

# How to configure an Anybus AS-Interface Master module



## More info about the network and products

This document gives a brief description of how to configure an Anybus Master product for AS-Interface. For further information about the products, please consult the HMS homepage, [www.anybus.com](http://www.anybus.com). The latest manuals etcetera can be downloaded from that location.

For more information regarding AS-Interface network please see the AS-Interface webpage, <http://www.as-interface.net>.

## Document history

Revision	Date	Description	Responsible
1.00	2008-01-25	Created	Thorbjörn Palm
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# 1 Solution overview

This application note describes how to configure an Anybus AS-Interface Master module and how to set up the AS-Interface network. Below you can find an overview of the system described in this document. Other nodes may be attached to the network, but are not necessary.

The configuration is described in two steps.

1. The Anybus Master module configuration is explained.
2. The configuration of the AS-Interface network is described.

**Note:** This document is valid for all Anybus AS-Interface Master products, however sections written in *italics* describe the configuration of a specific product.

The contents describe step by step how a configuration is done. This document assumes the reader is familiar with industrial communication, AS-Interface networks and Anybus X-gateway.

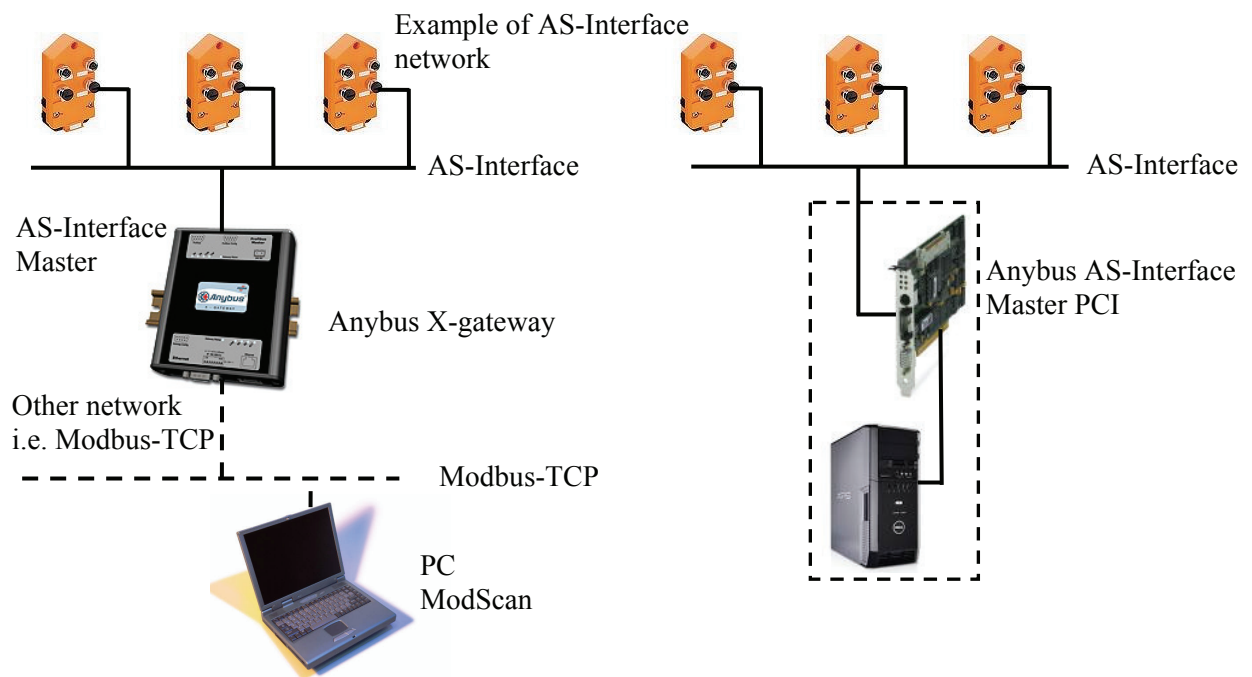


Figure 1 Hardware connection overview.

## 2 Applicable Anybus products

The following table specifies the relevant Anybus products for this document.

Description	Name / Type
Anybus-M Master	AS-Interface (Module software version higher than 2.04)
Anybus-M Master PCI	AS-Interface (Module software version higher than 2.04)
Anybus X-gateway Master	AS-Interface (Module software version higher than 2.04)

## 3 Requirements

The following equipment is needed to setup a successful configuration.

Description	Name / Type	Version
Terminal software	HyperTerminal, TeraTermPro	5.1, 2.3
X-gateway Interface Addendum	X-gateway AS-Interface Master Interface Addendum	2.10
X-gateway User Manual	X-gateway User Manual	1.11
Master Fieldbus Appendix	Anybus-M Master AS-Interface Fieldbus Appendix	2.00
Power supply 24VDC	n.a.	n.a.
Configuration cables	n.a.	n.a.

## 4 Anybus configuration

In the following chapters the configuration of the Anybus-M Master, PCI Master and X-gateway AS-Interface Master are explained.

### **4.1 Anybus-M Master and PCI Master configuration**

*The Anybus-M Master and Anybus PCI Master are configured via the host application interface using the mailbox interface. Refer to the Anybus-M Fieldbus Appendix for details.*

*The Anybus AS-Interface Master can also be auto configured by the Configuration Button and the Terminal Interface. Please see section 5 AS-Interface configuration for details.*

## 4.2 Anybus X-gateway configuration

Use the HyperTerminal on a PC to configure the X-gateway. Connect a serial cable between the PC and the config port on the X-gateway (make sure that it is **not** connected to the AS-Interface Master). Start the HyperTerminal and open the “File” menu and click on new, choose the desired COM port and then click on OK. The following window will appear.

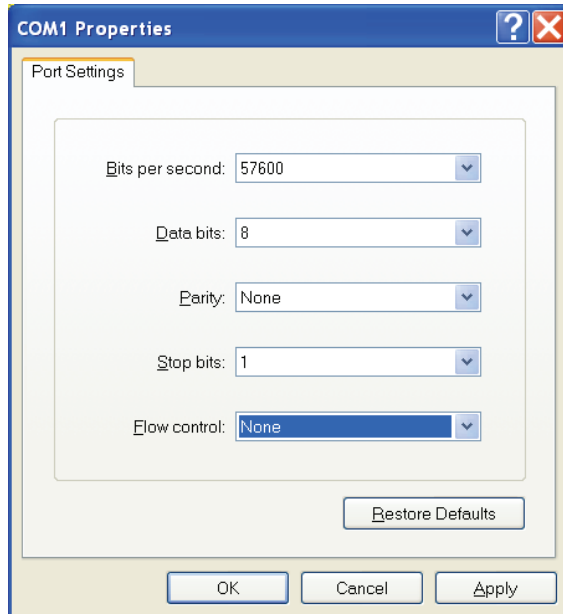


Figure 2 Configuring the connection in the HyperTerminal.

