



Precision Current
Measurements

ELUCS

Product Catalogue



CAENels
Gear For Science

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CT-BOX ²

Digital Current Transducer Box for the Highest Accuracy Current Measurements



4 CT-PCB Series

13 A, 26 A and 52 A Full-Scale Precision Current Transducers for PCB Mounting

CT-100 / CT-150 ⁶

100 A and 150 A Full-Scale Precision Current Transducers for Rack/Panel and PCB Mounting



8 - Selection Guide

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CT-200 / CT-300 / CT-400 ⁹

200 A, 300 A and 400 A Full-Scale Precision Current Transducers for Rack/Panel Mounting



11 CT-600 / CT-1000

600 A and 1000 A Full-Scale Precision Current Transducers for Rack/Panel Mounting

PS1215 ¹³

Low-Noise Bipolar Power Supply for Current Transducers



15 Frequency Response
Maximum Current Ratings



CT-BOX

Digital Current Transducer Box
for the Highest Accuracy Current Measurements

Precision Current
Transducers



CT-BOX

- Precise and accurate current measuring system includes current transducer and measuring unit in order to obtain best-in-class performances.
- Internal calibration and thermal stabilization to obtain excellent stability of current measurements.
- Data-logger and oscilloscope modes of operation

FEATURES

- Digital Interface
 - Ethernet
 - USB
 - RS-232
- < 1 ppm/K Temperature Coefficient
- < 0.005 % Full-Scale Accuracy (with High-Accuracy Calibration Option)
- Configurable Recorder on microSD-Flash
- Trigger Input / Output and Alarm Output
- External Temperature Sensors
- Analog Monitor
- Local Display for Current Readings
- Desktop or Rack Mounting in 1U
- Integrated Fan-less AC/DC Power Supply
- Dedicated Software Application

APPLICATIONS

- Test & Measurement Setups
- Sensing Element in Calibration Systems
- Power Supplies
- Biomedical Devices

The CT-BOX is a stand-alone system designed to measure with the highest accuracy and precision DC and AC currents, providing the readings in different digital formats.

The CT-BOX system is developed to be used with the 0-FLUCS current output DCCTs allowing measurements of currents up to kA.

The system integrates a burden resistor and a conditioning network feeding a 24-bit temperature stabilized ADC in order to have < 1 ppm/K temperature dependence. The digital section interfaced to the ADC performs a calibrated measurement in order to eliminate the non-ideal behavior thus providing a 0.005% Full-scale current value accuracy (optional). The ADC sampling frequency can be configured up to 100 kHz allowing to acquire high frequency components and fast current transients.

Current readings can be triggered in different modes:

- by an external LVTTTL or TTL signal;
- by a remote command sent to the digital interface;
- internally, setting the sampling period and the acquisition window.

The time-stamp, the current readings and the external temperature values are stored in a microSD Flash memory allowing long-term acquisitions.

The microSD memory can be either read via Ethernet, USB or RS-232 interfaces or removed from the system and transferred to other devices in order to download its content.

A temperature probe can be plugged on the back of the system if needed in order to also read and store external temperature values.

A local display showing current readings as well as other settings – e.g. IP address, mode of operation – is present.

A configurable alarm output can be used to signal to an external device if a pre-set current threshold has been exceeded.

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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An integrated function allows to compensate for measurement setup offset currents.

The unit integrates a low-noise mixed AC/DC power supply to connect the

CT-BOX directly to the AC mains.

The extremely compact design (1U–9”) allows using the instrument as benchmark or to install the systems in a 1U-19” rack.

Technical Specifications

CT-BOX

AC Line Input	90-260 V(AC), 46-440 Hz
Maximum Power Consumption	25W
Current Accuracy	< 0.01 % (standard) < 0.005 % (High-Accuracy option)
Current Resolution	24-bit
Sampling Frequency	0.1 Hz – 100 kHz
Thermal Coefficient (typ.)	< 1 ppm/K
Current Ranges Available [A]	100, 150, 200, 300, 400, 600, 1000
Current Readings	7 ½ digits
Linearity	< 25 ppm/FS
Long Term Stability	< 10 ppm/FS
Noise	< 1 ppm (up to 10 Hz readout) < 5 ppm (up to 10 kHz readout)
Offset	< 1 ppm/FS (with Zero Offset function)
Number of Memory Readings	depending on microSD card capacity
LED Indicators	Power OK, DCCT connected , Status, SD reading/writing, Acquisition running
Temperature Probe Resolution	0.1 °C
Temperature Probe Accuracy	± 0.5 °C
Temperature Accuracy	0.05%
Digital Interfaces	Ethernet 10/100 Mbps TCP-IP USB 2.0 RS-232
Analog Monitor	±10 V (LEMO connector)
Trigger Inputs	Digital Interface (soft-trigger) TTL 5V – LVTTTL compatible
Alarm Output	TTL 5V Solid State Relay
Mechanical Dimensions (L x W x H)	180 x 220 x 41 mm
Operating Temperature	0 ... 40 °C



