

PORTABLE ELECTRONIC STRAIGHTNESS MEASURER

MODEL RECTIRAIL-DL2

The **Portable Electronic Straightness Measuring Tool, model RectiRail-DL2** is a simple-to-use non-contact instrument designed to measure the rail geometry (running surface, sides and corners at 45°, i.e. all the rail head profile).

The tool has been designed specifically to meet the needs for rail straightness control. It permits the operator to check and identify corrugation, straightness, parallelism and perpendicularity of welds, to check rail end sections. RectiRail-DL2 is the latest generation of straightness measuring instruments used and by operators all over the world, **for over 15 years**.

Its' highly accurate system is designed to simplify the measuring process, ensure the exactness, and guarantee excellent repeatability and reproducibility. This equipment presents all necessary qualities for quick and user-friendly usage, **due to its accompanying wireless Android GPS-enabled rugged Smartphone/PDA**. RectiRail-DL2 is ergonomically designed with a joystick and two buttons allowing to be used with gloves (**redesigned handles for higher ergonomy with PDA support**).

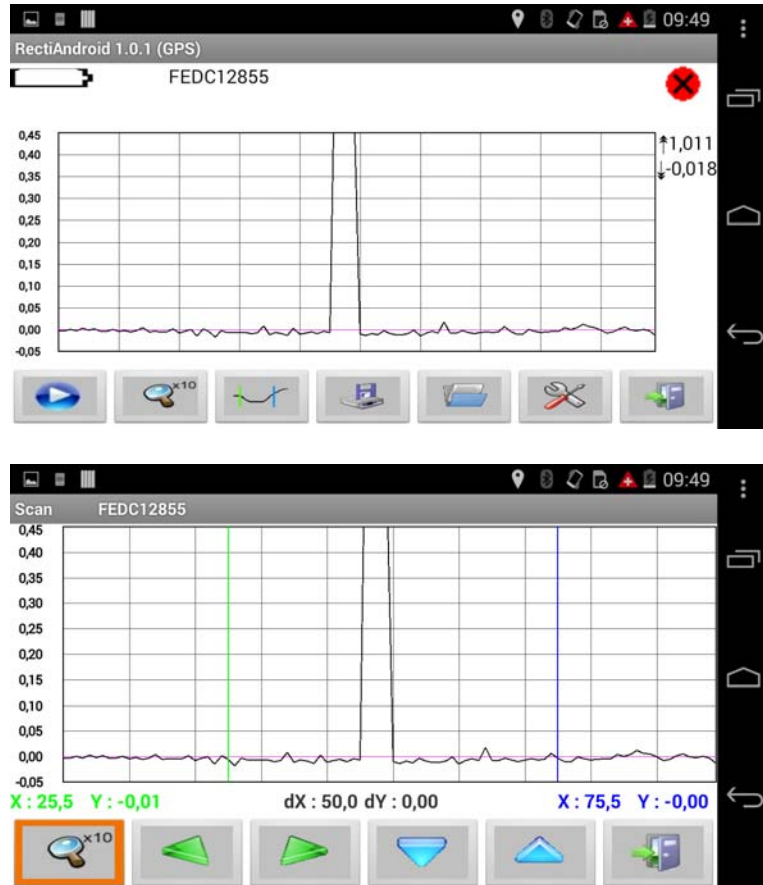


1. DESCRIPTION AND OPERATION

Description:

Portable and self-contained, the RectiRail-DL2 can be used both in the field and in fixed plant environments using its rechargeable battery. An array of non-contact measuring transducers ensures highly accurate and repeatable measurements every time. The measuring process is initiated by engaging a simple button and within a few seconds the recording is displayed on the screen of the Smartphone/PDA. Depending on its orientation, straightness measurements can be taken on:

- Railhead crown (vertical alignment) including curved lines;
- Railhead running gauge (horizontal alignment) including curved lines;
- Gauge corner on curved lines.



Once positioned on the conductive rail, the RectiRail-DL2 is held in place by means of two magnetic pins. This ensures that the instrument is correctly placed and held stable during the measuring process (measuring without any movement and any part in movement allows excellent repeatability and reproducibility).

