]
Vin threshold Pn	active	active	active	Over Voltage threshold (3 points) [V]

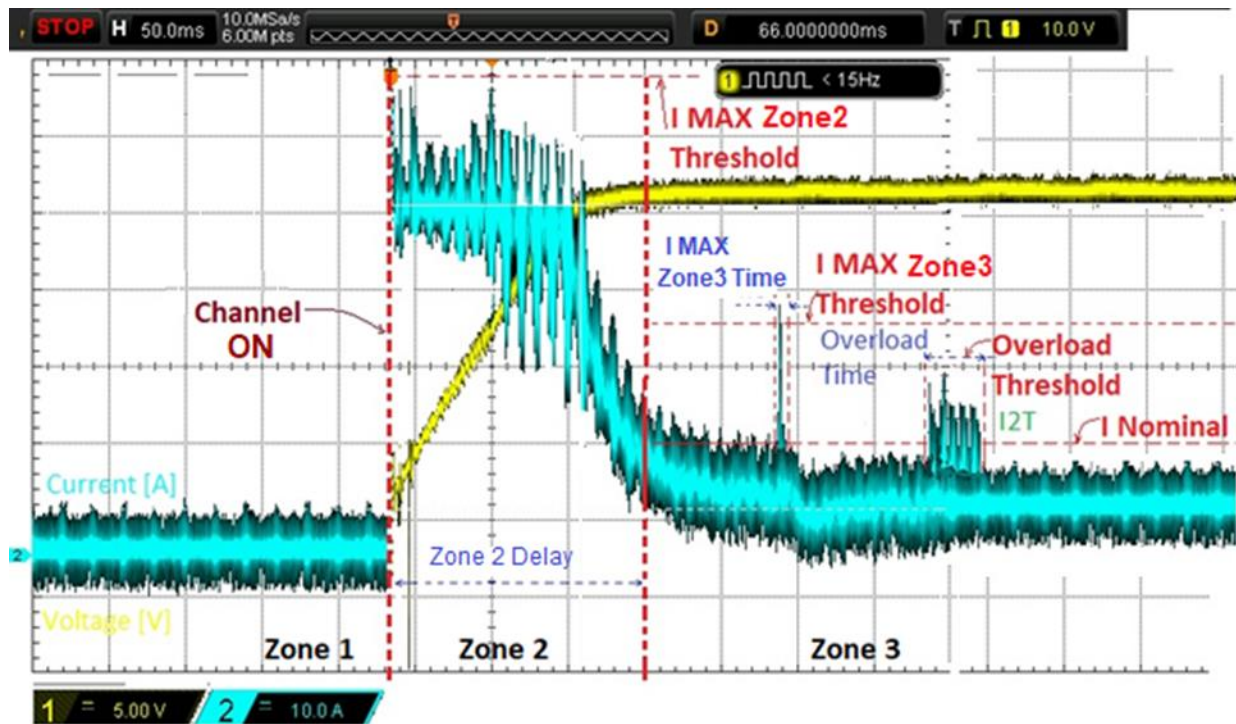


Figure 52 Channel operation parameters

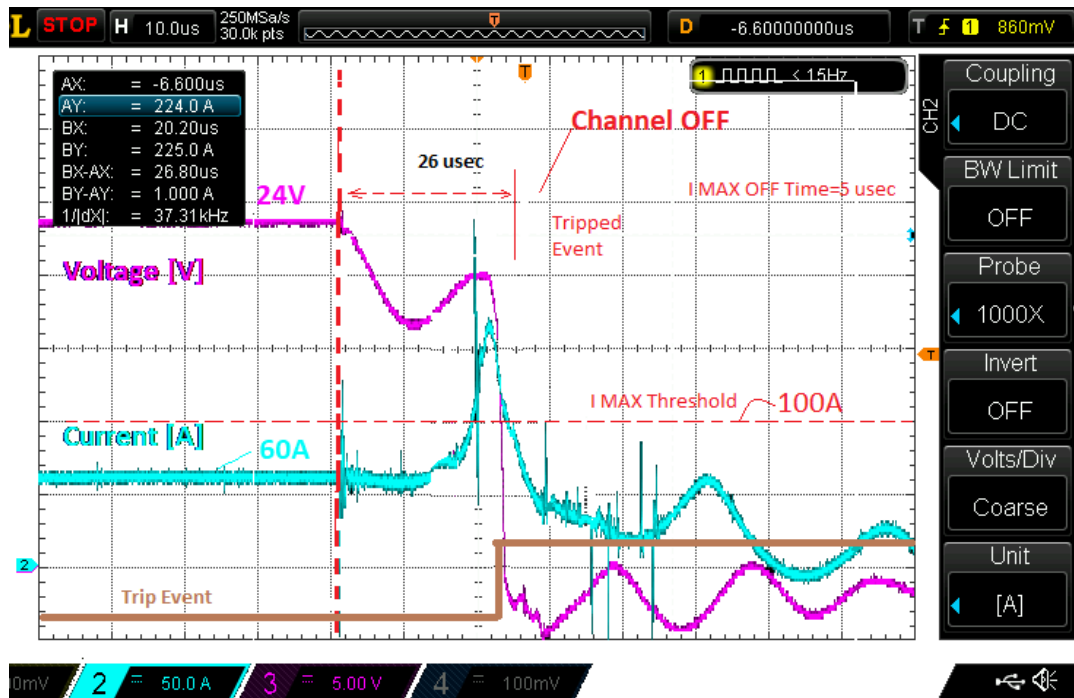


Figure 53 Trip Event Example

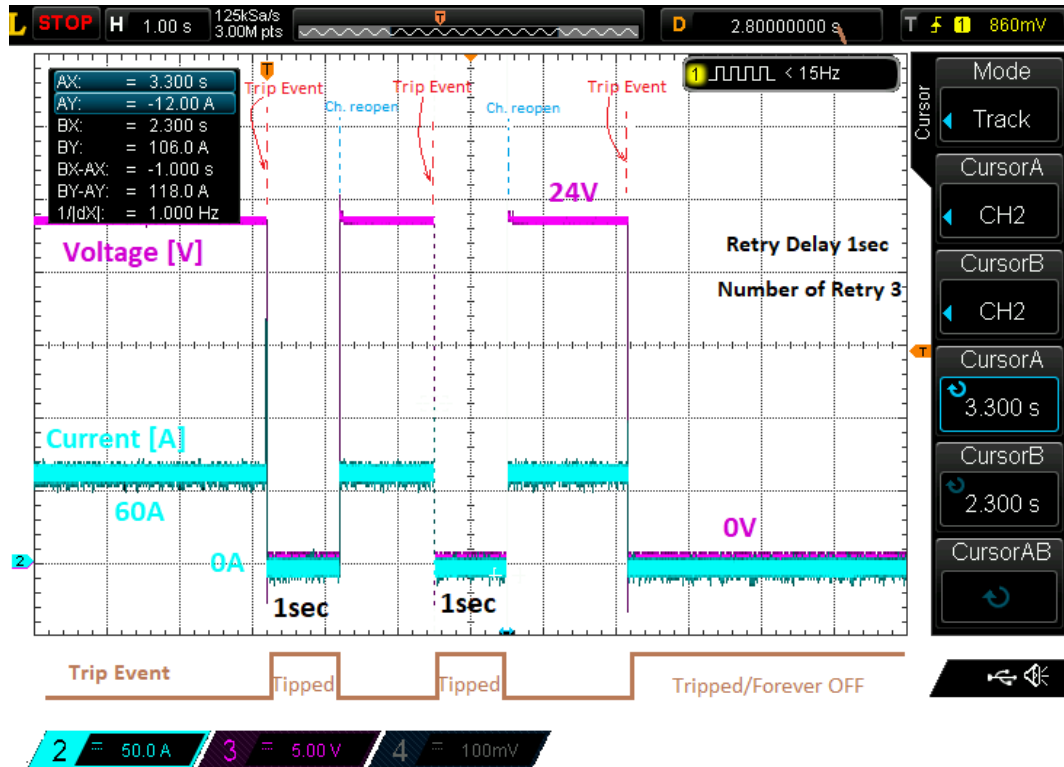
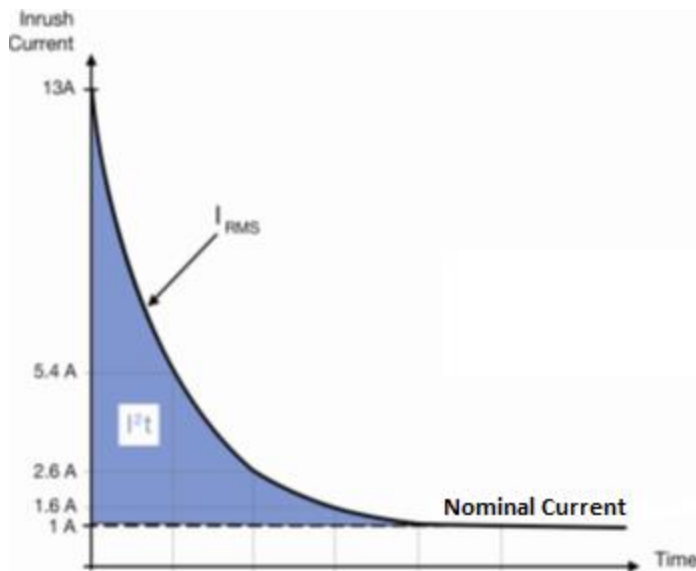


