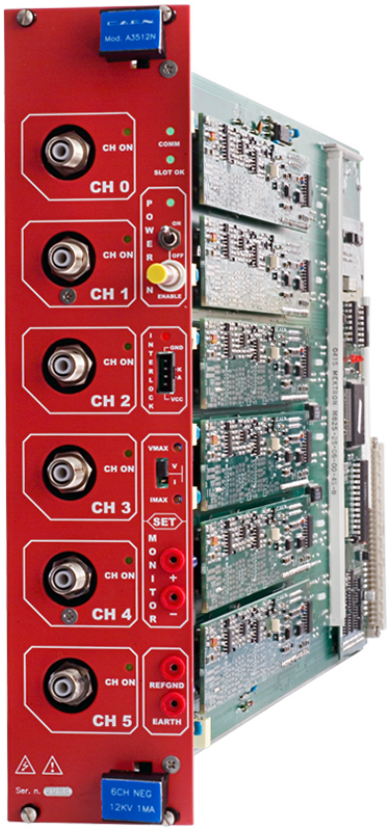
Rev. 12 - 30/05/2018

A3512 / A3512H

6 Channel 12 kV / 1 mA Power Supply Board



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User Manual

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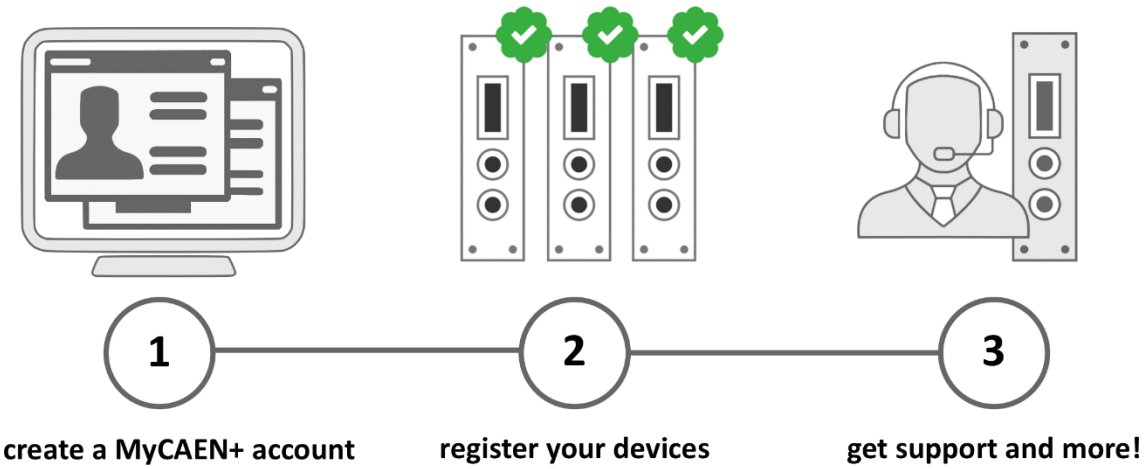
MyCAEN+ dashboard is designed to offer you a direct access to all our after sales services. Registration is totally free, to create an account go to https://www.caen.it/become-mycaenplus-user and fill the registration form with your data.



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Purpose of this Manual

This document is the A3512 - A3512H 6 Channel 12kV/1mA Power Supply Board user manual; it contains information about the installation, the configuration and the use of the board.

Change Document Record

Date	Revision	Changes
30 May 2018	12	Updated with data for A3512H

Symbols, abbreviated terms and notation

N.A.

Reference Documents

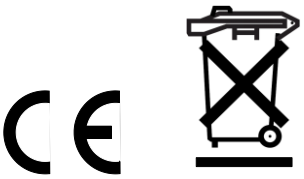
Disclaimer

CAEN will repair or replace any product within the guarantee period if the Guarantor declares that the product is defective due to workmanship or materials and has not been caused by mishandling, negligence on behalf of the User, accident or any abnormal conditions or operations.

