

# Modbus for SKF IMx and SKF @ptitude Analyst



User Manual Part No. **32257600-EN**  
**Revision F**

**⚠ WARNING!** - Read this manual before using this product. Failure to follow the instructions and safety precautions in this manual can result in serious injury, damage to the product, or incorrect readings. Keep this manual in a safe location for future reference.

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# 1 Introduction

## Modbus for IMx Units

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This user manual describes how to use Modbus with IMx units' condition monitoring (CM) part. Modbus is an application layer messaging protocol that provides client/server communication between devices connected on different types of buses or networks. **The Modbus feature is configured through SKF @ptitude Analyst software.**

- Information on how to use Modbus with the Modbus part of IMx-M units is described in "IMx-M User Manual", Rev M or later.

IMx units offer the Modbus protocol over 2-wire RS 485 which can run as a Modbus Master or a Modbus Slave.

The following are common scenarios of when to use Modbus functionalities with IMx:

- To transmit data to a control system
- To receive data from a control system
- To receive data from sensors such as oil particle counters
- To exchange data between IMx units (used only for testing)

This user manual document describes the following:

- How to physically configure Modbus/RTU protocol over RS 485 and cable connections - [Modbus \(RS 485\) Interface](#)
- How to use Modbus capabilities - [Modbus and IMx CM Part](#)
- How to configure condition monitoring (CM) part of IMx units through SKF @ptitude Analyst software - [Configuring Modbus Capability for CM Part](#)
- [Checking Modbus Interface / Troubleshooting](#)

## About This User Manual

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This user manual describes how to use Modbus with IMx units' condition monitoring (CM) part. **The Modbus feature is configured through SKF @ptitude Analyst software.**

- In writing this manual we assume you are familiar with common Windows® operations. Refer to your Windows guides for information in these areas.

As you use this manual, you'll discover certain conventions used:

**Bold** type is used to indicate text that appears on a menu, window, or dialog.

*Italics* are used to emphasize important information.

➤ - are used to indicate notes to the reader.

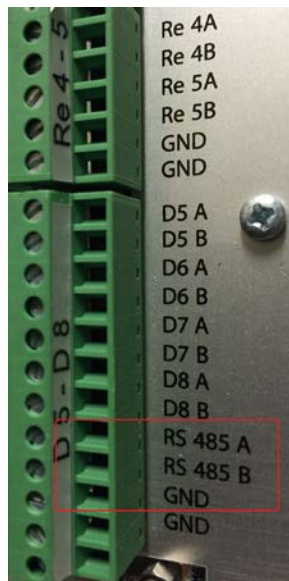
### Related Documentation

Document	Part No.
IMx-M User Manual, Rev M or later	32179800
SKF @ptitude Analyst and SKF Multilog On-Line Systems User Manual	32296700

## Modbus (RS 485) Interface

### Terminal Blocks

The following are different terminal blocks available on IMx units.



IMx-T RS 485 terminal block\*



IMx-S RS 485 terminal block

Figure 2 - 1.  
Examples of RS 485 Terminal Blocks.

A = Non-inverting

B = Inverting

GND = Reference ground

\* Note that the connections of red and black wires do not imply a particular polarity. [Wires don't show in these images.]

Note that some RS 485 equipment have the A and B naming reversed. In that case, connect the wires in reverse fashion in order to avoid the communication failure over RS 485.

When connecting IMx/MasCon16 to a third party equipment refer to [Notes on Implementation](#) under the chapter, [Modbus and IMx CM Part](#), of this User Manual.

## Transmission Characteristics

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The supported transmission parameters are listed in the table, below. The most commonly used values are in bold.

Any combination of transfer rate, parity and stop bits can be chosen. However, these parameters must match those of other equipment on the network.

Table 2-1.  
Supported RS 485 Transmission Parameters.

RS 485 Transmission Parameter	Supported values
Transfer rate (bps)	9600 / <b>19200</b>
Parity	<b>None</b> / Even / Odd
Stop bits	<b>1</b> / 2

## RS485 Bus Termination

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IMx units have termination which is controlled manually with a DIP switch.

If an IMx unit is at the end or beginning of the RS485 Bus, activate the built-in termination resistor by setting the DIP switch DIP21 for IMx-S or ANA21 for IMx-T switch number 2 to ON.

- DIP21 can be accessed after the front panel of the IMx-S has been taken off.
- ANA21 can be accessed after removing the IO board from the IMx-T rack.
- DIP21/ANA21 has four switches in total, of which only switch number 2 has working functionality.

Table 2-2.  
DIP Switch Setting Definition.

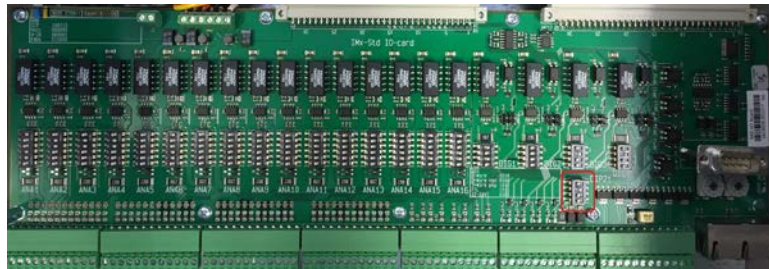
DIP21/ANA21 Switch number 2	Functionality
ON	Termination resistor enabled
OFF	Termination resistor disabled

- For IMx-S and IMx-T units switch OFF means no termination whereas switch ON means termination(120 Ω).

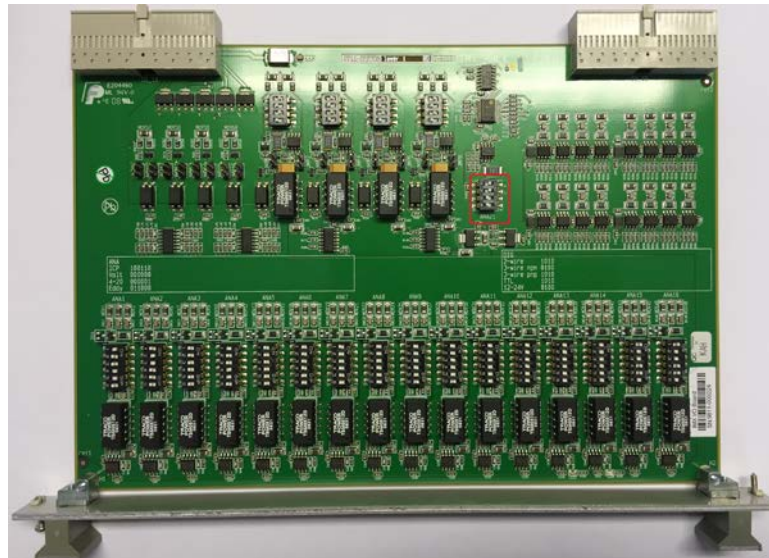
Table 2-3.  
DIP21/ANA21 Switch Number 2 Functionality.

