

## Current Measurement with Confidence

*A High Performance DC and AC Current Transducer with integrated USB Data Acquisition is an ideal equipment for development of systems which require high current dynamic range and long-term testing.*

### Applications

- Test and Measurement of USB 3.0, 3.1, 2G, 3G, 4G, and 5G Products
- Measurement of Solar Panels, Inverters and Other Energy Harvesting Devices
- Development of Lion/LiPo Battery Controllers and Chargers
- Performance Measurement of Switching Power Supplies
- Coulomb Counter (Battery Fuel Gauge)
- Power Measurements with Auxiliary Voltage Input
- Interactive Mode and 24/7 Unattended Long-Term Measurements

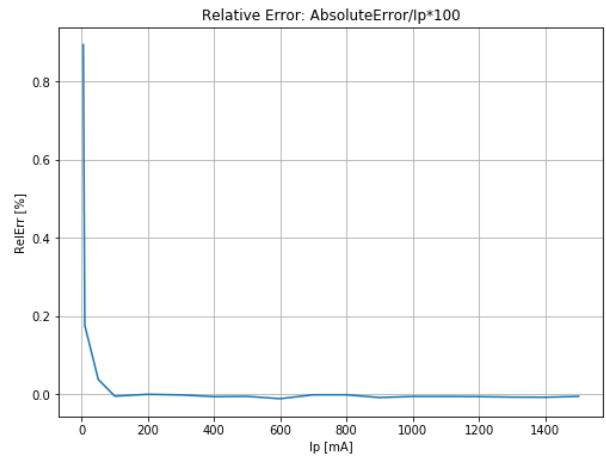
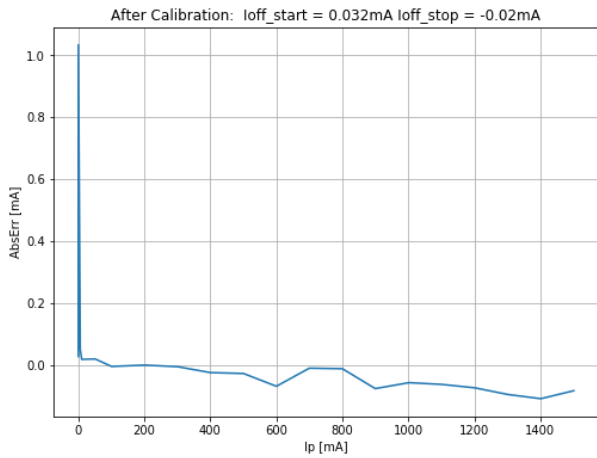
### Features

- Analog DC Accuracy <0.1%, Linearity <100 ppm, Bandwidth 2 MHz
- Data Acquisition Current DC Accuracy 0.1%, 16-bit at 50 kSa/s (alias free)
- Offset Calibration can be performed at any primary current
- Primary Current Fuse simplifies direct connections of Batteries
- Auxiliary DAQ Voltage Measurement +/-10 V | 1 MOhm or as Trigger Input
- Synchronized Data Acquisition of Multiple Isotel Precision Units
- Isolated USB CAT II 125 Vrms
- Isolated Current Sense CAT II 300 Vrms

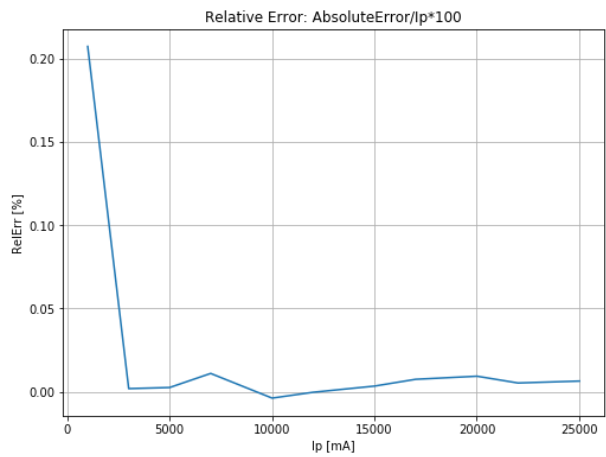
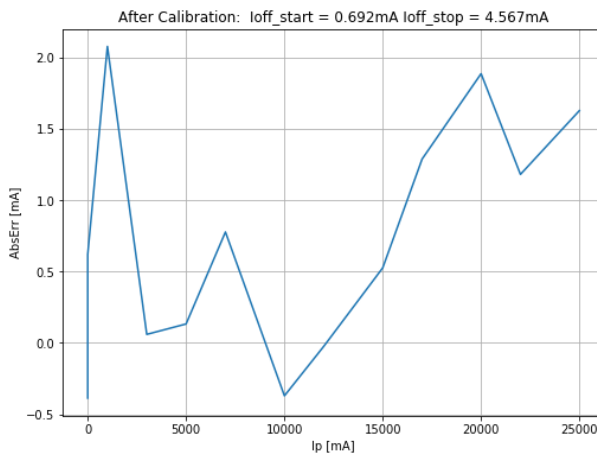
### Specifications

