

LTT24

1 - 32 Channel

Installation Guide & User Manual



LTT Labortechnik Tasler GmbH
Friedrich-Bergius-Ring 15
D-97076 Würzburg

LTT24 – TransientRecorder

Multi-functional 24 bit data acquisition up to 4MHz

LTT Labortechnik Tasler GmbH

The multi-functional data acquisition device LTT24 combines the functionality of a Transient-Recorder with 24 bit ADC and 4 MSample/s per channel with amplification functions for voltage, current, IEPE (ICP®), strain gauge, resistance, temperature, charge and more.

With all error sources consistently minimized, the full precision of the LTT24 preamp can be exploited. Distortion and noise together are as good as -119 dB and allow an ENOB (effective number of bits) of true 16 bit across a wide range of frequencies and amplitudes.

This manual will guide you through proper LTT24 device installation. In addition you will get a detailed explanation of available couplings and how to connect your sensors to the LTT24 device.

LTT24 Manual

© 2023 LTT Labortechnik Tasler GmbH

All rights reserved. No parts of this work may be reproduced in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information storage and retrieval systems - without the written permission of the publisher.

Products that are referred to in this document may be either trademarks and/or registered trademarks of the respective owners. The publisher and the author make no claim to these trademarks.

While every precaution has been taken in the preparation of this document, the publisher and the author assume no responsibility for errors or omissions, or for damages resulting from the use of information contained in this document or from the use of programs and source code that may accompany it. In no event shall the publisher and the author be liable for any loss of profit or any other commercial damage caused or alleged to have been caused directly or indirectly by this document.

Printed: April 2023

Publisher

LTT Labortechnik Tasler GmbH

Managing Editors

Michael Tasler

David Bachert

Technical Editors

Michael Tasler

Ekkehard Loesti

Software Editor

Christian Schmiedecke

Cover Photo

LTT Labortechnik Tasler GmbH

Production

LTT GmbH 2015

Manual Version

V1.0.39C

Special thanks to:

All the people who contributed to this document.

Table of Contents

Part I Installation	6
1 Unpacking.....	6
2 Setup and Connections.....	7
3 Software.....	8
Part II Operation	10
1 Overview.....	11
2 Couplings (Sensor Types).....	12
Single Ended (SE) Operation.....	13
Differential Ended (DE) Operation.....	14
IEPE (ICP™).....	15
STRAIN GAUGE: Quarterbridge.....	16
STRAIN GAUGE: Halfbridge.....	17
STRAIN GAUGE: Fullbridge.....	18
Part III Optional Features	20
1 Extended Channel Features.....	20
IEPE.....	20
STRAIN GAUGE.....	20
2 Internal Harddisk	20
3 Accumulator.....	21
Part IV Specifications	23
1 Technical Specifications.....	23
Data Recording.....	23
Data Transfer Rate.....	23
Input Characteristics.....	23
Output Characteristics.....	24
Signal Conditioning.....	24
Operation Conditions.....	24
2 DIN socket pin assignment.....	25
3 Binder Series 693 power plug.....	26
Part V Troubleshooting	28
1 Problems with computer connection.....	28
Index	30

Installation

Part



1 Installation

Before you start with your new LTT24, please read the following chapters carefully. Unless otherwise noted, instructions apply to all device types with any number of channels or optional features.

If your LTT24 device or parts of the accessory seem to be damaged or incomplete, please contact LTT immediately. Do not disassemble the device or the delivered power supply on your own! When using your own power supply, refer to chapter [Specifications](#) [23] for notes on power requirements.

1.1 Unpacking

Every LTT24 device comes with a set of accessories that is common to all device types. Check the following list for completeness:

- LTT24 device
- Power supply (available in different versions) and power cord
- USB 3.0 cable A-B male/male, 1.8m
- Software as downloadlink inclusive license and user manual



**LTT24 device, power supply and power cord and all necessary cables,
software and documentation as downloadlink**

Depending on the configuration of your LTT24 device, some additional parts may be enclosed. Please check delivery note carefully for completeness.

If you have ordered additional hardware with your LTT24 device (e.g. notebook or sensors), please refer to the corresponding manuals for setup and operation.

1.2 Setup and Connections

Your LTT24 comes with an appropriate power supply. Depending on the number of channels and embedded features, 90W, 140W or 300W version is delivered.



Different power supply units for different device types



Binder S. 693 Plug

Connect the Binder Series 693 plug of the power supply unit to the power socket of your LTT24 and the Schuko® plug to the grid. The connection to the Personal Computer (PC) can be established in different ways. Select the option you have ordered:


1. **USB 3.0:** Plug the USB cable into the **(blue)** USB socket of your LTT24 and to a USB 3.0 port of your computer. **Be aware that using a USB 2.0 (or slower) port will result in lower data transfer rates! There is no need to install any drivers for connecting LTT24 devices!** Turn on your LTT24 with the power switch at the rear.

2. **Ethernet:** At press date of this manual, ethernet option for the LTT24 is realized by a separate (19-inch or SBC) computer system. Connect this external computer system to power, USB interface with the delivered cable to the LTT24 device and ethernet interface to your local network (LAN). Please check for separate manuals or setup guides that are delivered with the external computer in order to get additional information on default IP-address, cable setup and more. Turn on the LTT24 with the power switch at the rear before you power up the external computer device.

Before installing the LTTpro software on your personal computer, please check if your LTT24 is recognized by your computer.

