

Application Note

AN2002

D-Series

SSI interface usage

V 2.04

Please check www.dimetix.com
for the latest version

Abstract

This document describes how the D-Series laser distance sensor must be configured and connected to operate it as a SSI Slave. The SSI Interface is a synchronous serial interface used in industrial application.

This Application Note is provided as is without any warranty for any problems this sample may cause.



Table of content

1	Introduction	3
1.1	Requirements.....	3
2	Configuration	3
2.1	SSI interface configuration.....	3
2.2	Operation mode configuration.....	4
3	Wiring	6
3.1	SSI connection.....	6
3.2	External trigger connection.....	6
3.3	Supported cable length.....	6



1 Introduction

The D-Series sensor provides a Synchronous Serial Interface (SSI). SSI is a widely used serial interface standard for industrial applications between a master (e.g. controller) and a slave (e.g. DPE). On an SSI communication channel, the master generates a clock, while the slave sends the data corresponding to the received clock signal. Only point to point communication is possible with the SSI interface. The RS-422 standard defines the electrical signal levels of the SSI interface.

1.1 Requirements

- D-Series sensor or others (please check the sensor manual for this display feature)
- Computer with an USB or RS-232 interface
- The free software "Laser Sensor Utility"

2 Configuration

This chapter is a step by step configuration example how to configure the sensor as a SSI Slave.

2.1 SSI interface configuration

Steps	Description
1	Connect the laser sensor over USB or RS-232 to the PC, start the "Laser Sensor Utility" software and check the connection. Download and install the latest "Laser Sensor Utility" software (www.dimetix.com/UtilitySW).
2	Check the right firmware version of the D-Series interface board: V1.16 (or newer) because older versions had a SSI bug. Otherwise update the laser sensor firmware according firmware update instructions on the Dimetix knowledge base. https://dimetix.com/en/services/knowledge-base/#how-can-the-sensor-firmware-be-updated
3	Choose the "Configuration" tab and the "SSI" sub tab
4	Choose the "SSI" (physically the same port as RS-422, however "RS-422" will be deactivated)
5	Set the necessary configuration for the SSI output
6	Information: In case a measuring error, the SSI output will have the value specified in "Replacement value"
7	Press the "Download to device" button to send and save the chosen configuration to the laser sensor

