ibaPDA-Interface-Toshiba-ADMAP

Data Acquisition on Toshiba ADMAP-5M Bus

Manual

Issue 1.0

Measurement and Automation Systems

Manufacturer

iba AG

Koenigswarterstr. 44

90762 Fuerth

Germany

Contacts

Main office: +49 911 97282-0

Fax: +49 911 97282-33

Support: +49 911 97282-14

Engineering: +49 911 97282-13

E-Mail: iba@iba-ag.com

Web: www.iba-ag.com

The content of this publication has been checked for compliance with the described hardware and software. Nevertheless, deviations cannot be excluded completely so that the full compliance is not guaranteed. However, the information in this publication is updated regularly. Required corrections are contained in the following regulations or can be downloaded on the Internet.

The current version is available for download on our web site http://www.iba-ag.com.

Protection note

TOSDIC-CIE is the registered trade mark of Toshiba Corporation. Windows® is a label and registered trademark of the Microsoft Corporation.

Other product and company names mentioned in this manual can be labels or registered trademarks of the corresponding owners.

Issue	Date	Revision	Author	Version SW
1.0	08-19-2011	First edition	rm	6.27.0

Table of contents

1 About this manual

This manual describes the use of the software ibaPDA-Interface-Toshiba-ADMAP.

1.1 Target group

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

1.2 Basic knowledge

The following basic knowledge is required to use the software ibaPDA-Interface-Toshiba-ADMAP:

❑ Basic knowledge of ibaPDA-V6 data acquisition system

❑ Knowledge of Toshiba's CIE control system recommended

1.3 Designations

The following designations are used in this manual:

Action	Designations
Menu command	Menu „Logic diagram"
Call of menu command	„Step 1 – Step 2 – Step 3 – Step x" Example: Select menu „Logic diagram – Add – New logic diagram"
Keys	<Key name> Example: <Alt>; <F1>
Press keys simultaneously	<Key name> + <Key name> Example: <Alt> + <Ctrl>
Buttons	<Button name> Example: <OK>; <Cancel>
File names, Paths	„File name", „Path" Example: „Test.doc"

1.4   Used symbols

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

⚠ DANGER

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

- By an electric shock!
- Due to the improper handling of software products which are coupled to input and output procedures with control function!

⚠ WARNING

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

⚠ CAUTION

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

Note

A note specifies special requirements or actions to be observed.

Important note

Note if some special features must be observed, for example exceptions from the rule.

Tip

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

Other documentation

Reference to additional documentation or further reading.

2   Introduction

2.1   Control LAN ADMAP

The control LAN ADMAP is a mainstay network of the Toshiba CIE integrated-control system, thus enabling a free communication with TOSDIC-CIE devices connected to them.

2.2   Hardware configuration

The hardware interface to the ADMAP Network is the JAMI1 board from Toshiba.

The JAMI1 board is a 32 bit PCI board of double width, full height and full length and requires two PCI slots in an IBM-PC compatible computer. Only one ADMAP card JA-MI1 can be installed per computer.
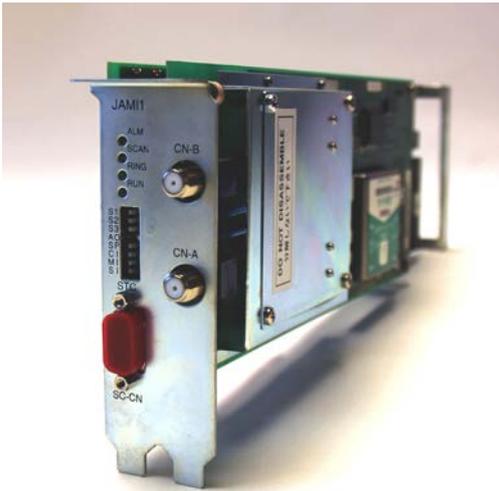
Fig. 1 Toshiba JAMI1 board

