

LTX-552X

Digital Fiber Optic Link

Manual



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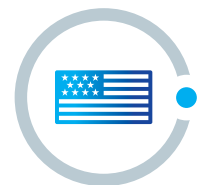
INTRODUCTION

The LTX-5520/5525 Electrical to Optical and Optical to Electrical Converter system comprise a convenient product that 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 all sixteen digital input channels simultaneously. The data rate of each channel may range from 0 to 24 (50) mega bits per second. The digital inputs accept TTL, CMOS or LVTTTL levels and output LVTTTL levels, i.e. 0 to 3.3V for a logic zero and logic one respectively. The signal sense is non-inverting.

FEATURES AND BENEFITS

- Channel capacity up to 50 Mb/S
- Outputs are LVTTTL (0 - 3.3 V)
- Accepts LVTTTL and/or CMOS/TTL inputs
- 1310 nm version for SM links up to 10 KM
- 850 nm version for multimode links up to 500 Meters
- Transmits 16 independent TTL signals over a single fiber
- Paired with LTX-551x to configure remote high speed
12 or 14-bit A/D and D/A converter modules



MADE IN THE USA

Quick Start Page

- 1. Connect a multimode (single mode for 1310 nm ver.) fiber optic patch cord between the ST connectors on the rear panels of the LTX-552XT (transmitter) and the LTX-552XR (receiver).**
- 2. Set the transmitter controls as follows: POWER - Off**
- 3. Set the receiver controls as follows: POWER - Off**
- 4. Connect the power supply plugs to the connector on the back of each unit.**
- 5. Plug the power supplies into a wall socket.**
- 6. Connect the receiver DB-25 connector output pins to an oscilloscope or other device. (NOTE: The order of steps 7 and 8 is crucial)**
- 7. Switch the receiver power switch to ON.**
- 8. Switch the transmitter power switch to ON.**
- 9. Connect the signal(s) to be transmitted to the appropriate pins of the DB-25 connector.**
- 10. The input signal(s) at the transmitter should now be present at the output of the receiver.**

LTX-552X-Specifications		
	LTX-5520	LTX-5525
Number of independent Channels	16	
Signal Latency (with one meter of fiber)	Approximately 300 ns	
Input Impedance	50 Ohms or 1 Megohm 20 pF, selectable	
Output Drive Capability	+/- 5 V open circuit, +/- 2 V into 50 ohm load	
Output Impedance	50 Ohms	
Digital Inputs	TTL, LVTTTL, CMOS compatible	
Digital Outputs	LVTTTL (0 - 3.3 V)	
Digital switching Rates	0-12.5 MHz (up to 24 Mb/s)	0-24 MHz (up to 48 Mb/s)
Digital Signal Edge Uncertainty	0 - 20 ns	0 - 10 ns
Laser Wavelength	850 nm +/- 20 nm or 1310 nm +/- 20 nm	
Optical Transmission Rate	1.0 Gb/S	2.0 Gb/S
Loss Budget	15 dB max	
Optical Return Loss	> 15 dB	
Laser Safety Classification	Class I safety per FDA/CDRH and IEC-825-1 regulations	
Typical Trans. Distances MM	500 M - 50/125 μ and 300 M - 62.5/125 μ	250 M - 50/125 μ and 150 M - 62.5/125 μ
Typical Trans. Distances SM	10 KM with 9/125 micron fiber	
Fiber Optic Connectors	ST standard, FC optional	
Signal Connectors	DB25 on input and output	
Power Requirements	9 VDC (Optional 9 - 24 VDC, 500mA)	
Power Supply Included	95 - 260 VAC, 50 - 60 Hz, 16 VA Max - Output 9VDC/.67A with Universal, US, UK, Continental Europe and Australian plugs included	
LED Annunciators Provided	Input Overload (transmitter), Optical Signal - ON (receiver)	
Operating Temperature	0 - 40 C	
Tx and Rx Dimensions	175 L x 105 W x 40 H	
Weight (each)	0.46 Kg	
Standard Warranty	Two Years, Components and Workmanship, 30 day Satisfaction Guarantee	
Accessories Supplied	DB25 Connectors for Digital Inputs/Outputs and Power Supply With International Mains	

