

Technical Information Manual

Revision n. 4
14 October 2003

*OPC SERVER
FOR CAEN
POWER SUPPLIES
Release 2.X*

**NPO:
00100/00:1527M.MUT_x/04**

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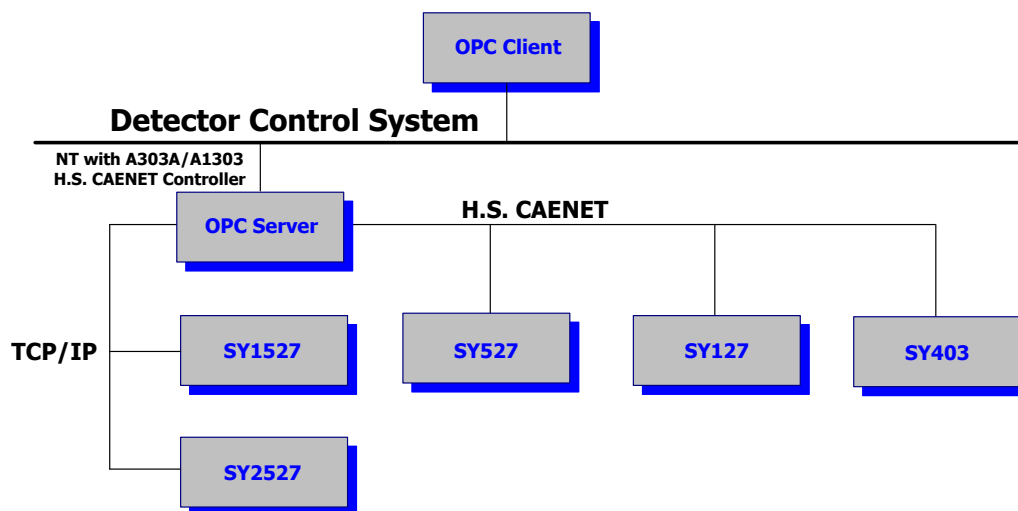
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1. Introduction

1.1. Overview

CAEN has taken a new step forward in power supplies' ease of use and integration into Detector Control Systems (DCS). A newly released suite of applications guarantees CAEN power supplies' interoperability between virtually all available computing environments and communication protocols (TCP/IP, CANbus...).

In the latest years OPC (OLE for Process Control) has clearly emerged as one of the most popular standards in the world of industry automation. OPC is an open interface based on the OLE/COM (now ActiveX) and DCOM technology; OPC offers "Plug&Play" connectivity between disparate hardware devices. The introduction of the OPC interface has caused the number of driver developments which hardware manufacturers implement for their components to be reduced to only one: *the OPC server*. On the other hand, OPC client applications (from any vendor) can communicate with the OPC server to exchange data in a standard way. Each device property is accessed via an *OPC item*. An OPC server creates OPC items on behalf of an OPC client. The client's OPC items are organised in *OPC groups* with a hierarchical structure.



CAEN, in close collaboration with CERN (IT/CO group), has developed an OPC server which allows powerful, flexible, and yet simple control of its power supply systems, indifferently through TCP/IP or H.S. CAENET communication path, by any OPC compliant client application.

Version 2.4 of CAEN HV OPC Server which has been now released is fully compliant with the OPC Data Access 2.0 specifications; this version provides:

- CAEN SY 1527/SY 2527, SY 527, SY 127, SY 403, N 470, N 570 and N 568/N 568B N 568LC control
- TCP/IP or H.S. CAENET communication path

- DCOM based interface for local/remote OPC server configuration

1.2. References

The following documents and links may be helpful:

- [1] OPC overview, version 1.0, 27 October 1998 (available from the OPC Foundation)
- [2] OPC common definitions and interfaces, version 1.0, 27 October 1998 (available from the OPC Foundation)
- [3] OPC data access custom interface standard, version 2.0, 14 October 1998 (available from the OPC Foundation)
- [4] Results of the OPC evaluation done within JCOP for the control of the LHC experiments, R. Barillère et al. (available from CERN JCOP group)
- [5] The Joint COntrols Project (JCOP) <http://itcowww.cern.ch/jcop/>
- [6] The OPC Foundation <http://www.opcfoundation.org>
- [7] SY1527 Universal Power Supply System User Manual (available at www.caen.it)
- [8] A303A H.S. CAENET Controller User Manual (available at www.caen.it)
- [9] SY1527 Universal Power Supply System User Manual (available at www.caen.it)
- [10] SY527 Universal Power Supply System User Manual (available at www.caen.it)
- [11] SY127 Universal Power Supply System User Manual (available at www.caen.it)
- [12] A128HS SY127 H.S. CAENET Controller User Manual (available at www.caen.it)
- [13] OPC servers validation tests, IT-CO-FE (available from CERN JCOP group)
- [14] SY403 Universal Power Supply System User Manual (available at www.caen.it)
- [15] N470 Programmable Power Supply User Manual (available at www.caen.it)
- [16] N570 Programmable Power Supply User Manual (available at www.caen.it)
- [17] A1303 H.S. CAENET Controller User Manual (available at www.caen.it)
- [18] N568 16 Ch Spectroscopy Amplifier User Manual (available at www.caen.it)
- [19] N568 B/LC 16 Ch Spectroscopy Amplifier User Manual (available at www.caen.it)
- [20] ITCOFE: OPC Support <http://itcofe.web.cern.ch/itcofe/Services/OPC/welcome.html>

1.3. Support

Our Software Support Group is available for questions, support and any other software related issue concerning CAEN Power Supplies; for software support visit the page <http://www.caen.it/computing/support.php>

Moreover, a newsletter on CAEN Software issues (CAEN SOFTWARE NEWS) will be periodically sent via e-mail to all subscribers to our mailing list. For subscription to the free newsletter send an e-mail to support.computing@caen.it.

2. Installation and configuration

2.1. Installation requirements

- Network Interface Card + TCP/IP protocol (to control SY 1527/ SY 2527)
- A303A/A1303 H.S. CAENET Controller Card (to control SY 527, SY 127, SY 403, N 470, N 570, N 568 and N 568 B/LC)
- A128HS SY127 H.S. CAENET Controller installed on SY 127
- SY 1527/ SY 2527 firmware version 1.10.0 or later (recommended 1.12.02)
- SY 403 firmware version 1.45 or later (recommended 1.46)
- SY 527 firmware version 4.03 or later
- Windows 2000 (A1303 only), Windows NT 4.0 + SP3

2.2. Install the OPC server

Unzip the CAENHVOPCServer_2.x.zip file and then launch setup.exe; this will install all the OPC server (version 2.x) components on your local machine. If H.S. CAENET control is needed, to talk with SY 127 and SY 527 systems, it's necessary to install the A1303/A303A card drivers (see [8] and [17] for further details).

The OPC server will be configured as a Windows NT/2000 service.

2.3. OPC server configuration interface

The software release 2.X has a new user interface, based on DCOM technology, which allows remote configuration of the OPC server. A sample configuration program is provided (OPC Server Configurator) but a custom configuration tool can be easily developed via VB/VBA/VBScript.

2.3.1. The OPC server configuration file

With release 1.X, if the OPC server would start before the power supply system is operational, it might be unable to create OPC groups and items (see § 3 "Server address space description"). To overcome this problem, release 2.X provides a configuration file which allows to create OPC groups and items irrespectively of the availability of the power supply system or boards. The configuration file allows to restart a power supply system when the OPC server is running as well.

A configuration file example for a generic power supply system is illustrated in Fig. 2.1. The character ";" indicates a comment; the file is subdivided into [Chassis], [BoardXX] and [ChanYYY] entries.

The [Chassis] entries are system items (*CnetCrNum*, *SwRelease*, *Slots* in our example, for a complete list of system items see § 4.1, 5.1, 6.1) or BoardXX branches (*Board00*, *Board01*, *Board02* in our example).

The [BoardXX] entries are board items (for a complete list of system items see § 4.2, 5.2, 6.2); for each BoardXX branch, the relevant [BoardXX] entries must be listed into the file (*SerNum* for [Board00], *Temp* for [Board01], *NrOfCh* and *Model* for [Board02] in our example). The [ChanYYY] entries are channel items (for a list of channel items see § 4.3, 5.3, 6.3 or refer to the board User Manual). Below the [BoardXX] entries (and before the [BoardXX+1] entries), the relevant [ChanYYY] entries (items of channelYYY of boardXX) must be listed (*V0Set* and *Pw* for [Chan000] of [Board00], *VMon* and *Pw* of [Chan010] of [Board00] in our example).

If a client tries to connect to the OPC server and the power supply system is not operational (or power supply boards are missing) only the items listed in the configuration file will be present in the server address space (see § 3), marked by a “bad” quality flag. When the power supply boards are successfully started, the server address space is extended to include all the board and channel items that are not already listed in the configuration file.

```
; CAEN SpA - Computing Division
;
;
; CAEN HV OPC Server Configuration file
;
;
[Chassis]
CnetCrNum
SwRelease
Slots
Board00
Board01
Board02

[Board00]
SerNum

[Chan000]
V0Set
Pw

[Chan010]
VMon
Pw

[Board01]
Temp

[Board02]
NrOfCh
Model

[Chan000]
V0Set
VMon
Pw
```

Fig. 2.1: Configuration file example

2.3.2. CAEN OPC server configurator tool

2.3.2.1. Installation

Unzip the OPCServerConf_1.1.0.zip file and then launch setup.exe; this will install the CAEN HV OPC Server Configurator (version 1.1) components on your local machine.

2.3.2.2. OPC Server configuration

From Start/Programs/CAEN run CAEN HV OPC Server Configurator, the following window will be displayed; select the server location (**Local/Remote**) and, if the server is resident in a remote machine, specify the **Machine Name** on your network.

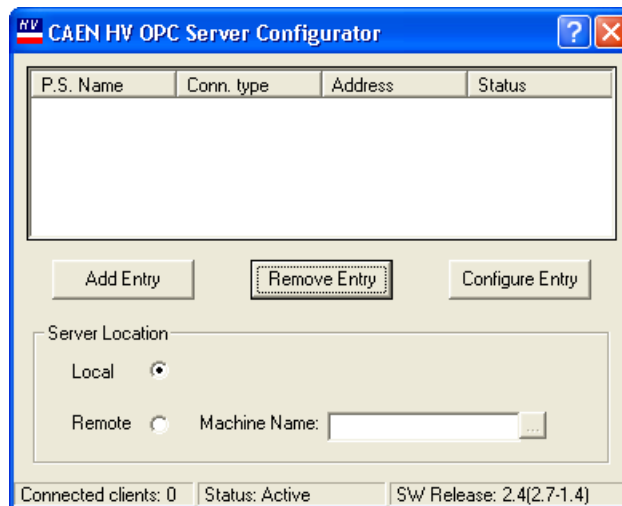


Fig. 2-2: CAEN HV OPC Server Configurator start up window

Click on the **Add Entry** button, the following window will be displayed.

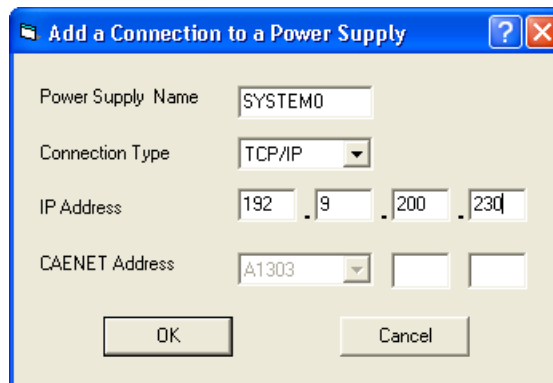


Fig. 2-3: TCP/IP connection parameters

Once entered the *Power Supply Name* in the relevant field, the *Connection Type* (TCP/IP or CAENET) must be selected; if TCP/IP is selected, then the *IP Address* must be entered; if the connection takes place via CAENET, then the *CAENET Address* must be entered, with the following syntax:

A303A: [A303A][BaseAddress][CAENETCrateNumber]

A1303: [A1303][BoardNumber][CAENETCrateNumber]

N.B.: The **CAENETCrateNumber** parameter must be entered in hexadecimal digits.

Example 1) (TCP/IP):

SYSTEM0
TCP/IP
[192][9][200][230]

Example 2) (CAENET/A303A):

SYSTEM0
CAENET
[A303A][180][2]

Example 3) (CAENET/A1303):

SYSTEM0
CAENET
[A1303][0][1]

then click on the OK button, the following window will be displayed. Possible values for Status are: Ko, Ok or Pending. The Status is Pending immediately after adding a new Entry, until the OPC Server has connected to the Power Supply, then it becomes either Ok or Ko, depending whether the connection is successful or faulty.

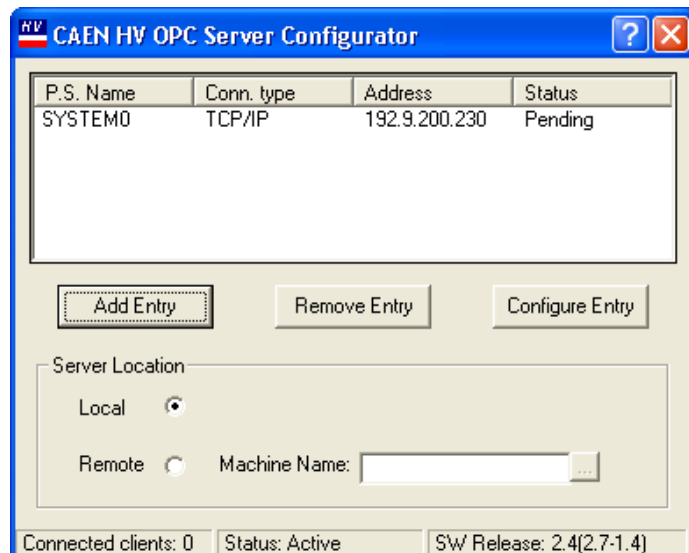


Fig. 2-4: Configuring an Entry

Select a P.S. name and click on the **Configure Entry** button to open the relevant Configuration File (see window below); insert all desired system, board and channel items (cfr. § 3 "Server address space description") and then, from the **File** menu, select **Send to Server** (optionally it is possible to save a local copy of the Configuration file).

To configure another power supply system, simply click on the **Add Entry** button and repeat the steps described above.

3. Server address space description

3.1. OPC groups and items

The OPC groups provide a way for clients to organise the data they want to access to; within each group, the OPC items represent connections to data sources; several data types are supported: boolean, integer, string, The server address space has a tree-like structure which will be described in detail in the next chapter; OPC clients can browse the available data items in the server like illustrated in the figure below.

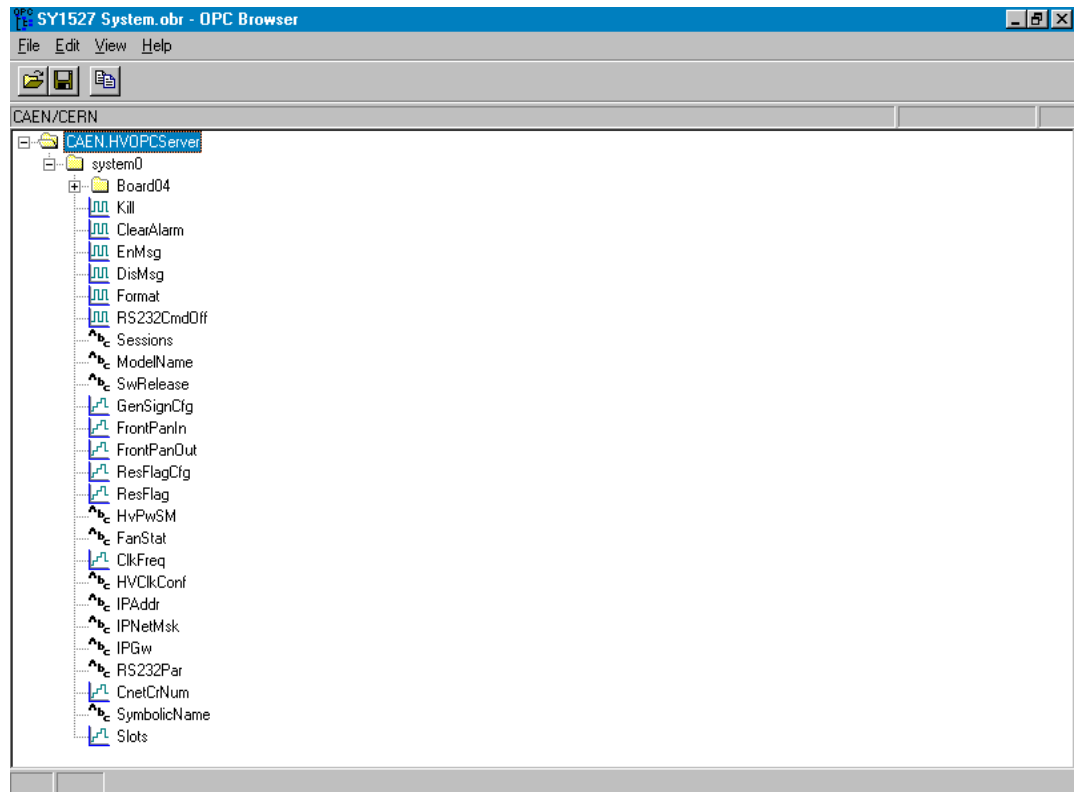


Fig. 3-1: Browsing the server address space

3.2. Data access mechanism

Four communication mechanisms have been defined for data access: synchronous and asynchronous read/write, refresh and subscription; the client defines the update rate at which the items' values will be refreshed by the server. When a client subscribes to a list of Items, the server notifies it if any data change occurs. The client can optionally specify a band of tolerance (or deadband) so that it is not notified by the server if the changes are within a fixed percentage of the data range.

