

FLM-L-T Fanned Laser Module

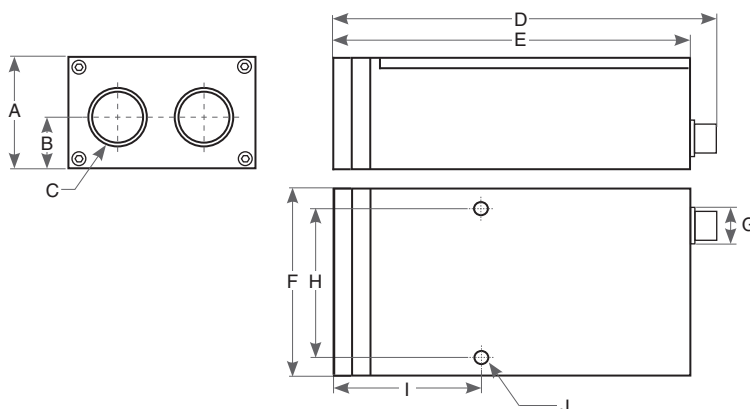
Renishaw's range of OEM Fanned Laser Modules (FLM) utilise pulsed time-of-flight technology to provide users with contactless measurements to passive targets.

This is achieved through using an invisible and eye-safe laser source and low-level detector mounted within a robust housing.

The FLM-L-T is unique in that it produces a fanned beam without the use of any moving parts. These laser modules can be used as a trigger to detect moving vehicles, objects or people.

Features of Renishaw's FLM-L-T laser modules include:

- Fanned beam variants of 5°, 10°, 15° and 20°
- Typical range of 1m to 20 m to a passive target of 18% reflectivity
- Accuracy of 10 cm**
- Repeatability of 10 cm**
- Laser safety to Class 1
- Data rate – output of up to 750 Hz
- Environmental protection to IP67
- RS232 protocol (*RS422 available by special request*)



Electrical connections

- FISCHER-DBEE-102A054-130 is located on the rear of the ILM unit.
- A standard 2 m adaptor cable is available, which converts the FISCHER connector to a 9-way D-type and two flying leads for power.

The pin outs for these connectors are described within the table opposite.



FLM-L-T variants

- FLM-L-5-T = 5° fanned beam
- FLM-L-10-T = 10° fanned beam
- FLM-L-15-T = 15° fanned beam
- FLM-L-20-T = 20° fanned beam

Key dimensions

Model	FLM-L-T
A	53.0
B	24.6
C	Ø 30.0
D	148.3
E	138.0
F	83.0
G	Ø 14.0

Mounting dimensions

Model	FLM-L-T
H	71.0
I	52.0
J	M6 x 1.0

All dimensions in mm unless otherwise stated

Function	FISCHER Pin number	9-Way D-type Pin number
+9V to 24V DC	1	Not connected
Data out	2	2
Data in	3	3
Trigger out	4	Not connected
GND (0v)	5	5

Model	FLM-L-5-T	FLM-L-10-T	FLM-L-15-T	FLM-L-20-T
Performance				
Fanned beam angle	5°	10°	15°	20°
Typical measuring range (18%)*	25 m	20 m	15 m	12 m
Min measuring range	1 m	1 m	1 m	1 m
Accuracy **	10 cm	10 cm	10 cm	10 cm
Repeatability **	10 cm	10 cm	10 cm	10 cm
Data rate – output (max)	750 Hz	750 Hz	750 Hz	750 Hz
Resolution	10 cm	10 cm	10 cm	10 cm
Electrical				
Power consumption	<5 W	<5 W	<5 W	<5 W
Supply voltage	9 to 24 V DC	9 to 24 V DC	9 to 24 V DC	9 to 24 V DC
Mechanical				
Dimensions (L x W x H)	148 x 83 x 53 mm	148 x 83 x 53 mm	148 x 83 x 53 mm	148 x 83 x 53 mm
Housing materials	Anodised aluminium	Anodised aluminium	Anodised aluminium	Anodised aluminium
Weight	800g	800g	800g	800g
Optical				
Laser classification	Class 1	Class 1	Class 1	Class 1
Beam divergence	88 x 0.2 mrad	175 x 0.2 mrad	263 x 0.15 mrad	350 x 0.15 mrad
Typical spot size at distance	0.88 m x 0.03 m (10 m)	1.75 m x 0.03 m (10 m)	2.63 m x 0.03 m (10 m)	3.50 m x 0.03 m (10 m)
Wavelength (Peak)	905 nm	905 nm	905 nm	905 nm
Max pulse energy	1.14 nJ	1.31 nJ	1.31 nJ	1.31 nJ
Light source	InGaAs Laser diode	InGaAs Laser diode	InGaAs Laser diode	InGaAs Laser diode
Inputs / Outputs				
Connection type	Fischer DBEE-102A054-130	Fischer DBEE-102A054-130	Fischer DBEE-102A054-130	Fischer DBEE-102A054-130
Standard adaptor cable	Fischer to 9-Way D-type cable 2 m	Fischer to 9-Way D-type cable 2 m	Fischer to 9-Way D-type cable 2 m	Fischer to 9-Way D-type cable 2 m
I/O	RS232	RS232	RS232	RS232
Baud rate	115200	115200	115200	115200
Trigger out (digital)	FET open drain	FET open drain	FET open drain	FET open drain
Environment				
IP degree of protection***	IP67	IP67	IP67	IP67
Vibration resistance	BSEN 60068-2-6 TR2130C-5-1	BSEN 60068-2-6 TR2130C-5-1	BSEN 60068-2-6 TR2130C-5-1	BSEN 60068-2-6 TR2130C-5-1
Operating temperature range	-20 °C to +60 °C	-20 °C to +60 °C	-20 °C to +60 °C	-20 °C to +60 °C
Storage temperature	-20 °C to +90 °C	-20 °C to +90 °C	-20 °C to +90 °C	-20 °C to +90 °C
Tests & Approvals				
CE conformity	DoC available	DoC available	DoC available	DoC available
Laser safety classification	IEC/EN 60825-1 (2001/2007) US 21CFR	IEC/EN 60825-1 (2001/2007) US 21CFR	IEC/EN 60825-1 (2001/2007) US 21CFR	IEC/EN 60825-1 (2001/2007) US 21CFR
FCC compliance	Part 15	Part 15	Part 15	Part 15
EMC	BS-EN-61326-1:2006	BS-EN-61326-1:2006	BS-EN-61326-1:2006	BS-EN-61326-1:2006

* Max measuring ranges are recorded against Kodak grey card (18% reflectivity).

** Completed to Kodak white card, statistical error of 1σ. Both specifications are tested under standard Renishaw test conditions.

*** Environmental protection is tested in accordance with IEC 60529 (2001).

Observed performance is application specific and dependent on a number of environmental and target parameters. As a result it may vary from the performance figures stated above. It is the customer's responsibility to confirm that laser performance is acceptable for their application. Please discuss with your local Renishaw office or distributor for further information.

The following clause applies for instruments delivered into the United States: Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice 50, dated 24 June 2007

**CLASS 1
LASER PRODUCT**