It provides a computer access to the legacy ADMAP network (ADMAP-5M bus) which is a redundant network.
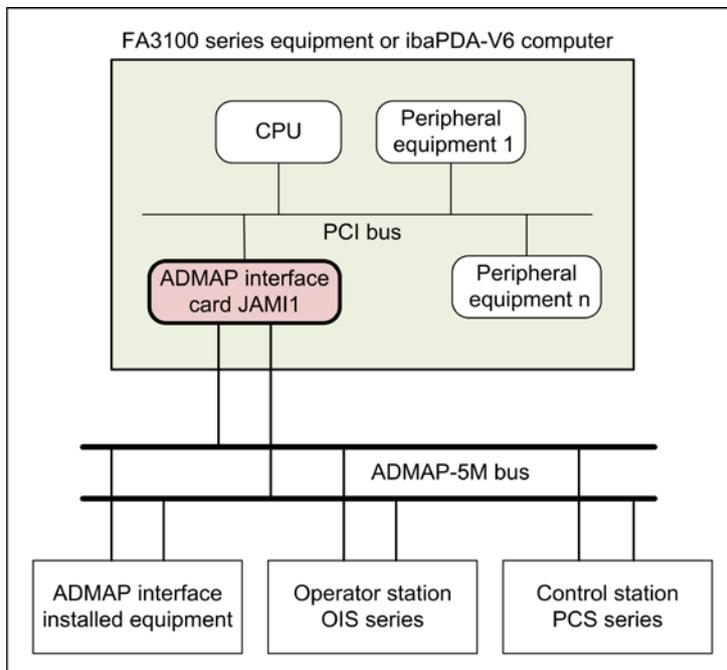
Fig. 2 Principle of ADMAP hardware configuration

2.3   Communication principle

Other documentation

This documentation covers only the parts of functionality which refer to ibaPDA-V6. For more information about the board and other subjects of the Toshiba ADMAP communication system please refer to the manufacturer's documentation, e. g.

- Integrated Control System TOSDIC-CIE ADMAP interface card JAMI1 Instruction Manual (no. 6F8C0731)

3 communication protocols are available on the Toshiba JAMI1 board.

❑ Scan transmission

❑ MMS transmission (not supported by ibaPDA-V6)

❑ LLC transmission (not supported by ibaPDA-V6)

Important note

The only protocol supported by ibaPDA-V6 is the scan transmission protocol. Furthermore, only the ADMAP-5M bus is supported by ibaPDA-V6.

Memory

The communication of the ADMAP system is based on the use of dedicated memory.

The overall memory consists of two major parts as shown in the following figure:
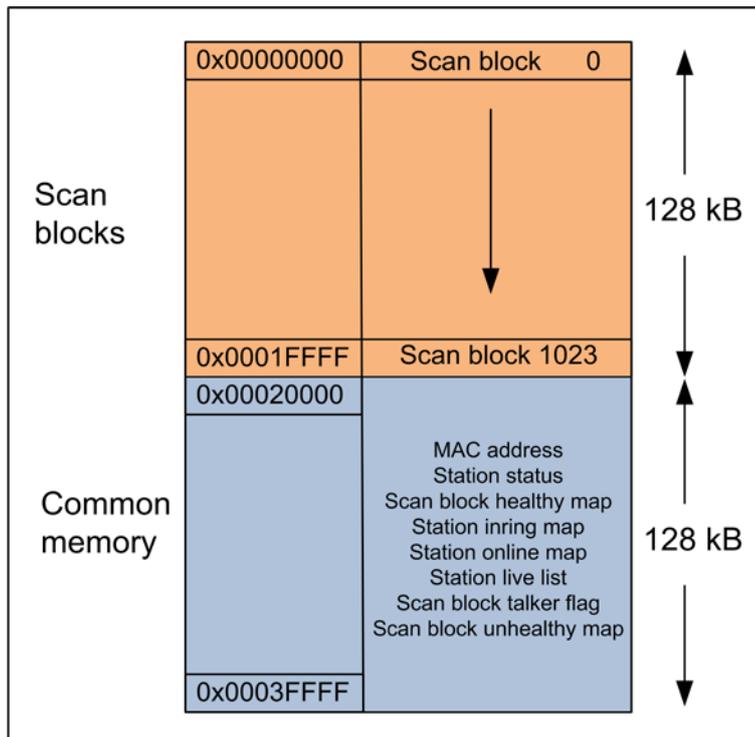
Fig. 3 Memory organization

Scan transmission protocol

The scan transmission is ADMAP's characteristic transmission mode which enables multiple devices to share the same data.

In the ADMAP card, there is a memory area called scan memory. The address range of 0x00000000 to 0x0001FFFF corresponds to 1024 blocks x 128 Byte. All the TOSDIC-CIE or compatible devices connected to the ADMAP-5M bus, have the same scan memory. When the contents of the blocks are automatically transmitted/received by the ADMAP card, all the devices hold the same memory image in the system. This means, all stations on the network see the same 128 kB of data.

