

UM11766

P3T1085UK-ARD evaluation board

Rev. 1.0 — 15 February 2023

User manual

Document information

Information	Content
Keywords	P3T1085UK, I ² C/I3C-bus, I3C IBI, temperature resolution of 0.0625 °C, 12-bit A-to-D conversion, 0.5 °C temperature accuracy.
Abstract	The P3T1085UK-ARD evaluation board is easy to test and designed for the P3T1085UK which is an I3C, I ² C-bus, 0.5 °C accuracy, digital temperature sensor. This evaluation board, along with the MIMXRT685-EVK MCU board provides an easy to use evaluation platform.



Revision history

Rev	Date	Description
v.1.0	20230215	Initial version

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1 Introduction

The P3T1085UK-ARD evaluation board features an I³C, I²C-bus, 0.5 °C accuracy, digital temperature sensor. A graphical interface allows the user to easily explore the different functions of the driver. The board can be connected in parallel with other I²C-bus demo-boards to create an evaluation system.

The IC communicates to the host via the industry standard I²C-bus port. The evaluation software runs under Microsoft Windows 7,8,10 PC platform.

2 Features

- A complete evaluation platform for the P3T1085UK I³C, I²C-bus, 0.5 °C accuracy, digital temperature sensor
- Easy to use GUI based software demonstrates the capabilities of the P3T1085UK
- On-board temperature sensor for system thermal management experiments
- Convenient test points for easy scope measurements and signal access
- USB interface to the host PC
- Power supply from USB port (x2) or external power supply can be used to power P3T1085UK-ARD evaluation board

3 Finding kit resources and information on the NXP web site

NXP Semiconductors provides online resources for the evaluation board and its supported device(s) on <http://www.nxp.com>.

The information page for NTS0304EUK-ARD evaluation board is at <http://www.nxp.com/P3T1085UK-ARD>. The information page provides overview information, documentation, software and tools, parametrics, ordering information and a **Getting Started** tab. The Getting Started tab provides quick-reference information applicable to using the P3T1085UK-ARD evaluation board, including the downloadable assets referenced in this document.

4 Getting ready

Working with the P3T1085UK-ARD evaluation board requires the kit contents, additional hardware, and a Windows PC workstation with installed software.

4.1 Kit contents

- Assembled and tested evaluation board in an antistatic bag
- Quick Start Guide

4.2 Assumptions

Familiarity with the SPI-bus is helpful but not required.

4.3 Static handling requirements

CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Therefore care should be taken during transport and handling. You must use a ground strap or touch the PC case or other grounded source before unpacking or handling the hardware.

4.4 Minimum system requirements

- PC Pentium processor (or equivalent)
- One USB port (either 3.0 or 2.0 or 1.1 compatible)
- Windows 7, 8, 10
- MIMXRT685-EVK MCU board (from www.nxp.com)

4.5 Power requirements

The MIMXRT685-EVK MCU board obtains power from the PC USB port, two USB parts can be connected to the MIMXRT685-EVK MCU board simultaneously. Please use external power supply option if exceeding the USB port current capabilities.

5 Hardware installation

5.1 P3T1085UK-ARD EV board and MIMXRT685-EVK MCU board connection

P3T1085UK-ARD evaluation board is connected to the MIMXRT685-EVK MCU board using four connectors (J4/J5/J7/J8 on P3T1085UK-ARD board and J27/J28/J29/J30 on MIMXRT685-EVK board) for I²C-bus and power supply, and one connector (J13 on P3T1085UK-ARD board and J18 on MIMXRT685-EVK board) for I3C-bus.

The MIMXRT685-EVK MCU board communicates with P3T1085UK demo GUI through PC USB port and uses I²C or I3C-bus to communicate to P3T1085UK.

