

TECHNICAL REFERENCE MANUAL

DC-CT V26-2





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1. About this document

This is the Technical Reference Manual for DC-CT® Sensors Version **V26-2**

DC-CT® is a high-performance, low-power consumption current transducer, specially designed in a smaller housing than usual for easier mounting in E-mobility applications, where enough space is usually an issue. Together with our measurement devices and power supply, it represents a high-speed, accurate and precise solution for current measurements of your choice.

The manual is divided into several chapters. You will find:

- A detailed description of the DC-CT current transducers
- A detailed description of the DC-CT accessories
- A description of the patented technology used for measurement
- A comprehensive introduction to the configuration of the modules using DewesoftX®
- Detailed technical data and electrical characteristics

1.1. Legend

The following symbols and formats will be used throughout the document.



Important

It gives you important information about the subject.
Please read carefully!



Hint

It gives you a hint or provides additional information about a subject.



Example

Gives you an example of a specific subject.

1.2. Online versions

1.2.1. Device Technical Reference Manual

The most recent version of this manual can be downloaded from our homepage:

<https://dewesoft.com/download/manuals>

In the *Hardware Manuals* section click the download link for the *Device® technical reference manual*.

1.2.2. DEWESoft® User Manual

The DEWESoft® User Manual document provides basics and additional information and examples for working with DEWESoft® and certain parts of the program.

The latest version of the DEWESoft® tutorials can be found here:

<https://dewesoft.com/download/manuals>

In the *Software Manuals* section, click the download link of the DEWESoft X User Manual entry.



2. Safety instructions

Your safety is our primary concern! Please be safe!

3. Product overview

3.1. Main features

The DC-CT sensor is a compact and accurate zero-flux current transducer based on ISOTEL's proprietary technology and the patented Platiše Flux Sensor (PFS).

Features a typical D-SUB / LEMO connector with 22 / 45 mm opening in an aluminium chassis, delivering 1 MHz of flat bandwidth with a total error below 200 ppm FS. It offers low standby power consumption of 0.5 W, a flexible unipolar/bipolar power supply, and differential current output.

- **EASY MOUNTING WITH PRECISE MEASUREMENTS:** single gap-less high-permeability core design, compact implementation of very high current sensors,
- **MADE FOR HARSH ENVIRONMENTS:** excellent immunity to external magnetic fields due to compact gapless design, good temperature stability, a property of PFS.
- **HIGH BANDWIDTH:** wide and flat bandwidth due to good coupling between primary and secondary sides,
- **VERY LOW OFFSET:** due to compact implementation and gapless design
- **LOW POWER CONSUMPTION:** high sensitivity at low power consumption,
- **TYPICAL APPLICATIONS:** Test and Measuring Equipment, DC and AC Metering, Power Quality Analysis in Mains, Stable Precision Power Supplies, Battery Management Systems • Electrical Vehicle Chargers

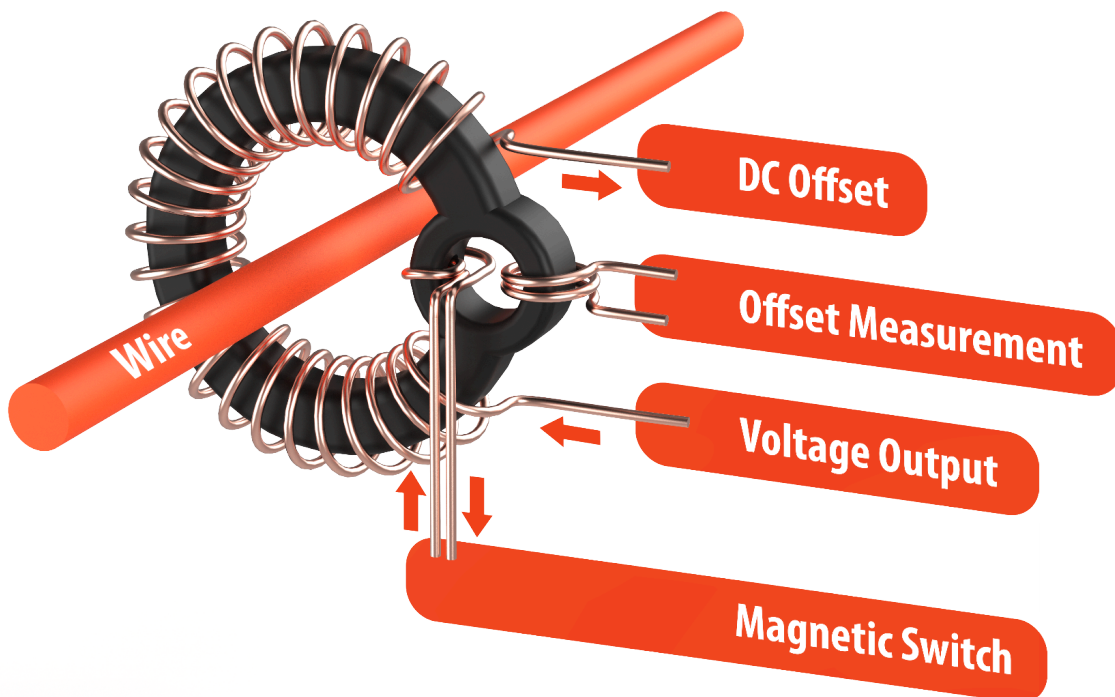
3.2. The DC-CT® technology

The DC-CT technology at its core consists of a high-permeability core and a zero-flux closed-loop null method measurement principle, using the innovative Platiše Flux Sensor (PFS) zero-flux sensor.

The DC-CT, in addition, comprises a zero-flux, or null method, to achieve the highest accuracy and compensates for non-linearities caused by the magnetic material, in a similar way to other closed-loop DC-CT sensors. Key blocks of the Platiše Flux Sensor are represented in the image below.

The primary current flows through the magnetic core wound by a secondary compensating winding of N turns, defining a current transformation ratio. To a small part of the magnetic core, additional modulating winding, driven by a magnetic switch driver, and sensing winding, sensed by offset measurement circuitry, are added. The residual flux is added to the output amplifier to compensate for the DC component, while the AC component of the DC-CT basically passes through the sensor, directly to the output.

For more information about the technology, please visit www.dc-ct.com.



