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MAXREFDES79# IO-Link Master Quick Start Guide

Rev 0; 3/15



For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim Integrated's website at www.maximintegrated.com.

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1. Required Equipment

- PC with Windows® 7 or Windows 8 (Verify with TEConcept that your version of Windows is supported before purchasing their software license. See Section 4 Software License Keys.)
- MAXREFDES79# (Box Contents)
 - MAXREFDES79# 4-Port IO-Link® Master
 - AC-to-DC 24V/1A output power converter
 - USA-to-Euro power adapter
 - Two Black 1 meter IO-Link cables (1 meter)
 - Micro-USB cable (2 meters)
- Necessary downloadable software includes:
 - TEConcept IO-Link Control Tool (CT) Software (see note)
 - STM32F4 VCP Driver (see note)
- An IO-Link compliant sensor or actuator (MAXREFDES27# IO-Link proximity sensor was used in this document, but any IO-Link compliant sensor or actuator from any company can be used. Other Maxim options are MAXREFDES23#, MAXREFDES36#, MAXREFDES37#, or MAXREFDES42#.)

Note: Download files from the Design Resources tab at: www.maximintegrated.com\MAXREFDES79.



Figure 1. MAXREFDES79# box contents.



Figure 2. MAXREFDES79# system connected and running.

2. Overview

- 1. Install the **TEConcept CT** software (**TC_Installer.msi**).
- 2. Install the STM32F4 VCP driver.
- 3. Connect the Micro-USB cable from the PC to the MAXREFDES79#.
- 4. Connect the AC-to-DC 24V DC power converter.
- 5. Connect the MAXREFDES27# to Port 1 of the MAXREFDES79# IO-Link master.
- 6. Run the **TEConcept CT** software and connect to the MAXREFDES79#.
- 7. Load in the IODD file for your sensor or actuator.
- 8. Press the **IO-Link** button to connect to sensor or actuator.
- 9. Read and write to sensor or actuator parameters.

3. Procedure

- 1. Download the **TEConcept CT** software and **STM32F4 VCP** driver from the **DESIGN RESOURCES** tab at <u>www.maximintegrated.com/MAXREFDES79</u>.
- 2. Install the **TEConcept CT** software (**TC_Installer.msi**).
- 3. Install the appropriate **STM32F4 VCP** driver depending on the version of Windows operating system (32-bit or 64-bit) as shown in <u>Figure 3</u>.

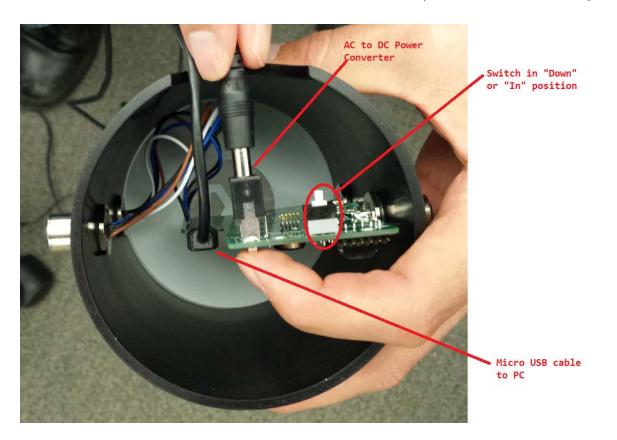
STM32F4 VCP Driver provided by TE Concepts + stsw-stm32102 + stsw-stm32102								
Name	Date modified	Туре	Size					
📄 readme.txt	12/31/2014 12:31	Text Document	2 KB					
VCP_V1.3.1_Setup.exe	12/31/2014 12:31	Application	6,345 KB					
VCP_V1.3.1_Setup_x64.exe	12/31/2014 12:31	Application	6,345 KB					
version.txt	12/31/2014 12:31	Text Document	2 KB					

Figure 3. STM32F4 VCP Driver for 32-bit and 64-bit Windows 7/Windows 8.

4. Connect the Micro-USB cable from the PC to the MAXREFDES79# as shown in Figure 4.



Figure 4. Connect the Micro-USB cable from underneath the MAXREFDES79# and then connect it to the PC.



