



CAEN OPC Server 5.x OPC Server for CAEN Power Supplies Rev. 15 - 1 July 2014

Purpose of this User Manual

This User's Manual contains the full description of the OPC Server for CAEN Power Supplies.

Change Document Record

Date	Revision	Changes
20 December 2013	14	OPC Rel. 5.x
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Symbols, abbreviated terms and notation

T.B.D.

Reference Document

SY1527 User's Manual SY4527 User's Manual V6533 User's Manual VME8100 and VME8200 User's Manual

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1. Introduction

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, through various communication path, by any OPC compliant client application.

CAEN HV OPC Server is fully compliant with the OPC Data Access 2.0 specifications; this version provides:

- CAEN Power Supply Systems, V65XX power supplies, VME8x00 crates
- CONET, USB2.0, TCP/IP caenecommunication path
- DCOM based interface for local/remote OPC server configuration

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

Install the OPC server

Unzip the CAENHVOPCServer_5.x.zip file and then launch setup.exe; this will install all the OPC server (version 5.x) components on your local machine. The OPC server will be configured as a Windows OS service.

OPC server configuration interface

The software release 5.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)

CAEN OPC server configurator tool

Installation

Unzip the CAENHVOPCServerConfiguratorSetup zip file and then launch setup.exe; this will install the CAEN HV OPC Server Configurator components on your local machine.

OPC Server configuration

From Start/Programs/CAEN run CAEN HV OPC Server Configurator, the following window will be displayed:

CAEN HV OPC Ser	ver Configurator (v	5.32)		- • ×
CAEN Discovery	The second	X		A.
P.S. Name	Sys. Type	Conn. Type	Conn. Param.	Status
Edit entries Add Entry	Remove Entry	Restart Ser	rver	Exit
Connected clients:	0 Status: Activ	e Sw Release: 5	.37 (5.31)	

Fig. 1: CAEN HV OPC Server Configurator start up window

Click on the Add Entry button, one of the following windows will be displayed, depending on the selected device: SY1527/2527 SY4527/5527

51152//252/		31432//332/	
Create new Entry	 ,	Create new Entry	X
Power Supply Name		Power Supply Name	
Power Supply Type	SY1527 / SY2527 🔹	Power Supply Type	SY4527 / SY5527 🔹
Connection Type	TCP/IP -	Connection Type	TCP/IP
Connection Parameters		Connection Parameters	
IP Address	0 0 0 0	IP Address	0 0 0 0
Usemame	admin	Usemame	
Password	••••	Password	
	OK Cancel		OK Cancel
VME8x00 TCP/IP		VME8x00 USB VCF)
Create new Entry		Create new Entry	
Power Supply Name		Power Supply Name	
Power Supply Type	V8100 -	Power Supply Type	V8100 V
Connection Type	TCP/IP -	Connection Type	USB VCP -
Connection Parameters		Connection Parameters	
IP Address	0 0 0 0	Port	COM0 -
Usemame			
Password			
	OK Cancel		OK Cancel
V65xx USB		V65xx PCI OPTICA	L LINK
Create new Entry		Create new Entry	
Power Supply Name		Power Supply Name	
Power Supply Type	V65XX 💌	Power Supply Type	V65XX
Connection Type	USB •	Connection Type	PCI OPTICAL LINK
Connection Parameters		Connection Parameters	
VME Connection		VME Connection	
	OK Canal		OK Cancel

Fig. 2: Connection parameters

Once entered the *Power Supply Name* in the relevant field, the *Connection Type* must be selected; then enter the correct connection parameters and 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.

S. Name	Sys. Type	Conn. Type	Conn. Param.	Status
	SY4527 / SY5527	TCP/IP	10.0.7.52	Pending

Fig. 3: Configuring an Entry

Select a P.S. name and click on the **Configure Entry** button to open the relevant Configuration File; 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

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.

CE SY1527 System.obr - OPC Browser	_ 🗗 🗡
<u>File Edit V</u> iew <u>H</u> elp	
CAEN/CERN	
CAEN.HV0PCServer	
i⊟system0	
ie	
I In Msg	
RS232CmdOff	
U Careford	
- Construction	
hyperson hy	
^e_ IPAddr	
♠ _E IPNetMsk	
- Che IPGw	
m [™] e RS232Par	
SymbolicName	
tingru Slots	

Fig. 4: Browsing the server address space

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.

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. SY4527 / SY5527 Power Supply System

This chapter describes the OPC Items which are available for the SY 4527 / SY 5527 system control.

SY4527 / SY5527 System control

OPC Items available for general system control are fully listed in Table 1. For a detailed description of the SY4527 / SY5527 system operation, refer to SYx527 User's manual

A write access to the Kill Item (Value = 1) allows to switch OFF at the max rate all system channels;

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

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;

A read access to the ModelName Item returns a string indicating the system model (SY4527, SY5527, ...).

A read access to the SwRelease Item returns a string indicating the system firmware release (example: 2.00.00).

The GenSignCfg Item allows to configure the GEN signal by writing an 16 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) Bit 8: GEN enable MASK Bit 9: GEN always ON MASK Bit 10: GEN ON due to OvV (Over Voltage) MASK Bit 11: GEN ON due to OvC (Over Current) MASK Bit 12: GEN ON due to UnV (Under Voltage) MASK Bit 13: GEN ON due to TRIP MASK Bit 14÷15: Don't care (=0)

This Item is a 2-byte integer; in order to set or reset bits 0..5, it is necessary to set to 1 the corresponding "MASK" bit (bits 8..13).