DC-CT technology schematics

3.2.0.1. A brief comparison of different current measurement technologies

The table below summarizes the key features across different technologies:

Technology	Type	Isolated	Current range	AC Bandwidth	Linearity	Accuracy
DC-CT®	DC/AC	Yes	High	High	Excellent	Very High
Flux-Gate	DC/AC	Yes	High	High	Excellent	Excellent
Hall	DC/AC	Yes	High	Medium	Medium	Medium
Shunt	DC/AC	No	Medium	Medium	Good	High
Rogowsky	AC	Yes	High	High	Good	Medium
CT	AC	Yes	High	Medium	Medium	Medium



4. Getting started

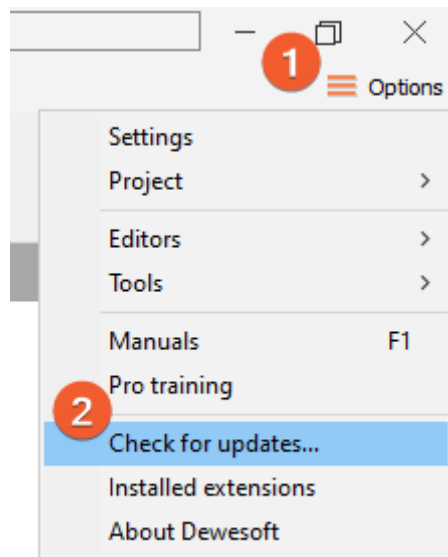
This chapter will help you install the software, connect your SIRIUSi system to the PC via USB and show you how to configure DewesoftX®.

To follow these steps, you need the following items:

- Your brand new DC-CT sensor (included in the shipment)
- a DC-CT power supply SIRIUSi-PWR-MCTS2, SIRIUSir-PWR-MCTS2 or SIRIUSir-HD-PWR-MCTS2
- a SIRIUS device with LV, STG, STGS or UNI channel
- your PC with Windows 10/11 (older versions like Windows® 7 may also work)

4.1. Software installation

For optimal working, we recommend that you install the latest version of Dewesoft. If you have already installed the older version, it is recommended that you find the newest version on the website under the Support/Downloads/DewesoftX section. You can also check if a newer version is available in the software.



Check for update

4.2. Connecting a standalone DC-CT® unit to Dewesoft DAQ



DC-CT connection

4.2.1. List of required equipment:

Function	Dewesoft order code
Power supply for the system	PS-120-L1B2f (default), L1B2f-BAN-Xm
Power supply for the sensor	SIRIUSi-PWR-MCTS2 / SIRIUSi-HD-PWR-MCTS2 / DSi-PWR-MCTS-SINGLE
Wiring cable	D9m-D9f-Xm-MCTS
DSI adapter for current transducer	DSi-DC-CT-1000-0.3M
Measurement device	Any DEWESoft device with LV, STG, STGS or UNI channel

4.2.2. Wiring

1. Use DSi-DC-CT-1000-0.3M to connect the SIRIUS amplifier to SIRIUSi-PWR-MCTS2. First, connect the **male** DB9 connector of the DSI cable to the SIRIUS amplifier and then the **female** DB9 connector to the MCTS device.



Important

Do **NOT** connect the male DB9 connector of the DSi cable to the female connector on the MCTS device. In this case the TEDS chip will be damaged!



2. Use D9m-D9f-Xm-MCTS to connect your DC-CT sensor to the SIRIUS-PWR-MCTS2 device. First, connect the **male** DB9 connector of the cable to the MCTS device and then the **female** DB9 connector to your DC-CT sensor.



Important

For best CMRR performance, units should be earthed via the screw on the bottom or back plate. Note that the D-SUB connector is also grounded; this may create a ground loop with the chassis. So, make sure that the chassis is grounded and that the cable of the D-SUB connector is not grounded at the same time.

4.3. Powering a standalone DC-CT® unit when connecting to the 3rd party DAQ

The power supply can be either:

1. bipolar: Vs+ (15 V), Vs- (-15 V) and GND 4 (0 V) or
2. unipolar: Vs+ (30 V) and Vs- (0 V)

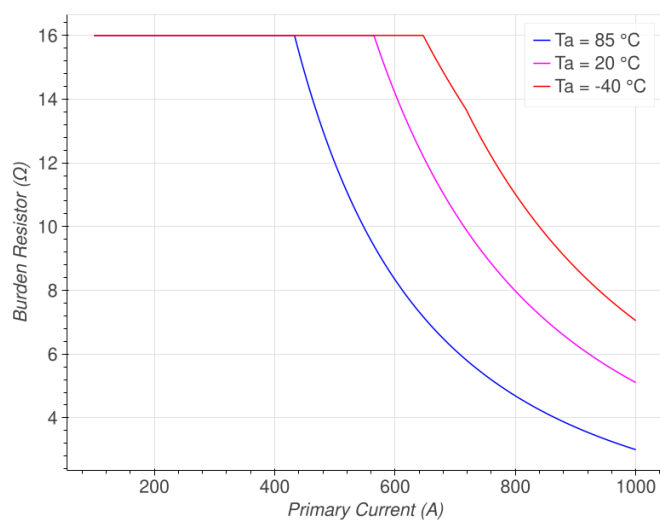
For the best CMRR performance, the units should be earthed via the screw on the bottom or the back-plate. Note that the D-SUB connector is also earthed, but it may create a ground loop with the chassis. It is therefore important to ensure that if the chassis is earthed, the cable of the D-SUB connector is not earthed.

The maximum in-rush current is internally limited to below 0.5 A, as shown in Figure 21.

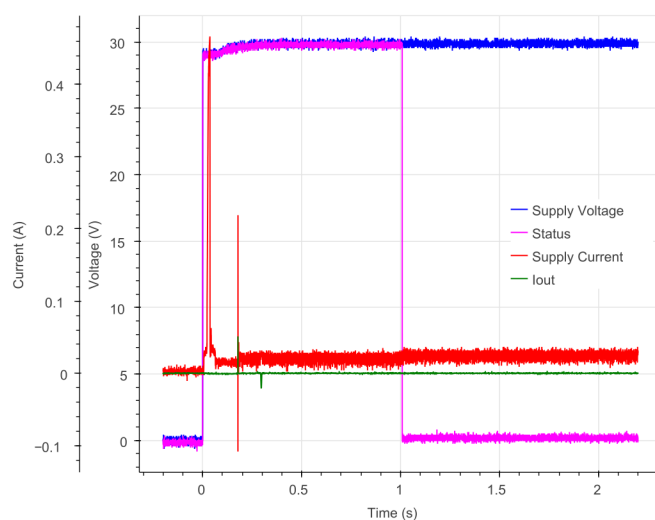
4.4. Differential Current Output and Status Signal

The DC-CT-1000I provides a differential current output with a common voltage set by pin 4 and scaled down for the number of turns N as the output signal on pins 1 and 6. The user must connect a burden resistor with a maximum resistance vs temperature as provided in Figure 23.