#### Performance of Integrated 16-bit USB DAQ

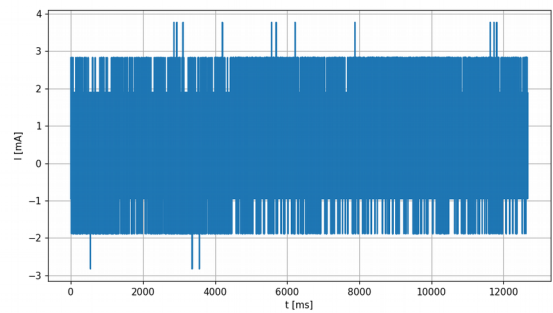
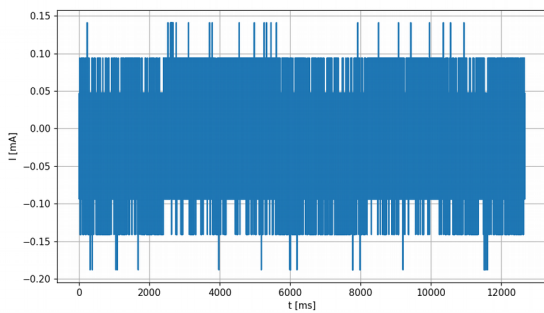
Absolute and Relative Accuracy of 1002U (Early Product Samples)



Absolute and Relative Accuracy of 1016U (Early Product Samples)



16-bit A/D Noise at 20 kSa/s for 1002U (Left) and 1016U (Right) (Early Product Samples)



## DAQ USB Full-Speed Specifications

Parameter	Min	Typ	Max	Unit	Notes
Single Channel Mode, Sample Rate at 16-bit	100	..	50k	Sa/s	Alias Free
Single Channel Mode, Sample Rate at 15-bit			100k	Sa/s	Alias Free
Multi Channel Mode, Sample Rate at 16-bit	100	..	5k	Sa/s	Per Channel
Multi Channel Mode, Sample Rate at 15-bit			10k	Sa/s	Per Channel
SNR		73		dB	1 kHz @ 10 kSa/s
SFDR		-86		dB	1 kHz @ 50 kSa/s
Long Term Voltage Accuracy		0.1%			
Voltage Temperature Drift		3		ppm/K	
USB Current Consumption			500	mA	
USB Rated Isolation CAT II		125		Vrms	Cert. Pending

## Analog Current Sensing Specifications for 1002U

Parameter	Min	Typ	Max	Unit	Notes
Rated Current Range		±2		A	
Short Term (<4 seconds) Maximum Current			±2.5	A	
Input Resistance		40	50	mΩ	
Additional Resistance due to Primary Fuse		150	160	mΩ	Can be reduced
Current to Voltage Gain		TBD		V / A	
Current Sense Gain Stability		100		ppm	
Frequency Bandwidth		~2		MHz	-3 dB (TBD)
Hysteresis Referred to Primary Side		100	300	μA	
Offset Referred to Primary Side		50		μA	
RMS Noise Referred to Primary Side		100		μA	
Peak-to-Peak Noise Referred to Primary Side		300		μA	
Current Sense Isolation CAT II		300		Vrms	Cert. Pending