CAEN declines all responsibility for damages or injuries caused by an improper use of the Modules due to negligence on behalf of the User. It is strongly recommended to read thoroughly the CAEN User's Manual before any kind of operation. *CAEN reserves the right to change partially or entirely the contents of this Manual at any time and without giving any notice.*

Disposal of the Product *The product must never be dumped in the Municipal Waste. Please check your local regulations for disposal of electronics products.*

Made In Italy: We stress the fact that all the boards are made in Italy because in this globalized world, where getting the lowest possible price for products sometimes translates into poor pay and working conditions for the people who make them, at least you know that who made your board was reasonably paid and worked in a safe environment. (this obviously applies only to the boards marked "Made in Italy", we cannot attest to the manufacturing process of "third party" boards).



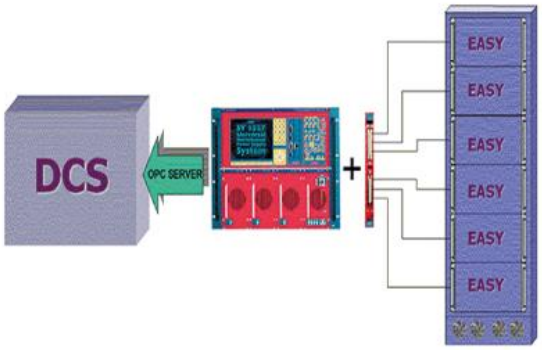
Index

1. EASY (Embedded Assembly SYstem)

EASY (Embedded Assembly SYstem) is the CAEN high/low voltage power supply to be used every time the magnetic field and radiation become a problem.

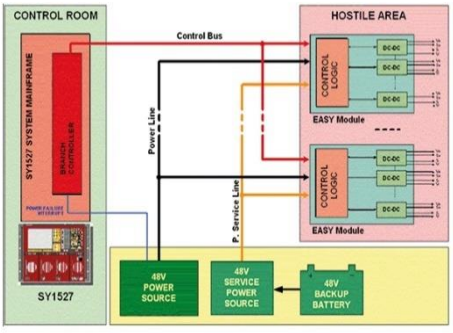
During the last decade, CAEN has been involved in developing different solutions to satisfy the requirements coming from main LHC experiments where the electronic equipment of the experiment is dealing with high dose of radiation and strong magnetic field. To provide safe and reliable operations in these hostile areas, CAEN started tests with rad-tolerance components and magnetic field resistant solutions, patenting this technology that is now used in a line of products for "hostile" area. In addition, even if designed for harsh environment the EASY modules can work also in normal conditions with excellent performance. Widely used in LHC experiments, producing over 6,500 electronic units, containing more than 190,000 sub-boards.

In addition, even if designed for harsh environment the EASY modules can work also in normal condition with excellent performance.



The power supply is located directly in the hostile area; here the **EASY** modules provide a wide variety of output voltages to satisfy the requirements of most detectors and front end electronics (LV up to 100A and HV up to 12 kV).The control of the EASY power supply system can be done remotely using a Branch Controller (model **A1676A**) plugged in a SYx527 mainframe located in the control room. Trough the mainframe an immediate and "automatic" interfacing with the DCS or the custom control software is achieved using the provided and full reliable **OPC server software.**

Each branch controller module can handle up to 6 EASY crates. Since the A1676A is a one unit wide board, one SY4527 power system can house up to 16 branch controller boards, enabling the monitoring up to 96 EASY systems. The module can work even side by side with standard HV and/or LV board. An unique interface and a cost effective set-up for all the experiment's power requirements!



The EASY3000 (for boards up to 40cm long, A3XXX Family) can house up to 10 boards depending on the boards' width, while the EASY4000 (for boards up to 55cm long, A4XXX Family) can house up to 9 boards. As illustrated in Figure, the branch controller is the interface between the supply unit (SYx527) and the remote boards in the EASY crate. The branch controller role is to configure the EASY channels as they belong to the supply unit slot in which the branch controller is located. In this way all the channels of the EASY boards, will be considered as channels of the branch control board, increasing hugely the number of channels the system can handle.