CT-BOX
 also for 1U – 19” installation

Ordering Options

WCTBOX100XAA	CT-BOX-100	100A Current Transducer Digital Box with Local Display and Ethernet, USB, RS-232 Communication Interfaces
WCTBOX150XAA	CT-BOX-150	200A Current Transducer Digital Box with Local Display and Ethernet, USB, RS-232 Communication Interfaces
WCTBOX200XAA	CT-BOX-200	200A Current Transducer Digital Box with Local Display and Ethernet, USB, RS-232 Communication Interfaces
WCTBOX300XAA	CT-BOX-300	300A Current Transducer Digital Box with Local Display and Ethernet, USB, RS-232 Communication Interfaces
WCTBOX400XAA	CT-BOX-400	400A Current Transducer Digital Box with Local Display and Ethernet, USB, RS-232 Communication Interfaces
WCTBOX600XAA	CT-BOX-600	600A Current Transducer Digital Box with Local Display and Ethernet, USB, RS-232 Communication Interfaces
WCTBOX1000XA	CT-BOX-1000	1000A Current Transducer Digital Box with Local Display and Ethernet, USB, RS-232 Communication Interfaces
WCTBOXMBXAAA	CT-BOX-MB	CT-BOX mounting brackets for 1U – 19” cabinet installation
WCTBOX1YXAAA	CT-BOX-YC	CT-BOX In-House Yearly Calibration Service (< 0.01% accuracy)
WCTBOXSICLXA	CT-BOX-HAC	CT-BOX High-Accuracy Calibration Service (<0.005% accuracy)



CT-13
CT-26
CT-52
Current or
Voltage
Output



CT-PCB Series

- Closed-loop current transformer technology allows accurate monitoring of DC and AC bipolar currents up to $\pm 52A$ with a small PCB-mount device.
- Galvanic isolation between primary and secondary conductor for simple current sensing at different potential.
- Standard current output and voltage output (“V”-version) available.

FEATURES

- Monitoring of DC and AC currents
- Excellent Linearity
- Closed-loop detection
- Galvanically isolated from primary
- Low Temperature Drift
- Current-output or Voltage-output versions
- Wide Bandwidth
- High Accuracy
- UL 94 V-0 flammability grade
- LED indicates correct operation
- PCB-mount versions

APPLICATIONS

- Power Supplies
- Sensing Element in Calibration Systems
- Biomedical Devices
- Test & Measurement Setups

The 0-FLUCS (0-FLUX Current Sensor) family is based on a closed loop technology that allows accurate and precise monitoring of DC and AC currents with high bandwidth. The metal casing guarantees higher noise immunity and reduces undesired noise pick-up from external sources.

The transducers CT-13, CT-26 and CT-52 are PCB-mount devices rated at maximum currents of 13A, 26A and 52A with primary to secondary ratio of 1:250, 1:500 and 1:1000 respectively.

Galvanic isolation between the primary and the secondary circuits allows to measure currents at a different potential and simplifies interfacing when using the 0-FLUCS as the feedback element of current regulated power supplies.

Output from the CT-PCB sensors can be chosen between two different versions: standard secondary current output or buffered voltage output (low temperature coefficient shunt resistor

and low-noise amplifier are embedded in the CT-13V, CT-26V and CT-52V).

Main characteristics of the 0-FLUCS current transformers are negligible temperature coefficient on the secondary output current, excellent linearity and extremely low noise.

DC current transformers represent the ideal replacement for systems where Hall-effect sensors are used as current sensing elements and better performances are needed.

The compact mechanical dimensions of this transducer series and its limited weight allow for easy mounting on printed circuit boards with a Through Hole (TH) topology. A plastic cover is placed on the bottom side of the device to allow for easier mounting on the PCB.

Main applications for these current transducers are precise and stable regulated power supplies and power inverters.

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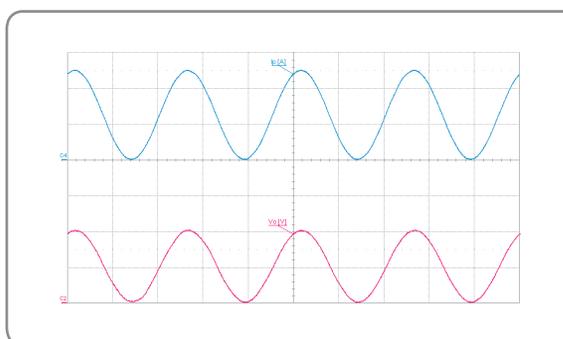
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Due to the excellent characteristics, the CT PCB transducers can be used in a variety of calibration, acceptance testing and quality control applications in industrial, power generation and automotive fields.

Commercially available versions of the CT-13, CT-26 and CT-52 with their respective “V” voltage-output versions CT-13V, CT-26V and CT-52V.