3.3. Items' properties

Associated with each Item there is a set of Specific properties: Canonical Data Type, Value, Quality Flag (Good/Bad), Time Stamp, Access Rights, Server Scan Rate. The Time Stamp indicates the time the Value and the Quality was obtained from the device. With OPC Data Access 2.0 a second set of Recommended properties has been released: the CAEN OPC Server provides Engineering Units (EU), High EU (the highest value that can be returned from the device for analog data), Low EU (the lowest value that can be returned from the device for analog data) and the Contact Close/Open Labels (CLOSE/OPEN strings associated with boolean values).

Each item is fully identified in the server address space during data access by an ItemID; the ItemID has the following general syntax:

PowerSupplyName.BoardXX.ChanYYY.ItemName

Items of the kind *PowerSupplyName.ItemName* are associated with general system parameters.

Items of the kind *PowerSupplyName.BoardXX.ItemName* are associated with boards' parameters.

Items of the kind *PowerSupplyName.BoardXX.ChanYYY.ItemName* are associated with channels' parameters.

4. SY 1527 / SY 2527 Power Supply System

This chapter describes the OPC Items which are available for the SY 1527 / SY 2527 system control.

4.1. SY 1527 / SY 2527 System control

OPC Items available for general system control are fully listed in table 4.1. For a detailed description of the SY 1527 / SY 2527 system operation, refer to [7].

A write access to the **Kill** Item (Value = 1) allows to switch OFF at the max rate all system channels; see [7], § 7.1.15, for further details.

A write access to the **Clear Alarm** Item (Value = 1) allows to clear channels' alarm messages; see [7], § 7.1.16, for further details.

A write access to the **Format** Item (Value = 1) causes the Format command to be executed ; see [7], § 7.1.19, for further details.

A read access to the **Sessions** Item returns a string with the list of Users connected to the system, their access level, communication line and access time; see [7], § 7.1.8, for further details.

A read access to the **ModelName** Item returns a string indicating the system model (SY1527, SY2527, ...).

A read access to the **SwRelease** Item returns a string indicating the system firmware release (1.10.00 or later).

The **GenSignCfg** Item allows to configure the GEN signal by writing an 8 bit pattern as follows:

- Bit 0: GEN enable
- Bit 1: GEN always ON
- Bit 2: GEN ON due to OvV (Over Voltage)
- Bit 3: GEN ON due to OvC (Over Current)
- Bit 4: GEN ON due to UnV (Under Voltage)
- Bit 5: GEN ON due to TRIP
- Bit 6÷7: Don't care (=0)

see [7], § 7.1.17, for further details.

A read access to the **FrontPanIn** Item returns a 16 bit patterns indicating the system inputs and switches status, as follows:

Bit 0: Vsel, 0=V0 1=V1
Bit 1: Isel, 0=I0 1=I1
Bit 2: Kill
Bit 3: Interlock
Bit 4: Remote Enable
Bit 5: Local Enable
Bit 6: TTL/NIM, 0=TTL 1=NIM
Bit 7÷15: Don't care (=0)

A read access to the **FrontPanOut** Item returns a 16 bit patterns indicating the system outputs status, as follows:

Bit 0: OVC
Bit 1: UNV
Bit 2: OVV
Bit 3: CHON
Bit 4÷7: Don't care (=0)
Bit 8: Fan failure
Bit 9: OVT
Bit 10÷15: Don't care (=0)

A read access to the **HvPwSM** Item returns a string with the power supply module status, like follows: "ACstatus:Primary:Add 0:Add 1:Add 2 ". If:

ACstatus = -1 ⇒ FAIL
ACstatus = 1 ⇒ GOOD
Primary = -1 ⇒ Primary supply module FAIL
Primary = 1 ⇒ Primary supply module GOOD
Add X = -1 ⇒ Add on supply module nr. X FAIL
Add X = 0 ⇒ Add on supply module nr. X NOT PRESENT
Add X = 1 ⇒ Add on supply module nr. X GOOD

A read access to the **FanStat** Item returns a string with the 6 fans (3 for the SY 2527) status and speed, like follows: "status:speed: status:speed: ... status:speed". If:

status = -1 ⇒ FAIL
status = 1 ⇒ GOOD

The speed parameter is expressed in rpm.

A read access to the **ClkFreq** Item returns an integer indicating the clock frequency as follows:

ClkFreq = -1 ⇒ FAIL
ClkFreq = 0 ⇒ 50 Hz
ClkFreq = 1 ⇒ 60 Hz
ClkFreq = 2 ⇒ 400 Hz

A read access to the **HVCIkConf** Item returns a string with the clock configuration like "clock:status", where if:

Clock = 1 ⇒ MASTER
Clock = 0 ⇒ SLAVE
Status = -1 ⇒ FAIL
Status = 0 ⇒ NOT PRESENT
Status = +1 ⇒ GOOD

see [7], § 7.1.27, for further details.

The **IPaddress** item allows to specify the system IP address (for example 192.9.200.48); see [7], § 6.2.1, for further details.

The **IPNetMsk** item allows to specify the system IP net mask (for example 255.255.255.0); see [7], § 6.2, for further details.

The **IPGw** item allows to specify the system IP gateway (for example 0.0.0.0); see [7], § 6.2, for further details.

The **RS232Par** item allows to configure the RS232 parameters (for example 115200:8:1:N:XON/XOFF); see [7], § 6.1, for further details.

The **CnetCrNum** item allows to specify the CAENET crate number; see [7], § 6.3, for further details.

The **SymbolicName** Item allows to assign to the system a symbolic name.

A read access to the **Slots** Item returns the number of system's slots.

Table 4.1 – SY 1527/ SY 2527 System Items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.Kill	Boolean	W	Kill all channels
PowerSupplyName.ClearAlarm	Boolean	W	Clear alarm
PowerSupplyName.EnMsg	Boolean	W	To be implemented
PowerSupplyName.DisMsg	Boolean	W	To be implemented
PowerSupplyName.Format	Boolean	W	Execute Format command
PowerSupplyName.RS232CmdOff	Boolean	W	To be implemented
PowerSupplyName.Sessions	String	R	List Users connected to the system
PowerSupplyName.ModelName	String	R	System name
PowerSupplyName.SwRelease	String	R	System firmware release
PowerSupplyName.GenSignCfg	2-byte integer	R/W	GEN signal configuration
PowerSupplyName.FrontPanIn	2-byte integer	R	System input status
PowerSupplyName.FrontPanOut	2-byte integer	R	System output status
PowerSupplyName.ResFlagCfg	2-byte integer	R/W	To be implemented
PowerSupplyName.ResFlag	2-byte integer	R	To be implemented
PowerSupplyName.HvPwSM	String	R	Power supply modules status
PowerSupplyName.FanStat	String	R	Fan status
PowerSupplyName.ClkFreq	2-byte integer	R	Clock frequency
PowerSupplyName.HVClkConf	String	R	Clock configuration
PowerSupplyName.IPAddr	String	R/W	System IP address
PowerSupplyName.IPNetMsk	String	R/W	System IP net mask
PowerSupplyName.IPGw	String	R/W	System IP gateway
PowerSupplyName.RS232Par	String	R/W	RS232 parameters
PowerSupplyName.CnetCrNum	2-byte integer	R/W	CAENET crate number
PowerSupplyName.SymbolicName	String	R/W	System symbolic name
PowerSupplyName.Slots	2-byte integer	R	Slots number

4.2. SY 1527 / SY 2527 Board control

This chapter describes the Items which are available for the control of a generic SY 1527 / SY 2527 system board (for example the Mod. A 1832N). The list of Items may differ for some custom boards (refer to the board's manual for further details).

A read access to the **Model** Item returns a string with the board model.

A read access to the **Description** Item returns a string with the board synthetic description (for example "12 Ch Neg 6 kV 1/0.2 mA").

A read access to the **Fmw Release** item returns a string with the board firmware release.

A read access to the **SerNum** item returns the board serial number.

A read access to the **NrOfCh** item returns the number of board's channels.

A read access to the **HVMax** item returns the voltage hardware limit set by trimmer on the board.

A read access to the **HVMax#EU** item returns a string with the HVMax Engineering Units.

A read access to the **HVMax#HighEU** item returns the highest possible HVMax value.

A read access to the **HVMax#LowEU** item returns the lowest possible HVMax value.

A read access to the **Temp** item returns the board's temperature.

A read access to the **Temp#EU** item returns a string with the Temp Engineering Units.

A read access to the **Temp#HighEU** item returns the highest possible Temp value.

A read access to the **Temp#LowEU** item returns the lowest possible Temp value.

Table 4.2 – SY 1527/ SY 2527 Board items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.Model	String	R	Board model
PowerSupplyName.BoardXX.Description	String	R	Board description
PowerSupplyName.BoardXX.Fmw Release	String	R	Board firmware release
PowerSupplyName.BoardXX.SerNum	2-byte integer	R	Board serial number
PowerSupplyName.BoardXX.NrOfCh	2-byte integer	R	Number of channels
PowerSupplyName.BoardXX.BdStatus	2-byte integer	R	To be implemented
PowerSupplyName.BoardXX.HVMax	4-byte real	R	Hardware voltage limit
PowerSupplyName.BoardXX.HVMax#EU	String	R	HVMax EU
PowerSupplyName.BoardXX.HVMax#HighEU	8-byte real	R	HVMax upper limit
PowerSupplyName.BoardXX.HVMax#LowEU	8-byte real	R	HVMax lower limit
PowerSupplyName.BoardXX.Temp	4-byte real	R	Board temperature
PowerSupplyName.BoardXX.Temp#EU	String	R	Temperature EU
PowerSupplyName.BoardXX.Temp#HighEU	8-byte real	R	Temp upper limit
PowerSupplyName.BoardXX.Temp#LowEU	8-byte real	R	Temp lower limit

4.3. SY 1527 / SY 2527 Channel control

This chapter describes the items which are available for the control of a generic channel within the SY 1527 / SY 2527 system. The list of items may differ in case of channels belonging to custom boards (refer to the board's manual for further details).

The **Name** item allows to assign to the channel a symbolic name.

The **V0set** item allows to set V0; see [7], § 4.4.5 for further details.

A read access to the **V0set#EU** item returns a string with the V0set Engineering Units.

A read access to the **V0set#HighEU** item returns the highest possible V0set value.

A read access to the **V0set#LowEU** item returns the lowest possible V0set value.

The **I0set** item allows to set I0; see [7], § 4.4.6 for further details.

A read access to the **I0set#EU** item returns a string with the I0set Engineering Units.

A read access to the **I0set#HighEU** item returns the highest possible I0set value.

A read access to the **I0set#LowEU** item returns the lowest possible I0set value.

The **V1set** item allows to set V1; see [7], § 4.4.7 for further details.

A read access to the **V1set#EU** item returns a string with the V1set Engineering Units.

A read access to the **V1set#HighEU** item returns the highest possible V1set value.

A read access to the **V1set#LowEU** item returns the lowest possible V1set value.

The **I1set** item allows to set I1; see [7], § 4.4.8 for further details.

A read access to the **I1set#EU** item returns a string with the I1set Engineering Units.

A read access to the **I1set#HighEU** item returns the highest possible I1set value.

A read access to the **I1set#LowEU** item returns the lowest possible I1set value.

The **RUp** item allows to program the ramp-up rate; see [7], § 4.4.9 for further details.

A read access to the **RUp#EU** item returns a string with the RUp Engineering Units.

A read access to the **RUp#HighEU** item returns the highest possible RUp value.

A read access to the **RUp#LowEU** item returns the lowest possible RUp value.

The **RDwn** item allows to program the ramp-down rate; see [7], § 4.4.10 for further details.

A read access to the **RDwn#EU** item returns a string with the RDwn Engineering Units.

A read access to the **RDwn#HighEU** item returns the highest possible RDwn value.

A read access to the **RDwn#LowEU** item returns the lowest possible RDwn value.

The **Trip** item allows to program the trip time; see [7], § 4.4.13 for further details.

A read access to the **Trip#EU** item returns a string with the Trip Engineering Units.

A read access to the **Trip#HighEU** item returns the highest possible Trip value.

A read access to the **Trip#LowEU** item returns the lowest possible Trip value.

The **SVMax** item allows to set the software voltage limit; see [7], § 4.4.4 for further details.

A read access to the **SVMax#EU** item returns a string with the SVMMax Engineering Units.

A read access to the **SVMax#HighEU** item returns the highest possible SVMMax value.

A read access to the **SVMax#LowEU** item returns the lowest possible SVMMax value.

The **VMon** item returns back the VMon value; see [7], § 4.4.11 for further details.

A read access to the **VMon#EU** item returns a string with the VMon Engineering Units.

A read access to the **VMon#HighEU** item returns the highest possible VMon value.

A read access to the **VMon#LowEU** item returns the lowest possible VMon value.

The **IMon** item returns back the IMon value; see [7], § 4.4.12 for further details.

A read access to the **IMon#EU** item returns a string with the IMon Engineering Units.

A read access to the **IMon#HighEU** item returns the highest possible IMon value.

A read access to the **IMon#LowEU** item returns the lowest possible IMon value.

A read access to the **Status** item returns back a 16 bit pattern indicating channel status, as follows:

- Bit 0: ON/OFF
- Bit 1: Ramp Up
- Bit 2: Ramp Down
- Bit 3: OverCurrent
- Bit 4: OverVoltage
- Bit 5: UnderVoltage
- Bit 6: External Trip
- Bit 7: Over HVmax
- Bit 8: External Disable

Bit 9: Internal Trip
Bit 10: Calibration Error
Bit 11: Unplugged ("remote" boards only)
Bit12: UnderCurrent
Bit13: OverVoltage Protection
Bit14: Power Fail
Bit15: Temperature Error

The **Pw** item allows to switch ON/OFF the channel.

A read access to the **Pw#CoOpen** returns back the label "Off" associated to Pw=0.

A read access to the **Pw#CoClose** item back the label "On" associated to Pw=1.

The **POn** item allows to select the power ON option, as follows

POn=1 ⇒ Enabled
POn=0 ⇒ Disabled

see [7], § 7.1.9 for further details.

A read access to the **POn#CoOpen** returns back the label "Disabled" associated to POn=0.

A read access to the **POn#CoClose** item returns back the label "Enabled" associated to POn=1.

The **PDwn** item allows to select the power-down option, as follows

PDwn=1 ⇒ RAMP
PDwn=0 ⇒ KILL

see [7], § 7.1.9 for further details.

A read access to the **PDwn#CoOpen** item returns back the label "Kill" associated to PDwn=0.

A read access to the **PDwn#CoClose** item returns back the "Ramp" associated to PDwn=1.

