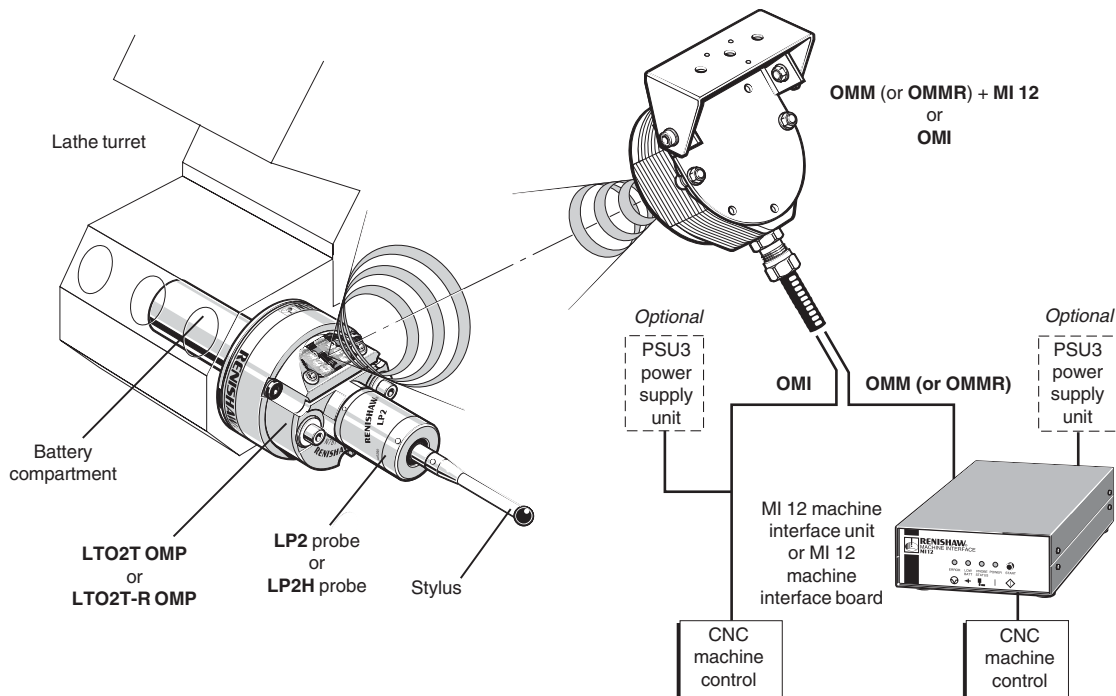


LTO2T / LTO2T-R systems for CNC lathes



System features

- The compact size suits medium-size machines.
- Easy to install as original equipment or retrofit.
- Exposed Renishaw components are fully sealed against coolant and hot chips.
- Optical housing made from steel.
- Optical windows made from toughened non-scratch material.
- Rapid job set-up and inspection.
- Automatic updating of work offsets.

System components

LTO2T OMP (optical module probe)

The OMP receives and transmits optical signals. Power for probe operation is supplied by a battery. The OMP is sealed to IPX8 and designed for reliable operation in the machine tool environment.

LTO2T-R OMP (optical module probe)

This is the visible-red version of the LTO2T (for twin OMP installation only). The LTO2T-R OMP must be used with an OMMR and MI 12 to form a system.

OMM (optical module machine) + MI 12 (machine interface unit)

Signals pass from the CNC control to the OMP via the MI 12 and OMM and return along the same route. The MI 12 interface converts probe signals into the correct format for the CNC machine control input. OMM transmission and reception ranges are factory set to 100%. If OMM signals interfere with probes on other machines, the optical range can then be reduced.

OMI (optical machine interface)

This is an alternative to the OMM + MI 12 interface, combining the functions of the OMM and MI 12 in one unit.

LP2 probe or LP2H probe

3D touch-trigger inspection probes ($\pm X$, $\pm Y$, $\pm Z$ directions). The LP2 is more sensitive than the LP2H. The LP2H is for heavier duty applications where vibration or heavy stylus arrangements cause spurious trigger signals.

PSU3 power supply unit for MI 12 or OMI

This is used when a +24 V supply is not available from the machine.

Extension bars and MA4 90° adaptor

Accessories provide greater access to workpiece features.

Software for probe routines

Renishaw single and double-touch probing cycles are available for use with Renishaw probing systems.

Note: Each system component is fully described on a separate data sheet – refer to the parts list on the back page.

