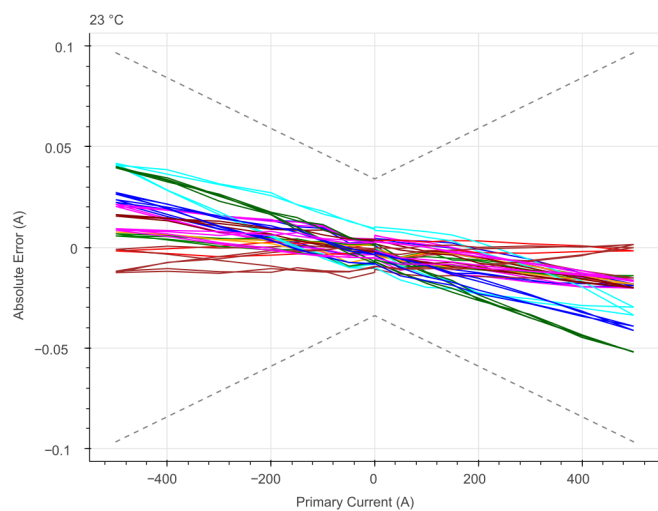
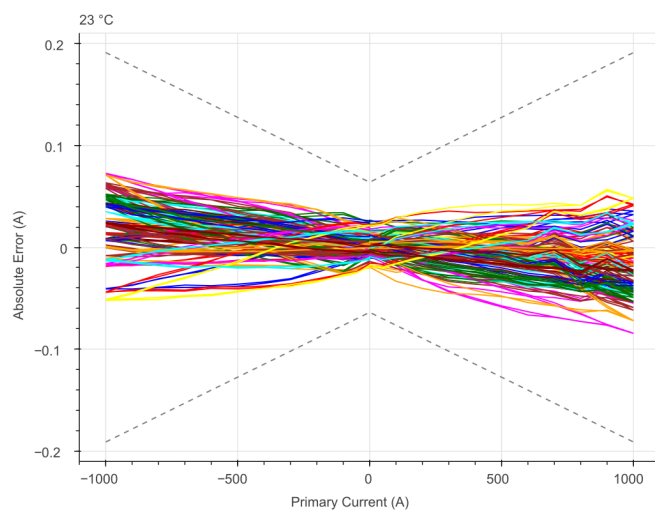
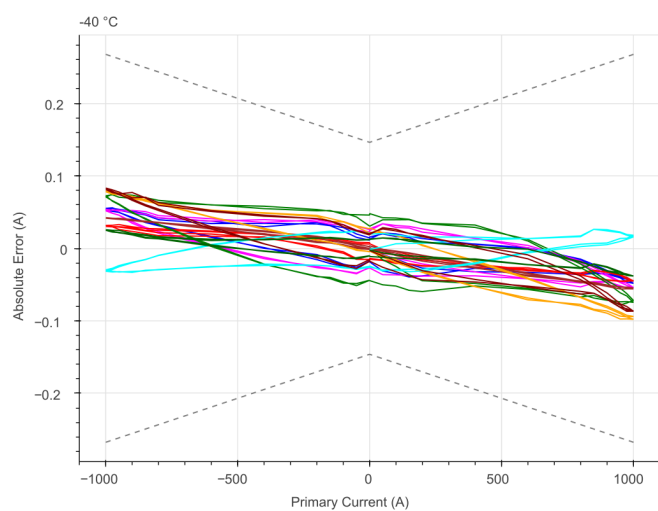




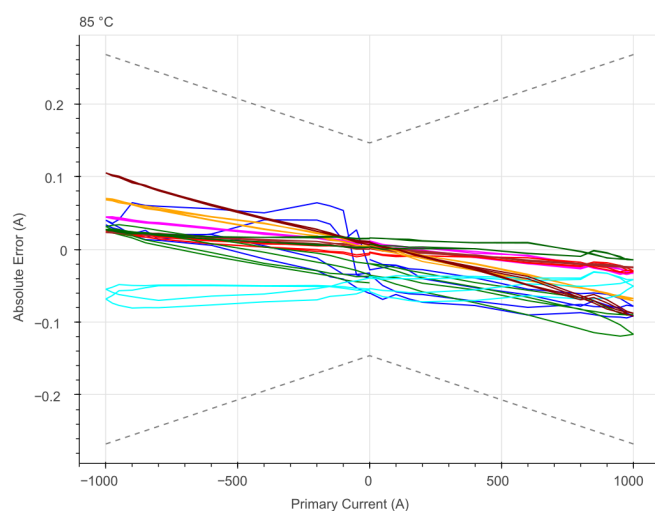
Typical Accuracy at IP=±500 A



Typical Accuracy at IP=±1000 A



Typical Accuracy at IP=±1000 A



Typical Accuracy at IP=±1000 A

The following figures represent non-linearity vs. selected measurement range I_{range} .

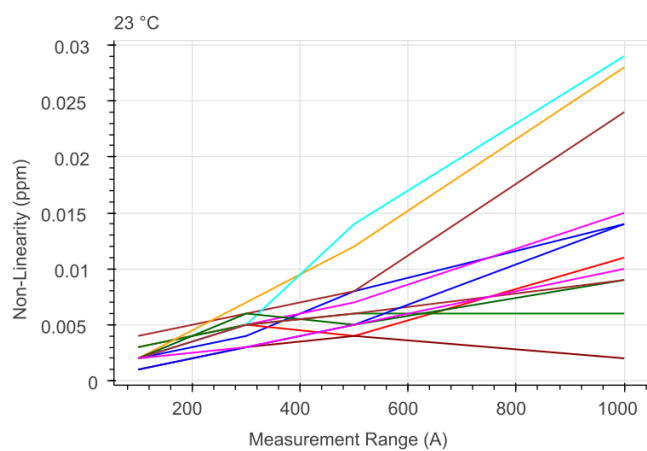


Figure 7: Non-Linearity Referred to Full Scale $I_P=1000$ A

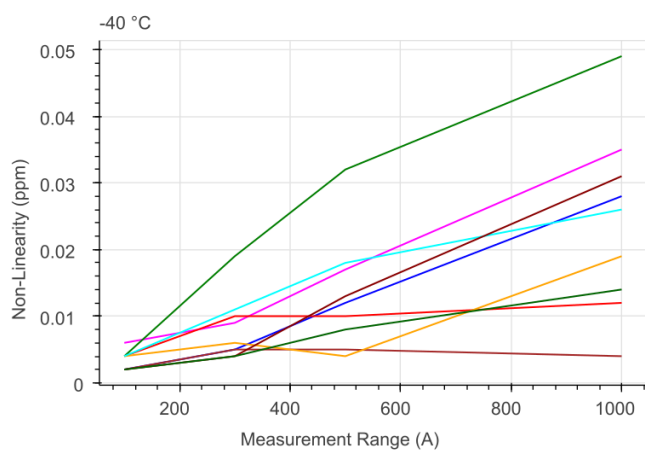


Figure 8: Non-Linearity Referred to Full Scale $I_P=1000$ A

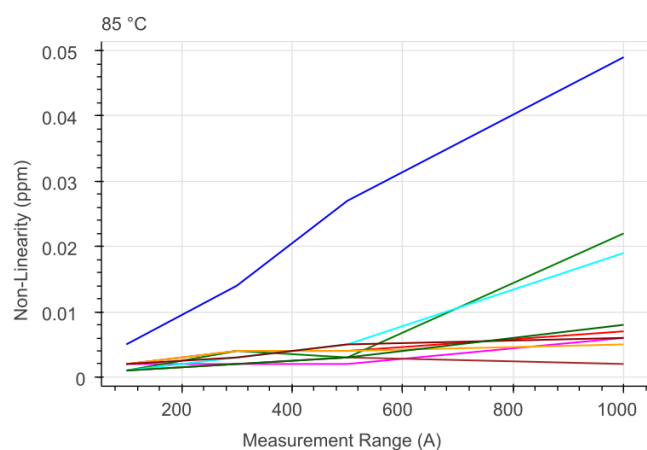


Figure 9: Non-Linearity Referred to Full Scale $I_P=1000$ A

7.1.1.2. AC Response

Figure 10 depicts the typical small-signal response at $0.7 A_{RMS}$, and Figure 11 shows the large-signal response up to 1000 Hz (TBD).