Devices that are connected directly to a USB port of your computer should appear as "LTT24 USB device" (mass storage) after powering up. At Microsoft Windows™ Systems you will find the LTT24 device in section *disk drives* of the Windows device manager.

External computer systems with ethernet interface should be checked with the ping command for responsiveness. Contact the system- or network administrator of your company in order to integrate the LTT24 ethernet interface in your LAN. If your system is secured by a firewall or your local network is setup with active port filtering, you have to allow ports **8110** (TCP), **8111** (UDP) and **8112** (UDP).

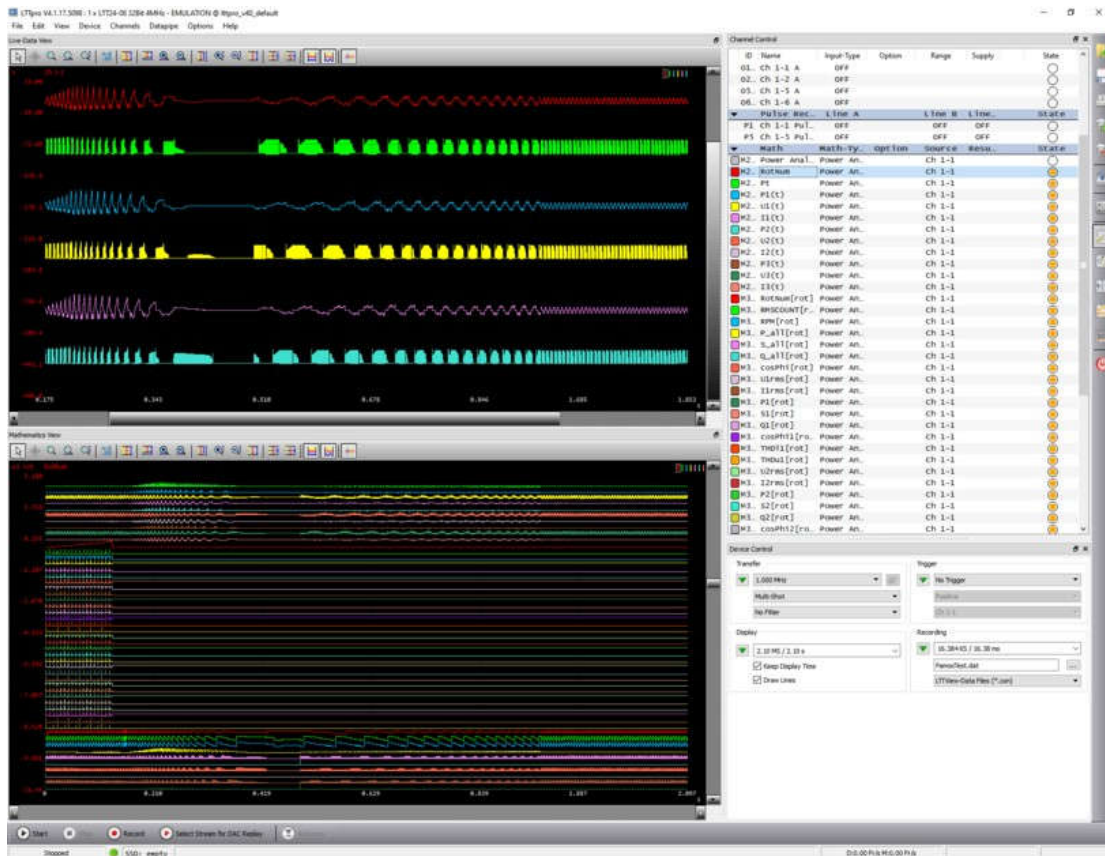
If the LTT24 is not recognized by your computer, please refer to chapter [Troubleshooting](#) 28 to get further information and assistance.

1.3 Software

The LTTpro software for your LTT24 device running under Microsoft Windows™ is available as a download link. You should always install the latest version of the software that comes with your device even if you have already installed a previous version of LTTpro on your computer.

If you want to explore yourself with the LTTpro software before installation, you will get the complete software manual (in Adobe Portable Document Format - you need additional software to open PDF files!) via the download link.

After installation it is also possible to run *LTTpro* software in *device emulation mode* without *real devices* attached. All software controls can be explored, a signal is simulated and essential workflow can be exercised without a real device.



LTTpro software in device emulation mode

LTTpro is also available for Linux operating system. Due to the multitude of Linux distributions on the market, it is not possible to supply a standard setup for *LTTpro* on that operating system. If you want to run *LTTpro* on Linux, please contact LTT software development for binaries and instructions.

If you want to implement LTT24 device(s) in your own measurement or analysis product you can use *ltt2api* libraries for complete control and data handling on our devices. Visit our website (www.tasler.de) or contact our software support to get further information on *ltt2api*.

Operation

Part



2 Operation

The modular concept of the LTT24 allows different (hardware) configuration with each channel. While all channels implement *VOLT* and *CURRENT* coupling, other features like *IEPE*, *STRAIN GAUGE* or *CHARGE* are optional and can be ordered individually.

In order to achieve most flexibility, each channel of an LTT24 comes with an 8-pole *DIN* socket in addition to a conventional *BNC* jack. In the following chapters we will describe the pin assignment of the different couplings - please read them carefully because there are very important notes on safety precautions and range limits.