As the unit is powered up, the sequence includes the ramping up of power supplies, the microprocessor boot sequence, followed by the signal search until it is ready. A typical power up sequence takes less than 100 ms. During the power up and signal search, the Status signal is deasserted, as shown in Figure 24; once the signal is valid, the Status is asserted.



Maximum Burden Resistance vs TA



Power-Up Supply, Output Current, Status and Supply Current

Whenever the signal is lost, typically due to being out-of-range and the inability to track the primary signal, the Status signal is deasserted within 300 μ s, and the signal Search procedure begins. As soon as the primary current is successfully tracked within the IMD, the status signal is reasserted.

5. DC-CT® Sensors

5.1. DC-CT-1000I-S22DA



DC-CT-1000I-S22DA: front render

5.1.1. DC-CT-1000I-S22DA: Specifications

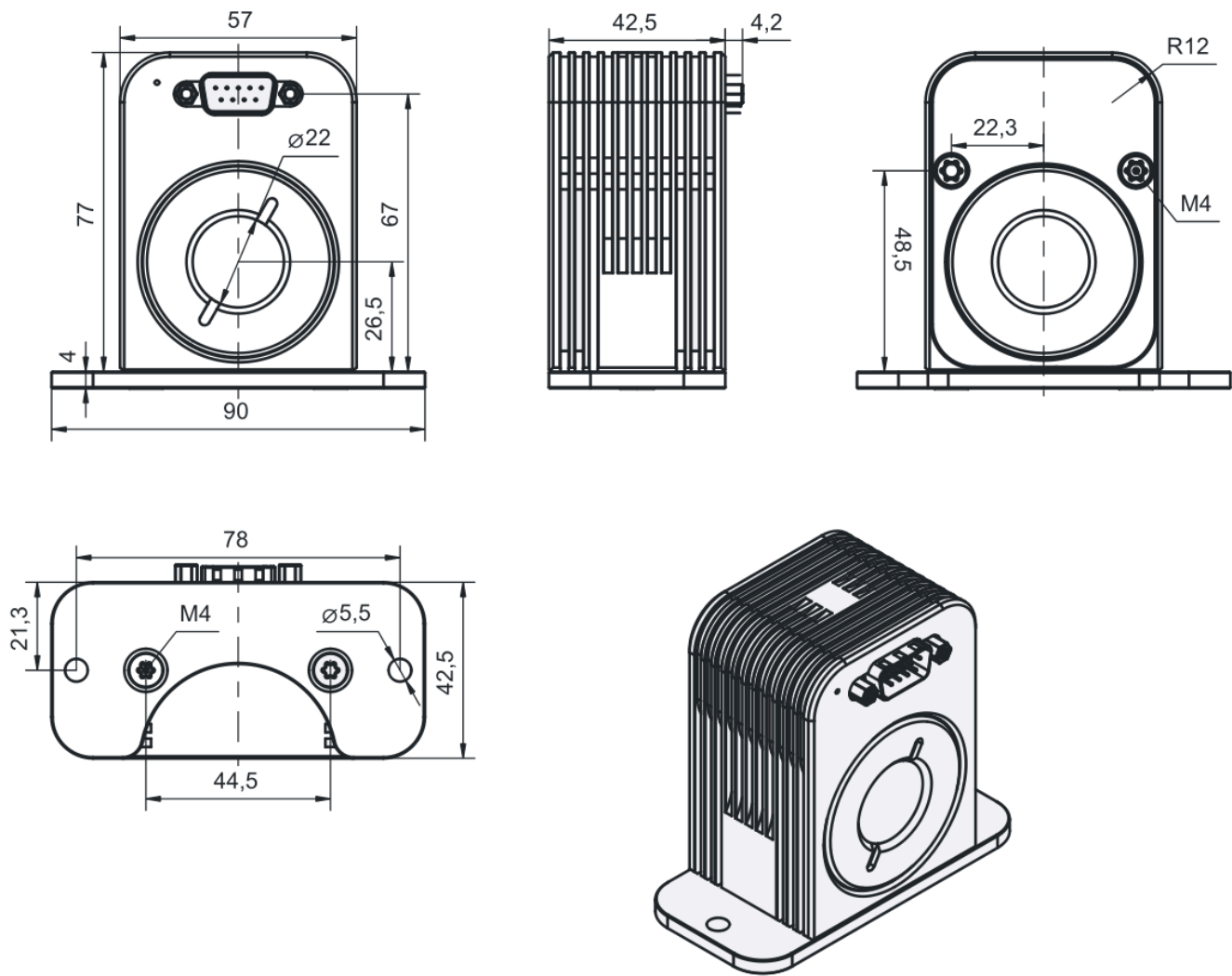
DC-CT-1000I-S22DA	Symbol	Min -5σ	Typ μ	Max 5σ	Unit
DC Accuracy					
Rated/Nominal Measuring Current DC	IP	-1000	..	1000	A
Rated/Nominal Measuring Current AC RMS	IP(AC)		..	700	A
Max Measuring Current Range AC RMS @ Ta = 23°C	IPmax	-1000	..	1000	A
Max Overloading Current (limited by primary conductor)	IPOV		5		kA
Nominal Secondary Current at IP	IS	-595.238	..	595.238	mA
Nominal Burden Resistance		0	1	3	Ω
Transformer Ratio	N		1680		turns
Gain Error, BFSL over Ip @ Ta = 23°C	εG		22	< 163	ppm
... @ Ta = -40°C			46	< 193	ppm
... @ Ta = 85°C			43	< 194	ppm
Gain Off-Center Error Up/Down			50	< 100	ppm
... Left/Right			20	< 50	ppm
Integral Non-Linearity including Hysteresis @ Ta = 23°C	εL		22	< 62	ppm/Apeak
... Ta = -40°C			26	< 107	ppm/Apeak
... Ta = 85°C			12	< 86	ppm/Apeak
AC Accuracy					
Gain Accuracy @ 50 Hz, IP = 40 ARMS			280		ppm