The equipment is particularly well protected from electromagnetic perturbations (conforms to standard EN 50121/4 – March 1998 which includes insulation tests). It is also particularly robust thanks its metallic profile structure.

RectiRail-DL2 can be used to measure the alignment of joints on plant or Themit welds on 110RE-141AB and including girder rails.

Operation:

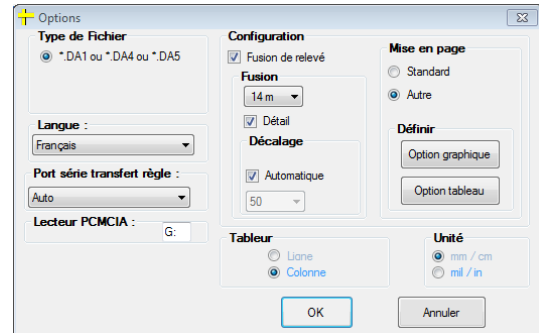
Operation of RectiRail-DL2 is user-friendly based on two buttons and a joystick on the body, accessible from both extremity handles at a fingers reach. It is never needed to set down the gauge to enter information, as everything can be done from the Smartphone/PDA. Smartphone/PDA can clip/fasten on the handle in the middle and swivel for higher comfort and visibility.

1. DESCRIPTION AND OPERATION (Cont'd)

The measuring is carried out by capacitive sensors: each gives a response directly related to the distance to the rail, knowing the real rail location with precision. Results are displayed on the wireless linked Smartphone/PDA, in graphical form, shortly after the measuring process is complete, they can be saved with date, hours, named, and information relating to the shape and amplitude of the fault can easily be interpreted.

Traces analysis:

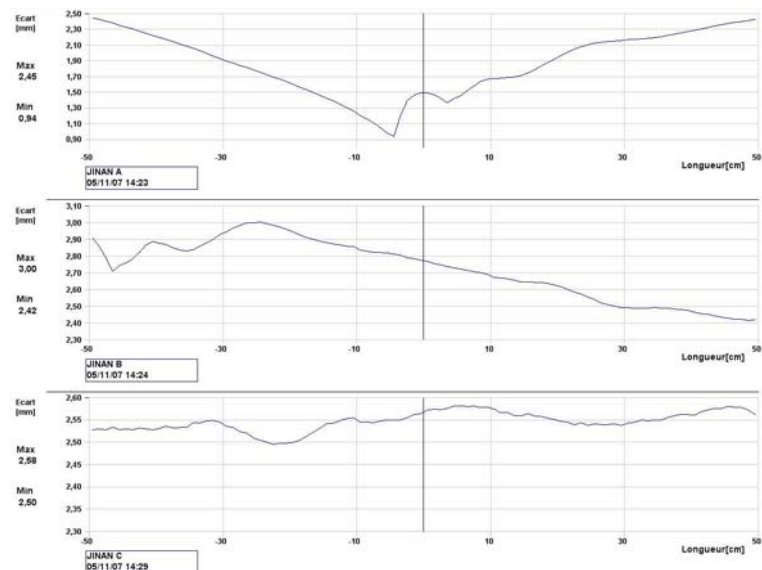
It is also possible to visualize traces which are archived in the Smartphone/PDA. The available traces list is given to the operator for this purpose. The integrated standard link of the Smartphone/PDA data can be transferred to a PC (through standard connections Smartphone/PDA-PC: USB cable, SD-card...) for a later processing.



The instruments configuration is user-selectable, thus allowing the operator to set options such as language and other parameters.

The RectiRail-DL2 is supplied with standard RECTIPC Windows based software to allow for detailed analysis of the measurements on a desktop PC (see picture below). RECTIPC is totally compatible with previous generation gauges, such as RectiWay and RectiRail(-DL). Measurements can be displayed and/or printed in a wide variety of formats or simply archived for future analysis.

The software also enables the user to select desired language, to set-up different display modes of traces, to export measurements as .CSV files (for Excel process or any other Windows-base software...).



