



Leica T-Scan Quick Guide

Version 1.0
English

- when it has to be **right**

Leica
Geosystems

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Important Information about your Instrument



Read and follow the User Manual on the accompanying USB documentation card before using the product or the accessories delivered with the product.



To ensure safety when using the system, please also observe the directions and instructions in the User Manual and Safety Handbook issued by the machine, robot or sensor manufacturer.



Keep for future reference!

Intended use

- Usage as accessory to the Leica Absolute Tracker.
 - Digitising of surfaces and character lines.
 - Carrying out 6DOF measurements as a component of the Leica Geosystems Absolute Tracker in various industrial applications.
 - Transmission of coordinates from the Absolute Tracker to the T-Scan for inspection and build measurements.
 - Transmission of measurement data to the Absolute Tracker.
-

LED and Laser beam

The T-Scan sensor contains the following types of LEDs:

Type of LED	Laser class	Classification
Status LEDs: produce a visible LED beam	Exempt Group	IEC 62471-1 (2006-07)
Infrared LEDs: produce an invisible LED beam	Exempt Group	IEC 62471-1 (2006-07)

A product classified as exempt group does not pose any hazard provided that the product is used and maintained in accordance with the user manual.

The scanning module of the T-Scan sensor produces a visible red laser beam:

Laser class	Classification
Class 2M	IEC 60825-1 (2007-03)



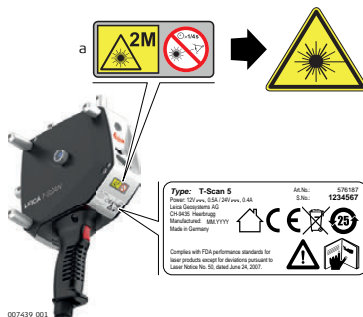
CAUTION

From a safety perspective, class 2M laser products are not inherently safe for the eyes.

Precautions:

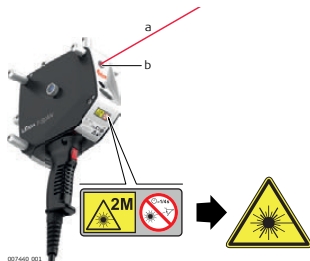
- 1) Avoid staring into the beam or viewing it directly with telescopic optics.
- 2) Avoid pointing the beam at other people or at animals.
- 3) Avoid pointing the beam at mirror-like (specular) surfaces.

Labelling



a) Laser class 2M

Laser Radiation
 Do not stare into the beam or view directly
 with optical instruments
 Class 2M Laser Product
 according to IEC 60825-1
 (2007 - 03)
 $P_o \leq 12 \text{ mW}$
 $\lambda = 660 \text{ nm}$



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- a) Laser beam
- b) Exit for laser beam



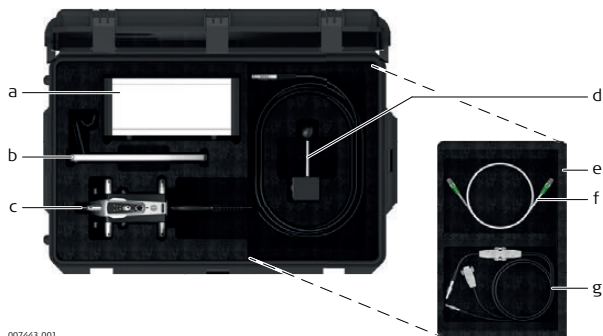
**Conformity to
national
regulations**

The product must not be disposed with household waste.

- FCC Part 15 (applicable in US)
- CE** Hereby, Leica Geosystems AG, declares that the product is in compliance with the essential requirements and other relevant provisions of the applicable European Directives. The declaration of conformity may be consulted at <http://www.leica-geosystems.com/ce>.
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Container Contents

Container for
T-Scan System
Components

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- a) T-Scan Controller
- b) Horizontal Scanner Holder
- c) T-Scan Sensor
- d) Calibration Sphere
- e) Removable Inlay
- f) LAN cable
- g) Trigger/Probe Cable

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System Concept

General



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Component	Description
T-Scan sensor	Used to measure clouds of points. The T-Scan sensor can be operated as a handheld scanner or can be mounted onto a robot or machine.
T-Scan controller	Controls scan frequencies. Records and synchronises measurement data.

