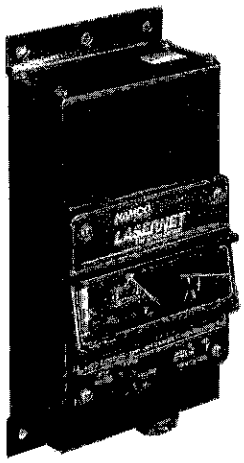
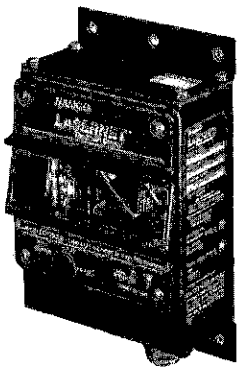
LN110/120 Non-Contact Laser Based Position Sensor

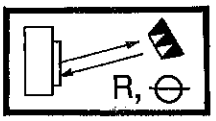
LASERNET®



EXTENDED RANGE LN120 SERIES



STANDARD RANGE LN110 SERIES



- DETERMINES DISTANCE & ANGLE TO RETROREFLECTOR TARGETS
- UTILIZES ADVANCED LASER TECHNOLOGY
- MICROPROCESSOR BASED
- ANALOG 0-10V OUTPUTS
- REAL TIME TTL OUTPUTS
- SERIAL COMMUNICATIONS
- USER PROGRAMMABLE OPTIONS
- ON BOARD DIAGNOSTICS
- PATENTS PENDING

Description:

Namco Control's LN110/120 series Lasernet sensors are a whole new dimension in intelligent sensing.

Lasernet is truly unique. It combines the latest in helium-neon laser technology with the simplicity of retroreflectors. The principles of operation and application are so fundamental that we have applied for patents with over 30 separate claims.

Lasernet is controlled by an onboard microprocessor for maximum reliability and flexibility. Signals are inherently digital so that the environment does not affect the output accuracy. It provides real time information, updating every 50 milli-seconds. It's absolute so that restart after power loss poses no problems. All of this in a single, cost-effective sensor providing simultaneous measurements of web width distance, angle, height and code of the target. Lasernet truly brings a whole new dimension to production automation, allowing simple control solutions previously unobtainable without extremely costly vision systems.

The LN110/120-30001 series sensors offer single or multiple target sensing, dual analog outputs, three real time TTL outputs, RS-232C serial communications, on board diagnostics and a programmable options list.

The optional parameters offer extensive flexibility for the user to tailor the sensor for specific application requirements. The options can be used to measure the angle to the leading edge or the center of a target, to merge multiple targets, and measure a nonreflective target in a reflective background.

The LN110/120-30001 series Lasernet sensors also offer the following features: simultaneous sensing of up to 8 discrete targets, adjustable viewing angle, adjustable target width discrimination, settable speed tolerance limits and an adjustable target in view, on/off delay that operates in either a light or dark mode. Full 90° tangent and nonincident correction tables are included for when viewing abnormally wide targets. An extensive parameter options list is included for selecting valid targets. All of these features and options are changeable via the RS-232 serial port.

The LN100/120-40001 series sensors are functionally the same as the 30001 series units except that an RS-485 serial port is used instead of the RS-232C port. This allows you to network up to 16 separate sensors from a single remote computer. Each sensor has its own address and can be instructed to grab and hold data until polled by the central computer.

NAMCO

Specifications:

LN110/120 SERIES	
Range	1′ to 20′ using 4″ target (LN110 Series) 3′ to 50′ using two 4″ targets ① (LN120 Series)
View Angle	±5° to ±45° from normal center line (user adjustable for LN110/120-30001 & 40001 Series)
Scan Rate	20 scans of viewing field per second
Standard Target	4″ x 4″ retro-reflector EP175-13900 (LN110 Series) Two 4″ x 4″ retro-reflectors EP175-13900 (LN120 Series) ①
Range Accuracy	±4% error or less at 20 ft. (LN110 Series) ±2% error or less at 10 ft. (LN110 Series) ±4% error or less at 50 ft. (LN120 Series) ±2% error or less at 25 ft. (LN120 Series)
Angle Accuracy	±1% error or less
Range Resolution	Analog Output: 9.6″ @ 20 ft. decreaasing to less than 0.1″ @ 1 ft. for the LN110 Series. 24″ @ 50 ft. decreasing to less than 0.1″ @ 2.5 ft. for the LN120 Series. Digital Output: 1.57″ @ 20 ft. decreasing to less than .017″ @ 1 ft. for the LN110 Series. 3.94″ @ 50 ft. decreasing to .017″ @ 2.5 ft. for the LN120 Series.
Angle Resolution	Analog Output: 0.1° over entire view angle (corresponds to 0.4″ @ 20 ft.) Digital Output: 0.0058° over entire view angle (corresponds to 0.024″ @ 20 ft.)
Sensitivity to Target/Beam Normality	Standard specifications are based on normal (perpendicular scanning of target). When non-normal scanning of target arises, the effect on range is to indicate the target is further away according to the Cosine Law.
Outputs (Analog)	1) 0-10 volts representing 0 ft. to maximum range (User adjustable) 2) 0-10 volts representing minimum to maximum view angle (User adjustable)
Outputs (Digital)	1) TTL real time signal return pulse (high during return of light from retro-reflector) 2) TTL scan synchronization pulse (high when scanning view angle) 3) TTL target in view signal: (high when retro-reflector target is in view; polarity can be adjusted in LN110/120-30001 & 40001 Series)
Indicator LED's	1) "Laser Power On" 2) "Target in View"
Power Requirements	Nominal 24 volts DC input; 12 watts (17 watts for LN120 Series). Operational from 20-28 VDC input.
Laser Source	Class II helium neon 0.8 MW (2.0 MW for LN120 Series). Meets CDRH requirements. Direct viewing of non-scanning beam not recommended.
Failure Detection Modes	1) Laser is turned off when scanning motor stops. 2) TTL synchronous signal is lost when laser source fails. 3) Loss of "Target in View" signal indicates no target or that beam is blocked.
Mounting	Mounting bracket attached.
Environmental	NEMA 1, 12 & 13 metal housing, 0°C to 40°C operation, moderate vibration
Calibration	Calibrated at factory; external adjustments for range and angle available
Ambient Light	Insensitive to ambient light
Scan Buffer Zone	Used to prevent partial scanning of targets that cross boundaries of viewing angle.
Serial Communications	RS-232C or RS-485 data format; 8 data bits, 1 or 2 stop bits no parity. Selectable transmission rates from 300-38400 B.P.S.

NOTE ① Two 4″ x 4″ retro-reflectors with outside edges of reflectors spaced 10″ apart.

Software Options:

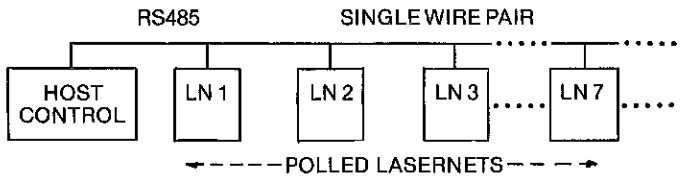
MULTIPLE TARGET LASERNET FEATURES FOR LN110/120-30001 & 40001 SERIES ONLY

- All previous option functions
- Sense up to 8 targets for range and angle
- Output selectable data:
  - — All targets range and angle
  - — All targets range values only
  - — All targets angle values only
  - — Select specific (valid) targets for range/angle
  - — Ignore targets which have width smaller than defined
- Adjustable field of view (10 degrees to 90 degrees)
- Scaled analog outputs for field of view setting
- Settable number of scans for "target in view" to be on/off
- Tangent correction for full field of view (90 deg.) (Corrects for errors in sensing wide targets)
- Invertable TTL logic "target in view" signal
- Single/multiple target mode operation
- All options changeable by serial port communication
- Full parameter option setup report
- Visual diagnostic report of all targets

NETWORKED LASERNET FOR LN110/120-40001 SERIES ONLY

TECHNICAL CHARACTERISTICS

- The networked LASERNET is functionally the same as the MULTIPLE TARGET LASERNET, with the added features of being able to connect up to 16 units on a multidrop single pair of wires from the control computer. The Network Hardware Standard RS485 is used.
- Typical configuration would look like this:



- Each Lasernet on the Network is addressable so that any given Lasernet can be asked for data, while the others remain silent.
- Global commands are available to ask all Lasernets to collect data at the same time, but then to hold it until asked to individually report.
- An example command from the Host Computer to ask Lasernet Number 7 for its target data is given below:
  - — A networked command would be:

    < # > 7 < CR >

    where the # character < # > would indicate a network command, and "7" would call Lasernet #7 to attention. It would then report directly to the Host.

