RTX Nexus ICE-III

User Manual

This document and the information contained is property of RTX A/S, Denmark. Unauthorized copying is not allowed. The information in this document is believed to be correct at the time of writing. RTX A/S reserves the right at any time to change said content, circuitry and specifications.

1 Preface 3
1.1 About this document 3
1.2 Intended audience 3
1.3 Further reading 3
1.4 Feedback 3
2 Introduction 4
2.1 About RTX Nexus ICE-III 4
2.2 Availability 4
2.3 Compatibility 4
3 System Setup 5
3.1 Installation 5
3.2 The RTX Nexus ICE-III interface unit 5
4 Reference 6
4.1 20-pins header 6
4.2 DB-9, 1-wire JTAG (SDI+) 7
4.3 DB-9, 2-wire SWD 8

This document and the information contained is property of RTX A/S, Denmark. Unauthorized copying is not allowed. The information in this document is believed to be correct at the time of writing. RTX A/S reserves the right at any time to change said content, circuitry and specifications.

1 Preface

1.1 About this document

This document describes the RTX Nexus ICE-III target interface unit.

1.2 Intended audience

This document is written for users of RTX Nexus ICE-III on the Windows platform, using the RTX Nexus Debugger debugging environment. It is assumed that you are a software engineer with some experience of the ARM Cortex-M or NSC CR16C architecture.

1.3 Further reading

This section lists publications by thirds parties that are related to this product.

ARM Cortex-M Series Family:
http://www.arm.com/products/processors/cortex-m

ARM Serial Wire Debug (SWD):
https://www.arm.com/products/processors/serial-wire-debug.php

JTAG technology, IEEE standard 1149.1:
http://www.ieee.org/

1.4 Feedback

RTX A/S welcomes feedback both on the RTX Nexus ICE-III, the RTX Nexus Debugger and the documentation.

The software for the RTX Nexus Debugger and RTX Nexus ICE-III is updated regularly with new features and bug fixes. The latest versions are available free of charge from the download section at https://www.rtx.dk/.

If you have any problems with RTX Nexus ICE-III, please use the contact from at https://www.rtx.dk/. To help us provide a rapid and useful response, please give:

- the RTX Nexus ICE-III serial number you are using.
- the RTX Nexus Debugger software version you are using.
- a clear explanation of what you expected to happen, and what actually happened.
- if possible, sample output illustrating the problem.

This document and the information contained is property of RTX A/S, Denmark. Unauthorized copying is not allowed. The information in this document is believed to be correct at the time of writing. RTX A/S reserves the right at any time to change said content, circuitry and specifications.

2 Introduction

2.1 About RTX Nexus ICE-III

RTX Nexus ICE-III is a target interface unit for the ARM's Cortex-M or NSC's CR16C architectures. It enables you to debug software via the SWD or SDI+ interface pins.

RTX Nexus ICE-III unites 2-wire SWD, 1-wire JTAG (SDI+), UART and galvanic isolation in a single box, providing the full functionality needed for both Dialog SC14xxx and DA14xxx series processors.

The RTX Nexus ICE-III product comprises:

- An interface unit that connects a USB port of a PC to the JTAG and/or UART interfaces of a processor that includes SWD or SDI+ debug capability.
- A standard USB A to mini-B cable.
- Software available from the download section at https://www.rtx.dk/.
- The software package includes the following components:
  - Virtual COM port driver
  - Debugger interface driver
  - a Dynamic Link Library (DLL) to use with the debugger
  - the RTX Nexus Debugger

2.2 Availability

RTX Nexus ICE-III is available from RTX A/S. Contact RTX sales (http://www.rtx.dk/) for pricing.

Software upgrades are available free of charge from the download section at https://www.rtx.dk/.

2.3 Compatibility

The UART is exposed as a standard COM port on the PC and can be used as any other COM port.

The debugger interface can currently only be used with the RTX Nexus Debugger.

This document and the information contained is property of RTX A/S, Denmark. Unauthorized copying is not allowed. The information in this document is believed to be correct at the time of writing. RTX A/S reserves the right at any time to change said content, circuitry and specifications.

3 System Setup

3.1 Installation

The software for the RTX Nexus Debugger and RTX Nexus ICE-III runs on Windows 7 or newer.

1) **Install software**. Run Nx4Setup_vxx.exe to install the RTX Nexus Debugger. This also pre-installs the USB drivers needed for RTX Nexus ICE-III.

2) **Connect USB cable**. Connect RTX Nexus ICE-III to the PC using a standard USB A to mini-B cable.
Windows now automatically installs the USB drivers for RTX Nexus ICE-III. A new COM port also appears.

3) **Update Firmware**. Run the RTX Nexus Debugger. If new firmware is available for RTX Nexus ICE-III, it will be updated automatically.

4) The system is now ready for use. You can now connect the target and configure RTX Nexus Debugger.

3.2 The RTX Nexus ICE-III interface unit

3.2.1 Rear side connectors

The rear side on the box has a USB connector. It used to connect RTX Nexus ICE-III to a PC using a standard USB A to mini-B cable. The RTX Nexus ICE-III hardware is powered from the USB connector.

3.2.2 Front side connectors

The front side has the connectors for the target device. These are galvanic isolated from the PC USB connection.

- **20-pin header**: I/O ports for UART, SWD and 1-wire JTAG. See pin out reference in section 4.1.

- **Button**: The JTIO and RXD pins are pulled low while the button is pressed. This used for bringing SC14xxx/DA14xxx targets into boot mode.

- **Blue LED**: On when RTX Nexus ICE-III is powered on and idle.