Make sure the settings are identical to those shown in the window above. Alternatively download a HyperTerminal session file from the HMS website<sup>1</sup>, double click on it and select COM port.

Connect and press ESC and the following menu will appear.

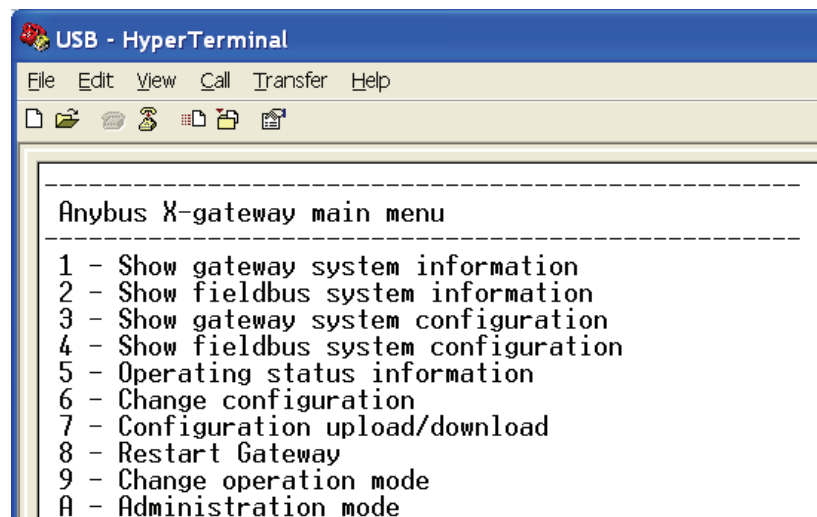


Figure 3 Anybus X-gateway main menu.

Press 6 and enter the desired configuration.

<sup>1</sup> [www.anybus.com](http://www.anybus.com)

The figure below shows an example; in this case an AS-Interface Master to Modbus-TCP Slave X-gateway is used. 20 bytes of I/O data on the Modbus-TCP side and 312 bytes of I/O data on the AS-Interface side are configured. Also byte mode is used in this configuration.

**Note:** The Input and Output data size is always set to 312 bytes and cannot be changed.

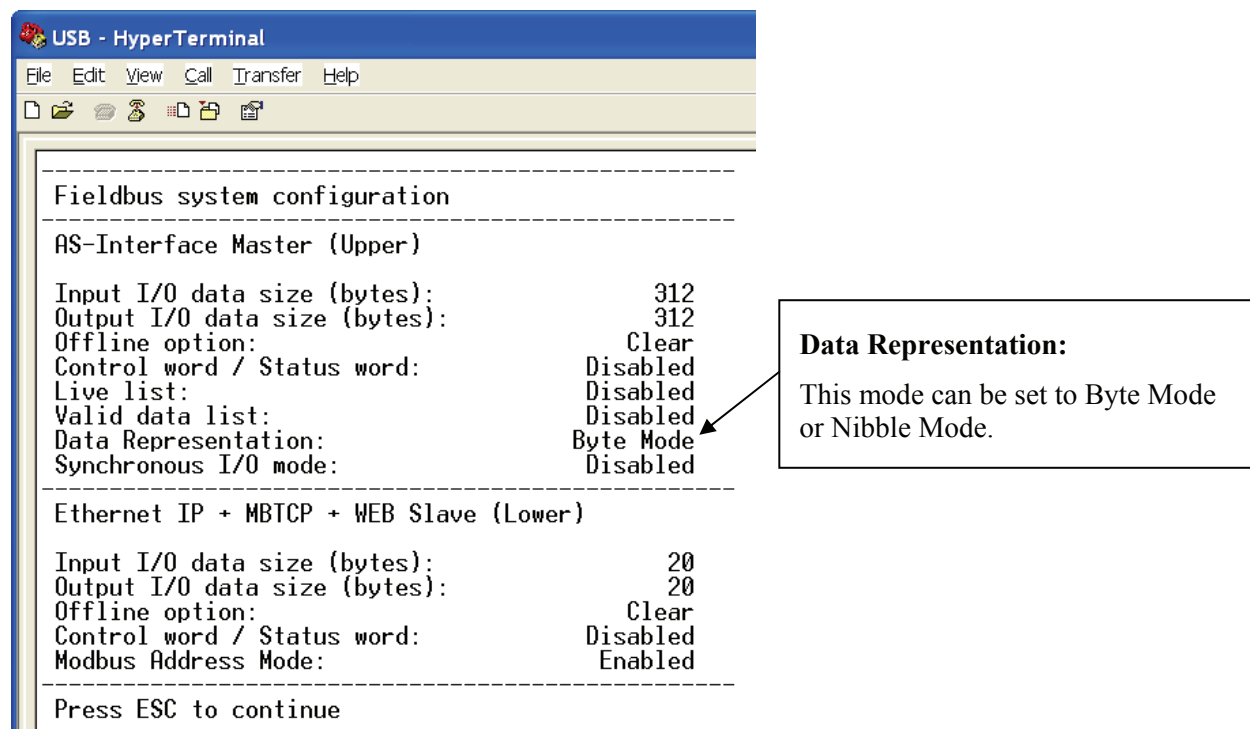


Figure 4 The X-gateway configuration.

The next step is to set the X-gateway in running mode.

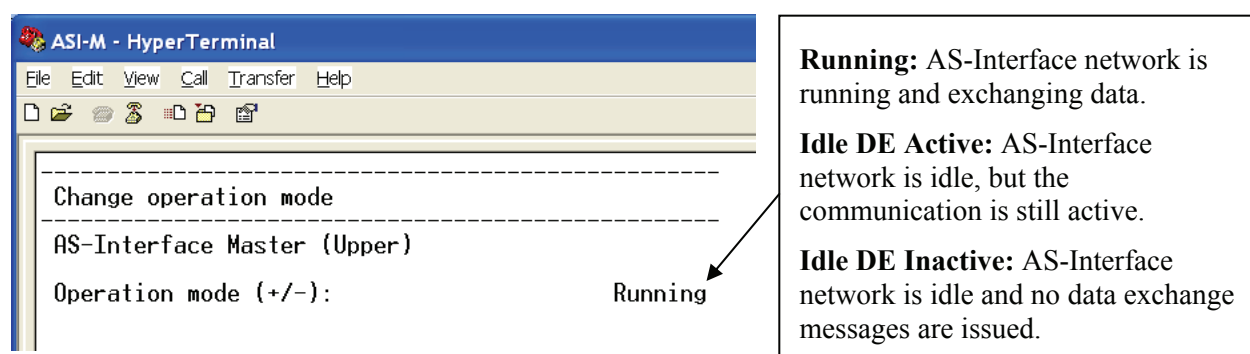


Figure 5 Changing Operation mode of the X-gateway.

Choosing 9 from the main menu the X-gateway can be set to Running, Idle DE Active or Idle DE Inactive. Set the Operation Mode to Running.