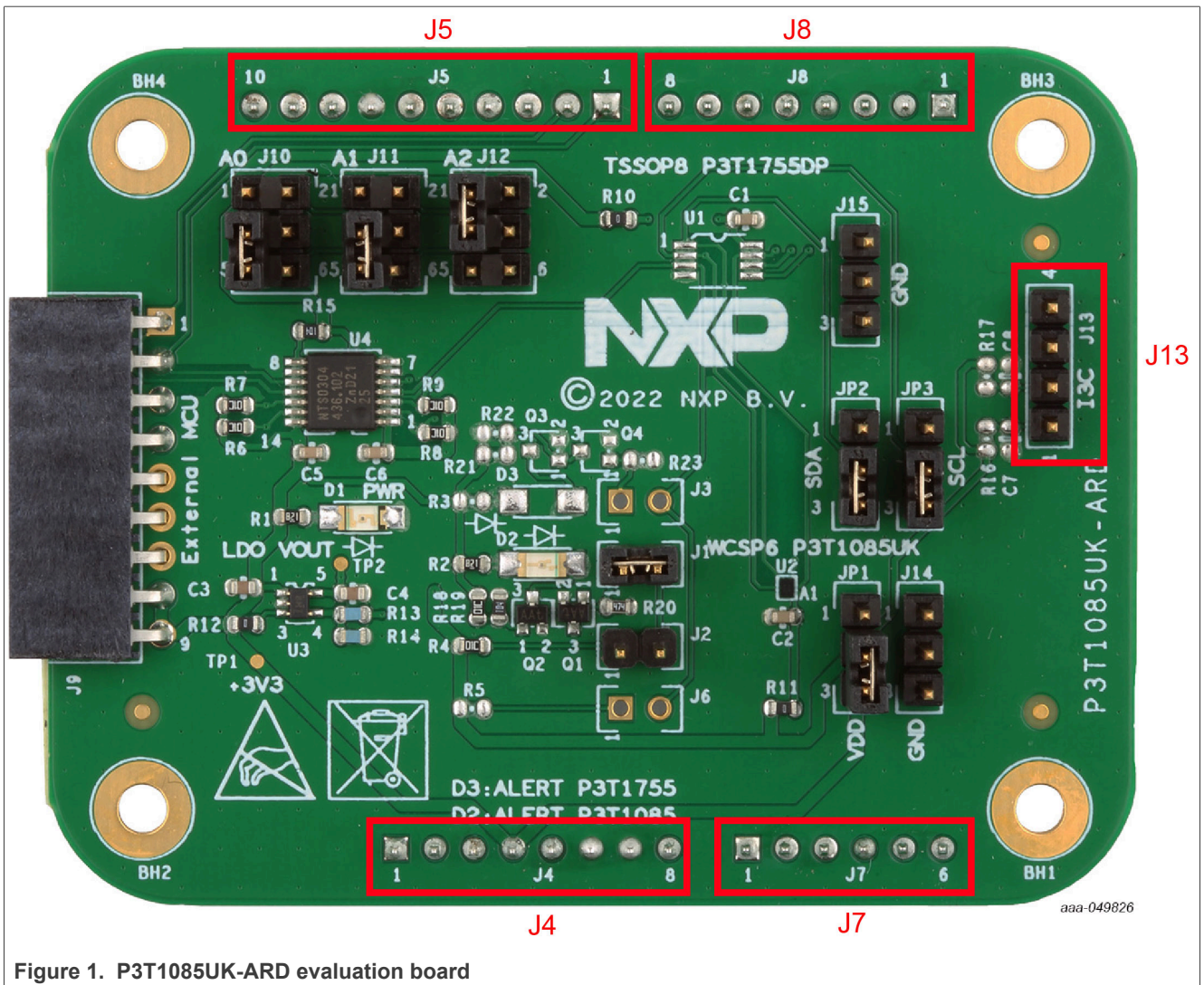
