

Initial Start-Up Instructions

for IO-Link Devices at IO-Link Master USB - EFBL001



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1. Connecting and Configuring the IO-Link Device at the IO-Link-Master USB

1.1. Software installation (Windows XP® 32 bit / Windows 7® 32/64 bit)

You'll need administrative rights at your computer in order to install the software. Do not yet connect the IO-Link Master USB to your computer. Make sure that you have the necessary rights and insert the included CD into the CD drive at your computer. Go to the "IO-Link Master USB" directory on the CD and start the IO-Link Device Tool-Setup program. If you are prompted to install ".net Frameworks®" during the installation procedure, the corresponding installation file (dotnetfx.exe®) is located in the same directory as the IO-Link Master installation program.

After installation has been completed, you can connect the IO-Link Master USB to your computer (see hardware installation). Please observe notes regarding supply power.

1.2. Hardware Installation

Use the included USB cable in order to connect your PC to the IO-Link Master USB. Use a standard sensor cable (3 or 4 pin) with M12 plug connector at both ends to connect the interface to the IO-Link device (sensor).



IO-Link Device



IO-Link Master USB



PC

1.2.1. Notes Regarding Supply Power

As a default feature, USB 2.0 ports supply up to 500 mA at 5 V. Without a plug-in power pack, the IO-Link Master USB delivers approximately 40 mA at 24 V. This is enough to operate numerous IO-Link devices.

If more current is required for the IO-Link device (including initial current), the plug-in power pack must be used. Please note that some laptops and tablets are very sensitive to initial current requirements. If there's any doubt, use the plug-in power pack. In the case of Windows 7, the driver for the IO-Link USB Master is installed automatically. If you're still using Windows XP®, please read the following section.

1.3. Driver Installation Description (only Windows XP®)

- 

1. Assistant für das Suchen neuer Hardware

Willkommen

Mit diesem Assistenten können Sie Software für die folgende Hardwarekomponente installieren:

USB IO-Link Master SE

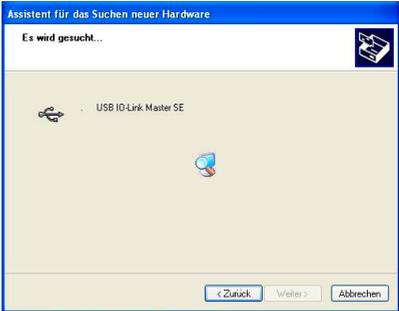
Falls die Hardwarekomponente mit einer CD oder Diskette geliefert wurde, legen Sie diese jetzt ein.

Wie möchten Sie vorgehen?

Software automatisch installieren (empfohlen)

Software von einer Liste oder bestimmten Quelle installieren (für fortgeschrittene Benutzer)

Klicken Sie auf "Weiter", um den Vorgang fortzusetzen.

< Zurück Weiter > Abbrechen
- 

2. Assistant für das Suchen neuer Hardware

Es wird gesucht...

USB IO-Link Master SE

< Zurück Weiter > Abbrechen
- 

3. Hardwareinstallation

Die Software, die für diese Hardware installiert wird:

USB IO-Link Master SE

hat den Windows-Logo-Test nicht bestanden, der die Kompatibilität mit Windows XP überprüft. (Wann ist dieser Test wichtig?)

Das Fortsetzen der Installation dieser Software kann die korrekte Funktion des Systems direkt oder in Zukunft beeinträchtigen. Microsoft empfiehlt strengstens, die Installation jetzt abzubrechen und sich mit dem Hardwarehersteller für Software, die den Windows-Logo-Test bestanden hat, in Verbindung zu setzen.

Installation fortsetzen Installation abbrechen
- 

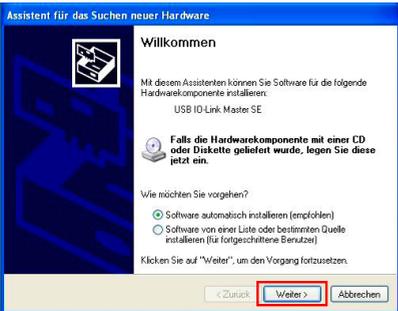
4. Assistant für das Suchen neuer Hardware

Fertigstellen des Assistenten

Die Software für die folgende Hardware wurde installiert:

USB IO-Link Master SE

Klicken Sie auf "Fertig stellen", um den Vorgang abzuschließen.

< Zurück Fertig stellen Abbrechen
- 

5. Assistant für das Suchen neuer Hardware

Willkommen

Mit diesem Assistenten können Sie Software für die folgende Hardwarekomponente installieren:

USB IO-Link Master SE

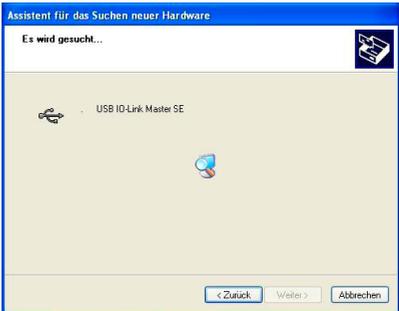
Falls die Hardwarekomponente mit einer CD oder Diskette geliefert wurde, legen Sie diese jetzt ein.