DIP Switch Setting	Definition
0	ON
1	OFF





IMx-S modbus termination DIP switch (DIP21)\*



IMx-T modbus termination DIP switch (ANA21)

Figure 2 - 2.  
Modbus Termination DIP Switches.



## The Modbus Protocol

---

The Modbus protocol allows for only one Master, but many Slaves.

### Modbus Slave

- Modbus Slaves respond to requests from Modbus Master.
- A Modbus Slave can export values or import values from Modbus registers, following requests of Modbus Master.
- An IMx Modbus Slave makes all of its measured analogue vibration and digital speed channels available for export at the request of any kind of Modbus Master.

### Modbus Master

- An IMx Modbus Master can read data from one Modbus Slave device.
- When an IMx Master is appropriately configured, the Modbus registers are read into Modbus channels. Modbus channels are available for analysis in the same way as local measured channels.

### Notes on Implementation

- IMx Modbus Master only polls for data.
- Master polling rate is about 1 to 2 times per second.
- When used as a Slave, data can both be imported and exported.
- Measurement points translate to exported Modbus registers according to Table 3-1, below.
- Imported Modbus registers translate Modbus channels according to Table 3-2, below.
- The read function code is 0x04.
- The write function code is 0x10.
- The data format is 16-bit signed integers.
- Modbus Slave speed channels are transmitted in cycles per minute (cpm).
- The number of available relay channels varies depending on the type of IMx unit.

## Modbus Register, Modbus Channel and Measured Channel

---

The correspondence between measurement points and exported Modbus registers are listed in the following table.

Table 3-1.  
 Correspondence Between Measurement Points and Exported Modbus Registers.

Exported Modbus Register	Content
0x0400001 to 0x0400016	Freely Configurable*
0x0400017	Speed digital channel 1
0x0400018	Speed digital channel 2
0x0400019	Speed digital channel 3
0x0400020	Speed digital channel 4
0x0400021	Speed digital channel 5
0x0400022	Speed digital channel 6
0x0400023	Speed digital channel 7
0x0400024	Speed digital channel 8
0x0400025	Relay mask **
0x0400026	Alert mask**
0x0400027	Danger mask**
0x0400028	Heartbeat
0x0400029	Reserved
0x0400030	Reserved
0x0400031 to 0x0400100	Freely Configurable*

\*Any IMx measurement point can be selected and exported via Modbus on these registers.

\*\*Mask is a 16-bit mask which shows conditions of each channel in hex decimal. See Bit Representation of Mask below for detailed information.

The correspondence between imported Modbus registers and Modbus channels are listed in the following table.

Table 3-2  
 Correspondence Between Imported Modbus Registers and Modbus Channels.

Modbus Channel	Imported Modbus Register
1	0x0300001
2	0x0300002
3	0x0300003
4	0x0300004
5	0x0300005
6	0x0300006
7	0x0300007

Modbus Channel	Imported Modbus Register
8	0x03000008
9	0x03000009
10	0x03000010
11	0x03000011
12	0x03000012
13	0x03000013
14	0x03000014
15	0x03000015
16	0x03000016

## Bit Representation of Mask

Bit representations of Relay Mask, Warning Mask and Alarm Mask can be combinations of more than one channel condition. The following table lists those possible combinations in channel numbers.

Table 3-3  
Bit Representation for Relay Mask, Warning Mask and Alarm Mask.

Bit Representation in Hex	Channel Numbers	Bit Representation in Hex	Channel Numbers
0x1000	13	0x0010	5
0x2000	14	0x0020	6
0x3000	14,13	0x0030	6,5
0x4000	15	0x0040	7
0x5000	15,13	0x0050	7,5
0x6000	15,14	0x0060	7,6
0x7000	15,14,13	0x0070	7,6,5
0x8000	16	0x0080	8
0x9000	16,13	0x0090	8,5
0xA000	16,14	0x00A0	8,6
0xB000	16,14,13	0x00B0	8,6,5
0xC000	16,15	0x00C0	8,7
0xD000	16,15,13	0x00D0	8,7,5
0xE000	16,15,14	0x00E0	8,7,6
0xF000	16,15,14,13	0x00F0	8,7,6,5

Bit Representation in Hex	Channel Numbers
0x0100	9
0x0200	10
0x0300	10,9
0x0400	11
0x0500	11,9
0x0600	11,10
0x0700	11,10,9
0x0800	12
0x0900	12,9
0x0A00	12,10
0x0B00	12,10,9
0x0C00	12,11
0x0D00	12,11,9
0x0E00	12,11,10
0x0F00	12,11,10,9

Bit Representation in Hex	Channel Numbers
0x0001	1
0x0002	2
0x0003	2,1
0x0004	3
0x0005	3,1
0x0006	3,2
0x0007	3,2,1
0x0008	4
0x0009	4,1
0x000A	4,2
0x000B	4,2,1
0x000C	4,3
0x000D	4,3,1
0x000E	4,3,2
0x000F	4,3,2,1

# Configuring Modbus Capability for CM Part

## Configuration Scenarios

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The configuration for Condition Monitoring (CM) part of IMx units is done through the SKF @ptitude Analyst software. Refer to SKF @ptitude Analyst and SKF Multilog On-Line Systems User Manual.

There are different procedures for configuring Modbus capabilities depending on the scenario. Select a matching scenario and follow the steps.

- [Export Data from IMx Modbus Slave to Generic Modbus Master](#)
- [Import Data from Generic Modbus Master to IMx Modbus Slave](#)
- [Import Data from Generic Modbus Slave to IMx Modbus Master](#)
- [Data Transfer between IMx Units](#)

## Export Data from IMx Modbus Slave to Generic Modbus Master

---

IMx Modbus Slaves can export data to generic Modbus Master via Modbus register:

- All analogue measurement point types of IMx units.
- All digital measured channels of IMx units.

Refer to Table 3-1 for the correspondence between measurement points and exported Modbus register numbers, described in the chapter, [Modbus and IMx CM Part](#).

To have an IMx unit perform in this setting, follow the listed steps in order.

1. Determine RS 485 network parameters, such as bps, parity and stop bit, described in [Transmission Characteristics](#) in the chapter, Modbus (RS 485) Interface.
2. Determine a unique Modbus Slave address for the unit to use in the Modbus network.
3. Configure the unit as a Modbus Slave by following the instructions described in the section, [Configuring IMx Units for Modbus](#).
4. Configure the measurement points to be exported according to the section, [Modbus Export Properties](#), in the chapter, Modbus Export through SKF @ptitude Analyst.
5. Check the configuration setup by performing the steps described in the chapter, [Checking Modbus Interface / Troubleshooting](#)

## **Import Data from Generic Modbus Master to IMx Modbus Slave**

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IMx Modbus Slaves can import values from generic Modbus Master via Modbus registers.

To have an IMx unit to perform in this setting, follow the listed steps in order.