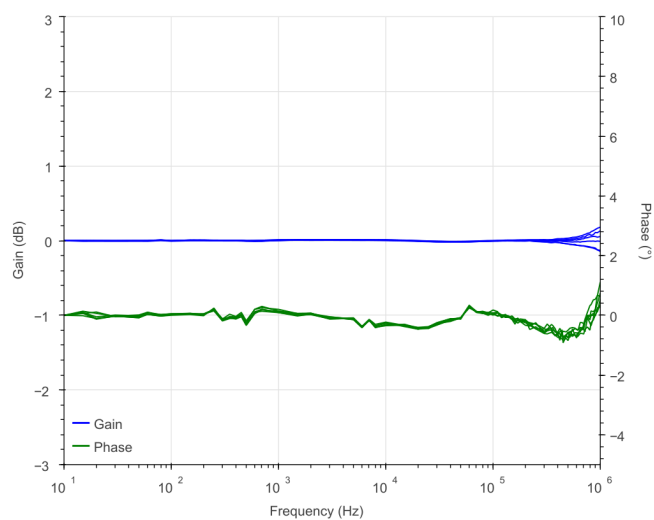


Figure 10: Small Signal AC Response at $I_p \approx 0.7 A_{RMS}$

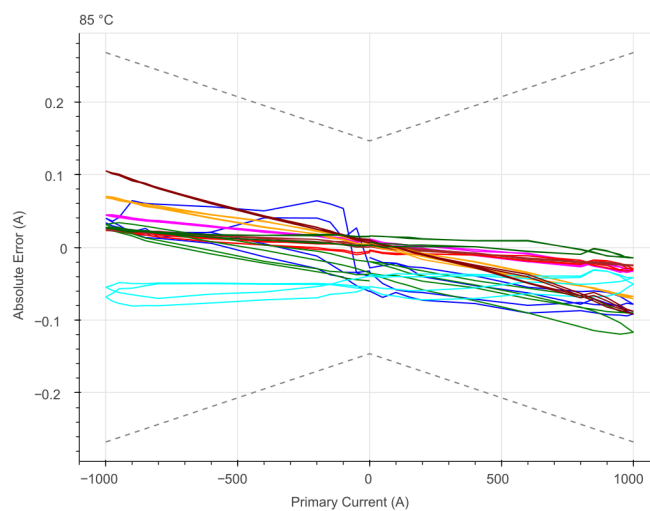


Figure 11: Large Signal AC Response at $I_p \approx 0.7 A_{RMS}$

7.1.2. Temperature Drift and Stability

7.1.2.1. Offset Drifting

The following two tests were performed using a $2.5\ \Omega$ burden resistor and a Fluke 5502A current source as reference. The first chart shows the sensor output at $I_P = 0\text{ A}$ with the core intentionally magnetized (offset) to the maximum possible value. The second chart shows the drift from $-35\text{ }^\circ\text{C}$ for magnetized cores at a constant current of 100 A. It was found that temperature stress in either direction reduces the offset resulting from hysteresis.

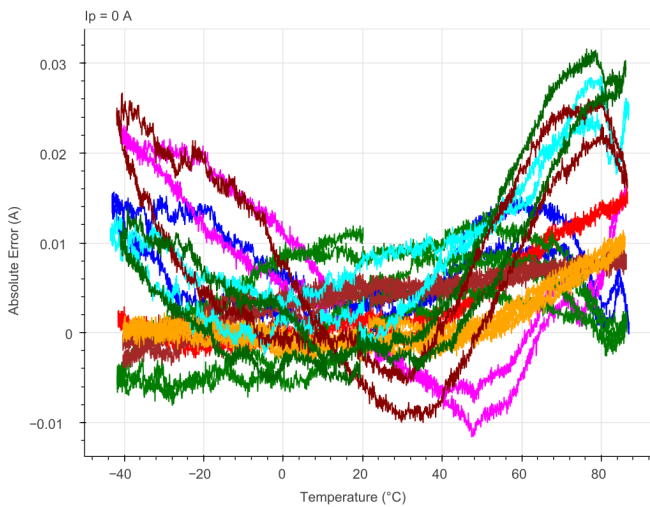


Figure 12: Temperature Drift at $I_P = 0\text{ A}$

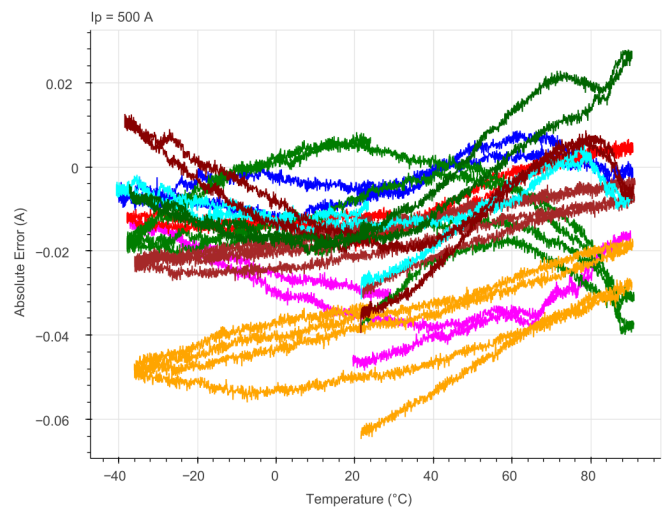


Figure 13: Temperature Drift at $I_P = 500\text{ A}$

7.1.2.2. Time Stability

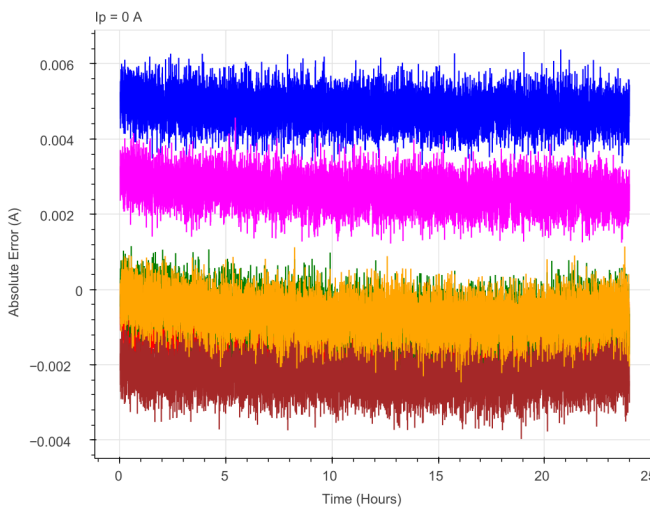


Figure 14: Stability Over 24 Hours at $I_P = 0\text{ A}$

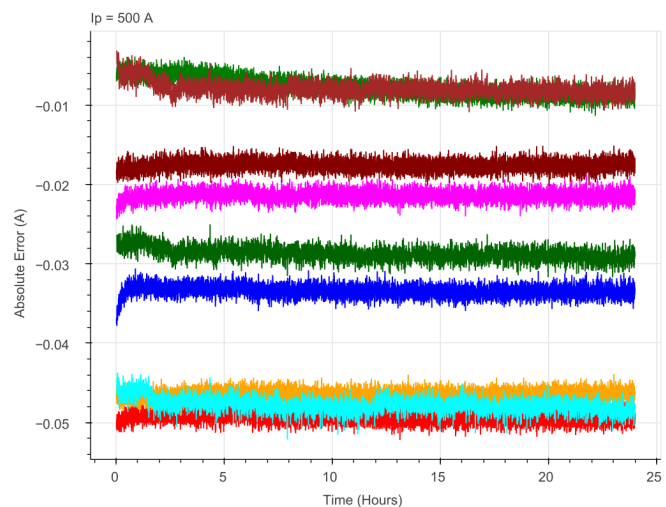
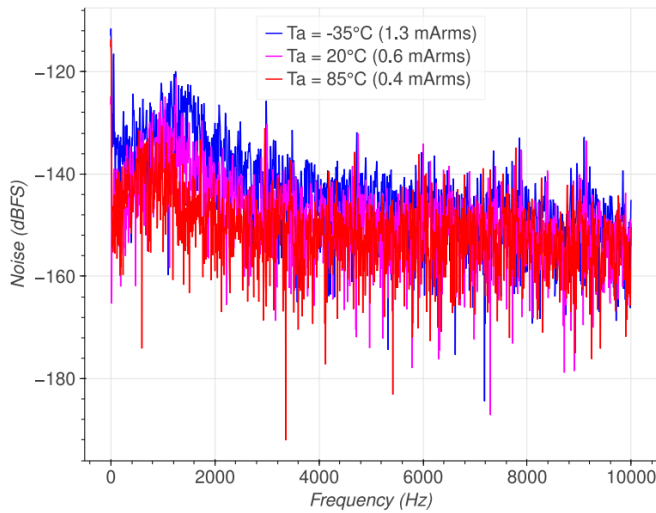


Figure 15: Stability Over 24 Hours at $I_P = 500\text{ A}$

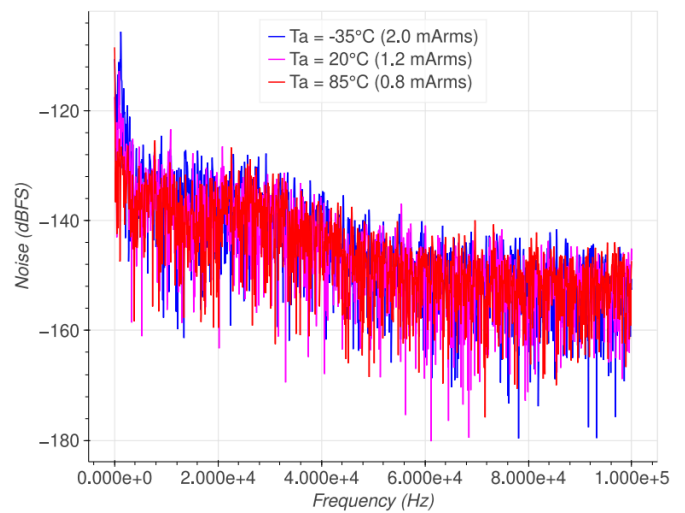
7.1.3. Noise

Noise was evaluated using the INA849 amplifier with $G=501$, $2.5\ \Omega$ burden resistor, R&S RTO1004, and primary current IP of 0 A.

