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User's Guide

FWLoader Help

Firmware Loader Program

DC Power Supply System

Smartpack Based Systems

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Firmware Loader Help

Welcome to *FWLoader*

FWLoader Online Help System, 350003.063, 4v0c, 2009-11-10

The pane on the left is a **Table of Contents**, a complete list of all topics. You can click on the **Index button**, on the toolbar, to get a list of all topics in alphabetical order.

You can also search for answers by using the **Search button** on the toolbar.

Tips for searching Help:

- Limit the number of words you type in the search box
- Make sure that your search terms are spelled correctly
- Save useful topics by clicking on the **Add to Favorites** button on the toolbar

FWLoader Online Help is divided into the following sections:

- "Getting Started" on page 3
  Provides introductory information about *FWLoader* program, the controller, etc.
- "Using FWLoader" on page 5
  Provides detailed information about how to upgrade the firmware in
  - the *Smartpack* controller,
  - the rectifiers and CAN Bus control units
- "About CAN bus" on page 11
  Provides detailed information about Eltek Valere's CAN Bus, how to terminate and address the CAN Nodes
- Glossary of Terms (page 16)
  Clarifies expressions, technical terms, functions, etc. used in *Eltek Valere*'s DC power systems.

Getting Started

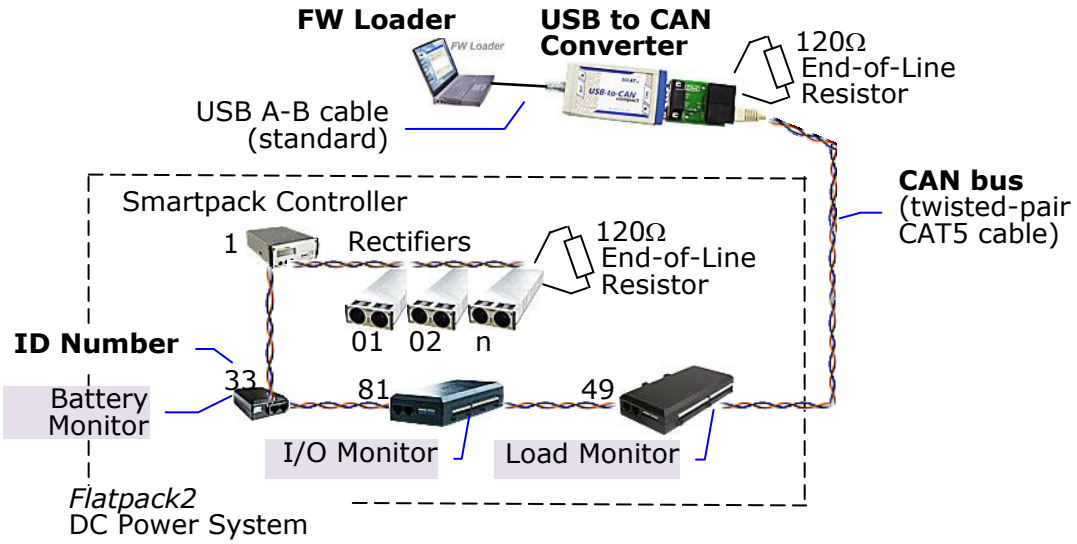
This section provides introductory information about *FWLoader* program, the controller, etc.

About the *FWLoader* Program

The *FWLoader* (FirmWare Loader) is a PC software application used with *Smartpack*-based DC Power Systems.

FWLoader helps you upgrade the firmware installed in your power system's control units, such as controller, rectifiers and other CAN Bus nodes.

FWLoader Online Help helps you using the *FWLoader* graphical user interface (GUI).



The example above shows a *Flatpack2* power system with 3 CAN Bus nodes connected: a Battery Monitor, an I/O Monitor and a Load Monitor.

Using an external PC and the USB-to-CAN Converter (art. 208565) you can upgrade the firmware installed in the *Flatpack2* rectifiers and any of the control units connected the system's CAN Bus.

NOTICE:
USB-to-CAN Converter is not required to upgrade the firmware of the *Smartpack* controller. You connect the USB cable directly to the controller's USB port.

Smartpack Controller

The *Smartpack* controller is a monitoring and control unit used as the vital nerve center of the DC power plant. You operate the system directly from the elegant front panel, using three front keys and the LCD-display; they represent the main interface between you and the system.

You can also operate the system remotely via modem, Ethernet and the Web. The module then utilizes the USB or RS232 ports to interface with NMS or Web adapters.

The *Smartpack* controller's standard front panel consists of a three-button keypad, a graphic display, an USB port and 3 LED lamps.

The *Smartpack* controller has the following LED indications:

- Alarm (red) indicates an alarm situation (major alarm)
- Warning (yellow) indicates an abnormal situation (minor alarm)
- "Power" (green) indicates that the power supply is ON or OFF

You can operate the DC power system from the *Smartpack* controller, by means of display menus and sub-menus.

For more advanced operation, you can use the *WebPower* GUI from a computer, or install and run the *PowerSuite* application.

Using FWLoader

This section provides detailed information about how to upgrade the firmware in the *Smartpack* controller, the CAN Bus control units and the rectifiers.

Firmware Upgrade (USB) – Smartpack Controller

You can use the *FWLoader* program running on a PC to upgrade the *Smartpack* controller's firmware.

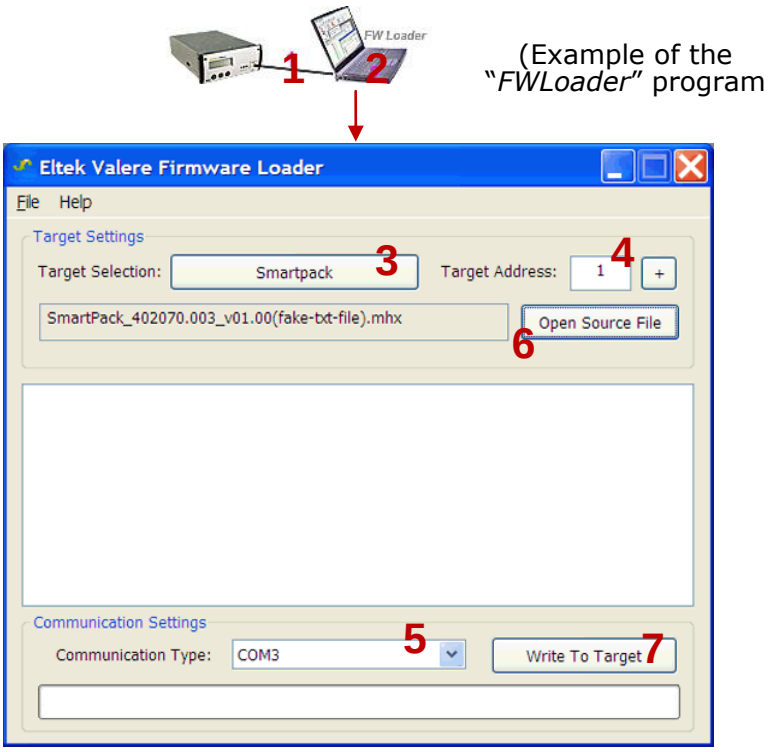
This topic describes the firmware upgrade procedure via the controller's USB port. For description to upgrade via the USB-to-CAN Converter (art. 208565), refer to topic "Firmware Upgrade (USB>CAN) – Rectifiers, CAN Nodes" on page 7.

The *PowerSuite* program has to be installed previously on the PC, but not running at the same time as the *FWLoader* program (they cannot use the same communication port).

To find your controller's firmware version, use the controller's front keys or the *PowerSuite* program. Read how in the topic "Tutorials", in PowerSuite Online Help.

NOTICE: You can get a copy of the "*FWLoader*" program, by contacting Eltek Valere's Service Dep.

