



QuadraTherm[®] 640i & 780i

Profibus DP

Instruction Manual

Profibus DP Device Specification for Models:
640i and 780i
Thermal Mass Flow Meters



Part Number: IM-640i/780i-DP, Rev. V1
June 2014



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Sierra Instruments, Inc. is not liable for any damage or personal injury, whatsoever, resulting from the use of Sierra Instruments standard mass flow meters for oxygen gas. You are responsible for determining if this mass flow meter is appropriate for your oxygen application. You are responsible for cleaning the mass flow meter to the degree required for your oxygen flow application.

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TRADEMARKS

QuadraTherm® and qTherm™ are trademark of Sierra Instruments, Inc. Other product and company names listed in this manual are trademarks or trade names of their respective manufacturers.

Warnings and Cautions



Warning! Agency approval for hazardous location installations varies between flow meter models. Consult the flow meter nameplate for specific flow meter approvals before any hazardous location installation.

Warning! Hot tapping must be performed by a trained professional. U.S. regulations often require a hot tap permit. The manufacturer of the hot tap equipment and/or the contractor performing the hot tap is responsible for providing proof of such a permit.

Warning! All wiring procedures must be performed with the power off.

Warning! To avoid potential electric shock, follow National Electric Code safety practices or your local code when wiring this unit to a power source and to peripheral devices. Failure to do so could result in injury or death. All AC power connections must be in accordance with published CE directives.

Warning! Do not power the flow meter with the sensor remote (if applicable) wires disconnected. This could cause damage to the electronics.

Warning! Before attempting any flow meter repair, verify that the line is de-pressurized.

Warning! Always remove main power before disassembling any part of the mass flow meter.



Caution! Before making adjustments to the device, verify the flow meter is not actively monitoring or reporting to any master control system. Adjustments to the electronics will cause direct changes to flow control settings.

Caution! All flow meter connections, isolation valves and fittings for hot tapping must have the same or higher pressure rating as the main pipeline.

Caution! Changing the length of cables or interchanging sensors or sensor wiring will affect the accuracy of the flow meter. You cannot add or subtract wire length without returning the meter to the factory for re-calibration.

Caution! When using toxic or corrosive gases, purge the line with inert gas for a minimum of four hours at full gas flow before installing the meter.

Caution! The AC wire insulation temperature rating must meet or exceed 80°C (176°F).

Caution! Printed circuit boards are sensitive to electrostatic discharge. To avoid damaging the board, follow these precautions to minimize the risk of damage:

- Before handling the assembly, discharge your body by touching a grounded, metal object
- Handle all cards by their edges unless otherwise required
- When possible, use grounded electrostatic discharge wrist straps when handling sensitive components

Note and Safety Information

We use caution and warning statements throughout this book to draw your attention to important information.



Warning!

This statement appears with information that is important to protect people and equipment from damage. Pay very close attention to all warnings that apply to your application.



Caution! / Note

This statement appears with information that is important for protecting your equipment and performance. Read and follow all cautions that apply to your application.

Receipt of System Components

When receiving a Sierra mass flow meter, carefully check the outside packing carton for damage incurred in shipment. If the carton is damaged, notify the local carrier and submit a report to the factory or distributor. Remove the packing slip and check that all ordered components are present. Make sure any spare parts or accessories are not discarded with the packing material. Do not return any equipment to the factory without first contacting Sierra Customer Service.

Technical Assistance

If you encounter a problem with your flow meter, review the configuration information for each step of the installation, operation, and setup procedures. Verify that your settings and adjustments are consistent with factory recommendations. Installation and troubleshooting information can be found in the [QuadraTherm 640i/780i Instruction Manual](#) .

If the problem persists after following the troubleshooting procedures outlined in the 640i or 780i product manuals, contact Sierra Instruments by fax or by E-mail (see inside front cover). For urgent phone support you may call (800) 866-0200 or (831) 373-0200 between 8:00 a.m. and 5:00 p.m. PST. In Europe, contact Sierra Instruments Europe at +31 72 5071400. In the Asia-Pacific region, contact Sierra Instruments Asia at +86-21-58798521. When contacting Technical Support, make sure to include this information:

- The flow range, serial number, and Sierra order number (all marked on the meter nameplate)
- The software version (visible at start up)
- The problem you are encountering and any corrective action taken
- Application information (gas, pressure, temperature, and piping configuration)

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Chapter 1: Introduction

This manual will explain how to add a Sierra flow meter to a Profibus DP network. Profibus DP allows access to all relevant data available in the flow meter. This manual does not cover the operation of the QuadraTherm 640i/780i. See the [QuadraTherm 640i/780i Instruction Manual](#) for more information 640i/780i.

The 640i/780i process data flow, temp, pressure, totalizer, and alarm status supports Profibus DP V0 cyclic data communications. The 640i/780i also supports Profibus DP V1 acyclic data for meter information and setup data. If your Class 1 master doesn't support DPV1 data, then a separate Class 2 supervisory master may be used to access it. The acyclic data would only need to be accessed occasionally for setup and informational reasons.

Set Up Step Plan

To successfully add the flow meter to a Profibus DP network you need the following:

- Profibus DP network with a DP master
- GSD file
- Bitmap files (Optional)
- Connection cable
- Power supply (for the flow meter)

Setup steps:

1. Load GSD
2. Copy bitmaps
3. Add slave (640i/780i) device to system
4. Set slave configuration
5. Set slave station address
6. Download configuration
7. Test configuration

Chapter 2: Field Bus Installation

Wiring

Option DP1

This option uses a full five-wire Profibus DP connection using the M12 connector per the Profibus DP standard. This connection allows you to use ready-made cables, tees, and terminators which maintain a daisy chain topology.

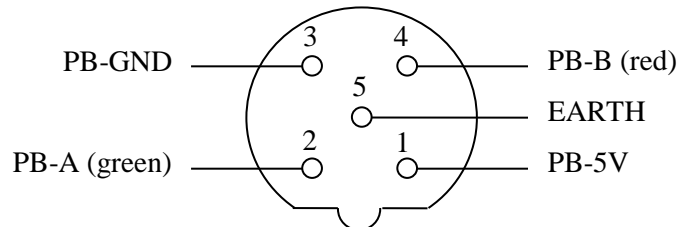


Figure 1: Ready-made cables, tees, and terminators

The Profibus DP connects to the M12 connector to the right of the QuadraTherm (shown below). The 24 VDC@1A power to power the meter connects pins 1 and 2.

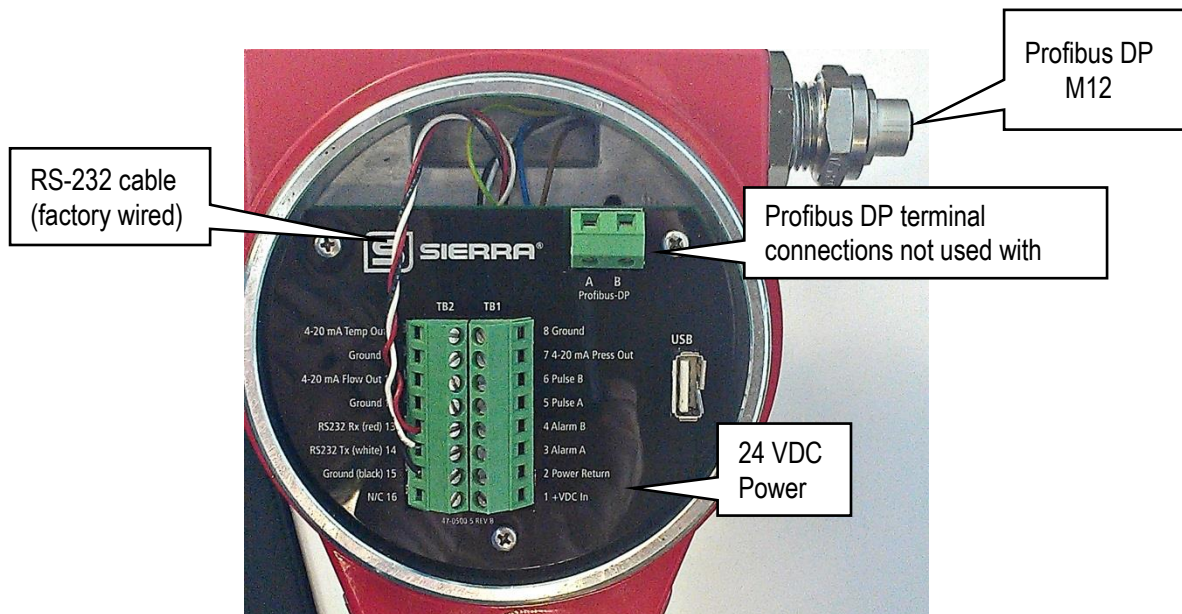


Figure 2: 640i/780i Wiring Connection DP1

Option DP2

For applications where the Profibus DP cable needs to be protected in conduit, we offer an alternate terminal block Profibus DP connection. This must be requested at the time of ordering. The PB-5V and PB-GND will not be available to power a terminator. The last device on the Profibus DP segment may need an external “powered terminator” or at minimum a 220Ω resistor across A&B. The daisy chain topography cannot be maintained, so spur lines may be unavoidable. Make sure to account for maximum number of spur lines in your application. For higher baud rates and longer wire runs, repeaters or hubs may be needed.

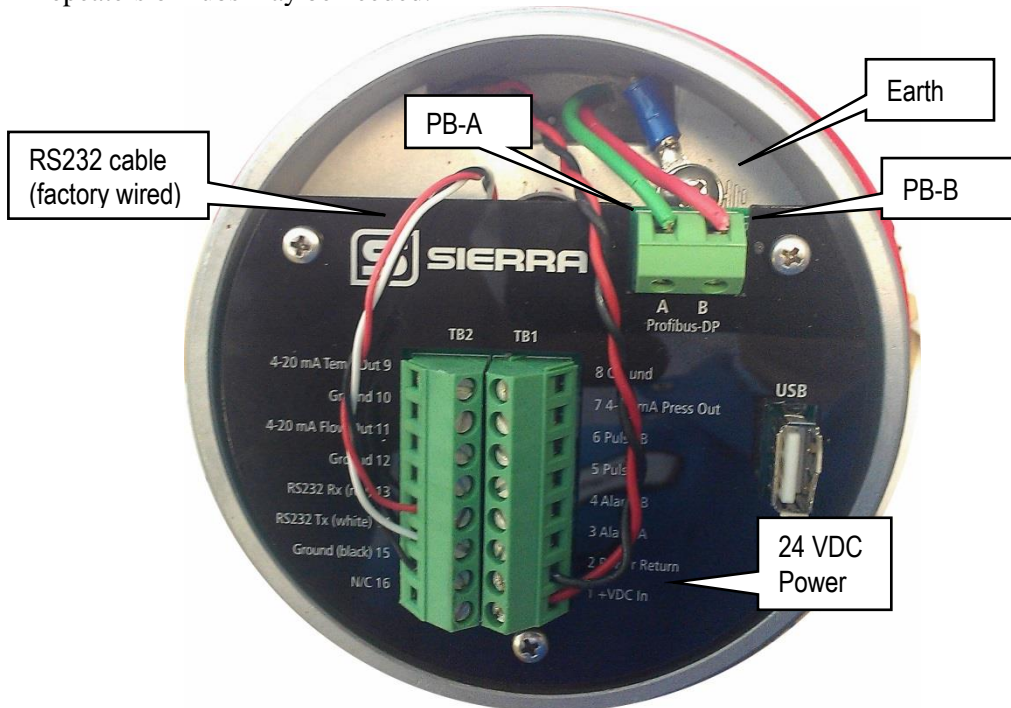


Figure 3: 640i/780i Wiring Connection DP2

Cable

Profibus DP cables are shielded, twisted-pair copper cables which differ from each other in the type of wire (fixed/flexible) and/or sheath. The two inner cores of a Profibus DP cable have green and red insulation. The specifications in this chapter are primarily intended to provide a general introduction and describe the cable properties to be considered (see also IEC 61784-5-3). A good cabling guide can be found online at: http://verwertraining.com/wp-content/uploads/InstallationGuideV9_2.pdf.