7.1.3.1. 100 kHz Bandwidth Noise

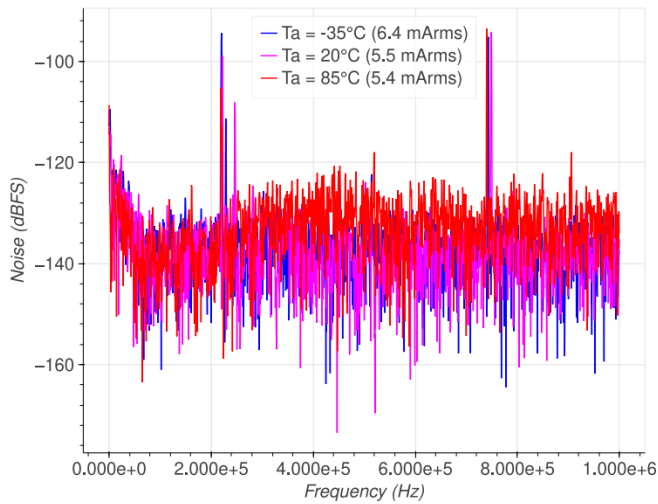


Noise spectrum vs. TA up to 10 kHz

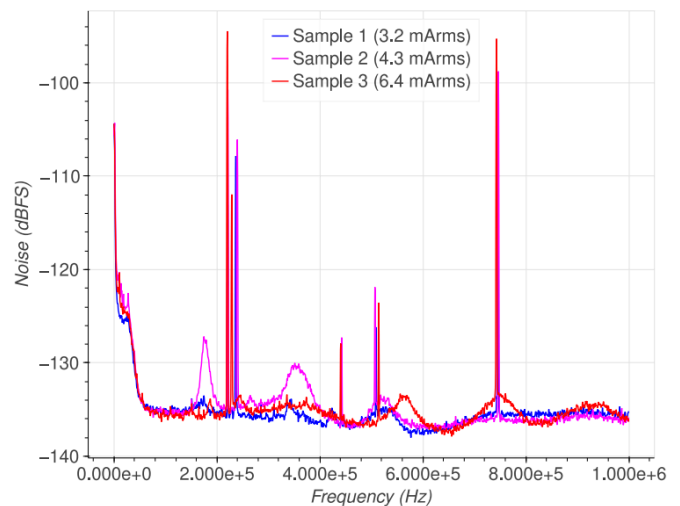


Noise spectrum vs. TA up to 100 kHz

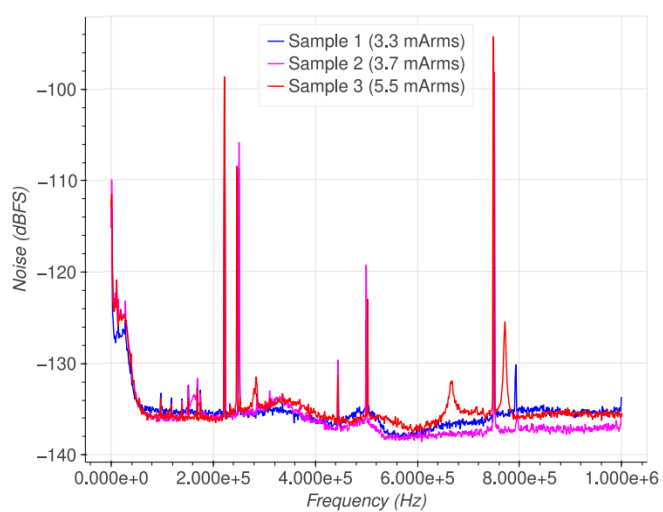
7.1.3.2. 1 MHz Bandwidth Noise and Ripple



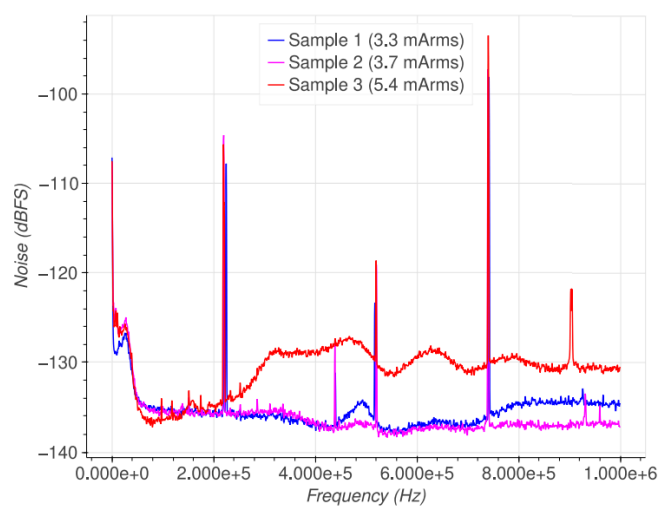
Noise spectrum vs. TA up to 1 MHz



Averaged noise spectrum at TA= -35°C



Averaged noise spectrum at TA= 20°C



Averaged noise spectrum at TA= 85°C

7.2 DC-CT-1000I-S45xA

7.1.1. Accuracy

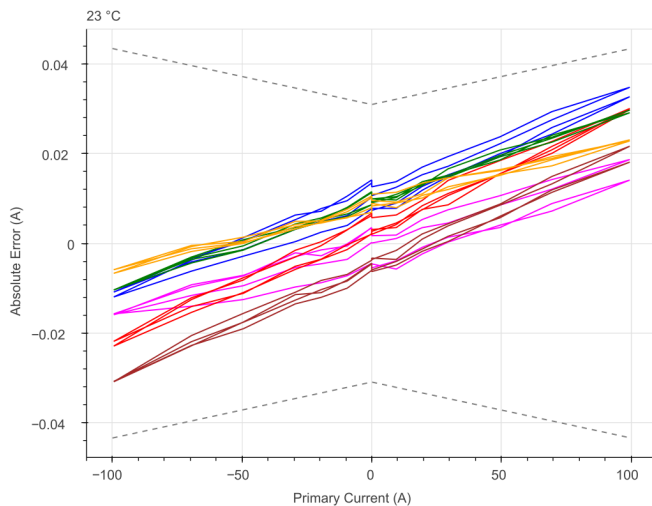
7.1.1.1. Non-Linearity including Offset due to Hysteresis

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 $k = 5$:

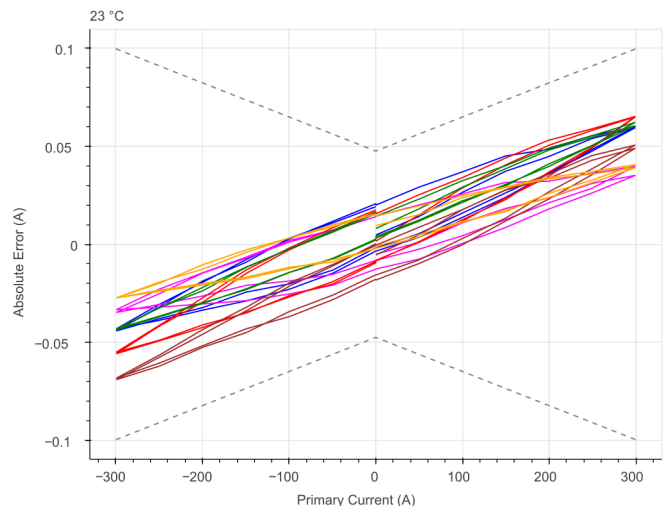
$$E_{total} = I_{meas} \cdot \varepsilon_G + I_{range} \cdot \varepsilon_L + I_{OS} + 5u_c$$