Wie möchten Sie vorgehen?

Software automatisch installieren (empfohlen)

Software von einer Liste oder bestimmten Quelle installieren (für fortgeschrittene Benutzer)

Klicken Sie auf "Weiter", um den Vorgang fortzusetzen.

< Zurück Weiter > Abbrechen
- 

6. Assistant für das Suchen neuer Hardware

Es wird gesucht...

USB IO-Link Master SE

< Zurück Weiter > Abbrechen
- 

7. Hardwareinstallation

Die Software, die für diese Hardware installiert wird:

USB IO-Link Master SE

hat den Windows-Logo-Test nicht bestanden, der die Kompatibilität mit Windows XP überprüft. (Wann ist dieser Test wichtig?)

Das Fortsetzen der Installation dieser Software kann die korrekte Funktion des Systems direkt oder in Zukunft beeinträchtigen. Microsoft empfiehlt strengstens, die Installation jetzt abzubrechen und sich mit dem Hardwarehersteller für Software, die den Windows-Logo-Test bestanden hat, in Verbindung zu setzen.

Installation fortsetzen Installation abbrechen
- 

8. Assistant für das Suchen neuer Hardware

Fertigstellen des Assistenten

Die Software für die folgende Hardware wurde installiert:

TMG USB IO-Link Master SE

Klicken Sie auf "Fertig stellen", um den Vorgang abzuschließen.

< Zurück Fertig stellen Abbrechen

2. Working with the software

After the software has been successfully installed, the following icon appears on your desktop.



IO-Link Device Tool
V4

Start the program:

Select your administrative rights level when starting the program, after which you'll be prompted to enter a password.



The screenshot shows a dialog box titled "TMG IO-Link Device Tool V4.0" with a "User Login" section. Under "Authorization", there are three radio button options: "Operator", "Maintenance", and "Specialist". The "Specialist" option is selected. Below the radio buttons is a "Password" label and an empty text input field. At the bottom of the dialog are two buttons: "Cancel" and "Log In".

Passwords:

- Operator: no password
- Maintenance: maintain
- Specialist: special

2.1. Program Overview



The user interface which appears after logging on is subdivided into several areas, namely:

- Catalog
- Topology
- Menu bar

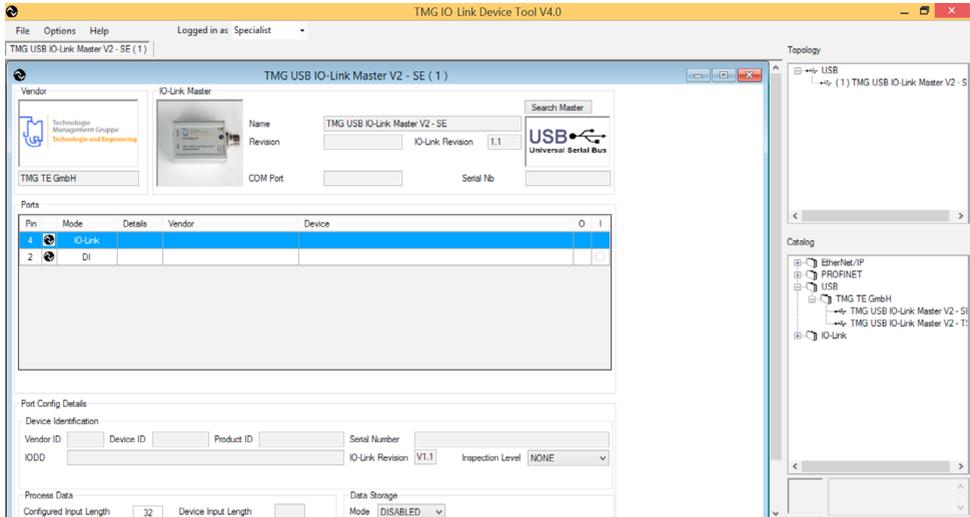
The catalog is located at the right-hand side of the user interface. All available driver files for the IO-Link Master and IO-Link devices appear in this catalog. No additional IO-Link devices appear after initial installation.

The topology window depicts the flow of communication as a tree structure. The IO-Link Master appears at the uppermost level, and IO-Link devices which have been connected to the master are at the next lower level.

The menu bar is used for software operation.

2.2. IO-Link Master Initial Start-Up and Communication

In order to be able to start up the IO-Link Master, the master must be dragged and dropped into the topology from the catalog using the following path: USB → TMG TE GmbH → TMG USB IO-Link Master V2 – SE. A new window appears underneath the menu bar with the master's data. Click the “Search Master” button in order to connect the master to the computer. After clicking the master(s) which have then been found, connection is established and the master's revision level and serial number, as well as the COM port to which it's connected, are displayed.



