



Guida Tecnica:
Interfaccia di Comunicazione
USB2DxR

Technical Guide:
USB2DxR
Communication Interface



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INDICE DELLA REVISIONE		
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REVISION HISTORY		
Revision	Date	Description
Rev. 00	02/2015	Initial Release

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 This revision supersedes and replaces all previous versions.
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1. Contents of the Interface Kit

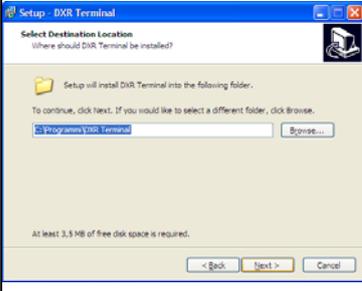
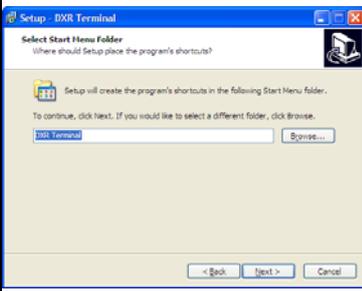
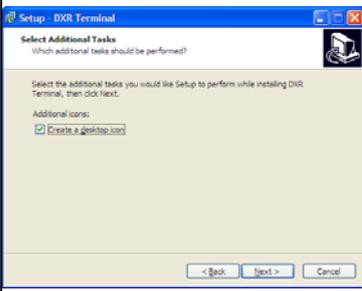
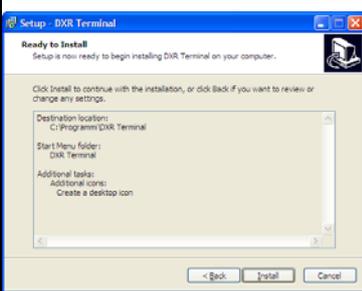
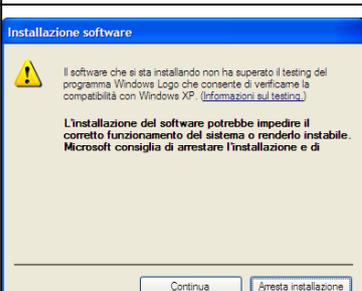
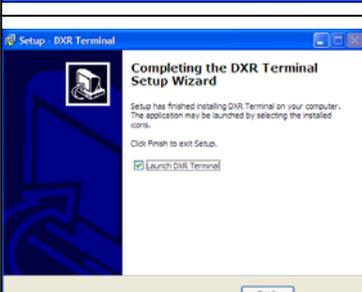
Item	Description	Code
1	USB2DxR communication interface	4505005608
2	USB Cable, male-male, A type	8503012946
3	USB2DxR connecting cable	8503012945
4	Technical documents on CD + communication SW	9513019095

2. Description of the parts

<p>2.1 USB2DxR: USB converter for digital regulators</p> <p>The USB2DxR communication interface is an insulated device that connects and converts signals coming from the communication port (COM) of DSR or DER1 digital regulators to the USB port of a programming and control unit (e.g. a PC, the characteristics of which are given in chapter 7). The interface does not need an external power supply because it draws the requested power from the USB port and the DSR or DER1 regulator.</p>	
<p>2.2 USB cable, male-male, A type</p> <p>The USB cable is 1.5 metres long and connects the USB2DxR communication interface to the USB port of a programming and control unit (e.g. a PC).</p>	
<p>2.3 USB2DxR connecting cable</p> <p>The “USB2DxR connecting cable” is 1 metre long and connects the DSR or DER1 regulator to the communication interface.</p> <p>To prevent damaging the cable when disconnecting, release the connectors by pressing the locking device before removing them from their respective regulator and interface connectors.</p>	
<p>2.4 CD Technical documents + communication software</p> <p>Read this manual carefully before carrying out any operation.</p> <p>Installing the communication software also automatically installs the USB2DxR communication interface drivers.</p> <p>The DxR Terminal software is available in the Extra section of the CD.</p>	

	<p>Do not insert or connect the USB2DxR communication interface until the relative drivers have been installed.</p> <p>The USB2DxR communication interface must always be connected and disconnected with the regulator switched off.</p>
---	---

3. Installation

Step	Note				
1	Launch the “DXR Terminal Setup.exe” installation program and follow the instructions given below				
Step	Window	Note	Step	Window	Note
2		The first window opens Select [NEXT]	3		Select the program installation folder Select [NEXT]
4		Select the position of the program shortcuts Select [NEXT]	5		Create an icon on the desktop Select [NEXT]
6		Check the selections made Select [Install]	7		Drivers Select [Extract]
8		Driver installation begins Select [Next]	9		Select [Continue]
10		Driver installation complete Select [Finish] DxR Terminal installation begins	11		DxR Terminal installation complete Remove the “Launch DxR Terminal” flag and Select [Finish]
Step	Note				
12	Connect the USB2DxR device to a free USB port				

Step	Window	Note	Step	Window	Note
13		Connection found Select "Not yet" and Select [Next]	14		Select "Install the software automatically" and Select [Next]
15		Select [Continue]	16		First part of installation complete Select [Finish]
17		Repeat the procedure Select "Not yet" and Select [Next]	18		Select "Install the software automatically" and Select [Next]
19		Select [Continue]	20		Installation complete Hardware recognised Select [Finish]

The USB2DxR device is now ready to operate, and installation can be verified.

Step	Window	Note	Step	Window	Note
21		Start Settings Control panel System Select "Hardware"	22		Select "Device Manager" then "Ports (COM and LPT)" There must be a device present at "USB Serial port"

The C:\Programmi\DxRTerminal folder was created, which holds the executable code and the corresponding link on the desktop.

4. Description of the DxR Terminal software

The DxR Terminal program can be started directly from the respective icon on the desktop of Windows. When opened, the user interface appears as shown in fig. 1.