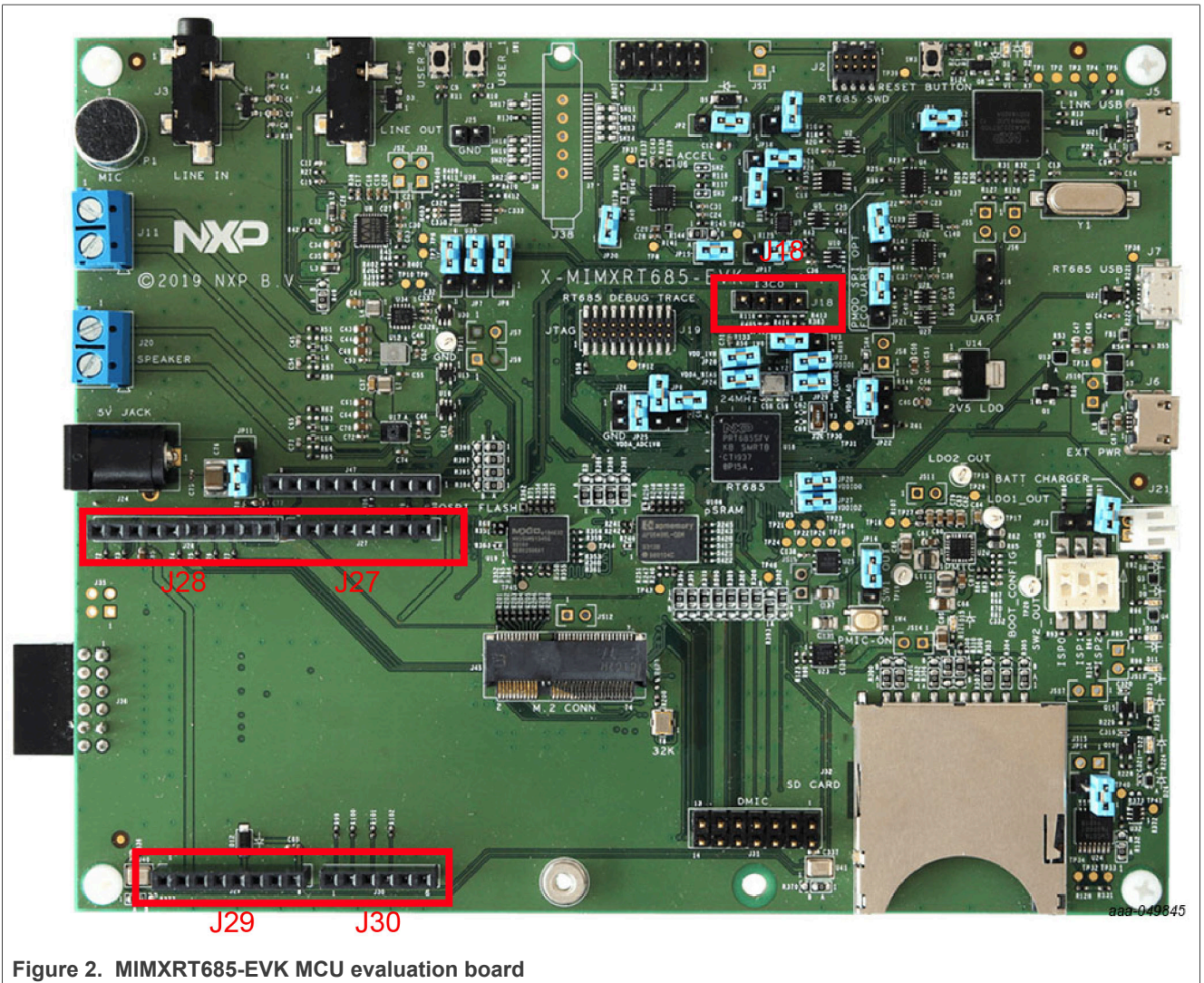