The cable must conform to the following specifications:

- Impedance: 150 Ohm (nominal) at frequencies from 3 to 20 MHz
- Cable capacitance: < 30 pF per meter
- Core diameter: > 0.34 mm², corresponds to AWG 22
- Cable type: twisted pair cable. 1x2 or 2x2 or 1x4 lines
- Resistance: < 110 Ohm per km
- Signal attenuation: max. 9 dB over total length of line section
- Shielding: CU shielding braid or shielding braid and shielding foil
- Max. Bus length: 200 m at 1500 Kbit/s, up to 1.2 km at 93.75 Kbit/s

Termination

The Profibus DP physical layer is based on RS-485, and therefore termination resistors of 220Ω are needed at both ends of the network to prevent reflections. 390Ω resistors are used to bias the idle state voltages. This power terminator circuit is shown below:

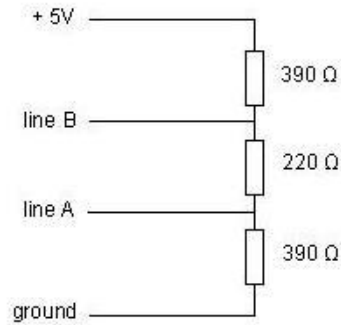
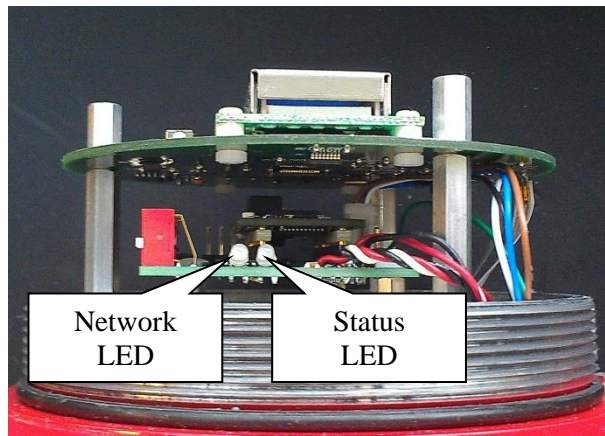


Figure 4: Powered Terminator

Ready-made terminators are available for easy installation.

Status LEDs

The interface has two multi-color LED's mounted inside the enclosure to indicate the status. To access the LED's, remove the display side cap.



Status LED

Status	Description
Flashing Green/red	Initializing
Steady Green	Device operational
Flashing Red	Recoverable hardware failure
Steady Red	Hardware failure – attention required (RS232 wires may be disconnected)

Network LED

Status	Description
Off	Not online – waiting for configuration
Steady Green	Data exchange
Flashing Red	Connection lost

Slave Address

Once the interface is installed, the slave address of the interface can be set. DP instruments will be delivered with slave address 126. This address has been agreed by the Profibus DP organization to be free for installing new devices to the bus. Changing the station address is done in two ways, either through a dip switch or through the master.

Dip Switch

The dip switches are located to the left of the LEDs.



The dip switch is binary encoded with the LSB (least significant bit) on the left side. The switch is only read during power-up.

The switch becomes active when the slider is moved upwards to “On”. Below is an example of some addresses:

Address ID	Dip Switch							
	1	2	3	4	1	2	3	4
1	On	Off	Off	Off	Off	Off	Off	Off
14	Off	On	On	On	Off	Off	Off	Off
60	Off	Off	On	On	On	On	Off	Off
125	On	Off	On	On	On	On	On	Off



Note: An address set with the dip switch has the highest priority and the slave address will use this address when powering up.

Server Assigned Address

It is possible to change the address of the unit through the server. Perform the following steps to change the address:

1. Assign a new address from the server
2. Set the dip switch to address to >128 (last switch on) or higher.

The assigned address will be used each time that the unit is powered.

Set Address (126)

It is possible to force the address of the unit to 126. Set the dip switch to zero and power cycle the unit. The address is set to 126. The address can be changed by the server if needed. Do keep in mind that if the dip switch remains set to zero, the address will be set to 126 at each power-up.

Chapter 3: Configuration

GSD File

Each Profibus DP device comes with its own [GSD-file](#). The GSD file can be obtained from the documents and downloads page ([http://www.sierrainstruments.com/products/downloads/Profibus DP-dp](http://www.sierrainstruments.com/products/downloads/Profibus_DP_dp)). The GSD file contains the instrument specifications telling the master configuration software which facilities/features the instrument offers to the Profibus DP system.

The GSD-file is a text file containing:

- Identification info:
 - Model name: “QuadraTherm 640i/780i”
 - Vendor name: “Sierra Instruments Inc.”
 - File name SIER0E14
 - Identification number: 0x014E
 - Bitmap device: “640i_de”
 - Bitmap diagnostics: “640i_di”
 - Bitmap SF: “640i_sf”
(Bitmap files are used in configuration software to indicate instrument status)
- Revision numbers
- Hardware characteristics:
 - VPC3+C dependable properties
- Software characteristics:
 - Supported features of Profibus DP: freeze, sync, auto baud rate detection
- Maximum bus data lengths
- Size of used data buffers
- DPV0 modules with cyclic inputs definitions
- DPV1 acyclic input/output data definitions

Cyclic Data Overview (inputs)

The tables below (Incoming Cyclic Data (Slave to Master Module 1) and Incoming Cyclic Data (Slave to Master Module 2)) shows the cyclic input buffer supported by the device. To make configuration more flexible the process data has been divided between three modules. Three more modules were added to allow combination of Module 1, 2, and 3. Only one module can be configured at a time. The actual data address (index) will depend on preceding devices on your bus and what modules are configured. The matrix example below shows the actual data addresses, assuming the 640i/780i is the first device on your Profibus DP network, and Module 6 (1+2+3) was configured.

Incoming Cyclic Data (Slave to Master Module 1)

Data Address	Description	Size (bytes)	Format
0	Flow	4	Real

Incoming Cyclic Data (Slave to Master Module 2)

Data Address	Description	Size (bytes)	Format
4	Temperature	4	Real
8	Pressure	4	Real
12	Totalizer	4	Real

Incoming Cyclic Data (Slave to Master Module 3)

Data Address	Description	Size (bytes)	Format
16	Totalizer	4	32 INT
20	Alarm Status	1	8 INT

Module 4, Module 1+2

Module 5, Module 2+3

Module 6, Module 1+2+3

DPV0 Cyclic Data Reads (inputs)

Flow

Data type: 32 bit real (same as 32 bit floating point or IEEE 754)

Description: The actual flow as measured by the instrument in the active flow units on the 640i/780i.

Temperature

Data type: 32 bit real

Description: The actual process temperature as measured by the instrument in the active temperature units on the 640i/780i.

Pressure

Data type: 32 bit real

Description: The actual process pressure as measured by the instrument in the active pressure units on the 640i/780i.

Totalizer

Data type: 32 bit real

Description: The totalized flow as measured by the instrument in the active flow units on the 640i/780i. This total is in the common IEEE 754 data type, but will start rounding off at flow above 40,000.

Totalizer

Data type: 32 bit unsigned integer (byte order LSB – MSB)

Description: The totalized flow as measured by the instrument in the active flow units on the 640i/780i. This total will count to 2^{23} , or 4,294,967,296. It will not round off, or include a decimal point.

Alarm Status

Data type: Byte (Boolean)

Description: This is the status of the 640i/780i alarm. (0=inactive, 1=active) The alarm setup can be done through the keypad or the 640i/780i SIP software.

DPV1 Acyclic Writes (outputs)

Slot 0

Total Reset: 16 bit integer data type. Resets the totalizer to zero when sending a hex 00,01.

Slot 1

Password: Four character ASCII string. This sends a new password to the 640i/780i keypad, which over writes the old one. The password can be any four text numbers as in (i.e. 1, 2, 3, 4). This is useful to lockout unauthorized changes to the 640i/780i from the keypad.

Slot 2

Meter Tune: This 32 bit real number will adjust the flow calibration of the active gas. The factory calibration should be already correct. However this can be used to correct an undetermined application issue. Example 1.100 would increase the flow readings by 10%.

Slot 3

Change Active Gas: This is a 16 bit integer data type. The 640i/780i can hold up to four gas calibrations. Index "0" is always set to air. Indexes 1, 2, or 3 can be calibrated for other gases. Sending a hex 00,00 would be air, hex 00,01 would be gas 2, hex 00,02 would be gas 3, and hex 00,03 would be gas 4.

Slot 4

Write Full Scale: This is a 32 bit real data type that will set the meter full scale. When reading the flow using the Profibus DP, this doesn't really matter. This just sets the 4-20 mA. Full scale can also be useful information to indicate a meter in your system.

Slot 5

Internal Pipe Diameter: This is a 32 bit real data type that can be used to change the calibrated pipe diameter. In order to measure flow accurately, the pipe ID must be correct on a 640i/780i. At the factory we used the Pipe ID that was supplied at the time the meter was ordered. If this has changed, you may enter a new pipe ID here or use the 640i/780i keypad.

DPV1 Acyclic Reads (inputs)

Slot 7

Read Full Scale: This is a 32 bit real data type. This is the meter full scale. When reading the flow using the Profibus DP, this doesn't really matter. Read Full Scale is just a 4-20 mA full scale. This data can also be useful information to indicate a meter full scale in your system.

Slot 8

Reads Meter Tune: This is a 32 bit real number that can be used to adjust the flow calibration of the active gas. At the factory calibration this should always be set to 1.000.

Slot 9

Reads Gas Name: This 10 character ASCII string with the name of the currently active gas. This should be the same as the calibration certificate. This will change as the active gas is changed.

Slot 10

Reads Internal Pipe Diameter: This is a 32 bit real data type that represents the calibrated pipe diameter. In order to measure flow accurately, the pipe ID must be correct on a 640i/780i. At the factory, we used the Pipe ID that was supplied at the time the meter was ordered.

Slot 11

Reads Active Gas: This is a 16 bit integer data type. The 640i/780i can hold up to four gas calibrations. Index 0 is always set to Air. Indexes 1, 2, or 3 can be calibrated for other gases. Reading a hex 00,00 would be air, hex 00,01 would be gas 2, hex 00,02 would be gas 3, and hex 00,03 would be gas 4.

Slot 12

Reads all Active Engineering Units: This is a 22-character ASCII string. This string contains the active engineering units for temperature, pressure, flow, and total using a semicolon to separate each. Example: F;PSIA;SCFM; SCFM

Slot 13

Reads Serial Number: This is a 6-character ASCII string with the unique serial number of the meter.

Slot 14

Reads the Last Factory Calibration Date: This 10-character ASCII string has the most recent factory calibration date. Example: 10/10/2010

Slot 15:

Reads T1 Wattage: This is an 8-character ASCII string with the reference T1 wattage done at ambient conditions during calibration.

Reference Application Examples

For a DPV0 Class 1 master for the cyclic data, below we will be using a Hilscher CIF50-PB PCI card as the master. Configuration will be done by using Hilscher's Syscon software. Syscon is a tool for the configuration of a fieldbus networks using a Hilscher CIF50-PB master. You may be using different configuration software and different master. However, you will need to accomplish the same functions. No specific slave DTMs (Device Type Manager) of the 640i/780i are available. Below we will be using the Syscon generic slave DTM.

Online diagnostic indicators and auto-scan function for the reading of network participants can be used to assist in the commissioning of the network.