To each scan block, logic Nos. 0 to 1023 is allocated. A device writing data to the bus is a so called talker. A scan block can only be written by one talker but can be read by multiple listeners. Therefore, a scan talker block is allocated to each device on the network. A scan talker block is one of the 1024 scan blocks to be transmitted by one device only for writing the data. Other devices receiving this block store the data in the same position of the scan memory as so called listeners. Hence, the data of one device can be transferred to all the other devices by just writing the data in the talker specified block.

The allocation through the entire system must grant that multiple devices will not become the talker of the same block.
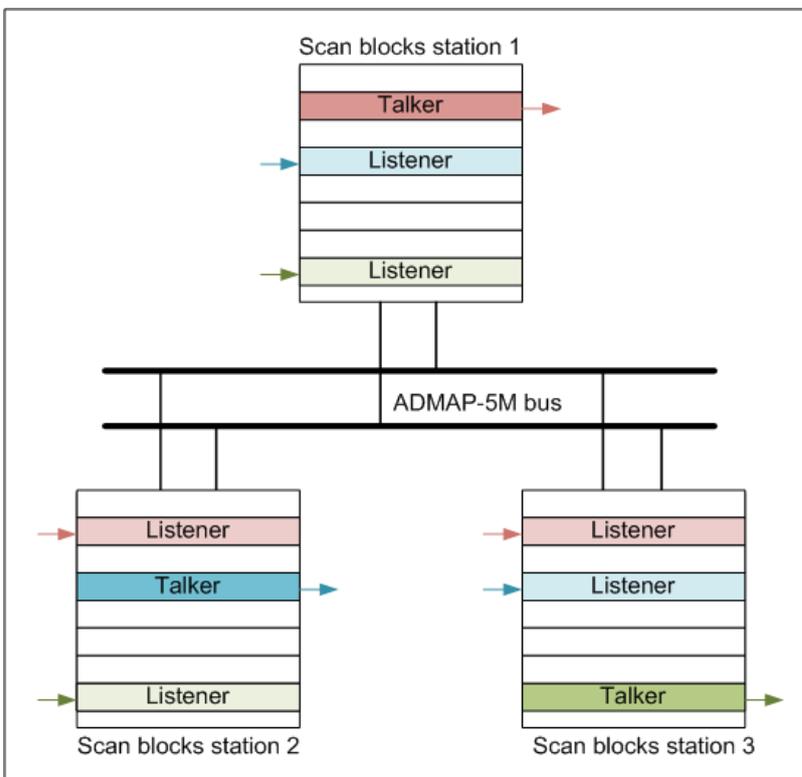
Fig. 4 Principle of scan block transmission

In terms of ibaPDA-V6 the scan block transmission is used for measurement of signals.

Therefore, in ibaPDA-V6 the so called Scan block modules should be used.

ibaPDA-V6 is reading data only, hence never can be a talker.

There are 3 time classes defined for the blocks:

❑ Fast

❑ Medium

❑ Slow

The talker determines the update rate of the block it writes to.

While the slow and medium time classes are based on fixed and constant cycles the fast time class is rather dynamic and depends on the number of scan blocks to be transmitted in this time class. The system always tends to transmit scan blocks in the fast time class as fast as possible.

Common memory

In addition to the scan blocks for measured data transmission it is possible to access a memory range which is called "Common memory". The common memory is allocated in the address range of 0x00020000 to 0x0003FFFF and provides for system status and station information. ibaPDA-V6 uses this common memory for diagnostic purposes.

The basic structure of the common memory is shown in the table below.

↗ For more detailed information please refer to chapter 4, "Reference"

Offset address	Name (number of bytes)	Chapter for more information in this manual	Chapter for detailed explanation in manufacturer's manual
46H	MAC address of own station (6)		
4CH	Station status (2)	4.1.1	2.5.3
60H	Scan block healthy map (128)	4.1.2	2.2.4
E0H	Station in ring map (32)	4.1.3	2.5.3
100H	Station online map (32)	4.1.4	2.5.3
120H	Station live list (514)	4.1.5	2.5.3
B30H	Scan block talker flag (128)	4.1.2	2.2.4
DB0H	Scan block unhealthy map (128)	4.1.2	2.2.4

Table 1 Information in common memory

3 Configuration of ibaPDA-V6

3.1 Interface Toshiba ADMAP JAMI1

When the board is installed in the ibaPDA-V6 computer the I/O manager will show the Toshiba ADMAP JAMI1 interface. If you have a license for the board then the title area will be a blue gradient otherwise it will be a red gradient with an icon of a dongle with a red cross.

