



**SLOVENSKI STANDARD**  
**oSIST prEN 13848-4:2010**  
**01-julij-2010**

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**Železniške naprave - Zgornji ustroj - Kakovost tirne geometrije - 4. del: Merilni sistemi - Ročne in lahke naprave**

Railway applications - Track - Track geometry quality - Part 4: Measuring systems - Manual and lightweight devices

Bahnanwendungen- Oberbau - Qualität der Gleisgeometrie - Teil 4: Messsysteme - Handgeführte und leichte Vorrichtungen

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**ICS:**

93.100

Gradnja železnic

Construction of railways

**oSIST prEN 13848-4:2010**

**en,fr,de**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 13848-4**

April 2010

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ICS

English Version

## Railway applications - Track - Track geometry quality - Part 4: Measuring systems - Manual and lightweight devices

Bahnanwendungen - Oberbau - Geometrische  
Gleislagegüte - Teil 4: Messsysteme - Gleisbau und  
Instandhaltungsmaschinen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 256.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (prEN 13848-4:2010) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

In this European standard, the annexes A and C are normative and the annex B is informative.

This European Standard is one of the series EN 13848 “*Railway applications – Track – Track geometry quality*” as listed below:

- *Part 1: Characterisation of track geometry*
- *Part 2: Measuring systems – Track recording vehicles*
- *Part 3: Measuring systems – Track construction and maintenance machines*
- *Part 4: Measuring systems – Manual and lightweight devices*
- *Part 5: Geometric quality levels*

This document includes a Bibliography.

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## 1 Scope

This part of the European Standard specifies the minimum requirements that shall be met by measuring systems fitted on track recording trolleys and manually operated devices to give an evaluation of track geometry quality when using one or more of the parameters described in EN 13848-1. It sets out the acceptable differences from EN 13848-1 when using track recording trolleys and manually operated devices to measure track geometry.

It applies to all track geometry measuring systems fitted to track recording trolleys and manually operated devices after the date of implementation of this standard.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

EN 13848-1:2003+A1:2008, *Railway applications – Track – Track geometry quality – Part 1: Characterisation of track geometry*

## 3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

**3.1 track geometry measuring trolley (TGMT)**  
trolley designed for measuring one or more track geometry parameters, having the following characteristics:

- self-propelled, hauled or moved by human force;
- portability (capability to be placed readily on or off the track manually or by other means);
- capability of measuring from standstill to the maximum permissible speed of the trolley;
- having wheels which do not load the track as defined in clause 5 of EN 13848-1:2003+A1:2008.

**3.2 manually operated device (MOD)**  
hand tool designed for measuring track gauge and/or cross level at standstill

**3.3 sensor**  
device which detects, measures and translates characteristics of track geometry into quantities that can be used for further data processing

**3.3 measuring direction**  
course between two points on a track, independent of orientation of the TGMT. Between two given points A and B, there are two opposite directions: A to B and B to A

**3.4 orientation**  
physical positioning of a TGMT, with regards to which end of the TGMT is leading or trailing

**prEN 13848-4:2010 (E)****3.5****repeatability**

degree of agreement between the values of successive measurements of the same parameter made under same conditions, within a short period of time, where the individual measurements are carried out on the same section of track using the same measurement and interpretation methods, subject to the following:

- similar speed;
- same measuring direction;
- same TGMT orientation;
- similar environmental conditions.

**3.6****reproducibility**

degree of agreement between the values of successive measurements of the same parameter made under varying conditions, within a short period of time, where the individual measurements are carried out on the same section of track using the same measurement and interpretation methods, subject to one or more of the following:

- variation of speed;
- different measuring directions;
- different TGMT orientations;
- different environmental conditions.

**3.7****validation**

set of tests for determining if the TGMT or MOD complies with the requirements of this standard

**3.8****calibration**

set of procedures for adjusting the TGMT or MOD in order to meet the requirements of this standard

**3.9****event**

record of a track or line-side feature that can be either technical, physical or natural

**3.10****localisation**

information required to locate events and the measured track geometry

**3.11****reference track**

track with known characteristics, to allow adequate testing of the track geometry measuring and recording system

**3.12****transfer function**

refer to Annex A of EN 13848-2

**3.13****resolution**

smallest change in the value of a quantity to be measured which produces a detectable change in the indication of the measuring instrument



### 3.14 uncertainty

Refer to ENV 13005:1999, § 2.3.5

## 4 Symbols and abbreviations

For the purposes of this European Standard, the following symbols and abbreviations apply.

