LTT 24 – Transient Recorder *Including Sensor-Preamplifiers*

Multifunctional Data Acquisition 24 Bit ADC, Sampling Rate up to 4 MHz per Channel.

- ➜ Best signal quality on the market.
- ➜ Best CMRR on the market.
- ➜ Amazing 24 Bit ADC, sampling rate up to 4 MHz per channel.
- ➜ Combinable modules.
- ➜ Voltage / ICP / strain gauge / charge / current / LVDT / resistance
- ➜ Sensor supply: Voltage, current, carrier frequency.
- ➜ Internal storage media (SSD).
- ➜ 20 Bit DAC output, sampling rate up to 2 MHz per channel.

LTT24 - Family

www.tasler.de

LTT 24 – One for All!

The multifunctional data acquisition system LTT24 combines the functionality of a Transient Recorder, a sensor preamplifier and a tape recorder with replay functionality. It comes with 24 Bit ADCs with 4 MSamples/s per channel and with signal support for voltage, current, ICP, strain gauge, resistance, temperature, LVDT and more. Optional 20 Bit DACs can replay the signals either online or from internal SSD with up to 2 MSamples/s per channel.

Configuration According to Your Needs

You select

- the size of the housing.
- the number of input channels.
- the list of sensor options for each channel.
- the number of output channels.
- the size of the internal SSD.
- the number of LTT24 devices.

Modular Housing

- 4, 8 or 16 slots.
- Extendable at any time.
- Easy cascading and synchronization of multiple LTT24 devices.

LTT24-8 front panel

- All input signals: Volt, ICP, strain gauge and others.
- Status LEDs for all channels and for the whole device.

LTT24-8 rear panel

- Analog outputs.
- Digital I/O and synchronization interface.
- USB3.0, USB 2.0, Gigabit Ethernet.
- Power supply, power switch, GND-connector.

Modular Options

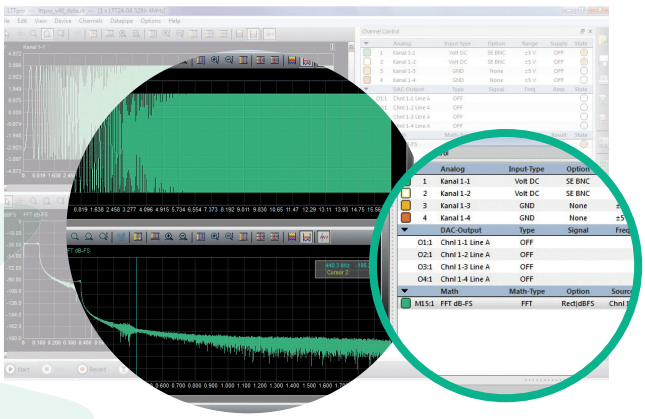
- Up to 16 analog input channels per LTT24.
- Up to 16 analog output channels per LTT24.
- Up to 16 digital I/O per LTT24.
- Up to 1000 GB SSD per LTT24.
- Up to 1024 devices synchronized.

Modular Channels

- All-in-one: each channel may support all input signals/sensors: voltage, charge, ICP, strain gauge, current, LVDT, resistance….
- High precision sensor supply output: constant voltage, constant current and carrier frequency.
- Ultra-performance: 24 Bit with 4 MS/s/channel.
- Continuous storage to internal SSD at full speed.
- Unmatched accuracy on the market:
  - **16 ENOB** *(Effective Number of Bits)*
  - flat bandwidth ***DC – 1.7MHz***
  - best CMRR *(Common Mode Rejection Ratio)*
  - best galvanic isolation
- Pulse/Counter-Inputs with 1.20 ns resolution.

Connectivity

- Synchronization interface for external hardware.
- USB 3.0, USB2.0 or Gigabit Ethernet connection to PC.



Software

- LTTproV4: Control and visualization software.
- LTT2API: Library for integration into customer software.
- Compatible with LabView, DasyLab, Matlab, and more.

LTT 24 Technical Data

Transient Recorder Including Sensor-Preamplifiers

Technical Specifications – *All Specifications marked with * are optional*

Available Housings

LTT24-4	4 channel housing: 142 x 400 x 75 mm³, 3.7 kg
LTT24-8	8 channel housing: 244 x 400 x 75 mm³, 5.9 kg
LTT24-16	16 channel housing: 447 x 400 x 75 mm³, 10.4 kg

Data Transfer Rates

Internal SSD	256 MByte/s *
PC *with USB*	170 MByte/s (USB3.0); 35 MByte/s (USB2.0)
PC *with Gigabit LAN*	27 MByte/s *

Number of Channels

Max. No. of Channels per Device	4, 8 or 16 (dependent on housing)
Max. No. of Devices	1024
Synchronisation *	Yes (max. delay between devices: ±1 ns)
External Clock *	1 input and 1 output with 3.3V LVPECL
External Trigger *	1 input and 1 output with 5V TTL
Digital Inputs *	16 inputs and 16 outputs with 5V TTL

