ibaPDA X-Pact request

System overview

Manual

Edition V 1.1 en / ibaPDA X-Pact request V1

Measurement and Automation Systems

ibaPDA X-Pact request Manual

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Edition V 1.1, ibaPDA X-Pact request

We have checked that the contents of this manual match the hardware and software described here. However, deviations cannot be fully ruled out, so that we cannot assume any warranty should any deviations actually exist. This manual is regularly updated. Necessary revisions are included in future editions, or can be downloaded from the Internet.

The latest version is always available for downloading at

http://www.iba-ag.com.

Work is currently underway on an online help function for the PDA program.

We would welcome any suggestions for improvements which you may have.

Version	Date	Revision	Chapter	Pages	Author	Version SW
V 1.1_en	17 Feb. 2009	Layout, Contacts	all	all	if	

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This manual

This manual describes in detail the functionality of iba's ibaPDA X-Pact request system.

In this manual you may find several symbols which essentially have the following meanings:

Important hint or warning in order to avoid hazard against material or life.

A useful tip or clue to make youwork easier.

This draws your attention to special features, such as eceptions to rules, etc.

A reference to additional documentation or more in-depth literature.

Software or file name

reference to associated software or sample applications on the CD-ROM.

iba training courses

Hint for training courses by iba concerning related products or subjects

1 System overview

1.1 Introduction

This document describes the ibaPDA X-Pact request interface. This is an interface between ibaPDA and the X-Pact system of SMS Demag. It provides ibaPDA with symbolic access to all signals defined in the X-Pact system. The user can change the list of signals he wants to measure without having to change anything in the X-Pact system. The system has been designed to be as user-friendly and flexible as possible. The next chapters will explain how this is achieved.poijpoijp

1.2 Connection between X-Pact and ibaPDA

An X-Pact system consists of 1 or more controllers. A controller can contain multiple CPUs. An agent called DAQPROXY needs to be loaded on the first CPU in the controller. ibaPDA communicates with these agents via TCP/IP. The agents are responsible for cyclically sending the requested signals to ibaPDA. They can use different data interfaces to send the data over. Currently 2 interfaces are supported: iba SM128V boards and reflective memory 5576 and 5565 boards of VMIC. Figure 1 shows all possible connections between the X-Pact system and ibaPDA.
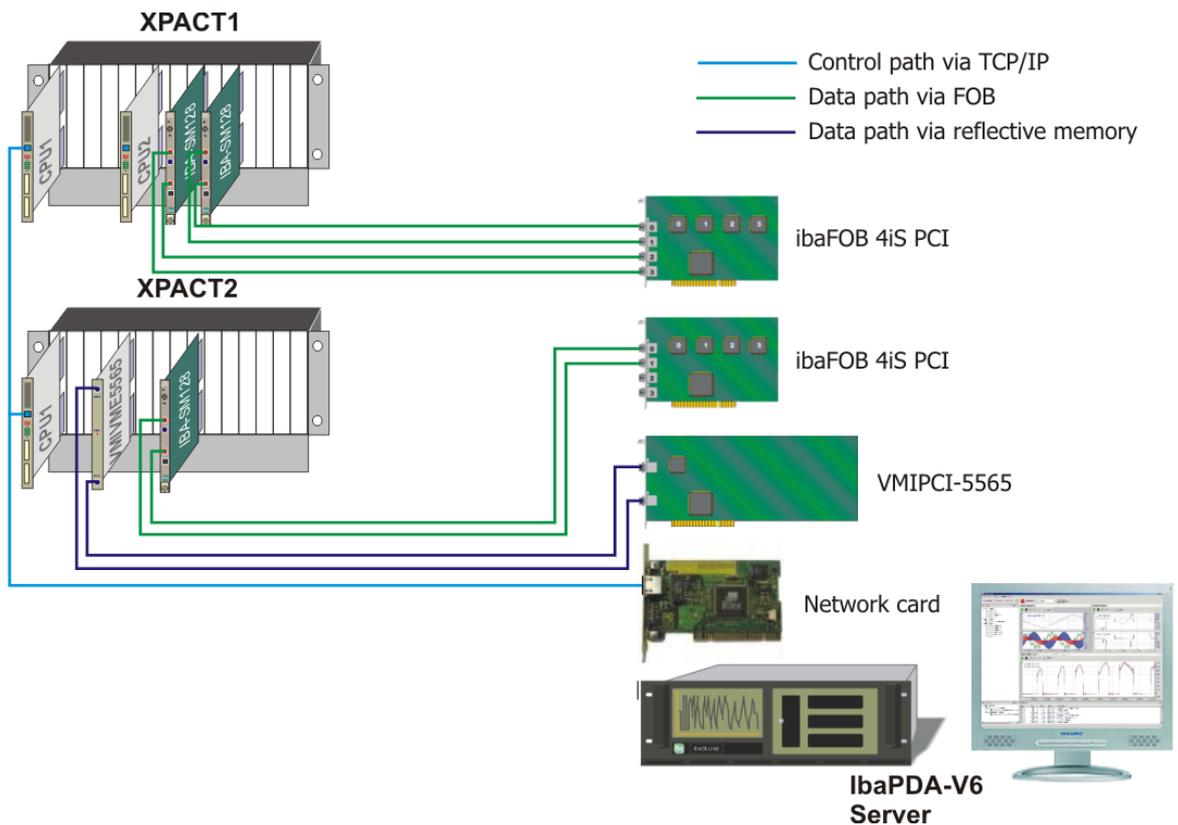