## 5 AS-Interface configuration

The AS-Interface Master configuration can be done in several ways.

1 The Configuration Button enables the auto configuration as described in section 5.1 Configuration using the Configuration Button.

2 The Terminal Interface can also be used to configure the AS-Interface Master as described in section 5.2 Configuration using the Terminal Interface. Using this alternative it is possible to change the slave parameters.

3 *The configuration can also be done by using mailbox commands. Please see the Master Fieldbus Appendix. **Note:** This alternative is usable only by Anybus-M AS-Interface Master and Anybus-M PCI AS-Interface Master.*

In the end of this chapter, section 5.3 Memory Mapping, the memory mapping is described in detail.

### 5.1 Configuration using the Configuration Button

This alternative assumes the AS-Interface network is connected to the Anybus Master. Please follow the steps below.

#### 1 Changing to Configuration mode using the Configuration Button

This is done by pressing the Configuration Button for less than 2 seconds, which will toggle the mode between Configuration and Protected mode. The Module Status/MS LED is solid green in Configuration mode.

#### 2 Pressing the Configuration Button to upload and save the network configuration

Push and hold the Configuration Button for more than 5 seconds, this will enable the Auto Configuration.

#### 3 Changing to Protected mode

Press the Configuration button again for less than 2 seconds to change the mode to Protected mode.

#### 4 Network running

If the configuration is successful the network is now online and running. The Running/RUN LED is now solid green and Network Status/NS LED and Module Status LED are flashing green. Auto prog./AUP LED is off indicating no error.

## 5.2 Configuration using the Terminal Interface

The AS-Interface Master can also be configured using the Terminal Interface. Please follow the steps below.

### 1 Connecting to the AS-Interface with a Terminal software

Use for example the HyperTerminal or TeraTermPro on a PC to configure the AS-Interface Master. Connect a serial cable between the PC and the config port on the AS-Interface Master (make sure that it is **not** connected to the gateway interface). The config port is located next to the AS-Interface network connectors on the X-gateway. Start the HyperTerminal and connect using the same parameter settings as described in section 4.2 Anybus X-gateway configuration.

### 2 Opening the main menu

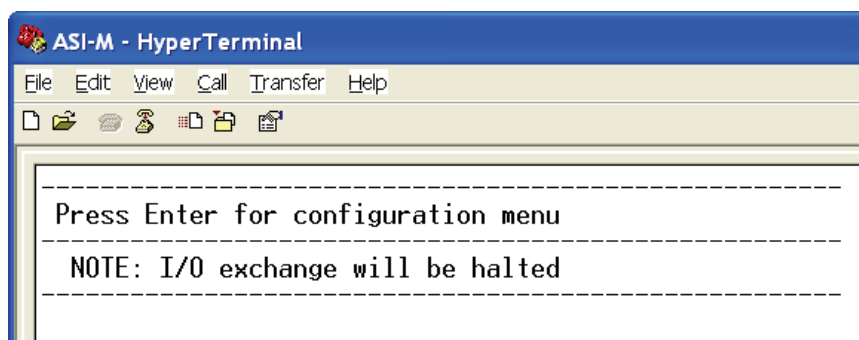


Figure 6 Entering the menu of the AS-Interface Master.

Press enter to open the configuration menu. Now the module is set to Idle mode, until the terminal is removed.

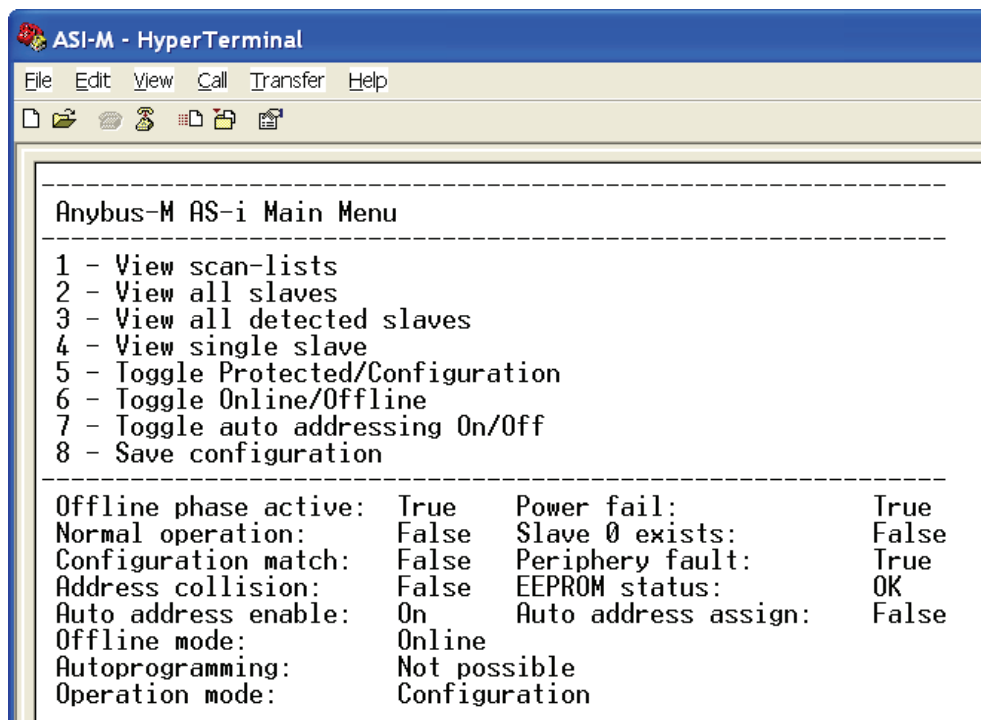


Figure 7 The main menu of the AS-Interface Master.

### 3 Changing to Configuration mode

Enter 5 in the main menu and change the mode to Configuration mode.

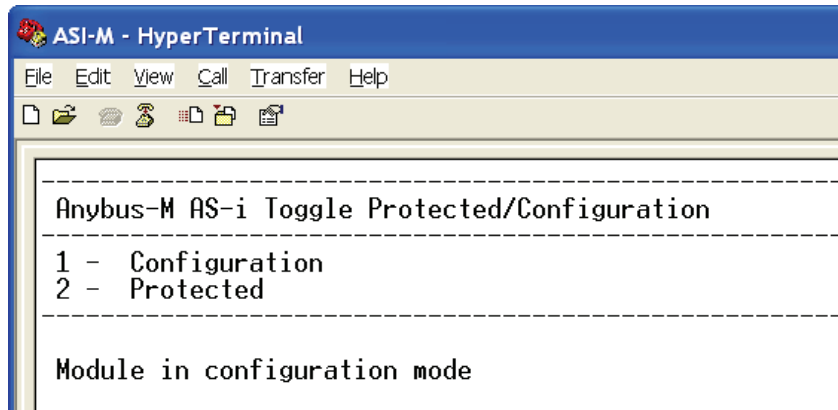


Figure 8 Changing the mode of the AS-Interface Master.

