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Gear For Science



# Regul8OR

**Universal High-Precision Power Supply Controller**

Your **DIGITAL POWER ELECTRONICS** Partner.

## REGUL8OR

- **The REGUL8OR is a universal power supply controller that allows converting your standard power supply or amplifier in a state-of-the-art multi-function power converter**
- **The digital current control loop makes the connection and configuration of the power supply to any load quick and simple**
- **Obtain outstanding long-term stability, great accuracy, low temperature coefficient, excellent load and line regulation**

## FEATURES

- **19"-1U stand-alone crate**
- **Voltage and Current control**
- **100 kHz Regulation Loop**
- **Up to ± 200 V and ± 1.000 A**
- **Used with FLUCS current transducers**
- **Digital output regulation loop**
- **Waveform Generation at 100 kHz**
- **Embedded 4-channel Oscilloscope**
- **Embedded Web-Server**
- **External Configurable Interlocks and Status Signals**
- **External Signals for Analog Control, Analog Acquisition, Hall Probes and Temperature Sensors**
- **Local Display and Controls**
- **10/100/1000 Mbit Ethernet**
- **Synchronization of multiple units**
- **Fanless operation**

## APPLICATIONS

- **Programmable Power Supplies**
- **Laboratory Equipment**
- **Power Source Emulation**

**REGUL8OR**. This breakthrough power supply controller allows converting your programmable power supply unit or amplifier in a state-of the-art power converter unit with built-in web-server, waveform generation and oscilloscope functions.

This fan-less unit comes together with a FLUCS current transducer by CAEN ELS and with voltage sensing terminals, with current measuring ranges up to 1.000 A and 200 V.

Any power converter within these ratings can be connected to the controller and its current and voltage values are monitored and stabilized by the internal configurable digital control loop (on a FPGA) so that any load conditions can be easily fit in order to obtain the desired response. This controller will transform any power converter to a ppm-level stability power unit, with negligible line and load regulation values and will greatly improve the accuracy.

The programmable power supply connected to the REGUL8OR can be driven by multiple interfaces: a precision fast DAC (± 5 V or ± 10 V), a 4-20 mA loop driver or optional optically-isolated PWM signals.

The 10/100/1000 Ethernet connection over TCP-IP or UDP allows controlling the power converter in a very simple and reliable manner and also accessing the embedded web-server.

The embedded Web-Server allows running pre-loaded or custom waveforms at 100 ksps and monitor and record the response of different values – e.g. output current, voltage, etc. – at 100 ksps per channel simultaneously.

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## 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 Electronics Instrumentation
- FMC and MicroTCA


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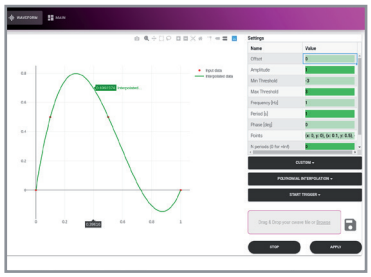
**Embedded 4-channel OSCILLOSCOPE**



**Embedded WAVEFORM GENERATOR**

Waveform Generation | Linux OS | Embedded EPICS IOC

| *Technical Specifications* | **Regul8OR** |
|---|---|
| **Output Current Ranges**[1] | ± 100 A, ± 150 A, ± 200 A, ± 300 A, ± 400 A, ± 600 A, ± 1000 A |
| **Output Voltage Ranges** | ± 5 V, ± 10 V, ± 20 V, ± 50 V, ± 100 V, ± 200 V |
| **Maximum Controllable Power** | 200 kW |
| **Regulation Type** | Constant Current (CC) or Constant Voltage (CV) |
| **Current Setting/Readback Resolution** | 24 bit |
| **Voltage Setting/Readback Resolution** | 24 bit |
| **Output Readout Resolution** | 24 bit |
| **Line Regulation (±10% variation)** | < 0.0001 %/FS in CC mode |
| **Load Regulation (±10% variation)** | < 0.0001 %/FS in CC mode |
| **Temperature Coefficient (TC)** | < 0.0002 %/K in CC mode<br>< 0.005 %/K in CV mode |
| **Long-Term Stability (8 h)** | < 0.001 %/FS in CC mode<br>< 0.001 %/FS in CV mode |
| **Overall Accuracy** | < 0.01 %/FS in CC mode<br>< 0.01 %/FS in CV mode |
| **Output Control Interfaces** | • Analog Voltage Output: ± 5 V or ± 10 V<br>• Analog Current Output: 4 - 20 mA<br>• 8 x High-Resoltion optical PWM outputs |
| **External Interlocks** | • 4 x inputs accepting dry-contacts<br>• 2 x inputs accepting 24 $V_{DC}$ (e.g. from PLC) |
| **External Hardware Interfaces** | • 2 x output magnetic relay[2]<br>• 2 x output solid state relay<br>• 2 x output isolated TTL (0 - 5 V) signals |
| **External Signals** | • 1 x Analog control input (±10 V full-scale, 100 ksps @ 16 bit)<br>• 1 x Analog input (+4 V full-scale, 100 ksps @ 16 bit)<br>*e.g. readout of an Hall probe*<br>• 1 x 5-V or 20-mA configurable power output available<br>*e.g. to supply an Hall probe*<br>• 1 x isolated SPI interface (4-wire)<br>• 1 x External Temperature sensor Input<br>*including 1.8 V and 3.3 V supply for the temperature sensor*<br>• 2 x Optical "Fault" Input Signals<br>*e.g. from IGBT modules*<br>• 1 x isolated Trigger Input<br>• 1 x Sync IN and 1 x Sync OUT signals<br>*i.e. to synchronize multiple controllers* |
| **Connectivity** | • 1 x Ethernet 10/100/1000 Mbit TCP-IP or UDP<br>• 2 x SFP+ (6.25 Gbps) |
| **Extra Features** | • Embedded Web-Server<br>• 4-channel Embedded Oscilloscope Function at 100 ksps<br>• Embedded Waveform Generator<br>• Embedded EPICS IOC<br>• Firmware Remote Update<br>• Paralleling and Synchronization of Multiple Units |
| **Local Indicators** | • LCD display<br>• LEDs |
| **Mechanical Dimensions** | 19" x 1 U x 230 mm |
| **Weight** | < 2 kg |
| **AC Input Ratings** | 90 - 264 $V_{AC}$ @ 47 - 63 Hz |

1 0-FLUCS current transducers to be purchased separately
2 NO, NC and CENTER TAP are all three available on the connector

| Ordering Code | Acronym | Description |
|---|---|---|
| REGUL8ORXAAA | REGUL8OR | Universal High-Precision Power Supply Controller |
| REGUL8ORPWMX | REGUL8OR-PWM | Universal High-Precision Power Supply Controller w/ 8 PWM Optical Outputs |

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Rev. 1.0 - Printed in February 2021.