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)

The ResFlagCfg Item allows to configure the system reset by writing an 16 bit pattern as follows:

Bit 0: backplane reset due to CPU failure Bit 1: always set to 1 Bit 2: backplane reset due to front panel reset input signal Bit 3: CPU reset due to front panel reset input signal Bit 4÷5: always set to 1 Bit 6÷15: always set to 0

A read access to the **ResFlag** Item returns a 16 bit pattern with the reset flag status:

Bit 0: backplane reset due to CPU failure Bit 1: always set to 1 Bit 2: backplane reset due to front panel reset input signal Bit 3: CPU reset due to front panel reset input signal Bit 4÷5: always set to 1 Bit 6÷15: always set to 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:

 $\begin{array}{l} \mathsf{ACstatus} = -1 \Longrightarrow \mathsf{FAIL} \\ \mathsf{ACstatus} = 1 \Longrightarrow \mathsf{GOOD} \\ \mathsf{Primary} = -1 \Longrightarrow \mathsf{Primary} \ \mathsf{supply} \ \mathsf{module} \ \mathsf{FAIL} \\ \mathsf{Primary} = 1 \Longrightarrow \mathsf{Primary} \ \mathsf{supply} \ \mathsf{module} \ \mathsf{GOOD} \\ \mathsf{Add} \ \mathsf{X} = -1 \Longrightarrow \mathsf{Add} \ \mathsf{on} \ \mathsf{supply} \ \mathsf{module} \ \mathsf{nr.} \ \mathsf{X} \ \mathsf{FAIL} \\ \mathsf{Add} \ \mathsf{X} = 0 \Longrightarrow \mathsf{Add} \ \mathsf{on} \ \mathsf{supply} \ \mathsf{module} \ \mathsf{nr.} \ \mathsf{X} \ \mathsf{NOT} \ \mathsf{PRESENT} \\ \mathsf{Add} \ \mathsf{X} = 1 \Longrightarrow \mathsf{Add} \ \mathsf{on} \ \mathsf{supply} \ \mathsf{module} \ \mathsf{nr.} \ \mathsf{X} \ \mathsf{GOOD} \\ \end{array}$

A read access to the HVFanStat Item returns a string with the cooling fans status. If:

status = $-1 \Rightarrow FAIL$ status = $1 \Rightarrow GOOD$

A read access to the **HVFanSpeed** Item returns a string with the cooling fans speed, The speed parameter is expressed in rpm.

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

ClkFreq = $-1 \Rightarrow$ FAIL ClkFreq = $0 \Rightarrow 50$ Hz ClkFreq = $1 \Rightarrow 60$ Hz ClkFreq = $2 \Rightarrow 400$ Hz

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

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

The IPaddress item allows to specify the system IP address (for example 192.168. 0.1);

The IPNetMsk item allows to specify the system IP net mask (for example 255.255.255.0);

The IPGw item allows to specify the system IP gateway (for example 0.0.0.0);

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

A read access to the ConnStatus Item returns a string with the connection status of the system. If:

status = OK \Rightarrow CONNECTED status = KO \Rightarrow DISCONNECTED

The **CPULoad** item allows to monitor the load on the system CPU This item has the following format: value1:value5:value15 Value1, value5 and value15 are the average CPU loads, calculated respectively over one, five and fifteen minutes.

The **CmdQueueStatus** item allows to monitor the number of commands in queue in the system; if CmdQueueStatus >0 then the System is performing commands on the boards, therefore monitor values may not be updated until all queued commands are executed. As soon as all commands are performed and CmdQueueStatus returns to 0, monitor values are updated to correct values.

The **MemoryStatus** item allows to monitor the system memory usage This item has the following format: value0:value1:value2:value3 Value0 is the total memory, value1 is the used memory, value2 is the free memory, value3 is the buffers memory

Table 1 – SY4527/ SY5527 System Items

ItemID	Data Type	Access Rights	Description
PowerSupplyName.Kill	Boolean	W	Kill all channels
PowerSupplyName.ClearAlarm	Boolean	W	Clear alarm
PowerSupplyName.Sessions	String	R	List Users connected to 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	Reset Flag configuration
PowerSupplyName.ResFlag	2-byte integer	R	Reset Flag status
PowerSupplyName.HvPwSM	String	R	Power supply modules status
PowerSupplyName.HVFanStat	String	R	Fan status
PowerSupplyName.HVFanSpeed	String	R	Fan speed
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.SymbolicName	String	R/W	System symbolic name
PowerSupplyName.Slots	2-byte integer	R	Slots number
PowerSupplyName.ConnStatus	String	R	connection status
PowerSupplyName.CPULoad	2-byte integer	R	load on the system CPU
PowerSupplyName.CmdQueueStatus	2-byte integer	R	number of commands in queue
PowerSupplyName.MemoryStatus	2-byte integer	R	system memory usage

SY4527 / SY5527 Board control

This chapter describes the Items which are available for the control of a generic SY4527 / SY5527 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 BdStatus item returns the status of generic board's parameters, namely:

bit 0: PowerFail; if 1, it indicates a failure in the channels local power supply

bit 1: Firwmare Checksum Error; if 1, it indicates an error in the board firmware checksum

bit 2: HVMax Calibration Error; if 1, it indicates that the board HVMax parameter (if present) is not calibrated

bit 3: Temperature Calibration Error; if 1, it indicates that the board temperature sensor (if present) is not calibrated bit 4: Under Temperature; if 1, it indicates that the board temperature sensor (if present) signals a board temperature $< 5 \,^{\circ}C$

bit 5: Over Temperature; if 1, it indicates that the board temperature sensor (if present) signals a board temperature > 65 $^{\circ}$ C

bits 6..31: Reserved for future use

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 2 – SY4527/ SY5527 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	Board status
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

SY4527 / SY5527 Channel control

This chapter describes the items which are available for the control of a generic channel within the SY4527 / SY5527 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 SYx527 User's manual 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 SYx527 User's manual for further details.

