



High-Performance
Power Supplies

Product Catalogue

Guidant

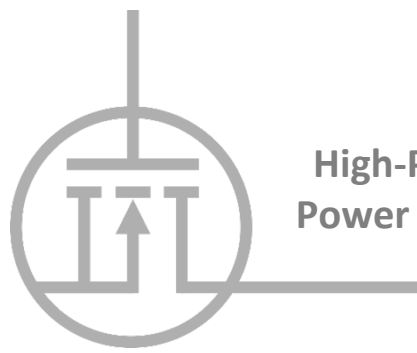
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High-Precision Power Supplies

EASY-DRIVER

2

Compact Digital Bipolar Power Supply Series
up to ± 10 A and to ± 20 V



4

FAST-PS

Bipolar Digital Voltage- and Current-controlled Fast Power Supply
up to ± 30 A and to ± 80 V

FAST-PS-M

6

High-Stability Digital Voltage- and Current-controlled Fast Power Supply
up to 100 A and to 30 V



Highlights

8



INDEX

FAST-PS-1K5

9

1500 W Bipolar Digital Voltage- and Current-controlled Fast Power Supply
up to ± 100 A and to ± 100 V



11

NGPS

10-kW New Generation High-Stability Digital Controlled Power Supply Series
up to 10 kW per unit

SY3634

13

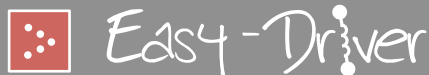
Bipolar Heterogeneous Digital Power Supply System
up to ± 30 A and to ± 40 V per channel





EASY-DRIVER

Compact Digital Bipolar
Power Supply Series



- The EASY-DRIVER series is a new family of current-controlled bipolar power supplies with Ethernet communication
- The digital current control loop makes the connection and configuration of the power supply to any load quick and simple
- Stand-alone unit with local display, extended input range and embedded air self-cooling

FEATURES

- 19" – 1U stand-alone crate
- $\pm 5A@ \pm 20V$ and $\pm 10A@ \pm 20V$
- True Bipolar Zero-crossing operation
- 10/100 Mbit Ethernet interface
- Digital Current regulation loop
- Low noise
- Internal protections and auxiliary readbacks
- External Interlock and Status Signal
- Extended input range (90-260VAC)
- Local display for monitoring
- **VISUAL** free software available

APPLICATIONS

- Magnet Power Supplies
- Laboratory Equipment
- Current Control

The new EASY-DRIVER series by CAEN ELS is composed of two different models of digital bipolar power supplies: $5A@20V$ and $10A@20V$ bipolar units are commercially available.

Despite being the perfect replacement for the SY2064 system modules, the EASY-DRIVER is a perfect solution also for stand-alone and laboratory equipment.

The 10/100 standard Ethernet connection allows controlling the power converter in a very simple and reliable manner, especially for large installations.

The current control loop, as for most of CAEN ELS power supplies, is digital in order to obtain the maximum flexibility and easiness of configuration to any connected load.

The EASY-DRIVER models present the best performance-to-price ratio, having excellent characteristics while keeping the price at low values.





Low noise and good bandwidth are only two of the main features of these power units, based on a multi-DSP architecture.

Internal protections – e.g. over-voltage, over-temperature and others – are implemented as well as an external interlock signal is present. The circuitry to discharge inductive loads is also embedded.

The EASY-DRIVER unit also has a local display in order to locally monitor the output current and output voltage of the unit. LED indicators summarize the status of the power supply in real-time.

About Us

CAEN ELS is a leading company in the design of power supplies and state-of-the-art complete electronic systems for the Physics research world, having its main focus on dedicated solutions for the particle accelerator community and high-end industrial applications.

-  Power Supply Systems
-  Precision Current Measurements
-  Beamline Electronic Instrumentation
-  FMC & MTCA.4 – MicroTCA for Physics

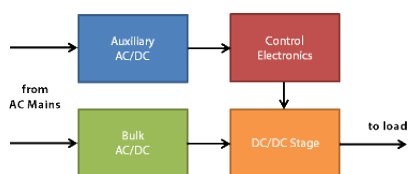
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EASY-DRIVER Basic Architecture

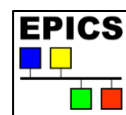
The EASY-DRIVER units are internally composed by separate Auxiliary and Bulk AC/DC sections.