Table 4.3 – SY 1527/ SY 2527 Channel items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.ChanYYY.Name	String	R/W	Channel name
PowerSupplyName.BoardXX.ChanYYY.V0Set	4-byte real	R/W	Set V0 voltage limit
PowerSupplyName.BoardXX.ChanYYY.V0Set#EU	String	R	V0set EU
PowerSupplyName.BoardXX.ChanYYY.V0Set#HighEU	8-byte real	R	V0set upper limit
PowerSupplyName.BoardXX.ChanYYY.V0Set#LowEU	8-byte real	R	V0set lower limit
PowerSupplyName.BoardXX.ChanYYY.I0Set	4-byte real	R/W	Set I0 current limit
PowerSupplyName.BoardXX.ChanYYY.I0Set#EU	String	R	I0set EU
PowerSupplyName.BoardXX.ChanYYY.I0Set#HighEU	8-byte real	R	I0set upper limit
PowerSupplyName.BoardXX.ChanYYY.I0Set#LowEU	8-byte real	R	I0set lower limit
PowerSupplyName.BoardXX.ChanYYY.V1Set	4-byte real	R/W	Set V1 voltage limit
PowerSupplyName.BoardXX.ChanYYY.V1Set#EU	String	R	V1set EU
PowerSupplyName.BoardXX.ChanYYY.V1Set#HighEU	8-byte real	R	V1set upper limit
PowerSupplyName.BoardXX.ChanYYY.V1Set#LowEU	8-byte real	R	V1set lower limit
PowerSupplyName.BoardXX.ChanYYY.I1Set	4-byte real	R/W	Set I1 current limit
PowerSupplyName.BoardXX.ChanYYY.I1Set#EU	String	R	I1set EU
PowerSupplyName.BoardXX.ChanYYY.I1Set#HighEU	8-byte real	R	I1set upper limit
PowerSupplyName.BoardXX.ChanYYY.I1Set#LowEU	8-byte real	R	I1set lower limit
PowerSupplyName.BoardXX.ChanYYY.RUp	4-byte real	R/W	Set ramp-up rate
PowerSupplyName.BoardXX.ChanYYY.RUp #EU	String	R	Ramp up rate EU
PowerSupplyName.BoardXX.ChanYYY.RUp #HighEU	8-byte real	R	Rup upper limit
PowerSupplyName.BoardXX.ChanYYY.RUp #LowEU	8-byte real	R	RUp lower limit
PowerSupplyName.BoardXX.ChanYYY.RDwn	4-byte real	R/W	Set ramp-down rate
PowerSupplyName.BoardXX.ChanYYY.RDwn #EU	String	R	Ramp down rate EU
PowerSupplyName.BoardXX.ChanYYY.RDwn #HighEU	8-byte real	R	RDwn upper limit
PowerSupplyName.BoardXX.ChanYYY.RDwn #LowEU	8-byte real	R	RDwn lower limit
PowerSupplyName.BoardXX.ChanYYY.Trip	4-byte real	R/W	Set trip time
PowerSupplyName.BoardXX.ChanYYY.Trip #EU	String	R	Trip time EU
PowerSupplyName.BoardXX.ChanYYY.Trip #HighEU	8-byte real	R	Trip time upper limit
PowerSupplyName.BoardXX.ChanYYY.Trip #LowEU	8-byte real	R	Trip time lower limit

PowerSupplyName.BoardXX.ChanYYY.SVMax	4-byte real	R/W	Set software voltage limit
PowerSupplyName.BoardXX.ChanYYY.SVMax #EU	String	R	SVMax EU
PowerSupplyName.BoardXX.ChanYYY.SVMax#HighU	8-byte real	R	SVMax upper limit
PowerSupplyName.BoardXX.ChanYYY.SVMax#LowEU	8-byte real	R	SVMax lower limit
itemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.ChanYYY.VMon	4-byte real	R	VMon
PowerSupplyName.BoardXX.ChanYYY.VMon #EU	string	R	VMon EU
PowerSupplyName.BoardXX.ChanYYY.VMon#HighU	8-byte real	R	VMon upper limit
PowerSupplyName.BoardXX.ChanYYY.VMon#LowEU	8-byte real	R	VMon lower limit
PowerSupplyName.BoardXX.ChanYYY.IMon	4-byte real	R	IMon
PowerSupplyName.BoardXX.ChanYYY.IMon #EU	string	R	IMon EU
PowerSupplyName.BoardXX.ChanYYY.IMon#HighU	8-byte real	R	IMon upper limit
PowerSupplyName.BoardXX.ChanYYY.IMon#LowEU	8-byte real	R	IMon lower limit
PowerSupplyName.BoardXX.ChanYYY.Status	2-byte integer	R	Channel status
PowerSupplyName.BoardXX.ChanYYY.Pw	boolean	R/W	Power ON/OFF
PowerSupplyName.BoardXX.ChanYYY.Pw#CoClose	string	R	Pw close label
PowerSupplyName.BoardXX.ChanYYY.Pw#CoOpen	string	R	Pw open label
PowerSupplyName.BoardXX.ChanYYY.POn	boolean	R/W	Power ON options
PowerSupplyName.BoardXX.ChanYYY.POn#CoClose	string	R	POn close label
PowerSupplyName.BoardXX.ChanYYY.POn#CoOpen	string	R	POn open label
PowerSupplyName.BoardXX.ChanYYY.PDwn	boolean	R/W	Power down options
PowerSupplyName.BoardXX.ChanYYY.PDwn#CoClose	string	R	PDwn close label
PowerSupplyName.BoardXX.ChanYYY.PDwn#CoOpen	string	R	PDwn open label
PowerSupplyName.BoardXX.ChanYYY.TripInt	4-byte real	R/W	To be implemented
PowerSupplyName.BoardXX.ChanYYY.TripInt #EU	string	R	To be implemented
PowerSupplyName.BoardXX.ChanYYY.TripInt#HighU	8-byte real	R	To be implemented
PowerSupplyName.BoardXX.ChanYYY.TripInt#LowEU	8-byte real	R	To be implemented
PowerSupplyName.BoardXX.ChanYYY.TripExt	4-byte real	R/W	To be implemented
PowerSupplyName.BoardXX.ChanYYY.TripExt #EU	string	R	To be implemented
PowerSupplyName.BoardXX.ChanYYY.TripExt#HighU	8-byte real	R	To be implemented
PowerSupplyName.BoardXX.ChanYYY.TripExt#LowEU	8-byte real	R	To be implemented

5. SY 527 Power Supply System

5.1. SY 527 System control

OPC Items available for general system control are fully listed in Table 5.1. For a detailed description of the SY 527 system operation, refer to [10].

A write access to the **Kill** Item (Value = 1) allows to kill all channels.

A write access to the **Clear Alarm** Item (Value = 1) allows to clear channels' alarm messages.

A write access to the **Format** Item (Value = 1) allows to execute the Format command.

A read access to the **ModelName** Item returns a string indicating the system model (SY527).

A read access to the **SwRelease** Item returns a string indicating the system firmware release.

A read access to the **CnetCrNum** Item returns the CAENET crate number.

A write access to the **LockKeyboard** Item allows to lock (Value = 1) /unlock (Value = 0) the panel keyboard.

A read access to the **FrontPanStat** Item returns a 16 bit patterns indicating the system outputs status, as follows (see [10], page I for further details):

- Bit 0: If 0 ⇒ V0 active, if 1 ⇒ V1 active
- Bit 1: If 0 ⇒ I0 active, if 1 ⇒ I1 active
- Bit 2: Kill
- Bit 3: Interlock
- Bit 4: HVEnable
- Bit 5÷15: Don't care

A read access to the **StatusAlarm** Item returns a 16 bit patterns indicating the system alarms status, as follows (see [10], page I for further details):

- Bit 0: Normal Level High/Low
- Bit 1: Level/Pulsed
- Bit 2: OverCurrent
- Bit 3: OverVoltage
- Bit 4: UnderVoltage
- Bit 5÷15: Don't care

A read access to the **Slots** Item returns the number of system's slots.

Table 5.1 - SY 527 System Items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.Kill	boolean	W	Kill
PowerSupplyName.ClearAlarm	boolean	W	Clear alarm
PowerSupplyName.Format	boolean	W	Execute Format command
PowerSupplyName.ModelName	string	R	System name
PowerSupplyName.SwRelease	string	R	System firmware release
PowerSupplyName.CnetCrNum	2-byte integer	R	CAENET crate number
PowerSupplyName.LockKeyboard	boolean	W	Lock/unlock panel keyboard
PowerSupplyName.FrontPanStat	2-byte integer	R	System outputs status
PowerSupplyName.StatusAlarm	2-byte integer	R	System alarms status
PowerSupplyName.Slots	2-byte integer	R	Slots number

5.2. SY 527 Board control

This chapter describes the Items which are available for the control of a generic SY 527 system board.

A read access to the **Model** Item returns a string with the board model.

A read access to the **Description** Item returns a string with the board synthetic description.

A read access to the **Fmw Release** item returns a string with the board firmware release.

A read access to the **SerNum** item returns the board serial number.

A read access to the **NrOfCh** item returns the number of board's channels.

A read access to the **HVMax** item returns the voltage hardware limit set by trimmer on the board.

A read access to the **HVMax#EU** item returns a string with the HVMax Engineering Units.

A read access to the **HVMax#HighEU** item returns the highest possible HVMax value.

A read access to the **HVMax#LowEU** item returns the lowest possible HVMax value.

Table 5.2 - SY 527 Board Items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXXX.Model	string	R	Board model
PowerSupplyName.Description	string	R	Board description
PowerSupplyName.BoardXXX.Fmw Release	string	R	Board firmware release
PowerSupplyName.SerNum	2-byte integer	R	Board serial number
PowerSupplyName.NrOfCh	2-byte integer	R	Number of board channels
PowerSupplyName.BoardXX.HVMax	4-byte real	R	Hardware voltage limit
PowerSupplyName.BoardXX.HVMax#EU	String	R	HVMax EU
PowerSupplyName.BoardXX.HVMax#HighEU	8-byte real	R	HVMax upper limit
PowerSupplyName.BoardXX.HVMax#LowEU	8-byte real	R	HVMax lower limit

5.3. SY 527 Channel control

The **Name** item allows to assign to the channel a symbolic name.

The **V0Set** item allows to set V0; see [10] for further details.

A read access to the **V0Set#EU** item returns a string with the V0set Engineering Units.

A read access to the **V0Set#HighEU** item returns the highest possible V0set value.

A read access to the **V0Set#LowEU** item returns the lowest possible V0set value.

The **I0Set** item allows to set I0; see [10] for further details.

A read access to the **I0Set#EU** item returns a string with the I0set Engineering Units.

A read access to the **I0Set#HighEU** item returns the highest possible I0set value.

A read access to the **I0Set#LowEU** item returns the lowest possible I0set value.

The **V1Set** item allows to set V1; see [10] for further details.

A read access to the **V1Set#EU** item returns a string with the V1set Engineering Units.

A read access to the **V1Set#HighEU** item returns the highest possible V1set value.

A read access to the **V1Set#LowEU** item returns the lowest possible V1set value.

The **I1Set** item allows to set I1; see [10] for further details.

A read access to the **I1Set#EU** item returns a string with the I1set Engineering Units.

A read access to the **I1Set#HighEU** item returns the highest possible I1set value.

A read access to the **I1Set#LowEU** item returns the lowest possible I1set value.

The **RUp** item allows to program the ramp-up rate; see [10] for further details.

A read access to the **RUp#EU** item returns a string with the RUp Engineering Units.

A read access to the **RUp#HighEU** item returns the highest possible RUp value.

A read access to the **RUp#LowEU** item returns the lowest possible RUp value.

The **RDwn** item allows to program the ramp-down rate; see [10] for further details.

A read access to the **RDwn#EU** item returns a string with the RDwn Engineering Units.

A read access to the **RDwn#HighEU** item returns the highest possible RDwn value.

A read access to the **RDwn#LowEU** item returns the lowest possible RDwn value.

The **Trip** item allows to program the trip time; see [10] for further details.

A read access to the **Trip#EU** item returns a string with the Trip Engineering Units.

A read access to the **Trip#HighEU** item returns the highest possible Trip value.

A read access to the **Trip#LowEU** item returns the lowest possible Trip value.

The **SVMax** item allows to set the software voltage limit, see [10] for further details.

The **VMon** item returns back the VMon value; see [10] for further details.

A read access to the **VMon#EU** item returns a string with the VMon Engineering Units.

A read access to the **VMon#HighEU** item returns the highest possible VMon value.

A read access to the **VMon#LowEU** item returns the lowest possible VMon value.

The **IMon** item returns back the IMon value; see [10] for further details.

A read access to the **IMon#EU** item returns a string with the IMon Engineering Units.

A read access to the **IMon#HighEU** item returns the highest possible IMon value.

A read access to the **IMon#LowEU** item returns the lowest possible IMon value.

A read access to the **Status** item returns back a 16 bit pattern indicating channel status, as follows (see [10], § 6.4.4 for further details):

Bit	bit value = 0	bit value = 1
0	Channel not present	Channel present
1, 2	Don't care	Don't care
3	Channel delivers current	Channel adsorbs current
4		External disable
5		Internal Trip
6		Kill
7	Don't care	Don't care
8		Vmax
9		External Trip
10		Overvoltage
11		Undervoltage
12		Overcurrent
13		Down
14		Up
15	Channel Off	Channel On

The **Pw** item allows to switch ON/OFF the channel.

A read access to the **Pw#CoOpen** returns back the label "Off" associated to Pw=0.

A read access to the **Pw#CoClose** item back the label "On" associated to Pw=1.

The **POn** item allows to select the power ON option, as follows

POn=1 ⇒ ON
POn=0 ⇒ OFF

see [10] for further details.

A read access to the **POn#CoOpen** returns back the label “Disabled” associated to POn=0.

A read access to the **POn#CoClose** item returns back the label “Enabled” associated to POn=1.

The **PEn** item allows to enable/disable a channel.

A read access to the **PEn#CoOpen** returns back the label “Disabled” associated to PEn=0.

A read access to the **PEn#CoClose** item back the label “Enabled” associated to PEn=1.

The **PDwn** item allows to select the power-down option, as follows

PDwn=1 ⇒ RAMP
PDwn=0 ⇒ KILL

see [10] for further details.

A read access to the **PDwn#CoOpen** item returns back the label “Kill” associated to PDwn=0.

A read access to the **PDwn#CoClose** item returns back the “Ramp” associated to PDwn=1.

The **Pswd** item allows to enable/disable the password.

A read access to the **Pswd#CoOpen** returns back the label “Disabled” associated to Pswd=0.

A read access to the **Pw#CoClose** item back the label “Enabled” associated to Pswd=1.