... IP = 700 ARMS			40		ppm
Frequency Bandwidth @ -0.5 dB, IP = 0.7 ARMS	f-0.5dB		> 1		MHz
AC Flatness < 100 kHz			< 0.1		dB
... < 1 MHz			< 0.5		dB
Phase Shift < 100 kHz			< 1°		deg
... < 1 MHz			< 2°		deg
RMS Noise at 10 kHz and entire TA		0.4	0.6	1.3	mA
... 100 kHz and entire TA		0.8	1.2	2	mA
... 1 MHz and entire TA		5.4	5.5	6.5	mA
Platiše Flux Sensor Frequency (seen as ripple)	fPFS		220		kHz
D-Class Switching Frequency (seen as ripple)	fDClass		750		kHz
Signal Integrity					
Time to Out of Range Detection to Status Deasserted			300		μs
Power-up Time to Status Asserted			100	< 150	ms
Primary to Secondary Maximum Difference RTI	IMD		±1500		mA
Status Open Collector Max Current			25	50	mA
Status Open Collector Max Voltage		-5	60	80	V
Immunity					
Common Mode Rejection @ 100 kHz RTI			TBD		μA/V
Immunity to external magnetic field, 5 mT in any direction RTI	IXB		±30	< 50	mA
Noise Injection into Primary					
Induced RMS voltage on primary conductor at IP = 0			32		μV
Induced RMS voltage on primary conductor during Search			1223		μV
Power Supply					
Power Supply Voltage between pin 9 and 5		24	30	35	V
Bi-polar Power Supply voltage		±12	±15	±17.5	V
Power Supply Maximum In-rush/working current @ 30 V				< 0.5	A
500 A Range Power Supply Voltage		12	30	35	V
Standby (Idle) Power Consumption			0.56	0.7	W
Power Consumption at IP = 500 A and Burden 3 Ω				3	W
... at IP = 1000 A and Burden 1 Ω			6.6	8	W
... at IP = 1000 A and Burden 3 Ω			7.6	9	W
Environmental Conditions					
Isolation CAT II / CAT III non-insulated wire			1000 / 600		V
Isolation CAT II / CAT III insulated wire			1000		V
Clearance / Creepage			12		mm

Weight	m			500	g
Storage and Operating Temperature	TA	-40		85	°C
Connector		DSUB-9 male			
Inner diameter		45			mm
Dimensions		77 x 57 x 46.7			mm

5.1.2. DC-CT-1000I-S22DA: Technical drawing



DC-CT-1000I-S22DA technical drawing

5.2. DC-CT-1000I-S45DA



DC-CT-1000I-S45DA: front render

5.2.1. DC-CT-1000I-S45DA: Specifications

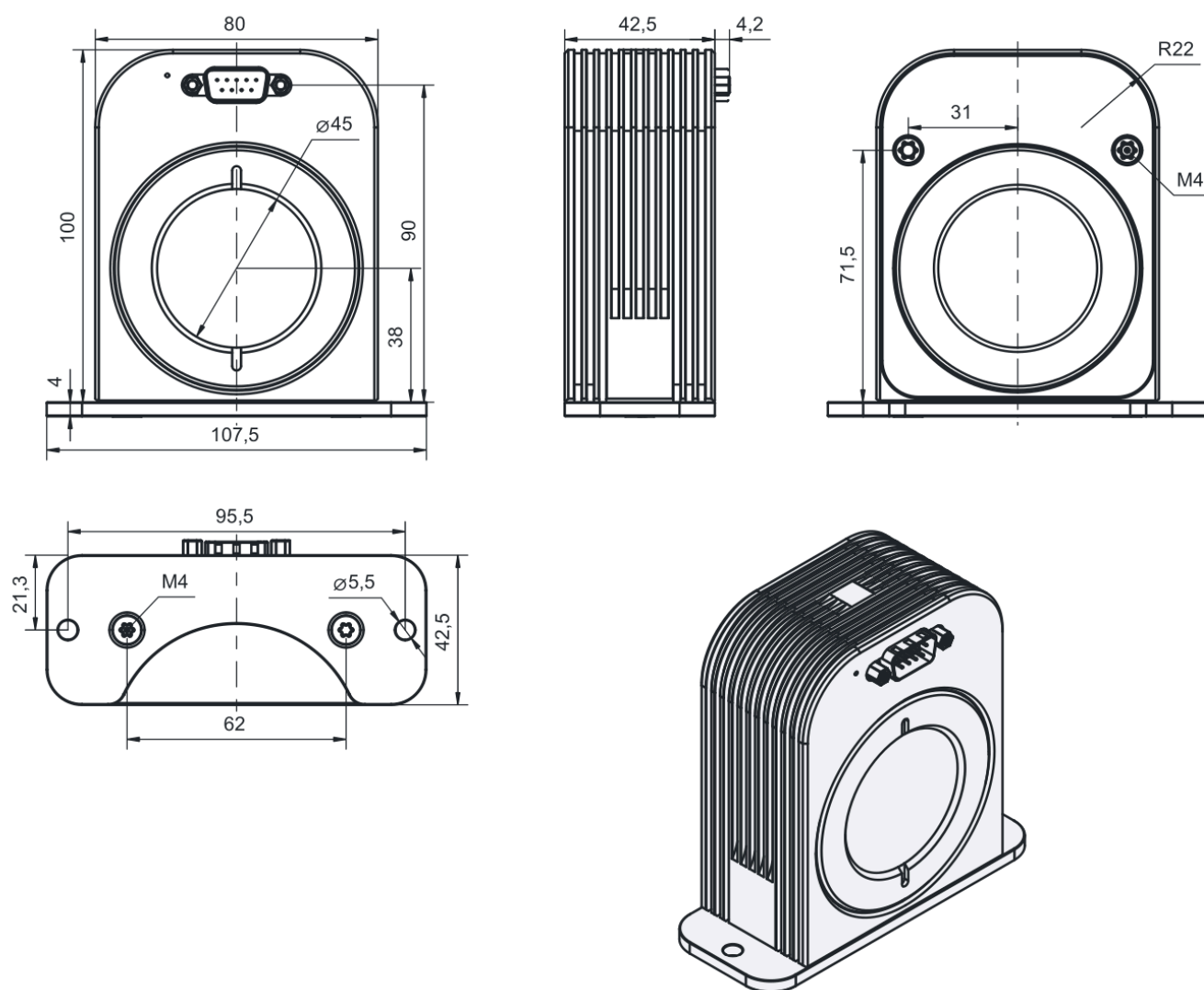
DC-CT-1000I-S45DA	Symbol	Min -5 σ	Typ μ	Max 5 σ	Unit
DC Accuracy					
Rated/Nominal Measuring Current DC	IP	-1000	..	1000	A
Rated/Nominal Measuring Current AC RMS	IP(AC)		..	700	A
Max Measuring Current Range AC RMS @ Ta = 23°C	IPmax	-1000	..	1000	A
Max Overloading Current (limited by primary conductor)	IPOV		5		kA
Nominal Secondary Current at IP	IS	-595.238	..	595.238	mA
Nominal Burden Resistance		0	1	3	Ω
Transformer Ratio	N		1680		turns
Gain Error, BFSL over Ip @ Ta = 23°C	ϵ_G		22	< 163	ppm
... @ Ta = -40°C			46	< 193	ppm
... @ Ta = 85°C			43	< 194	ppm
Gain Off-Center Error Up/Down			50	< 100	ppm
... Left/Right			20	< 50	ppm
Integral Non-Linearity including Hysteresis @ Ta = 23°C	ϵ_L		22	< 62	ppm/Apeak
... Ta = -40°C			26	< 107	ppm/Apeak
... Ta = 85°C			12	< 86	ppm/Apeak
AC Accuracy					



