

MAXREFDES27# IO-Link Proximity Sensor Quick Start Guide

Rev 0; 4/14



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Maxim Integrated 160 Rio Robles, San Jose, CA 95134 USA 1-408-601-1000

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1. Required Equipment

- PC with Windows® 7 (Verify with Balluff that your version of Windows is supported before purchasing their software.)
- Saratoga (MAXREFDES27#) board
- One Balluff USB IO-Link® master (silver box) with corresponding USB and power cables (This must be purchased separately.)
- Balluff IO-Link Device Tool (tested with version 2.11.1 and comes with the Balluff USB IO-Link master)
- One IO-Link cable (yellow) (This must be purchased separately.)
- RD27_RL78_V01_XX.ZIP (Maxim-Saratoga-20140318-IODD1.0.1.xml), where XX = minor version

2. Overview

Below is a high-level overview of the steps required to quickly get the Saratoga design running by connecting it to the Balluff USB IO-Link master and Balluff software. Detailed instructions for each step are provided in the following pages. The Saratoga (MAXREFDES27#) subsystem reference design will be referred to as Saratoga throughout this document.

- 1) Connect the A-to-B Type USB cable from the PC and yellow IO-Link cable to the Balluff USB IO-Link master (silver box with part number BNI USB-901-000-A501) as shown in Figure 1.
- Connect the MAXREFDES27# proximity sensor board to the other side of the yellow IO-Link cable. Make sure the green LED is lit as shown in <u>Figure 2</u>. The red and yellow LEDs do not need to be lit.
- 3) Download the latest "all design files" **RD27V01_XX.ZIP** file located at the Saratoga page.
- 4) Extract the RD27V01_XX.ZIP file to a directory on your PC.
- 5) Install the Balluff IO-Link Device Tool.
- 6) Add the Saratoga proximity sensor as a device into the Balluff IO-Link Device Tool.
- 7) Connect to the Saratoga by pressing the online connection button.



Figure 1. MAXREFDES27# Board Connected to a Balluff USB IO-Link Master



Figure 2. Green LED Is Lit

3. Included Files

The **RD27_RL78_V01_XX.ZIP** contains the corresponding IO-Link Device Descriptor (IODD) files. The IODD contains information on communication properties, device parameters, identification, process, and diagnostic data. It includes an XML file, an image of the device, an icon image, and the manufacturer's logo. The IODD structure is the same for all devices of all manufacturers, and is always represented in the same way by the IODD interpreter tools.



Figure 3. Block Diagram of System

4. Procedure

- Connect the A-to-B Type USB cable from the PC and yellow IO-Link cable to the Balluff USB IO-Link master (silver box with part number BNI USB-901-000-A501) as shown in <u>Figure 1</u>.
- Connect the MAXREFDES27# proximity sensor board to the other side of the yellow IO-Link cable. Make sure the green LED is lit as shown in <u>Figure 2</u>. The red and yellow LEDs do not need to be lit.
- Download the latest "all design files" RD27V01_XX.ZIP file at <u>www.maximintegrated.com/AN5868</u>. All files available for download are available at the bottom of the page.
- 4. Extract the **RD27V01_XX.ZIP** file to a directory on your PC. The location is arbitrary but the maximum path length limitation in Windows (260 characters) should not be exceeded.
- 5. Install the Balluff IO-Link Device Tool. This tool comes with the purchase of the Balluff USB IO-Link master (silver box with part number BNI USB-901-000-A501). Run the **setup.exe** file using the **Run as administrator** mode.

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Autorun1.exe		5/3/2011 2:52 AM	Applicat	tion	268 KB	
🔂 Balluff IO-Link Device Tool - Set	up.ms	i 5/3/2011 1:42 AM	Window	s Installer	2,992 KB	
NIO_Link.ico		12/3/2008 9:41 AM	Icon		4 KB	
🔂 setup.exe		Onen	A 12 1	ion	492 KB	
🕂 tool.ico		Run as administrator			4 KB	
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6. Choose the default installation folder and press the **Next** button.

Balluff IO-Link Device Tool
Select Installation Folder BALLUFF
IO-Link Device Tool
The installer will install Balluff IO-Link Device Tool to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Eolder: C:\Program Files (x86)\Balluff GmbH\IO-Link Device Tool\ Browse
Install Balluff IO-Link Device Tool for yourself, or for anyone who uses this computer:
⊘ Just <u>m</u> e
Cancel < <u>B</u> ack Next >

7. Press the **Next** button.





8. Change the language to English if applicable.

9. Close the program by clicking the **X** in the top right corner.

10. Press the **Close** button to complete the installation.



11. Verify the version of the IO-Link Device Tool. In this case, version 2.1.11 was used.



Balluff IO-Link Device Tool	Annual 1 Annual Annua	
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12. The User Login should be in Specialist mode. Password is special.