Do following:



1. **Connect a PC to the *Smartpack*,** using a standard USB cable (1)
2. **Start the *FWLoader* program on the PC** (2)

On the *FWLoader* dialog box:

3. **Select the controller as Target:**
   Click on the "Select Target" button (3), and
   select **"Control System Family > Smartpack"**

4. **Enter the Target Address:**
   Type "1", in Target Address field (4)
   If the controller's ID number in the CAN Bus is other than 1, then enter its ID number by clicking on the "+" button, or typing the ID number.
   Refer to topic "CAN Bus Address Range -- Control Units" on page 14

5. **Select Communication Type:**
   Select "COMx" in Communication Type field (5).
   The communication port that the PC uses to communicate with the controller.

6. **Select the Firmware Source File**:
   Click on the "Open Source File" button (6) and,
   select the **MHX-file "*.mhx"** that contains the firmware to upgrade the controller with

7. **Click on the "Write to Target" button**, (7)
   to load the firmware to the *Smartpack* controller

While the firmware is loaded to the *Smartpack* controller, the *FWLoader* program displays a progress bar, and the controller's display shows the currently programmed segment.

NOTICE: Uploading the firmware may take up to 15 minutes.

Once the firmware has loaded, the *Smartpack* controller will automatically restart.

Firmware Upgrade (USB>CAN) – Rectifiers, CAN Nodes

You can use the *FWLoader* program running on a PC and the USB-to-CAN Converter (art. 208565) to upgrade the firmware installed in the rectifiers and all the control units and CAN Bus nodes connected to your power system.

The firmware in system's controllers can also be updated via their USB ports, as described in topic "Firmware Upgrade (USB) – Smartpack Controller" on page 5.

NOTICE:
To upgrade the ***Compack*** controller's firmware via its Ethernet port, read the topic "Firmware Upgrade" in the Functionality Description section of WebPower Online Help

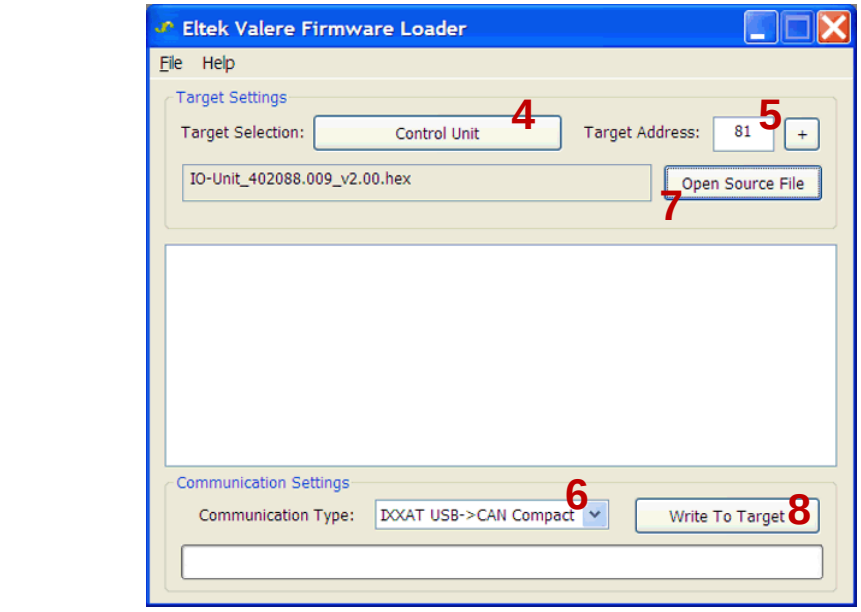
NOTICE:
-- You can get a copy of the "*FWLoader*" program, by contacting Eltek Valere's Service Dep.
-- The *PowerSuite* program has to be installed previously on the PC, but not running at the same time
-- The drivers for the USB-to-CAN Converter (art. 208565) has to be installed previously in the PC. You find them in the CD-ROM accompanying the converter

WARNING:
Before upgrading the firmware, ensure that:
-- The controllers, rectifiers and control units are **always connected to the system's CAN bus**

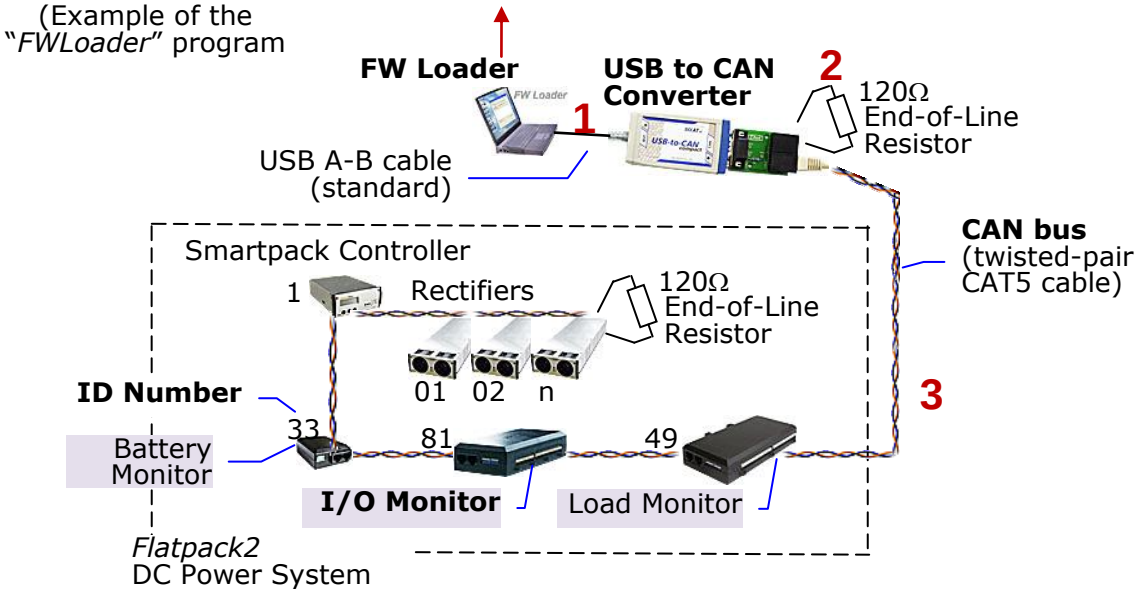
-- If the *Smartpack* controller is NOT connected to the system, you must power it with 18-72 VDC input voltage

-- If a rectifier is NOT connected to the system (and you have to upgrade its primary and/or secondary firmware) you must power it with at least 70 VAC input voltage, and also apply at least 30 VDC output voltage, to supply the secondary controller
TIPS:
Connect in parallel the DC Output of 2 rectifiers!

For example, to upgrade the firmware installed in control unit "*I/O Monitor*" connected with ID number "81",
do following:



(Example of the "*FWLoader*" program



1. **Connect a PC to the "USB-to-CAN Converter"** (art. 208565)**,**
   using a standard USB cable (1)
2. **Move the CAN Bus Termination** (120Ω resistor): (2)
   Unplug the "*120Ω End-of-Line Resistor*" from **the last** CAN bus node (e.g. Load Monitor), and
   plug it on the "USB-to-CAN Converter"
   Refer to topic "CAN bus Termination" on page 11
3. **Connect the "USB-to-CAN Converter" to the last CAN node**; (3)
   plugging one end of a CAT5 CAN bus cable to the "USB-to-CAN Converter" and the other end to the last CAN bus node
4. **Start the *FWLoader* program on the PC**

   On the *FWLoader* dialog box:
5. **Select the Target**:
   E.g. for the "*I/O Monitor*", click on the "Select Target" button (4), and select **"Control System Family > Control Unit"**

For other targets, refer to "Target Selection Table" on page 10.

6. **Enter the Target Address:**
   E.g. for the "*I/O Monitor*", type "81" in Target Address field (5), or by clicking on the "+" button.
   Ensure that you enter the correct control unit's or rectifier's ID number in the CAN Bus.
   Refer to topic "CAN Bus Address Range -- Control Units" on page 14

7. **Select Communication Type:**
   E.g. for the "*I/O Monitor*", select **"IXXAT USB->CAN Compact"** in the Communication Type field (6).
   The communication type used when connecting via the "USB-to-CAN Converter"

   For other targets, refer to "Target Selection Table" on page 10.