A read access to the IOset#EU item returns a string with the IOset 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 SYx527 User's manual, 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 **l1set** item allows to set I1; see SYx527 User's manual 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 SYx527 User's manual, 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 SYx527 User's manual, 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 SYx527 User's manual, 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 SYx527 User's manual, for further details.

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

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

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

The VMon item returns back the VMon value; see SYx527 User's manual, 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 SYx527 User's manual, 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

 $POn=1 \Rightarrow Enabled$ $POn=0 \Rightarrow Disabled$

see SYx527 User's manual 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

 $\begin{array}{l} \mathsf{PDwn=1} \Rightarrow \mathsf{RAMP} \\ \mathsf{PDwn=0} \Rightarrow \mathsf{KILL} \end{array}$

see SYx527 User's manual, 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 **TripInt** item allows to program the internal trip time.

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

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

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

The TripExt item allows to program the external trip time.

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

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

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

Table 3 – SY4527/ SY5527 Channel items

ItemID	Data Type	Access Type	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	l0set 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	11set 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

ItemID	Data Type	Access Type	Description
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
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	Set Internal trip time
PowerSupplyName.BoardXX.ChanYYY.TripInt #EU	string	R	Internal Trip time EU
PowerSupplyName.BoardXX.ChanYYY.TripInt#HighU	8-byte real	R	Int. Trip time upper limit
PowerSupplyName.BoardXX.ChanYYY.TripInt#LowEU	8-byte real	R	Int. Trip time lower limit
PowerSupplyName.BoardXX.ChanYYY.TripExt	4-byte real	R/W	Set external trip time
PowerSupplyName.BoardXX.ChanYYY.TripExt #EU	string	R	External Trip time EU
PowerSupplyName.BoardXX.ChanYYY.TripExt#HighU	8-byte real	R	Ext. Trip time upper limit
PowerSupplyName.BoardXX.ChanYYY.TripExt#LowEU	8-byte real	R	Ext. Trip time lower limit

5. SY1527 / SY2527 Power Supply System

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

SY1527 / SY2527 System control

OPC Items available for general system control are fully listed in Table 4. For a detailed description of the SY 1527 / SY 2527 system operation, refer to System User's manual.

A write access to the Kill Item (Value = 1) allows to switch OFF at the max rate all system 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) causes the Format command to be executed ;

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;

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 16 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) Bit 8: GEN enable MASK Bit 9: GEN always ON MASK Bit 10: GEN ON due to OvV (Over Voltage) MASK Bit 11: GEN ON due to OvV (Over Current) MASK Bit 12: GEN ON due to UnV (Under Voltage) MASK Bit 13: GEN ON due to TRIP MASK Bit 13: GEN ON due to TRIP MASK Bit 14÷15: Don't care (=0)

This Item is a 2-byte integer; in order to set or reset bits 0..5, it is necessary to set to 1 the corresponding "MASK" bit (bits 8..13).

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:

 $\begin{array}{l} \mathsf{ACstatus} = -1 \Longrightarrow \mathsf{FAIL} \\ \mathsf{ACstatus} = \ 1 \Longrightarrow \mathsf{GOOD} \\ \mathsf{Primary} = \ -1 \Longrightarrow \mathsf{Primary} \ \mathsf{supply} \ \mathsf{module} \ \mathsf{FAIL} \\ \mathsf{Primary} = \ 1 \Longrightarrow \mathsf{Primary} \ \mathsf{supply} \ \mathsf{module} \ \mathsf{GOOD} \\ \mathsf{Add} \ \mathsf{X} = \ -1 \Longrightarrow \mathsf{Add} \ \mathsf{on} \ \mathsf{supply} \ \mathsf{module} \ \mathsf{nr.} \ \mathsf{X} \ \mathsf{FAIL} \\ \mathsf{Add} \ \mathsf{X} = \ 0 \Longrightarrow \mathsf{Add} \ \mathsf{on} \ \mathsf{supply} \ \mathsf{module} \ \mathsf{nr.} \ \mathsf{X} \ \mathsf{NOT} \ \mathsf{PRESENT} \\ \mathsf{Add} \ \mathsf{X} = \ 1 \Longrightarrow \mathsf{Add} \ \mathsf{on} \ \mathsf{supply} \ \mathsf{module} \ \mathsf{nr.} \ \mathsf{X} \ \mathsf{GOOD} \end{array}$

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 = $-1 \Rightarrow FAIL$ status = $1 \Rightarrow GOOD$

The speed parameter is expressed in rpm.

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

 $\begin{aligned} \mathsf{ClkFreq} &= -1 \Longrightarrow \mathsf{FAlL} \\ \mathsf{ClkFreq} &= 0 \Longrightarrow 50 \; \mathsf{Hz} \\ \mathsf{ClkFreq} &= 1 \Longrightarrow 60 \; \mathsf{Hz} \\ \mathsf{ClkFreq} &= 2 \Longrightarrow 400 \; \mathsf{Hz} \end{aligned}$

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

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

see SYx527 User's manual for further details.

The IPaddress item allows to specify the system IP address (for example 192.9.200.48);

The IPNetMsk item allows to specify the system IP net mask (for example 255.255.255.0);

The IPGw item allows to specify the system IP gateway (for example 0.0.0.0);

The RS232Par item allows to configure the RS232 parameters (for example 115200:8:1:N:XON/XOFF);

The CnetCrNum item allows to specify the CAENET crate number; see SYx527 User's manual 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.

