



ibaPDA-Request-S7-DP/PN

Request Data Interface to SIMATIC S7

Manual Issue 3.10

> Measurement Systems for Industry and Energy www.iba-ag.com

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

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1 About this manual

This manual describes the use of the Request data interface to SIMATIC S7.

The product *ibaPDA-Request-S7-DP/PN* is an extension of *ibaPDA* for the direct access to S7 symbols and S7 operands when recording data from SIMATIC S7-CPUs. In this manual only the extensions and deviations are shown. For all other functions and operating functions, please see the *ibaPDA* manual.

Other documentation



This documentation provides supplementary information to the general *ibaPDA* manual.

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 the 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-Request-S7-DP/PN* the following basic knowledge is required and/or useful:

- Windows operating system
- Basic knowledge *ibaPDA*
- Basic knowledge network technology
- Knowledge of configuration and operation of SIMATIC S7 PLCs

1.2 Notations

In this manual, the following notations are used:

Action	Notation
Menu command	Menu <i>Logic diagram</i>
Calling the menu command	Step 1 – Step 2 – Step 3 – Step x
	Example:
	Select the menu <i>Logic diagram - Add - New function</i>
	block.
Keys	<key name=""></key>
	Example: <alt>; <f1></f1></alt>
Press the keys simultaneously	<key name=""> + <key name=""></key></key>
	Example: <alt> + <ctrl></ctrl></alt>
Buttons	<key name=""></key>
	Example: <ok>; <cancel></cancel></ok>
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:

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.

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 System requirements

The following system requirements apply for the use of the data interface *ibaPDA-Request-S7-DP/PN*:

- *ibaPDA* v7.0 or higher
- Basic license for *ibaPDA*
- Additional license for *ibaPDA-Request-S7-DP/PN*
- *ibaBM-PN, ibaBM-DP, ibaBM-DPM-S* or *ibaCom-L2B*
- *ibaFOB-D* card on the *ibaPDA*-PC when using *ibaBM-PN*, *ibaBM-DP* or *ibaBM-DPM-S* for connecting via FO conductor
- SIMATIC S7 controller S7-300, S7-400, S7-400H, S7-1500, WinAC
- In case PC/CP connections are used:
 - SIMATIC STEP 7 or SIMATIC NET or
 - SIMATIC TIA Portal
- SIMATIC CFC (beginning with V 6.0), if signals are to be chosen by drag & drop

For integrating the Request blocks in the S7 program:

- SIMATIC STEP 7 V5.4 SP5 or higher, or
- SIMATIC STEP 7 (TIA Portal) V14 SP1 or higher

For more requirements on the used PC hardware and the supported operating systems, please see the *ibaPDA* documentation.

System restrictions

- Access to optimized data blocks of S7-1500 controllers is not supported.
- Access to S7-1200 controllers is not supported.
- Connectors of CFC blocks, which have constant values assigned, have no operand address. They are marked as constant in the address book and cannot be selected as signal.
- If FB function blocks are used in CFC, the internal static variables of the FB are also displayed in the address book, because they are treated in exactly the same way as connectors by the compiler. These are to be ignored.
- For data acquisition, *ibaPDA* supports only the following data types:
 - BOOL, BYTE, WORD, DWORD, INT, DINT, REAL, TIME, CHAR

All other data types exist in the address book but cannot be entered in the signal list.

For functions FC with connections of the data type STRING, POINTER, STRUCT or ANY under CFC, the interpretation of the SCL code does not work, as there are no references to the data types available in the source.

Licenses

Order no.	Name	Description
31.001310	ibaPDA-Request-S7-DP/PN	Extension license for an ibaPDA system to
		ibaBM-DP, ibaBM-DPM-S or ibaCom-L2B

Table 1: Available licenses

3 ibaPDA-Request-S7-DP/PN

3.1 General information

ibaPDA-Request-S7-DP/PN is suitable for the measurement data acquisition via PROFIBUS and PROFINET. The measurement data are sent actively from the controller to *ibaPDA* via the PROFIBUS slaves or PROFINET devices - which are realized in the used device (e.g. *ibaBM-DP*). For this purpose, one or more Request blocks (FB/FC+DBs) have to be integrated per slave/device in the program of the S7-CPU. These Request blocks serve to send cyclically the S7 operands which have been selected by the user within *ibaPDA* via PROFIBUS/PROFINET to be recorded in *ibaPDA*. When modifying the signal selection, no modifications in the S7 program are needed.

The signals to be measured can be comfortably selected either by the absolute operand address or by the symbolic name with support of the *ibaPDA* address book browser. This browser allows to access to all defined symbols of the connected STEP 7 project.

When using the SIMATIC CFC editor on the same PC, the signals and connectors that are to be measured can be configured via drag & drop from the control program.

For recording data from SIMATIC S7-CPUs with *ibaPDA*, there are different hardware devices of iba AG available.

Via PROFIBUS

- *ibaBM-DP* or the predecessor *ibaBM-DPM-S*
- *ibaCom-L2B* PCI card

Via PROFINET

■ ibaBM-PN

Request blocks for *baPDA-Request-S7-DP/PN* are available for the following system configuration:

SIMATIC STEP 7 V5.x (SIMATIC Manager)					
SIMATIC S7 CPU	ibaBM-DP	ibaBM-DPM-S	ibaCom-L2B	ibaBM-PN	
S7-300 integrated DP interface	х	х	х		
S7-300 CP342-5 (PROFIBUS)			х		
S7-400 integrated DP interface and	Х	Х	Х		
CP443-5					
S7-400 integrated DP interface and CP443-5 (PROFIBUS)	Х	Х			
S7-300 integrated PN interface				Х	

SIMATIC STEP 7 V5.x (SIMATIC M	anager)			
SIMATIC S7 CPU	ibaBM-DP	ibaBM-DPM-S	ibaCom-L2B	ibaBM-PN
S7-400				
integrated PN interface and				Х
CP443-1 (PROFINET)				

Table 2: Available Request blocks SIMATIC Manager

SIMATIC STEP 7 V1x Professional (TIA Portal)					
SIMATIC S7 CPU	ibaBM-DP	ibaBM-DPM-S	ibaBM-PN		
S7-300	V	v			
integrated DP interface	^	^			
S7-300			v		
integrated PN interface			^		
S7-400	v	v			
integrated DP interface and CP443-5	^	^			
S7-400					
integrated PN interface and CP443-1			Х		
(PROFINET)					
S7-1500					
integrated DP interface and	Х	Х			
CM1542-5 or CP1542-5 (PROFIBUS)					
S7-1500					
integrated PN interface and			Х		
CM1542-1 (PROFINET)					

Table 3: Available Request blocks SIMATIC TIA portal

Note



You find the Request blocks in the iba S7 library (see chapter **7** *Iba S7 library*, page 139). Always use the current version of this library.

3.1.1 Overview

ibaPDA-Request-S7-DP/PN works with direct access to the S7 operands. The variables that are to be measured can be entered in the signal list either with their operand designations or with their symbolic names that are determined when configuring them in the data block, in the CFC chart or in the symbol table.

This manual is divided into two main parts:

■ General part, valid for all communication channels (chapter **7** *ibaPDA-Request-S7-DP/PN*, page 13)

Device specific part with special information for each variant (chapter **7** Request-S7 Variants, page 32)

Currently, the following devices are supported as communication channels of *ibaPDA-Request-S7-DP/PN*:

- *ibaCom-L2B-x-8* card, in the following called "L2B-Request"
- *ibaBM-DP*, in the following called "DP-Request", in standard mode as well as in redundancy mode. Here is also a compatibility mode available for replacing systems with *ibaCom-L2B* cards.
- *ibaBM-DPM-S* as predecessor of *ibaBM-DP* in standard mode as well as in redundancy mode.
- *ibaBM-PN*, in the following called "PN-Request".

Other documentation

You find detailed information about the devices

- ibaCom-L2B-x-8 card
 - ibaBM-DP
 - ibaBM-DPM-S
 - ibaBM-PN

in the corresponding device manuals.

3.1.2 How does the symbolic Request work?

The S7-CPU generally works with operand addresses. This requires a mapping table between symbols and operands to be created to enable the *ibaPDA* user to select symbolic variables. When selecting a symbol, *ibaPDA* will simultaneously assign the suitable operand addresses.

The mapping table of the symbols to the operand addresses - the address book - is generated using the S7 address book generator that is integrated in *ibaPDA*.

One part of the address book (symbol table and data blocks) is generated by direct evaluation of the STEP 7 project. When using SIMATIC CFC, the SCL code is analyzed that is generated by the CFC Compiler. This SCL code is stored in the STEP 7 project in the "Sources" folder. One look at the SCL code shows that all temporary calculation results at the connectors of the function blocks are stored in data blocks. The address book generator uses this information to create the mapping between block connectors and data blocks.

The browser integrated in the I/O Manager of *ibaPDA* then uses the address book to select the signals.



3.2 Configuration and engineering SIMATIC S7

Independent of the used communication interface, generally the following configuration steps have to be carried out on the SIMATIC side:

- Hardware configuration: Integration of the devices in the device configuration, HW Config or NetPro.
- Software configuration (STEP 7): Integration of the Request blocks in the S7 program

For detailed information about this subject, see the respective paragraph in chapter **7** Request-S7 Variants, page 32.

3.3 Configuration and engineering ibaPDA

3.3.1 General interface settings

For the configuration of the device-specific settings, please see chapter **7** Request-S7 Variants, page 32.

3.3.2 General module settings

All modules have the following common setting options:

🔝 iba I/O Manager							
🗄 🗋 💕 🛃 🌒 🕨 🕶 Hardware Grou	ups Technostring Outputs	h &					
e	S7 request (0)	Analog II Digital					
X40: Bus 0	⊿ Basic	d de set					
Click to add module	Module Type	S7 request					
	Enabled	True	108				
Click to add module	Name Module No	S7 request					
	Timebase	10 ms					
	Use name as prefix	False					
	Auto enable/disable	False					
	Bus number	0					
	Slave number	10					
0 11 0 12	CPU Name	No addressbook					
→ 0 13 → 0 14 → 0 15 ⊕ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	Name The name of the module.						
E [] S7-Xplorer 	Select S7 operands Manage addressbooks						
	0 256 512 768 1	024 1280 1536 1792 2048	0 OK Apply Cancel				

Fig. 1: General module settings

Basic settings

Module Type (information only)

Indicates the type of the current module.

Locked

A module can be locked to avoid unintentional or unauthorized changing of the module settings.

Enabled

Disabled modules are excluded from 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 time base.

Use name as prefix

Puts the module name in front of the signal names.

S7

CPU Name

Select the S7-CPU that is connected to this module. When selecting a S7-CPU, you can select the signals symbolically. Otherwise, the signals are selected via the S7 operand.

This requires that address books have already been generated. Otherwise, the selection list is empty. By clicking on "Create address book…" in the selection list, you get directly to the address book generator (see chapter **7** *Selection via the operand symbols*, page 20).

Note



General settings that are not described here are module-specific settings. These settings are described in chapter **7** *Request-S7 Variants*, page 32 under the respective module version.

3.3.3 Signal configuration

The signals to be measured are selected in the I/O Manager, either using the absolute operand address or the symbolic name provided by the *ibaPDA* address book browser.

When using the SIMATIC CFC editor on the same PC, the signals to be measured and the connectors can be configured from the PLC program via drag & drop in *ibaPDA*.

There are 3 options for selecting measurement values:

- 1. Selection via the absolute address of the S7 operands.
- 2. Selection via the S7 symbol addresses (symbol table and symbols from data blocks)
- 3. Selection of the CFC connectors (when programming the CPU with SIMATIC CFC)

SIMATIC CPU	Access via absolute address	Access via symbol	Access via CFC connectors ¹⁾
S7-300	Х	X	Х
S7-400	Х	X	Х
WinAC	Х	Х	Х
S7-1500	Х	X	

Table 4: Possible ways of access

Supported operand ranges:

Operand ranges	SIMATIC CPUs S7-300/400	SIMATIC CPUs S7-1500
Inputs (I)	Х	Х
Peripheral inputs (PI)	Х	
Outputs (Q)	Х	Х
Markers (M)	Х	Х
Data blocks (DB)	Х	X ²⁾

Table 5: Supported operand ranges

²⁾ The access to optimized data blocks of S7-1500 controllers is not supported.

¹⁾ Prerequisite is the use of the SIMATIC STEP 7 options package S7-CFC

3.3.3.1 Selection via the absolute address of the operands

There are 2 ways for selecting the measurement values via the operand address.

1. On the one hand, you can click on the *General* tab of the module on the "Select S7 operands" link in order to open the S7 operand editor.

🔢 iba I/O Manager					
📔 📑 😂 🛃 🌒 🕨 🕂 Hardware Gro	ups Technostring Outputs	46.			
B deneral B baFOB-4io-D B baFOB-4io-D	S7 request (0)				
ibaBM-DP	General S Connection	V Analog JU Digital			
🛱 🛲 X40: Bus 0	⊿ Basic		A1		
S7 request (0)	Module Type	S7 request			
Click to add module	Locked	False			
	Enabled	True			
Click to add module	Name	S7 request			
	Module No.	0			
	Timebase	10 ms			
	Use name as prefix	False			
	Auto enable/disable	False			
	Bus number	0			
	Slave number	10			
		Na addressbards -			
	CFU Name	No addressbook			
→ 0 13 → 0 14 → 0 15 → 15 → 10 Link 1 → 10 Link 2 → 10 Link 3 → Click to add module → 10 Link 3 → Click to add module → 10 Link 3 → 10 Link 3	CPU Name Select the S7 CPU that is linked to this module. If no CPU is selected then request via S7 symbols is disabled and only request via S7 operands is available.				
∰ Unmapped	Manage addressbooks	124 1280 1536 1792 2048 0	OK Apply Cancel		

Fig. 2: Selecting S7 operands

2. On the other hand, you can click on the *Analog* or *Digital* tab of the module in one field of the "S7 Operand" column.

ş	7 request (0)								
	General 🝠 Connection		log 👖 Digit	al				_	
	Name	Unit	Gain	Offset	S7 Operand	S	7 DataType	Active	*
0	DB 100.DBD 0		1	0	DB 100.DBD 0	D	WORD		
1	DB 100.DBD 4		1	0	DB 100.DBD 4	D١	WORD		
2	DB 100.DBD 8		1	0	DB 100.DBD 8	D١	WORD		
3			1	0	[π		Е
4	5	-	1	0		13IN	π		
5			1	0		Th	π		



In both cases, a dialog box is opened 🛄 in which you can select the S7 operand to be measured.

iba

perand inotation:	DB 1.DBW 0		
Datatype:	INT	•	
Operand	Address	DB Operand	DB Address
8 38 39 39 30 30 30 30 30 30 30 30 30 30 30 30 30	1 * •	DBB DBW DBD	0

Fig. 4: S7 operand constructor

After you have set the desired operand address, click <OK> to exit the dialog.

Thereafter, you can enter the signal name in the *Name* column.

ş	7 request (0)							
	General 🍠 Connection	∿ <mark>Ana</mark>	log 👖 Digit	tal				
	Name	Unit	Gain	Offset	S7 Operand	S7 DataType	Active	-
0	temperature 🛛 🏹)	1	. 0	DB 100.DBD 0	DWORD	V	
1	DB 100.DBD 4	à	1	0	DB 100.DBD 4	DWORD		
2	DB 100.DBD 8		1	0	DB 100.DBD 8	DWORD		
3			1	0		INT		Ш
4	8		1	0		INT		



3.3.3.2 Selection via the operand symbols

This method of access requires that the signals to be measured already have an entry in the S7 symbol table, the PLC variable list or in a data block and that an address book has been created (see chapter **7** Address books, page 27).

An advantage of this way of access is that the symbol addresses are applied automatically in *ibaPDA* as signal names.

You can integrate an address book into the module as follows:

1. Select the S7-CPU you want to assign this module to in the drop down menu on the *General* tab of the module under "CPU Name".

G	eneral 💋 Connection	∧ Analog ∬ Digital							
۵	Basic								
	Module Type	S7 request							
	Locked	False							
	Enabled	True							
	Name	S7 request							
	Module No.	0 10 ms							
	Timebase								
	Use name as prefix	False							
۵	Connection								
	Auto enable/disable	False							
۵	Profibus								
	Bus number	0							
	Slave number	10							
۵	S7								
	CPU Name	with DP-IF (CPU 412-2 DP)							
CF Sel sel	CPU Name PU Name ect the S7 CPU that ect dt hen request v uest via S7 operand Crex	with DP-IF (CPU 412-2 DP addressbook J3xx with DP-IF (CPU 314C-2 PN_DP) J4xx with DP-IF (CPU 412-2 DP) J4C RTX (WinLC RTX) ate addressbook							

2. An additional "S7 symbol" column is displayed on the Analog and Digital tab.

99	S7 Request (0)										
	General 💋 Connection	Analog	∬ Dig	gital							
	Name	Unit	Gain	Offset	S7 Symbol	S7 Operand	S7 DataType	Active			
0			1	0			INT				
1			1	0			INT				
2			1	0			INT				
3			1	0			INT				

Lookup symbols in the signal grid

S7-Xplorer (6)										
General 💋 Connection	∿ Analog	∭ Digital	Diagnostic	3						
Name	Unit	Gain	Offset S7 9	ymbol		S7 Operand	S7 DataType	Active		
0 MB 0		1	0		Columns	MB 0	BYTE			
1 IW 1		1	0	æ	Replace	IW 1	WORD			
2 MD 3		1	0		Lookup missing symbols	MD 3	REAL			
3		1	0		Lookup all symbols		INT			
4		1	0				INT			

Fig. 6: Lookup symbols

ibaPDA can search for the symbol that corresponds to an operand. Right-click on the header of the signal grid and select either *Lookup missing symbols*, then only the missing symbols are searched for. Or select *Lookup all symbols*, then all symbols will be searched and replaced. The command performs a reverse resolution of the S7 symbols from the S7 operands. *ibaPDA* first searches the symbol table, then CFC, and finally the DBs for the operands.

3.3.3.2.1 Selection via Symbol Browser

Now, you can access the symbol addresses via the S7 CFC and symbol browser (short: symbol browser). The symbol browser can be opened in different ways:

1. Click on the link "Select S7 symbols" on the *General* tab. The selected signals are entered automatically in the right table *Analog* or *Digital*. The symbol browser stays open until it is closed with <OK>. This way, several signals can be added successively.



2. On the *Analog* or *Digital* tabs click in a cell of the "S7 Symbol" column. You can only select the symbols with the data type matching the table. After every selection, the symbol browser is closed.

S7 request (0)									
	General 🝠 Connection 🔨	Analog	∬ Dig	ital					
	Name	Unit	Gain	Offset	S7 Symbol	S7 Operand	S7 DataType	Active	
0	ICosine		1	0	SYMBOL\\ICosine	MW 44	INT	V	
1	ITriangle		1	0	SYMBOL\\ITriangle	MW 40	INT		
2	RTriangle		1	0	SYMBOL\\RTriangle	MD 36	REAL		
3	System clock byte		1	0	DBS\DB_TestData\SystemClockByte	DB 20.DBB 0	BYTE	V	
4	Sawtooth signal step width 1		1	0	DBS\DB_TestData\SawTooth_Step1	DB 20.DBW 2	INT		
5	Sawtooth signal step width 100		1	0	DBS\DB_TestData\SawTooth_Step100	DB 20.DBW 6	INT		
6	Sinus frequency 2 Hz		1	0	DBS\DB_TestData\Sinus_2Hz	DB 20.DBD 20	REAL		
7	Cosinus frequency 2 Hz		1	0	DBS\DB_TestData\Cosinus_2Hz	DB 20.DBD 28	REAL		
8			1	0			INT		

In the symbol browser, you have the following options:

CFC variables:

On the *CFC* tab, you can select the configured CFC variables – consisting of the configured names of chart, block and connector.

DB variables:

On the DB tab, the individual data blocks and their variables are displayed.

Symbol table:

On the Symbols tab, the entries of the S7 symbol table can be selected.

Search tab:

You can search the variable via a part of the name.

III S7 CFC and symbol browser	X
S7 CPU : S7-412 (CPU 412-2 DP)	
S7 Symbol : DBS\DB_TestData\Sinus_2Hz	
PCFC DB B Symbols Q Search	
😥 🖅 DPMS_S10_PDA (DB10)	S7 Operand :
🚍 🖬 DB_TestData (DB20)	DB20 DBD20
SystemClockByte	
Saw Tooth_Step 1	S7 Datatype :
SawTooth_Step10	Res and the second s
Saw Tooth_Step 100	REAL
Angular_Frequency_1Hz	
Angular_Frequency_2Hz	
Sinus_1Hz	
Sinus_2Hz	
Cosinus_THZ	Comment :
	Cinus formula and 2 Ha
DB 244bytes_MIX (DB21)	Sinus requercy 2 Hz
DD_244bytes_1221W1 (DD22)	
DB 244Bytes 61DINT (DB24)	
DPMS S10 Intem (DB25)	
DB Slave21 Inputs (DB30)	
PO DPM-S Status (DB39)	
DPMS S11 PDA (DB41)	Show only allowed
DPMS_S12_PDA (DB42)	operands
DPMS S11 Intem (DB71)	
DPMS S12 Intem (DB72)	Use comment as
	signal name
	ОК
	Cancel

Fig. 7: S7-CFC and symbol browser

After having selected the variable, the assigned operand address, the data type and signal comment are displayed on the right side.

The variables are shown in the following colors:

Green	The operand is valid and can be transferred to the module setting with <ok>.</ok>
Yellow	The operand has a data type that does not match the selected column, e. g. in case you have selected a boolean variable as analog value or an integer value as digital value.
Red	The operand has a data type that is not supported by ibaPDA (e.g. STRING), or the operand is a constant.

You can hide all non-valid variables, by clicking on the option "Show only allowed operands".

Usually, the symbolic signal name from STEP 7 is adopted as signal name in the I/O Manager. Optionally, you can adopt the STEP 7 signal comment as signal name in the I/O Manager by selecting the option "Use comment as signal name".



3.3.3.3 Measuring the CFC connectors

For selecting CFC connectors for the measurement process, proceed basically as described in chapter **7** Selection via the operand symbols, page 20 until opening the S7-CFC and symbol browser.

In the S7-CFC and symbol browser open the CFC tab and select the signals here. The connectors are listed hierarchically by chart name, module name and connector name:

S7 CFC and symbol browser	X
S7 CPU : S7-412 (CPU 412-2 DP)	
S7 Symbol : Signalgenerator\COSINE_I\OUT	
B CFC DB B Symbols Search B baPda_Request	S7 Operand :
in <u>in</u> in interactor	DB61.DBW122
	S7 Datatype :
	INT
	Comment :
B - 日 OB122 B - 日 OB80 B - 日 OB82 D - 日 OB82 D - 日 OB85	Show only allowed operands
日本 日本 日本 日本 日本 日本 日本 日本 日本 日本	Use comment as signal name
	Cancel

Fig. 8: S7-CFC and symbol browser



Note



In case no connectors are displayed on the CFC tab, then possibly the SCL sources have not been translated in the STEP 7 project.

To solve this problem, make sure that the following options are selected in the dialog box for compiling the program in the SIMATIC software:

Compile Charts as Pro	ogram	
CPU:	CPU 412-2 DF	
Program name:	S7-412\CPU	412-2 DP\S7-Programm(1)
Cnanges only		1997004
Generate module	e drivers	Block Driver Settings
Generate module	e drivers ource	<u>B</u> lock Driver Settings

Create the address books again.

Note



When compiling a CFC program, generated DB addresses are assigned automatically to the connectors in STEP 7. Depending on the scope of program changes adopted between two compilation runs, connectors may have assigned different DB addresses.

In that case, the address book for *ibaPDA* must be newly generated, too. The symbolically configured signals are checked automatically in the I/O Manager and the associated absolute S7 operands are updated.

Special function Drag & Drop

A convenient way to select signals is to drag & drop them from the CFC chart into the I/O Manager of *ibaPDA*.

For this purpose, display the CFC editor on the same PC in the background as full screen and the *ibaPDA* client in the window mode in the foreground. Then, start the I/O Manager.

T_V61	Object name	Version	PH Assignment	Туре	Author	Last modified	Commer	it (
	🖻 ibaPda_Request	0.0001		CFC		06/20/2014 12:29:16	PM				
412-2 DP 7-Programm(1) 3 Quellen	Signalgenerator	0.0001	iba I/O Ma	nager							
2) CDU 412 2 D	0) 1		🗌 🗋 💕 🎬	🛃 🛃 🌚 👻 Hardwar	e Groups Tec	hnostring Outputs	ð 🚨				
Dptions Wind	ow Help			-4io-D	S7 (9	µest (0)					
	1 8 or 30 = 14	18 1			General	Connection VAr	nalog 👖 Digita	1			
		C Davidsen		x40: Bus 0	Name	U	nit Gain Offs	et S7 Symbol	S7 Operand	S7 DataTyp	pe Active
				S7 request (0)	0 ICosine		1	0 SYMBOL\\ICosine	MW 44	INT	
				Click to add module	1 ITriangle		1	0 SYMBOL\\ITriangle	MW 40	INT	
				Click to add module	2 RTriangle		1	0 SYMBOL\\RTriangle	MD 36	REAL	
				2	3 System d	ock byte	1	0 DBS\DB_TestData\SystemClockByte	DB 30.DBB 0	BYTE	 Image: A state Image: A state
				3	4 Sawtooth	signal step width 1	1	0 DBS\DB_TestData\SawTooth_Step1	DB 30.DBW 2	INT	
		-	2	5	5 Sawtooth	signal step width 100	1	0 DBS\DB_TestData\SawTooth_Step	DB 30.DBW 6	INT	 Image: A start of the start of
+		1		6	6 Sinus free	quency 2 Hz	1	0 DBS\DB_TestData\Sinus_2Hz	DB 30.DBD 20	REAL	
	1	and the second s		7	7 Cosinus f	requency 2 Hz	1	0 DBS\DB_TestData\Cosinus_2Hz	DB 30.DBD 28	REAL	
	1	-		9	8		1	0		INT	
	CMP_R			10	9	No.	1	0		INT	
	REAL-Cop			11	10		1	0		INT	
628.319-	IN2 GE	F		12	11		1	0		INT	
	EG	-		14	12		1	0		INT	
		1-0		15	13		1	0		INT	
			E E Link	C 10	14			0	0	INT	

Fig. 9: Selecting signals via drag & drop

Now, click the connector in the CFC chart, hold the mouse key down, drag it onto the I/O Manager and drop it in the desired signal row. The CFC connector is then entered in the signal table of the request module.

Note



For the drag & drop mechanism to work correctly, the address book belonging to the CPU has to be generated before and assigned to the request module.

During the drag & drop procedure, the associated absolute S7 operand is searched based on the selected connector (described by chart, block and connector name) from the address book and inserted into the signal row.



3.3.4 Address books

The address books for SIMATIC S7 controllers are created and managed across modules. One address book can be used in more than one module.

🔢 iba I/O Manager					
🗄 🗋 🎽 🎽 🚽 🌗 🕇 Har	dware Grou	ps Technostring Ou	utputs 🛛 🖻 🖺		
General GPC server Multistation Addressbooks S Time synchronization Bar Bar B-2io-D	Addre	essbooks			
	🕎 Simatic	: \$7			
	S7 operand:	s in 💿 English		Import address books	Create address books
		🔘 German		Delete selected address books	
i ∰ - ∰ S7 TCP/UDP	CPU	/	Creation Time	S7 Project	Modules
Playback	🦂 🗏 Proj	ject Type: Step7			
	CPL 412	J412_REQ_TEST (CPU ?-2 PN)	19.11.2015 13:59	H:\20_Projekte\ibaPDA-Reque st-57\Test\test57412_REQ_D P_PN_UDP\test5741.s7p	57-Xplorer 412 (0) 57 PN Request 412 64 (1) 57 UDP Request 412 (10) 57 DP Request 412 FC122 (20) 57 DP Request 412 NEW (21) 57 PN Request 412 252 (31)
	🔛 🖂 Proj	ject Type: TIA Portal		6 G	
	CPL	J1516_REQ_TEST	19.11.2015 14:29	H:\20_Projekte\ibaPDA-Reque st-57\Test\testTIA1516_REQ _DP_PN_UDP\testTIA1516_R EQ_DP_PN_UDP.ap13	57-Xplorer 1516 TCP (5) 57-Xplorer 1516 TIA (6) 57 UDP Request 1516 (15) 57 UDP Request 1516 TIA (16) 57 DP Request 1516 TIA (26) 57 DP Request 1516 TIA (26) 57 PN Request 1516 252 (35) 57 PN Request 1516 252 TIA (36)



There are different types of address books for the different S7 project types:

- STEP 7: SIMATIC Manager project (not for modules with connection mode TCP/IP S7-1x00)
- TIA Portal: TIA Portal Project

S7 operands in English / German

Selection of the signal mnemonics

Import address books

Import of address books which have already been created

Create address books

Creates new address books from STEP 7 projects

Delete selected address books

Deletes address books from a table

Table

List of all address books currently available in the system with name, creation date, storage path of the STEP 7 project or IP address of the CPU for address books read online and location of use of the address book.

Creating an address book

An S7 address book can either be created offline from an S7 project (both STEP 7 CLASSIC and TIA-Portal) or online directly from a CPU (S7-1200 / 1500 only).



iba

Offline from S7 project

For creating an address book, the S7 project has to be available. This is not necessary for subsequent use.

Open the S7 address book generator with the <Create address books> button. Optionally, you can also open it under "S7 - CPU Name" on the *General* tab in the module configuration. Select "Create addressbook..." in the dropdown menu.