Figure 54 Tripped Retry mechanism

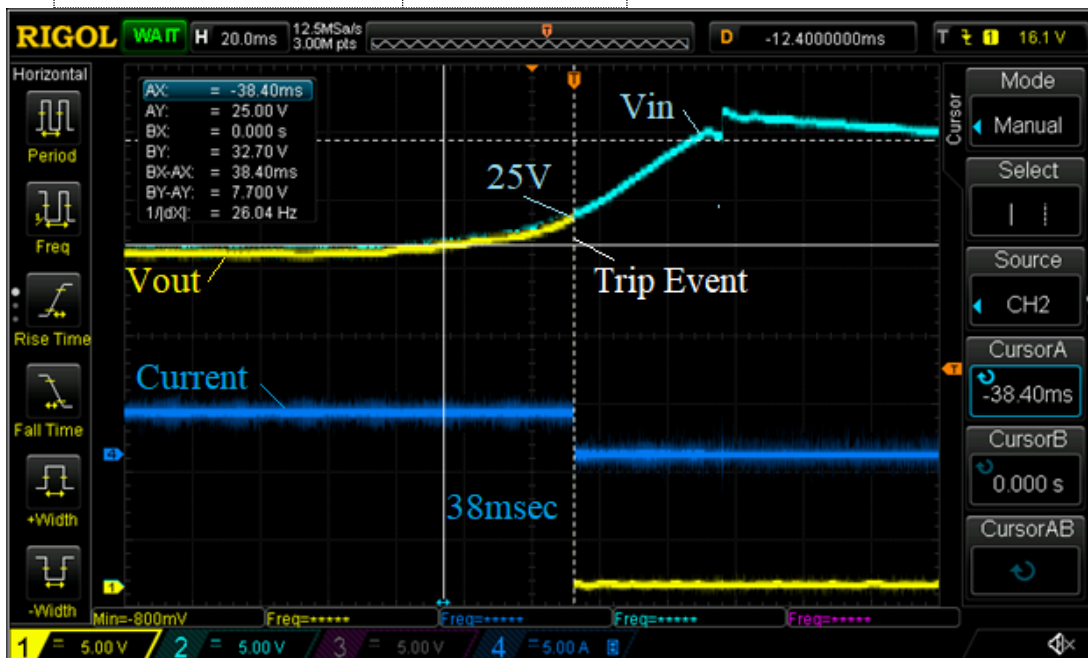
Nominal Melting, I^2t :

I^2t is the amount of heat energy, in terms of current and time, required to melt the channel link.

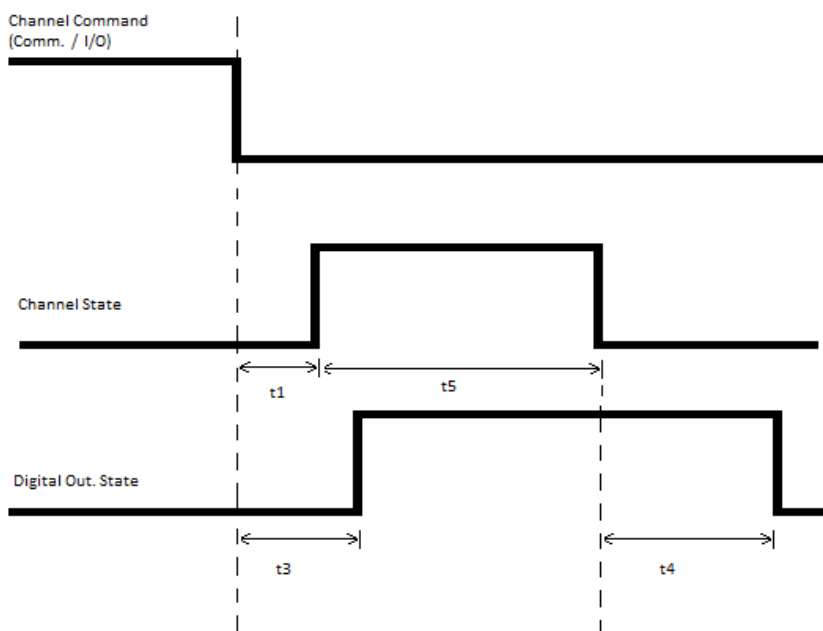
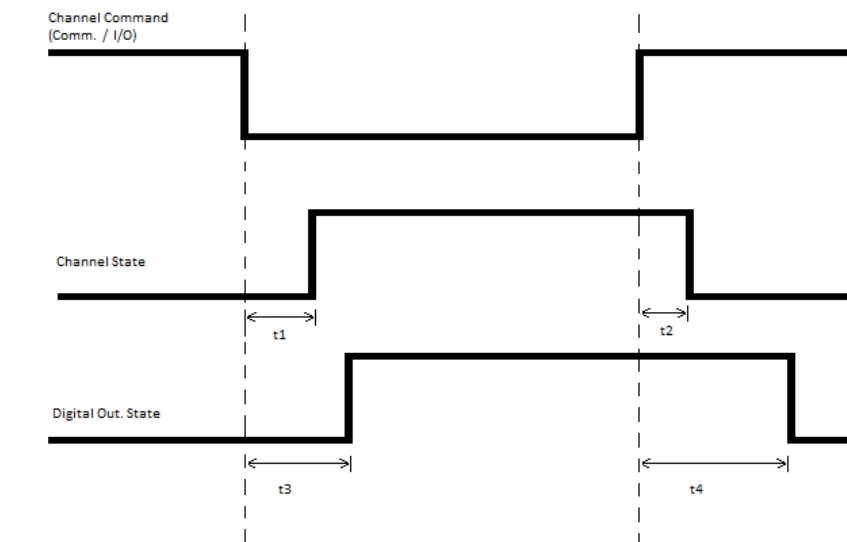