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

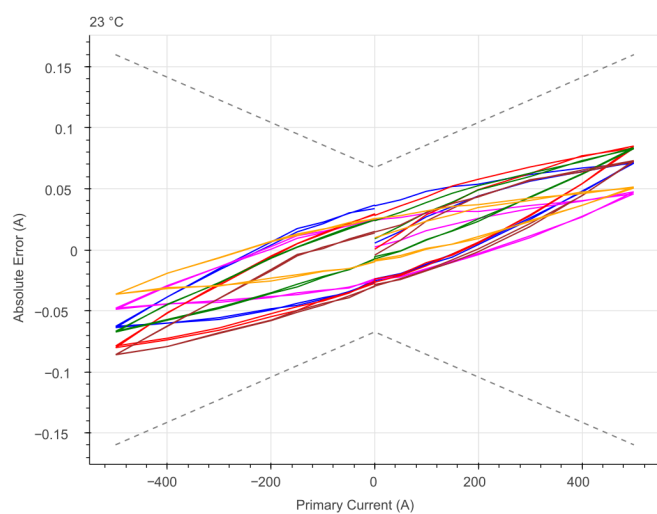
$$u_c = \sqrt{(I_{meas} \cdot \varepsilon_{G,std})^2 + (I_{range} \cdot \varepsilon_{L,std})^2 + (I_{OS,std})^2}$$



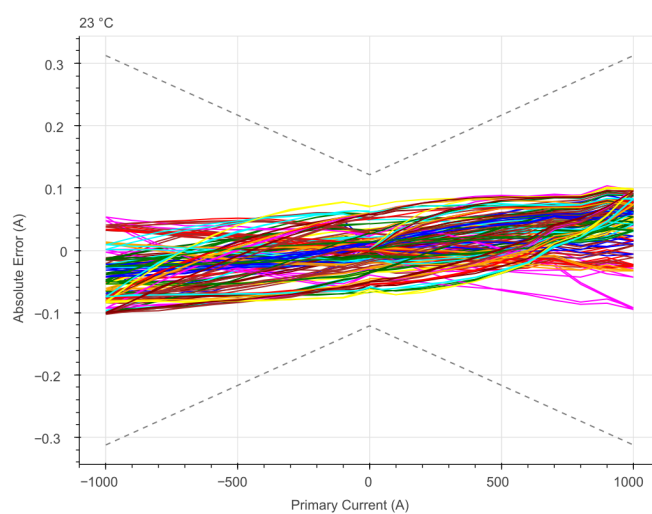
Typical Accuracy at IP=±100 A



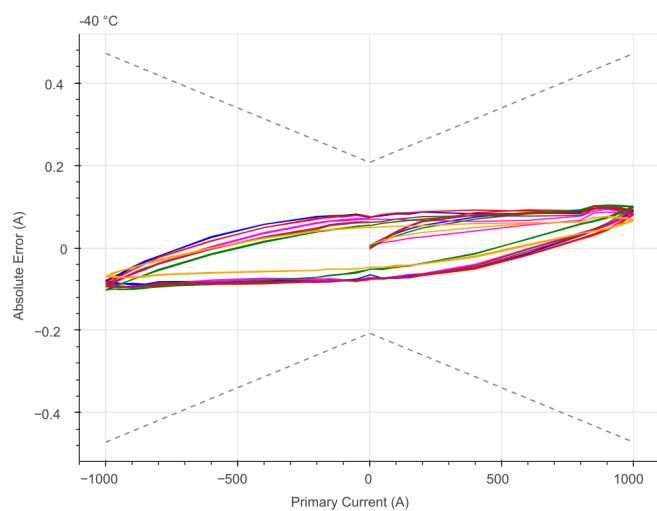
Typical Accuracy at IP=±300 A



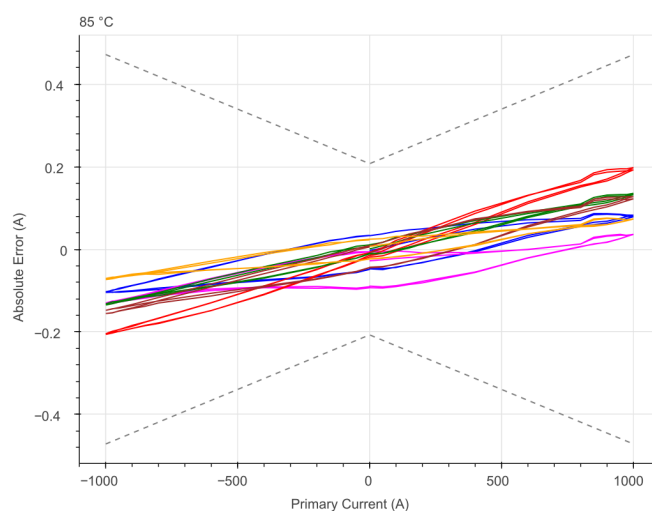
Typical Accuracy at IP=±500 A



Typical Accuracy at IP=±1000 A



Typical Accuracy at IP=±1000 A



Typical Accuracy at IP=±1000 A

The following figures represent non-linearity vs. selected measurement range I_{range} .

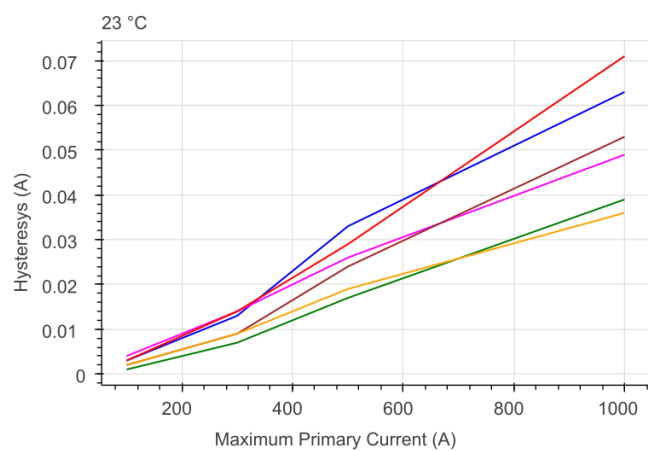


Figure 7: Non-Linearity Referred to Full Scale $I_P=1000$ A

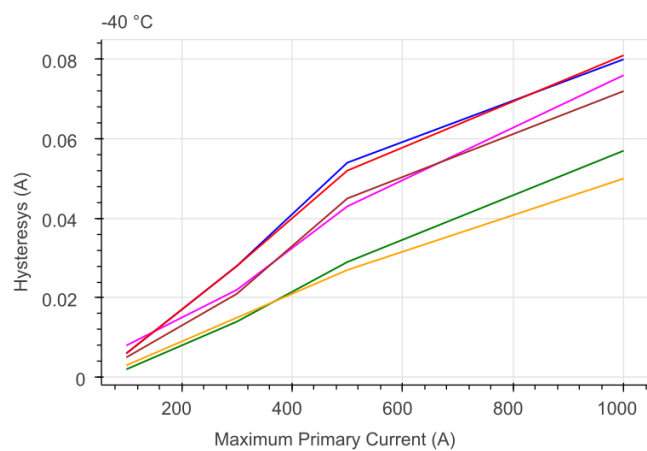


Figure 8: Non-Linearity Referred to Full Scale $I_P=1000$ A

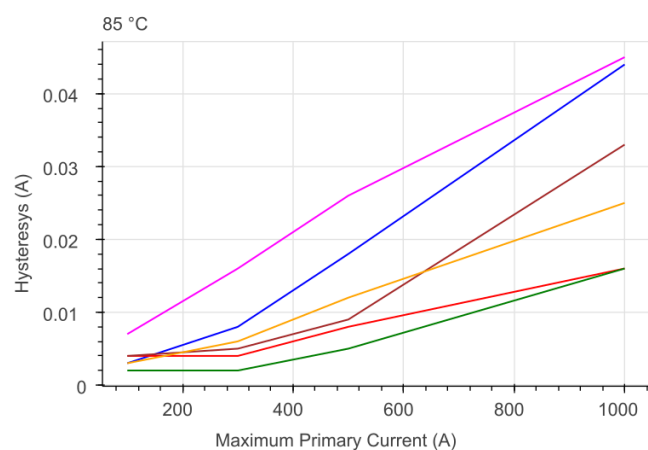


Figure 9: Non-Linearity Referred to Full Scale $I_P=1000$ A

7.1.1.2. AC Response

Figure 10 depicts the typical small-signal response at $0.7 A_{RMS}$, and Figure 11 shows the large-signal response up to 1000 Hz (TBD).