G	eneral 🍠 Connection	🔨 Analog 👖 Digital 🔟 S7 request in
۵	Basic	
	Module Type	ibaBM-PN\S7 Request
	Locked	False
	Enabled	True
	Name	S7 Request
	Module No.	0
	Timebase	10 ms
	Use name as prefix	False
۵	Advanced	
	No. analog signals	64
	No. digital signals	64
۵	Connection	
	Auto enable/disable	False
۵	Profinet	
	Device	0
	Slot	1
۵	S7	an an an
	CPU Name	🚫 No addressbook 🛛 🚽
		🚫 No addressbook
CD	U Namo	Create addressbook

Fig. 11: Create S7 address book from module configuration

Procedure in the S7 address book generator:

1. Click on the button <Add project>

🗑 S7 addressbook generator	- • •
CPU Name:	
Step 7 HW Config export:	
Comment language:	
Add project Remove project Creat	e addressbooks

CPU Name

CPU designation

Step 7 HW Config export

optional selection of a HW Config export file (useful when using an iba busmonitor in sniffing mode)

Comment language

Imported comment language can be selected (only available in SIMATIC TIA Portal projects)

Add project

Adds a new project to the list

Remove project

Removes the marked project from the list

Create address books

Creates address books from the selected projects

- 2. Select a project file in the file browser
- 3. Now, the STEP 7 project with all configured CPUs is displayed. Mark the CPUs you want to create the address books from and click on the button <Create addressbooks>.

iba

E:\S7-projects\S7C	LASSIC_S7_Xplorer\S7classi.s7p	
📄 🔄 🎒 S7CLASSIC	_S7_Xplorer_V01	
E-E E CPU3xx		
	U3xx (CPU 317-2 PN_DP)	1 10
	IA_57_Xplorer_V13_5P1\571IA_57_Xplorer_V13_5P	1.ap13
□ □ □ □ □ □ □ 1/1/A_0/_/	~piorer_v13_3F1	
S7-151	6 Xplorer	
	6 Xplorer	
	6 Xplorer	
S7-151	6 Xplorer	
S7-151	6 Xplorer S7-1516 Xplorer	
CPU Name: Step 7 HW Config export:	6 Xplorer S7-1516 Xplorer	
CPU Name: Step 7 HW Config export: Comment language:	6 Xplorer S7-1516 Xplorer	
CPU Name: Step 7 HW Config export: Comment language:	6 Xplorer S7-1516 Xplorer Deutsch (Deutschland)	(

4. Now, you can select the created address book in the selection list.

Note



The entry in the "CPU Name" field can be overwritten. Thus, you can assign a unique name for the CPU that differs from that in the STEP 7 project. This is especially interesting, when you use several STEP 7 projects in which the CPUs have the same name.

Note



TIA Portal projects must be compiled, saved and closed, when address books of these projects are generated.

Online from S7-1200 / 1500 CPU

Online address books can be created out of an S7-1200 or S7-1500 CPU if connection mode TCP/IP S7-1x00 has been selected. The address data are read directly from the CPU. Accessing the S7 project is not necessary.

Click on button <Load addressbook from S7> to load the address book.

The CPU name of the address book will be given automatically.

🛄 General	🖉 Connection 🔨 Analog 👖 🛛	Digital 🛄 S7 reque	est info			
Connection						
Connection m	node: TCP/IP S7-1x00 💌	Connection type:	PG connection	-	Timeout (s):	15 🚔
Address:	192.168.50.90					Test
DB:	🥫 ibaREQ_DB_PN (DB17)		levice slot: 1 🚔	Load	addressbook from	S7
CPU Name:	PLC (192.168.50.90)	👻 🔽 Dete	ct S7 restart (This applies to all	S7 request modules	5)	
onnecting to onnected suc oading symbo uccessfully lo /riting address	S7 at 192.168.50.90 ccessfully to S7 at 192.168.50.90 ols from S7 paded symbols sbook	50 90)				

Fig. 12: Load address book online from CPU

Address books which have been created online do also contain operand type address information and hence can be used in connection mode TCP/IP as well. Change the connection mode after creation of the address book.



4 Request-S7 Variants

4.1 Request-S7 for ibaBM-PN

In the following, we describe the Request-S7 version for the PROFINET bus module *ibaBM-PN*.

4.1.1 General information

Request-S7 for *ibaBM-PN* can be configured in the following system configurations:

SIMATIC S7 CPU	SIMATIC STEP 7 V5.x (SIMATIC Manager)	SIMATIC STEP 7 V1x Professional (TIA Portal)
S7-300 integrated PN interface	Х	Х
S7-400 integrated PN interface and CP443-1	Х	Х
S7-1500 integrated PN interface and CM1542-1		Х

Table 6: Request-S7 for ibaBM-PN system configuration

With the PN Request, the measurement values (Request Handshake) are requested via a separate TCP/IP connection.

Depending on the hardware and software, different access points can be selected for the Request:

- TCP/IP: the connection to the SIMATIC S7 is established over an integrated PN interface of the S7-CPU or the respective CP modules in the PLC and the standard network interface of the PC. No additional Siemens software is required for the connection.
- PC/CP: this is the designation for different SIMATIC specific access points. In contrast to the TCP/IP connection, the SIMATIC communication software (and the corresponding licenses) must be installed on the PC for all connection types within the PC/CP group.
 - MPI, PROFIBUS: The connection to the SIMATIC S7 is established via the MPI or PROFIBUS interface of the PC; e.g. with the PCI card CP5611 or the MPI adapter for USB or serial PC interface.
 - TCP/IP, ISO: here, either the standard network interface of the PC or a suitable interface card is used for the connection to the S7.
- TCP/IP S7-1x00: The connection to a SIMATIC S7-1500 is established via an integrated PN interface of the S7-CPU or respective CP modules in the PLC and the standard network interface of the PC. No additional Siemens software is required for the connection.



System integration with ibaBM-PN

The measured data are transmitted to the *ibaBM-PN* device over PROFINET.

You need the following connections:

- Online connection between *ibaPDA* and S7-CPU (TCP/IP, MPI or DP)
- Fiber optic connection between ibaPDA/ibaFOB-io-D and ibaBM-PN
- PROFINET connection between *ibaBM-PN* and S7-CPU

The bus monitor offers two separate PROFINET devices. A transfer rate of max. 1440 Byte is possible for each device.



Fig. 13: Request-S7 with ibaBM-PN

Other documentation



For detailed information about *ibaBM-PN*, please see the device manual.

For information about application examples, see chapter **7** Application examples, page 148.

4.1.2 Configuration and engineering SIMATIC S7-300, S7-400 and WinAC

In the following, we describe the configuration and engineering on the SIMATIC S7 side with SIMATIC Manager (STEP 7 Version \leq V5).

On the SIMATIC side, generally the following configuration steps have to be carried out:

- Hardware configuration
 Integration of the PROFINET device in the hardware configuration
- Software configuration (STEP 7 V5): Integration of the Request blocks in the S7 program

4.1.2.1 Description of the Request blocks

The communication between the S7 and ibaPDA is initialized and controlled with these blocks.

One set of Request blocks has to be called for each Request module (connection) in *ibaPDA*. The used blocks are part of the iba S7 library (see chapter **7** *Iba S7 library*, page 139).

Depending on the system configuration, different Request block combinations have to be used:

Request block	CPU with integrated PN interface or WinAC RTX	S7-400 CPU + CP443-1	recommended call up level
ibaREQ_M (FB140)	Х	Х	OB1
ibaREQ_PN (FB141)	Х	Х	OB1 or OB3x
ibaREQ_PNdev (FB150)	х	Х	OB1 or OB3x
ibaREQ_DB (DB15)	х	Х	-

Table 7: Request blocks

The following blocks always have to be used:

■ ibaREQ_M (Management)

The block realizes the communication with *ibaPDA*. Ideally, the block is called in the OB1. This block has to be called separately in every system configuration for each module in ibaPDA.

- ibaREQ_PN (provides the actual signal values)
 The block provides the actual signal values in the call up cycle and sends the provided values via PROFINET.
- ibaREQ-PNdev (diagnostics for PROFINET device)
 The block diagnoses cyclically the availability of the used PROFINET device.
- ibaREQ_DB (interface DB)
 This DB serves as interface to *ibaPDA* and between the different Request blocks.

4.1.2.1.1 ibaREQ_M (FB140)

Description	of the	formal	parameters:
-------------	--------	--------	-------------

Name	Туре	Data Type	Description
REQ_DB	IN	BLOCK_DB	DB of the ibaPDA communication interface ibaREQ_DB
RESET	IN	BOOL	FALSE -> do no perform reset (Standard) TRUE -> perform reset



Name	Туре	Data Type	Description
INP_RANGE	IN	INT	Number of input bytes (evaluation only during initialization), 0:automatic detection (recommended)
OUT_RANGE	IN	INT	Number of output bytes (evaluation only during initialization), 0:automatic detection (recommended)
MARKER_RANGE	IN	INT	Number of marker bytes (evaluation only during initialization), 0:automatic detection (recommended)
ERROR_STATUS	OUT	DWORD	Internal error code

The following SFCs are used internally:

- SFC 20 (BLKMOV)
- SFC 21 (FILL)
- SFC 24 (TEST_DB)
- SFC 51 (RDSYSST)

Detailed description:

REQ_DB

The DB is used for data exchange with *ibaPDA*. For all Request blocks that belong together, the identical DB has to be configured.

Length: 5280 Bytes : up to 128 Pointers (min.) 9120 Bytes : up to 512 Pointers 14240 Bytes : up to 1024 Pointers (max.)

Any other length within these limits is permitted. The number of usable pointers will be evaluated according to the length.

RESET

Serves for manually resetting the Request blocks. All Request blocks of a combination are automatically reset together. Usually, the input does not have to be connected

INP_RANGE

Limits the number of input bytes to be measured.

If INP_RANGE = 0, the size of the available processor image of the inputs is determined by the Request FB itself (recommended). Evaluation is done only during the initialization phase of the module.

OUT_RANGE

Limits the number of output bytes to be measured.

With OUT_RANGE = 0, the size of the available processor image of the outputs is determined by the Request FB itself (recommended). Evaluation is done only during the initialization phase of the module.



MARKER_RANGE

Limits the number of marker bytes to be measured.

With MARKER_RANGE = 0, the number of available markers is determined by the Request FB itself (recommended). Evaluation is done only during the initialization phase of the module.

ERROR_STATUS

Internal error of the block. If there is no error, the value 0 will be issued.

For a list of all possible error codes, see chapter **7** Error codes of Request blocks, page 168.

4.1.2.1.2 ibaREQ_PN (FB141)

Description of the formal parameters:

Name	Туре	Data Type	Description
REQ_DB	IN	BLOCK_DB	DB of the ibaPDA communication interface ibaREQ_DB
ADR_SLOT	IN	INT	Start address of the peripheral output range
DEVICE_STATUS	OUT	INT	Status of the PROFINET device
ERROR_STATUS	OUT	INT	Internal error code

The following SFCs are used internally:

- SFC 15 (DPWR_DAT)
- SFC 20 (BLKMOV)
- SFC 21 (FILL)
- SFC 50 (RD_LGADR)
- SFC 71 (LOG_GEO)

Detailed description:

REQ_DB

The DB is used for data exchange with *ibaPDA*. For all Request blocks that belong together, the identical DB has to be configured.

ADDR_SLOT

Peripheral start address of the used slot in ibaBM-PN in the peripheral output range for sending data.

DEVICE STATUS

Status of the addressed PROFINET device in the ibaBM-PN. (0: Device not accessible / error, 1: Device accessible)

ERROR_STATUS

Internal error of the block. If there is no error, the value 0 will be issued.

For a list of all possible error codes, see chapter **↗** Error codes of Request blocks, page 168.
4.1.2.1.3 ibaREQ_PNdev (FB150)

Description of the formal parameters:

Name	Туре	Data Type	Description
ADR_SLOT	IN	INT	Start address of the peripheral output range
DEVICE_STATUS	OUT	INT	Status of the PROFINET device
ERROR_STATUS	OUT	INT	Internal error code

The following SFCs are used internally:

- SFC 51 (RDSYSST)
- SFC 71 (LOG_GEO)

Detailed description:

ADDR_SLOT

Peripheral start address of the used slot in ibaBM-PN in the peripheral output range for sending data.

DEVICE STATUS

Status of the addressed PROFINET device in the ibaBM-PN. (0: Device not accessible / error, 1: Device accessible)

ERROR_STATUS

Internal error of the block. If there is no error, the value 0 will be issued.

For a list of all possible error codes, see chapter **7** Error codes of Request blocks, page 168.

4.1.2.2 Hardware configuration

For each PROFINET device, a separate PROFINET device has to be configured.

The GSDML file "GSDML-Vx.yy-ibaBM-PN-yyyymmdd.xml" has to be used.

Note



You find the latest version of the GSDML file on the "iba Software & Manuals" DVD in the following directory:

\02_iba_Hardware\ibaBM-PN\01_GSD_Files\

S7-CPUs provide consistent slots with a max. of 252 Bytes. You need one slot for each Request block. You can also use slots with a smaller size.



🔁 (0) UR		1			
1 2 X1 X2 X3 X3 P1 R X3 P2 R 3 4 5 6 7 8 9 10 11	CPU 319-3 PN/1 MPI/DP DP PN-10 Port 1 Port 2	<u></u>	Etheme ib	t(1): PROFINE baBM-P aBM-PN	T-IO-System (100)
		m			
(1)	ibaBM-PN		tu.u	le u	1. Contraction
Slot	Module	Urder number	I Address	U address	Diagnostic Address
<i>u</i>	IDaBM-PN	13.1200000		2	8785*
X7	Interface				8764*
XTFTR	Fort 1				8783**
X1 F2 R	Fort 2	0			8182×
1	252 bytes 0	0		256507	-
2					
3					

Fig. 14: Hardware configuration

4.1.2.3 Configuration in STEP 7

In the following, we describe how to configure the Request blocks in STEP 7 V5.

Request-S7 is intended for the use with CPUs S7-300/400 with integrated PN interface or CPUs S7-400 with external interface CP 443-1 (PROFINET controller).

Note

1

The use of the external PN interface CP343-1 of a CPU S7-300 is not supported!

Note



The request blocks do not support multi-instance calls.

Copy the required blocks from the iba S7 library (see chapter **7** *Iba S7 library*, page 139) to the blocks folder of your STEP 7 project:



Note



If the block numbers in your project are already occupied, assign new numbers to the blocks from the iba S7 library when copying.

The following blocks are required:

- ibaREQ_M (FB140)
- ibaREQ_PN (FB141)
- ibaREQ_PNdev (FB150)
- ibaREQ_DB (DB15)

For each used PROFINET device of an ibaBM-PN, the following steps have to be carried out:

Call the ibaREQ_PNdev (FB150) preferably within the OB1 or a cyclic interrupt (OB3x).



For each Request module, the following steps have to be carried out:

1. Call the ibaREQ_M (FB140) preferably within the OB1



- 2. Enable "Retain" for the complete instance block, you have just created.
- 3. Call the ibaREQ_PN (FB141), preferably within the OB1 or a cyclic interrupt OB (OB3x).



For each additional Request module:

- In the blocks folder, an ibaREQ_DB (DB15) has to be available for each Request module. Copy the data block and assign a new unique DB number.
- Within the OB1, the ibaREQ_M (FB140) has to be called once more for each Request module with a new DB number (input REQ_DB).
- Within the OB1 or a cyclic interrupt OB (OB3x), the ibaREQ_PN (FB141) has to be called once more for each Request module with the new DB number (Input REQ_DB).
- Please consider that all instance data blocks have to be unique and that the values for the ADR_SLOT are assigned uniquely.
- It is sufficient to call the ibaREQ_PNdev just once per used PROFINET device and not for each Request module.

Finish:

• Load all blocks into the S7-CPU and restart.

4.1.3 Configuration and engineering SIMATIC S7-1500

In the following, we describe the configuration and engineering on the SIMATIC S7 side with the SIMATIC TIA Portal.

Basically, the following configuration steps have to be carried out on the SIMATIC TIA Portal side:

- Network configuration
 Integration of the PROFINET devices in the device configuration
- Configuration Software: Integration of the Request blocks in the S7 program
- Device configuration: Setting the CPU protection properties



4.1.3.1 Description of the Request blocks

The communication between the S7 and ibaPDA is initialized and controlled with these blocks. One set of Request blocks has to be called for each Request module (connection).

The used blocks are part of the iba S7 library (see chapter **7** *Iba S7 library*, page 139).

Request block	S7-1500 CPU with inte- grated PN interface	S7-1500 CPU with CM1542-1	recommended call up level
ibaREQ_M (FB1400)	х	Х	OB1
ibaREQ_PN (FB1401)	х	Х	OB1 or OB3x
ibaREQ_DB (DB15)	х	Х	-
ibaREQ_DB-Interface	X	Х	-

Table 8: Request blocks

- ibaREQ_M (Management)
 The block realizes the communication with *ibaPDA*. Ideally, the block is called in the OB1.
- ibaREQ_PN (provides and sends the actual signal values)
 The block provides the actual signal values in the send cycle. Ideally, the block is called in a cyclic interrupt OB.
- ibaREQ_DB (interface DB)
 This DB serves as interface to *ibaPDA* and between the different Request blocks.

4.1.3.1.1 ibaREQ_M (FB1400)

Description of the formal parameters:

Name	Туре	Data Type	Description
REQ_DB	IN	DB_ANY	DB of the ibaPDA communication interface ibaREQ_DB
RESET	IN	BOOL	TRUE -> perform reset
CPU_HW_ID	IN	HW_IO	Hardware ID of local CPU
ERROR_STATUS	OUT	WORD	Error code

The following SIMATIC standard blocks are used internally:

GET_IM_DATA (FB801)

Detailed description:

REQ_DB

The DB is used for data exchange with *ibaPDA*. For all Request blocks that belong together, the identical DB has to be configured.

The length of the data block is fixed.

RESET

Serves for manually resetting the Request blocks. All Request blocks of a combination are automatically reset together. Usually, the parameter does not have to be connected

CPU_HW_ID

TIA Portal system constant, which refers to the corresponding CPU.

ERROR_STATUS

Internal error of the block. If there is no error, the value 0 will be issued.

For a list of all possible error codes, see chapter **7** Error codes of Request blocks, page 168.

4.1.3.1.2 ibaREQ_PN (FB1401)

Description of the formal parameters:

Name	Туре	Data Type	Description
ADR_SLOT	IN	VARIANT	Start address of the output range
RESET_CON	IN	BOOL	TRUE -> reset of the communication connec- tion
REQ_DB	INOUT	UDT	DB of the ibaPDA communication interface ibaREQ_DB
ERROR_STATUS	OUT	WORD	Internal error code

Detailed description:

ADR_SLOT

Start address of the used slot in *ibaBM-PN* in the output range of the process image.

REQ_DB

The DB is used for data exchange with *ibaPDA*. For all Request blocks that belong together, the identical DB has to be configured.

ERROR_STATUS

Internal error of the block. If there is no error, the value 0 will be issued.

For a list of all possible error codes, see chapter **7** Error codes of Request blocks, page 168.



4.1.3.2 Network configuration

For each PROFINET device, a separate PROFINET device has to be configured.

The GSDML file "GSDML-Vx.yy-ibaBM-PN-yyyymmdd.xml" has to be used.

Note



You find the latest version of the GSDML file on the "iba Software & Manuals" DVD in the following directory:

\02_iba_Hardware\ibaBM-PN\01_GSD_Files\

S7-CPUs allow consistent slots with max. 252 Bytes. You need one slot for each Request block. You can also use slots with a smaller size.



Fig. 15: Net view

dt	ibaBM-PN	🔽 🖽 🖽 🔍 ±		Device overview							
			^	1 Module	 Rack	Slot	I address	Q address	Туре	Article number	
				🔻 ibaBM-PN	0	0			ibaBM-PN busmoni	13.120000	^
	APA			Interface	0	0 X1			ibaBM-PN		
	1385M			252 bytes O_1	0	1		256507	252 bytes O		-
	N.		1		0	2					
					0	з					
			•		0	4					
					0	5					
		14	<u> </u>		0	6					
		ibaBM-PN	1		0	7					
					0	8					
					0	9					
					0	10					
					0	11					
					0	12					
			~		0	12					v

Fig. 16: Device view

4.1.3.3 Configuration in STEP 7

In the following, we describe how to configure the Request blocks in TIA Portal STEP 7.

Copy the required blocks from the iba S7 library (see chapter **7** *Iba S7 library*, page 139) to the blocks folder of your STEP 7 project:

iba

Note



The request blocks do not support multi-instance calls.

The following blocks are required:

- ibaREQ_M (FB1400)
- ibaREQ_PN (FB1401)
- ibaREQ_DB (DB15)
- ibaREQ_DB-Interface (PLC data type)

For each Request module, the following steps have to be carried out:

1. Call the ibaREQ_M (FB1400) preferably within the OB1



2. Enable "Retain" for the complete instance block, you have just created.

	S7TIA_PN_REQ	_V13_SP1 → S7-	1516 REQ-S7-PN [0	PU 151	6-3 PN/DP] 🕨	Program blo	:ks → ibaREC	Q_M_DB [D	B1400]
Devices									
300 Ma			a 🖿 🔣 😤				1		
	ibaREO M I	DB					1		
STIA PN REO V13 SP1	Name		Data type	Offset	Start value	Retain	Accessible f	Visible in	Setnoint
Add new device	1 TI Input		boto ope	onser	Store Foree				
Devices & networks	2 - RES	SET	Bool	0.0	false				
• 1 S7-1516 REQ-S7-PN [CPU 1516-3 PN/DP]	3 🕣 🔻 Outpu	ıt		N. M. M.			Ä		
Device configuration	4 🕣 = ERF	ROR STATUS	Word	2.0	16#0				
Q Online & diagnostics	5 🕣 🕶 InOut							ā	
▼ 🔜 Program blocks	6 🕣 = REC	Q DB	*ibaREQ_DB-Interfa	4.0					
Add new block	7 📹 🔻 Static								
Cyclic interrupt 1ms [OB31]	8 🕣 = 🕨 EXI	PERT	Struct	10.0					
Cyclic interrupt 10ms [OB30]	9 🕣 🔳 siD	Binitialized	Bool	12.0	false				
📲 Main [OB1]	10 🤕 = sO	perandsInvalid	Bool	12.1	false		V	Image: A start and a start	
🔹 ibaSignalgenerator [FC99]	11 📶 🖷 siN	/DataValid	Bool	12.2	false				
🔁 ibaREQ_M [FB1400]	12 📹 🕷 sO	k	Bool	12.3	false			Image: A start and a start	
🚰 ibaREQ_PN [FB1401]	13 🕣 🖬 🕨 sGl	ET_IM_DATA	Get_IM_Data					V	
🥃 Demo (DB100)	14 📹 🔹 🕨 silv	LDATA	Array[053] of Byte	14.0					
🏮 ibaREQ_DB [DB15]	15 📹 🔹 sAd	drOPList	Dint	68.0	0				
ibaREO_DB_1[DB16]	16 📹 🔹 cDi	BAddr_PDA257	Int	72.0	64		V	V	
🗃 ibaREQ_M_DB [DB1400]	17 🕣 = cDi	BAddr_S72PDA	Int	74.0	1440			Image: A start and a start	
108 REQ_M_DB_1 [DB1402]	18 🕣 🔹 cDi	BAddr_Xchange	Int	76.0	2464		V	Image: A start and a start	
ᇕ ibaREQ_PN_DB [DB1401]	19 📹 🔹 cDi	BAddr_Ops	Int	78.0	2528		V		
ᇕ ibaREQ_PN_DB_1 [DB1403]	20 📹 🔹 cDi	BAddr_actVal	Int	80.0	12768		V	Image: A start and a start	
System blocks	21 📹 = cM	laxDataLength	UInt	82.0	1472		V		
Technology objects	22 📹 🔹 sRE	EQ_AnzOperandenI	Int	84.0	0		V	1	
External source files	23 - sRE	Q AnzOperandenI	Int	86.0	0				

3. Call the ibaREQ_PN (FB1401), preferably within the OB1 or a cyclic interrupt OB (OB3x).



For each additional Request module:

- In the blocks folder, an ibaREQ_DB (DB15) has to be available for each Request module. Copy the data block and assign a new unique DB number.
- Within the OB1, the ibaREQ_M (FB1400) has to be called once more for each Request module with the new DB number.
- Within the OB1 or within a cyclic interrupt (OB3x), the ibaREQ_PN (FB1401) has to be called for each Request module with the new DB number once more.
- Please consider that all instance data blocks have to be unique and that the values for the ADR_SLOT are assigned uniquely.

Finish:

■ Load all blocks into the S7-CPU and restart.

4.1.3.4 Device configuration

The following settings have to be done in the device configuration of the CPU:



Fig. 17: Device configuration

1. Disable ibaREQ_DB (DB15) Properties – Attributes – Optimized block access

General		
General Information	Attributes	
Time stamps		
Compilation	Only store in load memory	
Protection	Data block write-protected in the device	
Attributes	Optimized block access	

When using the connection mode TCP/IP (not TCP/IP S7-1x00) with S7-1500 CPUs, the following settings at the device configuration have to be made in addition:

2. Properties – General – Protection – Connection mechanisms: Permit access with PUT/GET communication

demoREQ-S7-UDP [CPU 1516-3 PN/DP]					Properties	Linfo 🚺 💟 Diagnostics 📃	
General IO tags System cor	nstants Texts						
 General Project information 	Protection						^
Catalog information Identification & Maintenance > PROFINET interface [X1] > PROFINET interface [X2]	Access level Select the access level for the PLC.						
 DP interface [X3] 	Access level		Access		Access permi		
Startup		HMI	Read	Write	Password		
Cycle	 Full access (no protection) 	~	~	~	-		
Communication load	Read access	~	~				
System and clock memory	HMI access	~					
 System diagnostics 	 No access (complete protection) 						
Webserver							
Display							
User interface languages							
Time of day	Full access (no protection): The Party Lucase and Life applications will be a						
Protection	No password is required.	access to all full	cuons.				
 System power supply 	A Contraction of the second						
Configuration control							
Connection resources							
Overview of addresses							
	Connection mechanisms						
				-			
	🖌 Permit ac	cess with PUT/GI	Tcommunica	tion from rer	mote partner (PLC, H	MI, OPC,)	

Access protection S7-1500

An access protection can be enabled for an S7-1500 CPU. The following dependencies on *ibaPDA* apply:

Access level	CPU access	ibaPDA reads symbolic from CPU	S7-Request access
Full access (no protec- tion)	HMI, read, write	ОК	ОК
Read access	HMI, read	ОК	ОК
HMI access	НМІ	No	ОК
No access (complete protection)		No	No

Table 9: Access protection S7-1500

4.1.4 Configuration and engineering ibaPDA

4.1.4.1 General interface settings

The interface *ibaPDA-Request-S7-DP/PN* is configured in the *ibaPDA* "I/O Manager". Prerequisite is the installation of an *ibaFOB-D* card in the *ibaPDA* computer. When the *ibaFOB* card has been installed successfully, it is shown in the interface tree.

🗋 📂 🚰 🌒 🂽 🔻 Hardware Groups	Technostring Outputs	©_D)				
## can bisket ## can bisket	Configuration Interface settings Interrupt mode :	Info Memory view Master mode internal	•	💟 In use	Enable watchdog	
OPC STCP/UDP STATE/UDP STAJere が Playback f Vitual Unmapped	PCI Info Slot Number: Bus Number: Vendor:	1	IO Address: Mem. Address: iba AG	0x00004000 0xD3340000	IO Length: Mem. Length: Device Id:	0x00000100 0x00000200 0xF0B4

Fig. 18: I/O Manager, display ibaFOB-D card

Other documentation

al.



You can find more information about the *ibaFOB-D* card in the respective manu-

Configuring ibaBM-PN

- 1. Start the *ibaPDA* client 🔤 and open the I/O Manager 🕮.
- 2. Select the link of the *ibaFOB* card to which *ibaBM-PN* is connected in the interface tree (left). Click on the link "Click to add module..." and select the *ibaBM-PN* module.



General Josephi - Construction - Construct	ibaFOB-4io).D	
unita un	Definition Configuration	Info Memory view	_
Click to add module		Maeter mode internal	
G w Link A G w Link B G Click to add module G OPC Click to add module G Click to add module G Click to add module	Name : ibaBM-DP Module type : ibaPADU-4-AI-U ibaPADU-8	ibaPADU-D-8AI-U	📑 ibaBM-CAN
S7-Xplorer Click to add module Playback Fx Virtual	ibaPADU-8-1 ibaPADU-8-ICP ibaPADU-8-M ibaPADU-8-M ibaPADU-16	Barbar ibaPADU-S-IT-2x16 Barbar ibaPADU-S-IT-16 Barbar HAICMON CMU Barbar ibaCMU-S	ibaBM-DDCS ibaBM-DDCSM ibaBM-DP ibaBM-DP ibaBM-DP-64
→ fr Vitual (0) Click to add module Unmapped	ibaPADU-16-M baPADU-32 baPADU-D-8AI-I	To ibaPACO-4 ibaPQU-S ibaDIG-40	ibaBM-DPM-64 ibaBM-DPM-S ibaBM-DPM-S-64

- 3. Add a Request module (or several modules, in case you need more connections to one or to different S7-CPUs) to the *ibaBM-PN* module on the respective PROFINET connection Device 0 or Device 1. Available modules are:
 - S7 Request

(for acquiring analog and digital signals)

 S7 Request Decoder (for acquiring up to 1024 digital signals)

🖀 Add module	×
Name : Device slot	
Module type :	
III S7 Request III S7 Request Dekoder	
ОК Са	ncel

- 4. Configure the required module settings and signals as described in the following chapters. The *General* and *Connection* tabs are identical for all Request modules. The Request modules only differ in the *Analog* and *Digital* tabs.
- 5. After you have finished the configuration, click <Apply> or <OK> to transfer the new configuration to the device and start data acquisition with *ibaPDA*.



4.1.4.2 General module settings

You find the description of all settings that are identical for all Request-S7 modules in chapter **7** General interface settings, page 16.

The *ibaBM-PN* modules have the following common specific setting options:

Profinet

Device

Number of the PROFINET device, to which the module is assigned

Slot

Number of the slot, to which the module is assigned

4.1.4.3 Connection settings

On the *Connection* tab, the connection to the controller is configured.

The following controllers, connection modes and selection methods are supported:

Controller	Connection mode					
	TCP/IP	PC/CP	TCP/IP S7-1x00			
\$7-300	Х	Х				
\$7-400	Х	Х				
S7-1500	Х		Х			

Depending on the connection mode different settings have to be made.

4.1.4.3.1 Connection mode TCP/IP

This mode activates a connection via the standard network interface of the PC.