Data sheet
LTO2T and LTO2T-R systems for CNC lathes

Dimensions in mm (in)

LTO2T OMP

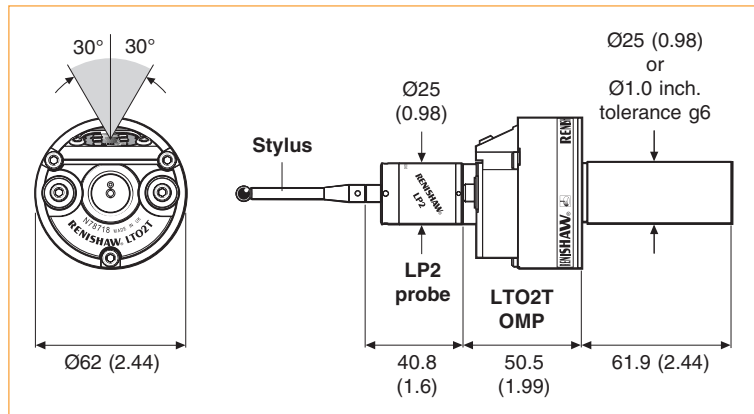
The LTO2T OMP is mounted in a tool position on the lathe turret. Signal transmission and reception LEDs communicate with the OMM or OMI. Timeout and debounce time-setting switches are located inside the OMP.

For an explanation of terms and settings, see **System operation** on the opposite page.

LTO2T-R OMP

When a lathe is fitted with two optical signal transmission systems, problems with signal crosstalk between the two OMPs can occur. To prevent crosstalk, the second OMP should be an LTO2T-R visible-red ('R') model.

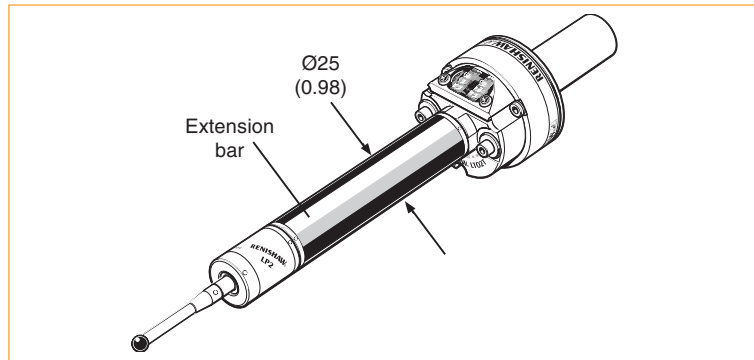
Signals transmitted from an LTO2T-R are of a different optical frequency to the signals transmitted from a standard LTO2T model OMP.



LPE extension bars

Additional reach may be obtained by fitting an LPE extension bar between the LP2 probe and the LTO2T OMP.

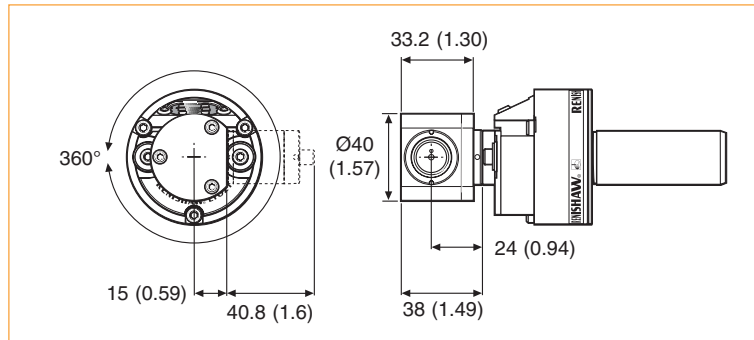
Extension	Length mm (in)
LPE1	50 (1.96)
LPE2	100 (3.94)
LPE3	150 (5.90)



MA4 90° adaptor

The MA4 adaptor with M16 thread connects to the LTO2T OMP.

The LP2 mounts on the MA4 at 90° to the OMP centre-line and can be set in any position through 360° before being clamped in place with three set screws.