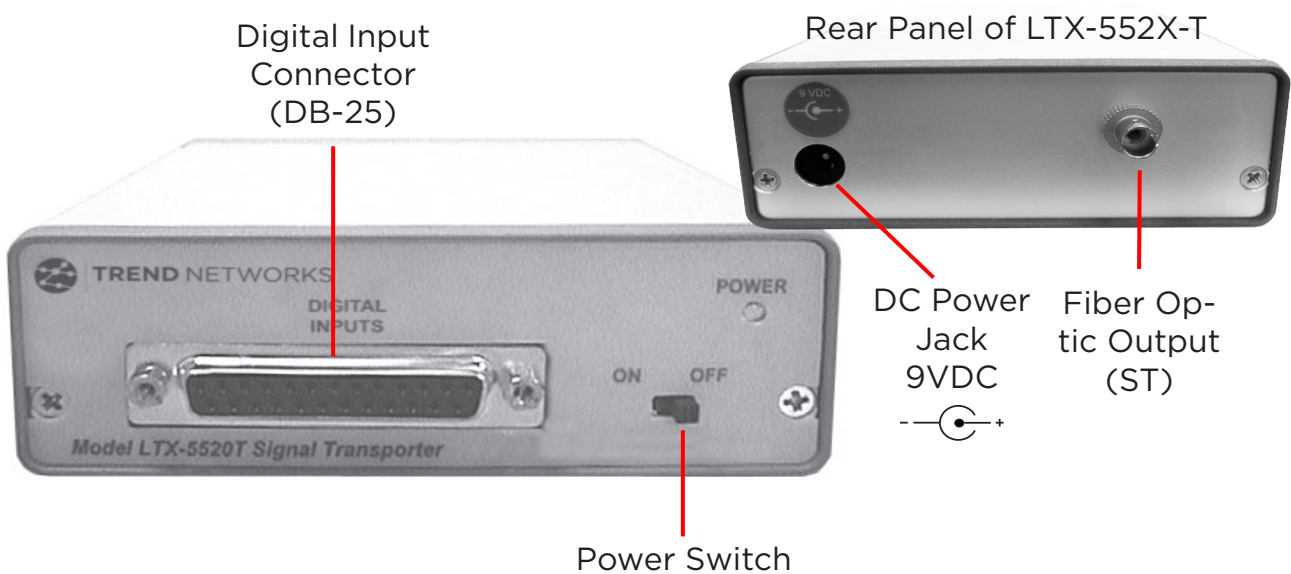
UNPACKING AND INSPECTION

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 TREND Networks should be notified.

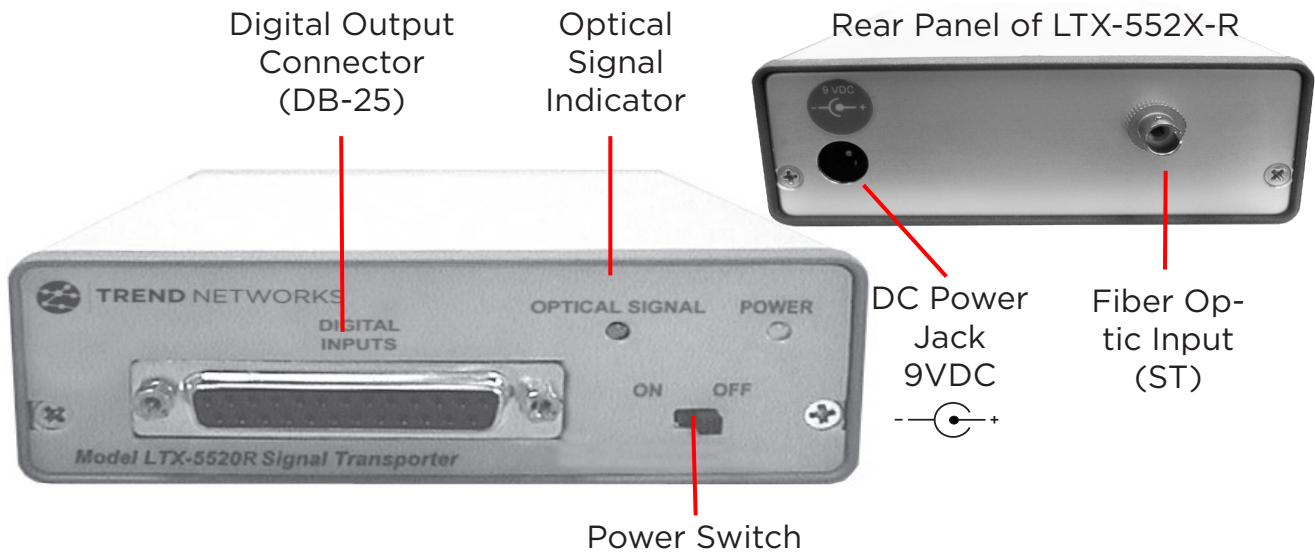
POWER CONSIDERATIONS

The LTX-552X T and R operate 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.