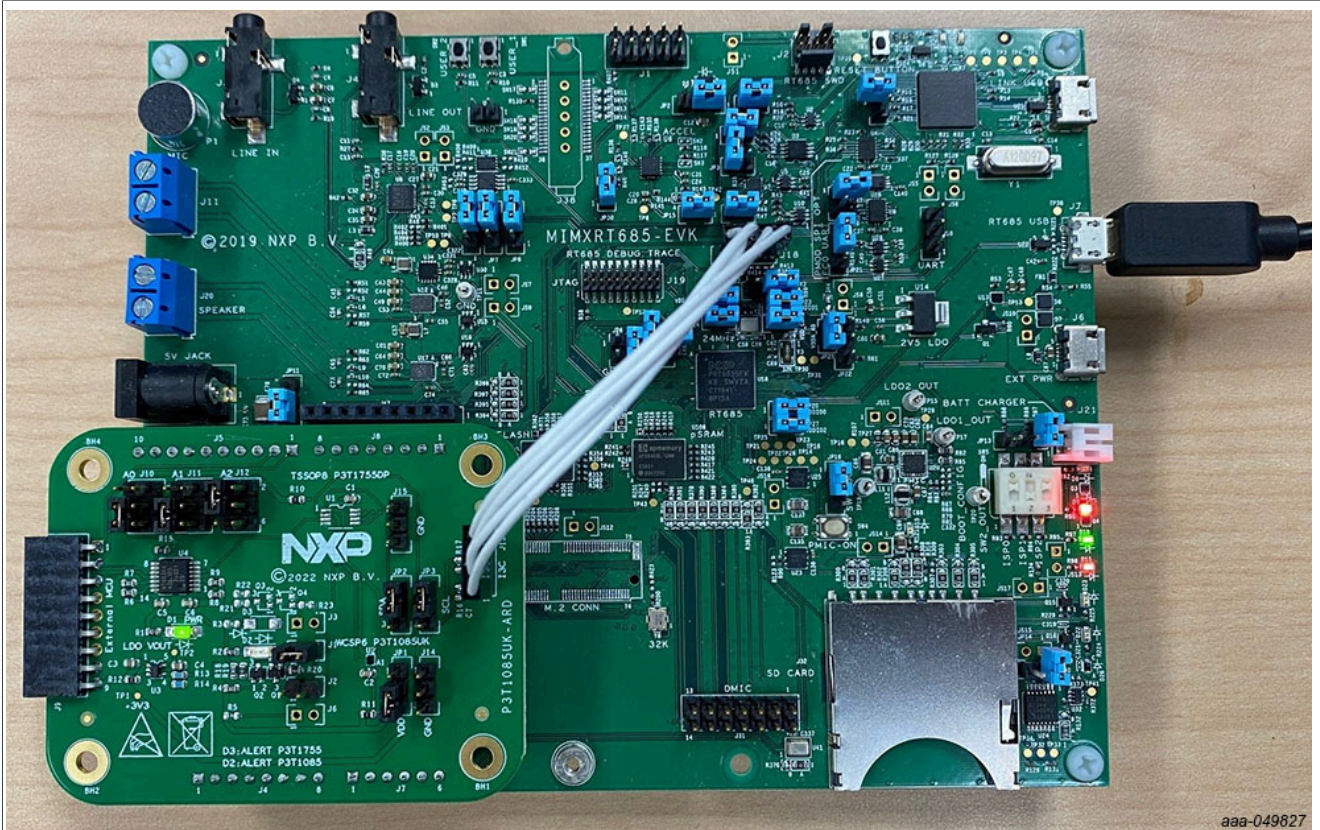