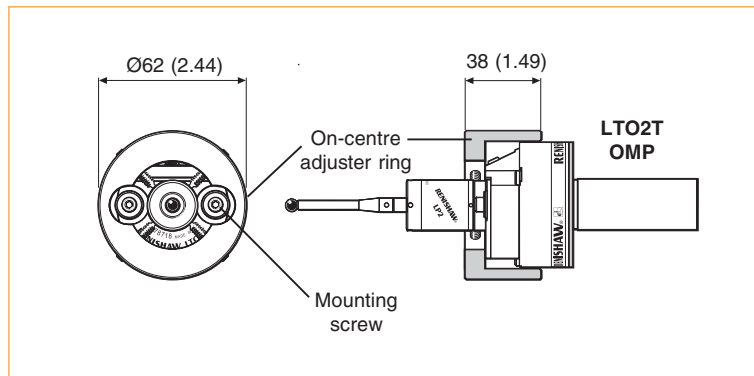


Stylus on-centre adjuster

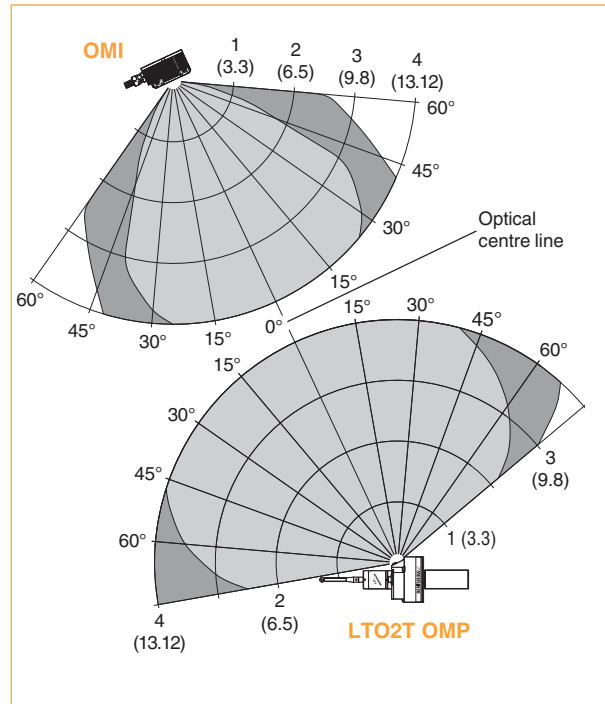
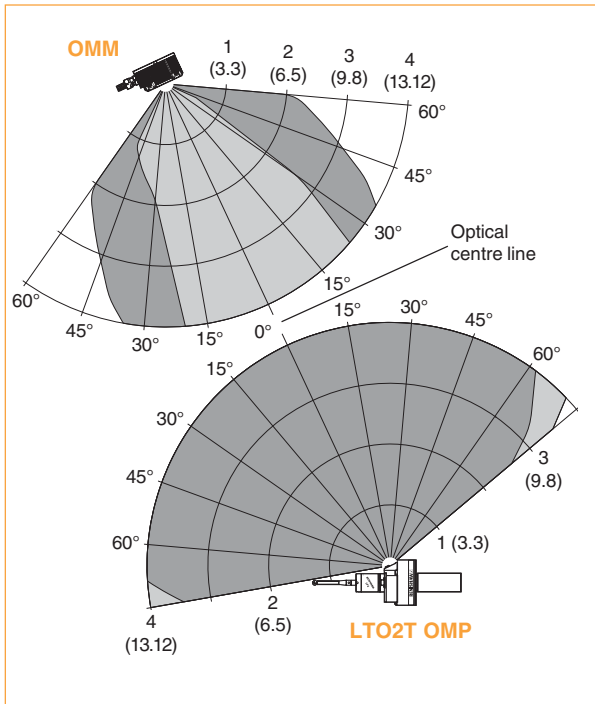
The stylus can be set to correspond with the nominal tool tip position.

The on-centre adjuster ring is mounted on the OMP. The probe mounting screws are slackened, and the probe can be moved in incremental stages relative to the OMP by adjusting opposing grubscrews.

The mounting screws are tightened when the correct position is achieved. The adjuster ring is then removed.



Signal transmission operating envelope



- SWITCH ON/OFF Range in metres (feet).
- OPERATING The OMP must be within 4 m (13.12 ft) of the OMM/OMI.

The LTO2T OMP and OMM/OMI diodes must be in each other's field of view, and within the performance envelope shown.

For the LTO2T-R, truncate the transmission plot to 2 m, as visible red light does not transmit as far as infrared. Use an OMMR instead of an OMM. The LTO2T-R cannot operate with an OMI.

System operation

Before using the LTO2T probe, the program selected to 'drive' the probe must be verified. Incorrect programming may result in damage to the machine, workpiece and probe system.

LTO2T system: comprises LTO2T, LP2 probe, stylus, and either an OMM (one or two) and MI 12, or an OMI.

LTO2T-R system: comprises LTO2T-R, LP2 probe, stylus, and an OMMR (one or two) and MI 12.

The battery-powered LTO2T has two modes of operation:

1. Standby mode

To conserve battery life, the probe is held in standby mode until the CNC control sends a start signal, via the OMM or OMI, to the OMP receiving diodes. The start signal switches the probe to operating mode.

