



# ibaPDA-Interface-Hitachi-MicroSigma

## Data Interface for HITACHI $\mu\Sigma$ NETWORK-1000

Manual  
Issue 1.0

Measurement Systems for Industry and Energy  
[www.iba-ag.com](http://www.iba-ag.com)

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## Content

<b>1</b>	<b>About this Manual .....</b>	<b>4</b>
1.1	Target group and previous knowledge .....	4
1.2	Notations .....	4
1.3	Used symbols.....	5
<b>2</b>	<b>System requirements .....</b>	<b>6</b>
<b>3</b>	<b>Hitachi MicroSigma interface .....</b>	<b>7</b>
3.1	General information .....	7
3.2	Device IKS-LM-SN1G .....	7
3.3	System topology .....	8
3.4	Configuration and engineering ibaPDA.....	9
3.4.1	Interface settings .....	9
3.4.2	MicroSigma symbol browser .....	13
3.4.3	Module settings .....	14
3.4.4	Signal configuration .....	16
3.4.5	Address books .....	18
<b>4</b>	<b>Diagnostics.....</b>	<b>19</b>
4.1	License .....	19
4.2	Connection diagnostics with PING.....	20
4.3	Diagnostics tab .....	21
<b>5</b>	<b>Support and contact.....</b>	<b>22</b>

# 1 About this Manual

This document describes the function and application of the software interface

*ibaPDA-Interface-Hitachi-MicroSigma*

This documentation is a supplement to the *ibaPDA* manual. Information about all the other characteristics and functions of *ibaPDA* can be found in the *ibaPDA* manual or in the online help.

## 1.1 Target group and previous knowledge

This documentation addresses qualified professionals, who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded as a professional if he/she is capable of assessing the work assigned to him/her and recognizing possible risks on the basis of his/her specialist training, knowledge and experience and knowledge of standard regulations.

This documentation in particular addresses persons, who are concerned with the configuration, test, commissioning or maintenance of Programmable Logic Controllers of the supported products. For the handling of *ibaPDA-Interface-Hitachi-MicroSigma* the following basic knowledge is required and/or useful:

- Windows operating system
- Basic knowledge of *ibaPDA*
- Knowledge of configuration and operation of the relevant measuring device/system

## 1.2 Notations

In this manual, the following notations are used:

Action	Notation
Menu command	Menu <i>Logic diagram</i>
Calling the menu command	<i>Step 1 – Step 2 – Step 3 – Step x</i> Example: Select the menu <i>Logic diagram - Add - New function block</i> .
Keys	<Key name> Example: <Alt>; <F1>
Press the keys simultaneously	<Key name> + <Key name> Example: <Alt> + <Ctrl>
Buttons	<Key name> Example: <OK>; <Cancel>
File names, paths	"Filename", "Path" Example: "Test.doc"

## 1.3 Used symbols

If safety instructions or other notes are used in this manual, they mean:

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### Danger!



The non-observance of this safety information may result in an imminent risk of death or severe injury:

- Observe the specified measures.
- 

### Warning!



The non-observance of this safety information may result in a potential risk of death or severe injury!

- Observe the specified measures.
- 

### Caution!



The non-observance of this safety information may result in a potential risk of injury or material damage!

- Observe the specified measures
- 

### Note



A note specifies special requirements or actions to be observed.

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### Tip



Tip or example as a helpful note or insider tip to make the work a little bit easier.

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### Other documentation



Reference to additional documentation or further reading.

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## 2 System requirements

The following system requirements are necessary for the use of the Hitachi-MicroSigma data interface:

- *ibaPDA* v7.3.0 or higher
- License for *ibaPDA-Interface-MicroSigma*
- DAQ system *IKS-LM-SN1G* or *IKS-LM-SN100* for HITACHI  $\mu\Sigma$ Network-1000 (ibaKorea)

For further requirements for the used computer hardware and the supported operating systems, please refer to the *ibaPDA* documentation.

### License information

Order no.	Product name	Description
31.001100	ibaPDA-Interface-Hitachi-MicroSigma	ibaPDA data interface for connecting an IKS-LM-SN1G/-SN100 device in a $\mu\Sigma$ NETWORK-1000 network; incl. 32 modules for up to 4096 bytes each
31.101100	one-step-up-Interface-Hitachi-MicroSigma	Extension license for 8 additional modules  (a maximum of 4 extensions permissible)

Table 1: Available Hitachi-MicroSigma interface licenses

## 3 Hitachi MicroSigma interface

### 3.1 General information

The Hitachi MicroSigma interface in *ibaPDA* is used to connect to an IKS-LM-SN1G or IKS-LM-SN100 device, which is connected to a  $\mu\Sigma$ NETWORK-1000 PLC network.

$\mu\Sigma$ NETWORK-1000 is a high-speed network for control and information systems of HITACHI HISEC-04-Rxxx series.

$\mu\Sigma$ NETWORK-1000 generally consists of the following components:

- PLC (Process Control Station), up to 16 PLCs per network
- LANBOX ( $\mu\Sigma$ NETWORK adapter for POC connection)
- POC (Process Operator's Console)

It has been developed by HITACHI for control and information with reliability and high-speed performance.

### 3.2 Device IKS-LM-SN1G

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#### Note



The following descriptions will always refer to the device IKS-LM-SN1G. However, the predecessor device IKS-LM-SN100 can also be used. The main difference between the two devices is that IKS-LM-SN1G supports Gigabit-Ethernet while the IKS-LM-SN100 supports only 100 Mbit Ethernet.

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IKS-LM-SN1G is a device which serves as a gateway between *ibaPDA* and the  $\mu\Sigma$ NETWORK-1000. It acquires data from the cycle memory on the  $\mu\Sigma$ NETWORK-1000. Because the device only works in sniffer mode no additional load is put on PCS, PIST or POC for data acquisition.