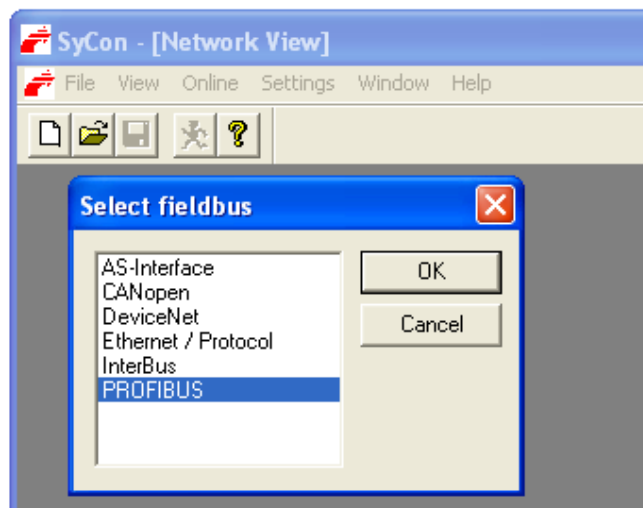
This manual will explain step by step how to configure the system to support various fieldbus slaves on a Hilscher CIF50-PB master.

Before starting make sure that the necessary device description files (GSD & bit maps) are available in your device catalog. These are available on our [web site](#).

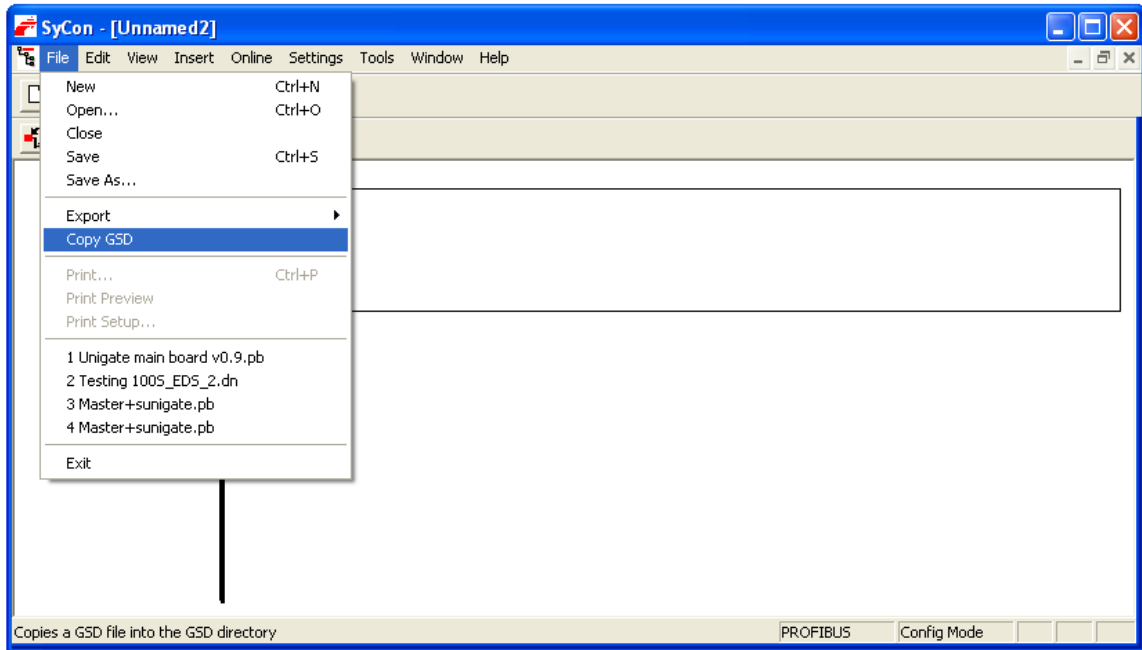
Import Device Description Files

In order to use a Profibus DP device, its properties need to be added to the server. This is done by importing the device description files into the Syscon configuration software. Follow the steps below to import device description (DD) files:

1. Start Syscon and create a new document (File -> New). A dialog window appears asking to select a fieldbus. For this example select "PROFIBUS DP."



2. The main window is loaded. Go to the file menu and select “Copy GSD.”

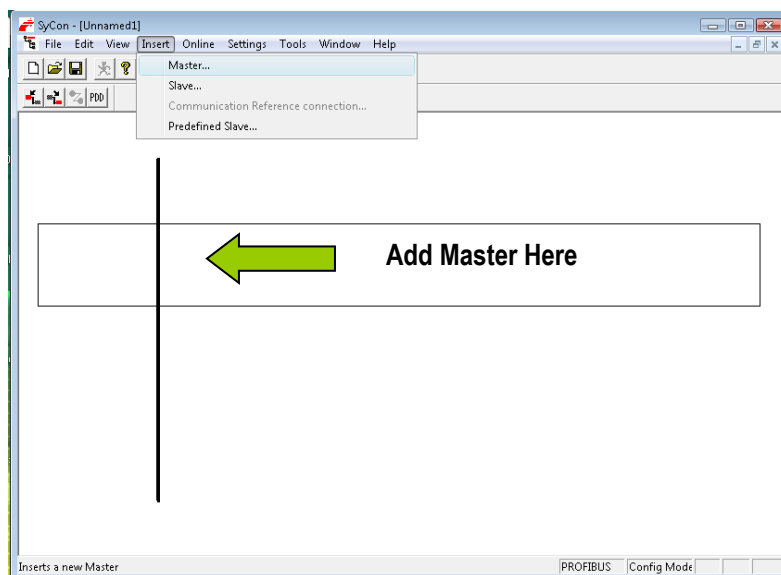


3. Locate the [SIER0E14.gsd](#) GSD file and load it. The GSD file is added to the Sycon library but it isn't available yet. Quit the program and restart it to make it available.

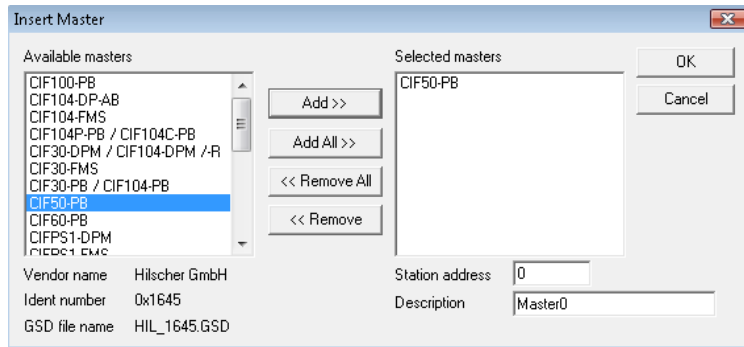
Configuring a Slave

Create a New Configuration and Insert a Master

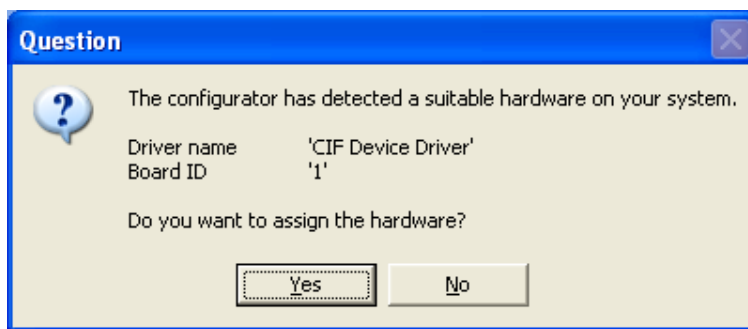
1. Place the master at the top of the line. A dialog window appears where a master needs to be selected from a list. The list shows every type of master supported by Sycon. Select the Profibus DP master which has been installed on the PC:




2. Leave the station address set to zero. Press the “Add” button and then the “OK” button.



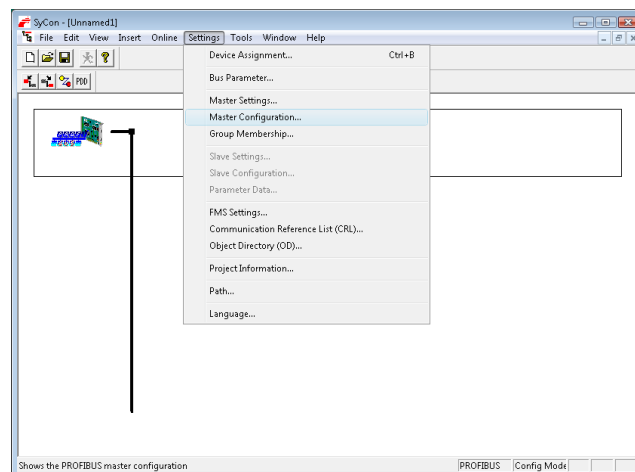
3. A window pops up showing the driver linked to the selected master. Press “Yes” to use the hardware.



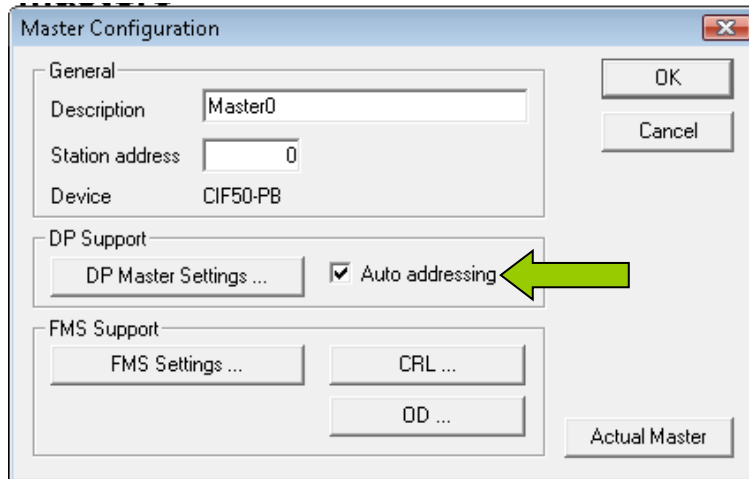
 **Note:** The board ID number changes when extra PCI cards are added to the PC. Older configurations must be checked before trying to run them.

Auto Addressing

After inserting the master as shown in the previous section, the master needs to be set to auto addressing. To do this, go under the file menu “Settings” and select “Master Configuration.”

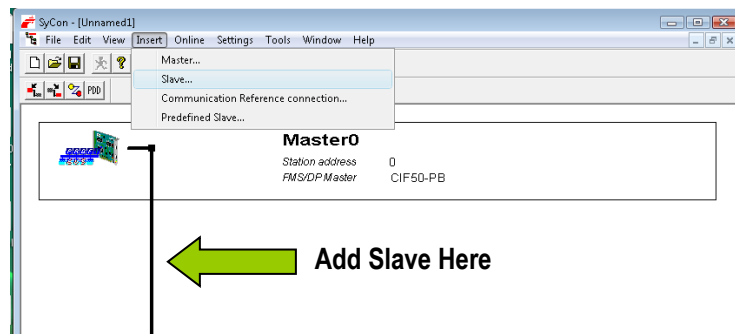


Check the box next to “Auto addressing,” if the box is not checked.