Figure 1

The agents announce their presence via IP multicast. Every 10 seconds they send a status message to a predefined multicast group. This message contains amongst others the name of the controller, its IP-address and the data interfaces that are available. ibaPDA joins the multicast group and listens for these status messages. When ibaPDA receives a multicast status message he makes a TCP connection to the agent. This connection is called the control path. The agent will now send the status messages via the TCP connection instead of via multicast. ibaPDA responds to the status messages with another status message. This exchange of status messages acts as a watchdog. If ibaPDA or the agent doesn't receive a status message every 10 seconds then the connection is closed.

Once the control path is established ibaPDA tries to establish the data path. It tries to find the data interfaces in the PC that correspond with the data interfaces the agent has. ibaPDA sends a data path discovery message to the agent. The agent then writes a certain pattern on to the data interface. ibaPDA then tries to find that pattern on the boards in the pc. This process is repeated for all data interfaces reported by the agent. This system of automatic discovery of the data path makes the system a lot easier to use because the user doesn't have to configure the data path on the pc.

The user can browse a list of all X-Pact signals in ibaPDA. He can make a selection of all the signals he wants to measure. He can also decide how fast he wants to measure each signal. When the user starts the measurement ibaPDA will send the list of signals via the control path to the agent. The agent will check if all signals are available. He will also check if the sending of the data will not overload the CPU. If everything is ok then the agent will start sending the data via the data path to ibaPDA.

2 X-Pact side

2.1 Prerequisites

TODO

2.2 DAQPROXY

TODO

3 ibaPDA side

3.1 Prerequisites

ibaPda version 6.15.0 or higher is required for X-Pact request. You also need the X-Pact request license in the dongle. If you use reflective memory for the data path then also a reflective memory license is required.

3.2 X-Pact request interface

If you have the X-Pact request license then the X-Pact request interface will appear in the ibaPDA I/O manager.

3.2.1. Configuration
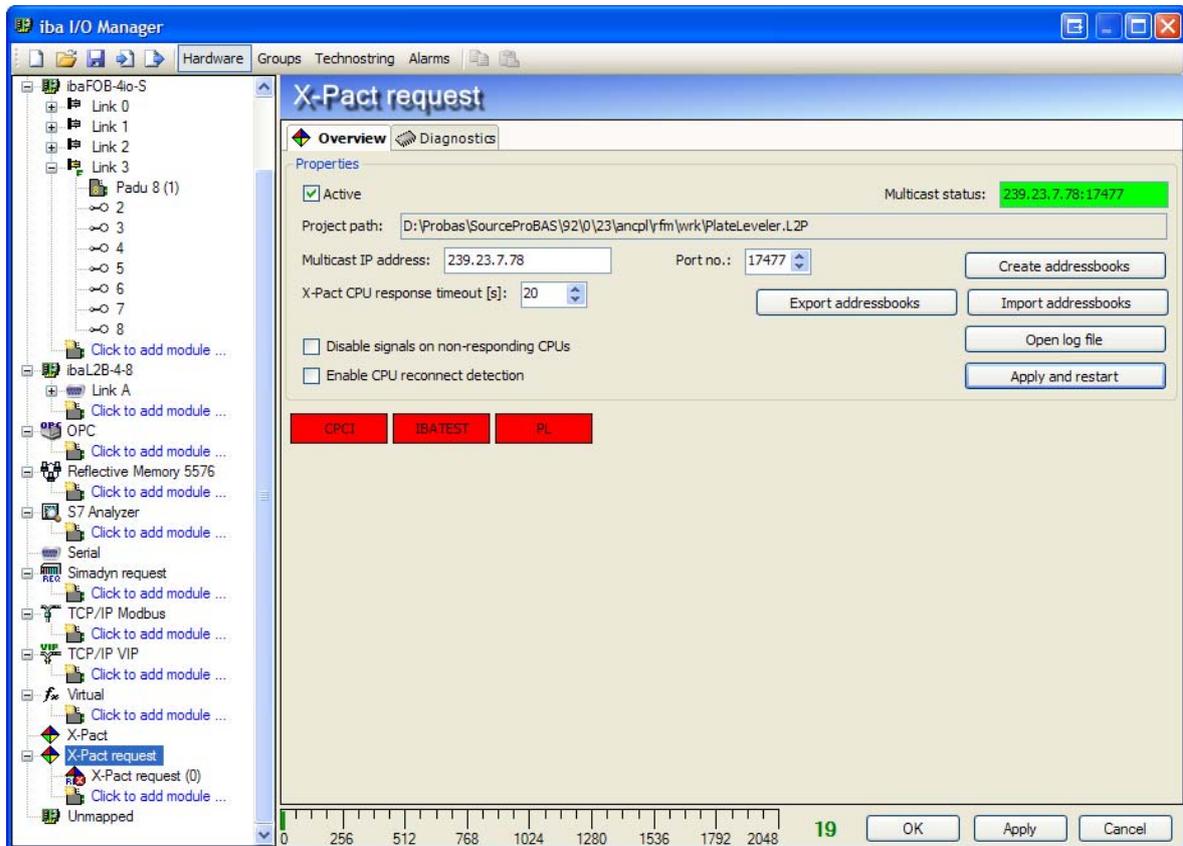
The interface can be enabled or disabled with the Active checkbox. The first thing you must do is create the address books.