In the right pane there are 3 tabs:

❑ Station list

❑ Scan block list

❑ Memory view

Station list tab
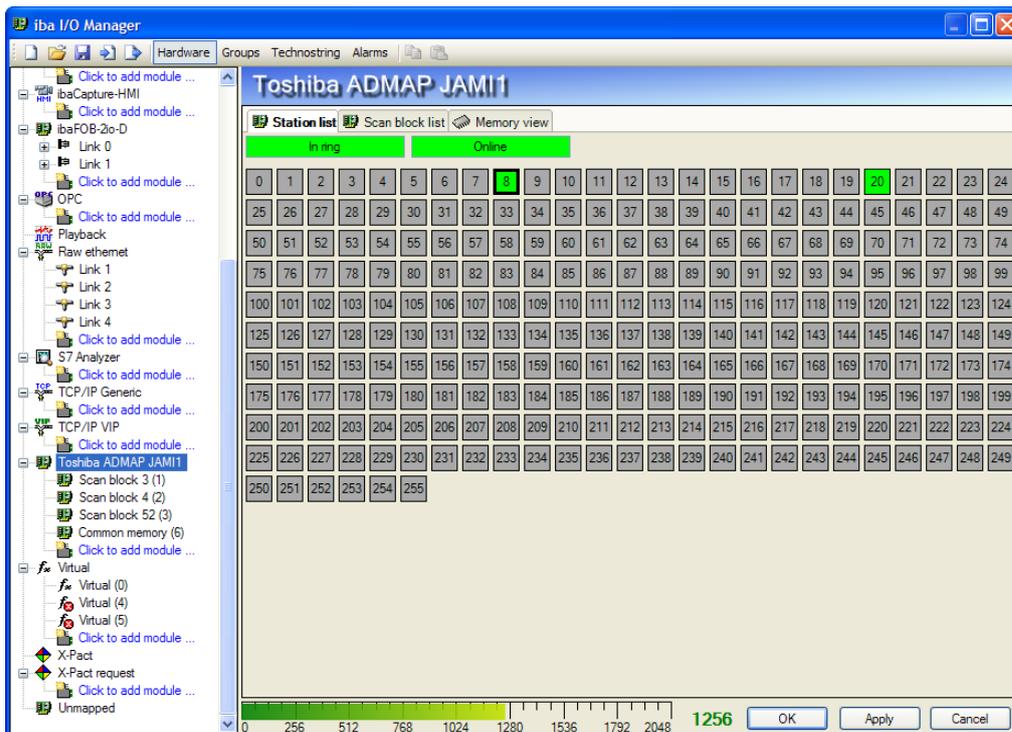
Fig. 5 Toshiba ADMAP JAMI1 interface, Station list tab

❑ Labels "In ring" and "Online"

The first two labels show if the board itself is connected to the ring and if it is online. When a board is online then all data that is written to the board will be transmitted to the other stations in the ring.

When you boot the PC then the board will be automatically in online status.

❑ Station array

Below you can see an array of 256 boxes. Each box represents a station on the AD-MAP network and shows the current status:

- Grey: Station is not connected
- Red: Station is connected and in stand-by mode
- Green: Station is connected and in online mode
- Thick border: Station is corresponding with JAMI1 board of ibaPDA-computer
               (like no. 8 in the fig. above)