Table 5.3 - SY 527 Channel items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.ChanYYY.Name	string	R/W	Channel name
PowerSupplyName.BoardXX.ChanYYY.V0Set	4-byte real	R/W	Set V0 voltage limit
PowerSupplyName.BoardXX.ChanYYY.V0Set#EU	string	R	V0set EU
PowerSupplyName.BoardXX.ChanYYY.V0Set#HighEU	8-byte real	R	V0set upper limit
PowerSupplyName.BoardXX.ChanYYY.V0Set#LowEU	8-byte real	R	V0set lower limit
PowerSupplyName.BoardXX.ChanYYY.I0Set	4-byte real	R/W	Set I0 current limit
PowerSupplyName.BoardXX.ChanYYY.I0Set#EU	string	R	I0set EU
PowerSupplyName.BoardXX.ChanYYY.I0Set#HighEU	8-byte real	R	I0set upper limit
PowerSupplyName.BoardXX.ChanYYY.I0Set#LowEU	8-byte real	R	I0set lower limit
PowerSupplyName.BoardXX.ChanYYY.V1Set	4-byte real	R/W	Set V1 voltage limit
PowerSupplyName.BoardXX.ChanYYY.V1Set#EU	string	R	V1set EU
PowerSupplyName.BoardXX.ChanYYY.V1Set#HighEU	8-byte real	R	V1set upper limit
PowerSupplyName.BoardXX.ChanYYY.V1Set#LowEU	8-byte real	R	V1set lower limit
PowerSupplyName.BoardXX.ChanYYY.I1Set	4-byte real	R/W	Set I1 current limit
PowerSupplyName.BoardXX.ChanYYY.I1Set#EU	string	R	I1set EU
PowerSupplyName.BoardXX.ChanYYY.I1Set#HighEU	8-byte real	R	I1set upper limit
PowerSupplyName.BoardXX.ChanYYY.I1Set#LowEU	8-byte real	R	I1set lower limit
PowerSupplyName.BoardXX.ChanYYY.RUp	4-byte real	R/W	Set ramp-up rate
PowerSupplyName.BoardXX.ChanYYY.RUp #EU	string	R	Ramp up rate EU
PowerSupplyName.BoardXX.ChanYYY.RUp #HighEU	8-byte real	R	Rup upper limit
PowerSupplyName.BoardXX.ChanYYY.RUp #LowEU	8-byte real	R	RUp lower limit
PowerSupplyName.BoardXX.ChanYYY.RDwn	4-byte real	R/W	Set ramp-down rate
PowerSupplyName.BoardXX.ChanYYY.RDwn #EU	string	R	Ramp down rate EU
PowerSupplyName.BoardXX.ChanYYY.RDwn #HighEU	8-byte real	R	RDwn upper limit
PowerSupplyName.BoardXX.ChanYYY.RDwn #LowEU	8-byte real	R	RDwn lower limit
PowerSupplyName.BoardXX.ChanYYY.Trip	4-byte real	R/W	Set trip time
PowerSupplyName.BoardXX.ChanYYY.Trip #EU	String	R	Trip time EU
PowerSupplyName.BoardXX.ChanYYY.Trip #HighEU	8-byte real	R	Trip time upper limit
PowerSupplyName.BoardXX.ChanYYY.Trip #LowEU	8-byte real	R	Trip time lower limit
PowerSupplyName.BoardXX.ChanYYY.SVMax	4-byte real	R/W	Set software voltage limit
PowerSupplyName.BoardXX.ChanYYY.SVMax#EU	String	R	SVMax EU
PowerSupplyName.BoardXX.ChanYYY.SVMax#HighEU	8-byte real	R	SVMax upper limit
PowerSupplyName.BoardXX.ChanYYY.SVMax#LowEU	8-byte real	R	SVMax lower limit

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.ChanYYY.VMon	4-byte real	R	VMon
PowerSupplyName.BoardXX.ChanYYY.VMon #EU	string	R	VMon EU
PowerSupplyName.BoardXX.ChanYYY.VMon#HighU	8-byte real	R	VMon upper limit
PowerSupplyName.BoardXX.ChanYYY.VMon#LowEU	8-byte real	R	VMon lower limit
PowerSupplyName.BoardXX.ChanYYY.IMon	4-byte real	R	IMon
PowerSupplyName.BoardXX.ChanYYY.IMon #EU	string	R	IMon EU
PowerSupplyName.BoardXX.ChanYYY.IMon#HighU	8-byte real	R	IMon upper limit
PowerSupplyName.BoardXX.ChanYYY.IMon#LowEU	8-byte real	R	IMon lower limit
PowerSupplyName.BoardXX.ChanYYY.Pw	boolean	R/W	Power ON/OFF
PowerSupplyName.BoardXX.ChanYYY.Pw#CoClose	string	R	Pw close label
PowerSupplyName.BoardXX.ChanYYY.Pw#CoOpen	string	R	Pw open label
PowerSupplyName.BoardXX.ChanYYY.Status	2-byte integer	R	Channel status
PowerSupplyName.BoardXX.ChanYYY.POn	boolean	R/W	Power ON options
PowerSupplyName.BoardXX.ChanYYY.POn#CoClose	string	R	POn close label
PowerSupplyName.BoardXX.ChanYYY.POn#CoOpen	string	R	POn open label
PowerSupplyName.BoardXX.ChanYYY.PEn	boolean	R/W	Channel enable
PowerSupplyName.BoardXX.ChanYYY.PEn#CoClose	string	R	PEn close label
PowerSupplyName.BoardXX.ChanYYY.PEn#CoOpen	string	R	PEn open label
PowerSupplyName.BoardXX.ChanYYY.PDwn	boolean	R/W	Power down options
PowerSupplyName.BoardXX.ChanYYY.PDwn#CoClose	string	R	PDwn close label
PowerSupplyName.BoardXX.ChanYYY.PDwn#CoOpen	string	R	PDwn open label
PowerSupplyName.BoardXX.ChanYYY.Pswd	boolean	R/W	Enable password
PowerSupplyName.BoardXX.ChanYYY.Pswd#CoClose	string	R	Pswd close label
PowerSupplyName.BoardXX.ChanYYY.Pswd#CoOpen	string	R	Pswd open label

6. SY 127 Power Supply System

6.1. SY 127 System control

OPC Items available for general system control are fully listed in . For a detailed description of the SY 127 system operation, refer to [11].

A write access to the **Clear Alarm** Item (Value = 1) allows to clear channels' alarm messages.

A write access to the **Format** Item (Value = 1) allows to execute the Format command, refer to [11] for further details .

A read access to the **ModelName** Item returns a string indicating the system model (SY127).

A read access to the **SwRelease** Item returns a string indicating the system firmware release.

A read access to the **CnetCrNum** Item returns the CAENET crate number.

A write access to the **LockKeyboard** Item allows to lock (Value = 1) /unlock (Value = 0) the panel keyboard.

A read access to the **FrontPanOut** Item returns a 16 bit patterns indicating the system outputs status, as follows:

- Bit 0÷3: Don't care
- Bit 4: If 0 ⇒ V0 active, if 1 ⇒ V1 active
- Bit 5: If 0 ⇒ I0 active, if 1 ⇒ I1 active
- Bit 6: Alarm
- Bit 7: HVEnable
- Bit 8÷15: Don't care

See [12]. § 4.4.4 for further details.

N.B. The SY 127 FrontPanOut item has a different content from the SY 527 FrontPanOut item

The **Pswd** item allows to enable/disable the password, refer to [11] for further details

A read access to the **Slots** Item returns the number of system's slots.

Table 6.1 - SY 127 System Items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.ClearAlarm	boolean	W	Clear alarm
PowerSupplyName.Format	boolean	W	Execute Format command
PowerSupplyName.ModelName	string	R	System name
PowerSupplyName.SwRelease	string	R	System firmware release
PowerSupplyName.CnetCrNum	2-byte integer	R	CAENET crate number
PowerSupplyName.LockKeyboard	boolean	R/W	Lock panel keyboard
PowerSupplyName.FrontPanStat	2-byte integer	R	System outputs status
PowerSupplyName.Slots	2-byte integer	R	Slots number
PowerSupplyName.POn	boolean	R/W	Power ON all channels
PowerSupplyName.Pswd	boolean	R/W	Enable password

6.2. SY 127 Board control

This chapter describes the Items which are available for the control of a generic SY 127 system board.

A read access to the **Model** Item returns a string with the board model.

A read access to the **Description** Item returns a string with the board synthetic description.

A read access to the **NrOfCh** item returns the number of board's channels.

Table 6.2 - SY 127 Board Items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXXX.Model	string	R	Board model
PowerSupplyName.Description	string	R	Board description
PowerSupplyName.NrOfCh	2-byte integer	R	Number of board channels

6.3. SY 127 Channel control

The **Name** item allows to assign to the channel a symbolic name.

The **V0Set** item allows to set V0; see [11] for further details.

A read access to the **V0Set#EU** item returns a string with the V0Set Engineering Units.

A read access to the **V0Set#HighEU** item returns the highest possible V0Set value.

A read access to the **V0Set#LowEU** item returns the lowest possible V0Set value.

The **I0Set** item allows to set I0; see [11] for further details.

A read access to the **I0Set#EU** item returns a string with the I0Set Engineering Units.

A read access to the **I0Set#HighEU** item returns the highest possible I0Set value.

A read access to the **I0Set#LowEU** item returns the lowest possible I0Set value.

The **V1Set** item allows to set V1; see [11] for further details.

A read access to the **V1Set#EU** item returns a string with the V1Set Engineering Units.

A read access to the **V1Set#HighEU** item returns the highest possible V1Set value.

A read access to the **V1Set#LowEU** item returns the lowest possible V1Set value.

The **I1Set** item allows to set I1; see [11] for further details.

A read access to the **I1Set#EU** item returns a string with the I1Set Engineering Units.

A read access to the **I1Set#HighEU** item returns the highest possible I1Set value.

A read access to the **I1Set#LowEU** item returns the lowest possible I1Set value.

The **RUp** item allows to program the ramp-up rate; see [11] for further details.

A read access to the **RUp#EU** item returns a string with the RUp Engineering Units.

A read access to the **RUp#HighEU** item returns the highest possible RUp value.

A read access to the **RUp#LowEU** item returns the lowest possible RUp value.

The **RDwn** item allows to program the ramp-down rate; see [11] for further details.

A read access to the **RDwn#EU** item returns a string with the RDwn Engineering Units.

A read access to the **RDwn#HighEU** item returns the highest possible RDwn value.

A read access to the **RDwn#LowEU** item returns the lowest possible RDwn value.

The **Trip** item allows to program the trip time; see [11] for further details.

A read access to the **Trip#EU** item returns a string with the Trip Engineering Units.

A read access to the **Trip#HighEU** item returns the highest possible Trip value.

A read access to the **Trip#LowEU** item returns the lowest possible Trip value.

The **VMon** item returns back the VMon value; see [11] for further details.

A read access to the **VMon#EU** item returns a string with the VMon Engineering Units.

A read access to the **VMon#HighEU** item returns the highest possible VMon value.

A read access to the **VMon#LowEU** item returns the lowest possible VMon value.

The **IMon** item returns back the IMon value; see [11] for further details.

A read access to the **IMon#EU** item returns a string with the IMon Engineering Units.

A read access to the **IMon#HighEU** item returns the highest possible IMon value.

A read access to the **IMon#LowEU** item returns the lowest possible IMon value.

A read access to the **Status** item returns back a bit pattern indicating channel status, see [11] for further details.

The **Pw** item allows to switch ON/OFF the channel.

A read access to the **Pw#CoOpen** returns back the label "Off" associated to Pw=0.

A read access to the **Pw#CoClose** item back the label "On" associated to Pw=1.

Table 6.3 - SY 127 Channel items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.ChanYYY.Name	string	R/W	Channel name
PowerSupplyName.BoardXX.ChanYYY.V0Set	4-byte real	R/W	Set V0 voltage limit
PowerSupplyName.BoardXX.ChanYYY.V0Set#EU	string	R	V0set EU
PowerSupplyName.BoardXX.ChanYYY.V0Set#HighEU	8-byte real	R	V0set upper limit
PowerSupplyName.BoardXX.ChanYYY.V0Set#LowEU	8-byte real	R	V0Set lower limit
PowerSupplyName.BoardXX.ChanYYY.I0Set	4-byte real	R/W	Set I0 current limit
PowerSupplyName.BoardXX.ChanYYY.I0Set#EU	string	R	I0Set EU
PowerSupplyName.BoardXX.ChanYYY.I0Set#HighEU	8-byte real	R	I0Set upper limit
PowerSupplyName.BoardXX.ChanYYY.I0Set#LowEU	8-byte real	R	I0Set lower limit
PowerSupplyName.BoardXX.ChanYYY.V1Set	4-byte real	R/W	Set V1 voltage limit
PowerSupplyName.BoardXX.ChanYYY.V1Set#EU	string	R	V1Set EU
PowerSupplyName.BoardXX.ChanYYY.V1Set#HighEU	8-byte real	R	V1Set upper limit
PowerSupplyName.BoardXX.ChanYYY.V1Set#LowEU	8-byte real	R	V1Set lower limit
PowerSupplyName.BoardXX.ChanYYY.I1Set	4-byte real	R/W	Set I1 current limit
PowerSupplyName.BoardXX.ChanYYY.I1Set#EU	string	R	I1Set EU
PowerSupplyName.BoardXX.ChanYYY.I1Set#HighEU	8-byte real	R	I1Set upper limit
PowerSupplyName.BoardXX.ChanYYY.I1Set#LowEU	8-byte real	R	I1Set lower limit
PowerSupplyName.BoardXX.ChanYYY.RUp	4-byte real	R/W	Set ramp-up rate
PowerSupplyName.BoardXX.ChanYYY.RUp #EU	string	R	Ramp up rate EU
PowerSupplyName.BoardXX.ChanYYY.RUp #HighEU	8-byte real	R	Rup upper limit
PowerSupplyName.BoardXX.ChanYYY.RUp #LowEU	8-byte real	R	RUp lower limit
PowerSupplyName.BoardXX.ChanYYY.RDwn	4-byte real	R/W	Set ramp-down rate
PowerSupplyName.BoardXX.ChanYYY.RDwn #EU	string	R	Ramp down rate EU
PowerSupplyName.BoardXX.ChanYYY.RDwn #HighEU	8-byte real	R	RDwn upper limit
PowerSupplyName.BoardXX.ChanYYY.RDwn #LowEU	8-byte real	R	RDwn lower limit
PowerSupplyName.BoardXX.ChanYYY.Trip	4-byte real	R/W	Set trip time
PowerSupplyName.BoardXX.ChanYYY.Trip #EU	String	R	Trip time EU
PowerSupplyName.BoardXX.ChanYYY.Trip #HighEU	8-byte real	R	Trip time upper limit
PowerSupplyName.BoardXX.ChanYYY.Trip #LowEU	8-byte real	R	Trip time lower limit
PowerSupplyName.BoardXX.ChanYYY.VMon	4-byte real	R	VMon
PowerSupplyName.BoardXX.ChanYYY.VMon#EU	string	R	VMon EU
PowerSupplyName.BoardXX.ChanYYY.VMon#HighEU	8-byte real	R	VMon upper limit
PowerSupplyName.BoardXX.ChanYYY.VMon#LowEU	8-byte real	R	VMon lower limit

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.ChanYYY.IMon	string	R	IMon
PowerSupplyName.BoardXX.ChanYYY.IMon#EU	string	R	IMon EU
PowerSupplyName.BoardXX.ChanYYY.IMon#HighEU	8-byte real	R	IMon upper limit
PowerSupplyName.BoardXX.ChanYYY.IMon#LowEU	8-byte real	R	IMon lower limit
PowerSupplyName.BoardXX.ChanYYY.Pw	boolean	R/W	Power ON/OFF
PowerSupplyName.BoardXX.ChanYYY.Pw #CoClose	string	R	Power ON close label
PowerSupplyName.BoardXX.ChanYYY.Pw #CoOpen	string	R	Power ON open label

7. SY 403 Power Supply System

7.1. SY 403 System control

OPC Items available for general system control are fully listed in Table 5.1. For a detailed description of the SY 403 system operation, refer to [14].

A write access to the **Kill** Item (Value = 1) allows to kill all channels.

A write access to the **Clear Alarm** Item (Value = 1) allows to clear channels' alarm messages.

A write access to the **Format** Item (Value = 1) allows to execute the Format command.

A read access to the **ModelName** Item returns a string indicating the system model (SY403).

A read access to the **SwRelease** Item returns a string indicating the system firmware release.

A read access to the **CnetCrNum** Item returns the CAENET crate number.

A write access to the **LockKeyboard** Item allows to lock (Value = 1) /unlock (Value = 0) the panel keyboard.

A read access to the **FrontPanStat** Item returns a 16 bit patterns indicating the system outputs status, as follows (see [14] for further details):

- Bit 0: If 0 ⇒ V0 active, if 1 ⇒ V1 active
- Bit 1: If 0 ⇒ I0 active, if 1 ⇒ I1 active
- Bit 2: Kill
- Bit 3: Interlock
- Bit 4: HVEnable
- Bit 5÷15: Don't care

A read access to the **StatusAlarm** Item returns a 16 bit patterns indicating the system alarms status, as follows (see [14] for further details):

- Bit 0: Normal Level High/Low
- Bit 1: Level/Pulsed
- Bit 2: OvC
- Bit 3: OvV
- Bit 4: UnV
- Bit 5÷15: Don't care

A read access to the **Slots** Item returns the number of system's slots.

Table 7.1 - SY 403 System Items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.Kill	boolean	W	Kill
PowerSupplyName.ClearAlarm	boolean	W	Clear alarm
PowerSupplyName.Format	boolean	W	Execute Format command
PowerSupplyName.ModelName	string	R	System name
PowerSupplyName.SwRelease	string	R	System firmware release
PowerSupplyName.CnetCrNum	2-byte integer	R	CAENET crate number
PowerSupplyName.LockKeyboard	boolean	W	Lock/unlock panel keyboard
PowerSupplyName.FrontPanStat	2-byte integer	R	System outputs status
PowerSupplyName.StatusAlarm	2-byte integer	R	System alarms status
PowerSupplyName.Slots	2-byte integer	R	Slots number

7.2. SY 403 Board control

This chapter describes the Items which are available for the control of a generic SY 403 system board.

A read access to the **Model** Item returns a string with the board model.

A read access to the **Description** Item returns a string with the board synthetic description.

A read access to the **Fmw Release** item returns a string with the board firmware release.

A read access to the **SerNum** item returns the board serial number.

A read access to the **NrOfCh** item returns the number of board's channels.

A read access to the **HVMax** item returns the voltage hardware limit set by trimmer on the board.

A read access to the **HVMax#EU** item returns a string with the HVMax Engineering Units.