A read access to the ConnStatus Item returns a string with the connection status of the system. If:

status = OK \Rightarrow CONNECTED status = KO \Rightarrow DISCONNECTED

A read access to the EventStatus Item returns a string with the connection type status of the system. If:

status = Enabled \Rightarrow CONNECTED with Event Mode ENABLED status = Disabled \Rightarrow Event Mode NOT AVAILABLE status = GlobalOPCDisable \Rightarrow Event Mode AVAILABLE BUT NOT ENABLED

The OPCServerEventMode item allows to enable the Event Mode function (if supported)

 $\mathsf{TRUE} \Rightarrow \mathsf{Event}$ Mode function enabled (default)

 $\mathsf{FALSE} \Rightarrow \mathsf{Event}$ Mode function disabled

When this item is set to False, the EventStatus Item reports GlobalOPCDisable

The **OPCServerVerifyTime** item allows to set the Cached Values Timeout (i.e. a set value is considered good as long as the OPCServerVerifyTime)

2byte bit integer (unit = seconds); default value = 600s

The **OPCServerLiveInsertion** item allows to enable the Live Insertion detection

 $\mathsf{TRUE} \Rightarrow \mathsf{Live}$ Insertion detected and automatic reboot

 $FALSE \Rightarrow$ Live Insertion ignored (default)

The **CPULoad** item allows to monitor the load on the system CPU This item has the following format: value1:value5:value15 Value1, value5 and value15 are the average CPU loads, calculated respectively over one, five and fifteen minutes.

The **CmdQueueStatus** item allows to monitor the number of commands in queue in the system; if CmdQueueStatus >0 then the System is performing commands on the boards, therefore monitor values may not be updated until all queued commands are executed. As soon as all commands are performed and CmdQueueStatus returns to 0, monitor values are updated to correct values.

The **MemoryStatus** item allows to monitor the system memory usage This item has the following format: value0:value1:value2:value3

Value0 is the total memory, value1 is the used memory, value2 is the free memory, value3 is the buffers memory

Table 4 – SY1527/ SY2527 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 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

ItemID	Data Type	Access Rights	Description
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
PowerSupplyName.ConnStatus	String	R	connection status
PowerSupplyName.EventStatus	String	R	Event Status
PowerSupplyName.OPCServerEventMode	String	R/W	Event Mode status
PowerSupplyName.OPCServerVerifyTime	2-byte integer	R/W	Verify Time value
PowerSupplyName.OPCServerLiveInsertion	String	R/W	Live Insertion status
PowerSupplyName.CPULoad	2-byte integer	R	load on the system CPU
PowerSupplyName.CmdQueueStatus	2-byte integer	R	number of commands in queue
PowerSupplyName.MemoryStatus	2-byte integer	R	system memory usage

SY1527 / SY2527 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 **BdStatus** item returns the status of generic board's parameters, namely:

bit 0: PowerFail; if 1, it indicates a failure in the channels local power supply

bit 1: Firwmare Checksum Error; if 1, it indicates an error in the board firmware checksum

bit 2: HVMax Calibration Error; if 1, it indicates that the board HVMax parameter (if present) is not calibrated

bit 3: Temperature Calibration Error; if 1, it indicates that the board temperature sensor (if present) is not calibrated bit 4: Under Temperature; if 1, it indicates that the board temperature sensor (if present) signals a board temperature < $5 \,^{\circ}$ C

bit 5: Over Temperature; if 1, it indicates that the board temperature sensor (if present) signals a board temperature > 65 $^{\circ}$ C

bits 6..31: Reserved for future use

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 5 – SY1527/ SY2527 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	Board status
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

SY1527 / SY2527 Channel control

This chapter describes the items which are available for the control of a generic channel within the SY1527 / SY2527 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;

A read access to the VOset#EU item returns a string with the VOset 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 IOset item allows to set IO;

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

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

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

The V1set item allows to set V1;

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;

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; 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. A read access to the **RUp#LowEU** item returns the lowest possible RUp value. The **RDWn** item allows to program the ramp-down rate; A read access to the **RDWn#EU** item returns a string with the RDWn Engineering Units.

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

The Trip item allows to program the trip time;

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;

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

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

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

The VMon item returns back the VMon value;.

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;

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

 $POn=1 \Rightarrow Enabled$ $POn=0 \Rightarrow Disabled$

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

 $\begin{array}{l} \mathsf{PDwn=1} \Rightarrow \mathsf{RAMP} \\ \mathsf{PDwn=0} \Rightarrow \mathsf{KILL} \end{array}$

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 **TripInt** item allows to program the internal trip time.

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

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

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

The TripExt item allows to program the external trip time.

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

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

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

Table 6 – SY1527/ SY2527 Channel items

ItemID	Data Type	Access Type	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

ItemID	Data Type	Access Type	Description
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	11set upper limit
PowerSupplyName.BoardXX.ChanYYY.I1Set#LowEU	8-byte real	R	11set 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
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	Set Internal trip time
PowerSupplyName.BoardXX.ChanYYY.TripInt #EU	string	R	Internal Trip time EU
PowerSupplyName.BoardXX.ChanYYY.TripInt#HighU	8-byte real	R	Int. Trip time upper limit
PowerSupplyName.BoardXX.ChanYYY.TripInt#LowEU	8-byte real	R	Int. Trip time lower limit
PowerSupplyName.BoardXX.ChanYYY.TripExt	4-byte real	R/W	Set external trip time
PowerSupplyName.BoardXX.ChanYYY.TripExt #EU	string	R	External Trip time EU
PowerSupplyName.BoardXX.ChanYYY.TripExt#HighU	8-byte real	R	Ext. Trip time upper limit
PowerSupplyName.BoardXX.ChanYYY.TripExt#LowEU	8-byte real	R	Ext. Trip time lower limit

6. VME8x00 Crates

VME8x00 control

CAEN HV OPC Server release 5.X supports the CAEN VME8x00 VME Powered Crates. Connect the VME8x00 to the Host PC via Ethernet, then launch the OPC Server configurator (see § 2):

Select "add entry", then type name of the Crate, IP address, user name and password.