Technical Specifications	CT-13	CT-26	CT-52
Current Transform Ratio - N	1:250	1:500	1:1000
Maximum DC Primary Current - $I_{P(DC)}$	±13 A	±26 A	±52 A
Maximum RMS Primary Current - $I_{P(RMS)}$	9.2 A	18.4 A	36.8 A
Current Polarity	Bipolar		
Maximum DC Secondary Current - $I_{S(DC)}$	±52 mA		
Maximum RMS Secondary Current - $I_{S(RMS)}$	37 mA		
Small Signal Bandwidth – typ.	500 kHz		
Small Signal Bandwidth – “V”-version – typ.	> 200 kHz		
Noise (RMS) – typ.	< 1 ppm (@200 Hz) < 10 ppm (@50 kHz)		
Output Voltage (“V”-version) - V_{OUT}	±10 V		
Output Voltage Ratio (“V” version) – $V_{OUT}/I_{P(DC)}$	0.8 V/A	0.4 V/A	0.2 V/A
Maximum Output Current – “V”-version	±15 mA		
External Shunt Resistor (current output only) – R_S	0...40 Ω		
Temperature Coefficient – TC (typ.)	< 0.5 ppm/K < 2 ppm/K (“V”-version)		
Protection Signal	Yes – OK Status		
Supply Voltage (± 6%)	±15 V		
Connections	16-pin through-hole PCB mounting		
Mechanical (Outer) Dimensions	66 × 68 × 48 mm		
Primary Conductor	Internal		
Maximum Weight	300 g		



CT-PCB Voltage Output – “V” Version 

DC + 20-kHz sine-wave primary current – i.e. I_p [A] – and output voltage of a CT-13V version – i.e. V_o [V]



0-FLUCS Closed-Loop Technology

The CT-PCB current transducer series is based on the CAEN ELS 0-FLUCS Closed-Loop Technology.

Ordering Options

WCT13XAAAAA	CT-13	13A Primary Current O-FLUCS, PCB-Mounting
WCT26XAAAAA	CT-26	26A Primary Current O-FLUCS, PCB-Mounting
WCT52XAAAAA	CT-52	52A Primary Current O-FLUCS, PCB-Mounting,
WCT13VAAAAA	CT-13V	13A Primary Current O-FLUCS, PCB-Mounting, Voltage-Output
WCT26VAAAAA	CT-26V	26A Primary Current O-FLUCS, PCB-Mounting, Voltage-Output
WCT52VAAAAA	CT-52V	52A Primary Current O-FLUCS, PCB-Mounting, Voltage-Output



CT-100 / CT-150

- Closed-loop current transformer technology allows accurate monitoring of DC and AC bipolar currents up to $\pm 100\text{A}$ (CT-100) or up to $\pm 150\text{A}$ (CT-150).
- Galvanic isolation between primary and secondary conductor for simple current sensing at different potential.
- Standard current output and voltage output (“V”-version) available.

FEATURES

- Monitoring of DC and AC currents
- Excellent Linearity
- Closed-loop detection
- Galvanically isolated from primary
- Low Temperature Drift
- Current-output or Voltage-output versions
- Wide Bandwidth
- High Accuracy
- UL 94 V-0 flammability grade
- LED indicates correct operation
- DB-9 Connector or PCB-mount versions

APPLICATIONS

- Power Supplies
- Sensing Element in Calibration Systems
- Biomedical Devices
- Nuclear Magnetic Resonance (NMR)
- Test & Measurement Setups

The 0-FLUCS (0-FLUx Current Sensor) family is based on a closed loop technology that allows accurate and precise monitoring of DC and AC currents with high bandwidth.

The CT-100/CT-150 transducers are rated at a maximum bipolar primary current of 100A/150A with a transformation ratio of 1:1000/1:1500.

Galvanic isolation between the primary and the secondary circuits allows to measure currents at a different potential and simplifies interfacing when using the 0-FLUCS as the feedback element of current regulated power supplies.

Output from the 0-FLUCS transducers can be chosen between two different versions: secondary current output or buffered voltage output (low temperature coefficient shunt resistor and low-noise amplifier are embedded in the device).

Also connection type can be chosen

between the “C” option – a male DB-9 Connector – and the “P” option – 7-pin through-hole for PCB mounting.

Main characteristics of the 0-FLUCS current transformers are negligible temperature coefficient on the secondary output current, excellent linearity and extremely low noise.

DC current transformers represents the ideal replacement for systems where Hall-effect sensors are used as current sensing elements and better performances are needed.

All CT-100/CT-150 devices also have different mounting holes in order to be easily installed in different configurations. Both self-threading screws and normal Ones can be used.

Main application fields for these current transducers are precise and extremely stable regulated power supplies and power inverters.

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0-FLUCS Closed-Loop Technology

The CT-100 and CT-150 current transducer series is based on the CAEN ELS 0-FLUCS Closed-Loop Technology.

Due to the excellent characteristics, the 0-FLUCS transducers can be used in a variety of calibration, acceptance testing and quality control applications in industrial, power generation and automotive fields.

Commercially available versions of the CT-100/CT-150 current sensors are DB-9 connector “C” and 7-pin strip type “P” with their respective voltage-output versions “V”.