Input Characteristics

Quantization	24 Bits			
Max. Sample Rate	4 MSamples/s per channel			
Max. Bandwidth	DC - 1.7 MHz			
Filter	Analog: 1.7 MHz low pass filter. Digital: A variety of selectable filters.			
Inter-Channel Phase Difference	< 1 ns			
Input Connectors	BNC and DIN			
Galvanic Isolation	± 200 V			
Volt Input Ranges	± 250 mV, 5 V, 50 V, ± 200 V *			
Volt Input Impedance	1MΩ_50pF, [10MΩ_5pF at ±200V *]			
Volt Input Couplings	Single-ended (AC/DC), differential (AC/DC)			
Current Input	± 50 mA range with internal 5R shunt resistor			
Dynamic Range	*Range:*	*Bandwidth:*		
		5 KHz	*50 KHz*	*1 MHz*
	± 50 V	116 dB	110 dB	100 dB
	± 5 V	118 dB	112 dB	101 dB
	± 250 mV	105 dB	97 dB	85 dB
ENOB (THD + noise) *(Effective Number of Bits)*	*Range:*	*Effektive Bits*	*dB @ 125 KHz Sampling Rate*	
	± 50 V	typ 15.6 Bit	-96 dB	
	± 5 V	typ 15.9 Bit	-98 dB	
	± 250 mV	typ 14.6 Bit	-90 dB	
Crosstalk	< -120 dB (DC - 200 kHz)			
CMRR *without Trimming* *(Common Mode Rejection Ratio)*	*Range:*	*0-20 KHz*	*0-100 KHz*	*0-1 MHz*
	± 250 mV:	typ 95 dB	87 dB	70 dB
	± 5 V:	typ 88 dB	74 dB	55 dB
	± 50 V:	typ 78 dB	73 dB	53 dB
CMRR *with Trimming** *(Common Mode Rejection Ratio)*	*Range:*	*0-20 KHz*	*0-100 KHz*	*0-1 MHz*
	± 250 mV:	> 100 dB	88 dB	70 dB
	± 5 V:	> 100 dB	75 dB	55 dB
	± 50 V:	> 100 dB	74 dB	53 dB
Input Protection	± 17.5 V @ range ± 250 mV, ± 5 V ± 175 V @ range ± 50 V ± 220 V @ range ± 200 V			

Data Recording

RAM	32 MByte per channel (512 MByte RAM with 16 channels)
Interface to PC	USB 3.0, USB 2.0, Gigabit Ethernet *
Recording Media	internal RAM, internal SSD *, PC's hard disk
Size of Internal SSD	120 GB - 1000 GB *

Operation Conditions

Power Supply	12 - 16 VDC (absolute max. rating 10 - 35 VDC) 11 W typical per channel without sensor supply. 100 - 240 VAC with external power supply.
Environmental Temperature	+10 °C to +40 °C
Extended Temperature Range	0 °C to +50 °C on request
Operating System	Windows XP / Vista / 7 / Linux and others

Signal Conditioning

Strain Gauge *	full-, half-, quarter-bridge sense, no sense constant voltage supply: 0 … 10V, 0 ... 20V * input coupling: AC and DC shunt calibration
IEPE (ICP®) *	constant current supply: 0 … 10mA input coupling: AC and DC
Resistance *	input coupling: AC and DC 2-wire, 3-wire and 4-wire
Charge *	1 mV/pC, range: ± 5 nC (optional up to ± 500 nC) high-pass: 0.15 Hz; 1.5 Hz; 15 Hz auto charge clear; manual clear
LVDT *	carrier frequency with up to 100 KHz and 0 - 5V Amplitude synchronous demodulation unipolar and bipolar output
Pulse/Counter Input *	signal input: ± 30 V input coupling: AC and DC time resolution 1.20 ns (832 MHz) direction detection zero marker

Analog Output Characteristics

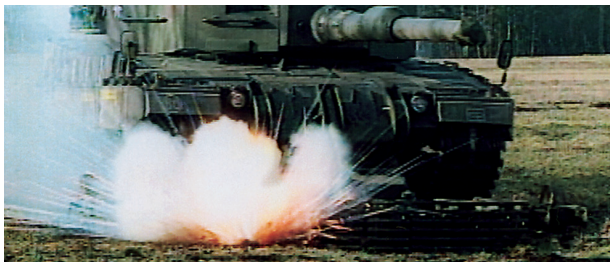
No. of Channels per Device	One analog output channel for each analog input channel.
Synchronization of Several Devices	Yes (max. delay between devices: 2 ns)
Sample Rate	Max. DAC rate 2 MSample/s/ch
Max. Bandwidth	DC - 500 KHz
Quantization	18 Bit, 20 Bit *
Output Impedance	100 Ω
Connector	BNC
Galvanic Isolation	Input to output of same channel: Yes (± 200 V). Output to LTT24 housing: No.
Output Ranges	± 10 V, ± 5 V, ± 500 mV, ± 250 mV
Coupling	DC
DC Offset	Digital
Dynamic Range	100 dB with 20 Bit DAC *
Inter-Channel Phase Difference	< 2 ns
Output Signal Sources	Monitoring: *Online ADC-data from analog input.* Replay: *Recorded ADC-data from internal SSD.* Arbitrary function generator: *PC data from internal SSD.*

LTT 24 – Applications Overview

Blast test of warship, 425 kg TNT and 8 km of wire

For Production and Test Field

- Production monitoring.
- Test systems for air bags.
- Engine development and control systems.
- Quality control and improvement of production processes.
- Turbine test stands:
  Distributed measurement front-ends
  connected to scalable computer performance via Gigabit Ethernet.



For Measurement and Development

- Flexible measurement technology at research institutes
  and universities.
- Investigation of predetermined breaking points
  and vibration analysis related to structural design.
- Component testing.
- Underwater sonar signals.
- Applications in biomedicine and neuromedicine.

For Mobile Measurements

- Long term test drives and studies in automotive engineering.
- Technical service and on-site applications.
- Mobile equipment for laboratories.
- Crash tests.
- Replacement of tape recorders for various applications.
- Underwater sound field measurements.

LTT GmbH is Worldwide Represented by:

BPS Italy • Johne+Reilhofer France • ISL China • Combine Pakistan • EC Test Systems Poland • Index TM Korea • ATiS Test and Measurement China • Record Tech India • Tekno Tasarim Turkey • Toyo Japan • UG Finland

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