The main features of IKS-LM-SN1G are:

- Data acquisition in *ibaPDA* with original sampling rate of the network
- No adding load on the network or PLC by sniffer function
- No need for additional programming on POC or LANBOX

The device IKS-LM-SN1G is distributed exclusively by ibaKorea.

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#### Other documentation



For more detailed information on the device please refer to the manual of the product IKS-LM-SN1G.

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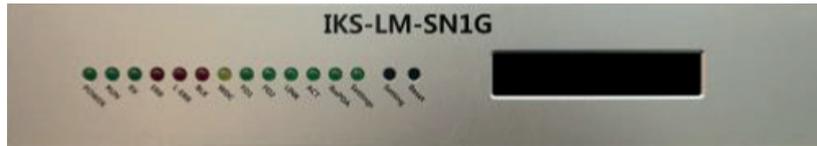
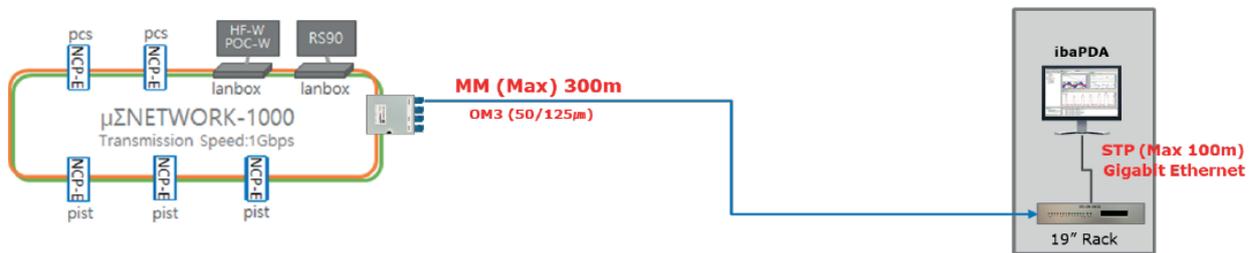


Fig. 1: Front plate of the device

### 3.3 System topology

The connection to the target network  $\mu\Sigma$ NETWORK-1000 can be established via the computer's standard Ethernet interface over an IKS-LM-SN1G device.

Case 1 : When used at distances of 300m or less (Gigabit Ethernet)



Case 2 : When used at a distance of 300m to 2km (Gigabit Ethernet)

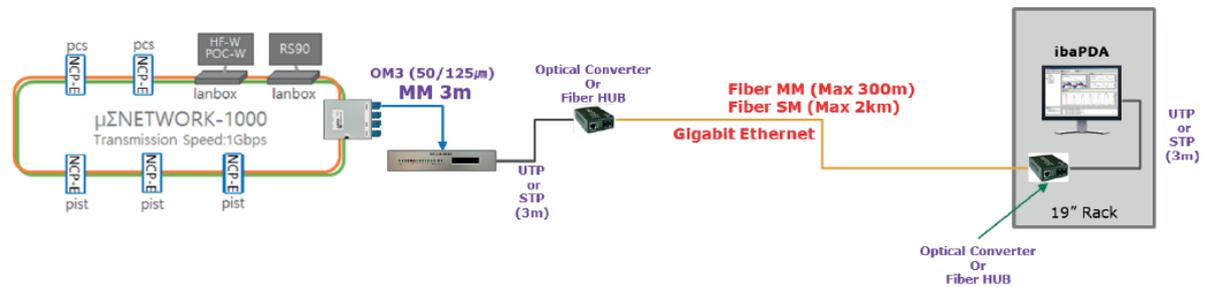


Fig. 2: Typical topologies, depending on the distance

Neither further software nor additional programming on the target systems is necessary for operation.

**Note**



It is recommended to use a peer-to-peer (1:1) network connection between *ibaPDA* and the IKS device in order to exclude a mutual influence by other network components.

## 3.4 Configuration and engineering ibaPDA

Open the I/O Manager, e.g., from the toolbar .

If all system requirements are met (see chapter [↗ System requirements](#), page 6), the "Hitachi MicroSigma" interface will be displayed in the signal tree.

### 3.4.1 Interface settings

The interface itself has the following functions and configuration options:

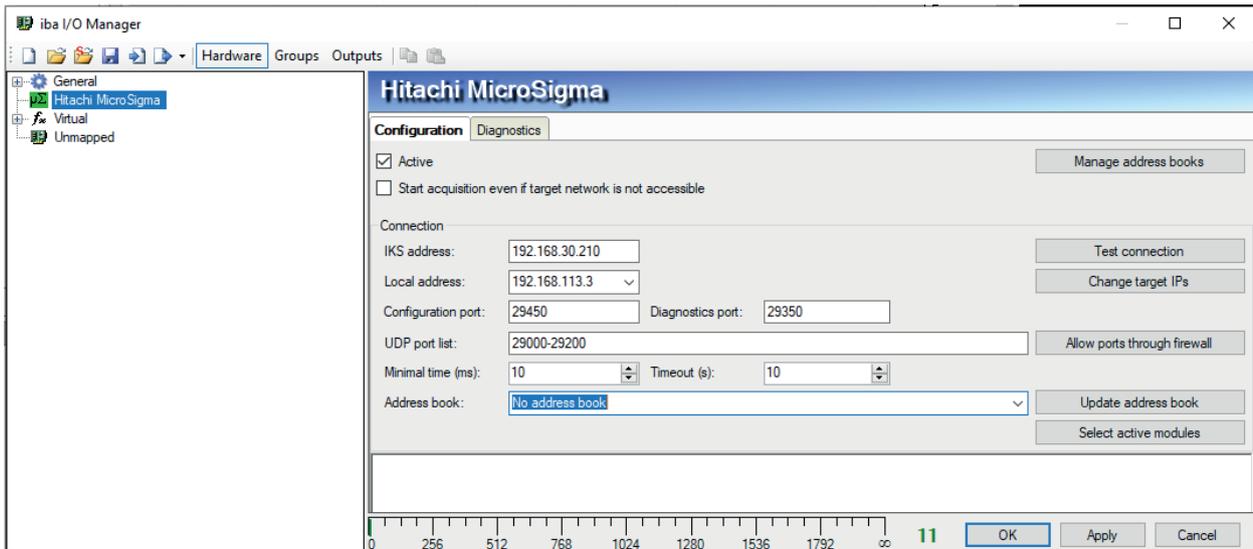


Fig. 3: MicroSigma interface

The interface hosts the connection configuration.

With the activation of the *ibaPDA-Interface-Hitachi-MicroSigma* license it is possible to configure one connection to an IKS-LM-SN1G device. This connection can contain several modules.

On the *Configuration* tab you can setup the interface.

#### Active

When you set the interface to active, the appropriate settings can be selected.

#### Start acquisition even if target network is not accessible

If this option is enabled, the acquisition will start even if the target network is not accessible. In case of an error, a warning is indicated in the validation dialog. If the system has been started without a connection to the target network, *ibaPDA* will periodically try to connect the target network.

#### Connection

##### IKS address

The IP address of the target IKS used to communicate with *ibaPDA*.

##### Local address

The interface address of the *ibaPDA* server used to receive data telegrams from the IKS.

### Configuration port

The IKS port used to update the configuration.

### Diagnostics port

The port for the optional diagnostic module where the IKS sends internal diagnostic data to. The port must be outside the UDP port list range.

### UDP port list

Range of ports used for the modules receiving data from the IKS.

### Minimal time

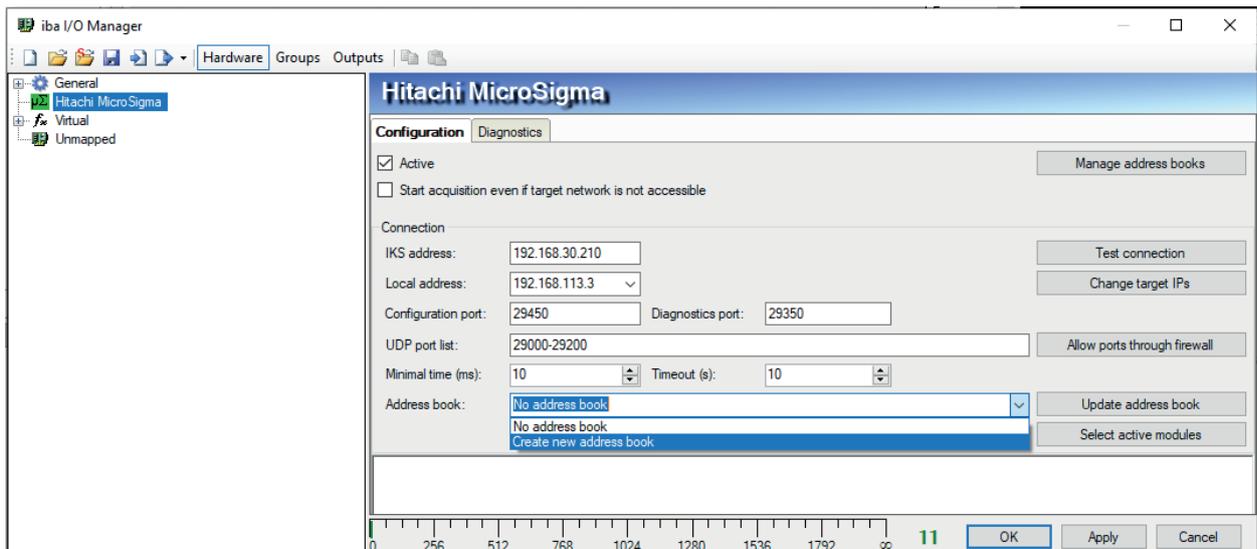
The minimal update time for the data modules

### Timeout

Timeout for communication; if time without communication exceeds the set timeout value, the connection will be considered as lost.

### Address book

The line *Address book* shows the address book, which is used for the current connection. If address books are available you may choose the right one from the drop-down list. If the right address book is not available you may create a new one by selecting *Create new address book* in the drop-down list.



If you do so, a dialog *Import MicroSigma solution* will open. This dialog facilitates the creation of a new address book by importing the defined variable settings from a HITACHI project.

### Name

The name of the address book should be entered here.

### Encoding, Code page

The code page used for reading the project files, if the PC running the HITACHI software is using another language setting than the *ibaPDA-PC*

### PIST solution file

#### Path from server

Path to the PIST solution file, can be selected using the browse button.

#### Username, Password

Optional username/password for accessing the file if it resides on a network share.

#### <Test>

Test access to the path containing the PIST solution file.

### Mica folder

#### Path from server

Path to the mica project folder, can be selected using the browse button.

#### Username, Password

Optional username/password for accessing the folder if it resides on a network share.

#### <Test>

Test access to the path of the folder.

The buttons on the *Configuration* tab have the following functions:

#### <Manage address books>

Click this button to create and manage address books for convenient symbol selection. See chapter [➤ Address books](#), page 18

#### <Test connection>

Connection test to the target IKS

#### <Change Target IPs>

Click this button to open a dialog where you can change the IP addresses, the configuration port and the Ethernet adapter used by the IKS. After changing an IP address, the IKS has to be re-booted, which takes about 2 minutes.

