



## OVERVIEW

Escalators have to be available 24 hours a day, 7 days a week. The consequences of a failure in high traffic systems are punitive, often financially as well as in transport disruption.

Manufacturers offer extensive maintenance regimes to minimise the risk of failure, with teams of engineers deployed to service escalators in situ, often working at night.

Transmission Dynamics has developed the Smart Step in-service data logging system that monitors and automatically reports potentially damaging events from the escalator to the operator during routine operation.

The Smart Step is now deployed in critical transport systems in the UK, reducing the incidence of escalator downtime and streamlining underground maintenance regimes. Continuous development has resulted in an extremely reliable system, proven over many years of service in demanding environments.

## GENERAL

The system consists of a data logger equipped with wireless communication and battery pack, fitted to a standard escalator step. The device has sufficient battery power to provide at least one year of operation between battery changes, and operates autonomously, alerting the user in case of any instances of abnormal operation.



The Smart Step monitors the operating parameters of the entire escalator, including stress levels, detecting for most common abnormalities such as instances of drive chain imbalance, excessive dynamic loads, misalignment, stick-slip motion etc.

Alarm level thresholds can be programmed by the user, and the system trends all data for quality control and documentation.



Quality Management System  
ISO 9001:2000  
Cert. No. 172 618255

- machine dynamics, NVH, failure analysis, fatigue/accelerated life testing
- specialised instrumentation, data acquisition and analysis
- rotating machinery design and troubleshooting:  
gearboxes, shafts, bearings, couplings, belts and chains

Company registered in England No. 3284935 VAT Reg No. GB 660 2407 64

## Transmission Dynamics

Unit 4, Arcot Court,  
Nelson Ind. Estate, Cramlington,  
Northumberland, NE23 1BB, UK

T +44 (0) 191 58 000 58

E support@jrdltd.com

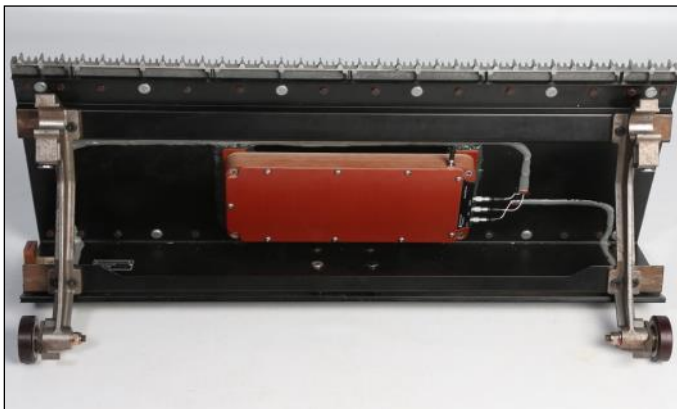
www.jrdltd.com

**FUNCTIONALITY**

During operation the Smart Step continuously acquires data from the strain gauges mounted in critical locations around the step.

In normal operation, this data is polled on a regular basis, and can be used to monitor the long-term trending of chain/component wear, structural deformation, foundation movement and other faults across the system.

If the user-defined alarm levels are exceeded, the Smart Step immediately establishes a wireless connection to the operator’s network via the internet to deploy a report. The system can be configured to alert designated recipients (e.g. field-based maintenance staff) immediately after the occurrence of critical events.



According to the severity of the event, the operator may plan off-cycle maintenance, or stipulate an immediate intervention to avoid rush-hour disruption.

**OPERATION**

A wireless link provides continuous, reliable communication between the Smart Step and internet-enabled receiver, with no need to stop the escalator. If internet is available in the control room, data download can be handled from the convenience of the office environment. Alternatively, maintenance engineers equipped with a wireless transceiver can interrogate the system locally.

***“The Smart Step has been extensively used to monitor escalator performance over the past few years, and has helped to identify multiple problems which were swiftly rectified.”***



Following installation, the escalator is benchmarked by acquiring typical time-domain traces corresponding to normal operation of a full escalator cycle.

Any deviation from the normal escalator behaviour can be easily detected, which provides a powerful tool for long-term condition monitoring and fault diagnostics.

**COMPANY PROFILE**

Transmission Dynamics have developed a comprehensive range of advanced instrumentation, allowing measurement of strain, temperature and acceleration in demanding industrial applications.

We provide a range of our own telemetry instrumentation products, which are used by blue-chip technology clients across the globe. Our in-service unattended data loggers are deployed in many critical applications, including 5 MW+ wind turbine gearboxes, mining, marine, defence, automotive and rail applications.