Technical Specifications	CT-100	CT-150
Current Transform Ratio – N	1:1000	1:1500
Maximum DC Primary Current - $I_{P(DC)}$	±100 A	±150 A
Maximum RMS Primary Current - $I_{P(RMS)}$	71 A	106 A
Current Polarity	Bipolar	
Maximum DC Secondary Current - $I_{S(DC)}$	±100 mA	
Maximum RMS Secondary Current - $I_{S(RMS)}$	71 mA	
Small Signal Bandwidth (±3 dB) - BW	> 500 kHz > 200 kHz (“V”-version)	
Noise (RMS) – typ.	< 0.5 ppm (@200 Hz) < 5 ppm (@50 kHz)	< 1.5 ppm (@200 Hz) < 8 ppm (@50 kHz)
External Shunt Resistor (current output only) - R_s	0...40 Ω	
Output Voltage (“V”-version) - V_{OUT}	±10 V	
Output Voltage Ratio (“V” version) – $V_{OUT}/I_{P(DC)}$	0.1 V/A	(1/15) V/A
Maximum Output Current – “V”-version	±15 mA	
Temperature Coefficient – TC (typ.)	< 0.5 ppm/K < 2 ppm/K (“V”-version)	
Linearity	< 3 ppm < 15 ppm (“V”-version)	
Induction into Primary (typ.)	35 μV (RMS)	
Protection Signal	Yes - Primary Over-Current	
Supply Voltage (± 6%)	±15 V	
Connections	DB-9 Connector (“C”) or 7-pin type (“P”)	
Mechanical (Outer) Dimensions	45 × 57 × 75 mm	
Primary Conductor Hole Diameter – Ø	16 mm	
Operating Temperature Range	0...+50 °C	
Maximum Weight	250 g	

PS1215I – PS1215V
Low-Noise Power Supplies
for current transducers




CT-100/CT-150
7-pin strip connector for PCB



Ordering Options

WCT100CXAAAA	CT-100-C	100 A Primary Current 0-FLUCS , DB-9 connector
WCT100PXAAAA	CT-100-P	100 A Primary Current 0-FLUCS , 7-pin type connections
WCT100VCXAAA	CT-100V-C	100 A Primary Current 0-FLUCS , DB-9 connector, Voltage-Output
WCT100VPXAAA	CT-100V-P	100 A Primary Current 0-FLUCS , 7-pin type connections, Voltage-Output
WCT150CXAAAA	CT-150-C	150 A Primary Current 0-FLUCS , DB-9 connector
WCT150PXAAAA	CT-150-P	150 A Primary Current 0-FLUCS , 7-pin type connections
WCT150VCXAAA	CT-150V-C	150 A Primary Current 0-FLUCS , DB-9 connector, Voltage-Output
WCT150VPXAAA	CT-150V-P	150 A Primary Current 0-FLUCS , 7-pin type connections, Voltage-Output

FLUCS - Selection Table

The following table summarizes data and characteristics of

Model	Maximum DC Primary Current	Current Transform Ratio - N	Bandwidth (3 dB) – BW	Equivalent Input Noise	Temperature Coefficient - TC	Output Type	
						Current	Voltage
CT-13	±13 A	1:250	>500 kHz	<1 ppm @ BW = 200 Hz	< 0.5 ppm/K	✓	✗
CT-13V			>200 kHz	<10 ppm @ BW = 50 kHz	typ. < 2 ppm/K	✗	✓
CT-26	±26 A	1:500	>500 kHz	<1 ppm @ BW = 200 Hz	< 0.5 ppm/K	✓	✗
CT-26V			>200 kHz	<10 ppm @ BW = 50 kHz	typ. < 2 ppm/K	✗	✓
CT-52	±52 A	1:1000	>500 kHz	<1 ppm @ BW = 200 Hz	< 0.5 ppm/K	✓	✗
CT-52V			>200 kHz	<10 ppm @ BW = 50 kHz	typ. < 2 ppm/K	✗	✓
CT-100	±100 A	1:1000	>500 kHz	<1 ppm @ BW = 200 Hz	< 0.5 ppm/K	✓	✗
CT-100V			>200 kHz	<10 ppm @ BW = 50 kHz	typ. < 2 ppm/K	✗	✓
CT-150	±150 A	1:1500	>300 kHz	<1 ppm @ BW = 200 Hz	< 0.5 ppm/K	✓	✗
CT-150V			>200 kHz	<10 ppm @ BW = 50 kHz	typ. < 2 ppm/K	✗	✓
CT-200	±200 A	1:1000	>100 kHz	<1.5 ppm @ BW = 200 Hz	< 0.5 ppm/K	✓	✗
CT-200V			>100 kHz	<10 ppm @ BW = 50 kHz	typ. < 2 ppm/K	✗	✓
CT-300	±300 A	1:1500	>100 kHz	<1.5 ppm @ BW = 200 Hz	< 0.5 ppm/K	✓	✗
CT-300V			>100 kHz	<10 ppm @ BW = 50 kHz	typ. < 2 ppm/K	✗	✓
CT-400	±400 A	1:2000	>100 kHz	<1.5 ppm @ BW = 200 Hz	< 0.5 ppm/K	✓	✗
CT-400V			>100 kHz	<10 ppm @ BW = 50 kHz	typ. < 2 ppm/K	✗	✓
CT-600	±600 A	1:1500	>150 kHz	<1.5 ppm @ BW = 200 Hz	< 0.5 ppm/K	✓	✗
CT-600V			>150 kHz	<10 ppm @ BW = 50 kHz	typ. < 2 ppm/K	✗	✓
CT-1000	±1000 A	1:2000	>150 kHz	<1.5 ppm @ BW = 200 Hz	< 0.5 ppm/K	✓	✗
CT-1000V			>150 kHz	<10 ppm @ BW = 50 kHz	typ. < 2 ppm/K	✗	✓



of the **ELCS** current transducer standard models:

Type Voltage	Max DC secondary current / Max voltage output	Max external Shunt Resistor	Supply Voltage	Mounting		Primary Conductor Hole Diameter	Mechanical Dimensions	Temperature Range
				PCB	Panel			
X	±52 mA	40 Ω	±15 V	✓	X	Internal	66 x 64 x 48 mm	0°C – 50°C
✓	±10.4 V	n/a		✓	X			
X	±52 mA	40 Ω		✓	X			
✓	±10.4 V	n/a		✓	X			
X	±52 mA	40 Ω		✓	X			
✓	±10.4 V	n/a		✓	X			
X	±100 mA	40 Ω		✓	✓	16 mm	45 x 57 x 75 mm	
✓	±10V	n/a		✓	✓			
X	±100 mA	40 Ω		✓	✓			
✓	±10V	n/a		✓	✓			
X	±200 mA	40 Ω		X	✓	30.7 mm	94 x 91 x 50 mm	
✓	±10V	n/a		X	✓			
X	±200 mA	30 Ω		X	✓			
✓	±10V	n/a		X	✓			
X	±200 mA	20 Ω		X	✓			
✓	±10V	n/a		X	✓			
X	±400 mA	5 Ω		X	✓	107 x 91 x 50 mm		
✓	±10V	n/a		X	✓			
X	±500 mA	2 Ω	X	✓				
✓	±10V	n/a	X	✓				

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CT-200
CT-300
CT-400
Current or
Voltage
Output



CT-200 / CT-300 / CT-400

- Closed-loop current transformer technology allows accurate monitoring of DC and AC bipolar currents up to $\pm 200\text{A}$ (CT-200), $\pm 300\text{A}$ (CT-300) or $\pm 400\text{A}$ (CT-400).
- Galvanic isolation between primary and secondary conductor for simple current sensing at different potential.
- Standard current output and voltage output (“V”-version) available.

FEATURES

- Monitoring of DC and AC currents
- Excellent Linearity
- Closed-loop detection
- Galvanically isolated from primary
- Low Temperature Drift
- Current-output or Voltage-output versions
- Wide Bandwidth
- High Accuracy
- UL 94 V-0 flammability grade
- LED indicates correct operation
- DB-9 Connector for rack/panel mounting

APPLICATIONS

- Power Supplies
- Sensing Element in Calibration Systems
- Biomedical Devices
- Nuclear Magnetic Resonance (NMR)
- Test & Measurement Setups

The 0-FLUCS (0-FLUX Current Sensor) family is based on a closed loop technology that allows accurate and precise monitoring of DC and AC currents with high bandwidth.

The CT-200/CT-300/CT-400 transducers are rated at a maximum bipolar primary current of 200A/300A/400A with a transform ratio of respectively 1:1000, 1:1500 and 1:2000.

Galvanic isolation between the primary and the secondary circuits allows to measure currents at a different potential and simplifies interfacing when using the 0-FLUCS as the feedback element of current regulated power supplies.

Output from the 0-FLUCS transducers can be chosen between two different versions: secondary current output or buffered voltage output (low TC shunt resistor and low-noise amplifier are embedded in the device).

A standard DB-9 connector is used for

the transducer connections.

Main characteristics of the 0-FLUCS current transformers are negligible temperature coefficient on the secondary output current, excellent linearity and extremely low noise.

DC current transformers represents the ideal replacement for systems where Hall-effect sensors are used as current sensing elements and better performances are needed.

All CT-200/CT-300/CT-400 devices also have different mounting holes in order to be easily installed in different configurations. Both self-threading screws and normal ones can be used.

Main application fields for these current transducers are precise and extremely stable regulated power supplies and power inverters.

Due to the excellent characteristics, the 0-FLUCS transducers can be used in a variety of calibration, acceptance

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testing and quality control applications in industrial, power generation and automotive fields.

Commercially available versions of the CT-200/CT-300/CT-400 current

transformers are the standard current-output and the voltage-output “V” version.

Different output voltage ratings – e.g. ± 2.5 V or ± 5 V – are available upon request for a minimum quantity

Technical Specifications	CT-200	CT-300	CT-400
Current Transform Ratio - N	1:1000	1:1500	1:2000
Maximum DC Primary Current - $I_{P(DC)}$	± 200 A	± 300 A	± 400 A
Maximum RMS Primary Current - $I_{P(RMS)}$	141 A	212 A	283 A
Current Polarity	Bipolar		
Maximum DC Secondary Current - $I_{S(DC)}$	± 200 mA		
Maximum RMS Secondary Current - $I_{S(RMS)}$	141 mA		
External Shunt Resistor Value – R_S	0...40 Ω	0...30 Ω	0...20 Ω
Small Signal Bandwidth – typ. BW	> 200 kHz	> 200 kHz	> 200 kHz
Small Signal Bandwidth – “V” version – typ. BW	100 kHz	150 kHz	150 kHz
Noise (RMS) – typ.	< 1.5 ppm (@200 Hz) < 6 ppm (@50 kHz)	< 1.8 ppm (@200 Hz) < 7 ppm (@50 kHz)	< 2 ppm (@200 Hz) < 8 ppm (@50 kHz)
Output Voltage (“V”-version) - V_{OUT}	± 10 V		
Output Voltage Ratio (“V” version) – $V_{OUT}/I_{P(DC)}$	0.05 V/A	(1/30) V/A	0.025 V/A
Maximum Output Current – “V”-version	± 15 mA		
Temperature Coefficient – TC (typ.)	< 0.5 ppm/K < 2 ppm/K (“V”-version)		
Linearity	< 3 ppm < 15 ppm (“V”-version)		
Induction into Primary (typ.)	5 μ V (RMS)		
Offset (with factory trimming)	< 10 ppm/FS		
Protection Signal	Yes - Primary Over-Current		
Supply Voltage ($\pm 6\%$)	± 15 V		
Maximum Current Consumption	50 mA + I_S		
Connections	DB-9 Connector		
Mechanical (Outer) Dimensions	94 × 91 × 50 mm		
Primary Conductor Hole Diameter – ϕ	30 mm		
Maximum Weight	380 g		