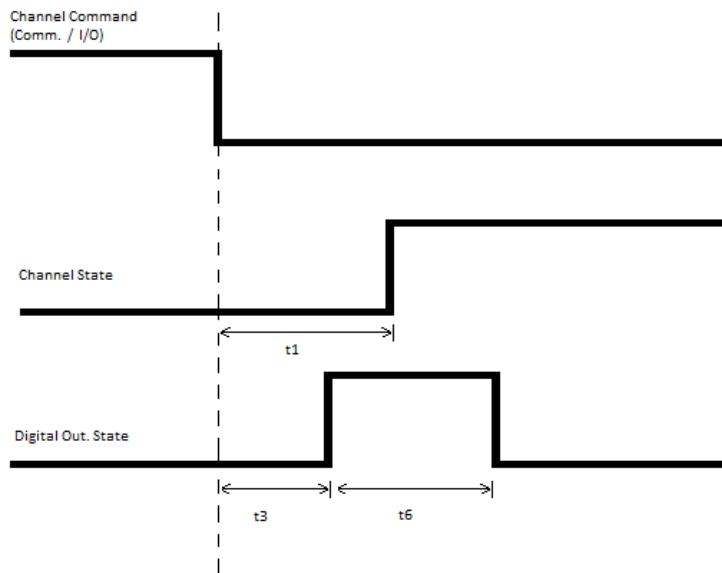
Over-Voltage trip:

Parameter Name	Value
OverVoltage Time	40 mSec.
Vin high threshold	25 V
Vin Error CH Control	ON



Description of the I/O and operation channel's timing:





- t1 – Channel active delay [mSec.].
- t2 – Channel inactive delay [mSec.].
- t3 – Output active delay [mSec.].
- t4 – Output inactive delay [mSec.].
- t5 – Channel inactive timeout [mSec.].
- t6 – Output inactive delay [mSec.].

Digital Input control type:

Type	Note
None	None
Toggle	Up/Down event
Momentary Up	Up event
Momentary Down	Down event

Description of the Control Events:

Type	Command	Note
None		
Digital Inputs	In1	Input 1... Input 12
Communication timeout	LTCM	Lost Communication (in case of approved functionality)
Emergency Stop	EMRG	
Digital Output	OUT1	Output 1/2 O.C.
Parameters error	EPAR	Error while reading parameters from memory.

Temperature error	ETEM	
Voltage error	EVOL	Total Voltage input error Vin1 or Vin2
BlackOut Mode	EBOM	Software protection cancel mode
BIT	EBIT	Bild In Test Error
General Trip status	TANCH	At least one of Channel Tripped
VIN1 Low error	EV1L	Voltage input 1 Low error (VIN1 LOW)
VIN1 High error	EV1H	Voltage input 1 High error (VIN1 HIGH)
VIN2 Low error	EV2L	Voltage input 2 Low error (VIN2 LOW)
VIN2 High error	EV2H	Voltage input 2 High error (VIN2 HIGH)
General VIN1 error	EVI1	Voltage input 1 error (VIN1 LOW or VIN1 HIGH)
General VIN2 error	EVI2	Voltage input 2 error (VIN2 LOW or VIN2 HIGH)
Channel status	SCH1	It is possible to define a specific channel event.
Channel Trip	TCH1	It is possible to define a specific channel trip event.
Channel error	ECH1	It is possible to define a specific channel error or any channel error event.

Control events invers logic:

Type	Command	Note
Digital Inputs	!In1	Input 1... Input 12
Communication timeout	!LTCM	Lost Communication (in case of approved functionality)
Emergency Stop	!EMRG	
Digital Output	!OUT1	Output 1/2 O.C.
Parameters error	!EPAR	Error while reading parameters from memory.
Temperature error	!ETEM	
Voltage error	!EVOL	Total Voltage input error Vin1 or Vin2
BlackOut Mode	!EBOM	Software protection cancel mode
BIT	!EBIT	Bild In Test Error
General Trip status	!TANCH	At least one of Channel Tripped
VIN1 Low error	!EV1L	Voltage input 1 Low error (VIN1 LOW)

VIN1 High error	!EV1H	Voltage input 1 High error (VIN1 HIGH)
VIN2 Low error	!EV2L	Voltage input 2 Low error (VIN2 LOW)
VIN2 High error	!EV2H	Voltage input 2 High error (VIN2 HIGH)
General VIN1 error	!EVI1	Voltage input 1 error (VIN1 LOW or VIN1 HIGH)
General VIN2 error	!EVI2	Voltage input 2 error (VIN2 LOW or VIN2 HIGH)
Channel status	!SCH1	It is possible to define a specific channel event.
Channel Trip	!TCH1	It is possible to define a specific channel trip event.
Channel error	!ECH1	It is possible to define a specific channel error or any channel error event.

Channel control Logic Boolean operations:

[Event 1] (Oper. 1) [Event 2] (Oper. 2) [Event 3] (Oper. 3) [Event 4]

Operation:

Operation Name	Mark
AND	&
OR	
XOR	^

The maximum number of possible events in one expression is 7.

Example of Channel control Logic expression: In1 & !In2 | !EVOL

[Dig.In1] AND [Dig.In2 inverted] OR [Voltage error inverted]

4.4 BIT

A Bild In test (BIT) is performed periodically every 2 seconds.

Bit number	Bit Value	Note	
0	Over temperature error	The one of temperature sensors is above Temperature high threshold parameter (Temp high threshold).	Warning
1	Under temperature error	The one of temperature sensors is under Temperature low threshold parameter (Temp low threshold).	Warning

2	Over Voltage VIN1 error	The input voltage VIN1 is above Voltage high threshold parameter.	Warning
3	Under Voltage VIN1 error	The input voltage VIN1 is under Voltage low threshold parameter.	Warning
4	CAN error	CAN Bus Error.	Communication error
5	Under Voltage VIN2 error	The input voltage VIN2 is under Voltage low threshold parameter.	Warning
6	ADC error	A/D Error.	Critical error
7	Emergency	Emergency active command	Warning
8	EEPROM failure	Internal Memory communication fail.	Critical error
9	Expender failure	Expender communication fail (Internal interface).	Critical error
10	WDG reset	Watchdog reset detection.	Warning
11	Channel error	A fail in one or more channels or Trip in one or more channels.	Trip or Critical error
12	Parameters fail	Configuration parameters fail (checksum of parameters fail).	Warning
13	V protected	Vin protected (Internal input voltage)	Critical error
14	Communication Timeout	Lost communication (based on COM Timeout parameters)	Communication error
15	Over Voltage VIN2 error	The input voltage VIN2 is above Voltage high threshold parameter.	Warning

For parameter planning and explanation see [System configuration parameters guide Appendix](#).

5. APPENDIX B – ERROR DESCRIPTION

5.1 SYSTEM ERROR LIST

Error Code		Error description
Dec.	Hex.	
0	0	General system command format error
1	1	Changing this parameter is possible in Configuration mode only
2	2	Index BIT command error
3	3	All channels must be closed
4	4	S/N system command format error
5	5	Load parameters from memory fail
6	6	Logical parameters fail
7	7	CAN Bus silent mode
8	8	Unit ID address error
9	9	Host ID address error
10	A	I/O Command format error
11	B	I/O Get command format error
12	C	I/O Set command format error
15	F	Index Voltage measure command error
20	14	Configuration Command format error
21	15	Incorrect bootloader command password
22	16	Incorrect reset command password
23	17	Incorrect configuration mode command password
24	18	Incorrect save command password
25	19	Save parameters to memory fail
26	1A	Sleep mode Command format error
27	1B	Incorrect standby command password
28	1C	Incorrect channel reset command password
29	1D	CAN BUS mode Command format error
40	28	Offset Command format error
41	29	V in offset Index command error
42	2A	Current offset Index command error
43	2B	V Out offset Index command error
44	2C	Temp. offset Index command error
45	2D	Voltage dimmer offset Index command error
60	3C	Logger Success
61	3D	Clean Log file Success
62	3E	Time Reset System Success
63	3F	Logger Error