EASY3000/4000 Crates and Boards hostile areas tolerances

Magnetic field: 2 kGauss

Radiation:

$1 \cdot 10^{11}$ p/cm^2 TD

$2 \cdot 10^{12}$ n/cm^2 TD

15 kRad TID

2. A3512 – A3512H Power Supply Boards

This document shows the features of the CAEN A3512 and A3512H 6 Channel 12 kV / 1 mA Power Supply Boards, developed for operation in magnetic field and moderate radioactive environment. One A3512 houses 6 floating (i.e. with independent return) 12 kV / 1 mA channels; the board is available with either positive or negative polarity.

The connector output voltage range is 0 ÷ 12 kV with 1 V monitor resolution.

If the output voltage differs from the programmed value by more than 3% of voltage full scale range, the channel is signalled to be either in OVERVOLTAGE or UNDERVOLTAGE condition. Moreover, for each channel, a voltage protection limit SVMAX can be fixed via software with 1 V resolution and the output voltage can not be programmed beyond this value.

The output current is monitored with 100 nA resolution; if a channel tries to draw a current larger than its programmed limit it is signalled to be in OVERCURRENT condition; the SYX527 system detects this state as a fault and reacts according to the setting of the TRIP parameter1, namely:

TRIP=infinite (= 1000 s)

The output current is permitted to keep the programmed limit; if the maximum output current value is reached the channel behaves like a constant current generator.

TRIP=finite (< 1000 s)

The output current is permitted to keep the limit only for programmed time interval and then is switched off.

The TRIP time (i.e. the maximum time an OVERCURRENT condition can last) can be programmed in 0.1 s steps.

The maximum output voltage (VMAX Hardware), common to all channels, can be fixed through a potentiometer located on the front panel. When VMAX is reached the channel is switched off immediately.

The maximum output current (IMAX Hardware), common to all channels, can be fixed through a potentiometer located on the front panel. If a channel tries to draw a current larger than IMAX it is signalled to be in OVERCURRENT condition; the SYX527 system detects this state as a fault and reacts according to the setting of the TRIP parameter (see above).

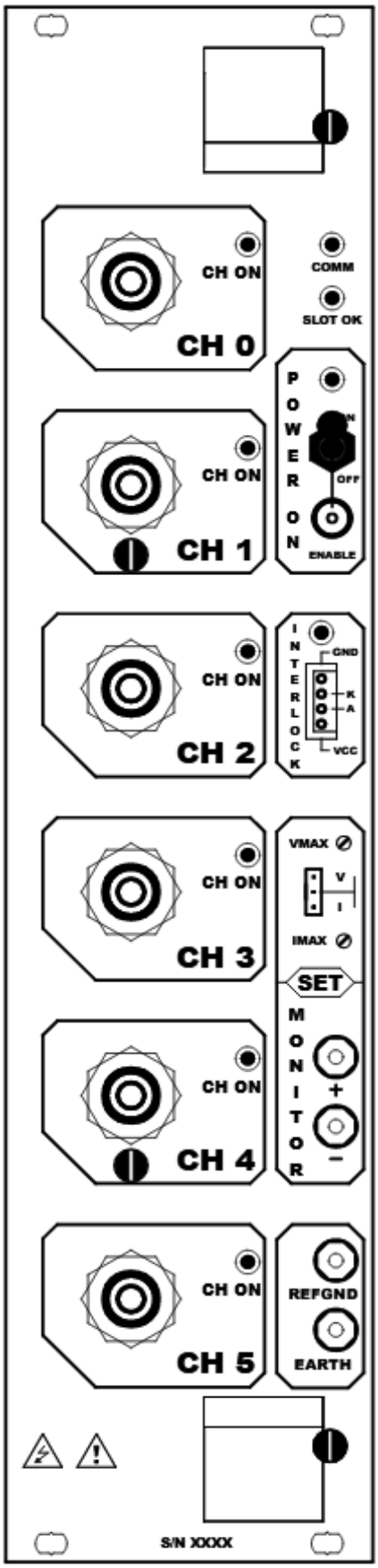
[1] Refer to the SYx527 User's Manuals for details about the TRIP Handling.

