



HV-ADAPTOS

High-Voltage ADAPTive Optics Supply system

Multi-channel High-Voltage bipolar power supply system – 8 independent channels/board and up to 6 boards/system.

Integrated CPU with Web Server software application dedicated to bimorph mirror control and monitoring – possibility to control multiple mirrors with a single system.

Proprietary creep and hysteresis control and minimization routines.

Features

- up to 48 HV channels per system
- $\pm 2\text{kV}@1\text{W}$ low-noise
- Compact dimensions
- Internal Hardware protections
- Excellent long-term output stability
- Standard Ethernet connectivity
- Web Server application with mirror dedicated software
- Proprietary creep and hysteresis control and minimization routines
- Integrated EPICS IOC
- Integrated system cooling
- Extended Input Range

Applications

- Bimorph Mirror Control and Monitor
- Electrostatic Lenses
- Electron Beam

The HV-ADAPTOS is a multi-channel High-Voltage (HV) bipolar power supply system especially developed to control, monitor and safely operate bimorph mirrors. The system is composed by a standard 19" – 4U crate containing a CPU board, integrated cooling, power supply sources and the HV boards.

Up to 6 independent HV boards, each one housing 8 channels – rated at $\pm 2\text{kV}$ @ $\pm 0.5\text{mA}$ – can be installed into the system crate.

Every HV board has dedicated internal protections that limits differential voltage between adjacent channel outputs to 500V. This behavior is required in order to protect the mirror from damages and it allows safe operation of the overall optical system.

Each HV board also has an OVP (Over Voltage Protection) output and an OVP input connector in order to daisy-chain the differential protection – i.e. 500V – between channels of different boards.

Other hardware-dedicated protections

– e.g. passive emergency output discharging – are implemented for the specific application.

The HV-ADAPTOS system includes an internal web server software dedicated to bimorph mirror control and monitoring and allows to simultaneously control more than one mirror with a single system. The 8-channel boards can also be collected into different groups, each one associated with 8, 16, 24 or 32 number of electrodes.

Three different levels of users' privileges (power user, user and generic) with different features and accessibility to configuring-setting-reading are implemented.

The possibility to dynamically assign individual HV channels to "super-electrodes" within the same group is also provided.

Communication to the HV-ADAPTOS system is guaranteed by means of a 10/100/1000 Ethernet interface over standard TCP-IP protocol.

About CAENels

CAENels is a dynamic company that provides power supplies and state-of-the-art dedicated electronic systems to the particle accelerator community – e.g. synchrotron light sources and Free Electron Laser (FEL) facilities.

- Magnet Power Supply Systems
- Beamline Electronic Instrumentation
- Precision Current Transducers
- High-Voltage Dedicated Systems
- AMC Boards - MTCA.4

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HV-ADAPTOS Web Server

An embedded Web Server application, specifically developed to control and monitor different mirrors is included in the system as well as the EPICS IOC.

EPICS drivers are integrated into the system crate and easily allows interfacing to the control system.

The system also includes proprietary creep and hysteresis control and minimization routines.

HV-channels connected to the same mirror move in a coordinated manner in order not to make OVP trip during setpoint changes.

External interlocks – e.g. vacuum – are accessible and configurable.

Technical Specifications

HV-ADAPTOS

Rated Output Voltage	±2 kV (per channel)
Rated Output Current	±0.5 mA (per channel)
Rated Output Power	85-264 V(AC) @ 47-63 Hz
Channels	8 channels / board
Boards	Up to 6 boards / system – i.e. 48 channels
Setting Resolution	75 mV
Output Noise and Ripple – typ.	< 10 mV _{PK-PK}
Long Term Stability (8h)	< 50 ppm / FS
Temperature Stability	< 50 ppm / K
Interlocks	Configurable external interlocks
Hardware Protections	500 V differential between channels
Cooling	Integrated air convection
Drivers	EPICS - integrated
Communication	10/100/1000 Ethernet TCP-IP
Software	Internal dedicated Web Server with different users' privileges <ul style="list-style-type: none"> - Power user - User - generic
Mechanical Dimensions	19" wide – 4U high Euro-mechanics crate



HV-ADAPTOS System – Rear View

Ordering Options

WADAPTOS8XAA	HV-ADAPTOS8	HV-ADAPTOS – 8-channel High-Voltage ADAPTive Optics System (±2kV@0.5mA) with Web-Server and EPICS
WADAPTOS16XA	HV-ADAPTOS16	HV-ADAPTOS – 16-channel High-Voltage ADAPTive Optics System (±2kV@0.5mA) with Web-Server and EPICS
WADAPTOS24XA	HV-ADAPTOS24	HV-ADAPTOS – 24-channel High-Voltage ADAPTive Optics System (±2kV@0.5mA) with Web-Server and EPICS
WADAPTOS32XA	HV-ADAPTOS32	HV-ADAPTOS – 32-channel High-Voltage ADAPTive Optics System (±2kV@0.5mA) with Web-Server and EPICS