A read access to the **HVMax#HighEU** item returns the highest possible HVMax value.

A read access to the **HVMax#LowEU** item returns the lowest possible HVMax value.

Table 7.2 - SY 403 Board Items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXXX.Model	string	R	Board model
PowerSupplyName.Description	string	R	Board description
PowerSupplyName.BoardXXX.Fmw Release	string	R	Board firmware release
PowerSupplyName.SerNum	2-byte integer	R	Board serial number
PowerSupplyName.NrOfCh	2-byte integer	R	Number of board channels
PowerSupplyName.BoardXX.HVMax	4-byte real	R	Hardware voltage limit
PowerSupplyName.BoardXX.HVMax#EU	String	R	HVMax EU
PowerSupplyName.BoardXX.HVMax#HighEU	8-byte real	R	HVMax upper limit
PowerSupplyName.BoardXX.HVMax#LowEU	8-byte real	R	HVMax lower limit

7.3. SY 403 Channel control

The **Name** item allows to assign to the channel a symbolic name.

The **V0Set** item allows to set V0; see [14] for further details.

A read access to the **V0Set#EU** item returns a string with the V0set Engineering Units.

A read access to the **V0Set#HighEU** item returns the highest possible V0set value.

A read access to the **V0Set#LowEU** item returns the lowest possible V0set value.

The **I0Set** item allows to set I0; see [14] for further details.

A read access to the **I0Set#EU** item returns a string with the I0set Engineering Units.

A read access to the **I0Set#HighEU** item returns the highest possible I0set value.

A read access to the **I0Set#LowEU** item returns the lowest possible I0set value.

The **V1Set** item allows to set V1; see [14] for further details.

A read access to the **V1Set#EU** item returns a string with the V1set Engineering Units.

A read access to the **V1Set#HighEU** item returns the highest possible V1set value.

A read access to the **V1Set#LowEU** item returns the lowest possible V1set value.

The **I1Set** item allows to set I1; see [14] for further details.

A read access to the **I1Set#EU** item returns a string with the I1set Engineering Units.

A read access to the **I1Set#HighEU** item returns the highest possible I1set value.

A read access to the **I1Set#LowEU** item returns the lowest possible I1set value.

The **RUp** item allows to program the ramp-up rate; see [14] for further details.

A read access to the **RUp#EU** item returns a string with the RUp Engineering Units.

A read access to the **RUp#HighEU** item returns the highest possible RUp value.

A read access to the **RUp#LowEU** item returns the lowest possible RUp value.

The **RDwn** item allows to program the ramp-down rate; see [14] for further details.

A read access to the **RDwn#EU** item returns a string with the RDwn Engineering Units.

A read access to the **RDwn#HighEU** item returns the highest possible RDwn value.

A read access to the **RDwn#LowEU** item returns the lowest possible RDwn value.

The **Trip** item allows to program the trip time; see [14] for further details.

A read access to the **Trip#EU** item returns a string with the Trip Engineering Units.

A read access to the **Trip#HighEU** item returns the highest possible Trip value.

A read access to the **Trip#LowEU** item returns the lowest possible Trip value.

The **SVMax** item allows to set the software voltage limit, see [14] for further details.

The **VMon** item returns back the VMon value; see [14] for further details.

A read access to the **VMon#EU** item returns a string with the VMon Engineering Units.

A read access to the **VMon#HighEU** item returns the highest possible VMon value.

A read access to the **VMon#LowEU** item returns the lowest possible VMon value.

The **IMon** item returns back the IMon value; see [14] for further details.

A read access to the **IMon#EU** item returns a string with the IMon Engineering Units.

A read access to the **IMon#HighEU** item returns the highest possible IMon value.

A read access to the **IMon#LowEU** item returns the lowest possible IMon value.

A read access to the **Status** item returns back a 16 bit pattern indicating channel status, as follows (see [14] , pag. 85 for further details):

- Bit 0÷1: Don't care
- Bit 2: Channel present/not present
- Bit 3÷7: Don't care
- Bit 8: Over HVMAX
- Bit 9: Trip
- Bit 10: OverVoltage
- Bit 11: UnderVoltage
- Bit 12: OverCurrent
- Bit 13: Ramp Down
- Bit 14: Ramp Up
- Bit 15: ON/OFF

The **Pw** item allows to switch ON/OFF the channel.

A read access to the **Pw#CoOpen** returns back the label "Off" associated to Pw=0.

A read access to the **Pw#CoClose** item back the label "On" associated to Pw=1.

The **PEn** item allows to enable/disable a channel.

A read access to the **PEn#CoOpen** returns back the label "Disabled" associated to PEn=0.

A read access to the **PEn#CoClose** item back the label "Enabled" associated to PEn=1.

The **PDwn** item allows to select the power-down option, as follows

PDwn=1 ⇒ RAMP
PDwn=0 ⇒ KILL

see [14] for further details.

A read access to the **PDwn#CoOpen** item returns back the label "Kill" associated to PDwn=0.

A read access to the **PDwn#CoClose** item returns back the "Ramp" associated to PDwn=1.

The **Pswd** item allows to enable/disable the password.

A read access to the **Pswd#CoOpen** returns back the label "Disabled" associated to Pswd=0.

A read access to the **Pw#CoClose** item back the label "Enabled" associated to Pswd=1.

Table 7.3 - SY 403 Channel items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.ChanYYY.Name	string	R/W	Channel name
PowerSupplyName.BoardXX.ChanYYY.V0Set	4-byte real	R/W	Set V0 voltage limit
PowerSupplyName.BoardXX.ChanYYY.V0Set#EU	string	R	V0set EU
PowerSupplyName.BoardXX.ChanYYY.V0Set#HighEU	8-byte real	R	V0set upper limit
PowerSupplyName.BoardXX.ChanYYY.V0Set#LowEU	8-byte real	R	V0set lower limit
PowerSupplyName.BoardXX.ChanYYY.I0Set	4-byte real	R/W	Set I0 current limit
PowerSupplyName.BoardXX.ChanYYY.I0Set#EU	string	R	I0set EU
PowerSupplyName.BoardXX.ChanYYY.I0Set#HighEU	8-byte real	R	I0set upper limit
PowerSupplyName.BoardXX.ChanYYY.I0Set#LowEU	8-byte real	R	I0set lower limit
PowerSupplyName.BoardXX.ChanYYY.V1Set	4-byte real	R/W	Set V1 voltage limit
PowerSupplyName.BoardXX.ChanYYY.V1Set#EU	string	R	V1set EU
PowerSupplyName.BoardXX.ChanYYY.V1Set#HighEU	8-byte real	R	V1set upper limit
PowerSupplyName.BoardXX.ChanYYY.V1Set#LowEU	8-byte real	R	V1set lower limit
PowerSupplyName.BoardXX.ChanYYY.I1Set	4-byte real	R/W	Set I1 current limit
PowerSupplyName.BoardXX.ChanYYY.I1Set#EU	string	R	I1set EU
PowerSupplyName.BoardXX.ChanYYY.I1Set#HighEU	8-byte real	R	I1set upper limit
PowerSupplyName.BoardXX.ChanYYY.I1Set#LowEU	8-byte real	R	I1set lower limit
PowerSupplyName.BoardXX.ChanYYY.RUp	4-byte real	R/W	Set ramp-up rate
PowerSupplyName.BoardXX.ChanYYY.RUp #EU	string	R	Ramp up rate EU
PowerSupplyName.BoardXX.ChanYYY.RUp #HighEU	8-byte real	R	Rup upper limit
PowerSupplyName.BoardXX.ChanYYY.RUp #LowEU	8-byte real	R	RUp lower limit
PowerSupplyName.BoardXX.ChanYYY.RDwn	4-byte real	R/W	Set ramp-down rate
PowerSupplyName.BoardXX.ChanYYY.RDwn #EU	string	R	Ramp down rate EU
PowerSupplyName.BoardXX.ChanYYY.RDwn #HighEU	8-byte real	R	RDwn upper limit
PowerSupplyName.BoardXX.ChanYYY.RDwn #LowEU	8-byte real	R	RDwn lower limit
PowerSupplyName.BoardXX.ChanYYY.Trip	4-byte real	R/W	Set trip time
PowerSupplyName.BoardXX.ChanYYY.Trip #EU	String	R	Trip time EU
PowerSupplyName.BoardXX.ChanYYY.Trip #HighEU	8-byte real	R	Trip time upper limit
PowerSupplyName.BoardXX.ChanYYY.Trip #LowEU	8-byte real	R	Trip time lower limit
PowerSupplyName.BoardXX.ChanYYY.SVMax	4-byte real	R/W	Set software voltage limit
PowerSupplyName.BoardXX.ChanYYY.SVMax#EU	String	R	SVMax EU
PowerSupplyName.BoardXX.ChanYYY.SVMax#HighEU	8-byte real	R	SVMax upper limit
PowerSupplyName.BoardXX.ChanYYY.SVMax#LowEU	8-byte real	R	SVMax lower limit

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.ChanYYY.VMon	4-byte real	R	VMon
PowerSupplyName.BoardXX.ChanYYY.VMon #EU	string	R	VMon EU
PowerSupplyName.BoardXX.ChanYYY.VMon#HighU	8-byte real	R	VMon upper limit
PowerSupplyName.BoardXX.ChanYYY.VMon#LowEU	8-byte real	R	VMon lower limit
PowerSupplyName.BoardXX.ChanYYY.IMon	4-byte real	R	IMon
PowerSupplyName.BoardXX.ChanYYY.IMon #EU	string	R	IMon EU
PowerSupplyName.BoardXX.ChanYYY.IMon#HighU	8-byte real	R	IMon upper limit
PowerSupplyName.BoardXX.ChanYYY.IMon#LowEU	8-byte real	R	IMon lower limit
PowerSupplyName.BoardXX.ChanYYY.Pw	boolean	R/W	Power ON/OFF
PowerSupplyName.BoardXX.ChanYYY.Pw#CoClose	string	R	Pw close label
PowerSupplyName.BoardXX.ChanYYY.Pw#CoOpen	string	R	Pw open label
PowerSupplyName.BoardXX.ChanYYY.Status	2-byte integer	R	Channel status
PowerSupplyName.BoardXX.ChanYYY.PEn	boolean	R/W	Channel enable
PowerSupplyName.BoardXX.ChanYYY.PEn#CoClose	string	R	PEn close label
PowerSupplyName.BoardXX.ChanYYY.PEn#CoOpen	string	R	PEn open label
PowerSupplyName.BoardXX.ChanYYY.PDwn	boolean	R/W	Power down options
PowerSupplyName.BoardXX.ChanYYY.PDwn#CoClose	string	R	PDwn close label
PowerSupplyName.BoardXX.ChanYYY.PDwn#CoOpen	string	R	PDwn open label
PowerSupplyName.BoardXX.ChanYYY.Pswd	boolean	R/W	Enable password
PowerSupplyName.BoardXX.ChanYYY.Pswd#CoClose	string	R	Pswd close label
PowerSupplyName.BoardXX.ChanYYY.Pswd#CoOpen	string	R	Pswd open label

8. N 470/ N 570 Power Supply System

8.1. N 470/ N570 System control

OPC Items available for general system control are fully listed in Table 8.1. For a detailed description of the N470/N570 operation, refer to [15] and [16].

A write access to the **Kill** Item (Value = 1) allows to kill all channels.

A write access to the **Clear Alarm** Item (Value = 1) allows to clear channels' alarm messages.

A read access to the **ModelName** Item returns a string indicating the power supply model.

A read access to the **SwRelease** Item returns a string indicating the system firmware release.

A read access to the **CnetCrNum** Item returns the CAENET crate number.

A write access to the **LockKeyboard** Item allows to lock (Value = 1) /unlock (Value = 0) the panel keyboard.

A read access to the **FrontPanStat** Item returns a 16 bit patterns indicating the system outputs status, as follows (see [15] and [16] for further details):

- Bit 0: If 0 ⇒ V0 active, if 1 ⇒ V1 active
- Bit 1: If 0 ⇒ I0 active, if 1 ⇒ I1 active
- Bit 2: Kill
- Bit 3: HVEnable
- Bit 4: If 0 ⇒ NIM level selected, if 1 ⇒ TTL level selected
- Bit 5: Out of calibration
- Bit 6: Alarm
- Bit 7:-15: Don't care

A read access to the **LevelSelect** allows to switch between TTL and NIM levels for control signals, as follows (see [15] and [16] for further details):

If LevelSelect = 0 ⇒ NIM level selected, if =1 ⇒ TTL level selected

A read access to the **Slots** Item returns the number of system's slots (1).

Table 8.1 - N 470/ N 570 System Items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.Kill	boolean	W	Kill
PowerSupplyName.ClearAlarm	boolean	W	Clear alarm
PowerSupplyName.Format	boolean	W	Execute Format command
PowerSupplyName.ModelName	string	R	System name
PowerSupplyName.SwRelease	string	R	System firmware release
PowerSupplyName.CnetCrNum	2-byte integer	R	CAENET crate number
PowerSupplyName.LockKeyboard	boolean	W	Lock/unlock panel keyboard
PowerSupplyName.FrontPanStat	2-byte integer	R	System outputs status
PowerSupplyName.LevelSelect	boolean	R/W	NIM/TTL level selection
PowerSupplyName.Slots	2-byte integer	R	Slots number

8.2. N 470/ N570 Board control

This chapter describes the Items which are available for the control of a N 470/ N 570 board.

A read access to the **Model** Item returns a string with the board model.

A read access to the **Description** Item returns a string with the board synthetic description.

A read access to the **Fmw Release** item returns a string with the board firmware release.

A read access to the **SerNum** item returns the board serial number.

A read access to the **NrOfCh** item returns the number of board's channels.

Table 8.2 - N 470/ N 570 Board Items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.Model	string	R	Board model
PowerSupplyName.BoardXX.Description	string	R	Board description
PowerSupplyName.BoardXX.Fmw Release	string	R	Board firmware release
PowerSupplyName.BoardXX.SerNum	2-byte integer	R	Board serial number
PowerSupplyName.BoardXX.NrOfCh	2-byte integer	R	Number of board channels

8.3. N 470/ N570 Channel control

The **Name** item allows to assign to the channel a symbolic name.

The **V0Set** item allows to set V0; see [15] and [16] for further details.

A read access to the **V0Set#EU** item returns a string with the V0set Engineering Units.

A read access to the **V0Set#HighEU** item returns the highest possible V0set value.

A read access to the **V0Set#LowEU** item returns the lowest possible V0set value.

The **I0Set** item allows to set I0; see [15] and [16] for further details.

A read access to the **I0Set#EU** item returns a string with the I0set Engineering Units.

A read access to the **I0Set#HighEU** item returns the highest possible I0set value.

A read access to the **I0Set#LowEU** item returns the lowest possible I0set value.

The **V1Set** item allows to set V1; see [15] and [16] for further details.

A read access to the **V1Set#EU** item returns a string with the V1set Engineering Units.

A read access to the **V1Set#HighEU** item returns the highest possible V1set value.

A read access to the **V1Set#LowEU** item returns the lowest possible V1set value.

The **I1Set** item allows to set I1; see [15] and [16] for further details.

A read access to the **I1Set#EU** item returns a string with the I1set Engineering Units.

A read access to the **I1Set#HighEU** item returns the highest possible I1set value.

A read access to the **I1Set#LowEU** item returns the lowest possible I1set value.

The **RUp** item allows to program the ramp-up rate; see [15] and [16] for further details.

A read access to the **RUp#EU** item returns a string with the RUp Engineering Units.

A read access to the **RUp#HighEU** item returns the highest possible RUp value.

A read access to the **RUp#LowEU** item returns the lowest possible RUp value.

The **RDwn** item allows to program the ramp-down rate; see [15] and [16] for further details.

A read access to the **RDwn#EU** item returns a string with the RDwn Engineering Units.

A read access to the **RDwn#HighEU** item returns the highest possible RDwn value.

A read access to the **RDwn#LowEU** item returns the lowest possible RDwn value.

The **Trip** item allows to program the trip time; see [15] and [16] for further details.

A read access to the **Trip#EU** item returns a string with the Trip Engineering Units.

A read access to the **Trip#HighEU** item returns the highest possible Trip value.

A read access to the **Trip#LowEU** item returns the lowest possible Trip value.

The **VMon** item returns back the VMon value; see [15] and [16] for further details.

A read access to the **VMon#EU** item returns a string with the VMon Engineering Units.

