NANOMOTION

A Johnson Electric Company

Shutter Evaluation Kit

SHTR-EVAL-CL

User Manual

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Table of Contents

About this Guide

Scope

This user guide provides instructions for connecting and operating the Shutter Evaluation Kit. The document describes the Shuter Evaluation Kit components, functionalities, operation modes, hardware and electrical specifications, and NM proprietary software.

Reference Documentation

N/A.

Glossary

ASIC	Application-specific integrated circuit
D/N	Document Number
FPGA	Field-Programmable Gate Array
GUI	Graphical user interface
GPIO	General Purpose Input/Output
IDC	Insulation-displacement connector
I^2C (IIC)	Inter-Integrated Circuit Serial Communication Interface
NM	Nanomotion
PC	Personal Computer
P/N	Part Number
SW	Software

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1   Safety

⚠️ **WARNING!**

For safe usage of the Shutter Evaluation Kit, carefully read the following instructions:

1. Turn off power before connecting or disconnecting any of the cables.

2   Overview

The closed loop shutter evaluation kit allows the user to evaluate NM shutter technology.

The Shutter Evaluation Kit is provided as an autonomous unit, based on the S787 NUC (Non-Uniformity Correction) Shutter series solution (read more information on www.nanomotion.com), allowing a simple interface to customer FPGA/PC. The kit supports two modes of operation: the GUI Mode, and the FPGA Mode. The GUI Mode, enables the user controlling the kit using the NanoCommander application, installed on user's PC. The FPGA Mode enables the user control the kit using the I^2C communication.

The S787 NUC Shutter is designed to meet the most challenging operating conditions of infrared imaging systems (thermal sensors). The S787 shutter operates linearly with a direct drive EDGE motor (the smallest industrial motor of its kind available in the markeplace today), providing the lightest weight configuration while maintaining the closest proximity to the imaging detectors's Focal Plane Array (FPA) the imaging lens.
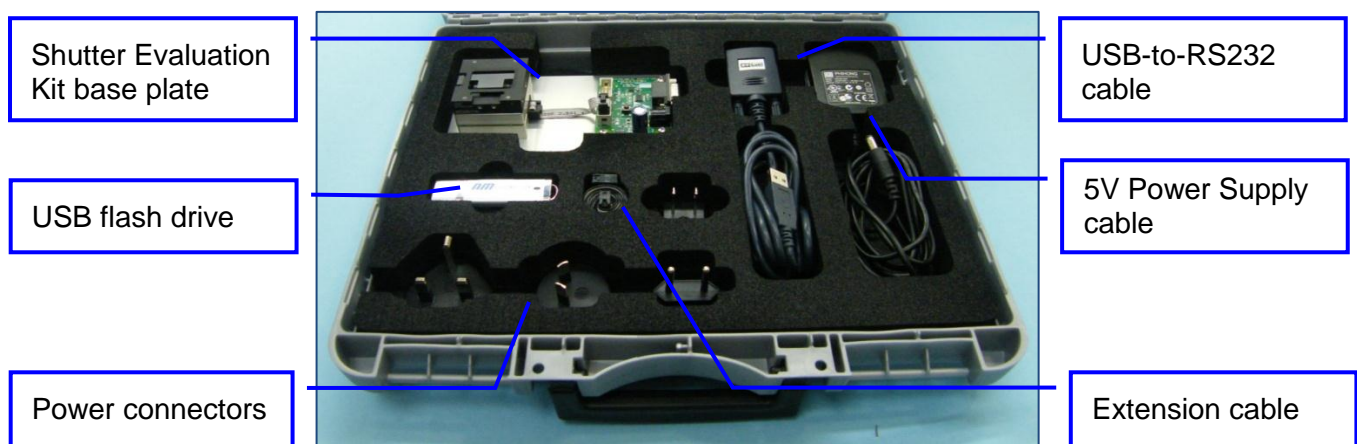
Important: this Shutter Evaluation Kit is an integrated sytem and does not allow a stand-alone installation of the Shutter Module.
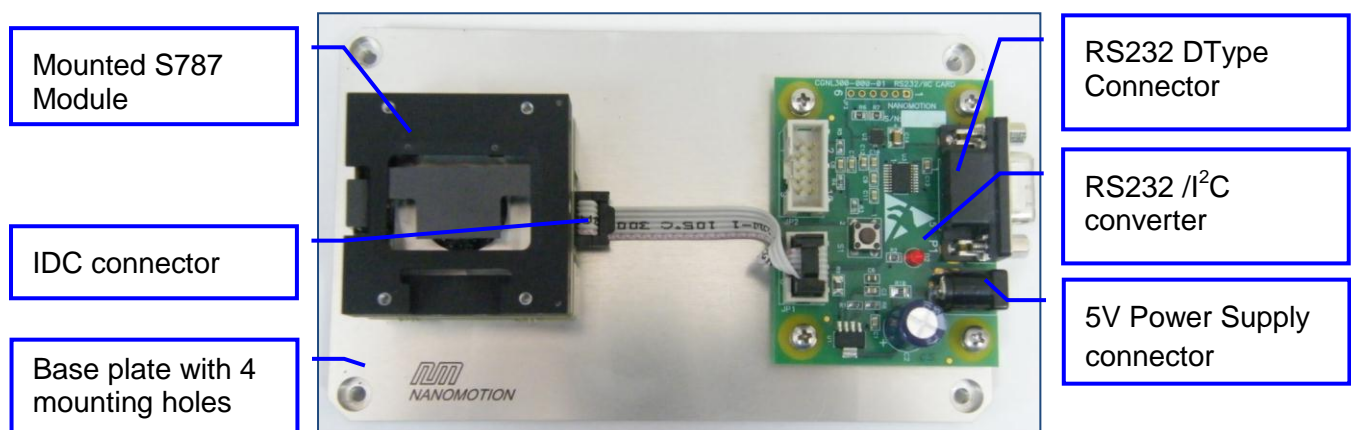
3   Main Components and Features