8. **Select the Firmware Source File**:
   E.g. for the "*I/O Monitor*", click on the "Open Source File" button (7) and, select the **HEX-file "*.hex"** that contains the firmware to upgrade the *I/O Monitor* with.

   The "Files of Type" field, in the Open dialog box will always show the default type of file for the selected target.

9. **Click on the "Write to Target" button**, (8)
   to load the firmware to the *I/O Monitor*

   While the firmware is loaded to the *I/O Monitor*, the *FWLoader* program displays a progress bar.

   Once the firmware has loaded, the *I/O Monitor* will automatically restart.

Target Selection Table

TYPE	TARGET NAME	TARGET SELECTION	COMMUNICATION TYPE
Controllers	**Smartpack**	Control System Family > Smartpack	COM1-COMx or IXXAT USB->CAN Compact
Control Units	**Smartnode**	Control System Family > Smartpack	IXXAT USB->CAN Compact
CAN nodes	**Battery Monitor**	Control System Family > Control Unit	IXXAT USB->CAN Compact
CAN nodes	**Load Monitor**	Control System Family > Control Unit	IXXAT USB->CAN Compact
CAN nodes	**I/O Monitor**	Control System Family > Control Unit	IXXAT USB->CAN Compact
CAN nodes	**Mains Monitor**	Control System Family > Control Unit	IXXAT USB->CAN Compact
Rectifiers	**Flatpack2**	FP2 Rectifier Family > FP2 Secondary OR FP2 Rectifier Family > FP2 Primary	IXXAT USB->CAN Compact
Rectifiers	**Flatpack2 HE**	FP2 HE Rectifier Family > FP2 HE Secondary OR FP2 HE Rectifier Family > FP2 HE Primary	IXXAT USB->CAN Compact
Rectifiers	**Powerpack /TEC**	Powerpack/ TEC Family > Powerpack/ TEC Secondary OR Powerpack/ TEC Family > Powerpack/ TEC Primary	IXXAT USB->CAN Compact
Rectifiers	**Minipack**	Minipack Family > Minipack Secondary	IXXAT USB->CAN Compact
Rectifiers	**Micropack**	Micropack Family > Micropack Secondary	IXXAT USB->CAN Compact
Converters	**Flatpack2 HE Solar**	FP2 HE Solar Family > FP2 HE Solar Secondary OR FP2 HE Solar Family > FP2 HE Solar Primary	IXXAT USB->CAN Compact
Inverters	**Flatpack2 HE Inverter**	FP2 HE Inverter Family > FP2 HE Inverter Secondary OR FP2 HE Inverter Family > FP2 HE Inverter Primary	IXXAT USB->CAN Compact

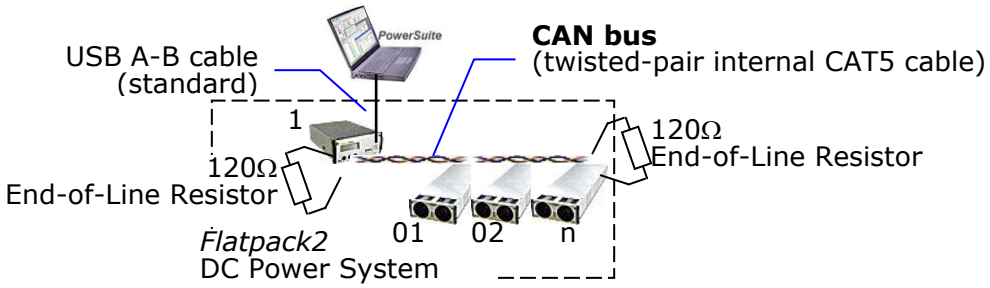
About CAN bus

The *Compack*-based and the *Smartpack*-based DC power systems utilize the CAN bus -- a digital interface architecture that supports a dedicated communication channel between the control units and each of the rectifiers.

CAN bus Termination

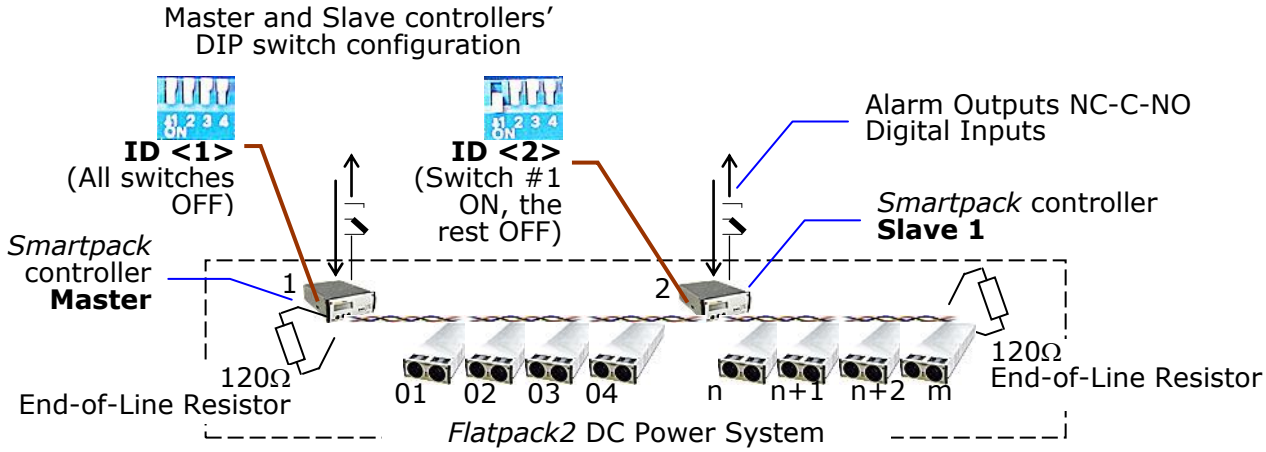
To ensure a correct bus communication and avoid data reflection, you must always terminate the CAN bus with two 120Ω resistors at both ends of the line (*60Ω bus impedance*). The CAN bus is connected using CAT5 twisted-pair cables.

Read also topic "CAN Bus Address Range -- Control Units" on page 14.



CAN bus terminated with a 120Ω resistor on both line ends (60Ω bus impedance)

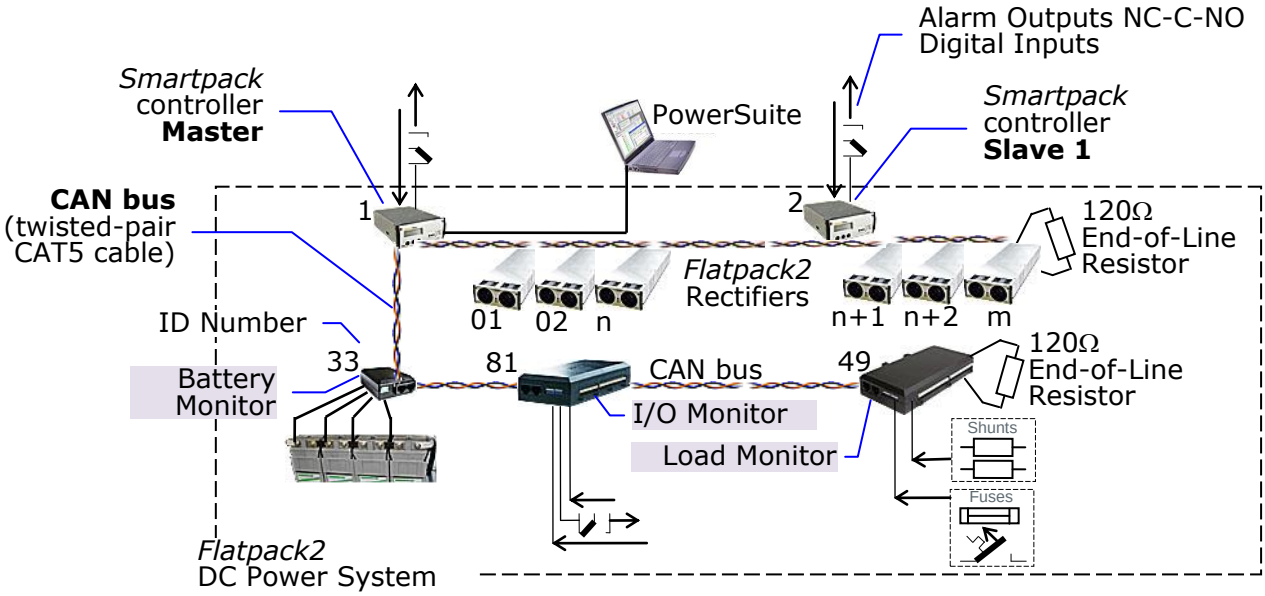
The figure below shows a *Flatpack2* DC power system expanded with a slave controller to implement additional digital inputs, relay outputs or similar functionality.



