D-Series – Laser Distance Sensor

Quickstart Guide

V0.12

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1 Document scope

This document describes the first steps of using a Dimetix D-Series laser distance sensor. It contains a step by step instruction how to execute a first measurement and some additional information to improve the measurements.

2 Safety instructions

This Quickstart Guide is written for qualified system integrators for first evaluations on laboratory scale.
Before using the D-Series sensor in a real world application also the safety related information in the D-Series Technical Reference Manual must be considered.

Looking into the laser beam may be hazardous to the eyes.

- Do not look into the laser beam. Make sure the laser is aimed above or below eye level. (particularly with fixed installations, in machines, etc.).

Take precaution against electrostatic discharge (ESD) when the D-Series laser distance sensors exchangeable cover is open.

- Generally the sensor with removed exchangeable cover is a sensitive device and can be damaged by electrostatic discharge.
- Only handle the device properly grounded and with care.
- No warranty will be granted on improper handling and / or ESD caused problems**.**

3 Starting with the sensor

This chapter describes the first steps with a Dimetix laser sensor.

3.1 Installation notes

Please read the following important notes before the installation of the laser sensor:

- The installation of the sensor should only be carried out by appropriate specialists
- To install the cables, remove the two terminal blocks from the sensor before connecting them. This prevents wires or other foreign objects from entering the sensor. Recommended wire types: Crimped ferrules.
- After the installation of the cables be sure that the cover and the cable gland are tightly closed.
- Never measure on high reflective surfaces (e.g. mirror or other reflectors). This may damaged the ensor.
- Never shine a laser sensor into another laser sensor. This may damaged the laser sensor too.
- When using the Industrial Ethernet interfaces: Never install or remove the ribbon connector cable with applied sensor power.

3.2 Preparation

Do the described steps to prepare the Dimetix laser distance sensor for the first measurement with the Laser Sensor Utility software. The required equipment is listed below:

- PC (only Windows) with USB or RS-232 interface
- D-Series sensor, e.g. DAN-10-150, DPE-10-500 or others
- Part Number 500595 Accessories for Start Kit D-Series
  - Power and USB or RS-232 connection cable
  - Power supply e.g. 24 VDC (min. 0.2 A)

To prepare for the first measurement please follow the steps below:

Steps	Description
1	Download and install the latest «Laser Sensor Utility» software (www.dimetix.com/UtilitySW)
2	Connect the power supply (12...30 VDC) to the laser sensor
3	Connect the laser sensor over USB or RS-232 interface with the PC
4	Start the Laser Sensor Utility software
5	Select the correct COM Port (take a look into the device manager)
6	Choose the standard baud rate Nr. 7 (19200 Baud, 7 Bit, Parity even)
7	Click on the button «CHECK CONNECTION»

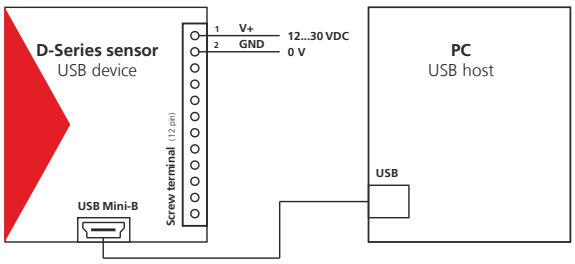


Figure 1: Connection via USB interface

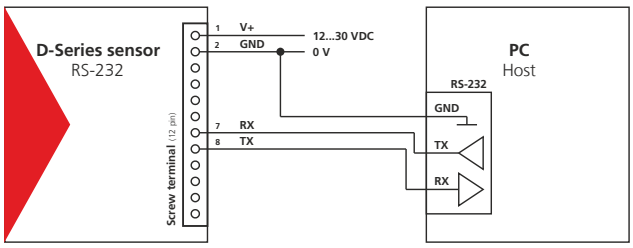
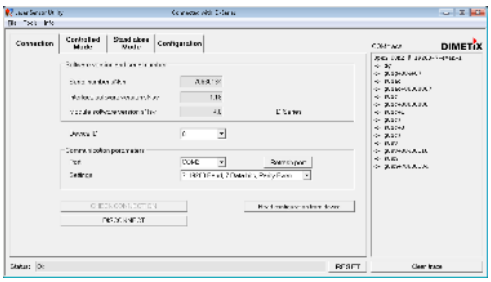
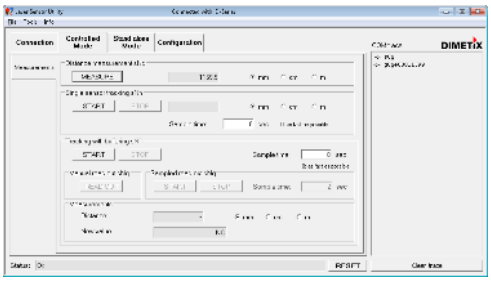
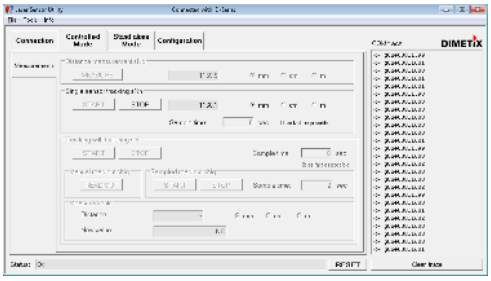


Figure 2: Connection via RS-232 interface

3.3 Doing the first measurements

Use the «Laser Sensor Utility» and do the following steps to do the first measurements.