13. Import the IODD xml file for the Maxim sensor. In this case, the file is Maxim-Saratoga-20140318-IODD1.0.1.xml and can be located in the RD27_RL78_V01_00.ZIP file.

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		Sample Device
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14. In this case, this is the IODD file shown below, but may be a different .xml file if a different Maxim sensor is used.



15. See the Maxim Sensor show up in the IO-Link devices in the Catalog window.



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16. Select File | Properties.

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	Company	created	-Devices
	Organzation	Project Description	Renesas Electronics Europe G
			Renesas-RL78-Maxim
			TMG TE GmbH
			Sample Device
		~	^

17. After **Properties** is selected, the screen looks like the below screenshot.

18. Verify that the USB cable is plugged into the silver USB IO-Link Master box.

Balluff IO-Link Device Tool File Options View Help Image: State S	음입 . +1 + +? + Specialist • ①	
Topology	Common Common Evice Balleff USB IO-Link Master DE (COM15) Version Research for interfaces Connected Device Name Vendor Description Vendor ID Delete Device Delete Device	Catalog Catalo
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19. Drag the **Balluff USB IO-Link Master** to the **Topology** window.

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< >	Proximity and Ambiant Light Sensor with Max44000, MAX14821, RL78 TMG TE IO-Link Device Stack	r ^

20. Drag the Maxim sensor to the Name field in the Common window.

21. Verify a picture of the sensor shows up with the name **Maxim Saratoga Demo**.



Salluff IO-Link Device Tool		
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22. Press the **Connect** button on the Balluff IO-Link Device Tool software.

23. If your sensor has a problem or is unconnected, you will see the below figure.

Salluff IO-Link Device Tool		
File Options View Help Image: Construction of the state of the s	Algemein Process Data Parameter Scope IO-Link Hersteller Renesas Bectronics Europe Gml Maxim Vendor ID 0x018C maxim CCONESAS	Catalog X PC-Interfaces Catalog Vendor Catalog Vendor
	Gerät Renesas-RL78-Maxim-Sample Beschreibung Sample Device for RL78 with MAX14821 Device ID 0x18C001 Hardware-Version 1.0 Baudrate COM3 SIO-Mode yes Dokumentversion V1.0 Okumentversion V1.0	→ © IO-Ink Sample Device → TMG TE GmbH → Sample Device → Sample Device

24. If you see the green **Online** indication on the software, the sensor has connected. Click on the Maxim sensor device icon to make the **Parameter** tab show up. Change the values as shown in the figure below by right-clicking with the mouse.

Balluff IO-Link Device Tool	or a few seconds and then cover	the tip of	the MAXPER	DES27# sens		×
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Topology	Common Process Data Parameter Oscilloscope					
	Name	R/W	Preadjustment	Value	Unit	<u> </u>
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	Product Name	ro	Maxim Saratoga	Maxim Saratoga		
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	Firmware Revision	ro	1.0	1.0		
Click here to	Application Specific Name	rw	USE IO-Link	USE IO-Link		=
make the	[-] Parameter					
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	Pin2 Mode	rw	Sensor Switch	Sensor Switch		
show up.	Gain	rw	1x	1x		
	Conversion Time	rw	100	100		
Then click on	Trim Gain	rw	use factory-programmed tri.	use factory-programmed tr		
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the mouse to	System Command <teach></teach>	wo		40		
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25. Click on the **Process Data** tab and vary your hand approximately 20mm to 150mm from the tip of the proximity sensor to see the changing value.

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	Sensor Switch	false	
	Value	70	
	[-] Process Data Outputs		
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5. Appendix A: Project Structure and Key Filenames



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6. Trademarks

IO-Link is a registered trademark of ifm electronic GmbH. Windows is a registered trademark and registered service mark of Microsoft Corp.

7. Revision History

REVISION	REVISION	DESCRIPTION	PAGES
NUMBER	DATE		CHANGED
0	4/14	Initial release	





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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.З, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж: moschip.ru moschip.ru_4

moschip.ru_6 moschip.ru_9