Gain Accuracy @ 50 Hz, IP = 40 ARMS			280		ppm
... IP = 700 ARMS			40		ppm
Frequency Bandwidth @ -0.5 dB, IP = 0.7 ARMS	f-0.5dB		> 1		MHz
AC Flatness < 100 kHz			< 0.1		dB
... < 1 MHz			< 0.5		dB
Phase Shift < 100 kHz			< 1°		deg
... < 1 MHz			< 2°		deg
RMS Noise at 10 kHz and entire TA		0.4	0.6	1.3	mA
... 100 kHz and entire TA		0.8	1.2	2	mA
... 1 MHz and entire TA		5.4	5.5	6.5	mA
Platiše Flux Sensor Frequency (seen as ripple)	fPFS		220		kHz
D-Class Switching Frequency (seen as ripple)	fDClass		750		kHz
Signal Integrity					
Time to Out of Range Detection to Status Deasserted			300		μs
Power-up Time to Status Asserted			100	< 150	ms
Primary to Secondary Maximum Difference RTI	IMD		±1500		mA
Status Open Collector Max Current			25	50	mA
Status Open Collector Max Voltage		-5	60	80	V
Immunity					
Common Mode Rejection @ 100 kHz RTI			TBD		μA/V
Immunity to external magnetic field, 5 mT in any direction RTI	IXB		±30	< 50	mA
Noise Injection into Primary					
Induced RMS voltage on primary conductor at IP = 0			32		μV
Induced RMS voltage on primary conductor during Search			1223		μV
Power Supply					
Power Supply Voltage between pin 9 and 5		24	30	35	V
Bi-polar Power Supply voltage		±12	±15	±17.5	V
Power Supply Maximum In-rush/working current @ 30 V				< 0.5	A
500 A Range Power Supply Voltage		12	30	35	V
Standby (Idle) Power Consumption			0.56	0.7	W
Power Consumption at IP = 500 A and Burden 3 Ω				3	W
... at IP = 1000 A and Burden 1 Ω			6.6	8	W
... at IP = 1000 A and Burden 3 Ω			7.6	9	W
Environmental Conditions					
Isolation CAT II / CAT III non-insulated wire			1000 / 600		V
Isolation CAT II / CAT III insulated wire			1000		V

Clearance / Creepage			12		mm
Weight	m			500	g
Storage and Operating Temperature	TA	-40		85	°C
Connector		DSUB-9 male			
Inner diameter		45			mm
Dimensions		100 x 80 x 46.3			mm