RectiRail-DL2 is supplied along with Smartphone/PDA enabling operators to work data acquired with Unicode characters (Chinese, Cyrillic, ...). On this unit, data can be identified (name of railway line, measuring location, **GPS location**, mile posts, left/right rail, weld identifier, measuring date...). From Smartphone/PDA, data can be uploaded to a PC on which the full RectiPC processing software runs and allows a better visualization.

For instances where straightedge references in excess of 1 meter are required, RECTIPC provides a method of overlapping multiple recordings. Automatic synchronization of the individual recordings is achieved by means of software correlation techniques (from 1.5 meter up to 14 meters). Results can also be printed.

1. DESCRIPTION AND OPERATION (Cont'd)

In order to compare two readings of the same rail section done at different times they can be superimposed. The first recording is taken as it is, while the second one is appearing superimposed. Exposing the abscissa of one in relation to the other, the operator can search the maximum of coherent points between the two recordings.

The RectiPC software and the Smartphone/PDA software (RectiPDA) enables the user to correct rail profiles according to the curvature of the track.

Accessories supplied with RectiRail-DL2 (see casing on the picture):

The RectiRail-DL2 is supplied with:

- 1 Smartphone/PDA and its accessories;
- 1 RECTIPC Windows based PC data transfer/analysis software;
- 1 RectiRail charger;
- 1 operating manual;
- 1 protective box (see picture on the right).



2. TECHNICAL DATA

RectiRail-DL2:

– Measuring length:	1 000 mm
– Number of transducers:	100 (with polycarbonate protection)
– Measuring range:	5 mm (-2.5/+2.5)
– Resolution:	2.5 µm
– Accuracy:	±12.5 µm
– Measured target area:	12 mm diameter
– Measuring time:	≈ 4 seconds
– Memory capacity:	> 25 000 measurements
– Linearity error:	insignificant
– Measuring points:	running surface, sides 14 mm below running surface, and corners
– Environmental (except Smartphone/PDA):	IP55
– Humidity:	90 %
– Autonomy of the gauge (status of battery on the Smartphone/PDA screen):	> 650 measurements
– Use temperature:	
Ambiant air:	from 0 to 35 °C
On rail:	from 0 to 50 °C

2. TECHNICAL DATA (cont'd)

RectiRail-DL2 (cont'd):

- Dimensions (RectiRail):
 - Length: $\approx 1\,160$ mm
 - Width: ≈ 95 mm
 - Height: ≈ 160 mm
- Mass (*with cells in working order*): ≤ 5 kg

Smartphone / PDA

- Operating system: Android (4.4) KitKat
- Processor: 1 GHz (double core)
- Capacitive touch screen: 4 inches (*virtual keyboard*)
- Screen resolution: 800 x 480 pixels
- Battery: 2 000 mA.h
- Internal memory: 4 Gb (DDR3)
- Measuring points memory capacity: 50 000 on Smartphone/PDA
- RAM: 1 Gb
- Card reader: MicroSD (*not supplied, 32 Gb maximum*)
- Connection: WiFi, BlueTooth
- Operating temperature: from -20 to +55 °C
- Storage temperature: from -40 to +70 °C
- Environmental:
 - Protection rate: IP67
 - Military standard: 810-G
 - Fall test: 1,8 m
- Accessories: shoulder strap, fixation support
- Autonomy: 10 hours (*nominal, without backlit, high capacity battery available as option*)
- Recharging time: 4 hours complete
- Dimensions:
 - Length: 125 mm
 - Width: 69.5 mm
 - Height: 15 mm
- Mass: 0.6 kg

3. ACCESSORIES AND OPTIONS (at extra price)

- **Calibration set, comprising:**
 - 1 calibration rail (accuracy 10 µm) supplied with the manufacturer's calibration certificate
 - 2 calibration wedges (2 mm) supplied with the manufacturer's calibration certificate

*We reserve the right to modify any equipment specification of the present offer to take into account the latest technical improvements and working conditions at the date of manufacturing.
Pictures and drawings may include some options and are not contractual.*