While each channel has individual LEDs for socket selection and active supply, the LTT24 also comes with three global LEDs for common status information:

- **Status:** **green** signals device powered up and running in normal condition, **red** indicates error
- **Trigger:** **off** signals no trigger, **orange** signals waiting for trigger, **green** signals fired trigger
- **Data:** **off** signals no data, **green** (blinking) signals data transfer, **red** signals error condition



Normal Device Operation



Waiting for Trigger



Trigger was fired

With small display sizes in *LTTpro* a lot of small packets are transferred from LTT24 to your personal computer resulting in a heavily flashing Data LED. With higher data rates (large display sizes) the Data LED seems to remain permanently on.

If Data LED turns **red** in constant intervals, the combination of sample clock, active channels and display size exceeds available RAM buffer - not all data will be recorded or transferred to your computer.

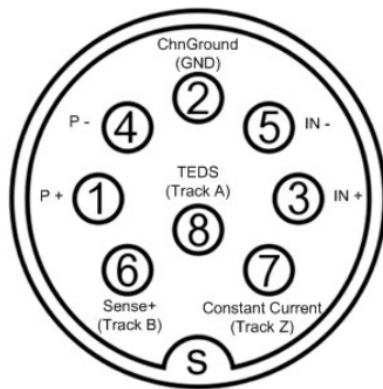
If Status LED turns **red**, a severe error condition has reached. Turn off device immediately and check for proper environment conditions.

2.1 Overview

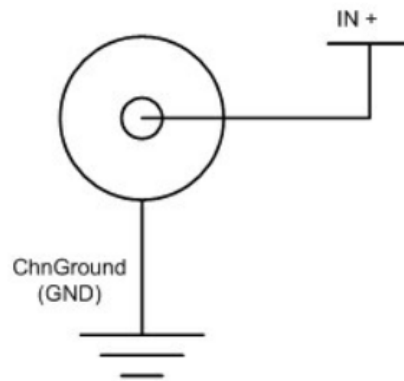
The default hardware configuration of an LTT24 channel has a *DIN* socket and a *BNC* jack with the following pin assignment. See the following chapters for a description of the different sensortypes and measurement applications.

Pin Name Description

1. *P+* Positive Supply
2. *GND* Channel Ground
3. *IN+* Positive Input
4. *P-* Negative Supply
5. *IN-* Negative Input
6. *S+* Sense+ (Track A with Pulse Option)
7. *CC* Constant Current (Track Zero with Pulse Option)
8. *TEDS* TEDS (Track A with Pulse Option)



LTT24 DIN socket (front view)



BNC jack





Keep in mind that not all signals are available with all configurations. Several signals depend on hardware or firmware features, e.g. Track A, B and Z are available only with pulse recognition option.

Note that even if *IN+* signal of *BNC* jack goes to the same signal path as PIN 3 of the *DIN* socket and *ChnGround* is same as PIN 2 of the *DIN* socket, only one interface (*DIN* or *BNC*) is available at a time.

Caution: Channels that come with *Pulse Recognition* or *DACout* option have *ChnGround* and Pin 2 shorted all the time!

2.2 Couplings (Sensor Types)

This chapter describes all available couplings composite to their connection diagram. While SingleEnded (SE) operation affects both interfaces, all other couplings will describe only *DIN* socket. The following couplings will be described:

- [Single Ended \(SE\) Operation](#) 13
- [Differential Ended \(DE\) Operation](#) 14
- [IEPE \(ICP™\)](#) 15
- [STRAIN GAUGE: Quarterbridge](#)
- [STRAIN GAUGE: Halfbridge](#)
- [STRAIN GAUGE: Fullbridge](#) 18

You will see activity of *DIN* socket or *BNC* jack at the channel LEDs. **Green** LED signals channel activity, **orange** LED signals active supply.



