

CAEN

Tools for Discovery

Nuclear



Products Catalog

2007



CAEN



Nuclear Physics

Short Form Catalog 2007



The present pages include all the CAEN Catalog products. Anyhow, this list is not exhaustive: almost 40% of CAEN production is Custom design and does not appear in the Catalog. CAEN has always been and would like to continue to be the experimenters' partner. So if you don't find in our Catalog the Product that you need, or if you are beginning a new experiment and require a completely new design, feel free to contact us at any moment. CAEN will help you at any stage of your project.

The quality of CAEN S.p.A. products is constantly monitored by the application of the UNI EN ISO 9001:2000 standard. CAEN S.p.A. is ISO 9001 certified since 1996.



Welcome to the 2007 CAEN Short Form Catalog!

The CAEN Short Form Catalog is the result of more than 25 years of experience in developing "Tools for Discovery". It is a further proof of the skill and the in-depth knowledge kept by the CAEN staff. All the aspects of the research problems have been solved by CAEN specialists with high level R&D and high quality production for the achievement of clients purposes.

Always at the customers' service.

Thanks to the collaboration with worldwide research Institutions and to the presence in CAEN of extremely qualified and professional physicists and engineers, CAEN is able to develop advanced solutions to completely meet the customers' satisfaction.

On this Catalog you can find a complete line of products for Research Laboratories and for Particle, Astroparticle and Nuclear Physics experiments.

CAEN is now extending its products range:

- *Power Supplies:*
 - high level quality High Voltage and Low Voltage Power Supply Systems
- *NIM CAMAC VME:*
 - new Front-End/Data Acquisition modules which meet IEEE Standards for Nuclear and Particle Physics
 - new Flash ADC/FPGA technologies for digital pulse shape analysis
 - complete DAQ systems from the detector to the acquisition
- *New powered low noise Crate line*

With endless gratitude to the world of Research.

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CAEN Network Companies

CAEN SpA is one of the most important industrial spin-offs of the Italian Nuclear Physics Research. The company was founded in Viareggio (Italy) in 1979 by a group of senior engineers from the Istituto Nazionale di Fisica Nucleare (INFN) and today still designs and manufactures sophisticated electronic equipment for Nuclear Physics Research. CAEN is recognized world wide as one of the leading companies in this field.

The experience in the electronic integration field allows CAEN to face new challenges and new sectors as Aerospace, Microelectronics and RFID supported by autonomous operative Companies of the CAEN Company Network. The CAEN Company Network is structured into four autonomous operative sectors:



Nuclear

CAEN SpA is leader in the design and manufacture of sophisticated electronic equipment for Nuclear and Particle Physics such as Low Voltage & High Voltage Power Supply Systems, Front-End and Data Acquisition Electronics (standard VME, NIM, CAMAC solutions). CAEN activities are at the forefront of technology also thanks to years of intensive collaborations with the major Research Centers and Universities in the world. CAEN is also proud of its extensive collaboration with the most important HEP experiments world-wide: almost 40% of our production is custom design.



Aerospace

CAEN Aerospace Srl provides the design and production of high reliability electronics for Space applications and collaborates with the main Space Agencies (NASA, ESA, ASI, CNES) and Prime Industries (ASTRIUM, ALCATEL-ALENIA, COMDEV).



Microelectronics

Aurelia Microelettronica Srl provides a complete microelectronics design service for digital, mixed/analog ASICs and complex FPGA designs, with a wide offering of HW and SW Intellectual Properties (IP) blocks.

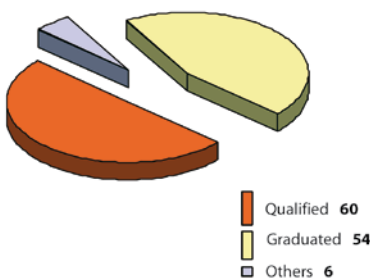


RFID

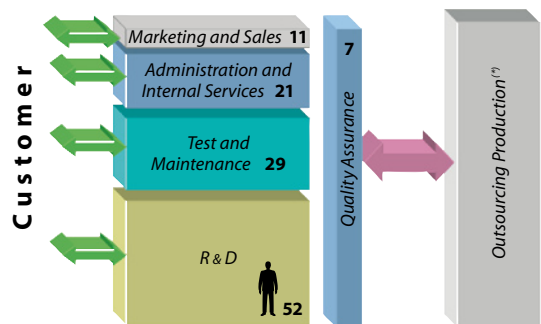
CAEN RFID Srl is pioneering the use of the new UHF Radio Frequency Identification technology in Europe. Its readers and tags offer a way of overcoming the traditional bar-code system limitations.

CAEN Network Companies know-how has been acquired by working side by side in daily collaboration with research groups. This has allowed us to maintain the constantly improving technology of our products, and also to develop and consolidate a whole range of innovations.

Staff background



Organization



(*) All outsourcing Partners are ISO 9001:2000 certified.

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CAEN Headquarters, Viareggio - Italy

Explore CAEN world on www.caen.it

Keep yourself updated with the latest technical info:

- Cross reference tables to easily compare different boards
- Products data sheets and technical information manuals
- Latest software releases to be freely downloaded
- Forthcoming products
- Custom projects developed for the most important physics experiments



Get in touch with CAEN people:

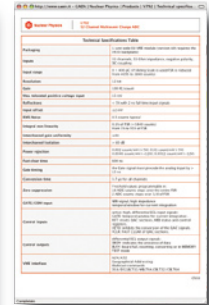
- Meetings attended by CAEN personnel all around the world
- Technical experts on line to answer your questions
- Company news and periodical newsletters
- Sales network

** Printable DataSheet

** Technical specification table

** Ordering Option

Code	Version	Description	Availability	New
V792	1.0	32 Channel Multievent Charge ADC	Available	
V792	1.1	32 Channel Multievent Charge ADC	Available	



* Page Compare similar Modules

Model	Package	No. of Channels	Resolution (MSB)	Conversion Time (µs)	LSE (FC)	Full Scale Range (µC)	Gain Width (µs)	Fast Clear (µs)	Connectors	Features
C1205	CAMAC	16	12 (17-dyn)	< 6	21 / 180 / 7 (330)	90/650/6000	0.01 / 0.5	1	LEMO	triple range
C205	CAMAC	32	12 (15-dyn)	1000	30/200	120 / 900	0.05 / 5	0.3	Std. Flat	dual range
C205A	CAMAC 2U	16	12 (15-dyn)	800	30/200	120 / 900	0.1 / 5	0.3	LEMO	dual range
V8748	V4321/1	4 x 4	12 (14-dyn)	11	n/a	n/a	0.04	0.5	LEMO	TDC section
V792	VME	32	12	5.7	100	400	0.05	0.6	Std. Flat	-
V792B	VME	16	12	2.8	100	400	0.05	0.6	LEMO	-
V862	VME	32	12	5.7	100	400	0.05	0.6	Robinson Support Flat	Individual gate
V8748	V4321/1	4 x 4	12 (14-dyn)	11	n/a	n/a	0.04	0.5	LEMO	TDC section
V965	VME	16	12 (15-dyn)	5.7	25 / 200	100/400	0.05	0.6	LEMO	dual range
V965A	VME	8	12 (15-dyn)	2.8	25 / 200	100 / 400	0.05	0.6	LEMO	dual range

Register here! By requiring registration, you get free-of-charge access to user manuals, software, application notes and other useful material. In addition, you may choose to receive the periodical newsletter with important news about the modules of your interest.

Our Profile, Products Catalog and services



Features and performances... all is here in just a product card: an arriving point and a starting point! Use the product page to deepen your knowledge of the CAEN modules.

Find out the details by clicking the zoom button!

Up to date information introduce the module here!

* This option will help you to find the best solution for your application. Compare similar modules at a glance!

Login | Register

CAEN
tools for discovery

Nuclear Physics
Tools for discovery

Company | Products | Support | News | Exhibition | Success History

CAEN Group
Sales Network
Contact us
Newsletter Area

VME - V792
32 Channel Multievent Charge ADC

Large pics

Highlights

- High channel density
- 12-bit resolution
- 5.7 µs / 32 ch conversion time
- 600 ns fast clear time
- Zero and overflow suppression for each channel
- ±1.5% differential non linearity
- ±0.1% integral non linearity
- 32 event buffer memory
- BLT32/MBLT64/CBLT32/CBLT64 data transfer
- Multicast commands
- Live insertion

Products

- Front End
- VME
- QDCs

V792

- Technical Specifications Table
- Manual
- Software
- Release Notes
- Ordering Options
- Printable Data-Sheet
- 2005 VME Catalog
- Compare with other QDCs

Compare with other QDCs

Request a Quote V792 - 32 Channel Multievent Charge ADC

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> Nuclear Physics > Products | Support | News | Events | Custom Projects



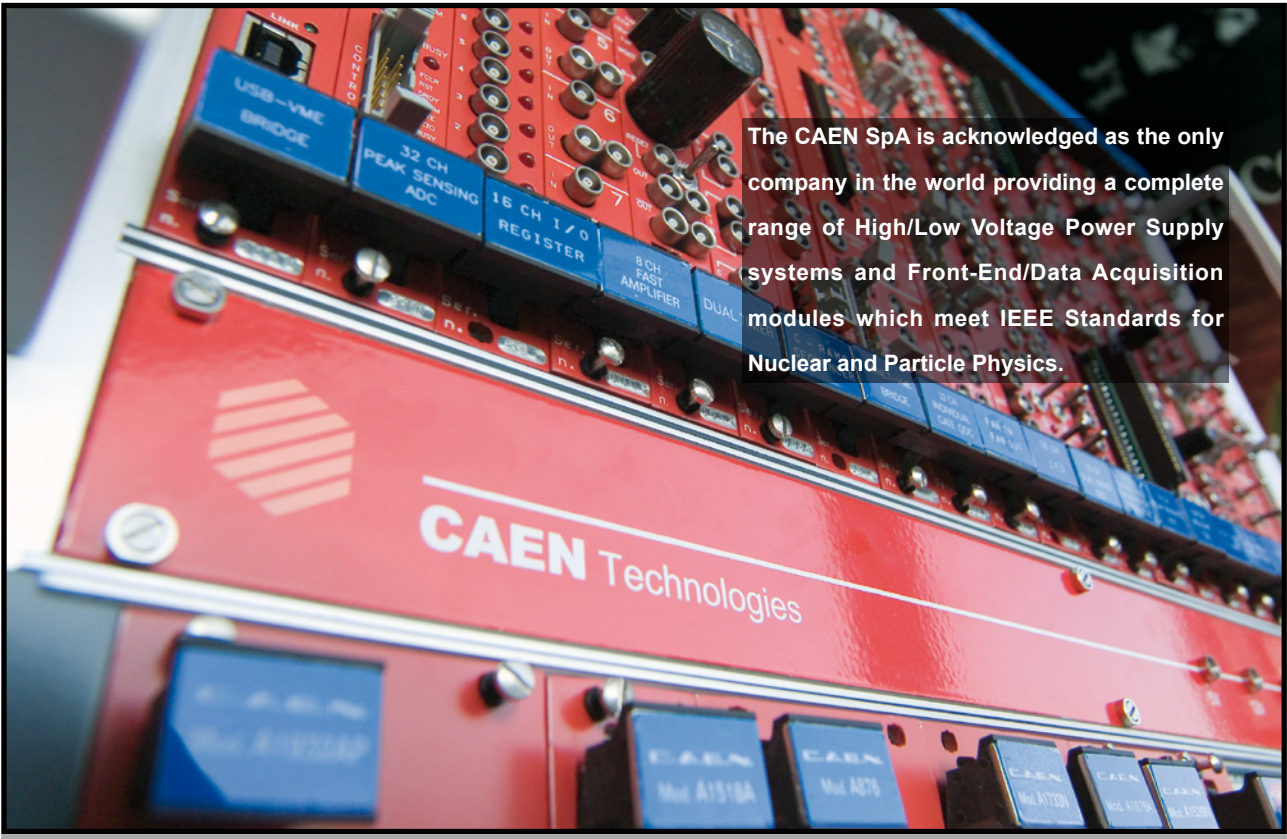
Easy navigation with the visual folder tree!

** All products related documentation in a "click"

* Compare similar modules at a glance!

Need a quotation? Just a click here!

CAEN Network Overview



The 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.



Nuclear 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.

Our Mission:

- To provide our customers with better solutions to measure, research and test the world around them*
- To proceed along this path with continuous energy to live the new electronics reality and to offer the best technical support to the researchers of the new century*
- To provide innovative products which allow our customers access to improved scientific results*
- To offer effective sales and after-sales support*

Our Vision:

Realizing our Customer's dream by developing the most useful "Tools for Discovery".

CAEN Network Overview



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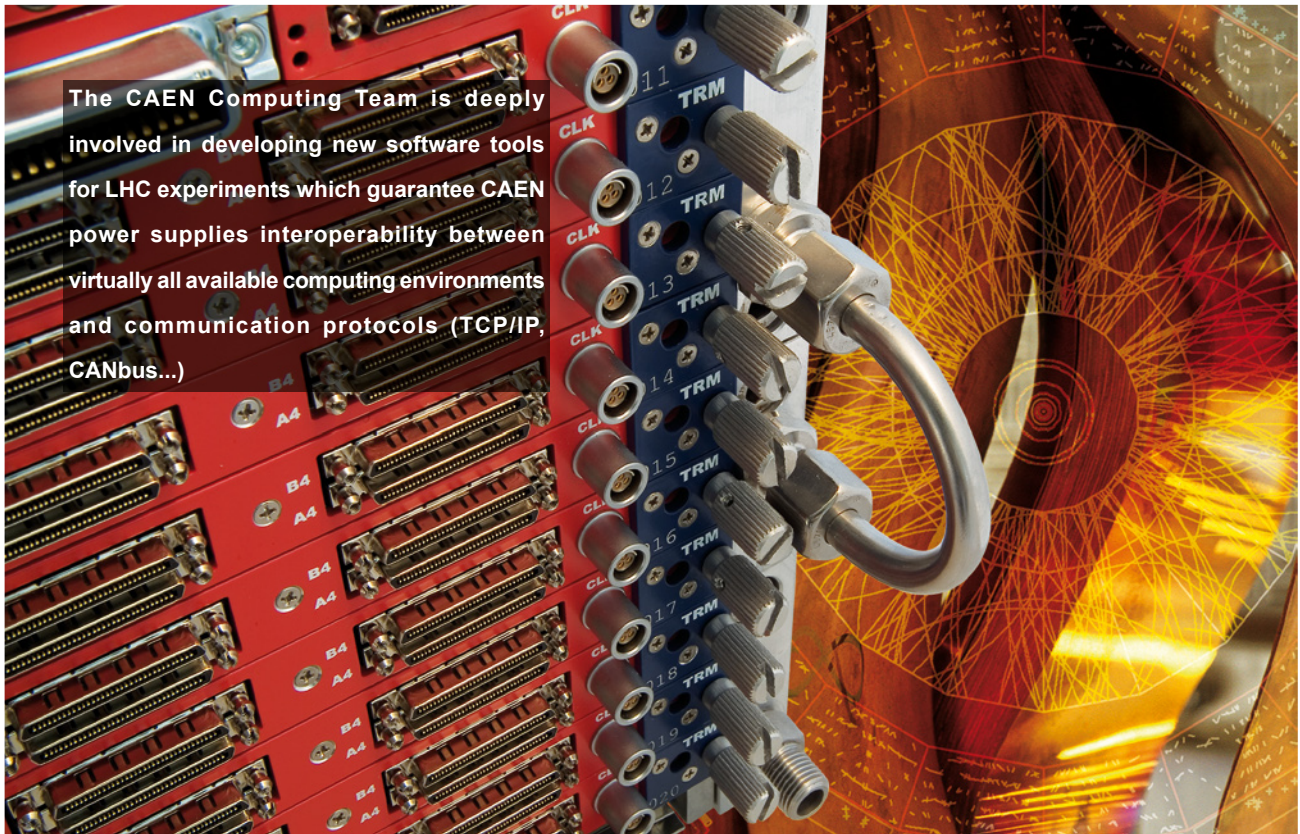
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CAEN Network Overview



Computing Team

The CAEN SpA includes also a Computing Team founded to meet the growing requirements of CAEN for increased computing and data transmission support.

The main role of this Group is to be the software and networking advisor for CAEN, focusing on the development of embedded systems and production of software to support the operation of all CAEN products.

Other activities range from modular solutions for Easy System integration to specific application software development for Data Acquisition systems.

Market sharing

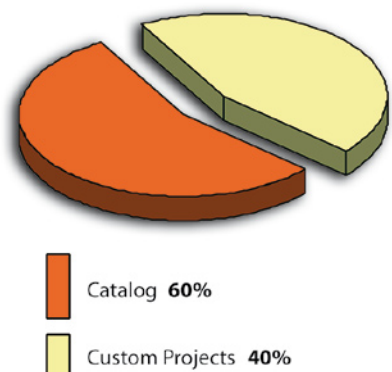
Our catalog includes more than 250 products ranging from Power Supplies to Front End, Acquisition modules in NIM, CAMAC and VME Standards and a powered Crates line.

However, this list is not exhaustive: almost 40% of CAEN SpA production is Custom designed and does not appear in the catalog.

CAEN SpA has always been and would like to continue to be the experimenters' partner.

(see http://www.caen.it/nuclear/custom_projects.php)

Market sharing





The CAEN Aerospace Company R&D activity has led to the implementation of HV/MV/LV Power Supplies Systems, Power Conditioning and Distribution Units, DC/DC Converters, DC/AC Converters, Payload Power Supply, Frontend electronics, Payload Data Processing. CAEN Aerospace is fully equipped with state-of-the-art facilities for electronics design manufacturing and testing (including thermal and vacuum chamber and a class 100,000 clean room).

Official ESA/NASA standard certifications have been obtained in order to guarantee high-quality production.



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Aerospace

CAEN Aerospace has successfully taken part in many international projects (PAMELA, AMS1, INTEGRAL/JEM-X, ALTEINO) and is currently involved in other international projects and missions such as SWARM and AMS2. In the Framework of several ESA projects, CAEN Aerospace is developing the central Payload Power Supply for Compact Instruments (envisaged for all future ESA small satellite missions) and the Integrated Payload Data Processing and Storage System (a real single board computer for different space mission scenarios).

Moreover, CAEN Aerospace is able to provide HV Power Supply Systems for Field Emission Electric Propulsion and Power Conditioning and Distribution Units for low power Hall Propulsion Thrusters.

The strong expertise acquired in the aerospace field allows CAEN Aerospace to develop electronic devices for any high reliability application such as the under-ice HV Power Supply System for the Icecube experiment at the South Pole.

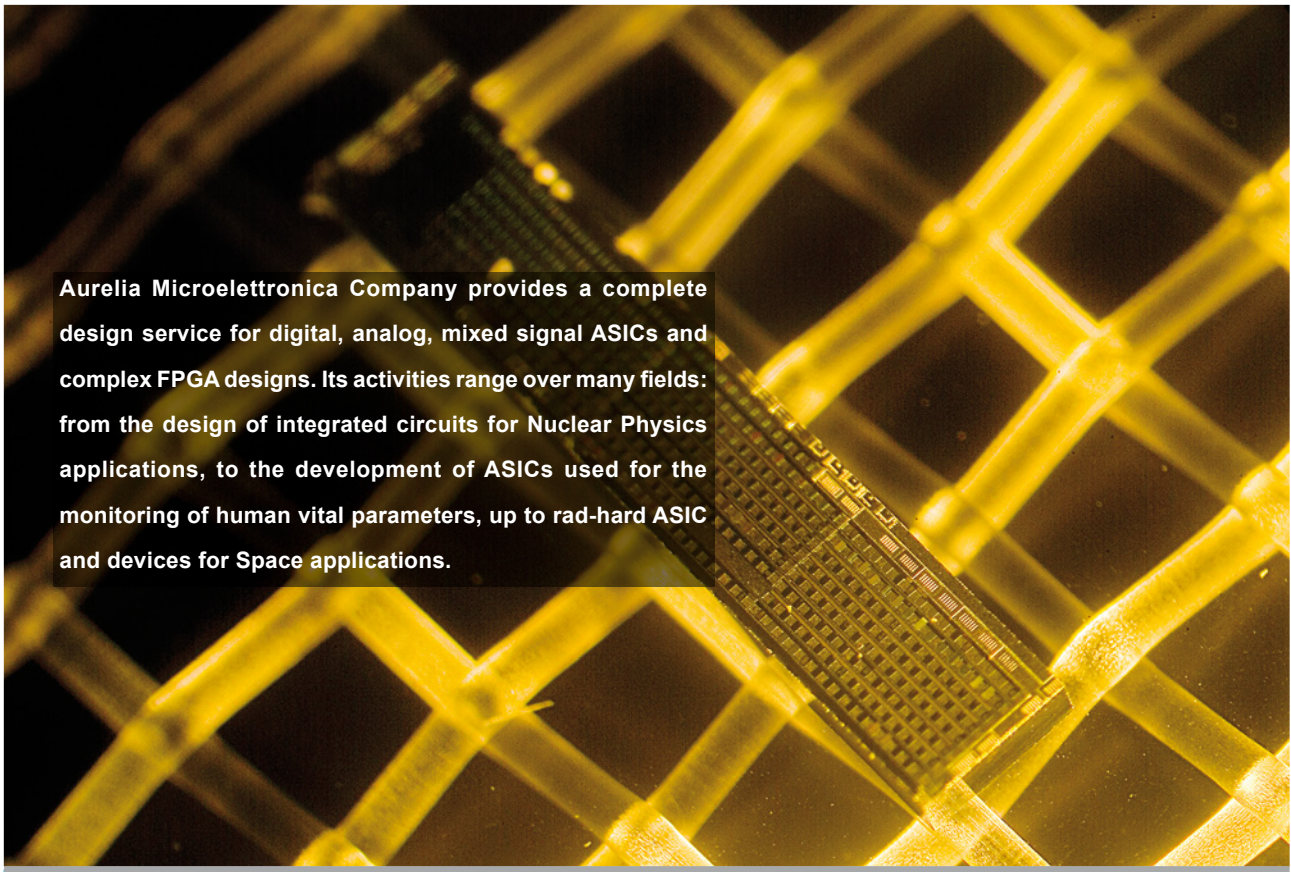
High Reliability Mission Tailored Space Electronics is a CAEN Aerospace signature.

Our Mission:

- *We provide design, production and support for integration of electronic devices for space applications*
- *We find "mission tailored" solutions for everyone working in the space field*
- *We solve hidden problems our customers sometimes ignore thanks to our every day increasing experience and our passion for this work*
- *We wish to have outstanding financial returns providing in the meantime the community with a benefit*

Our Vision:

A CAEN Aerospace power supply system in any payload.

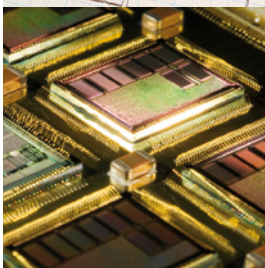
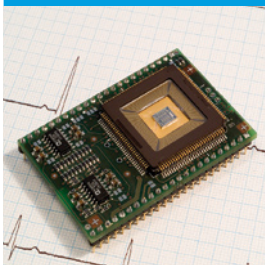


Aurelia Microelettronica Company provides a complete design service for digital, analog, mixed signal ASICs and complex FPGA designs. Its activities range over many fields: from the design of integrated circuits for Nuclear Physics applications, to the development of ASICs used for the monitoring of human vital parameters, up to rad-hard ASIC and devices for Space applications.



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Microelectronics

Aurelia Microelettronica is involved in the development of microelectronics for several application fields. In collaboration with the CAEN SpA, has designed sophisticated electronic equipment for nuclear and particle physics experiments: (ICARUS, CMS, ATLAS, ALICE, LHCb).

The experience in the Aerospace field has allowed Aurelia Microelettronica to succeed in several international projects with the main Space Agencies and Industries (NASA, ESA, ASI, ASTRUM, ALCATEL, ALENIA).

Thanks to its technical background and the professional competence of its personnel, is able to follow all the necessary development phases of both the microelectronic systems (digital and analog) and the dedicated space electronics.

Aurelia Microelettronica has carried out the implementation of dedicated Systems for human vital parameters monitoring in the Biomedical field.

Our Mission:

- *We contribute towards products' innovation through custom IC development*
- *We provide high performing IC solutions for applications in critical environments*
- *We meet the requests of technological innovation also by low volume ASIC production*

Our Vision:

Everything around Microelectronics Art.



CAEN RFID Company was born in 2006, receiving as capital contribution the CAEN SpA RFID branch, started in 2002 to seek for new opportunities outside the field of fundamental research.



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RFID

The longstanding experience acquired with Physics and Aerospace experiments has been the substrate on which the new developments on Radio Frequency systems have begun. A totally internal expertise and know-how on Radio Frequency electronics and related Software has allowed CAEN RFID to rapidly become a leading European company in the manufacturing and supplying of UHF systems.

Our RFID UHF readers are the state-of-the-art for all vertical applications, fully compliant with the ETSI and FCC rules and EPC Gen2 protocol and able to cover distances of 5-6m with on-metal passive tags.

As an active participant of ETSI and EPC Global working groups, CAEN RFID is committed to providing customers with readers and tags that meet ISO/EPC standards and ETSI/FCC requirements.

Thanks to our R&D skills, CAEN RFID can also design specific equipment on a custom basis, thus providing RFID readers and tags for special applications on demand.

Recent collaborations with partners such as INTEL and Oracle enable CAEN RFID to be an active player in the most relevant RFID ecosystems.

Our Mission:

- To provide our Customers with the best UHF readers and tags which meet standards and protocol requirements
- To provide our best support for their integration

Our Vision:

To become the leading UHF RFID hardware manufacturer in Europe.



Power Supply products

CAEN Short Form Catalog 2007

Function	Model	Description	Page	
NIM Power Supply	N470	4 Channel Programmable HV Power Supply	15	
NIM Power Supply	N471	2 Channel HV Power Supply (± 8 kV)	15	
NIM Power Supply	N471A	2 Channel HV Power Supply (± 8 kV; $8\mu\text{A}/1\text{nA}$ res.)	15	
NIM Power Supply	N471G	2 Channel HV Power Supply for Germanium Detectors	16	NEW
NIM Power Supply	N472	4 Channel HV Power Supply (± 8 kV)	16	
Mainframe	SY1527	Universal Multichannel Power Supply System 16 slot	17	
Mainframe	SY1527LC	Low Cost Universal Multichannel Power Supply System 16 slot	18	NEW
Mainframe	SY2527	Universal Multichannel Power Supply System 6 slot	19	
Mainframe	SY3527	Universal Multichannel Power Supply System 2 slot	19	
LV Floating Board	A1513B	6 Channel Floating LV Board (10V / 2.7A)	20	
LV Floating Board	A1516B	6 Channel Floating LV Board (15V / 1.5A)	20	
LV Floating Board	A1517B	6 Channel Floating LV Board (7V / 4A)	20	
LV Floating Board	A1518B	6 Channel Floating LV Board (4.5V / 6A)	20	
HV Floating Board	A1510	12 Channel Floating HV Board (100V; 10mA)	20	
HV Floating Board	A1511B	12 Channel Floating HV Board (500V; 1mA / 10mA)	20	
HV Floating Board	A1512	12 Channel Floating HV Board (500V; 100 μA / 1mA)	20	
HV Floating Board	A1514B	7 Channel Floating HV LV Board (500V; 10V; 7V)	20	
HV Floating Board	A1519B	12 Channel Floating HV Board (250V; 100 μA / 1mA)	20	
HV Floating Board	A1520P	12 Channel Floating HV Board (500V; 15mA / 1.5mA)	21	
HV Floating Board	A1533	6 Channel Floating HV Board (4kV / 3mA)	21	
HV Floating Board	A1534	6 Channel Floating HV Board (8kV / 200 μA)	21	
HV Floating Board	A1526	6 Channel Common Floating Return HV Board (15kV; 0.1mA / 1mA)	22	
HV Floating Board	A1535	24 Channel Common Floating Return HV Board (3.5kV / 3mA)	22	NEW
HV Floating Board	A1932A	48 Channel Common Floating Return HV Distributor Board (3kV / 500 μA)	22	
HV Board	A17xx	12 / 28 Channel HV Board	23	
HV Board	A18xx	12 / 28 Channel HV Board	23	
EASY3000 Crate	EASY3000	Embedded Assembly System	25	
Branch Controller	A1676A	EASY3000 Branch Controller	26	
EASY3000 HV Board	A35XX	12 / 6 / 32 Channel EASY3000 Floating HV Board	26	
EASY3000 LV Board	A30XX	2 / 4 / 6 / 12 Channel EASY3000 Floating LV Board (45 + 300 W)	27	
EASY3000 LV Board	A3100	1 Channel EASY3000 Floating LV Board (600 W)	27	
EASY3000 LV Board	A3602	3 Channel EASY3000 Floating LV Board (7V / 5A)	28	NEW
EASY3000 ADC Board	A3801	128 Channel EASY3000 ADC Board	28	
EASY3000 ADC Board	A3801A	128 Channel EASY3000 Temperature Sensor Board	28	
EASY3000 AC/DC Converter	A3486	2 Channel EASY3000 AC/DC Converter (48V / 2kW)	29	NEW
EASY3000 DAC Board	A3802	128 Channel EASY3000 DAC Board	29	NEW
Stand Alone	A864	High Efficiency DC-DC Converter (2.1kV / 100 μA)	30	
Stand Alone	S9090	High Efficiency DC-DC Converter (2kV / 30 μA)	30	NEW

OUT: 5VDC
1600mA

Control Software for CAEN Power Supply System



In the LHC era, experiments will have an enormous number of items to be controlled. Reliable solutions are required to integrate heterogeneous components into Detector Control Systems. CAEN is deeply involved in developing new software tools for LHC experiments which guarantee its power supplies, interoperability between virtually all available computing environments and communication protocols (TCP/IP, CANbus...)

OPC Server

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 TCP/IP or HS CAENET communication path, by any OPC compliant client application.

OPC (OLE for Process Control) 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.

Active HV

An activeX object library (ActiveHV) is now available, enabling CAEN power supplies to be controlled by and exchange data with a variety of Windows applications supporting the ActiveX standard, including Visual Basic, Visual C++, Internet Explorer and MS Office programs. The ActiveHV library comes with a VB 6.0 example application (HVPS Controller) for general purpose CAEN HV boards control.

Our software support group is available for questions, support and any other software related issues concerning CAEN power supplies.

For software support send an e-mail to support.computing@caen.it

Highlights

OPC Server

- ...> Runs as Windows XP and Windows 2000 service
- ...> Supports SY1527, SY2527 and SY127 systems, N470 NIM HV Power Supply and N568 NIM module
- ...> Communication via TCP/IP and HS CAENET
- ...> OPC Data Access v. 2.0 compatibility
- ...> Tag browse compatibility
- ...> DCOM based interface for local/remote OPC server configuration
- ...> 32 bit multi-threading
- ...> Supports COM/DCOM & OLE Automation

Active HV

- ...> Designed for Windows XP and Windows 2000
- ...> Embeds in any ActiveX container
- ...> Includes VB 6.0 application example
- ...> Advanced Object Oriented Interface
- ...> Supports SY1527, SY2527 and SY127 systems, N470 NIM HV Power Supply and N568 NIM module
- ...> Communication via TCP/IP and HS CAENET

N470 Programmable HV Power Supply



Overview

The Mod. N470 is a double width NIM unit housing 4 independent High Voltage channels.

The output voltage ranges of each channel are:

- from 0 to ± 3 kV / 3 mA;
- from ± 3 kV to ± 4 kV / 2 mA;
- from ± 4 kV to ± 8 kV / 1 mA.

The range selection is automatic, as the output voltage is set. The current resolution is 1 μ A.

The output polarity is independently selectable for each channel. It is possible on each channel to control several operating parameters: two levels of presettable high voltage, two levels of current limit, Ramp-up, Ramp-down. All these parameters can be programmed and monitored either in remote mode, via High Speed CAENET (either using the V288 VME controller or the A1303 PCI Bus controller), or in local mode, via front panel alphanumeric keypad and two 8-character displays. In addition some LEDs display the status of the selected channel.

All the functional parameters are stored in a non-volatile memory.

Front panel trimmers allow the setting of maximum voltage limits, and the two current and voltage limits can be selected via two external NIM/TTL signals. A NIM/TTL signal is also available for the KILL function, as well as a complete calibration menu.

The High Voltage output is provided by SHV connectors.



Highlights

- ± 3 kV / 3 mA, ± 4 kV / 2 mA or ± 8 kV / 1 mA
- High flexibility to power a wide range of detectors
- Positive or negative polarity selectable for each channel
- Alphanumeric keypad and two 8-digit displays
- Remote control via HS CAENET
- Internal CPU, digital setting of all parameters
- Friendly software user interface
- Under/over-voltage alert, overcurrent and max. voltage protection

Ordering options

Code	Description
WN470XAAAAAA	N470 - 4 channel Programmable High Voltage Power Supply (± 8 KV)

N471 - N471A 2 Channel HV Power Supplies

Overview

The Mod. N471 and N471A are single width NIM units housing 2 independent High Voltage channels. The output voltage ranges (automatic selection) are:

- ± 3 kV / 3 mA or ± 8 kV / 1 mA (1 μ A resolution) in the Mod. N471;
- ± 8 kV / 8 μ A (1 nA resolution) in the Mod. N471A.

The output polarity is independently selectable for each channel. Two 10-turn potentiometers (one per channel) located on the front panel allow the HV setting, while 4 trimmers (2 per channel) allow the current and the max. voltage limit settings. The channel polarity, the overcurrent and overvoltage status are displayed by front panel LEDs. One front panel connector per channel allows the current monitoring. The channel inhibit can be done either individually for each channel via a front panel switch, or in common to all channels, both locally via front panel switch and remotely via an external signal. A common four digit display indicates the value of the parameter under control. The selection of the channel, the parameters and the set/monitor mode is performed via front panel switches. The module is intrinsically safe: the High Voltage is present only on the SHV output connectors



Highlights

- N471: ± 3 kV / 3 mA or ± 8 kV / 1 mA (1 μ A resolution)
- N471A: ± 8 kV / 8 μ A (1 nA resolution)
- High flexibility to power a wide range of detectors
- 2 channels in a single width unit
- Positive or negative polarity selectable for each channel
- 4 digit display
- Display monitoring of all functional parameters
- Local or remote Inhibit
- Hardware max. HV limit

Ordering options

Code	Description
WN471XAAAAAA	N471 - 2 channel High Voltage Power Supply (± 8 KV)
WN471AXAAAAA	N471 A - 2 channel High Voltage Power Supply (± 8 KV; 8 μ A/1nA res.)

NEW**N471G** 2 Channel HV Power Supply for Germanium Detectors**Overview**

The Mod. N471G is a single width NIM unit housing 2 independent High Voltage channels. The output voltage ranges (automatic selection) is ± 8 kV / 8 μ A with 1 nA resolution.

The output polarity is independently selectable for each channel. The unit is specially designed, with slow HV ramps, in order to be used with Germanium Detectors, coupled with the Mod. A483 External 8 kV HV filter; using such filter output voltage ripple is kept under 5 mV (28 μ s period ripple < 2 mV).

Two 10-turn potentiometers (one per channel) located on the front panel allow the HV setting, while 4 trimmers (2 per channel) allow the current and the max. voltage limit settings. The channel polarity, the overcurrent and overvoltage status are displayed by front panel LEDs. One front panel connector per channel allows the current monitoring. The channel inhibit can be done either individually for each channel via a front panel switch, or in common to all channels, both locally via front panel switch and remotely via an external signal. A common four digit display indicates the value of the parameter under control. The selection of the channel, the parameters and the set/monitor mode is performed via front panel switches. The module is intrinsically safe: the High Voltage is present only on the SHV output connectors

**Highlights**

- >>> ± 8 kV / 8 μ A output with 1 nA resolution
- >>> 2 channels in a single width unit
- >>> Ripple smaller than 5 mVpp with A483 External 8 kV HV filter
- >>> Positive or negative polarity selectable for each channel
- >>> 1 V/s HV ramp for usage with Germanium Detectors
- >>> 4 digit display
- >>> Display monitoring of all functional parameters
- >>> Local or remote Inhibit
- >>> Hardware max. HV limit

Ordering options

Code	Description	
WN471GXAAAAA	N471G - Germanium 2 channel High Voltage Power Supply (± 8 KV; 8 μ A/1nA res.)	NEW
WN471GKITXAA	N471GKIT - Germanium 2 channel High Voltage Power Supply (N471G) + 2 HV Filter (A483)	NEW

N472 4 Channel 6 kV Power Supply**Overview**

The Mod. N472 is a double width NIM unit housing 4 independent High Voltage channels.

The output voltages range from 0 to ± 3 kV / 3 mA, or up to ± 6 kV / 1 mA (max. output ripple of 30 mVpp at full load).

The output polarity is independently selectable for each channel. All channels have individual settings and feature test points and connectors for the monitoring of voltages and currents. The setting of the output voltages can be done locally, via trimmers located on the front panel, or remotely, via analog signals.

The setting of the output maximum Voltage and Current limit can be done only locally via front panel trimmers. The channel polarity, overcurrent status and reaching of the max. voltage limit are displayed on front panel LEDs.

The High Voltage enable can be set both locally, via front panel switch, and remotely, via an external TTL level. Each channel can be individually turned on, either locally or remotely.