Scan block list tab
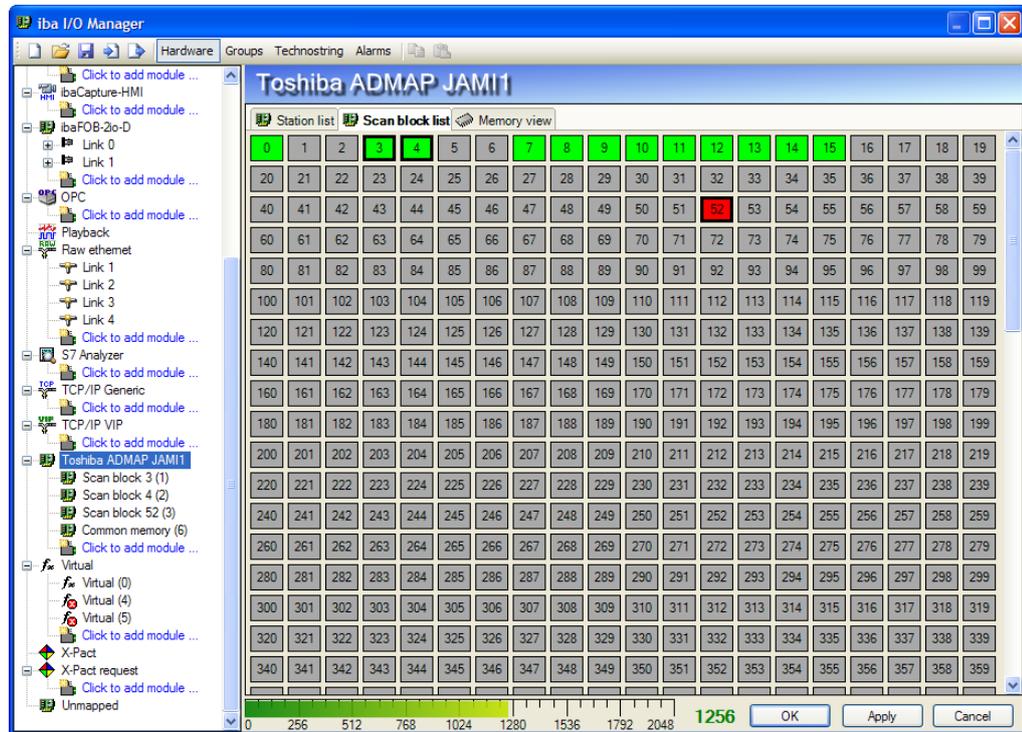
Fig. 6 Toshiba ADMAP JAMI1 interface, Scan block list tab

The scan block list tab shows the scan blocks. There are 1024 boxes and each box corresponds to a scan block, showing the current status of the block.

- Grey: Scan block is unhealthy
- Red: Scan block is unhealthy while ibaPDA-V6 is measuring from that block
  (like no. 52 in the fig. above)
- Green: Scan block is healthy
  A scan block is healthy when there is a talker for that block, so when there is a station writing to that block.
- Thick border: ibaPDA-V6 is measuring from that block
  (like nos. 3 and 4 in the fig. above)

Memory view tab

The memory view tab shows a view of the complete memory on the board.

The first 128 kB (address 0x00000000 – 0x001FFFF) correspond to the 1024 scan blocks.

The second 128 kB (address 0x00020000 – 0x0003FFFF) correspond to the common memory area. This area contains diagnostic information like the scan block healthy list.

➔ Please refer to chapter 4, "Reference" or to the manufacturer's instruction manual to find out the exact meaning of each byte in the common memory area.


Fig. 7 Toshiba ADMAP JAMI1 interface, Memory view tab

3.2   Modules

There are 2 types of modules you can add to the Toshiba ADMAP JAMI1 interface:

❑   Scan block module

❑   Common memory module.

3.2.1   Scan block module

The scan block module is able to measure the 128 bytes of a scan block. Therefore, a scan block module should be used to measure process data and signals.

One scan block per module is allowed, i. e. at least one scan block module is required for each scan block to be measured. Otherwise, multiple scan block modules can refer to the same scan block.

"General" tab

On the "General" tab you have to specify the scan block number (0 – 1023) of the block you'd like to measure

You can also specify the swap mode and the number of signals.

The module time base should be set equal or faster than the time class the talker uses to write on this block. See configuration of talker to find out the time class.
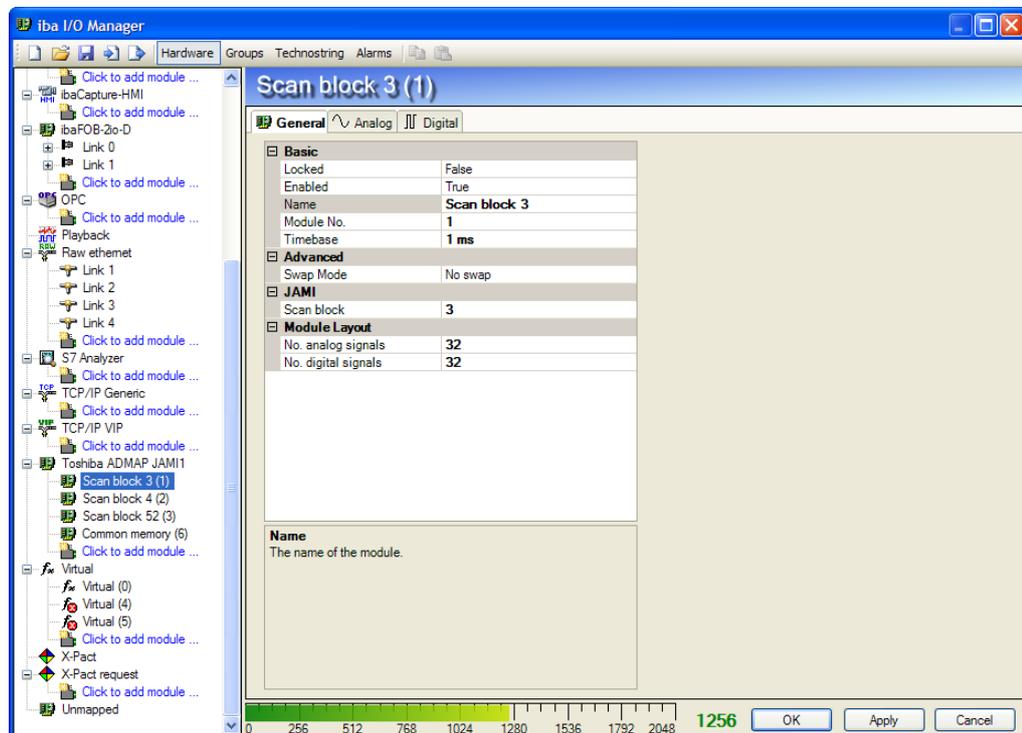
Fig. 8 Scan block module, General tab