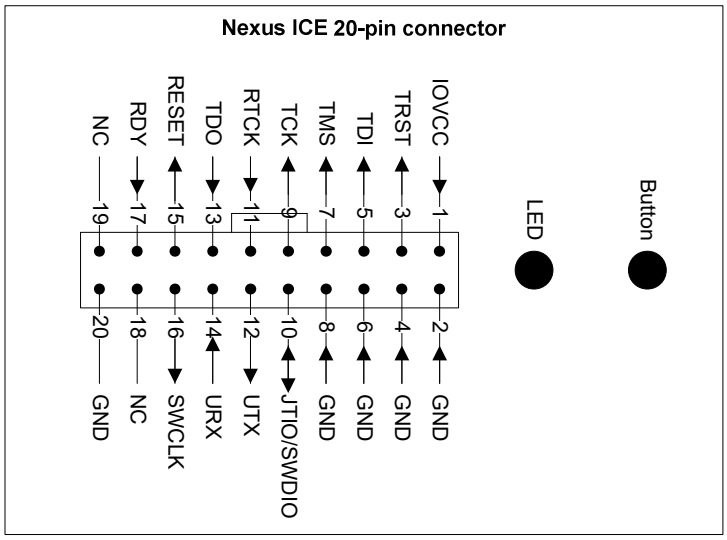
- **Green LED**: On when RTX Nexus Debugger is active. Flashes during JTAG communication.

- **Red LED**: On when COM port is open. Flashes during UART communication.

This document and the information contained is property of RTX A/S, Denmark. Unauthorized copying is not allowed. The information in this document is believed to be correct at the time of writing. RTX A/S reserves the right at any time to change said content, circuitry and specifications.

4 Reference

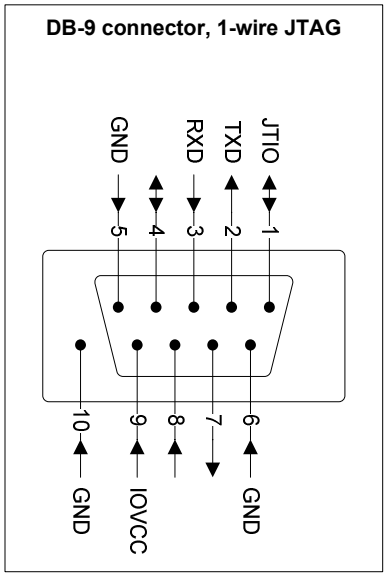
4.1 20-pins header



#	Pin	Description
1	IOVCC	Target I/O voltage input. RTX Nexus ICE-III adapts the voltage for the other I/O ports to the voltage detected on this pin. The supported range is 1V8-3V3.
3	TRST	5-wire JTAG: Test logic reset.
5	TDI	5-wire JTAG: Test data input.
7	TMS	5-wire JTAG: Test mode select.
9	TCK	5-wire JTAG: Test clock.
11	RTCK	5-wire JTAG: Return clock.
13	TDO	5-wire JTAG: Test data output.
15	RESET	5-wire JTAG: Processor reset.
17	RDY	5-wire JTAG: Ready (SDI+).
2-8, 20	GND	Ground.
10	JTIO	1-wire JTAG: I/O pin.
10	SWDIO	2-wire SWD: I/O pin.
12	UTX	UART transmit.
14	URX	UART receive.
16	SDWCLK	2-wire SWD: Clock pin.

This document and the information contained is property of RTX A/S, Denmark. Unauthorized copying is not allowed. The information in this document is believed to be correct at the time of writing. RTX A/S reserves the right at any time to change said content, circuitry and specifications.

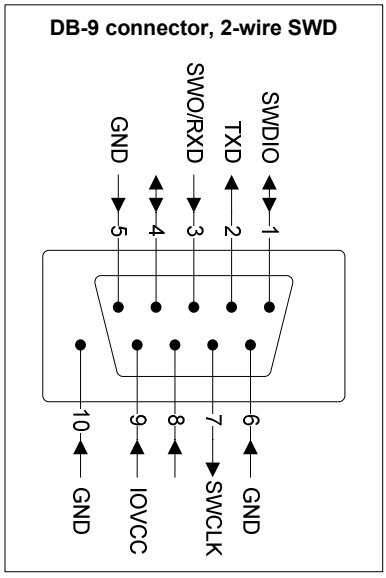
4.2 DB-9, 1-wire JTAG (SDI+)



#	Pin	Description
1	JTIO	1-wire JTAG I/O pin.
2	TXD	UART transmit.
3	RXD	UART receive.
5, 6, 10	GND	Ground.
9	IOVCC	Target I/O voltage input. RTX Nexus ICE-III adapts the voltage for the other I/O ports to the voltage detected on this pin. The supported range is 1V8-3V3.

This document and the information contained is property of RTX A/S, Denmark. Unauthorized copying is not allowed. The information in this document is believed to be correct at the time of writing. RTX A/S reserves the right at any time to change said content, circuitry and specifications.

4.3 DB-9, 2-wire SWD



#	Pin	Description
1	SWDIO	SWD data I/O pin.
7	SWDCLK	SWD clock pin.
2	TXD	UART transmit.
3	RXD	UART receive.
5, 6, 10	GND	Ground.
9	IOVCC	Target I/O voltage input. RTX Nexus ICE-III adapts the voltage for the other I/O ports to the voltage detected on this pin. The supported range is 1V8-3V3.

EOF.

This document and the information contained is property of RTX A/S, Denmark. Unauthorized copying is not allowed. The information in this document is believed to be correct at the time of writing. RTX A/S reserves the right at any time to change said content, circuitry and specifications.