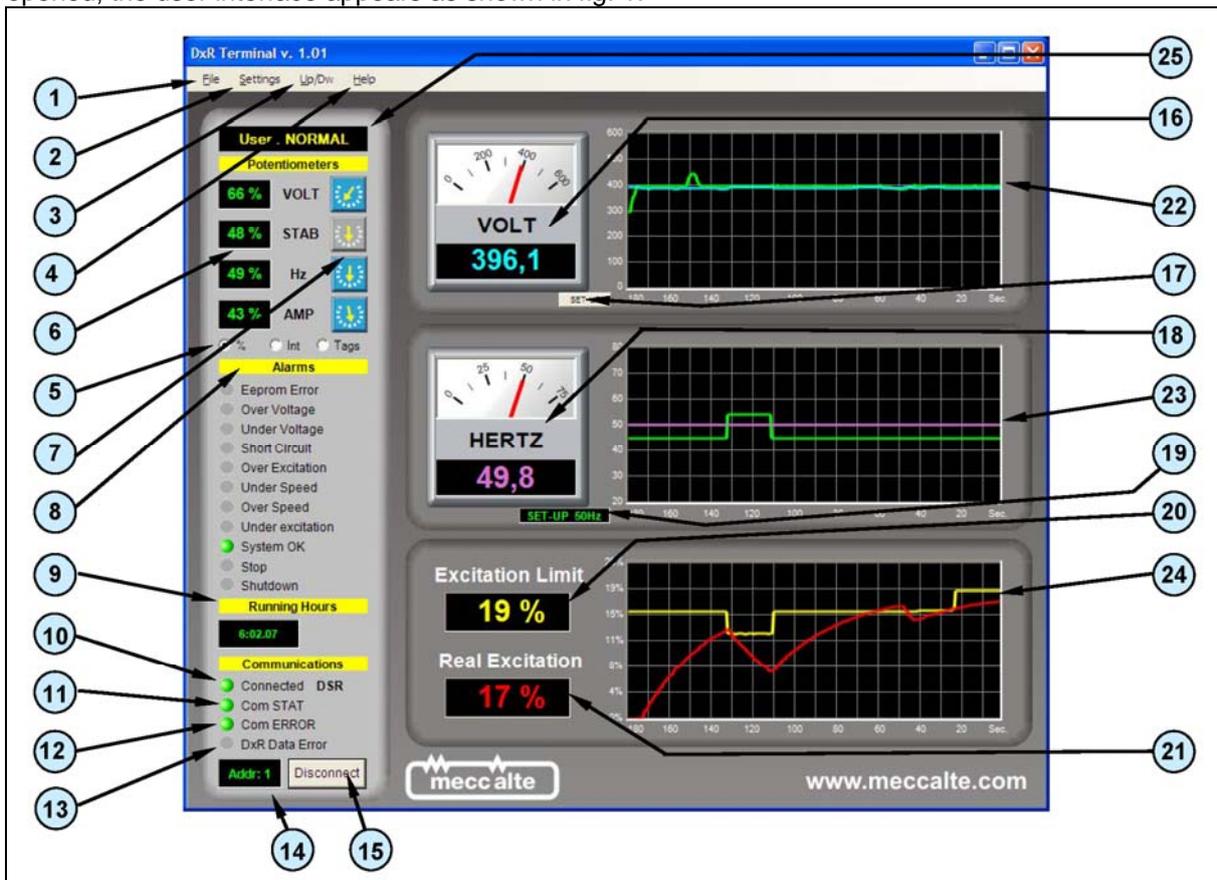


Fig. 1

The COM port (emulated) to which the USB2DxR communication interface was connected is assigned automatically when connected to the USB port.

If there is only one USB2DxR communication interface, the COM port (emulated) to which it is connected is automatically defaulted (121). If several interfaces are connected, the device used to exchange data can be selected from the Com Port menu (2e).

Establish the connection clicking on "Connect" (15) button.

Connection is confirmed when the **Connected** indicator (10) changes from yellow to green.

If communication occurs without any errors, the **Com STAT** indicator (11) changes from red to green.

IMPORTANT: Communication can only take place if all three indicators, **Connected** (10), **Com STAT** (11) and **Com ERROR** (12) are green.

The user interface of the DxR Terminal software (rel. 1.01), which appears as indicated in fig. 1, can program and monitor from 1 to 16 slave units connected by USB. The available functions are briefly described in the following tables with the respective references to the relative figures.

