

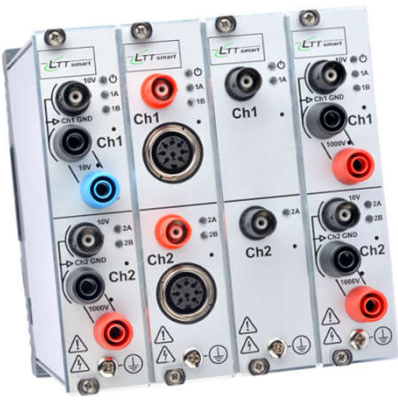
## LTTsmart – Technical Data

2-channel high precision data acquisition system incl. analog front end per module

Technical Specifications – Optional Specifications marked with \*

Specifications are subject to change without notice.

### Available types of Modules

	<p>2-Channel precision data acquisition system with 2 analog inputs:</p> <ul style="list-style-type: none"> <li>– 2 MHz // 24 Bit ADC per channel (optional 4 MHz)</li> <li>– <math>\pm 500</math> mV and <math>\pm 10</math> V AC/DC (low voltage)</li> <li>– Optional: <math>\pm 90</math> V (mid voltage) or 1000Vrms (high voltage)</li> <li>– Extremely high precision: <math>\pm(0.015\% \cdot \text{Signal} + 0.015\% \cdot \text{Range})</math></li> <li>– ICP®/IEPE with 4 mA supply*</li> <li>– Charge input*</li> <li>– Pulse/Counter Inputs with 1.20 ns resolution*</li> <li>– Strain-Gauge*</li> <li>– 2.5 kV galvanic isolation</li> </ul> <p>USB 3.0 Interface            Digital-I/O (LVCMOS/LVTTL 0 V to 3.3 V)*            SyncUp/SyncDown- Interface to cascade multiple devices</p> <p>ca. 146 x 31 x 140 mm<sup>3</sup> (L x W x H) per Module</p>
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### Input Characteristics

<b>Quantization</b>	24 Bits
<b>max. Sampling Rate</b>	2 MSample/s per channel (optional 4 MHz)
<b>max. Bandwidth</b>	DC – 900 kHz (optional 1.7 MHz)
<b>Filter</b>	Analog: 900 kHz low-pass filter (optional 1.7 MHz) Digital: a variety of selectable filters
<b>Inter-Channel Phase Difference</b>	< 10 ns
<b>Input Connectors</b>	BNC, High Voltage Banana and/or DIN
<b>Galvanic Isolation</b>	2500 VDC
<b>Volt Input Ranges</b>	$\pm 500$ mV, $\pm 10$ V, $\pm 90$ V*, $\pm 1000$ Vrms*
<b>Volt Input Impedance</b>	1M $\Omega$ _50pF, [10M $\Omega$ _5pF at 1000 Vrms]*
<b>Volt Input Couplings</b>	single-ended (AC/DC) (AC available only at $\pm 500$ mV and $\pm 10$ V)

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### Input Characteristics

	Range	Bandwidth		
		5 kHz	50 kHz	1 MHz
<b>Dynamic Range</b>	1000 Vrms*	110 dB	104 dB	94 dB
	±90 V*	113 dB	107 dB	96 dB
	±10 V	115 dB	109 dB	98 dB
	±500 mV	102 dB	94 dB	82 dB
<b>ENOB (THD + noise) effective number of bits</b>	Range	effective bits	dB @ 125 kHz sampling rate	
	1000 Vrms*	typ 15.3 Bit	-95 dB	
	±90 V*	typ 15.4 Bit	-96 dB	
	±10 V	typ 15.6 Bit	-97 dB	
±500 mV	typ 14.3 Bit	-89 dB		
<b>Crosstalk</b>	< -120 dB (DC – 200 kHz)			
<b>Input Protection</b>	±17.5 V @ range ±500 mV, ±10 V ±2000 V @ range 1000 Vrms			

### Signal Conditioning

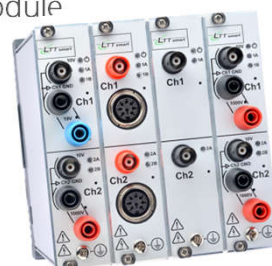
<b>ICP®/IEPE*</b>	Constant current supply: 4 mA Input coupling: AC and DC
<b>Charge*</b>	1 mV/pC, range: ±5 nC (optional up to ±500 nC) High-pass: 0.15 Hz auto charge clear; manual clear
<b>Pulse/Counter Input*</b>	Input signal: TTL Time resolution 1.20 ns (832 MHz)
<b>Strain-Gauge*</b>	Quarter (120 Ω, 350 Ω) / Half / Full Bridge Constant voltage supply: 0 ... 10 V with sense

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### Operation Conditions

<b>Power Supply</b>	12-16 VDC (absolute max. rating 10-35 VDC)
	6 W typical per channel
	external power supply: 100-240 VAC
<b>Environmental Temperature</b>	+10 °C to +30 °C
<b>Operating System</b>	Windows 7 / 8 / 10, Linux and others

### Data Recording

<b>Internal RAM</b>	64 MByte per channel 512 MByte RAM with 8 channels
<b>Interface to PC</b>	USB 3.0, USB 2.0
<b>Recording Media</b>	internal RAM, PC's hard disk

### Data Transfer Rates

<b>PC with USB</b>	170 MByte/s (USB 3.0) – 35 MByte/s (USB 2.0)
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### Number of Channels

<b>max. No. of Devices</b>	Any number of devices with up to 8 modules each (max. 16 Channel per device)
<b>Synchronization*</b>	Yes (max. delay between devices: $\pm 10$ ns)
<b>External Clock*</b>	1 input and 1 output with 3.3 V LVPECL
<b>External Trigger*</b>	1 input and 1 output with 3.3V LVCMOS
<b>Digital Inputs*</b>	8 inputs and 8 outputs with 3.3VLVCMOS per device

### Available File Formats

<b>FAMOS</b>	<b>Excel</b>
<b>DASLab</b>	<b>Matlab</b>
<b>DIAdem</b>	and others

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### Module variants:

	Base	HH	LH	MM	LL	LL	Li	LDi	LDiP	
1000 Vrms		✓ (2 x)	✓ (1 x)							1000 Vrms
+/-90 V				✓						+/-90 V
+/-10 V		✓	✓	✓	✓	✓	✓	✓	✓	+/-10 V
+/-500 mV		✓	✓	✓	✓	✓	✓	✓	✓	+/-500 mV
+/-100 mA										+/-100 mA
ICP							✓	✓	✓	ICP
Resistance							✓	✓	✓	Resistance
PT100, PT1000							✓	✓	✓	PT100, PT1000
Charge							✓	✓	✓	Charge
Strain Gauge								✓	✓	Strain Gauge
Pulse/Counter									✓	Pulse/Counter
Digital I/O	✓ (8 x)					✓ (2 x)			✓ (2 x)	Digital I/O
Sync Up/Down	✓									Sync Up/Down
USB 3.1	✓									USB 3.1
Power Input	✓									Power Input
Front-Style	A	B	F	C	C	E	C	D	D	Front-Style

Type	LTTbase	HH	MM, LL, Li	LDi, LDiP	LL_TTL	LH
Front:	A	B	C	D	E	F