Channel Characteristic Table

Version	A3512	A3512H
Polarity	Positive (A3512P) or Negative (A3512N), with Floating return	
Output Voltage	0 ÷ 12 kV (connector output)	
Max. Output Current	1 mA	
Voltage Set/Monitor Resolution	1 V	
Current Set/Monitor Resolution	100 nA	
VMAX hardware	0 ÷ 12 kV	
VMAX hardware accuracy	± 2% of FSR	
VMAX software	0 ÷ 12 kV	
VMAX software resolution	1 V	
Voltage Ripple [2]	< 50 mV pp	< 20 mV pp
Voltage Monitor vs. Output Voltage Accuracy [3]	typical: ± 0.3% of reading ± 5 V maximum: ± 0.3% of reading ± 10 V	
Voltage Set vs. Output Voltage Accuracy [3]	typical: ± 0.3% of setting ± 5 V maximum: ± 0.3% of setting ± 10 V	
Current Monitor vs. Output Current Accuracy [3]	typical: ± 2% of reading ± 1 µA maximum: ± 2% of reading ± 2 µA	
Current Set vs. Output Current Accuracy [3]	typical: ± 2% of setting ± 1 µA maximum: ± 2% of setting ± 2 µA	
Test set up	Test Load: 12 and 15 MOhm Cable length: 30m	
48Vin (Power & Service)	45÷51Vdc	
Polarity	Positive (A3512P) or Negative (A3512N), with Floating return	

[2] From 10 Hz to 20 MHz at full load
[3] From 10% to 90% of Full Scale Range

Front Panel


CH ON
CH 0
COMM
SLOT OK
CH ON
CH 1
POWER ON
ON
OFF
ENABLE
CH ON
CH 2
INTERLOCK
GND
K
A
VCC
CH ON
CH 3
VMAX
V
I
IMAX
SET
CH ON
CH 4
MONITOR
+
−
CH ON
CH 5
REFGND
EARTH
S/N XXXX

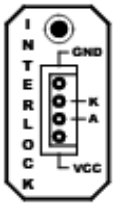
Technical Specifications

Packaging

The module is housed in a 16 TE wide, 6U-high mechanics.

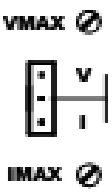
Front panel connections

The board front panel houses the following components:

	OUT CH #	CPE 23.100.151.046 18KV	Positive HV output.
			WARNING! These connectors produce extremely hazardous high voltages at a potentially lethal current level; never connect or disconnect the HV OUT connector with the power ON/OFF switch ON; always switch power OFF and wait at least 30s before connecting or disconnecting HV cables.
	MON +/-:	Radiall R921921	Monitor of Vmax and Imax
	INTERLOCK	AMP 280371-2	Interlock enable jumpers
	EARTH	RADIALL R921921	earth auxiliary reference
	REFGND	RADIALL R921921	floating return, to be connected to the ground reference of the load
	48V STATUS/EN	FISCHER DP101A004-28 (LEMO 00)	TTL signal (active = ON), allows to enable/disable the 48 V power supply (general ON/OFF of the module). The module is ON with LEMO 50Ohm termination and switch set to ON.

Front panel trimmers and switches

The board front panel houses the following trimmers and switches:



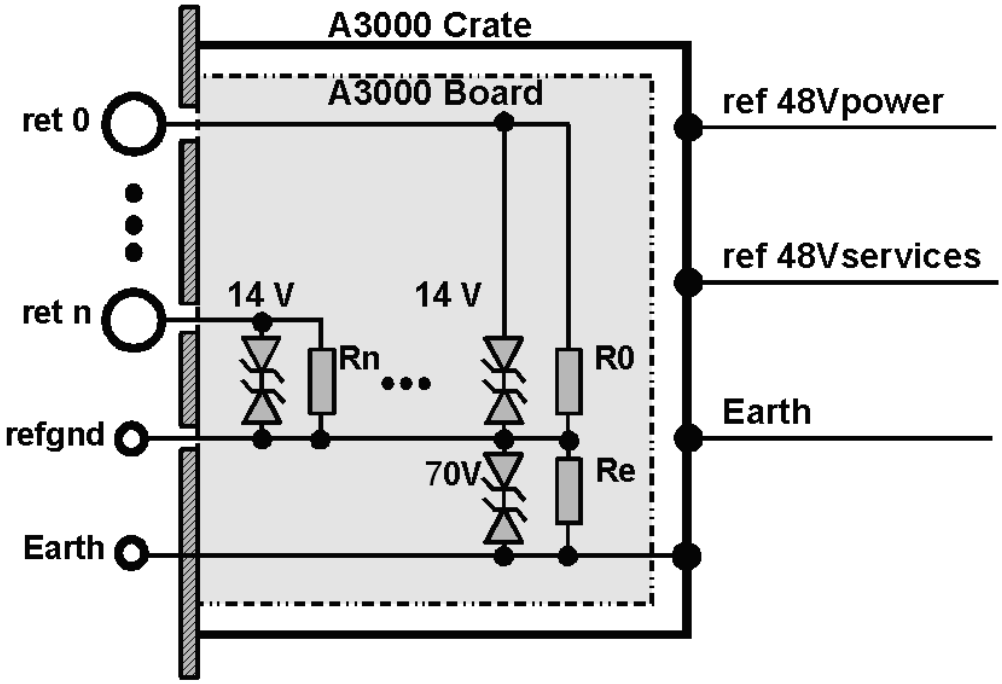
IMAX: Allows to set IOUT maximum hardware value

VMAX: Allows to set VOUT maximum hardware value

Front Panel Displays

CH ON LED	red LED; lights up as the channel is on
PWGOOD LED	green LED; lights up as the +48 V power, ± 12V supplies are present
COMM LED	green LED; lights up as the communications take place
INTERLOCK LED	green LED; lights up as the interlock is active
SLOT OK LED	green LED; lights up as the module is recognised by the A1676A (the A3512 is expected in this slot by the EASY CRATE map table)

Ground scheme



Re=100KOhm (Refgnd-EARTH)

Ro=1MOhm (CH- Refgnd)

3. Safety and installation requirements

General safety information

This section contains the fundamental safety rules for the installation and operation of the boards. Read thoroughly this section before starting any procedure of installation or operation of the product.

Injury Precautions

Review the following precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use the product only as specified. Only qualified personnel should perform service procedures.

Avoid Electric Overload.

To avoid electric shock or fire hazard, do not apply a voltage to a load that is outside the range specified for that load.

Avoid Electric Shock.

To avoid injury or loss of life, do not connect or disconnect cables while they are connected to a voltage source.

Do Not Operate Without Covers.

To avoid electric shock or fire hazard, do not operate this product with covers or panels removed.

Do Not Operate in Wet/Damp Conditions.

To avoid electric shock, do not operate this product in wet or damp conditions.

Do Not Operate in an Explosive Atmosphere.

To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

Do Not Operate With Suspected Failures.

If you suspect there is damage to this product, have it inspected by qualified service personnel.

Safety Terms and Symbols on the Product

These terms may appear on the product:

- **DANGER** indicates an injury hazard immediately accessible as you read the marking.
- **WARNING** indicates an injury hazard not immediately accessible as you read the marking.
- **CAUTION** indicates a hazard to property including the product.

The following symbols may appear on the product:

DANGER
High Voltage

ATTENTION
Refer to Manual

Installation

The Mod. A3512 is a power supply board which has to be plugged in a EASY3000 Remote Crate for Hostile Area.

For more information about operation with the EASY3000 System, please refer to the Mod. A1676A Branch Controller documentation.

The Mod. A1676A is a single-width board for the SYx527 systems. At power ON the SYx527 system processor will scan all the slots in the crate to find out where the module is plugged and what kind of module it is.