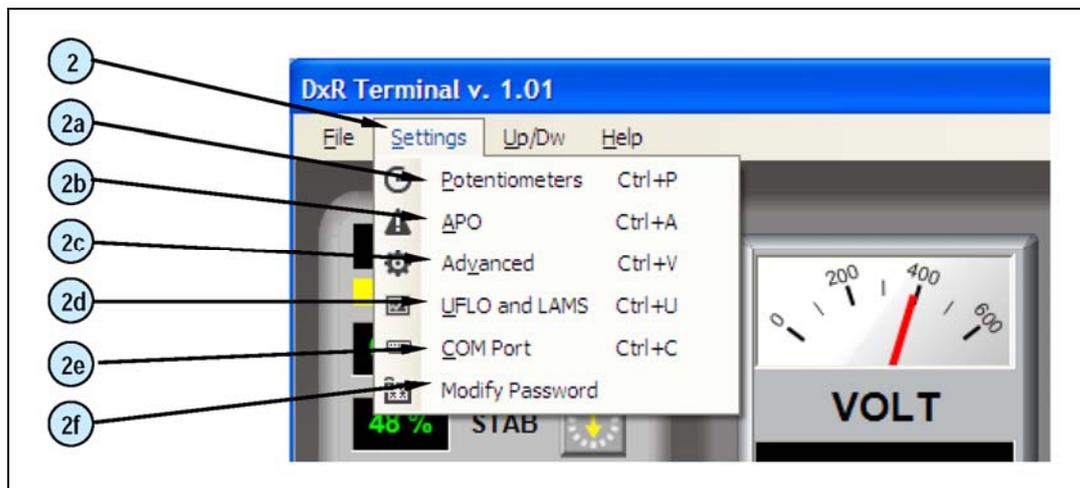


Fig. 2

Ref.	Main window (fig. 1): Functional description
1	File menu: presents only Exit option to close the DxR Terminal user interface.
2	Settings menu: gives access to the following advanced settings: <ul style="list-style-type: none"> a) Potentiometer (controlled by password) for enabling or disabling the VOLT, STAB, Hz, AMP trimmers, and to set the adjustment level assigned to each of the corresponding parameters. b) APO (controlled by password) relative to the settings of the regulator output with the same name. c) Advanced (controlled by password) for the Soft Start, Potentiometer / external DC Voltage and Short circuit settings; also for configuring the regulator and reading/writing parameters directly. d) UFLO & LAMS (controlled by password) for all voltage-frequency regulation settings. e) COM Port (no restrictions) for accessing the communication settings. f) Change Password (controlled by password) for modifying the password used to access the advanced settings.
3	Up/Dw menu: uploads and downloads the settings or alarms file to and from the regulator.
4	Help menu: used to obtain information on the current revision of the software and to access the technical documents (Internet connection required).
5	Selection flags of the type that numerically represent the VOLT, STAB, Hz and AMP trimmer position.
6	Indication of the VOLT, STAB, Hz and AMP trimmer position expressed in absolute values, as a percentage or notches according to the selection made at point 5.
7	Graphical representation of the VOLT, STAB, Hz and AMP trimmers showing the physical trimmer wiper position on the regulator; if the trimmer is not active it is shown in grey.
8	Alarms: Shows the active alarms.
9	Running Hours: shows the operation time of the regulator since last switching on or the last event (alarm or correct operation) occurred.
10	Connected: Indicates that communication has been made and is active.
11	Com STAT: Communication error (yellow indicator).
12	Com Error: Connection error (red indicator).
13	DxR Data Error: The data shown are not valid (red indicator).
14	Address of the DSR or DER1 (Slave) in communication.
15	Connect/Disconnect enables or disables connection with the slave unit (DSR or DER1).
16	Voltmeters: gives a graphic and numeric representation (settable using the Set-up button) of the alternator output voltage.

17	Set-up sets the voltage conversion factor on the voltmeters and the graphic display.
18	Frequency meters: gives a graphic and numeric representation of the alternator output frequency.
19	Current frequency setting indicator (50Hz or 60Hz, from jumper or from flag).
20	Excitation Limit: percentage value of the intervention threshold of the excitation overcurrent protection
21	Real Excitation: percentage value of the location L[45].
22	Graphic representation of the Voltage, in Volts, versus time; the reference is green (location L[42]) the measured value is blue (location L[43]); the scale factor depends on the setting made using Scale Settings (point 17), fixed time base 10sec/div.
23	Graphic representation of the frequency, in Hz, versus time; the intervention threshold of the low frequency protection is green (location L[34] or parameter P[21] together with the setting 50/60), the pink line is the measured value (location L[37]); fixed time base 10sec/div.
24	Graphic representation of the rotor temperature estimator versus time; the excitation overcurrent threshold is yellow, the value at location L[45], as a percentage, is red; the scale factor is automatic according to the settings of the threshold value, fixed time base 10sec/div.
25	User Type: NORMAL = read only, EXPERT = read and write