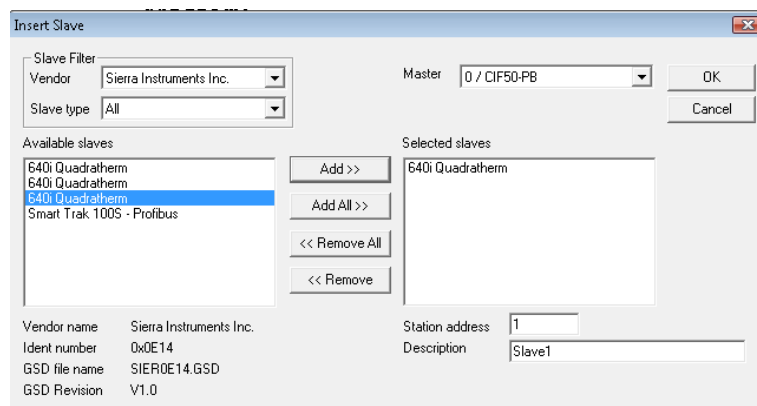


Insert a Slave in the Configuration

1. To insert a slave to the configuration, go under “Insert” and select “Slave.” Place the slave below the **master** as shown below.

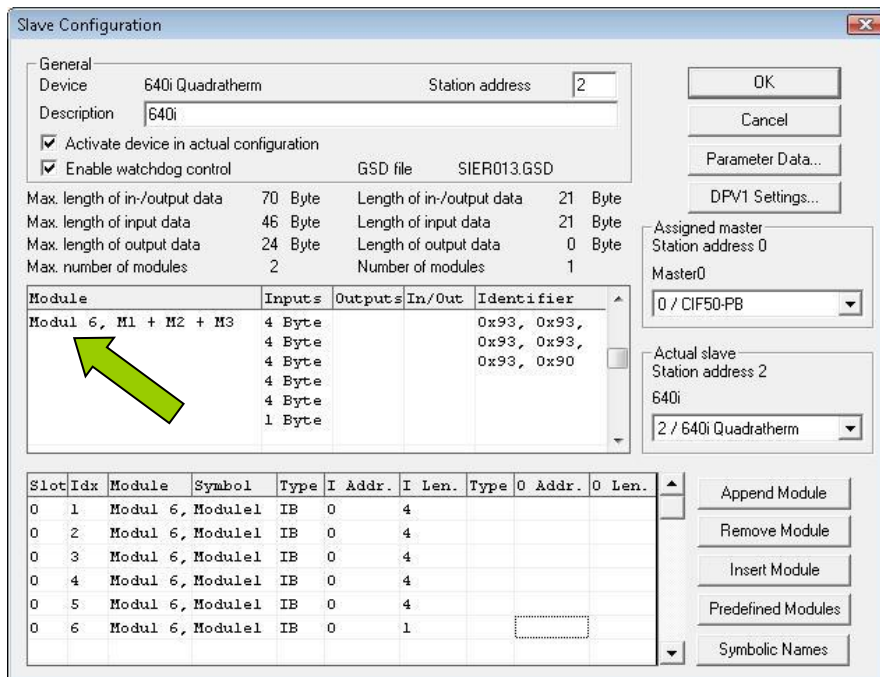


2. Set the slave filter to “Sierra Instruments Inc.” Select the desired GSD file, press the “Add” button, set the slave address and description to match the slave and press the “OK” button.



Note: If a slave device does not appear in the window then the GSD file hasn't been copied into Sycon.

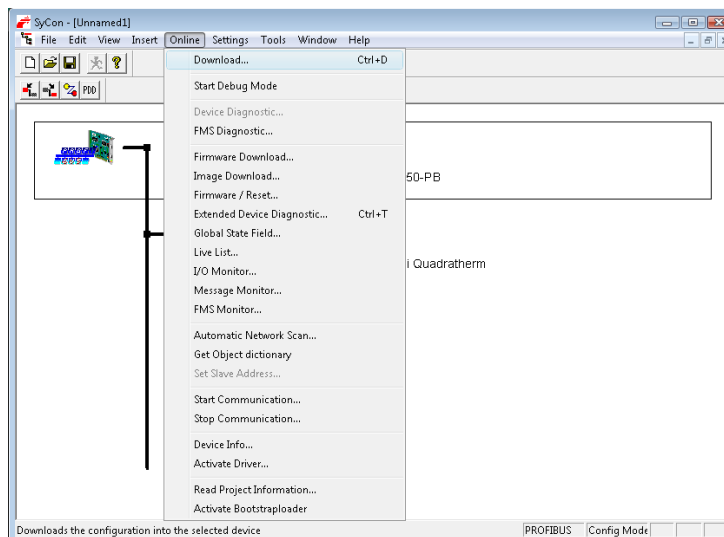
- Double click on the added slave in the main window. The slave configuration window appears.



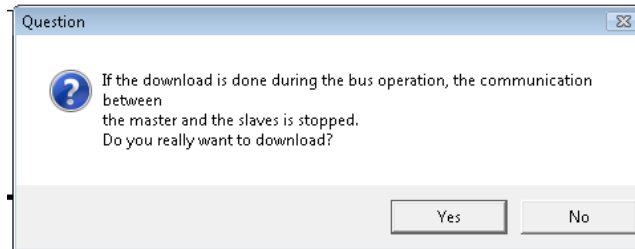
- Select the desired module (one only) by double clicking on the module name. Note that you have a choice between module 1, 2, 3, 4, 5, and 6. In the above example, module 6 is chosen for all cyclic data. Once the desired module is selected, press the “OK” button.
- When done save the new configuration by clicking “OK.”

Download Configuration

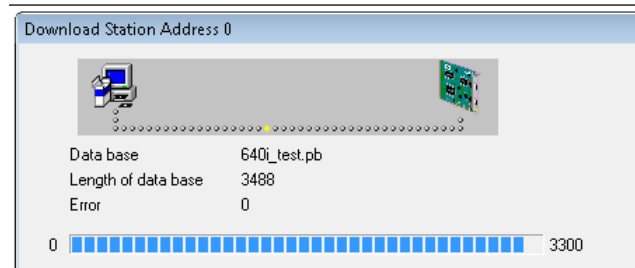
The configuration needs to be downloaded to the master. To do this, click on “Online” and choose “Download” as shown below.



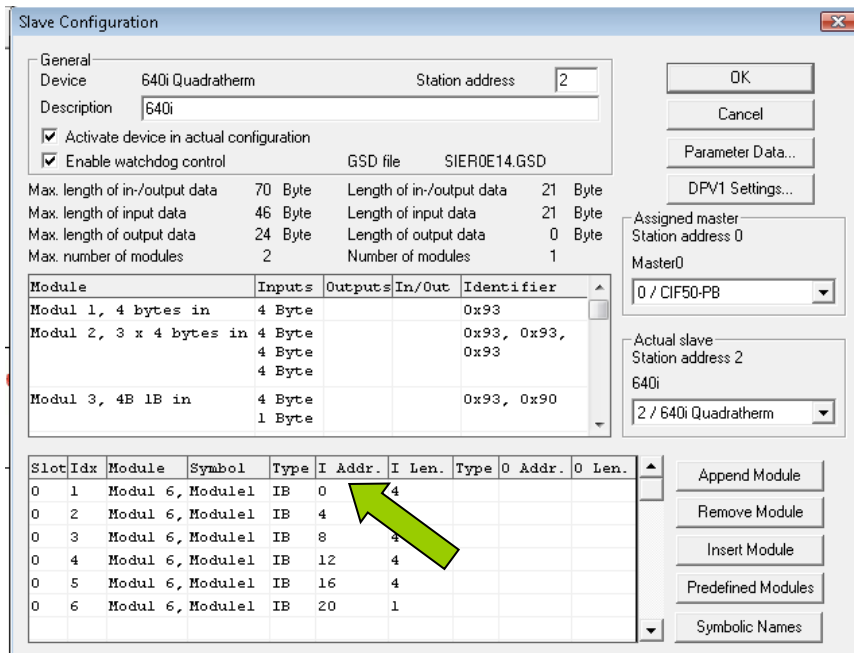
A pop-up may appear warning you that the communication may stop. See example below.



Press “Yes” to continue. The data is downloaded to the master:



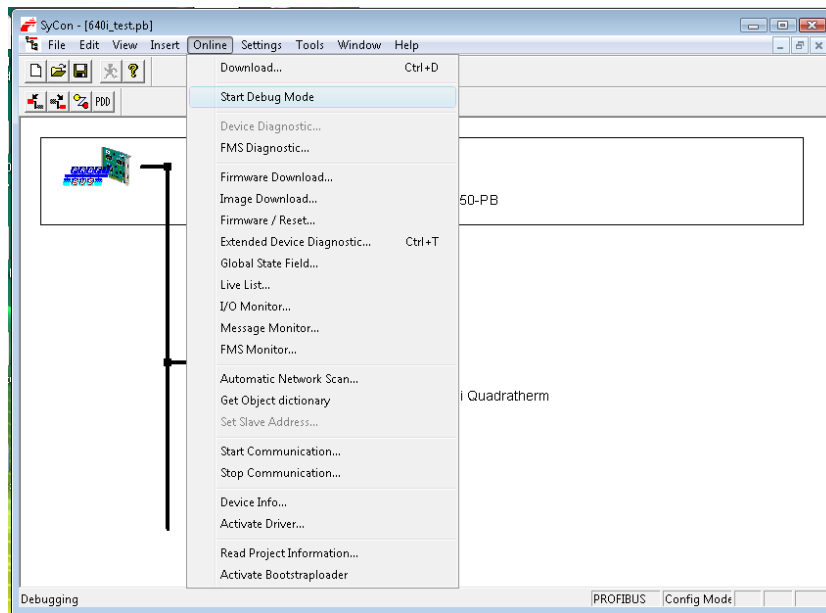
After the download, you can double click the new slave again and see the actual data addresses assigned to your network under the “I Addr.” column.



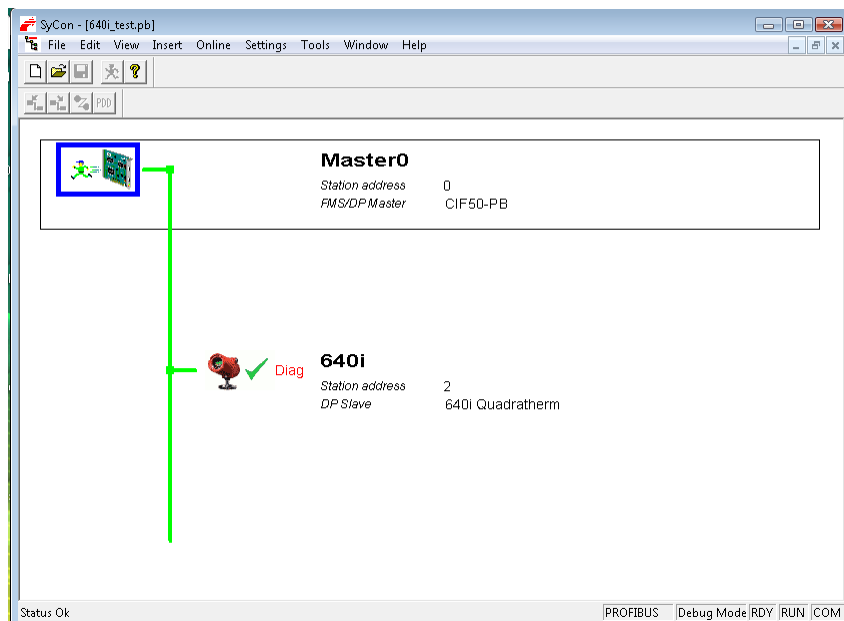
The QuadraTherm is now configured. Click “OK” to close this window. You can now save this configuration file in a convenient location to be used later. In this case File> Save As...> 640i_test.