1: \$7	Request (0)				
🛄 General	/Connection 🔨 Analog 🎵 I	Digital 🛄 S7 reques	t info		
Connection Connection n	node: TCP/IP 💌	Connection type:	PG connection	•	Timeout (s): 15 🚔
Address:	192.168.50.95	Rack: 0	Slot:	0	Test
Activate S	57 routing				
DB:	15 🚖	Profinet device slo	t 1 🚔		
CPU Name:	🔕 No addressbook 🗸 👻	📝 Detect S7 rest	art (This applies to a	ll S7 request modules)	

Fig. 19: Connection configuration TCP/IP

CPU Name

Selection of the linked address book

Connection mode

Selection of the TCP/IP connection mode

Connection type

Selection of the connection type PG, OP or other connections (determines which type of connection resource is occupied on the CPU).

Timeout

Timeout of the connection

Address

IP address of the controller

Rack

Rack number of the controller (default: 0)

Slot

Slot number of the controller in the rack (for: S7-1500 CPUs: 0)

Test

Connection test to the CPU and available diagnostic data are issued

1: S7 Rec	uest (0)		
II ST HS			
🛄 General 🍠 L	Connection V Analog JU	Digital 🛄 S7 request info	
Connection			
Connection mode:	TCP/IP 🔻	Connection type: PG connection	Timeout (s): 15 🚔
Address: 192	2.168.50.95	Rack: 0 🚔 Slot: 0 🛬	Test
📃 Activate S7 rou	uting		
DB: 15	×	Profinet device slot: 1	
CPU Name: 🚫	No addressbook 🗸 👻	Detect S7 restart (This applies to all S7 request modules)	
Connection establish MLFBNr of PLC is: PLC status: Cycle times: Reading DB15 DB id: DB version: FB version: DB length: Max. pointers: Max. data bytes: HW version: Total memory size: DB memory size: DB memory size: DB used size: Code memory size: Code used size: No. inputs: No. outputs: No. markers: No. counters: 1/O space: Local datasize:	hed 6ES7 412-2EK06-0AB0 RUN Actual 1 ms Min 1 m ibaREQ-S7-M 1.0.0.0 1.0.0 1.0.0 1.0.0 1.28 252 0 1072432 528384 11762 544048 26580 128 128 128 128 128 128 252 0 1072432 528384 11762 544048 26580 128 128 26580 128 26580 128 26580 128 26580 128 26580 128 26580 128 26580 128 26580 128 26580 128 2640 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 40 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400 400	ns Max 2ms	
Device slot 1	Length Status 252 available		

Fig. 20: Connection test / diagnostic data

Тір



Error message "DB is not a valid request DB ..."

Please check if...

- the Request block has been loaded into the CPU
- the right DB number has been configured on the Request block
- the Request block is called in the program
- possibly, the DB is written from another source.

Activate S7 routing

(see also **7** S7 routing, page 157)

Activate this option, if the S7-CPU and the *ibaPDA*-PC are not in the same network, but only communicate over a gateway that supports S7 routing. Such a gateway can be e. g. an IE/PB link, over which a S7-CPU can be reached without an Ethernet connection.

Two additional input fields appear:

- Address of the device acting as gateway: Enter IP address of the gateway
- S7 Subnet ID of target net: Enter subnet ID from STEP 7 NetPro

Detect S7 restart:

The current request configuration is stored in a data block on the CPU. In case the "Detect S7 restart" option is enabled, *ibaPDA* can detect if this data block has been deleted or overwritten, e. g. as a result of loading the offline program or due to a cold restart and will restart the data acquisition. The configuration data are transferred again. This does not affect a warm restart of the CPU.

4.1.4.3.2 Connection mode PC/CP

This mode activates a connection over the interface card of the PC, which is configured using SIMATIC Net.

The interfaces configured in SIMATIC Net can be used, e.g.:

- MPI adapter (COM)
- MPI adapter (USB)
- PROFIBUS (CP5611)
- TCPIP (RFC1005)
-

Note



If you want to use this connection type, the Siemens software SIMATIC Net (e.g. SIMATIC Manager or Softnet) has to be installed. When using the modules CP55..., CP56... and the MPI adapter, the installation of the device drivers will be sufficient.

1: \$7	Request (0)				
🛄 General	Sonnection 🔨 Analo	og 🗍 Digital 🛄 S7 reque	st info		
Connection					
Connection r	mode: PC/CP 🔻	Connection type:	PG connection	•	Timeout (s): 15 🚔
Access point	for applications: ibaTCP	=> TCP/IP -> Intel(R) PRO/10	100 PL N •	- Con	figure PG/PC interface
Address:	192.168.50.95	Rack: 0	Slot:	0	Test
C Activate	S7 routing				
DB:	15 🚖	Profinet device s	ot: 1 🚖		
CPU Name:	🚫 No addressbook	✓ Ø Detect S7 res	start (This applies to all S	7 request module:	s)

Fig. 21: Connection configuration PC/CP

CPU Name

Selection of the linked address book

Connection mode

Selection of the PC/CP connection mode

Connection type

Selection of the connection type PG, OP or other connections (determines which type of connection resource is occupied on the CPU).

Timeout

Timeout of the connection

Access point for applications

Selection of the access point that is to be used

For notes on creating and adapting an access point, see **7** Setting PG/PC interface / defining new access point, page 153

1: S7 Request ((0)	
📓 General 🍠 Connection	🔨 Analog 👖 Digital 🏢 S7 request info	
Connection		
Connection mode: PC/CP	Connection type: PG connection T	fimeout (s): 15 🚔
Access point for applications:	ibaTCP => TCP/IP -> Intel(R) PRD/1000 PL N	PG/PC interface
Address: 192.168.50.95	ibaPLCSIM => PLCSIM(TCP/IP) ibaTCP => TCP/IP -> Intel(R) PRD/1000 PL N	Test
Activate S7 routing	S70NLINE => TCP/IP -> Intel(R) PR0/1000 PL N	
DB: 15 🚔	Profinet device slot:	
CPU Name: 🚫 No address	book Detect S7 restart (This applies to all S7 request modules)	

Fig. 22: Select access point

Note



The access points that are available under SIMATIC Net are configured using the Siemens tool "PG/PC interface settings".

In case *ibaPDA-Request-S7-DP/PN* and SIMATIC Manager run on the same computer, iba recommends configuring a special access point for *ibaPDA* for the connection between *ibaPDA-Request-S7-DP/PN* and SIMATIC S7 via PC/CP connections. A separate access point for *ibaPDA-Request-S7-DP/PN* prevents the risk that access for *ibaPDA* is impaired when changing the standard access point in the SIMATIC Manager.

Configure PG/PC interface

Opens the dialog box for setting the PG/PC interface of SIMATIC STEP 7

Address

Address of the controller (MPI, PROFIBUS or IP address depending on the configured access point)

Rack

Rack number of the controller (default: 0)

Slot

Slot number of the controller in the rack (for: S7-1500 CPUs: 0)

Test

Connection test to the CPU and available diagnostic data are issued.



iba

1: S7 Reg	quest (0)		
🔟 General 💋 C	Connection \wedge Analog \mathbbm{N}	Digital 📓 S7 request info	
Connection	L		
Connection mode:	PC/CP 🔹	Connection type: PG connection	▼ Timeout (s): 15
Access point for ap	plications: ibaTCP => TCF	P/IP -> Intel(R) PRO/1000 PL N	Configure PG/PC interface
Address: 192	2.168.50.95	Rack: 0 🚔 Slot:	0 🚔 Test
Activate S7 rou	uting		
DB: 15		Profinet device slot: 1	
CPU Name: 🚫	No addressbook	 Detect S7 restart (This applies to all 	S7 request modules)
CLC status: Cycle times: Reading DB15 DB id: DB version: FB version: DB length: Max. dota bytes: Max. data bytes: HW version: Total memory size: DB memory size: DB memory size: DB used size: Code used size: Code used size: Code used size: No. outputs: No. outputs: No. outputs: No. outputs: No. timers: No. timers: No. timers: Local datasize: Device slot 1	Actual 1 ms Min 1 ibaREQ-S7-M 1.0.0.0 1.0.0.0 5280 128 252 0 1072432 528384 11762 528384 11762 544048 26580 128 128 128 26580 128 26580 128 26580 128 26580 128 2048	ms Max 2 ms	

Fig. 23: Connection test / diagnostic data

Тір



Error message "DB is not a valid request DB ..."

Please check if...

- the Request block has been loaded into the CPU
- the right DB number has been configured on the Request block
- the Request block is called in the program
- possibly, the DB is written from another source.

Activate S7 routing

(see also **7** S7 routing, page 157)

Activate this option, if the S7-CPU and the *ibaPDA*-PC are not in the same network, but only communicate over a gateway that supports S7 routing. Such a gateway can be e.g. an IE/PB link, over which a S7-CPU can be reached without an Ethernet connection. Two additional input fields appear:

- Address of the device acting as gateway: Enter IP address of the gateway
- S7 Subnet ID of target net: Enter subnet ID from STEP 7 NetPro

Detect S7 restart:

The current request configuration is stored in a data block on the CPU. In case the "Detect S7 restart" option is enabled, *ibaPDA* can detect if this data block has been deleted or overwritten, e. g. as a result of loading the offline program or due to a cold restart and will restart the data acquisition. The configuration data are transferred again. This does not affect a warm restart of the CPU.

4.1.4.3.3 Connection mode TCP/IP S7-1x00

This mode activates a connection over the standard network interface of the PC and can only be used in combination with S7-1500 CPUs.

📶 General	/Connection 🔨 Analog 🏾	Digital 🛄 S7 request in	fo			
Connection			ф.,			
Connection m	node: TCP/IP S7-1x00 🔻	Connection type:	G connection	•]	Timeout (s): 15	5 🛓
Address:	192.168.50.90					Test
DB:	🥫 ibaREQ_DB_PN (DB17)		e slot: 1 🚔	Load	Jaddressbook from S7	6
CPU Name:	PLC (192.168.50.90)	▼ V Detect S	restart (This applies to all S7	request module:	s]	

Fig. 24: Connection configuration TCP/IP S7-1x00

CPU Name

Selection of the linked address book; only address books of the "TIA Portal" type can be selected.

Connection mode

Selection of the TCP/IP S7-1x00 connection mode

Connection type

Selection of the connection type PG, OP or other connections (determines which type of connection resource is occupied on the CPU).

Timeout

Timeout of the connection

Address

IP address of the controller

Test

Connection test to the CPU and available diagnostic data are issued.



📓 General	💋 Connect	tion 🔨 Analog 🎵	Digital [🛄 S7 reque	st info				
Connection					10				
Connection m	node: TCI	P/IP \$7-1x00 🔻	Conne	ection type:	PG conn	ection	•	Timeout (s): 15	
Address:	192.168.50	.90						Tes	st
DB:	🍵 ibaREQ	_DB_PN (DB17)	•	Profinet d	evice slot:	1 🌲	Load	d addressbook from S7	
CPU Name:	PLC (19	92.168.50.90)	•	🔽 Deter	st S7 restart	(This applies to al	S7 request module	s)	
Connection est	ablished	516-3AN00-0AB0							
Reading ibaR	EQ_DB_PN	(DB17) ibaBEQ-S7-M							
DB version:		1.0.0.0							
		1000							
-B version:		1.0.0.0							
-B version: DB lenath:		9120							
-B version: DB length: Max. pointers:		1.0.0.0 9120 512							
-B version: DB length: Max. pointers: Max. data byte	s:	9120 512 252							
-B version: DB length: Max. pointers: Max. data byte HW version:	s:	1.0.0.0 9120 512 252 0							
B version: DB length: Max. pointers: Max. data byte HW version: [otal memory s	s: ize:	1.0.0.0 9120 512 252 0							
-B version: DB length: Max. pointers: Max. data byte HW version: Fotal memory siz DB memory siz	s: ize: e:	1.0.00 9120 512 252 0 0							
-B version: DB length: Max. pointers: Max. data byte HW version: Fotal memory siz DB memory siz DB used size:	s: ize: e:	1.0.00 9120 512 252 0 0 0 0							
-B version: DB length: Max. pointers: Max. data byte HW version: Total memory siz DB memory siz DB used size: Code memory s	s: ize: e: size:	1.0.0.0 9120 512 252 0 0 0 0 0							
-B version: DB length: Max. pointers: Max. data byte HW version: Total memory siz DB memory siz DB used size: Code memory siz	s: ize: e: x:	1.0.0 9120 512 252 0 0 0 0 0 0 0							
-B version: DB length: Max. pointers: Max. data byte 	s: ize: e: size: x:	1.0.0 9120 512 252 0 0 0 0 0 0 0 0 32768 32768							
H version: DB length: Max, pointers: Max, data byte HW version: Fotal memory siz DB used size: Dade used size No, on inputs: No, on utputs:	s: ize: e: iize: x	1.0.0 9120 512 252 0 0 0 0 0 0 0 32768 32768 32768							
H version: DB length: Max, Dointers: Max, data byte HW version: Total memory si DB memory si DB used size: Dode memory si Code used size No, inputs: No, outputs: No, markers:	s: ize: e: x:	1.0.0 9120 512 252 0 0 0 0 0 0 0 0 0 32768 32768 16384 2049							
H version: DB length: Max, pointers: Max, data byte HW version: Fotal memory siz DB memory siz DB used size Dade memory s Code used size No. inputs: No. outputs: No. markers: No. inters:	s: ize: e: ;ize: x	1.0.0 9120 512 252 0 0 0 0 0 0 0 0 0 0 32768 32768 32768 16384 2048 2048							
H version: A version: Max. pointers: Max. data byte HW version: fotal memory s DB memory s DB used size: Do B memory s Code used size: Code used size: Code used size: No. imputs: No. imputs: No. markers: No. timers: No. cunters: No. cunt	s: ize: e: x:	1.0.0 9120 512 252 0 0 0 0 0 0 32768 32768 32768 32768 32768 32768 2048 2048							
HB version: DB length: Max. pointers: Max. data byte HW version: Total memory s DB memory s DB used size: Dode used size Dode used size Code used size Code used size No. imputs: No. outputs: No. markers: No. timers: No. tourters: /O space: _ocal datasize:	s: ize: e: x:	1.0.0 9120 9120 9122 252 0 0 0 0 0 0 0 32768 32048 2048 2048 2048 2048 2048 2048 2048							
H version: DB length: Max. pointers: Max. data byte HW version: Total memory siz DB memory siz DB used size: Date used size: Code used size: Code used size: No. inputs: No. outputs: No. markers: No. timers: No. timers: No. timers: No. counters: No. counters: O space: Device slot	s: ize: e: : : :	1.0.0 9120 9120 9122 252 0 0 0 0 0 0 0 0 0 0 0 32768 32768 32768 16384 2048 0 0 51abus							



Load addressbook from S7

By clicking on this button *ibaPDA* will read the list of symbols directly from the PLC and store it in an addressbook for further use in the symbol browser.

1: \$7	Request (0)		
General	💋 Connection 🔨 Analog 👖	Digital 🔟 S7 request info	
Connection			
Connection m	node: TCP/IP S7-1x00 🔻	Connection type: PG connection 🗸	Timeout (s): 15 🍝
Address:	192.168.50.90		Test
DB:	🥃 ibaREQ_DB_PN (DB17)	✓ Profinet device slot: 1 ★	Load addressbook from S7
CPU Name:	B PLC (192.168.50.90)	 Detect S7 restart (This applies to all S7 request r 	modules)
Connecting to Connected suc Loading symbo Successfully lo Writing addres: Successfully of I	S7 at 192.168.50.90 ccessfully to S7 at 192.168.50.90 ils from S7 aded symbols sbook leated addressbook PLC (192.16 4	8.50.90)	

Тір



Error message "DB is not a valid request DB ..."

Please check if...

- the Request block has been loaded into the CPU
- the right DB number has been configured on the Request block
- the Request block is called in the program
- possibly, the DB is written from another source.

In this context, also note the access protection of an S7-1500 CPU.

For more information, see **7** *Device configuration Device configuration*, page 45

Detect S7 restart:

The current request configuration is stored in a data block on the CPU. In case the "Detect S7 restart" option is enabled, *ibaPDA* can detect if this data block has been deleted or overwritten, e. g. as a result of loading the offline program or due to a cold restart and will restart the data acquisition. The configuration data are transferred again. This does not affect a warm restart of the CPU.

4.1.4.4 Module S7 Request

With the "S7 Request" module it is possible to acquire data according to the size of the PROFI-NET slots used. A maximum of up to 254 bytes is possible.

A separate PROFINET slot and Request block call has to be configured for each module.

For a description of the module settings, see chapter **7** *General module settings*, page 16 and **7** *General module settings*, page 49.

4.1.4.5 Module S7 Request Decoder

The "S7 Request Decoder" module allows the acquisition of up to 16384 digital signals sent as a maximum of 128 words (16 Bit). This module type is suited for applications where large amounts of digital signals have to be acquired and for which the max. 1024 directly addressable digital values of the *ibaBM-PN* are not sufficient.

A separate PROFINET slot and Request block call has to be configured for each module.

For a description of the module settings, see chapter **7** *General module settings*, page 16 and **7** *General module settings*, page 49.

4.1.5 Diagnostics

When you select the bus module node in the signal tree and choose the *Analog* or *Digital* tab, you get a list of all operands that have been acquired in the bus module with data type and actual value.

🔢 iba I/O Manager								- • •
🗄 🗋 📂 🎥 🌒 🕩 🗸 [Hardware] G	roups	Technostring Outpu	uts 🛛 🗈 📸					
⊛🐡 General ⊨∰ ibaF0B-2io-D	ib	aBM-PN						
□ · · · · · · · · · · · · · · · · · · ·								
Device 0	Name Symbol			Device	Slot	Address	DataType	Actual
		Source: (0) 57 Request						
Lick to add module	0	[0:0]: counter_16bit	SYMBOL\\counter_16bit	0	1	1	WORD_B	6450
Click to add module	1	[0:1]: counter_32bit	SYMBOL\\counter_32bit	0	1	3	DWORD_B	26111
	2	[0:2]: sinus	SYMBOL\\sinus	0	1	7	FLOAT_B	0,641438
	3	[0:3]: cosinus	SYMBOL\\cosinus	0	1	11	FLOAT_B	0,767175
	4	[0:4]: counter_10ms	SYMBOL\\counter_10ms	0	1	15	WORD_B	64508

Fig. 26: List of the acquired operands on the Analog tab

🔢 iba I/O Manager							0	
🗄 🗋 💕 🍃 🎝 🌗 🕶 Hardware	Groups	s Technostring Outpu	ts 🛛 🛅 📆					
😰 🎲 General	iķ	aBM-PN						
E. Link 0		General 🔨 Analog 🗍	Digital					
Device 0		Name	Symbol	Device	Slot	Address	Bit no.	Actual
1: S7 Request (0)		🗏 Source: (0) S7 Request						
Ulick to add module	0	[0.0]: clock_0_1s	SYMBOL\\clock_0_1s	0	1	0	0	0
Click to add module	1	[0.1]: clock_0_2s	SYMBOL\\clock_0_2s	0	1	0	1	0
	2	[0.2]: clock_0_4s	SYMBOL\\clock_0_4s	0	1	0	2	1
	3	[0.3]: clock_0_5s	SYMBOL\\clock_0_5s	0	1	0	3	1
	4	[0.4]: clock_0_8s	SYMBOL\\clock_0_8s	0	1	0	4	0
	5	[0.5]: clock_1_6s	SYMBOL\\clock_1_6s	0	1	0	6	1
	6	[0.6]: clock_1s	SYMBOL\\clock_1s	0	1	0	5	1
i i i i i i i i i i i i i i i i i i i	7	[0.7]: dock_2s	SYMBOL\\clock_2s	0	1	0	7	1

Fig. 27: List of the acquired operands on the Digital tab

Other documentation



You find a detailed description of the device-specific diagnostic options of *ibaBM-PN* in the device manual.

4.2 Request-S7 for ibaBM-PN in redundancy mode

In the following, the Request-S7 version for the PROFINET bus module *ibaBM-PN* in S2 redundancy mode is described.

4.2.1 General information

With the S2 redundancy mode of *ibaBM-PN*, the device can be operated on redundant PROFI-NET systems (S2 system redundancy) in combination with SIMATIC S7-R/H controllers, whose measurement data is to be acquired. You need an additional license for using the S2 redundancy mode of the *ibaBM-PN*. Please contact the iba AG support team.

The following figure shows an exemplary integration of an *ibaBM-PN* in S2 redundancy mode:



Fig. 28: Request-S7 for ibaBM-PN in S2 redundancy mode

Other documentation



For detailed information about the S2 redundancy mode of the *ibaBM-PN*, please see the device manual.

The functionality of the Request-S7 for *ibaBM-PN* in redundancy mode mostly corresponds to the functionality in standard mode (see chapter **7** *Request-S7 for ibaBM-PN*, page 32). The differences and extensions are described in the following.



4.2.2 Configuration and engineering SIMATIC S7-300, S7-400 and WinAC

4.2.2.1 Description of the Request blocks

For use in S2 redundancy mode, the same request blocks are used as in normal operation (see chapter **7** *Description of the Request blocks*, page 34).

4.2.2.2 Hardware configuration

For each PROFINET device used, a separate PROFINET device has to be configured in the hard-ware configuration.

The same GSDML file is to be used as for normal operation (from version V2.35-20200101).

Note



You find the latest version of the GSDML file on the "iba Software & Manuals" DVD in the following directory:

\02_iba_Hardware\ibaBM-PN\01_GSD_Files\

When inserting an *ibaBM-PN* in a redundant hardware configuration, this is automatically connected with both PROFINET IO systems.







This can be adapted in the *Redundancy* tab of Properties.



Fig. 30: Redundancy settings

ibaBM-PN is operated in the S2 redundancy mode by applying this hardware configuration.

iba

4.2.2.3 Configuration in STEP 7

The configuration of the request blocks corresponds to the configuration in normal operation (see chapter **7** *Configuration in STEP 7*, page 38).

4.2.3 Configuration and engineering ibaPDA

First connect *ibaBM-PN* to a free link of an ibaFOB-D card. In the I/O Manager, add a device module *ibaBM-PN* to the corresponding link.

Then add a module "S7 Request."

In the *General* tab, set the parameter "S2 Redundancy" to "True." The redundancy mode switched on in this way is indicated by an orange colored icon of the device module.

G	eneral 🖉 Verbindung 0	🍠 Verbindung 1 🔨 Analog 🗍 Dig	tal 🗱 S7 request info
*	Basic		149
	Module Type	ibaBM-PN\S7 Request	
	Locked	False	
	Enabled	True	21 J
	Name	S7 Request Slot3 252	
	Module No.	3	
	Timebase	10 ms	
	Use name as prefix	False	
Y	Module Layout		
	No. analog signals	64	
	No. digital signals	64	
*	Connection	and the second	
	Auto enable/disable	False	
*	PROFINET		
	Device	0	
	Slot	3	
	S2 Redundancy	True	
Y	S7		
	CPU Name	CPU412-5H REQ (CPU 41	

Fig. 31: Setting redundancy mode in the I/O Manager

The configuration of the modules otherwise corresponds to the configuration in standard mode. You can find information about this in chapter **7** *General module settings*, page 49

Connection settings

For transmitting the operand data to both CPUs of the SIMATIC S7-R/H, two different connections are established. These connections are switched on and off depending on availability and requirements.

Both connections are configured on the tabs *Connection 0* and *Connection 1*. The name of the tabs can be assigned in the "Connection name" fields.

📓 General 🍠 Ve	rbindung 0 🝠 Verbindung	1 🔨 Analog 🎵	Digital 🛄 S7 re	equest info		
Connection						
Connection name:	Verbindung 0					
Connection mode:	TCP/IP ~	Connection type:	PG connection		~	Timeout (s): 5
Address: 192.1	68.50.66	Rack:	0	Slot: 3	÷	Test
Activate S7 routi	ng					
DB: 15		PROFIN	ET device slot:	3 🜲		
CPU Name:	PU412-5H REQ (CPU 412-5		ct S7 restart (This a	oplies to all S7 re	auest modules	.)

Fig. 32: Connection settings for connection 0

🚻 General	💋 Ve	bindung 0 💋 Verbindu	ing 1 🔨 Analog 🗍	Digital 🛄 S7 m	request info			
Connection								
Connection	name:	Verbindung 1						
Connection	mode:	TCP/IP ~	Connection type:	PG connection	(~	Timeout (s):	5
Address:	192.1	68.50.67	Rack:	1 🚔	Slot: 3	-		Test
Activate	S7 routi	ng						
DB:	15		PROFIN	ET device slot:	3 🌲			
DB: CPU Name:	15	÷ PU412-5H REQ (CPU 412	PROFIN	ET device slot: ect S7 restart (This a	3	quest modules	s)	

Fig. 33: Connection settings for connection 1

The other settings are identical to the settings for operation without redundancy mode (see chapter **7** *Connection settings*, page 49).

The following special features have to be considered:

- The rack numbers for an H system are 0 or 1 for the both redundant CPUs.
- The DB number, the PROFINET device slots and the CPU name for assigning an address book is set only once in the *Connection 0* tab.

4.3 Request-S7 for ibaBM-DP

In the following, we describe the Request-S7 version for the PROFIBUS bus module *ibaBM-DP*.

4.3.1 General information

Request-S7 for *ibaBM-DP* can be configured in the following system configurations:

SIMATIC S7 CPU	SIMATIC STEP 7 V5.x (SIMATIC Manager)	SIMATIC STEP 7 V1x Professional (TIA Portal)
S7-300 integrated DP interface	х	х
S7-400 integrated DP interface and CP443-5	Х	Х
S7-400 integrated DP interface and CP443-5	Х	H-CPUs are not supported by the TIA portal, yet.
S7-1500 integrated DP interface and CM1542-5 or CP1542-5		Х

For DP Request, the measurement values (Request Handshake) are not requested via the PROFI-BUS, but via a separate connection.

Depending on the hardware and software, different access points can be selected for the Request:

- TCP/IP: the connection to the SIMATIC S7 is established over an integrated PN interface of the S7-CPU or the respective CP modules in the PLC and the standard network interface of the PC. No additional Siemens software is required for the connection.
- PC/CP: this is the designation for different SIMATIC specific access points. In contrast to the TCP/IP connection, the SIMATIC communication software (and the corresponding licenses) must be installed on the PC for all connection types within the PC/CP group.
 - MPI, PROFIBUS: The connection to the SIMATIC S7 is established via the MPI or PROFIBUS interface of the PC; e.g. with the PCI card CP5611 or the MPI adapter for USB or serial PC interface.
 - TCP/IP, ISO: here, either the standard network interface of the PC or a suitable interface card is used for the connection to the S7.
- TCP/IP S7-1x00: The connection to a SIMATIC S7-1500 is established via an integrated PN interface of the S7-CPU or respective CP modules in the PLC and the standard network interface of the PC. No additional Siemens software is required for the connection.

System integration with ibaBM-DP

The measured data are transmitted to the *ibaBM-DP* device over PROFIBUS DP.



You need the following connections:

- Online connection between *ibaPDA* and S7-CPU (TCP/IP, MPI or DP)
- Fiber optic connection between ibaPDA/ibaFOB-io-D and ibaBM-DP
- PROFIBUS connection between *ibaBM-DP* and S7 PROFIBUS master
- A connection from *ibaBM-DP* to the network (TCP/IP over Ethernet) is only needed if the device is operated in compatibility mode, i.e. not with 32Mbit Flex (short: Flex). In this case the system integration is like with ibaBM-DPM-S (see chapter **7** Request-S7 for *ibaBM-DPM-S*, page 98.

In the standard version a maximum of eight connections, i.e. eight PROFIBUS slaves, can be configured per device. Up to 244 Byte data can be transmitted per slave.



Fig. 34: Request-S7 with ibaBM-DP

Note



The following description refers to the Request blocks V4.0 or higher. Should you require information regarding older versions, please contact our support.

Other documentation



For detailed information about *ibaBM-DP*, please see the device manual.

For information and application examples, see chapter **7** Application examples, page 148.

4.3.1.1 ibaCom-L2B compatibility mode

ibaBM-DP can be used for the Request-S7 functionality of the *ibaCom-L2B*-PROFIBUS card as successor with full functional compatibility.



Fig. 35: Request-S7 with ibaBM-DP, replaces ibaCom-L2B

For this purpose, the following modules can be used:

- S7 Request (ibaCom-L2B compatible)
- S7 Request Dig512 (ibaCom-L2B compatible)

Compared to the original configuration on the basis of the *ibaCom-L2B* card, modifications in the S7 configuration are not necessary (Hardware or S7 program).

For detailed information about this subject, please see chapter **7** Request-S7 for ibaCom-L2B, page 113 and chapter **7** Replacing Request-S7 on ibaCom-L2B by ibaBM-DP, page 166.

Note



The *ibaCom-L2B* compatibility mode can only be used in the Flex-mode of *ibaBM-DP*.

4.3.2 Configuration and engineering SIMATIC S7-300, S7-400 and WinAC

In the following, we describe the configuration and engineering on the SIMATIC S7 side with SIMATIC Manager (STEP 7 Version \leq V5) when using the modules "S7 Request" and "S7 Request Decoder".

The configuration and engineering when using the compatibility modules "S7 Request (ibaCom-L2B compatible)" and "S7 Request Dig512 (ibaCom-L2B compatible)" corresponds to using an *ibaCom-L2B* card. You find a description in chapter **7** *Configuration and engineering SIMATIC S7-300, S7-400 and WinAC,* page 114.



4.3.2.1 Description of the Request-FC ibaDP_Req (FC122)

With this function, the communication between the S7, *ibaPDA* and the *ibaBM-DP* device is initialized and controlled.

The ibaDP_Req has to be called once for each slave in the cyclic program.

The used blocks are part of the iba S7 library (see chapter **7** *Iba S7 library*, page 139).