## Analog Current Sensing Specifications for 1016U

Parameter	Min	Typ	Max	Unit	Notes
Rated Current Range		±16		A	
Short Term (<4 seconds) Maximum Current			±25	A	
Input Resistance		TBD		mΩ	
Additional Resistance due to Primary Fuse		15		mΩ	Can be reduced
Current to Voltage Gain		TBD		V / A	
Current Sense Gain Stability		100		ppm	
Frequency Bandwidth		~2		MHz	-3 dB (TBD)
Hysteresis Referred to Primary Side		5		mA	
Offset Referred to Primary Side		700		μA	
RMS Noise Referred to Primary Side		1		mA	
Peak-to-Peak Noise Referred to Primary Side		5		mA	
Current Sense Isolation CAT II		300		Vrms	Cert. Pending

## Auxiliary Voltage & Trigger Input, Calibration

Parameter	Min	Typ	Max	Unit	Notes
Voltage Range		±10		V	
Absolute Maximum Voltage Applied to Input			±30	V	
Input Impedance		1   10		MΩ   pF	
Absolute Measurement Accuracy		0.1		%	
Accuracy of Multiple Instrument Synchronization		<100		ns	via USB
Offset Calibration Time		<1		s	

## Standard Compliance

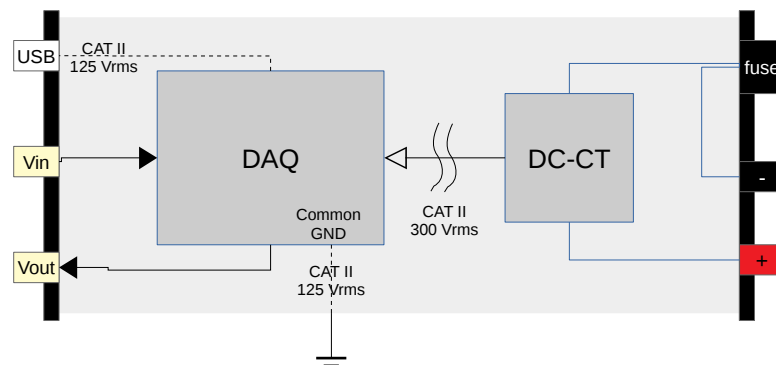
- IEC 61010: **Note:** Pending Certifications

## Operation

### Connecting the Instrument

The Isotel Precision Family is a double isolated instrument to simplify measurements by reducing number of potential ground loops:

- USB to Instrument Common Ground is isolated as CAT II 125 Vrms
- Voltage Input and Current Analog Output are referred to above Common Ground
- Instrument Common Ground to Current Sense Inputs has additional isolation of CAT II 300 Vrms



For operation of the instrument simply connect the Instrument to an USB port, or an USB power supply and current input to the unit under test.

All inputs can be continuously connected even when instrument is powered off. During calibration procedure the instrument will not affect any of the inputs.

### Current Sense, Calibration and Offset Cancellation

Current sense input features an innovative measurement technology DC-CT (<http://dc-ct.com>), which is providing to the instrument high-bandwidth, low-noise, isolated DC/AC transducer based on shielded magnetic circuits to provide superb immunity to external magnetic fields.

Every magnetic circuit features a small hysteresis which increases in the case instrument is overloaded. Overloading conditions are detected and reported via communication interface. Optionally instrument can automatically degauss for Offset Cancellation on such events, or manually by pressing the key or sending the command via communication protocol. During the calibration procedure current sense and voltage inputs are left intact, only the analog current output will be invalid during this period, and digital measurement won't be available.

Instrument will automatically do the calibration procedure after power-up.

## Operational States, Signaling and Calibration Push-button

The front-end LED reports instrument operation:

- Green ON: Instrument is Ready and Operating
- Green Blinking: Instrument Selected in Software
- Green/Red Alternating: Calibration in Progress
- Red Blinking: Overloading event detected and instrument accuracy may be affected
- Red ON: Instrument faced an error.

Press on the push button starts Calibration procedure, and may be pressed at any time. Current sense inputs won't be affected by any means.

## Software Support

Isotel Precision comes with cross-platform software support with desktop GUI, web standard RESTful API and python library support.

More information will be added soon.

**Register to our news to be up-to-date at**

**<http://isotel.eu>**

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