In the addressbook generator you have to enter the path to your X-Pact project. When you press the Load project button then the generator will read the configurations and their resources from the project database. It will also detect if a configuration has a reflective memory board. The reflective memory boards are shown as Rfm in the tree. You can now select for which resources you want to generate the addressbook. You create the addressbook by pressing the Create addressbooks button. When you have created the addressbooks you can exit the generator.

The next thing you should do is enter the correct multicast address and port number. By default these are 239.23.07.78 and port 17477.

You then have to click the Apply and restart button. You should then see all the configurations that exist in the system on the bottom. The color of the configuration corresponds with the status of the connection to the (first CPU of the) configuration. There are 4 possibilities:

- Red: There is no TCP connection and no data connection to the configuration.

- Yellow: There is a TCP connection but no data connection to the configuration.

- Green with exclamation mark: There is a TCP connection and at least 1 data connection to the configuration is discovered.

- Green without exclamation mark: There is a TCP connection and all data connections to the configuration are discovered.

A configuration can also be flashing. This means that there is a connection to the configuration but it was not listed in the project. This also means that there is no address book available for that configuration. If this happens then you should update the addressbooks by reloading the project in the addressbook generator.

At the start of measurement all CPUs are polled. If the disable signals on non-responding CPUs checkbox is checked and a CPU does not respond then the related signals will be deactivated and the measurement will be started without these signals. The use of this option is recommended during commissioning or maintenance works, when some X-Pact controllers are switched off. If this option is not enabled the measurement won't start until all CPUs have replied to the polling at start of measurement.

When CPU reconnect detection is enabled then the measurement will stop and restart as soon as the connection to a CPU is established during the measurement.

3.2.2. Diagnostics

On the diagnostics tab of the X-Pact request interface you can find some extra diagnose info. If you select the configuration in the tree then you get some extra information about it. You can view the CPU load and the load generated by the agent. You can see the status of the TCP connection and you can also see the data interfaces on the X-Pact side and their counterparts on the PC side.