5.2.2. DC-CT-1000I-S45DA: Technical drawing



DC-CT-1000I-S45DA: technical drawing

5.3. DC-CT-1000I-S22LA



DC-CT-1000I-S22LA: front render

5.3.1. DC-CT-1000I-S22LA: Specifications

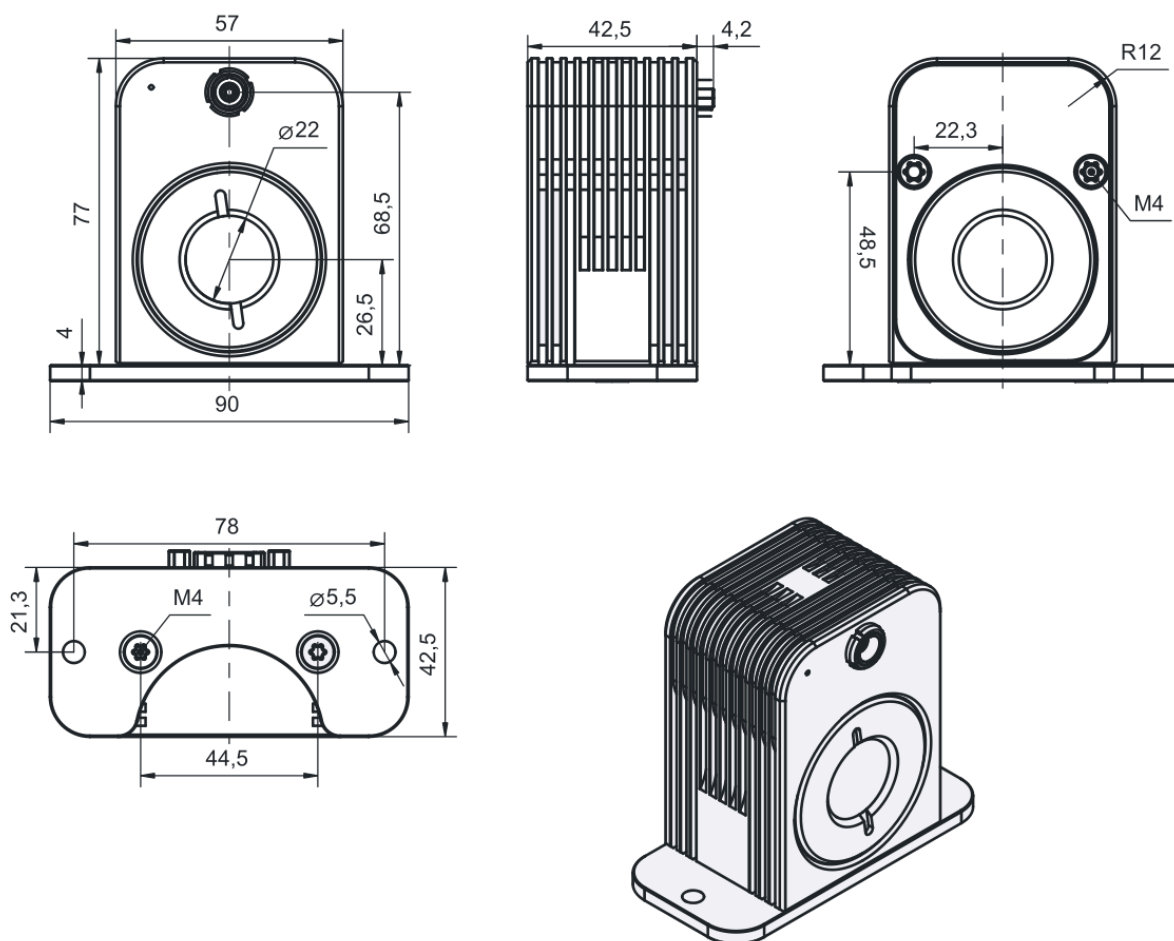
DC-CT-1000I-S22DA	Symbol	Min -5 σ	Typ μ	Max 5 σ	Unit
DC Accuracy					
Rated/Nominal Measuring Current DC	IP	-1000	..	1000	A
Rated/Nominal Measuring Current AC RMS	IP(AC)		..	700	A
Max Measuring Current Range AC RMS @ Ta = 23°C	IPmax	-1000	..	1000	A
Max Overloading Current (limited by primary conductor)	IPOV		5		kA
Nominal Secondary Current at IP	IS	-595.238	..	595.238	mA
Nominal Burden Resistance		0	1	3	Ω
Transformer Ratio	N		1680		turns
Gain Error, BFSI over Ip @ Ta = 23°C	ϵ_G		22	< 163	ppm
... @ Ta = -40°C			46	< 193	ppm
... @ Ta = 85°C			43	< 194	ppm
Gain Off-Center Error Up/Down			50	< 100	ppm
... Left/Right			20	< 50	ppm
Integral Non-Linearity including Hysteresis @ Ta = 23°C	ϵ_L		22	< 62	ppm/Apeak
... Ta = -40°C			26	< 107	ppm/Apeak
... Ta = 85°C			12	< 86	ppm/Apeak
AC Accuracy					



Gain Accuracy @ 50 Hz, IP = 40 ARMS			280		ppm
... IP = 700 ARMS			40		ppm
Frequency Bandwidth @ -0.5 dB, IP = 0.7 ARMS	f-0.5dB		> 1		MHz
AC Flatness < 100 kHz			< 0.1		dB
... < 1 MHz			< 0.5		dB
Phase Shift < 100 kHz			< 1°		deg
... < 1 MHz			< 2°		deg
RMS Noise at 10 kHz and entire TA		0.4	0.6	1.3	mA
... 100 kHz and entire TA		0.8	1.2	2	mA
... 1 MHz and entire TA		5.4	5.5	6.5	mA
Platiše Flux Sensor Frequency (seen as ripple)	fPFS		220		kHz
D-Class Switching Frequency (seen as ripple)	fDClass		750		kHz
Signal Integrity					
Time to Out of Range Detection to Status Deasserted			300		μs
Power-up Time to Status Asserted			100	< 150	ms
Primary to Secondary Maximum Difference RTI	IMD		±1500		mA
Status Open Collector Max Current			25	50	mA
Status Open Collector Max Voltage		-5	60	80	V
Immunity					
Common Mode Rejection @ 100 kHz RTI			TBD		μA/V
Immunity to external magnetic field, 5 mT in any direction RTI	IXB		±30	< 50	mA
Noise Injection into Primary					
Induced RMS voltage on primary conductor at IP = 0			32		μV
Induced RMS voltage on primary conductor during Search			1223		μV
Power Supply					
Power Supply Voltage between pin 9 and 5		24	30	35	V
Bi-polar Power Supply voltage		±12	±15	±17.5	V
Power Supply Maximum In-rush/working current @ 30 V				< 0.5	A
500 A Range Power Supply Voltage		12	30	35	V
Standby (Idle) Power Consumption			0.56	0.7	W
Power Consumption at IP = 500 A and Burden 3 Ω				3	W
... at IP = 1000 A and Burden 1 Ω			6.6	8	W
... at IP = 1000 A and Burden 3 Ω			7.6	9	W
Environmental Conditions					
Isolation CAT II / CAT III non-insulated wire			1000 / 600		V
Isolation CAT II / CAT III insulated wire			1000		V

Clearance / Creepage			12		mm
Weight	m			500	g
Storage and Operating Temperature	TA	-40		85	°C
Connector		LEMO 0B 6-pin Female G-Key			
Inner diameter		45			mm
Dimensions		77 x 57 x 46.7			mm

