TW-231S
Long Stroke Digital Wire Extensometer

General Description

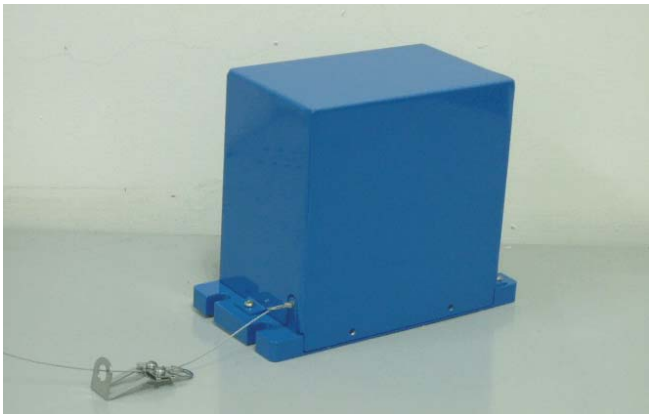
The **Long Stroke Digital Wire Extensometer TW-231S**, also named as Digital Cable-Extension Position Transducer, is designed for geo-deformation monitoring especially for landslide and debris flow.

Wire Extensometer TW-231S allows to monitor the stroke distance changes between an anchor and the transducer located up to 30m apart. It can be used for monitoring large movement, sudden variation and precision deformation. The flexible steel cable of TW-231S is driven by a constant torque spring and guided on rollers so that the displacement can be measured with high linearity. In addition, the soft retraction can help prevent damage from sudden loosing of the cable.

TW-231S functions as an absolute position counter is operated by a CMOS module and a multi-polar magnetic disk which excites onboard dual reed switches. The 16-bit value captured from the counter can be read out through the serial output port. An extra pulse will be generated from each change state of reed switches when the magnetic disk rotationally driven by the extension cable attached to the monitoring object or an anchor. It will trigger/awaken the connected transmitter for event mode data acquisition or real time warning. When no displacement occurs, TW-231S consumes little power and the transmitter can stay in the standby state.

With digital sensing and event-triggering function, no care must be taken to filter noise and cyclic fluctuations, which is inevitable for analog sensors so that the measurement of TW-231S is more precise and ensures an evolutional upgrade comparing to conventional analog displacement transducer. The magnetic excited CMOS counter using a lithium cell on the module board is another cost-effective upgrade comparing to conventional absolute encoder based CET.

TW-231S is commonly connected to a wireless transmitter to be deployed at various locations, the displacement data derived from cable in extension can be interpreted as various degrees of slope failure clearly. Actual landslide event can be triggered by pulse signal to transmitter for disaster warning. Battery powered wireless transmission is easy for installation and can achieve maximum safety from lightening damage.



Features

1. Digital sensing, no need of analog-to-digital conversion; no care must be taken to avoid noise and cyclic fluctuations. Precise parameter for warning threshold can be obtained.
2. Absolute position value with pulse output help precision data acquisition and provide real-time and event-triggered warning.
3. Long stroke up to 400cm with 1mm resolution, both amount and rate of movement can be interpreted as various deformation conditions.
4. Constant tension and soft retraction help flexible applications and non-damage cable retracting operation.

Specifications

Measuring range	400cm
Resolution	1 mm (0.025% F.S.)
Accuracy	± 0.1 % F.S.± 1 mm
Value output	4 wires serial TWS Protocol
Pulse signal	Open collector pulse for every 1mm increment / decrement
Power Consumption	50 μA standby current; 200μA transmission current
Measuring Cable	0.9mm dia. stainless steel
Cable extension	1.6kg(57oz), constant
Working Temperature	-20℃ to 60℃
Body Size	190 mm x 130 mm x 190 mm

Applications

Debris flow warning
Landslide Monitoring
Rock-fall Warning
Roadway slope Monitoring
Settlement monitoring