### 4 Viewing all detected slaves.

Enter 3 in the main menu to view all detected slaves.

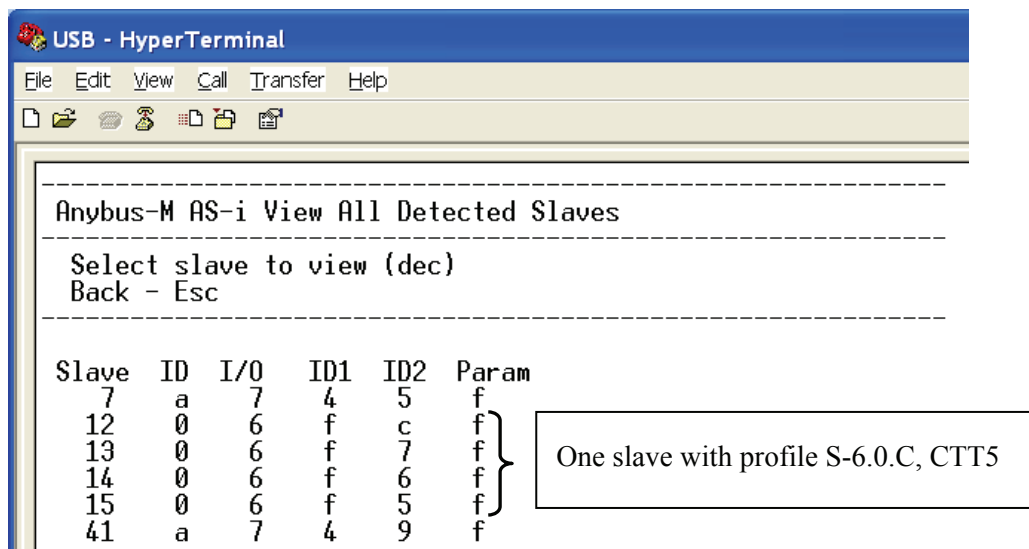


Figure 9 Viewing all detected slaves on the AS-Interface network.

In this case 3 slaves are detected. The slaves 7 and 41 use both digital and analogue data. Slave 12 uses digital data only. Enter the number of the individual slave to view the settings in detail.

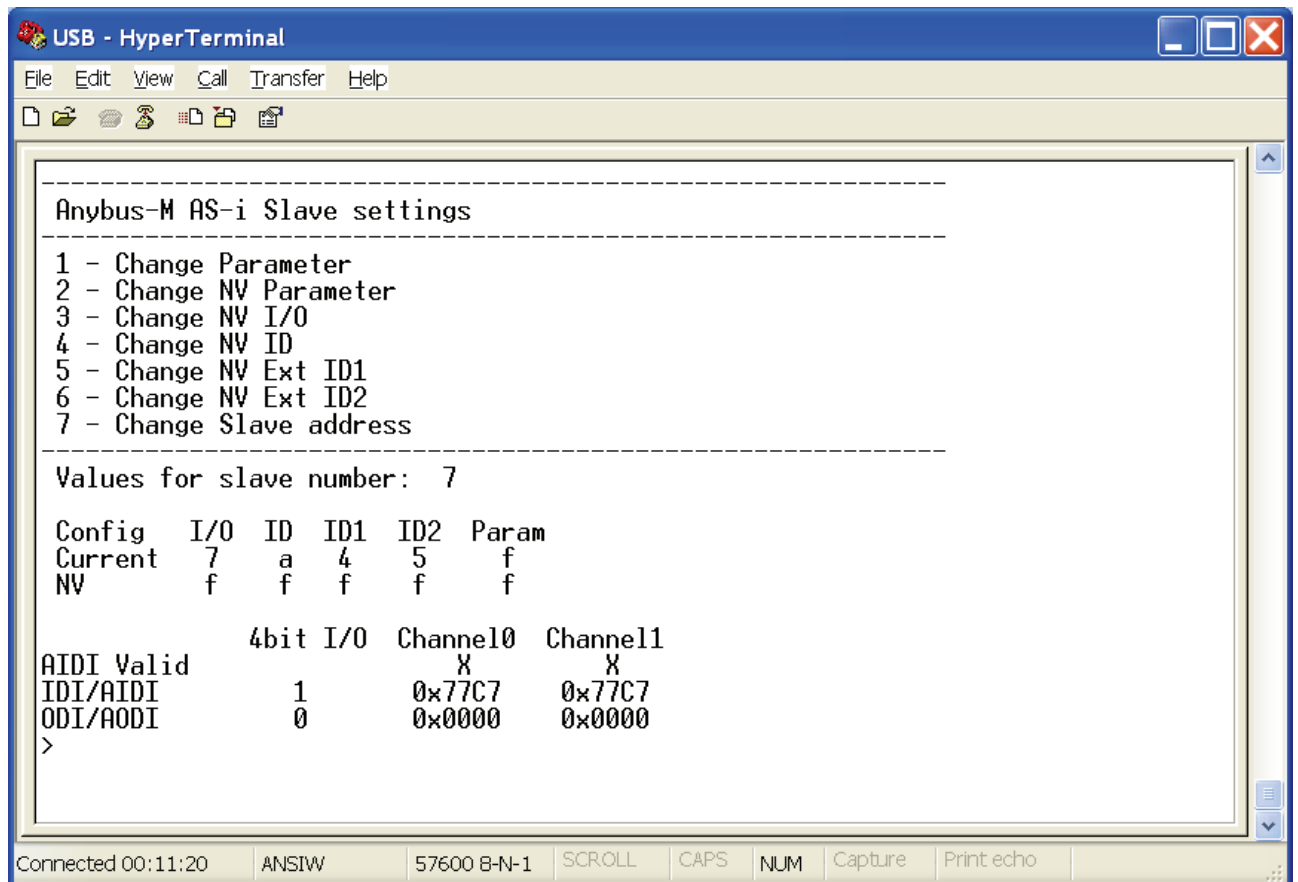


Figure 10 Viewing the slave settings.

The settings can now be changed if desired. In this case the settings are left at the default values.

## 5 Saving the configuration.

The next step is to save the configuration. Enter 8 in the main menu to open the Save configuration menu.

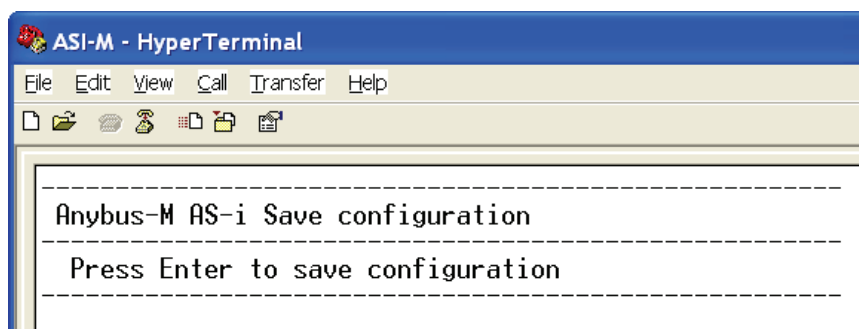


Figure 11 Saving the configuration.