1. Decide which Modbus register is of interest to you.
2. Translate the register number according to Table 3-2: Correspondence Between Imported Modbus Registers and Modbus Channels" in [Modbus and IMx CM Part](#) to determine which Modbus channel to set up.
3. Determine RS 485 network parameters, such as bps, parity and stop bit described in [Transmission Characteristics](#) in Modbus (RS 485) Interface chapter.
4. Determine a unique Modbus Slave address for the unit to use in the Modbus network.
5. Configure the unit as a Modbus Slave by following the instructions described in the section, [Configuring IMx Units for Modbus](#).
6. Set up a Modbus channel for the IMx Modbus Slave by following the instructions described in the section [Modbus Import Properties](#) in the chapter, Modbus Import through SKF @ptitude Analyst. Use the Modbus analog channel number from step 2.
7. Create the measurement points associated to the Modbus channels. Refer to SKF @ptitude Analyst and SKF Multilog On-line Systems User Manual.
8. Check the configuration setup by performing the steps described in [Checking Modbus Interface / Troubleshooting](#) chapter.



## **Import Data from Generic Modbus Slave to IMx Modbus Master**

---

IMx Modbus Master can import data from a generic Modbus Slave via Modbus register.

To have an IMx unit perform in this setting, follow the listed steps in order.

1. Decide which register is of interest to you.
2. Translate the register number according to "Table 3-2: Correspondence Between Imported Modbus Registers and Modbus Channels " in the chapter, [Modbus and IMx CM Part](#), to determine which Modbus channel to set up on the Master.
3. Determine RS 485 network parameters, such as bps, parity and stop bit described in [Transmission Characteristics](#) in Modbus (RS 485) Interface chapter.
4. Find out the Slave address of the generic Modbus Slave with which IMx Modbus Master will communicate.
5. Configure the unit as a Modbus Master by following the instructions described in the chapter, [Configuring IMx Units for Modbus](#). Use the Modbus Slave address from step 4.
6. Set up a Modbus channel for the IMx Modbus Master by following the instructions described in section [Modbus Import Properties](#) in the chapter, Modbus Import through SKF @ptitude Analyst. Use the Modbus analog channel number from step 2.
7. Set up an appropriate measurement point on the channel created in step 6.
8. Check the configuration setup by performing the steps described in the chapter, [Checking Modbus Interface / Troubleshooting](#).

## Data Transfer between IMx Units

---

A transfer of measurement data from an IMx unit to another IMx unit is used for test only.

To have data transfer between two IMx units, follow the listed steps in order.

1. Decide which unit is to export data and which unit is to import data:
  - The unit which is to export data has to be configured as a Modbus Slave.
  - The other unit which is to import data has to be configured as a Modbus Master.
2. Decide which register is of interest to you.
3. Translate the register number according to "Table 3-1: Correspondence Between Measurement Points and Export Register Number" and "Table 3-2 Correspondence Between Imported Modbus Registers and Modbus Channels" in the chapter, [Modbus and IMx CM Part](#).
  - The corresponding Modbus channel number is used when setting up a channel on the Master.
  - The corresponding measurement point and export register number is used when setting up a channel on the Slave.
4. Determine RS 485 network parameters, such as bps, parity and stop bit for both units. Refer to [Transmission Characteristics](#) in Modbus (RS 485) Interface chapter.
5. For the unit that is to export data (Modbus Slave):
  - Configure a Modbus Slave with a unique Slave address on the export unit by following instructions described in the chapter, [Configuring Modbus Capability for CM Part](#).
  - Set up a channel (refer to SKF @ptitude Analyst and SKF Multilog On-Line System User Manual).  
Use the corresponding measured channel number from step 3.
  - Set up a measurement point channel (refer to SKF @ptitude Analyst and SKF Multilog On-Line System User Manual).
6. For the unit that is to import data (Modbus Master):
  - Configure a Modbus Master with the Slave address from step 5 to create a Modbus Master-Slave pair. Follow the instructions described in [Configuring IMx Units for Modbus](#).
  - Set up a Modbus channel by following the instructions described the section [Modbus Import Properties](#) in the chapter, Modbus Import through SKF @ptitude Analyst.  
Use the corresponding Protection channel number from step 3.
  - Set up a measurement point (refer to SKF @ptitude Analyst and SKF Multilog On-Line System User Manual).
7. Check the configuration setup by performing the steps described in the chapter, [Checking Modbus Interface / Troubleshooting](#).

## Configuring IMx Units for Modbus

The configuration of Modbus for IMx units' condition monitoring (CM) part is done through @ptitude Analyst software. [pending implementation]

1. First start the SKF @ptitude Analyst software located in the SKF @ptitude Monitoring Suite. For more detailed information about @ptitude Analyst software, refer to "@ptitude Analyst User Manual".

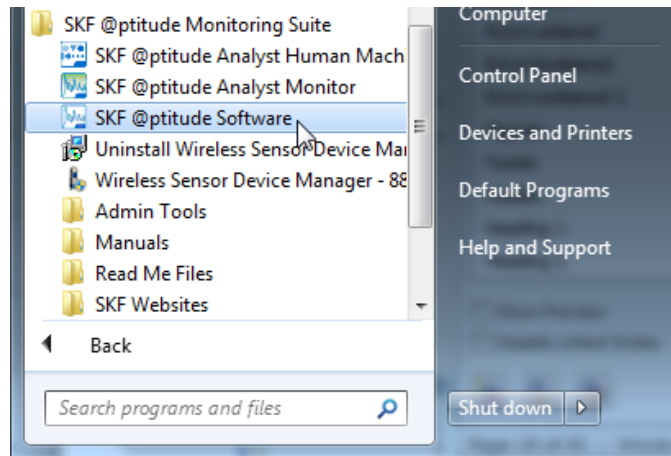


Figure 4 - 1.  
@ptitude Analyst in the Start Menu.

