INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai 400076.

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Distributed Acoustic Sensor

DAS-MG Interrogator with Accessories

Salient Features:

- DAS-MG interrogator is based on highly phase-sensitive balanced interferometric detection.
- The measurement technique used on DAS interrogator is based on highly phase-sensitive balanced interferometric detection - removing the effect of phase noise, each pulse interferes with an exact delayed copy of itself - that can achieve an ultimate shot-noise (due to random fluctuations in electric current) performance down to picostrain per sqrt Hz.
- DAS is capable of being triggered from an external Source controller by a conventional rising edge. TTL pulse (3.5V-5V) with a minimum length of 30 nanoseconds.
- The internal clock is TCXO-based and is accurate to 1ppm. Maintain clock accuracy continuously to within order of ns.
- The DAS unit is equipped with PCIe Gen2 x4 specification internal storage. This specification allows for high-speed higher than 1200MB/s w/r capability with 3.72TB usable storage, with a maximum data capacity of 400MB/s over 10GbE (short range).

Sr. No	Parameters	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1.	**Measurement Technology**	Phase coherent distributed acoustic sensor with linear amplitude and phase response		
2.	**Optical architecture**	Balanced interferometric phase detection to achieve the ultimate shot-noise performance down to pico-metre resolution		
3.	**Sampling Frequency (sampling rate)**	400Hz - 100kHz depending on the fibre length		
4.	**Power consumption**	Typically, 210 - 220W		
5.	**Fibre compatibility**	Standard single mode (SM) and multimode (MM) optical fibre using E2000/APC connector		

6.	**In-built Triggering**	PXI Trigger Input, SMB Jack		
7.	**Max data capacity**	400MB/s over 10GbE (short range)		
8.	**Internal data storage**	At least 3-4TB usable storage		
9.	**Sample spacing (spatial sampling)**	25 cm to 32 m (40,000 samples maximum)		
10.	**Finest Spatial Resolution**	1 m		
11.	**Frequency Range:**	0.001 Hz to 50 kHz		
12.	**Self-noise (Noise floor)**	~2 pε per sqrt Hz @ 1 kHZ @ 10m GL		
13.	**Dynamic Range @ 10 Hz [dB power]**	120 dB @ 10Hz for 1s FFT		
14.	**Interrogation range**	40-50 km		
15.	**Gauge length**	3m, 5m, 10m ,30m software selectable gauge length		
16.	**Power requirements**	100-240 VAC		
17.	**Physical dimensions**	Portable - rack mounted, 178mm x 444mm x 518mm (H x W x D) (without feet)		
18.	**Laser Product Category**	Class 1		
19.	**In-built synchronization**	GPS Antenna Input SMB, Synchronisation Clock Output SMB		
20.	**Power connection** **Ethernet connection** **USB connection** **Display**	1 x IEC 60320-1 C20 inlet 2 x 1 GbE RJ45 port 2 x USB 3.0 port and 4 x USB 2.0 port 2 x DisplayPort		
21.	**Operating Environment**	Windows/LINUX		

22.	**Antivibration table**	For optimum performance, the unit should be placed on a negative-stiffness vibration isolation platform (weight < 50 kg) to minimize noise. The platform's dimensions must be compatible with the DAS-MG.		
23.	**Data Storage**	RAID-External data storage (72TB) compatible with the DAS-MG.		
24.	**GPS kit**	standard GPS antennae; RS PRO Black Male SMB to Male SMB RG174 Coaxial Cables, 50 Ω; N Plug-BNC Jack adaptors and BNC Jack - SMB Jack adaptors		
25.	**Optical Switch**	8 channel, DAS-MG support for parallel data acquisition		
26.	**E2000/APC (2 units)**	Standard optical connector compatible with the DAS-MG.		
27.	**Transport cases for DAS-MG, RAID and Antivibration table**	Military-type ruggedized pelican cases		
28.	**FO cable multi connector (optional)**	4 FO cable same time data acquisition compatible with the DAS-MG.		
29.	**Warranty and support**	3-years on-site warranty by OEM/Bidder for technical problems and must be available within a week. Physical on-site warranty services including visits by technical experts of Bidder or OEM for maintenance and technical support whenever needed. Software Support free of cost (directly from OEM with updates and upgrades.)		
30.	**Additional terms and conditions**	• All components like cables, connectors, etc. for integration of the storage solution should be included in the quotation. • **Training session, Maintenance and Support and Software must be included in the cost and support all module should not be limited access.** • **Management/Monitoring Interface:** Browser based management GUI, should have management tool to monitor status, health of the DAS-MG system, like Performance, Network Connection, controller health, data quality and data		

		acquisition. • **Performance Benchmark:** Benchmark report for desired and configuration must be generated as per need. • Installation & commissioning should be free of cost at IIT-Bombay. The vendors are required to give an estimate of the time required for installation, fine-tuning of the cluster and hand-holding principal users in the technical bid. The vendor shall be responsible for setting up of DAS-MG free of cost. It will be required by the vendor to install or pre-install supporting libraries/software.		
31.		The bidder must provide at least three feedback reports from past users of the DAS-MG relevant to our applications, particularly in Ambient Noise Tomography, Earthquake Monitoring, and CCUS studies. Examples/References of local, regional, and teleseismic earthquake records obtained using the DAS-MG should also be included. Given that the instrument has multiple multi-geotechnical applications, it is essential to ensure that the quoted system is suitable for our specific needs. The technical committee may ask bidder to be prepared to demonstrate the instrument during the technical review process within one week of request and/or must also provide evidence of the DAS-MG's capabilities through peer-reviewed publications and dataset**.** Delaying the process will cancel the bidder tender.		
32.		OEM/bidder must not be debarred or blacklisted or stopped from supplying equipment to any govt organization in the past 5 years.		
33.		The vendor must submit a table indicating the compliance of the features of the model of the components being quoted with those given in the indent.		
34.		Bidder Should have Local sales with expertise & support office in India at least from last 5 years. Documentary evidence should be submitted.		
35.		Bidder should have the required expertise of installing various frameworks and bidder will have to install all the applications needed by the user department. Self-declaration in this regard needs to be submitted by the bidder.		

36.		If any feature not mentioned/left over in the technical bid by the bidder, the same will be presumed to be absent without any further references to the bidder/vendor. No further discussion with the bidder can be entertained.		
37.		All the quoted technical features must be demonstrated after installation with quoted precision.		
38.		Equipment Model and make to be mentioned; brochures must be provided along with the technical bid.		
39.		Bidder is requested to quote for all the items. Institute reserves the right to omit any item from the final purchase order.		
40.		If more than one bidder happens to quote the same lowest price, IIT BOMBAY reserves the right to award the contract to more than one bidder or any bidder.		
41.		The IIT BOMBAY reserves the right to cancel the tender without providing any explanation.		
42.	**Salient points for compliance**	The supplier must submit a table indicating the compliance of the features of the model of the equipment being quoted with those given in the indent.		
43.		Features not matching – must be clearly indicated with reason.		
44.		Photo, dimension and weight of each item must be included in technical details.		
45.		Additional features and features in the quoted equipment which are better than those in the tender – may be clearly explained.		
46.		The supplier must submit technical brochures and proper application notes adequately.		
47.		Explaining and confirming the availability of the features in the model of the equipment being quoted.		
48.		Compliance statement needs to be provided by vendors clearly specifying COMPLY/DO NOT COMPLY for all items with REMARKS.		