



LTX-7225 Fiber Optic Link



Operating Instructions

Quick Start Page

1. Connect a Singlemode fiber optic patch cord between the ST connectors on the rear panel of each unit.
2. Set power switch to off
3. Connect the power supply plugs to the connector on the back of each units.
4. Plug the power supplies into a wall socket and switch the power switches to ON.
5. Using the supplied DB26 High Density connectors connect the input of one end of the fiber optic link to be matched the output of the opposite end of the fiber link.

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Introduction

The LTX-7225 bidirectional fiber optic link is intended to transmit 16 independent channels of digital information to a remote location via fiber optic cable. Its primarily designed to be used in those situations where the signals to be transmitted have a high common mode voltage with respect to the receiving equipment. Such situations arise in plasma physics experiments, power transmission equipment, EMC chambers and high power laser systems. Trigger information from electrically noisy sources such as high current discharge laser systems may be transmitted without conducting Electro-Magnetic Interference, (EMI) to the measurement or control equipment.

The system transmits and receives sixteen digital input channels simultaneously. The data rate of each channel may range from 0 to 50 Mb/s. The digital inputs accept TTL, CMOS or LVTTL levels and output LVTTL levels, i.e. 0 to 3.3V for a logic zero and logic one respectively. The signal sense is non-inverting.

Unpacking and Inspection

Prior to shipment this instrument was inspected and found to be free of mechanical and electrical defects. Upon acceptance by the carrier he assumes responsibility for its safe arrival. After unpacking, examine the unit for any evidence of shipping damage. Should you receive this instrument in a damaged condition, apparent or concealed, it must be noted on the freight bill or express receipt and signed by the carrier's agent. Failure to do so could result in the carrier refusing to honor the claim. Upon filing a claim TTI should be notified.

Power Considerations

The LTX-7225 operates from a regulated 9 VDC wall-mount power supply. These power supplies operate with line voltages ranging from 95 to 260 VAC, 50-60 Hz. Four interchangeable power line connectors are supplied that are compatible with connectors used in North America, Continental Europe, Australia, and the United Kingdom. Do not use with any other wall-mount supply or damage may result.

Theory of Operation

The LTX-7225 samples the 16 digital inputs presented at the front panel hi density DB-26 connector at a 100 MS/S rate to form a sixteen bit digital word. This word is converted to an 8b/10b code and transmitted as a twenty bit word. This process is repeated at a 100 MHz rate resulting in a 2 Gb/s data stream. This data is converted to an optical bitstream and transmitted via a user-supplied optical fiber to the companion unit.

The companion unit receives the optical bitstream and converts it to a digital signal. It then decodes and de-multiplexes this data. The original 16 bits are latched and presented at the digital output ports.

Operating Considerations

The LTX-7225 system may be used to transmit signals from a source that is distant or at a different ground potential with respect to measuring devices such as an oscilloscope. The input digital signals may be TTL, CMOS or LVTTTL levels. The output signals are LVTTTL (0-3.3 V).

The power supply for the unit must be at roughly the same potential of the signal common mode voltage. For example, using the unit at a 10 000 V potential while it is utilizing the wall mount power supply at conventional line potential will result in a *hazardous situation and certain damage to the equipment*. An isolation transformer with sufficient isolation voltage rating must be used to power the wall mount supply.

The transmission distance is limited by signal loss. Typical ranges of 10 km may be achieved with this model using single mode fiber.

Do not connect active signals to the input ports prior to energizing the unit. Doing so may interfere with the framing sequence that is initiated during power-on/reset. This will result in erroneous data transmission.

The optical signal LED on the unit indicates that it is operating with an adequate optical input signal. If the indicator goes dark, the transmitting unit has lost power or the connecting fiber is disconnected or broken.

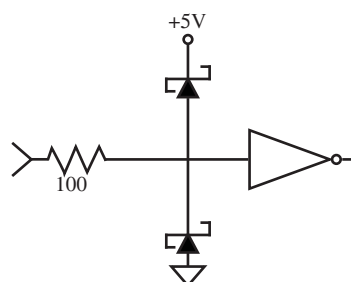
Operating Considerations

The input and output pin-outs of the DB-26 connectors are shown below.

Digital Input Connections

| PIN | FUNCTION | PIN | FUNCTION |
|-----|----------|-----|----------|
| 1 | Input 0 | 14 | Input 6 |
| 2 | Input 1 | 15 | Input 8 |
| 3 | Input 3 | 16 | Input 10 |
| 4 | Input 5 | 17 | Input 12 |
| 5 | Input 7 | 18 | Input 14 |
| 6 | Input 9 | 19 | Ground |
| 7 | Input 11 | 20 | Ground |
| 8 | Input 13 | 21 | Ground |
| 9 | Input 15 | 22 | Ground |
| 10 | NC | 23 | Ground |
| 11 | NC | 24 | Ground |
| 12 | Input 2 | 25 | Ground |
| 13 | Input 4 | 26 | Ground |

