MONITORING TEST MEASUREMENTS DATA MANAGEMENTS ASSISTANCE SUPPLY

VIBRATIONAL MONITORING SYSTEM







SYSTEM DESCRIPTION

The FIELD Vibrometric system allows the registration, analysis and interpretation of phenomena related to the propagation of vibration waves on several typologies of structures in civil industrial field and on infrastructures as motorways, railway systems, bridges and viaducts. This system could be applied also during the use of explosives, during buildings demolition and for subterranean excavation works for tunnels and mines. The Vibrometric system is composed by triaxal sensors (VSF15) housed in IP66 steel boxes, with a frequency range from 1,5 to 80 Hz (in agreement with regulations UNI 9614 and DIN 4150/3) and by a datalogger (DDR15), housed inside a polycarbonate or stainless steel case, equipped with a Dual Core Intel 18GHz processor and DDR3 800MHz, 2GB SDRM memory. This memory allows to acquire and store all the different aspects of the wave signal (max-min peaks, also for months without any data download) The high calculation capacity and versatility of this system allow in any moment all the analysis in time and frequency domains. In addition, they allow the evaluations on the wave damping and permit to apply the most correct typologies of filter to "clean" the signal as buttherworth, chebyshev and inverted chebyshev, elliptic etc filters. The system allows both the fixed and the portable applications. This system is easy to install thanks to dowels, regulation through three screws that allow an effective alignment of the sensor. It has also been designed to be modified, implemented and reconfigured during the use, making this system completely adaptable to the necessities in site.

Moreover, the system is protected from hazard shock both at the level of the Data Logger that on the sensors.











SOFTWARE and DATA ANALYSIS

The management and analysis software allows:

- channels configuration;
- to activate and deactivate the registration;
- the configuration of the acquisition times pre and post trigger;
- to visualize in real time the values;
- to do manual registrations.

In addition, it is possible to set up programmable filters to limit the analysis in frequency only to significant spectrums. The user could configure the interesting frequency band and delete all the other components in frequency. These could return values that are altered with respect to the frequencies of the viaduct. It could also be defined how to delete the "unwanted" components in frequency, defining the filter to apply.









The Vibrometric monitoring system completely integrates within WMS Software Platform for the validation, processing, conversion, management and automatic visualization of data.

The signals of the acquired instruments, through F/O - LAN - GPRS - Radio - Satellite connection are sent to a server, integrating them within a SQL type database.

Data are subjected to a first automatic validation to delete potential reading peaks and/or abnormal readings. Then, these are converted in the opportune engineering units. Through an application and a web connection, data are made available for the client, both in graphic and in tabular format (.xlsx). This way, the system could be completely automatic and updated in real time 24h/365 days a year.



Services For Geotechnical Engineering

ARCHITECTURE

In case of a complex monitoring, the system is designed to be divided into units MASTER and units SLAVE, with the peculiarity to have in one single field several datalogger to which sensors are connected (SLAVE) and only one intelligent unit (MA-STER) able to communicate with the remote server/PC.

This particular configuration allows to optimize the whole architecture of the vibrometric monitoring system, through LAN or WLAN connection between the different components of the system



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		06/05/28/3 (3/250)	40752	0.0627	4079	6.0870	4,2585	00514	0.0354	0.029	-0.0444	0.7518	0.0453
		06/05/28(3 13/00)	-61996	0.0949	-6.0707	0.0548	-0.0525	0.0%	-0.0348	004	-04562	6/2577	-0.0466
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		06/05/28/5 (3/5502	-0.0909	0.0548	-0.0689	0.0634	-0.0429	0.0527	-0.0346	00136	-0.0169	6.0125	-0.617
		06/05/2815 140502	40525	0.0985	-0.0648	0.0505	402505	0.0679	-04282	00342	-0.1306	63258	-0.0465
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		05/05/28/3 14/062	-60125	0.0942	-0.2019	0.0279	-0.0108	0677	-04528	00289	-0.0450	0.01299	-0.0550
		06/05/28/2 14/2022	-6.0420	0.0777	-0.2177	0.1940	-0.0400	0.077	-0.0658	00142	-0.0686	6.0172	-0.0150
		06/05/2815 (5/0042	4083	0.0694	-0.0617	84756	40621	0.0479	06295	00349	0.0503	62154	-0.0430
		06/05/28/2 25 25 00	40132	0.0949	412087	0.2252	42552	043944	085	0629	0.089	0.2396	-0.0489
- Andrew		06/05/28/3 (520/0	4051	0.0540	-0.068	0.0703	4.0850	0.0518	-04018	0.0712	-0.0794	61131	-0.0544
		96-15-28(3 (5-804)	40734	0.0001	-0.0658	0.094	40452	0.01(3	-08154	0.0322	-0.038	62199	-0.0640
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Model	VSF15 - 4,5	VSF15 - 1,6					
Number of axis	"3 orthogonal axis X,Y,Z (2D or 1D Optional)"						
Frequency range	4,5 - 80 Hz	1,5 - 80 Hz					
Sensors	Geophones						
Reel displacement	2,5 mm (P-P)						
Measuring range	±15,0 mm/s @15 Hz						
Sensitivity	33,3 V/mm/s OPP.Ure 333 V/mm/s						
Linearity	±0.5 dB						
Power Supply	13-20 VDC galvanically isolated						
Output Impedance	< 100 Ω						
Consumption	~ 600 mW						
Operating Temperature	-20°C + 60°C						
Output	±5V F.S. isolated from power supply						
Box	Allumium						
Protection	IP66						
Dimensions	105 x 150 x 95 mm						
Connection	cable with cable gland						

DATALOGGER



TECHNICAL	CHAR	ACTERISTICS
Computer Dual Core 1.8 GHz	 Du. Me 2G 8 L 3 F 1 in Eth 3 ir 8 l/ Poi 	al Core Intel 1.8GHz processor mory DDR3 800MHz B SDRAM ISB input, S232 input, nput RS232/422/485,2 input LAN ernet put SATA 3Gb/s O digital (4 input/4 output) wer supply 12VDC +/-5% 1.7A
Acquisition card IO-TECH daqboard 3005usb/3035usb	 16 (30) 24 Co. thra Alir Op Acc 10 ana 16 No. Pre 0.0 	acquisition channels single ended 35USB: 64 singles ended channles) ports digital input/output ntrol and acquisition of computer ough serial interfaceUSB 2 mentation 6/16 VDC - 2 W erating field -30/70°C quisition speed 1Ms/channel Mohm of input impedence and alogical inputs bit resolution n linearity error +/-2 LSB max ecision +/-0.031% and reading +/- 08% f.s.
Router wireless netbox NB1600	 UN 2 E 1 L 1 s 4 l/ Anti Point Ter 	ITS/GSM/2G/3G ithernet ports ISB input erial input RS232 O (2 inputs and 2 outputs) ienna connector SMA female wer supply 12/48V DC 5W nperature -25°C/70°C



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