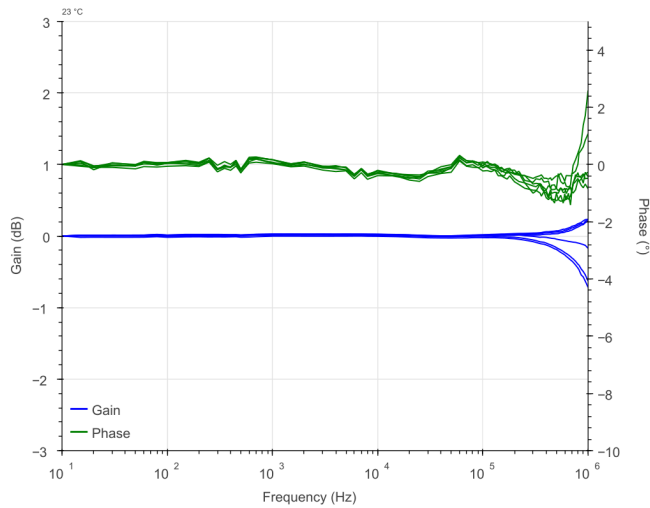


Figure 10: Small Signal AC Response at $I_p \approx 0.7 A_{RMS}$

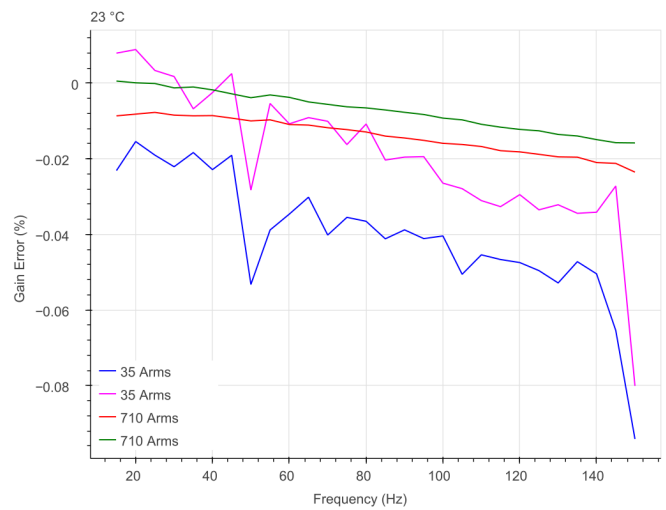


Figure 11: Large Signal AC Response at $I_p \approx 0.7 A_{RMS}$

7.1.2. Temperature Drift and Stability

7.1.2.1. Offset Drifting

The following two tests were performed using a $2.5\ \Omega$ burden resistor and a Fluke 5502A current source as reference. The first chart shows the sensor output at $I_P = 0\text{ A}$ with the core intentionally magnetized (offset) to the maximum possible value. The second chart shows the drift from $-35\text{ }^\circ\text{C}$ for magnetized cores at a constant current of 100 A. It was found that temperature stress in either direction reduces the offset resulting from hysteresis.

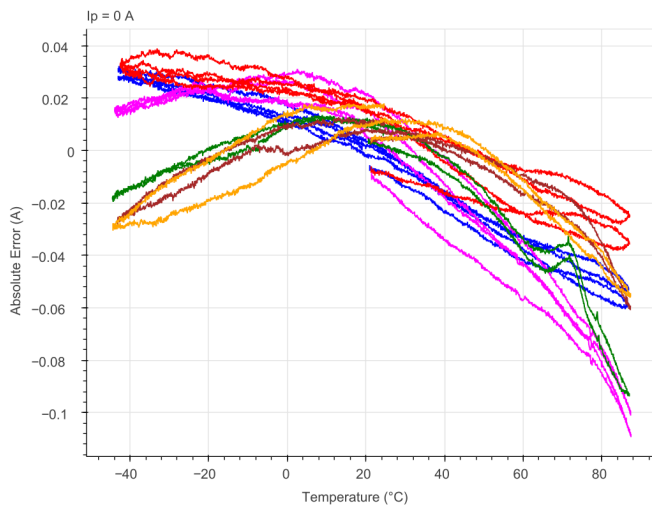


Figure 12: Temperature Drift at $I_P = 0\text{ A}$

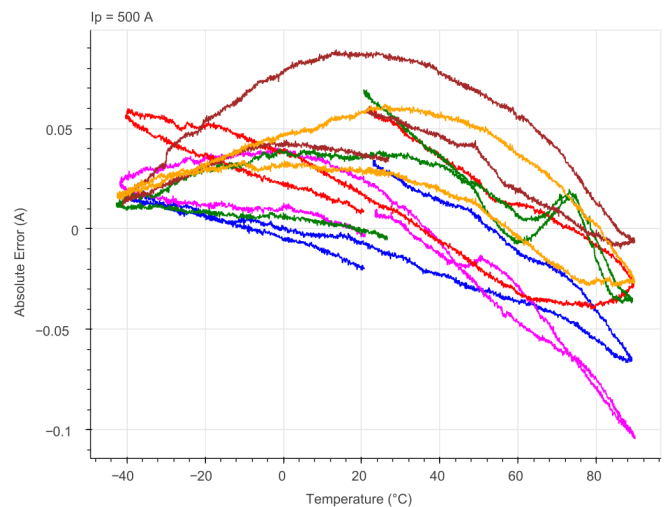


Figure 13: Temperature Drift at $I_P = 500\text{ A}$

7.1.2.2. Time Stability

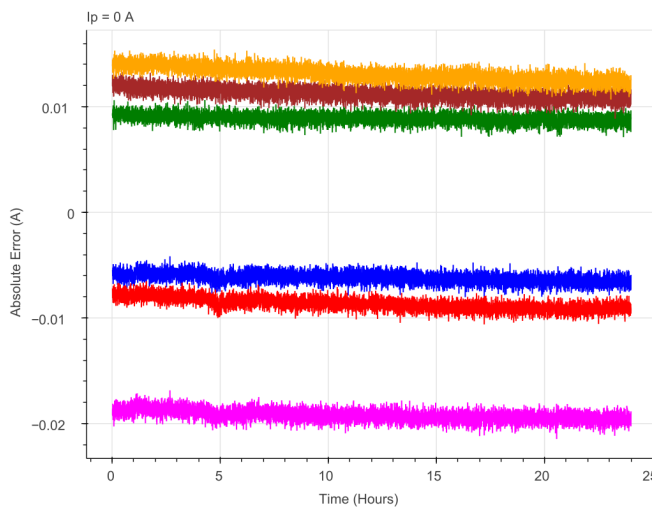


Figure 14: Stability Over 24 Hours at $I_P = 0\text{ A}$

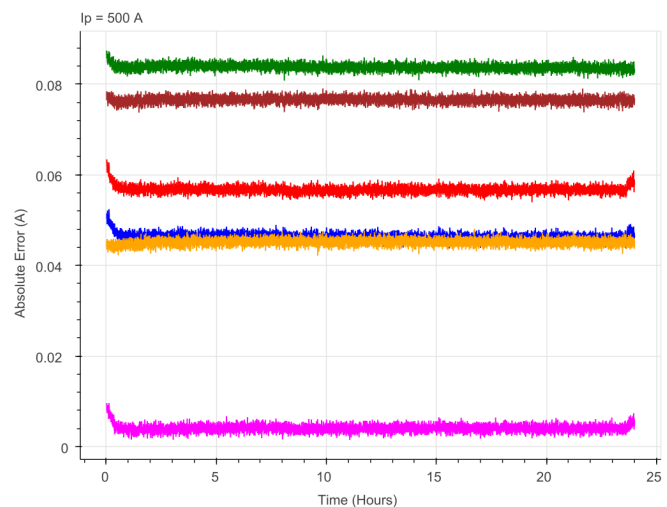
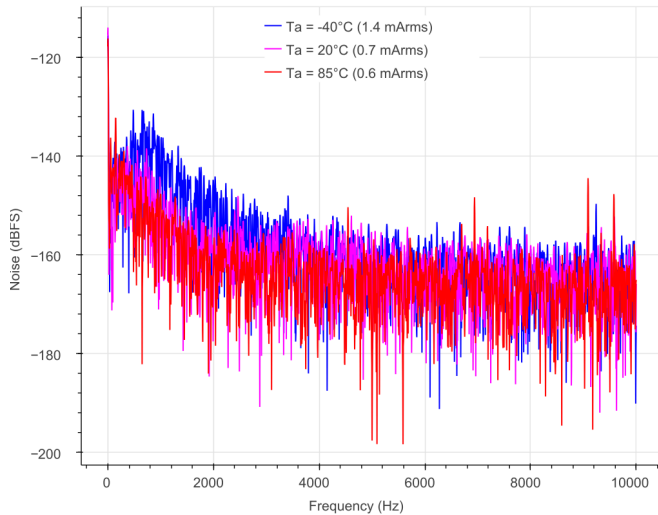