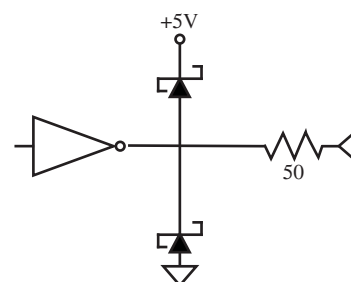
Typical Input



Digital Output Connections

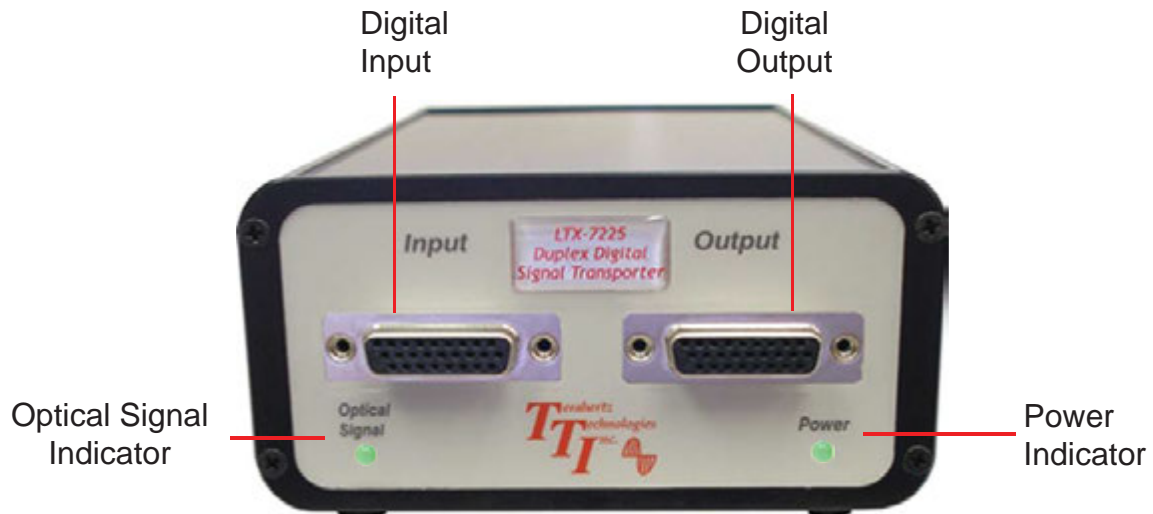
| PIN | FUNCTION | PIN | FUNCTION |
|-----|-----------|-----|----------|
| 1 | Output 14 | 14 | Output 9 |
| 2 | Output 15 | 15 | Output 7 |
| 3 | Output 12 | 16 | Output 5 |
| 4 | Output 10 | 17 | Output 3 |
| 5 | Output 8 | 18 | Output 1 |
| 6 | Output 6 | 19 | Ground |
| 7 | Output 4 | 20 | Ground |
| 8 | Output 2 | 21 | Ground |
| 9 | Output 0 | 22 | Ground |
| 10 | NC | 23 | Ground |
| 11 | NC | 24 | Ground |
| 12 | Output 13 | 25 | Ground |
| 13 | Output 11 | 26 | CLKOUT |