Select OK, at this point the configurator will return the connection status; for example

P.S. Name	Sys type	Conn. Type	Address	Status
VME Crate	V8100	TCP/IP	10.07.27	Ok

Now the board is ready to be accessed via OPC server; launch the OPC Client (for example the Matrikon OPC Explorer, which is available as freeware):



Fig. 5: Matrikon OPC Explorer start up

Select CAEN HV OPC Server in the Host menu, then click on "Connect"

Click on "Tag" Icon in the upper tool bar:



Fig. 6: Matrikon OPC Explorer tool bar

Select "Add Tags", the following window will open:

File Edit View Browse	MatrikonOPC Explorer (GRP00D03738)	? 🗾 🏹
Tag Entry Tag Entry Teg Entry Teg to be added:	File Edit View Browse	
Tag Entry	🗙 🗄 🗙 💼 💺 🖻 🚅	
Tag Entry Tag Entry Tag En		Tags to be added:
Item ID: Data Type: Entry: Entry: Data Type: Entry: Data Type: Entry: Data Type: Entry: Data Type: Entry: Entry: <t< td=""><td>Tag Entry</td><td></td></t<>	Tag Entry	
Data Type: Entry: Dgta Type: Pitra: Dgta Type: Pitra: Dgta Type: Pitra: Pitra: <tr< td=""><td>TAG9 Item ID:</td><td></td></tr<>	TAG9 Item ID:	
Access Bath: Biter: Data Type Fiter: Empty/Default V Wite Access V Read Access B granches T Items Available Items in genver CAEN.HNOPCServer.5: Common	Data Type: Empty/Default 💌 🔽 Create Active	
Elter: Data Type Filter: Image: State	Access Path:	
With Access Read Access Ranches I tems Available Items in Server 'CAEN.HUOPCServer.5: Image: Server Difference Items Image: Server Ditems Image:	Eilter: Data Type Filter: Empty/Default	
Available Items in Server CAEN.HVOPCServer.5:	▼ Write Access ▼ Read Access ▼ Branches ▼ Items	
Image: Listing angle role: CACHLINGPLASE VEI.3:	Ausiable Items in Server (CAEN) HUGDOCOmuse El	
Image: Available Tags Image: Available Tags <td< th=""><th>Image: Second California Image: Second Californi Image: Second C</th><th></th></td<>	Image: Second California Image: Second Californi Image: Second C	
Image: Available Tags Image: Available Tags Image: Available Tags Image: Available Tags <td></td> <td></td>		
Image: Available Tags Image: CANAddr Image: CANAddr <td< td=""><td></td><td></td></td<>		
Image: Available Tags Image: CANAddr Image: CANBR		
Image: Available Tags		
We CANAddr We CANAddr We CANAddr We CANAddr We CANAddr We CANAddr We Canada We Fan1 We Fan2 We Fan3 We Fan3 We Fan3 We Fan3 We FuserNum	Available Tags	
Image CANBR Image Cirkling Image Cir	CANAddr	
Wey CrArm Wey CrStat Wey Description Wey Fan1 Wey Fan2 Wey Fan3 Wey Fan4 Wey Fan4 Wey Fan4 Wey Furwel Wey FUrwenp Wey IPAddr Wey IPAddr Wey IPAddr Wey IPAddr Wey ITMade	THE CANBR	
Workstat E	teo CirAirm	
Implementation Implemen	E Description	
Wey-ran1 Wey-ran2 Wey-ran3 Wey-ran4	Description	
With Fand With Fands With Fandspeed With Fandspeed With Full Release With FUSerNum	Ten 1	
Wij FanSpeed Wij FanSpeed Wij Furw Release Wij FUSerNum Wij FUSerNum <td>Fanz</td> <td></td>	Fanz	
Wo Find Speed Wo Fild Rel Wo FUSerNum Wo FUSerNum Wo FUSerNum Wo FUTemp Wo FUTE	Table Earstreed	
With Notesace		
We FUSerNum We FUSErNum <t< td=""><td></td><td></td></t<>		
Image: Solution Image	Tage El ISerNum	
Implementation Implemen	TWO FL Temp	
Image: Second	THE IPAddr	
	THE IPGtw	
	TOMAL	
		<u>QK</u> <u>Cancel</u>

Fig. 7: Matrikon OPC Explorer; VME8100 item list

The VME8100 is detected and the following subfolders are available: VME, BoardXX, ChanXXX; each subfolder contains the relevant OPC items.

In order to edit an Item, double click on it and it will be added to the list on the rightmost tab:

Tags to be adde	ed:				_
TAG	TAG	TAG	TAG	TAG	
vme.ConnS	vme.Board	vme.Board	vme.Board	vme.Board	
TAG	TAG				
vme.Board0	vme.Board0				
					X

Fig. 8: Matrikon OPC Explorer; VME8100 item selection

Click OK, then the Items will be ready to be monitored and/or edited; in order to do this, right click on the Item name and select "Write values":

Contents of 'GRP00D03738'					
Item ID	Access Path	Value	Quality	Timestamp	Status
wme.Board00.Chan000.IMon wme.Board00.Chan000.IMon#EU			Bad, non-s Bad, non-s	n/a n/a	Active Active
	Write Values Deactivate		d, non , non-s d, non	12/17/201 n/a 12/17/201	Active Active Active
www.Board00.Chan000.VSet#E0 www.Board00.Chan000.VSet#Resol www.Board00.Fan1 www.Board00.Fan1	Delete Export Items	De	, non-s d, non	n/a 12/17/201	Active Active
wme.Board00.FanSpeed	Properties	Alt+Enter	non-s	n/a 12/17/201	Active
www.connStatus		52	Bad, non-s	n/a	Active