Figure 1. P3T1085UK-ARD evaluation board





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Use J7 (USB Micro-B connector) on MIMXRT685-EVK for power supply and GUI communication port.

Figure 3. P3T1085UK-ARD evaluation board connecting to the MIMXRT685-EVK MCU board

6 Hardware description

- J4/J5/J7/J8 are connected to the MIMXRT685-EVK MCU board for P3T1085UK-ARD power supply and I²C-bus interface.
- J13 is connected to the MIMXRT685-EVK MCU board for P3T1085UK-ARD I3C-bus interface.
- JP1 selects P3T1085UK VDD power supply.
- J10 selects P3T1085UK I²C target address.
- JP2/JP3 select I²C or I3C-bus interface.

Table 1. P3T1085UK-ARD EV board main components

Device	Description	Location
P3T1085UK	I3C, I ² C-bus, 0.5 °C accuracy, digital temperature sensor	U2
TPS71701DCKT	Adjustable output voltage LDO	U3
NTS0304EPWJ	4-bit dual supply translating transceiver	U4
Green LED	Power supply on LED	D1
Red LED	Alert LED	D2

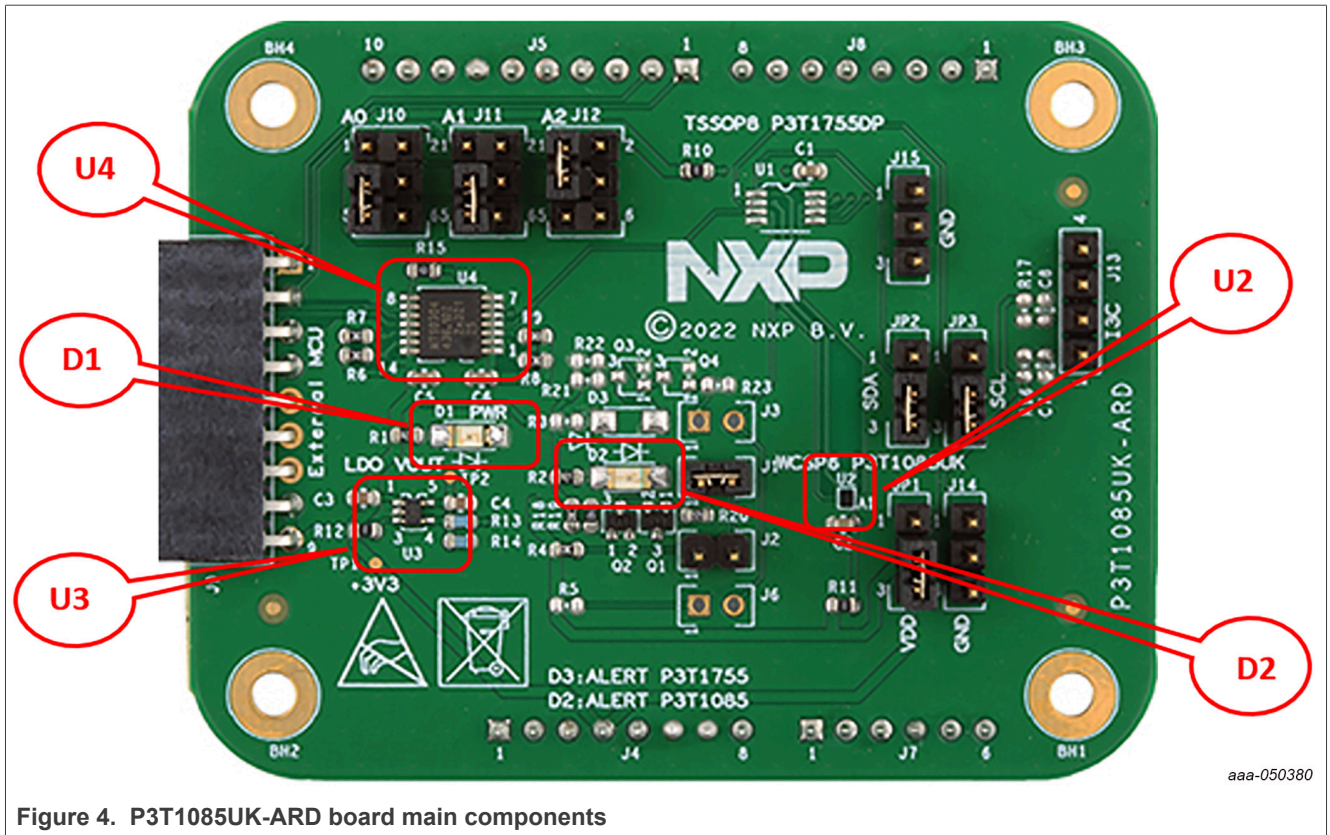


Figure 4. P3T1085UK-ARD board main components

Table 2. Jumper settings

Jumper	Default setting	Comment
J1	1-2	1-2: Alert LED is used. Open: No Alert LED used.
J2	Open	1-2: Alert pin 10K pull-up resistor is selected. Open: No Alert pin 10K pull-up resistor selected.
J3	DNP	No used
J4-J5		Arduino connector
J6	DNP	No used
J7-J8	N/A	Arduino connector
J9		External MCU interface connector
J10	3-5	1-3: A0 pin connected to VDD 3-5: A0 pin connected to ground 2-4: A0 pin connected to SCL 4-6: A0 pin connected to SDA
J11-12	DNP	No used
J13		I3C connector
J14-15		Ground test pins
JP1	2-3	1-2: VDD = 1.8V 2-3: VDD = 3.3V
JP2	2-3	1-2: SDA = SDA_I3C 2-3: SDA = SDA_I2C
JP3	2-3	1-2: SCL = SCL_I3C 2-3: SCL = SCL_I2C

7 Schematic

The schematic diagram of P3T1085UK-ARD is available at URL: <http://www.nxp.com/P3T1085UK-ARD>.