The A1676A must be connected to the EASY3000/4000 remote crates through the control lines. The control connectors are placed on the A1676A front panel and on the EASY3000/4000 back or front panel respectively.

Ventilation

It is necessary to provide the unit the proper ventilation by using for example the CAEN Mod. A3000F Fan Unit; (A34FU Fan Unit must be used when the board is operated with EASY 3000 crate first issue). Ventilation is necessary even when channels and 48VPwS are off.

4. Operating modes

The EASY3000 System boards can be controlled, either locally or remotely, through the SYx527 software interface.

For details on the EASY3000 System, please refer to the User's Manual of the A1676A Branch Controller. For details on SYx527 system operation, please refer to the User's Manual of this product.

Output control and monitoring

It is possible, through the SYX527 system, to perform the following operations:

⇨ OVER THE A1676A BOARD

- **RESET** all remote channels controlled by Branch Controller (all settings will be ERASED)
- **RECOVERY** all remote channels controlled by Branch Controller (all settings will be SAVED and communications reset)
- Enable / Disable 48 V output of Branch Controller (**A1676A 48V**)
- Select destination of software downloading (**UPGRADE**) (REMOTE on remote board/ LOCAL on A1676A controller)
- Monitor board firmware release (**REL**)

⇨ OVER THE A3512 BOARD

- Assign to the board symbolic name
- Monitor auxiliary low voltages (**12 VPSW**) (OK if present, FAIL if absent)
- Monitor service and power 48 V supply (**48PWR**) (OK if presents, FAIL if one absent)
- Monitor 50 Hz synchronisation (**Sync**) (OK if present , FAIL if absent)
- Monitor 625 kHz synchronisation (**HVSync**) OK if present, FAIL if absent)
- Monitor channels temperature (**Temp**)
- Monitor of interlock status (**REMILK**)
- Monitor of board name (**Rem Bd NAME**)
- Monitor of 48PWR supply status (**MainPWS**); in case of failure, 48V service is maintained by back up battery and channels can be shut down.

⇨ ON REMOTE CHANNELS

- Assign to channel a symbolic name
- Set output voltage (**VSET**)
- Set max. output current (**ISET**)
- Set output voltage software limit (**SVMAX**)
- Set **TRIP** parameter
- Set voltage ramp-up speed (**RAMP-UP**)
- Set voltage ramp-down speed (**RAMP-DOWN**)
- Switch channel **ON/OFF**
- Monitor output voltage (**VMON**)
- Monitor output current (**IMON**)

- Monitor channel status

The following messages may be returned by the SYX527 when monitoring the channel status:

- OFF (channel turned OFF)
- ON (channel turned ON)
- OVC (channel in OVERCURRENT condition)
- OVV (channel in OVERVOLTAGE condition)
- UNV (channel in UNDERVOLTAGE condition)
- ITRIP (*) (channel OFF due to internal OVERCURRENT condition)
- HVMAX (*) (channel OFF due to VMON pass Vmax set by panel trimmer)

Moreover it is possible to monitor board temperature and to check board status; the following messages may be returned by the SYX527 when monitoring the board status:

- TEMPERR (*) (channels temperature > 65°C)

When the board status is TEMPERR all channels are switched off.

All the alarms marked by (*) requires a **Clear Alarm** operation before returning on the channel(s). To Clear all alarms it's necessary to select menu "*UTILITY*" in SYx527, then "*CLEAR ALARM".*

A3512 Board OPC Items

This chapter describes the items which are available for the A3512 board control.

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

A read access to the **Temp** item returns the channels 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.

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

A read access to the **12VPS** item returns the internal ±12 V status.

A read access to the **12VPS#CoOpen** item returns back the label "Off" associated to 12VPS=FAIL.

A read access to the **12VPS#CoClose** item returns back the label "On" associated to 12VPS=OK.

A read access to the **48VPS** item returns the external +48 V status.

A read access to the **48VPS#CoOpen** item returns back the label "Off" associated to 48VPS=FAIL.