**Table 1 — Symbols and abbreviations**

No.	Symbol	Designation	Unit
1	<i>D1</i>	Wavelength range $3 \text{ m} < \lambda \leq 25 \text{ m}$	m
2	<i>D2</i>	Wavelength range $25 \text{ m} < \lambda \leq 70 \text{ m}$	m
3	<i>D3</i>	Wavelength range $70 \text{ m} < \lambda \leq 150 \text{ m}$ for longitudinal level Wavelength range $70 \text{ m} < \lambda \leq 200 \text{ m}$ for alignment	m
4	<i>Lo</i>	Lower limit of wavelength range <i>D1</i> , <i>D2</i> , <i>D3</i>	m
5	<i>Lu</i>	Upper limit of wavelength range <i>D1</i> , <i>D2</i> , <i>D3</i>	m
6	$\lambda$	Wavelength	m
7	<i>l</i>	Twist base-length	m
8	<i>TGMT</i>	Track geometry measuring trolley	
9	<i>MOD</i>	Manually operated device	

## 5 Track geometry measuring system fitted on trolleys or on manually operated devices

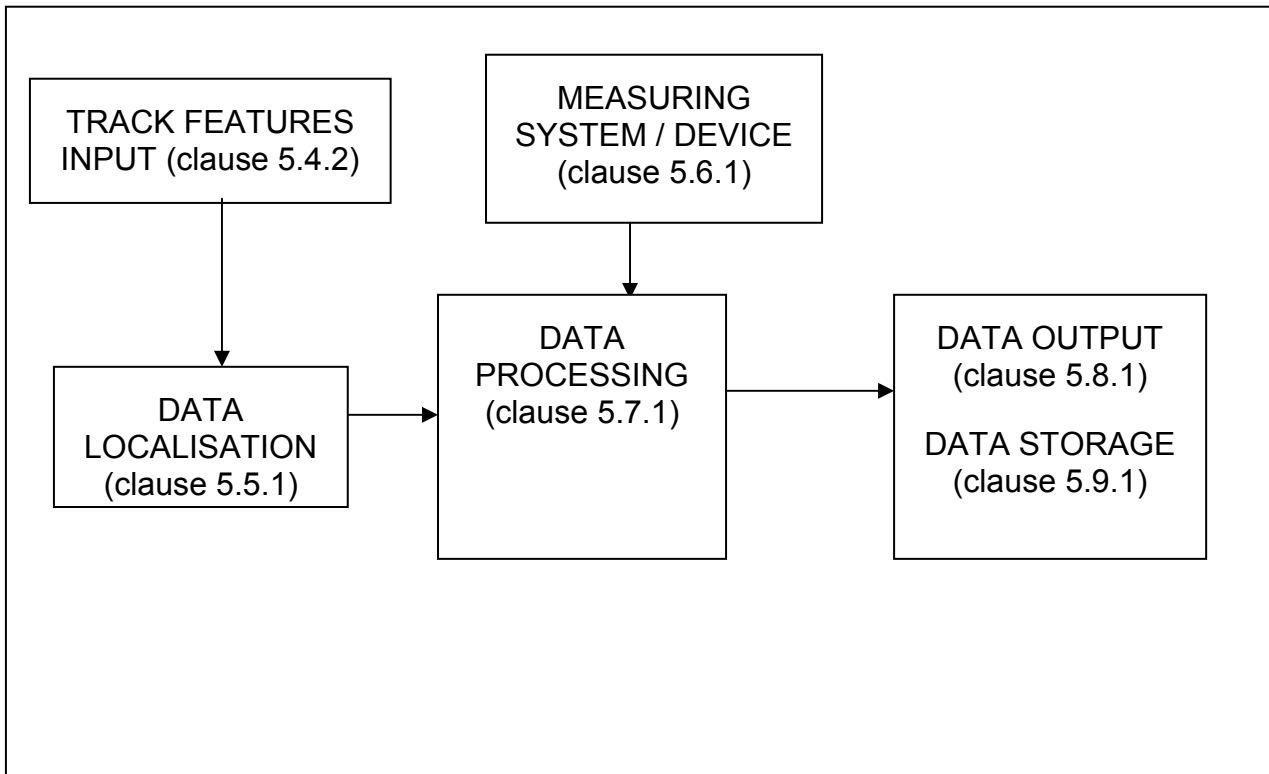
### 5.1 Introduction

This standard concerns only the track geometry measuring systems installed on trolleys or on manually operated devices used to measure one or more of the parameters described in EN 13848-1.

### 5.2 General description

#### 5.2.1 General description: TGMT

For the purpose of this standard, the track geometry measuring system fitted on TGMTs is divided into several units as represented in Figure 1 below:



**Figure 1 — TGMT Track geometry measuring system**

The track geometry measuring system installed on a TGMT is intended to:

- measure track geometry parameters;
- measure the longitudinal distance between measuring operations;
- associate the precise location to the measured data;
- process the measured data, preferably on site, in order to analyse the track geometry parameters;
- record these parameters on computer readable media or on paper.

The results of the above system can be used for track quality monitoring and safety assurance with respect to track geometry on track sections where maintenance works have been or will be carried out.

This standard takes account of the capabilities of the TGMTs in its requirements and as a consequence some of the requirements of EN 13848-1, e.g. loaded track, have been relaxed.