4 T-Scan Components

4.1 T-Scan Sensor

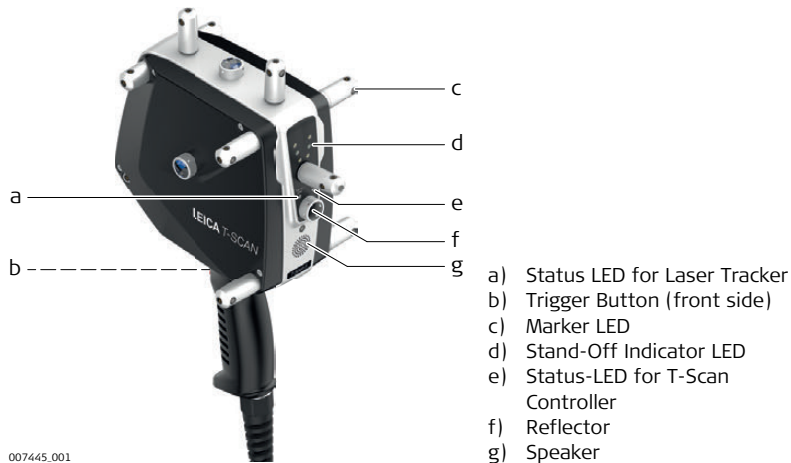
Front view



- a) Aperture for Laser Beam (Scan Line)
- b) Aperture for Pilot Beam
- c) Aperture for Receiver Optics
- d) Trigger Button

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Back view



**CAUTION**

Putting too much strain on the cable when bending it for a prolonged time may cause damage to the cable.

Precautions:

Ensure that the bending radius is not less than 8 cm when bending the cable for a prolonged time.



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T-Scan Indicators**Acoustical status information**

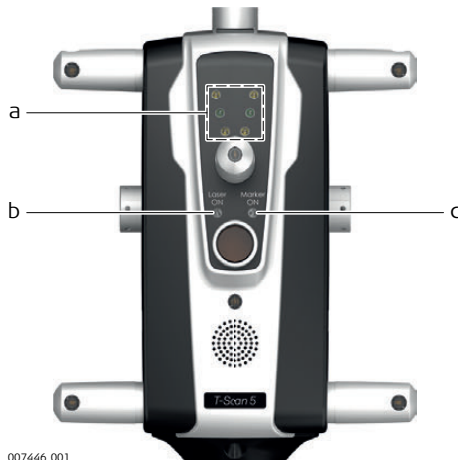
To inform about the current measurement status of the sensor, the T-Scan can give an acoustical status information. For example, the following status information is indicated by different acoustic signals:

- Laser Tracker beam locked on and ready to measure
- Measurement completed
- 6DOF not available
- Laser beam broken

The volume of the acoustic signal can be adjusted in the emScon software. Refer to the emScon Reference Manual for detailed information on the T-Scan configuration.

Optical status information

The T-Scan can also give an optical information to inform about the status of the sensor and the communication to other system components:

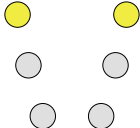
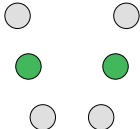
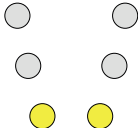


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- a) Stand-Off Indicator LED
- b) Status LED for Laser Tracker
- c) Status LED for T-Scan Controller

Stand-Off Indicator LED

The Stand-Off Indicator LED shows the following status cases:

LED Status	Status information
Off	Laser Tracker beam is not locked on or T-Scan sensor is outside of working range
	Maximum working distance, Stand-Off is at far end of working range
	Mid working distance
	Minimum working distance, Stand-Off is at close end of working range

**Status LED for
Laser Tracker**

The Status LED for the Laser Tracker shows...