TMG IO-Link Device Tool V4.0

File Options Help Logged in as: Specialist

TMG USB IO-Link Master V2 - SE (1)

TMG USB IO-Link Master V2 - SE (1)

Vendor: TMG TE GmbH

IO-Link Master: Name: TMG USB IO-Link Master V2 - SE, Revision: , IO-Link Revision: 1.1, COM Port: , Serial No: , Search Master

Pin	Mode	Details	Vendor	Device	O	I
4	IO-Link					
2	DI					

Port Config Details

Device Identification

Vendor ID: , Device ID: , Product ID: , Serial Number: , IO-Link Revision: V1.1, Inspection Level: NONE

Process Data

Configured Input Length: 32, Device Input Length: , Data Storage Mode: DISABLED

Topology

- USB
 - (1) TMG USB IO-Link Master V2 - SE

Catalog

- EtherNet/IP
- PROFINET
- USB
 - TMG TE GmbH
 - TMG USB IO-Link Master V2 - SE
 - TMG USB IO-Link Master V2 - T
 - IO-Link

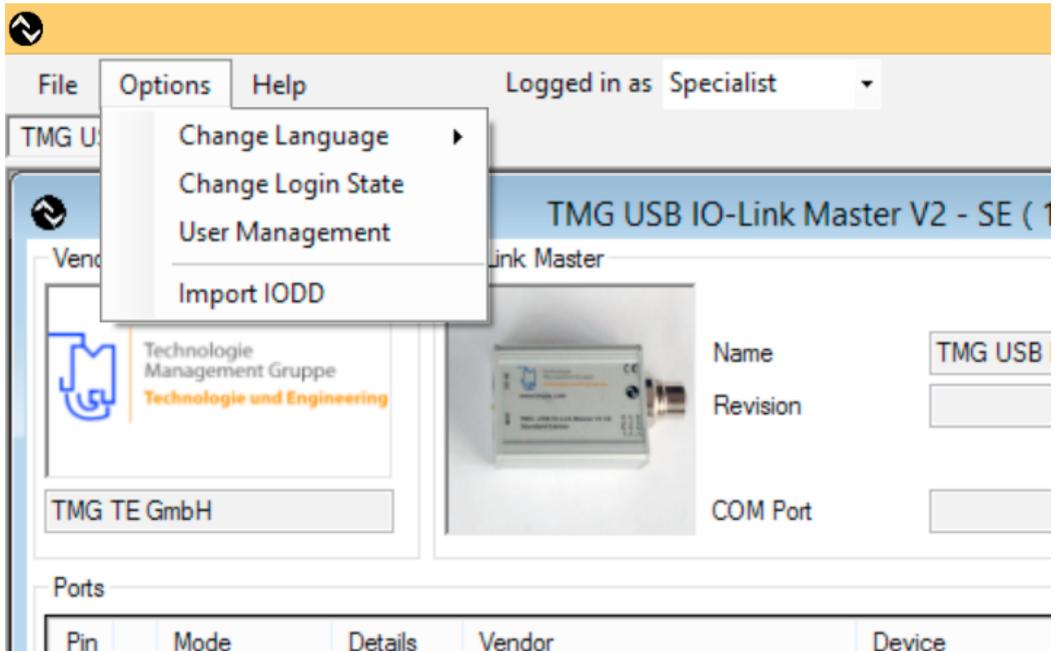
Master Discovery			
IO-Link Master	Vendor Name	Device Name	Address
USB	TMG TE GmbH	TMG USB IO-Link Master V2 - SE	COM4