A Flatpack2 DC power system expanded with two controllers connected with CAT5 twisted-pair cables. Two 120Ω resistors are to be terminated on both line ends (60Ω total bus impedance)

The figure below shows a *Flatpack2* DC power system expanded with a slave controller and 3 CAN bus Nodes to implement additional relay outputs and digital inputs (for current and fuse monitoring, temperature and fan speed control & monitoring or similar functionality).

The 3 CAN Bus nodes connected are: a Battery Monitor (ID#33), an I/O Monitor (ID#81) and a Load Monitor (ID#49).



A Flatpack2 DC power system expanded with two controllers and 3 CAN bus Nodes connected with CAT5 twisted-pair cables. Two 120Ω resistors are to be terminated on both line ends (60Ω total bus impedance)

CAN bus Addressing

All rectifiers, *Compack* and Smartpack controllers and other control units connected to the *Eltek Valere*'s CAN bus must have a unique address or ID number.

The control system's master controller assigns automatically the rectifiers' addresses (**software assignment**).

The control system's controllers – except *Compack* -- and control units use DIP switches for configuring their unique CAN bus ID number (**hardware assignment**)

Software Assignment — Rectifiers

Each rectifier in the DC power system is automatically configured by its controller (*Compack* or *Smartpack*) with a unique CAN bus ID number (software-assignment).

When the rectifiers are hot-plugged in the system the first time, the system's controller dynamically assigns the rectifiers with the next available ID number (software-assignment), and automatically increases the number of communicating rectifiers on the CAN bus. Also, the controller registers the rectifiers' ID numbers, or CAN bus address (01, 02…), together with their serial numbers.

When a previously installed rectifier is again hot-plugged in the system, it retains its previous ID and serial number, unless reassigned during a Reset Rectifier command.

WARNING: To replace installed rectifiers with new ones, remove the installed rectifiers and wait for the controller to notify communication error with the extracted rectifiers. Push the new rectifiers firmly inwards — one module at a time, allowing a 2s delay — to plug them in the power shelf. Start with the shelf position with lowest ID number. Lock their handles.

When a new *Compack* or *Smartpack* controller is inserted in an existing system, the controller will recalculate the number of connected rectifiers, reassigning them with the same ID numbers as they already have in memory.

Hardware Assignment — Control Units

The control system consists of one or several CAN bus-connected control units. The control units are factory configured with a unique CAN bus ID number, using DIP switches on the units (**hardware-assignment**). *Compack* controllers are factory configured with CAN bus ID number <1> (not changeable).

For example, in a distributed DC power system with several *Smartpack* controllers, the master is configured with ID # <1>, the slave with ID # <2> and so on.

Refer to the table in topic "CAN Bus Address Range -- Control Units" on page 14 and to the figure in topic "CAN bus Termination" on page 11.

CAN Bus Address Range -- Control Units

In the control system's CAN bus, you can address a maximum of 14 control units of each type -- but a maximum of 8 *Smartpack* controllers and *Smartnode* units. See table below:

Number of nodes >> Control Units' Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Smartpack controllers	1	2	3	4	5	6	7	8	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	<-- ID #
Smartnodes	17	18	19	20	21	22	23	24	*25*	*26*	*27*	*28*	*29*	*30*	*31*	*32*	<-- ID #
Battery Monitor CAN nodes	33	34	35	36	37	38	39	40	41	42	43	44	45	46	*47*	*48*	<-- ID #
Load Monitor CAN nodes	49	50	51	52	53	54	55	56	57	58	59	60	61	62	*63*	*64*	<-- ID #
**	*65*	*66*	*67*	*68*	*69*	*70*	*71*	*72*	*73*	*74*	*75*	*76*	*77*	*78*	*79*	*80*	<-- ID #
I/O Monitor CAN nodes	81	82	83	84	85	86	87	88	89	90	91	92	93	94	*95*	*96*	<-- ID #
Mains Monitor nodes	97	98	99	100	101	102	103	104	105	106	107	108	109	110	*111*	*112*	<-- ID #

ID numbers formatted in red italics are not available due to software constraints.

** Only 4 of the 8 mounted DIP switches may be used (max. 14 Load Monitors may be connected).

NOTICE: *Compack* controllers have no DIP switches, as they are configured from factory with CAN bus ID number <1> (not changeable)

The table below shows the DIP switch position on *Smartpack* controllers:

DIP switch position for *Smartpack* controllers

Smartpack Controller	ID #	DIP Switch Position 1 -- 2 -- 3 -- 4
(Master) Controller 1	1	OFF--OFF--OFF--OFF
(Slave) Controller 2	2	**ON**--OFF--OFF--OFF
(Slave) Controller 3	3	OFF-- **ON**--OFF--OFF
(Slave) Controller 4	4	**ON**-- **ON**--OFF--OFF
(Slave) Controller 5	5	OFF--OFF-- **ON**--OFF
(Slave) Controller 6	6	**ON**--OFF-- **ON**--OFF
(Slave) Controller 7	7	OFF-- **ON**-- **ON**--OFF
(Slave) Controller 8	8	**ON**-- **ON**-- **ON**--OFF

Note that the controller's ID number corresponds to the DIP switch's binary value plus 1.

The table below shows the DIP switch position on *Smartnode* control units:

DIP switch position for *Smartnode* control units

Smartnode Control Unit	ID #	DIP Switch Position 1 -- 2 -- 3 -- 4
Smartnode 1	17	OFF--OFF--OFF--OFF
Smartnode 2	18	**ON**--OFF--OFF--OFF
Smartnode 3	19	OFF-- **ON**--OFF--OFF
Smartnode 4	20	**ON**-- **ON**--OFF--OFF
Smartnode 5	21	OFF--OFF-- **ON**--OFF
Smartnode 6	22	**ON**--OFF-- **ON**--OFF
Smartnode 7	23	OFF-- **ON**-- **ON**--OFF
Smartnode 8	24	**ON**-- **ON**-- **ON**--OFF

Note that the control unit's ID number corresponds to the DIP switch's binary value plus 17.

The table below shows the DIP switch position on the CAN nodes for one of the node types, e.g. for Battery Monitors:

DIP switch position for Battery Monitors

Node Type X	ID #	DIP Switch Position 1 -- 2 -- 3 -- 4
Node 1	33	OFF--OFF--OFF--OFF
Node 2	34	**ON**--OFF--OFF--OFF
Node 3	35	OFF-- **ON**--OFF--OFF
Node 4	36	**ON**-- **ON**--OFF--OFF
Node 5	37	OFF--OFF-- **ON**--OFF
Node 6	38	**ON**--OFF-- **ON**--OFF
Node 7	39	OFF-- **ON**-- **ON**--OFF
Node 8	40	**ON**-- **ON**-- **ON**--OFF
Node 9	41	OFF--OFF--OFF-- **ON**
Node 10	42	**ON** --OFF--OFF-- **ON**
Node 11	43	OFF-- **ON** --OFF-- **ON**
Node 12	44	**ON** -- **ON** --OFF-- **ON**
Node 13	45	OFF--OFF-- **ON** -- **ON**
Node 14	46	**ON** --OFF-- **ON** -- **ON**

Note that the node's ID number corresponds to the DIP switch's binary value plus 33.