A read access to the **VMon#HighEU** item returns the highest possible VMon value.

A read access to the **VMon#LowEU** item returns the lowest possible VMon value.

The **IMon** item returns back the IMon value; see [[15] and [16] for further details.

A read access to the **IMon#EU** item returns a string with the IMon Engineering Units.

A read access to the **IMon#HighEU** item returns the highest possible IMon value.

A read access to the **IMon#LowEU** item returns the lowest possible IMon value.

A read access to the **Status** item returns back a 16 bit pattern indicating channel status, as follows (see [15] and [16] for further details):

- Bit 0: ON/OFF
- Bit 1: OverCurrent
- Bit 2: OverVoltage
- Bit 3: UnderVoltage
- Bit 4: Trip
- Bit 5: Ramp up
- Bit 6: Ramp down
- Bit 7: Over MAXV
- Bit 8: Polarity (0⇒positive)
- Bit 9-15: Don't care

The **Pw** item allows to switch ON/OFF the channel.

A read access to the **Pw#CoOpen** returns back the label "Off" associated to Pw=0.

A read access to the **Pw#CoClose** item back the label "On" associated to Pw=1.

A read access to the **HVMax** item returns the voltage hardware limit set by trimmer on the board.

A read access to the **HVMax#EU** item returns a string with the HVMax Engineering Units.

A read access to the **HVMax#HighEU** item returns the highest possible HVMax value.

A read access to the **HVMax#LowEU** item returns the lowest possible HVMax value.

Table 8.3 - N 470/ N570 Channel items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.ChanYYY.Name	string	R/W	Channel name
PowerSupplyName.BoardXX.ChanYYY.V0Set	4-byte real	R/W	Set V0 voltage limit
PowerSupplyName.BoardXX.ChanYYY.V0Set#EU	string	R	V0set EU
PowerSupplyName.BoardXX.ChanYYY.V0Set#HighEU	8-byte real	R	V0set upper limit
PowerSupplyName.BoardXX.ChanYYY.V0Set#LowEU	8-byte real	R	V0set lower limit
PowerSupplyName.BoardXX.ChanYYY.I0Set	4-byte real	R/W	Set I0 current limit
PowerSupplyName.BoardXX.ChanYYY.I0Set#EU	string	R	I0set EU
PowerSupplyName.BoardXX.ChanYYY.I0Set#HighEU	8-byte real	R	I0set upper limit
PowerSupplyName.BoardXX.ChanYYY.I0Set#LowEU	8-byte real	R	I0set lower limit
PowerSupplyName.BoardXX.ChanYYY.V1Set	4-byte real	R/W	Set V1 voltage limit
PowerSupplyName.BoardXX.ChanYYY.V1Set#EU	string	R	V1set EU
PowerSupplyName.BoardXX.ChanYYY.V1Set#HighEU	8-byte real	R	V1set upper limit
PowerSupplyName.BoardXX.ChanYYY.V1Set#LowEU	8-byte real	R	V1set lower limit
PowerSupplyName.BoardXX.ChanYYY.I1Set	4-byte real	R/W	Set I1 current limit
PowerSupplyName.BoardXX.ChanYYY.I1Set#EU	string	R	I1set EU
PowerSupplyName.BoardXX.ChanYYY.I1Set#HighEU	8-byte real	R	I1set upper limit
PowerSupplyName.BoardXX.ChanYYY.I1Set#LowEU	8-byte real	R	I1set lower limit
PowerSupplyName.BoardXX.ChanYYY.RUp	4-byte real	R/W	Set ramp-up rate
PowerSupplyName.BoardXX.ChanYYY.RUp #EU	string	R	Ramp up rate EU
PowerSupplyName.BoardXX.ChanYYY.RUp #HighEU	8-byte real	R	Rup upper limit
PowerSupplyName.BoardXX.ChanYYY.RUp #LowEU	8-byte real	R	RUp lower limit
PowerSupplyName.BoardXX.ChanYYY.RDwn	4-byte real	R/W	Set ramp-down rate
PowerSupplyName.BoardXX.ChanYYY.RDwn #EU	string	R	Ramp down rate EU
PowerSupplyName.BoardXX.ChanYYY.RDwn #HighEU	8-byte real	R	RDwn upper limit
PowerSupplyName.BoardXX.ChanYYY.RDwn #LowEU	8-byte real	R	RDwn lower limit
PowerSupplyName.BoardXX.ChanYYY.Trip	4-byte real	R/W	Set trip time
PowerSupplyName.BoardXX.ChanYYY.Trip #EU	String	R	Trip time EU
PowerSupplyName.BoardXX.ChanYYY.Trip #HighEU	8-byte real	R	Trip time upper limit
PowerSupplyName.BoardXX.ChanYYY.Trip #LowEU	8-byte real	R	Trip time lower limit
PowerSupplyName.BoardXX.ChanYYY.VMon	4-byte real	R	VMon
PowerSupplyName.BoardXX.ChanYYY.VMon #EU	string	R	VMon EU
PowerSupplyName.BoardXX.ChanYYY.VMon#HighU	8-byte real	R	VMon upper limit
PowerSupplyName.BoardXX.ChanYYY.VMon#LowEU	8-byte real	R	VMon lower limit

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.ChanYYY.IMon	4-byte real	R	IMon
PowerSupplyName.BoardXX.ChanYYY.IMon #EU	string	R	IMon EU
PowerSupplyName.BoardXX.ChanYYY.IMon#HighU	8-byte real	R	IMon upper limit
PowerSupplyName.BoardXX.ChanYYY.IMon#LowEU	8-byte real	R	IMon lower limit
PowerSupplyName.BoardXX.ChanYYY.Pw	boolean	R/W	Power ON/OFF
PowerSupplyName.BoardXX.ChanYYY.Pw#CoClose	string	R	Pw close label
PowerSupplyName.BoardXX.ChanYYY.Pw#CoOpen	string	R	Pw open label
PowerSupplyName.BoardXX.ChanYYY.Status	2-byte integer	R	Channel status

9. N568/N568B/N568LC Spectroscopy amplifiers

9.1. N568 board control

This chapter describes the Items which are available for the control of a N568 module.

A read access to the **ModelName** item returns a string with the board model.

A read access to the **SwRelease** item returns a string with the board software release.

A read access to the **CnetCrNum** item returns the board Caenet crate number.

A read access to the **Slots** item returns the number of the board's slots (1).

A read access to the **Model** item returns a string with the board's name.

A read access to the **Description** item returns a string with the board synthetic description.

A read access to the **FmwRelease** item returns a string with the board firmware release.

A read access to the **SerNum** item returns a string with the board serial number.

A read access to the **NrOfCh** item returns the number of board's channels.

The **Offset** item allows to set the Offset; see the board's User's manual for further details.

A read access to the **Offset#EU** item returns a string with the Offset Engineering Units.

A read access to the **Offset#HighEU** item returns the highest possible Offset value.

A read access to the **Offset#LowEU** item returns the lowest possible Offset value.

Table 9.2 – N568 Board Items

ItemID	Data Type	Access Rights	Description
N568.ModelName	String	R	Board model
N568.SwRelease	String	R	Board software release
N568.CnetCrNum	2 byte integer	R	Caenet crate number
N568.Slots	2 byte integer	R	Number of slots
N568.BoardXX.Model	String	R	Board name
N568.BoardXX.Description	String	R	Synthetic description
N568.BoardXX.FmwRelease	String	R	Board firmware release
N568.BoardXX.SerNum	String	R	Board serial number
N568.BoardXX.NrOfCh	2 byte integer	R	Number of board channels
N568.BoardXX.Offset	4 byte integer	R/W	Offset value
N568.BoardXX.Offset#EU	String	R	Offset EU
N568.BoardXX.Offset#HighEU	8 byte integer	R	Offset upper limit
N568.BoardXX.Offset#LowEU	8 byte integer	R	Offset lower limit

9.2. N568 channel control

This chapter describes the Items which are available for the control of a N568 channel.

The **Name** item allows to assign to the channel a symbolic name.

The **FineGain** item allows to set Fine Gain; see the board User's manual for details.

A read access to the **FineGain#EU** item returns a string with the Fine Gain Engineering Units.

A read access to the **FineGain#HighEU** item returns the highest possible Fine Gain value.

A read access to the **FineGain#LowEU** item returns the lowest possible Fine Gain value.

The **CoarGain** item allows to set Coarse Gain; see the board User's manual for further details.

A read access to the **CoarGain#EU** item returns a string with the Coarse Gain Engineering Units.

A read access to the **CoarGain#HighEU** item returns the highest possible Coarse Gain value.

A read access to the **CoarGain#LowEU** item returns the lowest possible Coarse Gain value.

The **PoleZAdj** item allows the Pole Zero Adjustment; see the board User's manual for further details.

A read access to the **PoleZAdj#EU** item returns a string with the Pole Zero Adjustment Engineering Units.

A read access to the **PoleZAdj#HighEU** item returns the highest possible Pole Zero Adjustment value.

A read access to the **PoleZAdj#LowEU** item returns the lowest possible Pole Zero Adjustment value.

The **Shape** item allows the Shape setting; see the board User's manual for further details.

A read access to the **Shape#EU** item returns a string with the Shape Engineering Units.

A read access to the **Shape#HighEU** item returns the highest possible Shape value.

A read access to the **Shape#LowEU** item returns the lowest possible Shape value.

The **OutPol** item allows to set the Output Polarity; see the board User's manual for further details.

A read access to the **OutPol#CoClose** item returns back the label "Negative" associated to Negative output polarity.

A read access to the **OutPol#CoOpen** item returns back the label "Positive" associated to Positive output polarity.

The **OutConf** item allows to set the Output Configuration; see the board User's manual for further details.

A read access to the **OutConf#CoClose** item returns back the label "Inverted" associated to Inverted output.

A read access to the **OutConf#CoOpen** item returns back the label "Direct" associated to Direct output.

Table 9.3 – N568 Channel items

ItemID	Data Type	Access Rights	Description
N568.BoardXX.ChanYYY.Name	String	R/W	Channel name
N568.BoardXX.ChanYYY.FineGain	4 byte integer	R/W	Set Fine Gain
N568.BoardXX.ChanYYY.FineGain#EU	String	R	Fine Gain EU
N568.BoardXX.ChanYYY.FineGain#HighEU	8 byte integer	R	Fine Gain upper limit
N568.BoardXX.ChanYYY.FineGain#LowEU	8 byte integer	R	Fine Gain lower limit
N568.BoardXX.ChanYYY.CoarGain	4 byte integer	R/W	Set Coarse Gain
N568.BoardXX.ChanYYY.CoarGain#EU	String	R	Coarse Gain EU
N568.BoardXX.ChanYYY.CoarGain#HighEU	8 byte integer	R	Coarse Gain upper limit
N568.BoardXX.ChanYYY.CoarGain#LowEU	8 byte integer	R	Coarse Gain lower limit
N568.BoardXX.ChanYYY.PoleZAdj	4 byte integer	R/W	Allows Pole Zero Adjustment
N568.BoardXX.ChanYYY.PoleZAdj#EU	String	R	Pole Zero Adjustment EU
N568.BoardXX.ChanYYY.PoleZAdj#HighEU	8 byte integer	R	Pole Zero Adj. upper limit
N568.BoardXX.ChanYYY.PoleZAdj#LowEU	8 byte integer	R	Pole Zero Adj. lower limit
N568.BoardXX.ChanYYY.Shape	4 byte integer	R/W	Set Shape
N568.BoardXX.ChanYYY.Shape#EU	String	R	Shape EU
N568.BoardXX.ChanYYY.Shape#HighEU	8 byte integer	R	Shape upper limit
N568.BoardXX.ChanYYY.Shape#LowEU	8 byte integer	R	Shape lower limit
N568.BoardXX.ChanYYY.OutPol	Boolean	R/W	Set Output Polarity
N568.BoardXX.ChanYYY.OutPol#CoClose	String	R	Output Polarity close label
N568.BoardXX.ChanYYY.OutPol#CoOpen	String	R	Output Polarity open label
N568.BoardXX.ChanYYY.OutConf	Boolean	R/W	Set Output Configuration
N568.BoardXX.ChanYYY.OutConf#CoClose	String	R	Out Config. close label
N568.BoardXX.ChanYYY.OutConf#CoOpen	String	R	Out Config. open label

9.3. N568B / N568LC board control

This chapter describes the Items which are available for the control of a N568B / N568LC module.

A read access to the **ModelName** item returns a string with the board model.

A read access to the **SwRelease** item returns a string with the board software release.

A read access to the **CnetCrNum** item returns the board Caenet crate number.

A read access to the **Slots** item returns the number of the board's slots (1).

A read access to the **Model** item returns a string with the board's name.

A read access to the **Description** item returns a string with the board synthetic description.

A read access to the **FmwRelease** item returns a string with the board firmware release.

A read access to the **SerNum** item returns a string with the board serial number.

A read access to the **NrOfCh** item returns the number of board's channels.

The **MuxOut** item allows to enable the Multiplexed Output; see the board's User's manual for further details.

A read access to the **MuxOut#CoClose** item returns back the label "Enable" associated to Multiplexed Output Enabled.

A read access to the **MuxOut#CoOpen** item returns back the label "Disable" associated to Multiplexed Output Disabled.

The **LastCh** item returns the Latest Channel accessed; see the board's User's manual for further details.

A read access to the **LastCh#EU** item returns a string with the Latest Channel Engineering Units.

A read access to the **LastCh#HighEU** item returns the highest possible Latest Channel value.

A read access to the **LastCh#LowEU** item returns the lowest possible Latest Channel value.

The **Offset** item allows to set the Offset; see the board's User's manual for further details.

A read access to the **Offset#EU** item returns a string with the Offset Engineering Units.

A read access to the **Offset#HighEU** item returns the highest possible Offset value.

A read access to the **Offset#LowEU** item returns the lowest possible Offset value.

Table 9.2 – N568B / N568LC Board Items

ItemID	Data Type	Access Rights	Description
N568B.ModelName	String	R	Board model
N568B.SwRelease	String	R	Board software release
N568B.CnetCrNum	2 byte integer	R	Caenet crate number
N568B.Slots	2 byte integer	R	Number of slots
N568B.BoardXX.Model	String	R	Board name
N568B.BoardXX.Description	String	R	Synthetic description
N568B.BoardXX.FmwRelease	String	R	Board firmware release
N568B.BoardXX.SerNum	String	R	Board serial number
N568B.BoardXX.NrOfCh	2 byte integer	R	Number of board channels
N568B.BoardXX.MuxOut	Boolean	R/W	Enable Multiplexed Output
N568B.BoardXX.MuxOut#CoClose	String	R	Multiplexed Out close label
N568B.BoardXX.MuxOut#CoOpen	String	R	Multiplexed Out open label
N568B.BoardXX.Last	4 byte integer	R/W	Latest channel value
N568B.BoardXX.Last#EU	String	R	Latest ch. EU
N568B.BoardXX.Last#HighEU	8 byte integer	R	Latest ch. upper limit
N568B.BoardXX.Last#LowEU	8 byte integer	R	Latest ch. lower limit
N568B.BoardXX.Offset	4 byte integer	R/W	Offset value
N568B.BoardXX.Offset#EU	String	R	Offset EU
N568B.BoardXX.Offset#HighEU	8 byte integer	R	Offset upper limit
N568B.BoardXX.Offset#LowEU	8 byte integer	R	Offset lower limit

9.4. N568B / N568LC channel control

This chapter describes the Items which are available for the control of a N568B / N568LC channel.

The **Name** item allows to assign to the channel a symbolic name.

The **FineGain** item allows to set Fine Gain; see the board User's manual for details.

A read access to the **FineGain#EU** item returns a string with the Fine Gain Engineering Units.

A read access to the **FineGain#HighEU** item returns the highest possible Fine Gain value.

A read access to the **FineGain#LowEU** item returns the lowest possible Fine Gain value.

The **CoarGain** item allows to set Coarse Gain; see the board User's manual for further details.

A read access to the **CoarGain#EU** item returns a string with the Coarse Gain Engineering Units.

A read access to the **CoarGain#HighEU** item returns the highest possible Coarse Gain value.

A read access to the **CoarGain#LowEU** item returns the lowest possible Coarse Gain value.

The **PoleZAdj** item allows the Pole Zero Adjustment; see the board User's manual for further details.

A read access to the **PoleZAdj#EU** item returns a string with the Pole Zero Adjustment Engineering Units.

A read access to the **PoleZAdj#HighEU** item returns the highest possible Pole Zero Adjustment value.