0-FLUCS Closed-Loop Technology

The CT-200, CT-300 and CT-400 models are based on the CAEN ELS 0-FLUCS Closed-Loop Technology.



 Status LED and signal

PS1215I – PS1215V
Low-Noise Power Supplies
for current transducers



Ordering Options

WCT200XAAAA	CT-200	200 A Primary Current 0-FLUCS , DB-9 connector
WCT200VAAAA	CT-200V	200 A Primary Current 0-FLUCS , DB-9 connector, Voltage-Output
WCT300XAAAA	CT-300	300 A Primary Current 0-FLUCS , DB-9 connector
WCT300VAAAA	CT-300V	300 A Primary Current 0-FLUCS , DB-9 connector, Voltage-Output
WCT400XAAAA	CT-400	400 A Primary Current 0-FLUCS , DB-9 connector
WCT400VAAAA	CT-400V	400 A Primary Current 0-FLUCS , DB-9 connector, Voltage-Output



CT-600
CT-1000
Current or
Voltage
Output



CT-600 / CT-1000

- Closed-loop current transformer technology allows accurate monitoring of DC and AC bipolar currents up to $\pm 600\text{A}$ (CT-600) and to $\pm 1000\text{A}$ (CT-1000).
- Galvanic isolation between primary and secondary conductor for simple current sensing at different potential.
- Standard current output and voltage output ("V"-version) available.

FEATURES

- Monitoring of DC and AC currents
- Excellent Linearity
- Closed-loop detection
- Galvanically isolated from primary
- Low Temperature Drift
- Current-output or Voltage-output versions
- Wide Bandwidth
- High Accuracy
- UL 94 V-0 flammability grade
- LED indicates correct operation
- DB-9 Connector for rack/panel mounting

APPLICATIONS

- Power Supplies
- Sensing Element in Calibration Systems
- Biomedical Devices
- Nuclear Magnetic Resonance (NMR)
- Test & Measurement Setups

The 0-FLUCS (O-FLUX Current Sensor) family is based on a closed loop technology that allows accurate and precise monitoring of DC and AC currents with high bandwidth.

The CT-600 and CT-1000 transducers are rated at a maximum bipolar primary current of 600A and 1000A with a transform ratio of 1:1500 and 1:2000.

Galvanic isolation between the primary and the secondary circuits allows to measure currents at a different potential and simplifies interfacing when using the 0-FLUCS as the feedback element of current regulated power supplies.

Output from the transducers can be chosen between two different versions: secondary current output or buffered voltage output (low TC shunt resistor and low-noise amplifier are embedded in the device).

A standard DB-9 connector is used for the transducer connections.

Main characteristics of the 0-FLUCS current transformers are negligible temperature coefficient on the secondary output current, excellent linearity and extremely low noise.

DC current transformers represents the ideal replacement for systems where Hall-effect sensors are used as current sensing elements and better performances are needed.

All CT-600 and CT-1000 devices also have different mounting holes in order to be easily installed in different configurations. Both self-threading screws and normal ones can be used.

Main application fields for these current transducers are precise and extremely stable regulated power supplies and power inverters.

Due to the excellent characteristics, the CT-600 and CT-1000 transducers can be used in a variety of calibration,

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

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acceptance testing and quality control applications in industrial, power generation and automotive fields.

Commercially available versions of the CT-600 and CT-1000 current sensors are

the standard current-output CT-600 and CT-1000 and the voltage-output version CT-600V and CT-1000V.

Different output voltage ratings – e.g. ± 2.5 V or ± 5 V – are available upon request for a minimum quantity.