The table below shows the DIP switch position on the CAN nodes for one of the node types, e.g. for Load Monitors:

DIP switch position for Load Monitors

Node Type X	ID #	DIP Switch Position 1 -- 2 -- 3 -- 4
Node 1	49	OFF--OFF--OFF--OFF
Node 2	50	**ON**--OFF--OFF--OFF
Node 3	51	OFF-- **ON**--OFF--OFF
Node 4	52	**ON**-- **ON**--OFF--OFF
Node 5	53	OFF--OFF-- **ON**--OFF
Node 6	54	**ON**--OFF-- **ON**--OFF
Node 7	55	OFF-- **ON**-- **ON**--OFF
Node 8	56	**ON**-- **ON**-- **ON**--OFF
Node 9	57	OFF--OFF--OFF-- **ON**
Node 10	58	**ON** --OFF--OFF-- **ON**
Node 11	59	OFF-- **ON** --OFF-- **ON**
Node 12	60	**ON** -- **ON** --OFF-- **ON**
Node 13	61	OFF--OFF-- **ON** -- **ON**
Node 14	62	**ON** --OFF-- **ON** -- **ON**

Note that the node's ID number corresponds to the DIP switch's binary value plus 49.

Example:

In a DC power system with following control units: 2 *Smartpack* controllers, 1 Smartnode and 2 Load Monitors, you have to set their DIP switches as follows:

- First Smartpack controller:
  ID# 1 (All DIP switches OFF)
- Second Smartpack controller:
  ID# 2 (Only DIP switch 1 ON)
- First Smartnode:
  ID# 17 (All DIP switches OFF)
- First Load Monitor:
  ID# 49 (All DIP switches OFF)
- Second Load Monitor:
  ID# 50 (Only DIP switch 1 ON)

Glossary of Terms

2AC Power Shelves

2AC Power Shelves (Dual AC feed: 2 AC inputs per shelf, each feeding 2 rectifiers)

4AC Power Shelves

4AC Power Shelves (Single AC feed: 4 AC inputs per shelf, each feeding 1 rectifier)

AC

Alternating Current

Alarm Monitor

Alarm monitors are software modules used by the controller to **measure system internal and external input signals or logical states**.

When an alarm monitor is enabled, it **compares the measured parameter with pre-programmed values or limits**, and raises an alarm in the event of the measured parameter reaching one of the limits.

When this event occurs, the alarm monitor stores the event in the Event Log, initiates an internal action and activates an output group (AOG).

PowerSuite uses 3 types of alarm monitors:
Analogue Alarm Monitors (usually measure voltage or other analogue input signals),
Numeric Alarm Monitors (count the number of AC phases, rectifiers or other integers) and
Logical Alarm Monitors (report the state of relay contacts, open or close, or other similar status)

Read more about Alarm Monitors in the Functionality Description section.

Alarm Monitors

See Alarm monitor

Alarm Output Group

An Alarm Output Group (AOG) is a user defined software assignment that consists of grouping together all the outputs -- alarm relay outputs and or contactors (LVLD and LVBD); telephone numbers (*Smartnode*) -- that always are activated at the same time.

In order to activate the alarm relay outputs, contactors (LVLD and LVBD) or telephone numbers in the DC power supply system, you have to assign them to output groups.

Output relay assignment and output relay mapping are similar terms, synonyms.

Read more about Alarm Output Groups in the Functionality Description section.

Alarm Output Groups

See Alarm Output Group

Alarm State

The state of a voltage output or the position of alarm relay contacts when the output is NOT in normal condition (the output is activated).

Alphanumeric Field

In standard Windows interface, alphanumeric fields in dialogue boxes are areas that contain text strings or numeric values that the user may change.

Do following to edit the text strings or numeric values in alphanumeric fields:

1. **Click inside the field**, to insert the cursor in the text or value.
   Use your keyboard's arrow keys to reposition the cursor
2. Use the keyboard's **standard editing keys** (Delete, Backspace and typing keys) to edit the text or value
   Press the ESC key or click on the dialog box's Cancel button or Close ☒ button, if you want to discard the edited changes.
3. Click on the **Apply button**, in the dialogue box, to save the changes

Accepting or Rejecting Entered Data
In standard dialog boxes, clicking on the **Apply** or the **OK buttons** will activate the parameters and data you entered or selected in the box's fields.

Clicking on the **Cancel button** or the **Close button** – the cross, in the dialog box's title bar – will close the dialog box, and all parameters and data you may have selected in the box's fields will be rejected.

Allowed range of values
If you enter values outside a field's allowed range, a **red balloon with an exclamation mark** will appear by the field.

Use the mouse to **point at the exclamation mark**, and a tool tips text box will indicate the field's allowed range.

Alphanumeric Fields

See Alphanumeric field

Ampere-hours (Ah)

A measure of energy that is provided to or drawn from a battery. (A current of one ampere for one hour equals 1Ah).

Amp-Hour Battery Rating

This is the common rating of a battery. Amp-hour rating of battery capacity is calculated by multiplying the current (in amperes) by discharge time (in hours). Amp-hour battery rating is commonly used when describing sealed lead acid

batteries used in Telecom and UPS systems.
For example: a battery which delivers 2 amperes for 20 hours would have a 40 amp-hour battery rating (2 * 20= 40).

Battery Block

Consist of two or more battery cells connected together.

Read more about Battery Functions in the Functionality Description section.

Battery Boost Charging

Battery Boost Charging or Equalized Charging is a fast charge technique used to reduce recharge time for the batteries and equalize the voltage between individual cells.
The boost charging voltage should always be higher than the float voltage and lower than the OVP voltage.
If a reduction in recharge time is required, starting boost charging will increase the charge voltage and current.

Read more about Battery Functions in the Functionality Description section.

Battery Capacity

By accepted convention worldwide, it is described in "AMPERE HOUR" at the 10-hour rate C10 when discharged at 25°C.
i.e.: a battery is 200 Ah at C10, that is the battery will deliver 20 amps current for 10 hours to a cut off voltage of for example 1.80 volts per cell.

Battery capacity is affected by the discharge rate, end-voltage, temperature and age.

Read more about Battery Functions in the Functionality Description section.

Battery Cell

An electrochemical system that converts chemical energy into electrical energy.

Read more about Battery Functions in the Functionality Description section.

Battery Cut-off Voltage

Battery Cut-off Voltage is the volts-per-cell to which a battery may be discharged safely to maximize battery life.

This data is specified according to the actual discharge load and run time. As a rule of thumb, high amp loads and short run times will tolerate a lower cut off voltage, whereas a low amps long run time discharge will require a higher cut off voltage.

Read more about Battery Functions in the Functionality Description section.

Battery Cycle

A full charge followed by a full discharge (or the other way around). Cycle life is measured by the amount of times a battery may be charged and discharged. Every time a battery is charged and discharged, it uses one cycle. Cycle life is very important in battery applications such as laptop batteries and emergency light batteries. A NiCad battery has a cycle life of 500-1000 or more cycles.

Read more about Battery Functions in the Functionality Description section.

Battery Definition Table

It is also called Discharge Table, which indicates a battery's constant current discharge performance data.

A battery model for Telecom applications can be selected by referring to a constant current discharge table for a specific period of time, to a specified end-of-discharge voltage and temperature.

Battery Discharge Characteristic

The discharge capacity of a lead acid battery varies, and is dependant on the discharge current.
A battery could use a rate at the 10 hour rate. i.e. the capacity of the battery at 10 hours discharged to an end voltage of 1.80 Vpc (volts per cell) at a temperature of 25°C.