2. In @ptitude Analyst, select the specific IMx device in the hierarchy.
3. Click **Customize** to open the menu.

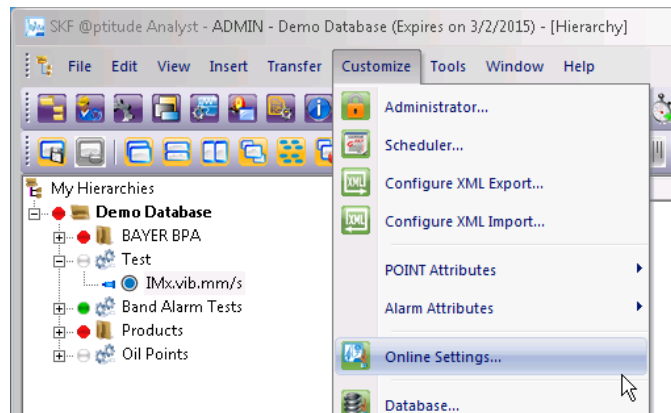


Figure 4 - 2.  
**Customize > Online Settings.**

4. Select **Online Settings...** to open the dialog.

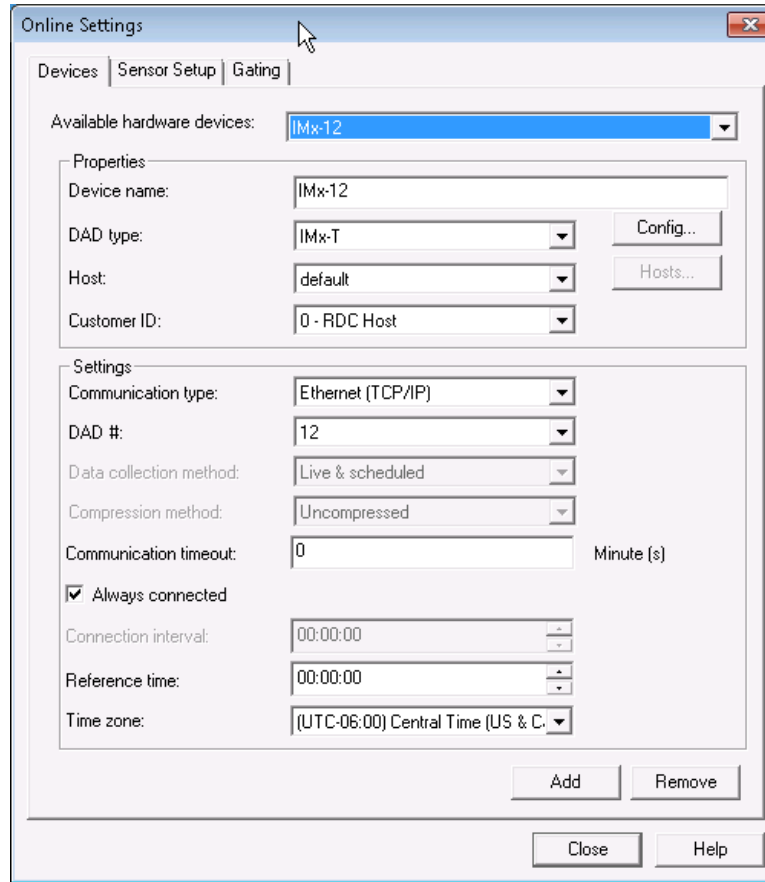


Figure 4 - 3.  
**Online Settings** Dialog.

5. Then, select the IMx unit you want to configure from the available hardware devices option and press the Config... button. The Channel Properties configuration dialog opens for the selected IMx device.
6. Click Communication to open the Communication tab.

**USE MATERIAL FROM EXPORT/IMPORT**

## Configuring a Modbus Slave

The screenshot shows the IMx configuration window with the 'External communication' tab selected. The 'General' section contains the following fields: Number (5), Model (IMx-S), Name (IMx-S Modbus Slave), Enabled (checked), Serial no. (0), Reference time (01:00:00), Timeout comm. (2 Minutes), and Connection interval (0 Hours). The 'External communication' section contains: Type (Modbus), Bps (19200), Parity (None), Stop bits (1), Mode (Slave), and Slave address (1). Buttons for 'System log', 'Ok', and 'Cancel' are located at the bottom of the window.

Figure 4 - 4.

Example of IMx - External Communication for Slave. [pending @Analyst implementation]

The “External communication” fields are described below:

- **Type** sets the external communication as Modbus or Modbus/RTU when selected.
  - **Bps** defines the speed of Modbus, transfer rate in bps. Refer to [Transmission Characteristics](#) for detailed information.
  - **Parity** can be set to None, Even or Odd.
  - **Stop bits** defines the number of stop bits in use. It can be 1 or 2.
  - **Mode** is to be set to **Slave** for it to act as a Modbus Slave.
  - **Slave address** becomes the Modbus address of this Slave. This Slave address number is the address with which a Modbus Master will communicate. Therefore, this exact Slave address number is to be entered when creating a Modbus Master if the Master will be communicating with this Slave and become a Modbus Master-Slave pair.
  - [pending @Analyst implementation] Click **Ok** to return to the **MasCon/IMx units** window.
1. You should now see the new or edited unit configured as a Modbus Slave in the list.
  2. The window may be closed. [pending @Analyst implementation]

## Configuring a Modbus Master

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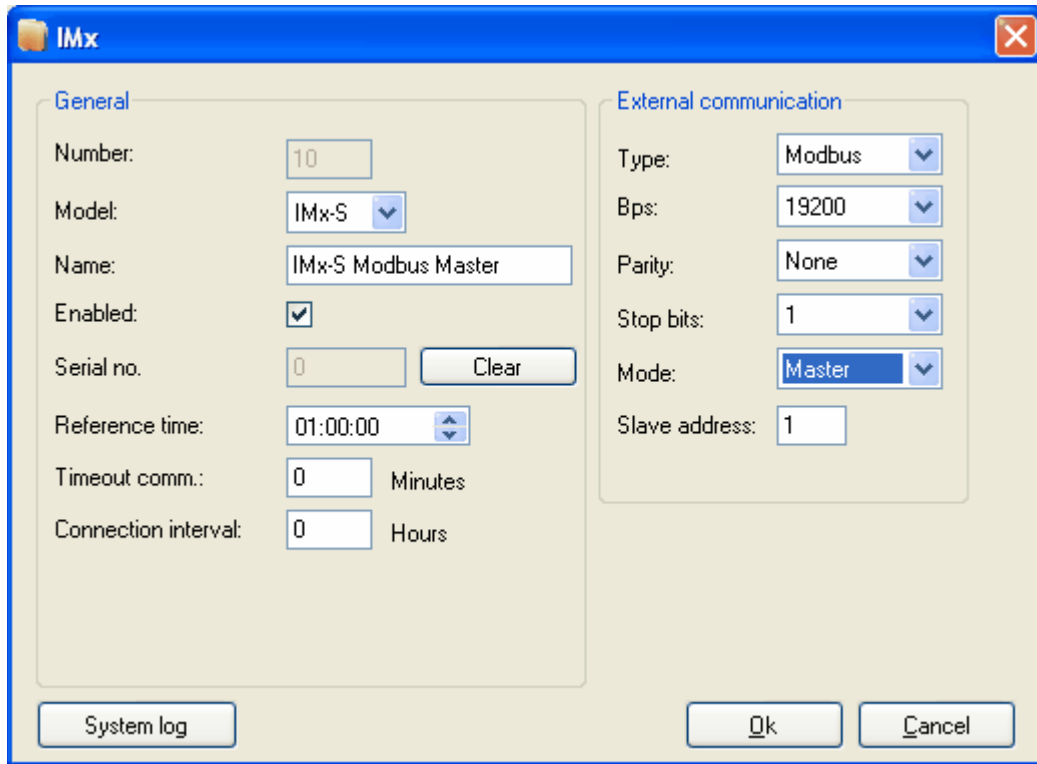


Figure 4 - 5.