Following is a list of the main compenents and features of the Shutter Evaluation Kit:

• Shutter Module

• Closed loop control allowing either PC or I^2C input

• 5Vdc power supply

• NanoCommander application software

• XMS with basic execution of open/close

The following elements are provided with the Shutter Evaluation Kit:

Shutter Evaluation Kit base plate

USB flash drive

Power connectors

USB-to-RS232 cable

5V Power Supply cable

Extension cable

4   Mechanical Interfaces

Mounted S787 Module

IDC connector

Base plate with 4 mounting holes

RS232 DType Connector

RS232 /I^2C converter

5V Power Supply connector

4.1   RS232 Connector

RS232 Connector: D-Sub, 9 pin, female, right angle connector.

Table 1: RS232 Connector Pinout:

Pin #	Pin Name	Description
2	TXD	RS232 Transmit Signal
3	RXD	RS232 Receive Signal
5	GND	System ground
1,4,6,7,8,9	N.C.	Not connected

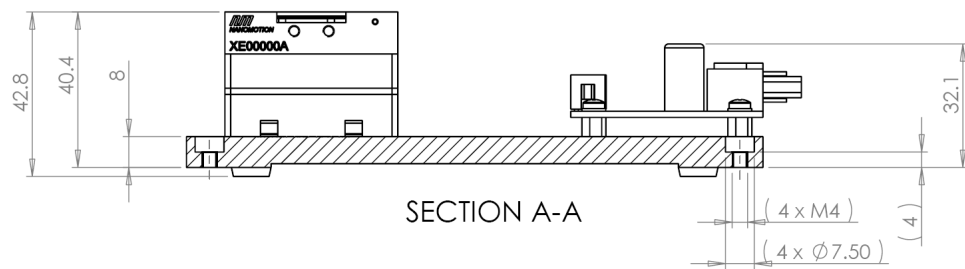# 4.2   IDC Connector

Table 2: Shutter Module IDC Pinout

Pin #	Pin Name	Description
1	SDA	I^2C -Data
2	SCL	I^2C -Clock
3	RESET_SH	External ASIC reset
4	GND	System ground
5	+5V	Power IN 5Vdc
6	GND	System ground