64	40	Logger command Format Error
65	41	End of Logger file
70	46	Logger Sync. Command error
71	47	Black Out Mode command error
72	48	Channel priority scenario command error
150	96	System parameters Command format error
151	97	Invalid R sense variable value
152	98	Invalid Gain variable value
153	99	Invalid Ring cancel delay variable value
154	9A	Invalid V IN limits variable value
155	9B	Invalid Temperature limits variable value
156	9C	Invalid General string size
157	9D	CAN Baud Command format error
158	9E	Serial Comm. Baud Command format error
159	9F	Output Index I/O delay ON command error
160	A0	Output Index I/O delay OFF command error
161	A1	Output Index I/O Timeout OFF command error
162	A2	Invalid Sting control variable value
163	A3	Index I/O Invert command error
164	A4	Invalid I/O type variable value
165	A5	Invalid I/O startup variable value
166	A6	Invalid MAX current LED variable value
167	A7	Invalid Sub-address variable value
168	A8	Invalid Logger write time
169	A9	Invalid Over Voltage Point 1 time
170	AA	Invalid digital Input Invert command
171	AB	Invalid digital Input Functional mode
172	AD	Invalid Input Voltage Threshold Point 1
173	AE	Invalid Input Voltage Threshold Point 2
174	AF	Invalid Input Voltage Threshold Point 3
175	B0	Invalid OverVoltage Point 2 time
176	B1	Invalid OverVoltage Point 3 time
177	B2	Invalid Unit MAX Total Current
178	B3	Invalid Channel Priority number
179	B4	Invalid OverVoltage delay command
180	B5	Invalid Input Voltage Low Hysteresis
181	B6	Invalid Input Voltage High Hysteresis
182	B7	Invalid Production string
183	B8	Invalid Lost Communication timeout

215	D7	CAN Baud Command format error (DLL error)
216	D8	Serial Comm. Baud Command format error (DLL error)
217	D9	Invalid General string size (DLL error)
218	DA	Invalid Channel control command (DLL error)
219	DB	Input Invert command (DLL error)
220	DC	Invalid Input type (DLL error)

5.2 CHANNEL ERROR LIST

Error Code		Error description
Dec.	Hex.	
0	0	General channel command format error
1	1	Invalid channel number
2	2	Invalid channel state
10	A	Invalid CH Current TH variable value
11	B	Invalid Retry Delay variable value
12	C	Invalid CH startup active variable value
13	D	Invalid Channel string size
14	E	Invalid CH Control variable value
15	F	Invalid SW retry Delay variable value
16	10	Invalid Current MAX Time variable value
17	11	Invalid Current MAX TH variable value
18	12	Invalid Nominal current variable value
19	13	Invalid I ² T TH variable value
20	14	Invalid Group variable value
21	15	Invalid Current MAX ON TH variable value
22	16	Invalid CH Input variable value
23	17	Invalid Current MAX ON Time variable value
24	18	Invalid Log. File Current TH
25	19	Invalid CH_Tech_Data
26	1A	Invalid channel Reset Delay
27	1B	Invalid channel Over-Voltage number of retries
28	1C	Invalid channel Priority S1
29	1D	Invalid channel Priority S2
30	1E	Invalid channel Priority S3
190	BE	Invalid PWM Frequency variable value

191	BF	Invalid PWM Duty Cycle variable value
192	C0	Invalid Power protection variable value
193	C1	Invalid PWM control variable value
200	C8	The threshold current must be greater than the maximum current
201	C9	The Overload Time must be less than the I Max Time
202	CA	The Current Max ON must be less than the I Max
203	CB	The Current Max time must be less than the I Max ON
204	CC	The Channel ON Delay Time must be less than the I Max ON Time
205	CD	VIN1 MIN TH must be less than VIN1 MAX TH
206	CE	VIN2 MIN TH must be less than VIN2 MAX TH
215	D7	Invalid Power protection variable value (DLL error)
216	D8	Invalid Channel string size (DLL error)
217	D9	Invalid Group variable value (DLL error)
218	DA	Invalid CH Input variable value (DLL error)
219	DB	Invalid Power protection variable value (DLL error)
250	FA	Warning, Over-Current point is above the recommended manufacturer settings.
251	FB	Warning, Current MAX Zone 3 point is above the recommended manufacturer settings.
252	FC	Warning, Current MAX Zone 2 point is above the recommended manufacturer settings.
253	FD	Channel Group configuration warning

6. APPENDIX C – TROUBLESHOOTS AND ERRORS

6.1 PILOT LED ERROR BLINKING TABLE:

Number of blinking	Error Name	
1	Channel Trip	
2	Channel error	
3	Parameters error	
4	Temperature error	
5	Voltage error	
6	BIT (the rest of the BIT)	

6.2 TROUBLESHOOTS:

Failing Name	Corrective action 1	Corrective action 2	
No communication, Pilot LED OFF.	Check power supply and setup.		
No communication, Pilot LED ON/Blinking green or red.	Check communication setup /CAN adapter. Reconnect USB adapter cable and press Refresh.	Check Device CAN BUS ID address.	
No communication, Pilot LED Blinking green / orange.	Bootloader mode		
Channel Trip	A trip event occurred, A channel functions according to defined logic.	Message trip reset after “Ch. Status reset delay” time.	
Channel FOREVER OFF	Load unplugged due to permanent trip.	Check that there is no short and do a channel reset.	
Channel error	Internal channel error.	do a device reset.	
BIT Fail, Voltage error	Check Voltage Input.	Check Voltage threshold parameter	
BIT Fail, Temperature error	Check Temperature.	Check Temperature threshold parameter	

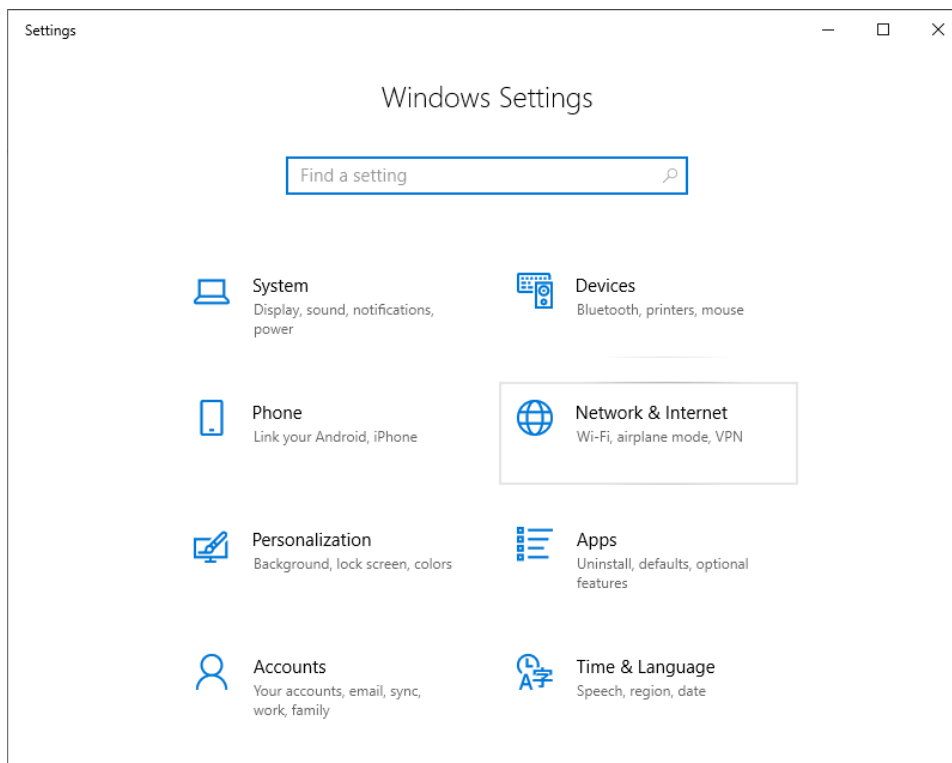
BIT Fail, Parameters error	Burn update parameters.		