2.3. Importing Device Descriptions (IODD)

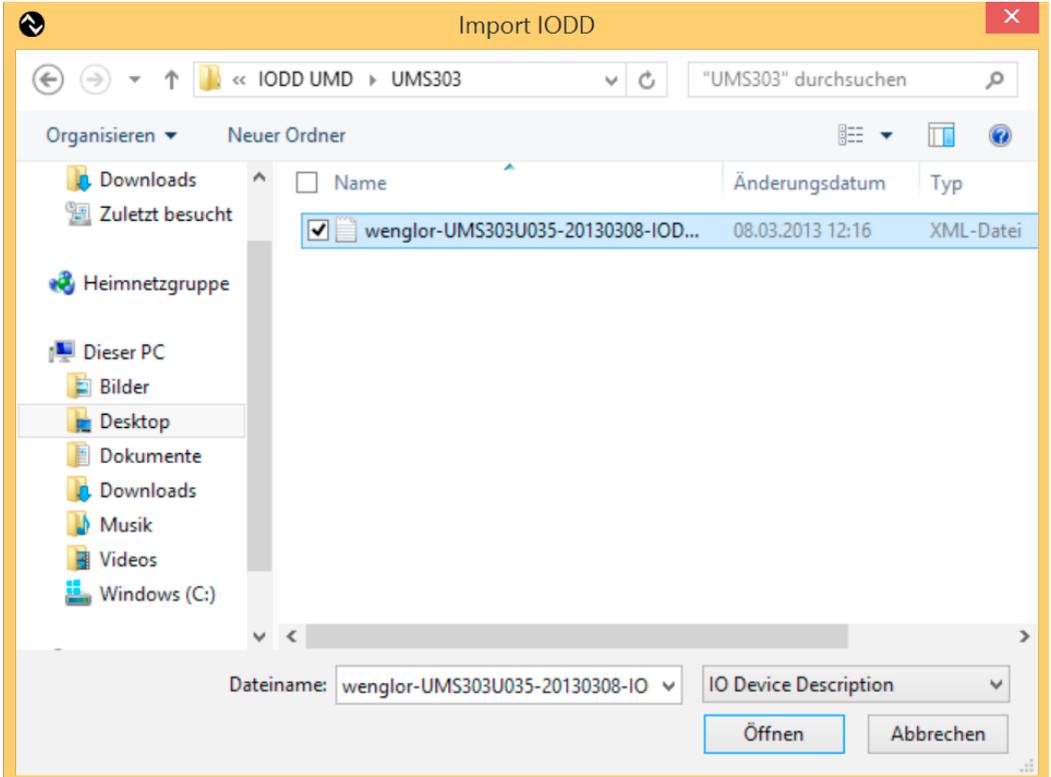
In order to be able to configure the parameters of an IO-Link device, it must first appear in the catalog.

The most up-to-date IODDs for all wenglor IO-Link devices are available for download at www.wenglor.com → Products → Product Search → Order No. → Product Description File → Show Matching Product Description File

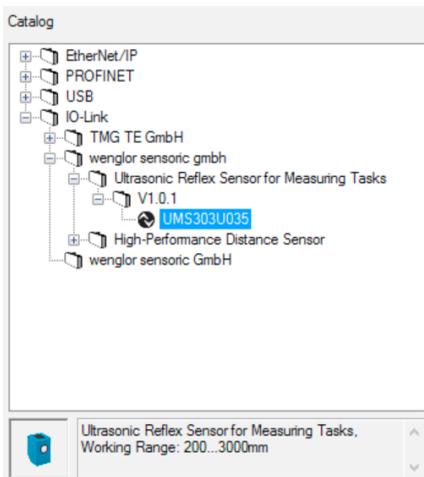
In order to add device descriptions, click Options in the menu bar, and then click → **Import IODD**.



A dialog box appears, from which the desired IODD can be selected.

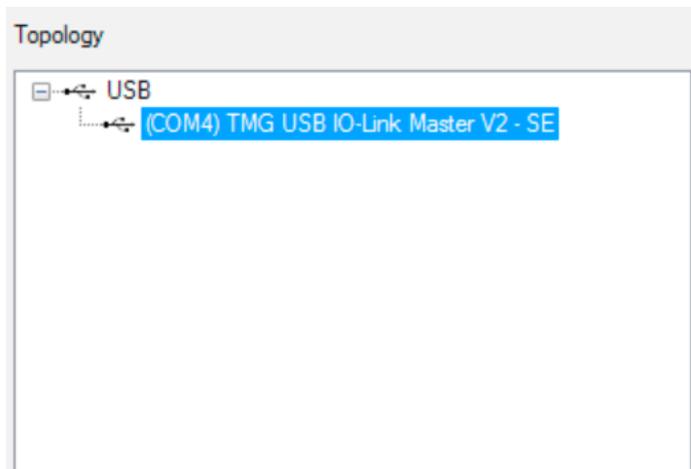


After the IODD has been imported, it appears in the catalog.

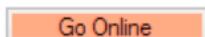


2.4. Creating a Project

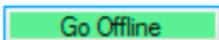
In order to start a project with the connected device, the device must be dragged and dropped into the “Pin 4” line of the IO Link Master. This product is then displayed in the topology underneath the IO-Link Master.



During the next step, an online connection is established with the IO-Link USB Master. The orange “Connect” button on the main page of the IO-Link USB Master is used to this end.



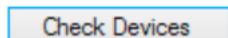
As soon as the software has been connected to the master, the orange “Connect” button turns into a green “Disconnect” button.



The connection is now active and can be disconnected by clicking one again. In the online mode, it's not possible to add products to the topology.

The IO-Link USB Master is equipped with an IO-Link port. This port can be polled in order to determine whether or not an IO-Link device has been connected to it.

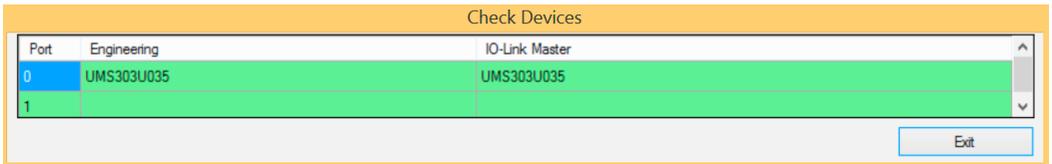
Click the “Check Device” button in order to poll the port automatically.