5. Ensure that switch SW1 is in the "Down" or "In" position as shown in Figure 5.

Figure 5. Verify the SW1 position and connect the AC-to-DC 24V DC power converter.

- 6. Connect the AC-to-DC 24V DC power converter as shown in Figure 5.
- 7. Connect the MAXREFDES27# to Port 1 of the MAXREFDES79# IO-Link master. Port 1 is the top M12 female connector on the LED side of the IO-Link master.

8. Open Windows **Device Manager** and verify the connected COM port number connected as **STMicroelectronics Virtual COM Port (COMx)** shown in <u>Figure 6</u>.

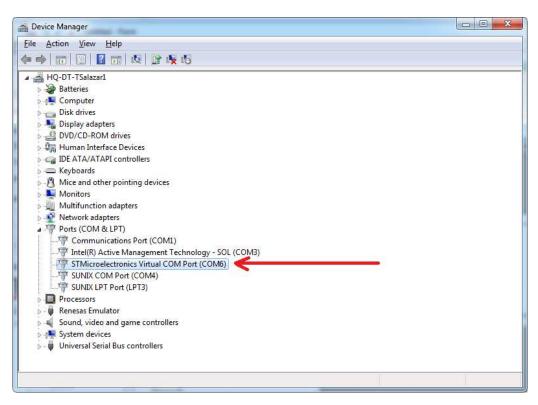


Figure 6. Verify COM port connected as "STMicroelectronics Virtual COM Port (COMx)." It may be a different COM port number on your PC.

 Run the TEConcept CT software as shown in <u>Figure 7</u>. Press the connection settings icon, which is a gray gear. (COM port may be different on your PC.) Press the Connect button and it will show a flashing green COM connection label at the bottom of the GUI once connected.

TEConcept GmbH - IO-Link Control To	ool (CT) - version 1.0.53.0			8 haar 18 h		and the second	
File View Master settings Firm	ware upgrade Tools Help						
0 🔘 🕲 🕄							
Connection settings	Port 1 Port 2 Port 3 Port 4						
Comm. port: COM3 -	Device parameters	Parameters					
TCP settings COM3 COM1	Device: -			SubInd, Name	Diabe	s Type Valu	
	IO-Link revision: -			Subinu. Name	Tagri	s type vaic	10
IP address: COM4 COM6	Bit rate: -						
Port: TCP/IP Aardvark	Min cycle time: -						
Aardvark interface	SIO / ISDU / DS:						
	Select device						
	Device configuration	Custom ISDU request		(20)%			
	Operating mode: FIXEDMODE	Index: 0	Ť				DS upload
Disconnect	Port cycle: FREE RUNNING -	Subindex: 0					
Topology	Inspection level: NO CHECK						Write
	DS activation state: DS DISABLED -	Data:					Read
TEConcept	DS download enable: DISABLE			1			1000
	DS upload enable: DISABLE	Process data					
	Cycle time (µs):	Name	Process data	Unit	1		
E-Port 1	Power OFF Power ON	Neme	1100033 0818	1 One	Process data collection:	•	Plot PD
- Device isn't selected					Raw Process Data In:	=	
Inactive	Inactive DI DO IO-Link	-					
Port 2 — Device isn't selected	Connected device state				Raw Process Data Out:		PDO invalid
Inactive	Vendor ID: -				and the second second		
E-Port 3	Device ID: - Product ID: -				🔿 Low 🔘 High		Send
Device isn't selected Inactive	Serial number: -	-					
⊟- Port 4	Vendor name: -	Events		T - Constanting		1	
- Device isn't selected	Product name: -	Time Event coo	e Mode	Туре	Source	Instance	
I Inactive	Cycle time: -						
• III	Port state: -						
A TO Link	Operate in IO-Link: No						
😢 IO-Link	Fault: NOFAULT						
IO-Link Master status: Not connected							

Figure 7. TEConcept IO-Link CT Software. Tested with version 1.0.53.0.

10. Load in the IODD file for your sensor or actuator. In this case, we will show the MAXREFDES27# IO-Link proximity sensor not included. First, press the Select device button. In the Device selector window, press the Import button and select the sensor's *1.1.xml IODD file. Highlight the IODD file in the IO-Link Devices box and press the Select device button. See Figure 8 and Figure 9.