- the communication status between T-Scan sensor and Laser Tracker.
- the measurement status of the T-Scan System.

Colour	Pattern	Status information
LED OFF	-	No communication between T-Scan and Laser Tracker
Green	Static	Communication to Laser Tracker is established T-Scan system is ready to measure
Red	Static	Laser Tracker beam not locked onto T-Scan T-Scan system is not ready to measure
Yellow	Static	Communication to Laser Tracker is established T-Scan measurement is in process

Status LED for T-Scan Controller

The Status LED for the T-Scan Controller shows...

- the status of the T-Scan Controller (ON/OFF).
- the communication status between controller and T-Scan sensor.

Colour	Pattern	Status information
LED OFF	-	T-Scan Controller is OFF No communication between controller and sensor
Red	Blinking	Power on
Yellow	Blinking	Booting
Green	Blinking	Successfully booted Communication between T-Scan Controller and sensor is okay.
Green	Static	PC Software has connected to T-Scan Controller

4.3

T-Scan Controller

Control unit for T-Scan sensor

The T-Scan controller is the control unit for the T-Scan sensor. This device controls the scan frequencies, records the measurement data and synchronises the scan data with the 6DOF measurements of the Absolute Tracker.

Front view



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Back view



- a) Connector for Scanner Cable
- b) Power Switch
- c) Power Socket with fuse
- d) Connector for Trigger/Probe Cable
- e) Connector for Trigger Cable
- f) LAN Connection to Application Computer
- g) LAN Connection to Laser Tracker Controller

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Technical Data

Environmental
specifications

Temperature

Type	Operating temperature	Storage temperature
T-Scan	+0°C to +40°C (+32°F to +104°F)	-25°C to +70°C (+77°F to +158°F)

Humidity

Type	Protection
All instruments	Max. 95% (non condensing) - To avoid the effects of condensation, periodically dry out the instrument.

Elevation

Elevation	Range	
	[m]	[ft]
Operation	-700 to 2000	-2300 to 6600
Storage	-700 to 21000	-2300 to 70000

Protection against water, dust and sand

Type	Protection
T-Scan	IP40 (IEC 60529)

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Care and Transport

Care and transport

- Carry the product in its original transport container.
 - Periodically carry out test measurements and perform the field adjustments indicated in the emScon Reference Manual, particularly after the product has been dropped, stored for long periods or transported.
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Operation

General

The first installation of the product should be done by authorised Leica Geosystems personnel. Installation by unauthorised personnel may cause damage and will make the warranty null and void.

Step-by-step

Setting up and connecting the T-Scan system components

- 1) Set up the Absolute Tracker system according to the instruction given in the Absolute Tracker User Manual.
- 2) Connect the T-Scan sensor cable to the connector marked with "Scanner" on the rear panel of the T-Scan controller.
- 3) Connect the Trigger/Probe cable to the connector marked with "Tracker" on the rear panel of the T-Scan controller and to the trigger/probe connector of the Absolute Tracker controller.
- 4) Connect a LAN cable to the RJ45 connector on the rear panel of the T-Scan controller as well as of the Absolute Tracker controller.
- 5) Connect a second LAN cable to the other connector of the T-Scan controller and to a connector of the application computer.
- 6) Connect the T-Scan controller to the power supply.

Starting the data recording

- 1) Switch on the Absolute Tracker system, the T-Scan controller and the application computer.
 - 2) Start the application on the application computer and connect to the T-Scan system.
 - 3) Initialise the Absolute Tracker.
 - 4) To start data recording, hold down the trigger button on the handle of the T-Scan sensor. As long as the trigger button is held down, the data is recorded.
 - 5) To stop data recording, release the trigger button.
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