"Analog" tab

For an analog signal you have to specify the address (hex or decimal) relative to the start address of the scan talker block (0 to 127) and the data type. The Actual column shows the current value of the signal. By clicking on the Actual column header you can switch between raw and scaled view of the value.

By clicking on the Address column header you can let ibaPDA-V6 calculate the addresses based on the data type of the signals.
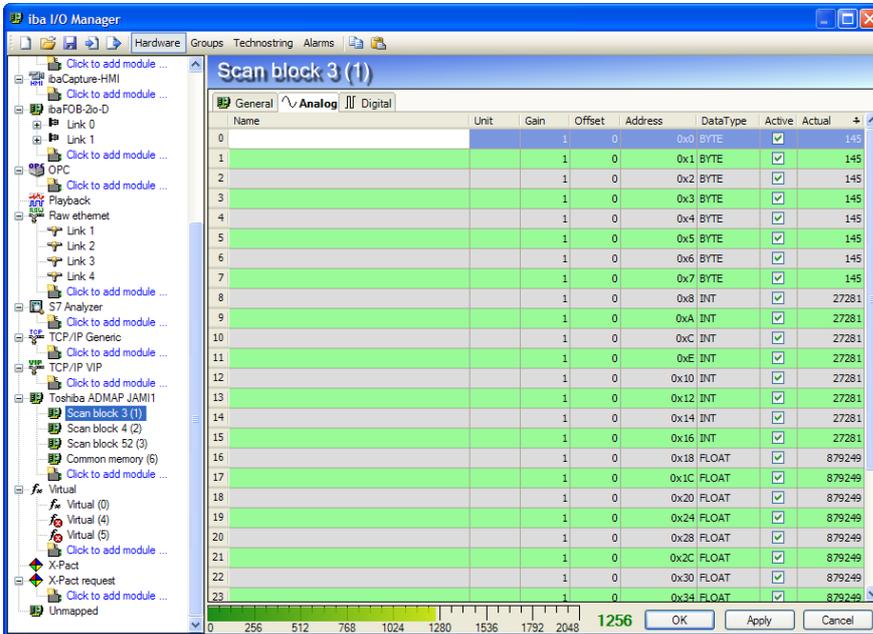
Fig. 9 Scan block module, Analog tab