2. Operating mode

During operating mode, probe signals are transmitted from the OMP transmitting LEDs to the OMM or OMI for onward transmission to the CNC control.

Probe switch-on

The probe is switched on by one of the following options:

- 1. Manual start** (*system with OMM + MI 12 only*)
Initiated by pressing the MI 12 manual start button.
- 2. Machine start** (*factory set to this option*)
(*system with OMM + MI 12 or system with OMI*)
Initiated by an M code generated by the program.
- 3. Auto start** (*system with OMM + MI 12 or system with OMI*)
Initiated by an auto start signal sent every second.

Probe switch-off

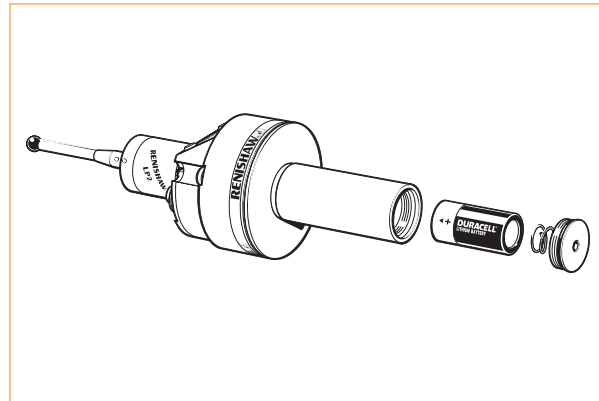
The probe is switched off by one of the following options:

- 1. Optical-on/Timer-off** (*factory set to this option*)
A timer automatically returns the probe to standby if the probe is not used for 33 or 134 seconds (*factory set to 134 seconds.*)
- 2. Optical-on/Optical-off**
A second start signal is generated by an M-code, which returns the probe to standby. The probe cannot be switched off for 5 or 9 seconds after switch-on (*factory set to 5 seconds.*)

Power supply for the probe

The LTO2T and LTO2T-R probe is powered by a 3 V lithium battery (Duracell type DL123A). A system low battery LED will light up when the battery needs to be replaced.

Typical battery life				
Standby life	5% usage (72 min/day)		Continuous use	
	Optical on Optical off	Optical on Timer off	Optical on Optical on	Optical on Timer off
108 days	45 days	42 days	88 hours	81 hours



Parts list – please quote the part number when ordering equipment

Component	Part number	Description
LTO2T OMP	A-2030-0218	LTO2T OMP (Ø25 mm shank) complete with battery, 3 mm hexagon key, stylus on-centre adjuster and user's guide
LTO2T OMP	A-2030-0274	LTO2T OMP (Ø1 inch shank) complete with battery, 3 mm hexagon key, stylus on-centre adjuster and user's guide
LP2	A-2063-6098	LP2 probe complete with two C spanners and TK1 tool kit
LP2H	A-2064-0002	LP2H probe complete with two C spanners and TK1 tool kit
Battery	P-BT03-0006	3 V lithium battery – Duracell type DL123A
Stylus	A-5000-3709	Ceramic PS3-1C stylus, 50 mm long with Ø6 ball
Extension bar	A-2063-7001	LPE1 – extension bar Ø25 x 50 mm long
Extension bar	A-2063-7002	LPE2 – extension bar Ø25 x 100 mm long
Extension bar	A-2063-7003	LPE3 – extension bar Ø25 x 150 mm long
MA4 adaptor	A-2063-7600	MA4 90° adaptor
OMM	A-2033-0576	Optical module machine (OMM), complete with cable
OMI	A-2115-0001	Optical module interface (OMI), complete with cable
MI 12	A-2075-0142	MI 12 machine interface unit

LTO2T-R (visible red) system only:

LTO2T-R OMP	A-2030-0227	LTO2T-R OMP (Ø25 mm shank) complete with battery, 3 mm hexagon key, stylus on-centre adjuster and user's guide
OMMR	A-2031-0181	Optical receiver for LTO2T-R system (use with MI 12)

Associated literature (refer to these publications for the part numbers of equipment used with the LTO2T system):

Stylus range	See brochure H-1000-3200 – Styli and accessories
LP2 and LP2H probes	See data sheet H-2000-2100 – LP2 and LP2H probes
Adaptors and extensions	See data sheet H-2000-2120 – Adaptors, extensions and holders
OMM optical module	See data sheet H-2000-2275 – Optical module machine
MI 12 interface	See data sheet H-2000-2195 – MI 12 interface unit
OMI optical interface	See data sheet H-2000-2285 – Optical machine interface
PSU3 power supply	See data sheet H-2000-2200 – PSU3 power supply unit
Software	See data sheet H-2000-2289 – Probe software for machine tools

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