Typical Output

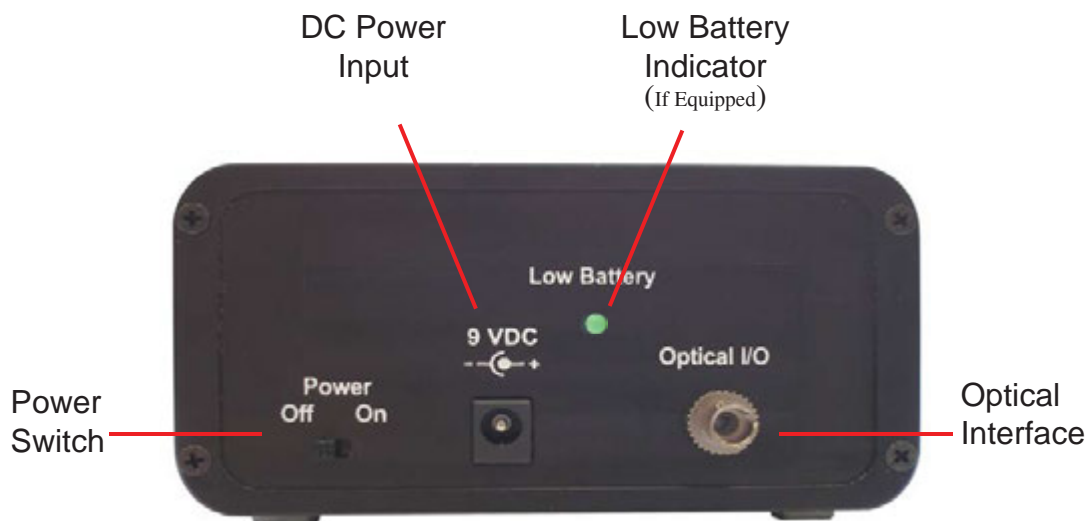


Operating Considerations

Front Panel



Back Panel



LTX-7225 Specifications

| | |
|---------------------------------------|---|
| Number of Digital Channels | 16 |
| Digital Inputs | TTL, LVTTTL, CMOS compatible |
| Digital Outputs | LVTTTL (0 - 3.3 V) |
| Signal Latency (w/one meter of fiber) | Approximately 300 ns |
| Digital Channel Switching Rate | 0 - 50 Mb/s |
| Laser Wavelength | 1310 nm +/- 20 nm |
| Optical Transmission Rate | 2.0 Gb/S |
| Loss Budget | 7 dB |
| Laser Safety Classification | Class I safety per FDA/CDRH and IEC-825-1 regulations |
| Typical Transmission Distances | 10 KM with 9/125 micron fiber |
| Fiber Optic Connectors | ST standard, FC available upon request |
| Analog Connector | BNC |
| Digital Connector | (Stripped Cable Supplied) |
| LED Annunciators Provided | Optical Signal, Low Battery Warning and Power |
| Power Supplies | Wall Mount, Universal, US, UK, Continental Europe and Australian plugs included |
| Power Requirements | 95 - 260 VAC, 50 - 60 Hz, 16 VA Max. |
| Batteries/hrs of Operation | 6 AA NiMH / 3.5-4 hrs |
| Operating Temperature Range | 0 - 40 C |
| Transmitter Dimensions (mm) | 214 L x 114 W x 59 H |
| Weight (each) | 0.578 Kg |
| Standard Warranty | Two Years, Components and Workmanship, 30 day Satisfaction Guarantee |

Battery Replacement

To replace batteries follow these procedures. Carefully remove the top two screws from front panel and the top two screws of the back panel that retain the top cover of the unit. With the LTX unit laying flat, carefully lift of the top to expose the two battery compartments. Remove the screw that holds each the battery covers in place. Replace only with 6 AA NiMH batteries. If you install NiMH batteries that are dead or less than 1 volt each, charge these batteries for (10) hours before using the LTX7225 on battery power operation.

For maintenance, batteries should be recharged on a monthly basis.

WARNING: To Prevent Fire or Shock Hazard: Do not install other battery types; Do not expose the power supply to rain or excessive moisture; Do not use the power when there are signs of damage to the enclosure or cord; Do not use any other power supply than the one provided with this instrument. Any other condition will void the warranty.

Repair Information

Products manufactured by Terahertz Technologies Inc.(TTI) are designed and fabricated to provide reliable performance. However, in the event that service is required, both telephone technical assistance and factory repair services are available.

For IN-WARRANTY REPAIRS, call us to obtain a Returned Material Authorization number, (RMA Number). All products are to be returned to TTI with freight charges pre-paid. Those products sent under warranty will be returned to our customers pre-paid. We cannot be responsible for returned products that do not reference the TTI RMA number.

For OUT-OF-WARRANTY repairs, services are billable for both time and materials.

LIMITED WARRANTY

TERAHERTZ TECHNOLOGIES INC. (“TTI”) WARRANTS THAT TO THE FIRST PURCHASER, FOR A PERIOD OF TWO YEARS FROM THE DATE OF RECEIPT, THAT THIS PRODUCT (“THE PRODUCT”) WILL BE FREE FROM DEFECTS IN MATERIALS AND MANUFACTURING. THE FOREGOING WARRANTY IS THE ONLY WARRANTY, EXPRESS OR IMPLIED, GIVEN BY TTI, I.E., THERE IS NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. TTI HEREBY DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY OTHER THAN THE WARRANTY IN THE FIRST SENTENCE TO THE FULLEST EXTENT PERMITTED BY LAW. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY IS REPAIR OR REPLACEMENT AT TTI’S OPTION OF ANY PRODUCT THAT PROVES TO BE DEFECTIVE IN MATERIALS OR MANUFACTURING WITHIN TWO YEARS OF RECEIPT OF THE PRODUCT. NOTE: THIS WARRANTY DOES NOT APPLY TO ANY PRODUCT WHICH HAS BEEN SUBJECT TO MISHANDLING, MISUSE, OR SERVICE BY UNAUTHORIZED PERSONNEL OR TO ANY PRODUCT WHICH HAS BEEN DAMAGED, MODIFIED, ALTERED OR TAMPERED WITH. TO THE FULLEST EXTENT OF THE LAW, TTI DISCLAIMS ALL LIABILITY FOR ANY OTHER DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ALLEGED TO BE CAUSED BY A DEFECTIVE PRODUCT, I.E., TTI WILL NOT BE RESPONSIBLE FOR ANY PERSONAL INJURY, PROPERTY DAMAGE OTHER THAN THE COST OF REPLACING THE PRODUCT OR ANY OTHER MONETARY DAMAGE SUCH AS LOST WAGES OR PROFITS CAUSED BY ANY USE, ATTEMPTED USE OR INABILITY TO USE THE PRODUCT. NOTE: BY USING THE PRODUCT, YOU AGREE THAT REPAIR OR REPLACEMENT AT TTI’S OPTION WILL FULLY SATISFY TTI’S WARRANTY OBLIGATION TO YOU, WHETHER IN CONTRACT, TORT, NEGLIGENCE, STRICT LIABILITY OR OTHER APPLICABLE LAW.