"Digital" tab

For a digital signal you have to specify the address (hex or decimal) relative to the start address of the scan talker block (0 to 127) and the bit number. The bit number goes from 0 to 31.
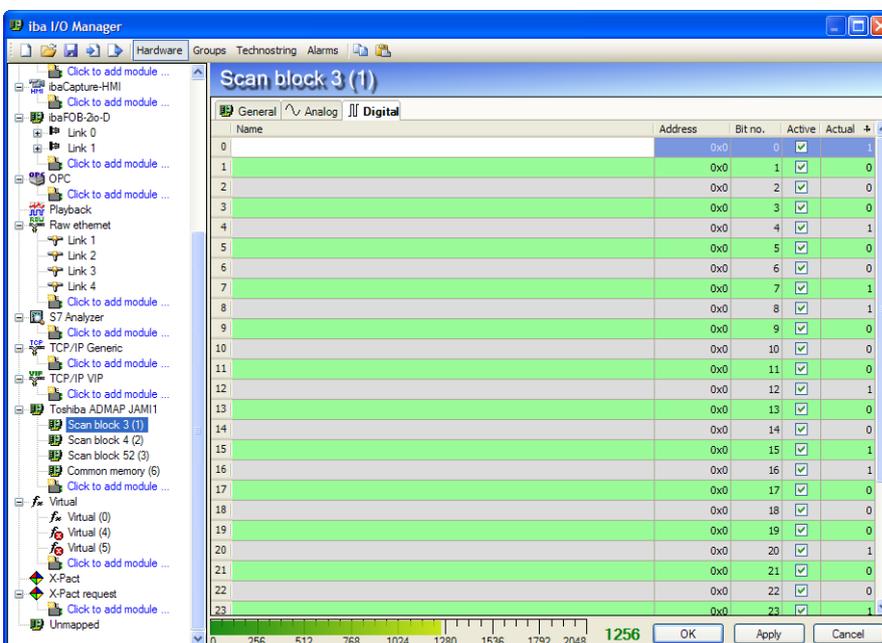
Fig. 10 Scan block module, Digital tab

3.2.2   Common memory module

The common memory module is able to measure the 128 kB of common memory. It can be used to acquire station information data in order to store it in a data file or for example to use it for display on an ibaQPanel client.

On the "General" tab you can specify the swap mode and the number of signals.
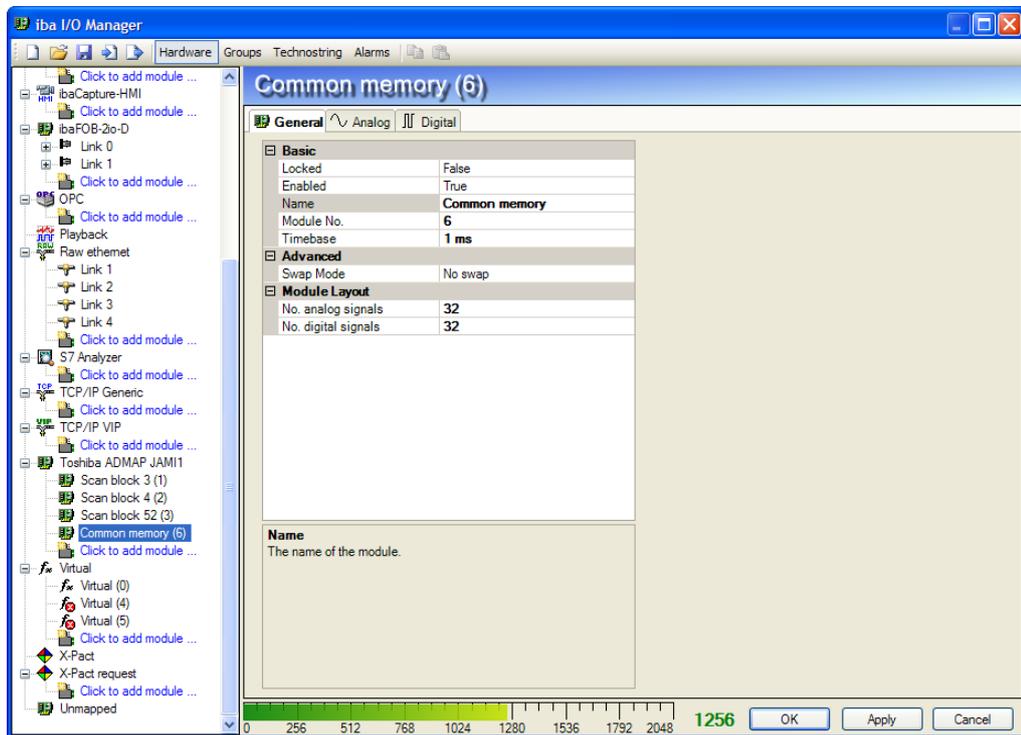
Fig. 11 Common memory module, General tab

"Analog" and "Digital" tabs

The analog and digital signals are configured in the same way like for the scan modules. Only the addresses to be specified here are relative to the start address of the common memory (0 to 128 kB).

For the offsets of the different maps in the common memory please refer to Table 1 "Information in common memory" at the end of chapter 2.3.

4   Reference

In the following you'll find some excerpts of the ADMAP Interface instruction manual (no. 6F8C0732, 1997), showing the allocation of station information in the common memory. You may refer to the offset addresses when using the memory view function in ibaPDA-V6 I/O manager.