Connected CPUs send the rack configuration in their status messages. This rack configuration is shown on the Rack overview tab.
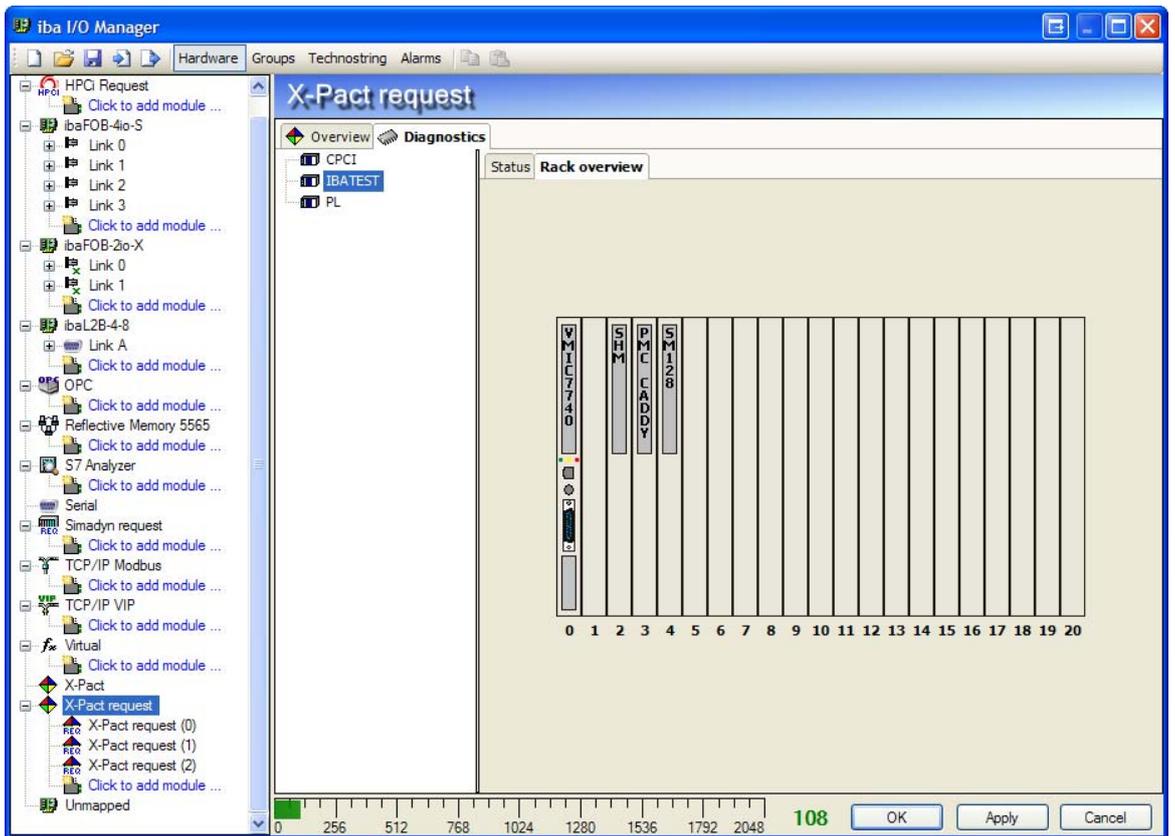
3.3   X-Pact request module

You can add X-Pact request modules to the X-Pact request interface.
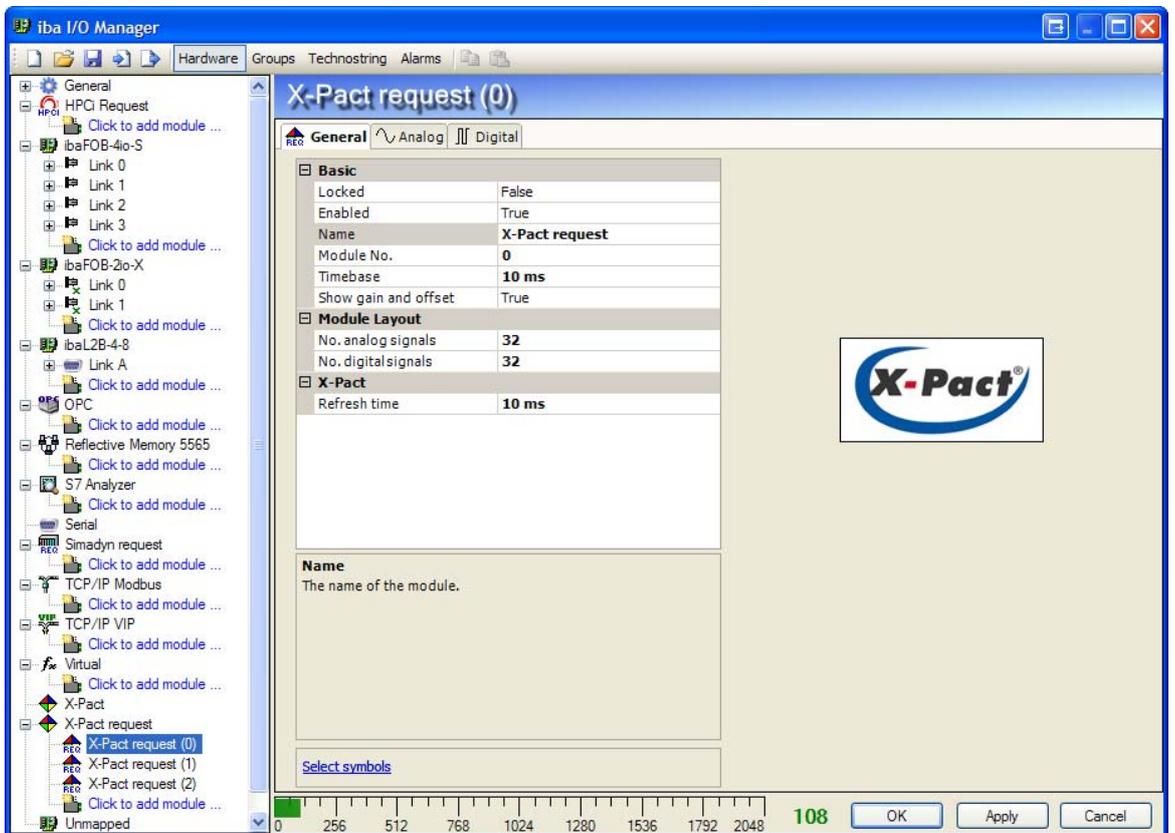
On the general tab of the module you have to select the refresh time. The refresh time is the rate at which the agent will send the data for this module to ibaPDA. The timebase is the rate at which ibaPDA will sample the data it receives from the agent. Usually refresh time and timebase are set to the same value.