The module is intrinsically safe: the High Voltage is present only on the SHV output connectors.

The module can be powered either by the NIM crate or with 110/220 Vac via a back panel Standard European connector.

**Highlights**

- >>> Two output ranges: ± 3 kV / 3 mA and ± 6 kV / 1 mA
- >>> 4 channels in a double width unit
- >>> Positive or negative polarity selectable for each channel
- >>> Local or remote individual channel setting and monitoring
- >>> Remote HV Enable via TTL common to all channels
- >>> Hardware HV limit
- >>> 110/220 Vac external power available

Ordering options

Code	Description
WN472XAAAAAA	N472 - 4 channel High Voltage Power Supply (± 6 KV/1 mA)

SY1527 Universal Multichannel Power Supply System

OPC


Overview

The SY1527 system is the fully equipped experiment version of a new line of power supply systems which represent CAEN's latest proposal in the matter of High Voltage and Low Voltage Power Supplying. This system outlines a completely new approach to power generation and distribution by allowing the housing, in the same mainframe, of a wide range of boards with different functions, such as High/Low Voltage boards, generic I/O boards (temperature, pressure monitors, etc.) and branch controllers, where the latter are used to control other remote generators and distributors. Modularity, flexibility and reliability are the key-points of its design, enabling this module to meet the requirements needed in a wide range of experimental conditions, which range from those of LHC experiments, where the features of this model find prior application, to those of other less challenging, but still demanding, High Energy Physics experiments.

The mainframe is housed in a 19"-wide, 8U-high euro-mechanics rack and hosts four main sections:

- the Board Section, with 16 slots to house boards, distributors and branch controllers;
- the Fan Tray Section, housing 6 fans arranged on two rows;
- the Power Supply Section, which consists of the primary power supply and up to 3 power supply units;
- the CPU and Front Panel Section which includes all interface facilities.

The User Software Interface features the usual friendliness of the previous CAEN systems which now also includes a 7.7" colour LCD. A wide choice of interface facilities provides full communication compatibility with the previous systems and the feasibility of controlling heterogeneous external devices. Modularity has been one of the leading criteria in the design and development of the system: both the Power Supply Section and the Board Section are completely modular. The Power Supply Section allows different configurations with up to 3 power supply units per mainframe (up to 2250 W), while the Board Section can house up to 16 boards able to perform different functions. A complete line of power supply boards and distributors has been specially developed for this new system. The minimum system configuration consists of the primary power supply, one Power Supply Unit and one board. The system allows also to deal with power supply solutions composed by "branch controllers" (housed in the system main frame) and on-detector "remote boards" (manufactured in order to be magnetic field and radiation tolerant). Channel trip control

Highlights

- > Houses up to 16 boards (HV/LV or "branch controllers")
- > Ad-hoc boards and peripheral systems
- > Communications via RS232, HS CAENET and TCP/IP
- > OPC Server to ease integration in DCS
- > Programmable handling of parameters and errors
- > Optical links for remote communications
- > Fast, accurate setting and monitoring of channel parameters
- > Sophisticated channel trip handling
- > Multilevel management of user profiles
- > Live insertion of boards
- > Advanced Trip handling
- > Hardware current protection
- > Modular and expandable power supply
- > Secure access to the system via Intranet
- > Remote debugging and technical support
- > Easy firmware upgrading

on other crates is performed via four external differential trip lines. A sophisticated trip handling via software allows to control and correlate trip conditions on the channels of the crate as well as of other crates connected to it. Live insertion and extraction of the boards, which reduces the down time of the global system, and easy access to the computing core and peripherals of the system complete the system flexibility. Easy interfacing is another key-point of the SY1527 system, which can be connected to SY127 and SY527 systems. The Ethernet interface (TCP/IP) allows both an easy Telnet access and the connection via OPC Server to a SCADA control system. Enhanced software programming features a unified command set independent from the interface used to communicate with the system. The Power Supply Section and Board Section can be externally synchronised via front panel connectors. Multi-layered access to the system via Intranet is foreseen through the management of several custom user profiles. In particular, three different access levels have been implemented: Guest, User and Administrator, each with password protection. Handy maintenance and upgrading, which constitute a major issue in the reliability of a system, are further guaranteed by the possibility of accessing and servicing the system via network facilities. Actually, the Telnet access facility allows remote debugging and technical support of the system, including future firmware upgrading.



Ordering options

Code	Description
WSY1527A1529	SY1527 - Universal Multichannel Power Supply System - 750 W
WSY1527A1531	A1531 - SY 1527 Primary Power Supply
WSY1527A1532	A1532 - SY 1527 Optional Power Supply Unit 750W

SY1527LC**Low Cost Universal Multichannel Power Supply System****OPC NEW****Overview**

The SY1527LC system is the "low cost" version of the CAEN fully equipped experiment power supply system SY1527. This system allows the housing, in the same mainframe, of a wide range of boards with different functions such as the mixing of High/Low Voltage boards, and branch controllers. These last ones are used to control other remote units like generators and distributors. Modularity, flexibility and reliability are the key-points of its design, enabling this module to meet the requirements needed in a wide range of experimental conditions.

The mainframe is housed in a 19"-wide, 8U-high euro-mechanics rack and hosts four main sections:

- the Board Section, with 16 slots to house boards, distributors and branch controllers;
- the Fan Tray Section, housing 6 fans arranged on two rows;
- the Power Supply Section, which consists of the primary power supply

Highlights

- > Excellent price-to-quality ratio
- > Houses up to 16 boards, HV/LV or branch controllers
- > Ad-hoc boards and peripheral systems
- > Communications via RS232 and TCP/IP
- > OPC Server to ease integration in DCS
- > Programmable handling of parameters and errors
- > Fast, accurate setting and monitoring of channel parameters
- > Multilevel management of user profiles
- > Live insertion of boards
- > Advanced trip handling
- > Hardware current protection
- > Modular and expandable power supply
- > Secure access to the system via Intranet
- > Remote debugging and technical support
- > Easy firmware upgrading

and up to 3 additional power supply units;
- the CPU and Front Panel Section which includes all interface facilities.

The User Software Interface features the usual friendliness of the previous CAEN systems.

A wide choice of interface facilities provides full communication compatibility with the previous systems and the feasibility of controlling heterogeneous external devices.

Ordering options

Code	Description	
WSY1527L1529	SY1527LC - Low Cost Universal Multichannel Power Supply System	NEW

SY2527 Universal Multichannel Power Supply System



Overview

The SY2527 system is the small scale experiment version of the latest CAEN Universal Multichannel Power Supply System. This system outlines a completely new approach to power generation and distribution by allowing to house, in the same mainframe, a wide range of boards with different functions, such as High/Low Voltage boards, generic I/O boards (temperature, pressure monitors, etc.) and branch controllers, where the latter are used to control other remote generators and distributors. Modularity, flexibility and reliability are the key-points of its design, enabling it to meet the requirements of a wide range of experimental conditions, which range from those of LHC experiments, where the system's features find prior application, to those of other less challenging, but still demanding, High Energy Physics experiments. The SY2527 mainframe is housed in a 19"-wide, 4U-high euro-mechanics rack and hosts three main sections:

- the Boards Section, with 6 slots to house boards, distributors and branch controllers;
- the Power Supply Section;
- the CPU and Front Panel Section which includes all interface facilities.

Ordering options

Code	Description
WSY2527A2529	SY2527 - Universal Multichannel Power Supply System

Highlights

- > Houses up to 6 boards (HV/LV or "branch controllers")
- > Ad-hoc boards and peripheral systems
- > Communications via RS232, HS CAENET and TCP/IP
- > OPC Server for easy integration in DCS
- > Optical links for remote communications
- > Programmable handling of parameters and errors
- > Fast, accurate setting and monitoring of channel parameters
- > Sophisticated channel trip handling
- > Multilevel management of user profiles
- > Live insertion of boards
- > Advanced Trip handling
- > Hardware current protection
- > Secure access to the system via Intranet
- > Remote debugging and technical support
- > Easy firmware upgrading



SY3527 Universal Multichannel Power Supply System

Overview

The Model SY3527 is the portable version of the latest CAEN Universal Multichannel Power Supply System. This system outlines a completely new approach to power generation and distribution by allowing to house, in the same mainframe, both ordinary HV/LV boards and branch controllers, which are used to control other remote generators and distributors.

Modularity, flexibility and reliability are the keypoints of its design, enabling this module to meet the requirements of a wide range of experimental conditions. The system can be controlled either via a VT100 Terminal or a PC running a Terminal Emulator program through the RS232 interface. Its compact mechanics (19" X 3U rack) makes it particularly suitable for small laboratories.



Highlights

- > 19" X 3U rack
- > Houses two boards (single or double width)
- > Terminal control via RS232
- > Up to 300 W output power
- > Fast, accurate setting and monitoring of channel parameters
- > Sophisticated channel trip handling
- > Live insertion of boards
- > Easy firmware upgrading

Ordering options

Code	Description
WSY3527A3529	SY3527 - Universal Multichannel Power Supply System - 2 slots 300 W

A1513B - A1516B - A1517B - A1518B**6 Channel Floating Low Voltage Boards****Overview**

The Mod. A1513B, A1516B, A1517B and A1518B are single width (5 TE wide) boards housing 6 LV floating channels each. The boards provide 10 V / 2.7 A, 15 V / 1.5 A, 7 V / 4 A and 4.5 V / 6 A outputs respectively, with 10 mV monitor resolution.

The voltage drop over the cables can be recovered by using either the featured Remote Sensing Lines, to be connected on the load for sensing the drop, or an automatic Line Drop Recovery system.

All the boards are provided with both current and voltage protections. If overcurrent occurs, the relevant channel can be programmed either to turn off after a programmable trip time or to keep on providing the maximum allowed current: this particular feature allows the modules to work as current generator. The maximum output voltage can be fixed, through a potentiometer located on the front panel, at the same common value for all the board channels and this value can be read out via software. A global enable/disable connector allows to disable the channels when it is not terminated on 50 Ohm.

It is also possible, via front panel logic signals, to enable individually each channel.

The voltage ramp rates may be set independently for each channel. Moreover the floating channels allow on-detector grounding, thus allowing to reduce the noise level.

Output channels are delivered through 37 pin DB connectors.

**Highlights**

- 6 floating channels
- High resolution on voltage set
- Programmable TRIP parameter
- Programmable Ramp Up / Down
- Voltage ripple smaller than 5 mVpp
- Current generator operation in Overcurrent condition

A1510 - A1511B - A1512 - A1514B - A1519B**Floating High Voltage Boards****Overview**

The Mod. A1510, A1511B, A1512 and A1519B are single width boards which house 12 HV floating channels each. The output voltage can be programmed and monitored in the following ranges:

A1510: 100 V (10 mA current);

A1511B: 500 V (1 mA / 10 mA dual current range);

A1512: 500 V (100 µA / 1 mA dual current range);

A1519B: 0 ÷ 250 V (100 µA / 1 mA dual current range).

The Mod. A1514B is a single width board with seven heterogeneous HV / LV floating channels, organised as follows:

- Two 500 V channels (1 mA / 10 mA dual current range);

- Three 10 V channels (2.7 A current);

- Two 7 V channels (4 A current).

The LV channels are provided with Remote Sensing Lines to sense the voltage directly over the load. The LV channels also feature a Line Drop Recovery system, which can automatically compensate for the voltage drop over the connection cables.

All the boards are provided with both current and voltage protections. If overcurrent occurs, the relevant channel can be programmed either to turn off after a programmable trip time or to keep on providing the maximum allowed current: this particular feature allows the modules to work as current generator. The maximum output voltage can be fixed, through a potentiometer located on the front panel, at the same common value for all the board channels and this value can be read out via software. A global enable/disable connector allows to disable the channels when it is not terminated on 50 Ohm. The voltage ramp rates may be set independently for each channel. Moreover the floating channels allow on-detector grounding, thus allowing to reduce the noise level.

Output channels are delivered through 37 pin DB connectors.

**Highlights**

- Floating channels
- High resolution on output voltage setting
- Low voltage ripple
- Programmable TRIP parameter
- Programmable Ramp Up / Down
- Current generator operation in Overcurrent condition

A1520P 12 Channel Floating 500 V/15 mA Board

Overview

The Mod. A1520P houses 12 positive HV channels; each output channel has an independent floating ground. The output voltage can be programmed and monitored in the range $0 \div +500$ V in 1 mV steps (17 bit resolution). All output channels are provided with Remote Sensing Lines to compensate for the voltage drop over the cables.

The board is provided with both current and voltage protections. For each channel, it is also possible to set an output current limit in the $0 \div 15$ mA range, in 250 nA steps. The output current is monitored with 25 nA resolution. If overcurrent occurs, the relevant channel can be programmed either to turn off after a programmable trip time or to keep on providing the maximum allowed current: this particular feature allows the module to work as current generator.

A global enable/disable connector allows to disable the channels when it is not terminated on 50 Ohm.

The HV Ramp-Up and Ramp-Down rates may be selected independently for each channel in the $1 \div 50$ V/s range (1 V/s step). Moreover the floating channels allow on-detector grounding, thus allowing to reduce the noise level.

The board features the AMP 75 pin output connector



Highlights

- >>> **0 ÷ 500 V output voltage**
- >>> **15 mA current range**
- >>> **17 bit voltage setting/monitor resolution**
- >>> **±1 ppm/°C thermal stability**
- >>> **±20 mV voltage regulation stability**
- >>> **Ripple smaller than 20 mV pp**
- >>> **Current generator operation in Overcurrent condition**

A1533 - A1534 6 Channel Floating High Voltage Boards

Overview

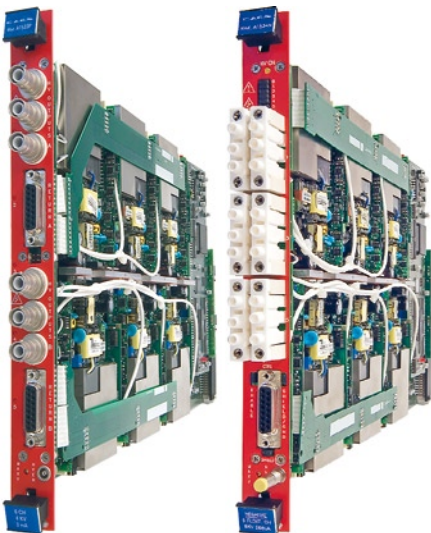
The Mod. A1533 and A1534 are single width (5 TE wide) boards housing 6 HV floating channels each. The channels feature independent returns, insulated up to 100 V between each other; polarity is non-reversible. The output voltage ranges are respectively $0 \div 4$ kV (3 mA maximum output current) and $0 \div 8$ kV (200 µA maximum output current), both with 0.5 V monitor resolution. The boards are available with either positive or negative polarity.

The boards are provided with both current and voltage protections. If overcurrent occurs, the relevant channel can be programmed either to turn off after a programmable trip time or to keep on providing the maximum allowed current: this particular feature allows the modules to work as current generator. The maximum output voltage can be fixed, through a potentiometer located on the front panel, at the same common value for all the board channels and this value can be read out via software. A global enable/disable connector allows to disable the channels when it is not terminated on 50 Ohm.

Channels can be individually enabled via front panel logic signals. It is also possible to configure the ground reference of the HV cables shield.

The HV RAMP-UP and RAMP-DOWN rates may be selected independently for each channel in the $1 \div 500$ V/s range (1 V/s step). Moreover the floating channels allow on-detector grounding, thus allowing to reduce the noise level.

The Mod. A1533 is provided with SHV type output connectors, while the Mod. A1534 features the CPE 3 pole connectors.



Highlights

- >>> **6 floating channels**
- >>> **0 ÷ 4 kV and 0 ÷ 8 kV output voltage respectively**
- >>> **3 mA and 200 µA current full scale, with 500 nA and 20 nA resolution respectively**
- >>> **500 mV Voltage Set/Monitor resolution**
- >>> **Small voltage ripple: <25 mVpp on A1533, <50 mVpp on A1534**
- >>> **Programmable TRIP parameter**
- >>> **Current generator operation in Overcurrent condition**

A1526 6 Channel 15 kV Common Floating Return Board

Overview

The Mod. A1526 is a double width board which houses 6 HV channels, available both with either positive or negative polarity. The channels share a common floating return, which allows on-detector grounding, thus reducing the noise level. The output voltage can be programmed and monitored in the $0 \div 15$ kV range with 1 V resolution. The current full scale can be fixed via internal jumpers either at 100 μ A or at 1 mA.

The board is provided with both current and voltage protections. If overcurrent occurs, the relevant channel can be programmed either to turn off after a programmable trip time or to keep on providing the maximum allowed current: this particular feature allows the module to work as current generator. The maximum output voltage can be fixed, through a potentiometer located on the front panel, at the same common value for all the board channels and this value can be read out via software. A global enable/disable connector allows to disable the channels when it is not terminated on 50 Ohm.

The HV Ramp-Up and Ramp-Down rates may be selected independently for each channel in the $1 \div 500$ V/s range (1 V/s step). Moreover the floating channels allow on-detector grounding, thus allowing to reduce the noise level.

The board features the CPE HV output connectors and the relevant coaxial cable connectors (Mod. A997) are also available.



Highlights

- > Channels with common floating return
- > Available with either positive or negative polarity
- > Dual current range
- > Programmable Ramp Up / Down
- > Programmable TRIP parameter
- > Current generator operation in Overcurrent condition

A1535 24 Channel 3.5 kV/3 mA Common Floating Return Board

NEW

Overview

The Mod. A1535 is a single width (5 TE wide) board housing 24 HV channels, available with either positive or negative polarity. The channels share a common floating return, which allows on-detector grounding reducing the noise level. The output voltage range is $0 \div 3.5$ kV, with 3 mA maximum output current and 0.5 V set and monitor resolution.

The board is provided with both current and voltage protections. If overcurrent occurs, the relevant channel can be programmed either to turn off after a programmable trip time or to keep on providing the maximum allowed current: this particular feature allows the module to work as current generator. The maximum output voltage can be fixed, through a potentiometer located on the front panel, at the same common value for all the board channels and this value can be read out via software. A global enable/disable connector allows to disable the channels when it is not terminated on 50 Ohm.

The HV RAMP-UP and RAMP-DOWN rates may be selected independently for each channel in the $1 \div 500$ V/s range (1 V/s step).

The Mod. A1535 board is provided with the Radiall 52 pin connector, whose mate cable connector (CAEN Mod. A996) and the relevant insertion/extraction tool (Mod. A995), are also available.



Highlights

- > Channels with common floating return
- > Available with either positive or negative polarity
- > $0 \div 3.5$ kV output voltage
- > 3 mA current full scale, with 500 nA resolution
- > 500 mV Voltage Set/Monitor resolution
- > Voltage ripple smaller than 30 mVpp
- > Programmable TRIP parameter
- > Current generator operation in Overcurrent condition
- > Radiall 52 pin connector

A1932A 48 Channel 3 kV/500 μ A Common Floating Return Distributor Board

Overview

The Mod. A1932A High Voltage Floating Distributor is a 48-Channel double-width board with a maximum output voltage of 3 kV (available both with positive and negative polarity).

The board houses a Primary High Voltage Channel, which supplies 48 Distributed Output Channels.

The internal Primary HV Channel has a set of parameters that can be programmed, such as high voltage, current limit and voltage ramps.

The voltage on each distributed channel can be independently programmed within a $100 \div 900$ V drop from the Primary Channel voltage setting, with a 0.5 mA current. The 48 output channels are organised into six 8-channel Groups.

The HV ramp rates may be selected independently for each channel in the range $1 \div 500$ V/s, in 1 V/s steps.

The output channels share a common floating return. Both the floating return and the crate ground are available on front panel connectors.

The board is provided with over current protection: if this condition occurs, the relevant channel is automatically turned off.

The Mod. A1932A board is provided with the Radiall 52 pin connector, whose mate cable connector (CAEN Mod. A996) and the relevant insertion/extraction tool (Mod. A995), are also available



Highlights

- > One primary and 48 distributed channels with common floating return
- > $0 \div 3$ kV output voltage
- > Available with either positive or negative polarity
- > Common floating return
- > 200 mV Voltage Set / Monitor resolution
- > Voltage ripple smaller than 30 mVpp
- > Programmable TRIP parameter
- > $1 \div 500$ Volt /sec programmable Ramp Up/Down

A17xx - A18xx 12 / 28 Channel High Voltage Boards

Overview

The Mod. A17xx – A18xx are single width boards housing 12 HV channels each, with either positive or negative polarity, on SHV output connectors; output voltages range from 250 V/1 mA to 6 kV/200 μ A.

Two 28 channel double width 3/4 kV boards are available (Mod. A1733B and A1833B); both models are available with either positive or negative polarity and feature Radial 52 pin connectors.

All the boards are provided with both current and voltage protections. If over current occurs, the relevant channel can be programmed either to turn off after a programmable trip time or to keep on providing the maximum allowed current: this particular feature allows the modules to work as current generator. The maximum output voltage can be fixed, through a potentiometer located on the front panel, at the same common value for all the board channels and this value can be read out via software. A global enable/disable connector allows to disable the channels when it is not terminated on 50 Ohm. The voltage ramp rates may be set independently for each channel.

The Mod. A996, 52 pin cable connector for the Mod. A1733B and A1833B, and the relevant insertion/extraction tool (Mod. A995), are available as well.



Highlights

- ...> **12 / 28 Channel HV boards**
- ...> **Available with positive or negative polarity**
- ...> **Output voltages from 250 V to 6 kV**
- ...> **Dual current range (A18xx)**
- ...> **14 bit Volt Voltage Set / Monitor resolution**
- ...> **12 bit current Set / Monitor resolution (A1821: 14 bit)**
- ...> **Low voltage ripple**
- ...> **Programmable TRIP parameter**
- ...> **Programmable Ramp Up/Down**
- ...> **Current generator operation in Overcurrent condition**

Ordering options A1513B - A1516B - A1517B - A1518B

Code	Description
WA1513XAAAA	A1513B - SY1527 L.V. channels 10 V 2.7 A floating (6 ch)
WA1516XAAAA	A1516B - SY1527 L.V. channels 15 V 1.5 A floating (6 ch)
WA1517XAAAA	A1517B - SY1527 L.V. channels 7 V 4 A floating (6 ch)
WA1518XAAAA	A1518B - SY1527 L.V. channels 4.5 V 6 A floating (6 ch)

Ordering options A1510 - A1511B - A1512 - A1514B - A1519B

Code	Description
WA1510XAAAA	A1510 - SY1527 H.V. channels 100 V 10 mA floating (12 ch)
WA1511XAAAA	A1511B - SY1527 H.V. channels 500 V 10/1 mA floating (12 ch)
WA1512XAAAA	A1512 - SY1527 H.V. channels 500 V 1/0.1 mA floating (12 ch)
WA1514XAAAA	A1514B - SY1527 H.V./L.V. channels 500 V 10 ma/1 mA (2 ch), 10 V 2.7 A (3 ch), 7 V 4 A (2 ch)
WA1519XAAAA	A1519B - SY1527 H.V. channels 250 V 1/0.1 mA floating (12 ch)

Ordering options A1520P

Code	Description
WA1520XAAAA	A1520P - SY1527 H.V. channels 500 V 15/1.5 mA floating (12 ch)

Ordering options A1526

Code	Description
WA1526XAAAA	A1526N - SY1527 H.V. channels -15 KV 1/0.1 mA - CPE Conn. (6 ch)
WA1526XAAAA	A1526P - SY1527 H.V. channels +15 KV 1/0.1 mA - CPE Conn. (6 ch)
WA997XAAAAA	A997 - H.V. coaxial cable connector for A1526

Ordering options A1533 - A1534 - A1535

Code	Description
WA1533XAAAA	A1533N - SY1527 H.V. channels -4 KV 3 mA floating (6 ch)
WA1533XAAAA	A1533P - SY1527 H.V. channels +4 KV 3 mA floating (6 ch)
WA1534XAAAA	A1534N - SY1527 H.V. channels -8 KV 200 µA floating (6 ch)
WA1534XAAAA	A1534P - SY1527 H.V. channels +8 KV 200 µA floating (6 ch)
WA1535XAAAA	A1535N - SY 1527 H.V. channels -3.5 KV 3 mA common floating (24 ch)
WA1535XAAAA	A1535P - SY 1527 H.V. channels +3.5 KV 3 mA common floating (24 ch)
WA995XAAAAA	A995 - Insertion/extraction tool Radiall 282549024 for A996
WA996XAAAAA	A996 - 52 pin cable connector for A173XB-A183XB-A1932A-A1535

**NEW
NEW**

Ordering options A1932A

Code	Description
WA1932AAAAA	A1932AN - SY1527 H.V. channels -3 kV/500 µA - Multipin Conn. (48 ch)
WA1932AAAAA	A1932AP - SY1527 H.V. channels +3 kV/500 µA - Multipin Conn. (48 ch)
WA995XAAAAA	A995 - Insertion/extraction tool Radiall 282549024 for A996
WA996XAAAAA	A996 - 52 pin cable connector for A173XB-A183XB-A1932A-A1535

Ordering options A17xx – A18xx

Code	Description
WA1732NAAAA	A1732N - SY1527 H.V. channels -6 KV 1 mA - SHV Conn. (12 ch)
WA1732PAAAA	A1732P - SY1527 H.V. channels +6 KV 1 mA - SHV Conn. (12 ch)
WA1733NAAAA	A1733N - SY1527 H.V. channels -3/4 KV 3/2 mA - SHV Conn. (12 ch)
WA1733PAAAA	A1733P - SY1527 H.V. channels +3/4 KV 3/2 mA - SHV Conn. (12 ch)
WA1733BAAAA	A1733BN - SY1527 H.V. channels -3/4 KV 3/2 mA - Multipin Conn. (28 ch)
WA1733BPAAAA	A1733BP - SY1527 H.V. channels +3/4 KV 3/2 mA - Multipin Conn. (28 ch)
WA1735NAAAA	A1735N - SY1527 H.V. channels -1.5 KV/7 mA - SHV Conn. (12 ch)
WA1735PAAAA	A1735P - SY1527 H.V. channels +1.5 KV/7 mA - SHV Conn. (12 ch)
WA1737NAAAA	A1737N - SY1527 H.V. channels -250 V/1 mA - SHV Conn. (12 ch)
WA1737PAAAA	A1737P - SY1527 H.V. channels +250 V/1 mA - SHV Conn. (12 ch)
WA1738PAAAA	A1738P - SY1527 H.V. channels +1.3 KV/10 mA - SHV Conn. (12 ch)
WA1738NAAAA	A1738N - SY1527 H.V. channels -1.3 KV/10 mA - SHV Conn. (12 ch)
WA1821NAAAA	A1821N - SY1527 H.V. channels -3 KV 200/20 µA (20/2nA res.) - SHV Conn. (12 ch)
WA1821PAAAA	A1821P - SY1527 H.V. channels +3 KV 200/20 µA (20/2nA res.) - SHV Conn. (12 ch)
WA1821HAAAA	A1821HP - SY1527 H.V. channels +3 KV 200/10 µA (20/1nA res.) - SHV Conn. (12 ch)
WA1832NAAAA	A1832N - SY1527 H.V. channels -6 KV 1 mA/200 µA - SHV Conn. (12 ch)
WA1832PAAAA	A1832P - SY1527 H.V. channels +6 KV 1 mA/200 µA - SHV Conn. (12 ch)
WA1832NEAAAA	A1832NE - SY1527 H.V. channels -6 KV 1mA/200 µA individual enable - SHV Conn. (12 ch)
WA1832PEAAAA	A1832PE - SY1527 H.V. channels +6 KV 1mA/200 µA individual enable - SHV Conn. (12 ch)
WA1833NAAAA	A1833N - SY1527 H.V. channels -3/4 KV 3/2 mA/200 µA - SHV Conn. (12 ch)
WA1833PAAAA	A1833P - SY1527 H.V. channels +3/4 KV 3/2 mA/200 µA - SHV Conn. (12 ch)
WA1833BAAAA	A1833BN - SY1527 H.V. channels -3/4 KV 3/2 mA/200 µA - Multipin Conn. (28 ch)
WA1833BPAAAA	A1833BP - SY1527 H.V. channels +3/4 KV 3/2 mA/200 µA - Multipin Conn. (28 ch)
WA1835NAAAA	A1835N - SY1527 H.V. channels -1.5 KV 7 mA/200 µA - SHV Conn. (12 ch)
WA1835PAAAA	A1835P - SY1527 H.V. channels +1.5 KV 7 mA/200 µA - SHV Conn. (12 ch)
WA1837NAAAA	A1837N - SY1527 H.V. channels -250 V 1 mA/100 µA - SHV Conn. (12 ch)
WA1837PAAAA	A1837P - SY1527 H.V. channels +250 V 1 mA/100 µA - SHV Conn. (12 ch)
WA995XAAAAA	A995 - Insertion/extraction tool Radiall 282549024 for A996
WA996XAAAAA	A996 - 52 pin cable connector for A173XB-A183XB-A1932A-A1535

EASY3000**Embedded Assembly SYstem****NEW****Overview**

EASY3000 (Embedded Assembly SYstem) is the CAEN power supply solution for operation in magnetic field and radioactive environment.

CAEN has been involved for more than a decade in developing different solutions for the main LHC experiments, where the electronic equipment of the experiment is dealing with high dose radiation and intense magnetic field.

In order to provide safe and reliable operations in such hostile areas, CAEN started tests with rad-tolerant components and magnetic field resistant solutions, patenting the technology that is now used in this line of products.

Moreover, though designed for harsh environment, the EASY3000 modules can work also in normal condition with excellent performance.

In this architecture, the power supply can be located directly in the hostile area, where the EASY3000 modules provide a wide variety of output voltages to satisfy the requirements of most detectors and front-end electronics.

The control of the EASY3000 power supply system is done remotely using a Branch Controller (model A1676A) plugged in a SY1527 or SY2527 mainframe located in the control room.

Each A1676A branch controller can handle up to 6 EASY3000 crates: in this way, one SY1527 power system, housing up to 16 A1676A boards, can handle up to 96 EASY3000 systems.

The branch controller is the interface between the mainframe (SY1527 or SY2527) and the remote boards in the EASY3000 crate: its role is to configure the EASY3000 channels as if they belong to the supply unit slot in which the branch controller is located. All the channels of the EASY3000 boards will be considered as channels of the branch control board, thus hugely increasing the number of channels the system can handle.

Through the mainframe, the provided and fully reliable OPC server

Highlights

- > Full integration in SY1527/SY2527 Systems
- > Up to 10 boards per crate
- > Up to 3 kW output power
- > Magnetic field tolerance up to 2 kGauss
- > Radiation tolerance



permits an immediate and "automatic" interfacing with the custom control software; moreover, a C-library for Windows and Linux is available as well.

The EASY3000 crate can house up to 10 boards, depending on the boards' width. The EASY3000 crate must be used with an air and/or water intercooler and its standard width fit the rack mounting. An optional fan tray (A3000F - EASY3000 Fan Unit) can be used for the stand-alone operation of the EASY3000 crate when no magnetic field is present.

EASY3000 is powered by external 48 V DC. The EASY architecture foresees two independent 48 V power supplies: the first (48 V Power) to power the channels regulators, the other (48 V Service) to power the control logic.

Three versions of the crate are available: EASY3000, with power supply and link connection on the rear panel, EASY3000S, with power supply and link connection on the front panel and EASY3000B, with power supply (bolt connectors) and link connection on the rear panel.

The use of CAEN 48 V power sources (Mod. A3484, A3485 and A3486), allows to integrate into the channels control also the management of the 48 V power supplies; A3486 is also suitable to hostile areas.

Ordering options

Code	Description
WEASY3000MB0	EASY3000 - Crate for EASY3000 Power Supply System for Hostile Area - APP Conn.
WEASY3000MBB	EASY3000B - Crate for EASY3000 Power Supply System for Hostile Area - Bolt Conn. NEW
WEASY3000MBS	EASY3000S - Crate for EASY3000 Power Supply System in Hostile Area - Frontal Access NEW
WA3000FXAAAA	A3000F - EASY3000 Crate Controlled Fan Unit
WA3000FXBAAA	A3000FB - EASY3000 Crate Fan Unit (no Remote Control)
WA3000NFXAAA	A3000NF - 3 Phase Notch Filter for a A3486 (no H.E.)
WA3484XAAAA	A3484 - AC/DC Converter for EASY3000 and EASY4000 400 V 3-phase 48 V 2500 W
WA3484SXAAAA	A3484S - AC/DC Converter for EASY3000 and EASY4000 400 V 3-phase 48 V 2500 W with Remote Control NEW
WA3485XAAAA	A3485 - AC/DC Converter for EASY3000 and EASY4000 400 V 3-phase 48 V 5000 W
WA3485SXAAAA	A3485S - AC/DC Converter for EASY3000 and EASY4000 400 V 3-phase 48 V 5000 W with Remote Control NEW
WK3000XAAAA	K3000 - Anderson Power and AMP connectors for 5 EASY3000

A1676A EASY3000 Branch Controller

Overview

The Mod. A1676A EASY Branch Controller is implemented in a single width SY1527/SY2527 board. Once plugged in, the Branch Controller must be linked to the EASY3000 crates (placed in the “hostile area”), via two front panel connectors (Control and Power Supply). The A1676A is the interface between the mainframe and the remote boards in the EASY3000 crate. It configures the EASY3000 channels as if they belong to the slot in which the branch controller is located: the channels of the EASY3000 boards operate as channels of the A1676A. Up to six EASY3000 crates can be controlled by one A1676A. An User friendly software tool, which can be downloaded for free from our website, allows the User to configure the A1676A to operate with any EASY crate layout.



Highlights

- > Single slot SY1527/SY2527 board
- > Up to 6 EASY3000 crates controlled
- > CANBus based protocol

Ordering options

Code	Description
WA1676AXAAAA	A1676A - EASY Branch Controller (up to 6 EASY crates controlled)

A35XX EASY3000 HV Power Supply Boards

Overview

The EASY3000 HV Power Supply Boards are developed for operation in magnetic field and radioactive environment. The HV line include the following boards:

A3501: 12 channel, ± 100 V / 1 mA, 2 slot wide;
 A3512: 6 channel, ± 12 kV / 1 mA, 3 slot wide;
 A3535: 32 channel, ± 3.2 kV / 0.5 mA, 4 slot wide;
 A3540: 12 channel, ± 4 kV / 1 mA, 2 slot wide.

All boards are available either in positive or negative polarity. Channels are floating up to 5 V between each other (In A3535 the floating channels have common return) and with respect to ground. The features provided by the power supply channels include overvoltage, overcurrent and overtemperature protections.



Highlights

- > Magnetic field and radiation tolerant
- > Polarized Floating Channels
- > Supplied voltages from 100V / 1mA to 12kV / 1mA
- > Vmax and Imax settable by trimmer
- > Channel protections: Overvoltage, Overcurrent, Overtemperature
- > On/off per Channel
- > Interlock capability
- > Local and remote 48V Service on/off
- > SHV, Lemo or CPE HV connectors

Ordering options

Code	Description
WE3501XAAAAA	A3501N - EASY3000 H.V. channels -100 V 1 mA (12 ch)
WE3501XPAAAA	A3501P - EASY3000 H.V. channels +100 V 1 mA (12 ch)
WE3512XAAAAA	A3512N - EASY3000 H.V. channels -12 KV 1 mA (6 ch)
WE3512XPAAAA	A3512P - EASY3000 H.V. channels +12 KV 1 mA (6 ch)
WE3535XAAAAA	A3535N - EASY3000 H.V. channels -3.2 KV 0.5 mA common floating (32 ch)
WE3535XPAAAA	A3535P - EASY3000 H.V. channels +3.2 KV 0.5 mA common floating (32 ch)
WE3540XAAAAA	A3540N - EASY3000 H.V. channels -4 KV 1 mA (12 ch)
WE3540XPAAAA	A3540P - EASY3000 H.V. channels +4 KV 1 mA (12 ch)

A30XX - A3100 EASY3000 LV Power Supply Boards

Overview

The EASY3000 LV Power Supply Boards are developed for operation in magnetic field and radioactive environment. The LV line include the following boards:

- A3006: 4 positive and 2 negative channels, 4÷16 V / 6 A / 90 W (per ch.)
- A3009: 12 channel, 2÷8 V / 9 A / 45 W (per ch.)
- A3009B: 12 channel, 2÷8 V / 9 A / 45 W (per ch.)
- A3016: 6 channel, 2÷8 V / 16 A / 90 W (per ch.)
- A3016B: 6 channel, 2÷8 V / 16 A / 90 W (per ch.)
- A3025: 4 channel, 2÷8 V / 25 A / 150 W (per ch.)
- A3025B: 4 channel, 2÷8 V / 25 A / 150 W (per ch.)
- A3050: 2 channel, 2÷8 V / 50 A / 300 W (per ch.)
- A3050B: 2 channel, 2÷8 V / 50 A / 300 W (per ch.)
- A3100: 1 channel, 2÷8 V / 100 A / 600 W (per ch.)
- A3100B: 1 channel, 2÷8 V / 100 A / 600 W (per ch.)

Polarity is reversible, voltage values are referred to the output connectors. Mod. A3006 polarity is not reversible. All boards are available provided with either APP output connectors or screw-lock output connectors ("B" version: see Ordering options). Each board require a four-slot space in the EASY3000 crate. The features provided by the power supply channels include overvoltage, overcurrent and over temperature protections plus Remote Sensing Lines to compensate for the voltage drop over the connection cables. Both the connector and the on-the-load voltage are monitored.