Technical Specifications

EASY-DRIVER

	"0520" Model	"1020" Model
Output current range	± 5 A	± 10 A
Output voltage range	± 20 V	
Maximum output power	100 W	200 W
Topology	Bipolar	
Current setting resolution	160 µA	320 µA
Output current readback	20 bit	
Output voltage readback	20 bit	
Output current ripple*	< 40 ppm / FS	
Output current stability	< 40 ppm / FS	
Output Current TC	< 40 ppm / °C	
Accuracy	< 0.05 %	
Switching Frequency	> 100 kHz	
Closed Loop Bandwidth	> 1 kHz	
Efficiency	up to 84 %	
External Interlocks/Status	1 Input: External Fault 1 Output: Power Supply Status	
Internal Interlocks	DC Link Under-Voltage MOSFETs Over-Temperature Shunt Over-Temperature	
Hardware Protections	Input Fuses Passive Crowbar (Over-Voltage)	
Cooling	Forced Air Convection – Front-to-Rear	
Control System Drivers	EPICS IOC	
Connectivity	Ethernet 10/100 Mbit TCP-IP	
Extra-Features	User-settable Slew Rate Value Firmware Remote Update	
Mechanical Dimensions	19" × 1U × 264 mm 19" × 1U × 295 mm - <i>with output connectors</i>	
Weight	4 kg	
Input Ratings	90/260 VAC) 47-63 Hz	
Local Indicators	LCD Display 6 LEDs	

* measured on 1mH load



EPICS IOC

Ordering Options

EASYDRV0520A	EASY-DRIVER 0520	EASY – DRIVER 0520 - Digital Bipolar Current Power Supply (±5A@±20V - 100W)
EASYDRV1020A	EASY-DRIVER 1020	EASY – DRIVER 1020 - Digital Bipolar Current Power Supply (±10A@±20V - 200W)



FAST-PS

Bipolar Multi-Interface Digital Voltage-
and Current-controlled Fast Power Supply



FAST-PS

- The FAST-PS series is a new series of fast power supplies with dual interface for standard and fast control of the output current and/or voltage
- Current and Voltage digital control loop for easiness of configuration on different loads
- Stand-alone unit with local control, extended input range and internal self-cooling by air convection

FEATURES

- 19" – 1U stand-alone crate
- Different Current and Voltage Ratings
- True Bipolar Zero-crossing operation
- 10/100/1000 Mbit Ethernet interface
- 2x Fast SFP interface (10 kHz update)
- Current and Voltage regulation
- High bandwidth
- Analog control and Trigger - *optional*
- Low noise
- Configurable Digital control loop
- Internal protections and auxiliary readbacks
- Extended input range (90-260VAC)
- Local display and control
- **VISUAL-PS** free software available

APPLICATIONS

- Magnet Power Supplies
- Laboratory Equipment
- Current or Voltage Control

The FAST-PS series is the new generation of bipolar power supplies by CAEN ELS and it was designed in order to have state-of-the-art performances both in current- and voltage-control modes.

The 10/100/1000 Ethernet connection and the two SFP slots (which can be used as electrical or optical communication channels) allow to control the power converter in two different modes: the "standard" interface over the Ethernet (up to 1 kHz) is intended in cases where the power supply has to be controlled at lower rates and/or to set and monitor general parameters of the unit. The "fast" interface over the SFP allows to run feedback loops and fast corrections by reaching a maximum update rate of 10 kHz.

The control loop, as for most of CAEN ELS power supplies, is digital in order to

obtain the maximum flexibility and easiness of configuration to any connected load.

The FAST-PS can be controlled either in current- or voltage-control modes and both control loops can be remotely configured.

Low noise and high bandwidth are just two of the main features of these power converters that are the ideal upgrade for the SY2604 and SY3634 system modules.

Internal protections – e.g. over-voltage, over-current - are implemented as well as external interlocks are present.

The units can be also locally controlled via a display and a local interface in order to set or monitor the main parameters and status of the power supply.

Different output current, voltage and power ratings are commercially available.



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Linux OS
Embedded



EPICS IOC

Technical Specifications

FAST-PS Series

Regulation Type	Current- or Voltage- Control
Output current range	± 5 A
	± 10 A
	± 20 A
	± 30 A
Output voltage range	± 20 V
	± 40 V
	± 80 V
Maximum output power	up to 600 W
Current setting resolution	18 bit
Voltage setting resolution	18 bit
Output current readback	24 bit
Output voltage readback	24 bit
Output current ripple*	30 ppm / FS
Output current stability	50 ppm / FS
Output voltage stability	50 ppm / FS
Switching Frequency	100 kHz
Max Current/Voltage update rate	10 kHz
Accuracy	< 0.05%
Slew Rate	up to 5 A/ms
External Interlocks/States	2 Inputs: user-configurable "dry" contacts 1 Outputs: relay (2 magnetic contacts)
Internal Interlocks	DC Link Under-Voltage Over-Temperature Over-Current Over-Voltage Earth Fault Current Regulation Fault Excessive Current Ripple
Hardware protections	Input Fuses Earth Fuse Over-Voltage
Auxiliary ADC Read-Backs	DC Link Voltage Ground Leakage Current Temperature
Cooling	On-Module Self-Regulated Fans
Connection	1 x Ethernet 10/100/100 2 x SFP ports
Extra-Features	Point-by-Point Current Waveform Loading User-definable interlock thresholds, active levels and timings Firmware Remote Updates Analog Control Input (1 kHz BW) - <i>optional</i>
Dimensions	19" – 1U – 365 mm (W x H x D)
Input Voltage	90/260 V(AC) (47-63 Hz)
Efficiency	up to 84 %
Power Factor	> 0.95
Local Control / Monitor	Graphic Display and Encoder 6 LEDs