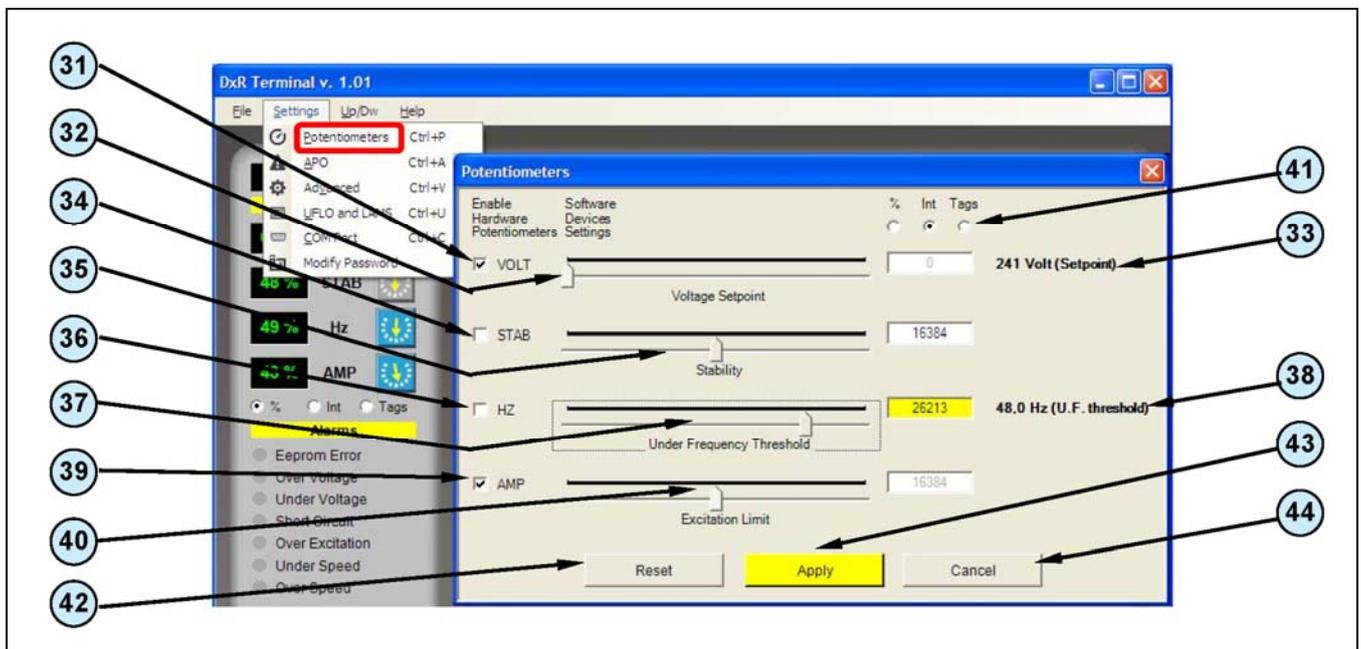


Fig. 3

Ref.	Potentiometer Menu (fig. 3): Functional description
31	Flag that enables reading of the <i>voltage reference</i> from the VOLT trimmer.
32	Virtual potentiometer for setting the <i>voltage reference</i> (active if flag 31 is not selected).
33	<i>Voltage reference</i> set using the VOLT virtual potentiometer (the scale factor is coherent with the "Voltmeter Set-up" setting made on the main window).
34	Flag that enables reading of the <i>stability</i> parameter from the STAB trimmer.
35	Virtual potentiometer for setting the <i>stability</i> (active if flag 34 has not been selected).
36	Flag that enables reading of the <i>low speed protection threshold</i> parameter from the Hz trimmer.
37	Virtual potentiometer for setting the <i>low speed protection threshold</i> (active if flag 36 has not been selected).
38	<i>Low speed protection threshold</i> set with the Hz virtual potentiometer.

39	Flag that enables reading of the <i>over excitation threshold</i> parameter from the AMP trimmer.
40	Virtual potentiometer for setting the <i>over excitation threshold</i> (active if flag 39 has not been selected).
41	Selects the type of numeric representation of the VOLT, STAB Hz and AMP virtual trimmer positions.
42	Resets the virtual trimmer default values: the key acts simultaneously on all values.
43	Apply: Saves and activates the settings.
44	Cancel: Cancels settings that have not been saved and then exits.

NOTE: If the virtual trimmer is enabled, the numeric and graphical indications appear coloured; otherwise the graphical indications appear in light grey to indicate that they are not active. The virtual potentiometer can only be used to set when the corresponding physical trimmer has been disabled. During setting, the background of the corresponding box becomes yellow to indicate that the values have not been saved. The pressing of the **Apply** button activates the setting and the background of the box returns to white.

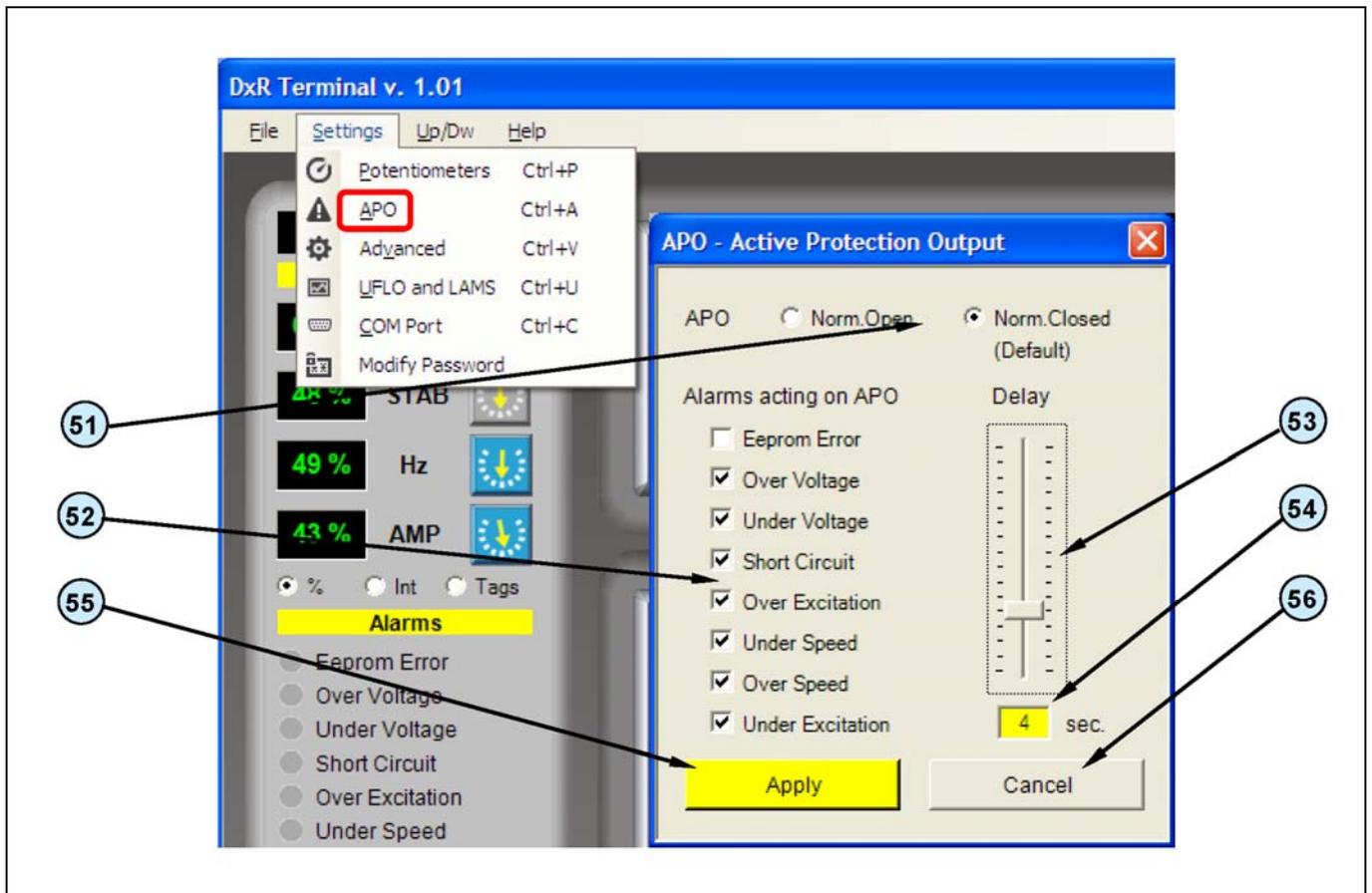


Fig. 4

Ref.	<i>APO (Active Protection Output) Menu (fig. 4): Operation description</i>
51	Mutually exclusive flags for inverting the APO signal. *
52	Flags for selecting the alarms acting on the APO. *
53	Sets the delay time of APO activation. *
54	Indicates the delay time of APO activation. *
55	Apply: Saves and activates the settings.
56	Cancel: Cancels any settings that have not been saved and then exits.