You can also select the number of analog and digital signals. Values between 0 and 1000 are valid. When you click on the *Select symbols* hyperlink the X-Pact symbol browser will open.
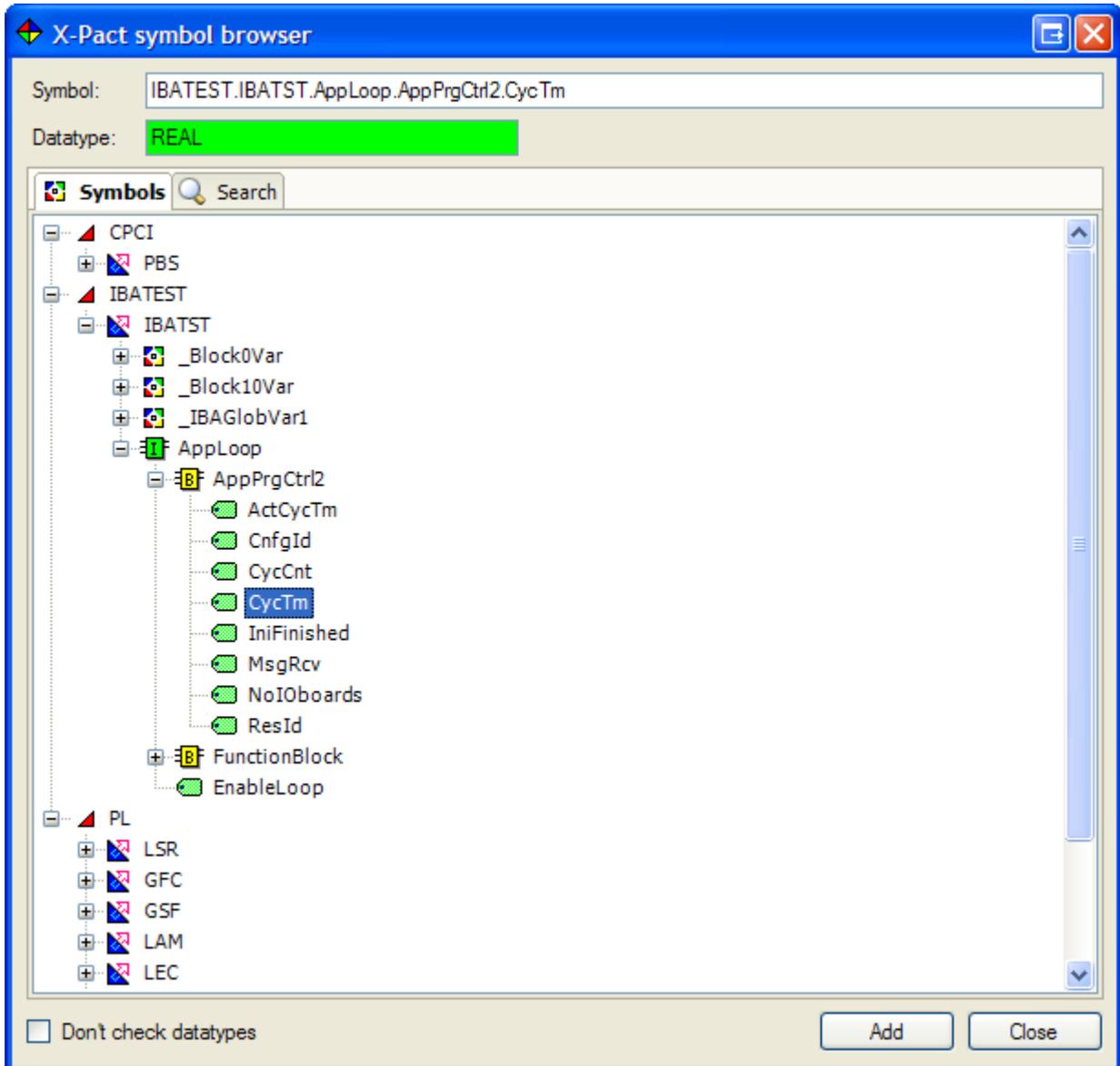
In the symbol browser you see the configurations, resources, global and local variables. You can double-click on a variable to add it to the module. You can also select multiple variables by holding CTRL or SHIFT while selecting. When you click the *Add* button all selected variables are added to the module. On the search tab you can search through all the available variables.