4.1.1   Station Status

ADMAP-5M holds information to express the status of own station and information to express the status of other stations.

The format for the station status retained in the ADMAP-5M card is shown below.

15	14	13	12	11	1		0
—	SC	—	—	OL	STATUS		—

SC :   during scan transmission
OL :   online
STATUS :   station status
0000000000 : PowerOn   0000000001 : Diagnose
0000000010 : OffRing   0000000100 : RingConnect
0000001000 : InRing   0000010000 : StandbyOrOnline
0000100000 : Disconnect 0001000000 : Retreat
0010000000 : Test   0100000000 : Halt
1000000000 : Down

4.1.2   Scan information map

As the map related to scan transmission, there exist three types of map:

❑ Scan healthy map

❑ Scan unhealthy map

❑ Scan talker flag

The scan healthy map indicates the present receiving condition using one bit per block. A healthy block is expressed by 1 and an unhealthy block by 0.

The scan unhealthy map is different in that 1 is set for the bit of a block judged healthy once and becomes unhealthy and 0 for others which is held until the application program clears.

All the maps are structured in the same way and provided in the form shown like hereafter.

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+00H	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+02H	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
+7EH	1023	1022	1021	1020	1019	1018	1017	1016	1015	1014	1013	1012	1011	1010	1009	1008

All the scan healthy map, scan unhealthy map, and scan talker flag are allocated one bit each from block 0.

4.1.3   Station inring map

The station inring map is a bit map to express IN/OFF status as to the logical ring for all the stations of the system. The following shows the types.

	15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
+00h	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+02h	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
+1eh	255	254	253	252	251	250	249	248	247	246	245	244	243	242	241	240

In the ascending sequence of the MAC address least significant bytes, the participation of the station in the logical ring is indicated by 1 and no participation by 0.

4.1.4   Online map

Bit map to express online/standby for all the stations in the system. The following shows the types.

	15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
+00h	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+02h	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
+1eh	255	254	253	252	251	250	249	248	247	246	245	244	243	242	241	240

In the ascending sequence of MAC address least significant bytes, the online status of the
station is indicated by 1 and the standby status or OffRing status by 0.

4.1.5 Live list

The live list is a list to store the status for all the stations in the system. The list varies with each ADMAP card.

The following diagram shows the format for the ADMAP-5M live list.

15	0
+00h Not used	EN
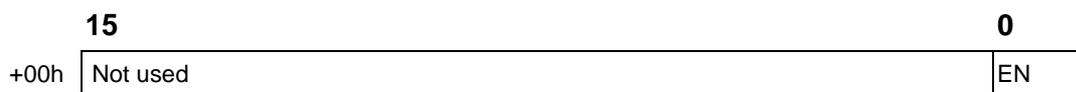
In the offset 0 or 5, the status flag is stored. EN indicates the completion of the list. 1 indicates the completion of data creation for all the stations.

	15 14 13 12 11 10 9	8	7	6	5	4	3	2	1	0	
+02h	Not used	Bnc	Anc	Ber	Aer	ncB	ncA	OL	RX	EN	RG	STN 1
+04h	Not used	Bnc	Anc	Ber	Aer	ncB	ncA	OL	RX	EN	RG	STN 2
+100h	Not used	Bnc	Anc	Ber	Aer	ncB	ncA	OL	RX	EN	RG	STN255

From the offset 2, the status of each station is stored in 16 bits, in the ascending order of the MAC address least significant bytes.

RG : 1 : participating in ring
EN : 1 : information of relevant station is effective
The following status can be judged by combining RG and EN.

EN   RG
0   0 - existence not checked
0   1 - not used
1   1 - status of participation in ring
1   0 - status of removal from ring
OL : 1 : online
ncA : medium A without carrier
ncB : medium B without carrier
Aer : medium A diagnosis abnormal
Ber : medium B diagnosis abnormal
Anc : medium A NCD abnormal
Bnc : medium B NCD abnormal

5   Support and Contact

Support

Phone: +49 911 97282-14

Fax: +49 911 97282-33

E-Mail: support@iba-ag.com

Note

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

Contact

Headquarters

iba AG
Koenigswarterstr. 44
90762 Fuerth
Germany
Phone: +49 911 97282-0
Fax: +49 911 97282-33
E-Mail: iba@iba-ag.com
Contact: Mr. Harald Opel

Regional and Worldwide

For contact data of your regional iba office or representative please refer to our web site

www.iba-ag.com.