

MAXREFDES36# IO-Link 16-Channel Digital Input Hub Quick Start Guide

Rev 0; 5/14



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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.)
- MAXREFDES36# 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.)
- RD36_RL78_V01_XX.ZIP (Maxim-SanFrancisco-20140127-IODD1.0.1.xml), where XX = minor version

2. Overview

Below is a high-level overview of the steps required to quickly get the MAXREFDES36# 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.

- 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 MAXREFDES36# 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" RD36V01_XX.ZIP file located at the MAXREFDES36# reference design page.
- 4) Extract the **RD36V01_XX.ZIP** file to a directory on your PC.
- 5) Install the Balluff IO-Link Device Tool.
- 6) Add the MAXREFDES36# digital input hub as a device into the Balluff IO-Link Device Tool.
- 7) Connect to the MAXREFDES36# by pressing the online connection button.



Figure 1. MAXREFDES36# Board Connected to a Balluff USB IO-Link Master



Figure 2. Green LED Is Lit

3. Included Files

The **RD36_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 MAXREFDES36# 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" RD36V01_XX.ZIP file at <u>www.maximintegrated.com/AN5879</u>. All files available for download are available at the bottom of the page.
- 4. Extract the **RD36V01_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.

DVD RW Drive (D:) Disc 🔸 Setup						√ 4 ₇
^						
Name		Date modified	Туре		Size	
 Files Currently on the Disc (6)) —					
E Autorun.exe		5/3/2011 2:52 AM	Applicat	tion	8 KB	
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	
	<u> </u>	Troubleshoot compatibility				
		Edit with Notenad++				
	1	TortoiseSVN	•			
	U	Scan for threats				
	0	Share in WebEx Meeting	+			
		WinMerge				
=		Send to	•			
		Conv				
		copy				
		Create shortcut				
		Properties				
	_			·		

6. Choose the default installation folder and press the **Next** button.

Balluff IO-Link Device Tool	
Select Installation Folder	
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 belo	w or click "Browse".
Folder	
C:\Program Files (x86)\Balluff GmbH\IO-Link Device Tool\	B <u>r</u> owse
,	Disk Cost
Install Balluff IO-Link Device Tool for yourself, or for anyone who uses this of	computer:
⊚ Just <u>m</u> e	
Cancel < <u>B</u> ack	Next >

7. Press the Next button.



- NO-Link Device Tool Datei Extras Ansicht Hilfe Sprachumschaltung ۲ English -----• 0 Topologie Login Status ändern Katalog X PC-Interfaces Benutzer verwalten E - ♥ Vendor E - ♥ Balluff GmbH Kommunikation simulieren Balluff USB IO-Link └──」 Balluff USB IO-Link I-◯ IO-Link-Devices I-◯ IO-Link -Devices I-◯ IO-Link Sample Dev IO-Link Sample Devices IO-C ID GrE GmbH I-◯ Sample Devices I-◯ Sample Devices TCI Aufruf ۲ Gerätebeschreibung importieren < □ * .
- 8. Change the language to English if applicable.

9. Close the program by clicking the \mathbf{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		
File Options View Help		
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Topology	Balluff IO-Link Device Tool User Login Operator Authorization Maintenance Ø Specialist Password Ext Login	Catalog

12. The User Login should be in Specialist mode. Password is special.

13. Import the IODD xml file for the Maxim device. In this case, the file is Maxim-SanFrancisco-20140127-IODD1.0.1.xml and can be located in the RD36_RL78_V01_00.ZIP file.

Salluff IO-Link Device Tool	Annual of the second	
File Options View Help		
Change Language	+ +? + Specialist - (i)	
Topolo Change Login Status		Catalog
User Management		PC-Interfaces
Import Device Description		E Ø Balluff GmbH
		Balluff USB IO-Link Ma
		E- Vendor
		⊟% TMG TE GmbH
		Sample Device
		4 III +
[<u></u>]		

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

Import Device Description								
CO VIII « 9. Firmware > FW On Your Board > Public FW > RD36_RL78_V01_00 > IODD + 47 Search IODD								
Organize 🔻 New folder		** • [] 📀						
 Dropbox dwhelper Favorites InstallAnywhere InstallAnywhere InstallAnywhere My Documents My Pictures My Videos SapWorkDir Saved Games Searches Virtual Machines workspace Xilinx Computer Network 	Maxim-SanFrancisco-20140127-IODD1.0.1.x	m						
Control Danol	•	- IO Link Draice Description (* 16 -						
File <u>n</u> ame: Ma	xxim-sanrrancisco-20140127-iODD1.0.1.xml	Open Cancel						

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



16. Select File | Properties.

Salluff IO-Link Device Tool					
File Options View Help					
New ne 🄛 🔢 . + 🛊 + +? + 🗾 Specialist 🗸 🛈					
Open	Catalog				
Save	ifaces				
Save as	Balluff GmbH				
Properties	Balluff USB IO-Link Master				
Exit	ndor				
	Renesas Electronics Europe G				
	Renesas-RL78-Maxim				
	- Sample Devices				
	Sample Device				