Highlights

- ...> **Magnetic field and radiation tolerant**
- ...> **Floating Channels with reversible polarity**
- ...> **Output power from 45 to 600 W per channel**
- ...> **VMax and IMax set by trimmer per channel**
- ...> **On/off per Channel**
- ...> **Channels individually controlled and protected**
- ...> **Remote Sensing Lines**
- ...> **Interlock capability**
- ...> **Local and remote 48V Service on/off**
- ...> **16 bit Output Register (A3025, A3050 and A3100)**

Ordering options

Code	Description
WE3006XAAAAA	A3006 - EASY3000 L.V. channels 16 V/6 A/90 W floating - APP Conn. (2 Ch neg. and 4 Ch pos.)
WE3009XAAAAA	A3009 - EASY3000 L.V. channels 8 V/9 A/45 W floating - APP Conn. (12 ch)
WE3009BXAAAA	A3009B - EASY3000 L.V. channels 8 V/9 A/45 W floating - Screw Conn. (12 ch)
WE3016XAAAAA	A3016 - EASY3000 L.V. channels 8 V/16 A/90 W floating - APP Conn. (6 ch)
WE3016BXAAAA	A3016B - EASY3000 L.V. channels 8 V/16 A/90 W floating - Screw Conn. (6 ch)
WE3025XAAAAA	A3025 - EASY3000 L.V. channels 8 V/25 A/150 W floating - APP Conn. (4 ch)
WE3025BXAAAA	A3025B - EASY3000 L.V. channels 8 V/25 A/150 W floating - Bolt Conn. (4 ch)
WE3050XAAAAA	A3050 - EASY3000 L.V. channels 8 V/50 A/300 W floating - APP Conn. (2 ch)
WE3050BXAAAA	A3050B - EASY3000 L.V. channels 8 V/50 A/300 W floating - Bolt Conn. (2 ch)
WE3100XAAAAA	A3100 - EASY3000 L.V. channels 8 V/100 A/600 W floating - APP Conn. (1 ch)
WE3100BXAAAA	A3100B - EASY3000 L.V. channels 8 V/100 A/600 W floating - Bolt Conn. (1 ch)
WK3009XAAAAA	K3009 - Anderson Power and AMP connectors for 5 A3009
WK3016XAAAAA	K3016 - Anderson Power and AMP connectors for 5 A3016
WK3025XAAAAA	K3025 - Anderson Power and AMP connectors for 5 A3025
WK3050XAAAAA	K3050 - Anderson Power and AMP connectors for 5 A3050
WK3100XAAAAA	K3100 - Anderson Power and AMP connectors for 5 A3100

A3602 3 Channel 7 V / 5 A Power Supply Board**NEW****Overview**

The Mod. A3602 3 Channel 7 V / 5 A Power Supply Board is a double width EASY module developed for operation in magnetic field and moderate radioactive environment.

The board houses 3 floating (up to 100 V with respect to ground, reversible polarity) 7 V / 5 A / 35 W maximum output power channel.

The connector output voltage range is $2 \div 7$ V with 5 mV monitor resolution.

Channels are provided with Remote Sensing Lines to compensate for the voltage drop over the connection cables. 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 5 mV resolution and the output voltage can not be programmed beyond this value.

The output current is monitored with 10 mA resolution; if a channel tries to draw a current larger than its programmed limit it is signalled to be in overcurrent condition; the SY 1527 system detects this state as a fault and reacts according to the setting of the TRIP parameter, which can be programmed in 0.1 s steps from 0 to 1000 s. Actually TRIP = 1000 s means infinite: in case of TRIP infinite 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. In case of TRIP < 1000 s, the output current is permitted to keep the limit only for programmed time interval and then is switched off.

The maximum output voltage and the maximum output current can be fixed for each channel through trimmers located on the front panel; if the connector output voltage exceeds the fixed maximum value, the channel is switched off and an alarm message is shown; if the output current exceeds the fixed maximum value, the channel is switched off and TRIP alarm is shown.

**Highlights**

- EASY3000 Power Supply Module
- Magnetic field and radiation tolerant
- 3 floating (up to 100 V with respect to ground) $2 \div 7$ V / 5 A channels
- 35 W maximum output power per channel
- VMax and IMax set by trimmer for each channel
- On/Off for each channel
- Channels individually controlled and protected
- Sensing Lines for voltage drop compensation
- Interlock capability (per channel)
- 48 V Service local and remote on/off

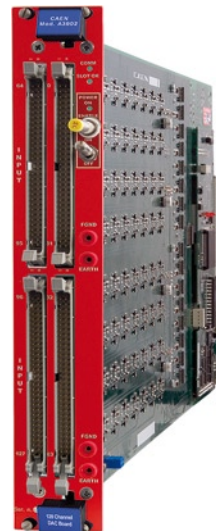
Ordering options

Code	Description	
WE3602XAAAAA	A3602 - EASY3000 L.V. channels 7 V/5 A/35 W floating up to 100V - Multipin Conn. (3 ch)	NEW

A3801 / A3801A EASY3000 128 Channel ADC Board / 128 Channel Temperature Sensor Board**Overview**

The Mod. A3801 is a 128 Channel ADC Board implemented in a double width EASY module. The module is developed for operation in magnetic field and radioactive environment and houses 128 input ADC channels on standard flat cable connectors. Once the threshold, which is common to all channels, is set, the module, when receives one over-threshold input, samples 250 values per channel, with a 1 kHz max sampling rate. Input range is $0 \div 10$ V (differential) and the ADC resolution is 0.2 mV.

The Mod. A3801A is a 128 Channel ADC Board suitable to digitize the temperature values sensed by the Analog Devices AD592 sensor. The A3801A provides also the power supplies for the AD592 sensors. The input range is $-45 \div +125$ °C, with a 0.1 °C LSB.

**Highlights**

- Magnetic field and radiation tolerant
- 128 input channels (differential)
- Flat cable input connectors
- A3801:
 - 10 V input dynamics
 - 0.2 mV resolution
 - 1 kHz max sampling rate
- A3801A:
 - $-45 \div +125$ °C range
 - 0.1 °C LSB
 - 2s conversion rate

Ordering options

Code	Description	
WE3801XAAAAA	A3801 - EASY3000 128 Channel ADC Board	
WE3801AXAAAA	A3801A - EASY3000 128 Channel Temp. ADC Board	

A3486 3-phase 220/400 Vac – 48 Vdc (2 ch x 2 kW/1 ch x 4 kW) Converter

NEW



Overview

The Mod. A3486 is a two channel 220/400 Vac – 48 Vdc converter, which allows to integrate into the EASY channels control also the management of the 48 V power supplies. Each channel provides a 2 kW output and can be tracked in order to obtain one 4 kW output. This module is designed to work as main converter in LHC hostile areas, thus completing the EASY system. Features include local or remote control, overload protection and local or remote inhibit function. The module front panel houses LEDs and channels monitor signals. The channel outputs can be provided either through Anderson Power single pin connectors (Mod. A3486) or through bolts (Mod. A3486B). Mod. A3486S, with power supply and link connection on the front panel, is also available.

Highlights

- >>> 3U 19" Euro Rack, 50 cm deep
- >>> Dual 2 kW or Single 4 kW 48V output
- >>> 48V ± 10% output dynamics (remotely programmable)
- >>> 40 A maximum programmable output current
- >>> Overcurrent protection (programmable trip time)
- >>> Overcurrent, Undervoltage and Overvoltage status remotely available
- >>> Voltage ripple smaller than 100 mV peak-to-peak
- >>> Local or remote inhibit function
- >>> Vertical "bottom-to-top" forced air cooling
- >>> Magnetic field and radiation tolerant



Ordering options

Code	Description	
WA3486XAAAAA	A3486 - 3-phase 220/400 Vac - 48 Vdc (2 ch x 2 kW/1 ch x 4 kW) Converter - APP Conn.	NEW
WA3486BXAAAA	A3486B - 3-phase 220/400 Vac - 48 Vdc (2 ch x 2 kW/1 ch x 4 kW) Converter - Bolt Conn.	NEW
WA3486SXAAAA	A3486S - 3-phase 220/400 Vac - 48 Vdc (2 ch x 2 kW/1 ch x 4 kW) Converter - Frontal Access	NEW
WK3486XAAAAA	K3486 - Anderson Power and AMP connectors for 5 A3486	

A3802 EASY3000 128 Channel DAC Board

NEW

Overview

The Mod. A3802 128 Channel DAC Board is developed for operation in magnetic field and radioactive environment. One A3802 houses 128 -4 V / 4 mA channels, suitable for applications such as discriminator thresholds generation. Voltage set/Voltage monitor resolution is 1 mV; the module features flat cable connectors.



Highlights

- >>> EASY Subsystem DAC Board
- >>> Magnetic field and radiation tolerant
- >>> 128 -4 V / 4 mA channels
- >>> 1 mV Voltage Set/Monitor resolution

Ordering options

Code	Description	
WE3802XAAAAA	A3802 - EASY3000 128 Channels DAC -4 V 4 mA 12 bit	NEW

A864 +2.1 kV/100 μ A High Efficiency DC-DC Converter**Overview**

The Mod. A864 provides an output voltage programmable in the 0 to 2.1 kV range, when supplied with a 12 V input voltage. The board is provided with an overcurrent protection: if a current larger than the programmed value is drawn, the module is not damaged. The channel has a 2.3 kV hardware upper limit. The module is engineered on a polyamide PCB, coated and housed in an alloy box. Overall dimension are 100 x 25 x 13 mm³.

**Highlights**

- High efficiency
- +12 V DC input
- Stand alone architecture
- Compact size (100 x 25 x 13 mm³)

Ordering options

Code	Description
WA864XAAAAAA	A864 - 2.1 KV 100 μ A high efficiency DC-DC Converter

S9090 2 kV/30 μ A High Efficiency DC-DC Converter**NEW****Overview**

The Mod. S9090 is a high-rel HV DC-DC converter specifically designed to supply the photomultiplier tubes of the ICECUBE neutrino telescope.

The Mod. S9090 operates with a +5 V DC input and delivers a remotely programmable output voltage ranging from 0 to 2 kV; the DC-DC converter is provided with an output voltage monitor and a HV enable/disable feature.

The Mod. S9090 offers compact size, very low power consumption (75 mW at no load), wide operating temperature range (-70 to +70 °C), very low ripple and high temperature stability.

The Mod. S9090 reliability, estimated according to MIL-HDBK-217F Notice 2, Part Stress Method, over 20 years mission length and -18 °C operating temperature, is better than 95%.

The Mod. S9090 is packaged in a PCB mountable, shielded metal enclosure with a coaxial HV output cable.

**Highlights**

- Ultra low power consumption (75 mW at no load)
- +5 V DC input
- 0-2 kV remotely programmable output voltage
- Low ripple and high output voltage stability
- High reliability (MTTF=0.77x10⁶ hours @ 20°C)
- Compact size (69.8 x 27.9 x 14 mm³)
- Wide operating temperature range
- Output voltage analog monitor
- HV enable signal
- 47 gr. weight

Ordering options

Code	Description
WS9090XAAAAA	S9090 - 2 KV 30 μ A high efficiency DC-DC Converter

NEW

Function	Model	Description	Page	
ADC (Peak Sensing) • MCA	N957	8 K Multi-Channel Analyzer	32	NEW
ADC (Sampling) • MCA	N1728A	4 Ch 14 bit 100 MS/s Digitizer with Pulse Shape Analysis (Differential Inputs)	32	NEW
ADC (Sampling) • MCA	N1728B	4 Ch 14 bit 100 MS/s Digitizer with Pulse Shape Analysis (Single Ended Inputs)	32	NEW
Amplifier (Fast)	N978	4 Channel Variable Gain Fast Amplifier	33	
Amplifier (Fast)	N979	16 Channel Fast Amplifier	33	
Amplifier (Spectroscopy)	N568B	16 Channel Programmable Spectroscopy Amplifier (Low Noise)	34	
Amplifier (Spectroscopy)	N568LC	16 Channel Programmable Spectroscopy Amplifier	34	
Amplifier (Spectroscopy)	N968	Spectroscopy Amplifier	34	
Amplifier (Spectroscopy)	N1568B	16 Channel Programmable Spectroscopy Amplifier & Pulse Shape Discriminator	35	NEW
Attenuator	N858	Dual Attenuator	35	NEW
Coincidence/Logic/Trigger Unit	N113	Dual OR 12 In-2 Out	36	
Coincidence/Logic/Trigger Unit	N405	Triple 4-Fold Logic Unit/Majority with VETO	36	
Coincidence/Logic/Trigger Unit	N455	Quad Coincidence Logic Unit	37	
Discriminator	N840	8 Channel Leading Edge Discriminator	37	
Discriminator	N841	16 Channel Leading Edge Discriminator	37	
Discriminator	N842	8 Channel Constant Fraction Discriminator	38	
Discriminator	N843	16 Channel Constant Fraction Discriminator	38	
Discriminator	N844	8 Channel Low Threshold Discriminator	38	
Discriminator	N845	16 Channel Low Threshold Discriminator	38	
Fan In-Fan Out Unit	N454	4-8 Logic Fan In-Fan Out	39	
Fan In-Fan Out Unit	N625	Quad Linear Fan In-Fan Out	39	
Scaler	N1145	Quad Scaler and Preset Counter/Timer	40	
Timing Unit	N93B	Dual Timer	40	
Timing Unit	N108A	Dual Delay	41	
Translator	N89	NIM-TTL-NIM Adapter	41	
Translator	N638	16 Channel NIM-ECL/ECL-NIM Translator and Fan Out	42	

N957 8 K Multi-Channel Analyzer**NEW****Overview**

The Mod. N957 is an 8 K Multi-Channel Analyzer (MCA) with USB2.0 port, housed in a 1-unit wide std. NIM module. The input pulses can be those produced by a standard spectroscopy amplifier. They can be Gaussian, semi-Gaussian or square waves, both unipolar and bipolar, in a range from 0 to +10 V, with a rise time greater than 0.2 μ s. The trigger can be made "on signal" or "external". In the first case a discriminator, with a settable threshold, opens the gate, which is automatically closed after the detection of the peak. In the second case, an external gate is fed to the module. The input channel has one peak amplitude stretcher, the output of which is digitized by a 14 bit successive-approximation fast ADC featuring a sliding scale technique to improve the differential non-linearity. Programmable zero and overflow suppression, trigger counter and test features complete the flexibility of the module.

The unit hosts an USB2.0 port (also compatible with previous USB versions), which permits a simple control and data-acquisition via PC.

Libraries for Windows and Linux will be provided as well.

Fully Supported by Winner Software.

**Highlights**

- >>> 1 input Multichannel Analyzer
- >>> Fully computer controlled MCA
- >>> 8K ADC, fast conversion time with linearization enhancement circuit
- >>> PHA acquisition mode
- >>> Suitable for HPGe, Nai(Tl), CdTe and other detector technologies
- >>> USB 2.0 communication interface
- >>> Fully supported by Winner Software

Ordering options

Code	Description	
WN957XAAAAA	N957 - 8 K Multi-Channel Analyzer	NEW

N1728A – N1728B 4 Ch. 14 bit 100 MS/s Digitizer with Pulse Shape Analysis**NEW****Overview**

The N1728 is a new NIM 4 channel digital pulse processor and waveform digitizer. The N1728 can work in "oscilloscope" mode, continuously storing waveforms (10 ms wide buffer with pre-trigger capability) and "Energy" mode, providing real time trapezoidal shaping, with a wide range of programmable filter parameters, and energy determination. A dedicated digital trigger algorithm allows very low energy threshold operation ensuring immunity to noise effects. A digital Constant Fraction Discriminator (CFD) has been implemented for applications requiring accurate timing.

The module is available in two versions: N1728A with differential input signals, N1728B with single ended input signals.

Fully Supported by Winner Software.

**Highlights**

- >>> 4 channels
- >>> 14 bit 100 MS/s ADC
- >>> Differential (N1728A) or Single Ended (N1728B) input signals
- >>> "Oscilloscope" mode/transient recorder with 10 ms wide waveforms buffer
- >>> "Energy" mode with real time trapezoidal shaping for energy determination and time stamp
- >>> Digital trigger and Constant Fraction Discriminator
- >>> Base Line Restoration and pile-up rejection
- >>> Two 512 ksamples circular memory buffers
- >>> Two analog TEST output signals via 12 bit / 100 MHz DAC (Monitor Output A1+A2)
- >>> External or internal clock
- >>> Firmware upgradeable via USB2.0
- >>> Software for full module control and data readout via USB2.0
- >>> Fully supported by Winner Software

Ordering options

Code	Description	
WN1728XAAAAA	N1728A - 4 Ch. 14 bit 100 MS/s Digitizer with Pulse Shape Analysis (Differential inputs)	NEW
WN1728XBAAAA	N1728B - 4 Ch. 14 bit 100 MS/s Digitizer with Pulse Shape Analysis (Single Ended inputs)	NEW

N978 4 Channel Variable Gain Fast Amplifier

Overview

The Mod. N978 is a 4 channel fast rise time amplifier housed in a one unit wide NIM module; each channel features a voltage gain variable in the range $0 \div 10$. Channels are non-inverting and bipolar: they amplify both positive and negative signals. Input bandwidth is 250 MHz for signals up to 50 mVpp and decreases for larger ones (up to 100 MHz @ 400 mVpp). Gain setting can be performed independently for each channel via four rotary handles. Channels can be cascaded in order to obtain larger gain values. Each channel is provided with three LEMO 00 connectors, one for the input and two bridged for the output. The board features a ± 2 V output dynamics. 4 screw-trimmers (one per channel) allow the offset calibration which operates over a ± 30 mV range.



Highlights

- ...> **x10 adjustable gain (x1 steps)**
- ...> **Input bandwidth up to 250 MHz**
- ...> **50 Ohm input impedance**
- ...> **± 2 V output dynamics**
- ...> **50 Ohm loads driven**
- ...> **Cascadeable channels**
- ...> **Rise/fall time smaller than 3.5 ns**
- ...> **I/O delay smaller than 3 ns**

Ordering options

Code	Description
WN978XAAAAA	N978 - 4 Channel Variable Gain Fast Amplifier

N979 16 Channel Fast Amplifier

Overview

The Mod. N979 is a 16 channel fast rise time amplifier housed in a one unit wide NIM module; each channel features a fixed voltage gain of 10. Channels are bipolar, non-inverting. Channels can be cascaded in order to obtain larger gain values. Input bandwidth is 250 MHz for signals up to 50 mVpp and decreases for larger ones (up to 130 MHz @ 400 mVpp). Each channel is provided with three LEMO 00 connectors, one for the input and two bridged for the output. The board features a ± 2 V output dynamics. 16 screw-trimmers (one per channel) allow the offset calibration which operates over a ± 30 mV range. The features include an output short circuit protection.



Highlights

- ...> **x10 fixed gain**
- ...> **Input bandwidth up to 250 MHz**
- ...> **50 Ohm input impedance**
- ...> **± 2 V output dynamics**
- ...> **50 Ohm loads driven**
- ...> **Cascadeable channels**
- ...> **Rise/fall time smaller than 1.5 ns**
- ...> **I/O delay smaller than 3 ns**

Ordering options

Code	Description
WN979XAAAAA	N979 - 16 Channel Fixed Gain Fast Amplifier

N568B - N568LC 16 Channel Programmable Spectroscopy Amplifier**Overview**

The Mod. N568LC is a 16 channel spectroscopy amplifier implemented in a single-width NIM module. The Mod. N568B provides the same features of the N568LC with a particularly low equivalent input noise (less than 15 μV RMS, with Gain=100 and 3 μs shaping time).

For each channel the amplification gain, the output polarity, the shaping time and the pole-zero cancellation, are remotely programmable, via HS CAENET line, by the following controllers: V288 VME (see *VME / HS CAENET Controller* section), A1303 PCI Bus or A250 Manual (see *Accessories* section).

The shaping time can be selected from 0.2 μs to 6 μs . The gain ranges from 0.15 to 480. The working parameter values are automatically stored in a non-volatile memory.

A semi-Gaussian output is provided either with the programmed gain (OUT) or with a further 10x amplification (XOUT), either direct or inverted. A COMMON OFFSET can be programmed via HS CAENET and allows to shift the baseline of the output. A FOUT output provides a fast amplification for timing purposes (fixed gain factor of 20). A MUX OUT allows to monitor both the OUT and the FOUT outputs of a single channel selected via HS CAENET.

(Designed in collaboration with INFN Milano).

**Highlights**

- 16 channels in a one unit wide NIM module
- Positive or negative inputs accepted on each channel
- Wide gain range (0.15 to 480) per channel
- Programmable shaping time per channel
- Programmable pole-zero cancellation per channel
- 16 normal or inverted outputs
- Further 10x amplification outputs also available
- 16 fast amplifier outputs for timing purposes
- Energy and timing multiplexed outputs
- Completely programmable via High Speed CAENET

Ordering options

Code	Description
WN568BXAAAAA	N568B - 16 Channel Progr. Spectroscopy Amplifier (0.2, 1, 3, 6 μs - 50 Ohm)
WN568LCXAAAA	N568LC - 16 Channel Low Cost Progr. Spectroscopy Amplifier (0.2, 1, 3, 6 μs - 50 Ohm)

N968 Spectroscopy Amplifier**Overview**

The Mod. N968 is a spectroscopy amplifier implemented in a one unit wide NIM module. It accepts the typical outputs generated from either optical feedback or resistor feedback preamplifiers connected with nuclear particle detectors. The output is quasi gaussian with 0 to +10 V output dynamics. A front panel switch allows to select between positive and negative input signals. Gain setting can be performed continuously in the 10 ÷ 1500 range, product of Coarse, Fine and Superfine Gain. Two internal jumpers allow to set a x0.1 attenuation and a further x2 amplification, thus extending the gain range to 1 ÷ 3000. The shaping time values are 0.5, 1, 2, 3, 6, 10 μs . The Pole Zero cancellation is performed via a front panel screw-trimmer. The module features also a Bipolar output (to be used for timing purposes), an advanced Gated Baseline Restorer circuit (with manual or automatic threshold setting) and a Pile Up Rejector which allows to reject piled up events.

**Highlights**

- Gain Range continuously variable from 1 to 3000
- Integral non-linearity $\leq \pm 0.025\%$ for 2 μs shaping time
- Unipolar output noise $< 4.0 \mu\text{V}$ rms for gain=100 and $< 3.5 \mu\text{V}$ rms for gain=1000 (@ 3 μs shaping time)
- Bipolar zero cross-over walk $\leq \pm 3\text{ns}$ (@ 50:1 dynamic range, 2 μs shaping time)
- LED indicator for high precision pole-zero cancellation without using oscilloscope
- Active filter networks with wide range of shaping times
- Gated baseline restorer with automatic controls of threshold and restoring rate
- Pile-up rejector and live-time corrector

Ordering options

Code	Description
WN968XAAAAAA	N968 - Spectroscopy Amplifier

N1568B 16 Channel Programmable Spectroscopy Amplifier & Pulse Shape Discriminator**NEW****Overview**

The Mod. N1568B is a 16 channel Pulse Shape Amplifier and Dual 16 Channel Constant Fraction Discriminator (30% and 80% constant fraction) implemented in a single-width NIM module. Each channel is composed by two sections: Energy section (A) and Timing section (B). The input signal is sent to both sections simultaneously. Section A processes the input signal with a differential circuit, followed by the gain stages (coarse: 2 bit; fine: 8 bit), by the shaping circuit and finally by a stretcher with programmable threshold (10 mV minimum).

Section B processes the signal with a low noise differential stage (500 ns) followed by a 2 bit programmable linear gain stage; the signal is then fed to two low walk and high resolution Constant Fraction Discriminator sections (30% and 80% constant fraction respectively). The discriminators share a 8 bit common threshold; the discriminators delay is adjustable via PCB jumpers (5 steps from 15 to 150 ns).

The RS485 interface allows to handle most functional parameters such as Shaping Time, Coarse and Fine Gain, Input Polarity, CFD and Stretcher Thresholds, Pole Zero Adjustment etc.

**Highlights**

- ...> 16 channels in a one unit wide NIM module
- ...> Positive or negative inputs accepted on each channel
- ...> ± 4 V input dynamics
- ...> Completely programmable via RS485 interface
- ...> Programmable (2 bit) shaping time per channel
- ...> 2bit coarse gain and 8 bit fine gain for energy amplifier
- ...> 2bit coarse gain for timing amplifier
- ...> 8 bit pole zero adjustment
- ...> Programmable stretcher threshold
- ...> 16 channel stretched energy output
- ...> Dual 16 channel CFD (30% and 80% constant fraction)
- ...> 16 channel 30% CFD multiplexed output
- ...> Energy multiplexed output
- ...> OR and Sum output

Ordering options

Code	Description	
WN1568XAAAAA	N1568B - 16Ch Programmable Pulse Shape Amplifier & Dual 16Ch CFD (30%; 80%)	NEW

N858 Dual Attenuator**NEW****Overview**

The Mod. N858 is a double attenuator housed in a one a one unit wide NIM module. The module does not require any power supply since it is made up of resistive cells. Attenuation ranges from 0 to 44.5 dB for each section (0.5 dB steps).

Each section is provided with two LEMO 00 connectors, one for the input (50 Ohm impedance) and one for the output, and seven toggle switches for attenuation setting.

**Highlights**

- ...> Attenuation adjustable from 0 to 44.5 dB
- ...> Input bandwidth larger than 300 MHz
- ...> 100 mW maximum input power
- ...> No power supply required

Ordering options

Code	Description	
WN858XAAAAA	N858 - Dual Attenuator (0 to 44.5 dB)	NEW

N113 Dual OR 12 In - 2 Out

Overview

The Mod. N113 is a one unit wide NIM Module, with two 12 input - 2 output OR sections.

Via 4 internal jumpers the module can be converted to a single 24 OR inputs with separate or common gate control.

All input/output signals are std. NIM.

The outputs can be "gated" via two front panel GATE inputs with relevant switches.



Highlights

- ...> **2 independent OR sections, 12 inputs each**
- ...> **1 GATE signal per section**
- ...> **Cascadeable sections**
- ...> **Less than 10 ns input/output delay**

Ordering options

Code	Description
WN113XAAAAAA	N113 - Dual OR 12 In-2 Out

N405 Triple 4-Fold Logic Unit/Majority with VETO

Overview

The Mod. N405 is a one unit wide NIM module housing three independent sections that can be used either as logic unit or majority. The two modes are selectable via internal DIP switches. Each section accepts 4 input signals, a VETO input and provides 4 outputs (2 normal and 1 complementary, shaped, plus 1 linear). The linear output provides a signal whose width is equal to the time during which the input signals satisfy the conditions programmed via the front panel lever switches. The shaped output widths can be set via front panel trimmers in the range 6 ns to 800 ns.

LOGIC UNIT MODE

The input signals can be disabled by means of a front panel lever switch. Each section can be programmed to perform either the AND or the OR functions via front panel switches. When only one input signal is enabled the section acts as a logic FAN-OUT independently from the selected mode.

MAJORITY MODE

The front panel enable/disable lever switches are used to set the majority level. The AND/OR lever switch must be set in the AND position.



Highlights

- ...> **Three independent sections with 4 DC coupled NIM inputs each**
- ...> **AND, OR, MAJORITY function selectable for each section**
- ...> **NIM outputs with Fan Out of two**
- ...> **One VETO input per section**
- ...> **Front panel trimmer for output width adjustment on each section**
- ...> **One auxiliary NIM output per section whose width is equal to the coincidence duration**
- ...> **One negated NIM output per section**

Ordering options

Code	Description
WN405XAAAAAA	N405 - Triple 4-Fold Logic Unit/Majority with Veto

N455 Quad Coincidence Logic Unit

Overview

The Mod. N455 houses, in a single width NIM module, 4 independent sections performing the logic function, AND or OR, selected via the relevant front panel switch. Each section has 3 normal and 1 complementary NIM shaped outputs whose width can be set via front panel trimmer and a supplementary overlap output (OVP OUT) whose width is equal to the time interval during which the desired function is satisfied. The OVP OUT allows to obtain an output signal with the minimum input/output delay. A common veto input signal is available to disable all the output signals.

(ISN-GRENOBLE design)



Highlights

- ...> 4 identical independent sections
- ...> Two inputs per section
- ...> 130 MHz Max input frequency
- ...> 6 ns double pulse resolution
- ...> 10 ns I/O delay
- ...> Switch selectable AND/OR logical function
- ...> Adjustable output FWHM (4 to 650 ns)
- ...> Overlap output
- ...> Common Veto

Ordering options

Code	Description
WN455XAAAAAA	N455 - Quad Coincidence Logic Unit

N840 - N841 8 / 16 Channel Leading Edge Discriminators

Overview

The Mod. N840 is an 8 Channel Leading Edge Discriminator housed in one unit wide NIM module. The module accepts 8 negative inputs and produces 2x8 NIM outputs (NIM outputs are provided with a fan-out of two) + 8/NIM outputs (negated) on 24 front panel LEMO 00 connectors.

The Mod. N841 is the 16 channel version of the module, featuring all the characteristics of the N840.

The pulse forming stage of the discriminator produces an output pulse whose width is adjustable in a range from 5 ns to 40 ns. Each channel can work both in Updating and Non-Updating mode according to on-board jumpers position. The discriminator thresholds are individually settable in a range from -1 mV to -255 mV (1 mV step), via an 8-bit DAC. The minimum detectable signal is -5 mV. The back panel houses VETO and TEST inputs, the OR output and the Current Sum output, which generates a current proportional to the input multiplicity, i. e. to the number of channels over threshold, at a rate of -1.0 mA per hit (-50 mV per hit into a 50 Ohm load) $\pm 20\%$.

Settings can be performed via front panel switches and viewed via the Led display.



Highlights

- ...> Individually programmable thresholds
- ...> Selectable Updating/Non Updating mode
- ...> Programmable output width
- ...> TEST and VETO inputs
- ...> OR and Current sum outputs
- ...> 4 digit led display

Ordering options

Code	Description
WN840XAAAAAA	N840 - 8 Channel Leading Edge Discriminator 50 Ohm Negative
WN841XAAAAAA	N841 - 16 Channel Leading Edge Discriminator 50 Ohm Negative

N842 - N843**8 / 16 Channel Constant Fraction Discriminators****Overview**

The Mod. N842 is an 8 Channel Constant Fraction Discriminator housed in a one unit wide NIM module. The module accepts 8 negative inputs and produces 2x8 NIM outputs (NIM outputs are provided with a fan-out of two) + 8/ NIM outputs (negated) on 24 front panel LEMO 00 connectors. The Mod. N843 is the 16 channel version of the module, featuring all the characteristics of the N842.

The constant fraction delay is defined by a delay line network of 20 ns with 5 taps. The timing stage of the discriminator produces an output pulse whose width is adjustable in a range from 16.5 ns to 273 ns. Moreover, in order to protect against multiple pulsing, it is possible to program a dead time during which the discriminator is inhibited from retriggering. The maximum time walk is ± 400 ps (for input signals in the range from -50 mV to -5 V with 25 ns rise time). The constant fraction is 20%. The individual discriminating thresholds are settable in a range from -1 mV to -255 mV (1 mV step) via an 8-bit DAC. The module can operate also with small (below 10 mV) input signals, though in this case the Constant Fraction operation is not performed, i.e. the time walk is higher. The channels' threshold, output width and dead time can be programmed via two switches and one rotary handle placed on the front panel. The back panel houses VETO and TEST inputs, the OR output and the Current Sum output, which generates a current proportional to the input multiplicity, i. e. to the number of channels over threshold, at a rate of -1.0 mA per hit (-50 mV per hit into a 50 Ohm load) $\pm 20\%$.

Settings can be performed via front panel switches and viewed via the Led display.

**Highlights**

- > Individually programmable thresholds
- > Programmable output width
- > Programmable dead time
- > TEST and VETO inputs
- > OR and Current sum outputs
- > 4 digit Led display

Ordering options

Code	Description
WN842XAAAAAA	N842 - 8 Channel Constant Frac. Discriminator (Delay 20 ns; F = 20%)
WN843XAAAAAA	N843 - 16 Channel Constant Frac. Discriminator (Delay 20 ns; F = 20%)

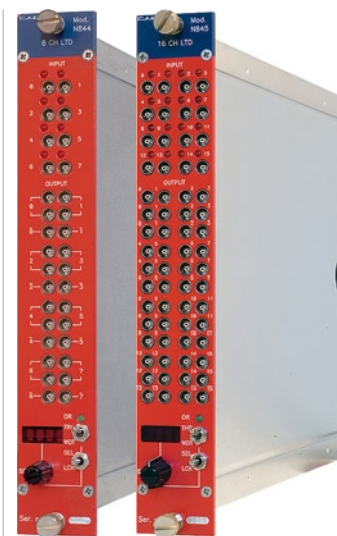
N844 - N845**8 / 16 Channel Low Threshold Discriminators****Overview**

The Mod. N844 is an 8 Channel Low Threshold (leading edge type) Discriminator housed in a one unit wide NIM module. The module accepts 8 inputs and produces 2x8 NIM outputs (NIM outputs are provided with a fan-out of two) + 8/NIM outputs (negated) on 24 front panel LEMO 00 connectors.

The Mod. N845 is the 16 channel version of the module, featuring all the characteristics of the N844.

The pulse forming stage of the discriminator produces an output pulse whose width is adjustable in a range from 6 to 95 ns. The channels work in updating mode. The discriminator thresholds are individually settable in a range from -1 mV to -255 mV (1 mV step), via an 8-bit DAC. The minimum detectable signal is -3 mV. A positive input version (Model N844P), with the thresholds settable in the 1 mV to 255 mV range, is also available. The back panel houses VETO and TEST inputs, the logical OR output (the relevant OR LED lights up if at least one channel is over threshold) and the Current Sum output, which generates a current proportional to the input multiplicity, i. e. to the number of channels over threshold, at a rate of -1.0 mA per hit (-50 mV per hit into a 50 Ohm load) $\pm 20\%$.

Settings can be performed via front panel switches and viewed via the Led display.

**Highlights**

- > Individually programmable thresholds
- > Programmable output width
- > TEST and VETO inputs
- > OR and Current Sum outputs
- > 4-digit Led display
- > High sensitivity on small signals

Ordering options

Code	Description
WN844XAAAAAA	N844 - 8 Channel Low Threshold Discriminator 50 Ohm Negative Inputs
WN844PXAAAAA	N844P - 8 Channel Low Threshold Discriminator 50 Ohm Positive Inputs
WN845XAAAAAA	N845 - 16 Channel Low Threshold Discriminator 50 Ohm Negative Inputs

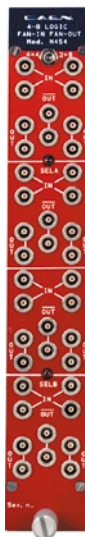
N454 4 - 8 Logic Fan In-Fan Out

Overview

The Mod. N454 is a single width NIM unit housing 4 independent Fan In-Fan Out sections. Each section accepts 4 input NIM signals and performs on these the logic OR function. The result of the function is available as 4 normal and 2 complementary NIM signals on 6 front panel connectors.

The unit can be programmed, via a front panel switch, to work as 4 OR sections (4 inputs/4 outputs) or 2 OR sections (8 inputs / 8 outputs).

(ISN-GRENOBLE design)



Highlights

- ...> 4 independent sections with 4 inputs each
- ...> OR output with fan out of four per section
- ...> Possibility of cascading channels to form a dual 8-fold Fan In-Fan Out
- ...> Input/output delay less than 7 ns
- ...> 100 MHz max. input frequency

Ordering options

Code	Description
WN454XAAAAAA	N454 - 4-8 Logic Fan In-Fan Out

N625 Quad Linear Fan In-Fan Out

Overview

The Mod. N625 is a 1-unit NIM module which houses four 4 Input + 4 Output Fan In-Fan Out sections and a Single Channel Discriminator. Each Fan In-Fan Out section produces on all its output connectors, the sum of the signals fed to the inputs, eventually inverted. Fan In-Fan Out inputs are bipolar, while the output can be either inverting or non inverting (jumper selectable independently for each section). Both input and output signals are DC coupled. Maximum input amplitude is ± 1.6 V. Moreover each Fan In-Fan Out section features a screwdriver trimmer which allows the DC offset adjustment. The discriminator channel has one DC coupled input (polarity is jumper selectable), the threshold is screwdriver adjustable and monitorable via test point; the output is NIM standard, its width is screwdriver adjustable as well. Front panel LEDs allow to monitor all the mode, gain and polarity adjustments performed via internal jumpers.



Highlights

- ...> Four independent sections
- ...> Bipolar inputs
- ...> Four 4 Input + 4 Output Fan In-Fan Out sections
- ...> 1 Channel Discriminator featured
- ...> Inverting or non-inverting mode independently selectable on each section
- ...> 100 MHz bandwidth

Ordering options

Code	Description
WN625XAAAAAA	N625 - Quad Linear Fan In-Fan Out

N1145 Quad Scaler and Preset Counter / Timer

Overview

The Mod. N1145 is a double unit NIM module that includes four independent 8-digit up-counters, plus a fifth 7-digit down-counter that can be used either as a preset counter or timer. The counters can have different operating modes and can be variously interconnected, thereby making the module a flexible and powerful tool for several applications involving time, frequency and ratio measurements. All counters can accept either TTL or NIM inputs. All control and output signals are standard NIM. The maximum input frequency is 250 MHz and the minimum pulse width is 2 ns for the up-counters, and respectively 80 MHz and 3 ns for the down-counter. All input and output connectors as well as all the control switches are located on the front panel. All input and output connectors are LEMO 00 type.