# 4.3 Mechanical Dimensions

Top View
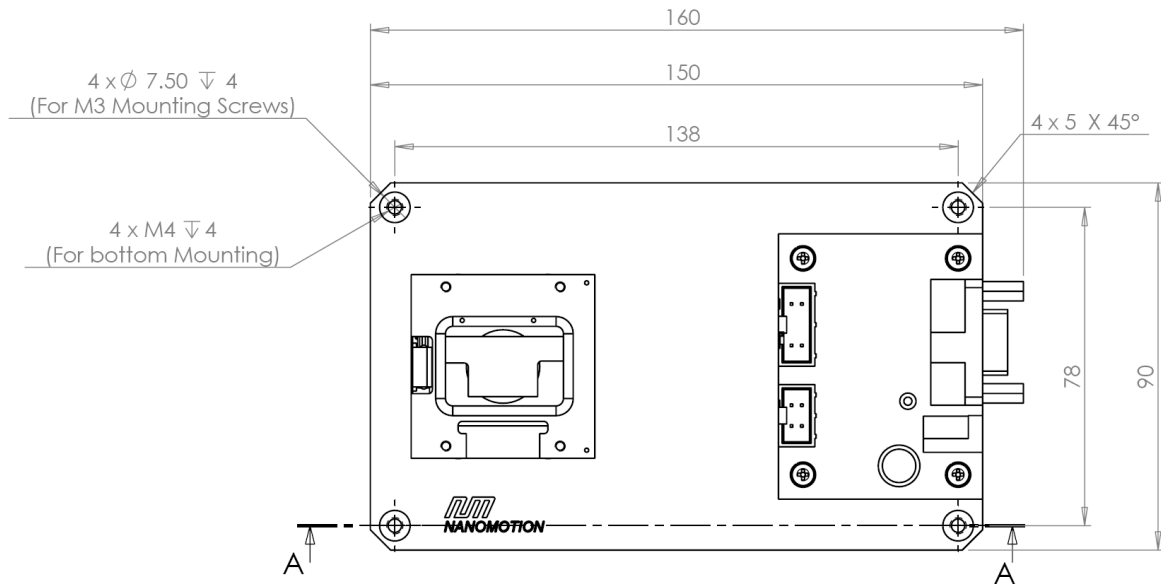
Side View

5   Connecting and Running the System

The connections are set according to the desired operation mode:

- GUI Mode – a configuration using the NanoCommander application.

- FPGA Mode – a configuration using I^2C communication.

5.1   The GUI Mode Configuration

When using the GUI Mode configuration, the Shutter-Eval-CL system is connected to the user's PC and the Shutter Module ASIC is controlled via the NanoCommander application.
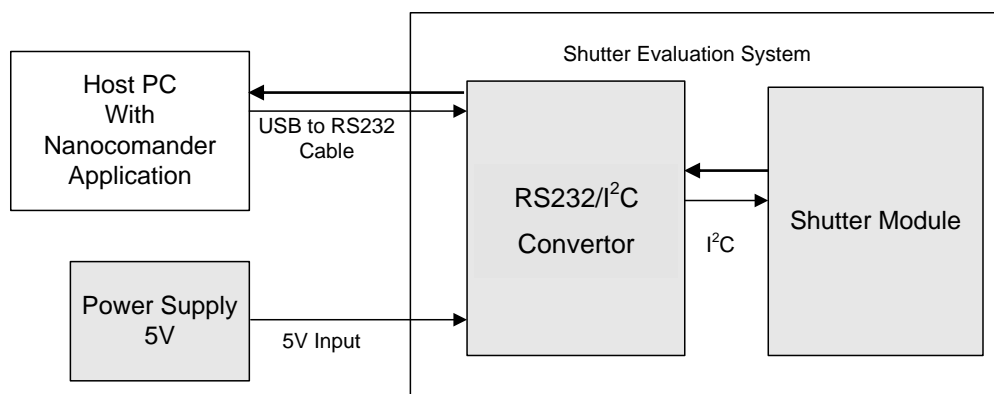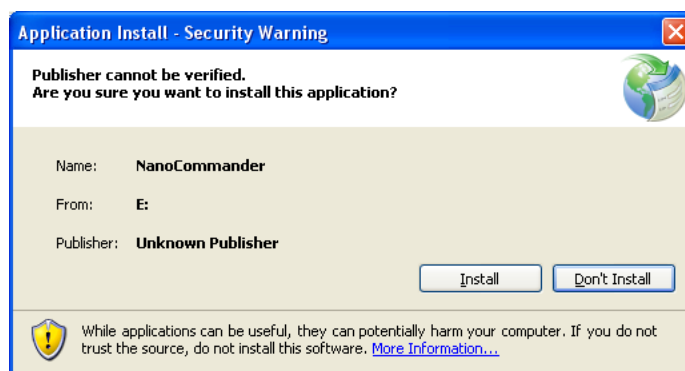
5.1.1   Installing the NanoCommander Application