Battery Float Voltage

A constant voltage applied to a battery to maintain the battery capacity.

Read more about Battery Functions in the Functionality Description section.

Boost Mode

Boost Mode is one of the PowerSuite's operation modes, where the rectifiers charge the batteries much faster than while in Float Mode.

Boost Voltage

Indicates the output voltage during fast battery recharge (battery boost charging). Increased charge voltage will reduce the required recharge time.

Browser

Short for Web browser, a software application used to locate and display Web pages. The two most popular browsers are Microsoft Internet Explorer and Firefox. Both of these are graphical browsers, meaning that they can display graphics as well as text. In addition, most modern browsers can present multimedia information, including sound and video, though they require plug-ins for some formats.

CAN Bus

Controller Area Network (CAN or CAN bus) is a serial protocol utilized for communication between *Eltek Valere*'s rectifiers, controllers and other control units. The protocol is used in DC power systems that use the *Smartpack* controller, the *Compack* controller and in Aeon systems.

The CAN bus standard was originally designed to allow microcontrollers and devices to communicate with each other without a host computer.

The CAN specification defines the Data Link Layer, while ISO 11898 defines the Physical Layer.

The CAN bus is a 2-wire interface running over either a Shielded Twisted Pair (STP), Un-shielded Twisted Pair (UTP), or Ribbon cable. Each node uses a Male 9-pin D connector.

Capacity

The electrical energy content of a battery as expressed in ampere-hours. Capacity is the total number of ampere-hours or watt-hours that can be withdrawn from a fully charged cell or battery under specific condition of discharge. The capacity is measured by observing the time it takes to discharge a battery at a constant current until a specified cut-off voltage is reached.

See also “Battery Capacity”

Cell mismatch

Cells within a battery pack containing different capacity and voltage levels.

Cell reversal

The stronger cells of a battery (several cells connected in series) impose a voltage of reverse polarity across a weaker cell during a deep discharge.

Charge

The process of replenishing or replacing the electrical charge in a rechargeable cell or battery.

Compack

A versatile microprocessor based controller for monitoring *Micropack* DC power supply systems. The controller is designed for DIN rail mounting.

Control Unit

See Control Units.

Control Units

The control system -- in Eltek Valere DC power systems – consists of control units or hardware devices connected to the system’s CAN bus.

Several types of control units may be connected, such as:

- *Smartpack* controllers
- *Compack* controllers
- Smartnode control units
- Battery Monitors
- Load Monitors
- I/O Monitors
- Mains Monitors
- Other CAN nodes

C-rate

Unit by which charge and discharge times are scaled. A battery rated at 1000mAh provides 1000mA for one hour if discharged at 1C. A discharge of 1C draws a current equal to the rated capacity. The same battery discharged at 0.5C would provide 500mA for two hours.

Critical Condition

A DC power system's state caused when one or several serious circumstances occur. Usually, the DC power supply system is in *critical condition* when the battery bank is the only supply source (negative battery current).

Using *PowerSuite*, you can configure which circumstances (monitors in alarm) the DC power system has to encounter for the system to be in *critical condition*.

Crossover Cable

An Ethernet crossover cable is a type of Ethernet cable used to connect computing devices together directly where they would normally be connected via a network switch, hub or router, such as directly connecting two personal computers via their network adapters.

The 10BASE-T and 100BASE-TX Ethernet standards use one wire pair for transmission in each direction. The Tx+ line from each device connects to the tip conductor, and the Tx- line is connected to the ring. This requires that the transmit pair of each device be connected to the receive pair of the device on the other end. When a terminal device is connected to a switch or hub, this crossover is done internally in the switch or hub. A standard straight through cable is used for this purpose where each pin of the connector on one end is connected to the corresponding pin on the other connector.

Current-limiting chargers

A charger that keeps the charge current constant during the charge process but allows the voltage to fluctuate.

Cycle life

The number of cycles a battery provides before it is no longer usable. (A battery is considered non-usable if its nominal capacity falls below 60 to 80 percent).

DC

Direct Current

DC Power Supply Systems

Eltek Valere's modern ranges of DC power supply systems using the *Smartpack* or the *Compack* as system controllers.

The ***Smartpack*-based systems** use the *Smartpack* controller and *Flatpack2* rectifiers or *Powerpack* three-phase rectifier modules as their building blocks.

In addition to these modules, a system incorporates AC distribution for the rectifier inputs and DC distribution, batteries, LVD options, etc.

The ***Compack*-based systems** use the *Compack* controller, *Micropack* rectifiers and Battery and Load Distribution modules as their building blocks.

All the *Micropack* building blocks are designed for DIN rail mounting.

DC Power System

See DC Power Supply Systems

DC Power Systems

See DC Power Supply Systems

Delta Voltage

Delta voltage is an absolute calculated value that represents how well balanced the battery blocks that form a string are. PowerSuite uses this expression when calculating battery symmetry.

Delta voltage (Vdelta) is the difference between the calculated and the measured voltages, e.g. (Vbattery / 2) - Vmeasured = | Vdelta |

A Delta voltage of 0V indicates a completely balanced battery string.

DHCP

Dynamic Host Configuration Protocol (DHCP) is a network application protocol used by devices (DHCP clients) to obtain configuration information for operation in an Internet Protocol network. This protocol reduces system administration workload, allowing devices to be added to the network with little or no manual intervention.

Drop-down List

In standard Windows interface, a drop-down list in a dialogue box is a field containing a down-arrow button at the field's right side, which displays a list of text strings or numeric values that the user may select from.

When the list is up, the field displays the selected value.

Do following to select values form the drop-down list:

1. **Click on the down-arrow button**, to display the list with available values
2. If the list is longer than displayed, **click on the list's scroll bar buttons** (up or down buttons) to find the value you want to select
3. **Click on the value you want to select**.
   The drop-down list disappears and the selected value is displayed

Accepting or Rejecting Entered Data

In standard dialog boxes, clicking on the **Apply** or the **OK buttons** will activate the parameters and data you entered or selected in the box's fields.

Clicking on the **Cancel button** or the **Close button** – the cross, in the dialog box's title bar – will close the dialog box, and all parameters and data you may have selected in the box's fields will be rejected.

Drop-down Lists

See Drop-down List

Eltek Valere

Eltek Valere is a global corporation that secures worldwide communication by providing critical power solutions for telecom infrastructure. The company is the result of the acquisition of Valere Power by Eltek Energy.

Eltek Valere Network Utility

Simple Windows-based utility program (EVIPSetup.exe) that needs no software installation

It is used to display the *Smartpack* and *Compack* controller's network parameters, when connected to an Ethernet LAN.

Also, it enables changing the controller's IP address, configuring the controller via a standard Web browser and upgrading the controller's firmware.

End-of-Discharge Voltage

The voltage point to which a battery can be discharged is a function of the discharge rate. The Recommended End-Voltage Point (REVP) is the voltage at which a battery should be disconnected from the load.
Discharging the battery below the REVP, or leaving the battery connected to a load in a discharged state will "over-discharge" the battery, and may impair its ability to accept charge.

Energy

Voltage multiplied by current expressed in watts.

Equalizing Charge

With time, the charge levels of individual cells of a large battery tend to become slightly unbalanced. The equalizing charge applies an elevated charge voltage for a few hours to balance the cells. Used mainly for large lead acid cells.

Ethernet

Local Area Network technology. Ethernet provides data transfer using a baseband (single-channel) communication technique. Ethernet uses carrier sense multiple access collision detection (CSMA/CD) that prevents network failures when two devices attempt to access the network at the same time. A 10/100 Ethernet port supports 10BASE-T and 100BASE-TX.

See also Ethernet, more…

Ethernet, more…

Ethernet is a large, diverse family of frame-based computer networking technologies that operates at many speeds for local area networks (LANs).

It defines a number of wiring and signaling standards for the physical layer, through means of network access at the Media Access Control (MAC)/Data Link Layer, and a common addressing format.