Highlights

- Four 8-digit up-counters with 250 MHz max counting rate
- One 7-digit down-counter with 80 MHz max counting rate
- NIM and TTL inputs
- One LED display per section
- Up to three sections can be cascaded for 24-digit counting
- Frequency and frequencies ratio measurements
- Individual GATE and RESET per counter
- Manual or pulse triggered RESET

Ordering options

Code	Description
WN1145XAAAAA	N1145 - Quad Scaler and Preset Counter-Timer

N93B Dual Timer

Overview

The Mod. N93 B is a one unit NIM module housing two identical triggered pulse generators.

The module produces NIM and ECL pulses whose width ranges from 50 ns to 10 s when triggered. Output pulses are provided normal and complementary.

Timers can be re-triggered with the pulse end marker signal.

The coarse adjustment of the output width is provided via a 10-position rotary switch, the fine adjustment can be performed via a rotary handle.

The trigger START can be provided either via an external signal or manually via a front panel switch.



Highlights

- Manual or pulse triggered START (NIM or ECL input)
- Monostable (retriggerable) or bistable operation
- NIM and ECL output pulses from 50 ns to 10 s
- Manual or pulse triggered RESET
- (NIM and ECL) END-MARKER output pulse
- VETO input

Ordering options

Code	Description
WN93BXAAAAA	N93B - Dual Timer (from CERN type 2255)

N108A Dual Delay

Overview

The Mod. N108A is a dual delay unit housed in a one unit wide NIM module. Delay ranges from 0 to 63.5 ns (+ 1.6 ns offset) per section. The delay can be set in 0.5 ns steps. The delay lines are made up of calibrated coaxial cable stubs for high accuracy delay and do not require power supply.



Highlights

- ...> Delay from 0 to 63.5 ns (+ 1.6 ns offset) per section
- ...> No power supply required
- ...> 0.5 ns step
- ...> ± 100 ps accuracy on 0.5 to 8 ns delay lines, ± 200 ps on higher lines
- ...> VSWR < 1.15

Ordering options

Code	Description
WN108AXAAAAA	N108A - Dual Delay Unit (1.6 to 65.1 ns)

N89 NIM - TTL - NIM Adapter

Overview

The Mod. N89 is a one unit wide NIM module housing two sections of 4 NIM to TTL converters and two sections of 4 TTL to NIM converters. All inputs are DC coupled.

On each section, a front panel switch allows logic inversion of the output signals.

The unit is capable of driving remote 50 Ohm loads with minimum signal degradation. Fast rise and fall times (2 ns) ensure reliable performance at minimum pulse width (10 ns) and maximum frequency (60 MHz).



Highlights

- ...> 8 NIM-TTL, 8 TTL-NIM translator channels
- ...> Less than 10 ns Input/Output delay
- ...> 60 MHz max operating frequency
- ...> No duty-cycle limitations

Ordering options

Code	Description
WN89XXAAAAA	N89 - NIM-TTL-NIM Adapter

N638 16 Channel NIM-ECL/ECL-NIM Translator and Fan Out

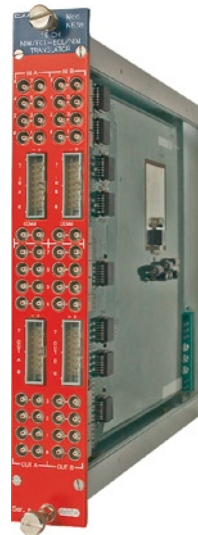
Overview

The Mod. N638 is a standard NIM module housing 16 independent logic level translators.

Each of the 16 channels accepts a NIM or an ECL signal and provides two NIM and one ECL outputs.

The NIM and ECL inputs of each channel are ORed prior to Fan Out. The maximum operating frequency is 300 MHz.

Two couples of front panel input bridged connectors accept two COMMON IN NIM signals; each common signal allows the use of the module as a Fan Out of 16 NIM and 8 ECL signals.



Highlights

- 16 independent NIM to ECL/NIM and ECL to NIM/ECL channels
- NIM Fan Out of two
- 300 MHz maximum operating frequency
- 2 COMMON IN input with a Fan Out of 16 NIM and 8 ECL
- I/O delay from 2.5 to 4 ns, depending on input type

Ordering options

Code	Description
WN638XAAAAA	16 Channel NIM-ECL/ECL-NIM Translator and Fan Out

CAMAC products

CAEN Short Form Catalog 2007

Function	Model	Description	Page
Controller	C111C	Ethernet CAMAC Crate Controller	44
Discriminator	C808	16 Channel Constant Fraction Discriminator	44
Discriminator	C894	16 Channel Leading Edge Discriminator	45
I/O Register	C219	16 Channel Programmable I/O Register	45
QDC	C1205	16 Channel QDC	46
Scaler	C257	16 Channel Scaler	46
TDC	C414	8 Channel TDC	47

C111C Ethernet CAMAC Crate Controller

Overview

The Mod. C111C is a complete CAMAC controller, housed in a double width CAMAC module, that allows advanced interaction by means of standard Ethernet services, such as a local web server and TCP socket based communication protocol. The internal processor runs a version of Linux optimized for low memory footprint. A CAMAC bus control subsection handles all bus access operations and interactions, including LAM detection; a separate NIM subsection manages I/O signals located on the front panel: four outputs, four inputs, event counters and two “COMBO I/O” (trigger/busy) modules. The dynamic local web server, perfectly suitable for crate setup and maintenance, allows advanced monitoring and control without the requirement of dedicated software installation, meanwhile, an embedded script interpreter allows the local execution of C-like code, with full control on CAMAC and NIM functions. Front panel indicators include X and Q signals on last access, four user LEDs (controllable from script) and fault, connection status and NIM default indicators.



Highlights

- Full CAMAC bus control with LAM detection
- Full control via embedded dynamic web server
- Available NIM I/O functions: outputs, inputs, event counters, pulse generators and trigger/busy modules
- Default I/O settings recallable with a dedicated pushbutton
- ANSI C remote control library, with extensions for local resources control
- Monitoring of crate voltages
- Embedded script interpreter for C-like code local execution, with CAMAC/NIM functions
- Stored script can be automatically launched at power-up (e.g. for crate initialization)
- X and Q signals on last access, user LEDs fault, status and NIM default indicators

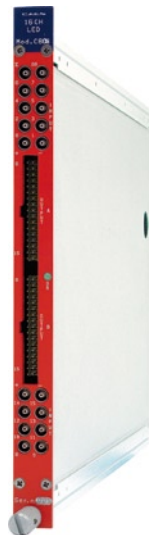
Ordering options

Code	Description
WC111CXAAAAA	C111C - Ethernet CAMAC Crate Controller

C808 16 Channel Constant Fraction Discriminator

Overview

The Mod. C808 is a 16 Channel Constant Fraction Discriminator housed in a single width CAMAC module. The module accepts 16 negative inputs and produces 16 differential ECL outputs with a fan-out of two on two front panel header connectors. Each channel can be turned on or off via CAMAC by using a mask register (Pattern of Inhibit). The constant fraction delay is defined by a delay line network of 20 ns with 5 taps. The pulse forming stage of the discriminator produces an output pulse whose width is adjustable in a range from 15 ns to 250 ns. Moreover it is possible to program a dead time interval during which the discriminator is inhibited from retriggering, in order to protect against multiple pulsing. The maximum time walk is ± 400 ps (for input signals in the range from -50 mV to -5 V with 25 ns rise time). The constant fraction is 20%. The individual discriminating thresholds are settable in a range from -1 mV to -255 mV (-1 mV step), via CAMAC through an 8-bit DAC. The module can operate also with small (below 10 mV) input signals, though in this case the Constant Fraction operation is not performed, i.e. the time walk is higher. VETO and TEST inputs are available on the back panel. A Current Sum output generates a current proportional to the input multiplicity, i.e. to the number of channels over threshold, at a rate of -1.0 mA $\pm 20\%$ per hit. A “MAJORITY” output on a back panel connector provides a NIM signal if the number of input channels over threshold exceeds the MAJORITY programmed value. Several C808 boards can be connected in a daisy chain via the Current Sum output: in this case, by switching the Majority logic to “External”, it's possible to obtain a Majority signal when the number of over threshold channels in the daisy chained modules exceeds a global Majority level. An “OR” output signal on a front panel connector provides a global OR of the outputs.



Highlights

- ECL outputs with fan-out of two
- Threshold programmable individually for each channel
- Programmable output width
- Programmable dead time
- TEST and VETO inputs
- OR, CURRENT SUM and MAJORITY outputs

Ordering options

Code	Description
WC808XAAAAA	C808 - 16 Channel Constant Fraction Discriminator (Delay 20 ns; F = 20%)

C894 16 Channel Leading Edge Discriminator

Overview

The Mod. C894 is a 16 Channel Leading Edge Discriminator housed in a single width CAMAC module. The module accepts 16 negative inputs (positive on request) and produces 16 differential ECL outputs with a fan-out of two on two front panel header connectors. The pulse forming stage of the discriminator produces an output pulse whose width is adjustable in a range from 5 ns to 40 ns. Each channel can work both in Updating and Non-Updating mode according to on-board jumpers position. The discriminator thresholds are individually settable in a range from -1 mV to -255 mV (1 mV step), via CAMAC through an 8-bit DAC. The minimum detectable signal is -5 mV. VETO and TEST inputs are available on the back panel. A Current Sum output generates a current proportional to the input multiplicity, i. e. to the number of channels over threshold, at a rate of -1.0 mA per hit $\pm 20\%$. A "MAJORITY" output on a back panel connector provides a NIM signal if the number of input channels over threshold exceeds the MAJORITY programmed value. Several C894 boards can be connected in a daisy chain via the Current Sum output: in this case, by switching the Majority logic to "External", it's possible to obtain a Majority signal when the number of over threshold channels in the daisy chained modules exceeds a global Majority level. An "OR" output on a front panel connector provides a global OR of the output channels.



Highlights

- > ECL outputs with fan-out of two
- > Selectable Updating/Non Updating mode
- > Threshold programmable individually for each channel
- > Programmable output width
- > TEST and VETO inputs
- > OR, CURRENT SUM and MAJORITY outputs

Ordering options

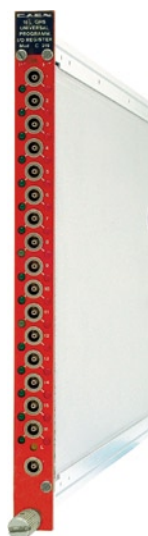
Code	Description
WC894XAAAAA	C894 - 16 Channel Leading Edge Discriminator 50 Ohm Negative

C219 16 Channel Programmable I/O Register

Overview

The Mod. C219 is a single width CAMAC module housing 16 channels, which can be set independently, via CAMAC functions, as Input or Output channels. An internal 16 bit mask register can be programmed via CAMAC to enable or disable each channel. Each channel is equipped with a 4-bit status register, which can be written in order to determine the operating mode. Inputs and Outputs can be enabled via CAMAC (Transparent Mode) or by an external Strobe signal (Externally Strobed Mode).

Each channel can also work in Glitched Mode; in this operating mode a positive or negative transition of an input signal can be memorized in the Input Register. The module features also a programmable LAM signal generator.



Highlights

- > 16 independent channels programmable as inputs/outputs
- > Inputs: Internally / Externally Strobed or Glitched
- > Outputs: Transparent or Externally Strobed
- > Programmable LAM generator

Ordering options

Code	Description
WC219XAAAAA	C219 - 16 Channel Universal Programmable I/O Register

C1205 16 Channel QDC

Overview

The Mod. C1205 is a 16-Channel Charge Integrating ADC single width CAMAC module provided with 16 independent input channels. The C1205 combines a triple range (the total dynamic range is greater than 17 bits, in three overlapping 12 bit ranges) gated integrator charge to voltage converter, 3 Wilkinson type analog to time converters and a sub nanosecond time digitizer. The result is a high performance, wide dynamic range QDC with low dead time (5.5 μ s). A clear input and a busy output are also provided. The GATE, clear and busy signals are all NIM levels, with 50 Ohm Lemo style connectors. The 16 inputs are also 50 Ohm Lemo style connectors. The sensitivity at the input connector ranges from 25 fC per count on the low (most sensitive) range, to 1.5 pC per count on the high range. Full scale (on the high range) is greater than 6 nC. This C1205 has been designed for short conversion time and maximum data throughput, as required in state-of-the-art physics experiments. The built-in data processing can include sliding scale, pedestal subtraction and threshold suppression to reduce data volume and readout time. The module contains a multiple event buffer that can store up to 51 events. Using FASTCAMAC, this buffer can be read out at up to 30 MByte/s.



Highlights

- Three simultaneous ranges: 80 pC, 670 pC and 6 nC
- 12 bit resolution
- Total dynamic range larger than 17-bit
- Integral non linearity: ± 20 counts on low range, ± 5 counts on high & mid range
- Noise smaller than ± 3 counts on low range, smaller than ± 1.5 counts on high & mid range
- Conversion time: 6.5 μ s
- Gate width from 10 to 500 ns

Ordering options

Code	Description
WC1205XAAAAA	C1205 - 16 Channel Charge Integrating ADC

C257 16 Channel Scaler

Overview

The Mod. C257 is a single width CAMAC module housing 16 independent 24 bit counting channels at a maximum input frequency of 100 MHz. The LAM is asserted by the 16th or 24th bit (programmable by internal jumpers) of each enabled channel. The status of the internal jumpers can be read via std. CAMAC functions. Each channel can be cascaded with the next one through internal jumpers. The unit exists in three different versions accepting respectively ECL (C257E), NIM (C257N) or TTL (C257T) inputs.



Highlights

- 16 independent 24-bit channels
- Cascadeable channels in order to obtain up to 24x16 bit counting depth
- 100 MHz counting frequency
- Three available versions: ECL, NIM or TTL inputs
- LAM generation when the counter is full
- Fast Clear, Inhibit and Test NIM inputs

Ordering options

Code	Description
WC257ECLAAAA	C257E - 16 Channel Scaler (ECL inputs)
WC257NIMAAAA	C257N - 16 Channel Scaler (NIM inputs)
WC257TTLAAAA	C257T - 16 Channel Scaler (TTL inputs)

C414 8 Channel TDC

Overview

The Mod. C414 is a single width CAMAC unit housing 8 independent 12 bit time-to-digital conversion channels. The full scale time can be selected from 100 ns to 5 μ s via internal DIP switches.

The time resolution ranges from 25 ps to 1.25 ns (respectively for 100 ns and 5 μ s full scale time range). The INL is lower than ± 4 counts, the DNL less than ± 1.5 %. The conversion time is 2.5 μ s per channel and it is reduced to 1.5 μ s for overflow channels. A CAMAC LAM is generated (if enabled) at the end of the conversion.



Highlights

- ...> **Six programmable FSRs: 100, 200, 500, 1000, 2000 and 5000 ns**
- ...> **12 bit resolution**
- ...> **Conversion time: 2.5 μ s per channel**
- ...> **Common START operation**
- ...> **Common STOP input signal**
- ...> **Full scale time up to 5 μ s**
- ...> **Zero suppression**
- ...> **Sliding scale for DNL improvement**

Ordering options

Code	Description
WC414XAAAAAA	C414 - 8 Channel Time to Digital Converter

Function	Model	Description	Page	
ADC (Peak Sensing)	V1785	8 Ch Dual Range Multievent Peak Sensing ADC	49	NEW
ADC (Peak Sensing)	V785	32 Channel Multievent Peak Sensing ADC	49	
ADC (Peak Sensing)	V785N	16 Channel Multievent Peak Sensing ADC	49	
ADC (Sampling)	V1721	8 Channel 8 bit 500 MS/s Digitizer	50	NEW
ADC (Sampling)	V1724	8 Channel 14 bit 100 MS/s Digitizer	51	NEW
ADC (Sampling)	V1729	4 Channel 12 bit 2 GS/s (300 MHz bandwidth) Switched-Capacitor Digitizer	51	
ADC (Sampling)	V729	4 Channel 12 bit 40 MS/s Digitizer	52	
ADC (C-RAMS)	V550	CAEN Readout for Analog Multiplexed Signals (10 bit)	52	
ADC (C-RAMS)	V550A	CAEN Readout for Analog Multiplexed Signals (12 bit)	52	
Amplifier (Fast)	V974	4 Channel Variable Gain Fast Amplifier	53	
Amplifier (Fast)	V975	8 Channel Fast Amplifier	53	
Attenuator	V859	Dual Attenuator	54	
Coincidence/Logic/Trigger Unit	V1495	General Purpose VME Board	54	NEW
Coincidence/Logic/Trigger Unit	V976	Quad 4 Fold AND/OR/MAJ, NIM-TTL TTL-NIM Translator, Fan In-Fan Out	55	
Controller	V1718	VME-USB2.0 Bridge	55	
Controller	V2718	VME-PCI Optical Link Bridge	56	
Controller	V718	VME Parallel Port Interface	56	
Pulse Height Analyzer	V730	8 Section - "8 Window Type" Pulse Height Analyzer and Counter	57	NEW
Discriminator	V812	16 Channel Constant Fraction Discriminator	57	
Discriminator	V814	16 Channel Low Threshold Discriminator	58	
Discriminator	V895	16 Channel Leading Edge Discriminator	58	
Fan In-Fan Out Unit	V925	Quad Linear Fan In-Fan Out	59	
HS CAENET Controller	V288	High Speed CAENET VME Controller	59	
I/O Register	V259	16 Bit Strobed Multihit Pattern Unit	60	
I/O Register	V977	16 Channel Input/Output Register (Status A)	60	
QDC	V792	32 Channel Multievent QDC	61	
QDC	V792N	16 Channel Multievent QDC	61	
QDC	V862	32 Channel Multievent Individual Gate QDC	61	
QDC	V965	16 Channel Dual Range Multievent QDC	62	
QDC	V965A	8 Channel Dual Range Multievent QDC	62	
Scaler	V560	16 Channel Scaler	62	
Scaler	V830	32 Channel Latching Scaler	63	
Sequencer	V551B	Sequencer for V550 - V550A C-RAMS	63	
TDC	V1190A	128 Channel Multihit TDC	64	
TDC	V1190B	64 Channel Multihit TDC	64	
TDC	V1290A	32 Channel Multihit TDC	64	
TDC	V1290N	16 Channel Multihit TDC	64	
TDC	V767	128 Channel Multihit TDC	65	
TDC	V767A	64 Channel Multihit TDC	65	
TDC	V775	32 Channel Multievent TDC	65	
TDC	V775N	16 Channel Multievent TDC	65	
Timing Unit	V462	Dual Gate Generator	66	
Timing Unit	V486	8 Channel Gate and Delay Generator	66	
Timing Unit	V706	16 Channel Mean Timer	67	
Timing Unit	V972	Delay Unit	67	
Timing Unit	V993B	Dual Timer	68	
Timing Unit	V993C	Dual Timer (locking dial switch-double unit)	68	NEW
Translator	V538A	8 Channel NIM-ECL/ECL-NIM Translator	68	

V1785 8 Ch Dual Range Multievent Peak Sensing ADC**NEW****Overview**

The Mod. V1785 is a 1-unit wide VME 6U module housing 8 Peak Sensing Analog-to-Digital Conversion channels. Each channel is able to detect and convert the peak value of the positive analog signals (with >50 ns risetime) fed to the relevant connectors. Input voltage range is 0 ÷ 4 V. Each channel is processed by two gain stage (x1 and x8) in parallel followed by the ADC stage: a dual input range is then featured: 0 ÷ 4 V (1 mV LSB) and 0 ÷ 500 mV (125 µV LSB); this allows to avoid saturation with big input signals while increasing resolution with small ones.

The ADCs use a sliding scale technique in order to reduce the differential non-linearity.

Programmable zero suppression, multievent buffer memory, trigger counter and test features complete the flexibility of the unit.

The module works in A24/A32 mode. The data transfer occurs in D16, D32, BLT32 or MBLT64 mode. The unit supports also the Chained Block Transfer (CBLT32/CBLT64) and the Multicast commands.

The VME interface is VME64 and VME64X standard compliant and features the A24/A32 and MultiCast addressing modes. The data readout occurs either in D32, BLT32, MBLT64 mode, or in daisy chain with 32/64 bit Chained Block Transfers. The module features a fully programmable RORA interrupter.

The board is provided with the P1 and P2 VME connectors and fits into both V430 and standard 6U crates. It also supports the "live insertion", allowing the User to insert (or remove) the board into (or from) the crate without switching it off.

**Highlights**

- Two simultaneous ranges: 0 ÷ 4 V / 0 ÷ 500 mV
- 12 bit resolution with 15 bit dynamics
- 125 µV LSB on low range, 1mV LSB on high range
- 2.8 µs / 8 ch conversion time
- 600 ns fast clear time
- Zero and overflow suppression for each channel
- ±0.1 % Integral non linearity
- ±1.5 % Differential non linearity
- 32 event buffer memory
- BLT32/MBLT64/CBLT32/CBLT64 data transfer
- Multicast commands
- Live insertion

Ordering options

Code	Description
WV1785XNCAAA	V1785NC - 8 Ch Dual Range Multievent Peak Sensing ADC

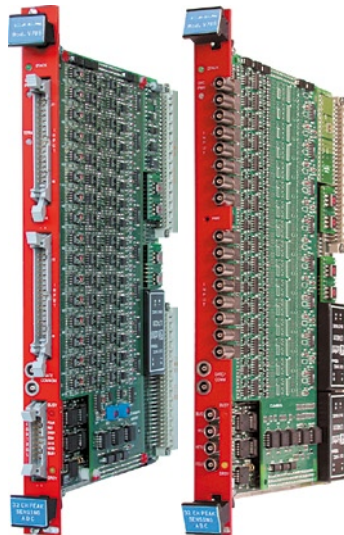
NEW**V785 - V785N****32 / 16 Channel Multievent Peak Sensing ADC****Overview**

The Mod. V785 is a 1-unit wide VME 6U module housing 32 Peak Sensing Analog-to-Digital Conversion channels. Each channel is able to detect and convert the peak value of the positive analog signals (with >50 ns risetime) fed to the relevant connectors. Input voltage range is 0 ÷ 4 V. The Model V785N houses 16 channels on LEMO 00 connectors and shares most of the other features with the Mod. V785. The outputs of the PEAK sections are multiplexed and subsequently converted by two fast 12-bit ADCs (V785: 5.7 µs for all channels, V785N: 2.8 µs for all channels). The integral non linearity is ±0.1% of full scale range (FSR), measured from 2% to 97% of FSR; the differential non linearity is ±1.5% of FSR, measured from 3% to 100% of FSR. The ADCs use a sliding scale technique to reduce the differential non-linearity.

Programmable zero suppression, multievent buffer memory, trigger counter and test features complete the flexibility of the unit.

The module works in A24/A32 mode. The data transfer occurs in D16, D32, BLT32 or MBLT64 mode. The unit supports also the Chained Block Transfer (CBLT32/CBLT64) and the Multicast commands.

A 16 ch. flat cable to LEMO input adapter (Mod. A385, see *Accessories* section) is available for the Mod. V785 (one 32 ch. V785 requires two A385 adapters). The boards support the live insertion that allows inserting or removing them into the crate without switching it off.

**Highlights**

- 0 ÷ 4 V input range
- Full 12 bit resolution
- 5.7 µs / 32 ch and 2.8 µs / 16 ch conversion times
- 600 ns fast clear time
- Zero and overflow suppression for each channel
- ±0.1% integral non linearity
- ±1.5% differential non linearity
- 32 event buffer memory
- BLT32/MBLT64/CBLT32/CBLT64 data transfer
- Multicast commands
- Live insertion

Ordering options

Code	Description
WV785XACAAAA	V785AC - 32 Channel Peak Sensing ADC (4V, No 12V DCDC, live ins)
WV785XAGAAAA	V785AG - 32 Channel Peak Sensing ADC (8V, No 12V DCDC, live ins)
WV785XNCAAAA	V785NC - 16 Channel Peak Sensing ADC (4V, No 12V DCDC, live ins)
WA385XAAAAAA	A385 - 16 Channel Cable Adapter (Flat to Lemo) for V785, 50cm ±10% cables

V1721 8 Channel 8 bit 500 MS/s Digitizer**NEW****Overview**

The Mod. V1721 is a 1-unit wide VME 6U module housing a 8 Channel 8 bit 500 MS/s Flash ADC Waveform Digitizer with threshold Auto-Trigger capabilities.

The single ended analog input signal has a dynamic range of $\pm 0.5V$. The DC offset of the signal can be adjusted channel per channel by means of a programmable 16bit DAC.

The board features a front panel clock/reference In/Out and a PLL for clock synthesis from internal/external references. This allows multi board phase synchronizations to an external standard or to a V1721 clock master board.

The data stream is continuously written in a circular memory buffer; when the trigger occurs the FPGA writes further N samples for the post trigger and freezes the buffer that then can be read either via VME or via Optical Link; the acquisition can continue without dead-time in a new buffer. Each channel has 2 Msamples (expandable up to 4 Msamples) of SRAM memory, divided in buffers of programmable size from 2 ksample x 1024 buffers (4 μ s window) to 1 Msamples x 2 buffers (1 ms window).

The trigger signal can be provided via the front panel input as well as via the VMEbus, but it can also be generated internally, as soon as a programmable voltage threshold is reached. The individual Auto-Trigger of one channel can be propagated to the other channels and onto the front panel Trigger Output.

The VME interface is VME64X compliant and the data readout can be performed in Single Data Transfer (D32), 32/64 bit Block Transfer (BLT/MBLT) and Chained Block Transfer (CBLT).

The board houses a daisy chainable Optical Link able to transfer data at 125 MB/s, thus it is possible to connect up to eight V1721 (64 ADC channels) to a single Optical Link Controller (Mod. A2818, see *Accessories/Controller*). The V1721 can be controlled and readout through the Optical Link in parallel to the VME interface.

**Highlights**

- ...> **8 channel**
- ...> **8 bit 500 MS/s ADC**
- ...> **External Trigger or programmable voltage threshold for automatic triggering**
- ...> **Front panel clock In/Out available for multi-board synchronisation**
- ...> **External ADC clock input or PLL synthesis from internal/external reference**
- ...> **Trigger Time stamps**
- ...> **2 Msamples memory per channel (expandable)**
- ...> **Programmable event size and pre-post trigger adjustment**
- ...> **VME64X compliant interface**
- ...> **Optical Link interface**
- ...> **A2818 PCI controller available for handling up to 8 V1721 daisy chained via Optical Link**
- ...> **FPGA firmware upgradable via VME**
- ...> **Demo software tool for board control with CAEN VME bridges (V1718, V2718, VX1718, VX2718)**

Ordering options

Code	Description	
WV1721XAAAAA	V1721 - 8 Ch. 8 bit 500 MS/s Digitizer	NEW

V1724 8 Channel 14 bit 100 MS/s Digitizer**NEW****Overview**

The Mod. V1724 is a 1-unit wide VME 6U module housing a 8 Channel 14 bit 100 MS/s Flash ADC Waveform Digitizer with threshold Auto-Trigger capabilities.

The single ended analog input signal has a dynamic range of ± 1.125 V or ± 5 V. The DC offset of the signal can be adjusted channel per channel by means of a programmable 16bit DAC.

The board features a front panel clock/reference In/Out and a PLL for clock synthesis from internal/external references. This allows multi board phase synchronizations to an external standard or to a V1724 clock master board.

The data stream is continuously written in a circular memory buffer; when the trigger occurs the FPGA writes further N samples for the post trigger and freezes the buffer that then can be read either via VME or via Optical Link; the acquisition can continue without dead-time in a new buffer. Each channel has 512 ksamples (expandable up to 2 Msamples and over) of SRAM memory, divided in buffers of programmable size from 500 sample x 1024 buffers (5 μ s window) to 256 ksamples x 2 buffers (2.56 ms window). The trigger signal can be provided via the front panel input as well as via the VMEbus, but it can also be generated internally, as soon as a programmable voltage threshold is reached. The individual Auto-Trigger of one channel can be propagated to the other channels and onto the front panel Trigger Output.

The VME interface is VME64X compliant and the data readout can be performed in Single Data Transfer (D32), 32/64 bit Block Transfer (BLT/MBLT) and Chained Block Transfer (CBLT).

The board houses a daisy chainable Optical Link able to transfer data at 125 MB/s, thus it is possible to connect up to eight V1724 (64 ADC channels) to a single Optical Link Controller (Mod. A2818, see *Accessories/Controller*). The V1724 can be controlled and readout through the Optical Link in parallel to the VME interface.

**Highlights**

- >>> 8 channel
- >>> 14 bit 100 MS/s ADC
- >>> External Trigger or programmable voltage threshold for automatic triggering
- >>> Front panel clock In/Out available for multi-board synchronisation
- >>> External ADC clock input or PLL synthesis from internal/external reference
- >>> Lower and variable frequency sampling available
- >>> Trigger Time stamps
- >>> 512 ksamples memory per channel (expandable)
- >>> Programmable event size and pre-post trigger adjustment
- >>> VME64X compliant interface
- >>> Optical Link interface
- >>> A2818 PCI controller available for handling up to 8 V1724 daisy chained via Optical Link
- >>> FPGA firmware upgradable via VME
- >>> Demo software tool for board control with CAEN VME bridges (V1718, V2718, VX1718, VX2718)

Ordering options

Code	Description	
WV1724XAAAAA	V1724 - 8 Ch. 14 bit 100 MS/s Digitizer	NEW

V1729 4 Channel 12 bit 2 GS/s (300 MHz bandwidth) Switched-Capacitor Digitizer**Overview**

The Mod. V1729 is a 1-unit wide VME 6U module suited for acquisition of fast analog signals based on the MATAcq (analog matrix) chip developed by collaboration of the CEA/DAPNIA and the IN2P3/LAL.

The board performs the coding of 4 analog channels of bandwidth up to 300MHz over 12 bits at a sampling frequency reaching up to 2 GS/s and over a depth of 2520 usable points. The analog signal is continuously sampled in a circular analog memory. The arrival of a trigger signal initiates the stopping phase of the sampling. At the end of this phase, the state of the analog memory is set: it then contains the last 2560 points sampled (of which 2520 are valid). Subsequently, the samples stored under analog form in the MATAcq chips are rapidly (650 μ s) re-read and coded into 12 bit digital data, then stored in a digital memory buffer. The memory buffer can then be re-read by the acquisition system either via VME or via the GPIB interface.

The board can accept four trigger modes: "on signal" (via a settable discriminator threshold), "external" (via a LEMO input connector), "auto" (via software) and "auto+normal" (a logic OR between the "auto" and the "on signal" triggers). The trigger edge (rising or falling) can be selected in all modes (except the direct external trigger which uses only the rising edge). The board works in A24/A32 mode, with a data size of D16/D32.

(*CEA/DAPNIA & IN2P3/LAL Design*)

**Highlights**

- >>> 4 channel
- >>> 12 bit 2 GS/s Switched-Capacitor Digitizer
- >>> 1 or 2 GS/s sampling rate
- >>> Full Scale Range: ± 0.5 V
- >>> 250 μ V LSB
- >>> 2520 usable sampled points
- >>> Four trigger mode operation (on signal, external, auto, auto+normal) with rising or falling edge detection
- >>> GPIB interface
- >>> Integral non linearity: $\pm 0.1\%$
- >>> Differential non linearity: $\pm 0.05\%$

Ordering options

Code	Description	
WV1729XAAAAA	V1729 - 4 Channel 12 bit 2 GS/s (300 MHz bandwidth) Switched-Capacitor Digitizer	

V729 4 Channel 12 bit 40 MS/s Digitizer

Overview

The Mod. V729 is a 1-unit wide VME 6U module which houses a 4 channel 40 MS/s ADC. Its function is to convert and store in an Output buffer the input analog signals which belong to a programmable temporal window placed before or around a STOP signal.

Each channel of the module accepts either single ended (positive, negative or bipolar) or differential (unipolar or bipolar) input signals.

The module employs four 40 MS/s ADCs and two FIFO buffers: a Circular buffer and an Output buffer. At each clock rising edge, the input signals are converted by the ADCs and stored in the Circular buffer. At the arrival of an external or software STOP, the data coming from the Circular buffer which belong to the programmed temporal window are transferred to the Output buffer.

The module has an A24/A32, D16/D32, BLT32 VME interface.



Highlights

- > 4 channel
- > 12 bit 40 MS/s ADC
- > Input range from 0 to 2V
- > 0.5 mV LSB
- > Single ended or differential input signals
- > Multievent output buffer
- > Pre-trigger data recording
- > External or internal clock

Ordering options

Code	Description
WV729ABXAAAA	V729AB - 4 Ch. 12 bit 40 MS/s Digitizer

V550 - V550A CAEN Readout for Analog Multiplexed Signals

Overview

The Mod. V550 and V550A CAEN Readout for Analog Multiplexed Signals (C-RAMS) are 1-unit wide VME modules housing 2 independent Analog to Digital Conversion channels, to be used for the readout of analog multiplexed signals coming from some of the well known front-end chips (Amplex, Gasplex, VA, etc.). Each channel of the module accepts positive, negative or differential input signals, amplifies and feeds them to a 10 bit ADC (12 bit for the V550A). The sensitivity (mV/bit) can be selected among 4 different values with relative ratios of 1, 2, 5 and 10. The input signals are sampled by the ADC up to a 5 MHz frequency and their digital value is compared to a threshold for each channel. If the signal is over the channel's threshold, a programmable individual pedestal is subtracted and the result is stored in a 2k x 32 bit FIFO.

The modules work in A24/A32, D32 mode. Block Transfer mode is also available. A positive open-collector signal ("DRDY") allows to obtain a wired-OR Global Data Ready signal. A fast CLEAR signal is also available for a cycle abort. It is also possible to operate the modules in TEST mode (VME selectable) by simulating some input patterns.

The Mod. V550 and V550A can be controlled by the CAEN Mod. V551B C-RAMS Sequencer (see VME/Sequencer section).



Highlights

- > 2 independent ADC blocks
- > Four ranges: 0.15, 0.30, 0.75 and 1.50 V
- > Resolution: 12 bit (V550A) or 10 bit (V550)
- > 5 MHz maximum sampling rate
- > Designed for multiplexed signals
- > Up to 2016 detector channels per block
- > Programmable zero suppression and pedestal subtraction
- > Controlled by the V551B Sequencer (pag.59)

Ordering options

Code	Description
WV550XBAAAA	V550B - CAEN Readout for Analog Multiplex. Signals (10 bit)
WV550AXBAAAA	V550AB - CAEN Readout for Analog Multiplex. Signals (12 bit)

V974 4 Channel Variable Gain Fast Amplifier

Overview

The Mod. V974 is a 4 channel fast rise time amplifier housed in a 1-unit VME module; each channel features a voltage gain adjustable from 1 to 10 in x1 steps. Channels are non-inverting and bipolar: they amplify both positive and negative signals. Input bandwidth is 170 MHz for signals up to 50 mVpp and decreases for larger ones (up to 100 MHz @ 400 mVpp). Gain setting is performed independently for each channel via four rotary handles. Channels can be cascaded in order to obtain larger gain values. Each channel is provided with three LEMO 00 connectors, one for the input and two bridged for the output. The board features a ± 2 V output dynamics. 4 screw-trimmers (one per channel) allow the offset calibration which operates over a ± 25 mV range. The features include an output short circuit protection.



Highlights

- ...> Input bandwidth up to 170 MHz
- ...> x10 adjustable gain with x1 steps
- ...> 50 Ohm input impedance
- ...> ± 2 V output dynamics
- ...> Drives 50 Ohm loads
- ...> Cascadeable channels
- ...> Rise/fall time <3 ns with a 25 mV unipolar input amplitude
- ...> I/O delay <3 ns

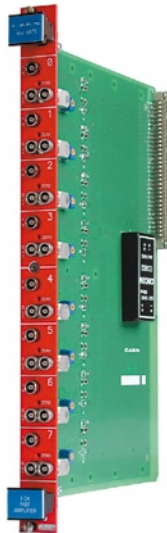
Ordering options

Code	Description
WV974XBAAAA	V974B - 4 Channel Variable Gain Fast Amplifier

V975 8 Channel Fast Amplifier

Overview

The Mod. V975 is an 8 channel fast rise time amplifier housed in a 1-unit VME module; each channel features a fixed voltage gain of 10. Channels are bipolar, non-inverting and can be cascaded in order to obtain larger gain values. Input bandwidth is 250 MHz for signals up to 50 mVpp and decreases for larger ones (up to 110 MHz @ 400 mVpp). Each channel is provided with three LEMO 00 connectors, one for the input and two bridged for the output. The board features a ± 2 V output dynamics. Screw-trimmers (one per channel) allow the offset calibration which operates over a ± 25 mV range. The features include an output short circuit protection.