Description of the formal parameters of the ibaDP_Req (FC122):

Name	Туре	Data Type	Description
DB_PDA	IN	BLOCK_DB	DB of the baPDA communication interface ibaDP_DB_PDA (2064 Byte)
DB_INTERN	IN	BLOCK_DB	DB of the internal data interface ibaDP_DB_work (1900 Byte)
OUTPUT_ADR_SLAVE	IN	INT	Start address of the peripheral output range, continuous and 244 Bytes long
INIT_FC	IN	BOOL	TRUE -> Initialize
INP_RANGE	IN	INT	Number of output bytes (evaluation only during initialization), 0:automatic detection (recommended)
OUT_RANGE	IN	INT	Number of output bytes (evaluation only during initialization), 0:automatic detection (recommended)
MARKER_RANGE	IN	INT	Number of marker bytes (evaluation only during initialization), 0:automatic detection (recommended)
ERROR_STATUS_INIT	OUT	BYTE	Initialization error
ERROR_STATUS_COM	OUT	BYTE	Communication error

The following SFCs are used internally:

- SFC 13 (DPNRM_DG)
- SFC 15 (DPRD_DAT)
- SFC 20 (BLKMOV)
- SFC 21 (FILL)
- SFC 24 (TEST_DB)
- SFC 49 (LGC_GADR)
- SFC 50 (RD_LGADR)
- SFC 51 (RDSYSST)

Detailed description:

DB_PDA

DB in the range of 1 to n (see technical data of the CPU). The DB is used for data exchange with *ibaPDA*. Length at least 2064 Bytes.

DB_INTERN

DB in the range of 1 to n (see technical data of the CPU). Length at least 1900 Bytes.

The following data are stored in this DB:

- Technical data of CPU which are determined during initialization
- The S7 pointers requested by *ibaPDA*
- The binary and analog transmission data

OUTPUT_ADR_SLAVE

DP start address of the *ibaBM-DP* in the peripheral output range for sending data. Length 244 Bytes, continuous (without gaps!)

INIT_FC

Used for initializing the Request block. The Request block is initialized automatically internally. Additionally, the initialization can be performed manually by an external logic via the input INIT_FC = TRUE.

INP_RANGE

Limits the number of input bytes to be measured.

If INP_RANGE = 0, the size of the available process image of the inputs will be evaluated by the Request block (recommended). Evaluation is done only during the initialization phase of the module.

OUT_RANGE

Limits the number of output bytes to be measured.

With OUT_RANGE = 0 the size of the available process image will be evaluated by the Request block (recommended). Evaluation is done only during the initialization phase of the module.

MARKER_RANGE

Limits the number of marker bytes to be measured.

With MARKER_RANGE = 0, the number of the available markers will be evaluated by the Request block (recommended). Evaluation is done only during the initialization phase of the module.

ERROR_STATUS_INIT

The following error codes can be generated:

- 1: DB_PDA is read-only
- 2: DB_PDA-No = 0 or higher than the max. permissible DB number of this CPU
- 3: DB_PDA with the specified number is not available
- 5: DB_PDA is too short

11: DB_INTERN is read-only12: DB_INTERN-No = 0 or higher than the max. permissible DB number of this CPU

13: DB_INTERN with the specified number is not available

- 15: DB_INTERN is too short
- 16: Error when reading the identification data of the CPU
- 19: Initialization not finished
- 21: Not enough memory space for the data set
- 22: SZL_ID is wrong or not known in this CPU
- 23: The index of SZL is wrong or not permitted

30: OUT_ADR_SLAVE is no peripheral output range

31: OUT_ADR_SLAVE has no ROFIBUS DP assigned

ERROR_STATUS_COM

The following error codes can be generated:

100: Bit number not 0

- 101: Bit number not 0-7
- 103: The operand range is not defined.
- 104: The data type is not defined
- 105: DB0 has been requested as data source
- 106: DB number is higher than the max. permitted number of DBs for this CPU

107: DB with the specified number is not available

- 109: DB is too short for the accessed operand
- 110 Specified data address does not exist

111: Initialization aborted with error

(error cause can be seen in ERROR_STATUS_INIT)

112 Initialization not carried out

(error cause can be seen in ERROR_STATUS_INIT)

150: Order fragmentation is not supported

- 151: Order Request: Total number of values does not match values in the order
- 152: Order Request: Up to 64 binary values permitted

153: Order Request: Up to 64 analog values permitted

200: DP station is not available

4.3.2.2 Hardware configuration

For each module, an iba-PROFIBUS slave has to be defined.

The GSD file "ibaDPMSi.gsd" has to be used (version V2.2 and higher).

Note



You find the GSD-file "ibaDPMSi.gsd" on the DVD "iba Software & Manuals" in the following directory:

\02_iba_Hardware\ibaBM-DP\02_GSD_Files\01_General\

³⁾ More recent S7 CPU models are generally: S7-400 with firmware version 3.0 or higher and S7-300 with firmware version 2.0 or higher

Note



The slots have to be created without gaps and with consecutive address range.

■ **S7-CPUs of newer type**³⁾ provide consistent slots with a max. of 128 Bytes. Use the elements "S7-Req **block consistent** Slot 0 / Slot 1".

(0) UR2	PS 407	10A				
3 X2	CPU 4	12-2 DP		8	PROFIBU	IS-CPU4xx: DP master system (2)
<u>X1</u> 4	MPI/DF	, 3-1				
X1 X1 P1 R X1 P2 R	Port 1					
5 6						DP-NORM
8 9						
(10)	ibaBM-DPM	-S/DP-Monitor				
Slot D	PID	Order Number / Design	ation	I Address	Q Address	Comment
1 128		S7-Reg block consistent	t Slot 0		256379	
2 128		S7-Reg block consistent	t Slot 1		380499	

■ for S7-CPUs and for CP443-5 of older types no long consistent slots can be used. Use the elements "S7-Req unit consistent Slot 0 / Slot 1"

	PS 407 10A	
3	CPU 412-2 DP	PROFIBILS CPLIA: DP master autom (2)
2	DP —	Phoribus-Cro4xx. Dr master system (2)
(1	MPI/DP	
4	CP 443-1	
X7	PN-10-1	
X1 P1 R	Port 1	
X1 P2 R	Port 2	
5		V (10) 1 D11
6		
7		DD NODM
8		DF-HORM
)		
		III

Slot	DPID	Order Number / Designation	I Address	Q Address	Comment
1	128	S7-Req unit consistent Slot 0		256383	42
2	128	S7-Req unit consistent Slot 1		384499	
3	0				
4					8

4.3.2.3 Configuration in STEP 7 (STL, LAD, FBD)

Request-S7 is intended for the use with CPUs S7-300/400 with integrated DP interface or CPUs S7-400 with external interface CP 443-5 (PROFIBUS master).

Note



The use of the external DP interface CP342-5 of a CPU S7-300 is not supported!

For Request-S7 with one PROFIBUS slave:

- Copy the following blocks from the iba S7 library (see chapter **7** *Iba S7 library*, page 139) to the blocks folder of your STEP 7 project:
 - FC122 (ibaDP_Req)
 - DB10 (ibaDP_DB_PDA)
 - DB25 (ibaDP DB work).

Note



If the numbers FC122, DB10 and DB25 are already used in your project, assign new numbers to the blocks from the iba S7 library when copying.

- Create the error OBs (OB82, OB85, OB86, OB87, OB122) in order to prevent CPU stops in case of an error.
- Call and parameterize the ibaDP_Req (FC122) in the cyclic program.



For Request-S7 with multiple PROFIBUS slaves:

- In the blocks folder, a data block ibaDP_DB_PDA (DB10) has to be available for each slave. Copy the DB10 in a DB with a new DB number.
- In the blocks folder, a data block ibaDP_DB_work (DB25) has to be available for each slave. Copy the DB25 in a DB with a new DB number.
- In the cyclic OB, the ibaDP_Req (FC122) must be called again for each slave with the new DB numbers and the peripheral addresses of the new PROFIBUS slave.
- The input INIT_FC and the outputs ERROR_STATUS_INIT and ERROR_STATUS_COM should have unique markers (or DB elements) for each slave.

Finish:

• Load all blocks into the S7-CPU and restart.

4.3.2.4 Configuration in STEP 7 (CFC)

For Request-S7 with one PROFIBUS slave:

- Copy the following blocks from the iba S7 library (see chapter **7** *Iba S7 library*, page 139) to the blocks folder of your STEP 7 project:
 - FC122 (ibaDP_Req)
 - DB10 (ibaDP_DB_PDA)
 - DB25 (ibaDP_DB_work).

Note



If the numbers FC122, DB10 and DB25 are already used in your project, assign new numbers to the blocks from the iba S7 library when copying.

The chosen block numbers have to match the reserved number ranges for DBs and FCs under the CFC settings for "Translating/Loading".

 Start the CFC editor and import the ibaDP_Req (FC122) (under menu "Options - Block Types"). The FC is stored in the group "ibaPDA" in the function block library.

ock Types			2
Block folder o	ffline	Chart folder	
FC106	R_I	FC106	R_I
FC122	ibaDP_Req	FC122	ibaDP_Req
FC60	CMP_R	FC60	CMP_R
FC61	ADD_R	FC61	ADD_R
FC63	MUL_R	FC63	MUL_R
FC72	SIN	FC72	SIN
FC73	COS	FC73	COS

 Drag the ibaDP_Req (FC122) to your CFC chart. Pay attention to the run sequence. The function block must be called in a cyclic OB (cyclic interrupt OB or OB1).




Make sure that the error tasks OB82, OB85, OB86, OB87 and OB122 are created in order to prevent the CPU from running into STOP in case of access failure.

To do so, you have to define an empty runtime group within the sequence of these tasks if they are empty. Alternatively, you may place any dummy block into the error OB. This block must not be deleted, too.

Note



Do not choose the option "Delete empty runtime groups" for compilation otherwise the error OBs will be removed! Some older CFC versions have this option in the compilation dialog.

For Request-S7 with multiple PROFIBUS slaves:

- In the blocks folder, a data block ibaDP_DB_PDA (DB10) has to be available for each slave. Copy the DB10 in a DB with a new DB number.
- In the blocks folder, a data block ibaDP_DB_work (DB25) has to be available for each slave. Copy the DB25 in a DB with a new DB number.
- In the CFC chart, you have to create another instance of the ibaDP_Req (FC122) for each slave. Configure the connectors with the new DB numbers and the peripheral addresses of the new PROFIBUS slave.

After each program modification:

- Compile the complete program: Activate the option "Entire program", activate the option "Generate SCL source" (for CFC version 6.1 or higher), deactivate the option "Delete empty runtime groups" if available.
- Load the program and restart S7-CPU.

4.3.3 Configuration and engineering SIMATIC S7-1500

In the following, we describe the configuration and engineering on the SIMATIC S7 side with the SIMATIC TIA Portal.

Basically, the following configuration steps have to be carried out on the SIMATIC TIA Portal side:

- Network configuration
 Integration of the PROFIBUS slaves in the device configuration
- Configuration Software: Integration of the Request blocks in the S7 program
- Device configuration: Setting the CPU protection properties

You cannot use the "S7 Request (ibaCom-L2B compatible)" and "S7 Request Dig512 (ibaCom-L2B compatible)" compatibility modules in combination with a CPU S7-1500.

4.3.3.1 Description of the Request blocks

The communication between the S7 and *ibaPDA* is initialized and controlled with these blocks. One set of Request blocks has to be called for each Request module (connection).

Request block	S7-1500 CPU with inte- grated DP interface	S7-1500 CPU with CM1542-5 or CP1542-5	recommended call up level
ibaREQ_M (FB1400)	Х	Х	OB1
ibaREQ_DP (FB1402)	х	х	OB1 or OB3x
ibaREQ_DB (DB15)	х	Х	-
ibaREQ_DB-Interface	Х	Х	-

The used blocks are part of the iba S7 library (see chapter **7** *Iba S7 library*, page 139).

Table 10:Combination of Request blocks

- ibaREQ_M (Management)
 The block realizes the communication with *ibaPDA*. Ideally, the block is called in the OB1.
- ibaREQ_DP (provides and sends the actual signal values)
 The block provides the actual signal values in the send cycle. Ideally, the block is called in a cyclic interrupt OB.
- ibaREQ_DB (interface DB)
 This DB serves as interface to *ibaPDA* and between the different Request blocks.



iba

4.3.3.1.1 ibaREQ_M (FB1400)

Description of the formal parameters:

Name	Туре	Data Type	Description
REQ_DB	IN	DB_ANY	DB of the ibaPDA communication interface
			ibaREQ_DB
RESET	IN	BOOL	TRUE -> perform reset
CPU_HW_ID	IN	HW_IO	Hardware ID of local CPU
ERROR_STATUS	OUT	WORD	Error code

The following SIMATIC standard blocks are used internally:

GET_IM_DATA (FB801)

Detailed description:

REQ_DB

The DB is used for data exchange with *ibaPDA*. For all Request blocks that belong together, the identical DB has to be configured.

The length of the data block is fixed.

RESET

Serves for manually resetting the Request blocks. All Request blocks of a combination are automatically reset together. Usually, the parameter does not have to be connected

CPU_HW_ID

TIA Portal system constant, which refers to the corresponding CPU.

ERROR_STATUS

Internal error of the block. If there is no error, the value 0 will be issued.

For a list of all possible error codes, see chapter **7** Error codes of Request blocks, page 168.

4.3.3.1.2 ibaREQ_DP (FB1402)

Description of the formal parameters:

Name	Туре	Data Type	Description
ADR_SLOT_0	IN	VARIANT	Start address of the output range of slot 0
ADR_SLOT_1	IN	VARIANT	Start address of the output range of slot 1
RESET_CON	IN	BOOL	TRUE -> reset of the communication connec- tion
REQ_DB	INOUT	UDT	DB of the ibaPDA communication interface ibaREQ_DB
ERROR_STATUS	OUT	WORD	Internal error code



Detailed description:

ADR_SLOT_0

Start address of the used slot 0 in *ibaBM-DP* in the output range of the process image.

ADR_SLOT_1

Start address of the used slot 1 in *ibaBM-DP* in the output range of the process image.

REQ_DB

The DB is used for data exchange with *ibaPDA*. For all Request blocks that belong together, the identical DB has to be configured.

ERROR_STATUS

Internal error of the block. If there is no error, the value 0 will be issued.

For a list of all possible error codes, see chapter **7** Error codes of Request blocks, page 168.

4.3.3.2 Network configuration

For each module, an iba-PROFIBUS slave has to be defined.

The GSD file "ibaDPMSi.gsd" has to be used (version V2.2 and higher).

Note



You find the GSD-file "ibaDPMSi.gsd" on the DVD "iba Software & Manuals" in the following directory:

\02_iba_Hardware\ibaBM-DP\02_GSD_Files\01_General\



Fig. 36: Net view

				6	P Topol	ogy view	Netv	work view 📑 Device view	w
Slave_1			Device overview						
		^	1 Module	Rack	Slot	I address	Q address	Туре	-
and a		=	Slave_1	0	0			ibaBM-DPM-S/DP-Monitor	. ^
9			S7-Req block consistent Slot 0_1	0	1		256379	S7-Req block consistent Slot 0	
			S7-Req block consistent Slot 1_1	0	2		380499	S7-Req block consistent Slot 1	=
		10		0	3				
		1		0	4				
				0	5				
	UP-HORM	2		0	6				
				0	7				
				0	8				
				0	9				
				0	10				
		~		0	11				~
<	·	- 🗐	<		101				>

Fig. 37: Device view

4.3.3.3 Configuration in STEP 7

In the following, we describe how to configure the Request blocks in TIA Portal STEP 7.

Copy the required blocks from the iba S7 library (see chapter **7** *Iba S7 library*, page 139) to the blocks folder of your STEP 7 project:

Note

i

The request blocks do not support multi-instance calls.

The following blocks are required:

- ibaREQ_M (FB1400)
- ibaREQ_DP (FB1402)
- ibaREQ_DB (DB15)
- ibaREQ_DB-Interface (PLC data type)

For each Request module, the following steps have to be carried out:

1. Call the ibaREQ_M (FB1400) preferably within the OB1



2. Enable "Retain" for the complete instance block, you have just created.

	S7TIA_PN_REQ_V13_SP1 → S7	7-1516 REQ-S7-PN [(CPU 151	6-3 PN/DP] →	Program bloc	ks ▶ ibaRE	Q_M_DB [[0B1400]
Devices								
13 O O 🔳		🗈 🖿 🔢 😤				1		
	ibaREO M DB					/		
STTA PN REQ V13 SP1	Name	Data type	Offset	Start value	Retain	Accessible f	Visible in	Setnoint
Add new device		boto ope	onset	, start raide				
Devices & networks	2 ST B RESET	Bool	0.0	false				
▼ 37-1516 REQ-S7-PN [CPU 1516-3 PN/DP]	3 🕣 🔻 Output	-						
Device configuration	4 - ERROR STATUS	Word	2.0	16#0				
Q Online & diagnostics	5 🔄 🕶 InOut				Ā		i iii	
▼ 🙀 Program blocks	6 🕣 = REQ DB	*ibaREQ_DB-Interfa	4.0					
Add new block	7 🤕 💌 Static							
Cyclic interrupt 1ms [OB31]	8 😋 🔹 🕨 EXPERT	Struct	10.0					
Cyclic interrupt 10ms [OB30]	9 🕣 🔹 sIDBinitialized	Bool	12.0	false				
🖀 Main [OB1]	10 🤕 🔹 sOperandsInvalid	Bool	12.1	false		V		
🐲 ibaSignalgenerator [FC99]	11 🕣 🔹 slMDataValid	Bool	12.2	false				
🔁 ibaREQ_M [FB1400]	12 🔄 🖷 sOk	Bool	12.3	false				
ibaREQ_PN [FB1401]	13 🔩 🔹 🕨 sGET_IM_DATA	Get_IM_Data				V		
🥃 Demo [DB100]	14 🔄 🖬 🕨 sIM_DATA	Array[053] of Byte	14.0			V		
🏮 ibaREQ_DB [DB15]	15 🕣 🖷 sAdrOPList	Dint	68.0	0		V		
ibaREO_DB_1[DB16]	16 📹 CDBAddr_PDA257	Int	72.0	64		V	V	
ibaREQ_M_DB [DB1400]	17 🕣 = cDBAddr_S72PDA	Int	74.0	1440			Image: A start and a start	
ibaREQ_M_DB_1 [DB1402]	18 📹 🔹 cDBAddr_Xchange	Int	76.0	2464		~	Image: A start and a start	
📑 ibaREQ_PN_DB [DB1401]	19 🕣 🖷 cDBAddr_Ops	Int	78.0	2528		 Image: A start of the start of	Image: A start and a start	
📁 ibaREQ_PN_DB_1 [DB1403]	20 😋 = cDBAddr_actVal	Int	80.0	12768			Image: A start and a start	
System blocks	21 🕣 🔹 cMaxDataLength	UInt	82.0	1472		V	V	
Technology objects	22 🔄 🔹 sREQ_AnzOperandenI.	Int	84.0	0				
External source files	23 - sREO AnzOperandeni.	Int	86.0	0				

3. Call the ibaREQ_DP (FB1402), preferably within the OB1 or an cyclic interrupt (OB3x).



For each additional Request module:

- In the blocks folder, an ibaREQ_DB (DB15) has to be available for each Request module. Copy the data block and assign a new unique DB number.
- Within the OB1, the ibaREQ_M (FB1400) has to be called once more for each Request module with the new DB number.
- Within the OB1 or a cyclic interrupt (OB3x), the ibaREQ_DP (FB1402) has to be called for each Request module once more with the new DB numbers.
- Please consider that all instance data blocks have to be unique and that the values for the ADR_SLOT_0 and ADR_SLOT_1 are assigned uniquely.

Finish:

■ Load all blocks into the S7-CPU and restart.



4.3.3.4 Device configuration

The following settings have to be done in the device configuration of the CPU:





1. Disable ibaREQ_DB (DB15) Properties – Attributes – Optimized block access

General		
General Information	Attributes	
Time stamps		
Compilation	Only store in load memory	
Protection	Data block write-protected in the device	
Attributes	Optimized block access	

When using the connection mode TCP/IP (not TCP/IP S7-1x00) with S7-1500 CPUs, the following settings at the device configuration have to be made in addition:

2. Properties – General – Protection – Connection mechanisms: Permit access with PUT/GET communication

demoREQ-S7-UDP [CPU 1516-3 PI	VDP]						Roperties	🚺 Info 🚺 🗓 Dia	agnostics	
General IO tags System	n constants	Texts								
General Project information Catalog information Identification & Maintenance PROFINET interface [X1] PROFINET interface [X2] DP interface [X3] Startup	Prote Ac	ection	el for the PLC. Access level		Access	-	Access permi			
Cycle Communication load System and clock memory System diagnostics Web server Display User interface languages Time of day Protection System power supply Configuration control Connection resources Overview of addresses	· Fi	Full access (ni Read access Hill access No access (co No access (co Roral users and Hi password is require	o protection) mplete protection) tion): M applications will have ed.	e access to all fun	ctions.	Vinte	P3580070			
	Con	nection mechanisn	ns Permit a	ccess with PUT/GI	Tcommunica	ation from rer	mote partner (PLC, H	1MI, OPC,)		

Access protection S7-1500

An access protection can be enabled for an S7-1500 CPU. The following dependencies on *ibaPDA* apply:

Access level	CPU access	ibaPDA reads symbolic from CPU	S7-Request access
Full access (no protec- tion)	HMI, read, write	ОК	ОК
Read access	HMI, read	ОК	ОК
HMI access	НМІ	No	ОК
No access (complete protection)		No	No

Table 11:Access protection S7-1500

4.3.4 Configuration and engineering ibaPDA

4.3.4.1 General interface settings

The interface *ibaPDA-Request-S7-DP/PN* is configured in the *ibaPDA* "I/O Manager". Prerequisite is the installation of an *ibaFOB-D* card in the *ibaPDA* computer. When the *ibaFOB* card has been installed successfully, it is shown in the interface tree.



Fig. 39: I/O Manager, display ibaFOB-D card

Other documentation



You can find more information about the *ibaFOB-D* card in the respective manual.

Configuring ibaBM-DP

- 1. Start the *ibaPDA* client 🔤 and open the I/O Manager 🕮.
- 2. Mark in the interface tree (left) the link of the *ibaFOB* card to which *ibaBM-DP* is connected. Click on the link "Click to add module..." and select the *ibaBM-DP* module.



3. If you operate the device in Flex mode, the IP address of the device will be set automatically.

Diagnostics	Refibus browser
ре	ibaBM-DP
	False
	True
	ibaBM-DP
	10 ms
as prefix	False
m	
	Elex mode
	1 Ion Ino do
	pe as prefix

If you operate the device in *compatibility mode,* enter the IP address on the *General* tab of the *ibaBM-DP* module: either as name e.g. "DP_000100" or as IP address e.g. "192.168.11.123".

G	eneral 🥋	Diagnostics	Refibus browser
4	Basic		
	Module Typ	be	ibaBM-DP
	Locked		False
	Enabled		True
	Name		ibaBM-DP
	Timebase		10 ms
	Use name a	as prefix	False
4	Connectio	n	
	Mode		Compatibility mode
	IP Address		DP_000100
	Auto write o	configuration	True
	A	diam bin	Enlan

Note



The differences between Flex mode and compatibility mode are described in detail in the *ibaBM-DP* device manual.

An online connection to the device via Ethernet or USB is mandatory in compatibility mode. In the manual of the *ibaBM-DP* device, you can see how you can establish and check this connection.

- 4. Add a request module (or several modules, in case you need more connections to one or to different S7-CPUs) to the *ibaBM-DP* module on the respective PROFIBUS connection Bus 0 or Bus 1. Available modules are:
 - S7 request (for acquiring analog and digital signals)
 - S7 request decoder (for the acquisition of up to 1024 digital signals)
 - S7 request (ibaCom-L2B compatible) (for acquiring analog and digital signals in ibaCom-L2B compatibility mode)
 - S7 request Dig512 (ibaCom-L2B compatible) (for acquiring up to 512 digital signals in ibaCom-L2B compatibility mode)





Note



If you want to migrate a Request-S7 solution based on an *ibaCom-L2B* card to an *ibaBM-DP* device, e.g. to replace an *ibaCom-L2B* card by an *ibaBM-DP* device, use the function in the I/O Manager for converting L2B Request-S7 modules.

Click with the right mouse button on the PROFIBUS links and select "Convert module" from the context menu. All available L2B Request-S7 modules are displayed. Select one by one the module, which should be converted to an *ibaCom-L2B* compatible module.

🔢 iba I/O Manager																	- [×
🗄 🗋 📸 🛃 🏹 🆫 🔹 Hardware 🕻	Groups Techn	ostrin	g Outputs 🔤 📸																
⊕-‡‡ General	X40: B	us	0)																
Ballon Link 0	X40: Bue 0																_		
🗁 🔂 ibaBM-DP	Cisture		Met converted	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
Calut Add mor	Jule N		Not connected		_		_	_	_	_	_	_	_		_	_		_	
Add inte	module	ाजन	128 S7 Request A (0)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Click to use mount			L2B S7 Request B (2)			18	19	20	21	22	23	24	25	26	27	28	29	30	31
	Masters:	100	L2B S7 Request DirE1		8	34	35	36	37	38	39	40	41	42	43	44	45	46	47
	Online slaves:	000	L2B 37 Request Dig31	2 (3)	_	50	51	52	53	54	55	56	57	58	59	60	61	62	63
5	Active slaves:			64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
	Offline slaves:			80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
	Phantom slave	s:		96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
0 9	Collision alsuos			112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	
	Collision sidves			10.00	110	anna.	110	1118	10.00	110	110	140	1060	166	120	1.4411	120	100	
🖶 🗭 Link 2																			
👜 🏴 Link 3																			
Click to add module																			
E- Ink A																			
L2B S7 Request A (0) L2B S7 Request B (2) → 0 2 → 0 3																			
Link B ∭ L28 57 Request Dig512 (3) 																			
Cick to add module																			
B-OPC																			
S7-Xplorer																			
Playback																			
⊞- f ∗ Virtual	TTTTT	TT			П	пт	TT	m			-		_	_		_	_		
Unmapped	0 256	512	768 1024 12	80	1536	5 1	792	00	e li	0		OK			Apply		C	ancel	

For more information about replacing an *ibaCom-L2B* card with an *ibaBM-DP* device, see chapter **7** *Replacing Request-S7 on ibaCom-L2B by ibaBM-DP*, page 166.

5. Configure the required module settings and signals as described in the following chapters. The *General* and *Connection* tabs are identical for all Request modules. The Request modules only differ in the *Analog* and *Digital* tabs. 6. After you have finished the configuration, click <Apply> or <OK> to transfer the new configuration to the device and start data acquisition with *ibaPDA*.

4.3.4.2 General module settings

You find the description of all settings that are identical for all Request-S7 modules in chapter **7** General interface settings, page 16.

The *ibaBM-DP* modules have the following common specific setting options:

Profibus

Profibus - Bus number

0 = connector X40 left, 1 = connector X41 right

Slave No.

PROFIBUS slave address assigned to the module.

Connection - Auto enable/disable

If TRUE, the acquisition is started, even if no connection can be established to the S7-CPU. The module is deactivated. During the acquisition, *ibaPDA* tries to reconnect to the S7-CPU. When it succeeds, the acquisition is restarted with this module enabled.

In case of FALSE, the acquisition is not started, if a connection to the configured S7-CPU cannot be established.

4.3.4.3 Connection settings

The connection settings are identical to those in chapter **7** *Connection settings*, page 49.

4.3.4.4 Module S7 Request

With the "S7 request" module, up to 64 analog and 64 digital signals can be acquired.

A separate PROFIBUS slave and Request block call has to be configured for each module.

For a description of the module settings, see chapter **7** *General module settings*, page 16 and **7** *General module settings*, page 84.

4.3.4.5 Modules S7 Request Decoder

The "S7 Request Decoder" module allows the acquisition of up to 1024 digital signals sent as a maximum of 64 words (16 Bit). This module type is suited for applications where large amounts of digital signals have to be acquired and for which the max. 1024 directly addressable digital values of the *ibaBM-DP* are not sufficient.

A separate PROFIBUS slave and Request block call has to be configured for each module.

On the "Digital" tab, you can enter directly the words as basic signals for decoding over absolute S7 operands. Only word operands (e. g. PIW, MW, DBW) are allowed. It is also possible to use S7 symbols by generating address books. For detailed information, see chapter **7** Selection via



the operand symbols, page 20. The signals selected in S7 CFC and symbol browser are applied and the columns Name, S7 symbol, S7 Operand and Data Type are filled in automatically.

Click the <+> symbol to the left of each line to open a list in which you can enter a name for each of the 16 digital values.

iba I/O Manager			-					
] 📴 🎬 🛃 🏹 🕟 🔹 Hardware G	roups Technostring Outputs 📑 🖺							
General	S7 request decoder (1)							
ian barobanatoro ian ing Link 0								
ibaBM-DP	General Connection JI Digital		I was a second					
E	Connector	S7 Operand	DataType	Active				
5/ request (0)	0 + PIW 1	PIW 1	WORD					
Click to add module	1 (+) DB 3,DBW 2 DB 3,DBW 2 WORD							
	2 DB 3.DBW 4	DB 3.DBW 4	WORD					
Click to add module	9. Name			Active				
→O 2	0 Digital Signal 0							
	1 Digital Signal 1							
	2 Digital Signal 2							
	3 Dinital Signal 3							
	4 Digital Signal 4							
	5 Digital Signal 5							
	6 Digital Signal 6							
	7 Dickel Grand 7							
	8 Digital Signal 8							
→O 15	9 Digital Signal 9							
⊢⊫ Link 1	10 Digital Signal 10							
⊢⊫ Link 2	11 Digital Signal 11							
- III Link 3 → Click to add module	12 Digital Signal 12							
ibaCom-L2B-8-8	13 Digital Signal 13							
Immi Link A	14 Digital Signal 14							
- 📟 Link B	15 Digital Signal 15							
Click to add module	3 + DB 3.DBW 6	DB 3.DBW 6	WORD					
Click to add module	4 [+]		WORD					
= S7 TCP/UDP	5 +		WORD					
Click to add module	6 +		WORD					
S/-Xplorer	7 +		WORD					
Playback	8 -		WORD					
Virtual	N LI WORD							
Click to add module			WORD					

Fig. 40: Modules S7 Request Decoder

Note



The module type "Dig512 S7 Request" of the predecessor device *ibaBM-DPM-S* is not available any more for *ibaBM-DP*. Please use instead the "S7 Request Decoder" module type.

4.3.4.6 Module S7 Request (ibaCom-L2B compatible)

The module "S7 Request (ibaCom-L2B compatible)" is fully compatible to the module "L2B S7 Request" when using an ibaCom-L2B card (see chapter **7** *Configuration and engineering ibaPDA*, page 129.)

