

MODEL LLT-1000

LIDAR LEVEL TRANSMITTER



Description

Jogler's **LIDAR Level Transmitter** is a non-contact, laser based instrument that measures the level in silos, tanks, hoppers, chutes and bunkers. With long measuring range, high accuracy and a narrow beam, the **LLT-1000** can be used in many different applications to measure to different types of surface. The 4...20 mA and relay interfaces provide linear and switchpoint controls while the onboard USB interface provides access to comprehensive, user-friendly configuration settings. With an optional, visible aiming laser and numerous mounting flanges, the **LLT-1000** is an easy to use, state of the art, level and position sensing solution.

Technology

The **LLT-1000** measures distance using time-of-flight, laser technology. This fast and accurate measuring principle offers numerous advantages over other methods. The narrow beam makes it easy to aim directly at the most critical point in the vessel; the long range permits unlimited stand-off distances when measuring into aggressive environments; the laser can measure through protective windows and sight glasses; the accuracy is not affected by atmospheric temperature or humidity; the high signal-to-noise ratio gives clean, reliable signals under any lighting conditions and when measuring to any color or granularity of surface.

Standard Features

- Non-contact measurement of level or distance
- Narrow beam and long range for accurate targeting
- Local USB programmability allows for easy parameter changes
- Visible aiming laser (optional)
- Dual compartment housing
- Numerous mounting options
- FM and CSA Hazardous area approved

Disclaimer

Information found in this document is used entirely at the reader's own risk and whilst every effort has been made to ensure its validity neither Jogler LLC nor its representatives make any warranties with respect the accuracy of the information contained herein.



SPECIFICATIONS

Performance

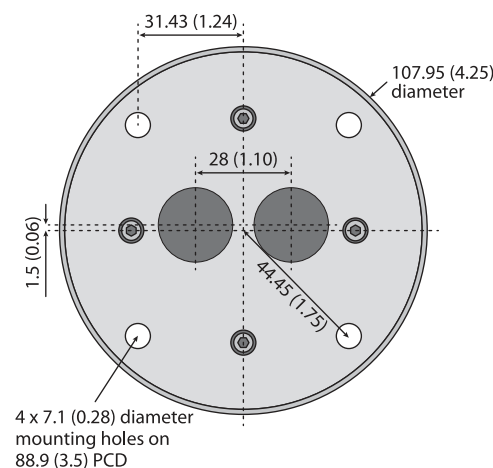
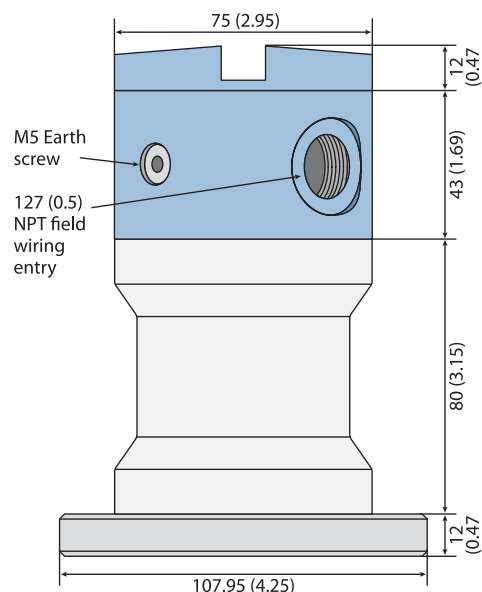
Range	2 ... 180 ft (white), 2 ... 100 ft (black), 2 ... 330 ft (reflector)
Accuracy	+/- 0.5 inches (typical on white surface)
Repeatability	0.1% of full span
Linearity	0.1% of full span
Refresh rate	8 readings per second
Initiation	5.00 seconds
Damping	0.00 to 10.00 @ 0.01 seconds