Highlights

- ...> Input bandwidth up to 250 MHz
- ...> x10 fixed gain
- ...> 50 Ohm input impedance
- ...> ± 2 V output dynamics
- ...> Drives 50 Ohm loads
- ...> Cascadeable channels
- ...> Rise/fall time <1.5 ns with a 25 mV unipolar input amplitude
- ...> I/O delay <3 ns

Ordering options

Code	Description
WV975XBAAAA	V975B - 8 Channel Fixed Gain Fast Amplifier

V859 Dual Attenuator

Overview

The Model V859 is a passive dual section attenuator housed in a 1-unit VME module; the module does not require any power supply since it is made up of resistive cells.

Attenuation ranges from 0 to 44.5 dB for each section (0.5 dB steps). The two sections can be cascaded in order to obtain a single section featuring a 0÷89 dB (0.5 dB step) attenuation.

Each section is provided with two LEMO 00 connectors, one for the input (50 Ohm impedance) and one for the output, and seven toggle switches for attenuation setting; an additional pushbutton, allows to cascade the two sections.



Highlights

- Attenuation adjustable from 0 to 44.5 dB
- Cascadeable sections
- Input bandwidth larger than 300 MHz
- 100 mW maximum input power
- No power supply required

Ordering options

Code	Description
WV859XAAAAA	V859 - Dual Attenuator (0 to 44.5 dB)

V1495 General Purpose VME Board

NEW

Overview

The Mod. V1495 is a VME 6U board, 1U wide, suitable for various digital Gate/Trigger/Translator/Buffer/Test applications, which can be directly customised by the User, and whose management is handled by two FPGA. The first one is the FPGA "Bridge", used for the VME interface and for the connection between the VME and the 2nd FPGA (FPGA "User") through a proprietary local bus. The FPGA "Bridge" manages also the programming via VME of the FPGA "User".

The FPGA "User" (Cyclone EP1C20) manages the front panel I/O channels and is substantially an empty FPGA. It is available to be programmed by the User according to the desired logic function. The I/O channel digital interface is composed by four sections placed on the motherboard. The channel interface can be freely expanded by adding up to three independent mezzanine boards, choosing between the four available types.

- A395A 32 LVDS/ECL/PECL input channels
- A395B 32 LVDS output channels
- A395C 32 ECL output channels
- A395D 8 NIM/TTL input/output channels

Therefore, the Mod. V1495 can achieve a maximum number of 194 I/O channels.

The FPGA "User" can be programmed "on the fly" via VME, without any external hardware tools, without disconnecting the board from the set up, and without resetting it or turning the crate off.

A flash memory on the board stores the programming file, which can be loaded to the FPGA "User" at any moment.

Four (independent, digital, programmable, asynchronous, chainable) timers, are available for Gate/Trigger applications.

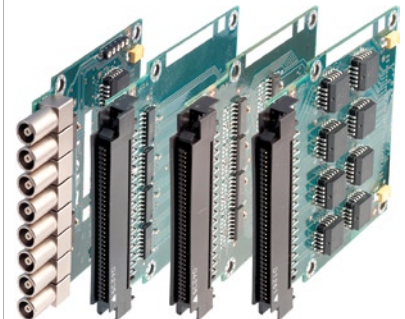
The Mod. V1495 has been developed in the framework of the european project EURITRACK, which belongs to the Sixth Framework Programme (FP6).



Coincidence/Logic/Trigger unit: **T19 pag. 93**
 Translator: **T33 pag. 98**
 I/O Register: **T25 pag. 95**
 Fan In-Fan Out: **T23 pag. 95**

Highlights

- User customisable FPGA Unit (with preloaded demo code)
- LVDS/ECL/PECL inputs (differential)
- 64 inputs, expandable to 162 (with 32 outputs)
- 32 outputs, expandable to 130 (with 64 inputs)
- 405 MHz maximum frequency supported by clock tree for registered logic
- I/O delay smaller than 15 ns (in Buffer Mode)
- Programmable 3-color LED



Ordering options

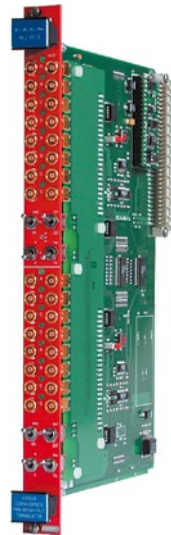
Code	Description	
WV1495XAAAAA	V1495 - General Purpose VME Board	NEW
WA395XAAAAAA	A395A - 32 LVDS/ECL/PECL input channels	NEW
WA395XBAAAAAA	A395B - 32 LVDS output channels	NEW
WA395XCAAAAAA	A395C - 32 ECL output channels	NEW
WA395XDAAAAAA	A395D - 8 NIM/TTL input/output channels	NEW
WA967XAAAAAA	A967 - 32 Channel Cable Adapter (1x32 to 2x16) for V767, V862, V1190, VX1190, V1495	

V976 Quad 4 Fold AND/OR/MAJ, NIM-TTL TTL-NIM Translator, Fan-In Fan-Out

Overview

The Mod. V976 is a 1-unit VME module housing four 4-input Coincidence Fan in/Fan out and NIM – TTL / TTL – NIM adapter sections. Each section features 4 inputs and 4 outputs on LEMO 00 connectors and can operate as a 4 channel level translator or as AND/OR gate. It is possible to use two or four sections together to obtain an 8 or 16 input majority. The logic functions can be selected via front-panel and internal switches. Some extra functions, such as a 1 to 12 Fan Out, can be performed by cascading properly the module's sections. The output width is not regulated by a monostable, but it is equal to the duration of the input condition which makes the logic function true.

The module accepts NIM and TTL inputs; the output can be programmed to provide either NIM or TTL levels as well, either direct or negated.



Highlights

- Four independent sections with four channels each
- TTL and NIM inputs automatically detected
- NIM/TTL selectable output level
- AND, OR, Majority function with selectable number of inputs
- Logic Fan In / Fan Out
- Selectable direct or negated output

Ordering options

Code	Description
WV976XBAAAAA	V976B - Quad 4 Fold AND/OR/MAJ, NIM-TTL TTL-NIM Level Translator and Fan-In Fan-Out

V1718 VME-USB2.0 Bridge

Overview

The Mod. V1718 is a 1-unit wide 6U VME master module which can be operated from the USB port of a standard PC; the board can perform all the cycles foreseen by the VME64 (except those intended for 3U boards). The board can operate as VME System Controller (normally when plugged in the slot 1) acting as Bus Arbiter in Multimaster systems.

The VME bus activity can be monitored in detail, both locally (through a LED display) and remotely. The front panel includes also 5 TTL/NIM programmable outputs on LEMO 00 connectors (default assignment is: DS0/1, AS, DTACK, BERR and LOCATION MONITOR) and two programmable TTL/NIM inputs (on LEMO 00 connectors). The I/Os can be programmed via USB in order to implement functions like Timer, Counter, Pulse generator, I/O register, etc.

The V1718 – PC interface is USB 2.0 compliant; previous issues are also supported. USB data transfer takes place through the High Speed Bulk Transaction protocol; the sustained data rate on the USB is up to 30 MByte/s in BLT Read cycles. Thanks to the 128KB memory buffer, the activity on the VME bus is not slowed down by the transfer rate on the USB port.

The Module is provided with drivers which support the use with the most common PC platforms (Windows 98/2000/XP, Linux); libraries and useful example programs in C/C++, Visual Basic and LabView are provided as well. Future firmware upgrade is possible via USB.



Highlights

- No boot required, ready at power ON
- Up to 30 MByte/s sustained data transfer rate
- VME Master (arbiter or requester)
- VME Slave (register and test RAM access)
- Cycles: R/W, RMW, BLT, MBLT, IACK, ADO, ADOH
- Addressing: A16, A24, A32, CR/CSR, LCK
- Data width: D8, D16, D32, D64
- System Controller capabilities
- Interrupt handler
- Front panel Dataway Display (available also from PC and VME)
- 5 outputs and 2 inputs, NIM or TTL, fully programmable

Ordering options

Code	Description
WV1718XAAAAA	V1718 - VME-USB 2.0 Bridge

V2718 VME-PCI Optical Link Bridge

Overview

The Mod. V2718 is a 1-unit wide 6U VME master module, which can be controlled by a standard PC equipped with the PCI controller card CAEN Mod. A2818.

The connection between the V2718 and the A2818 takes place through an optical fiber cable (AY2705, AY2720, AI2705, AI2720). Multi crate sessions can be easily performed, since up to eight daisy chained (via optical fiber cables) V2718 can be controlled by one A2818, thus building a CONet (Chainable Optical Network).

The V2718 can perform all the cycles foreseen by the VME64 (except those intended for 3U boards). The board can operate as VME System Controller (normally when plugged in the slot 1) acting as Bus Arbiter in Multimaster systems.

The VME bus activity can be monitored in detail, both locally (through a LED display) and remotely. The front panel includes also 5 TTL/NIM programmable outputs on LEMO 00 connectors (default assignment is: DS0/1, AS, DTACK, BERR and LOCATION MONITOR) and two programmable TTL/NIM inputs (on LEMO 00 connectors). The I/Os can be programmed in order to implement functions like Timer, Counter, Pulse generator, I/O register, etc.

The sustained data transfer rate is up to 70 MByte/s. Thanks to the 128KB memory buffer, the activity on the VME bus is not slowed down by the transfer rate on the CONet when several V2718s share the same network.

The Module is provided with drivers which support the use with the most common PC platforms (Windows 98/2000/XP, Linux); libraries and useful example programs in C/C++, Visual Basic and LabView are provided as well. Future firmware upgrade is possible via PCI.



Highlights

- > No boot required, ready at power ON
- > Daisy chain capability
- > PCI 32bit / 33MHz
- > Up to 70 MByte/s sustained data transfer rate
- > VME Master (arbiter or requester)
- > VME Slave (register and test RAM access)
- > Cycles: R/W, RMW, BLT, MBLT, IACK, ADO, ADOH
- > Addressing: A16, A24, A32, CR/CSR, LCK
- > Data width: D8, D16, D32, D64
- > System Controller capabilities
- > Interrupt handler
- > Front panel Dataway Display (available also from PC and VME)
- > 5 outputs and 2 inputs, NIM or TTL, fully programmable

Ordering options

Code	Description
WA2818XAAAAA	A2818 - PCI Optical Link
WK2718XAAAAA	V2718KIT - VME-PCI Bridge (V2718) + PCI Optical Link (A2818) + Optical Fibre 5m duplex (AY2705)
WV2718XAAAAA	V2718 - VME-PCI Bridge
WAY2705XAAAA	AY2705 - Optical Fibre 5 m. duplex
WAY2720XAAAA	AY2720 - Optical Fibre 20 m. duplex
WAI2705XAAAA	AI2705 - Optical Fibre 5 m. simplex
WAI2720XAAAA	AI2720 - Optical Fibre 20 m. simplex

V718 VME Parallel Port Interface

Overview

The Mod. V718 is a 1-unit wide VME controller which can be operated from the Parallel Port (PP) of a standard PC. The module performs A16, A24 and A32 data addressing, D16, D32, BLT32, MBLT64 data transfer and Interrupt Acknowledge cycles. The module features a LED display which allows to monitor the VME bus activity in detail. The front panel also features 6 outputs carrying DS, AS, DTACK, BERR, BLT and IACKOUT signals.

The Mod. V718 can be inserted in a crate to control all the slave modules within the crate itself (multimaster operation is not supported) but it can also be used out of a crate, as it features on board additional J1, J2 and JAUX female connectors to house a single slave module. In this case an external power source is needed to supply the slave module and the Mod. V718 itself. Together with a PC and a power source, the Mod. V718 is a complete test station for a single VME module.

Maximum transfer speed from VME to PC is approximately 300 kByte/s; this can only be achieved with BLT cycles. Single datum transfer speed is different whether accessing the same address or accessing several addresses and/or address modifiers. The average rate for single data transfer is approximately 50 kByte/s.

A C-language library and a set of LabView VIs easily allow the development of the board's control software.



Highlights

- > Basic VME master operations supported
- > Easy debug of VME modules from PC parallel port interface
- > LED display of VME bus activity
- > AS, DS0, DTACK, BERR and IACKOUT panel outputs
- > 300 kByte/s transfer rate in BLT cycles
- > Stand alone configuration supported

Ordering options

Code	Description
WV718XBAAAAA	V718B - VME Parallel Port Interface

V730**8 Section - "8 Window Type" Pulse Height Analyzer and Counter****NEW****Overview**

The Mod. V730 is a 1-unit wide VME 6U module which provides the functions of analog to digital conversion on input signal, digital discrimination and counting.

8 inputs, typically coming from pulse shaper, are simultaneously acquired.

The module is suitable to any type of impulse (photons, neutrons, particles, astrophysics and environmental measurements in general) requiring discrimination and counting.

It allows an automatic board calibration in situ, without measurement setup disconnection, measuring the complete electronic chain.

Input signals are amplified then converted by the 8 bit ADC's; it is possible to set the ADC Vref via VME bus, thus allowing a conversion gain setting to be used for the board automatic calibration.

The digital stages sort the converted pulses according into 8 "discrimination slices" (also programmable via VMEbus) in parallel with a digital "pile-up" rejection.

The number of pulses of each digital threshold level (with or without digital "pile Up" rejection) is finally stored into 12 bit counters to be read after an external acquisition signal and into an "histogram memory" to be used for board automatic calibration.

(CEA-Cadarache design)

**Highlights**

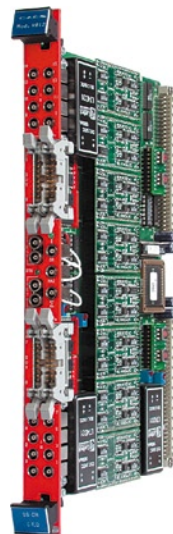
- 8-bit analog to digital conversion (15 MHz sampling frequency)
- Digital amplitude pulse analysis by 8 thresholds levels programmable by VME bus
- Counting rate fixed by external clock sampling
- Onboard digital "Pile Up" rejection by two parameters setting: input width and pulse time distance
- 8 counters (12 bits) per input (one for each amplitude level) for totality of incoming pulse
- 8 counters (12 bits) per input (one for each amplitude level) for incoming pulse after digital "Pile Up" rejection
- Onboard calibration capability (allowing easy automatic calibration)
- Onboard FIFO memories allowing to store the 8 ADC output data

Ordering options

Code	Description	
WV730XAAAAA	V730 - 8 Section: "8 Window Type" Pulse Height Analyzer and Counter	NEW

V812**16 Channel Constant Fraction Discriminator****Overview**

The Mod. V812 is a 1-unit wide VME module housing a 16 channel constant fraction discriminator. The module accepts 16 negative inputs and generates precise ECL pulses when the input signals exceeds a given threshold: constant fraction technique allows to precisely determine the timing of the discrimination. The pulse forming stage of the discriminator produces an output pulse whose width is adjustable in a range from 15 ns to 250 ns via VME. Moreover, in order to protect against multiple pulsing, it is possible to program via VME a dead time, from 150 ns to 2 µs, during which the discriminator is inhibited from retriggering. The discriminator thresholds are individually settable via VME in a range from -1 mV to -255 mV (1 mV step) through an 8-bit DAC. Each channel can be turned on or off via VME by using a mask register. A Current Sum output generates a current proportional to the input multiplicity, i. e. to the number of channels over threshold, at a rate of -1.0 mA per hit (-50 mV per hit into a 50 Ohm load). A MAJORITY output provides a NIM signal if the number of input channels over threshold exceeds the MAJORITY programmed value. Several V812 boards can be connected in a daisy chain via the Current Sum output: in this case, by switching the majority logic to External, it is possible to obtain a Majority signal when the number of active channels in the chained modules exceeds a global Majority level. The logic OR of discriminator outputs is available on a front panel NIM signal.

**Highlights**

- Thresholds individually programmable via VME
- Constant fraction for precise discrimination timing
- ECL outputs with fan-out of two
- Programmable output width
- Global VETO and TEST inputs
- Mask register for individual channel enable/disable
- OR, CURRENT SUM and MAJORITY outputs

Ordering options

Code	Description	
WV812XBAAAA	V812B - 16 Channel Constant Fraction Discriminator	

V814 16 Channel Low Threshold Discriminator

Overview

The Mod. V814 is a 1-unit wide VME module housing a 16 channel low threshold discriminator. The module accepts 16 negative (positive on request) inputs and produces 16 differential ECL outputs with a fan-out of two on four front panel flat cable connectors. Maximum input frequency is 60 MHz. The pulse forming stage of the discriminator produces an output pulse whose width is adjustable in a range from 6 to 95 ns via VME. The discriminator thresholds are individually settable in a range from -1 mV to -255 mV (1 mV step), via VME through an 8-bit DAC; a positive input version (Model V814 P), with the thresholds settable in the 1 mV to 255 mV range, is also available. Each channel can be turned on or off via VME by using a mask register. A Current Sum output generates a current proportional to the input multiplicity, i. e. to the number of channels over threshold, at a rate of -1.0 mA per hit (-50 mV per hit into a 50 Ohm load). A MAJORITY output connector provides a NIM signal if the number of input channels over threshold exceeds the MAJORITY programmed value. Several V814 boards can be connected in a daisy chain via the Current Sum output: in this case, by switching the majority logic to External, it is possible to obtain a Majority signal when the number of active channels in the chained modules exceeds a global Majority level. The logic OR of discriminator outputs is available on a front panel NIM signal.



Highlights

- Thresholds individually programmable via VME
- ECL outputs with fan-out of two
- Non updating operation
- Programmable output width
- Mask register for individual channel enable/disable
- Global VETO and TEST inputs
- OR, CURRENT SUM and MAJORITY outputs
- High sensitivity with small signals
- Negative or Positive input version available

Ordering options

Code	Description
WV814XBAAAA	V814B - 16 Channel Low Threshold Discriminator
WV814XPBAAAA	V814PB - 16 Channel Low Threshold Discriminator Positive Inputs

V895 16 Channel Leading Edge Discriminator

Overview

The Mod. V895 is a 1-unit wide VME module housing a 16 channel leading edge discriminator. The module accepts 16 negative (positive on request) inputs and produces 16 differential ECL outputs with a fan-out of two on four front panel flat cable connectors. Maximum input frequency is 140 MHz. The pulse forming stage of the discriminator produces an output pulse whose width is adjustable in a range from 5 to 40 ns via VME. Each channel can work both in Updating and Non-Updating mode according to on-board jumpers position. The discriminator thresholds are individually settable in a range from -1 mV to -255 mV (1 mV step), via VME through an 8-bit DAC. The minimum detectable signal is -5 mV. Each channel can be turned on or off via VME by using a mask register. A Current Sum output generates a current proportional to the input multiplicity, i. e. to the number of channels over threshold, at a rate of -1.0 mA per hit (-50 mV per hit into a 50 Ohm load). A MAJORITY output connector provides a NIM signal if the number of input channels over threshold exceeds the MAJORITY programmed value. Several V895 boards can be connected in a daisy chain via the Current Sum output: in this case, by switching the majority logic to External, it is possible to obtain a Majority signal when the number of active channels in the chained modules exceeds a global Majority level. The logic OR of discriminator outputs is available on a front panel NIM signal.



Highlights

- Thresholds individually programmable via VME
- ECL outputs with fan-out of two
- Selectable Updating/Non Updating mode
- Programmable output width
- Global VETO and TEST inputs
- Mask register for individual channel enable/disable
- OR, CURRENT SUM and MAJORITY outputs

Ordering options

Code	Description
WV895XBAAAA	V895B - 16 Channel Leading Edge Discriminator

V925 Quad Linear Fan In-Fan Out

Overview

The Mod. V925 is a 1-unit VME module which houses three 4 In / 4 Out and one 3 In / 3 Out sections; one Discriminator channel is also featured. Each Fan In-Fan Out section produces on all its output connectors, the sum of the signals fed to the inputs, eventually inverted. Fan in/Fan out inputs are bipolar, while the output can be either inverting or non inverting (jumper selectable independently for each section). Both input and output signals are DC coupled. Maximum input amplitude is ± 1.6 V. Moreover each Fan In-Fan Out section features a screwdriver trimmer which allows the DC offset adjustment. The discriminator channel has one DC coupled input (polarity is jumper selectable), the threshold is screwdriver adjustable and monitorable via test point; the output is NIM standard, its width is screwdriver adjustable as well. Front panel LEDs allow to monitor all the mode, gain and polarity adjustments performed via internal jumpers.



Highlights

- > Four independent sections
- > Bipolar inputs
- > Three 4 In / 4 Out and one 3 In / 3 Out sections
- > One Discriminator channel
- > Inverting or non-inverting mode independently selectable on each section
- > 120 MHz bandwidth

Ordering options

Code	Description
WV925XAAAAAA	V925 - Quad Linear Fan In-Fan Out

V288 High Speed CAENET VME Controller

Overview

The Mod. V288 is a 1-unit wide VME 6U module which houses a HS CAENET VME Controller Interface.

Up to 99 modules are controllable via 50 Ohm coaxial cable (High Speed CAENET) with 125 kByte/s transmission speed.

The V288 is an A16/A24 D16 VME slave. The module's VME base address is User selectable via DIP-switches on A4 to A23 address lines.

The unit generates an interrupt at the end of the transmission or when the data is collected from the line. The interrupt priority level can be selected through DIP switches, and the 8 bit interrupt vector can be programmed via software.



Highlights

- > Remote control of up to 99 CAENET nodes via VME cycles
- > Interrupt generation on data receiving
- > Manual or software reset
- > 125 kByte/s transmission rate
- > Tx/Rx data buffers (up to 4 Kwords)

Ordering options

Code	Description
WV288XAAAAAA	V288 - High Speed CAENET VME Controller

V259 16 Bit Strobed Multihit Pattern Unit

Overview

The Mod. V259 is a 1-unit wide VME 6U module able to store internally a 16 bit input pattern which can be read via the VME bus; the board has 16 inputs; an input coincidence circuit, controlled by a GATE signal, selects the hits which are stored in a Pattern register. If a channel has been already hit during the GATE window, the unit sets the relevant bit in a Multiplicity register.

The unit provides a fast OR signal of the inputs. Input signals can be std. NIM or ECL depending on the purchased version (V259N or V259E). The control signals (GATE, CLEAR, FAST OR) are NIM for both versions.

The unit has an A24, D16 VME interface.

(CEA-IRF SACLAY design)



Highlights

- 16 input channels ANDed with a GATE signal
- Two versions: NIM or ECL inputs
- FAST CLEAR input
- FAST OR output
- Multiple hits register

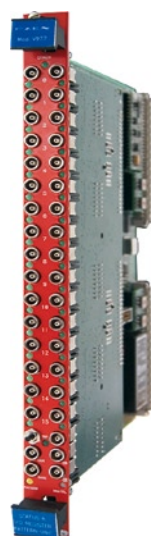
Ordering options

Code	Description
WV259ECLAAAA	V259E - 16 Bit Strobed Multi-Hit Pattern Unit (ECL Level)
WV259NIMAAAA	V259N - 16 Bit Strobed Multi-Hit Pattern Unit (NIM Level)

V977 16 Channel Input/Output Register (Status A)

Overview

The Mod. V977 is a 1-unit wide VME module that can work either as 16 channel general purpose I/O Register or as Multihit Pattern Unit; the operating mode is selected via VME and is signalled via front panel LEDs. The module has 16 Inputs/Outputs; an on-board switch allows to select between NIM and TTL output signals, NIM and TTL input signals are both accepted; 2 Leds signal the I/O status of each channel. The module features an additional channel (TEST CHANNEL), which allows to send a test pulse via a front panel pushbutton. Input channels can be individually/globally masked via VME or globally via a front panel GATE input. The channel status can be cleared either via VME or via the front panel common CLEAR input. The channels global OR and /OR outputs are available as front panel signals and can be eventually masked. GATE and CLEAR signals can be either NIM or TTL; OR and /OR can be set at NIM or TTL level in the same way of the output channels. The module houses also a fully programmable VME RORA INTERRUPTER that generates a VME interrupt request when the OR of a selected set of output channels has a TRUE status. Live insertion is supported.



Highlights

- NIM and TTL inputs/outputs
- Individual channel enabling/disabling
- Software Input/Output generation
- Fully programmable RORA Interrupter
- Pushbutton TEST signal
- Status A capabilities
- Live insertion

Ordering options

Code	Description
WV977XBAAAAA	V977B - 16 Channel I/O Register (Status A)

V792 - V792N**32 / 16 Channel Multievent QDC****Overview**

The Mod. V792 is a 1-unit wide VME 6U module housing 32 Charge-to-Digital Conversion channels with current integrating negative inputs (50 Ω impedance). For each channel, the input charge is converted to a voltage level by a QAC (Charge to Amplitude Conversion) section. Input range is 0 ÷ 400 pC. The outputs of the QAC sections are multiplexed and subsequently converted by two fast 12-bit ADCs. The integral non linearity is $\pm 0.1\%$ of Full Scale Range (FSR) measured from 5% to 95% of FSR. The ADCs use a sliding scale technique to improve the differential non-linearity.

The Mod. V792N houses 16 input channels on LEMO 00 connectors and shares most of the other features with the Mod. V792.

The Mod. V792/V792N offers a 32 event buffer memory, A24/A32 addressing mode, D16, D32, BLT32/MBLT64 and CBLT32/CBLT64 data transfer mode. Multicast commands also supported. A 16 ch. decoupling board Mod. A992 (see Miscellaneous section) is available for the Mod. V792 to avoid ground loops and signal reflections when long flat cable (110 Ω) connections to the 50 Ω inputs are used (one V792 requires two A992 boards). A 16 channel flat cable to LEMO input adapter, Mod. A392 (see Miscellaneous section) is also available for the Mod. V792 (one V792 requires two A392 boards).

The board has a special circuitry that allows it to be removed from and inserted in a powered crate without switching the crate off.

**Highlights**

- > 0 ÷ 400 pC input range
- > Full 12bit resolution
- > 100 fC LSB
- > 5.7 μ s / 32 ch and 2.8 μ s / 16 ch conversion times
- > 600 ns fast clear time
- > Zero and overflow suppression for each channel
- > $\pm 0.1\%$ integral non linearity
- > $\pm 1.5\%$ differential non linearity
- > 32 event buffer memory
- > BLT32/MBLT64/CBLT32/CBLT64 data transfer
- > Multicast commands
- > Live insertion

Ordering options

Code	Description
WV792XACAAAA	V792AC - 32 Channel Multievent QDC (No 12V DCDC, live ins)
WV792XNCAAAA	V792NC - 16 Channel Multievent QDC (No 12V DCDC, live ins)

V862 32 Channel Multievent Individual Gate QDC**Overview**

The Mod. V862 is a 1-unit wide VME 6U module housing 32 Charge-to-Digital Conversion channels with current integrating negative inputs. Each channel has an independent gate input (GATE I) logically ANDed with a COMMON GATE input; the input charge on the I-th channel is converted to a voltage level by a QAC (Charge to Amplitude Conversion) section when both the GATE I and COMMON GATE signals are active. Input range is 0 ÷ 400 pC. The integral non linearity is $\pm 0.1\%$ of full scale range (FSR), measured from 2% to 97% of FSR; the differential non linearity is $\pm 1.5\%$ of FSR, measured from 3% to 100% of FSR. The ADCs use a sliding scale technique to reduce the differential non-linearity.

The outputs of the QAC sections are multiplexed and subsequently converted by two fast 12-bit ADCs (5.7 μ s for 32 channels). The Mod. V862 offers a 32 event buffer memory; programmable zero suppression and trigger counter complete the features of the unit. The module works in A24/A32 mode. The data transfer occurs in D16, D32, BLT32, MBLT64 or CBLT32/CBLT64 mode. The unit also supports the Multicast commands.

The board has a special circuitry that allows it to be removed from and inserted in a powered crate without switching the crate off.

**Highlights**

- > Individual Gate input per channel
- > 0 ÷ 400 pC input range
- > Full 12-bit resolution
- > 100 fC LSB
- > 5.7 μ s / 32 ch conversion time
- > 32 event buffer memory
- > 600 ns fast clear time
- > Zero and overflow suppression for each channel
- > $\pm 0.1\%$ integral non linearity
- > $\pm 1.5\%$ differential non linearity
- > BLT32/MBLT64/CBLT32/CBLT64 data transfer
- > Multicast commands
- > Live insertion

Ordering options

Code	Description
WV862XACAAAA	V862AC - 32 Channel Multievent QDC With Individual Gate (live insertion)
WA967XAAAAAA	A967 - 32 Channel Cable Adapter (1x32 to 2x16) for V767, V862, V1190, VX1190, V1495

V965 - V965A 16/8 Channel Dual Range Multievent QDC

Overview

The Mod. V965 is a 1-unit wide VME 6U module housing 16 Charge-to-Digital Conversion channels with current integrating negative inputs (50 Ohm impedance). For each channel, the input charge is converted to a voltage level by a QAC (Charge to Amplitude Conversion) section. Each channel is processed by two gain stage (x1 and x8) in parallel then by the ADC stage: a dual input range is then featured: $0 \div 800$ pC (200 fC LSB) and $0 \div 100$ pC (25 fC LSB); this allows to avoid saturation with big charge pulses while increasing resolution with small ones.

The outputs of the QAC sections are multiplexed and subsequently converted by two fast 12-bit ADCs. The ADCs use a sliding scale technique to improve the differential non-linearity. Programmable zero suppression, multi-event buffer memory, trigger counter and test features complete the flexibility of the unit.

The module works in A24/A32 addressing mode; the data transfer occurs in D16/D32/BLT32/MBLT64. The module also supports the chained block transfer (CBLT32/CBLT64) and the multicast command.

The board supports the live insertion that allows inserting or removing it into the crate without switching it off.

The Mod. V965A is the 8 channel version of the board and shares all the other features with the Mod. V965



Highlights

- > Two simultaneous ranges: 100 and 800 pC
- > 12bit resolution with 15 bit dynamic range
- > 25 fC LSB on low range, 200 fC LSB on high range
- > 5.7 μ s / 16 ch and 2.8 μ s / 8 ch conversion times
- > 600 ns fast clear time
- > Zero and overflow suppression for each channel
- > $\pm 0.1\%$ Integral non linearity
- > $\pm 1.5\%$ Differential non linearity
- > 32 event buffer memory
- > BLT32/MBLT64/CBLT32/CBLT64 data transfer
- > Multicast commands

Ordering options

Code	Description
WV965XBAAAAA	V965 - 16 Channel Dual Range Multievent QDC (No 12V DCDC, live ins)
WV965AXBAAAA	V965A - 8 Channel Dual Range Multievent QDC (No 12V DCDC, live ins)

V560 16 Channel Scaler

Overview

The Mod. V560 is a single width VME module which houses 16 independent 32 bit counting channels at the maximum input frequency of 100 MHz.

Each channel can be software enabled to generate an interrupt signal when the counter is full. The interrupt level and the correlated vector can be set and read via std. VME write and read cycles. Each channel can be cascaded with the following one through internal jumpers to produce a 64 bit counting depth. The status of the internal jumpers can be read via std. VME read cycles.

ECL version (V560 E) is provided with header input connectors, NIM and TTL versions (V560 N and V560 T) are provided with LEMO 00 input connectors.

All the channels can be cleared via the relevant VME command and via the front panel pushbutton. The unit has a standard A24/A32, D32 VME interface.



Highlights

- > 3 versions available (with ECL, NIM or TTL inputs)
- > 32 bit deep counting channels
- > 100 MHz counting frequency
- > Cascadeable couples of channels
- > Clear, Veto and Test NIM inputs

Ordering options

Code	Description
WV560EBAAAAA	V560AE - 16 Channel 32 Bit Scaler ECL
WV560NBAAAAA	V560AN - 16 Channel 32 Bit Scaler NIM
WV560TBAAAAA	V560AT - 16 Channel 32 Bit Scaler TTL

V830 32 Channel Latching Scaler

Overview

The model V830 is a 1-unit wide VME 6U Multievent Latching Scaler, housing 32 independent counting channels.

Each channel has 32 bit counting depth and accepts either ECL or LVDS inputs, depending on the purchased version; the maximum input frequency is 250 Mhz. The counters' values can be read on the fly from VME without interfering on data acquisition process.

The model V830 is equipped with a 32 k x 32 bit multievent buffer memory which may be used to store and readout accumulated data during subsequent counting.

The Trigger signal can be provided by an external NIM/ECL signal or by a VME request. It is also possible to generate a periodical Trigger signal by means of an internal programmable timer.

The module features VETO and CLEAR ECL inputs and a TEST NIM input (in common for all channels).

The model V830 works in A24/A32 mode and data transfer occurs in D32, BLT32 or MBLT64 mode. The unit also supports the Chained Block Transfer (CBLT32/CBLT64) and the Multicast commands.

The board has a special circuitry that allows it to be removed from and inserted in a powered crate without switching the crate off.



Highlights

- > Available with either ECL or LVDS inputs
- > 250 MHz counting frequency
- > 32 bit channel depth
- > Multichannel scaler operation with programmable dwell time from 1.2 μ s to 1700 s
- > BLT32/MBLT64/CBLT32/CBLT64 data transfer
- > Multicast commands
- > 32 k x 32 bit multievent buffer memory
- > Live insertion

Ordering options

Code	Description
VV830XACAAAA	V830AC - 32 Channel 32 Bit Scaler 250 MHz (With FIFO) ECL inputs
VV830LXC AAAA	V830LC - 32 Channel 32 Bit Scaler 250 MHz (With FIFO) LVDS inputs

V551B Sequencer for V550 - V550A C-RAMS

Overview

The Mod. V551B is a 1-unit wide VME module which can handle data acquired by some of the well known front-end chips (VA, Amplex, Gasplex, etc.). The V551 has been developed to control the signals from/to the Mod. V550 and V550A C-RAMS (CAEN Readout for Analog Multiplexed Signals, see VME ADCs section). A single V551B can control up to 19 C-RAMS modules, enabling the read out of 76608 multiplexed detector channels. The module works in A24/A32 mode, the data transfer occurs in D16 mode. C-RAMS can be programmed via VME to readout groups of up to 2016 detector channels per block; the multiplexing frequency can be set from 100 kHz to 5 MHz with programmable duty cycle.

The module houses a VME RORA interrupter; it is possible to program, via VME, the interrupt generation on the condition that the DRDY signal is asserted, indicating that at least one channel has data to be read out.



Highlights

- > Control of up to 19 V550 – V550A modules
- > 5 MHz maximum multiplexing frequency
- > Programmable duty cycle

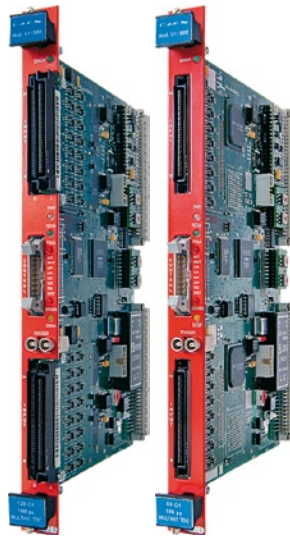
Ordering options

Code	Description
VV551BXBAAAA	V551BB - C-RAMS Sequencer

V1190A - V1190B**128/64 Channel Multihit TDC****Overview**

The board is a 1-unit wide VME 6U module that houses 128 (V1190A) or 64 (V1190B) independent Multi Hit/Multi Event Time to Digital Conversion channels. The unit features High Performance TDC chips, developed by CERN. LSB can be set at 100 ps (19 bit resolution, 52 μ s FSR), 200 ps (19 bit, 104 μ s FSR) or 800 ps (17 bit, 104 μ s FSR). The channels can be enabled for the detection of hits rising/falling edges or for their width measurement (both the edges' timing, and the hit width can be measured with the selected resolution). For each channel there is a digital adjustment for the zero-ing of any offsets. The data acquisition can be programmed in "EVENTS" ("TRIGGER MATCHING MODE", with a programmable time window) or in "CONTINUOUS STORAGE MODE". Both ECL and LVDS input signals are supported.

The VME interface allows the module to work in A24 and A32 addressing modes. The board houses a 32 k x 32 bit deep Output Buffer, that can be readout via VME in a completely independent way from the acquisition itself. The internal registers are available in D16 mode only, while the Output Buffer is accessible in D32, BLT32 or MBLT64. The module supports also the Chained Block Transfer mechanism and the Multicast commands. The board has a special circuitry that allows it to be removed from and inserted in a powered crate without switching the crate off.

**Highlights**

- > 3 programmable ranges: 100 ps LSB (19 bit resolution), 200 ps LSB (19 bit) and 800 ps LSB (17 bit)
- > ECL/LVDS inputs automatically detected
- > 5 ns Double Hit Resolution
- > Leading and Trailing Edge detection
- > Trigger Matching and Continuous Storage acquisition modes
- > 32 k x 32 bit output buffer
- > BLT32/MBLT64/CBLT32/CBLT64 cycles supported
- > Multicast commands
- > Live insertion

Ordering options

Code	Description
VV1190AEXAAA	V1190A - 128 Ch Multievent Multihit TDC 100-200-800 psec ECL/LVDS
VV1190BEXAAA	V1190B - 64 Ch Multievent Multihit TDC 100-200-800 psec ECL/LVDS
WA967XAAAAAA	A967 - 32 Channel Cable Adapter (1x32 to 2x16) for V767, V862, V1190, VX1190, V1495

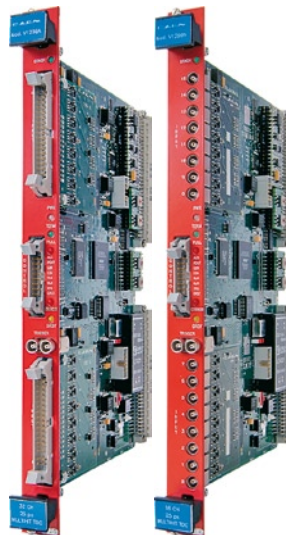
V1290A - V1290N**32/16 Channel Multihit TDC****Overview**

The Mod. V1290A is a 1-unit wide VME 6U module that houses 32 independent Multi Hit/Multi Event Time to Digital Conversion channels. The unit houses 4 High Performance TDC chips, developed by CERN. LSB is 25 ps (21 bit resolution, 52 μ s FSR). The module accepts both ECL and LVDS inputs.