The configuration on the SIMATIC S7 side has to be done according to chapter **7** Configuration and engineering SIMATIC S7-300, S7-400 and WinAC, page 114.

iba

Note



This module type usually is used to replace an existing Request-S7 solution based on an *ibaCom-L2B* card by an *ibaBM-DP* device. For more information about this application case, see chapter **7** *Replacing Request-S7 on ibaCom-L2B by ibaBM-DP*, page 166.

Note



The module "S7 Request (ibaCom-L2B compatible)" is not released for the connection to control systems of S7-1500 type.

4.3.4.7 Module S7 Request Dig512 (ibaCom-L2B compatible)

The module "S7 Request Dig512 (ibaCom-L2B compatible)" is fully compatible to the module "L2B S7 Request Dig512" when using an ibaCom-L2B card (see chapter **7** Configuration and engineering ibaPDA, page 129.)

The configuration on the SIMATIC S7 side has to be done according to chapter **7** Configuration and engineering SIMATIC S7-300, S7-400 and WinAC, page 114.

Note



This module type usually is used to replace an existing Request-S7 solution based on an *ibaCom-L2B* card by an *ibaBM-DP* device. For more information about this application case, see chapter **7** *Replacing Request-S7 on ibaCom-L2B by iba-BM-DP*, page 166.

Note



The module "S7 Request Dig512 (ibaCom-L2B compatible)" is not released for the connection to control systems of S7-1500 type.



4.3.5 Diagnostics

When you select the bus module node in the signal tree and choose the *Analog* or *Digital* tab, you get a list of all operands that have been acquired in the bus module with data type and actual value.

) iba I/O Manager										
🗋 📂 🎥 🏹 🕟 🗸 Hardware G	roups	Technostring Outp	outs 🗎 🛍					-		
⊕ - 😳 General 🖉 🗸 🗸 🖓 - 🕎 iba FOB-4io-D	ik	aBM-DP								
白開 Link 0		General 🔨 Analog	👖 Digital 🧼 Diagnostics 🛒	Profibus brov	wser					
🖮 📟 X40: Bus 0		Name	Symbol	Bus	Slave	I/O	Address	DataType	Actual	+
S7 request (0)	•	🗉 Source: (0) S7 reque	est							
Click to add module	0	[0:0]: sinus	DBS\DB_ibaPDA\signal01		0	10 Out		8 FLOAT_B		-26,959
Click to add module	1	[0:1]: cosinus	DBS\DB_ibaPDA\signal02		0	10 Out		12 FLOAT_B		50,5693
	2	[0:2]: ramp	DBS\DB_ibaPDA\signal03		0	10 Out		16 FLOAT_B		333
	0	256 51	2 768 1024	1280	1536	1792	2048 11	ОК	Арр	ly Cancel



🔢 iba I/O Manager										×
🗄 🗋 💕 🛃 🏹 🌗 🕶 Hardware (Group	os Technostring Outputs 🗎 👔	<u> </u>			_				
e		ibaBM-DP as General 🔨 Analog 👖 Digital	🧼 Diagnostics 🛒 Profibus browse	r						
🚊 📾 X40: Bus 0		Name	Symbol	Bus	Slave	I/O	Address	Bit no.	Actual	+
S7 request (0)		🖂 Source: (0) S7 request								
Click to add module	0	[0.0]: dockmarker 0.1s	DB 100.DBX 12.0	C	10	Out		0	0	1
Click to add module	1	[0.1]: clockmarker 0.2s	DB 100.DBX 12.1	C	10	Out		0	1	1
	2	[0.2]: clockmarker 0.4s	DB 100.DBX 12.2	C	10	Out		0	2	1
	3	[0.3]: dockmarker 0.5s	DB 100.DBX 12.3	C	10	Out		0	3	0
~ 5	4	[0.4]: dockmarker 0.8s	DB 100.DBX 12.4	C	10	Out		0	4	0
	5	[0.5]: dockmarker 1s	DB 100.DBX 12.5	C	10	Out		0	5	1
	6	[0.6]: clockmarker 1.6s	DB 100.DBX 12.6	C	10	Out		0	6	0
	7	[0.7]: clockmarker 2s	DB 100.DBX 12.7	C	10	Out		0	7	0
						1			245	
	- 0	256 512 70	68 1024 1280	1536 175	2 2041	11	ок	Apply	Cancel	

Fig. 42: List of the acquired operands on the Digital tab

Other documentation



You find a detailed description of the device-specific diagnostic options of *ibaBM-DP* in the device manual.

4.4 Request-S7 for ibaBM-DP in redundancy mode

In the following, the Request-S7 version for the PROFIBUS bus module *ibaBM-DP* in redundancy mode is described.

4.4.1 General information

With the redundancy mode of *ibaBM-DP*, the device can be operated on redundant PROFIBUS systems in combination with SIMATIC-400H controllers, whose measurement data are to be acquired.

You need an additional license for using the redundancy mode of the *ibaBM-DP*. Please contact the iba AG support team. The license is released using the administrator functions in the Web dialog of the *ibaBM-DP*.

Request-S7 redundant is suitable for operating *ibaBM-DP* with the Request functionality as single-channel periphery on a highly available SIMATIC S7-400H controller.

The following figure shows the exemplary integration of an *ibaBM-DP* in redundancy mode.



Fig. 43: Request-S7 for ibaBM-DP in redundancy mode

Note



The following description refers to the Request blocks V4.0 or higher.

Other documentation



For detailed information about the redundancy mode of the *ibaBM-DP*, please see the device manual.



The functionality of the Request-S7 for *ibaBM-DP* in redundancy mode mostly corresponds to the functionality in standard mode (see chapter **7** *Request-S7 for ibaBM-DP*, page 64). The differences and extensions are described in the following.

For information and application examples, see chapter **7** Application examples, page 148.

4.4.2 Configuration and engineering SIMATIC S7-300, S7-400 and WinAC

4.4.2.1 Description of the Request-FC ibaDP_Req_H (FC123)

With this function, the communication between the S7, *ibaPDA* and the *ibaBM-DP* device is initialized and controlled.

The ibaDP_Req_H function has to be called once per slave pair in the cyclic program.

The used blocks are part of the iba S7 library (see chapter **7** *Iba S7 library*, page 139).

Description of the formal parameters of the ibaDP_Req_H

Name	Туре	Data Type	Description
DB_PDA	IN	BLOCK_DB	DB of the baPDA communication interface ibaDP_DB_PDA (2064 Byte)
DB_INTERN	IN	BLOCK_DB	DB of the internal data interface ibaDP_DB_work (1900 Byte)
OUTPUT_ADR_SLAVE	IN	INT	Start address of the peripheral output range, continuous and 244 Bytes long
INIT_FC	IN	BOOL	TRUE -> Initialize
INP_RANGE	IN	INT	Number of input bytes (evaluation only during initialization), 0:automatic detection (recommended)
OUT_RANGE	IN	INT	Number of output bytes (evaluation only during initialization), 0:automatic detection (recommended)
MARKER_RANGE	IN	INT	Number of marker bytes (evaluation only during initialization), 0:automatic detection (recommended)
ERROR_STATUS_INIT	OUT	BYTE	Initialization error
ERROR_STATUS_COM	OUT	BYTE	Communication error

The following SFCs are used internally:

- SFC 13 (DPNRM_DG)
- SFC 15 (DPRD_DAT)
- SFC 20 (BLKMOV)
- SFC 21 (FILL)
- SFC 24 (TEST_DB)

- SFC 49 (LGC_GADR)
- SFC 50 (RD_LGADR)
- SFC 51 (RDSYSST)

Detailed description:

DB_PDA

DB in the range of 1 to n (see technical data of the CPU). The DB is used for data exchange with *ibaPDA*. Length at least 2064 Bytes.

DB_INTERN

DB in the range of 1 to n (see technical data of the CPU). Length at least 1900 Bytes.

The following data are stored in this DB:

- Technical data of CPU which are determined during initialization
- The S7 pointers requested by *ibaPDA*
- The binary and analog transmission data

OUTPUT_ADR_SLAVE

DP start address of the *ibaBM-DP* in the peripheral output range for sending data. Length 244 Bytes, continuous (without gaps!)

INIT_FC

Used for initializing the Request block. The Request block is initialized automatically internally. Additionally, the initialization can be performed manually by an external logic via the input INIT_FC = TRUE.

INP_RANGE

Limits the number of input bytes to be measured.

If INP_RANGE = 0, the size of the available process image of the inputs will be evaluated by the Request block (recommended). Evaluation is done only during the initialization phase of the module.

OUT_RANGE

Limits the number of output bytes to be measured.

With OUT_RANGE = 0 the size of the available process image will be evaluated by the Request block (recommended). Evaluation is done only during the initialization phase of the module.

MARKER_RANGE

Limits the number of marker bytes to be measured.

With MARKER_RANGE = 0, the number of the available markers will be evaluated by the Request block (recommended). Evaluation is done only during the initialization phase of the module.

ERROR_STATUS_INIT

The following error codes can be generated:

1: DB_PDA is read-only

2: DB_PDA-No = 0 or higher than the max. permissible DB number of this CPU

3: DB_PDA with the specified number is not available

5: DB_PDA is too short

11: DB_INTERN is read-only

12: DB_INTERN-No = 0 or higher than the max. permissible DB number of this CPU

13: DB_INTERN with the specified number is not available

15: DB_INTERN is too short

16: Error when reading the identification data of the CPU

19: Initialization not finished

21: Not enough memory space for the data set

22: SZL_ID is wrong or not known in this CPU

23: The index of the SZL is wrong or not permitted

30: OUT_ADR_SLAVE is no peripheral output range

31: OUT_ADR_SLAVE is not assigned to a PROFIBUS

32: RM⁴): The configured "OUTPUT_ADR_SLAVE_BUS_0" is incorrect

33: RM: The configured "OUTPUT_ADR_SLAVE_BUS_0" is not assigned to a PROFIBUS DP Slave.

34: RM: The configured "OUTPUT_ADR_SLAVE_BUS_1" is incorrect.

35: RM: The configured "OUTPUT_ADR_SLAVE_BUS_1" is not assigned to a PROFIBUS DP Slave.

36: RM: SLAVE BUSO and SLAVE BUS1 do not have the same DP address

ERROR_STATUS_COM

The following error codes can be generated:

- 100: Bit number not 0
- 101: Bit number not 0-7
- 103: The operand range is not defined.
- 104: The data type is not defined
- 105: DB0 has been requested as data source
- 106: DB number is higher than the max. permitted number of DBs for this CPU
- 107: DB with the specified number is not available
- 109: DB is too short for the accessed operand

110 Specified data address does not exist

111: Initialization aborted with error

(error cause can be seen in ERROR_STATUS_INIT)

112 Initialization not carried out

(error cause can be seen in ERROR_STATUS_INIT)

- 150: Order fragmentation is not supported
- 151: Order Request: Total number of values does not match values in the order
- 152: Order Request: Up to 64 binary values permitted
- 153: Order Request: Up to 64 analog values permitted
- 200: DP station is not available
- 201: RM⁵⁾: Slave Bus 0 not available
- 202: RM: Slave Bus 1 not available
- 203: RM: Slaves Bus 0 + 1 are not available

210: Output modules of the Slaves Bus 0 and 1 are configured differently

⁴⁾ RM: Redundancy mode

⁵⁾ RM: Redundancy mode

4.4.2.2 Hardware configuration

For each PROFIBUS master, a separate ibaBM-PROFIBUS slave has to be configured.

The GSD file "ibaDPMSi.gsd" has to be used (version V2.2 and higher).

Note



You find the GSD-file "ibaDPMSi.gsd" on the DVD "iba Software & Manuals" in the following directory:

\02_iba_Hardware\ibaBM-DP\02_GSD_Files\01_General\



Fig. 44: HW config redundant system

Both configured slaves have to be configured with identical bus addresses. The I/O address ranges are different. Use the modules "S7-Req block consistent Slot 0 / Slot 1".

1	PS 407 10A	<u> </u>	2	
3	CPU 412-3 H left			
X1	MPI/DP			
F1	H Sync Submodule			(10)
F2	H Sync Submodule			-
5	CP 443-1 left			DP-I
X1	\$7-412H-left			
X1 P1 R	Port 1			
X1 P2 R	Port 2	-		
3	CDU A12.2 U right			
	Cr0412-5 might			
X1				
X7 F1	MPI/DP H Sync Submodule			
X7 IF1 IF2	MPI/DP H Sync Submodule H Sync Submodule	E		17
X7 IF1 IF2 5	MPL/DP H Sync Submodule H Sync Submodule CP 443-1 right	E		
X1 IF1 IF2 5 X1	MPL/DP H Sync Submodule H Sync Submodule CP 443-1 right PN-IO	E		
X1 IF1 IF2 5 X1 X1 P1 R	MPL/DP H Sync Submodule H Sync Submodule CP 443-1 right PN-IO Port 1	E		
X1 IF1 IF2 5 X1 X1 P1 R X1 P2 R	MPL/DP H Sync Submodule H Sync Submodule CP 443-1 right PN-IO Port 1 Port 2	E		
X1 IF1 IF2 5 X1 X1 P1 R X1 P2 R 6	MPL/DP H Sync Submodule H Sync Submodule CP 443-1 right PN-IO Port 1 Port 2	E		

	Ш				
-	🔰 (10) ibaBM-DPM	I-S/DP-Monitor			
Slot	DP ID	Order Number / Designation	Address	Q Address	Comment
1	128	S7-Reg block consistent Slot 0		512635	
2	128	S7-Reg block consistent Slot 1		636755	
3					

Fig. 45: Slave IO addresses Bus 0



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-	DC 407 104		
	1 F3 407 10A	Â	T
	CPU 412-3 H left		
7	MPI/DP		
1	H Sync Submodule		(10) ibaBM-
2	H Sync Submodule		
	CP 443-1 left		DP-NORM
7	57-412H-left		
TP1R	Port 1		
1 P2 R	Port 2		
	PS 407 10A	<u> </u>	DP-NORM
	PS 407 10A	<u> </u>	DP-NORM
7	PS 407 10A CPU 412-3 H right MP/DP		 DP-NORM
7 1	PS 407 10A CPU 412-3 H right MPI/DP H Sync Submodule		 DP-NORM
7 1 2	PS 407 10A CPU 412-3 H right MPI/DP H Sync Submodule H Sync Submodule	E	
7 7 1 2	PS 407 10A CPU 412-3 H right MPI/DP H Sync Submodule H Sync Submodule CP 443-1 right		DP-NORM
7 1 2 7	PS 407 10A CPU 412-3 H right MPI/DP H Sync Submodule H Sync Submodule CP 443-1 right PN-/O	E	DP-NORM
7 1 2 7 7 7 7 7 7 7 7	PS 407 10A CPU 412-3 H right MPI/DP H Sync Submodule H Sync Submodule FCP 443-1 right PN-IO Port 1	E	DP-NORM
1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 2 R	PS 407 10A CPU 412-3 H right MPI/DP H Sync Submodule H Sync Submodule H Sync Submodule FCP 443-1 right PN-I0 Port 1 Port 2	E	DP-NORM
7 1 2 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	PS 407 10A CPU 412-3 H right H Sync Submodule H Sync Submodule H Sync Submodule H Sync Tright PN-IO Port 1 Port 2	E	DP-NORM
1 1 2 1 1 1 1 1 1 1 1 1 1 2 1 1 1 1 1 2 1 1 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 1 2 1	PS 407 10A CPU 412-3 H right MPI/DP H Sync Submodule H Sync Submodule H Sync Submodule H Sync T ight PN-I0 Port 1 Port 2	E	DP-NORM

-						
((10) ibaBM-DPM	I-S/DP-Monitor				
Slot	DPID	Order Number / Designation	I Address	0 Address	Comment	
1	128	S7-Reg block consistent Slot 0		756879		
2	128	S7-Reg block consistent Slot 1		880999		
3			N 8			
1		97				-



Note



The modules have to be created for each slave without gaps and with sequential start addresses.

4.4.2.3 Configuration in STEP 7 (STL, LAD, FBD)

Request-S7 redundant is intended for the use with S7-400H CPUs with integrated DP interface as well as with external interface CP 443-5 (PROFIBUS master).

For Request-S7 with one PROFIBUS slave:

- Copy the following blocks from the iba S7 library (see chapter **7** *Iba S7 library*, page 139) to the blocks folder of your STEP 7 project:
 - FC123 (ibaDP_Req_H)
 - DB10 (ibaDP_DB_PDA)
 - DB25 (ibaDP_DB_work).

Note



If the block numbers FC123, DB10 and DB25 are already used in your project, assign other free numbers to the blocks from the iba S7 library when copying.

- Create the error OBs (OB82, OB85, OB86, OB87, OB122) in order to prevent CPU stops in case of an error.
- Call and parametrize the ibaDP_Req_H (FC123) in the cyclic program.



For Request-S7 with multiple PROFIBUS slaves:

- In the blocks folder, a data block ibaDP_DB_PDA (DB10) has to be available for each slave pair. Copy the DB10 in a DB with a new DB number.
- In the blocks folder, a data block ibaDP_DB_work (DB25) has to be available for each slave pair. Copy the DB25 in a DB with a new DB number.
- In the cyclic program, another call of the ibaDP_Req_H (FC123) with the new DB numbers and the respective peripheral addresses of the new PROFIBUS slave pair has to be done for each slave pair.
- The assignment of markers to the input INIT_FC and the outputs ERROR_STATUS_INIT or ERROR_STATUS_COM (or DB elements) should be unambiguous for each slave pair.

Finish:

■ Load all blocks into the S7-CPU and restart.

4.4.3 Configuration and engineering ibaPDA

First of all, connect *ibaBM-DP* to a free link of an *ibaFOB-D* card. Insert a device module *ibaBM-DP* on the respective link in the I/O Manager.

Set the "Redundancy mode" to TRUE on the *General* tab. The activated redundancy mode is displayed by an orange colored symbol of the device module.

The device can be operated in the 32Mbit Flex mode as well as in compatibility mode with 32Mbit.

🔅 General 🗊 ibaFOB-4io-D	iba	BM-DP	
ink 0 in the babM-DP	🔓 G	eneral 🧼 Diagnostics	🛒 Profibus browser
er dundant bus	۵	Basic	
Click to add module		Module Type	ibaBM-DP
		Locked	False
		Enabled	True
		Name	ibaBM-DP
		Timebase	10 ms
		Use name as prefix	False
	4	Connection	
~ 8		Mode	Flex mode
~~ 9		IP Address	172.29.0.101
		Auto write configuration	True
		Auto enable/disable	False
		Redundancy mode	True
	4	Redundant Prohbus	
	1000	Enable default values	True
		Default analog value	0
······································		Default digital value	0
💷 🖻 Link 2		Active slaves	
}⊫ Link 3			

Fig. 47: Setting redundancy mode in I/O Manager

As on the redundant PROFIBUS both bus systems 0 and 1 are operated in parallel, there are only settings for the "Redundant Profibus" on the *General* tab.

In redundancy mode, the following modules are available with Request-S7:

- S7 Request
- S7 Request Decoder

Note



- The following modules cannot be used in redundancy mode:
 - Module S7 Request (ibaCom-L2B compatible)
 - Module S7 Request Dig512 (ibaCom-L2B compatible)

These modules are deactivated automatically and cannot be activated manually, either.

The configuration of the modules corresponds to the configuration in standard mode. For more information, see chapter **7** *General module settings*, page 84.

Connection settings

For transmitting the operand data to both CPUs of the SIMATIC S7-400H, two different connections are established. These connections are switched on and off depending on availability and requirements.

Both connections are configured on the tabs *Connection 0* and *Connection 1*. The name of the tabs can be assigned in the "Connection name" fields.

Connection					
Connection name:	Connection 0				
Connection mode:	TCP/IP -	Connection type:	PG connection	•	Timeout (s): 15
Address:	192.168.123.1	Rack: 0	▲ Slot: 3 ▲		Test
Activate S7 routi	ng				
DB number: 10	-	Profibus slave num	per: 10 🔺		
CPU Name: No a	ddressbook	Detect S7 resta	rt (This applies to all S7 request modules)		

Fig. 48: Connection settings for connection 0

Connection					
Connection name:	Connection 1				
Connection mode:	TCP/IP 👻	Connection type:	PG connection	•	Timeout (s): 15 🚔
Address:	192.168.123.1	Rack: 1	Slot: 3		Test
Activate S7 routi	ing				
DB number: 10	A	Profibus slave num	ber: 10 🛓		
CPU Name: No a	ddressbook 🔹	Detect S7 rest	art (This applies to all S7 request modules)		

Fig. 49: Connection settings for connection 1

The other settings are identical to the settings for operation without redundancy mode (see chapter **7** *Connection settings,* page 84).

The following special features have to be considered:

- The rack numbers for an H system are 0 or 1 for the both redundant CPUs.
- The DB number, the PROFIBUS slave number and the CPU name for assigning an address book is set only once on the *Connection O* tab.

4.5 Request-S7 for ibaBM-DPM-S

In the following, the Request-S7 version for the PROFIBUS bus module *ibaBM-DPM-S* is described.

The solution "Request-S7 for ibaBM-DPM-S" is replaced by "Request-S7 for ibaBM-DP" with full functional compatibility.

4.5.1 General information

For DP Request, the measurement values (Request Handshake) are not requested via the PROFI-BUS, but via a separate connection.

Depending on the hardware and software, different access points can be selected for the Request:

- TCP/IP: the connection to the SIMATIC S7 is established over an integrated PN interface of the S7-CPU or the respective CP modules in the PLC and the standard network interface of the PC. No additional Siemens software is required the connection.
- PC/CP: this is the designation for different SIMATIC specific access points. In contrast to the TCP/IP connection, the SIMATIC communication software (and the corresponding licenses) must be installed on the PC for all connection types within the PC/CP group.
 - MPI, PROFIBUS: The connection to the SIMATIC S7 is established via the MPI or PROFIBUS interface of the PC; e.g. with the PCI card CP5611 or the MPI adapter for USB or serial PC interface.
 - TCP/IP, ISO: here, either the standard network interface of the PC or a suitable interface card is used for the connection to the S7.

System integration with ibaBM-DPM-S

The measured data is transmitted to the *ibaBM-DPM-S* device over PROFIBUS DP.

You need the following connections:

- Online connection between *ibaPDA* and S7-CPU (TCP/IP, MPI or DP)
- Online connection between *ibaPDA* and *ibaBM-DPM-S* (TCP/IP over Ethernet or USB)
- Fiber optic connection between *ibaPDA/ibaFOB-i-D* and *ibaBM-DPM-S*
- PROFIBUS connection between *ibaBM-DPM-S* and S7 PROFIBUS master

In the standard version a maximum of eight connections, i.e. eight PROFIBUS slaves, can be configured per device. Up to 244 Byte data can be transmitted per slave.

The following illustration shows the configuration using a TCP/IP online connection between *ibaPDA* and S7-CPU.





Fig. 50: Request-S7 for ibaBM-DPM-S

Note



The following description refers to the Request blocks V4.0 or higher. Should you require information regarding older versions, please contact our support.

Other documentation



For detailed information about *ibaBM-DPM-S*, see the device manual.

For information and application examples, see chapter **7** Application examples, page 148.

4.5.2 Configuration and engineering SIMATIC S7-300, S7-400 and WinAC

The configuration on the SIMATIC S7 side corresponds to the configuration of *ibaBM-DP* (see chapter **7** *Configuration and engineering SIMATIC S7-300, S7-400 and WinAC*, page 66).



4.5.3 Configuration and engineering ibaPDA

4.5.3.1 General interface settings

The interface is configured in the *ibaPDA* "I/O Manager". Prerequisite is the installation of an ibaFOB-D card in the ibaPDA computer.

After the *ibaFOB-D* card has been installed successfully, it is displayed automatically in the interface tree.

😰 iba I/O Manager						
🗋 📸 😼 🎝 🕻 + Hardware Groups Technos	tring Outputs	12. In 19.				
a	ibaFOB-4	0-D				
	Configuration Interface settings Interface settings Interrupt mode : PCI Info Slot Number: Bus Number: Vendor:	Info Memory view Master mode internal	IO Address: Mem. Address: Iba AG	 ✓ In use 0x00004000 0xD3340000 	Enable watchdog IO Length: Mem. Length: Device Id:	0x00000100 0x00000200 0xF0B4
					OK Apply	Cancel

Fig. 51: I/O Manager, display ibaFOB-D card

Other documentation



For detailed information about the *ibaFOB-D* card, please see device manual.

Configuring ibaBM-DPM-S

- 1. Start the *ibaPDA* client 🏁 and open the I/O-Manager 🕮.
- 2. Mark the link of the *ibaFOB* card in the interface tree (left), to which *ibaBM-DPM-S* is connected. Click with the right mouse-button on the "Add module..." link and select the *ibaBM-DPM-S* module.

	iboEQP (io)		
ibaFOB-4io-D	1981-09-410-	9	
⊕ - I ệt Link 0 ⊕ II≎ Link 1 ⊕ II≎ Link 2 ⊕ II≎ Link 3	Definition Configuration	fo Memory view	I la cora
Cick to add module	Add module		×
🕀 📟 Link A	Name : iba PM DPM S		
Link B	INdifie . IDABM-DPM-S		
OPC	Module type :		
Click to add module	ibaPADU-4-Al-U	📑 ibaPADU-S-CM	📕 ibaBM-DDCS
Click to add module	ibaPADU-8	ibaPADU-S-IT-2x16	ibaBM-DDCSM
S7-Xplorer	ibaPADU-8-1	ibaPADU-S-IT-16	ibaBM-DP
Click to add module	ibaPADU-8-ICP	HAICMON CMU	baBM-DP-64
The Playback	ibaPADU-8-M	baCMU-S	baBM-DPM-64
fx Virtual	ibaPADU-16	baPACO-4	proibaBM-DPM-S
- fx Virtual (0)	ibaPADU-16-M	📑 ibaPQU-S	baBM-DPM-S-64
Click to add module	ibaPADU-32	tbaDIG-40	abaBM-eCAT
Unmapped	ibaPADU-D-8AI-I	ibaBM-CAN	ibaBM-SiLink
	ibaPADU-D-8AI-U	ibaBM-COL-8i-o	ibaBM-SLM
	۰ III		
		24	100 B

3. Enter the IP address of the ibaBM-DPM-S device on the *General* tab of the *ibaBM-DPM-S* module: either as name e.g. "dpms_0100" or as IP address e.g. "192.168.11.123".

iba	BM-DPM-S							
G stor	eneral 🧼 Diagnostics	💐 Profibus browser						
4	Basic							
1000	Module Type	ibaBM-DPM-S						
	Locked	False						
	Enabled	True						
	Name	ibaBM-DPM-S						
	Timebase	10 ms						
	Use name as prefix	False						
۵	Connection							
	IP Address	dpms_0100						
	Auto write configuration	True						
	Auto enable/disable	False						

Note



An online connection to the device via Ethernet or USB is mandatory. How to establish and test such a connection is described in the manual of the *ibaBM-DPM-S* device.

- 4. Add an S7 request module to the *ibaBM-DPM-S* module (or several if you need more connections to one or multiple S7-CPUs). Available modules are:
 - S7 request (for acquiring analog and digital signals)
 - S7 request decoder (for acquiring up to 1024 digital signals)
 - Dig512 S7 request (for acquiring up to 512 digital signals)

Name :	S7 request	
Module ty	ype : 2	
DP: Av	uctive slave	
📩 Si	niffer	
	ctive slave decoder	
1 SI	niffer decoder	
S S	7 request	
S	7 request (ibaCom-L2B compatible)	
S	7 request Dig512 (ibaCom-L2B compatible)	
S S	7 request decoder	
	OK Cance	1

- 5. Configure the required module settings and signals as described in the following chapters. The *General* and *Connection* tabs are identical for all Request modules. The Request modules only differ in the *Analog* and *Digital* tabs.
- 6. After you have finished the configuration, click <Apply> or <OK> to transfer the new configuration to the device and start data acquisition with *ibaPDA*.

4.5.3.2 General module settings

You find the description of all settings that are identical for all Request-S7 modules in chapter **7** General module settings, page 16.

The *ibaBM-DPM-S* modules all have the following common specific settings options.

Profibus

Profibus - Bus number

0 = connector X40 top, 1 = connector X41 bottom

Slave No.

PROFIBUS slave address assigned to the module.

Connection - Auto enable/disable

If TRUE, the acquisition is started, even if no connection can be established to the S7-CPU. The module is disabled. During the acquisition, *ibaPDA* tries to reconnect to the S7-CPU. When it succeeds, the acquisition is restarted with this module enabled.

In case of FALSE, the acquisition is not started, if a connection to the configured S7-CPU cannot be established.

4.5.3.3 Connection settings

On the *Connection* tab, the corresponding connection of the Request module to the controller is configured.

🔢 iba I/O Manager									
🗄 🗋 💕 🚰 🌒 🌗 🔹 Hardwar	e Groups Technostring Outputs 🕮 🔮	5							
⊕-☆ General ⊕-ഈ ibaFOB-4io-D	S7 request (1)								
S7 request (1) Click to add module	Connection Connection mode: TCP/IP	Connection type:	PG connection		▼ Timec	out (s): 15 🚖			
	Address: 192.168.123.1 Ø Activate S7 routing Address of device	Rack: 0 e acting as gateway (e.g	Slot: 3 IE/PB link): Si 0	Subnet ID of target net: 000-0000		Test			
G - ₩ Link A G - ₩ Link B Click to add module Click to add module Click to add module	DB number: 10 - CPU Name: No addressbook -	Profibus slave numb	er: 10 🚖 t (This applies to all S7 requ	uest modules)					

Fig. 52: Connection setting, Connection mode TCP/IP

On the *Connection* tab of the Request modules, you have to enter the connection parameters. With the <Test> button you can test the connection.

Selection of connection mode TCP/IP

Connection type

PG, OP connection or other

Timeout

15 s (default)

Address

IP address of the S7-CPU or the Ethernet-CP, e.g. "192.168.50.68"

Rack

Rack number of the S7 station, e.g. "0"

Slot

Slot of the CPU in the rack, e.g. "3"

Activate S7 routing

(also see chapter **7** S7 routing, page 157)

Activate this option, if the S7-CPU and the *ibaPDA*-PC are not in the same network, but only communicate over a gateway that supports S7 routing. Such a gateway can be e.g. an IE/PB link, over which a S7-CPU can be reached without an Ethernet connection. Two additional input fields appear:

- Address of the device acting as gateway: Enter IP address of the gateway
- S7 Subnet ID of target net: Enter subnet ID from STEP 7 NetPro

DB number

Number of the DB (ibaDP_DB_PDA), which is assigned to this connection, e.g. "10"

Profibus slave number

Slave number from the *General* tab. If you change the entry on the *Connection* tab, the entry changes accordingly on the *General* tab and vice versa.



