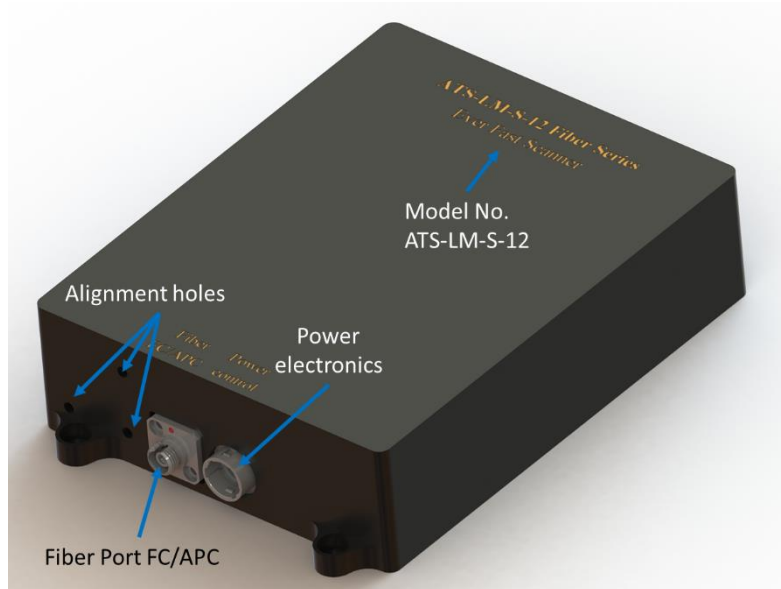


Ultrafast Optical Delay Line

ATS-LM-S-12 Series

Product Introduction

Advanced Terahertz Systems is the pioneer in providing standard all fiber coupled high speed delaylines which are fast, precise, compact, quiet and robust. The specially designed voice coil has a standard stroke of 12 mm, benefit from the double pass design, a tunable optical delay up to 48 mm is activatable, equivalent to 150 ps optical delays, while the delay resolution is down to 1.4 fs. Such an optical scanner is capable of high-speed motion up to 10 Hz, corresponding to 20 spectra/s under full stroke range (150 ps). Furthermore, the speed can be even faster, up to 20 Hz (40 spectra/s) when scanning for 50 ps delay. Thanks to the high performance & low moving mass stage, the module is quite with low vibration, and the optimized design grants extraordinary stability to the modules, ideal for long term operation. The optical delay modules can be independent instruments for “plug in & use”, and they are also suitable for integrating into wide range of systems, such as:



- Terahertz Time domain spectrometers
- Femtosecond laser powered Pump & probe systems
- Optical coherence tomography (OCT) systems, and
- Other equipment and/or testing instruments where the fast & precision optical delay management is required.

The standard version ATS-LM-S-12-PM1550-FC/APC equipped with polarization maintaining fibers and optics for 1550 nm laser, fibers and optics of other types are available upon request. For free space laser beams, we recommend our free space version **ATS-LM-12 Series**. The delay unit has integrated controllers in the optical heads, when power is on, the scanner will start to work automatically. Basic LabView (NI) program are provided for quick usage. Examples based on C, Python are available upon requests.

Application notes:

ATS recommends high speed data acquisition devices to be compatible with the fast scanners. Conventional Lock-in amplifiers may not be able to follow the fast scanners due to the low data handling rate.

ATS recommend polarization maintaining fibers for the all-fiber-coupled delaylines to resist noises.

The customers shall consider the dispersion management issue according to the fiber length and specification. Fiber length is customizable from 0.3 meter to infinite long.

Advanced Terahertz Systems Pte Ltd.

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Recommended combinations

In pump & probe system, *ATS-LM20 free space* or *ATS-LM-S-12 Fiber Series* is recommended for fast scanning on the Pump path, while *LRD-1500* or *LRD-DD series* are recommended for long range optical path management (up to 800 mm stroke) on the probe/detector path.

For THz spectroscopies, *AFG-400* module is recommended for THz signal amplification, *DCHV* module for DC bias up to 120V and *ACHV* for high speed AC modulation up to 50 kHz with ± 50 V peak amplitude.

Specifications (ATS-LM-S-12-PM1550-FC/APC)

Optical Delay	0 - 150ps (Double pass by default)
Optical Delay Resolution	0.4 μ m or 1.4 fs (calculated from encoder counts)
Optical damage power	300 mW (Ultrashort pulse laser)
Insertion loss	< 3dB (typical 2dB)
Internal fiber length & optical path ¹	30 mm (Standard fiber) + 9 cm (air) + Stroke length (air)
Power in	24 VDC 2.0A
¹ Control	Integrated controller with CAN bus communication
² Dimensions	142 mm \times 106 mm \times 36 mm

Notes:

¹The length measurement have an error $\pm 10\%$.

