

### 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)
  - o 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: <u>www.maximintegrated.com\MAXREFDES79</u>.



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 <u>Figure 4</u>.



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		
File View Master settings Firm	ware upgrade Tools Help		
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Connection settings	Port 1 Port 2 Port 3 Port 4		
Comm. port: COM3	Device parameters Device: IO Liek mutitien:	Parameters	Subind.   Name   Rights   Type   Value
IP address: COM4	Bit rate: -		
Port: TCP/IP	Min cycle time:		
Aardvark	SIO / ISDU / DS:		
Aardvark interface	Select device		
Disconnect Connect Topology TEConcept	Device configuration Operating mode: Port cycle: Inspection level: DS activation state: DS dowinoad enable: DS ABLE • DS ABLE •	Custom ISDU request: Index: 0 Subindex: 0 Data:	DS upload Write Read
B-PC B-MAXBEEDES79	Cycle time (µs):	Name Process data	Unit Descus data collections
-Port 1 -Device isn't selected -Inactive	Power OFF         Power ON           Inactive         DI         DO         IO-Link		Raw Process Data In: -
- Port 2 - Device isn't selected - Inactive - Port 3 - P	Connected device state Vendor ID: - Device ID: - Product ID: -		Raw Process Data Out:  PDO invalid  Low High Send
Inactive	Serial number: -	Evente	
⊟-Port 4	Vendor name: -	Time Event code Mode	Time Source Instance
Device isn't selected	Product name: -	Time Evencedae Mode	Type Jource Instance
	Cycle time: -		
4	Port state: -		
🐼 TO-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.

Open				Search IODD	<b>x</b>
					~
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	ស Maxim-logo.png		12/10/2014 5:28 PM	PNG image	6 KB
	Maxim-Saratoga-20140318-	IODD1.0.1.xml	12/10/2014 5:28 PM	XML Document	15 KB
	Maxim-Saratoga-20140318-	IODD1.1.xml	12/10/2014 5:28 PM	XML Document	16 KB
	Naxim-Saratoga-icon.png		12/10/2014 5:28 PM	PNG image	5 KB
	Naxim-Saratoga-pic.png		12/10/2014 5:28 PM	PNG image	154 KB
S N + ₹		III			P.
	File <u>n</u> ame: Maxim-Sara	toga-20140318-IODD1.1	Lxml		•
				<u>O</u> pen	Cancel

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

Device basic data		IO-Link data Bit rate:	COM3	Collin Devices:
Device:	Maxim Saratoga Demo	IO-Link Version	. 1.1	Maxim-ServoInterface-20140910-IODD1.1
/endor ID:	478	MinCycle Time: SIO mode:	2000 µs yes	
Jevice Id: Hardware Revision:	inte	grated.		
)escription:	Proximity and Ambiant Light Sensor with Max MAX14821, RL78 and TMG TE IO-Link Dev	44000, ice Stack		
DDD data				
DDD:	Maxim-Saratoga-20140318-IODD1.1			
(elease date:	2014-03-18 Document version:	V2.0		
elected device come IDD checked and v	sponds with connected device: - alid: -			< III Import Delete
				IODD Check Check connected device

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.

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File View Master settings Firmw	vare upgrade Tools Help		
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Topology	Port 1 Port 2 Port 3 Port 4		
TEConcont		Parametere	
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Pot 3 Device in t selected hocity Pot 4 Device in t selected hocity Pot 4 Device in t selected hocitye	Operating mode:     FIXEDMODE       Port cycle:     FREE RUNNING       Inspection level:     NO CHECK       DS activation state:     DS DISABLE       DS download enable:     DISABLE       Dyaload enable:     DISABLE       Cycle time (µs):     Power OFF       Power OFF     Power ON       Inactive     DI	(0x0015) Serial Number     (0x0015) Serial Number     (0x0015) Vequest: Index:     0 Deta:	DS upload Write
	Connected device state Vendor ID:	Process data	Read
	Product ID: - Serial number: - Vendor name: - Product name: - Cycle time: -	Name         Process data         Unit           Digital Out         -         <	Plot PD
	Port state: Inactive Operate in IO-Link: No Fault: NOFAULT	Raw Process Data Out: Low High	PDO invalid Send
	•		
			1
< b		Time Event code Mode Type Source Instance	C. C
🚷 IO-Link			•

10-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>.

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File View Master settings Firms	ware upgrade Tools Help			
0 0 0				
Topology	Port 1 Port 2 Port 3 Port 4			
PC     Pot 1     Pot 2     Pot 2     Por 2     Por 2     Por 2     Por 4     Pot	Device parameters       Device:     Maxim Saratoga       IO-Link revision:     1.1       Bit rate:     COM3       Min cycle time:     2000 µs       SIO / ISDU / DS:     ✓       Select device       Device configuration       Operating mode:       Port cycle:       Inspection level:       DS dativation state:       DS upload enable:       DS upload enable:       Cycle time (µs):       Power OFF       Power ON       Inactive:       DI       DO: Io-Link	Parameters  (k00029) Process Data Output  (k00040) Gain  (k00041) Conversion Time  (k00042) LED Current  (k00043) ProZMbde  (k00043) Ambert Light Teach Value  (k00043) Ambert Light Teach Value  (k00043) Gaint tim green channel  (k00043) gain tim green channel  (k00043) gaint tim green channel  (k00043) gaint tim green channel  (k00043) gain tim green channel  (	Subind. Name Rights Type Value 00 Proomty Value RW UhtegerT 128 Value Value RW UhtegerT 128 Value Value RW UhtegerT 128 Value Value RW UhtegerT 128 Value RW UhtegerT 128 Value RW UhtegerT 128 Value RW UhtegerT 128 Value RW UhtegerT 128 Value RW UhtegerT 128 Value Value RW UhtegerT 128 Value RW UhtegerT 128 Value Value RW UhtegerT 128 Value RW Value RW V	e DS upload
	Vendor ID: 0x011DE Device ID: 0x000002 Product ID: MAXIM_RL78_02 Senial number: 0123456789 Vendor name: Maxim Integrated Product name: Maxim Saratoga Cycle time: 2 000 µa Pot state: IO-Link Operate in IO-Link: Yes Feult: NOFAULT	Process data           Name         Process data           Digital Out         Failse           Sensor Switch         True           Value         252	Unit     Process data collection:     PD     •       Raw Process Data In:     0x03 0xF2       Raw Process Data Out:     •       Unit     •       Unit     •       Image: Source     Instance	PDO invalid Send

10-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.

License key management			x
Hardware ID: 32 35 34 37 32 33 47 04 00 38 00 25	Key number:	Remained time:	mins
License key:		Period:	mine
Send key	Export hardware	e ID Close	

Figure 12. License key management window.

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



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