If another IO-Link device for which no IODD has yet been uploaded to the catalog is connected to the IO-Link Master, this is indicated by means of a line highlighted in orange (port 0).

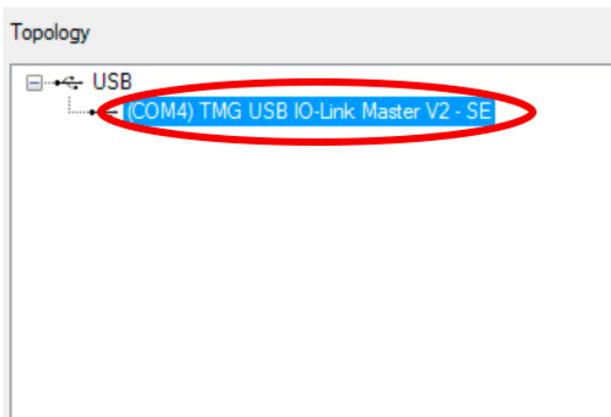


If an IO-Link device has already been added to the catalog, the device is detected and its name is displayed. Click Take over type of device into engineering in order to be able to configure the parameters of the IO-Link device

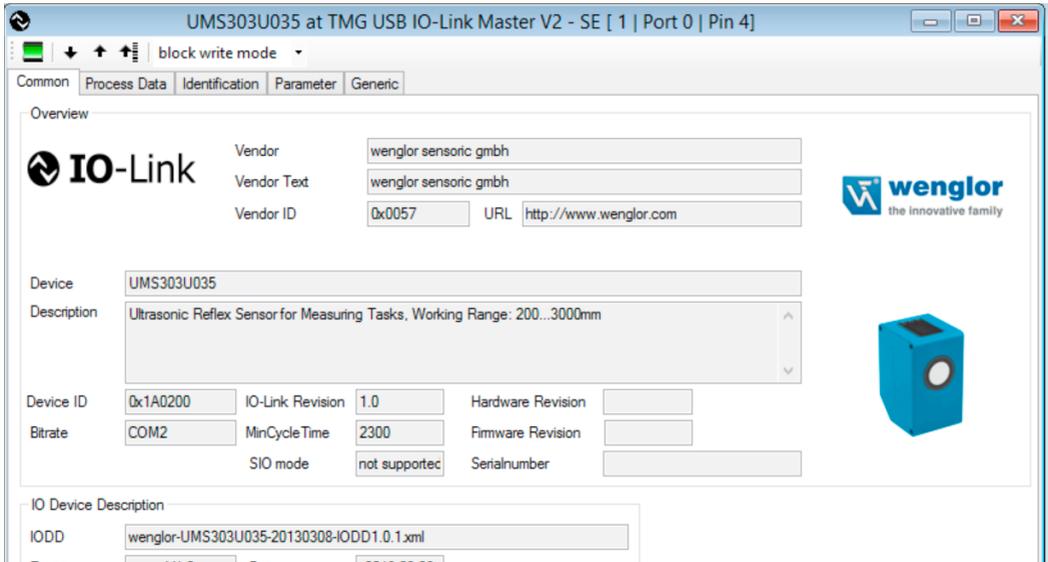


2.5. Parametrieren eines IO-Link Devices

Click the IO-Link device to be configured in the topology window.



An overview appears which provides you with general information about the device. After clicking the device within the topology, device-specific data appear in the main window.



The screenshot displays the 'Overview' tab of the IO-Link software interface. The window title is 'UMS303U035 at TMG USB IO-Link Master V2 - SE [1 | Port 0 | Pin 4]'. The interface includes a menu bar with 'Common', 'Process Data', 'Identification', 'Parameter', and 'Generic'. The 'Overview' section shows the following information:

- IO-Link** logo and 'wenglor the innovative family' logo.
- Vendor:** wenglor sensoric gmbh
- Vendor Text:** wenglor sensoric gmbh
- Vendor ID:** 0x0057
- URL:** http://www.wenglor.com
- Device:** UMS303U035
- Description:** Ultrasonic Reflex Sensor for Measuring Tasks, Working Range: 200...3000mm
- Device ID:** 0x1A0200
- IO-Link Revision:** 1.0
- Hardware Revision:** [empty field]
- Bitrate:** COM2
- MinCycleTime:** 2300
- Firmware Revision:** [empty field]
- SIO mode:** not supported
- Serialnumber:** [empty field]