²The drivers are integrated in the optical module.

³The dimensions exclude the optical and electrical connectors.

Product Code

Please contact us for the availability if your needs are beyond the listed terms

ATS	-XXXX	-XXXX	-XXXX	-XXXX
↓	↓	↓	↓	↓
A product of Advanced THz Systems	LM-S	Stroke: 12 mm	Fiber Type: PM1550 Other fiber type available upon requests	Connector type: FC/APC FC/PC LC/UPC

Caution!

- Precision instruments, handle with extra caution.
- Usage and storage out of controlled environment leads to lower performance.
- Disassemble the module with lead to the warranty void immediately.

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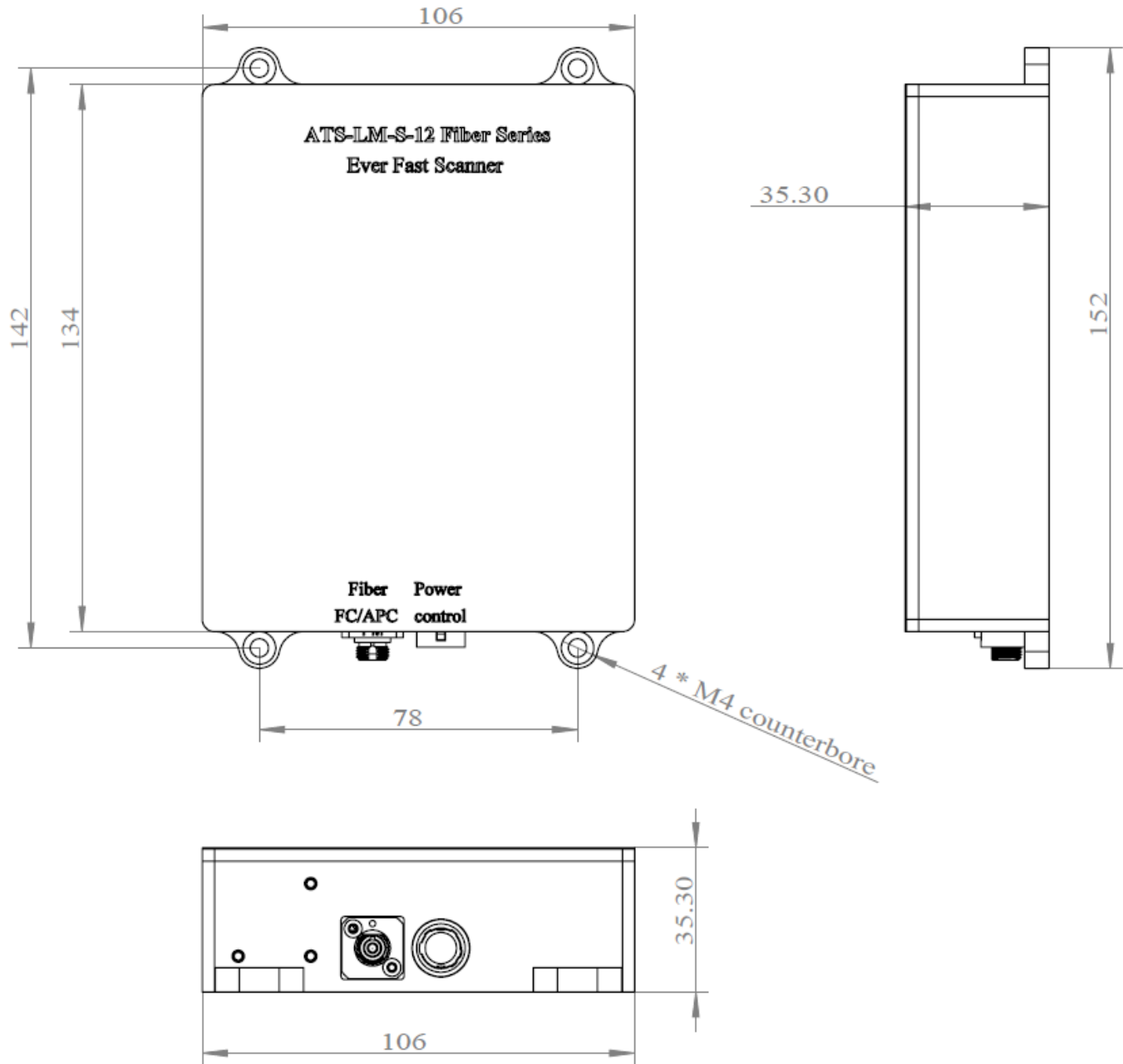
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3D drawing of the Fiber coupled long range delay line

All the dimensions are in mm.



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