* measured on 1mH load

Ordering Options

FASTPS052001	FAST-PS 0520-100	FAST-PS 0520-100 - Fast Corrector Current- and Voltage-Controlled Digital Power Supply ± 5 A@ ± 20 V (100W max)
FASTPS054002	FAST-PS 0540-200	FAST-PS 0540-200 - Fast Corrector Current- and Voltage-Controlled Digital Power Supply ± 5 A@ ± 40 V (200W max)
FASTPS058004	FAST-PS 0580-400	FAST-PS 0580-400 - Fast Corrector Current- and Voltage-Controlled Digital Power Supply ± 5 A@ ± 80 V (400W max)
FASTPS102002	FAST-PS 1020-200	FAST-PS 1020-200 - Fast Corrector Current- and Voltage-Controlled Digital Power Supply ± 10 A@ ± 20 V (200W max)
FASTPS104004	FAST-PS 1040-400	FAST-PS 1040-400 - Fast Corrector Current- and Voltage-Controlled Digital Power Supply ± 10 A@ ± 40 V (400W max)
FASTPS202004	FAST-PS 2020-400	FAST-PS 2020-400 - Fast Corrector Current- and Voltage-Controlled Digital Power Supply ± 20 A@ ± 20 V (400W max)
FASTPS204006	FAST-PS 2040-600	FAST-PS 2040-600 - Fast Corrector Current- and Voltage-Controlled Digital Power Supply ± 20 A@ ± 40 V (600W max)
FASTPS302006	FAST-PS 3020-600	FAST-PS 3020-600 - Fast Corrector Current- and Voltage-Controlled Digital Power Supply ± 30 A@ ± 20 V (600W max)
FASTPSACINXA	FAST-PS-AN-IN	FAST-PS Analog Control Input (± 10 V) on BNC connector – <i>optional</i> (1-kHz Bandwidth)
FASTPSTRINXA	FAST-PS-TR-IN	FAST-PS Trigger Input on BNC connector – <i>optional</i>
FASTPSHSXAAA	FAST-P-HS	FAST-PS High Stability with internal DCCT – 0-FLUCS - <i>optional</i>



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FAST-PS-M


Monopolar Multi-Interface Digital
Voltage- and Current-controlled Fast Power Supply



FAST-PS-M

- The FAST-PS-M series is a new series of fast power supplies with dual interface for standard and fast control of the output current and/or voltage
- Current and Voltage digital control loop for easiness of configuration on different loads
- Stand-alone unit with local control, extended input range and internal self-cooling by air convection

FEATURES

- 19" – 1U stand-alone crate
- **30A-30V, 60A-10V, 75A-8V and 100A-6V**
- 10/100/1000 Mbit Ethernet interface
- 2x Fast SFP interface (10 kHz update)
- Current and Voltage regulation
- High stability with 
- Analog control and Trigger - *optional*
- Low noise
- Configurable Digital control loop
- Internal protections and auxiliary readbacks
- Extended input range (90-260VAC)
- Local display and control
- **VISUAL-PS** free software available

APPLICATIONS

- Magnet Power Supplies
- Laboratory Equipment
- Current or Voltage Control

The FAST-PS-M series is the new generation of monopolar power supplies by CAEN ELS and it was designed in order to have state-of-the-art performances both in current- and voltage-control modes. Models rated at **600 W** and **900 W** and currents up to **100 A** are commercially available.

The 10/100/1000 Ethernet connection and the two SFP slots (which can be used as electrical or optical communication channels) allow to control the power converter in two different modes: the "standard" interface over the Ethernet (up to 1 kHz) is intended in cases where the power supply has to be controlled at lower rates and/or to set and monitor general parameters of the unit. The "fast" interface over the SFP allows to run feedback loops and fast corrections by reaching a maximum update rate of 10 kHz.

The control loop, as for most of CAEN

ELS power supplies, is digital in order to obtain the maximum flexibility and easiness of configuration to any connected load.

The FAST-PS can be controlled either in current- or voltage-control modes and both control loops can be remotely configured.

Low noise and high bandwidth are just two of the main features of these power converters that are the ideal upgrade for systems where higher performances are needed.

Internal protections – e.g. over-voltage, over-current - are implemented as well as external interlocks are present.

The units can be also locally controlled via a display and a local interface in order to set or monitor the main parameters and status of the power supply.