Then press Enter to save the configuration.

## 6 Changing to protected mode.

The final step is to change the operation mode to protected mode.

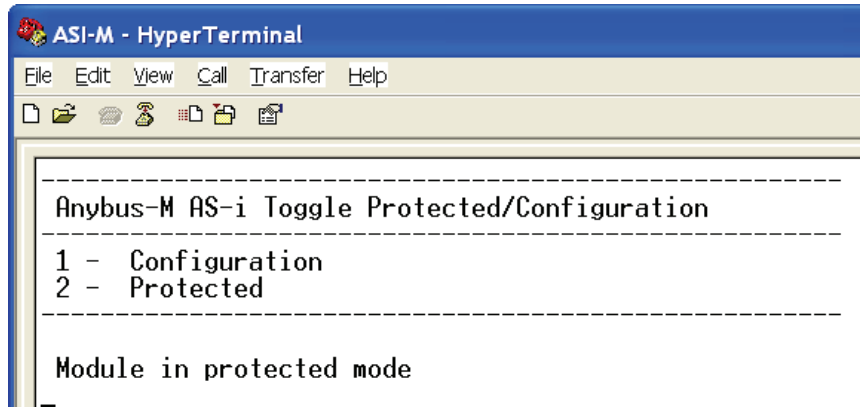


Figure 12 Changing the AS-Interface Master mode to Protected mode.

## 7 Disconnecting the Terminal connection.

In the HyperTerminal press the disconnect button and disconnect the serial cable. The module now changes to Running mode.

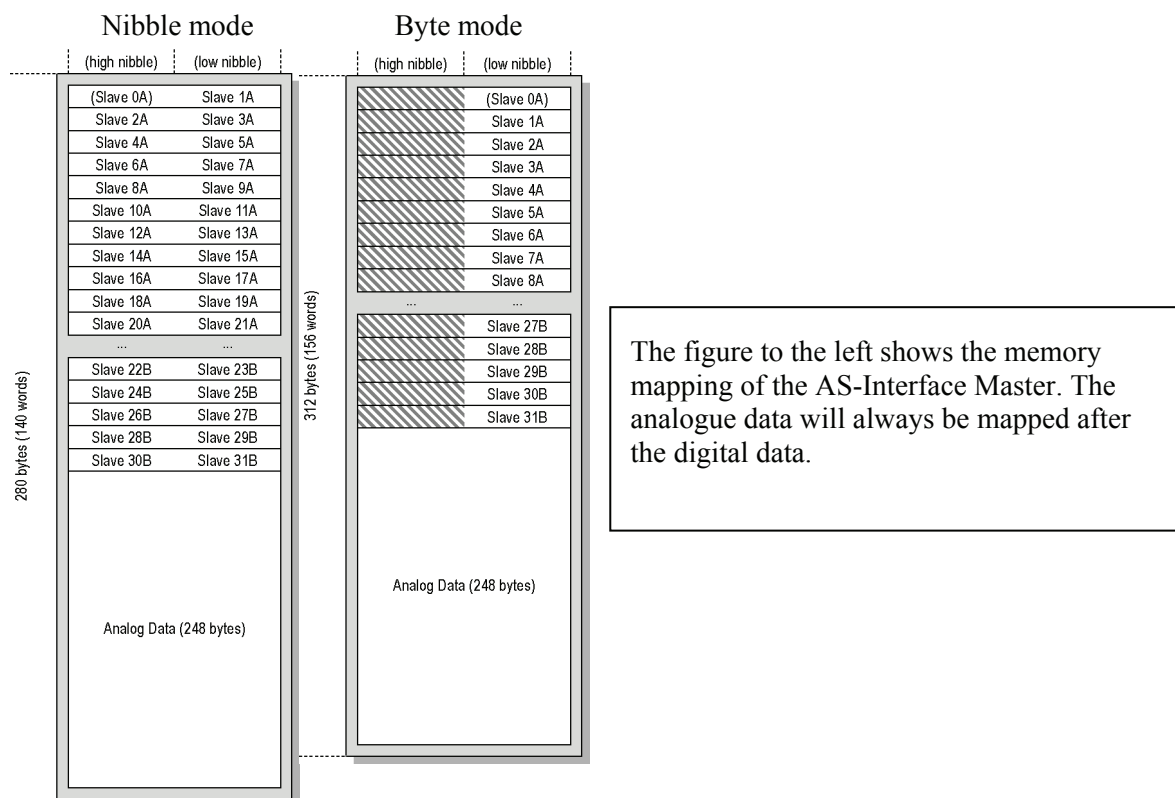
## 8 Network running.

If the configuration is successful the network is now online and running. The Running/RUN LED is now solid green and Network Status LED and Module Status LED are flashing green. Auto prog./AUP LED is off indicating no error.

## 5.3 Memory Mapping

The figure below shows the memory mapping of the AS-Interface Master generally.

**Note:** For the X-gateway the memory mapping will be different depending on if the Control Word, Status Word and Live List are used. This info will be mapped before the digital I/O data, please see the X-gateway Interface Addendum for details. The mapping is performed in the same way for both input and output data of the X-gateway.



**Figure 13** The memory mapping using the auto configuration.

The mapping of the analogue data is shown in the figure below.

Offset (byte)	Word no.	Description
0... 1	1	Analogue Input Data for slave 1, channel 0
2... 3	2	Analogue Input Data for slave 1, channel 1
4... 5	3	Analogue Input Data for slave 1, channel 2
6... 7	4	Analogue Input Data for slave 1, channel 3
8... 9	5	Analogue Input Data for slave 2, channel 0
10... 11	6	Analogue Input Data for slave 2, channel 1
12... 13	7	Analogue Input Data for slave 2B, channel 0
14... 15	8	Analogue Input Data for slave 2B, channel 1
...	..	
246... 247	124	Analogue Input Data for slave 31, channel 3

**Figure 14** The mapping of the analogue I/O data.

When extended addressing is used, for example slaves 2 and 2B, the analogue data area is shared.

In other words slave 2 and 2B will use 4 bytes of analogue data each.

## 6 Testing

The testing of the network can be done after finishing the configuration. In this particularly case the AS-Interface Master to Modbus-TCP Slave X-gateway is used for test purpose.

The communication is tested in two ways. Firstly the data is monitored in the AS-Interface Master Terminal Interface. This will verify that the AS-Interface network is exchanging data. Secondly the data is monitored on the other network side of the X-gateway using ModScan32.

### 6.1 Monitoring using the Terminal Interface

Open the Terminal Interface again and select 3 in the main menu.