7. APPENDIX D – ETHERNET CONFIGURATION

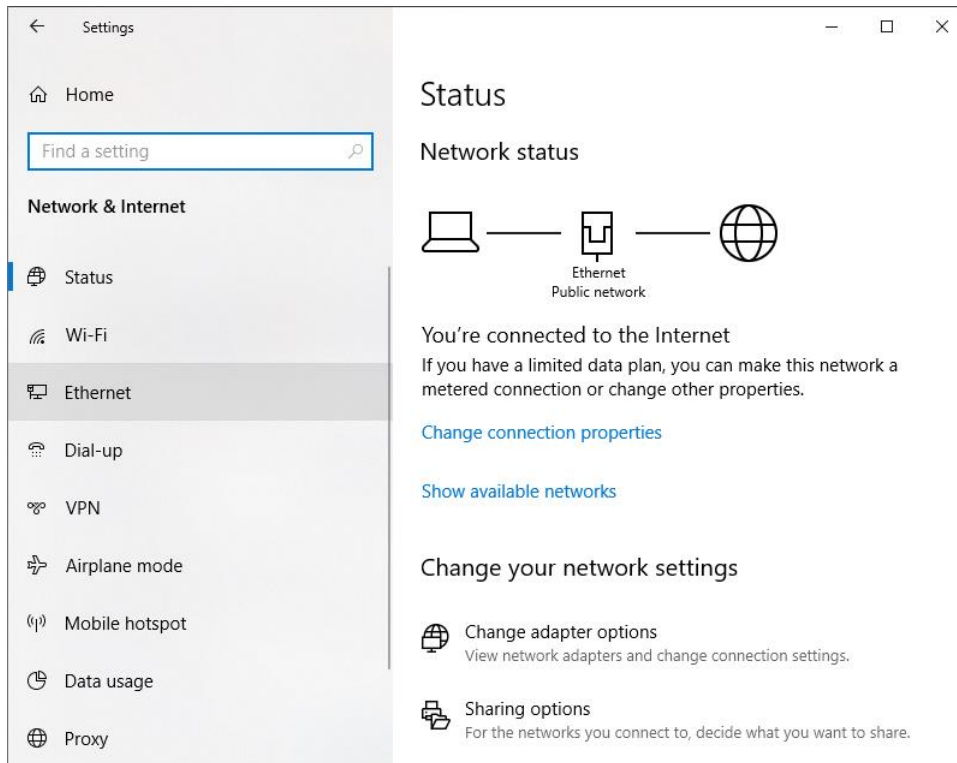
PC Ethernet configuration (Set host IP address)

Start>> Settings

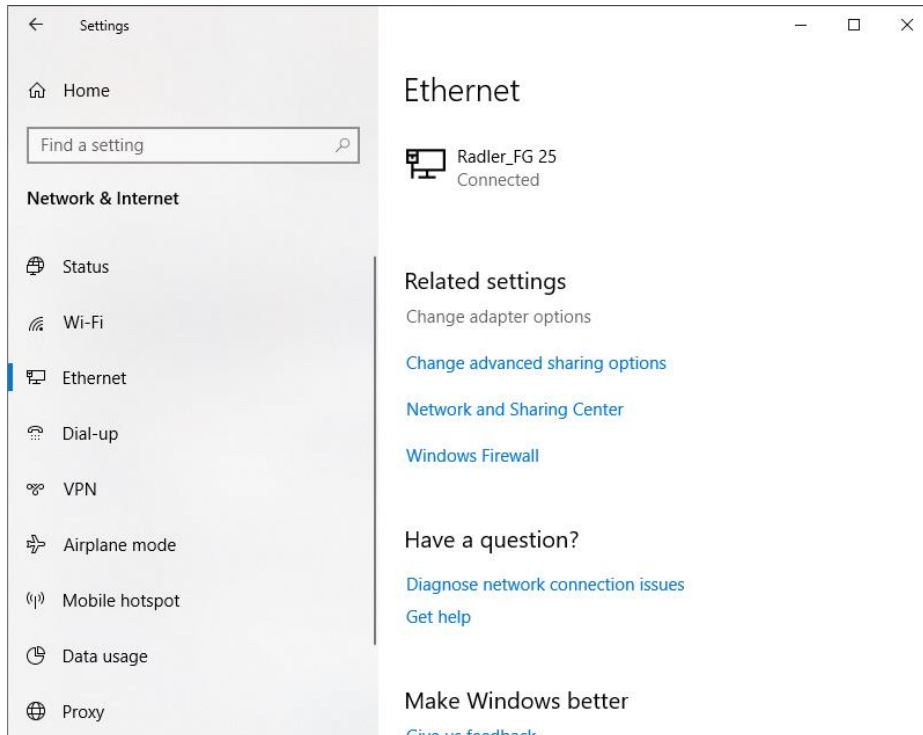
Press Network& Internet



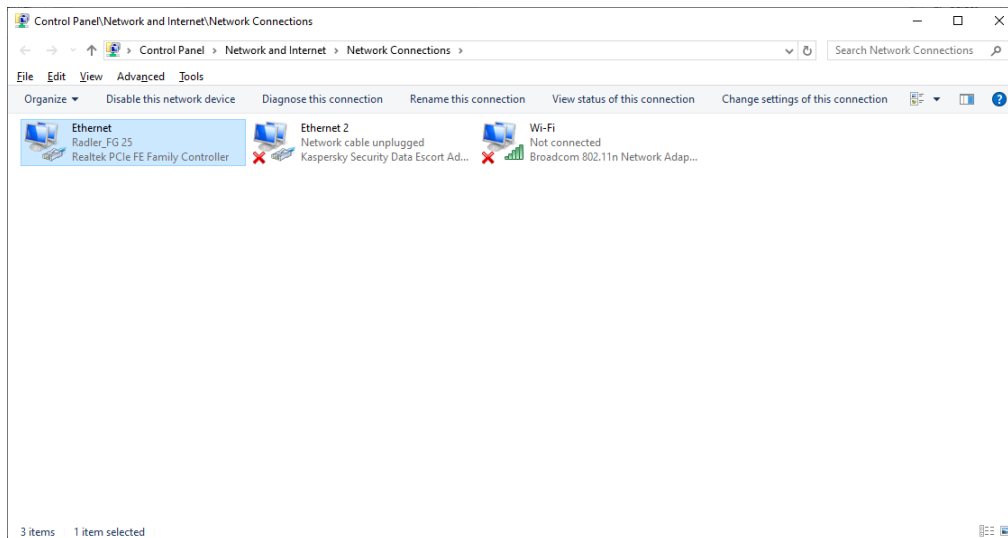
Press Ethernet



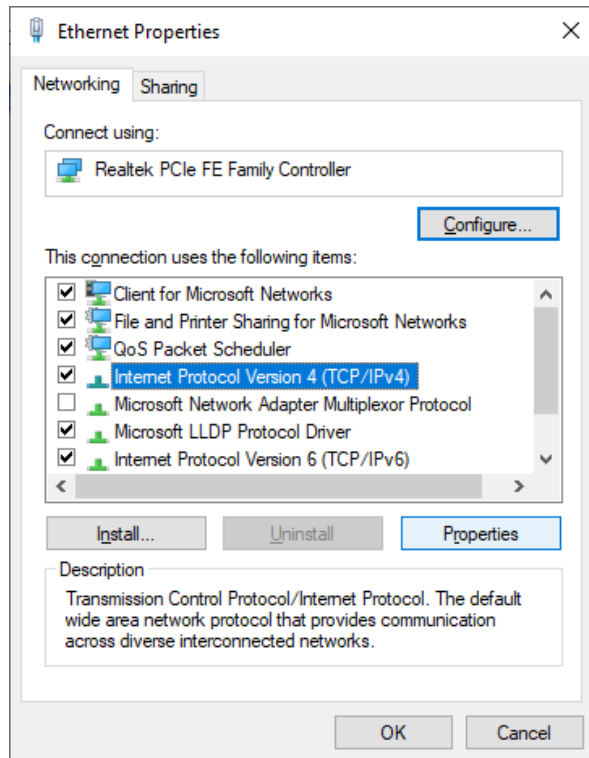
Press in Related setting on Change adapter options.