Example of IMx Unit - External Communication for Master. [pending @Analyst implementation]

The “External communication” fields are described below:

- **Type** sets the external communication as Modbus or Modbus/RTU when selected.
  - **Bps** defines the speed of Modbus. Refer to [Transmission Characteristics](#) for detailed information.
  - **Parity** can be set to None, Even or Odd.
  - **Stop bits** defines the number of stop bits in use. It can be 1 or 2.
  - **Mode** is to be set to **Master** for it to act as a Modbus Master.
  - **Slave address** is the Slave address number with which this Modbus Master will communicate. Therefore, it is important to enter the exact Slave address number of the Modbus Master-Slave pair.
  - [pending @Analyst implementation] Click **Ok** to return to the **MasCon/IMx units** window.
1. You should now see the new or edited unit configured as a Modbus Master in the list.
  2. The window may be closed. [pending @Analyst implementation]

# Modbus Import through SKF @ptitude Analyst

## Configuring the Modbus Import

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### The Modbus Import feature...

in SKF @ptitude Analyst applies to IMx-S and IMx-T only. It is supported by IMx firmware version 4.2, or later. If you are using IMx firmware version 4.1, or earlier, the Modbus Export features will appear dimmed in SKF @ptitude Analyst.

## Modbus Import Properties





## Modbus Export through SKF @ptitude Analyst

### Configuring the Modbus Export

The Modbus Export feature in SKF @ptitude Analyst applies to IMx-S and IMx-T only. It is supported by IMx firmware version 4.2, or later. If you are using IMx firmware version 4.1, or earlier, the Modbus Export features will appear dimmed in SKF @ptitude Analyst.

The Modbus Export tab page is used to configure which SKF @ptitude Analyst points associated with an IMx device will be exported through the Modbus interface in slave mode to external consumers. It enables you to map @Analyst points to specific Modbus registers and save the desired configuration into the @Analyst database.

#### To select the Modbus Mode:

- In @ptitude Analyst, select the specific IMx device in the hierarchy.
- Click the **Customize** option.

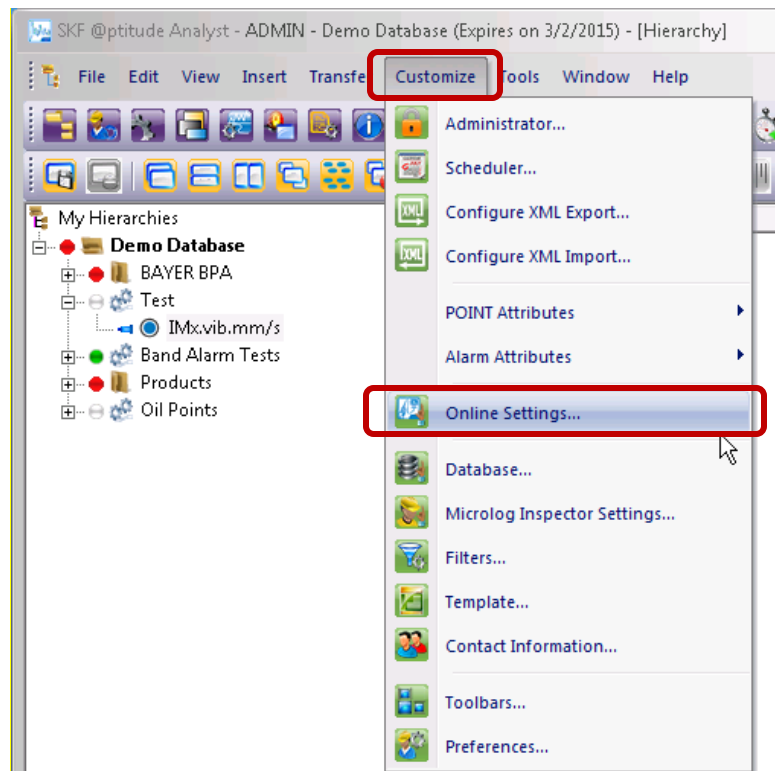


Figure 6 - 1.  
Customize Menu > Online Settings.

- From the menu, select **Online Settings...** to open the dialog.

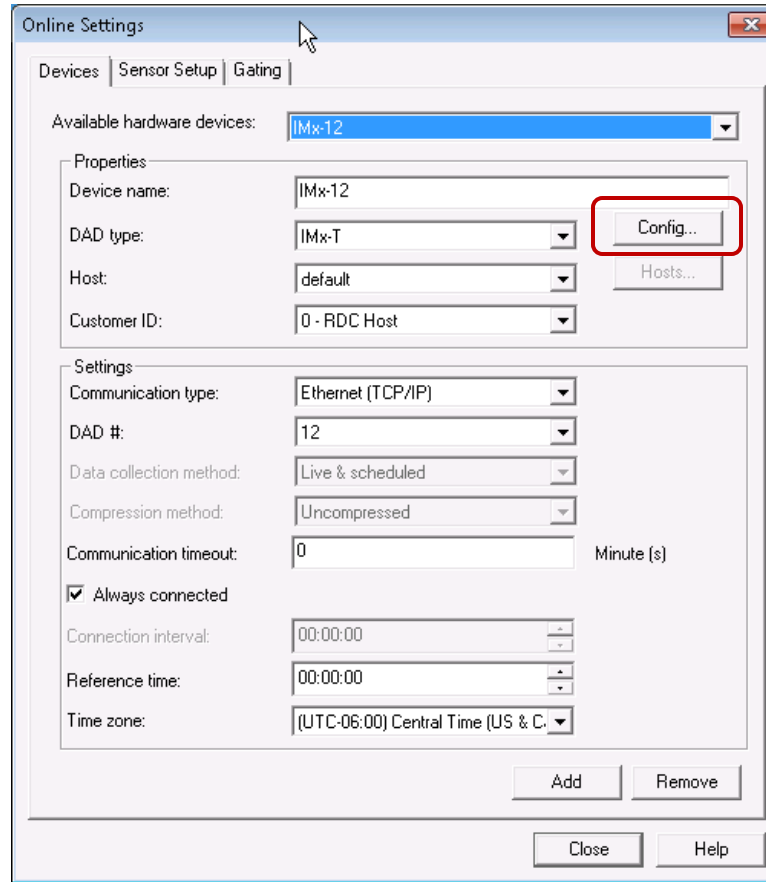


Figure 6 - 2.  
**Online Settings Dialog with Config... Button.**

- In the **Online Settings** dialog, click the **Config...** button. The **Channel Properties** configuration dialog opens for the selected IMx device.
- Click Communication to open the Communication tab.