The Mod. V1290N houses 16 independent Multi Hit/Multi Event Time to Digital Conversion channels. It houses 2 High Performance TDC chips and shares most of its features with the V1290A. The module accepts NIM inputs.

The channels can be enabled for the detection of hits rising/falling edges or for their width measurement. For each channel there is a digital adjustment for the zero-ing of any offsets. The data acquisition can be programmed in "EVENTS" ("TRIGGER MATCHING MODE", with a programmable time window) or in "CONTINUOUS STORAGE MODE".

The VME interface allows the module to work in A24 and A32 addressing modes. The board houses a 32 k x 32 bit deep Output Buffer, that can be readout via VME in a completely independent way from the acquisition itself. The internal registers are available in D16 mode only, while the Output Buffer is accessible in D32, BLT32 or MBLT64. The module supports also the Chained Block Transfer mechanism and the Multicast commands. The board has a special circuitry that allows it to be removed from and inserted in a powered crate without switching the crate off.

**Highlights**

- > 25 ps LSB
- > 21 bit resolution
- > 52 μ s full scale range
- > 5 ns Double Hit Resolution
- > Leading and Trailing Edge detection
- > Trigger Matching and Continuous Storage acquisition modes
- > 32 k x 32 bit output buffer
- > BLT32/MBLT64/CBLT32/CBLT64 cycles supported
- > Multicast commands
- > Live Insertion

Ordering options

Code	Description
VV1290AEXAAA	V1290A - 32 Ch Multievent Multihit TDC 25 psec ECL/LVDS
VV1290BNXAAA	V1290N - 16 Ch Multievent Multihit TDC 25 psec NIM

V767 - V767A 128 / 64 Channel Multihit TDC

Overview

The Mod. V767 is a 1-unit wide VME 6U module, which houses 128 independent time-to-digital conversion channels. The module hosts 4 TDC chips developed at CERN by the ECP-MIC Group. The Mod. V767A is the 64 channel version, which houses 2 TDC chips and shares most of its features with the 767.

The module is a multihit TDC with 20 bit resolution and allows COMMON START operations with 0.8 ns LSB. The unit features double hit resolution of 10 ns and can detect both leading and trailing edges.

The module is programmed via an on-board microcontroller by using a set of high-level symbolic commands, so enhancing the friendliness of the unit and its flexibility to match a large variety of experimental conditions (Trigger Matching, Continuous Storage and COMMON STOP emulation). A 32k x 32 bit deep output buffer completes the flexibility of the board.

The unit has a standard A24/A32 VME interface. The internal registers are available in D16 mode only, while the data buffer is available in D16, D32, BLT32 or MBLT64. Moreover, the unit supports the Chained Block Transfer and the Multicast commands.



Highlights

- Full Scale Range: 0.8 ms (with 40 MHz internal clock)
- 20 bit resolution
- Least Significant Bit: 0.8 ns
- Possibility of external clock (up to 45 MHz)
- 10 ns double hit resolution
- Rising and falling edge detection

Ordering options

Code	Description
VV767XBAAAAA	V767B - 128 Channel General Purpose Multihit TDC
VV767AXBAAAAA	V767AB - 64 Channel General Purpose Multihit TDC
WA967XAAAAAA	A967 - 32 Channel Cable Adapter (1x32 to 2x16) for V767, V862, V1190, VX1190, V1495

V775 - V775N 32 / 16 Channel Multievent TDC

Overview

The Mod. V775 is a 1-unit wide VME 6U module housing 32 Time-to-Digital Conversion channels. The Full Scale Range can be selected via VME from 140 ns to 1.2 μ s with 8 bit resolution. The board can operate both in COMMON START and in COMMON STOP mode. Each time interval between the COM signal and the input signal is converted into a voltage level by the TAC sections. The outputs of the TAC sections are multiplexed and subsequently converted by two fast ADC modules (5.7 μ s conversion time). The Mod. V775N houses 16 channels on LEMO 00 connectors and shares most of its features with the Mod. V775.

The integral non linearity is $\pm 0.1\%$ of full scale range (FSR), measured from 2% to 95% of FSR; the differential non linearity is $\pm 1.5\%$ of FSR, measured from 3% to 100% of FSR. The ADCs use a sliding scale technique to reduce the differential non-linearity.

Programmable zero suppression, multievent buffer memory, trigger counter and test features complete the flexibility of the unit. The module works in A24/A32 ADDRESS mode. The data transfer occurs in D16, D32, BLT32 or MBLT64 mode. The unit supports also the Chained Block Transfer (CBLT32/CBLT64) and the Multicast commands. The boards support the live insertion that allows inserting or removing them into the crate without switching it off.



Highlights

- Full scale range programmable from 140 ns to 1.2 μ s
- 12 bit resolution with 15 bit dynamic range
- 35 ps LSB
- 5.7 μ s / 32 ch and 2.8 μ s / 16 ch conversion times
- 600 ns fast clear time
- Zero and overflow suppression for each channel
- $\pm 0.1\%$ integral non linearity
- $\pm 1.5\%$ differential non linearity
- 32 event buffer memory
- BLT32/MBLT64/CBLT32/CBLT64 data transfer
- Multicast commands
- Live insertion

Ordering options

Code	Description
VV775XACAAAAA	V775AC - 32 Channel Multievent TDC (No 12V DCDC, No live ins)
VV775XNCAAAA	V775NC - 16 Channel Multievent TDC (No 12V DCDC, No live ins)

V462 Dual Gate Generator

Overview

The Mod. V462 houses, in 1-unit wide VME 6U unit, 2 independent Gate Generators. The width of each GATE output can be programmed either via VME or from the front panel in the range from 100 ns to 10 s, with a 100 ns step.

All the input and output signals are NIM levels. Together with the GATE, the unit provides BEGIN GATE and END GATE output pulses (100 ns wide). The output pulses have a fan out of two. The programmed gate width is displayed on two front panel displays, one per channel.

Each GATE can be started via a NIM input pulse, via VME or manually via the front panel START pushbutton. The unit has an A24, D16 VME interface.

(CEA-IRF SACLAY design)



Highlights

- 2 independent GATE generators
- GATE width programmable from 100 ns to 10 s (100 ns step)
- GATE width display for each channel
- NIM I/O signals
- External, push-button or VME trigger
- Begin GATE and End GATE signals available

Ordering options

Code	Description
WV462XAAAAAA	V462 - Dual Gate Generator

V486 8 Channel Gate and Delay Generator



Overview

The Mod. V486 houses, in a 1-unit wide VME 6U unit, 8 programmable Gate and Delay generators.

Both the input-output delay and the output pulse width can be independently programmed with 8 bit resolution. The programmable range for both gate and delay is 500 ns. The unit has a minimum programmable delay value that is 22 ns + 13% of the full scale.

All the input and output signals are ECL standard. The output pulses have a fan out of two. The unit can be tested both locally, via the front panel pushbutton, and remotely via a NIM input on the front panel. One of the channels can be selected via VME and fed to the MUX output.

A NIM level VETO signal can be used to disable the outputs.

The unit has a standard A32/A24, D16 VME interface and its VME base address can be set through 6 rotary switches housed in the module.



Highlights

- Independent programmable Gate and Delay generators
- Delay and Gate width programmable via VME for each channel
- 500 ns full-scale value of Gate width and Delay
- ECL I/O signals
- TEST, VETO and CLEAR inputs
- To be used only with V430 Backplane

Ordering options

Code	Description
WV486XAAAAAA	V486 - 8 Channel Gate and Delay Generator (500 ns, 500 ns, With JAUX)



V706 16 Channel Mean Timer

Overview

The Mod. V706 is a 16 Channel Mean Timer housed in a 1-unit wide VME module.

The module accepts 32 differential ECL inputs via two front panel multipin connectors (INPUTS 0 to 15) and produces 16 differential ECL outputs with fan-out of two that are available on two front panel flat cable connectors (OUTPUTS 0 to 15).

The maximum relative delay between the inputs is 30 ns and the timing resolution is 200 ps. Via internal trimmers it is possible to adjust the timings between the different channels. The Model V706 can be used with the CAEN VME Discriminators in order to obtain precise timing information when long scintillators are used.



Highlights

- 30 ns max. relative input delay
- 200 ps timing resolution
- 32 differential ECL inputs
- 16 ECL outputs with fan out of two
- VETO input
- **To be used only with V430 Backplane**

Ordering options

Code	Description
WV706XAAAAA	V706 - 16 Channel Meantimer With JAUX

V972 Delay Unit

Overview

The Mod. V972 is a 1-unit wide VME 6U module that houses a delay unit with a range from 0 to 31.5 ns with a 2.6 ns offset. The delay can be set in 0.5 ns steps via front panel toggle switches. The unit is made up of calibrated coaxial cable stubs for high accuracy delay and does not require any power supply. The module features LEMO 00 I/O connectors.



Highlights

- **Completely passive delay via a set of calibrated coaxial cable stubs (50 Ohm)**
- **0 to 31.5 ns delay with 2.6 ns offset**
- **0.5 ns resolution**
- **±100 ps accuracy on 0.5 to 8 ns delay steps; ±200 ps accuracy on 16 ns step**
- **VSWR < 1.15**

Ordering options

Code	Description
WV972XAAAAA	V972 - Delay Unit (2.6 to 34.1 ns)

V993B - V993C Dual Timer**NEW****Overview**

The Model V993B Dual Timer is a 1-unit VME module housing two identical triggered pulse generators.

The module produces NIM/TTL (NIM/TTL selection is performed via an on-board switch) and ECL pulses whose width ranges from 50 ns to 10 s when triggered. Output pulses are provided normal and negated.

Timers can be re-triggered with the pulse end marker signal, a short pulse occurring at the end of each output pulse.

The coarse adjustment of the output width is provided via a 9-position rotary switch, the fine adjustment can be performed via either a rotary handle or by providing an external voltage.

The trigger START can be provided via either an external signal (NIM, TTL or ECL) or manually via a front panel switch.

The module features also VETO and RESET input signals.

RESET is also available on a front panel switch.

The V993B is equipped with LEMO 00 connectors for NIM/TTL signals and male pin couples for ECL signals.

A double unit wide version (V993C), with locking dial switches for coarse adjustment, is also available.

**Highlights**

- Manual or pulse triggered START (NIM, TTL or ECL)
- Monostable (re-trigger) or bistable operation
- NIM, TTL and ECL output pulses from 50 ns to 10 s
- Manual or pulse triggered RESET
- (NIM, TTL and ECL) END-MARKER pulse
- VETO input

Ordering options

Code	Description
WV993XBAAAA	V993B - Dual Timer
WV993XCAAAA	V993C - Dual Timer (locking dial switch-double unit) NEW

V538A 8 Channel NIM-ECL/ECL-NIM Translator**Overview**

The Mod. V538A is a 1-unit wide VME module housing 8 independent logic level translators.

Each of the 8 channels accepts a NIM or ECL signal and provides two NIM and two ECL outputs (OUT 0÷7 A, B). The NIM and ECL inputs of each channel are ORed prior to fan-out.

The maximum operating frequency is 300 MHz.

Two front panel input bridged connectors accept a COMMON IN NIM signal, which allows the use of the module as a fan-out of 16 NIM and 16 ECL signals.

**Highlights**

- 8 independent NIM to ECL/NIM and ECL to NIM/ECL channels
- NIM and ECL fan-out of 2
- 300 MHz maximum operating frequency
- COMMON IN input with a fan-out of 16 (both NIM and ECL)
- I/O delay <5 ns

Ordering options

Code	Description
WV538XBAAAA	V538AB - 8 Channel NIM-ECL/ECL-NIM Translator

VME64X products

CAEN Short Form Catalog 2007

Function	Model	Description	Page
TDC	VX1190A	128 Channel Multihit TDC	70
TDC	VX1190B	64 Channel Multihit TDC	70
TDC	VX1290A	32 Channel Multihit TDC	70
TDC	VX1290N	16 Channel Multihit TDC	70
Controller	VX1718	VME-USB2.0 Bridge	71
Controller	VX2718	VME-PCI Optical Link Bridge	71

VX1190A - VX1190B 128/64 Channel Multihit TDC

Overview

The board is a 1-unit wide VME64X 6U module that houses 128 (VX1190A) or 64 (VX1190B) independent Multi-Hit/Multi-Event Time to Digital Conversion channels. The unit features High Performance TDC chips, developed by CERN. LSB can be set at 100 ps (19 bit resolution, 52 μ s FSR), 200 ps (19 bit, 104 μ s FSR) or 800 ps (17 bit, 104 μ s FSR). The channels can be enabled for the detection of hits rising/falling edges or for their width measurement (both the edges' timing, and the hit width can be measured with the selected resolution). For each channel there is a digital adjustment for the zero-ing of any offsets. The data acquisition can be programmed in "EVENTS" ("TRIGGER MATCHING MODE", with a programmable time window) or in "CONTINUOUS STORAGE MODE". Both ECL and LVDS input signals are supported.

The VME interface allows the module to work in A24 and A32 addressing modes. The board houses a 32 k x 32 bit deep Output Buffer, that can be readout via VME in a completely independent way from the acquisition itself. The internal registers are available in D16 mode only, while the Output Buffer is accessible in D32, BLT32 or MBLT64. The module supports also the Chained Block Transfer mechanism and the Multicast commands. The board has a special circuitry that allows it to be removed from and inserted in a powered crate without switching the crate off.



Highlights

- > 3 programmable ranges: 100 ps LSB (19 bit resolution), 200 ps LSB (19 bit) and 800 ps LSB (17 bit)
- > ECL/LVDS inputs automatically detected
- > 5 ns Double Hit Resolution
- > Leading and Trailing Edge detection
- > Trigger Matching and Continuous Storage acquisition modes
- > 32 k x 32 bit output buffer
- > BLT32/MBLT64/CBLT32/CBLT64 cycles supported
- > Multicast commands
- > Geographical address supported
- > Live insertion
- > VME64X Backplane required

Ordering options

Code	Description
WVX1190AEXAA	VX1190A - 128 Ch Multievent Multihit TDC 100-200-800 psec ECL/LVDS
WVX1190BEXAA	VX1190B - 64 Ch Multievent Multihit TDC 100-200-800 psec ECL/LVDS
WA967XAAAAAA	A967 - 32 Channel Cable Adapter (1x32 to 2x16) for V767, V862, V1190, VX1190, V1495

VX1290A - VX1290N 32/16 Channel Multihit TDC

Overview

The Mod. VX1290A is a 1-unit wide VME64X 6U module that houses 32 independent Multi-Hit/Multi-Event Time to Digital Conversion channels. The unit houses 4 High Performance TDC chips, developed by CERN. LSB is 25 ps (21 bit resolution, 52 μ s FSR). The module accepts both ECL and LVDS inputs.

The Mod. VX1290N houses 16 independent Multi-Hit/Multi-Event Time to Digital Conversion channels. It houses 2 High Performance TDC chips and shares most of its features with the VX1290A. The module accepts NIM inputs.

The channels can be enabled for the detection of hits rising/falling edges or for their width measurement. For each channel there is a digital adjustment for the zero-ing of any offsets. The data acquisition can be programmed in "EVENTS" ("TRIGGER MATCHING MODE", with a programmable time window) or in "CONTINUOUS STORAGE MODE". The VME interface allows the module to work in A24 and A32 addressing modes. The board houses a 32 k x 32 bit deep Output Buffer, that can be readout via VME in a completely independent way from the acquisition itself. The internal registers are available in D16 mode only, while the Output Buffer is accessible in D32, BLT32 or MBLT64. The module supports also the Chained Block Transfer mechanism and the Multicast commands.

The board has a special circuitry that allows it to be removed from and inserted in a powered crate without switching the crate off.



Highlights

- > 25 ps LSB
- > 21 bit resolution
- > 52 μ s full scale range
- > 5 ns Double Hit Resolution
- > Leading and Trailing Edge detection
- > Trigger Matching and Continuous Storage acquisition modes
- > 32 k x 32 bit output buffer
- > BLT32/MBLT64/CBLT32/CBLT64 cycles supported
- > Multicast commands
- > Geographical address supported
- > Live Insertion
- > VME64X Backplane required

Ordering options

Code	Version	Description
WVX1290AEXAA	VX1290A	32 Ch Multievent Multihit TDC 25 psec ECL/LVDS
WVX1290BNXAA	VX1290N	16 Ch Multievent Multihit TDC 25 psec NIM

VX1718 VME-USB2.0 Bridge

Overview

The Mod. VX1718 is a 1-unit wide 6U VME64X master module which can be operated from the USB port of a standard PC; the board can perform all the cycles foreseen by the VME64 (except those intended for 3U boards). The board can operate as VME System Controller (normally when plugged in the slot 1) acting as Bus Arbiter in Multimaster systems.

The VME bus activity can be monitored in detail, both locally (through a LED display) and remotely. The front panel includes also 5 TTL/NIM programmable outputs on LEMO 00 connectors (default assignment is: DS0/1, AS, DTACK, BERR and LOCATION MONITOR) and two programmable TTL/NIM inputs (on LEMO 00 connectors). The I/Os can be programmed via USB in order to implement functions like Timer, Counter, Pulse generator, I/O register, etc.

The VX1718 – PC interface is USB 2.0 compliant; previous issues are also supported. USB data transfer takes place through the High Speed Bulk Transaction protocol; the sustained data rate on the USB is up to 30 MByte/s in BLT Read cycles. Thanks to the 128KB memory buffer, the activity on the VME bus is not slowed down by the transfer rate on the USB port.

The Module is provided with drivers which support the use with the most common PC platforms (Windows 98/2000/XP, Linux); libraries and useful example programs in C/C++, Visual Basic and LabView are provided as well. Future firmware upgrade is possible via USB.



Highlights

- No boot required, ready at power ON
- Up to 30 MByte/s sustained data transfer rate
- VME Master (arbiter or requester)
- VME Slave (register and test RAM access)
- Cycles: R/W, RMW, BLT, MBLT, IACK, ADO, ADOH
- Addressing: A16, A24, A32, CR/CSR, LCK
- Data width: D8, D16, D32, D64
- System Controller capabilities
- Interrupt handler
- Front panel Dataway Display (available also from PC and VME)
- 5 outputs and 2 inputs, NIM or TTL, fully programmable
- VME64X Backplane required

Ordering options

Code	Description
WVX1718XAAAA	VX1718 - VME-USB 2.0 Bridge

VX2718 VME-PCI Optical Link Bridge

Overview

The Mod. VX2718 is a 1-unit wide 6U VME64X master module, which can be controlled by a standard PC equipped with the PCI controller card CAEN Mod. A2818.

The connection between the VX2718 and the A2818 takes place through an optical fiber cable (AY2705, AY2720, AI2705, AI2720). Multi crate sessions can be easily performed, since up to eight daisy chained (via optical fiber cables) VX2718 can be controlled by one A2818, thus building a CONet (Chainable Optical Network).

The VX2718 can perform all the cycles foreseen by the VME64 (except those intended for 3U boards). The board can operate as VME System Controller (normally when plugged in the slot 1) acting as Bus Arbiter in Multimaster systems.

The VME bus activity can be monitored in detail, both locally (through a LED display) and remotely. The front panel includes also 5 TTL/NIM programmable outputs on LEMO 00 connectors (default assignment is: DS0/1, AS, DTACK, BERR and LOCATION MONITOR) and two programmable TTL/NIM inputs (on LEMO 00 connectors). The I/Os can be programmed in order to implement functions like Timer, Counter, Pulse generator, I/O register, etc.

The sustained data transfer rate is up to 70 MByte/s. Thanks to the 128KB memory buffer, the activity on the VME bus is not slowed down by the transfer rate on the CONet when several VX2718s share the same network.

The Module is provided with drivers which support the use with the most common PC platforms (Windows 98/2000/XP, Linux); libraries and useful example programs in C/C++, Visual Basic and LabView are provided as well. Future firmware upgrade is possible via PCI.



Highlights

- No boot required, ready at power ON
- Daisy chain capability
- PCI 32bit / 33MHz
- Up to 70 MByte/s sustained data transfer rate
- VME Master (arbiter or requester)
- VME Slave (register and test RAM access)
- Cycles: R/W, RMW, BLT, MBLT, IACK, ADO, ADOH
- Addressing: A16, A24, A32, CR/CSR, LCK
- Data width: D8, D16, D32, D64
- System Controller capabilities
- Interrupt handler
- Front panel Dataway Display (available also from PC and VME)
- 5 outputs and 2 inputs, NIM or TTL, fully programmable
- VME64X Backplane required

Ordering options

Code	Description
WA2818XAAAAA	A2818 - PCI Optical Link
WK2718XAAAAA	VX2718KIT - VME-PCI Bridge (VX2718) + PCI Optical Link (A2818) + Optical Fibre 5m duplex (AY2705)
WVX2718XAAAA	VX2718 - VME-PCI Bridge
WAY2705XAAAA	AY2705 - Optical Fibre 5 m. duplex
WAY2720XAAAA	AY2720 - Optical Fibre 20 m. duplex
WAI2705XAAAA	AI2705 - Optical Fibre 5 m. simplex
WAI2720XAAAA	AI2720 - Optical Fibre 20 m. simplex

Powered Crate products

CAEN Short Form Catalog 2007



Function	Model	Description	Page
VME	VME8002	VME64 9 Slot 6U Mini Crate - 350 W Pluggable Power Supply	73 NEW
VME	VME8010	VME64 21 Slot 7U (6+1) Low Cost Crate - 470 W	73 NEW
VME	VME8011	VME64 21 Slot 7U (6+1) Low Cost Crate - 470 W Pluggable Power Supply	73 NEW
VME	VME8100	VME(64/64x/430) 21 Slot 8U (6+2) Crate Series - Configurable Power Supply	74 NEW
NIM	NIM8302/150W	NIM 10 slot 5U Crate - 150 W Pluggable Power Supply	75 NEW
NIM	NIM8301/300W	NIM 12 slot 7U (5+2) Crate - 300 W Pluggable Power Supply	75 NEW
NIM	NIM8301/600W	NIM 12 slot 7U (5+2) Crate - 600 W Pluggable Power Supply	75 NEW

VME8000 and VME8100 Crate Series

The VME8000 and VME8100 crate series consist of a VME mechanics both having flexible and pluggable Power Supply. A wide choice of options is available for building a small and flexible setup for all type of measurements. Thanks to the low noise Power Supply they are suitable both to analogue and digital electronics.

VME8002 VME64 9 Slot 6U Mini Crate

NEW


Highlights

- ...> 19" x 5U enclosure
- ...> 9 slot for 6U x 160mm VME modules
- ...> Pluggable 350W Power Supply
- ...> VME64 J1/J2 monolithic backplane
- ...> Short circuit protection
- ...> Over / Undervoltage protection
- ...> Over temperature protection
- ...> Remote control via CANBUS
- ...> Powered by 220 VAC or 115 VAC, 50-60 Hz
- ...> CBLT cycles supported

Overview

The Model VME8002 is a 9 slot VME crate, suitable for 6U x 160mm boards, with VME64 compliant backplane. The Unit is powered by 220 VAC or 115 VAC, 50-60 Hz. The crate is remotely controlled via CANBUS. The power distribution is +5V@30A, ±12V@8.5A.

Ordering options

Code	Description	
WV8002VME000	VME8002 - 6U VME64 9 Slot 6U Mini Crate - 350 W Pluggable Power Supply	NEW

VME8010 - VME8011 VME64 21 Slot 7U (6+1) Crates

NEW


Highlights

- ...> Low cost compact solution
- ...> 19" x 7U (6+1) enclosure
- ...> 21 slot for 6U x 160mm VME modules
- ...> 470W Power Supply
- ...> Pluggable Power Supply (VME8011 version)
- ...> VME64 J1/J2 monolithic backplane
- ...> Short circuit protection
- ...> Over / Undervoltage protection
- ...> Over temperature protection
- ...> 1U space for Fan Unit
- ...> Powered by 100÷230 VAC, 50 ÷ 60 Hz
- ...> CBLT cycles supported

Overview

The Model VME8010 and VME8011 are 21 slot VME crates, suitable for 6U x160mm boards, with VME64 compliant backplane. A 1U space is reserved for Fan Unit.

The Unit is powered by 100÷230 VAC, 50 ÷ 60 Hz. The Mod. VME8011 has a pluggable Power Supply.

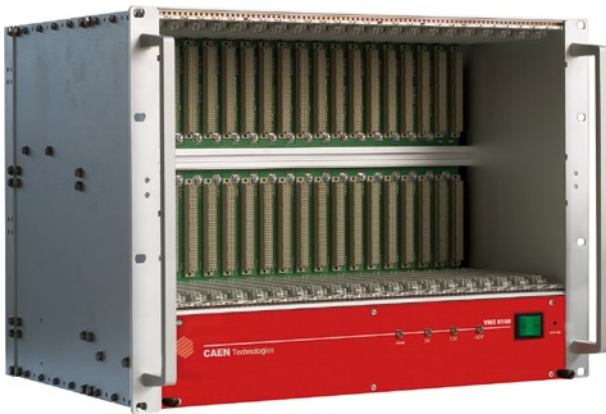
The power distribution is +5V@60A, -12V@6 A, +12V@8.9A.

Ordering options

Code	Description	
WV8010VME000	VME8010 - 7U (6+1) VME64 Low Cost 21 Slot Crate - 470 W	NEW
WV8011VME000	VME8011 - 7U (6+1) VME64 Low Cost 21 Slot Crate - 470 W Pluggable Power Supply	NEW
WV8011PSAAAA	V8011/PS - Pluggable Power Supply (+5V@60A, -12V@6 A, +12V@8.9A)	NEW

VME8100

VME(64/64X/430) 21 Slot 8U (6+2) Crate Series

NEW**Highlights**

- ...> 19" x 8U (6+2) enclosure
- ...> 21 slot for 6U x 160mm VME modules
- ...> Pluggable Power Supplies
- ...> Available with VME64, VME64X and VME430 compliant monolithic backplane
- ...> Pluggable 2U Fan Unit
- ...> Short circuit protection
- ...> Over / Undervoltage protection
- ...> Over temperature protection
- ...> Optionally available with CAN-bus or Ethernet interface for remote monitoring and control

Overview

The CAEN VME8100 crate series combines superior mechanical quality with lowest noise power supply technology. Microprocessor controlled power supplies and fan units are provided in order to guarantee the highest reliability. Three versions are available, with either standard, VME64, VME64X or VME430 backplanes.

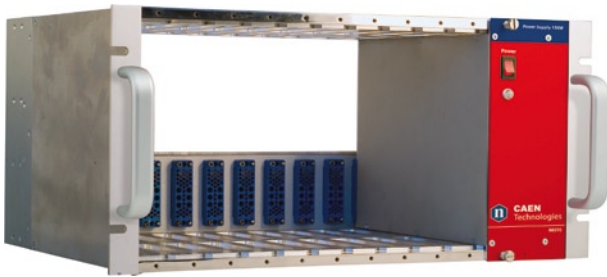
Ordering options

Code	Description	
WV8100VME000	VME8100 - 8U (6+2) VME64 21 Slot Crate	NEW
WV8100MAAAAA	V8100/M - Mechanics With J1/J2 Monolithic Backplane	NEW
WV8101AAAAAA	V8101 - Pluggable Power Supply (5V@110A; ±12V@20A)	NEW
WV8101AAAAAA	V8160 - Pluggable 2U Fan Unit	NEW
WV8100VME430	VME8100/V430 - 8U (6+2) VME430 21 Slot Crate	NEW
WV8100V430MA	V8100/V430/M - Mechanics With J1/JAux/J2 Monolithic Backplane	NEW
WV8101V430AA	V8101/V430 - Pluggable Power Supply (5V@110A; ±12V@20A; -5.2V@110A; -2V@110A; ±15V@20A) Max 2500W EU; Max 1500W USA	NEW
WV8100VME64X	VME8100/64X - 8U (6+2) VME64X 21 Slot Crate	NEW
WV8100V64XMA	V8100/64X/M - Mechanics With J1/J0/J2 Monolithic Backplane	NEW
WV810164XAAA	V8101/64X - Pluggable Power Supply (5V@110A; ±12v@20A; +3.3V@110A)	NEW
WA8120AAAAAA	A8120 - Extra Power Supply (5V@110A)	NEW
WA8121AAAAAA	A8121 - Extra Power Supply (-5.2V@110A)	NEW
WA8122AAAAAA	A8122 - Extra Power Supply (-2V@110A)	NEW
WA8123AAAAAA	A8123 - Extra Power Supply (3.3V@110A)	NEW
WA8140AAAAAA	A8140 - Extra Power Supply (±12v@20A)	NEW
WA8141AAAAAA	A8141 - Extra Power Supply (±15v@20A)	NEW

NIM8300 Crate Series

The NIM8300 crate series, consists of a NIM mechanics and a pluggable power supply (150W, 300W and 600W available). NIM standard, despite of its age, is still a great choice for building a small and flexible setup for high resolution measurements with analogue electronics such as amplifiers, ADCs, timing and logic units and also LV/HV power supplies.

NIM8302/150W 5U NIM Crate

NEW


Highlights

- > Low cost compact solution
- > 19" x 5U enclosure
- > 10 NIM slot
- > Pluggable 150W Linear Power Supply
- > Equipped with long-life NIM connectors
- > Short circuit protection
- > Over / Undervoltage protection
- > Over temperature protection

Overview

The CAEN Mod. NIM8302/150W is a compact (10 slot free) non ventilated 5U full size NIM crate (19"), provided with a pluggable 150W power supply.

NIM8301/300W NIM8301/600W

7U (5+2) NIM Crate; 300Watt & 600Watt

NEW


Highlights

- > 19" x 7U (5+2) enclosure
- > 12 NIM slot
- > Pluggable Linear Power Supplies
- > Alloy card guide structure
- > Equipped with long-life NIM connectors
- > Pluggable 2U Fan Unit
- > Short circuit protection
- > Over / Undervoltage protection
- > Over temperature protection

Overview

The CAEN Mod. NIM8301/300W and NIM8301/600W are 7U (5+2) full size NIM crates (19"), available with both pluggable 300W and 600W power supplies. The units are ventilated with pluggable 2U fan unit. Their features include protection against short circuit, Over / Undervoltage and over temperature.

Ordering options NIM8300 Crate Series

Code	Description	
WNIM8301300W	NIM8301/300W - 7U (5+2) NIM Crate - 300 W Pluggable Power Supply	NEW
WNIM8301600W	NIM8301/600W - 7U (5+2) NIM Crate - 600 W Pluggable Power Supply	NEW
WN8301MAAAAA	N8301/M - Mechanics	NEW
WN8301FAAAAA	N8301/F - Pluggable 2U Fan Unit	NEW
WNIM8302150W	NIM8302/150W - 5U NIM Crate	NEW
WN8302MAAAAA	N8302/M - Mechanics	NEW
WN8315WAAAAA	N8315 - Pluggable Linear Power Supply (±6V@5A; ±12V@3A; ±24V@1.5A)	NEW
WN8330WAAAAA	N8330 - Pluggable Linear Power Supply (±6V@17A; ±12V@3,4A; ±24V@3,4A)	NEW
WN8360WAAAAA	N8360 - Pluggable Linear Power Supply (±6V@17A; ±12V@8A; ±24V@8A)	NEW

Accessories products

CAEN Short Form Catalog 2007

Function	Model	Description	Page
HS CAENET Controller	A250	High Speed CAENET Manual Controller	77
HS CAENET Controller	A1303	High Speed CAENET PCI Controller	77
Controller	A1500	ARM Based General Purpose OEM Single Board Computer	77
Controller	A2818	PCI CONET Controller	78
Adapter	A293	CAMAC to NIM Power Adapter	78
Adapter	A385	16 Channel Flat-to-LEMO Cable Adapter for V785	78
Adapter	A392	16 Channel Flat-to-LEMO Cable Adapter for V792	78
Adapter	A967	32 Channel Cable Adapter for V767, V862, V1190, VX1190, V1495	79
Adapter	A992	16 Channel Impedance Adapter	79
Attenuator	A309	Single Channel 1 dB Attenuator	79
Attenuator	A310	Single Channel 3 dB Attenuator	79
Attenuator	A311	Single Channel 6 dB Attenuator	79
Attenuator	A312	Single Channel 12 dB Attenuator	79
Attenuator	A313	Single Channel 20 dB Attenuator	79
Splitter	A315	Splitter	80
HV Filter	A483	HV Bidirectional Passive Filter	80

OUT: 5VDC
1600mA

A250 High Speed CAENET Manual Controller



Overview

The Mod. A250 is a hand-held unit to monitor and control various CAEN modules via the HS CAENET serial link and protocol (1 MByte/s). Up to 99 daisy chained modules of different types can be controlled by a single Manual Controller. The protocol features simple yet effective programming and monitoring sequences. The A250 is particularly suited for setting up experiments, or laboratory tests. Settings are entered via a keypad and monitored via an alphanumeric LCD. Self explanatory messages are provided and errors are flagged in case of unsuccessful operations or out-of-range parameters selection.

Ordering options

Code	Description
WA250XAAAAA	A250 - High Speed CAENET Manual Controller

A1303 High Speed CAENET PCI Controller



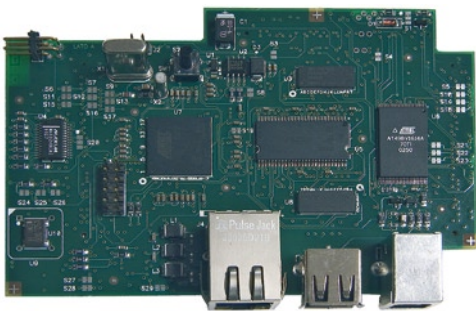
Overview

The Mod. A1303 is a 32-bit 33 MHz PCI card, which allows the control of a HS CAENET network through a standard PC. The communication path uses a simple 50 Ohm coaxial cable as its physical transmission line. The card drivers, together with C functions libraries, demo programs and diagnostic utilities are provided for both Windows and Linux Users.

Ordering options

Code	Description
WA1303XAAAA	A1303 - High Speed CAENET PC Controller (PCI Bus)

A1500 ARM Based General Purpose OEM Single Board Computer



Overview

The Mod. A1500 is a single board computer, suitable to a wide variety of product design and development tasks, whose core is the Atmel AT91RM9200 Microprocessor which provides excellent performance with low power consumption. These features, combined with the on-chip I²C, 5USART, 3SSC, USB Device, USB Host, Smart Media, 10/100 Ethernet, SPI and Compact Flash interfaces, allow the AT91RM9200 to form the basis of low-cost, high performance products for industrial automation, telematics, medical applications and many others. The AT91RM9200 Address and Data Bus as well as all GPIO are available via three 100-pin connectors.

Ordering options

Code	Description
WA1500XAAAA	A1500 - General Purpose Single Board CPU
WA751XAAAAA	A751 - Develop board for A1500

A2818 PCI CONet Controller**Overview**

The Mod. A2818 is a 32-bit 33 MHz PCI card, which allows the control, through a standard PC, of the CONet (the network of up to eight daisy chained V2718/VX2718 VME-PCI Bridges or V1721/V1724 Digitizers). The communication path uses optical fiber cables as physical transmission line (AY2705, AY2720, AI2705, AI2720). The card drivers, together with C functions libraries and demo programs are provided for both Windows and Linux Users.

Ordering options

Code	Description
WA2818XAAAA	A2818 - PCI Optical Link
WAY2705XAAAA	AY2705 - Optical Fibre 5m duplex
WAY2720XAAAA	AY2720 - Optical Fibre 20m duplex
WAI2705XAAAA	AI2705 - Optical Fibre 5m simplex
WAI2720XAAAA	AI2720 - Optical Fibre 20m simplex

A293 CAMAC to NIM Power Adapter**Overview**

The Mod. A293 allows the insertion of NIM modules inside a CAMAC crate by using the power lines of the CAMAC standard Dataway. The required ± 12 V power lines are obtained from the standard ± 24 V by means of independent voltage regulators.

Ordering options

Code	Description
WA293XAAAAA	A293 - CAMAC to NIM Power Adapter

A385 - A392 16 Channel LEMO Adapters**Overview**

The Mod. A385 and A392 allows to provide respectively the V785 and the V792, with LEMO 00 input connectors, adapting them to the flat connectors. The models A385 and A392 fit into one 17+17 pin male flat type connector and are provided with 16 LEMO 00 male connectors each. The Mod. A385 can also be used to match the output flat connectors of the Mod. N568B/LC Spectroscopy Amplifier with the LEMO input connectors of a discriminator (such as V812, V895 etc.). The devices are completely passive mechanical adapters for analog signals and feature 50 cm long cables.