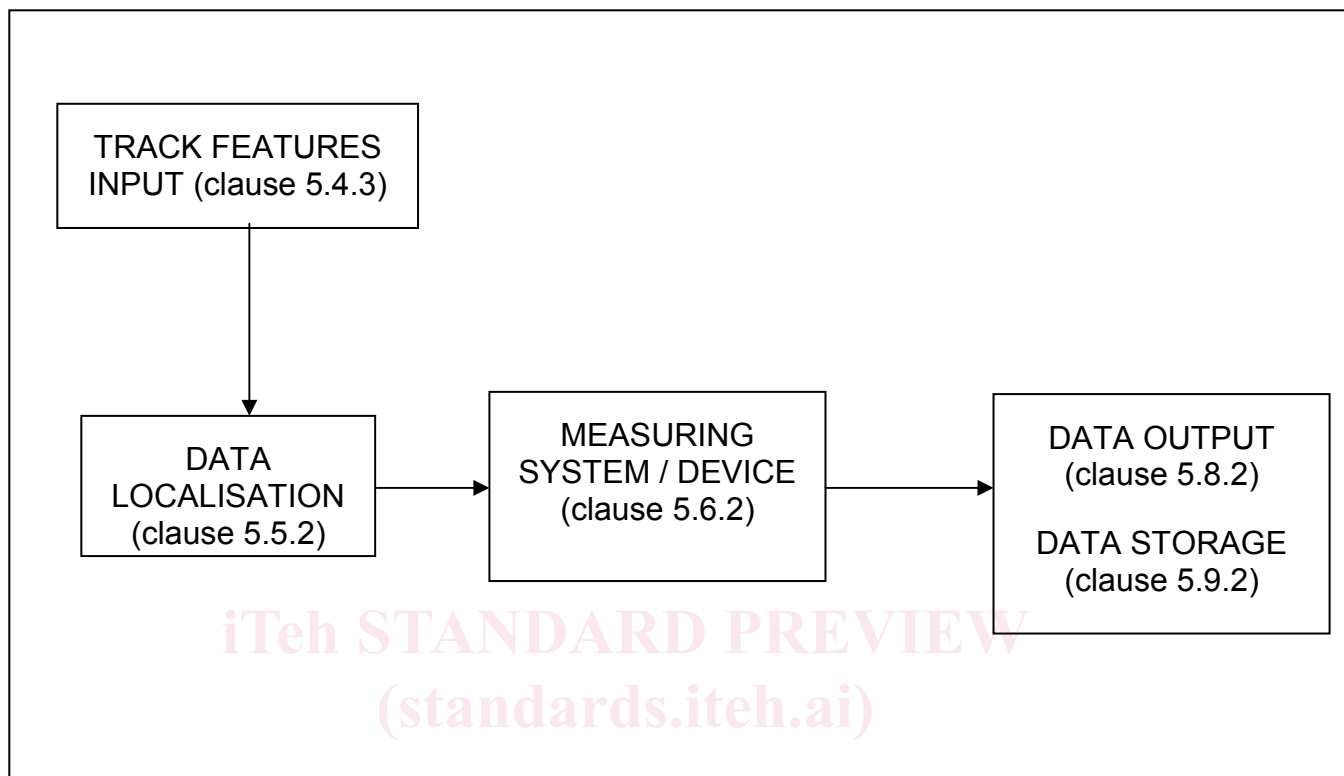
There is no requirement for a TGMT to measure all parameters. The parameters to be measured and their processing shall at least meet the requirements stated in Annex A.

Contrarily to the measuring systems fitted to track recording vehicles, the measuring systems fitted to TGMTs are not required to measure in both TGMT orientations.

The computer system shall be of a kind and type suitable for rail-bound vehicle applications and for outdoor use and shall represent widely used and supported technologies.

## 5.2.2 General description: MOD

For the purpose of this standard, the track geometry measuring system fitted on MODs is divided into several units as represented in Figure 2 below:



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**Figure 2 — MOD Track geometry measuring system**

The track geometry measuring system of a MOD is intended to:

- measure at least one track geometry parameter;
- when data storage is included, associate the precise location to the measured data.

The results of the above system can be used for track quality monitoring and safety assurance with respect to track geometry on track sections where maintenance works have been or will be carried out.

This standard takes account of the capabilities of the MODs in its requirements and as a consequence some of the requirements of EN 13848-1, e.g. loaded track, have been relaxed.

There is no requirement for a MOD to measure all parameters. The parameters to be measured and their processing shall at least meet the requirements stated in Annex A.

## 5.3 Environmental conditions

### 5.3.1 Introduction

All the measuring devices fitted on a TGMT and MOD shall comply with the environmental conditions specified below.

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### 5.3.2 Climatic conditions

Appropriate climatic conditions shall be taken into account in the design. These include:

- ambient temperature;
- condensation;
- precipitation;
- ambient relative humidity.

### 5.3.3 Operating conditions

Appropriate operating conditions especially during transport, assembly and operation shall be taken into account in the design. These include:

- grease on the rail;
- reflection condition of the rail;
- characteristic light conditions;
- dust, water and snow;
- safety requirements (laser beam or conductor rail, for example);
- user friendliness;
- vibrations and shocks;
- electromagnetic environment;
- compatibility with signalling and communication systems.

## 5.4 Track features input

### 5.4.1 General

The track features input supports the data localisation. The requirements for TGMTs and MODs are described below.

### 5.4.2 Track features input: TGMT

The track features input shall include at least:

- line identification;
- track identification;
- kilometreage.

All these data shall be able to be entered by manual or automatic means.