You can select variables from multiple configurations in the module.

3.4   Request process

When you have configured the X-Pact request interface and you have added some X-Pact request modules then you can click the OK button to start measuring. The request process has several steps:

1. A stop message is sent to all connected CPUs

2. Wait until at least 1 data interface of each active CPU is discovered

3. Map the signals on to the data interfaces

4. Send request messages to the active CPUs

5. Wait for the responses to the request messages

6. If the responses are ok then start measuring otherwise let the user decide what to do

The progress of the request process is shown on the ibaPDA client.
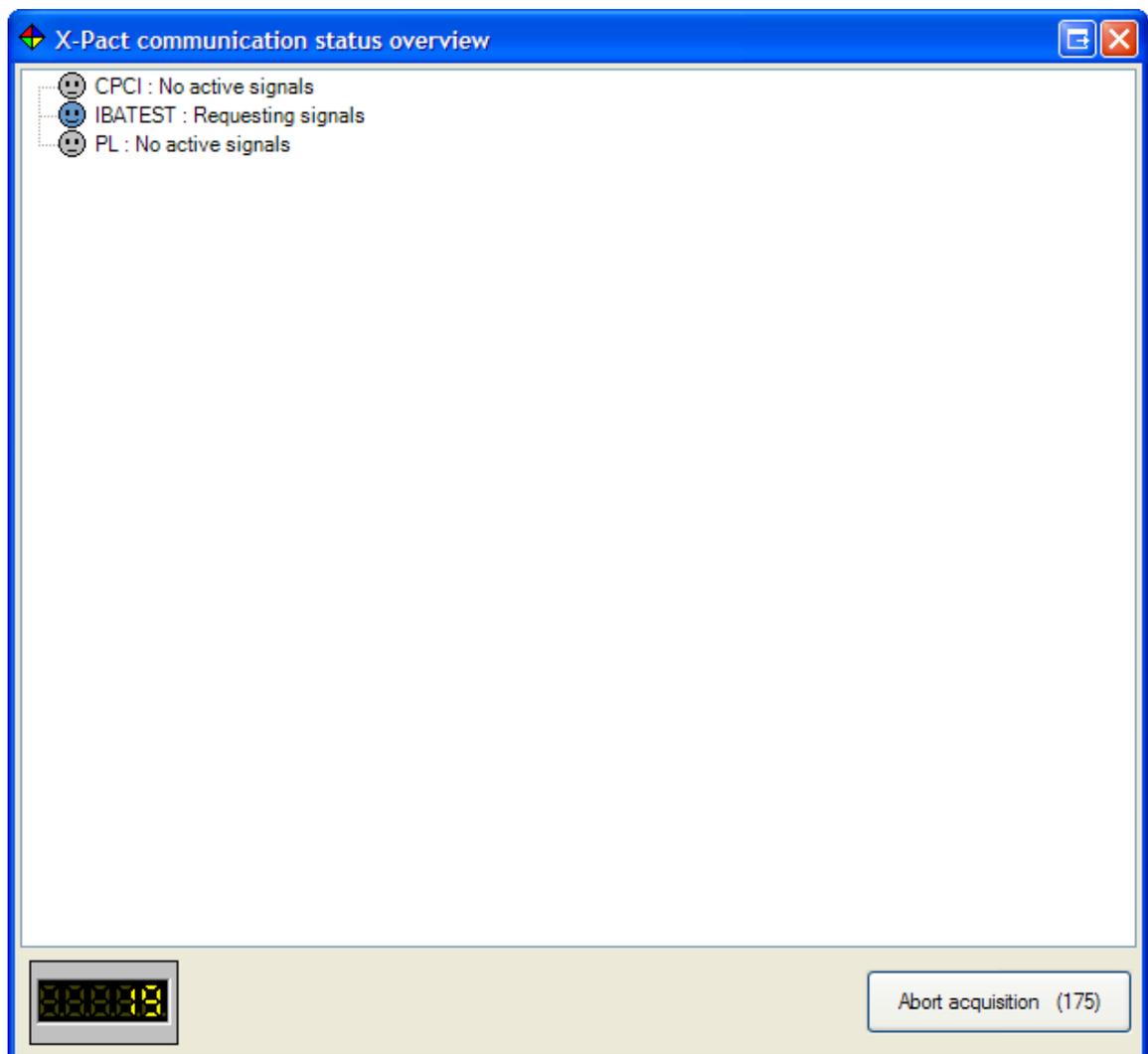
If there is some error during the request process then the user can decide what to do next. He can decide to abort the measurement. He can also decide to temporarily disable the signals on the non-responding CPUs and then try to start the measurement again.
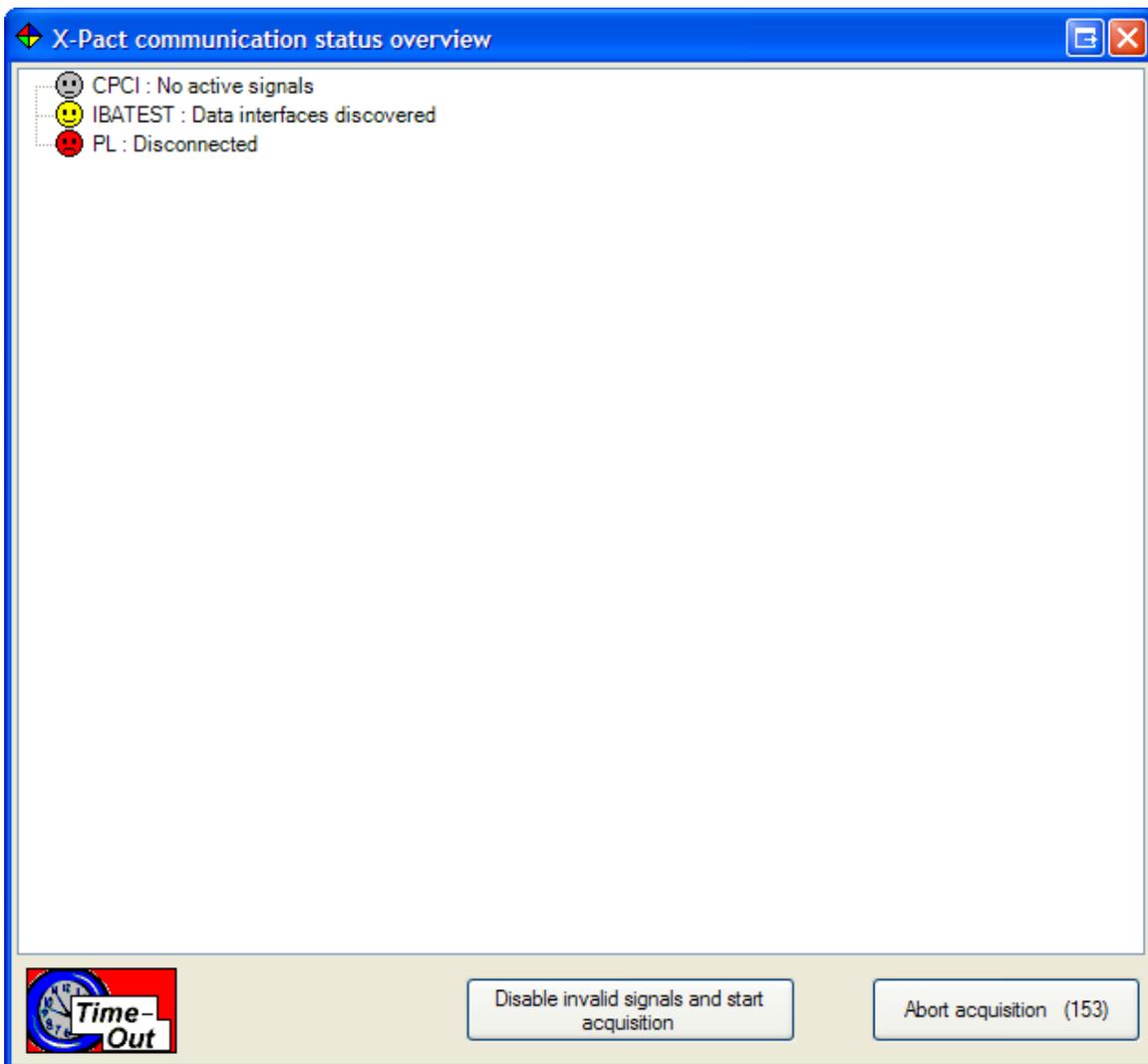
3.5   X-Pact data modules

ibaPDA automatically maps the requested signals onto the available data interfaces for the CPUs. The X-Pact data modules are generated during this mapping. These data modules are also shown in the I/O manager but they are just for diagnostics.