Ethernet has been standardized as IEEE 802.3. The combination of the twisted pair versions of Ethernet for connecting end systems to the network with the fiber optic versions for site backbones become the most widespread wired LAN technology in use from the 1990s to the present, largely replacing competing LAN standards such as coaxial cable Ethernet, token ring, FDDI, and ARCNET.

In recent years, Wi-Fi, the wireless LAN standardized by IEEE 802.11, has been used instead of Ethernet for many home and small office networks and in addition to Ethernet in larger installations.

Event

See Events

Events

In *Eltek Valere* DC power systems, events are system internal actions used in *PowerSuite* alarm monitors.

Alarm monitors measure system internal and external input signals or logical states, and compare the measured parameter with pre-programmed values or limits. The alarm monitors raise an alarm **in the event of the measured parameter reaching one of the limits**.

EVIPSetup.exe

See Eltek Valere Network Utility Program

Firmware

Firmware is software stored permanently on ROM or PROM chips. It can also be electrically erased and reprogrammed (flashed) when stored in EEPROM chips.

Flatpack

Eltek Valere's range of DC power supply systems, using the *MCU* controller and *Flatpack* rectifiers as their building blocks. Though the range has been installed worldwide in a variety of system solutions, and it is now replaced by the compact *Flatpack2* range.

Flatpack2

Eltek Valere's modern range of DC power supply systems, using the *Smartpack* controller and *Flatpack2* rectifiers as their building blocks. The range covers integrated, cabinetized and outdoor system solutions.

Float charge

Similar to trickle charge. Compensates for the self-discharge on a lead acid battery.

Float Mode

Float Mode is one of the PowerSuite's operation modes, where the rectifiers charge the batteries enough to compensate for self-discharging.

FTP Server

Trivial File Transfer Protocol Server (TFTP). A host to provide services according to TFTP; a TCP/IP standard protocol for file transfer with minimal capability and overhead depending on UDP for ts datagram delivery service.

GUI

Pronounced GOO-ee. Acronym for graphical user interface. A program interface that takes advantage of the computer's graphics capabilities to make the program

easier to use. Well-designed graphical user interfaces can free the user from learning complex command languages. On the other hand, many users find that they work more effectively with a command-driven interface, especially if they already know the command language.

HTTP

Hypertext Transfer Protocol (HTTP) is a communications protocol for the transfer of information on intranets and the World Wide Web. Its original purpose was to provide a way to publish and retrieve hypertext pages over the Internet.

HUB

A common connection point for devices in a network. Hubs are commonly used to connect segments of a LAN. A hub contains multiple ports. When a packet arrives at one port, it is copied to the other ports so that all segments of the LAN can see all packets.

I/O

Short for Input /Output. The term I/O is used to describe any program, operation or device that transfers data to or from a computer and to or from a peripheral device. Every transfer is an output from one device and an input into another.

InstallShield Wizard

A graphical screen interface that guides you through the steps required to install a Windows based software application, such as PowerSuite.

InstallShield for Windows Installer by InstallShield Software Corporation.

The InstallShield Software Corporation creates products that distribute and manage digital content by using packaged applications.

IP Address

The Internet Protocol Address

IP version 4 addresses (IPv4) uses 32-bit (4-byte) addresses, which limits the address space to 4,294,967,296 possible unique addresses. However, IPv4 reserves some addresses for special purposes such as private networks (~18 million addresses) or multicast addresses (~270 million addresses).

IPv4 addresses are usually represented in dot-decimal notation (four numbers, each ranging from 0 to 255, separated by dots, e.g. 208.77.188.166). Each part represents 8 bits of the address, and is therefore called an octet.

LAN

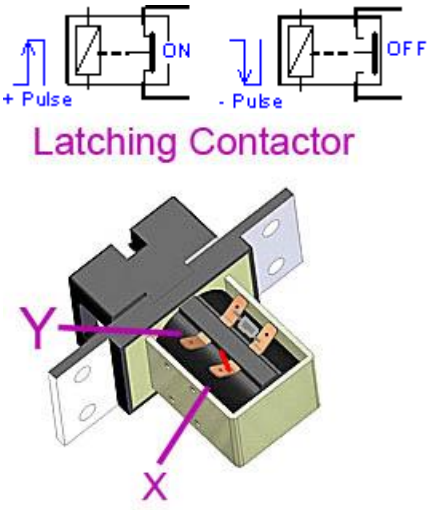
Local Area Network

A local area network is a computer network covering a small physical area, like a home, office, or small group of buildings, such as a school, or an airport. Current LANs are most likely to be based on Ethernet technology.

Latching Contactor

Magnetically latching contactor

The coil of latching contactors is not energized in any state. They change state from open to close, or vice versa, when a reversed pulse voltage is applied to its coil.



Latching Contactors

See Latching Contactor

Local Area Network

A local area network is a computer network covering a small geographic area, like a home, office, or group of buildings.

Current LANs are most likely to be based on switched IEEE 802.3 Ethernet technology, running at 10, 100 or 1,000 Mbit/s, or on IEEE 802.11 Wi-Fi technology.

Each node or computer in the LAN has its own computing power but it can also access other devices on the LAN subject to the permissions it has been allowed. These could include data, processing power, and the ability to communicate or chat with other users in the network.

LVBD

Low Voltage Battery Disconnect contactor

System internal latching contactor that disconnects the battery bank from the load, when a certain voltage limit is reached or other battery critical events occur.

LVD

Low Voltage Disconnect contactor

System internal latching contactor that disconnects the batteries from the load or the output power from non-priority load, when a certain voltage limit is reached or a certain event occurs.

LVLD

Low Voltage Load Disconnect contactor

System internal latching contactor that disconnects the output power from non-priority load, when a certain voltage limit is reached or the mains input fails or other events occur.

MAC Address

Media Access Control Address

Every Ethernet network card has a unique 48-bit serial number called a MAC address, which is stored in ROM carried on the card. Every computer on an Ethernet network must have a card with a unique MAC address. Normally it is safe to assume that no two network cards will share the same address, because card vendors purchase blocks of addresses from the Institute of Electrical and Electronics Engineers (IEEE) and assign a unique address to each card at the time of manufacture.

MCB

Miniature Circuit Breaker

MIB

Management Information Base, a database of objects that can be monitored by a network management system. SNMP uses standardized MIB formats that allows any SNMP tools to monitor any device defined by a MIB

Micropack

Eltek Valere's modern range of DC power supply systems using the *Compack* controller, *Micropack* rectifiers, Battery Distribution Base and Load Distribution Bases as their building blocks. All units are designed for DIN rail mounting.

The range covers low power solutions in telecom and industrial applications.

Mini Hub

A common connection point for devices in a network. Hubs are commonly used to connect segments of a LAN. A hub contains multiple ports. When a packet arrives at one port, it is copied to the other ports so that all segments of the LAN can see all packets

Modem

A modem (from **mo**dulate and **dem**odulate) is a device that modulates an analog carrier signal to encode digital information, and also demodulates such a carrier signal to decode the transmitted information.

NC-C-NO

Acronym for Normally Closed, Common and Normally Open. The expression refers to the position of 3 relay contacts, when the relay coil is de-energized. When the relay coil is energized, the NC-C contacts open, and the C-NO contacts close.

Negative DC Distribution

It is usually implemented in 48V and 60V DC power supply systems, which have the **DC distribution on the negative output** (-48VDC or -60VDC), and the positive on a Common Positive DC Output Rail (0V).

NIC

Network Interface Controller.

A network card, network adapter, network interface controller, network interface card, or LAN adapter is a computer hardware component designed to allow computers to communicate over a computer network. It is both an OSI layer 1 (physical layer) and layer 2 (data link layer) device, as it provides physical access to a networking medium and provides a low-level addressing system through the use of MAC addresses. It allows users to connect to each other either by using cables or wirelessly.

NMS

Network Management Station -An SNMP Manager application which interfaces with the SNMP Agent and provides communication capabilities through standard SNMP messaging commands (SET, GET). The NMS also serves to collect SNMP TRAP events.