A read access to the **PoleZAdj#LowEU** item returns the lowest possible Pole Zero Adjustment value.

The **Shape** item allows the Shape setting; see the board User's manual for further details.

A read access to the **Shape#EU** item returns a string with the Shape Engineering Units.

A read access to the **Shape#HighEU** item returns the highest possible Shape value.

A read access to the **Shape#LowEU** item returns the lowest possible Shape value.

The **OutPol** item allows to set the Output Polarity; see the board User's manual for further details.

A read access to the **OutPol#CoClose** item returns back the label "Negative" associated to Negative output polarity.

A read access to the **OutPol#CoOpen** item returns back the label "Positive" associated to Positive output polarity.

The **OutConf** item allows to set the Output Configuration; see the board User's manual for further details.

A read access to the **OutConf#CoClose** item returns back the label "Inverted" associated to Inverted output.

A read access to the **OutConf#CoOpen** item returns back the label "Direct" associated to Direct output.

Table 9.3 – N568B / N58LC Channel items

ItemID	Data Type	Access Rights	Description
N568B.BoardXX.ChanYYY.Name	String	R/W	Channel name
N568B.BoardXX.ChanYYY.FineGain	4 byte integer	R/W	Set Fine Gain
N568B.BoardXX.ChanYYY.FineGain#EU	String	R	Fine Gain EU
N568B.BoardXX.ChanYYY.FineGain#HighEU	8 byte integer	R	Fine Gain upper limit
N568B.BoardXX.ChanYYY.FineGain#LowEU	8 byte integer	R	Fine Gain lower limit
N568B.BoardXX.ChanYYY.CoarGain	4 byte integer	R/W	Set Coarse Gain
N568B.BoardXX.ChanYYY.CoarGain#EU	String	R	Coarse Gain EU
N568B.BoardXX.ChanYYY.CoarGain#HighEU	8 byte integer	R	Coarse Gain upper limit
N568B.BoardXX.ChanYYY.CoarGain#LowEU	8 byte integer	R	Coarse Gain lower limit
N568B.BoardXX.ChanYYY.PoleZAdj	4 byte integer	R/W	Allows Pole Zero Adjustment
N568B.BoardXX.ChanYYY.PoleZAdj#EU	String	R	Pole Zero Adjustment EU
N568B.BoardXX.ChanYYY.PoleZAdj#HighEU	8 byte integer	R	Pole Zero Adj. upper limit
N568B.BoardXX.ChanYYY.PoleZAdj#LowEU	8 byte integer	R	Pole Zero Adj. lower limit
N568B.BoardXX.ChanYYY.Shape	4 byte integer	R/W	Set Shape
N568B.BoardXX.ChanYYY.Shape#EU	String	R	Shape EU
N568B.BoardXX.ChanYYY.Shape#HighEU	8 byte integer	R	Shape upper limit
N568B.BoardXX.ChanYYY.Shape#LowEU	8 byte integer	R	Shape lower limit
N568B.BoardXX.ChanYYY.OutPol	Boolean	R/W	Set Output Polarity
N568B.BoardXX.ChanYYY.OutPol#CoClose	String	R	Out polarity close label
N568B.BoardXX.ChanYYY.OutPol#CoOpen	String	R	Out polarity open label
N568B.BoardXX.ChanYYY.OutConf	Boolean	R/W	Set Output Configuration
N568B.BoardXX.ChanYYY.OutConf#CoClose	String	R	Out configuration close label
N568B.BoardXX.ChanYYY.OutConf#CoOpen	String	R	Out configuration open label

10. OPC clients connection

The *CAEN HV OPC Server* has been successfully tested with Northern Dynamic OPC Browser ver. 1.0 and the following OPC clients:

- National Instruments Server Explorer ver. 1.1
- Softing OPC Client ver. 2.0
- National Instruments LabView 5.x and later

This chapter is mainly to help the User to familiarise with OPC clients operation.

10.1. Browsing the server address space

This section illustrates a typical OPC browse session. Start, for example, the ND OPC Browser, go to **File → Browse OPC Server...**, select CAEN.HVOPCServer from the list in the dialog window and then click "OK".

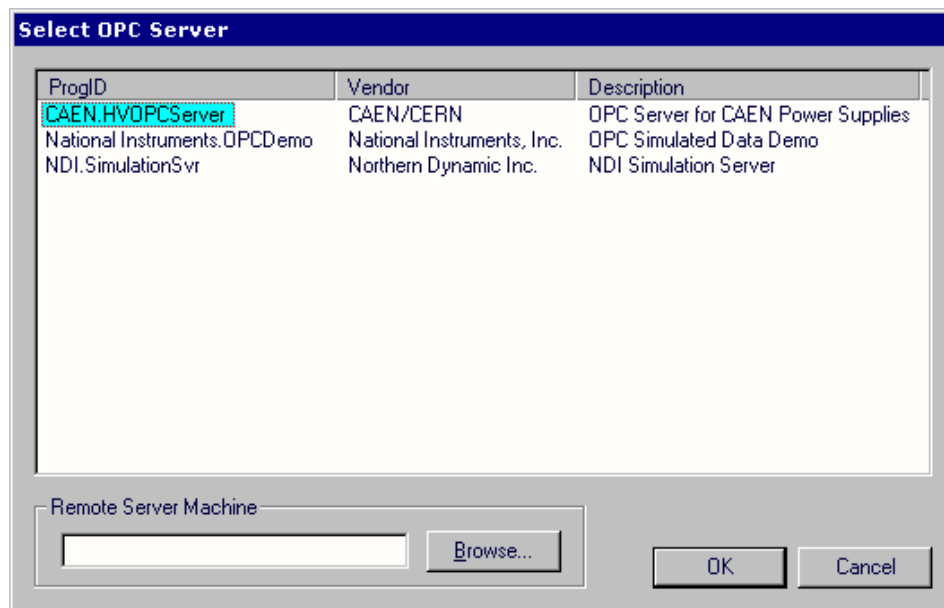


Fig. 10-1: Selecting the OPC server

In the Browser window is graphically depicted the server address space (see Fig. 3.1). By right clicking on the item tag, it is possible to access the item's Specific properties, like shown in the figure below.

The image shows a dialog box titled "OPC Server Item Properties". It contains the following fields and values:

- Item Id: V0Set
- Fully Qualified Item Id: system0.Board03.Chan000.V0Set
- Data Type: 4-byte real
- Access Rights: RW
- Selected Access Path: (empty dropdown menu)

Buttons: OK, Cancel

Fig. 10-2: The item's Specific properties

10.2. National Instruments LabView 5.x and later releases

National Instruments LabView 5.x and later releases include a native OPC Client embedded into its set of VIs based on Datasocket technology. You can develop your own LabView application basing it on Datasocket, or you can use some examples provided by National. In this section we will see how to read the temperature of the A1832 board.

In the main dialog of LabView press the "Search examples" button. In the Search Examples Help follow the "OPC" link. Choice the "Browse to OPC Item" example and run it. In the "Select URL path" window select CAEN.HVOPCserver on the machine where it has been registered.

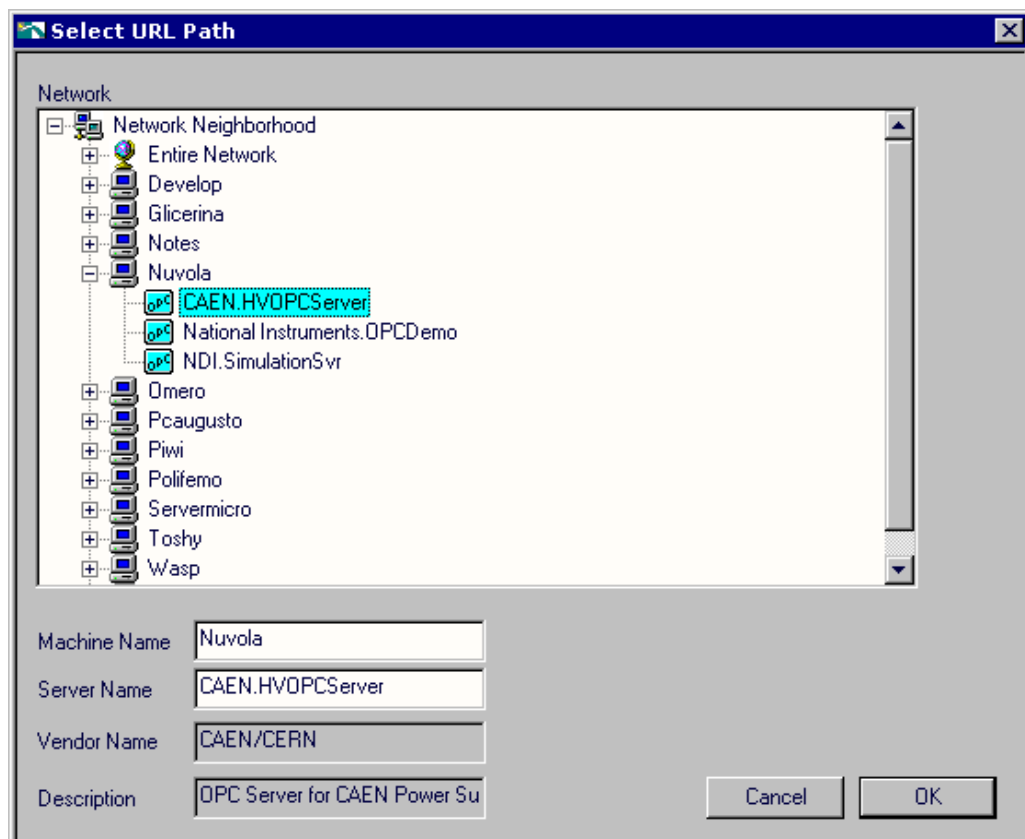


Fig. 10-3: Selecting URL path to server

This operation causes the automatic start-up of the OPC server; you can browse the server address space and select an ItemID (in our case we will choice the temperature of the board in slot 04: system0.Board04.Temp).

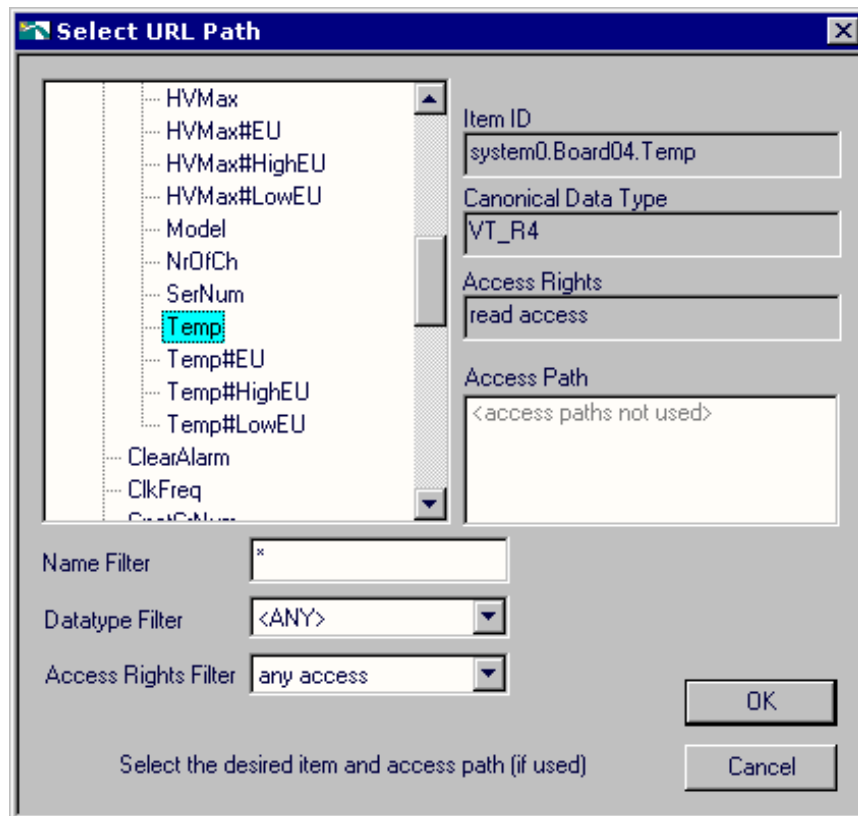


Fig. 10-4: Selecting an item

The fully qualified ItemID is then showed in the "URL" window of the VI's front panel.

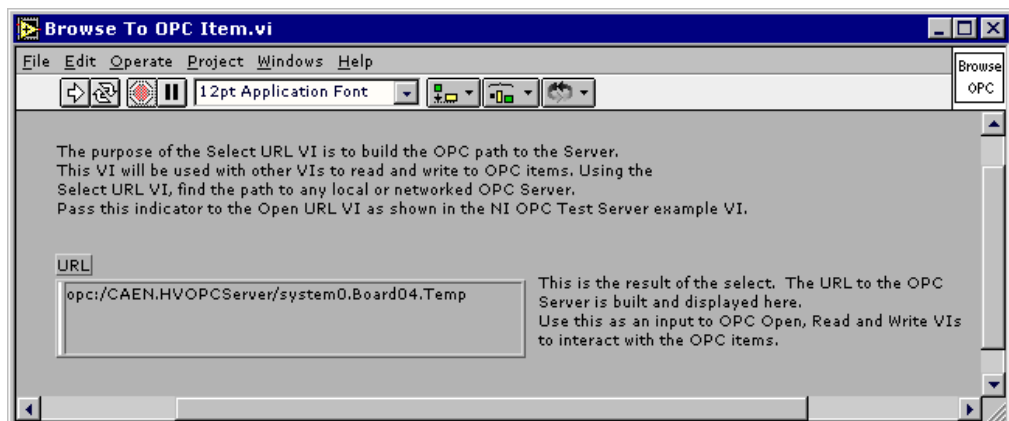


Fig. 10-5: "URL" window of the VI's front panel

If you want to monitor the current values of the temperature, you can use the "Demo OPC Client" example: simply set the Hostname (leaving it blank if the OPC server is on

the same PC as LabView), the Server Name (CAEN.HVOPCserver) and the Item name (system0.Board04.temp) and then launch the VI.

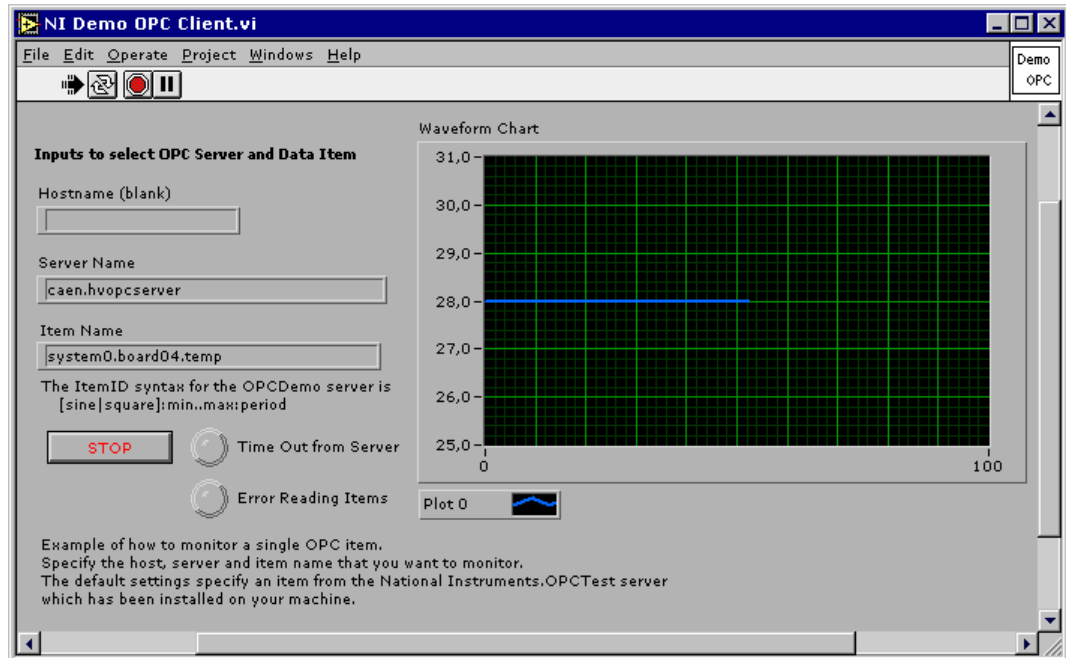


Fig. 10-6: Temperature plot

10.3. National Instruments Server Explorer

This section illustrates how to access data items by the help of NI Server Explorer. In the Server Explorer window select CAEN.HVOPCServer, in the menu bar go to **Servers**→**Connect to Server** and choose “Connect”. To create a group, go in the menu bar to **Edit**→**Add**, specify the group name in the dialog box (for example “group0”) and then click on the Add button.