3.6   X-Pact lite

With X-Pact lite you can measure the global variables that are already available on reflective memory. There are no agents needed on the X-Pact side. The only thing that is needed is an address book of all the variables that are on reflective memory. This address book is also generated by the X-Pact addressbook generator.
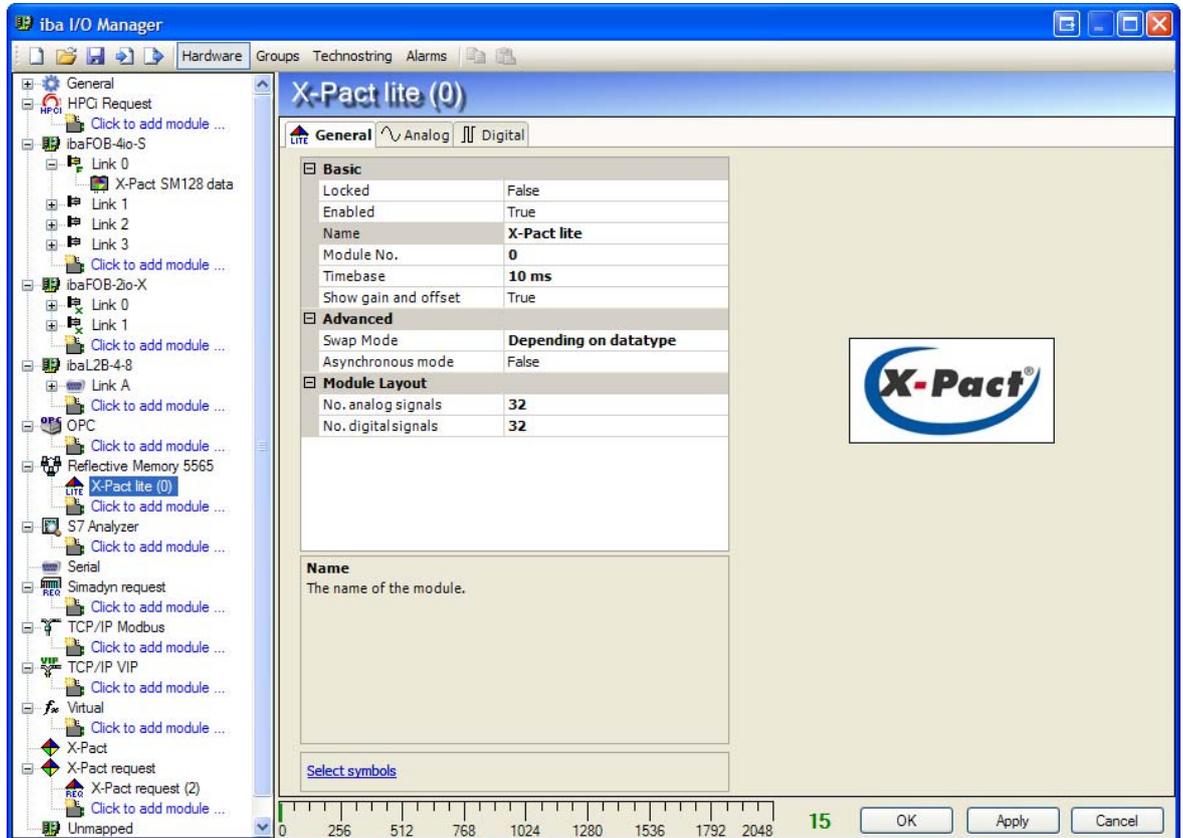
On the reflective memory interface you can then add an X-Pact lite module. You can select analog and digital signals from the signal browser. The analog and digital signals tabs have an actual column that shows the current value of the signal. You can change the swap mode if there is a difference in byte ordering between the X-Pact and PC reflective memory boards. The result of the swap mode can be seen immediately in the actual columns.

The asynchronous mode setting determines when the driver of ibaPDA will copy data from the board. If asynchronous mode is off then the data is copied during the interrupt service routine. If asynchronous mode is on then the data is copied on a separate thread outside of the interrupt service routine. Normally asynchronous mode should be off. Asynchronous mode is only needed when the interrupt service routine takes more than 2000 µs to copy all the data from the boards. You can check this by going to the general node in the I/O manager and checking the Interrupt info tab.

If the maximum interrupt time is larger than 2000 µs then you should enable asynchronous mode.

4   Support and Contact

For technical support or sales information, please contact your local iba representative or call the following numbers:

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For downloads of the latest software versions as well as hardware and software manuals please use our web-site at: http://www.iba-ag.com/

Any feedback, comments or tips on errata in this documentation or suggestions for improvement will be appreciated. Simply send an e-mail or fax to us, thank you for your support.

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