Figure 15: Stability Over 24 Hours at $I_P = 500\text{ A}$

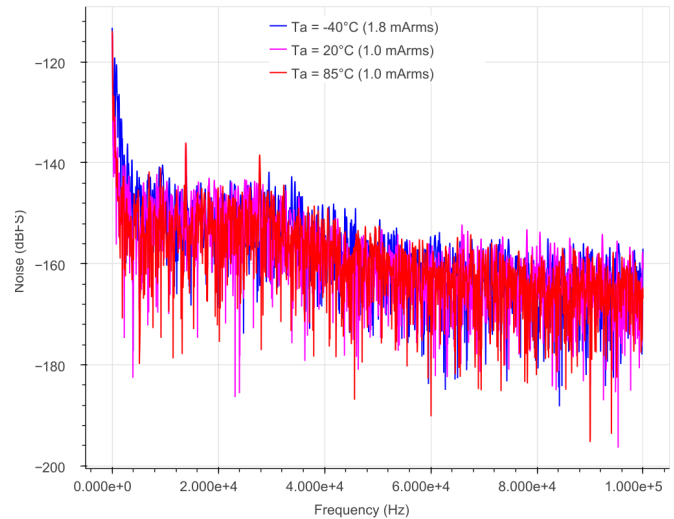
7.1.3. Noise

Noise was evaluated using the INA849 amplifier with $G=501$, $2.5\ \Omega$ burden resistor, R&S RTO1004, and primary current IP of 0 A.

7.1.3.1. 100 kHz Bandwidth Noise

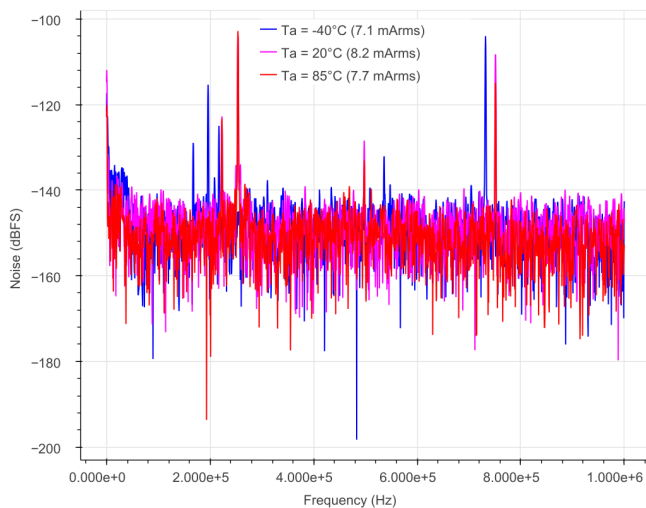


Noise spectrum vs. TA up to 10 kHz

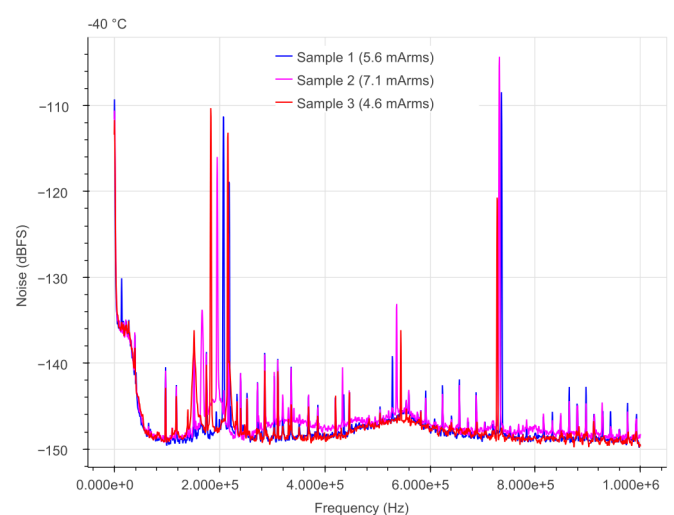


Noise spectrum vs. TA up to 100 kHz

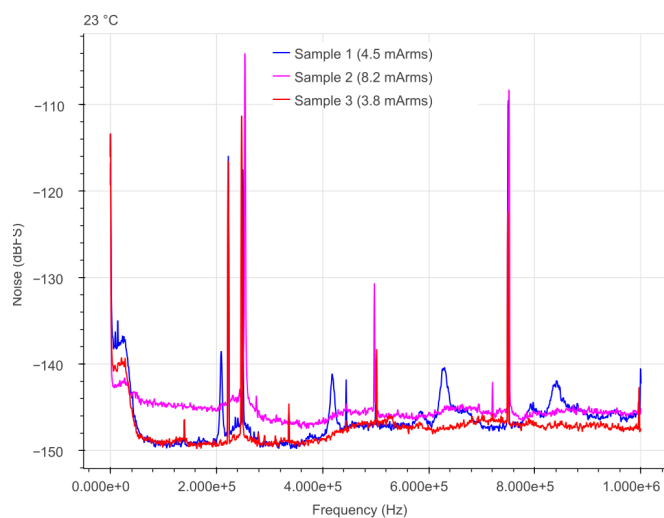
7.1.3.2. 1 MHz Bandwidth Noise and Ripple



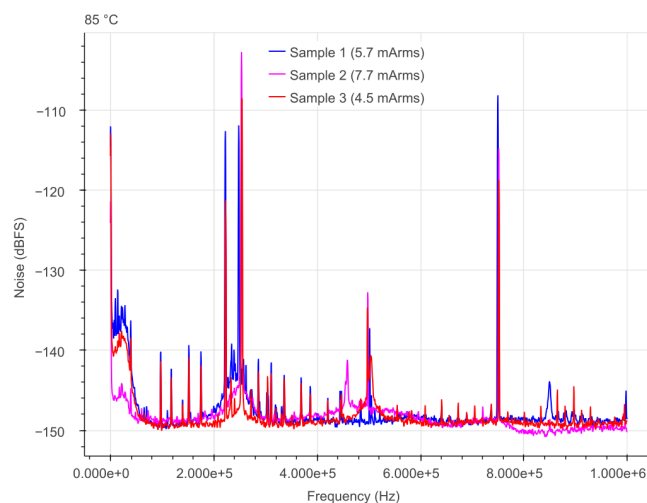
Noise spectrum vs. TA up to 1 MHz



Averaged noise spectrum at TA = -40°C



Averaged noise spectrum at TA= 20°C



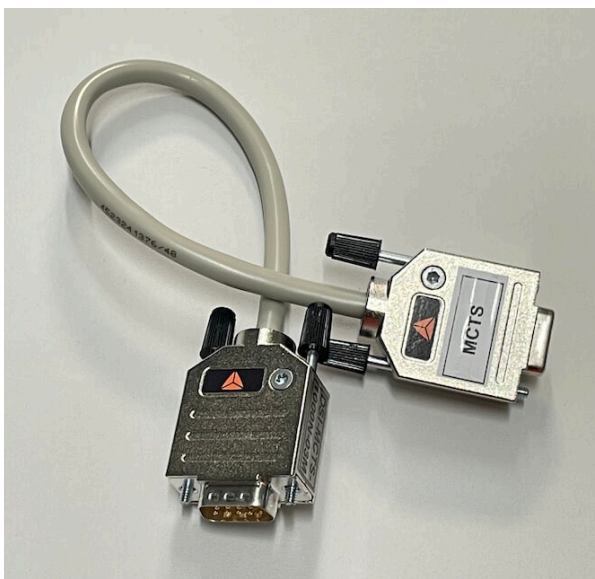
Averaged noise spectrum at TA= 85°C

8. Accessories

8.1. DSI-DC-CT-1000I-0.3m

DSI-DC-CT-1000I-0.3m is the DSI adapter for the DC-CT-1000I sensors. It fits between the Dewesoft DAQ device and the PWR-MCTS2 device.

It comes with a 1 Ω shunt resistor and TEDS chip.