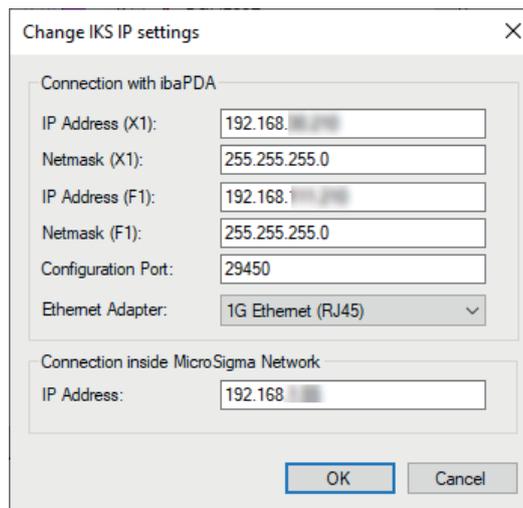


Fig. 4: Dialog for changing target IP addresses

#### <Allow ports through firewall>

When installing *ibaPDA*, the default port numbers of the used protocols are automatically entered in the firewall. If the port number or the port list is changed or if the interface was subsequently enabled, the port(s) has to be enabled in the firewall here by clicking on this button.

#### <Update address book>

Parse PIST solution file and Mica project folder for available variables and modules.

#### <Select active modules>

If an address book is available, select the modules to be used by *ibaPDA*. A click on the button opens the MicroSigma symbol browser.

For more information about the signal browser see [➤ MicroSigma symbol browser](#), page 13.

### 3.4.2 MicroSigma symbol browser

The MicroSigma symbol browser can be opened by clicking the button <Select active modules> on the *Configuration* tab of the Hitachi MicroSigma interface.

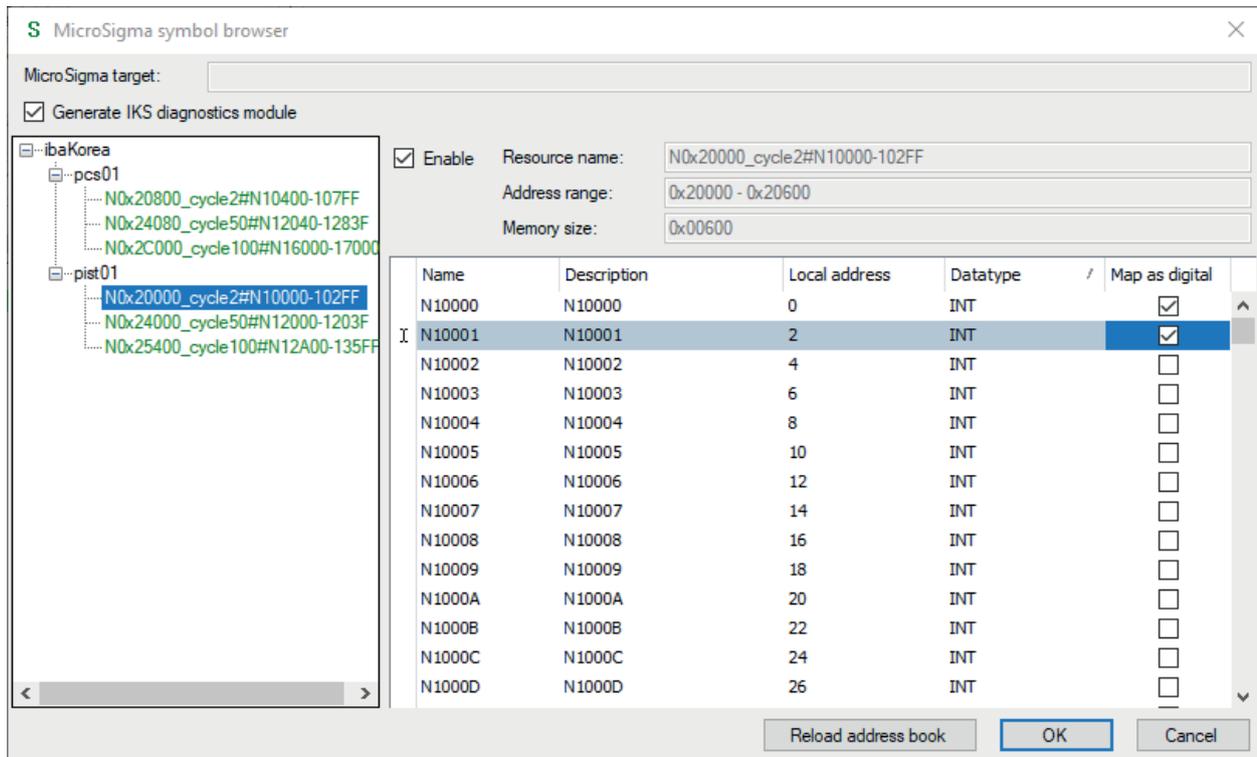


Fig. 5: MicroSigma symbol browser

#### Generate IKS Diagnostic module

When checking the *Generate IKS Diagnostics module* checkbox, the diagnostic module using the *Diagnostics Port* will be created.

#### Enable

You can activate each module by checking the “Enable” checkbox. For all signals of the modules, you can determine if the signal is used as 16 digital values instead of 16 bit integer by checking the appropriate *Map as Digital* checkbox.

By clicking <OK> the selected modules in *ibaPDA* are generated as acquisition modules. If a module is too large for a single UDP datagram, it is split into multiple modules. For each of these generated modules, you can select individually by the "Active" option if they should be recorded in *ibaPDA* or not.

