WoodWatch

Product Code	*WW01-xxx.xxx**
Series	*WoodWatch*

Typical Applications
° Wood monitoring
° Building, monitoring and control

Instrument
Dimensions: 72 x 180 x 38 mm
Weight: 500g
Power Supply: Mains powered (G210-9VDC power supply)
Battery Life: No battery fitted
Case Materials: Anodise aluminium
Operating Temperature Range: -20 +50°C
Memory Capacity: 50,000

Sensors
Sensor: AE Sensor
Range: 1 kHz – 1 MHz
Accuracy: +/-1%
Resolution: 1uV

Radio – as per RL4000 range
Radio Power: 10mW
Radio Range: 3kM

**Radio Frequency: standard range 434 MHz*

Physical structures, including buildings & other structures, are in a constant state of decay and require regular monitoring to ensure safety. In the particular case of wooden structures, internal stresses are considered to be one of the main factors which contribute to their deterioration. Physical changes in objects, and hence damage, are induced by various factors in their environment such as variations in temperature and relative humidity (RH). In order to manage and control the changing conditions preventative conservation techniques can beneficially be applied.

Acoustic emission (AE) is defined as sound waves released due to micro-damage in a material undergoing deformation, these sounds cover a frequency range which extends far beyond human hearing capabilities.

WoodWatch has been designed specifically with AE functionality and is a non-destructive tool to indicate the risk of mechanical damage to wooden structures, at sites and during transportation.

Energy released by micro-damage events passes through the material as ultrasound waves, and is detected at the surface using a wide band acoustic detector. This sensor utilises the piezoelectric effect whereby electric potential is generated from applied mechanical stress.

The resulting electrical signal is divided into two paths; a high frequency (HF) band resulting from the process of crack formation, and a low frequency (LF) band, which often relates to external environmental noises and events. Damage is detected when HF energy is detected with no LF energy present at the same time.

Data is continually collected from the WoodWatch acoustic detector and a processed measurement periodically logged or transmitted via radio. The cumulative energy over a period is a measure of the total energy emitted by damage events providing a non-intrusive method of assessing actual deterioration in real-time.

Accompanying software for WoodWatch enables users to view various graphs detailing AE, RH and temperature levels and hence to investigate and understand the relationships between these variables.

The acoustic emission sensor is a major step forward in a simple and objective measurement of physical damage for a broad range of materials and deterioration mechanisms. It has considerable potential of becoming an innovative 'problem solver' in the vast field of the preventative conservation.

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