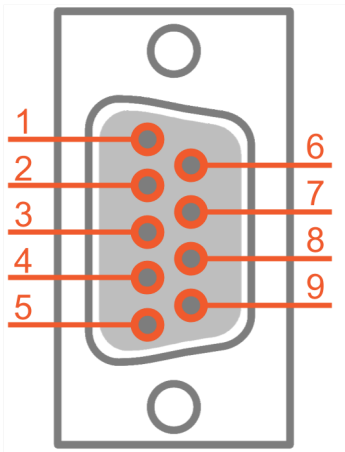


DSI-DC-CT-1000I-0.3m

8.1.1.1. DSI-DC-CT-1000I-0.3m: Specifications

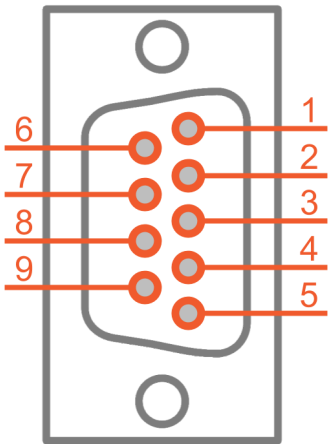
Resistor	
Technology	Metal Foil
DSI-MCTS-DC-CT-1000-03M	1 Ω / 2 Watt
Pulse Power (5 sec)	200 %
Accuracy	
Amplitude Accuracy	± 0.01 %
Temperature Coefficient	Typ: ± 2 ppm/ $^{\circ}$ C (max. ± 5 ppm/ $^{\circ}$ C)
Load Life Stability	± 0.005 % @ 25 $^{\circ}$ C, 2000 h at rated power
Frequency Characteristics	
Angular Accuracy	< 1 $^{\circ}$ @ 500 kHz
Frequency Range	< 0.5 dB @ 1000 kHz
Rise Time	1 ns
Inductance (L)	max. 0.1 μ H (typical 0.03 μ H)
Capacitance (C)	max. 1 pF (typical 0.5 pF)

8.1.1.2. DSI-DC-CT-1000I-0.3m: Pinout



DSI-MCTS-x-03M connector: pinout (DSUB-9 **female**)

Pin	Name	Description
1	RETURN	Return
2	NC	Not connected
3	GND	Ground
4	GND	Ground
5	NC	Not connected
6	OUT	Output
7	NC	Not connected
8	Normal op. st.	Normal op. st.
9	NC	Not connected

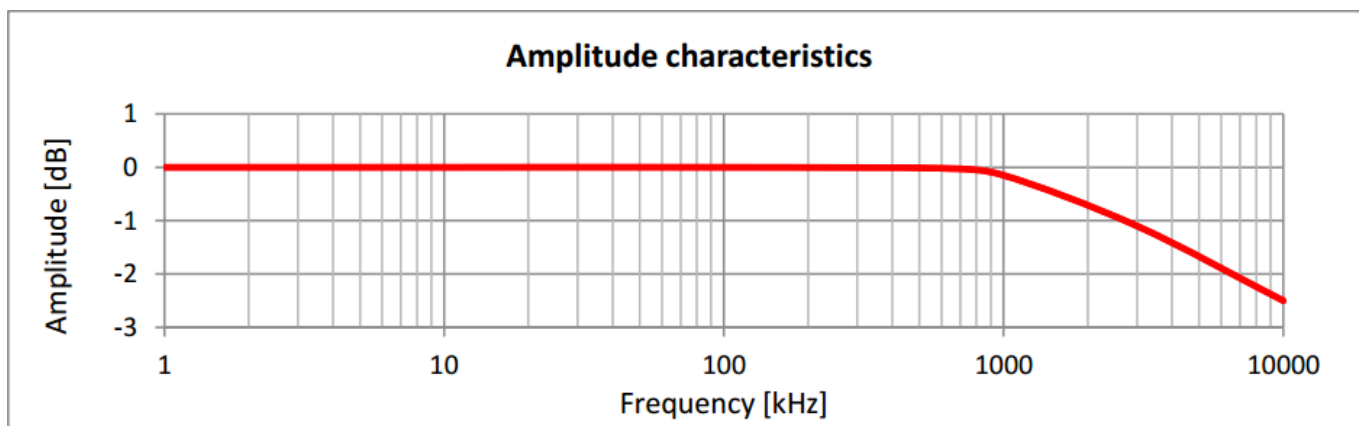


DSI-MCTS-x-03M connector: pinout (DSUB-9 **male**)

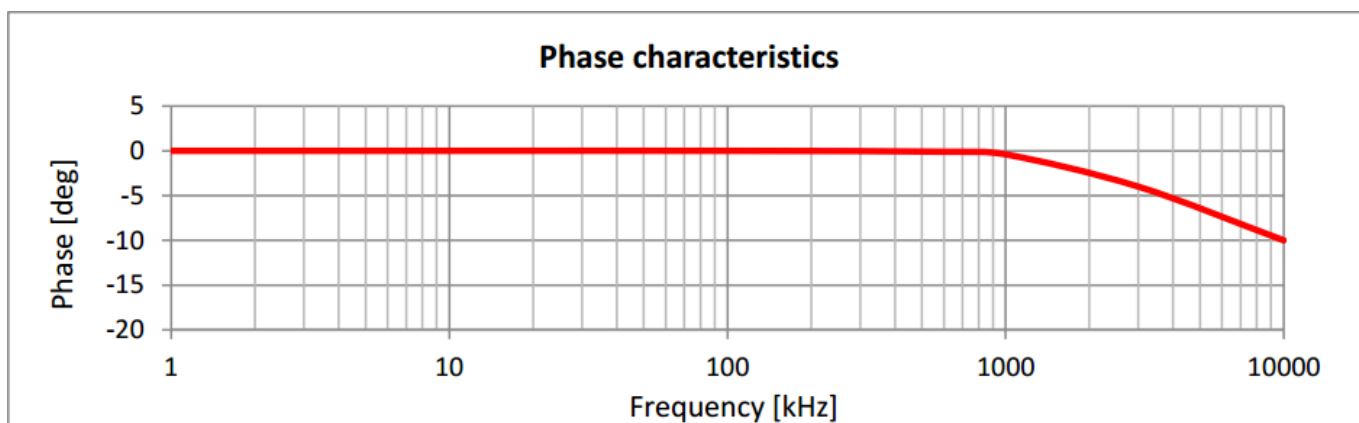
Pin	Name	Description
1	NC	Not connected
2	In+	In+
3	NC	Not connected
4	GND	Ground
5	Digital IO	Digital IO
6	NC	Not connected
7	In-	In-
8	NC	Not connected
9	TEDS	TEDS

8.1.1.3. DSI-DC-CT-1000I-0.3m: Characteristics

8.1.1.3.1. Magnitude response



8.1.1.3.2. Phase response



8.2. Power supplies

Dewesoft DAQ devices do not provide sufficient power on excitation to power the DC-CT sensors. You need to use the MCTS power supply between the sensor and the DAQ device.



Hint

For the manual and specification of MCTS power supplies, please refer to the [Current transducers](#) manual section 2.5. *SIRIUSi-PWR-MCTS: Power supply for current transducers.*



SIRIUSi-PWR-MCTS2 4 Channel



SIRIUSi-HD-PWR-MCTS2 8 Channel



*SIRIUSir-PWR-MCTS2 4 Channel and
SIRIUSir-HD-PWR-MCTS2 8 Channel*



DSi-PWR-MCTS-SINGLE



Important

The maximum length of the D9f-D9m-MCTS cable (between MCTS2 and DC-CT) is 10m for DSUB connector and 3m for LEMO connector..



Ordering Code	Description
DC-CT-1000I-S22DA	1000A, Standalone, 22 mm Opening, D-SUB, Analog Current Output
DC-CT-1000I-S45DA	1000A, Standalone, 45 mm Opening, D-SUB, Analog Current Output
DC-CT-1000I-S22LA	1000A, Standalone, 22 mm Opening, LEMO 0B 6-pin, Analog Current Output
DC-CT-1000I-S45LA	1000A, Standalone, 45 mm Opening, LEMO 0B 6-pin, Analog Current Output
	Key Specifications • Rated primary current $I_P = 1000$ ADC, 700 AAC • Linearity of <100 ppm • Typical Offset including Hysteresis <100 mA RTI • Bandwidth 1 MHz @ -0.5 dB • Immunity <50 mA RTI at 5 mT in any direction • CMRR <TBD $\mu\text{A/V}$ @ 100 kHz • TEDS (Current Loop Output Sensors Template) • Range OK Signal • Power Supply: Unipolar 30 V or Bipolar ± 15 V with floating current output • Standby Power Consumption 0.5 W • Typical Power consumption 6.6 W at rated I_P • Withstands rated DC/AC primary currents without being powered • Operational Range -40 to 85°C



9. Warranty information

Notice

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The copy of the specific warranty terms applicable to your Dewesoft product and replacement parts can be obtained from your local sales and service office. To find a local dealer for your country, please visit <https://dewesoft.com/support/distributors>.