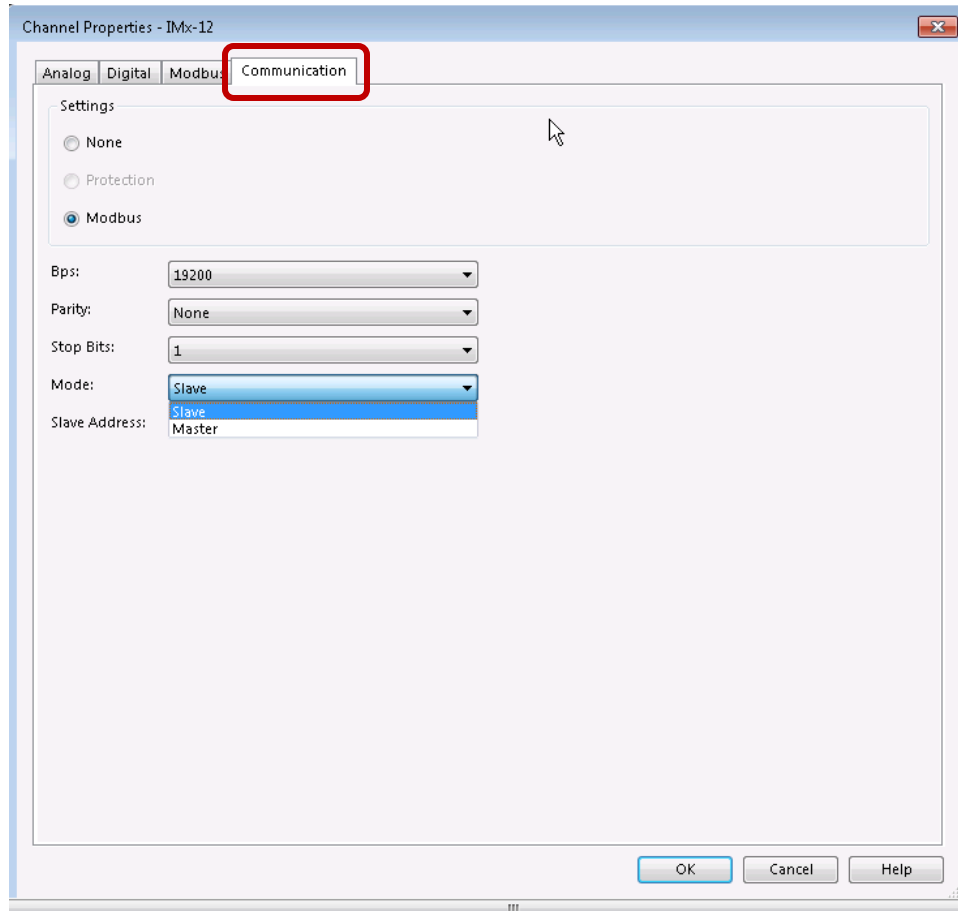


Figure 6 - 3.  
Channel Properties, Communication dialog in @ptitude Analyst.

- Under **Settings**, select **Modbus**. Additional fields display in the dialog.
- Select **Slave** as the **Mode**.
- Click **OK**.

Next, you will set up the Modbus export properties.

## Modbus Export Properties

- Click Modbus Export to open the Modbus Export tab.

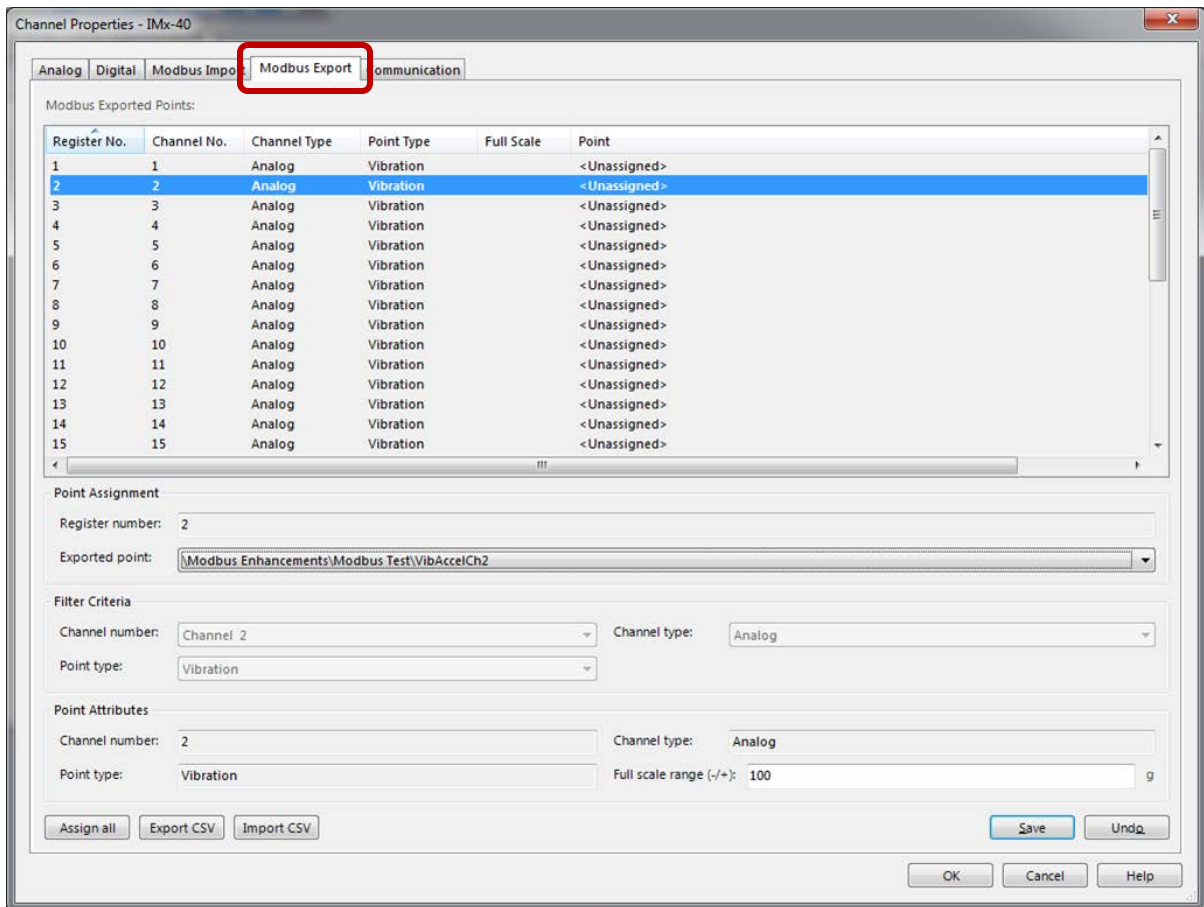


Figure 6 - 4.  
Modbus Export Tab in @ptitude Analyst.

The summary table at the top displays existing Modbus export configuration settings from the @Analyst database along with all known register assignments. If there are no existing Modbus register assignments, the Point column displays <Unassigned>. Each line shows information from a single record in the database table that associates a Modbus register with a specific point in @Analyst.