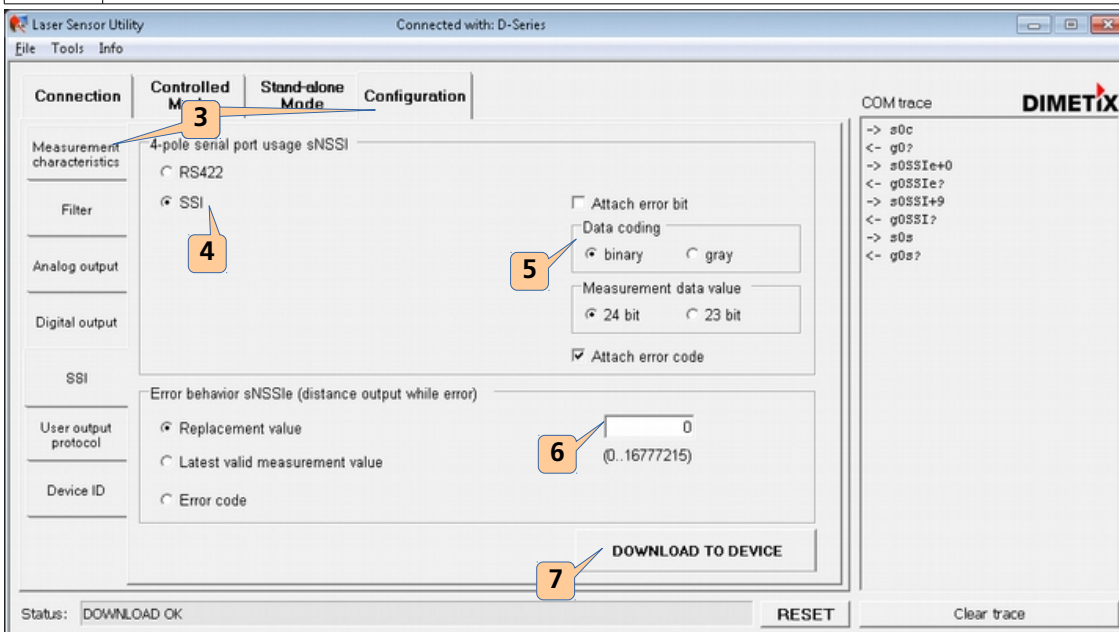


Fig. 1: SSI Configuration

2.2 Operation mode configuration

Now the SSI interface is configured. However, per default the laser sensor does not do distance measurements automatically. There are two operation modes to activate distance measurements without sending commands to the laser sensor. In automatic operation mode, the laser sensor starts measuring after power on, while in manual operation mode the laser sensor starts measuring based on a digital input.

2.2.1 Automatic operation mode

In this operation mode, the laser sensor starts measuring immediately after power on. The result of the distance measurement is available at all outputs and can therefore be polled by the SSI master.

Steps	Description
8	Choose the "Stand alone Mode" tab and the "Auto start configuration" sub tab
9	Set "Automatic Mode" to ON
10	Set a sample time. Set value to 0 sec for fastest possible measurements
11	Press the "Download to device" button to send and save the chosen configuration to the laser sensor. Immediately after downloading the sensor starts to measure.