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Linux OS
Embedded



EPICS IOC

Technical Specifications

FAST-PS-M Series

	3030	6010	7508	1006
Regulation Type	Current- or Voltage- Control			
Output current range	30 A	60 A	75 A	100 A
Output voltage range	30 V	10 V	8 V	6 V
Maximum output power	900 W	600 W	600 W	600 W
Current setting resolution	18 bit			
Voltage setting resolution	18 bit			
Output current readback	24 bit			
Output voltage readback	24 bit			
Output current ripple*	30 ppm / FS			
Output current stability	50 ppm / FS			
Output voltage stability	50 ppm / FS			
Switching Frequency	300 kHz (equivalent)			
Max Current/Voltage update rate	10 kHz			
Accuracy	< 0.05%			
External Interlocks/States	2 Inputs: user-configurable "dry" contacts 1 Outputs: relay (2 magnetic contacts)			
Internal Interlocks	DC Link Under-Voltage Over-Temperature Over-Current Over-Voltage Earth Fault Current Regulation Fault Excessive Current Ripple DCCT OK			
Hardware protections	Input Fuses Earth Fuse Over-Voltage			
Auxiliary ADC Read-Backs	DC Link Voltage Ground Leakage Current Temperature			
Cooling	On-Module Self-Regulated Fans			
Connection	1 x Ethernet 10/100/100 2 x SFP ports			
Extra-Features	Point-by-Point Current Waveform Loading User-definable interlock thresholds, active levels and timings Firmware Remote Updates Analog Control Input (1 kHz BW) - <i>optional</i>			
Dimensions (W x H x D)	600W models: 19" – 1U – 425 mm (including connectors) 900W models: 19" – 1U – 466 mm (including connectors)			
Input Voltage	90/260 V(AC) (47-63 Hz)			
Efficiency	up to 85 %			
Power Factor	> 0.95			
Local Control / Monitor	Graphic Display and Encoder 6 LEDs			

* measured on 1mH load



0-FLUCS Technology

Ordering Options

FASTPSM3030A	FAST-PS-M 3030-900	FAST-PS-M 3030-900 – Current- and Voltage-Controlled Digital Power Supply 30A@30V (900W max)
FASTPSM6010A	FAST-PS-M 6010	FAST-PS-M 6010 – Current- and Voltage-Controlled Digital Power Supply 60A@10V (600W max)
FASTPSM7508A	FAST-PS-M 7508	FAST-PS-M 7508 – Current- and Voltage-Controlled Digital Power Supply 75A@8V (600W max)
FASTPSM1006A	FAST-PS-M 1006	FAST-PS-M 1006 – Current- and Voltage-Controlled Digital Power Supply 100A@6V (600W max)
FASTPSACINXA	FAST-PS-AN-IN	FAST-PS-M Analog Control Input (0-10V) on BNC connector – <i>optional</i> – 1-kHz Bandwidth
FASTPSTRINXA	FAST-PS-TR-IN	FAST-PS-M Trigger Input on BNC connector – <i>optional</i>



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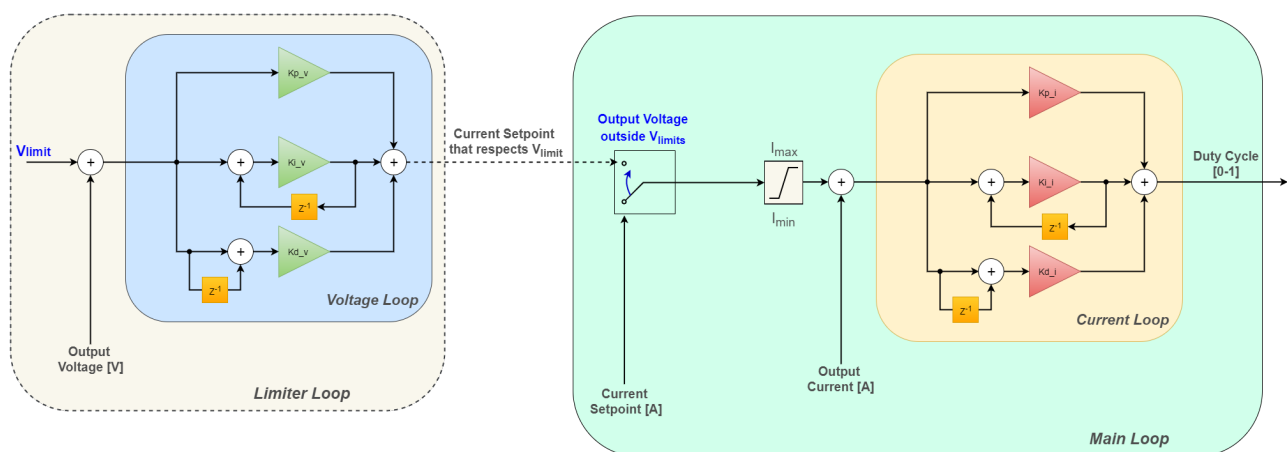
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Digital Control Loop

All CAEN ELS power supplies use a **digital control loop** technology and a state-of-the-art PWM generation in order to obtain the best regulation for any load condition.

The digital control loop allows for easily adapting, remotely and without changing any hardware component, the power supply response to a specific **inductive or capacitive load**.