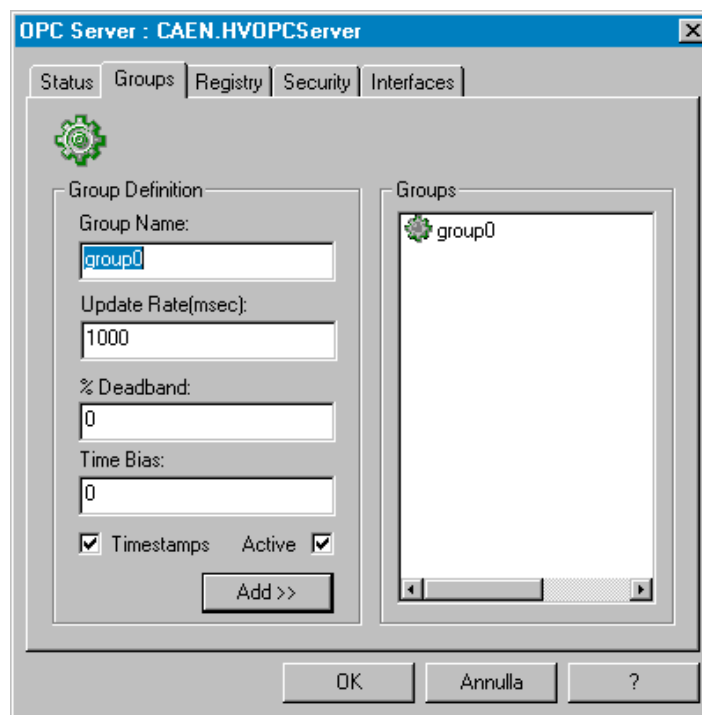


Fig. 10-7: Creating a group

To add items, select a group in the main window (for example “group0”), go in the menu bar to **Edit**→**Add**, select the desired items into the Item definition window and then click on the Add button (see Fig. 10-8).

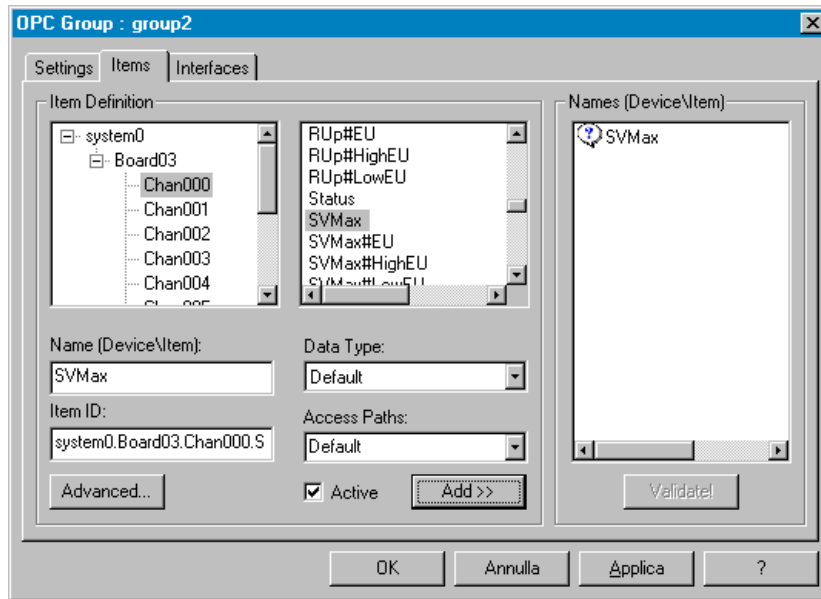


Fig. 10-8: Adding items to a group

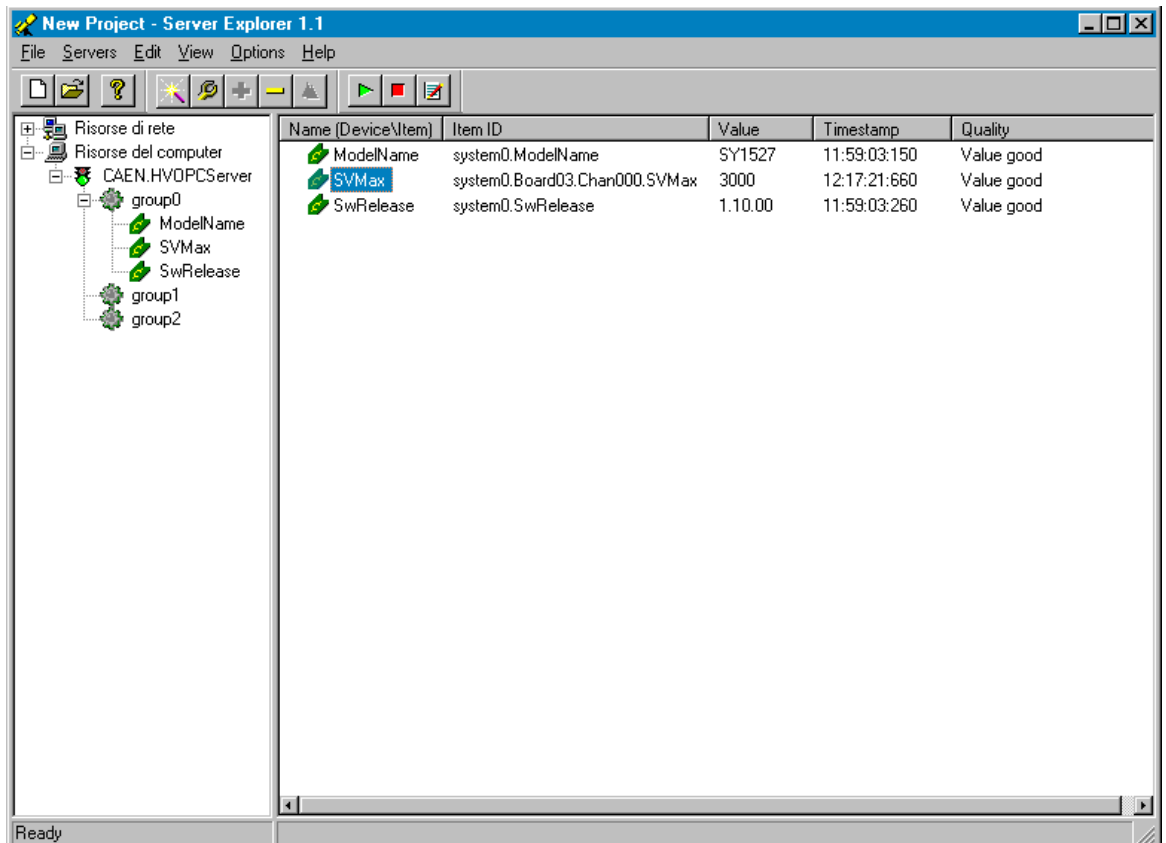


Fig. 10-9: Active items list

The list of active items appears in the Server explorer main window. To read/write data items or check items' properties, simply double click on the item tag in the main window and select the Read&Write option (see the figure below).

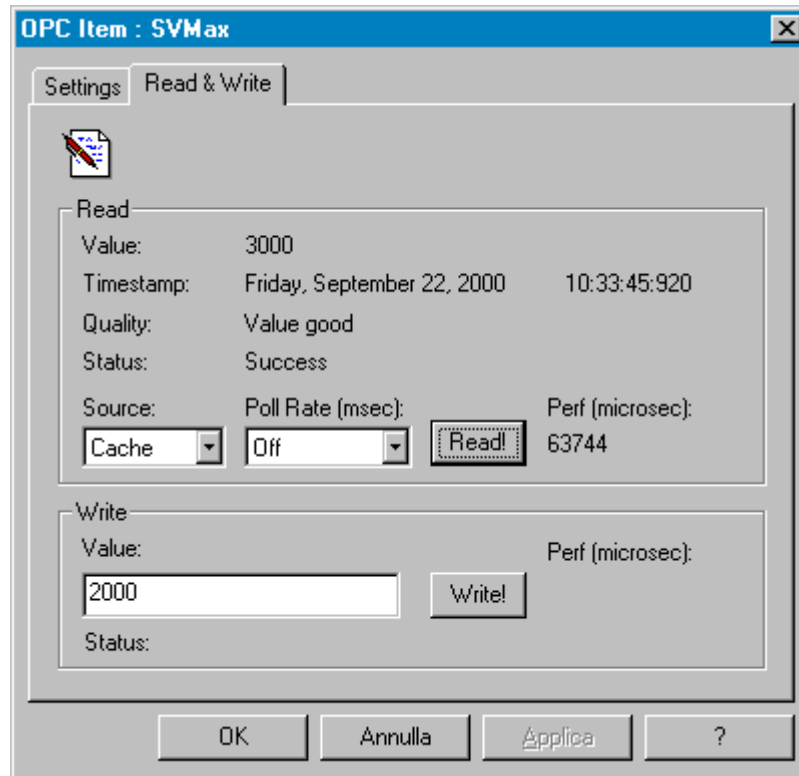


Fig. 10-10: Read/write data

10.4. Softing OPC Client

This section illustrates how to access data items by the help of the Softing OPC Client. In the main menu go to **Server→Add**, in the Browse window double click on “CAEN OPC Server for Power Supplies” then push the OK button; to start the server go to **Server→Start→Deep**.

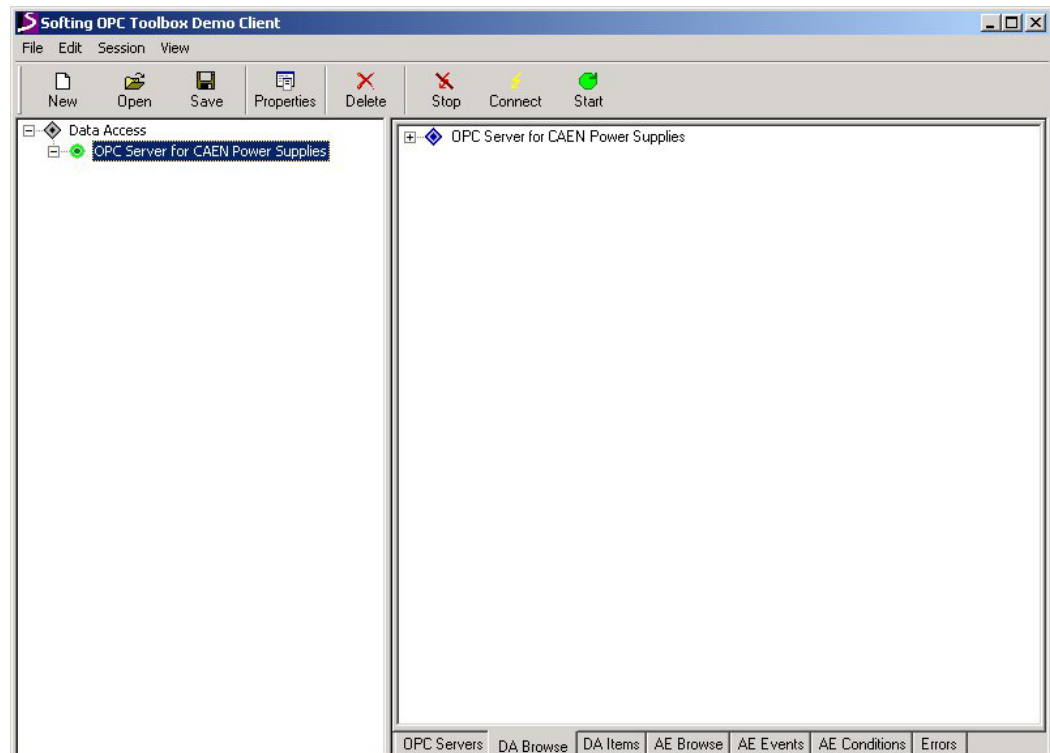


Fig. 10-11: Connect to OPC server

To add a group, go in the main menu to **Group→Add**, specify the group name in the dialog box and then go to **Group→Start →Deep**. To add items, select a group, go to **Items→Add**, specify the ItemID in the dialog box and click OK, then go to **Item→Start →Deep**. Item properties are indicated in the Properties window (see Fig. 10-13)

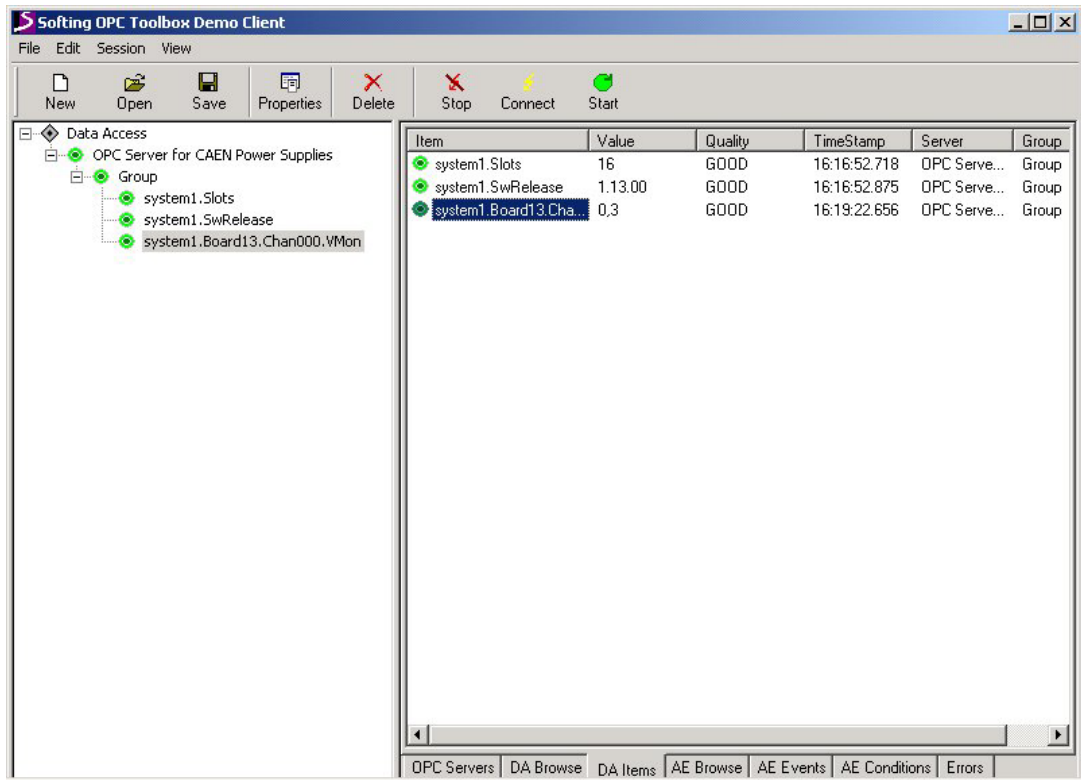


Fig. 10-12: The VMon item

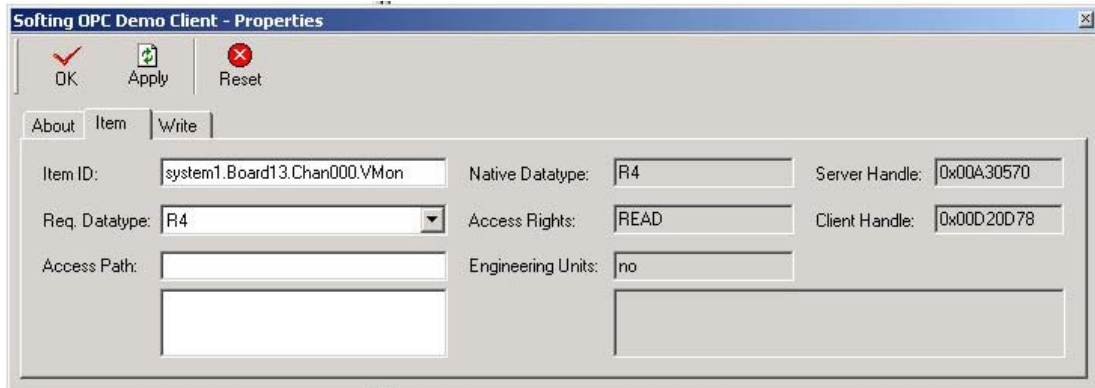


Fig. 10-13: The VMon item properties