5.3.2. DC-CT-1000I-S22LA: Technical drawing



DC-CT-1000I-S22LA: technical drawing

5.4. DC-CT-1000I-S45LA



DC-CT-1000I-S45LA: front render

5.4.1. DC-CT-1000I-S45LA: Specifications

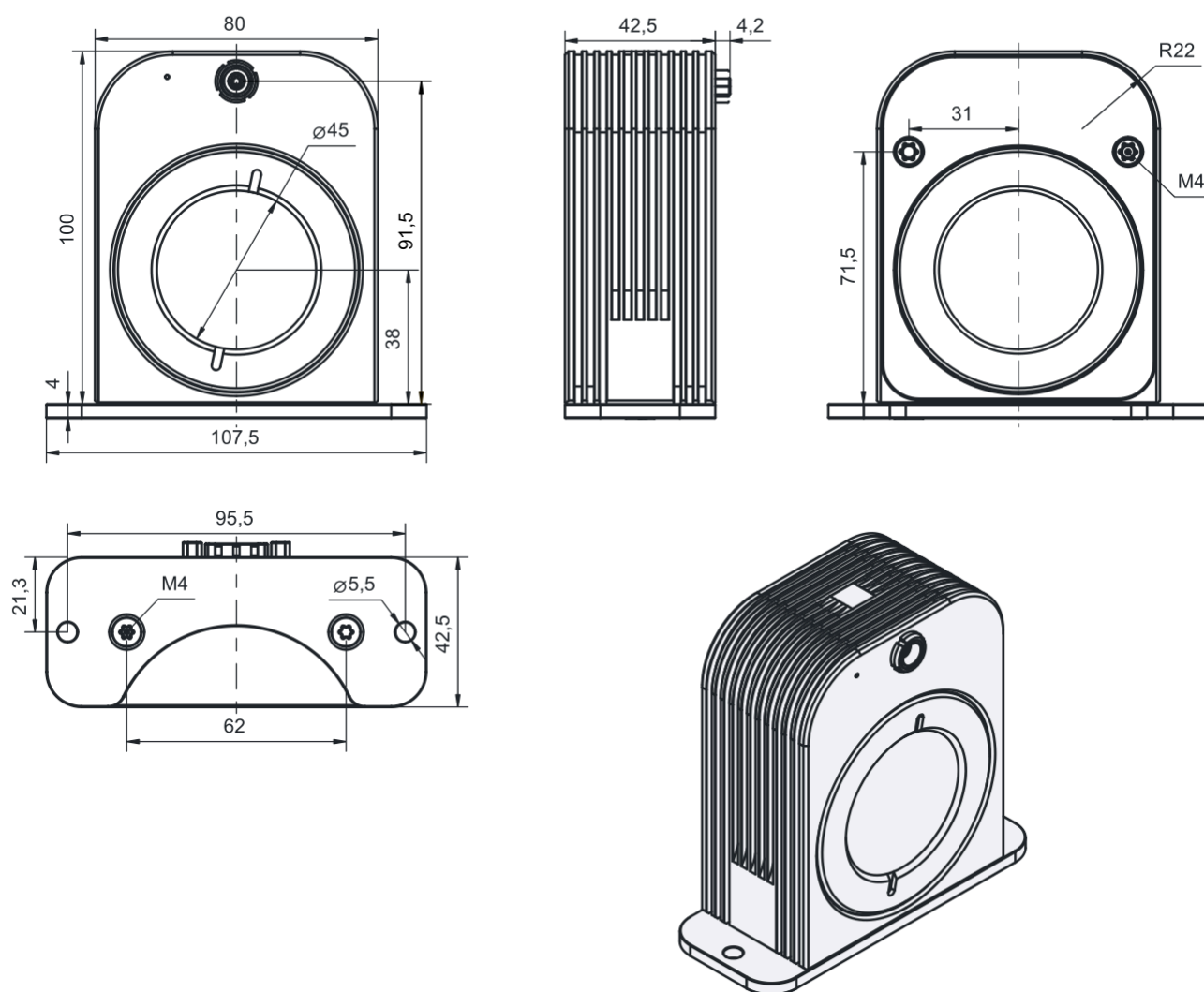
DC-CT-1000I-S45DA	Symbol	Min -5 σ	Typ μ	Max 5 σ	Unit
DC Accuracy					
Rated/Nominal Measuring Current DC	IP	-1000	..	1000	A
Rated/Nominal Measuring Current AC RMS	IP(AC)		..	700	A
Max Measuring Current Range AC RMS @ Ta = 23°C	IPmax	-1000	..	1000	A
Max Overloading Current (limited by primary conductor)	IPOV		5		kA
Nominal Secondary Current at IP	IS	-595.238	..	595.238	mA
Nominal Burden Resistance		0	1	3	Ω
Transformer Ratio	N		1680		turns
Gain Error, BFSI over Ip @ Ta = 23°C	ϵ_G		22	< 163	ppm
... @ Ta = -40°C			46	< 193	ppm
... @ Ta = 85°C			43	< 194	ppm
Gain Off-Center Error Up/Down			50	< 100	ppm
... Left/Right			20	< 50	ppm
Integral Non-Linearity including Hysteresis @ Ta = 23°C	ϵ_L		22	< 62	ppm/Apeak
... Ta = -40°C			26	< 107	ppm/Apeak
... Ta = 85°C			12	< 86	ppm/Apeak
AC Accuracy					



Gain Accuracy @ 50 Hz, IP = 40 ARMS			280		ppm
... IP = 700 ARMS			40		ppm
Frequency Bandwidth @ -0.5 dB, IP = 0.7 ARMS	f-0.5dB		> 1		MHz
AC Flatness < 100 kHz			< 0.1		dB
... < 1 MHz			< 0.5		dB
Phase Shift < 100 kHz			< 1°		deg
... < 1 MHz			< 2°		deg
RMS Noise at 10 kHz and entire TA		0.4	0.6	1.3	mA
... 100 kHz and entire TA		0.8	1.2	2	mA
... 1 MHz and entire TA		5.4	5.5	6.5	mA
Platiše Flux Sensor Frequency (seen as ripple)	fPFS		220		kHz
D-Class Switching Frequency (seen as ripple)	fDClass		750		kHz
Signal Integrity					
Time to Out of Range Detection to Status Deasserted			300		μs
Power-up Time to Status Asserted			100	< 150	ms
Primary to Secondary Maximum Difference RTI	IMD		±1500		mA
Status Open Collector Max Current			25	50	mA
Status Open Collector Max Voltage		-5	60	80	V
Immunity					
Common Mode Rejection @ 100 kHz RTI			TBD		μA/V
Immunity to external magnetic field, 5 mT in any direction RTI	IXB		±30	< 50	mA
Noise Injection into Primary					
Induced RMS voltage on primary conductor at IP = 0			32		μV
Induced RMS voltage on primary conductor during Search			1223		μV
Power Supply					
Power Supply Voltage between pin 9 and 5		24	30	35	V
Bi-polar Power Supply voltage		±12	±15	±17.5	V
Power Supply Maximum In-rush/working current @ 30 V				< 0.5	A
500 A Range Power Supply Voltage		12	30	35	V
Standby (Idle) Power Consumption			0.56	0.7	W
Power Consumption at IP = 500 A and Burden 3 Ω				3	W
... at IP = 1000 A and Burden 1 Ω			6.6	8	W
... at IP = 1000 A and Burden 3 Ω			7.6	9	W
Environmental Conditions					
Isolation CAT II / CAT III non-insulated wire			1000 / 600		V
Isolation CAT II / CAT III insulated wire			1000		V