Ordering options

Code	Description
WA385XAAAAA	A385 - 16 Channel Cable Adapter (Flat to Lemo) for V785, 50cm $\pm 10\%$ cables
WA392XAAAAA	A392 - 16 Channel Cable Adapter (Flat to Lemo) for V792, 50cm $\pm 10\%$ cables

A967 32 Channel Cable Adapter for V767, V862, V1190, VX1190, V1495**Overview**

The Model A967 allows to adapt one Robinson Nugent high density flat connector (used on V862, V767, V767A, V1190A/B, VX1190A/B and V1495) into two 17+17-pin Header-type male connectors with locks through two 25 cm long flat cables.

Ordering options

Code	Description
WA967XAAAAAA	A967 - 32 Channel Cable Adapter (1x32 to 2x16) for V767, V862, V1190, VX1190, V1495

A992 16 Channel Impedance Adapter**Overview**

The Mod. A992 is a plug-in card, provided with 16 independent input channels on a 34 pin male header connector, to be inserted into the Mod. V792 QDC's front panel connectors (one V792 requires two A992 adapters). The card matches the QDC's input impedance from 50 Ohm to 110 Ohm, decouples the QDC's and the source's ground and converts differential signals into single ended signals.

Ordering options

Code	Description
WA992XAAAAAA	A992 - 16 Channel Impedance Adapter for V792

A309 - A310 - A311 - A312 - A313**Single Channel Fixed Attenuators****Overview**

The Mod. A309, A310, A311, A312 and A313 are simple devices that provide a fixed attenuation (1, 3, 6, 12 and 20 dB respectively). The attenuators are 50 Ohm adapted and feature LEMO female type connectors; they do not require any power supply since they are made up of resistive cells.

Ordering options

Code	Description
WA309XAAAAAA	A309 - Single Channel Fixed Attenuator (1dB)
WA310XAAAAAA	A310 - Single Channel Fixed Attenuator (3dB)
WA311XAAAAAA	A311 - Single Channel Fixed Attenuator (6dB)
WA312XAAAAAA	A312 - Single Channel Fixed Attenuator (12dB)
WA313XAAAAAA	A313 - Single Channel Fixed Attenuator (20dB)

A483 HV Bidirectional Passive HV Filter**Overview**

The Mod. A483 is a bidirectional passive HV filter. The filter has a Maximum Input Voltage of ± 8 kV. The Ripple Rejection is 20 dB (26 dB @ 36 KHz), measured with 50 mVpp (40 mVpp @ 36 KHz) input ripple, 8 kV Input DC Voltage and 8 μ A Output Current.

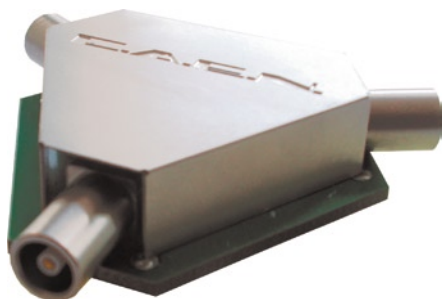
It does not require any power supply since it is made up of passive components.

The module is designed to be used together with a HV Power Supply when a low ripple is required (E.G. for Ge-detector applications).

The High Voltage input and output are provided by SHV connectors.

Ordering options

Code	Description
WA483XAAAAA	A483 - HV Filter (8KV)

A315 Splitter**Overview**

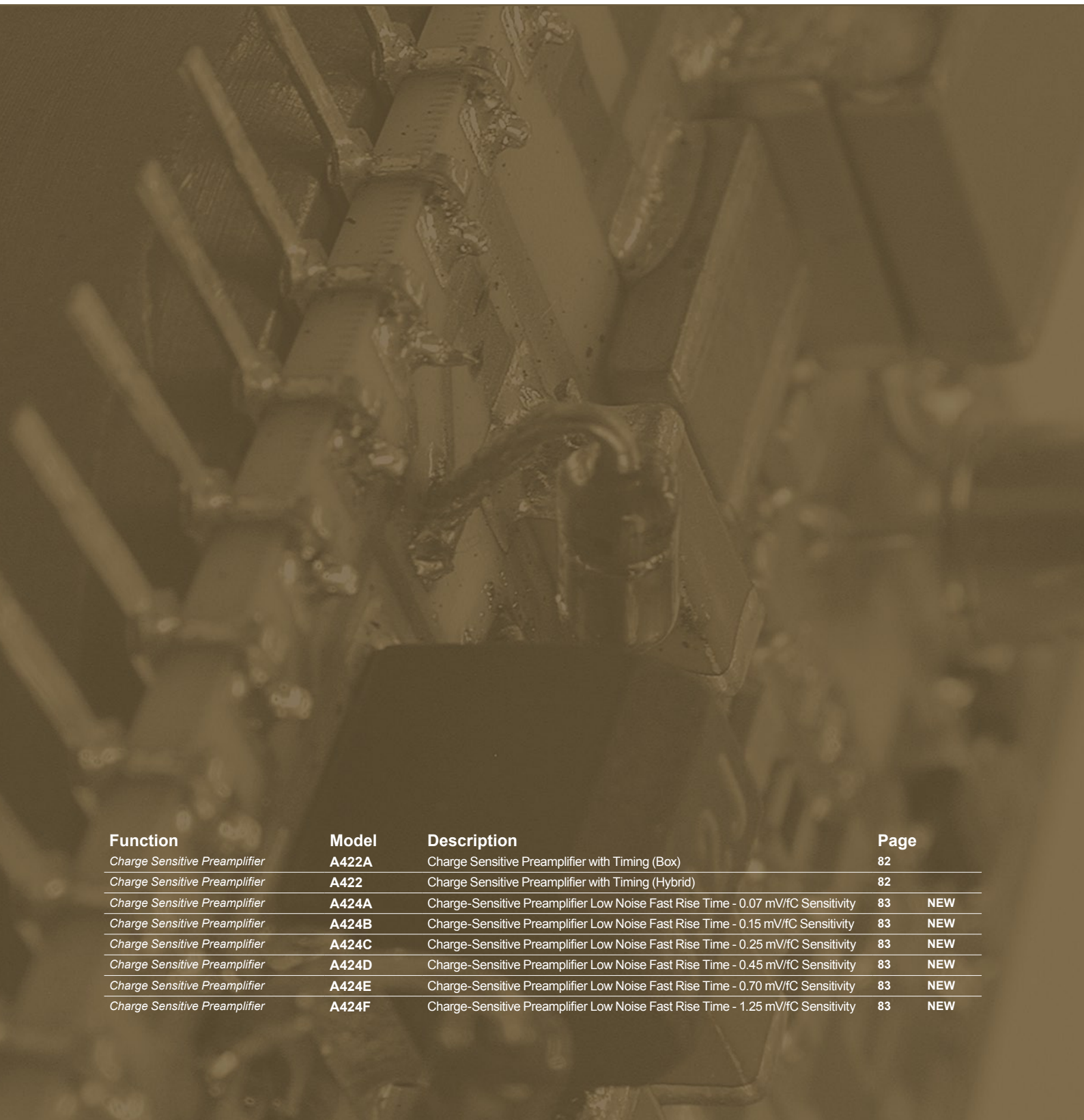
The Mod. A315 splits one input on two output signals. All the connectors are LEMO female type. The splitter is adapted for 50 Ohm lines. The device is completely passive (no power supply is required); the amplitude on each output is one half of that on the input.

Ordering options

Code	Description
WA315XAAAAA	A315 - Splitter

Preamplifiers products

CAEN Short Form Catalog 2007



Function	Model	Description	Page
Charge Sensitive Preamplifier	A422A	Charge Sensitive Preamplifier with Timing (Box)	82
Charge Sensitive Preamplifier	A422	Charge Sensitive Preamplifier with Timing (Hybrid)	82
Charge Sensitive Preamplifier	A424A	Charge-Sensitive Preamplifier Low Noise Fast Rise Time - 0.07 mV/fC Sensitivity	83 NEW
Charge Sensitive Preamplifier	A424B	Charge-Sensitive Preamplifier Low Noise Fast Rise Time - 0.15 mV/fC Sensitivity	83 NEW
Charge Sensitive Preamplifier	A424C	Charge-Sensitive Preamplifier Low Noise Fast Rise Time - 0.25 mV/fC Sensitivity	83 NEW
Charge Sensitive Preamplifier	A424D	Charge-Sensitive Preamplifier Low Noise Fast Rise Time - 0.45 mV/fC Sensitivity	83 NEW
Charge Sensitive Preamplifier	A424E	Charge-Sensitive Preamplifier Low Noise Fast Rise Time - 0.70 mV/fC Sensitivity	83 NEW
Charge Sensitive Preamplifier	A424F	Charge-Sensitive Preamplifier Low Noise Fast Rise Time - 1.25 mV/fC Sensitivity	83 NEW

A422A Charge Sensitive Preamplifier with timing (Box)

Overview

The Mod. A422A is a charge sensitive preamplifier, designed to be used especially with semiconductor detectors and in particular whenever the charge division is required (as in position sensitive silicon detectors). The unit accepts both positive and negative input pulses. A Test input for detector gain calibration and a HV input (up to 5 kV) for the detector bias are also included. The output is an inverting unipolar voltage pulse, proportional in amplitude to the integrated charge; decay time is 300 μ s. A Timing output provides an unipolar inverting fast voltage pulse, with a 15 ns typical rise time, across a 50 Ohm load. Three different sensitivities (5, 30 or 60 mV/MeV) can be selected.



Highlights

- ...> Positive or negative input signals
- ...> Energy sensitivity range of 5, 30 or 60 mV/MeV (Si)
- ...> Low noise
- ...> Timing output
- ...> Up to 5 kV (positive or negative) detector bias voltage

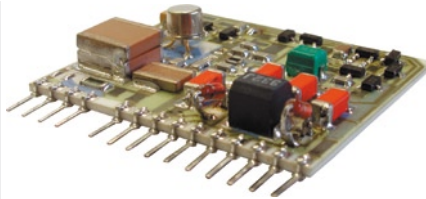
Ordering options

Code	Description
WA422AXAAAAA	A422A - Charge Sensitive Preamplifier with timing (Box)

A422 Charge Sensitive Preamplifier with Timing (Hybrid)

Overview

The Mod. A422 is a charge sensitive preamplifier implemented on an open frame SIP hybrid assembly. The module is designed to be used especially with semiconductor detectors and in particular whenever the charge division is required (as in position sensitive silicon detectors). The unit accepts both positive and negative input pulses. A Test input for detector gain calibration and a HV input (up to 1 kV) for the detector bias are also included. The output is an inverting unipolar voltage pulse, proportional in amplitude to the integrated charge; decay time is 220 μ s. A Timing output provides an unipolar inverting fast voltage pulse, with a 15 ns typical rise time, across a 50 Ohm load. Three different sensitivities (1, 45 or 90 mV/MeV) can be selected via internal connections. A 8-slot motherboard for the A422 is also available; it can be purchased equipped with LEMO 00 I/O connectors (Mod. A658) or with soldering pads (Mod. A658A).



Highlights

- ...> Fast, low noise inverting preamplifier
- ...> Positive or negative input signals
- ...> Energy sensitivity range selectable between 1, 45 or 90 mV/MeV (Si)
- ...> Timing output
- ...> Up to 1 kV (positive or negative) detector bias voltage

Ordering options

Code	Description
WA422XAAAAAA	A422 - Charge Sensitive Preamplifier with timing (Hybrid)
WA658AXAAAAA	A658A - A422 Mother Board (Without connectors)
WA658XAAAAAA	A658 - A422 Mother Board (With connectors)

A424A/B/C/D/E/F Low Noise Fast Rise Time Charge Sensitive Preamplifier**NEW****Overview**

The Mod. A424 preamplifier is a low-noise charge sensitive amplifier suitable for use with charged-particle detectors, scintillation detectors, or proportional counters. Fast rise time and small size make this module excellent for small detectors or laboratory measurements.

The preamplifier is optimized for high input capacitance (up to 1000 pF).

The module has a HV detector bias input (up to ± 3 kV), a protection circuit to avoid breakdown of the preamplifier's input circuit, and a test input for detector gain calibration.

The preamplifiers line Mod A424 include six options with the following sensitivities:

A424A: 0.07 mV/fC

A424B: 0.15 mV/fC

A424C: 0.25 mV/fC

A424D: 0.45 mV/fC

A424E: 0.70 mV/fC

A424F: 1.25 mV/fC

The Preamplifier input is provided by SHV connector and accepts positive and negative input pulses from detectors and supplies the HV bias to the detectors itself. The output, provided by BNC connector, is an inverting unipolar voltage pulse, proportional in amplitude to the integrated charge. A test input for detector gain calibration, provided by BNC connector, and a HV input (up to 3 kV), provided by SHV connector, are also included.

**Highlights**

- ...> **Fast, low noise inverting preamplifier**
- ...> **Positive or negative input signals**
- ...> **Energy sensitivity from between 0.07 to 1.25 mV/fC**
- ...> **Up to 3 kV (positive or negative) detector bias voltage**

Ordering options

Code	Description	
WA424AXAAAAA	A424A - Low-Noise, Fast-Rise-Time, Charge-Sensitive Preamplifiers 0.07 mV/fC sensitivity	NEW
WA424BXAAAAA	A424B - Low-Noise, Fast-Rise-Time, Charge-Sensitive Preamplifiers 0.15 mV/fC sensitivity	NEW
WA424CXAAAAA	A424C - Low-Noise, Fast-Rise-Time, Charge-Sensitive Preamplifiers 0.25 mV/fC sensitivity	NEW
WA424DXAAAAA	A424D - Low-Noise, Fast-Rise-Time, Charge-Sensitive Preamplifiers 0.45 mV/fC sensitivity	NEW
WA424EXAAAAA	A424E - Low-Noise, Fast-Rise-Time, Charge-Sensitive Preamplifiers 0.70 mV/fC sensitivity	NEW
WA424FXAAAAA	A424F - Low-Noise, Fast-Rise-Time, Charge-Sensitive Preamplifiers 1.25 mV/fC sensitivity	NEW

Sincrotrone Trieste



CAEN's collaboration with Sincrotrone Trieste SCpA focuses on electronics for innovative electron spectroscopy analysers.

Sincrotrone Trieste SCpA is the company that manages ELETTRA Laboratory, a multidisciplinary, third generation synchrotron radiation facility located in Trieste, Italy.

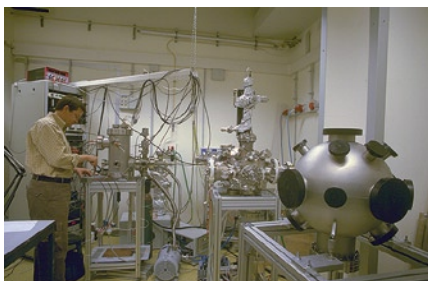
ELETTRA is equipped with ultra-bright light sources in the spectral range from UV to X-rays and offers an international and competitive environment to researchers from Universities, national laboratories and enterprises from all over the world.

One of the typical research fields using synchrotron light is material science, whose main goal is to investigate materials' structure, chemical composition, band structure and energy density of electron states.

Most experiments consist of bombarding the target with particles or radiation (photons, ions or electrons) and observing the resulting processes and reactions. In general, the first property to be analysed with an electron analyser, is the energy of the emitted particle. For this purpose Sincrotrone Trieste has implemented electronic devices particularly suitable to acquire the signals coming out of the analyser itself.

The cooperation with CAEN has led to the development of the SY900 S Multichannel Floating High Insulation System, which is able to control the electrostatic lenses' system employed in electron analysers, with speed and precision. The system represents a comprehensive solution for electron spectroscopy and piezo motor applications, and may be easily customized to meet the requirements of most synchrotron users.

Call CAEN for further information.



Instrumentation and detectors laboratory



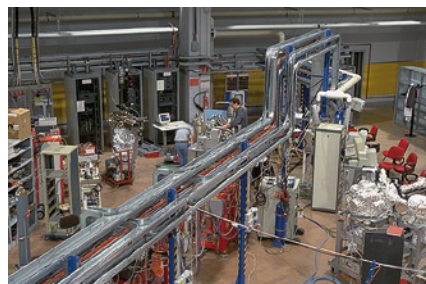
X-ray diffraction beamline control room



View of the Elettra experimental hall



LILIT beamline laboratories



View of the Elettra experimental hall



LILIT beamline laboratories

SY900S Multi-Channel High Insulation System

The SY900S is a powerful and versatile instrumentation system especially suited for applications in experimental physics (i.e. electron spectroscopy). A main general purpose control unit (A900) supplies and supervises all the connected modules assuring the communications with any host computer via ethernet or serial link. The system, a 19"/6U euro-mechanics rack, consists of:

- One controller unit 6U high 15TE wide (A900)
- Up to 8 modules 3U high 15TE wide (i.e. A90Xs)

Various modules are available for different applications and may be combined in various configurations. The most widespread is the A90XS High Voltage Power Supply family. Its modules, generating highly stable floating voltages ranging from



100V to 6kV, are particularly suited to drive complex electrostatic elements. Each module provides high voltage power supplies floating with respect to the ground and stackable with other modules. The SY900S system has no communication bus; the modules are daisy chained by cables both for power supply and for data acquisition. Other modules are available as a High Precision and Fast Settling Voltage Generator board (A910S) based on a 16 bits programmable DAC, which supplies 13, 32 or 64V bipolar

voltages, or as the A1902BS module which is a 4 Channels Linear Bipolar Power Supply delivering +2kV/-2kV @ 0.5mA especially designed to drive piezoelectric motors.

A pre-loaded Linux OS kernel provides the SY900 controller. Under this OS, a proprietary compact and reliable control system handles all the connected power supply modules as well as the external interfaces. As the instrumentation is designed for experimental set-ups of large scientific facilities, an EPICS integration tool has been also provided to the user. Under EPICS, the field I/O is concentrated on low level local controllers called I/O Controllers (IOC). The SY900 may act as an IOC under EPICS environment.

A1902BS 4 Channels Bipolar Power Supply

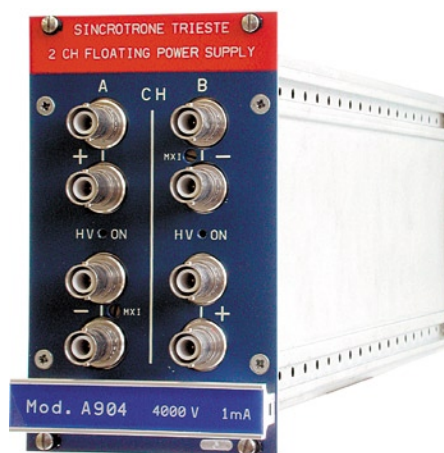
The A1902BS module is a 4 Channels Linear Bipolar Power Supply delivering +2kV/-2kV @ 0.5mA especially designed for driving piezoelectric loads. It is completely compatible with the A90XS family mechanical and electrical standard, although it is not floating but it is referred to ground. It allows bipolar operations and it has 4 channels for its more compact internal design. The A1902BS has a very low ripple of 5mV on the voltages supplied. This feature makes it extremely suitable for applications that require very high stability (i.e. benders for bimorph mirrors).



- > -2kV/2kV output voltage
- > Referred to ground
- > 4 channels per module
- > Resolution 16 bits
- > No communication bus
- > Max current internally limited
- > Very low ripple <5mV
- > Voltage and current monitor
- > Bipolar

A90XS High Voltage Floating Power Supply

The A90XS High Voltage Floating Power Supply family generates highly stable floating voltages ranging from 100V to 4kV, they are particularly suited to drive complex electrostatic elements. Each module provides high voltage power supplies floating with respect to the ground and stackable with other modules. For applications that are more demanding in terms of stability and precision, a High Precision and Fast Settling Voltage Generator module (A910S) is available, based on a 16 bits programmable DAC which supplies 13, 32 or 64V bipolar voltages. The A90XS family provides two independent and floating channels for each module, so that up to 16 channels can be housed in a single 19"/6U crate.



- > Up to 6kV output voltage
- > 6kV insulation vs. ground
- > Up to 16 channels per crate
- > 16 bits DAC unit
- > Stackable modules
- > No communication bus
- > 1mA programmable max current
- > 16 bit resolution (14 bit accuracy)
- > Voltage and current monitor
- > Low ripple (<20ppm/FS)

A910 16 bit DAC programmable board

The A910 S module is a 16 bit DAC programmable board for generation of extreme stable voltage in the range ± 12 V, ± 32 V, ± 64 V.

Particularly suitable to be cascaded with A90XS series power supplies, it is insulated with respect to ground up to 6kV.

It operates in all four quadrants and can draw and sink more than 10mA.

Capable of generating an arbitrarily composed waveform up to 400kHz (the contents of the whole memory can be outputted at 400kHz max).

Can be made to operate as a bipolar power supply directly outputting a particular voltage.

A910S modules provide a 2 pins lemo connector located on the front panel allowing to step values stored in internal eeprom with respect to an external synchronization signal (opto-insulated input).

The A910S family provides one channel per box.



- > +/- 64 V range
- > 6 kV insulation vs ground
- > Resolution 16 bit
- > No communication bus
- > 100 mA source/ 7 sync capability
- > Max current internally limited
- > Very low ripple < 5 mV
- > Bipolar

AH401 Picoammeter

The AH401 is a high resolution ultra-low current picoammeter. The charge-digitizing converter AH401 performs 20 bit currents measurements from 50pA (resolution 50aA) up to 350nA (resolution 350fA) with integration times from 1 ms to 1 s. The AH401 is light, extremely compact and allows simultaneous 4 channels operations: ideally suited for current measurements of four quadrant BPMs, photodiodes, segmented Ion-Chambers and wherever parallel multichannel currents acquisition is a concern. Its USB2.0 High-Speed link allows very fast data acquisition (currently up to 1 kHz) without significant dead time data transfer. Optionally a standard serial communication for longer distance data transmission is available.



- > 50 pA to 350 nA input range
- > 20 bit resolution
- > 4 channels input
- > Simultaneous input acquisition
- > ContinuousContinuous data sampling (no dead time)
- > 1 mS ms to 1 s integration time
- > USB 2.0 high speed link

NIM Power Supply Units

T1

Model	No. of Channels	V Full Scale (kV)	I Full Scale (mA)	Vset/Vmon resolution (V)	Iset/Imon resolution (nA)	Ramp UP/DWN full scale (V/s)	Max Ripple (mVpp)	Connectors
N470 p.15	4	± 3 / 4 / 8	3 / 2 / 1	1	1000	500	300	SHV
N471 p.15	2	± 3 / 8	3 / 1	1	1000	200 (fixed)	300	SHV
N471A p.15	2	± 8	0.008	1	1	200 (fixed)	60	SHV
N471G p.16	2	± 8	0.008	1	1	1 (fixed)	5 (with A483 filter)	SHV
N472 p.16	4	± 3 / 6	3 / 1	analog setting	analog setting	1000 (fixed)	30 @ 3 kV 80 @ 6 kV	SHV

All specifications guaranteed from 10% to 90% of FSR

Power Supply System - Mainframes

T2

Model	Max power (W)	Power requirements	Width	Height	Depth	Supported boards	Max # boards	Local control	Remote control
SY1527 p.17	2250	100 ÷ 230 Vac, 50 ÷ 60 Hz, 3400 W	19"	8 EU	72 cm	A15xx, A17xx, A18xx, A19xx A1676A	16	Keypad, 7.7" color LCD	RS232, TCP/IP
SY1527LC p.18	2250	100 ÷ 230 Vac, 50 ÷ 60 Hz, 3400 W	19"	8 EU	72 cm	A15xx, A17xx, A18xx, A19xx A1676A	16	n/a	RS232, TCP/IP
SY2527 p.19	750	100 ÷ 230 Vac, 50 ÷ 60 Hz, 1700 W	19"	4 EU	77 cm	A15xx, A17xx, A18xx, A19xx A1676A	6	Keypad, 7.7" color LCD	RS232, TCP/IP
SY3527 p.19	300	100 ÷ 230 Vac, 50 ÷ 60 Hz, 600 W	19"	3 EU	61 cm	A15xx, A17xx, A18xx, A19xx A1676A	2	n/a	RS232

SY1527 - SY2527 - SY3527 LV Floating Power Supply Boards

T3

Model	No. of Channels	V Full Scale	I Full Scale	Vset/Vmon resolution (mV)	Iset/Imon resolution	Ramp UP/DWN full scale (V/s)	Max Ripple (mVpp)	Connectors	Features
A1513B p.20	6	10 V	2.7 A	10	10 mA	19	5	DB37	Floating Channels
A1514B p.20	7	2x500 V	2x10/1 mA	2x100	2x1/0.1 µA	2x50	2x30	DB37	Floating Channels
		3x10 V	3x2.7 A	3x10	3x10 mA	3x19	3x5		
		2x7 V	2x4 A	2x10	2x10 mA	2x14	2x5		
A1516B p.20	6	15 V	1.5 A	10	10 mA	29	5	DB37	Floating Channels
A1517B p.20	6	7 V	4 A	10	10 mA	14	5	DB37	Floating Channels
A1518B p.20	6	4.5 V	6 A	10	10 mA	9	5	DB37	Floating Channels

All specifications guaranteed from 10% to 90% of FSR

SY1527 - SY2527 - SY3527 HV Floating Power Supply Boards

T4

Model	No. of Channels	V Full Scale	I Full Scale	Vset/Vmon resolution (mV)	Iset/Imon resolution	Ramp UP/DWN full scale (V/s)	Max Ripple (mVpp)	Connectors	Features
A1510 <i>p.20</i>	12	100 V	10 / 1 mA	20	1 μ A	50	20	DB37	Floating Channels
A1511B <i>p.20</i>	12	500 V	10 / 1 mA	100	1 / 0.1 μ A	50	30	DB37	Floating Channels
A1512 <i>p.20</i>	12	500 V	1 / 0.1 mA	100	100 / 10 nA	50	30	DB37	Floating Channels
A1514B <i>p.20</i>	7	2x500 V	2x10/1 mA	2x100	2x1/0.1 μ A	2x50	2x30	DB37	Floating Channels
		3x10 V	3x2.7 A	3x10	3x10 mA	3x19	3x5		
		2x7 V	2x4 A	2x10	2x10 mA	2x14	2x5		
A1519B <i>p.20</i>	12	250 V	1 / 0.1 mA	50	100 / 10 nA	50	30	DB37	Floating Channels
A1520P <i>p.21</i>	12	500 V	15 mA	1	set: 250 nA mon: 25 nA	50	20	AMP75	Floating Channels
A1526 P/N <i>p.22</i>	6	15 kV	1 / 0.1 mA	1000	100 / 10 nA	500	40	CPE HV	Common floating RTN
A1533 P/N <i>p.21</i>	6	4 kV	3 mA	500	500 nA	500	25	SHV	Floating Channels
A1534 P/N <i>p.21</i>	6	8 kV	200 μ A	500	20 nA	500	50	CPE 3 pole	Floating Channels
A1535 P/N <i>p.22</i>	24	3.5 kV	3 mA	500	500 nA	500	20	Radiall 52	Common floating RTN
A1932A P/N <i>p.22</i>	48	3 kV	500 μ A	200	-	500	30	Radiall 52	Common floating RTN

All specifications guaranteed from 10% to 90% of FSR

SY1527 - SY2527 - SY3527 HV Power Supply Boards

T5

Model	No. of Channels	V Full Scale (kV)	I Full Scale (mA)	Vset/Vmon resolution (mV)	Iset/Imon resolution (nA)	Ramp UP/DWN full scale (V/s)	Max Ripple (mVpp)	Connectors
A1732 P/N p.23	12	6	1	500	100	500	30	SHV
A1733 P/N p.23	12	3/4	3 / 2	250	200	500	30	SHV
A1733B P/N p.23	28	3/4	3 / 2	250	200	500	30	Radiall 52
A1735 P/N p.23	12	1.5	7	100	500	500	30	SHV
A1737 P/N p.23	12	0.25	1	20	100	50	20	SHV
A1738 P/N p.23	12	1.3	10	100	500	500	30	SHV
A1821 P/N p.23	12	3	0.2 / 0.02	250	20 / 2	500	30	SHV
A1821H P/N p.23	12	3	0.2 / 0.01	250	20 / 1	500	30	SHV
A1832 P/N p.23	12	6	1 / 0.2	500	100 / 20	500	30	SHV
A1832E P/N p.23	12	6	1 / 0.2	500	100 / 20	500	30	SHV
A1833 P/N p.23	12	3/4	3 / 2 / 0.2	250	200 / 20	500	30	SHV
A1833B P/N p.23	28	3/4	3 / 2 / 0.2	250	200 / 20	500	30	Radiall 52
A1835 P/N p.23	12	1.5	7 / 0.2	100	500 / 20	500	30	SHV
A1837 P/N p.23	12	0.25	1 / 0.1	20	100 / 10	50	20	SHV

All specifications guaranteed from 10% to 90% of FSR

EASY3000 Remote Crates

T6

Model	Nr. of modules per Crate (max)	Depth	Height	Width	Access	Connectors
EASY3000 p.25	10	50 cm	6 U	19"	Rear	APP PC5933T
EASY3000B p.25	10	50 cm	6 U	19"	Rear	Brass hexagon head bolt
EASY3000S p.25	10	50 cm	6 U	19"	Front	APP PC5933T

EASY3000 HV Power Supply Boards

T7

Model	No. of Channels	Voltage Full Scale (V)	Current Full Scale	Vset/Vmon resolution	Iset/Imon resolution	Max power per channel (W)	Width (slots)	No. max of boards per crate	Max Ripple (mVpp)	Connectors
A3501 P/N p.26	12	100	1 mA	100 mV	100 nA	0.1	2	10	30	SHV
A3512 P/N p.26	6	12000	1 mA	1 V	100 nA	12	3	7	50	CPE HV
A3535 P/N p.26	32	3200	500 μ A	500 mV	100 nA	1.75	4	5	50	SHV
A3540 P/N p.26	12	4000	1 mA	500 mV	100 nA	4	2	10	30	SHV

All specifications guaranteed from 10% to 90% of FSR

EASY3000 LV Floating Power Supply Boards

T8

Model	No. of Channels	Voltage Full Scale (V)	Current Full Scale (A)	Vset/Vmon resolution (mV)	Iset/Imon resolution	Max power per channel	Width (slots)	No. max of boards per crate	Max Ripple (mVpp)	Connectors
A3006 <i>p.27</i>	6	4 ÷ 16	6	10	10 mA	90 W	4	5	20	APP 1317G4
A3009 <i>p.27</i>	12	2 ÷ 8	9	5	10 mA	45 W	4	5	20	APP 1317G4
A3009B <i>p.27</i>	12	2 ÷ 8	9	5	10 mA	45 W	4	5	20	Brass hexagon head bolt
A3016 <i>p.27</i>	6	2 ÷ 8	16	5	10 mA	90 W	4	5	20	APP 1317G4
A3016B <i>p.27</i>	6	2 ÷ 8	16	5	10 mA	90 W	4	5	20	Brass hexagon head bolt
A3025 <i>p.27</i>	4	2 ÷ 8	25	5	100 mA	150 W	4	5	10	APP PC5933T
A3025B <i>p.27</i>	4	2 ÷ 8	25	5	100 mA	150 W	4	5	10	Brass hexagon head bolt
A3050 <i>p.27</i>	2	2 ÷ 8	50	5	100 mA	300 W	4	5	10	APP PC5933T
A3050B <i>p.27</i>	2	2 ÷ 8	50	5	100 mA	300 W	4	5	10	Brass hexagon head bolt
A3100 <i>p.27</i>	1	2 ÷ 8	100	5	100 mA	600 W	4	5	10	APP PC5933T
A3100B <i>p.27</i>	1	2 ÷ 8	100	5	100 mA	600 W	4	5	10	Brass hexagon head bolt
A3602 <i>p.27</i>	3	2 ÷ 7	5	5	10 mA	35 W	2	10	5	DB37
A3802 <i>p.29</i>	128	-4	0.004	1	1 µA	16 mW	2	10	n/a	Std. Flat

All specifications guaranteed from 10% to 90% of FSR

EASY3000 ADCs Boards

T9

Model	No. of Channels	Input Range	Resolution	Width (slots)	No. max of boards per crate	Connectors
A3801 <i>p.28</i>	128	0 ÷ 10 V	200 µV	2	10	Std. Flat
A3801A <i>p.28</i>	128	-4 ÷ +125 °C	0.1°C	2	10	Std. Flat

EASY3000 AC/DCs Converters

T10

Model	Package	Polarity	No. of Channels	AC input	Output Voltage	Max Output Power	Max Ripple (mVpp)
A3484 <i>p.25</i>	3U, 19" Eurorack	Positive	1	3-phase 220/400 V 50/400 Hz	45 ÷ 50 V	2500 W	100
A3485 <i>p.25</i>	3U, 19" Eurorack	Positive	2	3-phase 220/400 V 50/400 Hz	45 ÷ 50 V	5000 W	100
A3486 <i>p.29</i>	3U, 19" Eurorack	Positive	2, Trackable	3-phase 220/400 V 50/400 Hz	44 ÷ 52 V adjustable via software	4000 W	100

Powered Crates

T11

Model	Package	No. of Slots	Width	Height	Backplane connectors	Pluggable power supplies	Pluggable fan unit	Remote control	Output power
NIM8301/300W <i>p.75</i>	NIM	12	19"	7U	NIM	yes	yes	no	300W
NIM8301/600W <i>p.75</i>	NIM	12	19"	7U	NIM	yes	yes	no	600W
NIM8302/150W <i>p.75</i>	NIM	10	19"	5U	NIM	yes	no	no	150W
VME8002 <i>p.73</i>	VME64	9 (6U)	19"	5U	J1/J2	yes	no	CANBUS	30A @ +5V 8.5A @ -12V 8.5A @ +12 V
VME8010 <i>p.73</i>	VME64	21 (6U)	19"	7U	J1/J2	no	yes	no	60 A @ +5 V 6 A @ -12 V 8.9 A @ +12 V
VME8011 <i>p.73</i>	VME64	21 (6U)	19"	7U	J1/J2	yes	yes	no	60 A @ +5 V 6 A @ -12 V 8.9 A @ +12 V
VME8100 <i>p.74</i>	VME64, VME64X, V430	21 (6U)	19"	8U	J1/J2, J1/J2 five row/J0(opt), J1/J2/JAUX	yes	yes	CANBUS, Ethernet	Depending on version

ADCs (Peak Sensing)

T12

Model	Package	No. of Channels	Resolution (bits)	Conversion Time (µs)	LSB (mV)	Full Scale Range (V)	Gate Width (µs)	Fast Clear (ns)	Connectors
N957 <i>p.32</i>	NIM	1	13	1.2	1	8	2 ÷ 32	600	LEMO
V1785 <i>p.49</i>	VME	8	12	2.8	1 / 0.125 (Dual)	4 / 0.5 (Dual)	0.25 ÷ 1000	600	LEMO
V785 <i>p.49</i>	VME	32	12	5.7	1 / 2	4 / 8	0.25 ÷ 1000	600	Std. Flat
V785N <i>p.49</i>	VME	16	12	2.8	1	4	0.25 ÷ 1000	600	LEMO

ADCs C-RAMS (CAEN - Readout for Analog Multiplexed Signals)

T13

Model	Package	No. of Channels	Resolution (bits)	Sampling Rate (MHz)	LSB (µV)	Full Scale Range (V)	Fast Clear	Connectors
V550 <i>p.52</i>	VME	2	10	5	150 / 1500	0.15 / 1.5	Yes	LEMO
V550A <i>p.52</i>	VME	2	12	5	40 / 400	0.15 / 1.5	Yes	LEMO

ADCs (Sampling)

T14

Model	Package	No. of Channels	Bandwidth (MHz)	Resolution (bits)	Sampling Rate (MS/s)	LSB (μ V)	Full Scale Range (V)	Board Memory	Connectors
N1728A <i>p.32</i>	NIM	4	40	14	100	125	± 1.0	1 MSamples	LEMO EPG0B
N1728B <i>p.32</i>	NIM	4	40	14	100	125	± 1.0	1 MSamples	LEMO
V1721 <i>p.50</i>	VME	8	200	8	500	4000	± 0.5	2 MSamples/ch	MCX
V1724 <i>p.51</i>	VME	8	50	14	100	68 / 300	$\pm 1.125 / 5$	512 kSamples/ch	MCX
V1729 <i>p.51</i>	VME	4	300	12	2000	250	± 0.5	2520 Samples/ch	LEMO
V729 <i>p.52</i>	VME	4	N.A.	12	40	500	2	8 kSamples	LEMO

Amplifiers (Fast)

T15

Model	Package	No. of Channels	Gain	Bandwidth ⁽¹⁾ (MHz)	Coupling	Input Impedance (Ohm)	Output Rise Time (ns)	Output Dynamics (V)	Equivalent Input Noise (μ V RMS)	In Conn.	Out Conn.
N978 <i>p.33</i>	NIM	4	1 \div 10	250	DC	50	< 3	± 2	< 50	LEMO	LEMO
N979 <i>p.33</i>	NIM	16	10	250	DC	50	< 1.5	± 2	< 50	LEMO	LEMO
V974 <i>p.53</i>	VME	4	1 \div 10	170	DC	50	< 3	± 2	< 70	LEMO	LEMO
V975 <i>p.53</i>	VME	8	10	250	DC	50	< 1.5	± 2	< 50	LEMO	LEMO

(1) Bandwidth measured with ± 25 mV input signal

Amplifiers (Spectroscopy)