The critical action to take is to assign an **Exported point** to the selected **Register number**. You can use one of two methods to assign a point to the register number:

- The **Exported Point** drop-down list with optional filter criteria
- The **Assign All** automated function

Both methods are presented below in detail. But first, we'll describe the button controls located in the lower right of the tab.

### Buttons

**Save** – Saves any modified configuration information from the lower edit fields to the summary table.

- It is the **OK** button rather than the **Save** button that saves the configuration data to the @ptitude Analyst database. [true?]

**Undo** – Discards any modifications made to configuration information in the lower edit fields and returns values to what they were before the modifications were made.

- When **Modbus Export** first opens, the **Save** and **Undo** buttons are unavailable and appear dimmed. When you have made entries or edits in the fields, these buttons will activate.

At any time during the configuration process, you have the option to use the following buttons:

**OK** – Saves the Modbus export register configuration information shown in the summary table to the @ptitude Analyst database and closes the **Modbus Export** tab.

**Cancel** – Discards any recent edits and closes the **Modbus Export** tab.

**Help** – Opens help window providing guidance on how to use the **Modbus Export** tab.

### Method 1 – To assign an Exported Point with optional Filter Criteria:

- Highlight a register in the summary table. The number selected for configuration is reflected in the **Register number** field in the **Point Assignment** section below.
- Use the **Exported Point** drop-down arrow and select a point from the drop-down list.

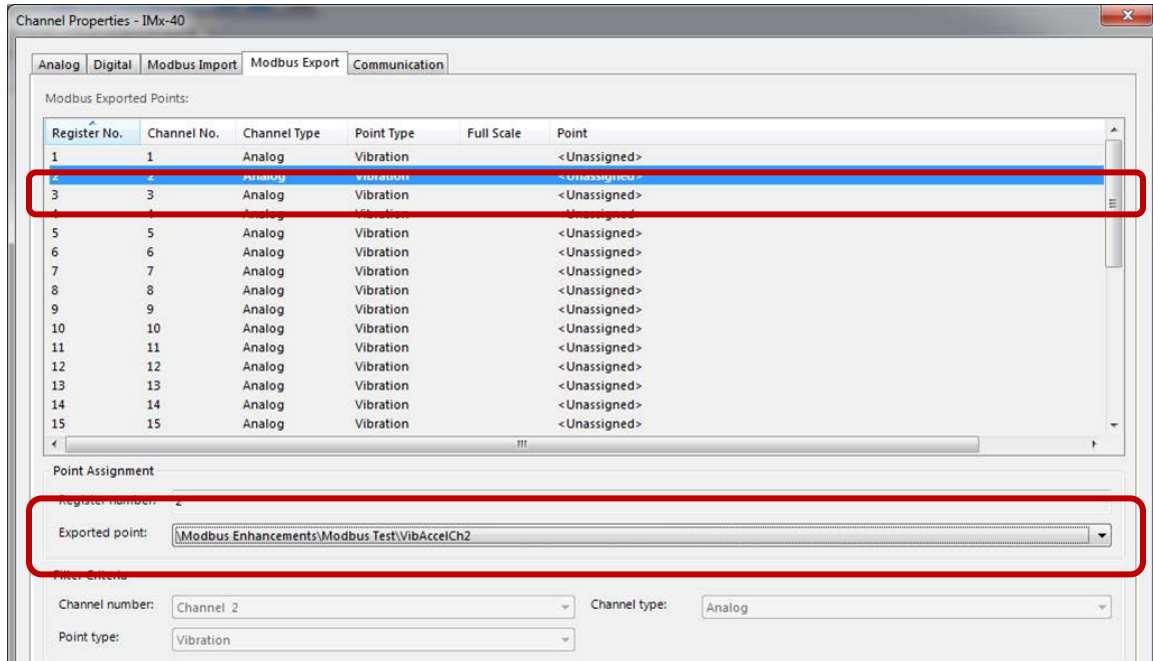
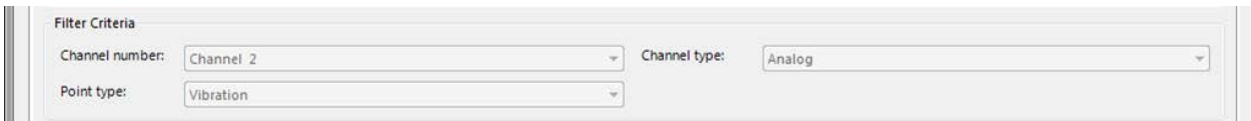


Figure 6 - 5.  
**Register Number and Exported Point**

All of the points in the Analyst database are displayed in the **Exported point** list unless you use the **Filter Criteria** to reduce the points displayed, as described below. **WHAT MAKES THE FIELDS ACTIVE? GET AN IMAGE**



- To limit the exported point options to a specific channel number, click the **Channel Number** drop-down arrow and select the desired channel. Only points related to that channel will display in the **Exported Point** options.
- To limit the point options to a specific type of point, click the **Point Type** drop-down arrow and select the type. Only points of the selected type will display in the **Exported Point** options.
- **Channel Type is always Analog?**

More than one filter criterion may be used to further reduce the number of available points listed in the **Exported Point** options.

The **Point Attributes** section in the lower part of the page is informational only. It provides information about the selected **Exported point**.

**Not informational? Full scale range (-/+)** enables you to enter a value for the full scale range of measurement values for the selected point. This range will be from the negative of the value entered to the value.

**Method 2 – To assign points by using the Assign All function and optional CSV functions:**

Instead of selecting an exported point, you can use an automatic assignment function, **Assign All**. **Export CSV** and **Import CSV** are additional functions that work with **Assign All**. We'll describe how this works below.

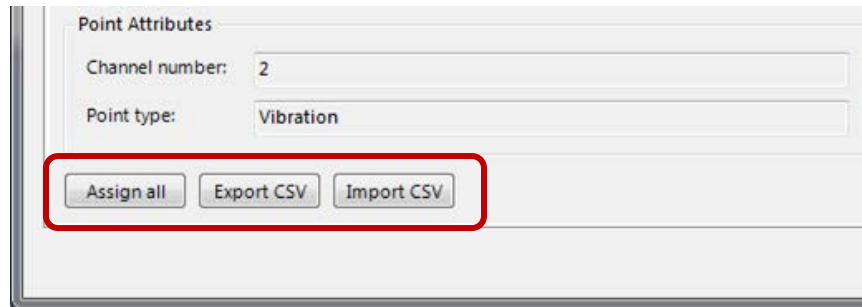


Figure 6 - 6.  
**Register Number and Exported Point.**

- If you click **Assign All**, an informational dialog [GET AN IMAGE] warns you that continuing with automatic Modbus register assignment will clear all existing configuration information from the summary table. [Populates the list view with associations between all IMx points found in @Analyst for the selected IMx device and Modbus export registers supported by the IMx firmware.]
- If you agree to **Continue**, the summary table is populated with Modbus register assignments with all supported points found to be associated with the current IMx device configuration.
  - The Exported points drop-down list will no longer display any points.