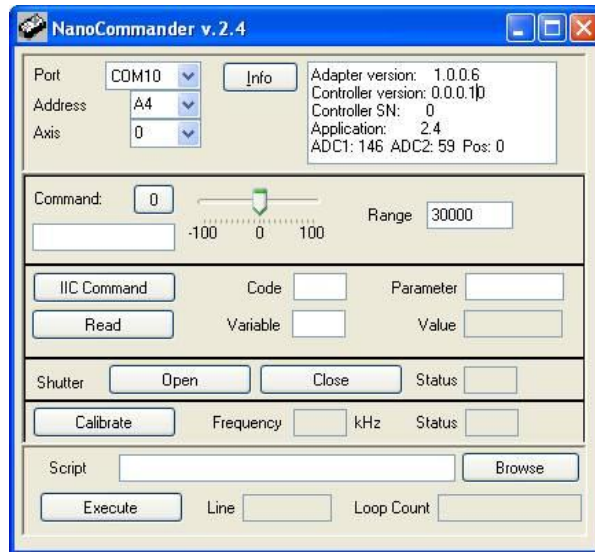Install the NanoCommander application according to the following steps:

1.   Insert the provided USB flash drive into your USB connection. The NanoCommander application will automatically install on user's computer. Proceed to step 3.

2.   *In case the NanoCommander application is not automatically installed* on user's computer, perform the following steps.

   - Navigate to the USB flash drive location on the computer.

   - Double-click on the **setup.exe** file.

   - *In case the following screen is displayed*, click **Accept** to approve .NET installation. Otherwise, continue to the next step.
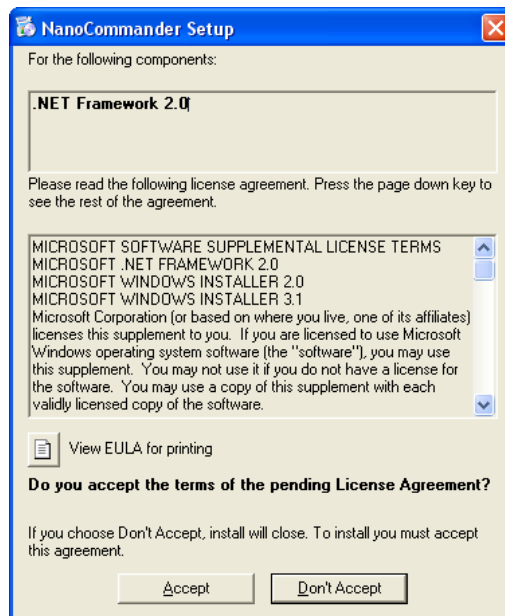
   - Click **Install** to approve the NanoCommander installation:

3.   The NanoCommander application and its icon are now installed on the computer (see Start→ All Programs→ Nanomotion→ NanoCommander), and the NanoCommander main screen appears:

Note: In case the NanoCommander main screen appears automatically at the end of the installation process, launch the application from the Start menu.

5.1.2 Connecting the System

RS232 cable

RS232/I^{2}C Converter
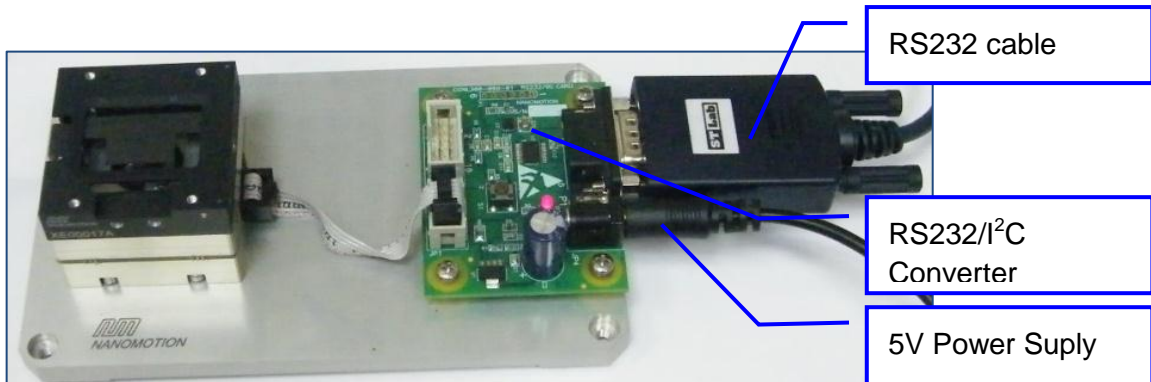
5V Power Suply

1. Connect the RS232 cable between the PC USB and the RS232/I^{2}C Converter Card (for RS232 DType connector see 4.1 for pinout description).