Electrical

Input	14...32 V DC (24 V DC nominal)
Output	4...20 mA NAMUR compliant self-powered & non-isolated 2 x Relays (N/O, N/C), 250 V at 3 A
Resistance	600 Ohms (max) @ 24 V DC
Power	2.4 watts (24 V DC x 100 mA)
Error signal	3.60 mA (low) or 22.0 mA (high)
Interface	Mini-USB
Software	Jogler Terminal software
Connection	0.5 inch NPT
Terminal Torque	0.25 Nm

Ratings

MAWP	1 bar
Ambient temp.	-4° to +140°F (-20° to +60°C)
Approvals	United States: Class I, II, III Division 2, Groups A, B, C, D, E, F, G; T4A Class I, Zone 2, AEx nA nC IIC T4 Gc Canada: Class I, II, III Division 2, Groups A, B, C, D, E, F, G; T4A Ex nA nC IIC T6 Gc ATEX: II 3 G Ex nA nC op is IIC T4 Gc II 3 D Ex tb op is IIC T85°C Dc
Enclosure	Powder Coated, Aluminum, IP 67



ORDERING INFORMATION

Model Number: LLT-1000/a

/a Visible aiming laser pointer

S	Standard instrument without visible aiming laser pointer
P	Instrument with visible aiming laser pointer

Units in mm (inch)

PC setup

- Install the latest revision of Jogler Terminal software and open.
- Connect the LLT-1000 to a PC using a USB 2.0 B male to mini B male cable. This provides both power and communication for the unit.
- Click the Jogler Terminal software's "Connect" icon to open a communications port. The distance measurements should begin to scroll in the Terminal window as follows:

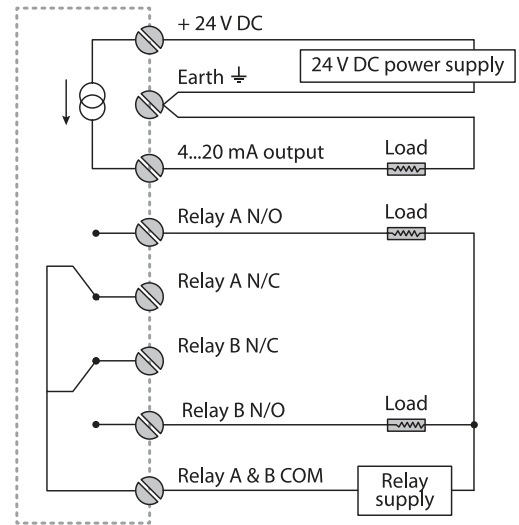
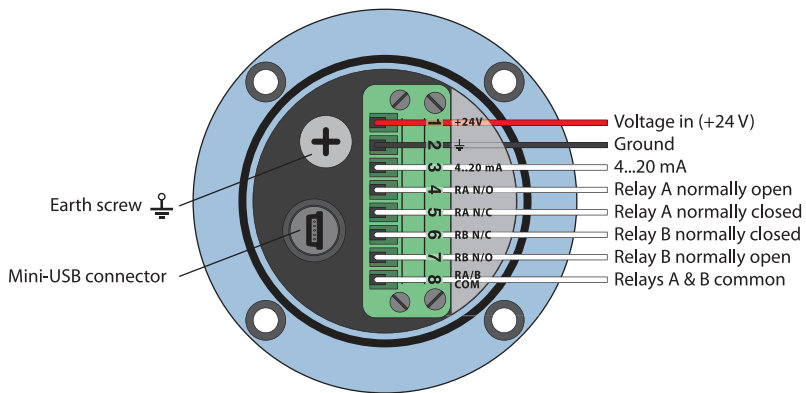
1.79 m --. -- mA 100 %	Distance	4...20 mA output	Signal strength
1.79 m --. -- mA 100 %			
1.79 m --. -- mA 100 %			

- If an automatic connection is not created, click the "Laser" icon and select the appropriate USB port and 115200 baud rate.
- To access the configuration menu of the **LLT-1000**, press the < space > key on the keyboard.