DIN IN active

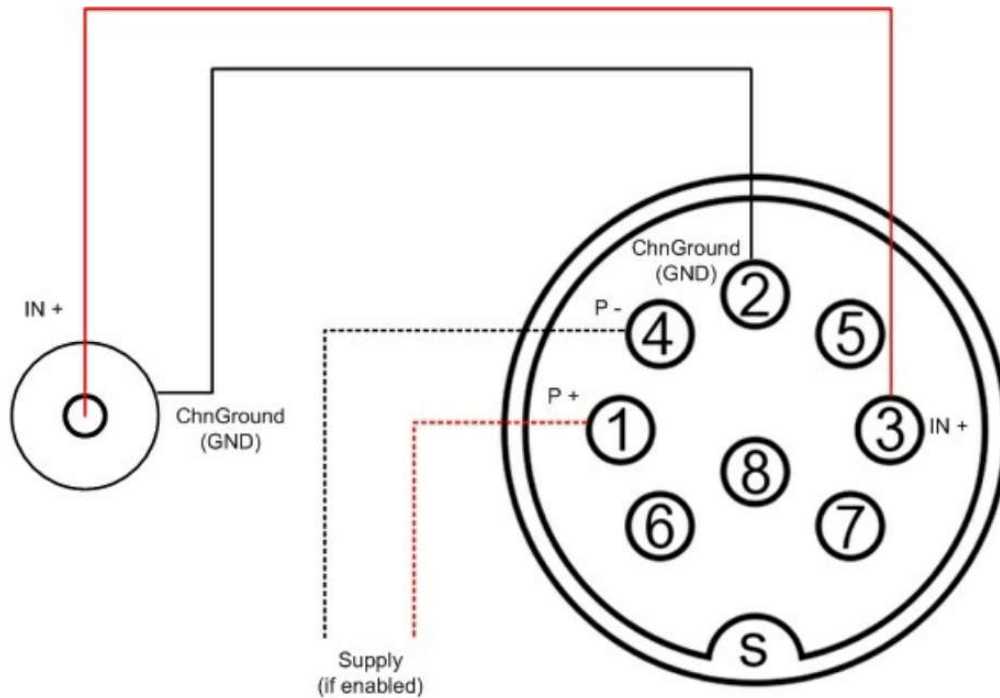


BNC IN active

2.2.1 Single Ended (SE) Operation

Single Ended (SE) measurement can be realized on both, *BNC* jack and *DIN* socket with the following couplings:

- VOLT SE (AC, DC)
- IEPE (ICP®)
- CHARGE SE
- CURRENT



SE pin assignment

In *CURRENT* coupling, the measuring input is bridged with a 5.1Ω shunt resistor.

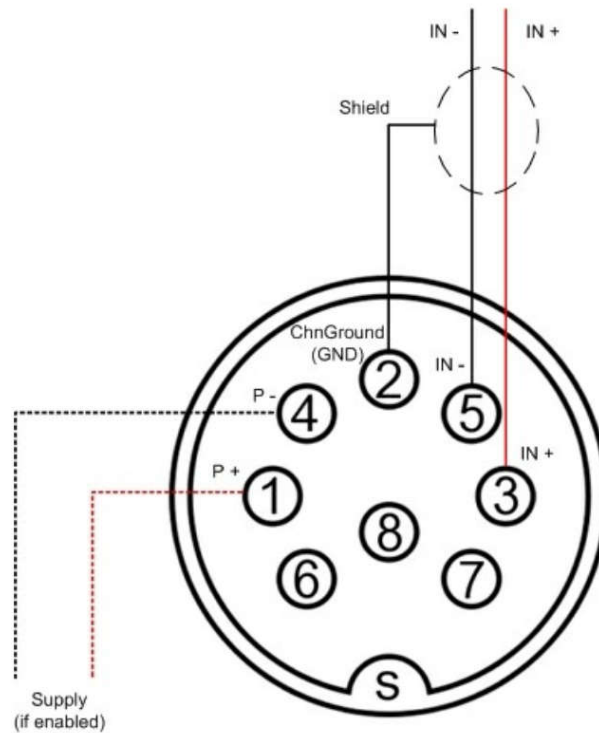
Caution: The 5.1Ω shunt resistor in *CURRENT* operation can damage inappropriate sources or sensors. Make sure that attached source is able to drive low-impedance devices.

Caution: In *CURRENT* operation (AC and DC), currents above ± 200 mA will heat up the 5.1Ω shunt resistor and will eventually damage the amplifier!

2.2.2 Differential Ended (DE) Operation

Differential Ended (DE) measurement with *DIN* socket:

- *VOLT* (DE)
- *CHARGE* (DE)

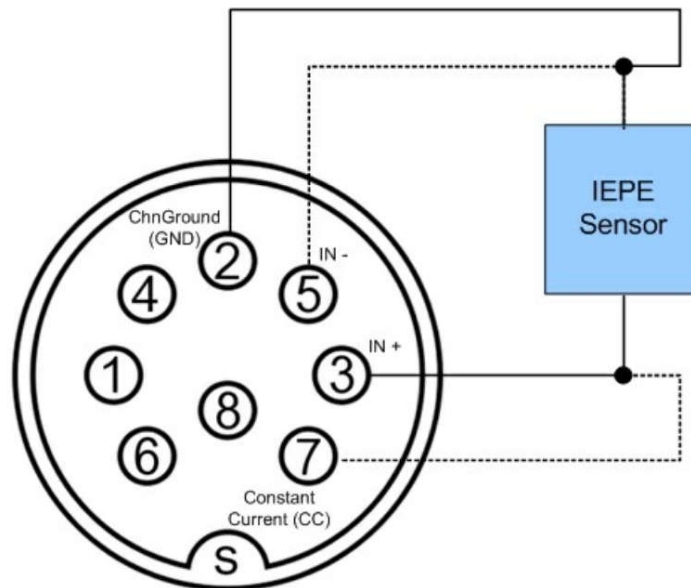


DE pin assignment

Note: With *DUAL-BNC* option *VOLT* (DE) and *CHARGE* (DE) mode is also available on *Dual-BNC* jack

2.2.3 IEPE (ICP™)

Pin assignment for *IEPE* (ICP™) measurement. Normally, *IEPE* sensors are attached with 2-wires. Depending on 2-wire, 3-wire or 4-wire measurement the dotted lines have to be used.