### 3.4.3 Module settings

All modules have the following common settings:

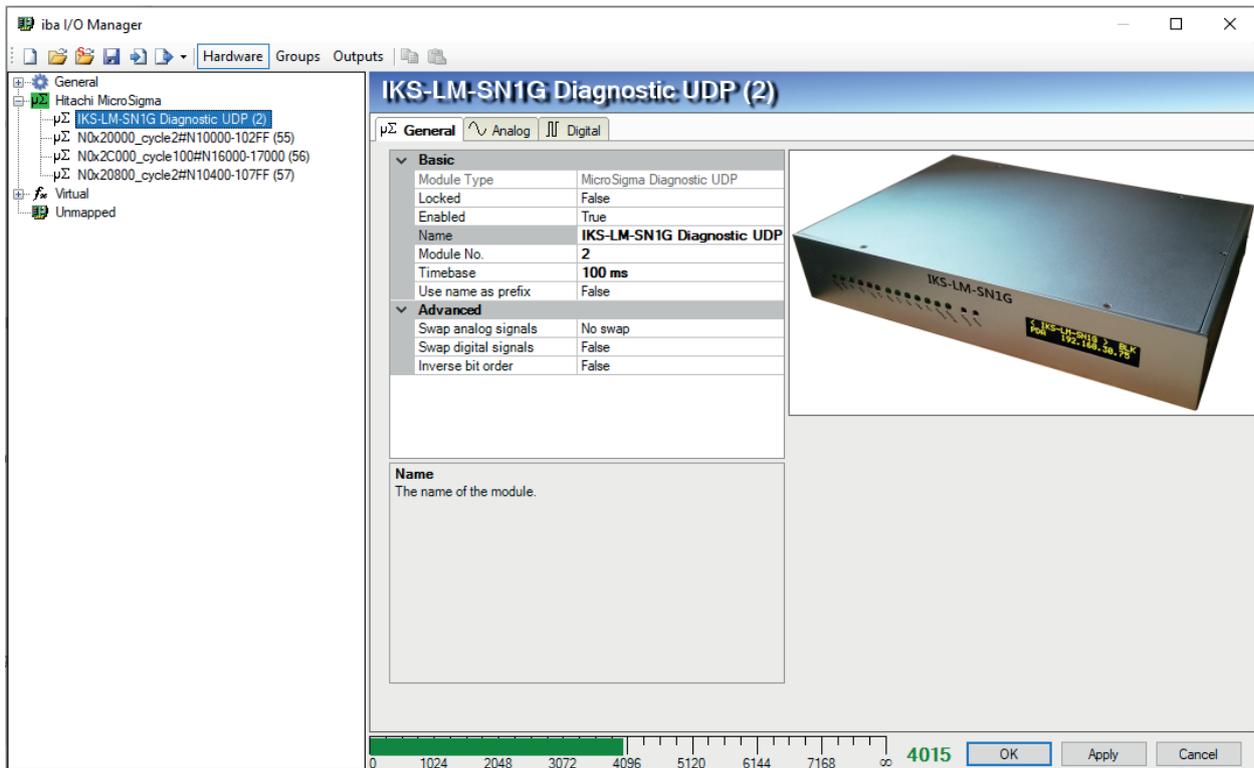


Fig. 6: General module settings

#### Basic

##### Module Type (information only)

Indicates the type of the current module.

##### Locked

A module can be locked in order to prevent change of module settings by accident or unauthorized users.

##### Enabled

Disabled modules are excluded from the signal acquisition.

##### Name

The plain text name should be entered here as the module designation.

##### Module no.

Internal reference number of the module. This number determines the order of the modules in the signal tree of ibaPDA client and ibaAnalyzer.

##### Timebase

All signals of the module will be sampled on this timebase.

##### Use name as prefix

Puts the module name in front of the signal names.

**Advanced**

The modules have advanced settings for the handling of the signals in the *Advanced* section. The settings are different for the *Diagnostic UDP* module and the *Data UDP* modules.

**Diagnostic UDP module**

Only one Diagnostic UDP module per Hitachi-MicroSigma interface is possible.

Configure the following settings for the Diagnostic UDP module:

- *Swap analog signals*: No Swap
- *Swap digital signals*: False
- *Inverse bit order*: False

**Data UDP module**

Configure the following settings for the Data UDP modules:

- *Swap analog signals*: Depending on datatype
- *Swap digital signals*: True
- *Inverse bit order*: True

### 3.4.4 Signal configuration

Within each module, you can select if the signal will be acquired in *ibaPDA* by checking the appropriate “Active” checkbox in the *Analog* and *Digital* tabs.

For each analog signal, the data type can be changed. Default data type is INT (16bit).