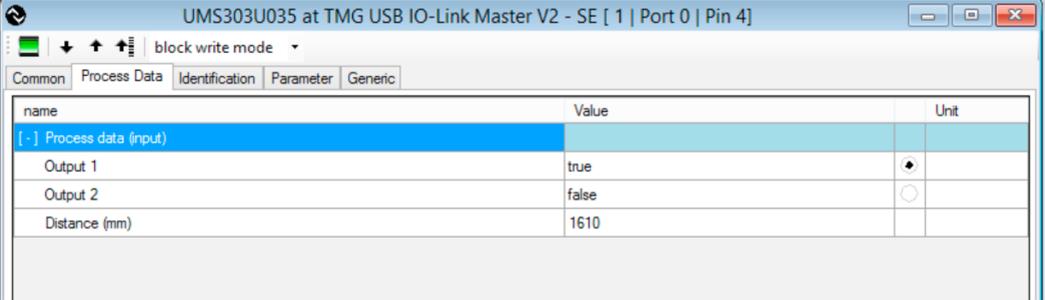
Below the overview, the 'IO Device Description' section shows the IODD file: wenglor-UMS303U035-20130308-IODD1.0.1.xml. A small 3D model of the blue sensor device is visible on the right side of the overview section.

The vendor, the device and the product ID are then visible in the main window underneath the menu bar. Information such as manufacturer, device name, firmware revision level etc. is read directly out of the connected device and displayed to this end.

Additional tabs appear at the top of this display including "Process Data", "Identification", "Parameters" and "Generic". These configuration tabs are available for all IO-Link devices, although their contents may vary depending on which data and options are made available by the device.

2.5.1. Process Data

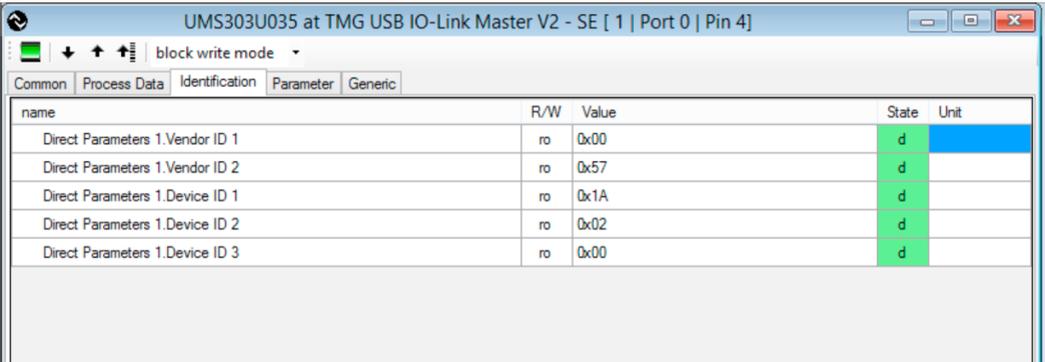
Sensor-specific process data, which are read out continuously by the device, appear in the process data tab. These process data may vary from device to device with regard to quantity and type. Depending on the product, different values can be queried from or received by the device.



name	Value	Unit
[-] Process data (input)		
Output 1	true	
Output 2	false	
Distance (mm)	1610	

2.5.2. Identification

The vendor, the device ID and other descriptive values for the connected product can be viewed once again in the identification area, broken down according to ID values. Data types and quantities are manufacturer and product-specific.

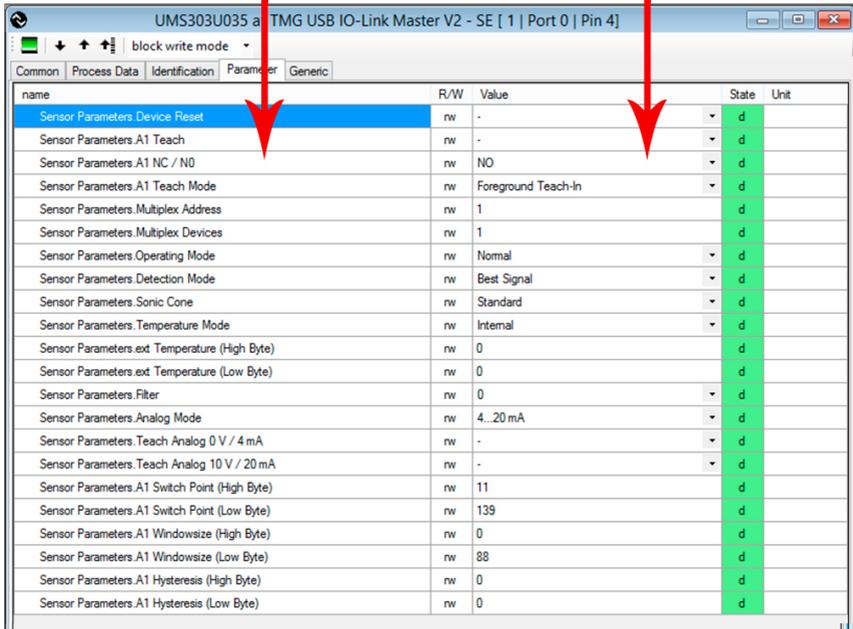


name	R/W	Value	State	Unit
Direct Parameters 1.Vendor ID 1	ro	0x00	d	
Direct Parameters 1.Vendor ID 2	ro	0x57	d	
Direct Parameters 1.Device ID 1	ro	0x1A	d	
Direct Parameters 1.Device ID 2	ro	0x02	d	
Direct Parameters 1.Device ID 3	ro	0x00	d	

2.5.3. Parameters

The respective parameters of the IO-Link devices can be configured in the parameters tab. The list of parameters data is product-specific and is specified by the manufacturer of the respective product.