LTX552X Transmitter



LTX552X Receiver



THEORY OF OPERATION

The LTX-552XT samples the 16 digital inputs presented at the front panel DB-25 connector at a 50 (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 50 (100) MHz rate resulting in a 1 (2) Gb/s data stream. This data is converted to an optical bitstream and transmitted via a user-supplied optical fiber to the LTX-552XR receiver.

The LTX-552XR 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. The system is intended to be used with 50/125 μ M or 62.5/125 μ M fiber optic cable. (The LTX-552X-1310 is intended for use with single mode fiber).

Upon energizing the LTX-552XT it transmits framing characters for a few seconds so that the receiver can determine where a valid word in the data stream begins and ends. The receiver is phase-locked to the transmitters data rate and will remain so unless the optical signal is disrupted in some fashion such as removing an optical fiber or power to one of the units.

OPERATIONAL CONSIDERATIONS

The LTX-552X 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 length of fiber optic cable that may be used is typically 300 M for 62.5/125 um fiber or 500 M for 50/125 um fiber. Fiber bandwidth and not loss is typically the limiting factor for range with multimode units. The single mode version is limited by loss. Typical ranges of 10 km may be achieved with this model using single mode fiber.

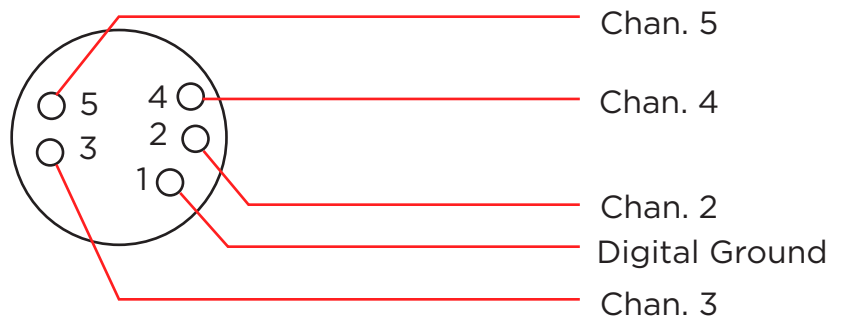
When setting up the LTX-552X system, note that the transmitter must be turned on last! This allows the receiver to detect the synchronizing framing characters. Meaningless signals will otherwise be generated. Should sync be lost by disconnecting the optical fiber, simply turn the transmitter off and then back on.

Do not connect active signals to the transmitter input 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 green LED on the receiver indicates that the receiver is operating with an adequate optical input signal. If the indicator goes dark, the transmitter has lost power or the connecting fiber is disconnected or broken.

The controls and their functions are indicated on the following pages. The input and output pin-outs of the input DB-25 connectors are shown below.

PIN	FUNCTION	PIN	FUNCTION	PIN	FUNCTION	PIN	FUNCTION	PIN	FUNCTION
1	Data0	6	Data10	11	Ground	16	Data5	21	Data15
2	Data2	7	Data12	12	Ground	17	Data7	22	Ground
3	Data4	8	Data14	13	Ground	18	Data9	23	Ground
4	Data6	9	NC	14	Data1	19	Data11	24	Ground
5	Data8	10	Ground	15	Data3	20	Data13	25	GND(Xmtr)
									Clcock out (RCVR)

DIGITAL INPUT/OUTPUT
CONNECTIONS



WARRANTY AND REPAIR INFORMATION

REPAIR INFORMATION

Products manufactured by TREND Networks are designed and manufactured to provide reliable performance. However, in the event that service is required, both telephone technical assistance and factory repair services are available. Call (973) 957-7700, e-mail contactus@trend-networks.com or visit our web site at <https://www.trend-networks.com/us/> for more information or to request an RMA number.

For IN-WARRANTY REPAIRS, call us to obtain a Returned Material Authorization number, (RMA Number). All products are to be returned to TREND Networks 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 TREND Networks RMA number.

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

LIMITED WARRANTY

TREND NETWORKS 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 TREND NETWORKS, I.E., THERE IS NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. TREND NETWORKS HEREBY DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY OTHER THAN THE WARRANTY IN THE FIRST SENTENCE TO THE FULLEST EXTENT PERMITTED BY LAW.

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