* Reference Technical Guide Digital Regulator DRS/DER1, chapter “Controlling of the regulator alarms”, paragraph “APO Output”

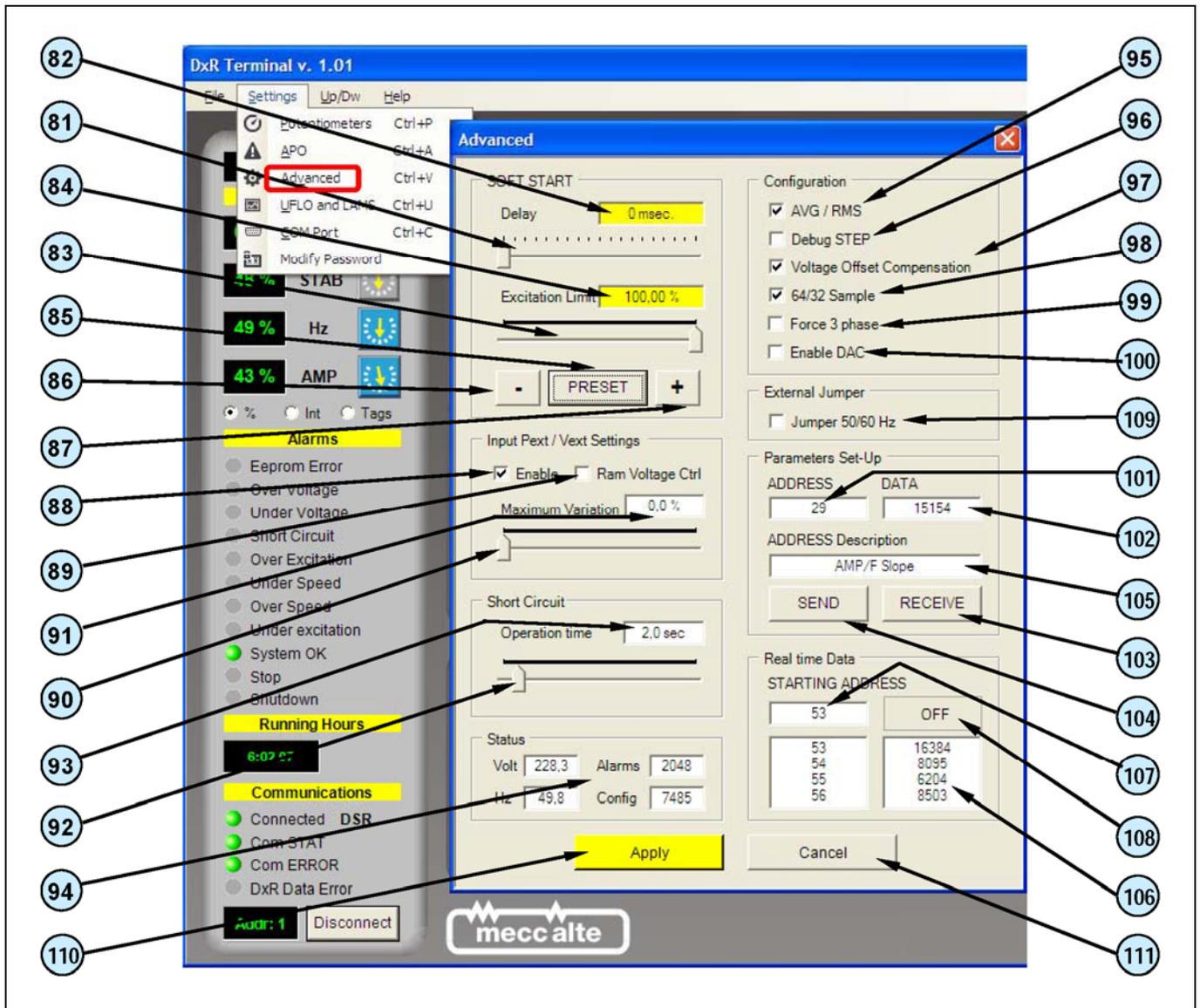


Fig. 5

Ref.	Advanced Menu (fig. 5): Operation description
81	Virtual potentiometer for setting the duration of the <i>excitation current limitation</i> generator start up.
82	Indicates the duration of the <i>excitation current limitation</i> at generator start up.
83	Virtual potentiometer for setting the <i>excitation current limit</i> at generator start up.
84	Indicates the <i>excitation current limit</i> at generator start up.
85	PRESET: Pre-set soft start setting (set P[8]=64, P[9]=24576), when pressed the function changes to RESET: Resets the default soft start parameters (P[8]=0, P[9]=32767).
86	- when pressed, reduces the <i>excitation current limit</i> at switch-on (reduces the value of P[9] by 2048).
87	+ when pressed, increases the <i>excitation current limit</i> at switch-on (increases the value of P[9] by 2048).
88	Flag that enables reading of the External potentiometer / external voltage input.
89	Flag that transfers reading of the external reference from P[15] to location L[49] and activates saturation of the External potentiometer / external voltage input if the minimum and maximum limits are exceeded.
90	Virtual potentiometer for setting the maximum variation permitted for the external reference.
91	Indicates the maximum variation permitted to the external reference.
92	Virtual potentiometer for setting the delay time of the regulator block following identification of a short circuit.