Right click on Ethernet icon and select properties.



Select Internet Protocol Version 4 (TCP/IPv4) and press Properties.



Select Use the following IP address and insert Host IP address (for example: 192:169:1:3) and subnet mask 255:255:255:0. Press OK.

Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: 192 . 168 . 1 . 3

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

☐ Validate settings upon exit

Advanced...

OK Cancel

8. APPENDIX E – SYSTEM CONFIGURATION PARAMETERS GUIDE

8.1 DEFINITION OF NOMINAL CURRENT

Nominal current is the current you would expect from normal use of a channel.

Set a value for each channel individually according to the load it is connected.

Parameters Name	Parameters section	Parameters Units
Nominal current value	Channel parameters	Amp

8.2 DEFINITION OF OVERCURRENT

An Overcurrent mechanism is designed to identify and protect an exceptional current consumption event. There are two mechanisms that can function in parallel: Overload and I^2t .

Overload:

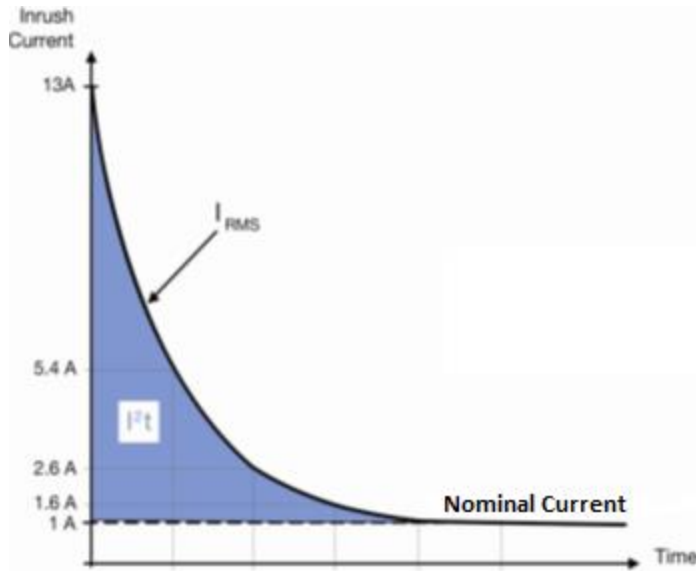
Two parameters must be set: Overcurrent threshold and pulse width of Overcurrent.

Parameters Name	Parameters section	Parameters Units
Overload Threshold	Channel parameters	% (Relative to the Nominal current)
Overload Time	Channel parameters	msec

For disable Overload mechanism set “Overload Threshold” to 0.

Nominal Melting, I^2t :

I^2T is the amount of heat energy, in terms of current and time, required to melt the channel link.



Parameters Name	Parameters section	Parameters Units
I^2t threshold	Channel parameters	Amp ² *s

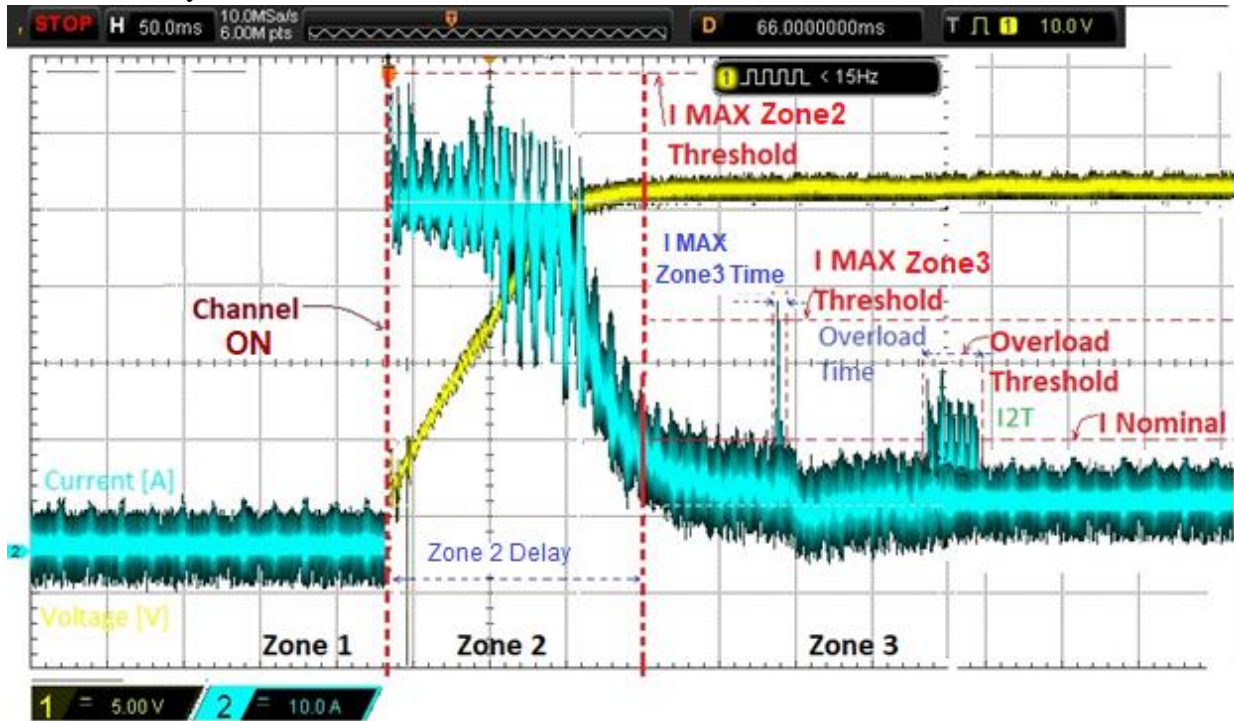
For disable I^2t mechanism set “ I^2t threshold” to 0.

8.3 DEFINITION OF MAXCURRENT

MAXCurrent protection is designed for short-circuit detection and protection with very fast response time.

Impotent: The MAXCurrent parameters must be correctly configured on the one hand to allow proper work of the load and on the other to identify the event as soon as possible to protect the load and the Power Rider unit.

Three work zones must be defined :Zone 1 -Load is disconnect, Zone 2- Inrush current zone, Zone 3- Steady state lode active zone.



Zone 2 time is defined from the channel ON command to entering a steady state working zone.

Parameters Name	Parameters section	Parameters Units
I MAX Zone2 Time	Channel parameters	usec

Two parameters must be set for Zone 2 : I MAX Zone2 threshold and pulse width of Overcurrent.

Parameters Name	Parameters section	Parameters Units
I MAX Zone2 Threshold	Channel parameters	Amp
I MAX Zone2 Time	Channel parameters	usec

Two parameters must be set for Zone 3 : I MAX Zone3 threshold and pulse width of Overcurrent.