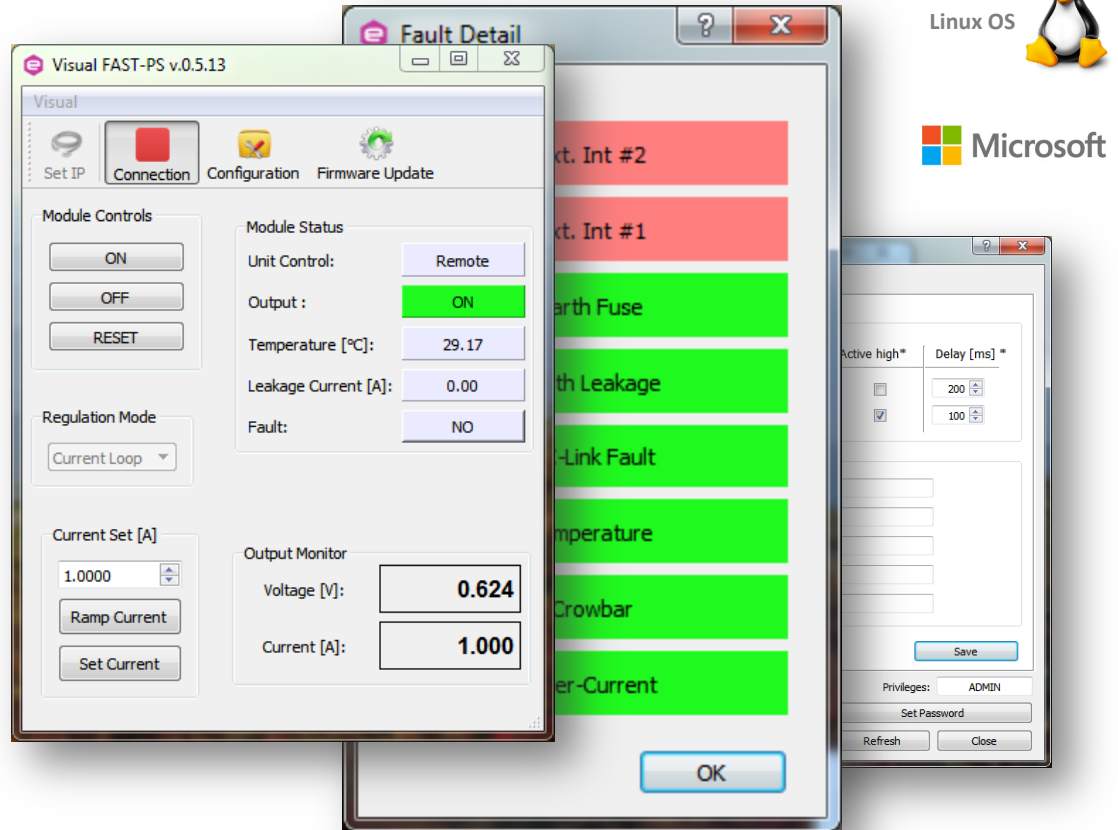
Current and Voltage Proportional-Integral-Derivative (**PID**) control with **anti wind-up** capability can be configured and used together in order to obtain the desired dynamic behaviour.



Protection circuits to protect the power supply unit and the load in case of an unwanted sudden variation of the output current are embedded in all power supplies.

Energy Protection

Control Software



Control software packages are available for free for any power supply model. From these software it is possible to control and monitor the units and to upgrade the firmware. A lot of advanced controls are available in order to obtain the best performance out of your power unit.

Precision Current Sensing

The use of the closed-loop **0-FLUCS** technology for **current sensing** guarantees low-noise, high-bandwidth and top-class stability performance on the output current of monopolar and bipolar sources.

The additional use on some units of internal **temperature-stabilized** circuit sections enables some models to reach an outstanding **1 ppm/K** temperature dependence.





FAST-PS-1K5

1.5-kW Bipolar Multi-Interface Digital Voltage and Current-controlled Fast Power Supply



FAST-PS-1K5

- Digital control loop – adapt the power supply to any load condition in both Current- and Voltage-controlled modes
- Low-noise and the lowest temperature dependence on the market at 1 ppm/K
- Quench protection for superconducting magnet applications

FEATURES

- 19" – 2U stand-alone crate
- Models up to 100 A and up to 100 V
- Configurable digital control loop
- 10/100/1000 Ethernet interface
- PARALLEL operation
- Current or Voltage regulation
- Low noise and Ripple - DCCT
- < 1 ppm/K temperature dependence
- Excellent long-term stability
- Quench protection for SC magnets
- External Analog Control and Temperature Sensor Inputs
- Fast SFP interface (10 kHz update)
- Embedded Linux OS
- **VISUAL-PS** free software available

APPLICATIONS

- Particle Accelerator
- Superconducting Magnets
- Military and Aerospace
- Industrial / Plant Operation
- Battery, Supercapacitor, Fuel Cell Testing
- Motor & Magnet Drives
- PV Cell Testing
- Medical Imaging

The FAST-PS-1K5 series is the new generation of bipolar power supplies by CAEN ELS and it is designed in order to have state-of-the-art performances both in current- and voltage-control modes. Models **up to 100 A** and **up to 100 V** are available in order to satisfy any need.

The use of a 0-FLUCS DCCT as the sensing element, combined with thermal stabilized electronic sections, make this power supply have the lowest temperature dependence on the market at less than 1 ppm/K.

The 10/100/1000 Ethernet connection and the two SFP slots allow controlling the power converter in different modes.