93	Defines the operating time with the alternator short circuited; after this period of time the regulator goes to the blocked status.
94	Displays the state of the regulator (voltage, frequency, active alarms, configuration).
95	Flag setting the adjustment of Effective Value.
96	Flag activating a periodic variation of the voltage reference (for preliminary setting).
97	Flag activating the automatic compensation of the offset in the voltage acquisition channels
98	Flag setting sampling on a single semi period.
99	Flag forcing three phase sensing (only for DER1).
100	Flag enabling the DAC.
101	Parameter address to receive from or to transmit to the regulator.
102	Value of the parameter received from or to transmit to the regulator.
103	Update command.
104	Transmission command.
105	Parameter description (referred to the address written in 101) to be received from or transmitted to the regulator.
106	Values of 4 parameters allocated to 4 consecutive addresses (starting from and including the address indicated in 107).
107	Address of the first of the 4 parameters requested from the regulator.
108	Update activation in almost real time.
109	External Jumper shows the inserted Jumper 50/60Hz.
110	Apply : Saves and activates the settings.
111	Cancel : Cancels the settings that have not been saved and then exits.

NOTE: When setting, the background of the corresponding box becomes yellow to indicate that the values have not been saved. The pressing of the **Apply** button activates setting and the background of the box returns to white.



Fig. 6

Ref.	UFLO & LAMS Menu (fig. 6): Operation description
61	Value of parameter P[18] - step limitation reference (read only).
62	Value of parameter P[24] - V/f curve slope when the regulator is switched on (read only).
63	Value of parameter P[23] - V/f curve slope after the low speed threshold has been exceeded (read and write).
64	Value of parameter P[21] (active if the Hz trimmer is disabled) – <i>low speed protection threshold</i> (read and write).
65	Value of parameter P[14] - ratio between auxiliary voltage and reference voltage (read and write).
66	Interactive graph for setting the V/f curve after the low speed threshold has been exceeded.
67	Mutually exclusive flags for reading the 50/60Hz hardware jumper.
68	Mutually exclusive flags for setting the nominal generator frequency (active if flag 67 is set at Disable).
69	LAMS Preset: Preset LAMS setting (disables the Hz trimmer and sets P[14]=32767, P[21]=26213, P[23]=32767 and also P[18]=100 and P[24]=8700 if DSR or P[18]=100 and P[24]=6000 if DER1), when selected the button changes function to UFLO & LAMS Reset , which enables the Hz trimmer and sets P[14]=6000, P[21]=16384, P[23]=9000, and also P[18]=20 and P[24]=12000 if DSR or P[18]=50 and P[24]=6000 if DER1, and the settings become operative after button 70 has been pressed.
70	Apply: Saves and activates the settings.
71	Cancel: Cancels the settings that have not been saved and then exits.

NOTE: When setting, the background of the corresponding box becomes yellow to indicate that the values have not been saved. The pressing of the **Apply** button activates setting and the background of the box returns to white.

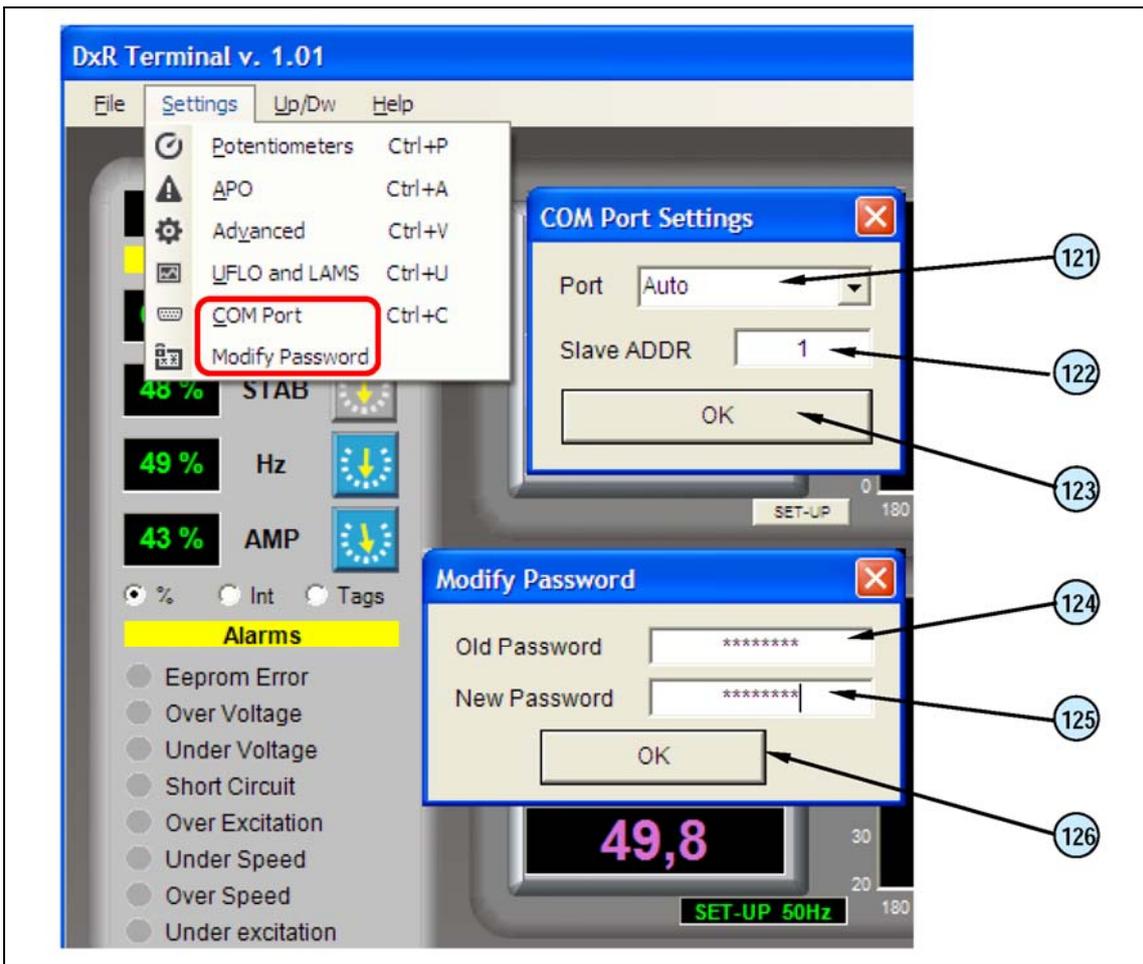


Fig. 7

Ref.	COM Port Menu (fig. 7): Operation description
121	Port: Selects the COM emulated by USB; Auto automatically identifies the USB2DxR device connected to the first free COM.
122	Slave Address: Selects the DSR or DER1 address (Slave) to be communicated with.
123	OK: Saves and activates the settings.