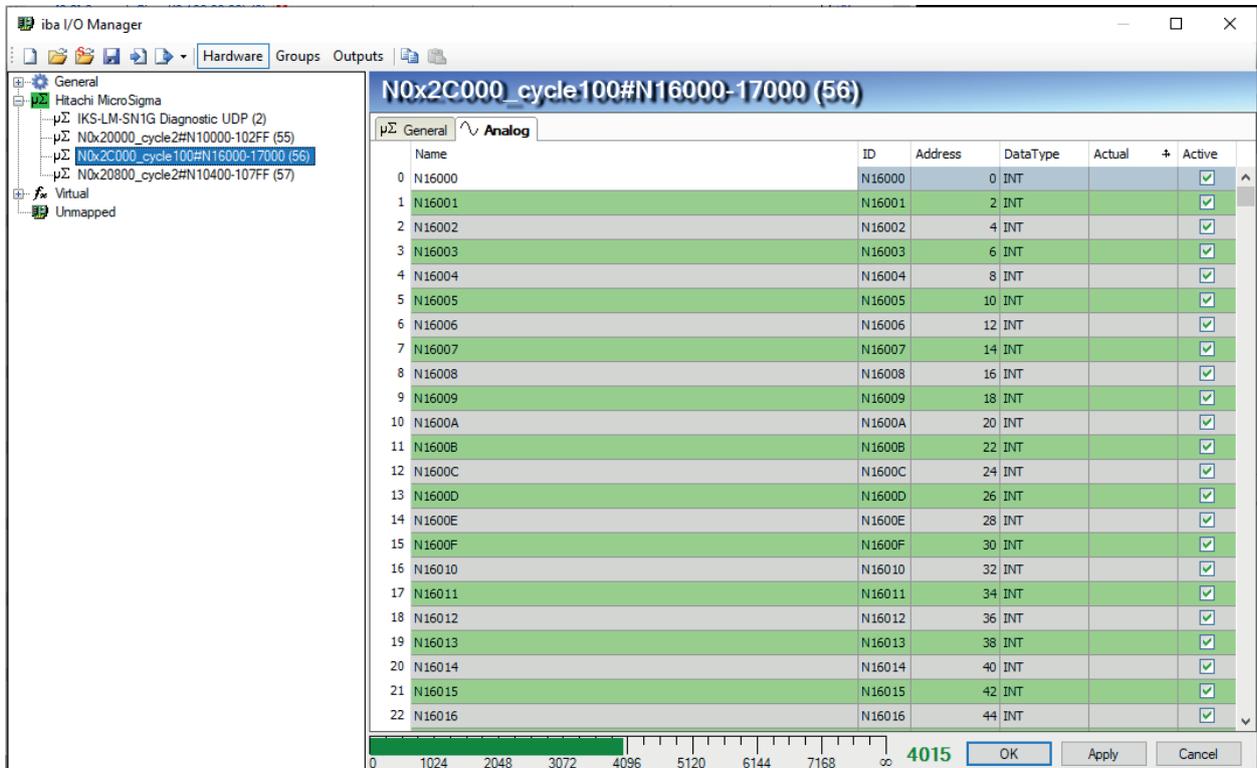


Fig. 7: Signals in the Analog tab

When starting the acquisition with <OK>, the active configuration is checked and updated if needed. After changing the configuration, the datahandling process on the IKS is restarted automatically

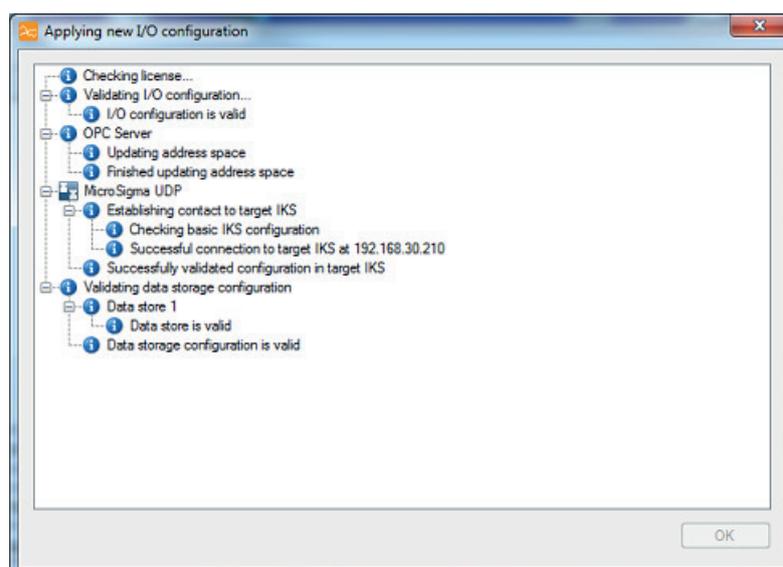


Fig. 8: Validation dialog

When the acquisition is running, the current values can be watched in the *Analog* and *Digital* tabs of the generated modules.

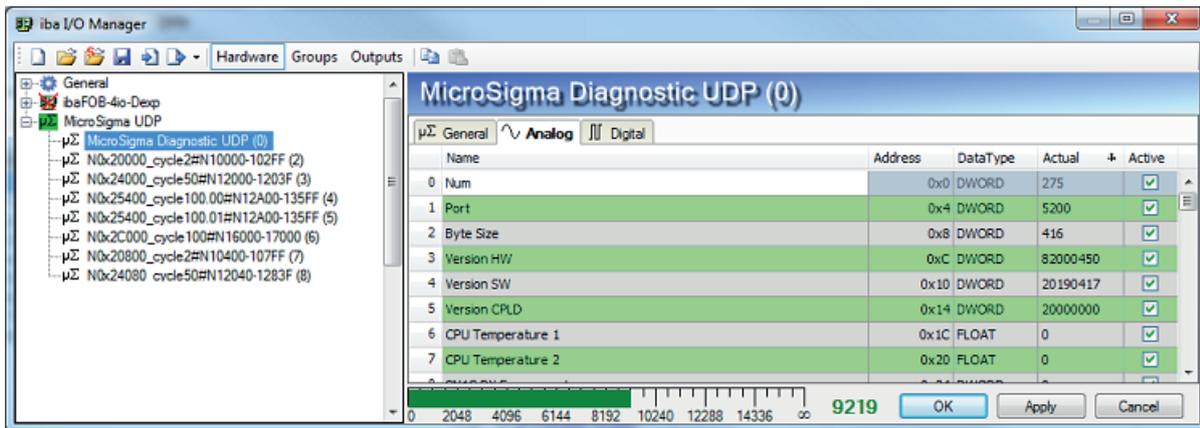


Fig. 9: Actual values in the Analog tab

### 3.4.5 Address books

The address books for  $\mu\Sigma$ NETWORK-1000 are created and managed across modules. One address book can be used in more than one module. There are several ways to open the address books dialog:

- Mark the *Address books* node under the *General* node in the *I/O Manager* and select the *Hitachi MicroSigma* tab.
- Mark the *Hitachi MicroSigma* interface and click the button <Manage address books> on the *Configuration* tab.