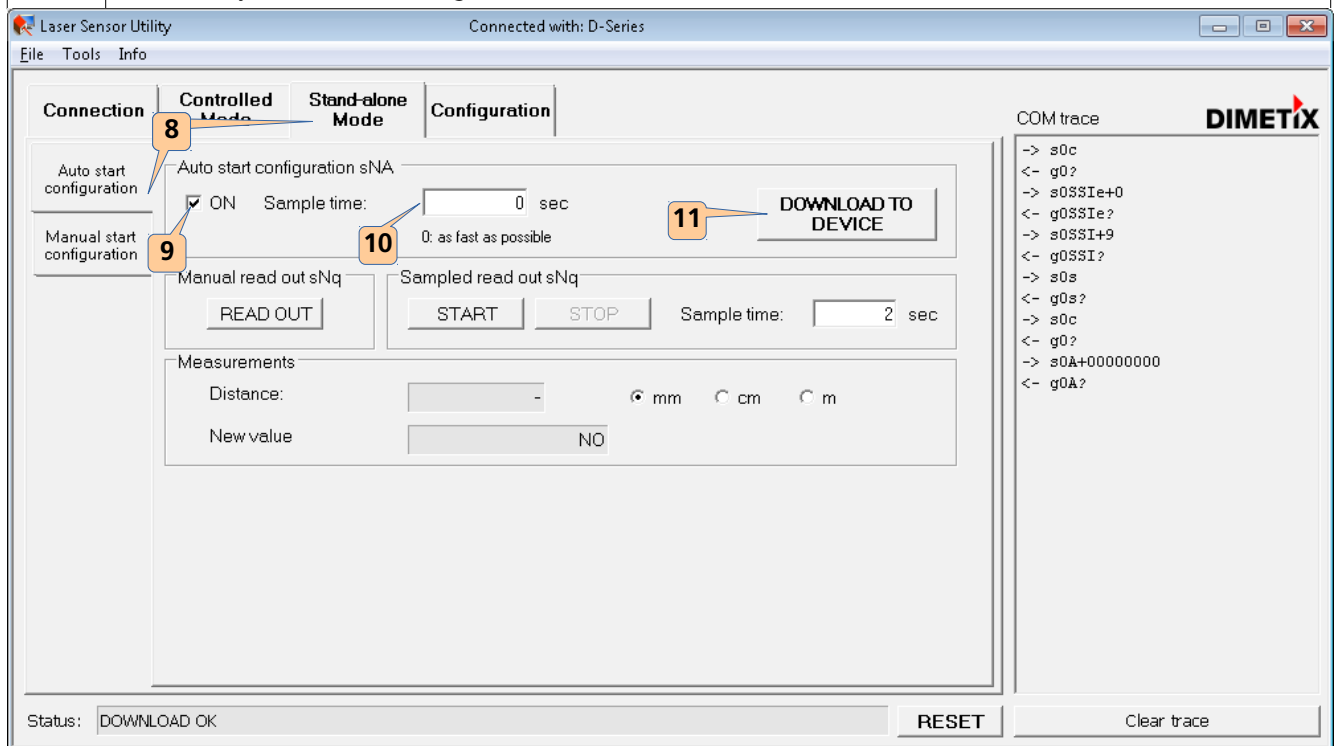


Fig. 2: Automatic operation mode configuration

2.2.2 Manual operation mode

In the manual operation mode, the measurement is controlled by the digital input.

Steps	Description
8	Choose the "Stand alone Mode" tab and the "Manual start configuration" sub tab
9	"Activate" the Digital Input (the Digital Output will be deactivated)
10	Choose an action for the Digital-Input. For example "start/stop tracking with buffering"
11	Set a sample time. Set value to 0 sec for fastest possible measurements
12	Press the "Download to device" button to send and save the chosen configuration to the laser sensor
13	As soon as the Digital Input goes to HIGH level the tracking will start