CPU Name

CPU name from the *General* tab. If you change the entry on the *Connection* tab, the entry changes accordingly on the *General* tab and vice versa.

Note



ibaPDA uses the following TCP port to communicate with ibaBM-DPM-S via Ethernet; it must be enabled in the firewall:

*ibaPDA-*PC --> *ibaBM-DPM-S*, port 999.

The S7-Request function requires the following port to be enabled, too.

ibaPDA-PC --> S7-CPU, Port 102.

Selection of connection mode PC/CP

🔢 iba I/O Manager					
🗄 🗋 🚰 🚰 🌒 🌗 🔹 Hardwar	e Groups Technostring Outputs 🐚 🛝				
General ibaFOB-4io-D	S7 request (1)				
E- E Link 0	🔟 General 🍠 Connection 🔨 Analog 👖	Digital			
Cick to add module	Connection Connection mode: PC/CP	Connection type:	PG connection	•]	Timeout (s): 15
i∎-l≢ Link 2	Access point for applications: ba => PC Adapt	ter MPI.1		-	Configure PG/PC interface
Link 3	Address: 2	Rack: 0	Slot: 0 ★		Scan Test
Becom-L28-8-8 Berrow Link A Berrow Link B Cick to add module OPC	Activate S7 routing DB number: 10 T CPU Name: No addressbook	Profibus slave numb	ar: 10 🚖		
Click to add module					

Fig. 53: Connection settings, connection mode PC/CP

Connection type

PG, OP connection or other

Timeout

15 s (default)

Access point for applications

Selection of an access point, e.g. S7 online, preferably create an own access point.

Address

MPI or DP address of the S7 CPU, e. g. "2" or for ISO MAC address of the Ethernet interface, e.g. "08-00-06-01-00-00"

Rack

Rack number of the S7 station, e.g. "0"

Slot

Slot of the CPU in the rack. For MPI/DP as transfer medium, use "0" as slot. Addressing is done via the MPI/DP address only. With ISO/TCP, however, the slot in the rack must be used.

S7 routing, DB number, Profibus slave number, CPU name

see "Connection mode TCP/IP", and chapter **7** S7 routing, page 157.

<Configure PG/PC interface>

Here, you configure the assignment between access point and physical interface. Additionally, you can create an own access point for *ibaPDA* here (also see chapter **7** Setting PG/PC interface / defining new access point, page 153)

Note



In order to use the connection type PC/CP, the SIMATIC communication software (e.g. SIMATIC Manager or driver for DP/MPI adapter) must be installed on the *ibaPDA* computer.

iba recommends generally setting up a special access point for *ibaPDA* for the connection to SIMATIC S7 via PC/CP connections. A separate access point prevents the risk that access for *ibaPDA* is impaired when changing the standard access point S7ONLINE in SIMATIC Manager.

Testing the connection

If you do not know the rack or slot number, you can click on the <Test> button to search the rack for CPUs (rack and slot are both set to "0").

As a result, the MLFB numbers of the available CPU modules are listed and displayed as blue hyperlinks.

🔢 iba I/O Manager								
🗄 🗋 📂 😹 🌒 🌛 🗕 Hardware Grou	ups Technostring Outputs 📳 🛍							
⊞	S7 request (0)							
Eink 0	🖩 General 🖋 Connection 🗸 Analog 👖 Digital							
S7 request (0)	Connection							
Click to add module	Connection mode: TCP/IP Connection type: PG connection Timeout (s): 15							
Click to add module	Address: 192.168.50.68 Rack: 0 🚖 Slot: 0 🛫 Test							
Click to add module	Activate S7 routing							
Playback	DB number: 10 🚖 Profibus slave number: 10 🚖							
 Virtual Click to add module 	CPU Name: No addressbook 🔹 🗹 Detect S7 restart (This applies to all S7 request modules)							
ag Unmapped	Connection established Address 192.168.50.68 Rack 0 Slot 0: connected to CP 6GK7 443-1EX11-0XE0 Scanning for connected CPUs: Address 192.168.50.68 Rack 0 Slot 3: connected to S7 CPU 6ES7 412-2XJ05-0AB0 Address 192.168.50.68 Rack 0 Slot 4: connected to FM CPU 6DD 1607-0AA2							
	Address 192. 168. 50. 68 Rack 0 Stot 7: connected to CP 6GK7 443-5DX04-0XE0 Address 192. 168. 50. 68 Rack 0 Stot 8: connected to CP 6GK7 443-1EX11-0XE0 Address 192. 168. 50. 68 Rack 0 Stot 8: connected to CP 6GK7 443-1EX11-0XE0							

Fig. 54: Testing the connection

By clicking on the hyperlink of a CPU, the connection will be established and the rack and slot number will be filled in automatically. If the right DB number is entered, the connection to the Request agent is established immediately and the PROFIBUS diagnostic data that are entered in the DB are read and displayed.

Diagnostic information

🔢 iba I/O Manager							
📋 💕 🚰 🚽 🌗 🗸 Hardware Grou	ips Technostring Outputs 🔤 🛝						
⊕	S7 request (0)						
iani sa baBM-DPM-S	📓 General 💋 Connection 🔨 Analog 👖 Digital						
S7 request (0)	Connection						
Click to add module	Connection mode: TCP/IP -	Connection type: PG connection	Timeout (s): 15				
Click to add module	Address: 192.168.50.68	Rack: 0 🜩 Slot: 3 🜩	Test				
OPC Click to add module	Activate S7 routing						
	DB number: 10 束 Profibus slave number: 10 🚖						
Click to add module	CPU Name: No addressbook						
	MLFBN- of PLC is: 6ES7 412-2XJ05-0AB0 PLC status: RUN Cycle times: Actual 2 ms Min 2 ns Reading DB10 DB version: 0.0.0.1 FB version: 69 Total memory size: 246096 546096 DB used size: 44812 Code memory size: 278856 Code used size: 44812 Code memory size: 279856 Code used size: 37720 No. inputs: 128 No. outputs: 128 No. outputs: 128 No. outputs: 128 No. outputs: 128 No. ditemes: 2048 VO space: 4096 Local datasize: 4096 Slave address Length Status 10 244 10 244 available 10 245 512 768 1024 1280	ns Max 5 ms [↑] [↑] [↑] [↑] [↑] [↑] [↑] [↑]	Apply Cancel				

Fig. 55: Diagnostic information

The following diagnostic data are available in the DB:

- PLC status: for example, "RUN" or "STOP"
- Cycle time: current, minimum and maximum value of OB1 cycle
- DB version: version code, for example, "0.0.0.1"
- FB version: version code, for example, "4.0.0.0"
- DB Length: length of the communication DB (must be 2064 bytes)
- HW version: release of CPU
- Total memory size
- DB memory
- DB used
- memory size for code
- used code
- number of inputs
- number of outputs
- number of markers
- number of timers
- number of counters

- IO area
- local data
- Slave address: slave address determined by the start address of the peripheral output range (see input OUTPUT_ADR_SLAVE of the FC122 Request block, chapter Description of the Request-FC ibaDP_Req (FC122), page 67).
- Length: length of the slave's output range. The length must be 244 bytes and match the slave length configured in HW Config.
- Status: indicates whether the slave is recognized by the CPU or not (unavailable/available). When setting up the S7 request module for the first time, the status is "not available", since the corresponding slave on the *ibaBM-DPM-S* is activated only when the configuration is applied in the I/O Manager by clicking <OK> or <Apply>.

If no connection is established to the S7-CPU, this might have the following causes:

- no TCP/IP connection possible (time out error), test network connection and IP address of controller and *ibaPDA* PC
- wrong address, rack or slot number
- wrong DB number
- DB too small (less than 2064 bytes)
- Error in the FC122 configuration; then an error number is issued, that corresponds to the connector ERROR_STATUS_COM of the FC122.
- An initialization error of the FC122 is displayed on the function block connector ERROR_STA-TUS_INIT.

The PROFIBUS slave number is read from the diagnostics information and applied automatically to the settings of the S7 request module.

Note



For some older S7 CPU models the automatic detection of the station number is not possible. Then the slave number 0 is indicated in the diagnostic information. In this case, the user must manually enter the station number configured in the HW Config into the field "Slave number" under "General / PROFIBUS".

4.5.3.4 Module S7 Request

With the "S7 request" module, up to 64 analog and 64 digital signals can be acquired.

A separate PROFIBUS slave and Request block call has to be configured for each module.

For a description of the module settings, see chapter **7** General module settings, page 16 and **7** General module settings, page 102.

4.5.3.5 Modules S7 Request Decoder

With the modules "S7 Request Decoder" up to 1024 digital signals can be acquired that are sent in form of up to 64 words. This module type is suited for applications where large amounts of digital signals have to be acquired and for which the max. 512 directly addressable digital values of the *ibaBM-DPM-S* are not sufficient.

For a detailed description of the "S7 Request Decoder" module, please see the module description of the *ibaBM-DP* device in chapter **7** *Modules S7 Request Decoder*, page 84.

4.5.3.6 Module Dig512 S7 Request

For the "Dig512 S7 request" module the same applies as for the module "S7 Request Decoder". But only 32 words (512 digital values) can be acquired.

The "Dig512 S7 Request" module is the predecessor of the "S7 Request Decoder" module and is still supported in *ibaPDA* for reasons of downward compatibility.

For new configurations, use the "S7 Request Decoder" module (see chapter **7** Modules S7 Request Decoder, page 108).

4.5.4 Diagnostics

When you select the bus module node in the signal tree and choose the *Analog* or *Digital* tab, you get a list of all operands that are acquired in the bus module with data type and actual value.

iba I/O Manager									x
🗋 💕 🎽 🎝 🌗 🛛 Hardware	Grou	ps Technostring Outputs	h 😩						
⊕-☆ General ⊕ ∰ ibaFOB-4io-D ⊖-♥ Link 0	ibaBM-DPM-S								
B BBM-DPM-S	N	lame	Symbol	Bus	Slave	I/O	Address DataType	Actual	+
Click to add module	Source: (2) S7 request								
i⊞-l≢ Link 1	0	[2:0]: sinus	DB 100.DBD 0	0	10	Out	8 DWORD_B		0
⊞ ⊫ Link 3	1	[2:1]: cosinus	DB 100.DBD 4	0	10	Out	12 DWORD_B		0
Click to add module	2	[2:2]: ramp	DB 100.DBD 8	0	10	Out	16 DWORD_B		0
 BaCom-L28-88 BaCom-L28-88 BaCom-L28-88 Click to add module Click to add module Click to add module Click to add module S7 Xplorer Click to add module Unmapped 						12	ОК Арру	Cancel	

Fig. 56: List of the acquired operands on the Analog tab


General	ib	aBM-DPM-S								
⊡… BB IbaFOB-440-D ⊟… BE Link 0	1	aonror nro	hanna tean ann an tean	1						
ibaBM-DPM-S S7 request (2)	DP:	General 🔨 Analog J Digital lame	Symbol	Bus	Slave	I/O	Address	Bit no.	Actual	+
Click to add module	•	B Source: (2) S7 request								
⊞ F Link 1	0	[2.0]: clockmarker 0.1s	DB 100.DBX 12.0		0 1	0 Out		0	0	(
ink 2 ink 2 ink 3	1	[2.1]: dockmarker 0.1s	DB 100.DBX 12.1		0 1	0 Out		0	1	0
Click to add module	2	[2.2]: clockmarker 0.2s	DB 100.DBX 12.2		0 1	0 Out		0	2	(
ibaCom-L2B-8-8	3	[2.3]: dockmarker 0.4s	DB 100.DBX 12.3		0 1	0 Out		0	3	(
E INK A	4	[2.4]: clockmarker 0.5s	DB 100.DBX 12.4		0 1	0 Out		0	4	(
Click to add module	5	[2.5]: clockmarker 0.8s	DB 100.DBX 12.5		0 1	0 Out		0	5	(
	6	[2.6]: clockmarker 1s	DB 100.DBX 12.6		0 1	0 Out		0	6	
ST TCP/UDP	7	[2.7]: clockmarker 1.6s	DB 100.DBX 12.7		0 1	0 Out		0	7	(
Click to add module	8	[2.8]: clockmarker 2s	DB 100.DBX 13.0		0 1	0 Out		1	0	(
Image: Sr-Xplorer Image: Sr-Xplorer <t< td=""><td></td><td>256 512 768</td><td>1024 1280 1536</td><td>1792</td><td>2048</td><td>12 [</td><td>ОК</td><td>Apply (</td><td>Cancel</td><td></td></t<>		256 512 768	1024 1280 1536	1792	2048	12 [ОК	Apply (Cancel	

Fig. 57: List of the acquired operands on the Digital tab

Other documentation



You find a detailed description of the device-specific diagnostic options of *ibaBM-DPM-S* in the device manual.

4.6 Request-S7 for ibaBM-DPM-S in redundancy mode

In the following, the Request-S7 version for the PROFIBUS bus module *ibaBM-DPM-S* in redundancy mode is described. The solution "Request-S7 for ibaBM-DPM-S in redundancy mode" is replaced by "Request-S7 for ibaBM-DP in redundancy mode" with full functional compatibility.

4.6.1 General information

With the redundancy mode of *ibaBM-DPM-S*, the device can be operated on redundant PROFI-BUS systems in combination with SIMATIC S7-400H controllers, whose measurement data are to be acquired. You need an additional license for using the redundancy mode of *ibaBM-DPM-S*. Please, contact the iba AG support team. Please contact the iba AG support team. The license is released using the administrator functions in the Web dialog of the *ibaBM-DPM-S*.

Request-S7 redundant is suitable for operating *ibaBM-DPM-S* with the Request functionality as single-channel periphery on a highly available SIMATIC S7-400H controller. The following figure shows the integration of an *ibaBM-DPM-S* in redundancy mode.



Fig. 58: Request-S7 for ibaBM-DPM-S in redundancy mode

Note



The following description refers to the Request blocks V4.0 or higher.

Other documentation



For detailed information about the redundancy mode of *ibaBM-DPM-S*, please see the device manual.



The functionality of the Request-S7 for *ibaBM-DPM-S* in redundancy mode mostly corresponds to the functionality in standard mode (see chapter **7** *Request-S7 for ibaBM-DPM-S*, page 98). The differences and extensions are described in the following.

For information and application examples, see chapter **7** Application examples, page 148.

4.6.2 Configuration and engineering SIMATIC S7-300, S7-400 and WinAC

The configuration on the SIMATIC S7 side corresponds to the configuration of *ibaBM-DP* (see chapter **7** *Configuration and engineering SIMATIC S7-300, S7-400 and WinAC*, page 89).

4.6.3 Configuration and engineering ibaPDA

First of all connect the *ibaBM-DPM-S* as usual to a free link of an *ibaFOBD* input card. In the I/O Manager, add an *ibaBM-DPM-S* device module on the respective link.

Set the "Redundancy mode" to TRUE on the *General* tab. The activated redundancy mode is displayed by an orange colored symbol of the device module.



Fig. 59: Setting redundancy mode in I/O Manager

As on the redundant PROFIBUS, both bus systems 0 and 1 are operated in parallel, there are only settings for the "Redundant PROFIBUS" on the *General* tab.

In redundancy mode, the following modules are available with Request-S7:

- S7 Request
- S7 Request Decoder
- Dig512 S7 request

The configuration of the modules corresponds to the configuration in standard mode. For information, see chapter **7** Configuration and engineering SIMATIC S7-300, S7-400 and WinAC, page 99.

Connection settings

For transmitting the operand data to both CPUs of the SIMATIC S7-400H, two different connections are established. These connections are switched on and off depending on availability and requirements.

The connection settings are identical to the Request-S7 for *ibaBM-DP* in redundancy mode (see chapter **7** *Configuration and engineering SIMATIC S7-300, S7-400 and WinAC*, page 89).

4.7 Request-S7 for ibaCom-L2B

In the following, the Request-S7 version for the *ibaCom-L2B* PROFIBUS card is described.

The solution "Request-S7 for ibaCom-L2B" is replaced by "Request-S7 for ibaBM-DP" with full functional compatibility.

For more information, see chapter **7** *Replacing Request-S7 on ibaCom-L2B by ibaBM-DP*, page 166.

4.7.1 General information



Fig. 60: Request-S7 for ibaCom-L2B

With the L2B Request, the measurement request (handshake request) is sent via PROFIBUS. A section of the IO range of the respective PROFIBUS slave is used for this purpose. No TCP/IP connection between the S7 controller and the ibaPDA computer is required for configuring.

Note



The following description refers to the Request blocks V3.4 or higher. Should you require information regarding older versions, please contact our support.

Older versions are required if ibaPDA-Request-S7-DP/PN is to be used in combination with older S7-CPUs, e.g. CPU 315 before release version 2AF03 or CPU 314 before release version 2AF04.

For information and application examples, see chapter **7** Application examples, page 148.

4.7.2 Configuration and engineering SIMATIC S7-300, S7-400 and WinAC

4.7.2.1 Description of the Request FCs

With these functions, the communication between S7 controller, *ibaPDA* and *ibaCom*-L2B card is initialized and controlled.

The functions have to be called once for each activated PROFIBUS slave in the program.

The used blocks are part of the iba S7 library (see chapter **7** *Iba S7 library*, page 139).

4.7.2.1.1 Initialization-FC ibaL2B_Init (FC111)

This function checks parameters of the S7-CPU and defines the default settings for the DBs. The ibaL2B_Init (FC111) function has to be called in all available start-up OBs (OB100, OB101 and OB102).

Name Туре Data Type Description DB PDA IN BLOCK DB DB of the ibaPDA communication interface ibaL2B DB work Range: 1 through n (see technical data of the CPU); each slave requires its own DB. INT Limits the number of input bytes to be measured (de-INP RANGE IN pends on CPU); we generally recommend the setting "0" (automatic detection). Only if the wrong number is displayed in the "S7 System Info" (ibaPDA), the number of input bytes can be set manually! "0": automatic detection (recommended). OUT RANGE IN INT Limits the number of output bytes to be measured (depends on CPU); we generally recommend the setting "0" (automatic detection). Only if the wrong number is displayed in the "S7 System Info" (ibaPDA), the number of output bytes can be set manually. "0": automatic detection (recommended). INT MARKER RANGE IN Limits the number of the marker bytes to be measured (depends on CPU); we generally recommend to define "0" (automatic detection). Only if the wrong number is displayed in the "S7 System Info" (ibaPDA), the number of marker bytes can be set manually! "0": automatic detection (recommended).

Description of the formal parameters of the ibaL2B_Init:



Name	Туре	Data Type	Description
ERROR_STATUS	OUT	BYTE	Parameterization error status
			The following error codes can be displayed:
			a) Concerning parameter "DB_NUMBER"
			"11" - DB is read-only (-> change DB attribute)
			"12" - DB no=0 or higher than the max. permissible DB number of this CPU (-> change to a valid DB)
			"13" - DB with the specified number does not exist. (-> copy/rename DB22)
			"14" – no sequence-relevant DB (-> contact iba ho- tline)
			"15" - DB too short (-> copy/rename DB22)
			b) While reading CPU parameters
			"21" - not enough memory space for data set (-> contact iba hotline)
			"22" - SZL_ID is wrong or unknown within this CPU. -> contact iba hotline
			"23" - Index is wrong or not allowed. -> contact iba hotline
			c) Exceptional status
			"19" – Initialization not finished (-> contact iba hotline)

The following SFCs are used internally:

- SFC 6 (RD_SINFO)
- SFC 24 (TEST_DB)
- SFC 51 (RDSYSST)

Ranges for number of inputs, outputs and markers

The number of inputs, outputs and markers in the CPU can be evaluated reliably by the ibaL2B_ Init function. For this purpose, the value "0" has to be assigned to the parameters as in our example.

In exceptional cases, these parameters may be adjusted/modified after consultation with the iba AG support. These parameters help to avoid configuration errors when selecting signals in *ibaPDA*. If, for example, the user selects a marker which does not exist in the S7, *ibaPDA* will generate an error message. In the *ibaPDA* diagnostics of the corresponding module you can recognize such conflicts quite easily.

In the "Value" column of the "Analog values" tab, the message "I/O address does not exist (6e) ---" appears, if the value does not comply with the range detected in ibaL2B_Init.

🔢 iba I/O Manager					x
🗄 🗋 💕 🚰 🎝 🗞 🗸 Hardware G	iroups Technostring C	Outputs 🛛 🛍 🛛	1		
General	L2B S7 Re	quest (Q))		
Click to add module ibaFOB-4io-D	General 🔨 Anal	log 👖 Digital	Contraction Diagnostics		
ia⊫e Link 0 ia⊫e Link 1	Analog values	∬ Digital value	s S7 system info		
⊞⊫ Link 2	S7 Operand	Datatype	Value	Displaytype	-
i∄⊶ 瞕 Link 3	0 MW 5000	INT	I/O address does not exist (6E)	DEC	
Click to add module	1	INT	0	DEC	
ink A	2	INT	0	DEC	
L2B S7 Request (0)	3	INT	0	DEC	
	4	INT	0	DEC	
	5	INT	0	DEC	
⊕ 📾 Link B	6	INT	0	DEC	
Click to add module	7	INT	0	DEC	Ε
OPC	8	INT	0	DEC	
Click to add module	9	INT	0	DEC	
B S7 Analyzer	10	INT	0	DEC	
Click to add module	11	INT	0	DEC	
E TCP/IP S7	12	INT	0	DEC	
	13	INT	0	DEC	
Click to add module	14	INT	0	DEC	
	15	INT	0	DEC	
Click to add module	16	INT	0	DEC	
Nicht abgebildet	17	INT	0	DEC	
	18	INT	0	DEC	
	19	INT	0	DEC	
	20	INT	0	DEC	
	21	INT	0	DEC	-
	0 256 512 76	8 1024 128	1 ОК 30 1536 1792 ∞ 1 ОК	Apply Cance	*

Fig. 61: Display of wrong configurations

In such case, please check the following:

- Did you select an operand address in *ibaPDA* which is available in the CPU? If not, use an available operand.
- Do the automatically determined address ranges in the *ibaPDA* menu "S7 System Info" correspond to the technical data of the S7-CPU? If not, set the number of I, O and M Bytes manually (from the "technical data" of the S7-CPU) when parameterizing the ibaL2B_Init.

4.7.2.1.2 Communication-FC ibaL2B_Req (FC112)

This function provides the communication between the S7 and the *ibaCom-L2B* card within the *ibaPDA* PC. It also supervises the communication links.

The ibaL2B_Req (FC112) function has to be called once per slave in the cyclic program.



Description	of the formal	parameters of	f the ibaL2B_	Req (FC112):
-------------	---------------	---------------	---------------	--------------

Name	Туре	Data Type	Description
DB_PDA	IN	BLOCK_DB	DB of the ibaPDA communication interface ibaL2B_ DB_work Range: 1 through n (see technical data of the CPU); each slave requires an own DB. The DB needs to be the same as the DB referenced by ibaL2B_Init.
DP_SEND_ADR	IN	INT	DP start address of the ibaCom-L2B card in the pe- ripheral output range for sending data.
DP_RECEIVE_ADR	IN	INT	DP start address of the ibaCom-L2B card in the pe- ripheral input range for the reception of data
TIME_OUT_VAL	IN	INT	Communication timeout Timeout = TIME_OUT_VAL x 100 ms
TIMER_NR	IN	Timer	Timer for the internal (stand-by) clock generator. Range: T0 to Tn (see technical data of the CPU); each slave requires an own timer.
TIME_OUT_FLAG	OUT	BOOL	Communication lost between S7 and ibaCom-L2B card

Name	Туре	Data Type	Description
ERROR_STATUS	OUT	BYTE	Parameterization error
			The following error codes can be displayed:
			" 92" - Invalid command from ibaPDA (-> contact iba hotline)
			"100" - not enough space in the DB address range for the requested analog values (-> reduce data amount in ibaPDA to a max. of 112 Byte)
			"101" – channel no. > 31 (-> contact iba hotline)
			"102" – data type is not supported (analog values only) (-> contact iba hotline)
			"103" – range identifier missing or cannot be inter- preted (-> contact iba hotline)
			"104 – this variable type cannot be interpreted> contact iba hotline
			"105" – DB 0 was requested as data source. (-> use other allowed DB)
			"106" – DB number is higher than max. permissible number of DBs of this CPU. (-> change to allowed DB)
			"107" - DB with the specified number does not ex- ist. (-> request existing DB data)
			"109" - DB is too short for the accessed operand (-> copy/rename DB22)
			"110" – actual operand address (I, O, M, P) does not exist. (-> request available operands)
			"111" – Initialization aborted with error (-> analyze error state of ibaL2B_Init, otherwise contact iba hotline)
			"112" – Initialization not performed (-> call ibaL2B_ Init in the start-up OBs)

The following SFCs are used internally:

- SFC 20 (BLKMOV)
- SFC 24 (TEST_DB)
- SFC 36 (MSK_FLT)
- SFC 37 (DMSK_FLT)
- SFC 50 (RD_LGADR)

4.7.2.1.3 Communication-FC ibaL2B_Req_CP (FC113) for CP342-5

Not every S7-300 CPU model has an integrated or free (unused) DP interface. As described before, in the S7-400 family, an external CP can be addressed with the functions ibaL2B_Init (FC111) and ibaL2B_Req (FC112). The external CP is connected to the so-called "communication bus" and acts like an internal DP interface.

With CPUs of the S7-300 family it is not as straightforward. They do not have a "communication bus". The connections to the iba slaves are realized by the standard blocks FC1 (DP_SEND) and FC2 (DP_RCV) from the S7 standard library (and not over the peripheral address space). The physical connection is carried out via the external CP342-5. For this case, the ibaL2B_Req (FC112) is replaced by the ibaL2B_Req_CP (FC113). Moreover, another DB ibaL2B_CP_SNDRCV (in example DB10) is required for all slave connections together, where the peripheral data of all slaves are stored temporarily.

The function ibaL2B_Req_CP (FC113) has to be called instead of the ibaL2B_Req (FC112) once per slave in the cyclic program.

Name	Туре	Data Type	Description
DB_PDA	IN	BLOCK_DB	DB of the ibaPDA communication interface ibaL2B_DB_work Range: 1 through n (see technical data of the CPU); each slave requires an own DB. The DB needs to be the same as the DB referenced by ibaL2B_Init.
DB_DP_Data	IN	BLOCK_DB	DB which buffers the send and receive data for FC_SEND and FC_RECV. Range: Range from 1 to n (see technical data of the CPU).The data of all slaves can be collected in one DB.
DB_ADR_Offset_SEND	IN	INT	DB-OFFSET address of the DB area for the SEND data (122 Byte are occupied per slave). Each slave must have an own OFFSET address for the SEND data.
DB_ADR_Offset_RECV	IN	INT	DB-OFFSET address of the DB range for receiv- ing (RECEIVE) data (16 Byte are occupied per slave). Each slave must have an own OFFSET ad- dress for the RECEIVE data.
TIME_OUT_VAL	IN	INT	Communication timeout
			Timeout = TIME_OUT_VAL x 100 ms
TIMER_NR	IN	Timer	Timer for the internal (stand-by) clock genera- tor. Range: T0 to Tn (see technical data of the CPU); each slave requires an own timer.

Description of the formal parameters of the ibaL2B_Req_CP (FC113):

Name	Туре	Data Type	Description
TIME_OUT_FLAG	OUT	BOOL	Communication lost between S7 and iba- Com-L2B card
ERROR_STATUS	OUT	BYTE	Parameterization error
			The following error codes can be displayed:
			" 92" - Invalid command from ibaPDA (-> con- tact iba hotline)
			"100" - not enough space in the DB address range for the requested analog values (-> re- duce data amount in ibaPDA to a max. of 112 Byte)
			"101" – channel no. > 31 (-> contact iba hotline)
			"102" – data type is not supported (analog val- ues only) (-> contact iba hotline)
			"103" – range identifier missing or cannot be interpreted
			(-> contact iba hotline)
			"104 – this variable type cannot be interpreted. -> contact iba hotline
			"105" – DB 0 was requested as data source. (-> use other allowed DB)
			"106" – DB number is higher than max. permis- sible number of DBs of this CPU. (-> change to allowed DB)
			"107" - DB with the specified number does not exist. (-> request existing DB data)
			"109" - DB is too short for the accessed operand (-> copy/rename DB22)
			"110" – actual operand address (I, O, M, P) does not exist. (-> request available operands)
			"111" – Initialization aborted with error (-> analyze error state of ibaL2B_Init, otherwise contact iba hotline)
			"112" – Initialization not performed (-> call ibaL2B Init in the start-up OBs)

4.7.2.2 Hardware configuration

Perform the following steps:

- Link the DP interface of the CPU or CP as DP master to a PROFIBUS network.
- Install the GSD-file IBA_0F05.GSD either by the menu

"Options - Installing GSD-files" or by copy/paste from the demo project.

- After the installation has been finished, you find the iba-GSD-file in the HW catalog under: Profibus-DP - Additional Field Devices - General - ibaL2B < S7 Direct Access >
- Attach the desired number of DP slaves "ibaL2B < S7 Direct Access >" to the PROFIBUS and set the DP addresses. The peripheral addresses are assigned automatically to the slaves as addresses in ascending order.
- HW Config. / Load system data to the S7-CPU.