IEPE pin assignment

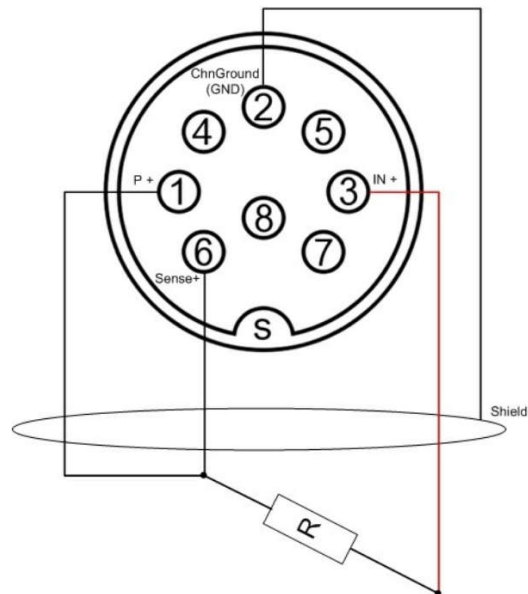
The above circuit can also be used for temperature sensors, current driven (quarterbridge) strain gauges and more.

You can determine cable impedance by changing from 4-wire to 3-wire to 2-wire operation:

- **2-wire:** *Constant Current (CC)* is internally bridged to *IN+*, *IN-* is bridged to *ChnGround (GND)*
- **3-wire:** *IN-* is bridged to *ChnGround (GND)*, *Constant Current* has to be connected
- **4-wire:** *ChnGround* and *Constant Current* have to be connected in addition to *IN+* and *IN-*

2.2.4 STRAIN GAUGE: Quarterbridge

Quarterbridge strain gauge pin assignment. By default, a 120Ω or 350Ω resistor is used. Supply range of the bridge is $0 \dots 5V$ if not otherwise ordered.



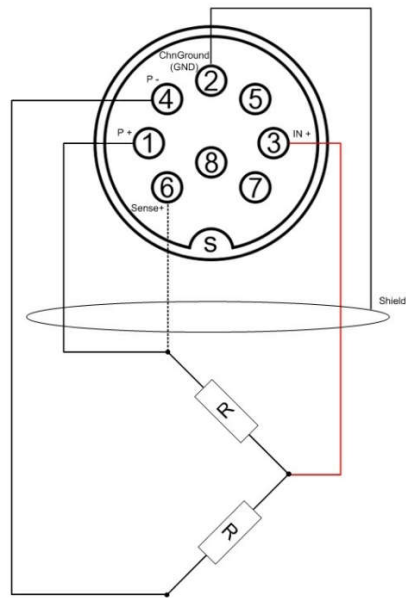
Quarterbridge pin assignment

Note: Quarterbridge always uses Sense+ line! In 2-wire operation, connect Sense+ with P+ as close as possible to the strain gauge.

Caution: No further resistors are allowed with Quarterbridge coupling!

2.2.5 STRAIN GAUGE: Halfbridge

When using strain gauges in halfbridge mode, supply voltage range is **0V to 10V** with a maximum of **90mA**. *Sense+* line can be used if needed and has to be selected within *LTTpro* software.



Halfbridge pin assignment

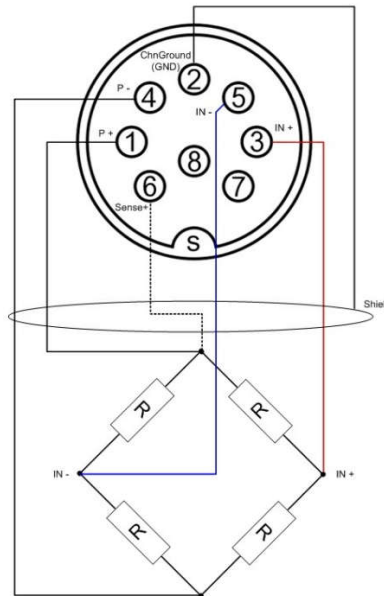
You should look out for same cable length and same cable impedance on *P+*, *P-* and (optional) *Sense+*. Signal quality will also be improved by twisting the cables.

Note: You should avoid to use coax cable for *P+* and *P-* because cable cross-section of coax cable for shield is different to those of center.

Sensors with 5 wires (including Sense-): Keep the Sense- unattached. **Caution: be aware of the antenna effect on open wires!**

2.2.6 STRAIN GAUGE: Fullbridge

Supply voltage range is **0V .. 10V** with a maximum of **90mA**. *Sense+* line can be used if needed and has to be selected in *LTTpro* software.



Fullbridge pin assignment

Fullbridge will work with any bridge impedances. You should pay attention to matching cable length and impedance of *P+*, *P-* and (optional) *Sense+*. Signal quality will also be improved by twisting the cables, in addition to halfbridge mode you should also twist *IN+* and *IN-* cables.

You should avoid to use coax cable for *P+* and *P-* because cable cross-section of coax cable for shield is different to those of center.

Sensors with 6 wires (including Sense-): Keep the Sense- unattached. **Caution: be aware of the antenna effect on open wires!**

Optional Features

Part



3 Optional Features

The basic LTT24 configuration consists of a 4-, 8- or 16-channel housing with a selectable number of default (*VOLT/CURRENT*) channels. In addition to that, you can order several channel and device features in compliance with your requirements. Explore the next sections to get to know available features and extensions.

3.1 Extended Channel Features

Each channel of an LTT24 can have its own capabilities. Along with the documents of your LTT24 you will get a *Release Report* that indicates the configuration of every channel. *LTTpro* software is aware of those features and offers only available options.

3.1.1 IEPE

This feature will support a wide range of IEPE (ICP®) sensors. With a supply current from 500µA up to 10mA (SE and DE), this feature enables most available sensors on the market. The available compliance voltage is **19V**.