Check The Configuration

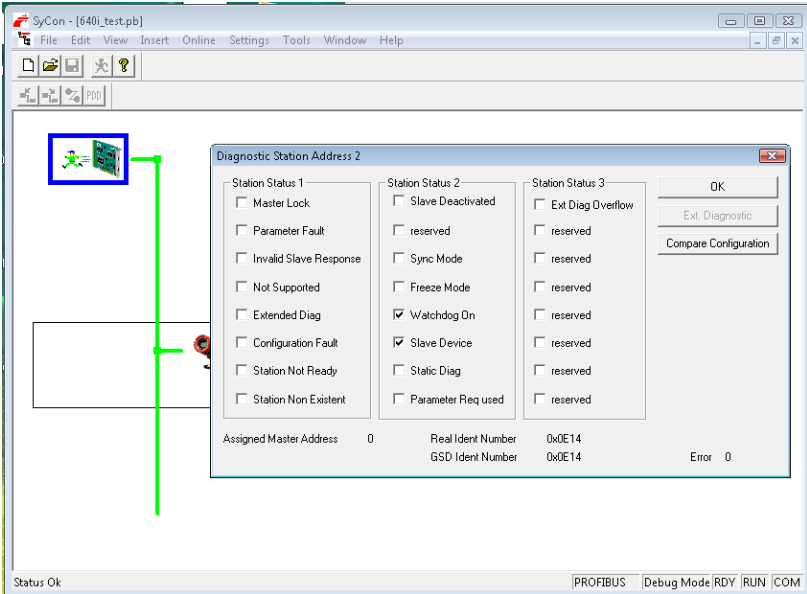
To confirm the configuration worked, you can start the debug mode.



If everything is working correctly then the line between the master and the slave will be green and the bit map shows a green check.

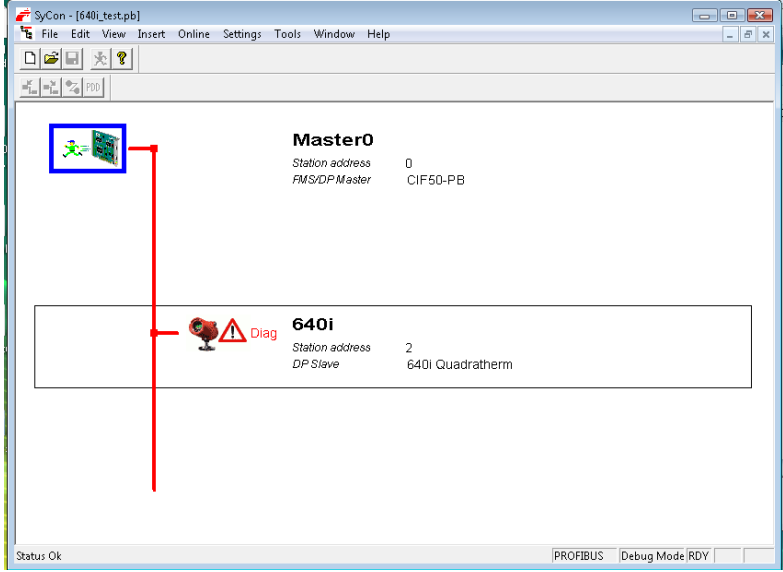


To see the diagnostic status, double click on the slave.

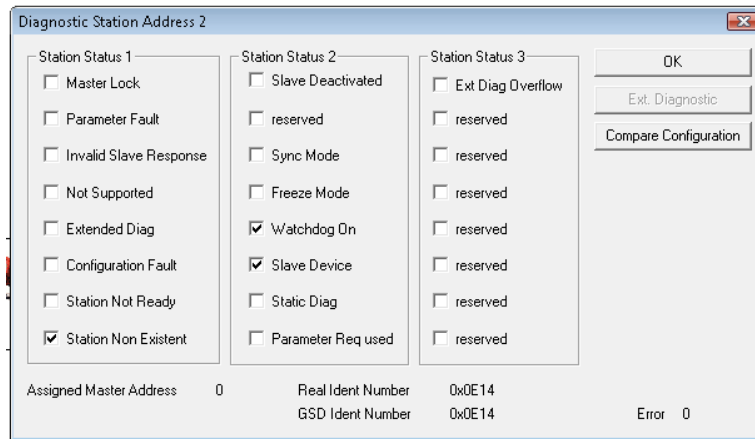


Press the “OK” button and leave the debug mode (Online -> Stop Debug Mode).

If the line turns red (error found), double click the slave to find out what the problem is.



The diagnostic window gives an indication of a problem, “Station Non Existent” wrong address here:



In this case the slave is deactivated. Check the address of “Slave1” to see if it matches with the physical address of the hardware slave.

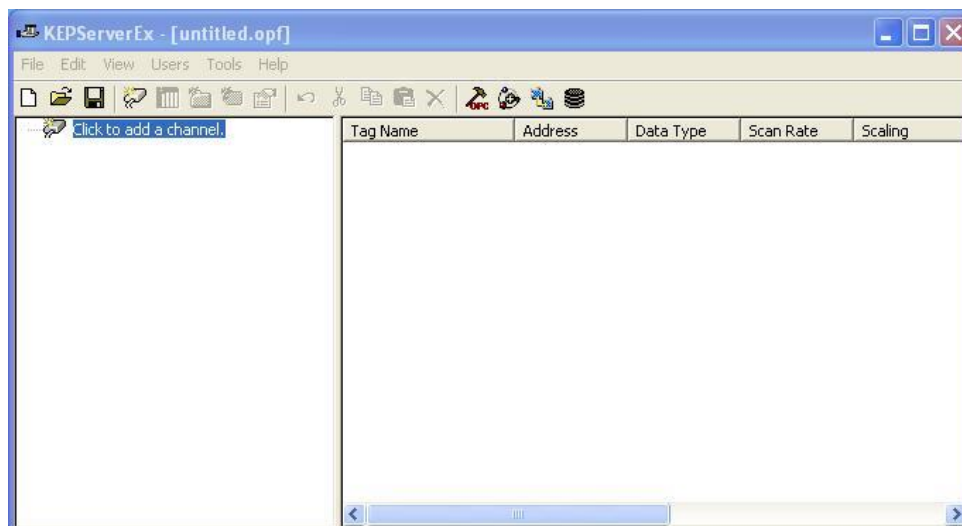
Correct any error found. If the slave address in the configuration is incorrect, adjust it and download the configuration.

Kepserverex 4.0

Now that the QuadraTherm has been configured to the network, you will need software to read the cyclic process data. You may be using different software or a PLC. This example shows how to use the KepserverEx 4.0 free demo software on a windows PC. For your convenience we put a copy on our [website](#).

After you have installed the KepserverEx software, start a new project.

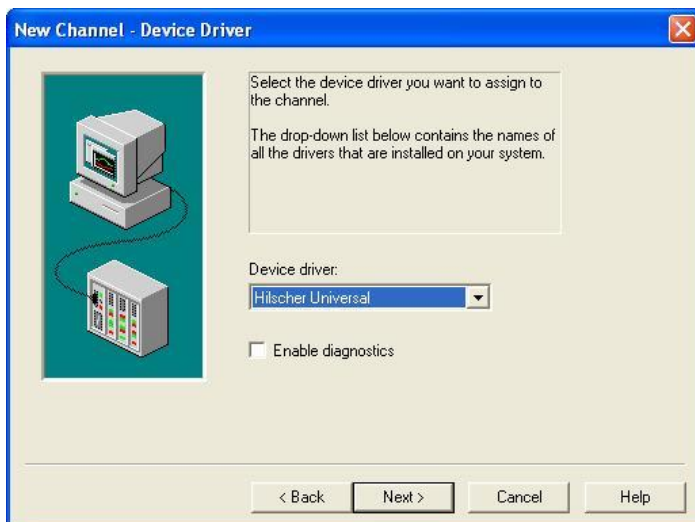
1. In the main menu click on “Click to add a channel.”



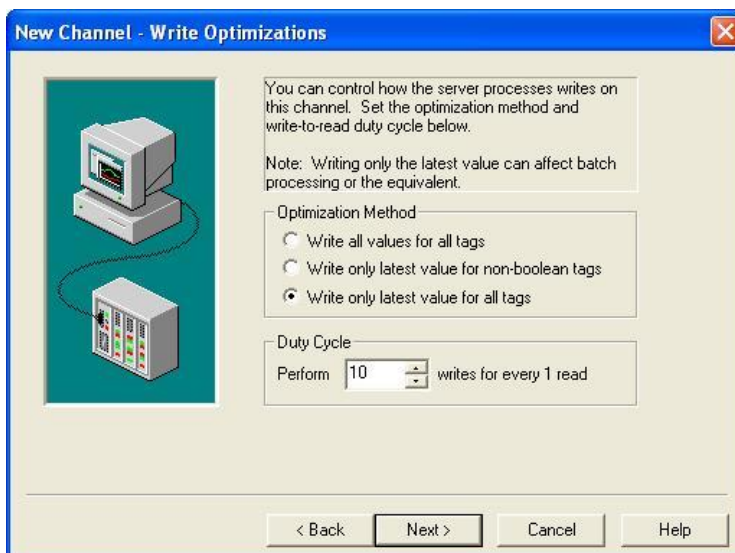
2. A window titled “New Channel- Identification” will appear. Type in the new channel name in the “Channel name” field then **click “Next.”**



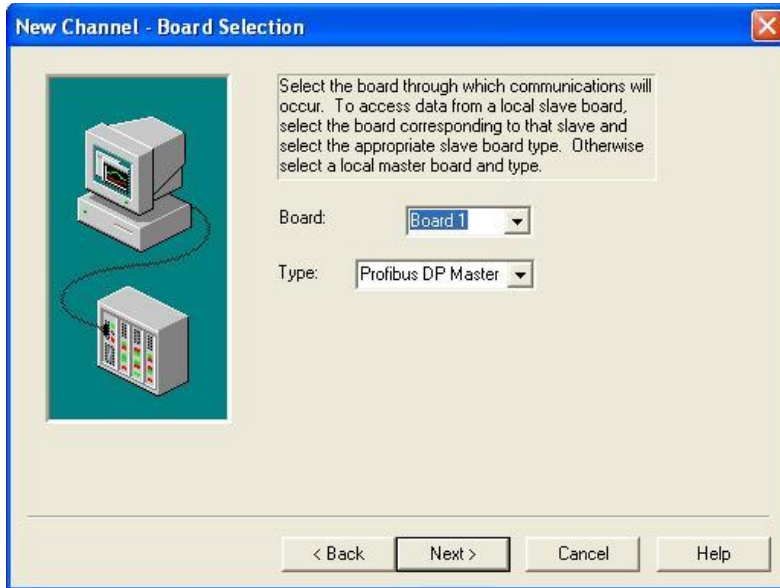
3. Choose a master. Below we are using a Hilscher CIF50 master. After choosing a master, click “Next.”



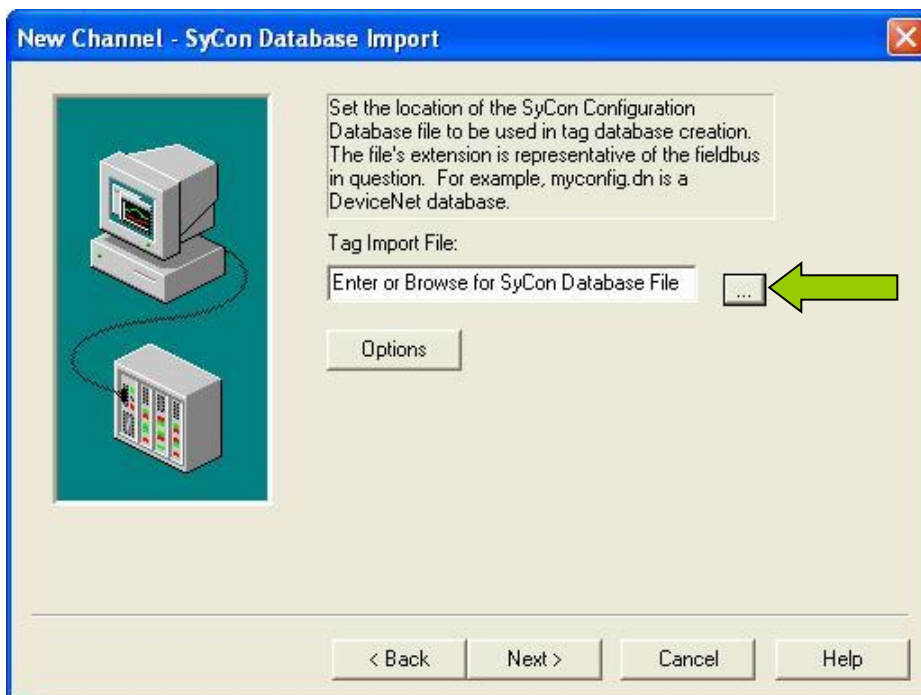
4. Leave the default selections (shown below). They will work. Click “Next” to move the next screen.