Clearance / Creepage			12		mm
Weight	m			500	g
Storage and Operating Temperature	TA	-40		85	°C
Connector		LEMO 0B 6-pin Female G-Key			
Inner diameter		45			mm
Dimensions		100 x 80 x 46.3			mm

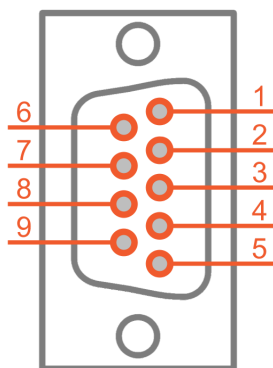
5.4.2. DC-CT-1000I-S45LA: Technical drawing



DC-CT-1000I-S45LA: technical drawing

6. DC-CT® Pinouts

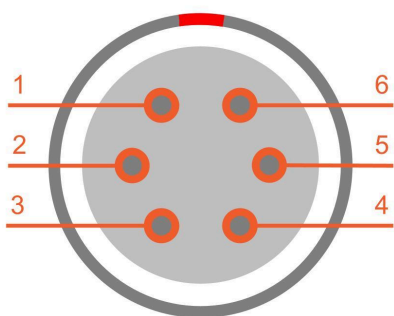
6.1 DB9 connector



Pinout (DSUB-9 **male**)

Pin	Name	Description
1	RETURN	Output -
2	TEDS	TEDS
3	STATUS -	Status -
4	GND	Ground
5	Vs-	Supply - (see 1)
6	OUTPUT	Output +
7	NC	Not connected
8	STATUS +	Status +
9	Vs+	Supply + (see 1)

6.2 LEMO 6-pin connector



Pinout (LEMO 0B 6-pin **female**)

Pin	Name	Description
1	STATUS +	Output +
2	STATUS -	Output -
3	TEDS	TEDS
4	Vs+	Supply + (see 1)
5	GND	Ground
6	Vs-	Supply - (see 1)



Hint

(1) Check the [Powering the unit](#) chapter for more information in case you are not using the PWR-MCTS.

7. Characteristics

7.1 DC-CT-1000I-S22xA

7.1.1. Accuracy

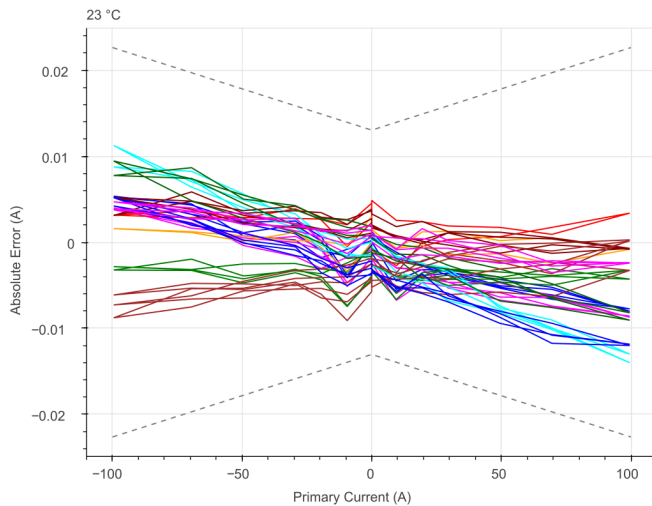
7.1.1.1. Non-Linearity including Offset due to Hysteresis

The following typical characteristics were obtained at a nominal power supply of ± 15 V, with a burden resistor of 2.5Ω , a 5 m cable length between the DC-CT and the burden resistor, Keithley DMM7510 and Keysight 34465A digital multimeters, a Danisense DR5000IM reference current sensor, an ambient temperature T_A of 23 ± 5 °C, a primary conductor consisting of a 20 mm diameter round bar in the central position, and a total system measurement uncertainty of 21 mA at 1000 A. Before each measurement, DC-CT-1000I was restarted. In the following plots, the error limit is derived as the sum of bias errors and expanded uncertainty $k = 5$:

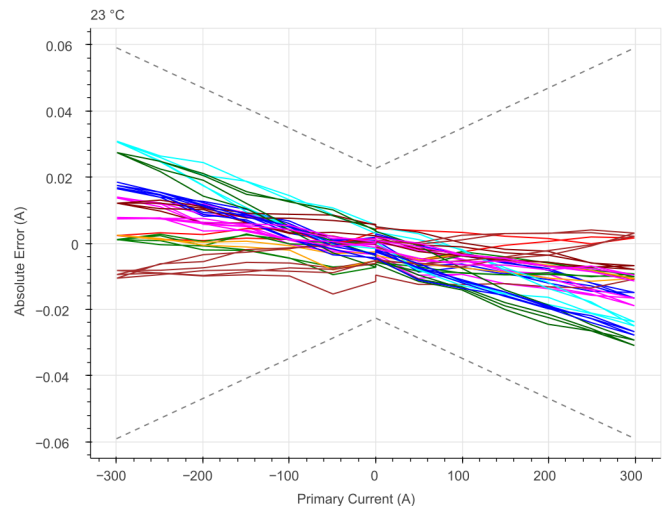
$$E_{total} = I_{meas} \cdot \varepsilon_G + I_{range} \cdot \varepsilon_L + I_{OS} + 5u_c$$

where I_{meas} is the measured current, I_{range} is selected measurement range, and u_c is the combined standard uncertainty:

$$u_c = \sqrt{(I_{meas} \cdot \varepsilon_{G,std})^2 + (I_{range} \cdot \varepsilon_{L,std})^2 + (I_{OS,std})^2}$$



Typical Accuracy at IP=±100 A



Typical Accuracy at IP=±300 A