A read access to the **48VPS#CoClose** item returns back the label "On" associated to 48VPS=OK.

A read access to the **Sync** item returns the external 50 Hz status.

A read access to the **Sync#CoOpen** item returns back the label "Off" associated to Sync=FAIL.

A read access to the **Sync#CoClose** item returns back the label "On" associated to Sync=OK.

A read access to the **HVSync** item returns the external 625 Hz status.

A read access to the **HVSync#CoOpen** item returns back the label "Off" associated to HVSync=FAIL.

A read access to the **HVSync#CoClose** item returns back the label "On" associated to HVSync=OK.

ItemID	Data Type	Access Rights	Description
PowerSupplyName.BoardXX.Name	String	R/W	Channel name
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
PowerSupplyName.BoardXX.Rel	String	R	Board firmware release
PowerSupplyName.BoardXX.12VPS	boolean	R	12VPS status
PowerSupplyName.BoardXX.12VPS#CoOpen	string	R	12VPS open label
PowerSupplyName.BoardXX.12VPS#CoClose	string	R	12VPS close label
PowerSupplyName.BoardXX.48VPS	boolean	R	48VPS status
PowerSupplyName.BoardXX.48VPS#CoOpen	string	R	48VPS open label
PowerSupplyName.BoardXX.48VPS#CoClose	string	R	48VPS close label
PowerSupplyName.BoardXX.Sync	boolean	R	Sync status
PowerSupplyName.BoardXX.Sync#CoOpen	string	R	Sync open label
PowerSupplyName.BoardXX.Sync#CoClose	string	R	Sync close label
PowerSupplyName.BoardXX.HVSync	boolean	R	HVSync status
PowerSupplyName.BoardXX.HVSync#CoOpen	string	R	HVSync open label
PowerSupplyName.BoardXX.HVSync#CoClose	string	R	HVSync close label

A3512 Output Channel OPC Items

This chapter describes the items which are available for the control of the power supply channel.

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

The **V0set** item allows to set V0.

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 **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 **I0set** item allows to set I0.

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 **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: don't care

Bit 7: Over HVmax

Bit 8: don't care

Bit 9: Internal Trip

Bit 10: Calibration Error

Bit 11: Unplugged

Bit 12: don't care

Bit 13: OverVoltage Protection

Bit 14: Power Fail

Bit 15: 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.

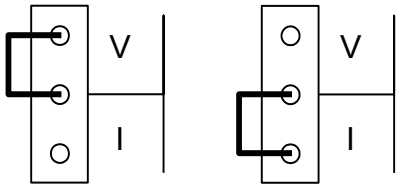
A read access to the **Pw#CoClose** item back the label "On" associated to Pw=1.

ItemID	Data Type	Access Rights	Description
werSupplyName.BoardXX.ChanYYY.Name	String	R/W	Channel name
werSupplyName.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
werSupplyName.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.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.Trip	4-byte real	R/W	Set trip time
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

ItemID	Data Type	Access Rights	Description
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 #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.TripInt	4-byte real	R/W	Internal Trip
PowerSupplyName.BoardXX.ChanYYY.TripInt #EU	string	R	TripInt EU
PowerSupplyName.BoardXX.ChanYYY.TripInt#HighU	8-byte real	R	TripInt upper limit
PowerSupplyName.BoardXX.ChanYYY.TripInt#LowEU	8-byte real	R	TripInt lower limit

VMAX and IMAX hardware set

In order to set VMAX and IMAX via front panel trimmer, connect the multimeter to the Monitor± connectors, then connect the jumpers according to desired setting (voltage/current) and set the VMAX / IMAX value via trimmers.



Interlock operation

PASSIVE INTERLOCK: it is necessary to short circuit pin 1 and pin 2 (GND and K), and pin 3 with pin 4 (A and VCC).

ACTIVE INTERLOCK: it is necessary to send a TTL level between pin 2 and pin 3 (A and K), leaving pin 1 and pin 4 disconnected.

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