The control loop, as for most of CAEN ELS power supplies, is digital in order to obtain the maximum flexibility and easiness of configuration to any

connected load – e.g. resistive, capacitive or inductive.

The FAST-PS-1K5 can be controlled either in **current-** or **voltage-control** modes and both control loops can be remotely configured.





Internal protections – e.g. over-voltage, over-current - are implemented as well as external interlocks are present. A **quench protection** feature is embedded in order to use these power units with superconducting magnets.

Features like waveform, triggers, etc. are also present in these state-of-the-art units that also embed a Linux OS to give the maximum flexibility.

The units can be also locally controlled via a display and a local interface in order to set or monitor the main parameters and status of the power supply.

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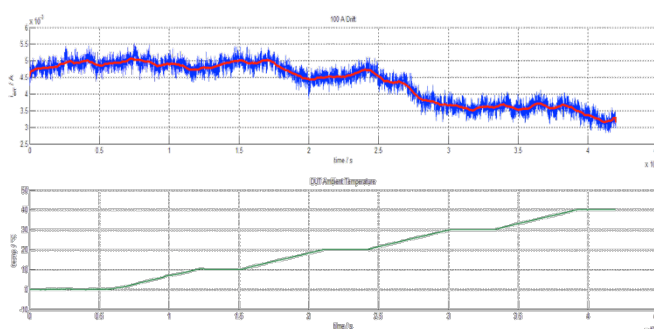


Technical Specifications

	FAST-PS-1K5			
	15-100	30-50	50-30	100-15
Output Current	±15 A	±30 A	±50 A	±100 A
Output Voltage	±100 V	±50 V	±30 V	±15 V
Maximum Output Power	1.500 W			
Topology	Bipolar			
Control Mode	Current (CC) and Voltage (CV) Control			
Floating Output	Up to 200 V			
Remote Sensing	Up to 500 mV			
Current Sensing	 High-Precision Current Transducers			
Analog Control Input	Yes			
Current Setting Resolution	150 µA	250 µA	400 µA	800 µA
Voltage Setting Resolution	1 mV	500 µV	300 µV	150 µV
Output Readback Resolution	24-bit			
Noise + Ripple (RMS)	< 0.01 % on resistive load < 0.005 % on 1 mH load			
Temperature Coefficient	< 0.0002 % / K (CC mode) < 0.005 % / K (CV mode)			
Long Term Stability (8 h)	< 0.0005 % / K (CC mode) < 0.005 % / K (CV mode)			
Accuracy	< 0.01 % (CC mode) < 0.05 % (CV mode)			
Analog Bandwidth (-3 dB)	> 2 kHz			
Control/Communication Interface	Ethernet TCP-IP SFP/SFP+			
Local Control	Colour display with multi-function navigation switch			
External Signals	2 External Interlocks 2 Status signals – 1 magnetic relay and 1 solid state Trigger Input Analog Control Input (BW = 1 kHz) External Temperature Sensor			
Extra Features	Waveform execution Quench Protection Remote Firmware Update Linux OS on-board			
Mechanical Dimensions (L x W x H)	19" x 2U x 550 cm			
Operating Temperature	0 ... 45 °C			

FAST-PS-1K5

The HIGHEST STABILITY on the market at less than 1 ppm/K



Ordering Options

FASTPS015100	FAST-PS-1K5 15-100	1.5-kW Fast High-Stability Current- and Voltage-Controlled Digital Power Supply ±15A@±100V
FASTPS030050	FAST-PS-1K5 30-50	1.5-kW Fast High-Stability Current- and Voltage-Controlled Digital Power Supply ±30A@±50V
FASTPS050030	FAST-PS-1K5 50-30	1.5-kW Fast High-Stability Current- and Voltage-Controlled Digital Power Supply ±50A@±30V
FASTPS100015	FAST-PS-1K5 100-15	1.5-kW Fast High-Stability Current- and Voltage-Controlled Digital Power Supply ±100A@±15V



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NGPS

10-kW New Generation High-Stability
Digital Controlled Power Supply Series




Designed with
OCEM
POWER ELECTRONICS



- The NGPS series is a new series of power supplies with high stability and low noise for the most demanding accelerator applications – e.g. dipoles, quadrupoles, sextupoles
- Stand-alone unit with local control and internal self-cooling by air convection
- Current and Voltage digital control loop: easy to be configured on different loads
- Best-in-Class Temperature Coefficient combined with fast dynamic response


FEATURES

- 19" – 3U stand-alone unit
- Different current and voltage ratings
- up to 200 A – 50 V (10 kW)
- 10/100/1000 Ethernet interface
- PARALLEL/SERIES operation
- 2x Fast SFP interface (10 kHz update)
- Current or Voltage regulation
- Low noise and Ripple –  transducers for current-sensing
- 1 ppm/K grade ("HS" version)
- High temperature and long-term stability
- Configurable digital control loop
- Internal protections and auxiliary readbacks
- Local display and control
- Embedded OS and EPICS IOC
- **VISUAL-PS** free software available

APPLICATIONS

- Particle Accelerator
- Military and Aerospace
- Industrial / Plant Operation
- Battery, Supercapacitor, Fuel Cell Testing
- Motor & Magnet Drives
- Medical Imaging

The NGPS – New Generation Power Supply – series is set of power converters that combines know-how and technology to a power supply with outstanding performances and functionalities.