T16

Model	Package	No. of Channels	Gain	Coupling	Shaping	Input Impedance (Ohm)	Output Rise Time (ns)	Output Dynamics (V)	Integral Non-linearity	Equivalent Input Noise (μ V RMS)	In Conn.	Out Conn.
N568B <i>p.34</i>	NIM	16	0.15 \div 480	DC	gaussian type	50	25 ⁽¹⁾	± 8	< 0.05%	< 15 (@ gain=100)	LEMO	Strip Header
N568LC <i>p.34</i>	NIM	16	0.15 \div 480	DC	gaussian type	50	25 ⁽¹⁾	± 8	< 0.05%	< 25 (@ gain=100)	LEMO	Strip Header
N968 <i>p.34</i>	NIM	1	1 \div 3000	DC	semi-gaussian	1000	-	10	< 0.025%	< 3.5 (@ gain=1000)	BNC	BNC
N1568B <i>p.35</i>	NIM	16	Coarse: 2 bit Fine: 8 bit	DC	semi-gaussian	50	-	-8 on 1 kOhm	< $\pm 0.1\%$ (2 μ s shaping)	-	Strip Header	Strip Header

(1) Typical value on FAST_OUT

Attenuators

T17

Model	Package	No. of Sections	Range per Section (dB)	Resolution (dB)	Max Frequency (MHz)	I/O Delay (ns)	Insertion Loss (dB)	I/O Connectors
N858 p.35	NIM	2	0 ÷ 44.5	0.5	300	< 5	< 0.10	LEMO
V859 p.54	VME	2	0 ÷ 44.5	0.5	300	< 5	< 0.10	LEMO

Charge Sensitive Preamplifiers

T18

Model	Package	Test Input Impedance (Ω)	Sensitivity (mV/fC)	Equivalent Input Noise	Output Rise Time (ns)	Output Linear Range (V)	Integral Non-Linearity	Max Detector Bias Voltage (V)	Test Capacitance (pF)	In Conn.	Out Conn.
A422 p.82	14 pin SIP hybrid	high	0.550 ⁽¹⁾ (max gain selected)	< 9.8 KeV FWHM @ 470 pF	< 20	± 8 ⁽³⁾ ± 4 ⁽¹⁾	< 0.05%	± 1000	10	-	-
A422A p.82	Shielded box	high	0.425 ⁽¹⁾ (max gain selected)	< 17.5 KeV FWHM @ 1 nF	< 50	± 8 ⁽³⁾ ± 4 ⁽¹⁾	< 0.045%	± 5000	10	SHV	BNC
A424A p.83	Shielded box	50	0,07 ⁽²⁾	< 3800 e- RMS @ 0 pF ⁽²⁾	< 40	± 7.5 ⁽³⁾ ± 3 ⁽²⁾	< 0.1%	± 3000	3.3	SHV	BNC
A424B p.83	Shielded box	50	0,15 ⁽²⁾	< 2000 e- RMS @ 0 pF ⁽²⁾	< 40	± 7.5 ⁽³⁾ ± 3 ⁽²⁾	< 0.1%	± 3000	3.3	SHV	BNC
A424C p.83	Shielded box	50	0,25 ⁽²⁾	< 2200 e- RMS @ 0 pF ⁽²⁾	< 60	± 7.5 ⁽³⁾ ± 3 ⁽²⁾	< 0.1%	± 3000	3.3	SHV	BNC
A424D p.83	Shielded box	50	0,45 ⁽²⁾	< 2100 e- RMS @ 0 pF ⁽²⁾	< 40	± 7.5 ⁽³⁾ ± 3 ⁽²⁾	< 0.1%	± 3000	3.3	SHV	BNC
A424E p.83	Shielded box	50	0,7 ⁽²⁾	< 1500 e- RMS @ 0 pF ⁽²⁾	< 100	± 7.5 ⁽³⁾ ± 3 ⁽²⁾	< 0.1%	± 3000	3.3	SHV	BNC
A424F p.83	Shielded box	50	1,25 ⁽²⁾	< 1500 e- RMS @ 0 pF ⁽²⁾	< 150	± 7.5 ⁽³⁾ ± 3 ⁽²⁾	< 0.1%	± 3000	3.3	SHV	BNC

N° channel: 1 for all models

Output Rise Time and Sensitivity: test pulse (50 ns rise time) on Test input

(1) Measured with 50 Ω termination(2) Measured with 100 Ω termination(3) Measured with 1 M Ω termination

Coincidence/Logic/Trigger Units

T19

Model	Package	No. of Sections	Function	Input per Section	Output per Section	I/O Delay (ns)	Input Bandwidth (MHz)	Majority	Strobe/Veto	Connectors
N113 p.36	NIM	2	OR	12 NIM	2 NIM	< 10	130	No	Yes	LEMO
N405 p.36	NIM	3	Logic Unit	4 NIM	2+1 NIM	< 14	100	Yes	Yes	LEMO
N455 p.37	NIM	4	Coincidence	2 NIM	3+1 NIM, 1 NIM Overlap	< 16	130	No	Yes	LEMO
V1495 p.54	VME	1	Programmable Trigger Unit	64 ECL/ PECL/ LVDS+2 bidirectional NIM/TTL (expandable up to 162)	32 LVDS+2 bidirectional NIM/TTL (expandable up to 130)	t.b.d.	200	Yes	Yes	Robinson Nugent Flat/ LEMO
V976 p.55	VME	4	Logic Unit	4 NIM/TTL	4 NIM/TTL	< 9	150	Yes	No	LEMO

Controllers (VME)

T20

Model	Package	Link	Max Transfer Rate (MByte/s)	Programmable I/O	Data-way Display	I/O Connectors
V1718 p.55	VME	USB 2.0	30	5 out + 2 in TTL/NIM	Yes	LEMO
V2718 p.56	VME	PCI/Optical	70	5 out + 2 in TTL/NIM	Yes	LEMO
V718 p.56	VME	PC Parallel Port	0.3	n/a	Yes	LEMO
VX1718 p.71	VME64X	USB 2.0	30	5 out + 2 in TTL/NIM	Yes	LEMO
VX2718 p.71	VME64X	PCI/Optical	70	5 out + 2 in TTL/NIM	Yes	LEMO

Controller (CAMAC)

T21

Model	Package	Link	Programmable I/O
C111C p.44	CAMAC 2U	Ethernet 10/100	4 out + 4 in + 2 combo

Discriminators

T22

Model	Package	No. of Channels	Function	Updating	Min Input (mV)	Output Width (ns)	I/O Delay (ns)	Outputs	Input Bandwidth (MHz)	In Conn.	Out Conn.
C808 p.44	CAMAC	16	Const. Fraction	No	- 5	15 ÷ 250	n/a ⁽¹⁾	2 ECL	n/a	LEMO	Std. Flat
C894 p.45	CAMAC	16	Leading Edge	Selectable	- 5	5 ÷ 40	10	2 ECL	140	LEMO	Std. Flat
N840 p.37	NIM	8	Leading Edge	Selectable	- 5	5 ÷ 40	10	2 + /1 NIM	140	LEMO	LEMO
N841 p.37	NIM	16	Leading Edge	Selectable	- 5	5 ÷ 40	10	2 + /1 NIM	140	LEMO	LEMO
N842 p.38	NIM	8	Const. Fraction	No	- 5	16.5 ÷ 273	n/a ⁽¹⁾	2 + /1 NIM	n/a	LEMO	LEMO
N843 p.38	NIM	16	Const. Fraction	No	- 5	16.5 ÷ 273	n/a ⁽¹⁾	2 + /1 NIM	n/a	LEMO	LEMO
N844 ⁽²⁾ p.38	NIM	8	Low Threshold	No	- 3	5 ÷ 90	10	2 + /1 NIM	60	LEMO	LEMO
N845 p.38	NIM	16	Low Threshold	No	- 3	5 ÷ 90	10	2 + /1 NIM	60	LEMO	LEMO
V812 p.57	VME	16	Const. Fraction	No	- 5	15 ÷ 250	n/a ⁽¹⁾	2 ECL	n/a	LEMO	Std. Flat
V814 ⁽²⁾ p.58	VME	16	Low Threshold	No	- 1	6 ÷ 95	10	2 ECL	60	LEMO	Std. Flat
V895 p.58	VME	16	Leading Edge	Selectable	- 5	5 ÷ 40	10	2 ECL	140	LEMO	Std. Flat

(1) For constant fraction discriminators, the I/O delay depends on delay set value

(2) Also available with positive inputs

Fan In - Fan Out Units

T23

Model	Package	No. of Sections	Type	Input per Section	Output per Section	I/O Delay (ns)	Input Bandwidth (MHz)	Connectors
N454 p.39	NIM	4	Logic	4 NIM	4+2 NIM	< 8	100	LEMO
N625 p.39	NIM	4	Linear	4 Bipolar	4 Bipolar	< 4	100	LEMO
V1495 p.54	VME	1	Logic	64 ECL/PECL/ LVDS+2 bidirectional NIM/TTL (expandable up to 162)	32 LVDS+2 bidirectional NIM/TTL (expandable up to 130)	< 15	200	Robinson Nugent Flat/ LEMO
V925 p.59	VME	4	Linear	3x4+1x3 Bipolar	3x4+1x3 Bipolar	< 4	120	LEMO
V976 p.55	VME	4	Logic	4 NIM/TTL	4 NIM/TTL	< 9	150	LEMO

All modules are DC coupled

HS CAENET Controllers

T24

Model	Package	Link	Max Transfer Rate (kByte/s)
A1303 p.77	PCI	HS CAENET	125
A250 p.77	Handheld Unit	HS CAENET	125
V288 p.59	VME	HS CAENET	125

I/O Registers

T25

Model	Package	No. of Sections	Function	Input per Section	Output per Section	In Connectors	Out Connectors
C219 p.45	CAMAC	1	I/O register	16 NIM	16 NIM	LEMO	LEMO
V1495 p.54	VME	1	I/O register	64 ECL/PECL/LVDS+2 bidirectional NIM/TTL (expandable up to 162)	32 LVDS+2 bidirectional NIM/TTL (expandable up to 130)	Robinson Nugent Flat/ LEMO	Robinson Nugent Flat/ LEMO
V259 p.60	VME	1	Pattern Unit	16 NIM / ECL	1 NIM	LEMO (NIM) / Std. Flat (ECL)	LEMO
V977 p.60	VME	1	Pattern Unit, I/O register	16 NIM / TTL	16 NIM / TTL	LEMO	LEMO

Multi Channel Analyzers

T26

Model	Package	No. of Sections	Resolution (bits)	Conversion Time (μs)	Sampling frequency (MS/s)	LSB (mV)	Full Scale Range (V)	Gate Width (μs)	Fast Clear (ns)	Connectors
N1728A p.32	NIM	4	14	-	100	0.125	± 1.0	-	n/a	LEMO EPG0B
N1728B p.32	NIM	4	14	-	100	0.125	± 1.0	-	n/a	LEMO 00
N957 p.32	NIM	1	13	1.2	-	1	8	2 + 32	600	LEMO

Pulse Height Analyzer

T27

Model	Package	No. of Channels	Resolution (bits)	Amplitude Levels	Sampling frequency (MS/s)	LSB (μ V)	Full Scale Range (V)	Gate Width (μ s)	Connectors
V730 p.57	VME	8	8	8	15	10	2.5	0.25 + 1000	LEMO

QDCs

T28

Model	Package	No. of Channels	Resolution (bits)	Conversion Time (μ s)	LSB (fC)	Full Scale Range (pC)	Gate Width (μ s)	Fast Clear (μ s)	Connectors	Features
C1205 p.46	CAMAC	16	12 (17 dyn.)	< 6	21 / 160 / 1300	80/650/6000	0.01 ÷ 0.5	1	LEMO	triple range
V792 p.61	VME	32	12	5.7	100	400	0.05 ⁽¹⁾	0.6	Std. Flat	-
V792N p.61	VME	16	12	2.8	100	400	0.05 ⁽¹⁾	0.6	LEMO	-
V862 p.61	VME	32	12	5.7	100	400	0.05 ⁽¹⁾	0.6	Robinson Nugent Flat	individual gate
V965 p.62	VME	16	12 (15 dyn.)	5.7	25 / 200	100 / 800	0.05 ⁽¹⁾	0.6	LEMO	dual range
V965A p.62	VME	8	12 (15 dyn.)	2.8	25 / 200	100 / 800	0.05 ⁽¹⁾	0.6	LEMO	dual range

(1) Minimum Gate Width

Scalers

T29

Model	Package	No. of Channels	Input Type	Count Rate (MHz)	Count Depth per Channel	Connectors
C257 p.46	CAMAC	16	NIM / TTL / ECL	100	24 bit	LEMO (Flat for ECL)
N1145 p.40	NIM 2U	4+1 downcounter	NIM / TTL	4x250 + 1x80	4x8 + 1x7 digit	LEMO
V560 p.62	VME	16	NIM / TTL / ECL	100	32 bit	LEMO (Flat for ECL)
V830 p.63	VME	32	ECL / LVDS	250	32 bit	Std. Flat

Sequencer

T30

Model	Package	Max Transfer Rate	CTRL Connectors
V551B p.63	VME	5 MHz	LEMO / Std. Flat

Sequencer for CAEN Readout for Analog Multiplexed Signals (V550 and V550A)

TDCs

T31

Model	Package	No. of Channels	Resolution (bit)	Double Hit Resolution (ns)	Conversion Time (µs)	LSB (ps)	Full Scale Range (µs)	Input Type	Connectors
C414 p.47	CAMAC	8	12	-	16	25 / 1250	0.1 / 5	NIM	LEMO
V1190A p.64	VME	128	19 / 17 ⁽¹⁾	5	-	100 / 200 / 800	52 / 104	ECL / LVDS	Robinson Nugent Flat
V1190B p.64	VME	64	19 / 17 ⁽¹⁾	5	-	100 / 200 / 800	52 / 104	ECL / LVDS	Robinson Nugent Flat
V1290A p.64	VME	32	21	5	-	25	52	ECL / LVDS	Std. Flat
V1290N p.64	VME	16	21	5	-	25	52	NIM	LEMO
V767 p.65	VME	128	20	10	-	800	840	ECL	Robinson Nugent Flat
V767A p.65	VME	64	20	10	-	800	840	ECL	Robinson Nugent Flat
V775 p.65	VME	32	12	-	5.7	35 / 300	0.14 / 1.2	ECL	Std. Flat
V775N p.65	VME	16	12	-	2.8	35 / 300	0.14 / 1.2	NIM	LEMO
VX1190A p.70	VME64X	128	19 / 17 ⁽¹⁾	5	-	100 / 200 / 800	52 / 104	ECL / LVDS	Robinson Nugent Flat
VX1190B p.70	VME64X	64	19 / 17 ⁽¹⁾	5	-	100 / 200 / 800	52 / 104	ECL / LVDS	Robinson Nugent Flat
VX1290A p.70	VME64X	32	21	5	-	25	52	ECL / LVDS	Std. Flat
VX1290N p.70	VME64X	16	21	5	-	25	52	NIM	LEMO

(1) Depending on the selected range

Timing Units

T32

Model	Package	No. of Sections	Function	Input per Section	Output per Section	Output Width/ Delay	In Conn.	Out Conn.
N93B p.40	NIM	2	Timer	1 NIM + 1 ECL	2+/1 NIM+ 1 ECL	50 ns ÷ 10 s	LEMO / Pin couple	LEMO / Pin couple
N108A p.41	NIM	2	Delay	1 Analog	1 Analog	1.6 ÷ 65.1 ns	LEMO	LEMO
V462 p.66	VME	2	Gate Generator	1 NIM	2 NIM	100 ns ÷ 10 s	LEMO	LEMO
V486 p.66	V430 ⁽²⁾	1	Gate & Delay Generator	8 ECL	2x8 ECL	500 ns	Std. Flat	Std. Flat
V706 p.67	V430 ⁽²⁾	1	Mean Timer	16+16 ECL	2x16 ECL	30 ns ⁽¹⁾	Std. Flat	Std. Flat
V972 p.67	VME	1	Delay	1 Analog	1 Analog	2.6 ÷ 34.1 ns	LEMO	LEMO
V993B p.68	VME	2	Timer	1 NIM/TTL + 1 ECL	2+/1 NIM/TTL+ 1 ECL	50 ns ÷ 10 s	LEMO / Pin couple	LEMO / Pin couple
V993C p.68	VME 2U	2	Timer	1 NIM/TTL + 1 ECL	2+/1 NIM/TTL+ 1 ECL	50 ns ÷ 10 s	LEMO / Pin couple	LEMO / Pin couple

(1) Max. input relative delay

(2) JAUX required

Translators

T33

Model	Package	No. of Sections	Function	Input/Section	Output/Section	I/O delay (ns)	Input Bandwidth (MHz)	In Conn.	Out Conn.
N89 <i>p.41</i>	NIM	2	NIM to TTL; TTL to NIM	4	4	< 10	60 / 40	LEMO	LEMO
N638 <i>p.42</i>	NIM	2	NIM to ECL/NIM; ECL to NIM/ECL	8 NIM / 8 ECL	2x8 NIM / 8 ECL	< 3	300	LEMO / Std. Flat	LEMO / Std. Flat
V538A <i>p.68</i>	VME	1	NIM to ECL/NIM; ECL to NIM/ECL	8 NIM / 8 ECL	2x8 NIM / 2x8 ECL	< 3	300	LEMO / Std. Flat	LEMO / Std. Flat
V976 <i>p.55</i>	VME	4	NIM to TTL; TTL to NIM	4	4	< 11.5	150	LEMO	LEMO
V1495 <i>p.54</i>	VME	1	Depending on board configuration	64 ECL/PECL/ LVDS+2 bidirectional NIM/TTL (expandable up to 162)	32 LVDS+2 bidirectional NIM/ TTL (expandable up to 130)	< 15	200	Robinson Nugent Flat/ LEMO	Robinson Nugent Flat/ LEMO

APP PC5933T

n. 1

Factory Name	APP PC5933T
Description	Vertical contact MINI P/ CLAW APP PC5933T type
Other features	-



APP30 1317G4

n. 2

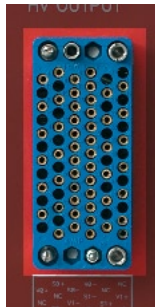
Factory Name	APP30 1317G4 / PP30 1327BK / PP30 1327G6BK
Description	APP30 1317G4 type
Other features	APP30 MOUNTING WINGS 1399G8BK type – Black: PP30 1327G6BK APP – Red: PP30 1327BK APP – Vert. contact PP30 1317G4 APP – Mounting: PP30 MOUNTING WINGS 1399G8BK APP



AMP 75

n. 3

Factory Name	AMP 201311-3
Description	HV multipin connector
Other features	Mates with AMP 201310 cable connector; suitable for operation in the -55 ÷ +150 °C range



Radiall 52

n. 4

Factory Name	Radiall 691 803 004
Description	HV multipin connector
Other features	Mates with Radiall 691 802 002 and CAEN Mod. A996 cable connectors; up to 9 kV supported



SHV

n. 5

Factory Name	Radiall R317580
Description	HV coaxial connector
Other features	Supports up to 10 kV



CPE 3 Pole

n. 6

Factory Name	CPE 28-019
Description	HV 3 Pin Panel Male Connector
Other features	supports up to 18 kV



CPE HV

n. 7

Factory Name	CPE 23.100.151.046
Description	HV Coaxial Connector
Other features	supports up to 18 kV; mates with HV Cable Connector CPE 23.100.052.045



DB37

n. 8

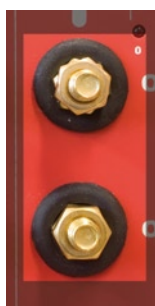
Factory Name	FCI DCPV37S300GT
Description	DB37 Female connector
Other features	-



Brass hexagon head bolt

n. 9

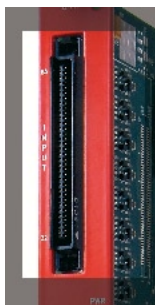
Factory Name	RS Stock no. 483-2390
Description	Brass hexagon head set screw, M6x30mm
Other features	-



Robinson Nugent 68 pin boardmount connector

n. 10

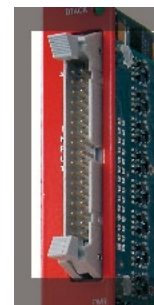
Factory Name	3M P50E-068P1-SR1-TG
Description	Robinson Nugent 68 pin straight angle thru-hole boardmount connector
Other features	Mates with Robinson Nugent P50E-068S-TG wiremount connector



Header-type connectors

n. 11

Factory Name	3M 3431-6202 (17+17 pin); 3M 3408-5202 (8+8 16 pin)
Description	Header-type connector
Other features	Available with different pin sets; the 17+17 connector mates with 3M 3414-6600 wiremount connector



LEMO

n. 12

Factory Name	Fischer DP101A004-51
Description	LEMO type coaxial connector
Other features	-



BNC

n. 13

Factory Name	Radiall R141603
Description	BNC type coaxial connector
Other features	-



Strip Header

n. 14

Factory Name	AMP 5/826634/0 (17+17 pin)
Description	Male strip header (17+17 pin)
Other features	the 17+17 connector mates with 3M 3414-6600 wiremount connector



USB

n. 15

Factory Name	AMP 787780-2
Description	USB Type B
Other features	-



LC

n. 16

Factory Name	Agilent HFBR-5911L/AL
Description	LC type duplex connector
Other features	-



LEMO EPG0B

n. 17

Factory Name	EPG.0B.302.HLN
Description	LEMO 2 pin type
Other features	-



MCX connector

n. 18

Factory Name	SUHNER CS 85MCX-50-0-16
Description	50 Ohm MCX connector
Other features	-



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Charge Sens. Preamp.	Preamplifier	A424E	CSP Low Noise Fast Rise Time - 0.70 mV/fC Sensitivity	83	T18	NEW
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EASY3000 LV Board	P. Supply EASY	A3100	1 Ch. EASY3000 Floating LV Board (600 W)	27	T8	
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NIM	Crate	NIM8301/600W	NIM 12 slot 7U (5+2) Crate - 600 W Pluggable Power Supply	75	T11	NEW
NIM	Crate	NIM8302/150W	NIM 10 slot 5U Crate - 150 W Pluggable Power Supply	75	T11	NEW
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NIM Power Supply	Power Supply	N471	2 Ch. HV Power Supply (\pm 8 kV)	15	T1	
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TDC	VME	V1290N	16 Ch. Multihit TDC	64	T31	
TDC	VME	V767	128 Ch. Multihit TDC	65	T31	
TDC	VME	V767A	64 Ch. Multihit TDC	65	T31	

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TDC	VME	V775	32 Ch. Multievent TDC	65	T31	
TDC	VME	V775N	16 Ch. Multievent TDC	65	T31	
TDC	VME64X	VX1190A	128 Ch. Multihit TDC	70	T31	
TDC	VME64X	VX1190B	64 Ch. Multihit TDC	70	T31	
TDC	VME64X	VX1290A	32 Ch. Multihit TDC	70	T31	
TDC	VME64X	VX1290N	16 Ch. Multihit TDC	70	T31	
Timing Unit	NIM	N108A	Dual Delay	41	T32	
Timing Unit	NIM	N93B	Dual Timer	40	T32	
Timing Unit	VME	V462	Dual Gate Generator	66	T32	
Timing Unit	VME	V486	8 Ch. Gate and Delay Generator	66	T32	
Timing Unit	VME	V706	16 Ch. Mean Timer	67	T32	
Timing Unit	VME	V972	Delay Unit	67	T32	
Timing Unit	VME	V993B	Dual Timer	68	T32	
Timing Unit	VME	V993C	Dual Timer (locking dial switch-double unit)	68	T32	NEW
Translator	NIM	N638	16 Ch. NIM-ECL/ECL-NIM Translator and Fan Out	42	T33	
Translator	NIM	N89	NIM-TTL-NIM Adapter	41	T33	
Translator	VME	V538A	8 Ch. NIM-ECL/ECL-NIM Translator	68	T33	
VME	Crate	VME8002	VME64 9 Slot 6U Mini Crate - 350 W Pluggable Power Supply	73	T11	NEW
VME	Crate	VME8010	VME64 21 Slot 7U (6+1) Low Cost Crate - 470 W	73	T11	NEW
VME	Crate	VME8011	VME64 21 Slot 7U (6+1) Low Cost Crate - 470 W Pluggable Power Supply	73	T11	NEW
VME	Crate	VME8100	VME(64/64x/430) 21 Slot 8U (6+2) Crate Series - Configurable Power Supply	74	T11	NEW

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A1511B	12 Channel Floating HV Board (500V; 1mA / 10mA)	Power Supply	20	T4
A1512	12 Channel Floating HV Board (500V; 100µA / 1mA)	Power Supply	20	T4
A1513B	6 Channel Floating LV Board (10V / 2.7A)	Power Supply	20	T3
A1514B	7 Channel Floating HV LV Board (500V; 10V; 7V)	Power Supply	20	T3/T4
A1516B	6 Channel Floating LV Board (15V / 1.5A)	Power Supply	20	T3
A1517B	6 Channel Floating LV Board (7V / 4A)	Power Supply	20	T3
A1518B	6 Channel Floating LV Board (4.5V / 6A)	Power Supply	20	T3
A1519B	12 Channel Floating HV Board (250V; 100µA / 1mA)	Power Supply	20	T4
A1520P	12 Channel Floating HV Board (500V; 15mA / 1.5mA)	Power Supply	21	T4
A1526	6 Channel Common Floating Return HV Board (15kV; 0.1mA / 1mA)	Power Supply	22	T4
A1533	6 Channel Floating HV Board (4kV / 3mA)	Power Supply	21	T4
A1534	6 Channel Floating HV Board (8kV / 200µA)	Power Supply	21	T4
A1535	24 Channel Common Floating Return HV Board (3.5kV / 3mA)	Power Supply	22	T4
A1676A	EASY3000 Branch Controller	P. Supply EASY	26	
A17xx	12 / 28 Channel HV Board	Power Supply	23	T5
A18xx	12 / 28 Channel HV Board	Power Supply	23	T5
A1932A	48 Channel Common Floating Return HV Distributor Board (3kV / 500µA)	Power Supply	22	T4
A250	High Speed CAENET Manual Controller	Accessories	77	T24
A2818	PCI CONET Controller	Accessories	78	
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A309	Single Channel 1 dB Attenuator	Accessories	79	
A30XX	2 / 4 / 6 / 12 Channel EASY3000 Floating LV Board (45 ÷ 300 W)	P. Supply EASY	27	T8
A310	Single Channel 3 dB Attenuator	Accessories	79	
A3100	1 Channel EASY3000 Floating LV Board (600 W)	P. Supply EASY	27	T8
A311	Single Channel 6 dB Attenuator	Accessories	79	
A312	Single Channel 12 dB Attenuator	Accessories	79	
A313	Single Channel 20 dB Attenuator	Accessories	79	
A315	Splitter	Accessories	80	
A3486	2 Channel EASY3000 AC/DC Converter (48V / 2kW)	P. Supply EASY	29	T10
A35XX	12 / 6 / 32 Channel EASY3000 Floating HV Board	P. Supply EASY	26	T7
A3602	3 Channel EASY3000 Floating LV Board (7V / 5A)	P. Supply EASY	28	T8
A3801	128 Channel EASY3000 ADC Board	P. Supply EASY	28	T9
A3801A	128 Channel EASY3000 Temperature Sensor Board	P. Supply EASY	28	T9
A3802	128 Channel EASY3000 DAC Board	P. Supply EASY	29	T8
A385	16 Channel Flat-to-LEMO Cable Adapter for V785	Accessories	78	
A392	16 Channel Flat-to-LEMO Cable Adapter for V792	Accessories	78	
A422	Charge Sensitive Preamplifier with Timing (Hybrid)	Preamplifier	82	T18
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A424A	Charge-Sensitive Preamplifier Low Noise Fast Rise Time - 0.07 mV/fC Sensitivity	Preamplifier	83	T18
A424B	Charge-Sensitive Preamplifier Low Noise Fast Rise Time - 0.15 mV/fC Sensitivity	Preamplifier	83	T18
A424C	Charge-Sensitive Preamplifier Low Noise Fast Rise Time - 0.25 mV/fC Sensitivity	Preamplifier	83	T18
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A483	HV Bidirectional Passive Filter	Accessories	80	
A864	High Efficiency DC-DC Converter (2.1kV / 100µA)	Power Supply	30	
A967	32 Channel Cable Adapter for V767, V862, V1190, VX1190, V1495	Accessories	79	
A992	16 Channel Impedance Adapter	Accessories	79	
C111C	Ethernet CAMAC Crate Controller	CAMAC	44	T21
C1205	16 Channel QDC	CAMAC	46	T28
C219	16 Channel Programmable I/O Register	CAMAC	45	T25

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C414	8 Channel TDC	CAMAC	47	T31	
C808	16 Channel Constant Fraction Discriminator	CAMAC	44	T22	
C894	16 Channel Leading Edge Discriminator	CAMAC	45	T22	
EASY3000	Embedded Assembly SYstem	<i>P. Supply EASY</i>	25	T6	
N108A	Dual Delay	NIM	41	T32	
N113	Dual OR 12 In-2 Out	NIM	36	T19	
N1145	Quad Scaler and Preset Counter/Timer	NIM	40	T29	
N1568B	16 Channel Programmable Spectroscopy Amplifier & Pulse Shape Discriminator	NIM	35	T16	NEW
N1728A	4 Ch 14 bit 100 MS/s Digitizer with Pulse Shape Analysis (Differential Inputs)	NIM	32	T14/T26	NEW
N1728B	4 Ch 14 bit 100 MS/s Digitizer with Pulse Shape Analysis (Single Ended Inputs)	NIM	32	T14/T26	NEW
N405	Triple 4-Fold Logic Unit/Majority with VETO	NIM	36	T19	
N454	4-8 Logic Fan-In Fan-Out	NIM	39	T23	
N455	Quad Coincidence Logic Unit	NIM	37	T19	
N470	4 Channel Programmable HV Power Supply	<i>Power Supply</i>	15	T1	
N471	2 Channel HV Power Supply (± 8 kV)	<i>Power Supply</i>	15	T1	
N471A	2 Channel HV Power Supply (± 8 kV; 8 μ A/1nA res.)	<i>Power Supply</i>	15	T1	
N471G	2 Channel HV Power Supply for Germanium Detectors	<i>Power Supply</i>	16	T1	NEW
N472	4 Channel Power Supply (± 6 kV)	<i>Power Supply</i>	16	T1	
N568B	16 Channel Programmable Spectroscopy Amplifier (Low Noise)	NIM	34	T16	
N568LC	16 Channel Programmable Spectroscopy Amplifier	NIM	34	T16	
N625	Quad Linear Fan-In Fan-Out	NIM	39	T23	
N638	16 Channel NIM-ECL/ECL-NIM Translator and Fan Out	NIM	42	T33	
N840	8 Channel Leading Edge Discriminator	NIM	37	T22	
N841	16 Channel Leading Edge Discriminator	NIM	37	T22	
N842	8 Channel Constant Fraction Discriminator	NIM	38	T22	
N843	16 Channel Constant Fraction Discriminator	NIM	38	T22	
N844	8 Channel Low Threshold Discriminator	NIM	38	T22	
N845	16 Channel Low Threshold Discriminator	NIM	38	T22	
N858	Dual Attenuator	NIM	35	T17	NEW
N89	NIM-TTL-NIM Adapter	NIM	41	T33	
N93B	Dual Timer	NIM	40	T32	
N957	8 K Multi-Channel Analyzer	NIM	32	T12/T26	NEW
N968	Spectroscopy Amplifier	NIM	34	T16	
N978	4 Channel Variable Gain Fast Amplifier	NIM	33	T15	
N979	16 Channel Fast Amplifier	NIM	33	T15	
NIM8301/300W	NIM 12 slot 7U (5+2) Crate - 300 W Pluggable Power Supply	<i>Crate</i>	75	T11	NEW
NIM8301/600W	NIM 12 slot 7U (5+2) Crate - 600 W Pluggable Power Supply	<i>Crate</i>	75	T11	NEW
NIM8302/150W	NIM 10 slot 5U Crate - 150 W Pluggable Power Supply	<i>Crate</i>	75	T11	NEW
S9090	High Efficiency DC-DC Converter (2kV / 30 μ A)	<i>Power Supply</i>	30		NEW
SY1527	Universal Multichannel Power Supply System 16 slot	<i>Power Supply</i>	17	T2	
SY1527LC	Low Cost Universal Multichannel Power Supply System 16 slot	<i>Power Supply</i>	18	T2	NEW
SY2527	Universal Multichannel Power Supply System 6 slot	<i>Power Supply</i>	19	T2	
SY3527	Universal Multichannel Power Supply System 2 slot	<i>Power Supply</i>	19	T2	
V1190A	128 Channel Multihit TDC	VME	64	T31	
V1190B	64 Channel Multihit TDC	VME	64	T31	
V1290A	32 Channel Multihit TDC	VME	64	T31	
V1290N	16 Channel Multihit TDC	VME	64	T31	
V1495	General Purpose VME Board	VME	54	T19/T23/T25/T33	NEW
V1718	VME-USB2.0 Bridge	VME	55	T20	
V1721	8 Ch. 8 bit 500 MS/s Digitizer	VME	50	T14	NEW
V1724	8 Ch. 14 bit 100 MS/s Digitizer	VME	51	T14	NEW
V1729	4 Ch. 12 bit 2 GS/s (300 MHz bandwidth) Switched-Capacitor Digitizer	VME	51	T14	
V1785	8 Ch Dual Range Multievent Peak Sensing ADC	VME	49	T12	NEW

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V2718	VME-PCI Optical Link Bridge	VME	56	T20	
V288	High Speed CAENET VME Controller	VME	59	T24	
V462	Dual Gate Generator	VME	66	T32	
V486	8 Channel Gate and Delay Generator	VME	66	T32	
V538A	8 Channel NIM-ECL/ECL-NIM Translator	VME	68	T33	
V550	CAEN Readout for Analog Multiplex. Signals (10 bit)	VME	52	T13	
V550A	CAEN Readout for Analog Multiplex. Signals (12 bit)	VME	52	T13	
V551B	Sequencer for V550 - V550A C-RAMS	VME	63	T30	
V560	16 Channel Scaler	VME	62	T29	
V706	16 Channel Mean Timer	VME	67	T32	
V718	VME Parallel Port Interface	VME	56	T20	
V729	4 Ch. 12 bit 40 MS/s Digitizer	VME	52	T14	
V730	8 Section - "8 Window Type" Pulse Height Analyzer and Counter	VME	57	T27	NEW
V767	128 Channel Multihit TDC	VME	65	T31	
V767A	64 Channel Multihit TDC	VME	65	T31	
V775	32 Channel Multievent TDC	VME	65	T31	
V775N	16 Channel Multievent TDC	VME	65	T31	
V785	32 Channel Multievent Peak Sensing ADC	VME	49	T12	
V785N	16 Channel Multievent Peak Sensing ADC	VME	49	T12	
V792	32 Channel Multievent QDC	VME	61	T28	
V792N	16 Channel Multievent QDC	VME	61	T28	
V812	16 Channel Constant Fraction Discriminator	VME	57	T22	
V814	16 Channel Low Threshold Discriminator	VME	58	T22	
V830	32 Channel Latching Scaler	VME	63	T29	
V859	Dual Attenuator	VME	54	T17	
V862	32 Channel Multievent Individual Gate QDC	VME	61	T28	
V895	16 Channel Leading Edge Discriminator	VME	58	T22	
V925	Quad Linear Fan-In Fan-Out	VME	59	T23	
V965	16 Ch Dual Range Multievent QDC	VME	62	T28	
V965A	8 Ch Dual Range Multievent QDC	VME	62	T28	
V972	Delay Unit	VME	67	T32	
V974	4 Channel Variable Gain Fast Amplifier	VME	53	T15	
V975	8 Channel Fast Amplifier	VME	53	T15	
V976	Quad 4 Fold AND/OR/MAJ, NIM-TTL TTL-NIM Translator, Fan-In Fan-Out	VME	55	T19/T23/T33	
V977	16 Channel Input/Output Register (Status A)	VME	60	T25	
V993B	Dual Timer	VME	68	T32	
V993C	Dual Timer (locking dial switch-double unit)	VME	68	T32	NEW
VME8002	VME64 9 Slot 6U Mini Crate - 350 W Pluggable Power Supply	Crate	73	T11	NEW
VME8010	VME64 21 Slot 7U (6+1) Low Cost Crate - 470 W	Crate	73	T11	NEW
VME8011	VME64 21 Slot 7U (6+1) Low Cost Crate - 470 W Pluggable Power Supply	Crate	73	T11	NEW
VME8100	VME(64/64x/430) 21 Slot 8U (6+2) Crate Series - Configurable Power Supply	Crate	74	T11	NEW
VX1190A	128 Channel Multihit TDC	VME64X	70	T31	
VX1190B	64 Channel Multihit TDC	VME64X	70	T31	
VX1290A	32 Channel Multihit TDC	VME64X	70	T31	
VX1290N	16 Channel Multihit TDC	VME64X	70	T31	
VX1718	VME-USB2.0 Bridge	VME64X	71	T20	
VX2718	VME-PCI Optical Link Bridge	VME64X	71	T20	

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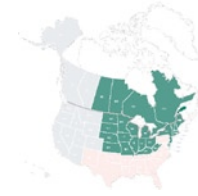


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