Fig. 9: Matrikon OPC Explorer; VME8x100item content

The following pop up window will allow to edit the Item value:

Multiple Value Sign	nal Generator		
Item ID	Current Value	Data Type	New Value
vme.Board00.C	han0 5	Single Float	5

Fig. 10: Matrikon OPC Explorer; VME8x100 item update

Then it is possible to save the session onto file, by selecting: File > save session

For the VME8x00 Crates the available OPC items are the following:

System items	Board items	Channel items
🚥 Available Tags	🚥 Available Tags	Mathematical Available Tags
M OPCServerLogLevel	CANAddr	1Mon
-	CANBR.	Mon#EU
	1000 Cir Airm	100 ISet
	🎟 CrStat	100 ISet#EU
	100 Description	🚥 ISet#HighEU
	1 Fan 1	100 ISet#LowEU
	🎟 Fan 2	100 ISet#Resol
	🎟 Fan 3	Mame Name
	1000 FanSpeed	100 Ovp
	🍩 Fmw Release	🚥 Ovp#EU
	100 FUFwRel	🚥 Status
	1000 FUSerNum	100 Uvp
	100 FUTemp	🚥 Uvp#EU
	🎟 IPAddr	100 VMon
	🎟 IPGtw	100 VMon #EU
	🎟 IPMsk	100 VSet
	MACAddr 🚥	Wet#EU
	100 Model	100 VSet#HighEU
	100 NrOfCh	Wet#LowEU
	100 Pw	1000 VSet#Resol
	100 Pw #CoClose	I
	100 Pw #CoOpen	
	MRS232BR	
	1000 SerNum	
	1000 SysRes	
	100 Temp	
	WPMax	

🚥 VPMin

Fig. 11: VME8x100 items

7. V65XX VME HV Power Supplies

V65XX control

CAEN HV OPC Server release 5.X supports the CAEN V65XX VME Programmable HV Power Supplies. The support is available when the V65XX are managed through the CAEN VME Controllers; if a third part controller/bridge is used (for example VME SBC), it is necessary to provide a "CAENComm equivalent" library by exporting the functions used by the software (see **www.caen.it** website for all details about VME Controllers and Libraries).

Install the V65XX board properly into the VME Crate, then launch the OPC Server configurator (see § 2):

Select "add entry", then type name of the power supply (for example V6534N), link type ("optical link", if using a V2718 VME bridge or USB if a V1718 is used instead) and VME base address of the board (for example 0x3210):

Select OK, at this point the configurator will return the connection status; for example

P.S. Name	Conn. Type	Address	Status
V6534N	OPTLINK	0_0_32100000	Ok

Now the board is ready to be accessed via OPC server; launch the OPC Client (for example the Matrikon OPC Explorer, which is available as freeware):



Fig. 12: Matrikon OPC Explorer start up

Select CAEN HV OPC Server in the Host menu, then click on "Connect"

Click on "Tag" Icon in the upper tool bar:

2 N	Aatrikoi	nOPC E	xplor	er								
File	Server	Group	Item	Viev	/ He	elp	 					
£	* 🖻		Ť	5	X	۲	B	1	1	-	ø	1

Fig. 13: Matrikon OPC Explorer tool bar

Select "Add Tags", the following window will open:

TAG Item ID:		<u> </u>
<u>D</u> ata Type:	Empty/Default 💌 🔽 🧐	Create Active
Access Path:		🐔
Eilter:	Data Type Filter:	:mpty/Default 💌
✓ Write Access	Read Access	nches 🥅 Items
Available Items in §	Server 'CAEN.HVOPCServer.1	Ľi
🖃 🦲 V6534N	-	
😑 🔂 Board	00	
🕀 🧰 Cł	han000	
🕀 🦲 Cł	han001	
🕀 🦲 CI	han002	
E C	han003	
	hanUU4	
± _ C	nanuus	
🧆 Available Ta	ags	
Description		
🍩 Fmw Release		
Max IMax		
🌆 IMax#EU		
🍩 IMax#HighEU		
Max#LowEU		
Model		
MrOfCh		
SerNum		
Constant Status		
SwRelease		
SwRelease#El	U	
SwRelease#H	ighEU	
SwRelease#Lo	owEU	
Max VMax		
🚥 VMax#EU		
🤷 VMax#HighEU	D.	
WMax#LowEU		

Fig. 14: Matrikon OPC Explorer; V6534N item list

The V6534N is detected and the following subfolders are available: V6534N, BoardXX, ChanXXX; each subfolder contains the relevant OPC items.

In order to edit an Item, double click on it and it will be added to the list on the rightmost tab:

TAG	TAG	TAG	TAG	TAG	TAG
6534N.Bo	V6534N.Bo Release	V6534N.Bo	V6534N.Bo	V6534N.Bo	V6534N.Bo
TAG	TAG	TAG	TAG	TAG	TAG
6534N.Bo	V6534N.Bo	V6534N.Bo	V6534N.Bo	V6534N.Bo	V6534N.Bo
TAG	TAG	TAG	TAG	TAG	TAG
6534N.Bo	V6534N.Bo	V6534N.Bo	V6534N.Bo	V6534N.Boa	V6534N.Bo

Fig. 15: Matrikon OPC Explorer; V6534N item selection

Click OK, then the Items will be ready to be monitored and/or edited; in order to do this, right click on the Item name and select "Write values":