~		•	Search IODD	
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٠ ال	Name	Date	Туре	Size
	属 Maxim-logo.png	12/10/2014 5:28 PM	PNG image	6 K
	Maxim-Saratoga-20140318-IODD1.0.1.xml	12/10/2014 5:28 PM	XML Document	15 K
	Maxim-Saratoga-20140318-IODD1.1.xml	12/10/2014 5:28 PM	XML Document	16 K
C	📭 Maxim-Saratoga-icon.png	12/10/2014 5:28 PM	PNG image	5 K
9 % 9 9				

Figure 8. Sensor IODD file (*1.1.xml).

Device basic data	οηςε			10-Link <mark>data</mark>			Maxim-Saratoga-20 Maxim-SanFranciso	co-20140127-IODD1.1
Vendor:	Maxim Integrated Prod	ucts, Inc.		Bit rate:	COM3		SICK-DT50-2-2014	
Device:	Maxim Saratoga Demo			10-Link Version:	1.1	1 1	Maxim-ServoInterfa	ice-20140910-IODD1.1
				MinCycleTime:	2000 µs			
Vendor ID:	478			SIO mode:	yes			
Device Id:	2	M inte	kim j			_7.		
Hardware Revision:		inte	grated	-	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			
imware Revision:				C C				
Description:	Proximity and Ambiant MAX14821, RL78 and	Light Sensor with Ma TMG TE IO-Link Der	x44000, vice Stack		A A A A A A A A A A A A A A A A A A A			
	1							
ODD <mark>data</mark>]							
	Maxim-Saratoga-2014	0318-IODD1.1						
ODD:	Maxim-Saratoga-20144 2014-03-18	D318-IODD1.1 Document version:	V2.0					
ODD: Release date:		Document version:	V2.0					
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IODD data IODD: Release date: elected device corre IOD checked and v	2014-03-18 esponds with connected of	Document version:	V2.0				ODD Check	

Figure 9. Press the Select device button when imported IODD files are highlighted.

11. The **IO-Link** button becomes active once the IODD file is assigned to a port and the MAXREFDES79# is connected to the PC. Press the **IO-Link** button once it becomes active as shown in Figure 10.

TEConcept GmbH - IO-Link Control To	ool (CT) - version 1.0.53.0	and the second s	And Indiana		
File View Master settings Firmw	vare upgrade Tools Help				10
0000					
Topology	Port 1 Port 2 Port 3 Port 4				
TEConcont	Device parameters	Parameters			
Pot 1 Pot 1 Pot 2 Pot 3 Pot 3 Pot 3 Pot 3 Pot 3 Pot 3 Pot 4 Pot 3 Pot 3 Pot 4 Pot 3 Pot 4 Pot 3 Pot 3 Pot 3 Pot 4 Pot 3 Pot 4 Pot 3 Pot 3 Pot 4 Pot 3 Pot 3 Pot 4 Pot 4 Pot 3 Pot 4 Pot 3 Pot 4 Pot 3 Pot 4 Pot 4 Pot 3 Pot 4 Pot 3 Pot 4 Pot 4 Pot 4 Pot 3 Pot 4 Pot 4 Pot 4 Pot 4 Pot 3 Pot 4 Pot 4	Device: Maxim Saratoga IO-Link revision: 1.1 Bit rate: COM3 Min cycle time: 2000 µa SIO / ISDU / DS: ✓ ✓ ✓ Select device Device configuration Operating mode: Port cycle: FREE RUINNING ▼ Inspection level: NO CHECK ▼ DS softwalon state: DS DISABLED ▼ DS supload enable: DISABLE ▼	Control C	Subind. Name	Rights Type	Value
	Cycle time (µ): Power OFF Power OFF Power ON DO DO DO DO Power ON DO DO DO DO DO DO DO DO DO DO	Process data	ss data Unit - - -	Process data collection: PD Raw Process Data In: -	Virte Read
	Operate in IO-Link: No Fault: NOFAULT			Raw Process Data Out:	PDO invalid Send
		Events			
			Mode Type	Source Instance	
e m r			1)90		C. C
🚷 IO-Link					

IO-Link Master status: Connected at COM6 (vendor: MAXIM Integrated, product name: MAXREFDES79, product ID: 0001, serial number: 001, hw rev: 1, sw rev: 2)

Figure 10. IO-Link button becomes active once an IODD is assigned to a port and the MAXREFDES79# is connected to the PC.