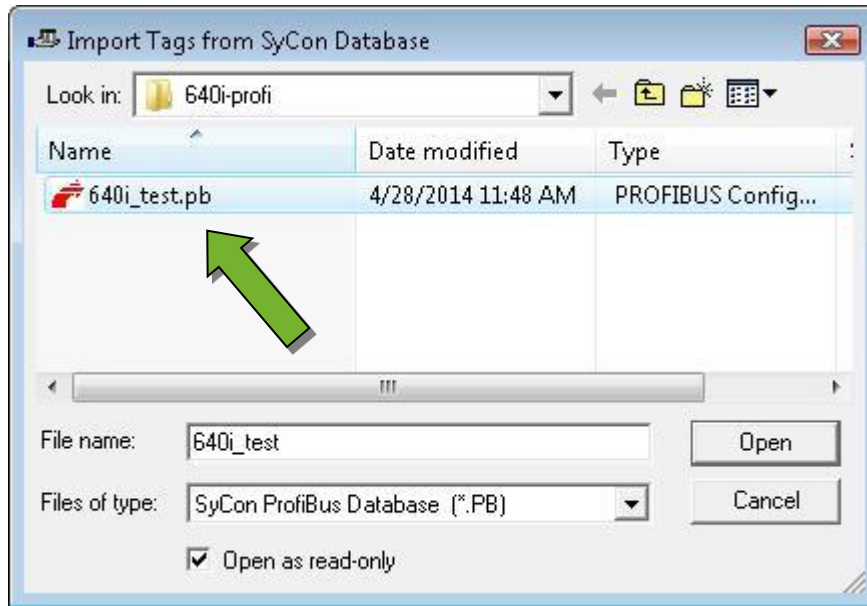
5. Chose the board and type then click “Next.”



6. You’ll need to import the setup 640i_test.pb file that we created earlier in Syscon. You may browse to the location where you saved it. Click on the Browse button.



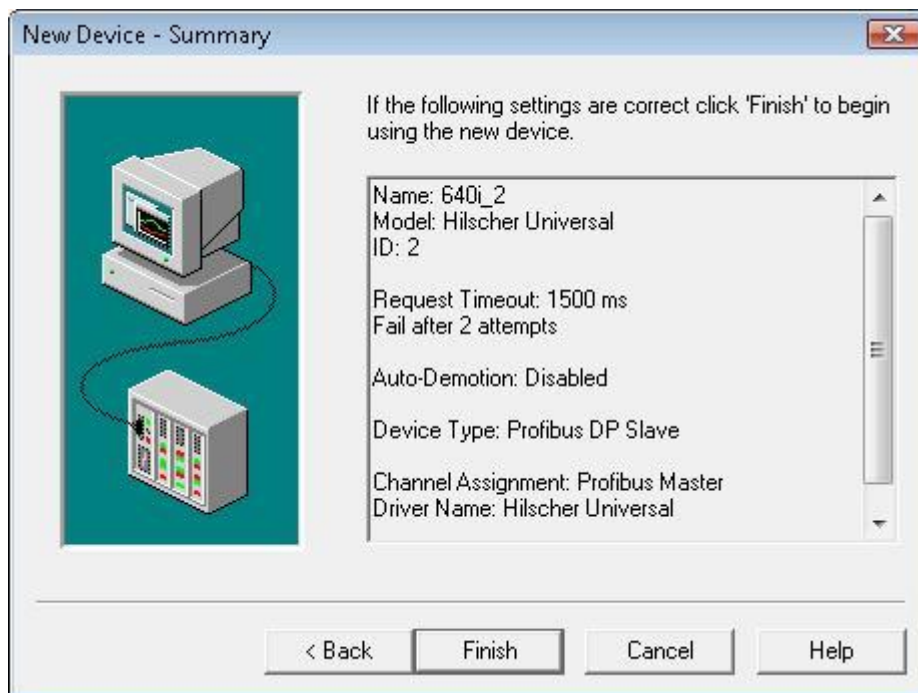
7. Browse to the 640i_test.pb you just created in Sycon. Once highlighted, click “Open.”



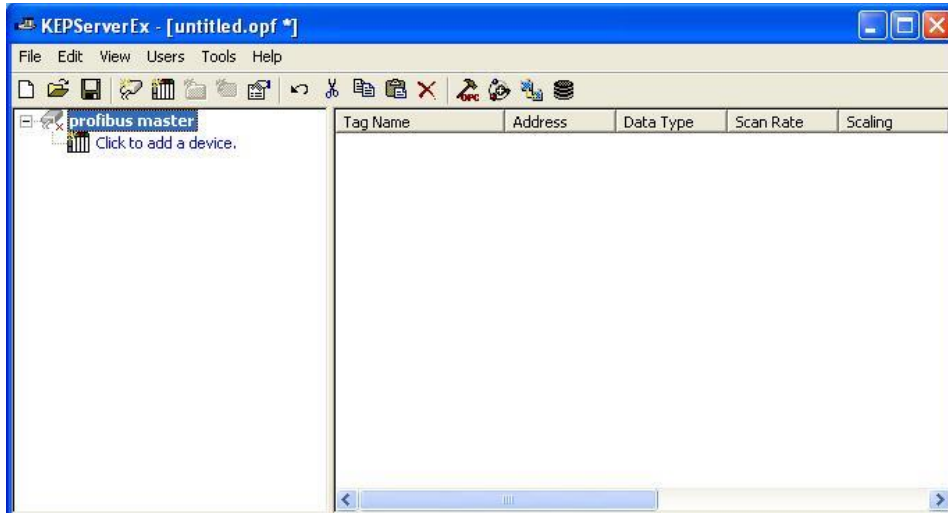
8. You should see the warning shown below. Click “OK” to synchronize.



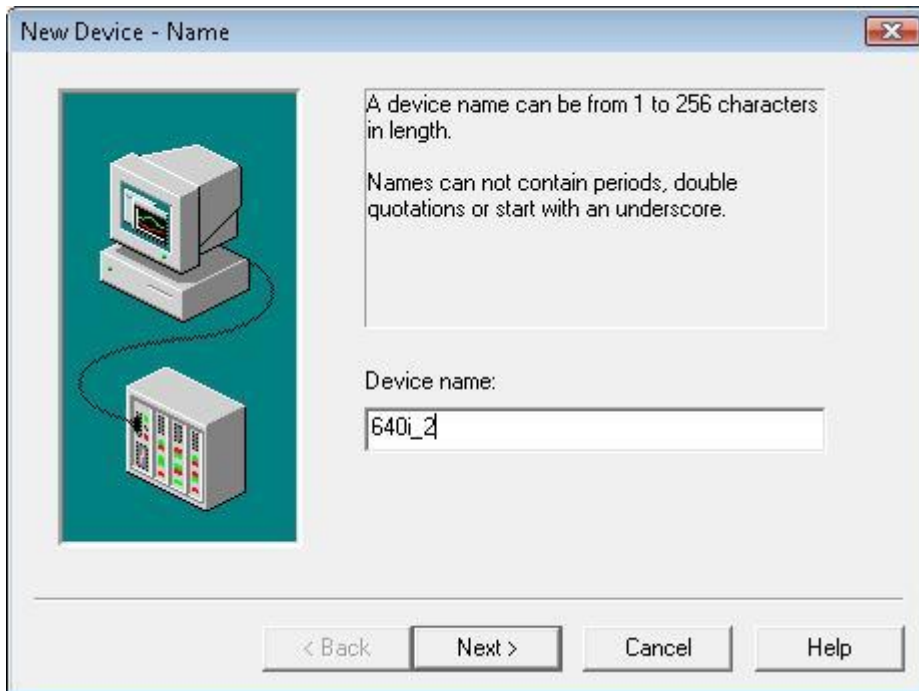
9. You can review the summary of the new channel you just created.



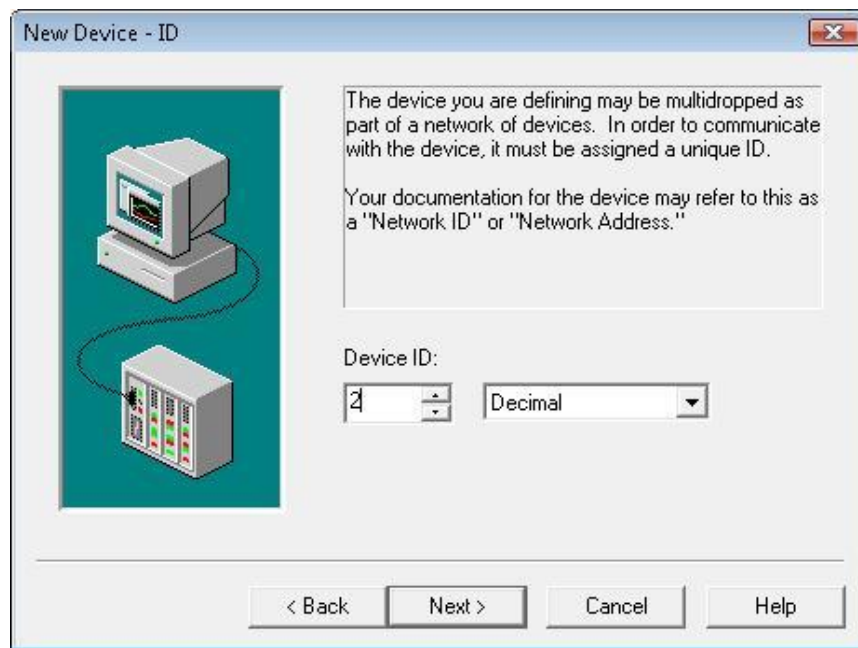
10. You may now add your first slave device. Click on “Click to add a device.”