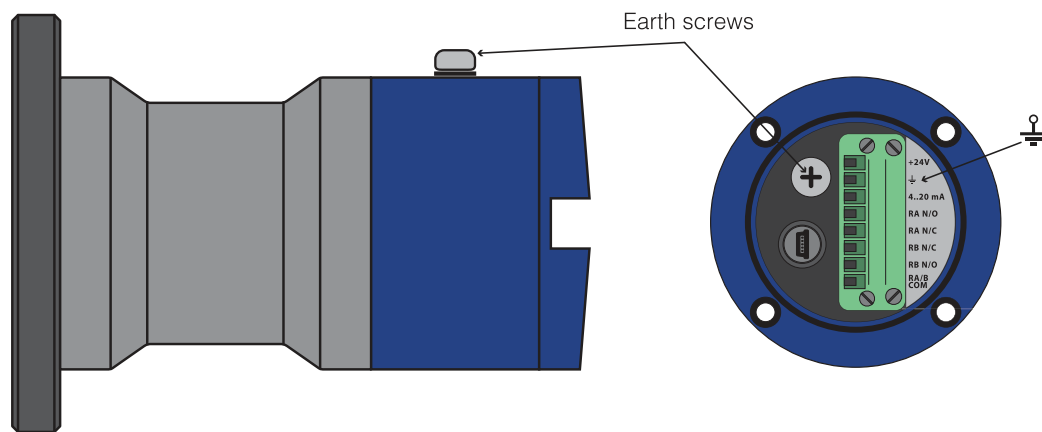
*** Settings ***		
.....		
a: Hide 4-20 mA settings		
b: 4 mA distance setting	0.00 m ... 120.00 m	Enter the distance that corresponds to the 4 mA output value.
c: 20 mA distance setting	0.00 m ... 120.00 m	Enter the distance that corresponds to the 20 mA output value.
d: 4-20 mA fail safe current	<3.6 mA or >21.0 mA or hold	Enter the failsafe condition of the 4...20 mA range for alarm indications.
e: 4-20 mA test	4 or 12 or 20 mA	Test the 4...20 mA output
.....		
f: Hide relay settings		
g: Relay A switch point 1	0.00 m ... 120.00 m	Enter the first distance at which relay A activates.
h: Relay A switch point 2	0.00 m ... 120.00 m	Enter the second distance at which relay A activates.
i: Relay A mode	near = closed or far = open	Enter the polarity for relay A
j: Relay B switch point 1	0.00 m ... 120.00 m	Enter the first distance at which relay B activates.
k: Relay B switch point 2	0.00 m ... 120.00 m	Enter the second distance at which relay B activates.
l: Relay B mode	near = closed or far = open	Enter the polarity for relay B
m: Relay test	open or closed	Test the relays
.....		
n: Hide system settings		
o: Measuring units	meter or feet	Enter the required measuring units
p: Zero distance offset	±10.00 m	Enter the zero datum trim
q: Lost signal timeout	0.00 m ... 600.00 sec	Enter the lost signal hold time delay
r: Smoothing filter	ON or OFF	Select output results as raw or filtered
s: Filling rate filter	ON or OFF	Enable the filling rate filter
t: Maximum filling rate	0.01 ... 100.00 m/min	Enter the maximum filling rate, when filling rate filter is ON
u: Moving obstacle filter	ON or OFF	Enable the moving obstacle filter
v: Obstacle filter size	3 ... 32 results	Enter the maximum obstacle filter, when moving obstacle filter is ON
w: Visible aimer	ON or OFF	Select the visible aiming laser ON continuously, or OFF
x: Aimer stops after	1 ... 10 min or always ON	Enter the visible aiming laser time out duration
.....		
----- Press <space> to run -----		

- To restart measurements, press the < space > key.
- To save a copy of the current screen data, click the "Save" icon.
- If you wish to start recording data, click the "Log" icon.
- To clear the screen of measurement data, click the "Clear" icon.
- Once you have configured the **LLT-1000**, click the "Disconnect" icon and disconnect the mini-USB cable from the unit.