12. Read and write to parameters by selecting a parameter in the **Parameters** box and then use the **Read** button to read the parameter. The value gets displayed in the **Value** field circled in <u>Figure 11</u>. Also, when writing to a parameter, first edit the value in the **Value** field using the mouse/keyboard and then press the **Write** button. Verify by pressing the **Read** button. See <u>Figure 11</u>.

) 🧿 🎯 🖸	Port 1 Port 2 Port 3	Dea 4							
and the second	Device parameters	101.4	Parameters		_				
PC MAXREFDES73 Pot 1 Maxim Saratoga Demo IO-Link Pot 2 Device ian't selected Inactive Pot 3 Device ian't selected Inactive Pot 4 Device ian't selected Inactive Pot 5 Pot 1 Device ian't selected Inactive	Device: IO-Link revision: Bit rate: Min cycle time: SIO / ISDU / DS:	Maxim Saratoga 1.1 COM3 2000 ja V V V t device FIXED MODE FREE RUNNING V NO CHECK DS DISABLE V V DISABLE V V DISABLE V V DISABLE DISABLE DISABLE DISABLE DISABLE DISABLE DISABLE		nversion Time D Current 12 Mode Ibient Light Tex xximity Value erating Mode m Gain n trim green ch	ach Value	00 Pro	During Value RV		DS uplead
	Connected device state Vendor ID:	0x01DE				1			(1000
	Device ID: Product ID:	0x000002	Process data	1	Process data	Unit			-
	Serial number:	MAXIM_RL78_02 0123456789	Digital Out		Frocess data	Unit	Process data collection:		Plot PD
	Vendor name: Product name: Cycle time: Port state:	Maxim Integrated Maxim Saratoga 2 000 μs IO-Link	Sensor Switch Value		True 252		Raw Process Data In:	0x03 0x1-2	
	Operate in IO-Link:	Yes							_
	Fault:	NOFAULT					Raw Process Data Out:		PDO invali
							🔘 Low 💮 High		Send
			Events						
				vent code	Mode	Туре	Source	Instance	
									Clark

IO-Link Master status: Connected at COM6 (vendor: MAXIM Integrated, product name: MAXREFDES79, product ID: 0001, serial number: 001, hw rev: 1, sw rev: 2)

Figure 11. Read and write to parameters by using the Read and Write buttons.

4. Software License Keys

The**TEConcept** IO-Link master stack ships with a finite time license displayed by the **TEConcept CT** software. The MAXREFDES79# ships with more than 9000 minutes of use time. When the time in the **Remained time** field goes to 0 minutes, the Master switches off all the IO-Link ports and shows the error message: **LICENSEFAULT**.

A new infinite time license can be easily purchased from TEConcept GmbH for less than a quarter of the price of the MAXREFDES79# by providing them a valid **Hardware ID** and **Key number**. Press the **Export hardware ID** button located in the **License key management** window. Provide the **hardwareID.txt** file when requesting the infinite time license from TEConcept GmbH. Contact info for TEConcept GmbH is provided below.

Hardware ID:	Key number:	Remained time:	
32 35 34 37 32 33 47 04 00 38 00 25	0	0	mins
License key:		Period:	
			mins

Figure 12. License key management window.

TEConcept GmbH Wentzingerstr. 21 D-79106 Freiburg Tel. +49 761 21443640 Fax +49 761 21443631 E-Mail: <u>info@teconcept.de</u> http://www.teconcept.de/Contact.php

Figure 13. TEConcept GmbH contact information.

5. Trademarks

IO-Link is a registered trademark of ifm electronic GmbH.

Windows is a registered trademark and registered service mark of Microsoft Corp.

6. Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	3/15	Initial release	—