11. Give your new device a name.

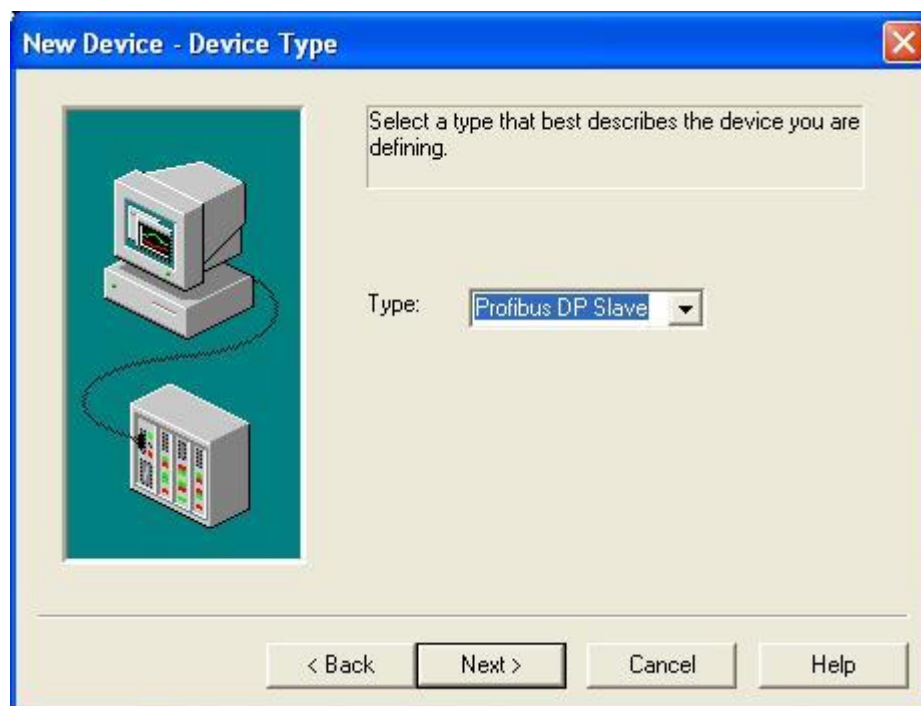


12. Set the device ID. Note: ID# 0 was already used for the master, so chose #2.

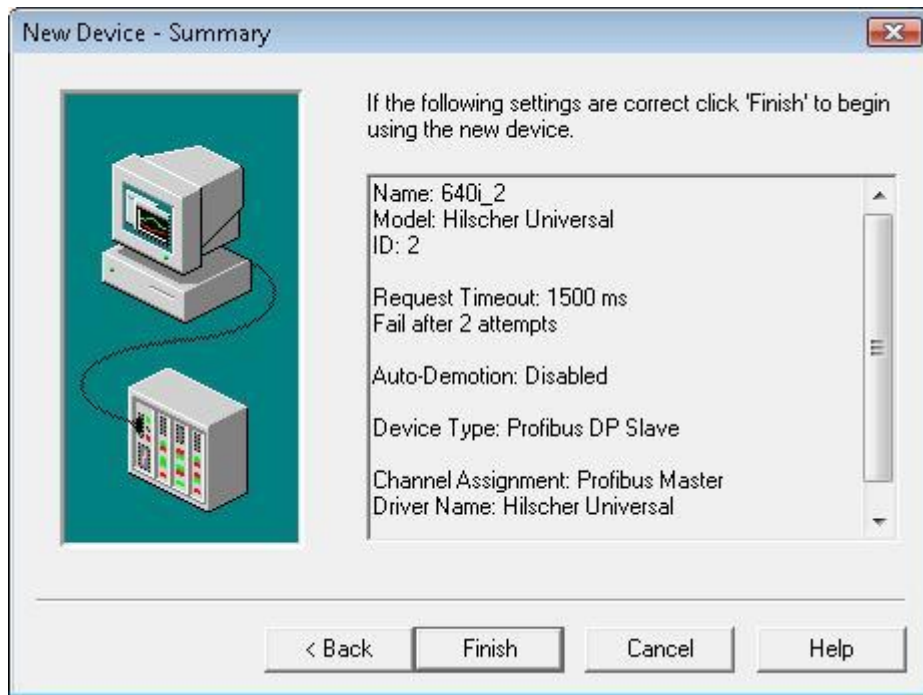


The next two screens will be fine at the default settings. Click “Next.”

13. In the “New Device – Device Type” window choose the “Profibus DP Slave” type. Click “Next.”



14. To review the new device summary, click “Next.”

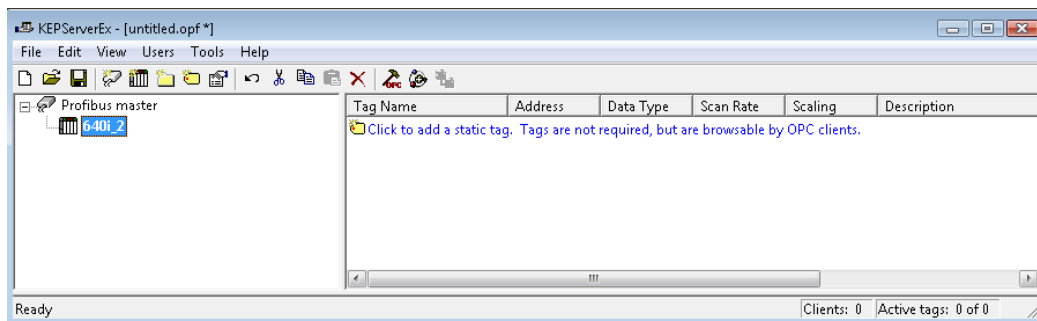


15. You have now created a new slave device for your network. Click “Finish.”

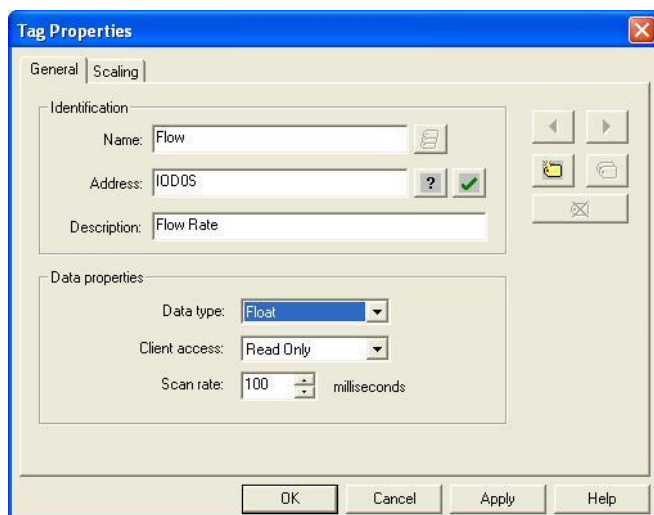
Adding Tags to Cyclic Data

You will now need to create tags to access each piece of cyclic data.

Click on “Click to add a static tag” below as shown below.




The dialog box above will appear. Fill out all the tag properties boxes as shown below.



The example above is for the Flow. Module 6 was configured so tags for Temperature (IOD4S Float), Pressure (IOD8S Float), Total (IOD12S Float), Total (IOD16S Dword), and Alarm Status (IOB20S) may also be added. Click Ok when done

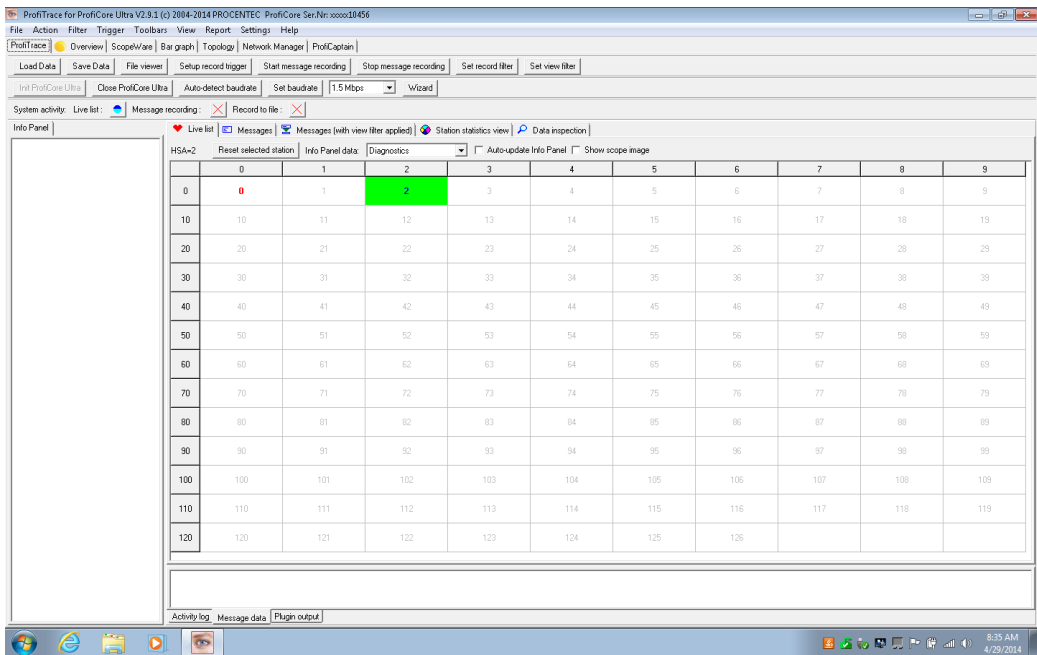
ProfiCore Ultra Diagnostic Kit

For a DPV1 data example, we will be using the popular ProfiCore Ultra diagnostic kit. Some Class 1 masters do include DPV1 acyclic data access, but we'll be using the ProfiCaptain Class 2 supervisory master in the ProfiCore kit. Profibus DP allows for two masters by using a token ring protocol. Unless you “steal” the slave, the DPV0 master will not be affected.

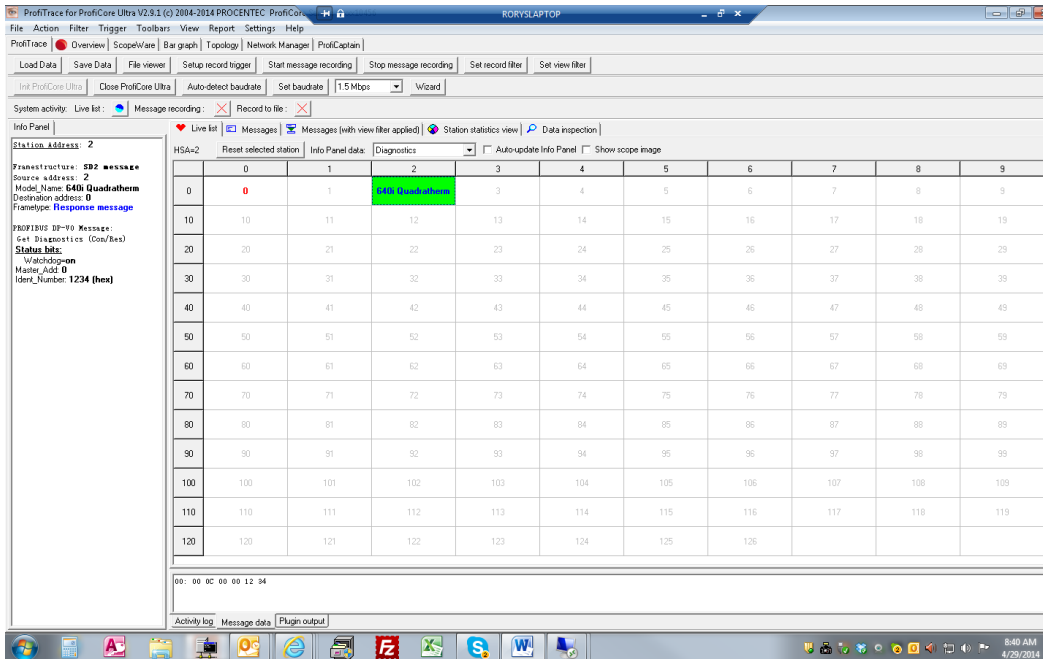


Note: Before starting, you'll need to import the GSD file to the ProfiTrace and ProfiCaptain. See Chapter 3 regarding GSD files.