A Network Management System (NMS) is a combination of hardware and software used to monitor and administer a network.

NO-C-NC

Acronym for Normally Open, Common and Normally Closed. The expression refers to the position of 3 relay contacts, when the relay coil is de-energized. When the relay coil is energized, the NO-C contacts close, and the C-NC contacts open.

Nominal voltage

The cell voltage that is accepted as an industrial standard.

Non-Priority Load

Telecom equipment or similar supplied from the DC power system's load output circuits. The equipment's continuous operation is NOT essential, and has low backup priority during Mains outages.

Generally, the DC power system temporally stops supplying this equipment during a system critical condition, or when the equipment's backup leasing time has expired.

Normal Condition

A DC power system's state when no serious circumstances occur. Usually, the DC power supply system is in *normal condition* when no critical condition occurs.

Normal State

The state of a voltage output or the position of alarm relay contacts when the output is in normal condition (not activated).

Overcharge

Charging a battery after it reaches full charge. On overcharge, the battery can no longer absorb charge and the battery heats up.

OVP

Over Voltage Protection

OVS

Over Voltage Shutdown

When the output voltage of a malfunctioning rectifier reaches a certain limit, the system automatically shuts down to prevent damages.

pComm

RS232 serial protocol used by Eltek Valere's controllers for communication with computers, modems, WebPower adapters and other equipment.

Pop-up

A window that suddenly appears (pops up) when you select an option with a mouse or press a special function key. Usually, the pop-up window contains a menu of commands and stays on the screen only until you select one of the commands. It then disappears. A special kind of pop-up window is a pull-down menu, which appears just below the item you selected, as if you had pulled it down.

Positive DC Distribution

It is usually implemented in 24V DC power supply systems, which have the **DC distribution on the positive output** (24VDC), and the negative on a Common Negative DC Output Rail (0V).

Powerpack

Eltek Valere's modern range of large three-phase DC power supply systems, using the *Smartpack* controller and *Powerpack* three-phase rectifier modules as their building blocks.

PowerSuite

PC application used to configure and operate *Micropack, Minipack, Flatpack2* and *Powerpack* DC power supply systems. The program is to be run on computers using the MS Windows operating systems.

Priority Load

Very important telecom equipment or similar supplied from the DC power system's load output circuits. The equipment's continuous operation is essential and has high backup priority during Mains outages.

PSS

Power Supply System

REVP

Recommended End-Voltage Point. Read also “End-of-Discharge Voltage”

RJ-45

Short for Registered Jack-45, an eight-wire connector used commonly to connect computers onto local area networks (LAN), especially Ethernets. RJ-45 connectors look similar to the ubiquitous RJ-11 connectors used for connecting telephone equipment, but they are somewhat wider.

RS232

Serial communication bus or communication port

RS485

Serial communication bus or communication port

Shunt

A current shunt is usually a resistor of accurately-known very small resistance that allows the measurement of current values too large to be directly measured by a particular ammeter.

The current shunt is placed in series with the load, so that nearly all of the current to be measured will flow through it. The voltage drop across the shunt is proportional to the current flowing through it, and since its resistance is known, a millivolt meter connected across the shunt can be scaled to directly read the current value.

Shunts are rated by maximum current and voltage drop at that current, for example, a 500A/75mV shunt would have a resistance of 0.15 milliohms, a maximum allowable current of 500 amps and at that current the voltage drop would be 75 millivolts.

By convention, most shunts are designed to drop 75mV when operating at their full rated current and most "ammeters" are actually designed as voltmeters that reach full-scale deflection at 75mV.

Smartpack

A versatile microprocessor based controller for monitoring *Minipack, Flatpack2* and *Powerpack* DC power supply systems in a network.

SNMP

Simple Network Management Protocol, a set of protocols for managing complex networks. The first versions of SNMP were developed in the early 80s. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters.

SNMP Agent

An SNMP-compliant device that stores data about itself in Management Information Bases (MIBs) and return this data to the SNMP requesters.

Software

Software are programs for directing the operation of computers, microprocessors, controllers, etc. or for processing electronic data.

TCP/IP

Transmission Control Protocol/Internet Protocol

A protocol suite used by more than 15 million users with a UNIX association and widely used to link computers of different kinds.

The Internet Protocol Suite (commonly known as TCP/IP) is the set of communications protocols used for the Internet and other similar networks. It is named from two of the most important protocols in it: the Transmission Control Protocol (TCP) and the Internet Protocol (IP), which were the first two networking protocols defined in this standard.

Test Mode

Test Mode is one of the PowerSuite's operation modes, where the system controller is performing a specific preprogrammed test of the battery bank.

The Cycle

A process consisting of a single charge and discharge of a rechargeable battery.

Trickle charge

Maintenance charge to compensate for the battery's self-discharge.

Tunnelling Protocol

The term tunnelling protocol is used to describe when one network protocol called the payload protocol is encapsulated within a different delivery protocol.

UDP

The User Datagram Protocol (UDP) is one of the core members of the Internet Protocol Suite, the set of network protocols used for the Internet. With UDP, computer applications can send messages, sometimes known as datagrams, to other hosts on an Internet Protocol (IP) network without requiring prior communications to set up special transmission channels or data paths. UDP is sometimes called the Universal Datagram Protocol.

URL

URL is an abbreviation of Uniform Resource Locator, the global address of documents and other resources on the World Wide Web.

The first part of the address is called a protocol identifier (ftp, http, etc.) and it indicates what protocol to use. The second part is called a resource name and it specifies the IP address or the domain name where the resource is located. The protocol identifier and the resource name are separated by a colon and two forward slashes. For example: ftp://sw.eltekenergy.com/powersuite.exe and http://www.eltekvalere.com/index.html

USB

Universal Serial Bus is a serial bus standard to interface devices to a host computer. USB was designed to allow many peripherals to be connected using a single standardized interface socket and to improve plug and play capabilities by allowing hot swapping, that is, by allowing devices to be connected and disconnected without rebooting the computer or turning off the device. Other convenient features include providing power to low-consumption devices without the need for an external power supply and allowing many devices to be used without requiring manufacturer specific, individual device drivers to be installed.

VPN

A virtual private network (VPN) is a computer network in which some of the links between nodes are carried by open connections or virtual circuits in some larger network (e.g., the Internet) as opposed to running across a single private network. The link-layer protocols of the virtual network are said to be tunnelled through the larger network. One common application is secure communications through the public Internet, but a VPN need not have explicit security features, such as authentication or content encryption. VPNs, for example, can be used to separate the traffic of different user communities over an underlying network with strong security features.

WAN

Wide Area Network is a computer network that covers a broad area (i.e., any network whose communications links cross metropolitan, regional, or national boundaries [1]). Less formally, a WAN is a network that uses routers and public communications links [1]. Contrast with personal area networks (PANs), local area networks (LANs), campus area networks (CANs), or metropolitan area networks (MANs) are usually limited to a room, building, campus or specific metropolitan area (e.g., a city) respectively. The largest and most well-known example of a WAN is the Internet.

WebPower

A common name for the firmware installed in *Eltek Valere*'s controllers -- *Compack* and *Smartpack*, web option – and in the external *WebPower* adapter module. The firmware provides a communication protocol translator, a physical layer conversion and Web server software.

WebPower translates the controller's internal protocol into the HTTP protocol over TCP/IP, used to communicate in an Ethernet network, LAN, WAN, VPN or even across the Internet.

The *WebPower* firmware provides a platform-independent graphical user interface (GUI), employed to configure and operate *Micropack*, *Minipack*, *Flatpack2* and *Powerpack* DC power supply systems using a standard Web browser.

In addition, *WebPower* provides an SNMP Agent, allowing *Eltek Valere* DC power systems to be interoperable with SNMP enterprise management solutions, which are commonly in use within the Telecommunications industry.

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Welcome to FWLoader 2

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