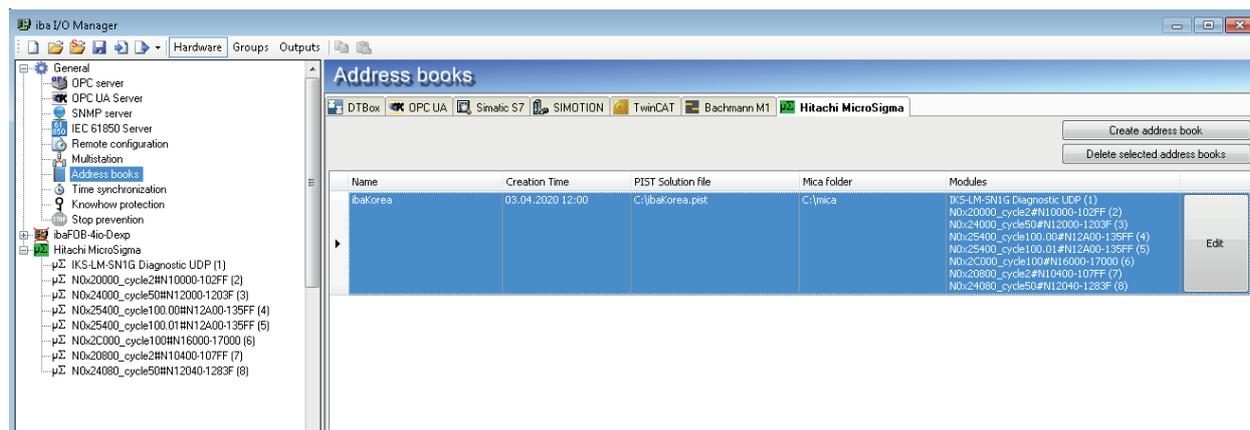


Fig. 10: Address book management for Hitachi MicroSigma in ibaPDA I/O manager

If there are already address books available you will see an overview of the address books in this view. Otherwise you have to create an address book using the button <Create address book>, see below. Existing address books can be deleted by clicking the <Delete selected address books> button.

An address book is referenced in *ibaPDA* through its unique Name. The following additional properties are shown in the address book table:

#### Creation time

The *ibaPDA* client time at which the address book was generated in *ibaPDA*.

#### PIST solution file

The original path of the PIST solution file.

#### Mica folder

Path to the mica project folder

#### Modules

These are the generated acquisition modules from the modules selected in the signal browser.



## 4.2 Connection diagnostics with PING

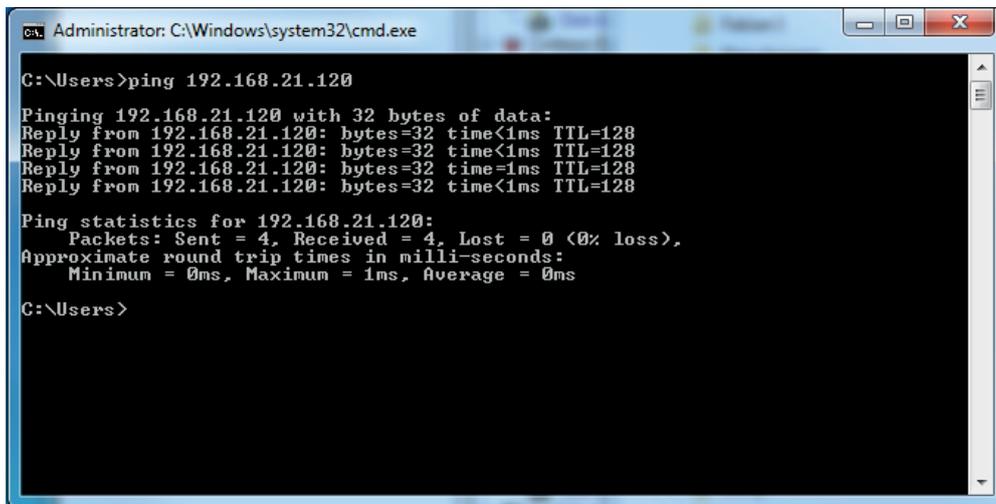
PING is a system command with which you can check if a certain communication partner can be reached in an IP network.

Open a Windows command prompt.



Enter the command “ping” followed by the IP address of the communication partner and press <ENTER>.

With an existing connection you receive several replies.

A screenshot of a Windows command prompt window titled 'Administrator: C:\Windows\system32\cmd.exe'. The prompt shows the command 'C:\Users>ping 192.168.21.120' and its output. The output indicates a successful ping with four replies, each showing 32 bytes of data, a time of less than 1ms, and a TTL of 128. Ping statistics show 4 packets sent, 4 received, and 0% loss, with a minimum round trip time of 0ms, a maximum of 1ms, and an average of 0ms.