Electrical



Earthing



Measuring laser of the LLT-1000/S and LLT-1000/P

The **LLT-1000/*** is a laser rangefinder that emits invisible ionizing laser radiation from its measuring laser. The unit is classified as Class 1M (EN/IEC 60825-1 2008) during all procedures of operation. This classification indicates that the laser beam is safe to look at with the unaided eye, but must not be viewed directly using binoculars or other optical devices at a distance of less than 14.53 meters.

Specification

Specification	Value
Laser emission wavelength	905 nm
Maximum average radiant power	15 W
Pulse width (half power points)	20 x 10-9
Beam divergence, of laser before optics	Horiz 15° Vert 30°
Beam diameter at laser aperture	21.8 mm
Laser output	Pulsed
Pulse energy (J) of single pulse	300 x 10-9 J
Pulse repetition rate	36 kHz
Angle of subtense of beam	<1.5 mrad
Beam divergence	9.77 mrad
Laser source size (X x Y)	10 x 200 µm
Nominal Ocular Hazard Distance and Area	<15 m

Aiming laser of the LLT-1000/P

The **LLT-1000/P** contains an aiming laser that emits visible laser radiation. The unit is classified as Class 2 (EN/IEC 60825-1 2008) during the following modes of operation:

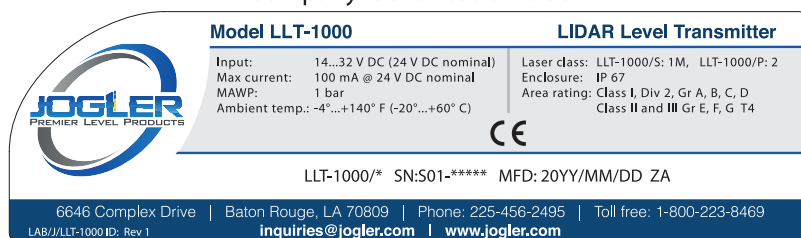
- During commissioning mode, the visible aiming laser has an automatic time-out of 1 minute;
- During running mode, the visible aiming laser can be set to:
 - Flash continuously with a 25% duty-cycle;
 - Flash with a 25% duty-cycle and time-out after a preset duration (user selectable from 1 to 10 minutes).

This classification indicates that the laser beam must not be stared at with the unaided eye.

Specification

Specification	Value
Laser emission wavelength	670 nm
Maximum radiant power	0.0008 W
Laser output	CW

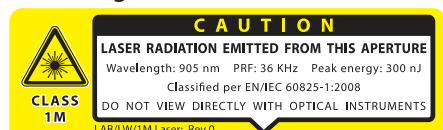
Company identification label



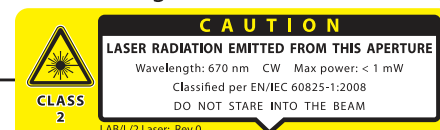
Product identification label

LLT-1000/* SN:S01-***** MFD: 20YY/MM/DD ZA

Laser warning label for LLT-1000/S & LLT-1000/P



Laser warning label for LLT-1000/P only



Service and maintenance

The laser eye safety ratings depend on the mechanical integrity of the optics and electronics. The LLT-1000 has no user serviceable components. Repair and service must only be carried out by the manufacturer or a factory-trained technician. No regular maintenance is required for the **LLT-1000** but if the lenses start to collect dust then they may be wiped with suitable lens cleaning materials. Ensure that the **LLT-1000** is switched OFF before looking into the lenses.

Warning-The equipment lens on the bottom flange shall be protected by installation from UV sunlight
 Avertissement - L'objectif de l'équipement sur la bride inférieure doit être protégé par l'installation de la lumière UV du soleil

Warning-Potential Electrostatic Charging Hazard - Use a damp cloth for cleaning
 Danger potentiel de charge électrostatique - Utiliser un chiffon humide pour le nettoyage

Warning-The Mini-USB port shall not be used when an explosive atmosphere is present
 Avertissement-Le port Mini-USB ne doit pas être utilisé lorsqu'une atmosphère explosive est présente

Warning-Explosion Hazard - Do not connect or disconnect when energized
 Avertissement-Risque d'explosion - Ne pas connecter ou déconnecter quand il est sous tension

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