Ordering Information:

SERIES LN110 LASERNET

SENSING RANGE	OPTIONS				CATALOG NUMBER
	RS232C	RS485	TARGET		
			SINGLE	MULTIPLE	
1-20 Ft. (Standard)	Yes	No	Yes	Yes	**LN110-30001**
	No	Yes	Yes	Yes	**LN110-40001**

SERIES LN120 LASERNET

3-50 Ft. (Long)	Yes	No	Yes	Yes	**LN120-30001**
	No	Yes	Yes	Yes	**LN120-40001**

ACCESSORIES
TARGETS / CONNECTORS / TAPES: SERIES LN175/180

Glass Bead R-R Tape 1″ x 12″	**EP175-31200**
Corner Cube High Gain R-R Target 4″ x 4″ x .33″	**EP175-31900**

Cable Connector Assembly	**LN180-00001**
Micro-Prism Retro-Reflective Sheeting 3″ Wide x Required Length	**LN180-00011**
Micro Corner Cube Retro-Reflective Tape 2″ x 27″	**LN180-00012**

CONTROL MODULES
SEE CATALOG SHEET
SERIES **LN150**

INDUSTRIAL
CODE READER
(SEE I & O SHEET **LN210-10001**)

APPLICATIONS:

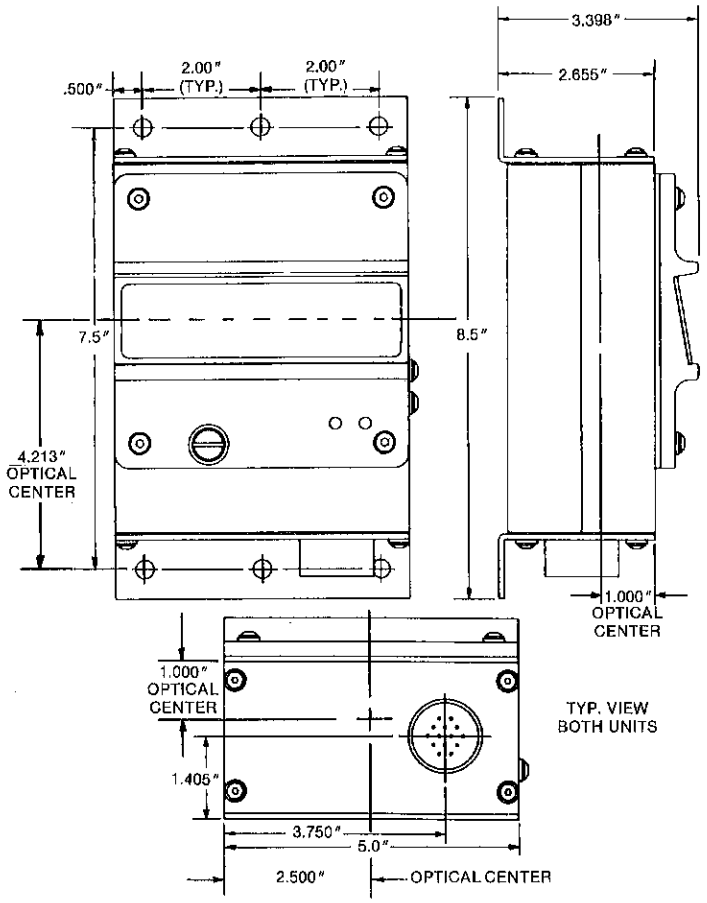
- — Automatic Vehicle Guidance
- — Web Width/Position Monitoring & Control
- — Loop Tension Control
- — Roll Diameter Gauging
- — Overhung Palletized Load Detection
- — Offcenter and Misalignment Detection
- — Code Reading
- — Profiling and Gauging

INDUSTRIES:

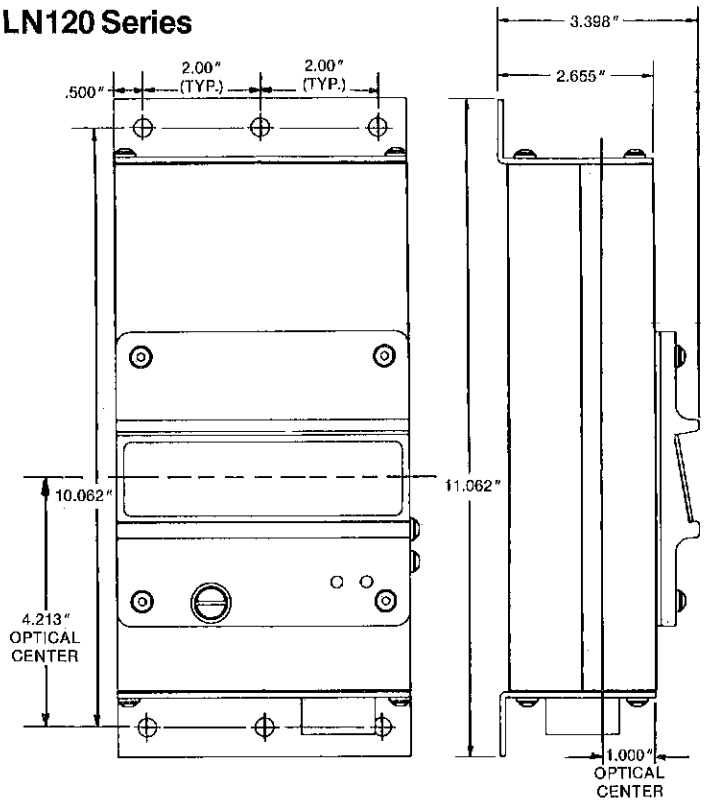
- — Automotive
- — Converting
  - Paper/Lumber
  - Plastic Film & Foil
  - Rubber & Tire
- — Textile & Carpet
- — Packaging
- — Electronics
- — Steel & Aluminum
- — Recycling

Dimensions:

LN110 Series

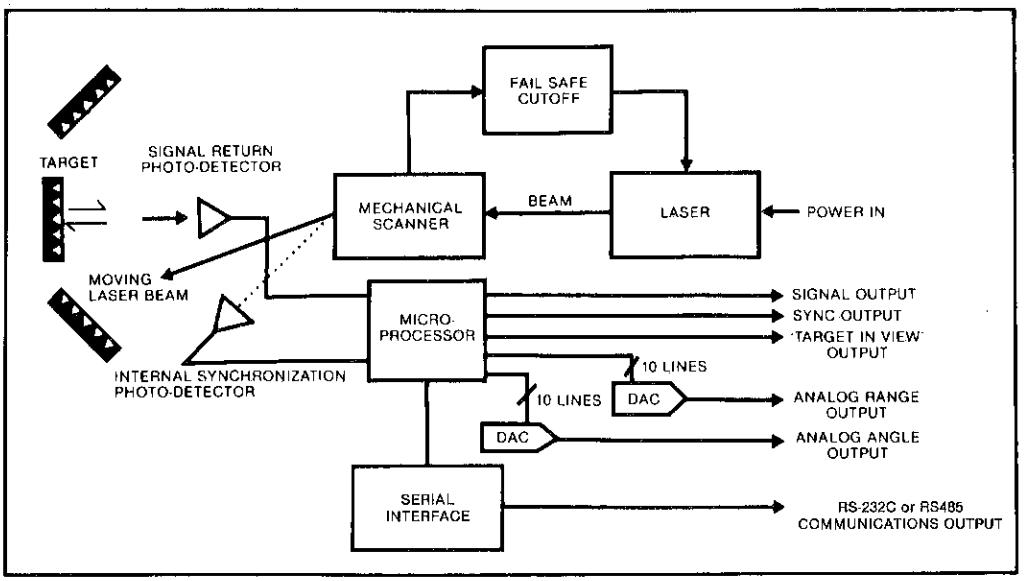


LN120 Series



OPTICAL CENTER IS REFERENCE POINT FOR RANGE & ANGLE MEASUREMENTS.

Block Diagram:



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