Select *IEPE AC* as *Input-Type* for selected channel(s) in *LTTpro* software. *Option* defines single ended or differential-ended operation and selects *DIN* (SE, SE-3-wire, DE-4-wire) or *BNC*-jack (SE BNC). Range can be defined from ±250mV to ±50V. The desired constant supply current gets selected in steps of 500µA by software.

3.1.2 STRAIN GAUGE

Strain gauge option enables your LTT24 to control quarter-, half- and fullbridge strain gauges with different options. See [Couplings \(Sensor Types\)](#) □₁₂ section for assistance on pin assignment on your desired strain-gauge type.

Bridge options (SE,DE,Sense etc.), input-range and supply is controlled by *LTTpro* software. Quarterbridges can be supplied with 0.5V to 5V, Half- and Fullbridges can be supplied with 1.0V to 10V. Higher supply options are available.

3.2 Internal Harddisk

If you have ordered your LTT24 with optional internal hard disk, the limitations of recording to a computer hard disk are mostly eliminated. Especially with higher sample clocks (> 1MHz) and a lot of active channels, direct recording to the hard disk of an attached computer system could be risky as data transfer over USB or ethernet may vary.

Note: The maximum continuous data throughput to the internal SSD depends strongly on the type of SSD used inside the LTT24. Also it depends on the temperature of the SSD and the number of performed write cycles to the SSD. At time of manufacturing of each individual LTT24, the most modern SSD with the highest performance grade is used that is available within the given mechanical dimensions at that time.

Today's highest performance SSDs are built with two different types of flash memory within one single SSD:

a) the first type is a very high speed flash memory with limited storage density.

b) the second type is a very high density flash memory with limited speed.

During idle times of the SSD it performs automatic internal copy procedures to clear as much high speed flash memory as possible by copying sectors from the high speed flash to the high density flash.

The high speed flash memory of these SSDs is fast enough to handle the maximum LTT24 data rate of 256 MB/s (that is when 16 channels are turned on at maximum sample rate of 4 MS/s/Ch).

Once the high speed flash memory of the SSD is filled up, the sustained data rate drops down to the performance limit of the high density flash, which is considerably less than 256 MB/s (with nowadays SSDs).

Unless new SSDs will be available in future, it is important to know that the free high speed flash memory size depends strongly on the SSD idle time before you start a measurement. If the high speed flash memory is completely free, it will last for about 9 minutes of full speed data recording.

In general it is possible to record at least 2-3 minutes of full speed data before the SSD slows down and forces the LTT24 recording to stop.

With the internal hard disk option a recording gets saved internally to the LTT24 disk and may get replayed later to screen or to disk on an attached computer with *LTTpro*. See software manual for further instructions.

Basic hard disk feature consists of a 64 GB (~64.000.000.000 bytes) Solid State Disk (SSD), other capacities up to 1000 GB are available. Even higher capacities will be available in future.

Note: Device internal recording is configured and started with *LTTpro* software. **An active recording will continue within LTT24 device even if computer connection (USB or Ethernet) is broken**, for example by a blast test or similar.

3.3 Accumulator

Accumulators will keep your LTT24 alive even if the normal power supply fails or is interrupted.

The accumulators in your LTT24 are lithium polymer (LiPo) based and not intended for replacement. Charge of LTT24 internal accumulators is done automatically with delivered power supply.

Caution: Never open the device in order to change or upgrade the internal accumulators of the LTT24!

Specifications

Part



IV

4 Specifications

4.1 Technical Specifications

4.1.1 Data Recording

RAM	32MByte/channel (512MByte RAM with 16 channels)
Interface to PC	USB 3.0, USB 2.0, Gigabit Ethernet
Recording media	Internal RAM, external PC hard disk, optional internal SSD

4.1.2 Data Transfer Rate

PC (with Gigabit LAN)	60 MByte/s
PC (with USB)	USB2.0: 35 MByte/s; USB3.0: 170MByte/s
Internal SSD	256MByte/s over up to 3 minutes depending on available SSD.

4.1.3 Input Characteristics

No. of channels per device	4, 8, 12, 16, ..., 32
Synchronisation of several devices	yes
Max. sample rate per channel	4 MSample/s/ch
Max. Bandwidth per channel	DC - 1.6MHz
Quantization	24bit
External Quantisation Clock	yes
Impedance	1M Ω , 10pF
Connector	BNC, DIN
Input Protection	$\pm 17.5V$ @ range $\pm 250mV$, $\pm 5V$ $\pm 175V$ @ range $\pm 10V$, $50V$ $\pm 220V$ @ range $\pm 100V$, $200V$
Galvanic Isolation	$\pm 200V$
Range	$\pm 250mV$, $5V$, $50V$ (optional $\pm 200V$)
Input dividers	(1:10), (optional 1:100)
Coupling	Single-Ended (AC/DC), Differential (AC/DC)
Dynamic range	118dB @ 5kHz Sample/s (gain 1) 109dB @ 125kHz Sample/s (gain 1) 94dB @ 4MHz Sample/s (gain 1)
Inter-channel phase difference	0°
Crosstalk	-120dB or less (DC - 200kHz)
Filter	Analog 1.6MHz low pass filter. Digital: selectable.