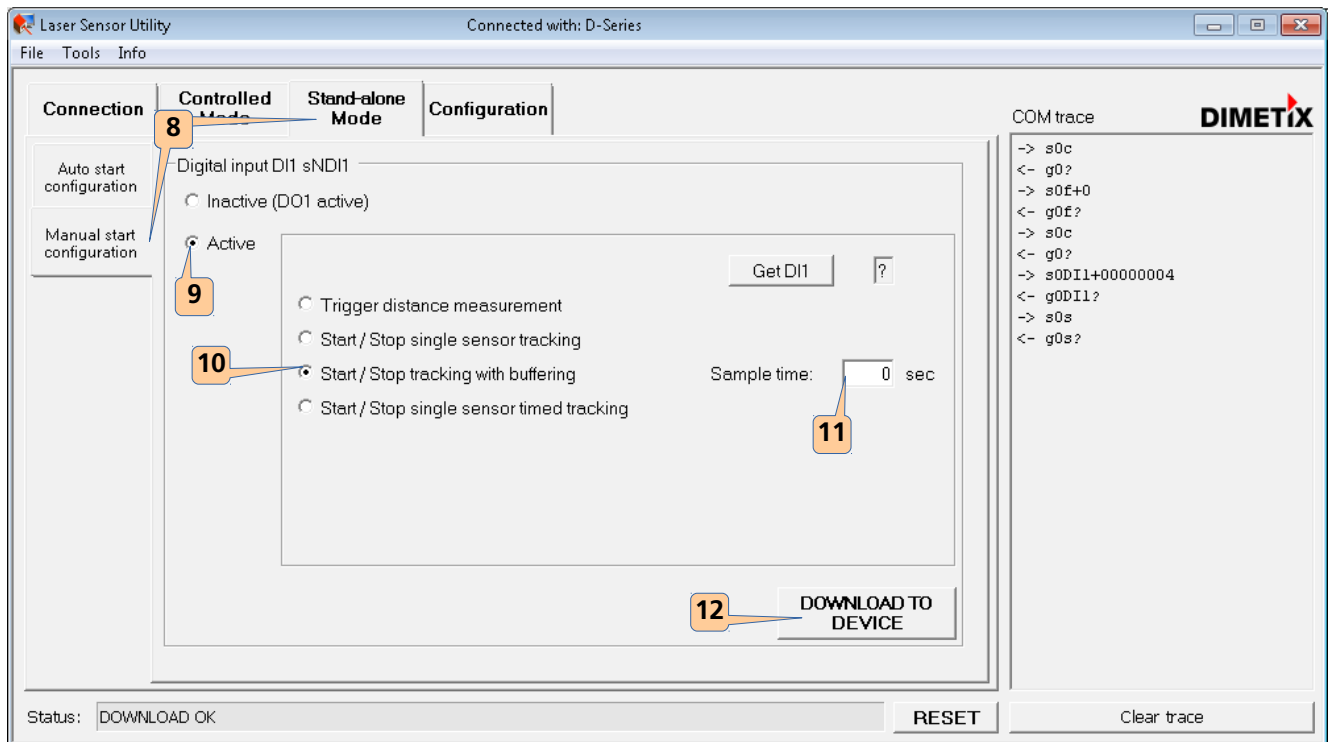


Fig. 3: Manual operation mode configuration



3 Wiring

3.1 SSI connection

Connect the laser sensor to the SSI master as shown in figure 4

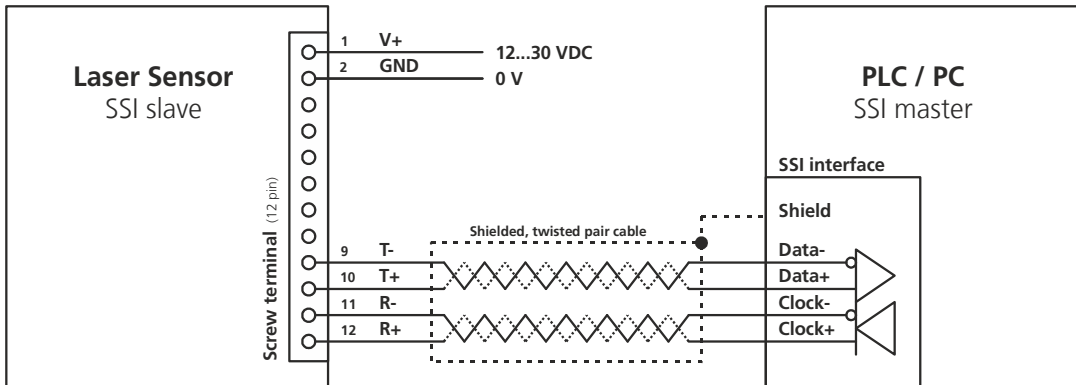


Fig. 4: Connection of a SSI master

3.2 External trigger connection

If the manual operation mode is used, connect a switch as shown in figure 5 to the digital input of the laser sensor.

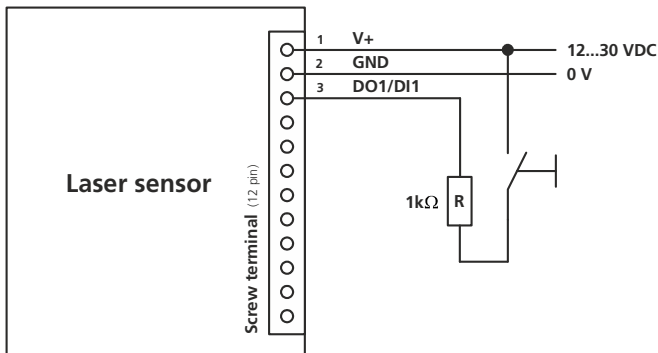


Fig. 5: Connection for external triggering

3.3 Supported cable length

The maximum transmission rate depends on the cable length as shown in the following table. The transmission rate must be specified at the SSI master.

Max. cable length (typical)	max. transmission rate (typical)
< 12.5 m	< 810 kBaud
< 25 m	< 750 kBaud
< 50 m	< 570 kBaud
< 100 m	< 360 kBaud
< 200 m	< 220 kBaud
< 400 m	< 120 kBaud
< 500 m	< 100 kBaud