**Note:** When connected to the AS-Interface Master no data is written to the AS-Interface network.

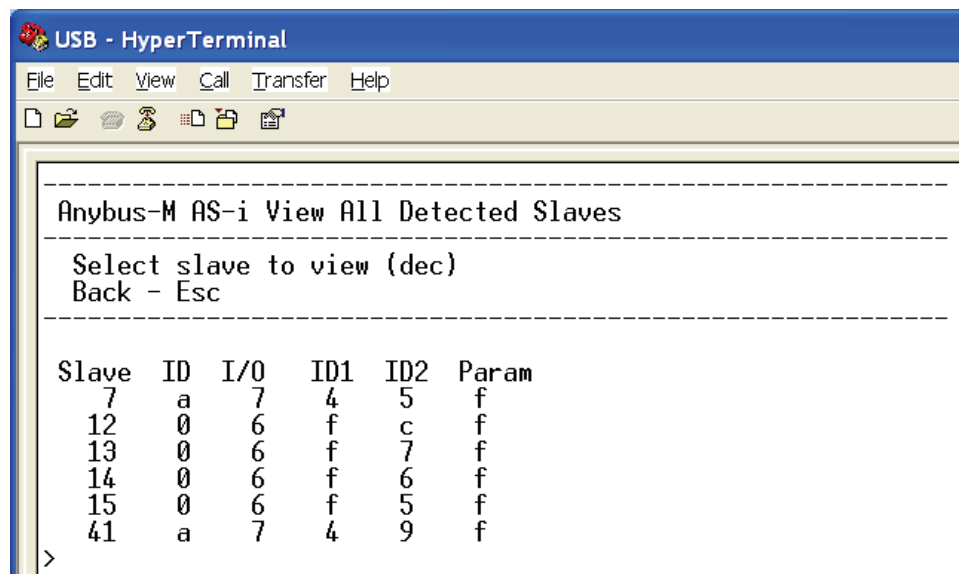


Figure 15 Viewing all the detected slaves on the network.

Enter the slave address of interest and press enter.

The window below shows the data values of slave 41. The marked data shows the analogue input from a temperature sensor on the AS-Interface network.

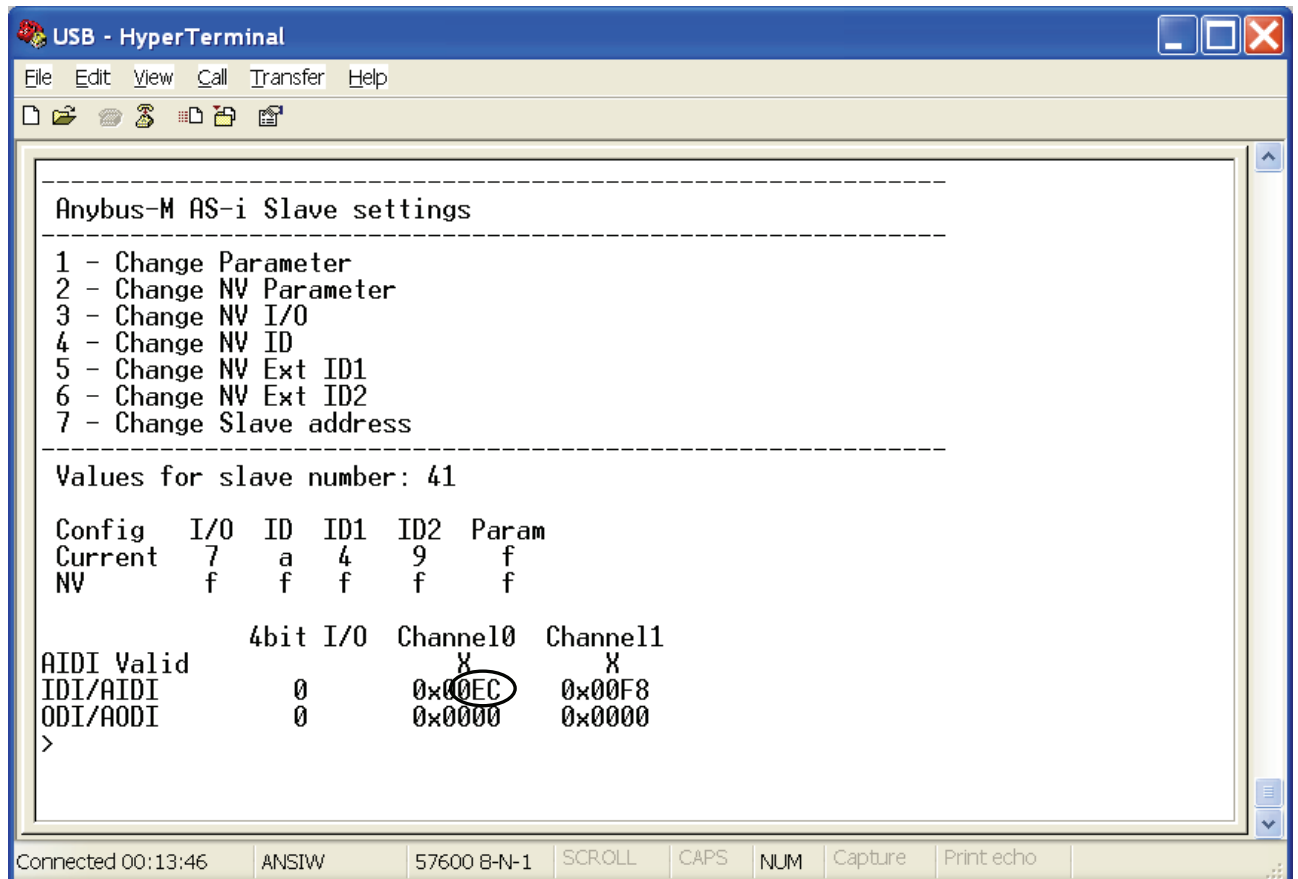


Figure 16 Monitoring analogue I/O data using the Master Terminal Interface.



In this case slave 7 is monitored. The marked data is digital input data.