2. Connect the 5V power supply cable to the power IN connector (inner pin is +) . Note: choose the power supply connector corresponding to your local electricity inlets.

5.1.3 Running the System

The NanoComander SW allows running comands using the following methods:

- Direct command-initiating buttons

- Running command **scripts** (script examples provided with the
  application)

- Running **manual commands** (I^2C commands)
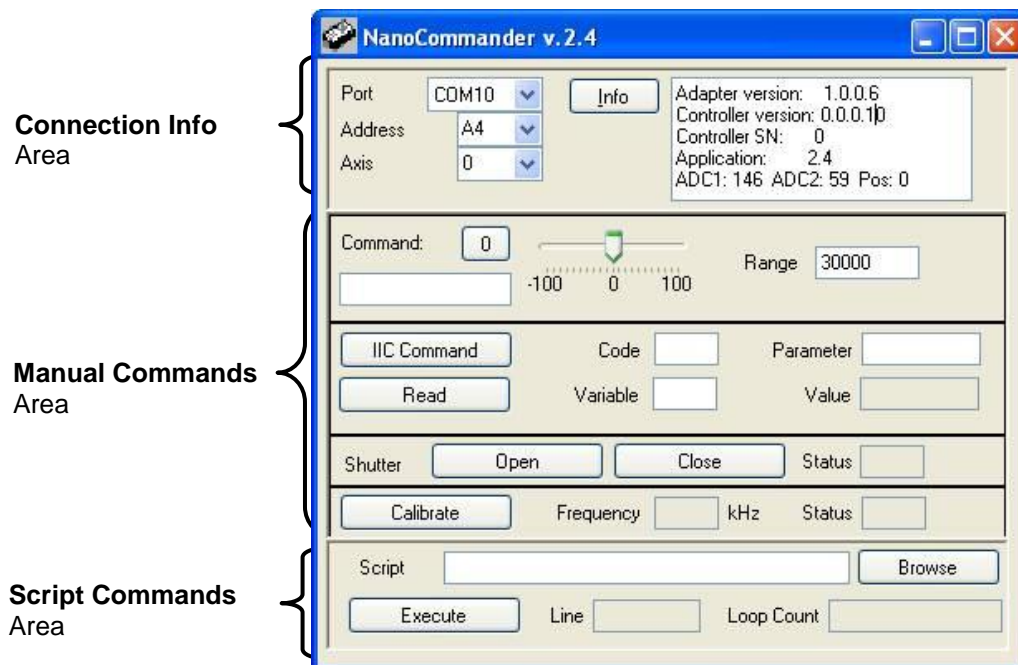
Connection Info Area

Determine ad select the following information parameters:

- **Port:** Select the USB-port (COM) in which the shutter evaluation kit
  is connected to your PC.

Port	
Address	COM3 COM1 COM4
Axis	
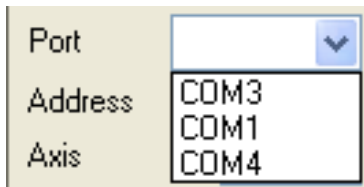
- **Address:** choose A4, to indicate the controller's I^2C address

- **Axis:** choose Axis 0

Manual Commands

The Manual Commands area allows running direct commands by either pressing on a command button (i.e. **Calibrate**), moving a slider, or by entering an I^2C command code and parameters.

Running Scripts

The system is provided with predefined scripts, allowing the user to quickly and easily operate the shutter.

To execute a script:

In the **Script Command area**, perform the following:

- Press on the **Browse** button and select the desired script.