Picture	Description	Commands (see COMTrace)
 Figure 3: Laser Sensor Utility connection	Click on the button «CHECK CONNECTION»	Read out serial number: –› sNsn ‹– gNsn+xxxxxxxx Read out firmware version: –› sNsv ‹– gNsv+xxxxxxxx
 Figure 4: Single sensor measuring	Select the tab «Controlled Mode» and the sub tab «Measurements». Click on the button «MEASURE» to make a first single measurement.	Single sensor measuring: –› sNg ‹– gNg+xxxxxxxx (distance in 1/10mm)
 Figure 5: Single sensor tracking	Click on the button «START» single sensor tracking to start a continuous measuring	Single sensor tracking: –› sNh ‹– gNh+xxxxxxxx (distance in 1/10mm)

4 Improving the measurements

4.1 Measuring performance

Use an appropriate target to improve the measurement speed. An optimal measurement surface has the following properties:

- Flat, fine and not porous
- Diffuse reflective (not glossy / reflective)
- Bright and stable / low vibration
- Measurement surface bigger than laser spot

Recommended measuring surfaces / targets and conditions are summarized in the table below.

For short range: 0...40 m)	White matt surface (e.g. white matt sprayed boards as an economical solution), or Dimetix orange reflective target for more performance (only for DPE, DEN & DEH devices)
For wide range: (> 40 m)	Dimetix orange reflective plate: Size 210 x 297 mm, Part Number 500113 Dimetix orange reflective foil. Size 600 x 1200 mm. Part Number: 500114
Good measuring conditions:	Reduce ambient light (e.g. shieldings, shadow, darkness, etc.), stable ambient temperatures, clear and clean air (no dust, fog, rain, etc.)

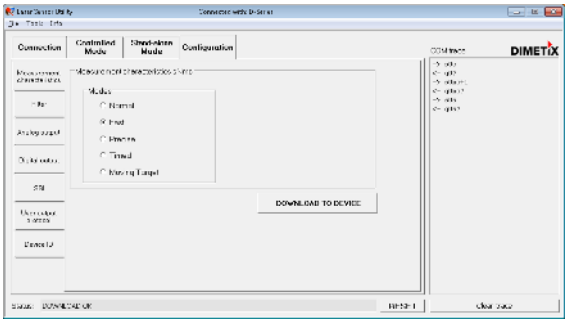
In general, on a bright measuring surface (e.g. white) with good reflectivity, a measurement takes less time than on a dark surface (e.g. black) with low reflectivity.

4.2 Overview configuration possibilities

There are several configuration possibilities with a Dimetix laser sensor. The following examples can improve the measurement performance. Further information can be found in the Technical Reference Manual on our website (www.dimetix.com).

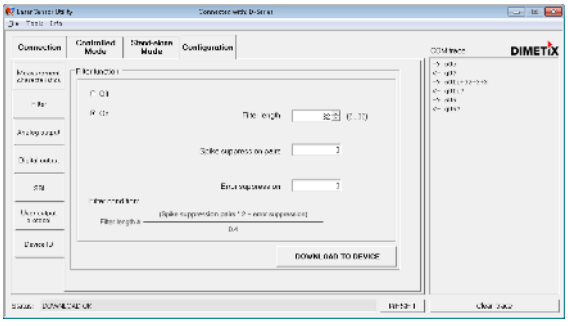
4.2.1 Measurement characteristic

The measurement characteristic gives the possibility to adjust the sensor measurement according the requirements of a specific application.

Picture	Description
1) Choose the tab «Configuration» and the sub tab «Measurement characteristics» 2) Choose a measurement characteristic and click on the button «DOWNLOAD TO DEVICE» 3) Start the distance measuring again (see chapter 3.3)  Figure 6: Measurement characteristic	There are five different measuring characteristics. Each measuring characteristic changes the measuring rate and accuracy. The measuring rate and accuracy depends on the D-Series device type: • Normal 20 Hz • Fast 250 Hz (DPE) / 100 Hz • Precise 10 Hz • Timed user programmed • Moving Target 250 Hz (DPE) / 100 Hz For more details about the available measuring characteristic, please take a look at the «Knowledge Base» and the «Technical Reference Manual» on our website (www.dimetix.com).

4.2.2 Moving average filter

For better accuracy of the measurements, it is possible to use the moving average filter on the sensor or directly on the master PLC.

Picture	Description
1) Choose the tab «Configuration» and the sub tab «Filter» 2) Select «ON» and choose the settings for the filter 3) Click on the button «DOWNLOAD TO DEVICE» 4) Start the distance measuring again (see chapter 3.3)  Figure 7: Moving average filter	The output value filter is based on a moving average filter and supports in addition a spike suppression filter and error suppression filter. The max. length of the filter is given with 32 entries.

5 Important links

Here is a main link to additional important information about the product, some tips and tricks and available software.
https://dimetix.com/QuickStartGuide/