PASSWORD

The software DxR Terminal allows the reading of almost all the data that regulators DSR/DER1 make available, in particular:

- Settings defined by parameters or external variables (trimmer or jumper position, voltages, etc.)
- Status and functional variables (voltage, frequency, active alarms, etc.)
- Alarms memory data
- Settings files

This mode of operation is defined as "User: NORMAL".

Changing of the regulator settings (write) is protected by password that will be asked only the first time trying to introduce any modification.

If the password is correct, you switch to mode "User: EXPERT" which allows both reading and writing; the password will be no longer required for all subsequent changes to any settings until you exit the program.

CAUTION: The default password is "meccalte"; if, during installation you want to give some protection to the settings, you should change the password via the menu "Modify password" (Fig. 7).

Ref.	Modify password menu (fig. 7): Operation description
124	Old password: Current password.
125	New password: New Password to be set.
126	OK: Saves and activates the password (if the password is lost or forgotten, the initial configuration can be reset by completely uninstalling and re-installing the program).

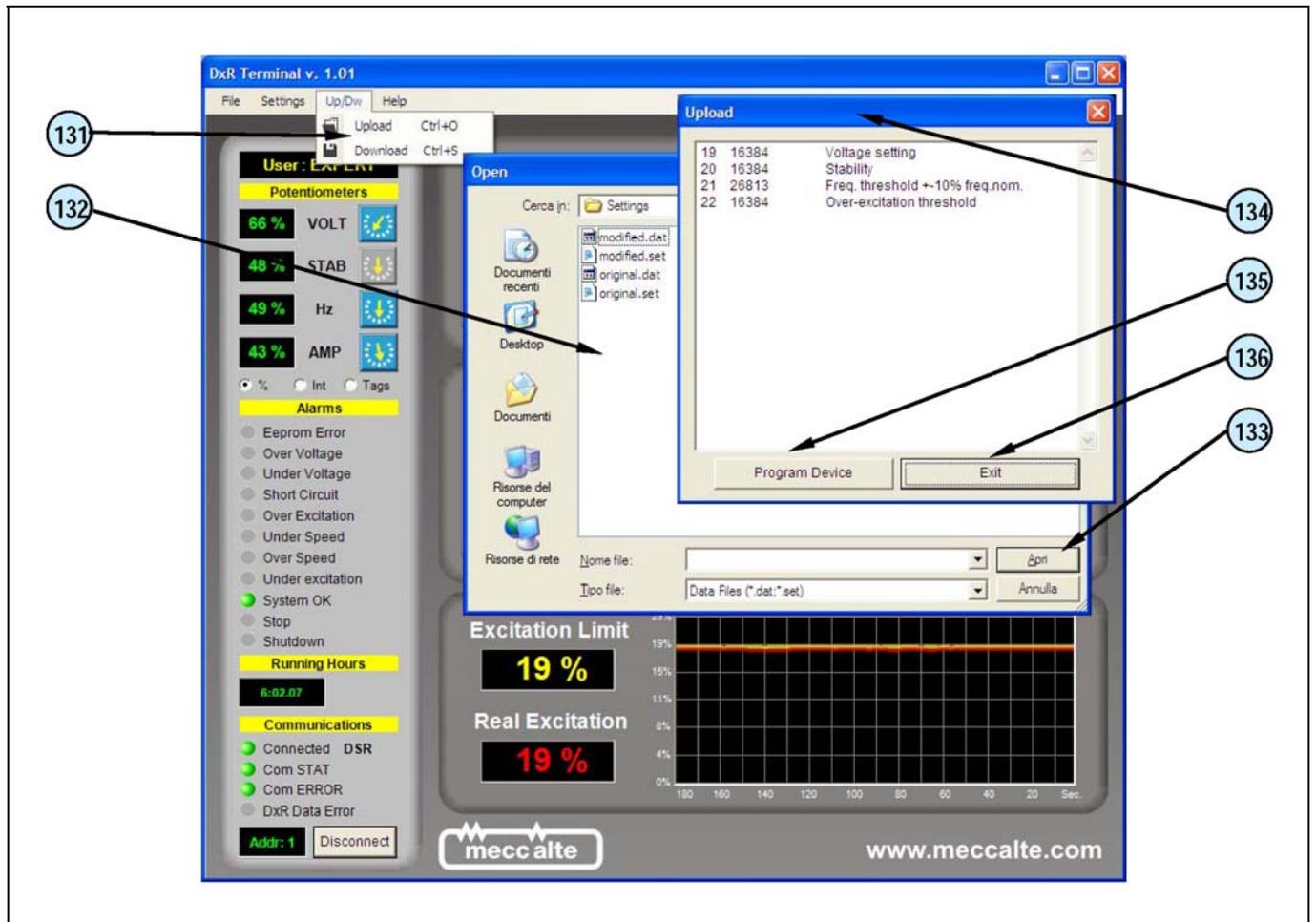


Fig. 8

Ref.	UpLoad Menu (fig. 8): Operation description
131	UpLoad opens the window (132) from which to select the settings files (see chap. 5) to be downloaded to the regulator.
132	Window for selecting the settings file.
133	Open the file with extension .dat or .set that is to be loaded and open the Upload window (134).
134	Upload window with the list of parameters to be downloaded.
135	Program device: downloads the displayed list of parameters to the regulator.
136	Exit: exits without downloading the settings file.