Parameter Description Selected Parameter Values



name	R/W	Value	State	Unit
Sensor Parameters Device Reset	nw	-	d	
Sensor Parameters A1 Teach	nw	-	d	
Sensor Parameters A1 NC / NO	nw	NO	d	
Sensor Parameters A1 Teach Mode	nw	Foreground Teach-In	d	
Sensor Parameters Multiplex Address	nw	1	d	
Sensor Parameters Multiplex Devices	nw	1	d	
Sensor Parameters Operating Mode	nw	Normal	d	
Sensor Parameters Detection Mode	nw	Best Signal	d	
Sensor Parameters Sonic Cone	nw	Standard	d	
Sensor Parameters Temperature Mode	nw	Internal	d	
Sensor Parameters.ext Temperature (High Byte)	nw	0	d	
Sensor Parameters.ext Temperature (Low Byte)	nw	0	d	
Sensor Parameters Filter	nw	0	d	
Sensor Parameters Analog Mode	nw	4...20 mA	d	
Sensor Parameters Teach Analog 0 V / 4 mA	nw	-	d	
Sensor Parameters Teach Analog 10 V / 20 mA	nw	-	d	
Sensor Parameters A1 Switch Point (High Byte)	nw	11	d	
Sensor Parameters A1 Switch Point (Low Byte)	nw	139	d	
Sensor Parameters A1 Window Size (High Byte)	nw	0	d	
Sensor Parameters A1 Window Size (Low Byte)	nw	88	d	
Sensor Parameters A1 Hysteresis (High Byte)	nw	0	d	
Sensor Parameters A1 Hysteresis (Low Byte)	nw	0	d	

The uppermost menu bar includes buttons which can be used to read out current settings from the device, or upload current data to the device.



Upload all parameters from the PC to the device



Download all device parameters to the PC



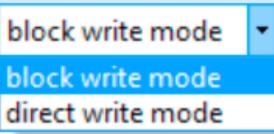
Dynamic Parameters Updating (must be supported by the parameter)

There are several different ways to adjust device settings.

The value of a given parameter can be adjusted by clicking it. Some parameters have a little arrow. The arrow can be clicked to open a dropdown list with selectable values.



There are two ways to transfer the selected values to the device. The “block write mode” is used to transfer all selected parameters as soon as transfer to the device is started manually (little yellow arrow next to the selection window). In this way, all of the parameters can be set as desired before transferring them to the device. The “direct write mode” is used to immediately transfer all changed values to the device.



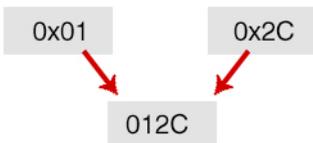
2.5.3.1. Conversion decimal to hexadecimal

With some products, parameters with two bytes have to be broken down into two parameters with one byte each. Whether or not this is necessary for any given device can be determined based on the parameter in the IODD.

Lower Threshold (Low Byte)	rw	0x96	0x2C
Lower Threshold (High Byte)	rw	0x00	0x01

Hexadecimal values are subdivided into two bytes, namely the high byte and the low byte. If these two bytes are put back together again, we end up with the entire parameter expressed in hexadecimal terms, as shown in the example below.

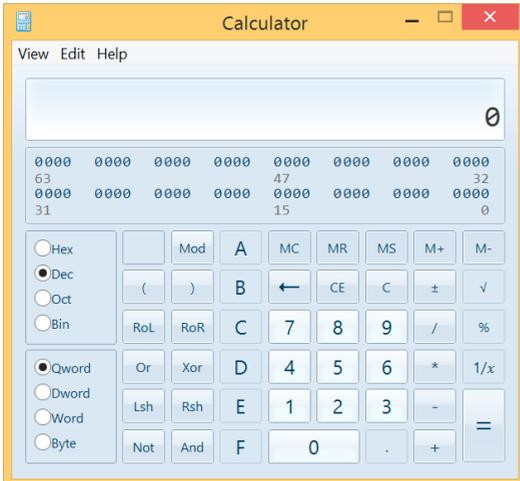
Lower Threshold (Low Byte)	rw	0x96	0x2C
Lower Threshold (High Byte)	rw	0x00	0x01



The hexadecimal value 012C corresponds to a decimal value of 300. Conversion is possible with a pocket calculator which is equipped with the appropriate function. A suitable calculator is included with the Windows® operating system.