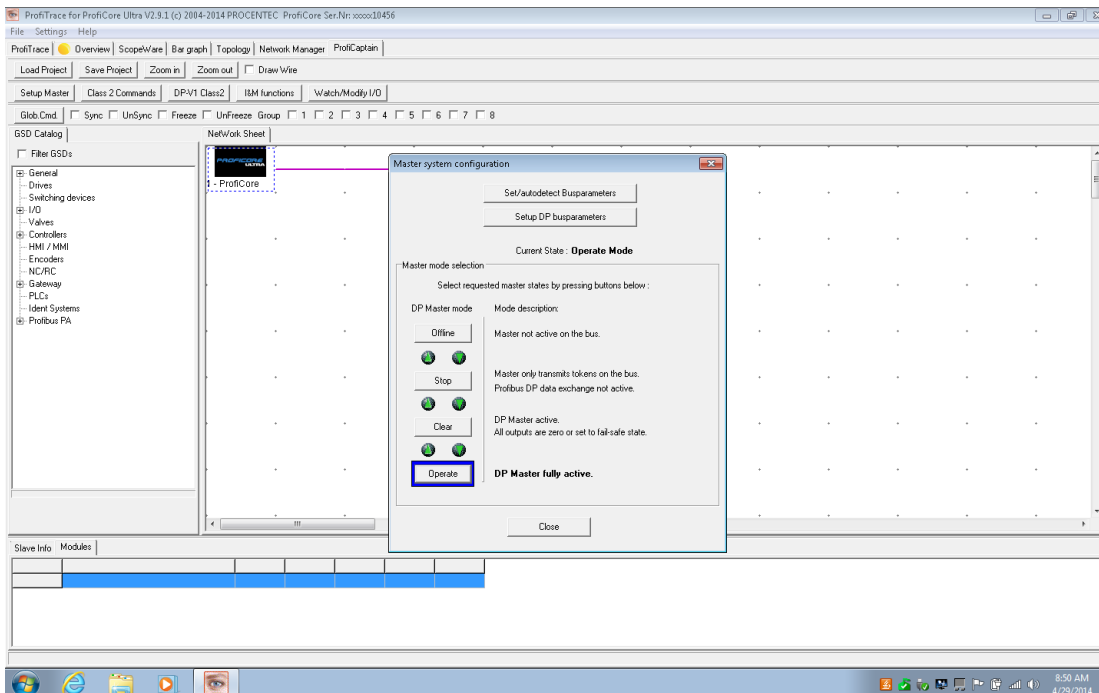
1. Connect the ProfiCore Ultra to a test port on your Profibus DP network. Start the ProfiTrace software on your PC or laptop.
2. Click on Init ProfiCore Ultra to initialize the ProfiCore Ultra. The software will automatically detect the baud rate and will show a “live list” of all devices on the Profibus DP network. A good slave will show up as a green block.



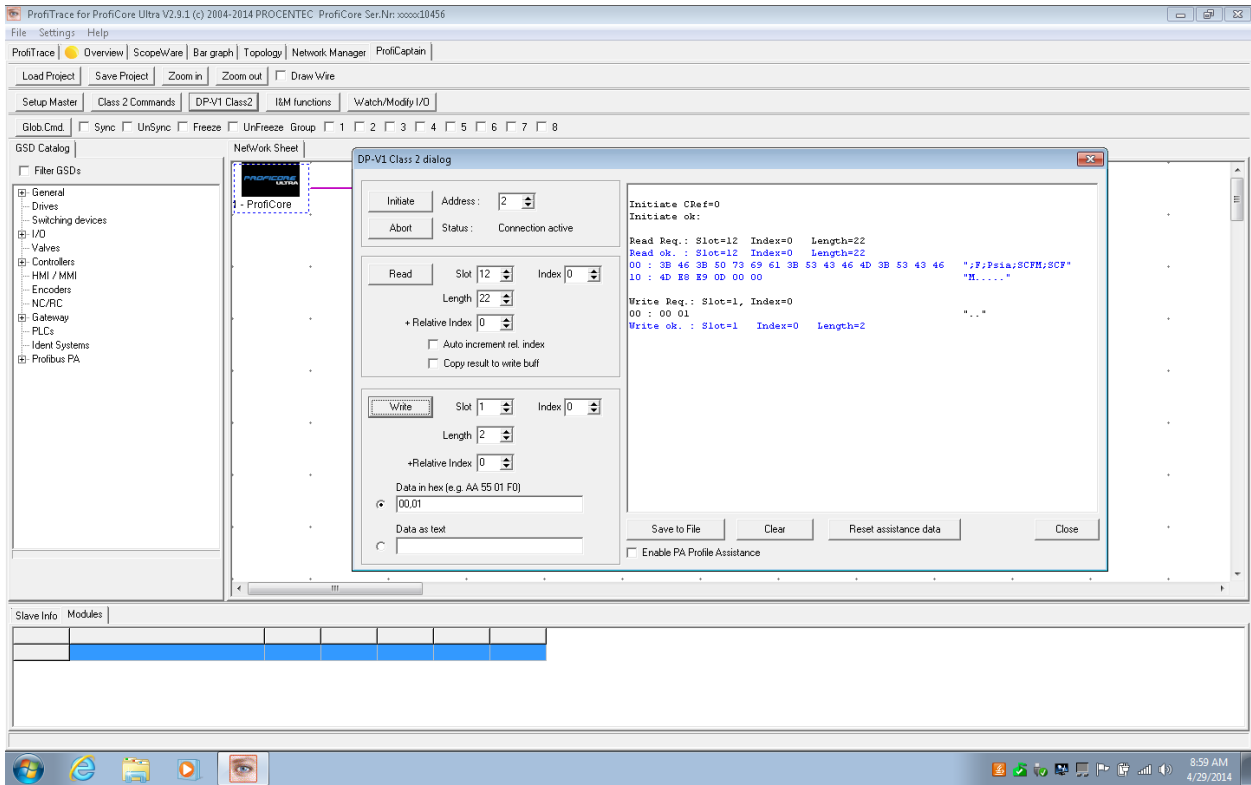
If you cycle the power on a slave, it will also display it's name. You can also click on the highlighted square and it will display more information about it to the left.



3. Click on the ProfiCaptain tab. For this test, you won't need to add the 640i/780i slave to the network sheet. Start the ProfiCaptain master by double clicking the black square on the "NetWork Sheet." Then click the "Operate" button.



4. Next, click on the "DP-V1 Class2" tab. The Class 2 dialog box will appear. Set the address of the 640i/780i slave and click "Initiat." For a Read example, we will try Slot 12 which is all the active engineering units in the 640i/780i. For a "Write" example, we will reset the totalizer using Slot 1.



The box above shows the “Read” results in hex and text in blue. The engineering units are “;F;Psia;SCFM;SCFM”. The “Write” result to reset the totalizer do not return any data, however the 640i/780i totalizer has been reset.

You can use this method to read or write to any DPV1 acyclic Slots.

GSD File (SIEROE14.gsd)

Below is a printed copy of the SIEROE14.gsd file

```
#Profibus DP_DP
;
; Sierra Instruments Inc.
;
; Version 1.0
;
; This GSD-File is intended for the Smart Trak mass flow meter
; This Unit support DPV0, DPV1
;
; History:
; =====
; V1.0 January 2012 Initial version
;
; Incoming cyclic data ( slave to master ):
; Process data:
; Instance ID | Description | Size (bytes) | Format
;-----+-----+-----+-----
;Modul 1
; 1 | Flow | 4 | REAL
;Modul 2
; 2 | Temp | 4 | REAL
; 3 | Pres | 4 | REAL
; 4 | Totl | 4 | INT
```

```

;Modul 3
; 5          | Totl          | 4          | REAL
; 6          | Stat          | 1          | INT
;
;=====
; Create DPV1 Objects
; Write Object's from 1 - 6 from Master
; Idx = 0 for all
; Outgoing Acyclic data ( Write: master to slave )
;
; Slot | Description          | Size (bytes) | Format
;-----+-----+-----+-----
; 0     | Totz Rset          | 2           | INT
; 1     | Password           | 4           | ASCII
; 2     | Meter Tune         | 4           | REAL
; 3     | Gas Index          | 2           | INT
; 4     | Full Scale         | 4           | REAL
; 5     | Pipe ID            | 4           | REAL
;=====
; Incoming Acyclic data ( Read: slave to master )
;
; Slot      | Description          | Size (bytes) | Format
;-----+-----+-----+-----
; 7         | Gas_[0] Flsc        | 4           | FLOAT
; 8         | Spln [0]            | 4           | REAL
; 9         | Gas_[0] Gnic        | 10          | ASCII
; 10        | Pipe[0]             | 10          | ASCII
; 11        | User_Gasi           | 10          | ASCII
; 12        | User                | 10          | ASCII
; 13        | Info                | 10          | ASCII
; 14        | -                   | 10          | ASCII
; 15        | System Response     | 10          | ASCII
;...
;
;
; GSD_Revision      = 4
;
; Vendor_Name       = "Sierra Instruments Inc."
; Model_Name        = "640i Quadratherm"
; Revision          = "V1.0"
; Ident_Number      = 0x0E14
; Protocol_Ident    = 0
; Station_Type      = 0
; FMS_supp          = 0
; Hardware_Release  = "V1.2"
; Software_Release  = "V1.4"
;
; 9.6_supp          = 1
; 19.2_supp         = 1
; 45.45_supp        = 1
; 93.75_supp        = 1
; 187.5_supp        = 1
; 500_supp          = 1
; 1.5M_supp         = 1
; 3M_supp           = 1
; 6M_supp           = 1
; 12M_supp          = 1
;
; MaxTsdr_9.6      = 60

```

```

MaxTsdr_19.2      = 60
MaxTsdr_45.45    = 60
MaxTsdr_93.75    = 60
MaxTsdr_187.5    = 60
MaxTsdr_500      = 100
MaxTsdr_1.5M     = 150
MaxTsdr_3M       = 250
MaxTsdr_6M       = 450
MaxTsdr_12M      = 800
;
Redundancy        = 0
Repeater_Ctrl_Sig = 0
24V_Pins          = 0
Implementation_Type = "VPC3+C"
Bitmap_Device     = "640i_De"
Bitmap_Diag       = "640i_Di"
Bitmap_SF         = "640i_Sf"
;
Freeze_Mode_supp = 1
Sync_Mode_supp   = 1
Auto_Baud_supp   = 1
Set_Slave_Add_supp = 1
Min_Slave_Intervall = 1
Publisher_supp   = 0
;
Modular_Station  = 1
Max_Module       = 2
Max_Input_Len    = 46
Max_Output_Len   = 24
Max_Data_Len     = 70
Modul_Offset     = 0
;
Fail_Safe        = 0
Slave_Family     = 9
Max_Diag_Data_Len = 11
;
DPV1_Slave       = 1

;C1_Read_Write_supp = 0

;Max_Initiate_PDU_Length = 52

C2_Read_Write_supp = 1
C2_Max_Data_Len    = 80
C2_Response_Timeout = 300
C2_Read_Write_required = 1
C2_Max_Count_Channels = 2
;
DPV1_Data_Types    = 0
;
Max_User_Prm_Data_Len = 237           ;depending from used Hardware (9..237)
;
PrmText=1
Text(0)="disabled"
Text(1)="enabled"
EndPrmText

ExtUserPrmData=1 "DPV1mode"
Bit(7) 0 0-1

```

```
Prm_Text_Ref=1
EndExtUserPrmData
```

```
Ext_User_Prm_Data_Const(0) = 0x00,0x00,0x00
```

```
Ext_User_Prm_Data_Ref(0) = 1
```

```
;
```

```
; <Module-Definition-List>
```

```
Module          = "Modul 1, 4 bytes in" 0x93
```

```
1
```

```
EndModule
```

```
Module          = "Modul 2, 3 x 4 bytes in" 0x93,0x93,0x93
```

```
2
```

```
EndModule
```

```
Module          = "Modul 3, 4B 1B in" 0x93,0x90
```

```
3
```

```
EndModule
```

```
Module          = "Modul 4, M1 + M2" 0x93,0x93,0x93,0x93
```

```
4
```

```
EndModule
```

```
Module          = "Modul 5, M1 + M3" 0x93,0x93,0x90
```

```
5
```

```
EndModule
```

```
Module          = "Modul 6, M1 + M2 + M3" 0x93,0x93,0x93,0x93,0x93,0x90
```

```
6
```

```
EndModule
```