HW C Stat	Config - [CPU tion Edit 1 음~ 묘 때	Bxx with DP-IF (Configu Insert PLC View O , ♣ �� 🕄 🏜	ration) S7C ptions Wind	LASSIC_L2B_RE	Q_V01]		
□ (0) 1 2 X1 X2 F 25 26 27 28 3 4 5 6 7 8 9 10 11	UR P1R F P2R C C C C C C C C C C C C C	PU 314C-2 PN/DP IPI/DP IT4-PN-IO tot 1 tot 2 124/DO16 15/AO2 South Sostion) (bal 28 KORM	PROFIBUS(1): DP mast	er system (1) (12) ibaL2B
_				ш			
Slot	(10) ibaL2	B_S7 Direct Access Order Number / D. <i>ibaFD4 (S7 Direct</i>	esignation (Access)	I Address	Q Address 256377	Comment	
2	84/	ibaFDA <s7 direct<="" td=""><td>(Donnee)</td><td>256 271</td><td></td><td></td><td></td></s7>	(Donnee)	256 271			

Fig. 62: Hardware configuration

4.7.2.3 Configuration in STEP 7 (STL, LAD, FBD)

4.7.2.3.1 CPU-internal DP interface or CP 443-5 (for S7-400)

If you use a CPU S7-300/400 with integrated DP interface or use the external interface CP 443-5 for a S7-400, proceed as follows. When using the external DP interface CP342-5 of a CPU S7-300, continue in chapter **7** *External DP interface CP342-5*, page 123.

For Request-S7 with one PROFIBUS slave:

- Copy the following blocks from the iba S7 library (see chapter **7** *Iba S7 library*, page 139) to the blocks folder of your STEP 7 project:
 - FC111 (ibaL2B_Init) and FC112 (ibaL2B_Req)
 - DB22 (ibaL2B_DB_work) and UDT22 (ibaL2B_DB_Struct)

Note



In case the block numbers FC111, FC112, DB22 and UDT22 are already used in your project, assign other free numbers to the blocks from the iba S7 library when copying.

 Create the error OBs (OB82, OB85, OB86, OB87, OB122) in order to prevent CPU stops in case of an error.

Note



DB22 and UDT22 contain a data structure which is not required for processing. Basically, a DB with a length of 1500 bytes would be sufficient. The data structure is useful for diagnostic purposes only.

• Call and parameterize the ibaL2B_Req (FC112) in the cyclic program.



■ Call and parameterize the ibaL2B_Init (FC111) in the start-up OBs (OB100, OB101, OB102).





For Request-S7 with multiple PROFIBUS slaves:

- For each Request slave, there must be one data block (DB) in the blocks folder which is referenced by both FCs. Copy the ibaL2B_DB_work (DB22) to a DB with a new DB number.
- Call the ibaL2B_Init (FC111) once more with a new DB number in the start-up OBs.
- In the cyclic OB, you have to call the ibaL2B_Req (FC112) once more with the new DB number and the peripheral addresses of the new PROFIBUS slave.

Finish:

■ Load all blocks into the S7-CPU and restart.

4.7.2.3.2 External DP interface CP342-5

When using an external DP interface CP342-5, perform the following steps.

For Request-S7 with one PROFIBUS slave:

- Copy the following blocks from the iba S7 library (see chapter 7 lba S7 library, page 139) to the blocks folder of your STEP 7 project:
 - FC113 (ibaL2B_Req_CP) and FC111 (ibaL2B_Init)
 - DB10 (ibaL2B_CP_SNDRCV), DB22 (ibaL2B_DB_work) and UDT22 (ibaL2B_DB_Struct)

Note



In case the block numbers FC111, FC113, DB10, DB22 and UDT22 are already used in your project, please assign other free numbers to the blocks from the iba S7 library when copying.

 Create the error OBs (OB82, OB85, OB86, OB87, OB122) in order to prevent CPU stops in case of an error. Call and parameterize the ibaL2B_Req_CP (FC113) in the cyclic program. As offset addresses for send and receive data, own areas within the DB "ibaPDA_SENDRECV" (DB10) have to be defined for each slave and handed over as parameters "DB_ADR_Offset_ SEND" or "DB_ADR_Offset_RECV".



■ Call and parameterize the ibaL2B_Init (FC111) in the start-up OBs (OB100, OB101, OB102).



■ Call and parameterize FC1 (DP_SEND) and FC2 (DP_RECV) in the cyclic program.





For Request-S7 with multiple PROFIBUS slaves:

- For each Request slave, there must be one data block (DB) in the blocks folder which is referenced by both FCs. Copy the ibaL2B_DB_work (DB22) to a DB with a new DB number.
- In the ibaL2B_CP_SNDRCV (DB10), 122 Bytes have to be reserved in the "Send" array and 16 Bytes in the "Receive" array for each Request slave. If necessary, you have to extend the arrays.
- Call the ibaL2B_Init (FC111) once more with a new DB number in the start-up OBs.
- In the cyclic OBs, you have to call the ibaL2B_Req_CP (FC113) once more with a new DB number and the respective address offsets for the send and receive range in the ibaL2B_CP_SNDRCV (DB10) of the new PROFIBUS slave.

Finish:

• Load all blocks in the S7-CPU and restart.

Note



The structure of the send and receive data in DB10 must correspond to the output addresses and input addresses of the DP slaves.

If there are more than two slaves, the arrays in DB10 have to be extended by 122 Bytes for sending and 16 Bytes for receiving direction, respectively.

In case of four slaves, for example, the following address assignment applies:

	DB10		PROFIBUS	ibaL2B_Req_CP.	ibaL2B_Req_CP.
			P-addresses	Offset_SEND	Offset_RECV
1: Slave	Send	Offset 0	Q-address 0	0	
2. Slave		Offset 122	Q-address 122	122	
3. Slave		Offset 244	Q-address 244	244	
4. Slave		Offset 366	Q-address 366	366	

1. Slave	Receive	Offset 0	I-address 0	488
2. Slave		Offset 16	I-address 16	504
3. Slave		Offset 32	I-address 32	520
4. Slave		Offset 48	I-address 48	536

Note

1

All parameters like times and markers have to be different!

4.7.2.4 Configuration in STEP 7 (CFC)

4.7.2.4.1 CPU-internal DP interface or CP 443-5 (for S7-400)

If you use a CPU S7-300/400 with integrated DP interface or use the external interface CP 443-5 for a S7-400, proceed as follows.

When using the external DP interface CP342-5 of a CPU S7-300, continue in chapter **7** External DP interface CP342-5, page 123.

For Request-S7 with one PROFIBUS slave:

- Copy the following blocks from the iba S7 library (see chapter **7** *Iba S7 library*, page 139) to the blocks folder of your STEP 7 project:
 - FC111 (ibaL2B_Init) and FC112 (ibaL2B_Req),
 - DB22 (ibaL2B_DB_work) and UDT22 (ibaL2B_DB_Struct)

Note



In case the block numbers FC111, FC112, DB22 and UDT22 are already used in your project, assign other free numbers to the blocks from the iba S7 library when copying.

Start the CFC editor and import these blocks (under menu "Options – Block Types"). The FCs are stored in the group "ibaPDA."



lock Types	1995		×
Block folder o	ffline	Chart folder	
FC106	RI	FC106	R I
FC111	ibaL2B_Init	FC111	ibaL2B_Init
FC112	ibaL28_Req	FC112	ibaL2B_Req
FC60	CMP_R	FC60	CMP_R
FC61	ADD_R	> FC61	ADD_R
FC63	MUL_R	FC63	MUL_R
FC72	SIN	FC72	SIN
FC73	COS	FC73	COS

 Drag the ibaL2B_Req (FC112) to your CFC chart. Pay attention to the run sequence. The ibaL2B_Req has to be called in a cyclic task (e. g. cyclic interrupt OB35 or free-running OB1).



Drag the ibaL2B_Init (FC111) to your CFC chart. Pay attention to the run sequence. The ibaL2B_Init is entered automatically in the start-up tasks (OB100, OB101 and OB102). Remove it from the cyclic tasks (e.g. OB35).



- Connect the blocks:
 - Enter the DB number of the Interface-DB (DB22) on both FCs on the input DB_NUMBER.
 - Enter the peripheral addresses of the PROFIBUS slave under DP_SEND_ADR and DP_RECEIVE_ADR of the ibaL2B_Req block from the hardware configuration.



Make sure to create the error OBs (OB82, OB85, OB86, OB87 and OB122) in order to prevent the CPU from running into STOP in case of an access failure.

To do so, you have to define an empty runtime group within the run sequence of these tasks if they are empty. Alternatively, you may place any dummy block into the error OB. This block must not be deleted, too.

Note



Do not choose the option "Delete empty runtime groups" for compilation otherwise the error OBs will be removed! Some older CFC versions have this option in the compilation dialog.

For Request-S7 with multiple PROFIBUS slaves:

- For each Request slave, there must be one data block (DB) in the blocks folder which is referenced by both FCs. Copy the ibaL2B_DB_work (DB22) to a DB with a new DB number.
- The ibaL2B_Init (FC111) has to be called once more on a CFC chart with a new DB number.
- The ibaL2B_Req (FC112) has to be called once more on a CFC chart with the new DB number and the peripheral addresses of the new slave.

After each program modification:

- Compile the complete program: Activate the option "Entire program", activate the option "Generate SCL source" (for CFC version 6.1 or higher), deactivate the option "Delete empty runtime groups" if available.
- Load the program and restart S7-CPU.



Note



Depending on the S7-CPU type, you may notice the following warnings after compiling and loading:

"W: OB101/ OB102 is not supported by this CPU" or

"W: OB101/OB102 could not be downloaded, because it is not supported by the connected online CPU".

These messages are displayed because the ibaL2B_Init is entered automatically in the start-up tasks OB101 and OB102. However, some S7-CPU types do not support OB101 and OB102. The warnings can be ignored.

4.7.3 Configuration and engineering ibaPDA

4.7.3.1 General interface settings

The interface is configured in the *ibaPDA* "I/O Manager". Prerequisite is the installation of an *ibaCom-L2B* card in the *ibaPDA* computer.

After the *ibaCom-L2B* card has been installed, it is displayed automatically in the interface tree.



Fig. 63: I/O Manager, display ibaFOB-D card

Other documentation



For more information about the *ibaCom-L2B* card, please see the respective manual.

4.7.3.2 General module settings

The module types "L2B S7 Request" and "L2B S7 Request Dig512" are available.

⊕\$\$ General ⊕ ₩ ibaFOB-4io-D	🖀 Add module
ibaCom-L2B-8-8 ibaCom-L2B-8-8 ibaCom-Link A ibaCom-Link B	Name : L2B S7 Request
Click to add module	Module type :
Click to add module	CB L2B integer
S7 TCP/UDP	CB L2B integer I/O
∃- 🕎 S7-Xplorer	S L2B real I/O
Click to add module	C L2B S7 real
Fx Virtual	SL2B dig512
Unmapped	ILZB 57 Request Dig512
	OK Cancel

Fig. 64: Module types

The L2B modules have the following common specific setting options:

Profibus

Slave No.

PROFIBUS slave address assigned to the module.

Profibus – Timeout

Waiting time in seconds before the firmware regards the connection as interrupted.

For a description of the other general module settings, see chapter **7** General module settings, page 16

In contrast to the Request-S7 solutions with the *ibaBM-DP* and *ibaBM-DPM-S* devices, no additional connection settings are required. The "Request-Handshake" is done via a part of the IO peripheral area.

4.7.3.3 Module L2B S7 Request

Up to 32 analog and 32 digital signals can be acquired with the "L2B S7 Request" module.

A separate PROFIBUS slave and Request block call has to be configured for each module.

For a description of the module settings, see chapter **7** General module settings, page 16 and **7** General module settings, page 130.

4.7.3.4 Module L2B S7 Request Dig512

With the "L2B S7 Request Dig512" module, up to 512 digital signals can be acquired that are sent as max. of 32 words (16 Bit). This is why this module type is especially suited for applications where many digital signals have to be acquired and the digital values of the modules "L2B S7 Request" which can be addressed directly are not sufficient.

A separate PROFIBUS slave and Request block call has to be configured for each module.



On the "Digital" tab, you can enter directly the words as basic signals for decoding over absolute S7 operands. Only word operands (e. g. PIW, MW, DBW) are allowed.

It is also possible to use S7 symbols by generating address books. For more information, see chapter **7** Selection via the operand symbols, page 20. The signals selected in S7 CFC and symbol browser are applied and the columns Name, S7 symbol, S7 Operand and Data Type are filled in automatically.

When clicking on the <+>-symbol on the left in each row, a list is opened in which you can enter a name for each of the 16 digital values.

😰 iba I/O Manager			- 8 %
🗄 🗋 💕 🛃 🏹 🌗 🕶 Hardware	Groups Technostring Outputs 🗎 📸		
eral eral ibaFOB-4io-D ibaFOB-200	L2B S7 Request Dig512 (0)		
ibaCom-L2B-8-8	General 🗍 Digital 🧼 Diagnostics		
L2B S7 Request Dig512 (0)	Connector	S7 Operand	Active 🔺
	0 + PEW 1	PEW 1	
	1 🖃 DB 3.DBW 2	DB 3.DBW 2	
🕀 📾 Link B	۹, Name		Active
Click to add module	0 Digital Signal 0		
Click to add module	1 Digital Signal 1		
	2 Digital Signal 2		
Click to add module	3 Digital Signal 3		
Click to add module	4 Digital Signal 4		
- Playback	5 Digital Signal 5		
E f Vitual	6 Digital Signal 6		
Uick to add module	7 Digital Signal 7		
	8 Digital Signal 8		
	9 Digital Signal 9		
	10 Digital Signal 10		
	11 Digital Signal 11		
	12 Digital Signal 12		
	13 Digital Signal 13		
	14 Digital Signal 14		
	15 Digital Signal 15		
	2 + DB 3.DBW 4	DB 3.DBW 4	
	3 + DB 3.DBW 6	DB 3.DBW 6	
	4 🛨		
	0 256 512 768 1024 1280 1536 1792 2048 64	OK Apply	Cancel

Fig. 65: Module L2B S7 Request Dig512, Digital tab



4.7.4 Diagnostics

4.7.4.1 ibaCom-L2B card

When marking the L2B card in the *ibaPDA* I/O Manager, a status overview of the card is displayed. The green checkmark on the slave number indicates an active connection (in the figure slaves 0-2 are active).

neral	ibaCom-L	2B-8-8					
Link 0							
Link 1 Link 2	Interface settings						
Link 3 Click to add module	Interrupt mode :	Slave mode	•	V In use			
Link A	PCI Info						
L2B S7 Request (0)	Slot Number:	0	IO Address:	0x00004400	IO Length:	0x0000080	
L2BS/Request (2) ⊶03	Bus Number:	17	Mem. Address:	0xD3200000	Mem. Length:	0x00100000	
Link B							
Click to add module Click to add module Click to add module TCP/UDP	Vendor Name:		iba AG		Device Id:	0x4C32	

Fig. 66: I/O Manager, display ibaCom-L2B card

Select the PROFIBUS link to display detailed information regarding the status of each slave. These are mainly interesting for support purposes.

🔢 iba I/O Manager						
🗋 💕 🏂 🛃 🏹 💽 🕶 Hardware Gro	oups Technostring	Outputs 📳 🛍				
terenal terenal terenal terenalista de la constantia de la constantia de la constantia de la constantia de la constantia terenalista de la constantia de la constantia terenalista de la constantia de la constanti	baCom-L2	8-8-8 Link A				
ibaCom-L2B-8-8 i∋ unk A	🛚 Slaves 🏶 Proces	ssor Info 🧼 Memory vie	w			
	Slave 0 😣 Slav	e 1 🕘 Slave 2 😝 Slav	ve 3			
L2B S7 Request Dig512 (2)	Slave Status Info	Comm. OK, all inputs	running (92)			
iank B Ink B Ink B Ink B	Slave Number	10	Input Length	16		
	Master Number	2	Output Length	122		
Click to add module	Slave Mode	S7 Request	Parameter Length	15		
⊡-∰ OPC	Cmd Ex.	0xFF18	Config. Length	3		
S7 TCP/UDP	Slave Step	21	Parriet made ante			
□ □ □ □ Click to add module □ - □ S7-Xplorer	Baudrate	1.5M	Request mode only	0.000		
Click to add module	Chan. Status	0x0000	C7 Made	0.12		
<i>⊡ f</i> Vitual	Com Counter	0	S7 Mode Ux1	0.12		
Unmapped	Message Counter	e Counter 10748	Comm. Error by S7	0x12		
	Resp. Time	3,840 ms	Collision Reason	0x00		
	Info Output	00 00 00 00				
	Info Input	00 00 00 00				
	ID Number	0x0F05				
	Channel Mask	0x0000				
0	256 51	2 768 1024	1280 1536 175	92 2048 8	OK Apply	Cancel

Fig. 67: Detailed information about the slave status

4.7.4.2 Module diagnostics

When marking an L2B-Request module, also a diagnostics tab is shown. It shows details of the individual measured values and system information of the S7-CPU.

ibaFOB-4io-D ibaComul 28-8-8	149 97 Maquasi ())			
	🖩 🖬 General 🔨 Analog ∬ Digital	Diagnostics			
	Analog values 📗 Digital valu	es 🔟 S7 system info			
L2B S7 Request Dig512 (2)	Name	S7 Operand	Datatype	Value	Displaytype
L	0 MW 10	MW 10	INT	-31999	DEC
E-We Link B	1 MW 12	MW 12	INT		DEC
	2 MW 14	MW 14	INT		DEC
	3 MW 16	MW 16	INT		DEC
_⊶o 3	4 MW 5000	MW 5000	INT	I/O address does not exist (6E)	DEC
Click to add module	5 MW 20	MW 20	INT		DEC
Click to add module	6 MW 22	MW 22	INT		DEC
S7 TCP/UDP	7 MW 24	MW 24	INT		DEC
Click to add module	8 MW 26	MW 26	INT		DEC
3 S7-Xpiorer Click to add module	9 MW 28	MW 28	INT		DEC
Playback	10 MW 30	MW 30	INT		DEC
virtual	11 MW 32	MW 32	INT		DEC
Click to add module	12 MW 34	MW 34	INT		DEC
9 Unmapped	13 MW 36	MW 36	INT		DEC
	14 MW 38	MW 38	INT		DEC
	15 MW 40	MW 40	INT		DEC
	16 MW 42	MW 42	INT		DEC
	17 MW 44	MW 44	INT		DEC
	18 MW 46	MW 46	INT		DEC
	19 MW 48	MW 48	INT		DEC
	20 MW 50	MW 50	INT		DEC
	21 MW 52	MW 52	INT		DEC

Fig. 68: Diagnostics of the measured values

🔛 iba I/O Manager					
🗄 🗋 💕 🚰 🌒 🕒 🕶 Hardware	Groups Technostring O	utputs 📳 🛍			
⊕-‡‡ General ⊕-∰ ibaFOB-4io-D	L2B S7 Requ	est (0)			
⊟-∰gibaCom-L2B-8-8 ⊟-mmillink A	General 🔨 Analog	I Digital Ciagnostics			
L2B S7 Request (0) L2B S7 Request (1) U2B S7 Request (1)	Analog values II D	igital values 🖩 S7 system info			
→ 0 3	Version of cycl. FC	3.1	Nr of inputs	128	
	Version of startup FC	3.1	Nr of outputs	128	
→ O 2 → O 3 → Click to add module	ID Number	1	Nr of markers	256	
OPC	Board ID	192	Nr of timers	256	
Click to add module	OS Version	2	Nr of counters	256	
Click to add module	PG Version	1	I/O space	1024	
Click to add module	Total Mem. Size	98304	Local datasize	3072	
	DB Memory Size	0			
	DB Used Size	0			
	Code Mem. Size	98304			
	Code Used Size	20544			
	Order Number	6ES7 314-6CG03-0AB0			
	0 256 512	768 1024 1280 1536	1792 2048	10 ОК Арріу	Cancel

Fig. 69: S7 system information

5 Diagnostics

5.1 Checking the license

In case the "Request-S7" modules are not displayed in the signal tree, you can check in the I/O Manager under "General - Settings - License Info" if your license "ibaPDA-Request-S7-DP/PN" is detected correctly.

🔢 iba I/O Manager	「「「「「「」」」	The sector 1		
📔 💕 🎽 🛃 🗞 🔹 Hai	rdware Groups Technos	tring Outputs 📳 🖺		
General	General			
General OPC Click to add module The Payback Click to add module Click to add module Unmapped	General Settings & Interrup General Settings Interrupt source : Acquisition timebase : Force reload of driver License info License no. : Customer Name: License time limit: Dongle HW Id: Data stores: 2	t info B Interfaces S Watchdog Internal timer 1 ms r at next start of the acquisition	Interrupt counter : Start acquisition on startup of server Restart acquisition on non-recoverable error Ucense options: Request HPCi Request M1 Request S7 DDP/PN Request S7 UDP (10)	76088
	Aive timeout for all suppo	Ited TCP and UDP protocols	tivity 192 0 OK Apply	Cancel

Fig. 70: Checking the license



5.2 Log files

If connections to target platforms or clients have been established, all connection-specific actions are logged in a text file. You can open this (current) file and, e.g., scan it for indications of possible connection problems.

The log file can be opened via the button <Open log file>. The button is available in the I/O Manager:

- for many interfaces in the respective interface overview
- for integrated servers (e.g. OPC UA server) in the *Diagnostics* tab.

In the file system on the hard drive, you will find the log files in the program path of the *ibaPDA* server (...\Programs\iba\ibaPDA\Server\Log\). The file names of the log files include the name or abbreviation of the interface type.

Files named interface.txt are always the current log files. Files named Interface_ yyyy_mm_dd_hh_mm_ss.txt are archived log files.

Examples:

- ethernetipLog.txt (log of EtherNet/IP connections)
- AbEthLog.txt (log of Allen-Bradley Ethernet connections)
- OpcUAServerLog.txt (log of OPC UA server connections)

5.3 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.

Administrator: C:\Windows\system32\cmd.exe	3
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 = Oms, Maximum = 1ms, Average = Oms	
C:\Users>	
	÷

Fig. 71: PING successful

With no existing connection you receive error messages.



Fig. 72: PING unsuccessful

5.4 Connection diagnostics via PG/PC interface

The diagnostic function of the PG/PC interface can be used to test the functionality and connection configuration.

1. Open the PG/PC interface.

S7 reques	tt (1)								
General J Co	onnection (√ Analog	∬ Digital						
Connection mode:	PC/CP	•	Connection	n type:	PG co	nnection	•	Timeout (s):	15
Access point for app	lications:						Cor	nfigure PG/PC inter	face
Address:	192.168.1	23.1	Rack:	0	*	Slot:	0 🜲		Test

2. Open the diagnostics dialog.

Access Point of the Application:	
S7ONLINE (STEP 7) -> CP5622	MPI.1
0 Interface Parameter Assignment Used:	Properties
CP5622.MPI.1 <active></active>	Tiopenies
CP5622.Auto.1	Diagnostics
CP5622.FWL.1	Copy
CP5622.MPI.1 <aktiv></aktiv>	
۰ III. ا	Delete
(Assigning Parameters to Your NDIS CPs with TCP/IP Protocol (RFC-1006))	
Add/Remove:	Select

3. The following screenshot shows the example of a diagnostics of a SIMATIC Net CP5622 (PROFIBUS).

With <Test> a net diagnosis is started.

With <Read> the availability of the bus participants is tested.

Indianaio	
Status/Network Diagnostics	
O.K.	Ĉ
Station address: Bus parameters:	
Baudrate 1671 Histhete Stationwadresse (HSR) 31 Him, Protokolbearbeitungsost (Him Tedr) 2018 Has, Protokolbearbeitungsost (Has Tedr) 400 Austimunet (Tert) 1218	SCHOR S A
Bus Nodes	
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	16 17 18 19
0	
0	
0 □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	

In this example, on the addresses 0 and 2 an active station was detected.

5.5 Module diagnostics

You will find a diagnostic help with a tabular display of the actual analog and digital values and the data types on the *Diagnostics* tab of each S7 Request module.

See chapter Request-S7 for ibaBM-PN **7** Diagnostics, page 58

See chapter Request-S7 for ibaBM-DP **7** *Diagnostics*, page 87

See chapter Request-S7 for ibaBM-DPM-S **7** *Diagnostics*, page 108

See chapter Request-S7 for ibaCom-L2B **7** Diagnostics, page 132



6 Appendix

6.1 Iba S7 library

The iba S7 library is available in two versions:

- SIMATIC Manager : STEP $7 \ge V5.5$
- SIMATIC TIA Portal STEP $7 \ge V14$ SP1

6.1.1 iba S7 library for SIMATIC Manager

The iba S7 library for SIMATIC Manager ("ibaS7LibCLASSIC_Vx_y") is suitable for the use with SIMATIC Manager V5.5 or higher. It contains the Request blocks described in the manual, which are required for the use of *ibaPDA-Request-S7-DP/PN*.

You find the iba S7 library as an archived file on the DVD "iba Software & Manuals" under \04_Libraries_and_Examples\10_Libraries\01_SIMATIC_S7\



Fig. 73: iba S7 library for SIMATIC Manager

The following components are included:

iba connection	Block name	Block no.	Note
ibaBM-DP	ibaDP_Req	FC122	
ibaBM-DPM-S	ibaDP_DB_PDA	DB10	
	ibaDP_DB_work	DB25	
ibaBM-DP	ibaDP_Req_H	FC123	For S7-400H
ibaBM-DPM-S	ibaDP_DB_PDA	DB10	
Redundancy mode	ibaDP_DB_work	DB25	
ibaBM-PN	ibaREQ_M	FB140	
	ibaREQ_PN	FB141	
	ibaREQ_PNdev	FB150	
	ibaREQ_DB	DB15	
	ibaUDT_UDPact	UDT145	

iba connection	Block name	Block no.	Note
ibaCom-L2B	ibaL2B_Init	FC111	formerly FC23 and FC101
	ibaL2B_Req	FC112	formerly FC22 and FC100
	ibaL2B_Req_CP	FC113	formerly FC26 and FC102 only necessary when us- ing a CP342-5 instead of the FC112
	ibaL2B_DB_work	DB22	
	ibaL2B_DB_Struct	UDT22	
	ibaL2B_CP_SNDRCV	DB10	only necessary when us- ing a CP342-5
ibaPDA-Interface-S7-	ibaREQ_M	FB140	
TCP/UDP	ibaREQ_UDPact	FB145	
	ibaREQ_UDPint	FB146	
	ibaREQ_UDPext3	FB147	
	ibaREQ_UDPext4	FB148	
	ibaREQ_DB	DB15	
	ibaUDT_UDPact	UDT145	

Table 12: ibaS7LibCLASSIC block overview

6.1.1.1 Integrating the library

For integrating the library, it has to be retrieved in the SIMATIC Manager. Copy the iba S7 library to a local directory of your computer, on which the SIMATIC Manager is executed.

■ Select the menu *File* – *Retrieve…*

ile PLC View Options Window Help	
New	Ctrl+N
'New Project' Wizard	
Open	Ctrl+O
S7 Memory Card	,
Memory Card File	,
Delete	
Reorganize	
Manage	
Archive	
Retrieve	

 Choose the archive file of the iba S7 library and select a storage location for the extracted library in a next step:

Look in: 退 ZIP	- 🗢 🖻 🚽		
Name	Date modified	Туре	Size
baS7libCLASSIC_V1_0.zip	24.04.2015 11:14	Compressed (zipp.	101 KB
File name: [baS7libCLASSIC_V1_0.zip			<u>c</u>

	Ė	s7esutil	
	÷	S7FPROJX	
		s7ftl	
		S7GR7	
		s7hlp	
		S7HSYS	- C
		S7ieapo	
	Ē.	s7ifc	
	Ē.	S7IKX	
	Ē.	S7INF	
	Ē.	S7LIBS	
	Ē.	S7MANUAL	
	Ē.	S7MET	
		SZNGD	
•			
01		7 I I	

• Confirm the message for a successful extraction.



• Open the library by confirming the following dialog with <YES>.

•	Libraries: ibaS7LibCLASSIC_V1_0
	Do you want to open these now?

Now, the library is integrated and can be closed again.

6.1.1.2 Using the blocks

There are two options for using the blocks from the library.

1. Display the block library on the left and drag the required blocks to the opened destination block.



2. Open the library via *File - Open - Libraries*, and the required destination project in parallel. With the <Tile horizontal> button, both projects can be displayed side by side. The blocks can be copied either via drag or copy & paste.

ſ.	SIMATIC Manager - S7-314_Demo-F	Projekt						
E	File Edit Insert PLC View Opt	ions Window Help						
	🗅 😅 🔐 🐖 👗 🖻 🛍 📩	0 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	🗧 📊 💽 🔤 No Filter >	() () () () () () () () () () () () () (· y 🐮 🕮 🐂 🗖 🕅 📢	2		
	📀 ibaS7LibCLASSIC_V1_0 D:\Siem	ens\S7_Libs\ibaS7_Libs	G		🞒 S7-314_Demo-Projekt D:\Sie	emens\S7_Projects\S7	-314_D	
	B ♦ ibaS7LibCLASSIC_V1_0	Object name	Symbolic name	Created in	🖃 🎒 S7-314_Demo-Projekt	Object name	Symbolic name	Created in lang
	B B babMOP_REQ_H_V4_0 B B babMOP_REQ_H_V4_0 B B backs B B backs B B babDP_REQ_V0_3 B B babDP_REQ_V0_3	₽ FC122 0810 0825	ibaDP_Req ibaDP_D8_PDA ibaDP_D8_work	STL DB DB	E I SMATIC 200(1) E I CPU 314C2 DP E I CPU 31	System data ⊕ 081	·	STL

The blocks may now be used in the destination project.

6.1.2 iba S7 library for SIMATIC TIA portal

The iba S7 library for SIMATIC TIA Portal ("ibaS7LibTIA_Vx_y") is suited for the use with SIMATIC TIA Portal. It contains the Request blocks described in the manual, which are required for the use of ibaPDA-Request-S7-DP/PN.

