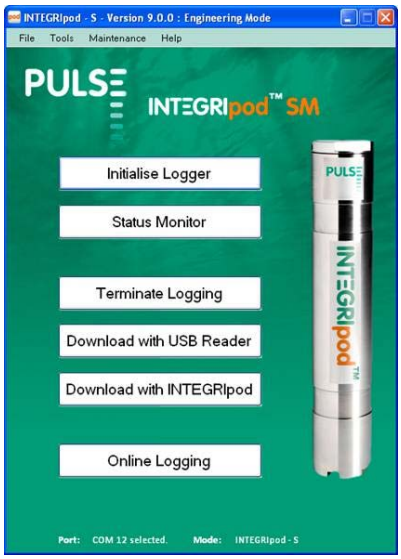
PULSE Structural Monitoring

INTEGRIpod™ SM

Stand-alone Motion Data Logger

Stand-alone motion data logger

Data logger installed on BOP frame



Software to initialise the data logger

INTEGRIpod™ SM is a stand-alone device that measures motion of structures. The device measures dynamic response and stores data on its on-board memory. Data is downloaded into to a computer for subsequent post data processing. The device measures 6DOF motion using:

- Tri axial accelerometers
- Tri plane angular rate sensors

From the measurements, various other parameters can be derived:

- Linear displacement
- Acceleration due to motion
- Inclination variations
- Harmonics

Typical applications are:

- Riser VIV monitoring
- BOP motion and displacement monitoring
- Subsea structures vibration monitoring
- Platform motion monitoring

A Pulse proprietary data viewing software called INTEGRIview™ is also supplied with the device for users to view the collected data in time domain; the software shows statistical data history and allows post processing data. A dedicated kit including laptop pre-installed with software, memory card reader and cables are provided with this device.

DEPLOYMENT OF LOGGERS

The data logger contains all electronics, batteries and sensors enclosed in a rugged subsea casing. After initialization using a computer, loggers can be deployed to the designated locations. This may simply involve strapping directly to the structure using bands or design of tailor-made interfaces to suit (available for diver or ROV operation for subsea use).

MOUNTING METHOD

- Strapped using suitable bands
- Retrofit diver and ROV friendly cradles or magnetic holder

ANALOGUE SIGNAL INPUTS

• Number of inputs channels	2, 4, 6 or 8
• Input range	0 – 2.5V
• Resolution	12bit ADC

DOWNLOADED DATA FILES

- Excel compatible time stamp files
- Raw voltages for all sensors inputs

MAXIMUM LOGGING PERIODS (EXAMPLES)

• Continuous logging @ 10Hz	23 days
• 10 minutes logging every 0.5 hours @10Hz	48 days
• 10 minutes logging every 2 hours @10Hz	81 days

SPECIFICATION

Tri-axial accelerometers

Sensor direction	X, Y and Z
Range	± 1.2*g*
Cut-off response	4.7 Hz
Dynamic acceleration measurement accuracy	± 3.0% of measured acceleration or ± 2m*g* (whichever is greater)
RMS Noise	< 1m*g* RMS@10sec
Sensor calibration	Use static gravity @ 20º C *g*= 9.812m/s^2 (London, UK)

Tri-plane angular rate sensors

Sensing direction	X-Z, Y-Z and X-Y
Range	± 4 deg/s
Cut-off response	4.7 Hz
Angular rate measurement accuracy	± 3.5% of measured angular rate or ± 0.05 deg/s (whichever is greater)
Noise	< 0.01deg/s RMS @ 10sec
Sensor calibration	Use a motion simulation rig (@ 3 & 6 RPM speed @ 20º C)

Logging program

Frequency [Hz]	2, 5,10,15,30,60,150
Logging mode	Continuous and intermittent
Log on period [min]	5,10,15,20 and 30 (for intermittent)
Cycle period [hour]	0.5,1, 1.5, 2, 2.5, 3, 4 (for intermittent)