4.1.4 Output Characteristics

No. of channels per device	4, 8, 12, 16, ..., 64
Synchronization of several devices	yes
Analog output: max. DAC rate	2MSample/s
Max. Bandwidth per channel	DC - 500kHz
Quantization	16bit (optional 18 oder 20)
Impedance	100Ω
Connector	BNC
Galvanic Isolation	no
Output range	± 5V (optional ±10V, ±250mV)
Coupling	DC
DC offset	digital
Dynamic range	100dB
Inter-channel phase difference	0°

4.1.5 Signal Conditioning

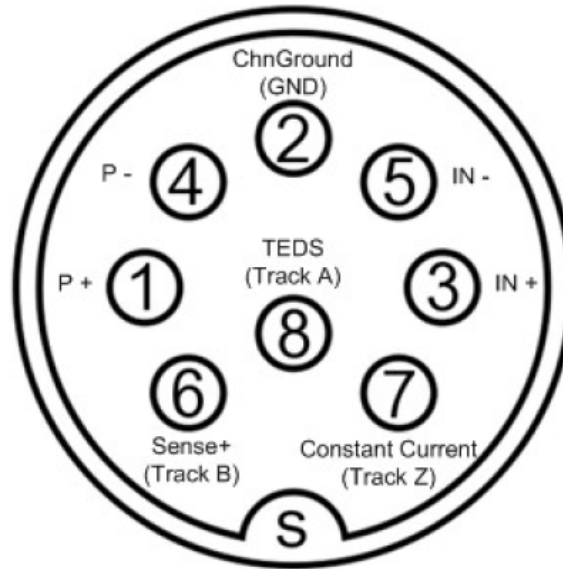
StrainGauge (optional)	Full-, Half-, Quarter-Bridge Sense, no Sense, Const. Voltage 0 ... 10V Const. Current 0 ... 25mA Shunt calibration
IEPE (ICP®)	DC / AC
Current	± 0 ... 50mA Single-Ended: AC / DC; Differential: DC
Charge	1mV/pC, 11mV/pC Range: ± 5nC, ± 100pC High-pass: 0.15Hz; 1.5Hz; 15Hz Auto charge Clear; manual Clear
TEDS (optional)	yes
Puls input	Signal input +/-30V Time resolution 1ns (1GHz) Direction detection Zero marker
Digital inputs (optional)	TTL
Error detection	IEPE (ICP®): Cable short/break; Charge: limit; Signal Out-Of-Range, Strain-Gauge: (Signal+Sense+Power) Short and Open detection

4.1.6 Operation Conditions

Power Supply	12-16VDC (absolute max. rating 10 - 35VDC) 100 - 240VAC with external power supply
Environmental Temperature	+10°C to +40°C Extended temp. range 0°C to +50°C on request
Operation System	Windows XP / Vista / 7 / Linux and others

4.2 DIN socket pin assignment

When looking from the front of the LTT24 device, the *DIN* socket has the following pin assignment:



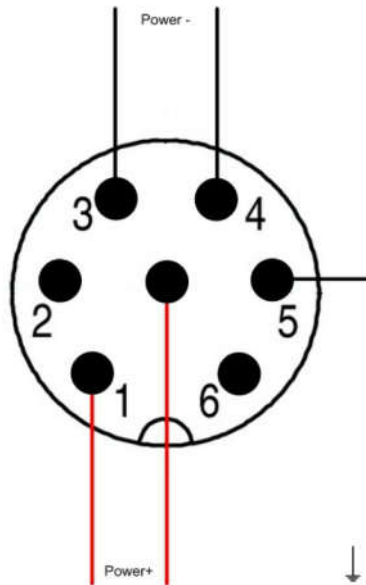
Note: Pin assignment may vary with different options. For example, *pulse recognition* feature excludes *TEDS*, and, depending on further options, also *Sense+* and *Constant Current*.

With a pre-configured DIN cable (LTT order no. **91-24-025**), use the following color assignment:

Color	Signal	Pin	Twist
White	Signal IN+	3	2 & 3
Green, Brown, Violet	Ground	2	
Yellow	Signal IN-	5	2 & 5
Pink	Sensor Supply P+ (+12V)	1	
Gray	Sense+	6	1 & 6
Red	Sensor Supply P- (-12V)	4	
Blue	TEDS	8	4 & 8
Black	Constant Current	7	2 & 7

4.3 Binder Series 693 power plug

When using your own power supply for LTT24 devices, use a Binder series 693 plug with the following pin assignment. Numbers are plotted from rear as looking to an open plug from behind:



Note: Due to power supply compatibility to former LTT devices, **the center pin of the Binder plug is NOT connected to ground!**

Minimum power requirements:

- 4-channels: **60 Watt**
- 8-channels: **120 Watt**
- 16-channels: **240 Watt**

Valid input voltage: **10 Volt ... 35 Volt**

Troubleshooting

Part



5 Troubleshooting

The LTT24 device is designed for easy handling and a non-problematic workflow. However, if problems occur while connecting your LTT24 device with your computer or network, read the following section carefully.

If you have problems concerning the *LTTpro* software, please explore the *LTTpro* manual for assistance.

5.1 Problems with computer connection

All LTT24 devices come generally with an USB 3.0 interface. If connected directly to your computer system, no device driver or extra software packet is necessary for device communication. Check the following solutions if you have problems with the link from LTT24 device to your computer.

- **Device is visible in device manager but inaccessible by software:**

LTT24 devices that are connected directly to your computer system with USB 3.0 interface are handled like a hard disk by the operation system. For maximum flexibility and performance, **you have to start the software with administrator privileges**. In Microsoft Windows™ this is realized by starting the software from the context-menu "Run as administrator ...". In Linux distributions, your account has to be in the "disk" group for full access to the LTT24 device.