You will probably want to establish the order of the register assignments and/or? the assigned points. You can export the data into a CSV (comma separated values) format file. Then, open the file and reorder the list in another application, such as Microsoft Excel, that can facilitate this process.

- To export the summary table, click **Export CSV**. In the Windows dialog, specify the folder location and file name.
- Click **OK**. The Windows dialog closes and a CSV formatted file that contains the current Modbus register assignments is generated.
- After using the file to establish the order you want, save the revised data in CVS format to import it.
- Click **Import CSV**. In the Windows dialog, browse to the updated CSV file and select it for import into SKF @ptitude Analyst.
- Click **OK**. The Windows dialog closes and the summary table is then updated with the imported Modbus export register configuration information.





# Setting up a Measurement Point for Modbus

## Measurement Point Scenario

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After channels have been set up on a unit, it is time to configure measurement points as needed.

Both Modbus Master and Slave on IMx units are required to have measurement points in the following scenario:

- Import data to IMx Modbus Master:
  - Process measurement point to read Modbus vibration channels or virtual process channels
  - Speed measurement point to read Modbus speed channels
  - Counter measurement point to read Modbus channels
  - Counter Rate measurement point to read Modbus channels
- Export data from IMx Modbus Slave:
  - Vibration measurement point
  - Speed measurement point Process measurement point to export process data or speed data

Refer to SKF @ptitude Analyst and SKF Multilog On-line Systems User Manual.



## Checking Modbus Interface / Troubleshooting

### Procedure

In order to check that Modbus configurations are done correctly, perform the following steps:

1. Start **@ptitude Analyst Multilog IMx Configurator** program located in the @ptitude Analyst / Administrative Tools directory.

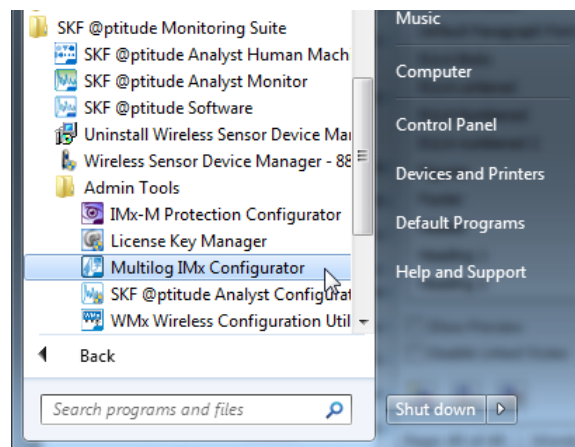


Figure 8 - 1.  
Admin Tools > Multilog IMx Configurator.

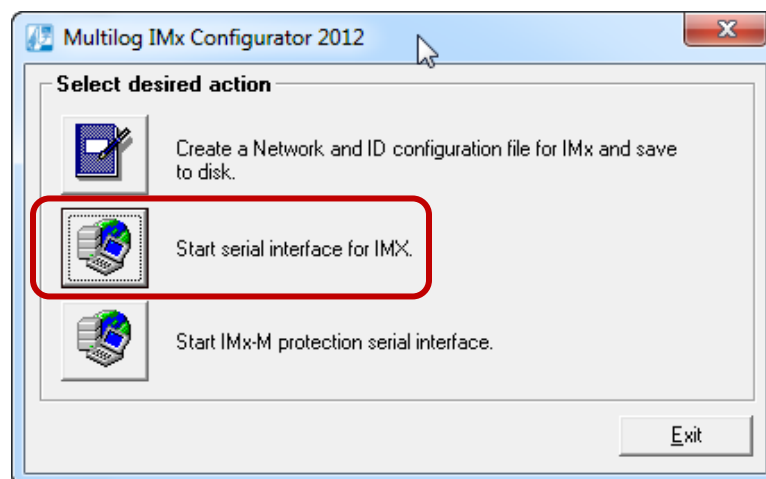


Figure 8 - 2.  
Multilog IMx Configurator, Desired Actions.

2. On the opening window, click **Start serial interface for IMx**. The **Serial interface** dialog opens.

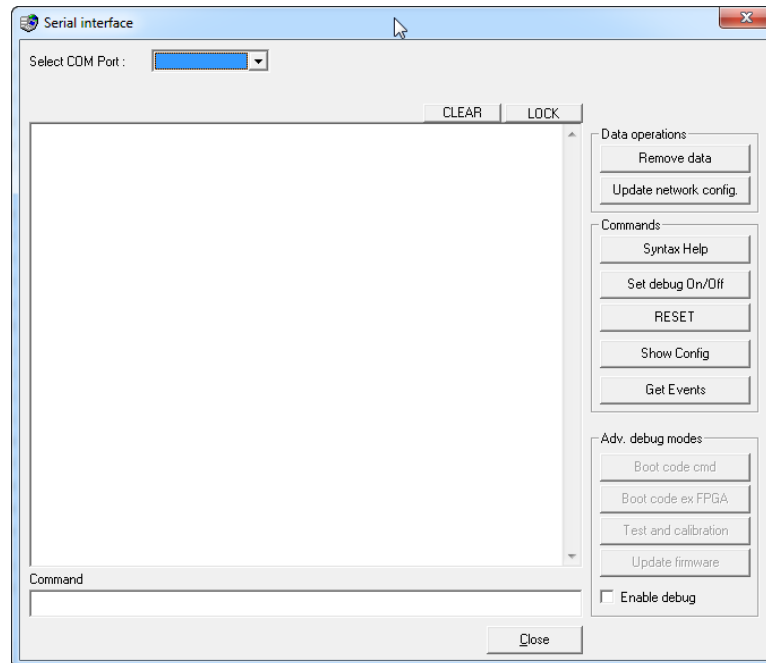


Figure 8 - 3.  
Multilog IMx Configurator, **Serial Interface** Dialog.

3. On the **Serial interface** dialog, enter the COM port number and type in the word **modbus** in the command box.
4. Statistics on communication and the contents of the import registers will appear on the screen. The statistics are the following:
  - Frame errors (short and long)
  - Checksum errors
  - The number of messages sent
  - The number of messages received
  - The number of timeouts of requests
5. A properly working Modbus communication should exhibit increasing sent and received messages. However, it should not exhibit significant increase of errors or timeouts.
6. In case of errors or timeouts, check that all of the following:
  - The physical connections of RS 485 cable wires are done correctly as described in [Modbus \(RS 485\) Interface](#).
  - The transmission characteristics are defined correctly as described in [Transmission Characteristics](#).
  - The Modbus Master-Slave pair address is entered correctly as described in [Configuring a Modbus Master](#).
7. This process of checking the Modbus sensor can be done several times during the installation/test to diagnose the communication activity, or lack of it.