Item ID	Access	s Path 🛛 🗸	Value	Quality	Timestamp	Status
100 V6534N.Board00.Chan000.IMonL		0		Good, non-specific	01/24/2012 5.46.59.421 PM	Active
🚥 V6534N.Board00.Chan000.IMonH		0		Good, non-specific	01/24/2012 5.46.59.421 PM	Active
100 V6534N.Board00.Chan000.Temp		31		Good, non-specific	01/24/2012 5.46.59.421 PM	Active
🚥 V6534N.Board00.Chan000.RDWn		50		Good, non-specific	01/24/2012 5.46.59.421 PM	Active
100 V6534N.Board00.Chan000.RUp		50		Good, non-specific	01/24/2012 5.46.59.421 PM	Active
🖙 V6534N.Board00.Chan000.VSet		500	<u>n</u>	Good, non-specific	01/24/2012 5.46.59.421 PM	Active
🚥 V6534N.Board00.Chan000.SVMax	Write Values			Good, non-specific	01/24/2012 5.46.59.421 PM	Active
🚥 V6534N.Board00.Chan000.Temp#	Deactivate		IS	Good, non-specific	01/24/2012 5.46.59.421 PM	Active
100. V6534N.Board00.Chan000.VSet#E	Delete Export Items	Del		Good, non-specific	01/24/2012 5.46.59.421 PM	Active
	Properties	Alt+Enter				

Fig. 16: Matrikon OPC Explorer; V6534N item content

The following pop up window will allow to edit the Item value:

	Item ID	Current Value	Data Type	New Value	
V6534N.Board00. 5000		00. 5000	Single Float	5000	

Fig. 17: Matrikon OPC Explorer; V6534N item update

Then it is possible to save the session onto file, by selecting: File > save session

For the V65XX VME Programmable HV Power Supply boards the available OPC items are the following:

Board items

System items

Channel items

🚥 Available Tags	TAO AV
🊥 ConnStatus	Tescr Descr
🍩 EventStatus	tem Fmw
🚥 OPCServerEventMode	IMax 🚳
100 OPCServerLiveInsertion	Max-
🚥 OPCServerVerifyTime	Max-
🊥 Slots	Max-
	Mode Mode
	🚥 NrOfe
	🔤 SerNu
	🔤 Statu
	SwRe
	SwRe
	SwRe
	SwRe
	1

ailable Tags ription Release #EU #HighEU #LowEU el Ch um IS elease elease#EU elease#HighEU elease#LowEU 🚥 VMax 🚥 VMax#EU 🚥 VMax#HighEU 🚥 VMax#LowEU

🚥 Available Tags	
🌆 ChStatus	100 RUp
🚥 IMonH	🚥 RUp#EU
🚥 IMonH#EU	🚾 RUp#HighEU
🍩 IMonH#HighEU	RUp#LowEU
🚥 IMonH#LowEU	🚥 SVMax
1MonL	🚥 SVMax#EU
🚥 IMonL#EU	🚥 SVMax#HighEU
🚥 IMonL#HighEU	🚥 SVMax#LowEU
🚾 IMonL#LowEU	🌆 Temp
🍩 ImonRange	🌆 Temp#EU
🍩 ImonRange#EU	🚥 Temp#HighEU
🍩 ImonRange#High	🚥 Temp#LowEU
🍩 ImonRange#Lowl	🌆 Trip
1Set	🌆 Trip#EU
🚥 ISet#EU	🌆 Trip#HighEU
🚥 ISet#HighEU	🌆 Trip#LowEU
🚥 ISet#LowEU	🚥 VMon
🚥 Name	🚥 VMon#EU
🚾 PDwn	🚥 VMon#HighEU
🚥 PDwn#EU	🚥 VMon#LowEU
🚥 PDwn#HighEU	🚥 VSet
🚥 PDwn#LowEU	🚥 VSet#EU
🚥 Polarity	🚥 VSet#HighEU
🚥 Polarity#EU	🚥 VSet#LowEU
🚾 Polarity#HighEU	
🚥 Polarity#LowEU	
Pw#EU	
🚥 Pw#HighEU	
Pw#LowEU	
100 RDWn	
BDWn#EU	
🚥 RDWn#HighEU	

BRDWn#LowEU

Fig. 18: V6534N items

8. 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.

Browsing the server address space

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

Se	lect OPC Server			
	ProgID CAEN.HVOPCServer National Instruments.OPCDemo NDI.SimulationSvr	Vendor CAEN/CERN National Instruments, Inc. Northern Dynamic Inc.	Description OPC Server for CAEN Power Supplies OPC Simulated Data Demo NDI Simulation Server	
	Remote Server Machine	<u>B</u> rowse	OK Cancel	

Fig. 19: 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.

OPC Server Item Prope	rties
Item Id:	V0Set
Fully Qualified Item Id:	system0.Board03.Chan000.V0Set
Data Type:	4-byte real
Access Rights:	RW
Selected Access Path:	•
	OK Cancel

Fig. 20: The item's Specific properties

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.

🕿 Select URL	Path		×
Network	(Majakharkaad		
Ent	ire Network		-
i in the second	velop rerina		
I I III III III III III III III IIII IIII	es		
📄 🗐 Nuv	/ola		
	National Instruments.OPCDemo		
	NDI.SimulationSvr		
III ⊞… ⊒ , Om ⊞… ⊡ Pca	ero		
Piw	i		
📄 🕀 Poli	femo		
E E Ser E E E Ins	hy		
📗 🗄 🗐 🗸 🖉	sp		•
Machina Nama	Nuvola		
Machine Marie			
Server Name	LAEN.HVUPCServer		
Vendor Name	CAEN/CERN		
Description	OPC Server for CAEN Power Su	Cancel	OK

Fig. 21: 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).