Technical Specifications	CT-600	CT-1000
Current Transform Ratio - N	1:1500	1:2000
Maximum DC Primary Current - $I_{P(DC)}$	± 600 A	± 1000 A
Maximum RMS Primary Current - $I_{P(RMS)}$	424 A	707 A
Current Polarity	Bipolar	
Maximum DC Secondary Current - $I_{S(DC)}$	± 400 mA	± 500 mA
Maximum RMS Secondary Current - $I_{S(RMS)}$	283 mA	354 mA
External Shunt Resistor Value – R_S	0...5 Ω	0...2 Ω
Small Signal Bandwidth (-1 dB) – typ. BW	> 150 kHz	
Noise (RMS) – typ.	< 1.5 ppm (@200 Hz) < 7 ppm (@50 kHz)	< 1.5 ppm (@200 Hz) < 10 ppm (@50 kHz)
Output Voltage ("V"-version) - V_{OUT}	± 10 V	
Output Voltage Ratio ("V" version) – $V_{OUT}/I_{P(DC)}$	(1/60) V/A	0.01 V/A
Maximum Output Current – "V"-version	± 15 mA	
Temperature Coefficient – TC (typ.)	< 0.5 ppm/K < 2 ppm/K ("V"-version)	
Induction into Primary (typ.)	5 μ V (RMS)	10 μ V (RMS)
Linearity	< 3 ppm < 15 ppm ("V"-version)	
Offset (with factory trimming)	< 10 ppm/FS	
Protection Signal	Yes - Primary Over-Current	
Supply Voltage ($\pm 6\%$)	± 15 V	
Maximum Current Consumption	50 mA + I_S	
Connections	DB-9 Connector	
Mechanical (Outer) Dimensions	107 × 91 × 50 mm	
Primary Conductor Hole Diameter – ϕ	30 mm	
Maximum Weight	450 g	600 g



0-FLUCS Closed-Loop Technology

The CT-200, CT-300 and CT-400 models are based on the CAEN ELS 0-FLUCS Closed-Loop Technology.



 Status LED and signal

PS1215I – PS1215V
Low-Noise Power Supplies
for current transducers



Ordering Options

WCT600XAAAA	CT-600	600 A Primary Current 0-FLUCS , DB-9 connector
WCT600VAAAA	CT-600V	600 A Primary Current 0-FLUCS , DB-9 connector, Voltage-Output
WCT1000XAAAA	CT-1000	1000 A Primary Current 0-FLUCS , DB-9 connector
WCT1000VXAAA	CT-1000V	1000 A Primary Current 0-FLUCS , DB-9 connector, Voltage-Output



PS1215I
PS1215V
Low-Noise
Power Supply for
Current Transducers



PS1215

- Low Noise Mixed Bipolar AC/DC Power Supply for optimal operation of the  Current Transducers.
- Extended Input Range for Voltage and Frequency.
- “I” and “V” versions include cables for Current and Voltage Output Transducers respectively.

FEATURES

- Mixed Switching/Linear Topology
- 27W Bipolar Output - ± 15 V
- Low Noise
- Extended AC Input Range
- Current-output or Voltage-output versions with cables
- LEDs indicate correct operation
- Three-pole screw locking connector

APPLICATIONS

- Power Supply for  Transducers
- Bipolar Supply for Precise Instrumentation
- Test & Measurement Setups

The PS1215 is a single-output, dual-voltage mixed switching-linear power supply that is designed in order to obtain low-noise operation and high efficiency and it is especially suited for optimal performances of current measurement systems where switching power supplies could corrupt the measure with noise, less accuracy and less precision.

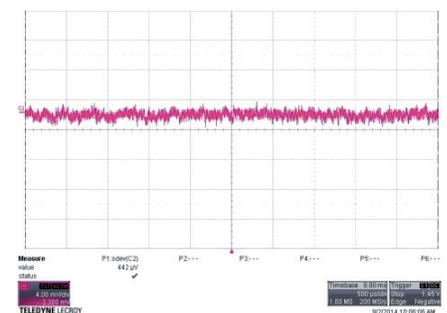
The power supply is housed in a robust and compact stainless steel box that can be placed close to the supplied device in order to reduce cable lengths and minimize consequent possible noise pick-up.

These power supplies are particularly designed for operation with CAEN ELS DC Current Transducers (DCCT) of the  series.

The PS1215 power supply has an output voltage accuracy of $\pm 3\%$ on both its positive and negative outputs.

Maximum peak-to-peak voltage noise

measured at the device output terminals is rated at 4 mV (measured at full load).



Output DC voltages are made available through a 3-pole connector with a screw locking that allows securing the connection.

The PS1215 power supply can be ordered in three different versions, differing by the output cabling.

The PS1215I version also includes the DB-9 connector and two “banana”-type plugs for the current output of standard transducers, the PS1215V version includes the same cabling with BNC coaxial connector for voltage-output ones.

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0-FLUCS Closed-Loop Technology

The PS1215 models are designed for optimal operation for the CAEN ELS 0-FLUCS current transducers.

Technical Specifications

PS1215

Output Positive Voltage ($\pm 3\%$)	+15 V
Output Negative Voltage ($\pm 3\%$)	-15 V
Maximum Output Power	27 W
Maximum Output Current	+15V @ 900 mA -15V @ 900 mA
Output Ripple + Noise	0.003 % _{RMS} @ DC-1MHz 0.025 % _{PEAK-PEAK} @ DC-1 MHz
AC Line Voltage Input	90 – 260 V _{AC}
AC Line Frequency	47 - 63 Hz
Input to Output Isolation	3 kV
Output to Earth-Case Isolation	500 V
Hold-up time	16 ms (typ.) at 115 V _{AC}
Cooling	Natural convection
Dimensions	136.4 × 41 × 90.7 mm
Weight	600 g
Y-Cable length (CT-I and CT-V)	3m
Indicators	2 LEDs
Protections	Output short-circuit Output over-voltage
Operating Temperature Range	0°C – 50°C