Parameters Name	Parameters section	Parameters Units
I MAX Zone3 Threshold	Channel parameters	Amp
I MAX Zone3 Time	Channel parameters	usec

The I MAX Zone Threshold must be higher than the Overload Threshold current.

8.4 DEFINITION OF RECOVERY PARAMETERS

There is a recovery mechanism after a trip event.

A number of recoveries attempts and stays between attempts must be defined for several groups of events.

Software Trip Recovery group:

Parameters Name	Parameters section	Parameters Units
SW Tripped Retry delay	Channel parameters	msec
SW Tripped Number of retry	Channel parameters	-

To cancel recoveries mechanism, set “SW Tripped Number of retry “parameter to 1.

To set up endless recovery attempts must be set “SW Tripped Number of retry “parameter to 255.

SW Tripped recoveries mechanism is consolidating several events: I MAX 2 trip, I MAX 3 trip, Overcurrent and I^2t .

Hard Short Recovery mechanism:

Hard Short- A short-trip hardware mechanism.

Parameters Name	Parameters section	Parameters Units
Hard Short Retry delay	Channel parameters	msec
Hard Short Number of retry	Channel parameters	-

To cancel recoveries mechanism, set “Hard Short Number of retry “parameter to 1.

To set up endless recovery attempts must be set “Hard Short Number of retry “parameter to 255.

Over Voltage Recovery mechanism:

OV1 Tripped – OverVoltage trip based on Voltage input 1 source

OV2 Tripped – OverVoltage trip based on Voltage input 2 source (only for multichannel unit)

Parameters Name	Parameters section	Parameters Units
OV1 Tripped Retry delay	System parameters	msec

OV2 Tripped Retry delay	System parameters	msec
OV Tripped Number of retry	Channel parameters	-

To cancel recoveries mechanism, set “OV1 Tripped Number of retry “parameter to 1.

To set up endless recovery attempts must be set “OV1 Tripped Number of retry “parameter to 255.

Channel tripped event status reset

Timeout for clean channel tripped status counters and channel status (only if channel in active status).

Parameters Name	Parameters section	Parameters Units
Ch. Status reset delay	Channel parameters	msec

8.5 DEFINITION OF PROTECTION TYPE PARAMETRS

Enable/Disable load protection while detecting a Voltage Low/High error occurred (power source VIN1 or VIN2 is set automatically by channel number).

Parameters Name	Parameters section	Parameters Units
Vin High Error	Channel parameters	ON/OFF
Vin High Error	Channel parameters	ON/OFF

Enable/Disable load protection while detecting a Temperature error occurred.

Parameters Name	Parameters section	Parameters Units
Temperature	Channel parameters	ON/OFF

Enable/Disable load protection while detecting an any BIT error occurred.

Parameters Name	Parameters section	Parameters Units
BIT Error	Channel parameters	ON/OFF

“OFF” - The appropriate BIT alert is triggered while an error has occurred.

“ON” - The appropriate BIT alert is triggered while an error has occurred, and power channel is disactivate.

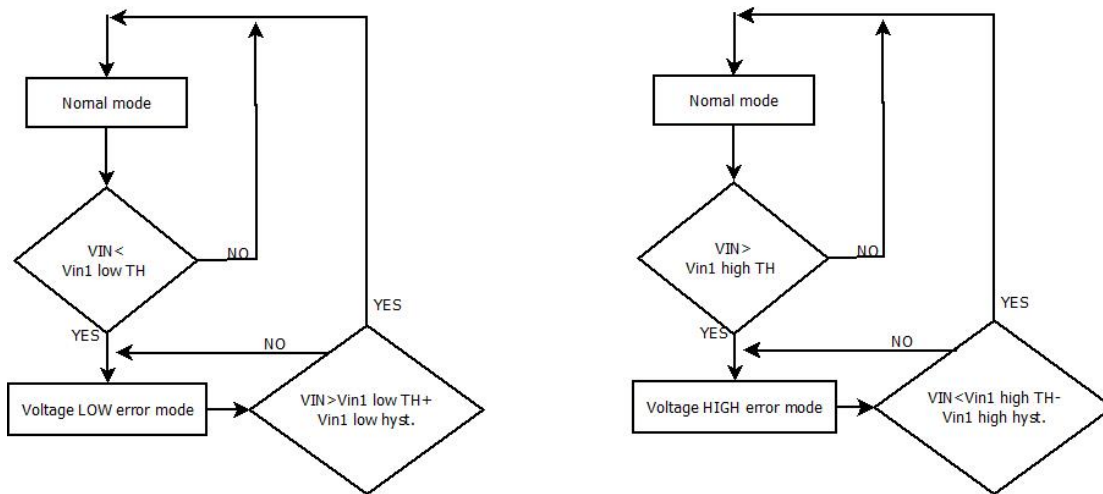
8.6 DEFINITION OF VOLTAGE THRESHOLD PARAMETERS

Set up a proper Voltage system working range

Vin1 low threshold - Proper working voltage 1 lower threshold.

3 upper limits of normal working voltage must be set. Each point contains two definitions:
Voltage threshold and pulse width of Over Voltage.

Input Voltage control state description:



Point N:

Vin1 high threshold PN- Proper working voltage 1 high threshold point N.

OverVoltage1 Time PN- Proper working voltage 1 high threshold point N.

Over Voltage trip based on Voltage input 1 source.

Parameters Name	Parameters section	Parameters Units
Vin1 low threshold	System parameters	Volt
Vin1 high threshold P1	System parameters	Volt
Vin1 high threshold P2	System parameters	Volt
Vin1 high threshold P3	System parameters	Volt
OverVoltage1 Time P1	System parameters	Volt
OverVoltage1 Time P2	System parameters	Volt
OverVoltage1 Time P3	System parameters	Volt
Vin1 low hysteresis	System parameters	Volt
Vin1 high hysteresis	System parameters	Volt

Only for Power Rider multichannel units:

Over Voltage trip based on Voltage input 2 source.

Parameters Name	Parameters section	Parameters Units
Vin2 low threshold	System parameters	Volt
Vin2 high threshold P1	System parameters	Volt
Vin2 high threshold P2	System parameters	Volt
Vin2 high threshold P3	System parameters	Volt
OverVoltage2 Time P1	System parameters	Volt
OverVoltage2 Time P2	System parameters	Volt
OverVoltage2 Time P3	System parameters	Volt
Vin2 low hysteresis	System parameters	Volt
Vin2 high hysteresis	System parameters	Volt

8.7 DEFINITION OF TEMPERATURE TRESHOLD PARAMETE S

Set up a proper Temperature working range

Parameters Name	Parameters section	Parameters Units
Temp high threshold	System parameters	C
Temp low threshold	System parameters	C

Temperature hysteresis is 2 C (constant value).

*Temperature measurement is based on sensors located within the unit in the power zone.

8.8 DEFINITION OF DIGITAL INPUTS PARAMETRS

There are 4 types of digital inputs:

“None” – Inactive digital input.

“Toggle”- Create an event on any change of input status (ON/OFF).

“Moment.Up”- Create an event in UP condition only (ON).

“Moment.Down”- Create an event in Down condition only (OFF).

Parameters Name	Parameters section	Parameters Units
Dig. Input 1 switch type	System parameters	-

Digital input logic inverse:

Parameters Name	Parameters section	Parameters Units
Dig. Input 1 logic. Inverse	System parameters	None/Invers

Function of Digital Input:

GPIO- Standard digital input working mode

Sleep mode- Energy saving mode

Standby mode- Energy saving mode

CAN Silent mode- Enable/Disable CANBUS Silent mode.