🖍 Select URL Path	×
	Item ID system0.Board04.Temp Canonical Data Type VT_R4 Access Rights read access Access Path <access not="" paths="" used=""></access>
Name Filter	
Datatype Filter	T
Access Rights Filter any access	▼ OK
Select the desired item and access	s path (if used) Cancel

Fig. 22: Selecting an item

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

Browse To OPC Item.vi	
<u>F</u> ile <u>E</u> dit <u>O</u> perate <u>P</u> roject <u>W</u> indows <u>H</u> elp	Browse
🗘 🐼 🂓 🔢 12pt Application Font 💽 🚛 🗸 💼	- Cope
The purpose of the Select URL VI is to build the OPC path This VI will be used with other VIs to read and write to OPC	to the Server. Citems, Using the
Select URL VI, find the path to any local or networked OPC Pass this indicator to the Open URL VI as shown in the NI	Server. OPC Test Server example VI
Pass dis indicator to the open one vi as shown in the mi	
URL	
opc:/CAEN.HVOPCServer/system0.Board04.Temp	 This is the result of the select. The URL to the OPC Server is built and displayed here.
	Use this as an input to OPC Open, Read and Write VIs
	► //

Fig. 23: "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.

🔁 NI Demo OPC Client.vi	-	. 🗆 🗙
File Edit Operate Project Windows Help		Demo
	Waveform Chart	
Inputs to select OPC Server and Data Item	31,0-	
Hostname (blank)	30,0-	
Server Name	29,0-	
caen.hvopcserver	28,0-	
Item Name system0.board04.temp	27,0-	
The ItemID syntax for the OPCDemo server is [sine square]:minmax:period	26,0-	
STOP OT Time Out from Server	25,0-1 0 100	,
O Error Reading Items	Plot 0	
Example of how to monitor a single OPC item. Specify the host, server and item name that you w The default settings specify an item from the Nati which has been installed on your machine.	vant to monitor. onal Instruments.OPCTest server	
		-
		_ _ //,

Fig. 24: Temperature plot

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.

OPC Server : CAEN.HVOPCServer	×
Status Groups Registry Security Interfaces	
- Group Definition	
Group Name:	
group0	
Update Rate(msec):	
1000	
% Deadband:	
Time Blas:	
I Imestamps Active I	
Add >>	
OK Annulla ?	

Fig. 25: Creating a group

To add items, select a group in the main window (for example "group0"), go in the menu bar to $Edit \rightarrow Add$, select the desired items into the Item definition window and then click on the Add button.

PC Group : group2 Settings Items Interfaces Item Definition Board03 Chan000 Chan000 Chan000 Chan002 Chan003 Chan004 Chan004	RUp#EU RUp#HighEU RUp#LowEU Status SVMax SVMax#EU SVMax#EU SVMax#HighEU SVMax#HighEU	Names (Device\Item)
SVMax	Default	
Item ID:	Access Paths:	
system0.Board03.Chan000.S	Default 💌	
Advanced	Active Add>>	Validate!
	OK Annulla	Applica ?

Fig. 26: Adding items to a group



Fig. 27: 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).

N .		
Value:	3000	
Timestamp:	Friday, September 22, 2000	10:33:45:920
Quality:	Value good	
Status:	Success	
Source:	Poll Rate (msec):	Perf (microsec):
Cache 💌	Off Read	63744
Write		
Value:		Perf (microsec):
2000	Write!	
Status:		

Fig. 28: Read/write data

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**.

Softing OPC Toolbox Demo Client		미×
New Open Save Properties Delete	s Stop Connect Start	
OPC Server for CAEN Power Supplies	OPC Server for CAEN Power Supplies	
	DPC Servers DA Browse DA Items AE Browse AE Events AE Conditions Errors	

Fig. 29: Connect to OPC server

To add a group, go in the main menu to **Group** \rightarrow **Add**, specify the group name in the dialog box and then go to **Group** \rightarrow **Start** \rightarrow **Deep**. To add items, select a group, go to **Items** \rightarrow **Add**, specify the ItemID in the dialog box and click OK, then go to **Item** \rightarrow **Start** \rightarrow **Deep**. Item properties are indicated in the Properties window.

Softing	OPC Toolb Session Vi	ox Demo ew	Client								<u>- ×</u>
D New	Dpen	R Save	Properties	× Delete	X Stop	Connect	C Start				
	a Access OPC Server Group Syst	for CAEN F em1.Slots em1.SwRei em1.Board	Yower Supplies lease 13.Chan000.V	Mon	Item System System System System	Slots SwRelease Board13.Cha	Value 16 1.13.00 0,3	Quality GOOD GOOD GOOD	TimeStamp 16:16:52.718 16:16:52.875 16:19:22.656	Server OPC Serve OPC Serve OPC Serve	Group Group Group

Fig. 30: The VMon item

ting OPC Demo Client - Properties				
UN Apply Heser				
bout Item Write				
tem ID: system1.Board13.Chan000.VMon	Native Datatype:	R4	Server Handle:	0x00A30570
Req. Datatype: R4	Access Rights:	READ	Client Handle:	0x00D20D78
Access Path:	Engineering Units:	no		
02		9		

Fig. 31: The VMon item properties





CAEN SpA is acknowledged as the only company in the world providing a complete range of High/Low Voltage Power Supply systems and Front-End/Data Acquisition modules which meet IEEE Standards for Nuclear and Particle Physics. Extensive Research and Development capabilities have allowed CAEN SpA to play an important, long term role in this field. Our activities have always been at the forefront of technology, thanks to years of intensive collaborations with the most important Research Centres of the world. Our products appeal to a wide range of customers including engineers, scientists and technical professionals who all trust them to help achieve their goals faster and more effectively.

CAEN S.p.A.



CAEN

Tools for Discovery

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