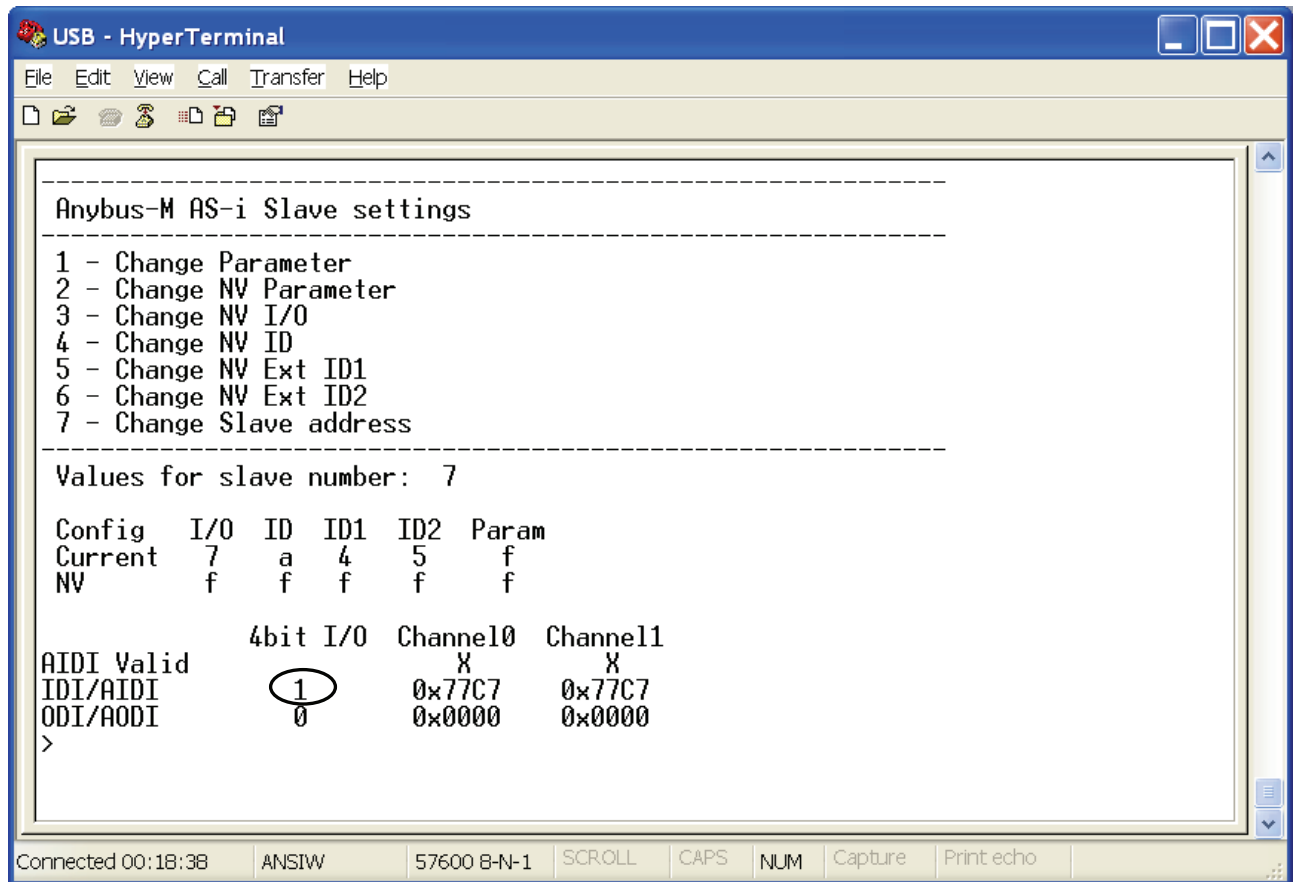


Figure 17 Monitoring digital I/O data Master Terminal Interface.

## 6.2 Monitoring using ModScan32

To verify that the data is exchanged between the two networks using the Anybus X-gateway, the program ModScan32 is used.

**Note:** To use ModScan for testing it is required that the gateway has an Ethernet connection.

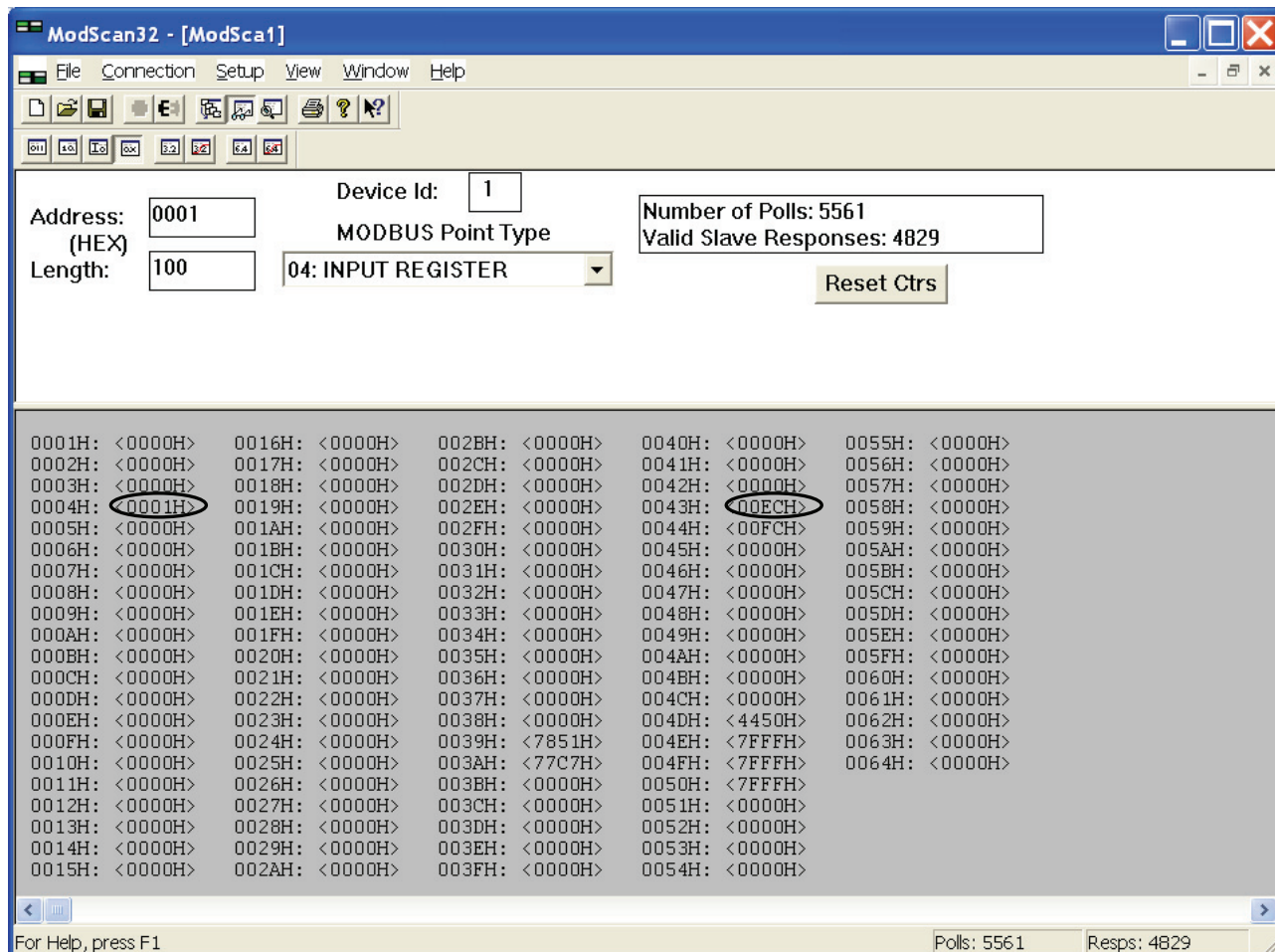


Figure 18 Monitoring the I/O data using ModScan32.