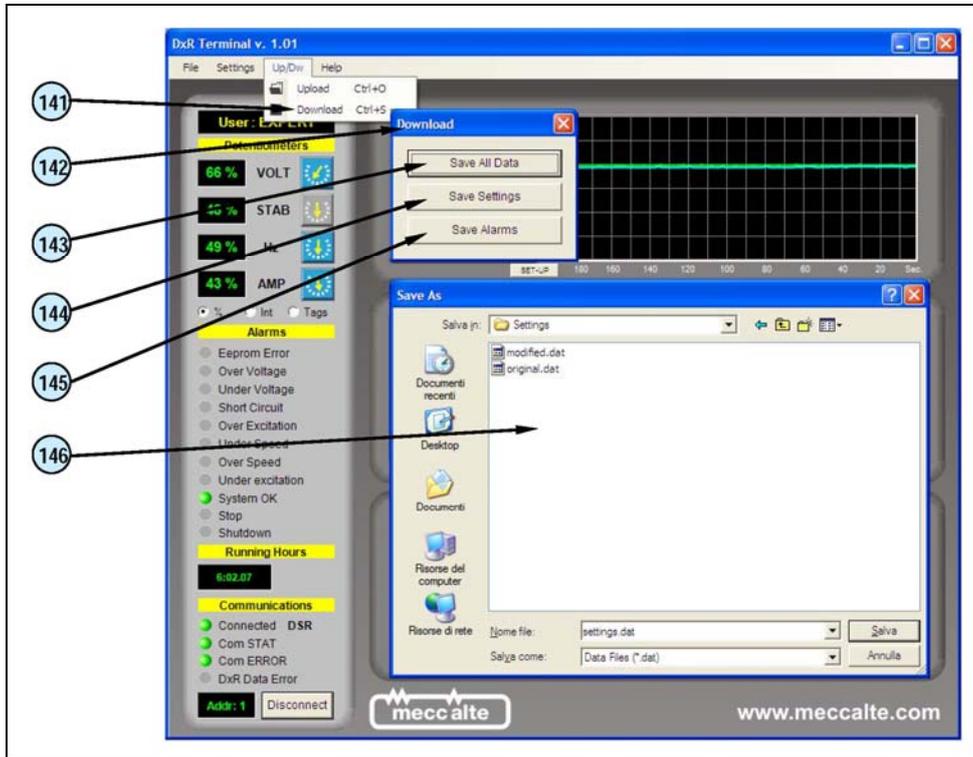


Fig. 9

Ref.	DownLoad menu (fig. 9): Operation description
141	DownLoad opens the window (142) from which to select the type of file to be downloaded from the regulator.
142	Download window
143	Save All Data saves the whole settings file (from 0 to 30) with extension .dat (see chap. 5).
144	Save Settings saves the personalised data file (parameters from 10 to 30) with extension .set (see chap. 5).
145	Save Alarms saves the alarm file with extension .alr.
146	Window for selecting the file to be downloaded by the regulator.

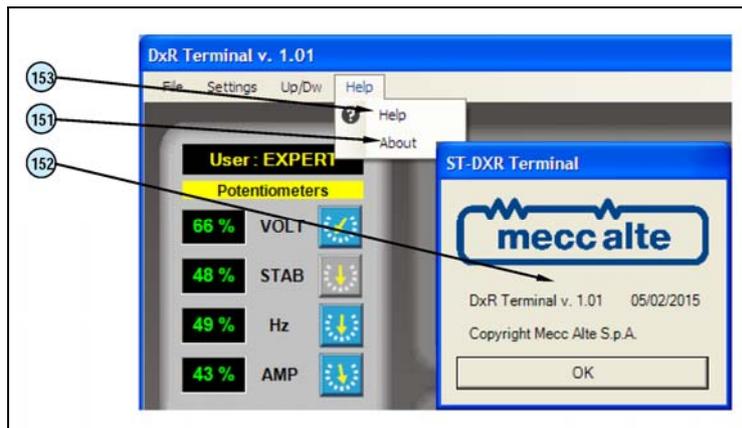


Fig. 10

Ref.	Help Menu (fig. 10): Operation description
151	About opens the window (152) that indicates the current revision of the DxR Terminal software.
152	Window that signals the current revision of the DxR Terminal software.
153	Help connects with the Download area of the www.meccalte.com site to access supporting technical documentation, including the electronic manual of the DxR Terminal software

5. Settings files

These are appropriately formatted text files, and each line:

- starts with a number that represents the **parameter** address
- this number must be followed by a **space** as a separating character
- the space is followed by a number, which represents the parameter **value**
- an **optional text** can be written beside the parameter value, but it must be separated by at least one **space**
- only parameters whose address is present will be modified, the others will remain unaltered
- the entire text that follows the character «%» is evaluated as a comment and is therefore not considered

```
% MECC ALTE S.p.A.
% Digital Regulators for Synchronous Alternators DSR/DER1
% Settings File
%
% Date: 05/02/2015 04.04
% Note:
%
% ATTENTION: Refer to manual for text formatting
%
10 07965 Configuration word
11 00004 Shift to Left proportional gain
12 00003 Shift to Left integral gain
13 16384 Coefficient tieing Ki to Kp
14 06000 Vout / Vaux Ratio
15 16384 Reference equivalent to Vext
16 00000 Limitation of Vext Variation
17 00254 APO delay & alarm settings
18 00020 Step limitation reference
19 00000 Voltage setting
20 16384 Stability
21 16384 Freq. threshold +-10% freq.nom.
22 16384 Over-excitation threshold
23 09000 V/F Slope
24 12000 V/F curve slope at start up
25 00139 Short circuit time
26 00000 Overspeed threshold
27 00512 Under excitation threshold
28 12287 Ki Over-excitation regulator
29 15154 AMP/F Slope
30 63600 Thermal dispersion coefficient
```

Example of a .set file

6. Technical characteristics

Size: 55mm x 29mm x 23mm (cables excluded)

Weight: 28g

Power supply (USB side): 5Vdc - 15mA

7. System requirements

PC with O.S. Microsoft Windows XP®, Windows Vista®, Windows 7® or Windows 8® and .NET Framework from version 4.1 and up, development tools.

Screen with minimum resolution of 1024 x 768 pixels



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