High-efficiency, low-noise and extreme temperature and long-term stability, obtained by the use of a DCCT of the  technology allow the NGPS units to be the perfect fit for high demanding applications – e.g. particle physics and medical accelerator magnets.

The control loops of current and voltage are performed via a combined FPGA – DSP – ARM technology that enables to obtain the desired dynamic response with any type of different load connected to the power unit.

An internal Operative System (Linux OS) and EPICS IOC make the integration of this power supply straightforward in any control system and installation.

Communication can be performed via a standard TCP-IP Gigabit Ethernet connection and simultaneously via two fast SFP links (optical or electrical) that enable for the update rate of the output current to reach and unprecedented 10 kHz value for a 10-kW power supply unit.

Dipole, quadrupole and sextupole magnets are typical applications of these power supply units that guarantee the high performances in terms of stability and noise as well of remote controlling and control system integration.

Internal protections against over-voltage (i.e. magnet stored energy), excessive current ripple, regulation fault, external interlocks, over temperature and ground current are implemented into the system with the same configurability level and easiness of use that all of CAEN ELS and OCEM power supplies have always presented.

A dedicated software application is



About Us

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- Power Supply Systems
- Precision Current Measurements
- Beamline Electronic Instrumentation
- FMC & MTCA.4 – MicroTCA for Physics

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Linux OS
Embedded



EPICS IOC



supplied with the units to easily configure and control the NGPS.

An extra analog input, rated at 0 - 10 V, is also provided for compatibility with older systems where a DAC was used in order to control the power unit (1-kHz bandwidth).

Commercially available models rated at 6 kW and 10 kW, with currents up to currents up to 200 A are available.

Ratings and requirements can be also matched upon customer's specifications and requests.

Technical Specifications

NGPS

Input Ratings	208 VAC ('E') Three-phase 50/60 Hz 400 VAC ('A') Three-phase 50/60 Hz	
Regulation Type	Current-control (C.C.) or Voltage-control (C.V.)	
Output current range	NGPS 140-50 NGPS 200-50	140 A 200 A
Maximum output voltage	50 V	
Maximum output power	up to 10 kW	
Output Isolation	500 V	
Power Factor	> 0.94	
Efficiency	> 90 %	
Current and Voltage Setting	18 bit	
Current and Voltage Readback	20 bit	
Max Current/Voltage update rate	10 kHz (over SFP)	
Closed-loop Bandwidth	C.C. mode C.V. mode	> 100 Hz > 200 Hz
Accuracy	C.C. mode C.V. mode	< 0.01 % (0.005% upon request) < 0.05 %
Line Regulation	±5 ppm/FS	
Load Regulation	±5 ppm/FS	
Remote Sensing Compensation	up to 2 V	
Cooling	Forced Air Convection (front-to-rear)	
Temperature Stability	C.C. mode C.V. mode	5 ppm/K (1 ppm/K – "HS" version) 50 ppm/K
Interfaces	10/100/1000 TCP-IP Ethernet Two (2) SFP/SFP+ other interfaces available upon request	
Internal Interlocks/Protections	Over-Temperature MOV Input Over-Voltage Main circuit-breaker for Over-Current Output Free-wheeling diodes Output Over-current and Over-Voltage Earth current leakage Input Phase-Loss	
External Interlocks/States	user-configurable "dry" contacts relay (magnetic contacts, NO and NC)	
Other Features	Firmware remote update Interlock configurability Adaptable thresholds for trips and interlocks Analog Control Input (BW = 1 kHz)	
Modularity	Parallel connection	up to 4
Mechanical Dimensions	19" x 3 U x 600 mm including connectors	
Weight	28 kg	
Operating Temperature	0 ... 50 °C	

Ordering Options

NGPS140050EX	NGPS 140-50-E	NGPS 140-50 – Current- and Voltage-Controlled Digital Power Supply 140A@50V (7 kW) – 400 VAC Input
NGPS140050AX	NGPS 140-50-A	NGPS 140-50 – Current- and Voltage-Controlled Digital Power Supply 140A@50V (7 kW) – 208 VAC Input
NGPS200050EX	NGPS 200-50-E	NGPS 200-50 – Current- and Voltage-Controlled Digital Power Supply 200A@50V (10 kW) – 400 VAC Input
NGPS200050AX	NGPS 200-50-A	NGPS 200-50 – Current- and Voltage-Controlled Digital Power Supply 200A@50V (10 kW) – 208 VAC Input

SY3634

Modular Bipolar Power Supply
Heterogeneous System



SY3634

- High efficiency, low cost, high stability, easiness of configuration and maintenance are the key features of this power supply system
- Different combinations of up to 4 modules (chosen among 5A, 10A, 20A or 30A) can be easily installed in the same rack
- Extremely versatile and easy to optimize for any load condition