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

Salluff IO-Link Device Tool	· Annual I	-	
File Options View Help			
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Topology	Project Description Changes		Catalog
	Project Name		ndor
	Author	Version	Balluff GmbH
	Company	created	-Devices
	Organzation	Project Description	Renesas Electronics Europe G
			Renesas-RL78-Maxim
			TMG TE GmbH
			Sample Device
			4
		-	-

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 File ? Dottions Stew Step	문국 · · · · · · · · · · · · · · · · · · ·	
Topology Baluff USB K0-Link Master DE Drag to Topology window	Common Common Device Balluff USB IO-Link Master DE (COM15) Version A Version Version Verdor Balluff USB IO-Link Master DE (COM15) Connected Device Name Verdor Description Device ID	Catalog Catalo
< <u> </u>	Vendor ID Delete Device	< <u>m</u> >

19. Drag the **Balluff USB IO-Link Master** to the **Topology** window.

O IO-Link Device Tool : MyProject_001.xml	
File Options View Help	
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Topology Image: Common Sector 2000 Image: Common Sector 2000	Catalog

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

21. Verify a picture of the device shows up with the name **Maxim San Francisco Demo**.



- IO-Link Device Tool : MyProject_001.xml Options View Help File 2 Offline 😫 🔠 + + +? + 📄 Specialist 👻 🛈 (😫 Common X Topology Catalog PC-Interface **O**IO-Link 🚳 [0] Maxim San Francisco Demo BALLUFF 🗄 🧐 Balluff GmbH Balluff USB IO-Link Master sensors worldwide 🌾 IO-Link-Devices Balluff USB IO-Link Master Device Nendor Version Balluff GmbH Maxim Integrated Products, Inc. Vendor Maxim Integrated Todots, Inc.
 Maxim Sample Devices
 Maxim Saratoga Demo
 Maxim Saratoga Demo
 MG TE GmbH Interface Search for interfaces Connected Device Press the Setup Sample Devices Name Maxim San Francisco Demo **Online Connection** Maxim Integrated Products, Inc. Vendor **Button** Digital Inputs with MAX14821, RL78 and TMG TE Device A Stack Description Device ID 0x000003 Vendor ID 0x01DE Delete Device .
- 22. Press the Connect button on the Balluff IO-Link Device Tool software.

23. If your device has a problem or is unconnected, you will see the below figure. Please check that your device is connected to the IO-Link master.

Balluff IO-Link Device Tool		
File Options View Help		
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Topology Alige	emein Process Data Parameter Scope Catalog	X
Balluff USB IO-Link Master DE (COM15) Balluff USB IO-Link Master DE (COM15) Common San Francisco Demo Geri Besu Dev Harc Bau SIO- IOD Dok	Hersteller Wendor ID Küt IDE Küt Maxim San Francisco Demo Digtal Inputs with MAX14821, RL78 and TMG TE Digtal Inputs with MAX14821,	ik Master ducts, Inc. evices ancisco Demo ga Demo 22

24. If you see the green **Online** indication on the software, the device has connected. Click on the Maxim device icon to make the tabs show up. Click on the **Process Data** tab.

🗞 Balluff IO-Link Device Tool						
File Options View Help						
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Topology	Common Process Data Parameter Oscilloscope					
Balluff USB IO-Link Master DE (COM15)	Name	Processdata	Unit			
[0] Maxim San Francisco Demo	[·] Process Data Inputs					
	Digital Input 1	false				
	Digital Input 2	false				
	Digital Input 3	false				
	Digital Input 4	false				
Click house to	Digital Input 5	false				
CIICK nere to	Digital Input 6	false				
make the tabs	Digital Input 7	false				
show up.	Digital Input 8	false				
-	Digital Input 9	false				
Then click on the	Digital Input 10	false				
"Process Data"	Digital Input 11	false				
Frocess Data	Digital Input 12	false				
tad to see the	Digital Input 13	false				
cyclic 1ms	Digital Input 14	false				
updates of the	Digital Input 15	false				
digital input	Digital Input 16	false				
status.	Digital Output Value	false				
	Pattern equal	true				
	[-] Process Data Outputs					
	Pin 2 Value	false				

- 25. Connect a wire from the **24V** terminal block to the **INPUT** terminal block (digital input 1) as shown in the figure below.

26. Verify that the **Process Data** for **Digital Input 1** changes to **true**.

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File Options View Help					
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Topology	Common Process Data Parameter Oscilloscope				
⊟ Balluff USB IO-Link Master DE (COM15)	Name	Processdata	Unit		
[0] Maxim San Francisco Demo	[·] Process Data Inputs				
	Digital Input 1	true			
	Digital Input 2	false			
	Digital Input 3	false			
	Digital Input 4	false			
	Digital Input 5	false			
	Digital Input 6	false			
	Digital Input 7	false			
	Digital Input 8	false			
	Digital Input 9	false			
	Digital Input 10	false			
	Digital Input 11	false			
	Digital Input 12	false			
	Digital Input 13	false			
	Digital Input 14	false			
	Digital Input 15	false			
	Digital Input 16	false			
	Digital Output Value	false			
	Pattern equal	true			
	[-] Process Data Outputs				
	Pin 2 Value	false			
1					

5. Appendix A: Project Structure and Key Filenames





Binary file programmed into the RL78

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	5/14	Initial release	—

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