- **My company does not allow administrator access for employees:**

When installing the *LTTpro* software, an additional small installation packet named "LTTROADService.exe" is copied to the *LTTpro* path. This packet contains a connection service for the *LTTpro* software and has to be installed once by a user with administrator privileges. After installing the service, select *LTTROAD*-service as operation mode in *LTTpro* and the software can be started without administrator privileges in the future. Be aware that due to the additional software layer of the service, **data transfer rate is decreased to ~80% of original speed** when using *LTTROAD*service!

Please execute *LTTROAD*-Config.exe once at every Windows user-account that wants to access the LTT system.

- **The LTT24 device is still inaccessible, regardless of the above mentioned procedures:**

Check your computer system or ask your companies system/network administrator for existing firewall- or security-solutions. LTT24 devices appear as "mass storage device", such as an USBstick or a hard drive. Some third-party security solutions restrict access to those devices or block access at all. At the moment, we know about problems with the following software security solutions:

- Cisco™ Security Agent® (no access to LTT24 device)
- WinMagic™ SecureDoc® (corrupted data)

Most security systems allow to define a "white-list" containing exceptions for their security rules. Contact your administrator to add *LTTpro* and the LTT24 device interface as an exception and your system should work.

- **Ethernet connection to LTT24 device can not be established:**

LTT24 devices with ethernet interface come with an external computer system. The IP-address and the subnet-mask of that external computer system has to match your local area network (LAN) settings, regardless if you work with a single computer or a complex network. A software ("*LTTFWUpdate*") is supplied for changing the network settings of the delivered external computer system. Ask your network administrator for assistance if you have problems with the network setup.

- **Data transfer rates are lower than expected:**

Transferred data rate from LTT24 device to computer system depends on three factors: interfacetype, transfer-mode and display-size of data-blocks:

- In "Multi-Shot" *transfer-mode*, the measurement is restarted after the preset *display-size*. With small *display-sizes*, the possible transfer rate is limited to the I/O subsystem of the used operation system. Always use higher display-sizes (>64KS) if you do not need the resolution of lower ones.
- With USB 2.0 interface, data transfer rate is limited to ~35MB/s due to interface specifications and protocol overhead. Use USB 3.0 interface for higher data-rates if available.
- When using the *LTTROAD*-service, the data rate will not exceed ~80% of the possible speed when working in direct mode. Use "Physical Disk" operation mode in *LTTpro* software if possible.

Index

- 5 -

5.1W shunt resistor 15

- A -

accessory 8
accumulator 23
administrator privileges 32

- B -

Bandwidth 26, 27
Binder series 693 9, 30
BNC 12
BNC jack 13
bridge impedances 20
buffer underrun 12

- C -

cable cross-section 19
cable impedance 17
cable length 20
center pin 30
Charge 16, 27
CHARGE SE 15
Cisco™ Security Agent® 32
coax cable 20
compatibility 30
Constant Current 29
Crosstalk 26
Current 15, 27
current driven 17

- D -

Data 12
data-blocks 32
device emulation mode 10
Differential Ended 16
Digital inputs 27
DIN socket 12, 13, 15, 29
Direction detection 27
display-size 32
DUAL-BNC 16
Dynamic range 26

- E -

Environmental Temperature 28
Error detection 27
Ethernet 9, 32
External Quantisation Clock 26

- F -

features 8, 22
Filter 26
firewall 32

Fullbridge 20, 22

- G -

Galvanic Isolation 26, 27
Gigabit 26

- H -

Halfbridge 19, 22
hard disk 32

- I -

ICP® 15, 22, 27
ICP™ 17
IEPE 15, 17, 22, 27
Impedance 26, 27
IN- 20
IN+ 20
Input Protection 26
input voltage 30
Inter-channel phase difference 26
Interface to PC 26
interface type 32
internal hard disk 22

- L -

LEDs 12, 13
Linux 10, 32
LiPo 23
low-impedance 15
I2t2api 10
LTTpro 10, 22, 32
LTTROAD 32

- M -

Multi-Shot 32

- O -

operation mode 32
Oversampling 27

- P -

P- 20
P+ 20
path 32
PC 9
performance 32
Physical Disk 32
Pin assignment 12, 13, 29
power plug 30
power requirements 30
power socket 9
power supply 8, 9, 28, 30
Puls input 27
pulse recognition 29

- Q -

Quantization 26, 27

Quarterbridge 18, 22

- R -

RAM 26

range limits 12

recording 22

Recording media 26

Release Report 22

replay 22

resistor 17

Run as administrator 32

- S -

safety precautions 12

Schuko® plug 9

security rules 32

Sense 27, 29

Sense+ 18, 19

Shunt calibration 27

software manual 10

SSD 22, 26

Status 12

Strain gauge 22

strain gauges 17

StrainGauge 27

Synchronisation 26

- T -

TEDS 27, 29

temperature sensors 17

transfer-mode 32

Trigger 12

TTL 27

twisting the cables 20

- U -

USB 26

USB 2.0 9

USB 3.0 9, 32

USB socket 9

USB-stick 32

- V -

VOLT 16

VOLT SE 15

- W -

white-list 32

WinMagic™ SecureDoc® 32

- Z -

Zero marker 27