- Press on the **Execute** button. The button toggles to **Cancel**, when a script is running**.**

Script	C:\Documents and Settings\ruth\Desktop\NanoC	Browse
Cancel	Line 3	Loop Count 998
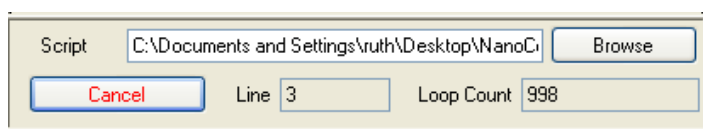
Verify that the desired action is performed.

*Note: you may stop the script execution at any time, by pressing on the Cancel button.*

5.2 The FPGA Mode Configuration

When using the FPGA Mode, the Shutter-Eval-CL system is connected to the user's FPGA, and the Shutter Module ASIC is controlled via I^2C communication.

Shutter Evaluation System

CGNL300-00-01
RS232/IIC

Shutter Module

IIC
Communication
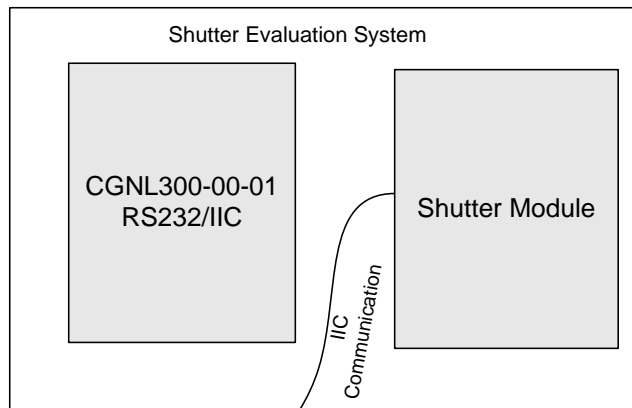
Towards customer's FPGA

5.2.1   Connecting the System for I^{2}C Communication
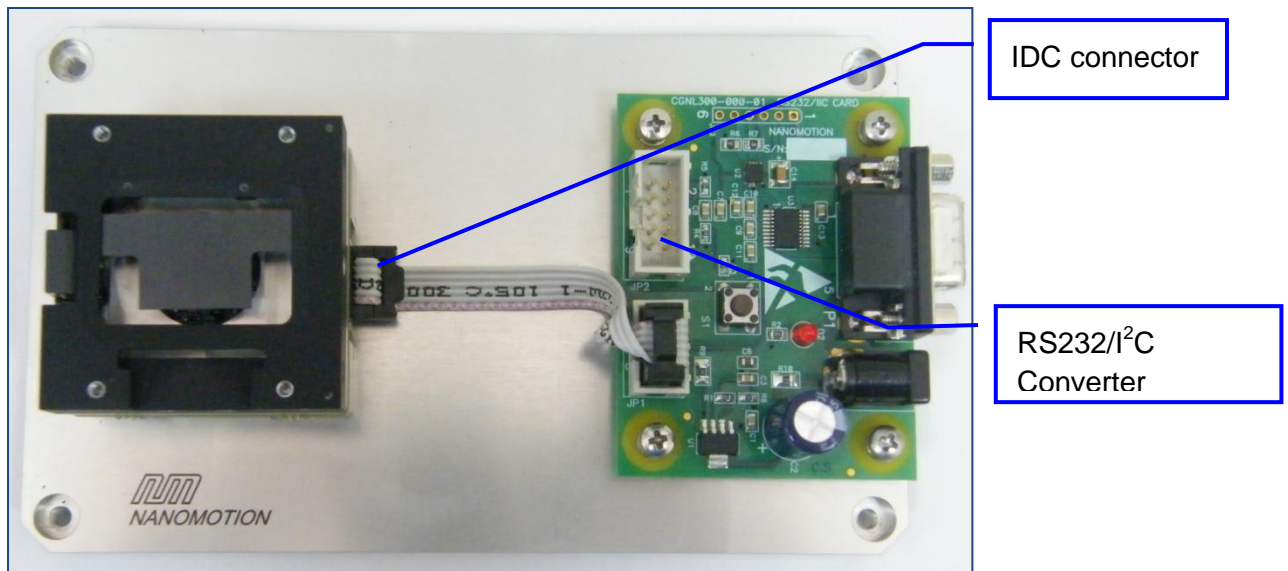
1. Disconnect the cable connecting the Shutter Module and the RS232/I^{2}C Converter Card.

2. Connect the extention cable between the Shutter Module IDC connector and user's FPGA (see 4.2 for pinout description).

5.2.2   Running the System

See section 5.1.3.