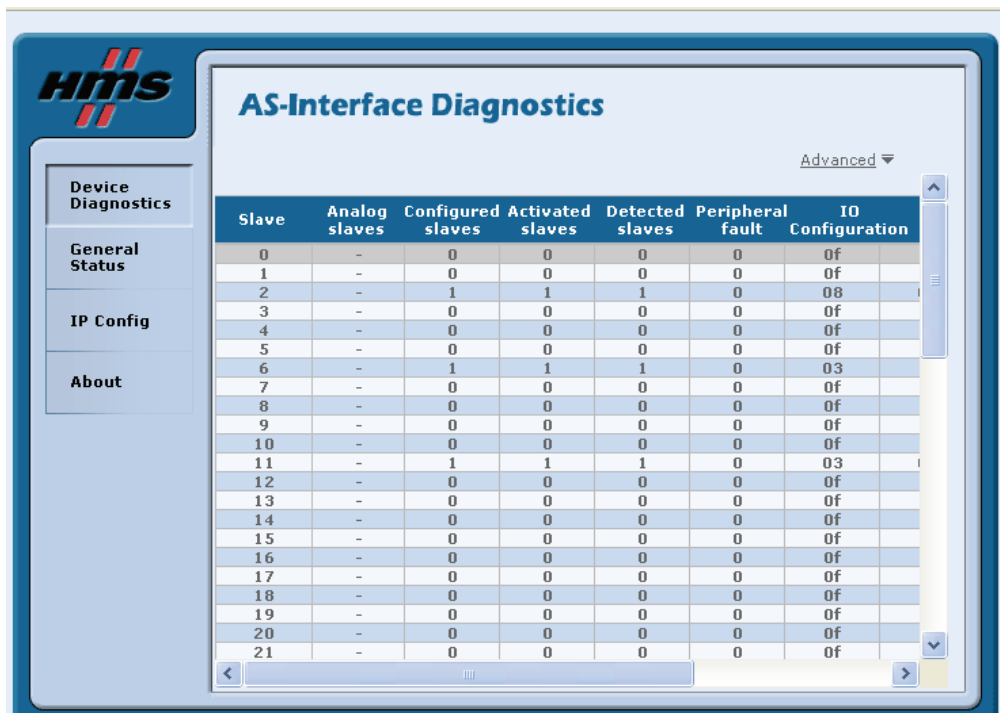
The window above shows the I/O data from the AS-Interface nodes. The marked data is the digital I/O data of slave 7 (register 0004H) and analogue I/O data from slave 41 (register 0043H). The data values are corresponding to the data values seen in Figure 16 and Figure 17.

## 6.3 Web interface

The configuration can also be verified using the web interface in the X-gateway.

**Note:** To use the web interface it is required that the X-gateway has an Ethernet connection. Use the Anybus IPconfig to find or set the IP-address. The tool can be downloaded at [www.anybus.com](http://www.anybus.com).

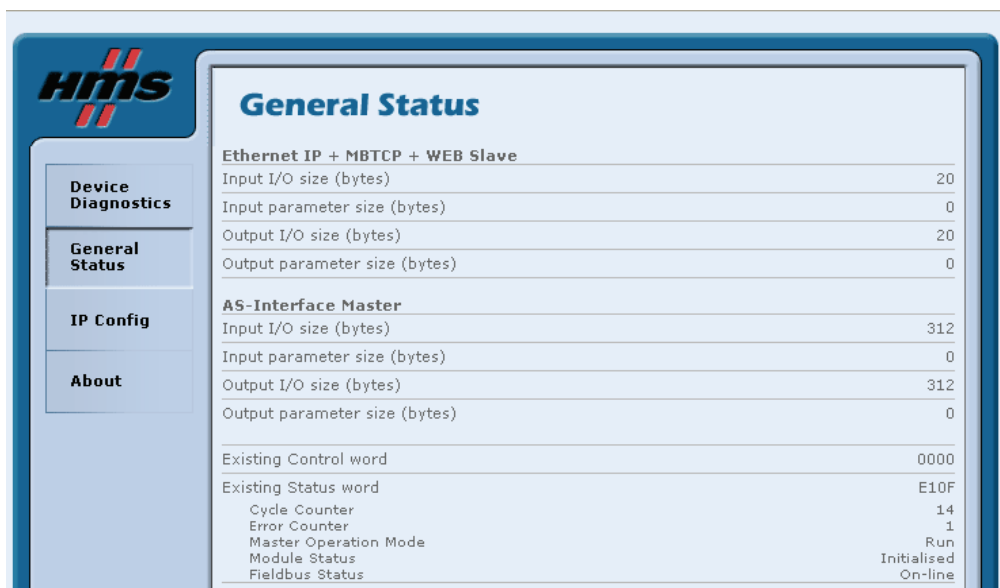
To enter the web interface, enter the IP-address of the Ethernet module in a web browser, e.g. <http://192.168.0.7>. Open the Device Diagnostics window to view the slave settings.



Slave	Analog slaves	Configured slaves	Activated slaves	Detected slaves	Peripheral fault	IO Configuration
0	-	0	0	0	0	0f
1	-	0	0	0	0	0f
2	-	1	1	1	0	08
3	-	0	0	0	0	0f
4	-	0	0	0	0	0f
5	-	0	0	0	0	0f
6	-	1	1	1	0	03
7	-	0	0	0	0	0f
8	-	0	0	0	0	0f
9	-	0	0	0	0	0f
10	-	0	0	0	0	0f
11	-	1	1	1	0	03
12	-	0	0	0	0	0f
13	-	0	0	0	0	0f
14	-	0	0	0	0	0f
15	-	0	0	0	0	0f
16	-	0	0	0	0	0f
17	-	0	0	0	0	0f
18	-	0	0	0	0	0f
19	-	0	0	0	0	0f
20	-	0	0	0	0	0f
21	-	0	0	0	0	0f

Figure 19 Viewing the AS-Interface Diagnostics in the web interface.

In the next window, the General Status window, it is possible to view the X-gateway configuration.



General Status	
<b>Ethernet IP + MBTCP + WEB Slave</b>	
Input I/O size (bytes)	20
Input parameter size (bytes)	0
Output I/O size (bytes)	20
Output parameter size (bytes)	0
<b>AS-Interface Master</b>	
Input I/O size (bytes)	312
Input parameter size (bytes)	0
Output I/O size (bytes)	312
Output parameter size (bytes)	0
Existing Control word	0000
Existing Status word	E10F
Cycle Counter	14
Error Counter	1
Master Operation Mode	Run
Module Status	Initialised
Fieldbus Status	On-line

Figure 20 Viewing the General Status in the web interface.