Proceed as follows. After starting the Windows calculator, it must first be switched to the “Programmer” function in the “View” menu in order to convert hexadecimal into decimal values.

In order to convert hexadecimal into decimal values, first click Hex. Now enter the value to be converted (012C in our example). Then click Dec, after which the converted value appears at the calculator display.

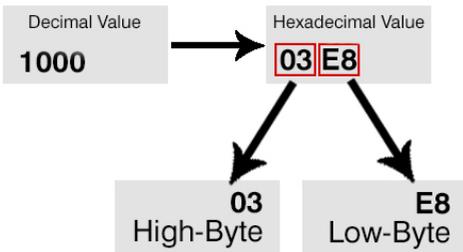


Decimal value

If you want to convert a decimal value into a hexadecimal value, proceed in reverse order.

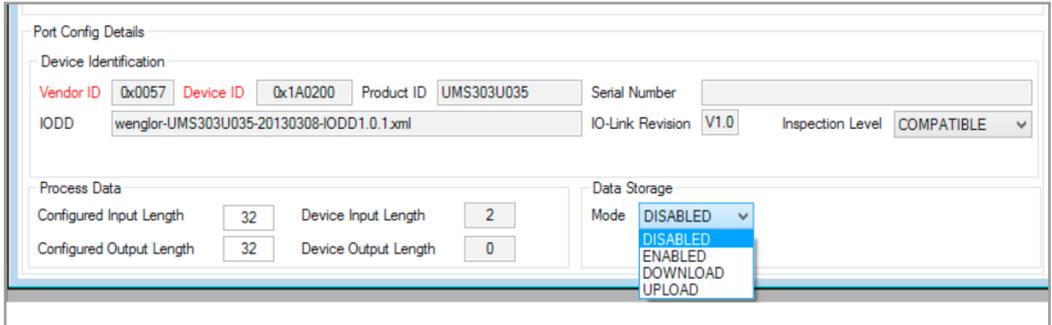
After calculation, you receive a three or four digit value, which then has to be broken down into two bytes and entered to the software. If you receive a three digit hexadecimal value, a leading “0” must be entered to the left of this value.

Example:



2.5.3.2. I/O-Link

This IO-Link Master supports functions in accordance with the IO-Link 1.1 specification. These include, for example, the data storage mode (also known as the parameter server function). In this way, data for a preconfigured device can be transferred to an identical replacement product the event of a failure, for example. The master detects this on the basis of the device's checksum and able to restore the parameters. In order to be able to select the data storage mode, the master may not be set to the communication mode for communication with the device (see section 2.4, "Creating a Project" "Connect"). This setting can be made on the master's main page.



The screenshot shows the 'Port Config Details' window with the following settings:

- Device Identification:**
 - Vendor ID: 0x0057
 - Device ID: 0x1A0200
 - Product ID: UMS303U035
 - Serial Number: (empty)
 - IODD: wenglor-UMS303U035-20130308-IODD1.0.1.xml
 - IO-Link Revision: V1.0
 - Inspection Level: COMPATIBLE
- Process Data:**
 - Configured Input Length: 32
 - Device Input Length: 2
 - Configured Output Length: 32
 - Device Output Length: 0
- Data Storage:**
 - Mode: A dropdown menu is open, showing options: DISABLED (selected), ENABLED, DOWNLOAD, and UPLOAD.

The data storage function can only be used with products equipped with IO-Link version 1.1.

Disable:

Data storage is inactive.

Enable:

In this mode, the master continuously stores the most up-to-date specifications. Settings can thus be entered via the software or directly at the device itself, and stored to the master. In the event that a device is replaced, the master transfers the stored configuration to the replacement product, as long as no manual (and thus newer configuration) has been entered to this product. The download mode should be selected in order to assure that any preset configuration at the master is transferred to a replacement device.

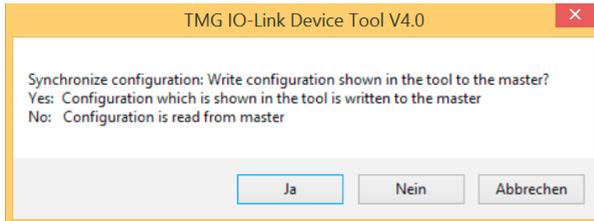
Download:

The configuration stored at the master is transferred to all additionally connected devices of the same type. The original configuration is retained by the master until it is overwritten, for example by uploading another configuration from a device.

Upload:

The configuration entered directly at the device or by means of the configuration tool is transferred to the master and stored there.

As soon as switching between the individual modes takes place, a pop-up window appears which asks whether or not the last data storage configuration should be retained or can be overwritten by the new mode selection and stored to the master as a result. “Yes” must be clicked in order to activate the new mode selection – otherwise the newly selected mode will be displayed and can be configured, but it won’t be stored to the master.



2.5.4. Generic

The device’s raw data can be accessed in the “Generic” tab even without IODD. All process and parameters data can be viewed and configured.

3. Exclusion of Liability

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