Emergency Stop- Emergency Stop input

BlackOut mode- Enable/Disable Black Out mode (Emergency mode with no load protection)

SW Reset – software reset

Parameters Name	Parameters section	Parameters Units
Dig. Input 1 funct. Mode	System parameters	-

8.9 DEFINITION OF DIGITAL OUTPUTS PARAMETRS

State of digital output on startup:

Parameters Name	Parameters section	Parameters Units
Dig. Out 1 startup state	System parameters	-

Digital Output Delay before active (ON):

Digital Output time delay between an event and a Digital Output state change.

Parameters Name	Parameters section	Parameters Units
Dig. Out 1 Delay before Active	System parameters	msec

Digital Output Delay before disactive (OFF):

Digital Output time delay between an event and a Digital Output state change.

Parameters Name	Parameters section	Parameters Units
Dig. Out 1 Delay before Deactivating	System parameters	msec

Digital Output Timeout:

Digital Output Timeout between digital output command to Self-closing of the digital output.

Parameters Name	Parameters section	Parameters Units
Dig. Out 1 OFF Timeout	System parameters	msec

The digital output logic expression:

Digital Output behavior should be defined.

Parameters Name	Parameters section	Parameters Units
Dig. Out 1 logic control	System parameters	Logical expression

See [definition of “Logic CH Cnt” parameter](#).

Digital output logic inverse:

Parameters Name	Parameters section	Parameters Units
Dig. Out 1 logic inverse	System parameters	None/Invers

- None
- Invers
- Fast rate blinking (0.5 sec rate).
- Fast rate blinking & Invers.
- Medium rate blinking (1 sec rate).
- Medium rate blinking & Invers.
- Slow rate blinking (2 sec rate).
- Slow rate blinking & Invers.

8.10 DEFINITION OF LOGIC CONTROL CHANNEL PARAMETRS

The channel logic must be defined as dependent on the following variables:

Digital Input- “In1” or “In2” ... (*A digital input must be defined before use, see Definition of Digital inputs Parameters section)

Power Channel status (ON/OFF) – “SCH1” or “SCH2”...

Power Channel trip status – “TCH1” or “TCH2” ...

Power Channel total trip status – “TANCH” (TCH1 or TCH2 or TCH3 ...)

Digital Output – “Out1” or “Out2” ...

Voltage General Error – “EVOL” (VIN1 or VIN2)

Voltage VIN1/VIN2 Low Error – “EV1L” or “EV2L”

Voltage VIN1/VIN2 High Error – “EV1H” or “EV2H”

Voltage VIN1/VIN2 General Error – “EVI1” or “EVI2”

Temperature Error – “ETEM”

BIT Error – “EBIT”

BlackOut Mode - “EBOM”

Communication Time-out – “LTCM” (Lost communication)

Logic operation: AND-” &”, OR- “|”, NOT-“!”

Parameters Name	Parameters section	Parameters Units
Logic CH Cnt	Channel parameters	Logical expression

Example of logical expression: In1 & !In3 | SCH2

See [definition of “Logic CH Cnt” parameter](#).

Power Channel Name:

Parameters Name	Parameters section	Parameters Units
Channel General string	Channel parameters	String

State of Power channel on startup:

Parameters Name	Parameters section	Parameters Units
Active on startup	Channel parameters	ON/OFF

Control of the Power Channel through communication:

Parameters Name	Parameters section	Parameters Units
Ch. Communication control	Channel parameters	Enable/Disable

Power Channel Delay before active (ON):

Power Channel time delay between an event and a Channel state change.

Parameters Name	Parameters section	Parameters Units
Ch. Delay before Opening	Channel parameters	msec

Power Channel Delay before disactive (OFF):

Power Channel time delay between an event and a Channel state change.

Parameters Name	Parameters section	Parameters Units
Ch. Delay before Closing	Channel parameters	msec

Power Channel Timeout:

Power Channel Timeout between digital output command to Self-closing of the Channel.

Parameters Name	Parameters section	Parameters Units
Ch. OFF Timeout	Channel parameters	msec

For more information see [Channel Parameter Table](#)

8.11 GENERAL SYSTEM PARAMETRS

System Name:

Parameters Name	Parameters section	Parameters Units
General string	System parameters	String

Communication Parameters:

Unit ID address – Power Rider unit communication address

Destination ID address - Host communication address

CAN_BAUD – CANBUS baud rate

Parameters Name	Parameters section	Parameters Units
Unit ID address	System parameters	-
Destination address	System parameters	-
CAN_BAUD	System parameters	kbps

Status message:

Status messages are sent independently and periodically.

Parameters Name	Parameters section	Parameters Units
J1939 Status message (Fast)	System parameters	Enable/Disable

J1939 Status message (Medium)	System parameters	Enable/Disable
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Communication Timeout:

Communication TimeOut configuration.

Parameters Name	Parameters section	Parameters Units
Communication Timeout	System parameters	See table below

- Disable
- 50 msec
- 100 ms
- 250 ms
- 500 ms
- 1 sec
- 1.5 sec
- 2 sec
- 5 sec
- 10 sec
- 30 sec
- 1 min
- 5 min
- 10 min
- 20 min

For more information see [System Parameter Table](#)

8.12 LOGGER PARAMETERS

There is an internal memory component that stores the data. A common memory space for all events in memory and information is destroyed as soon as the memory reaches its end. Therefore, the more events the information will save the least time.

Log. I TH event - Defines an unusual event current threshold for a Log. File write event.

Log. write I/V data – Write Current and Voltage to Log. File. (values are updated only in case there is a change/ for testing only).

Log. write control cmd – Write Power Channel comment to Log. File.

Log. Update data time - Log. File write update time.

Parameters Name	Parameters section	Parameters Units
Log. I TH event	System parameters	Amp
Log. write I/V data	System parameters	Enable/Disable
Log. write control cmd	System parameters	Enable/Disable
Log. Update data time	Channel parameters	msec

8.13 MULTICHANNEL UNITS PARAMETRS

*For Multichannel unit only.

Power Channel Group Definition:

Define channel group control to connect channels simultaneously. Two channels must be connected in one group.

One channel must be set a Master of the group (one only) and the second a Slave.

The group will be controlled via a Master only.

Parameters Name	Parameters section	Parameters Units
Group channel control	Channel parameters	None/Master/Slave

Total unit current limitation mechanism:

Three different modes must be defined that define a system's working scenario.

Each work scenario must have a maximum total system current consumption ("MAX Total current Sn") and priority for each channel ("MAX Total current Sn").

In case there is an excess of the maximum current set for a particular scenario, the system automatically disconnects the channels according to their scenario priority.

1-High Channel Priority, 12-Low Channel Priority.

Scenario mode- default /startup scenario mode number.

Parameters Name	Parameters section	Parameters Unit/Range
CH Priority S1	Channel parameters	1..12
CH Priority S2	Channel parameters	1..12
CH Priority S3	Channel parameters	1..12
MAX Total current S1	System parameters	Amp
MAX Total current S2	System parameters	Amp
MAX Total current S3	System parameters	Amp

Scenario mode	System parameters	1..3
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9. APPENDIX F –ABREVIATURE LIST

- Power Rider - The Power Rider is a single channel/multichannel Smart Circuit Breaker.
- PR25A - Power Rider 25A single channel Smart Circuit Breaker.
- PR150A - Power Rider 150A single channel Smart Circuit Breaker.
- PRMC - Power Rider 12CH/16CH multichannel Smart Circuit Breaker.
- MC - Multichannel.
- GUI - Graphical User Interface.

<https://www.redler.co.il/>

Technical support: andrei@redler.co.il



Redler Technologies Ltd.

5 Hagavish st.
Kfar Saba 4442211
Israel
contact@redler.co.il
Tel: +972-9-7672980
Fax: +972-9-8652381

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