FEATURES

- 19" – 3U crate housing up to 4 channels
- Current at $\pm 5A$, $\pm 10A$, $\pm 20A$ or $\pm 30A$
- Voltage at $\pm 20V$ or $\pm 40V$
- True bipolar zero-crossing operation
- 10/100 Mbit Ethernet interface
- Digital Current Regulation
- Low noise
- Hot-plug capability
- Internal protections and auxiliary readbacks
- Extended input range (90-260VAC)
- Local display and control
- **VISUAL** free software available

APPLICATIONS

- Magnet Power Supplies
- Laboratory Equipment
- Current or Voltage Control

High efficiency, low cost, high-stability, easiness of configuration and maintenance are the key features of this power supply system.

The system houses up to 4 independent current-controlled bipolar power supply modules, ranging from 5A to 30A, in a single 19-inch 3U standard crate (SY3634). Different combinations of modules (chosen among a catalogue including 5A, 10A, 20A or 30A channels) can easily be installed in the same rack.

An auxiliary AC/DC converter module, the A3636, powers the control circuits. Each module implements a completely digital feedback control loop with a proprietary PWM generation technique: this makes the system extremely versatile and easy to "tune" to any load/magnet condition.

Modules are composed by a Control Board (CB) and a Power Board (PB) that are mechanically connected:

communication between boards is almost exclusively performed by digital signals that avoid possible analog signal corruption and undesired noise pick-up.





The CB is mainly composed by a DSP that performs current control and an FPGA that supervises all processes like communications, diagnostic operations and interlocks handling.

Remote communication is guaranteed by means of an Ethernet 10/100 auto-sensing socket present on each module front panel. The power supplies can also be locally monitored/controlled via an encoder and a graphic color display featuring user-friendly menus.

An external DC bulk power supply feeds the power sections. Cooling is performed by embedded fans, directly controlled by an output current-related hysteretic algorithm.

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Technical Specifications

SY3634 Modules

	A3605BS	A3610BS	A3620BS	A3630BS
Regulation Type	Current Control			
Output current range	± 5 A	± 10 A	± 20 A	± 30 A
Output voltage range	± 20 V or ± 40 V			
Maximum output power	100 W	200 W	400 W	600 W
Current setting resolution	160 µA	320 µA	640 µA	950 µA
Output current readback	20 bit			
Output voltage readback	20 bit			
Output current ripple*	30 ppm / FS			
Output current stability	50 ppm / FS			
Switching Frequency	104 kHz			
Accuracy	< 0.05%			
External Interlocks/States	8 Inputs: user-configurable "dry" contacts 3 Outputs: relay-type (2 magnetic + 1 solid-state)			
Internal Interlocks	DC Link Under-Voltage MOSFETs Over-Temperature Shunt Over-Temperature Over-Current Over-Voltage Earth Fault Current Regulation Fault / Excessive Current Ripple			
Hardware protections	Input Fuses Earth Fuse Over-Voltage			
Auxiliary ADC Read-Backs	DC Link Voltage Ground Leakage Current MOSFETs Temperature Shunt Temperature			
Cooling	On-Module Self-Regulated Fans			
Connection	Ethernet 10/100			
Extra-Features	Hot-Swap Point-by-Point Current Waveform Loading User-definable interlock thresholds, active levels and timings Firmware Remote Updates			
Dimensions	19" wide – 3U high Euro-mechanics rack			
Input Voltage	90/260 V(AC) (47-63 Hz) and 24 VDC			
Efficiency	up to 84 %			
Power Factor	> 0.95			
Local Control / Monitor	Graphic Display and Encoder 6 LEDs			

* measured on 1mH load

Ordering Options

WSY3634XAAAA	SY3634	SY3634 - Crate
WSY3634TXAAA	SY3634T	SY3634T - Crate (with mating connectors included)
WA3605BSXAAA	A3605BS	A3605BS - LV Digital Bipolar Current Power Supply (5A 20V; 100W max)
WA3610BSXAAA	A3610BS	A3610BS - LV Digital Bipolar Current Power Supply (10A 20V; 200W max)
WA3605BSXAAA	A3620BS	A3620BS - LV Digital Bipolar Current Power Supply (20A 20V; 400W max)
WA3605BSXAAA	A3630BS	A3630BS - LV Digital Bipolar Current Power Supply (30A 20V; 600W max)
WA3631XAAAAA	A3631	A3631 - SY3634 Bulk PS Power Cable
WA3632XAAAAA	A3632	A3632 - SY3634 SHK (Sentinel Hardware Key)
WA3633XAAAAA	A3633	A3633 - SY3634 CH & Interlock Connector
WA3636XAAAAA	A3636	A3636 - SY3634 Auxiliary Supply
WA3640XAAAAA	A3640	A3640 - SY3634 Bulk Power Supply 40A 1000W (24V)
WA3621XAAAAA	A3621	A3621 - SY3634 Bulk Power Supply 21A 1000W (48V)






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High-Performance Power Supplies



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