9.1. Calibration

Every instrument needs to be calibrated at regular intervals. The standard norm across nearly every industry is annual calibration. Before your Dewesoft data acquisition system is delivered, it is calibrated. Detailed calibration reports for your Dewesoft system can be requested. We retain them for at least one year, after system delivery.

9.2. Support

Dewesoft has a team of people ready to assist you if you have any questions or any technical difficulties regarding the system. For any support please contact your local distributor first or Dewesoft directly.

Dewesoft d.o.o.
Gabrsko 11a
1420 Trbovlje Slovenia

Europe Tel.: +386 356 25 300
Web: <http://www.dewesoft.com>
Email: Support@dewesoft.com

The telephone hotline is available Monday to Friday from 07:00 to 16:00 CET (GMT +1:00)

9.3. Service/repair

The team of Dewesoft also performs any kinds of repairs to your system to assure a safe and proper operation in the future. For information regarding service and repairs please contact your local distributor first or Dewesoft directly on <https://dewesoft.com/support/rma-service>.

9.4. Restricted Rights

Use Slovenian law for duplication or disclosure. Dewesoft d.o.o. Gabrsko 11a, 1420 Trbovlje, Slovenia / Europe.

9.5. Printing History

Version 2.0.0, Revision 217 Released 2015 Last changed: 23. July 2018 at 16:54.



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DC-CT is a Registered Trademark of ISOTELpower d.o.o.

10. Safety instructions

Your safety is our primary concern! Please be safe!

10.1. Safety symbols in the manual



Warning

Calls attention to a procedure, practice, or condition that could cause the body injury or death



Caution

Calls attention to a procedure, practice, or condition that could possibly cause damage to equipment or permanent loss of data.

10.2. General Safety Instructions



Warning

The following general safety precautions must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. Dewesoft d.o.o. assumes no liability for the customer's failure to comply with these requirements.

All accessories shown in this document are available as an option and will not be shipped as standard parts.



10.2.1. Environmental Considerations

Information about the environmental impact of the product.

10.2.2. Product End-of-Life Handling

Observe the following guidelines when recycling a Dewesoft system:

10.2.3. System and Components Recycling

Production of these components required the extraction and use of natural resources. The substances contained in the system could be harmful to your health and to the environment if the system is improperly handled at its end of life! Please recycle this product in an appropriate way to avoid unnecessary pollution of the environment and to keep natural resources.



This symbol indicates that this system complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Please find further information about recycling on the Dewesoft web site www.dewesoft.com



Restriction of Hazardous Substances

This product has been classified as Monitoring and Control equipment and is outside the scope of the 2002/95/EC RoHS Directive. However, we take care of our environment and the product is lead-free.

10.2.4. General safety and hazard warnings for all Dewesoft systems

Safety of the operator and the unit depend on following these rules.

- Use this system under the terms of the specifications only to avoid any possible danger.
- Read your manual before operating the system.
- Observe local laws when using the instrument.
- DO NOT touch internal wiring!
- DO NOT use higher supply voltage than specified!
- Use only original plugs and cables for harnessing.
- You may not connect higher voltages than rated to any connectors.
- The power cable and connector serve as Power-Breaker. The cable must not exceed 3 meters, the disconnect function must be possible without tools.
- Maintenance must be executed by qualified staff only.
- During the use of the system, it might be possible to access other parts of a more comprehensive system. Please read and follow the safety instructions provided in the manuals of all other components regarding warning and security advice for using the system.
- With this product, only use the power cable delivered or defined for the host country.
- DO NOT connect or disconnect sensors, probes or test leads, as these parts are connected to a voltage supply unit.
- Ground the equipment: For Safety Class 1 equipment (equipment having a protective earth terminal), a non-interruptible safety earth ground must be provided from the mains power source to the product input wiring terminals.
- Please note the characteristics and indicators on the system to avoid fire or electric shocks. Before connecting the system, please read the corresponding specifications in the product manual carefully.



- The inputs must not, unless otherwise noted (CATx identification), be connected to the main circuit of category II, III and IV.
- The power cord separates the system from the power supply. Do not block the power cord, since it has to be accessible for the users.
- DO NOT use the system if equipment covers or shields are removed.
- If you assume the system is damaged, get it examined by authorized personnel only.
- Adverse environmental conditions are Moisture or high humidity Dust, flammable gases, fumes or dissolver Thunderstorm or thunderstorm conditions (except assembly PNA) Electrostatic fields, etc.
- The measurement category can be adjusted depending on module configuration.
- Any other use than described above may damage your system and is attended with dangers like short-circuiting, fire or electric shocks.
- The whole system must not be changed, rebuilt or opened.
- DO NOT operate damaged equipment: Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until the safe operation can be verified by service-trained personnel. If necessary, return the product to Dewesoft sales and service office for service and repair to ensure that safety features are maintained.
- If you assume a more riskless use is not provided anymore, the system has to be rendered inoperative and should be protected against inadvertent operation. It is assumed that a more riskless operation is not possible anymore if the system is damaged obviously or causes strange noises. The system does not work anymore. The system has been exposed to long storage in adverse environments. The system has been exposed to heavy shipment strain.
- Warranty void if damages caused by disregarding this manual. For consequential damages, NO liability will be assumed!
- Warranty void if damage to property or persons caused by improper use or disregarding the safety instructions.
- Unauthorized changing or rebuilding the system is prohibited due to safety and permission reasons (CE).
- Be careful with voltages >25 VAC or >35 VDC! These voltages are already high enough in order to get a perilous electric shock by touching the wiring.
- The product heats during operation. Make sure there is adequate ventilation. Ventilation slots must not be covered!
- Only fuses of the specified type and nominal current may be used. The use of patched fuses is prohibited.
- Prevent using metal bare wires! Risk of short circuit and fire hazard!
- DO NOT use the system before, during or shortly after a thunderstorm (risk of lightning and high energy over-voltage). An advanced range of application under certain conditions is allowed with therefore designed products only. For details please refer to the specifications.
- Make sure that your hands, shoes, clothes, the floor, the system or measuring leads, integrated circuits and so on, are dry.
- DO NOT use the system in rooms with flammable gases, fumes or dust or in adverse environmental conditions.
- Avoid operation in the immediate vicinity of high magnetic or electromagnetic fields, transmitting antennas or high-frequency generators, for exact values please refer to enclosed specifications.
- Use measurement leads or measurement accessories aligned with the specification of the system only. Fire hazard in case of overload!



- Lithium ion batteries are classified as not hazardous when used according to the recommendations of the manufacturer described in Battery Safety Data Sheet, which is available for download from [this link](#).
- Do not switch on the system after transporting it from a cold into a warm room and vice versa. The thereby created condensation may damage your system. Acclimatise the system unpowered to room temperature.
- Do not disassemble the system! There is a high risk of getting a perilous electric shock. Capacitors still might be charged, even if the system has been removed from the power supply.
- The electrical installations and equipment in industrial facilities must be observed by the security regulations and insurance institutions.
- The use of the measuring system in schools and other training facilities must be observed by skilled personnel.
- The measuring systems are not designed for use in humans and animals.
- Please contact a professional if you have doubts about the method of operation, safety or the connection of the system.
- Please be careful with the product. Shocks, hits and dropping it from already- lower level may damage your system.
- Please also consider the detailed technical reference manual as well as the security advice of the connected systems.
- This product has left the factory in safety-related flawlessness and in proper condition. In order to maintain this condition and guarantee safety use, the user has to consider the security advice and warnings in this manual.

EN 61326-3-1:2008

IEC 61326-1 applies to this part of IEC 61326 but is limited to systems and equipment for industrial applications intended to perform safety functions as defined in IEC 61508 with SIL 1-3.

The electromagnetic environments encompassed by this product family standard are industrial, both indoor and outdoor, as described for industrial locations in IEC 61000-6-2 or defined in 3.7 of IEC 61326-1.

Equipment and systems intended for use in other electromagnetic environments, for example, in the process industry or in environments with potentially explosive atmospheres, are excluded from the scope of this product family standard, IEC 61326-3-1.

Devices and systems according to IEC 61508 or IEC 61511 which are considered as “operationally well-tried”, are excluded from the scope of IEC 61326-3-1.

Fire-alarm and safety-alarm systems, intended for the protection of buildings, are excluded from the scope of IEC 61326-3-1.



10.3. Documentation version history

Version	Date	Notes
V23-1	30.10.2023	- Initial version of the manual including: specifications and characteristics, technical drawing, corresponding cable
V25-1	18.04.2025	- Updated specs
V26-1	15.01.2026	- Added DC-CT-1000I-S45DA - Added DC-CT-1000I-S22LA - Added DC-CT-1000I-S45LA - Added Power supplies section - Added pinout section
V26-2	7.4.2026	- Updated specifications - Updated Characteristics graphs - Overall rewrite of the manual