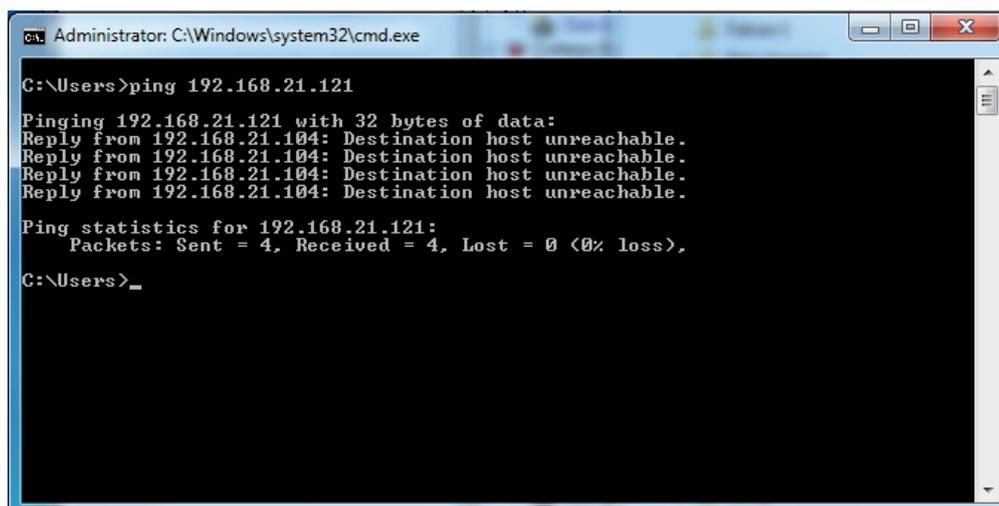
```
Administrator: C:\Windows\system32\cmd.exe
C:\Users>ping 192.168.21.120
Pinging 192.168.21.120 with 32 bytes of data:
Reply from 192.168.21.120: bytes=32 time<1ms TTL=128
Reply from 192.168.21.120: bytes=32 time<1ms TTL=128
Reply from 192.168.21.120: bytes=32 time=1ms TTL=128
Reply from 192.168.21.120: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.21.120:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users>
```

Fig. 12: PING successful

With no existing connection you receive error messages.

A screenshot of a Windows command prompt window titled 'Administrator: C:\Windows\system32\cmd.exe'. The prompt shows the command 'C:\Users>ping 192.168.21.121' and its output. The output indicates an unsuccessful ping with four replies, each showing 'Destination host unreachable'. Ping statistics show 4 packets sent, 4 received, and 0% loss, with a minimum round trip time of 0ms, a maximum of 1ms, and an average of 0ms.

```
Administrator: C:\Windows\system32\cmd.exe
C:\Users>ping 192.168.21.121
Pinging 192.168.21.121 with 32 bytes of data:
Reply from 192.168.21.104: Destination host unreachable.

Ping statistics for 192.168.21.121:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users>_
```

Fig. 13: PING unsuccessful

### 4.3 Diagnostics tab

When the acquisition is running, the *Diagnostics* tab of the interface shows statistics concerning the data updates received from the IKS.

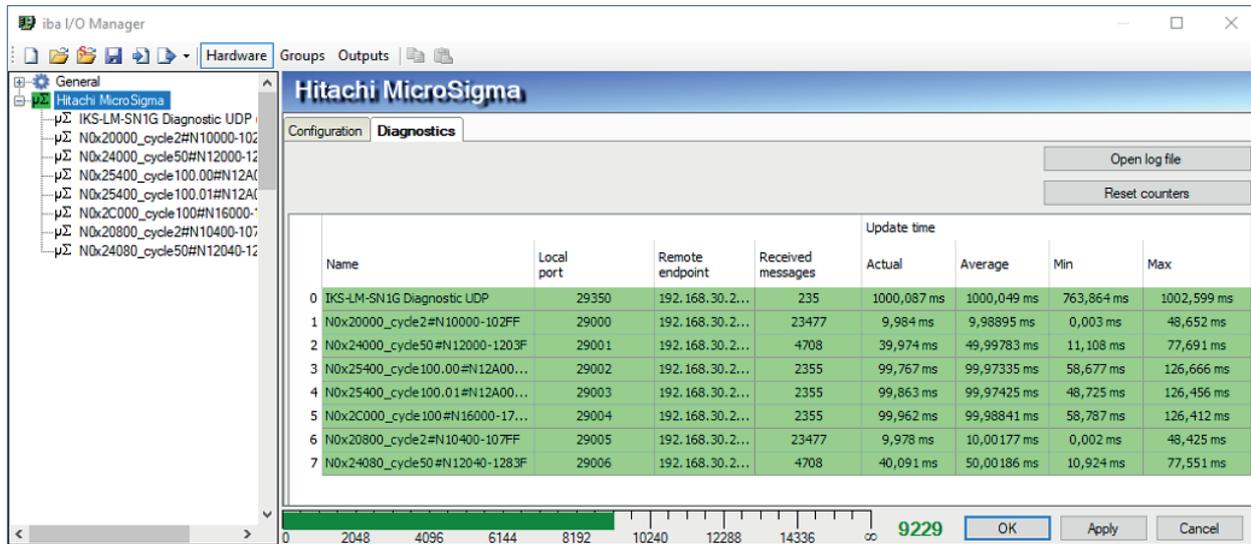


Fig. 14: Diagnostics tab

#### <Open log files>

A log file for interface related messages can be opened.

#### <Reset counters>

Diagnostic counters can be reset.

#### Module table

Each row corresponds to a module.

The columns in the table and their meaning:

- Name: Name of the module
- Local Port: For the Diagnostic UDP module it is the Diagnostic port as set in the interface configuration tab; for Data UDP modules there are different ports, one for each module, out of the UDP port list.
- Remote Endpoint: IP address of the target network to which *ibaPDA* is connected.
- Received Messages: Total amount of received messages.
- Update time Actual, Average, Min, Max: The update time indicates the time between 2 read operations.

Additional information is provided by the background color of the table rows:

Color	Meaning
Green	Connection is OK, receiving data.
Orange	Connection has been configured but no data received.
Grey	Connection not configured.

Table 2: Meaning of background color of the connection table

## 5 Support and contact

### Support

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Email: support@iba-ag.com

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### Note



If you require support, indicate the serial number (iba-S/N) of the product or the license number.

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### Contact

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