Communication port

Port	1 x RS232 port
Connection method	Standard RS232/USB cable

On-board memory

Memory media	512 Mb memory (Flash memory)

Software

Operating system	Windows 7 and all previous versions
Functions	- Diagnostic check of loggers - Initialise loggers - Download data from loggers - On-line logging - Battery/memory life calculation - Data processing (Statistics, FFT)

Power supply

Batteries	2 D-size 3.7V lithium batteries
Battery capacity	>12.5Ah @ 7.4V nominal
Current during logging	< 23 mA
Current during standby	< 5 mA

Casing

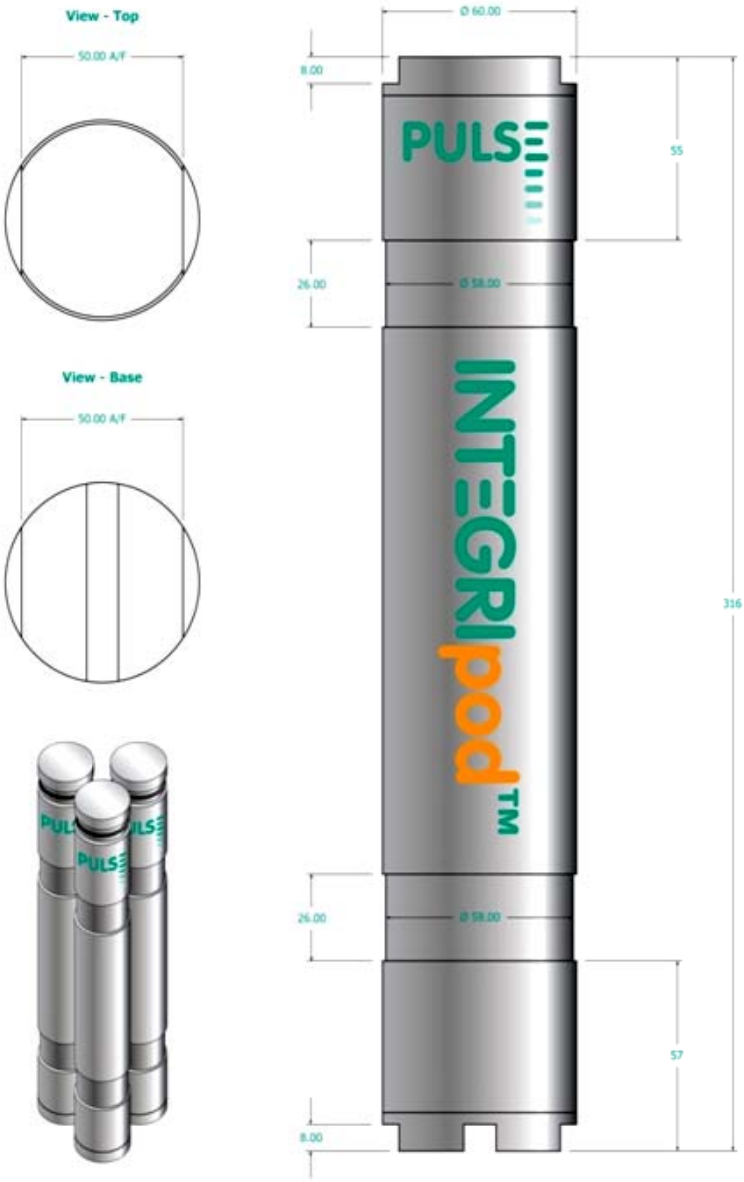
Material	Superduplex stainless steel
Size [mm]	60 diameter x 316 length
Weight in air	3.5kg (with batteries)
Weight in water	2.0kg (with batteries)
Direction of X Axis	Polarisation slot on base

Environmental

Operating	2º C to 30º C
Storage	-5º C to 50º C
Pressure rating	3,000 m water depth
Seals	3 'O-rings' on cap

DIMENSIONS

(all in mm)



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