8 P3T1085UK demo GUI

8.1 Run P3T1085UK-ARD GUI V0.1.exe on Windows 7,8,10 PC

1. Click “Connect” button to connect MIMXRT685-EVK board
2. Use Setting tab to select I²C and I3C-bus speed
3. Use I²C tab to use I²C-bus to access to the P3T1085UK
4. Use I3C tab to use I3C-bus to access to the P3T1085UK

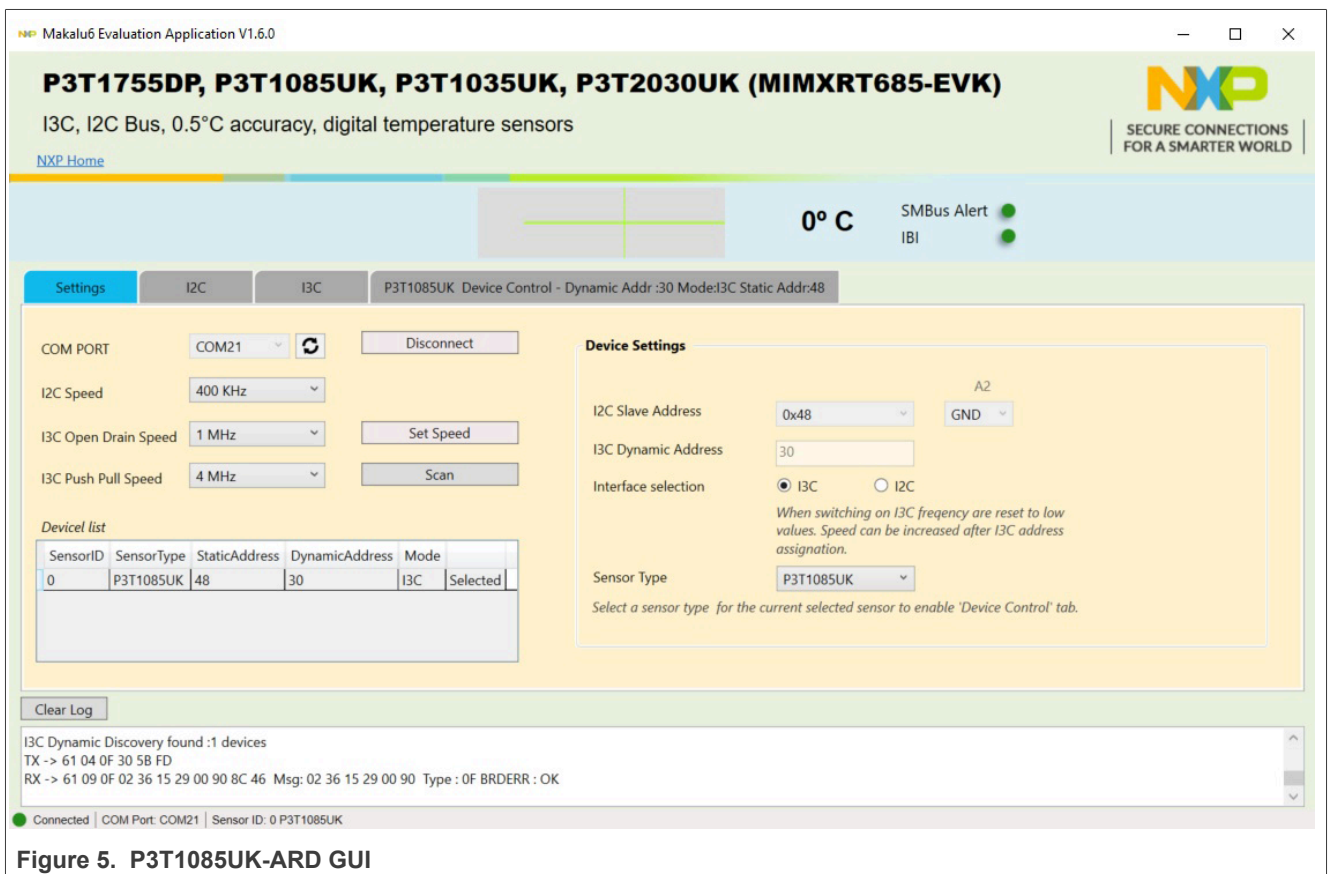


Figure 5. P3T1085UK-ARD GUI

9 Abbreviations

Table 3. Abbreviations

Acronym	Description
ESD	Electro Static Discharge
GUI	Graphical User Interface
I ² C-bus	Inter-Integrated Circuit bus

Table 3. Abbreviations...continued

Acronym	Description
IC	Integrated Circuit
LED	Light Emitting Diode
PC	Personal Computer
SCL	Serial Clock Line
SDA	Serial Data Line
USB	Universal Serial Bus

10 References

1. *P3T1085UK, I3C, I²C-bus, 0.5 °C accuracy, digital temperature sensor*
Product data sheet; NXP Semiconductors

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