PS1215V

AC-DC Power Supply and cables for
Voltage-Output Current Transducers



PS1215I

AC-DC Power Supply and cables for
Current-Output Current Transducers

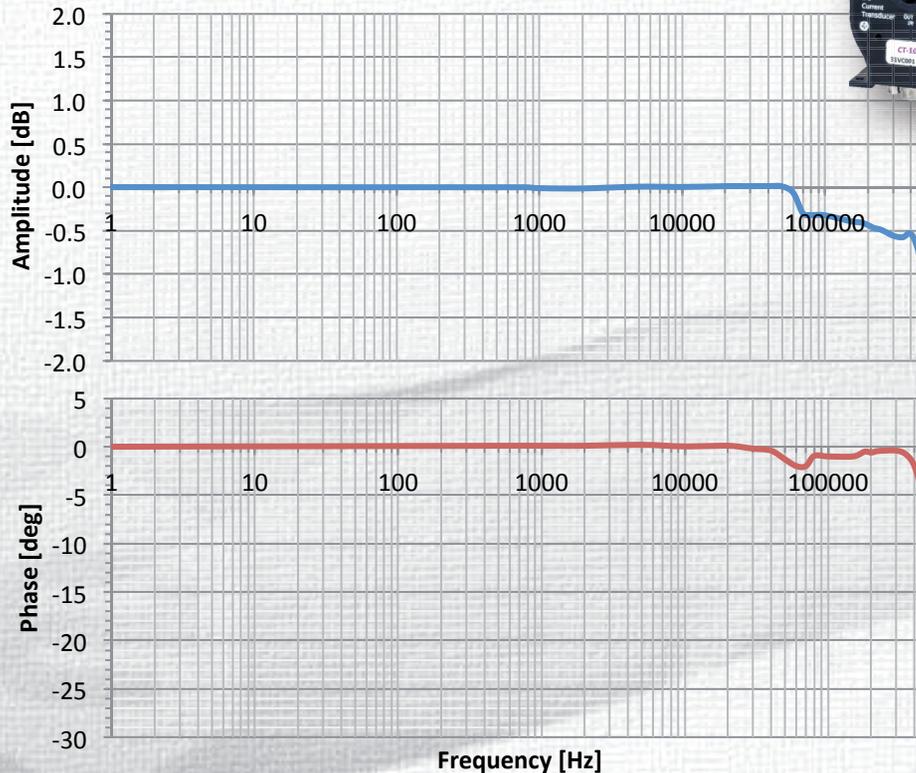
Ordering Options

WPS1215XAAAA	PS1215	PS1215 - AC/DC Single Output - Dual Voltage ± 15 V Low Noise Power Supply - 27W max - 3m cable
WPS1215IXAAA	PS1215I	PS1215 - AC/DC Single Output - Dual Voltage ± 15 V Low Noise Power Supply - 27W max + Y-Cable CT-I: 3m cable with DB-9 and "banana" plugs (current output)
WPS1215VXAAA	PS1215V	PS1215 - AC/DC Single Output - Dual Voltage ± 15 V Low Noise Power Supply - 27W max + Y-Cable CT-V: 3m cable with DB-9 and BNC (voltage output)



AC Performance

CT-150 Amplitude and Phase Response



Amplitude Response

Frequency	Amplitude
DC ... 50 kHz	< 0.02 dB
50 ... 200 kHz	< 0.5 dB
200 ... 400 kHz	< 1 dB

Phase Response

Frequency	Phase Shift
DC ... 2 kHz	< 0.1°
2 Hz ... 40 kHz	< 0.5°
40 ... 400 kHz	< 2°



Maximum Current Ratings

Absolute Ratings

Absolute Maximum Ratings for Single-Pulse Primary Current Overload

Model	Continuous*	for 10 s	for 1 s	For 0.1 s
CT-13	± 14 A	± 16 A	± 26 A	± 78 A
CT-13V	± 13.5 A	± 16 A	± 26 A	± 65 A
CT-26	± 28 A	± 32 A	± 52 A	± 156 A
CT-26V	± 27 A	± 32 A	± 52 A	± 130 A
CT-52	± 52 A	± 62 A	± 104 A	± 208 A
CT-52V	± 52 A	± 62 A	± 104 A	± 208 A
CT-100	± 105 A	± 125 A	± 200 A	± 600 A
CT-100V	± 105 A	± 125 A	± 200 A	± 500 A
CT-150	± 157 A	± 180 A	± 300 A	± 900 A
CT-150V	± 155 A	± 180 A	± 300 A	± 750 A
CT-200	± 210 A	± 250 A	± 400 A	± 1200 A
CT-200V	± 205 A	± 250 A	± 400 A	± 1000 A
CT-300	± 315 A	± 360 A	± 600 A	± 1800 A
CT-300V	± 310 A	± 360 A	± 600 A	± 1500 A
CT-400	± 420 A	± 480 A	± 800 A	± 2400 A
CT-400V	± 410 A	± 480 A	± 800 A	± 2000 A
CT-600	± 630 A	± 720 A	± 1200 A	± 3600 A
CT-600V	± 620 A	± 720 A	± 1200 A	± 3000 A
CT-1000	± 1020 A	± 1200 A	± 2000 A	± 5000 A
CT-1000V	± 1010 A	± 1200 A	± 2000 A	± 5000 A

* Specifications over the rated currents are not guaranteed

Precision Current Measurements



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