You find the iba S7 library as project archive on the DVD "iba Software & Manuals" under

\04_Libraries_and_Examples\10_Libraries\01_SIMATIC_S7\



Fig. 74: iba S7 library for SIMATIC TIA portal

The following components are included:

Target platform S7-300, S7-400, WinAC

iba connection	Block name	Block no.	Note
ibaBM-DP	ibaDP_Req	FC122	
	ibaDP_DB_PDA	DB10	
	ibaDP_DB_work	DB25	
ibaBM-PN	ibaREQ_M	FB140	
	ibaREQ_PN	FB141	
	ibaREQ_PNdev	FB150	
	ibaREQ_DB	DB15	
	ibaUDT_UDPact	UDT145	



iba connection	Block name	Block no.	Note
ibaCom-L2B	ibaL2B_Init	FC111	
	ibaL2B_Req	FC112	
	ibaL2B_Req_CP	FC113	only necessary when using a CP342-5 instead of the FC112
	ibaL2B_DB_work	DB22	
	ibaL2B_DB_Struct	UDT22	
	ibaL2B_CP_SNDRCV	DB10	only necessary when using a CP342-5
ibaPDA-Inter-	ibaREQ_M	FB140	
face-S7-TCP/UDP	ibaREQ_UDPact	FB145	
	ibaREQ_UDPint	FB146	
	ibaREQ_UDPext3	FB147	
	ibaREQ_UDPext4	FB148	
	ibaREQ_DB	DB15	
	ibaUDT_UDPact	UDT145	

Target platform S7-1500

iba connection	Block name	Block no.	Note
ibaBM-DP	ibaREQ_M	FB1400	
	ibaREQ_DP	FB1402	
	ibaREQ_DB	DB15	
	ibaREQ_DB-Interface		
ibaBM-PN	ibaREQ_M	FB1400	
	ibaREQ_PN	FB1401	
	ibaREQ_DB	DB15	
	ibaREQ_DB-Interface		
ibaPDA-Inter-	ibaREQ_M	FB1400	
face-S7-TCP/UDP	ibaREQ_UDP	FB1405	only for TIA V13 and
			V14
	ibaREQ_UDP2	FB1406	
	ibaREQ_UDPact	FB1410	
	ibaREQ_DB	DB15	
	ibaREQ_DB-Interface		
Note



TIA portal libraries are version-dependent. There may be upward compatibility depending on the TIA portal version.

6.1.2.1 Integrating the library

For integrating the library, you have to retrieve it in the TIA portal. Copy the iba S7 library to a local directory of your computer, where the TIA Portal is executed.

Select the *Retrieve library…* command on the *Libraries* tab in the context menu (right mouse-button).



 Select the archive file of the iba S7 library and select a storage location for the extracted library in a next step:

Look in:	📕 TIA Lib	1	· 🌀 🌶 📂 🛄 •			
Ca	Name	*	Date modified	Туре	Size	
ecent Places	ibaS7LibTI	A_V1_0_20150417.zal13	17.04.2015 10:35	ZAL13 File	1.263 KB	
Desktop						
Libraries						
Computer						
	File name:	baS7libTIA_V1_0_20150417.z	a)13			Onen
Network	The Lame.					opon

■ Now, the library is integrated.



6.1.2.2 Using the blocks

There are two options for using the blocks from the library.

1. Display the library and drag the required block to the opened destination block.



2. Drag or copy the blocks to the program blocks directory in the project navigation.



The blocks can now be called within a project block.

3. Drag or copy the PLC data type to the PLC data type directory in the project navigation.



6.2 Application examples

You find application examples on the DVD "iba Software & Manuals".

- For the ibaBM-DPM-S device in the path \04_Libraries_and_Examples\30_ibaBM-DPM-S\01_SIMATIC_S7\Request-S7\
- For the ibaBM-DP device in the path \04_Libraries_and_Examples\31_ibaBM-DP\01_SIMATIC_S7\Request-S7\
- For the ibaBM-PN device in the path \04_Libraries_and_Examples\32_ibaBM-PN\01_SIMATIC_S7\Request-S7\
- For the ibaCom-L2B card in the path \04_Libraries_and_Examples\40_ibaCOM-L2B\01_SIMATIC_S7\Request-S7\

Examples are available for the following configurations:

iba	S7-CPU	S7 project	ibaPDA project
7	S7-300 PN-IF	S7CLASSIC_	ibaPDA_S7CLASSIC_
1-Pr	S7-400 PN-IF	PN_REQ_Vxx.zip	PN_REQ_Vxx.zip
BR	S7-1500 PN-IF	S7TIA_	ibaPDA_S7TIA_
iba		PN_REQ_Vxx.zip	PN_REQ_Vxx.zip

iba	S7-CPU	S7 project	ibaPDA project
	S7-300 DP-IF	S7CLASSIC_	ibaPDA_S7CLASSIC_
		DP_REQ_VXX.2IP	
	57-400 DP-IF		IDAPDA_S/CLASSIC_
		-	
	S7-400 + CP443-5		IDAPDA_STCLASSIC_
		-	
	WINAC		IDAPDA_STCLASSIC_
	57-400 with CFC	DP REC CEC Vyy zin	DP REO CEC Vyy zin
	57 40011		
	S7-400H	DP REO H Vyy zin	DP REO CPU//yyH //yy zin
ЧĊ	37-300 DF-11	12B REO Vxx zin	DP L2Bcomp BEQ Vxx zin
Š	57-1500 DP-IF	<u>57ΤΙΔ</u>	ibaPDA_S7TIA
ibal	57 1500 51 11	DP REQ Vxx.zip	DP REQ Vxx.zip
	S7-300 DP-IF	S7CLASSIC	ibaPDA_S7CLASSIC
		DP_REQ_Vxx.zip	DPMS_REQ_CPU3xx_Vxx.zip
	S7-400 DP-IF		ibaPDA_S7CLASSIC_
			DPMS_REQ_CPU4xx_Vxx.zip
	WinAC		ibaPDA_S7CLASSIC_
-N			DPMS_REQ_WinAC_Vxx.zip
PΝ	S7-400 with CFC	S7CLASSIC_	ibaPDA_S7CLASSIC_
5		DP_REQ_CFC_Vxx.zip	DPMS_REQ_CFC_Vxx.zip
aBl	S7-400H	S7CLASSIC_	ibaPDA_S7CLASSIC_
<u>-</u> 9		DP_REQ_H_Vxx.zip	DPMS_REQ_CPU4xxH_Vxx.zip
	S7-300 DP-IF	S7CLASSIC_	ibaPDA_S7CLASSIC_
L2B	S7-300 + CP342-5	L2B_REQ_Vxx.zip	L2B_REQ_Vxx.zip
<u>ل</u>	S7-400 with CFC	S7CLASSIC_	ibaPDA_S7CLASSIC_
aCc		L2B_REQ_CFC_Vxx.zip	L2B_REQ_CFC_Vxx.zip
흔			

Table 13:

Configuration examples available on DVD

6.3 S7 cycle time measurements

6.3.1 ibaCom-L2B

The following tables provide information on the cycle time extension you can expect for *ibaPDA* in conjunction with L2B-Request depending on the S7-CPU type. Test series with up to 256 analog and 256 digital signals (8 slaves) were used to obtain the time values.

6.3.1.1 S7-CPUs with external DP interface (CP)

S7-CPU type/ CP	Max. cycle time extension per slave
	(32 analog + 32 digital signals)
316- 2AG00	13 ms
314- 6CF00	8.63 ms
315- 2AG10	6.88 ms
317-2EJ10	0.875 ms
317-6FF00	1.125 ms
318- 2AG00	0.75 ms
416- 2XK00	1.25 ms
413- 2XG02	2.625 ms
414- 2XG03	0.875 ms
416- 2XK04	0.375 ms

6.3.1.2 S7-CPUs with external DP interface (CP)

S7-CPU type/ CP	Max. cycle time extension per slave
	(32 analog + 32 digital signals)
CPU315 with CP342- 5	6.0 ms
CPU318 with CP342- 5	0.75 ms
CPU416 with CP443- 5	0.625 ms

Note



When using the external PROFIBUS-CP CP342-5 with the S7-300, a cycle-precise measurement is usually not possible, since the data transmission over the backplane bus of the S7-300 is too slow. Otherwise, precise cycle measurements are possible if the PROFIBUS cycle is sufficiently fast.

6.3.2 ibaBM-DP

The following tables provide information about the code runtimes that the request blocks require when using *ibaPDA* in combination with Request-S7 for *ibaBM-DP*.

The measurement values were determined in a test environment and only serve as reference points. The values may deviate in other system environments.

SIMATIC S7 CPU	Number of signals	Data amount	ibaDP_Req FC122
CPU412-2 PN 6ES7 412-2EK06-0AB0	1 INT + 0 BOOL (1 Pointer)	2 Byte	564 μs
	59 REAL + 64 BOOL (2 Pointers)	244 Byte	1614 μs
	59 REAL + 64 BOOL (123 Pointers)	244 Byte	1632 µs

SIMATIC S7 CPU	Number of signals	Data amount	ibaREQ_M FB1400	ibaREQ_DP FB1402
CPU1516-3 PN/DP 6ES7 516-3AN00-0AB0	1 INT + 0 BOOL (1 Pointer)	2 Byte	192 µs	286 µs
	59 REAL + 64 BOOL (2 Pointers)	244 Byte	194 µs	296 µs
	59 REAL + 64 BOOL (123 Pointers)	244 Byte	192 µs	834 µs
	122 INT + 0 BOOL (1 Pointer)	244 Byte	195 µs	287 µs
	122 INT + 0 BOOL (122 Pointer)	244 Byte	198 µs	706 µs

6.3.3 ibaBM-PN

The following tables provide information about the code runtimes that the request blocks require when using *ibaPDA* in combination with Request-S7 for *ibaBM-PN*.

The measurement values were determined in a test environment and only serve as reference points. The values may deviate in other system environments.

SIMATIC S7 CPU	Number of signals	Data amount	ibaREQ_M FB140	ibaREQ_PN FB141
CPU412-2 PN 6ES7 412-2EK06-0AB0	1 INT + 0 BOOL (1 Pointer)	2 Byte	128 µs	302 µs
	59 REAL + 64 BOOL (2 Pointers)	244 Byte	126 µs	376 µs
	59 REAL + 64 BOOL (123 Pointers)	244 Byte	132 µs	937 µs
	122 INT + 0 BOOL (1 Pointer)	244 Byte	126 µs	342 µs
	122 INT + 0 BOOL (122 Pointer)	244 Byte	132 µs	954 µs

SIMATIC S7 CPU	Number of signals	Data amount	ibaREQ_M FB1400	ibaREQ_PN FB1401
CPU1516-3 PN/DP 6ES7 516-3AN00-0AB0	1 INT + 0 BOOL (1 Pointer)	2 Byte	198 µs	276 µs
	59 REAL + 64 BOOL (2 Pointers)	244 Byte	194 µs	282 µs
	59 REAL + 64 BOOL (123 Pointers)	244 Byte	192 µs	806 µs
	122 INT + 0 BOOL (1 Pointer)	244 Byte	195 µs	274 µs
	122 INT + 0 BOOL (122 Pointer)	244 Byte	198 µs	672 μs

6.4 Setting PG/PC interface / defining new access point

ibaPDA-Request-S7-DP/PN cannot establish a connection to a S7-CPU, if the parametrization "AUTO" for an access point (MPI-adapter or CP) has been set in the SIMATIC Manager.

There are 2 possible remedies:

Changing the interface with remaining access point name

Change interface in the SIMATIC Manager e.g. from "CP5622 (AUTO)" to "CP5622 (MPI)" or "CP5622 (PROFIBUS)".

Disadvantage of this method: If the setting of the access point will be changed again in the SIMATIC Manager, the measurement does no longer work because *ibaPDA* no longer has any access.

Adding a special access point for *ibaPDA*

To avoid conflicts with the setting of SIMATIC Manager and *ibaPDA* when both programs run on the same computer, a new access point should be defined.

There is the <Configure PG/PC interface> button in the dialog window of the PC/CP module. It can be used to open the dialog for configuring the PG/PC interface.

The setting for the SIMATIC Manager will also be changed.

module (Q))							
General 💋 C	onnection	\sim Analog	∬ Digital	Ciagnost	ics			
Connection mode:	PC/CP	•	Con	nection type:	PG connection	•	Timeout (s):	15
Access point for app	olications:				-	Co	nfigure PG/PC inter	face
Address:	192.168	.123.1	Rac	k: 0	Slot:	0	* •	Test

Fig. 75: Configure PG/PC interface

Procedure

1. Open the dialog box with the <Configure PG/PC interface> button.



iba

CCess Path LLDP / DCP		
Access Point of the Application:		
S7ONLINE (STEP 7)> TCP/IP	-> Intel(F	R) 82579LM Gigab 🔻
(Standard for STEP 7)		
Interface Parameter Assignment Used:		
TCP/IP -> Intel(R) 82579LM Gigab		Properties
Kone>	-	Diagnostics
ISO Ind. Ethemet -> iba AG ibaFOB		Copy
ISO Ind. Ethemet -> Intel(R) Centrin	-	Delete
۰ III) ۲		
(Assigning Parameters to Your NDIS CPs with TCP/IP Protocol (RFC-1006)) Interfaces		
Add/Remove:		Select

2. Select the row <Add/Delete> under "Access Point of the Application".

	3	
STONLINE (STEP 7) ->	TCP/IP -> Intel(R)	82579LM Gigab 🝷
<add delete=""></add>		
CP_L2_1: 48		
FVVL_LOAD	net -> VMware Virti	al Ptheme (Board 2)
MPI (WinCC) -> TS Ada	pter	
S7ONLINE (STEP 7) ->	TCP/IP -> Intel(R)	82579LM Gigab
Weiger Chone>	× [Diagnostics
ISO Ind. Ethemet -> iba AC	G ibaFOB	
ISO Ind. Ethernet -> Intel(F	R) 825791	Copy
ISO Ind. Ethemet -> Intel(F	R) Centrin _	D.L.
		Delete
4		
< []	*	
Assigning Parameters to Your N with TCP/IP Protocol (RFC-100 Interfaces	NDIS CPs (6))	
Assigning Parameters to Your N with TCP/IP Protocol (RFC-100 Interfaces	NDIS CPs (6))	

3. Define a new access point; enter a name, e.g. PDA and optionally a description for a better understanding, click on <Add> and <Close>.

Add	
New Access Point:	
PDA	Add
Description:	
Delete	
CP_L2_1: FWL_LOAD ISO-PDA MPI (WinCC)	Delete
S70NLINE (STEP 7) Standard for STEP 7	

4. Add an interface to the access point, e.g. "CP5622 (MPI)" and exit with <OK>.

ccess Path	LLDP / DCP	PNIO Adapter Info	1
Access Poir	nt of the Application	on:	
PDA>	CP5622(MPI)		
)	24 - 29		
nterface <u>P</u> a	arameter Assignme	ent Used:	
CP5622(MF	기)		P <u>r</u> operties
🔛 CP562	2(Auto)		Diagnostics
CP562	2(FWL)		Copu
CP562	Z[FWL_FAST_LU 2000	JADJ	C0p <u>v</u>
<			Delete
^o arameter a ommunicat IPI network	assignment of you ions processor Cl <)	ır P5622 for an	
Interfaces			

The newly defined access (e.g. PDA --> CP5622.MPI.1) is displayed subsequently in the connection dialog of *ibaPDA* under "Access points for applications".

module	(0)					
🔛 General 💋		alog 👖 Digital 🧼 D	iagnostics			
Connection						
Connection mod	de: PC/CP 🔻	Connection	type: PG co	onnection 💌	Timeout	(s): 15 🌩
Access point for	applications: PDA =	> CP5622.MPI.1		-	Configure PG/PC i	nterface
Address:	2	Rack:	0	Slot: 0	*	Test



Notes on the different access points

Depending on which access points have been configured in the Engineering PC, there are different access points available for selection in the *ibaPDA* system.

Basically, there are 3 types of access points:

- TCP/IP
- ISO
- Bus system PROFIBUS or MPI

TCP/IP

If you select an access point using TCP/IP, you need to enter the IP address, rack and slot number of the CP in the module configuration dialog. If you do not know the rack and/or slot number, enter "0" for slot and click on the <Test> button.

ISO

If you select an access point using an ISO interface, you need to enter the MAC address, rack and slot number. For the rack and slot number, use the <Search> button.

Bus system (PROFIBUS or MPI)

If you select an access point using a bus interface, like e.g. PROFIBUS or MPI, you need to enter the bus address, the rack and slot number. You can also use the <Search> button and then click on one of the CPU links found to test the connection.



6.5 S7 routing

S7 routing is defined as the possibility to use S7 controls as router to access secondary target systems, i.e. controls or drives, which are in different subnets. This also includes changing the bus system (Ethernet / PROFIBUS / MPI).

6.5.1 Routing from Ethernet to Ethernet

Please do not mix up the "S7 Routing" function with "IP Routing".

The following constellation will make this clear:



Fig. 77: S7 Routing, example system topology

We want to access the CPU412 controller from the engineering PC (also with *ibaPDA*). The computer and the controller are not directly connected via a common network/bus. We want to run the connection over the CPU314C controller. "Passing" the communication in this controller is called "S7 Routing".

In our example, engineering PC and CPU314C are also located in two different (logic) subnets. You need an (IP-) Router for establishing a communication connection. This is completely independent of the "S7 Routing" function and should not be confounded with it.



6.5.1.1 Configuration of STEP 7/ NetPro

The following configuration steps are required to be able to access the secondary CPU412 control with the SIMATIC STEP 7 programming software. These are not required for using *ibaPDA*.

Inserting a PG/PC station:



Fig. 78: NetPro configuration

Assigning an interface (network interface card):

Configured Interfa	ices:			
Name	Type	Subnet		
entinemet Schnitt	stelle(1) Industrial Ethemet	Ethemet(1)	2	
Interface Paramet	ter Assignments in the PG/PC:	1		
Interface Paramet	ter Assignments in the PG/PC: Ethemet Adapter for VMnet8.T	: TCPIP.1	*	
Interface Paramet VMware Virtual I VMware Virtual I	ter Assignments in the PG/PC: Ethemet Adapter for VMnet8.T Ethemet Adapter for VMnet8.T	: TCPIP.1 TCPIP.Auto.1	•	
Interface Paramet VMware Virtual I VMware Virtual Inealtek PCIe GI	ter Assignments in the PG/PC: Ethemet Adapter for VMnet8.T Bhemet Adapter for VMnet8.T BE Family Controller, TCPIP.T	: TCPIP.1 TCPIP.Auto.1	- -	<u>A</u> ssign _N
Interface Paramet VMware Virtual I VMware Virtual Theattek PCIe G	ter Assignments in the PG/PC: Ethemet Adapter for VMnet8.T Phemet Adapter for VMnet8.T BE Family Controller, TCPIP.1	: TCPIP.1 TCPIP.Auto.1	* *	Assign
Interface Paramet VMware Virtual I VMware Virtual I Intealtek PCIe GI Assigned:	ter Assignments in the PG/PC: Ethemet Adapter for VMnet8.T Ethemet Adapter for VMnet8.T BE Family Controller.TCPIP.1	:: TCPIP.1 TCPIP.Auto.1	•	Assign Disconnect
Interface Paramet VMware Virtual VMware Virtual Inteatek PCIe GI Agsigned: Interface	ter Assignments in the PG/PC. Ethernet Adapter for VMnet8. Tehenet Adapter for VMnet8. BE Family Controller TCPIP.1 Parameter assign S	: TCPIP.1 TCPIP.Auto.1		Assign Disconnect

Fig. 79: PG/PC interface assigned

Result:



Not Assigned Configured Interfac	ces:		
Name	Туре	Subnet	T
nterface Paramete	er Assignments in the PG	G/PC:	
nterface Paramete CP5622.FWL.1	er Assignments in the PG	3/PC:	<u> </u>
nterface Paramete CP5622.FWL.1 CP5622.FWL_FA CP5622.MPL1	er Assignments in the PG AST_LOAD.1	G/PC:	
nterface Parameter CP5622.FWL.1 CP5622.FWL_FA CP5622.MPI.1 CP5622.PROFIB	er Assignments in the PG AST_LOAD.1 US.1	3/PC:	Assign
nterface Paramete CP5622.FWL.1 CP5622.FWL_FA CP5622.MPI.1 CP5622.PROFIB ssigned:	er Assignments in the PC AST_LOAD.1 IUS.1	3/PC:	Assign
nterface Paramete CP5622.FWL_1 CP5622.FWL_FA CP5622.PROFIB Assigned: Interface	er Assignments in the PG AST_LOAD.1 IUS.1	3/PC:	Assign Disconnect

Fig. 80: Interface assigned

The connection line of PG/PC to the network should be highlighted yellow now.

The following figure shows the communication channel using arrows (these are not shown in SIMATIC NetPro).



Fig. 81: Communication channel

Finally, load all hardware configurations and connection data from NetPro.

6.5.1.2 ibaPDA configuration

The following entries have to be made:

🔢 iba I/O Manager												×
🗋 📄 🎬 📕 🌒 🕨 🕇 Hardwar	e Groups Teo	hnostring Ou	itputs 📳 🛍									
General AB-Xplorer	\$7-Xp	lorer TC	P/IP (14)									
Codesys-Apiorer	Seneral	Sonnection	n 🔨 Analog 📗	Digital 🧼 Diag	nostic	s						
Playback	CPU Name:	CPU_mit_DP	-IF (CPU 314C- 🔻	Connection ty	pe:	PG conne	ction		•	Timeout (s):	15	×
S7-Xplorer TCP/IP (14)	Address:	192.168.0.2		Rack:	0	*	Slot:	3	*		Test	
	Activate	S7 routing	Address of device 192.168.11.245	acting as gateway	/ (e.g.	IE/PB link):		S7 S 007	ubnet ID E-000E	of target net:		
Click to add module												



Activate S7 routing

Enable to use S7 routing

Address

Address of the target control (here CPU412)

Address of device acting as gateway

Enter address of the gateway (here CPU314C)

S7 subnet ID of target net

Enter subnet ID from STEP 7 NetPro

You can identify the S7 subnet ID in NetPro. For doing so, right-click on the secondary bus system and open the "Properties".



Fig. 83: Determine S7 subnet ID



	[management	
<u>N</u> ame: <u>S</u> 7 subnet ID:	007E - 000E	
Project path:	Test\Ethemet(2)	
Storage location of the project:	D:\Carsten_support\20140825_Routing\Test	
Author:		
Date created: Last modified:	08/25/2014 12:10:12 PM 08/25/2014 12:14:05 PM	
<u>C</u> omment:		
		-

Fig. 84: S7 subnet ID

6.5.2 Routing from Ethernet to PROFIBUS

We want to implement the following way of access:



Fig. 85: S7 Routing, example system topology Ethernet PROFIBUS

We want to access the CPU319 controller from the engineering PC (also with *ibaPDA*). The computer and the controller are not directly connected via a common network/bus. We want to run the connection over the CPU412 controller. "Passing" the communication in this controller is called "S7 Routing".

6.5.2.1 Configuration STEP 7/ NetPro

The following configuration steps are exclusively required for accessing the subordinate controller CPU319 via the SIMATIC STEP 7 programming software. For using *ibaPDA*, these configuration steps are not required. Adding a PG/PC station:



Fig. 86: Configuration NetPro

Assigning an interface (network card):

Configured Interfa	aces:			
Hame Ethernet port(1)	Type Industrial Ether	net Ethem	et(1)]
-				
ļ				
Interface Parame	ter Assignments in the PG/	PC:		
Interface Parame VMware Virtual VMware Virtual	ter Assignments in the PG/ Ethemet Adapter for VMnet Ethemet Adapter for VMnet	PC: t8.TCPIP.1 t8.TCPIP.Auto	0.1	
Interface Parame VMware Virtual VMware Virtual Linksys USB3G	ter Assignments in the PG/ Ethemet Adapter for VMnet Ethemet Adapter for VMnet IGV1.TCPIP.1	PC: t8.TCPIP.1 t8.TCPIP.Auto	p.1	Assign
Interface Parame VMware Virtual VMware Virtual Uniksys USB3G	ter Assignments in the PG/ Ethemet Adapter for VMnet Ethemet Adapter for VMnet IGV1.TCPIP.1	PC: t8.TCPIP.1 t8.TCPIP.Auto	o.1	Assign Disconnect

Fig. 87: Assign PG/PC interface

Result:

Not Assigned	ces'		
Name	Туре	Subnet	
		1.17	
Interface Paramet	er Assignments in the PG/	PC:	
DUSTI COMT			<u>^</u>
DUST1.COM2 iba AG ibaFOB-D iba AG ibaFOB-D) Network Interface.ISO.1) Network Interface.TCPIP	9.1	▲ ▲ssign
DUST1.COM2 iba AG ibaFOB-E iba AG ibaFOB-E Agsigned:) Network Interface.ISO.1) Network Interface.TCPIP	2.1	▲ ▲ssign Disconnect
DUST1.COM2 iba AG ibaFOB-D iba AG ibaFOB-D Agsigned: Interface Ethemet port(1)) Network Interface.ISO.1) Network Interface.TCPIP Parameter assign Linksys USB3GI	.1 Subnet S70nlin Ethernet(1) Active	Assign Disconnect S70NLINE Access:

Fig. 88: Interface has been assigned

Now, the connection line from PG/PC to the network has to be marked in yellow. In the following figure, the communication path is shown using arrows (these are not displayed in SIMATIC NetPro).



Fig. 89: Communication path

Finally, all HW configurations and connection data are loaded from NetPro.

6.5.2.2 ibaPDA configuration

The following entries have to be made:

iba I/O Manager	
📔 💕 🎽 🚽 🌛 🕇 Har	dware Groups Technostring Outputs 📳 🖺
General S7-Xplorer S7-Xplorer 319 (0)	S7-Xplorer 319 (0)
Cick to add module	See General Connection Analog U Digital Digital
I	Address of device acting as gateway (e.g. IE/PB link): S7 Subnet ID of target net: 192.168.50.95 02D6-000B CPU Name: No address book

Fig. 90: Enable S7 routing

Activate S7 routing

Enable to use S7 routing

Address

Address of the target control (here CPU319)

Address of device acting as gateway

Enter address of the gateway (here CPU412)

S7 subnet ID of target net

Enter subnet ID from STEP 7 NetPro

You can identify the S7 subnet ID in NetPro. For doing so, right-click on the secondary bus system and open the "Properties".



Fig. 91: Determine S7 subnet ID

<u>N</u> ame:	PROFIBUS(1)
<u>S</u> 7 subnet ID:	02D6 - 000B
Project path:	S7Routing_Eth_DP\PROFIBUS(1)
Storage location of the project:	D:\40_SIMATIC\30_Demos\S7Routing_Eth_DP
Author:	
Date created:	01/04/2018 01:02:13 PM
Last modified:	01/04/2018 01:02:35 PM
Comment:	

Fig. 92: S7 subnet ID

Reference



For more information about the S7-Routing, please see:

Which modules support the "S7 Routing" function in S7 subnets?

http://support.automation.siemens.com/ww/view/en/584459

Which requirements must be fulfilled and what do I have to observe if I want to execute routing? https://support.industry.siemens.com/cs/ww/de/ view/2383206

How do you enable cross-project S7 Routing in the TIA Portal and in STEP 7 V5.x?

https://support.industry.siemens.com/cs/ww/en/view/109474569



6.6 Replacing Request-S7 on ibaCom-L2B by ibaBM-DP

A common task is the replacement of an existing Request-S7 solution based on the *ibaCom-L2B* card by an *ibaBM-DP*. This might be required in case of spare parts (the *ibaCom-L2B* card is discontinued) or when a new computer without PCI slots is used.



Fig. 93: Request-S7 with ibaBM-DP, replaces ibaCom-L2B

This task can be solved in an easy way by using the *ibaCom-L2B* compatible modules of *ibaBM-DP*.

No modifications in the program and the hardware configuration of the S7-CPU are required!

As for the *ibaCom-L2B* card also for the compatible solution with *ibaBM-DP* no network connection between *ibaPDA*-PC and the S7-CPU is required. The measurement values (Request hand-shake) are requested via FO and are sent via the PROFIBUS IO range.

The following steps have to be performed for the replacement:

- 1. If required, install a new *ibaFOB-D* card in the *ibaPDA*-PC. A card with input and output is needed (*ibaFOB-io-D*, *ibaFOB-2io-D* or *ibaFOB-4io-D*) as the compatible modules can only be used in the bidirectional 32Mbit Flex mode.
- 2. Connect the *ibaBM-DP* to the *ibaFOB-D* card via the bidirectional FO cable.
- 3. Connect the PROFIBUS connector of the *ibaCom-L2B* card to the PROFIBUS plugs of the *ibaBM-DP*.
- 4. In the *ibaPDA* I/O Manager, a newly installed *ibaFOB-D* card is displayed. Configure an *ibaBM-DP* device on the respective link.
- Click with the right mouse button on the PROFIBUS links and select in the context menu "Convert module". All available L2B Request-S7 modules are displayed. Select here the modules you want to convert to a *ibaCom-L2B* compatible module (usually all modules):

iba I/O Manager - D:_tmp\IO_Config_L2B_	Compat	ibilit	y.io													-0		x
🗄 🗋 📸 🛃 🏹 💽 🗸 Hardware Grou	ups Te	chno	ostring Outputs 🖓 🛍															
General	X4	01-	Bus 0															
⊡ 🔛 ibaFOB-4io-D	714	9.	533 0													_		
⊡ na ibaBM-DP	X40: I	Bus	0															
Add we dule	Status:		Not connected															
		te:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Convert module	- Cyclo		L2B S7 Request A (0)	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	Maste		L2B S7 Request B (2)	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
	Online	1	L2B S7 Request C (3)	40	50	60	50	52	EA	EE.	FC	67	EO	50	00	01	0	<u></u>
	Unline		L2B S7 Request D (4)	49	JU	21	52	53	34	22	90	57	20	23	OU	DI	02	03
	Active		L2B S7 Request Dig512 A (5)	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
→ 0 7	Offline		L2B S7 Request Dig512 B (6)	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
	Phant	-	L2B S7 Request Dig512 C (7)	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
	Collisi		L2B S7 Request Dig512 D (8)	113	114	115	116	117	118	119	120	121	122	123	124	125	126	
→0 11		-		-	100000	10000	1000050	of a final sector	10000	101051	1007020		100 march	005050	1007005	COLUMN ST	100525	
⊶O 13																		
man in Link 2																		
Click to add module																		
ibaCom-L2B-8-8																		
⊟ Iink A																		
L2B S7 Request A (0)																		
L2B S7 Request B (2)																		
L2B S7 Request C (3)																		
L2B S7 Request D (4)																		
🖻 📟 Link B																		
L2B S7 Request Dig512 A (5)																		
L2B S / Request Dig512 B (6)																		
L2B S7 Request Dig512 C (7)																		
PA OPC																		
H ST TCP/UDP																		
⊕ S7-Xplorer																		
- Playback																		
⊕ f _∞ Virtual													_					
Unmapped			1004 1500 0040	Т		010			217	6 [(эк		Ap	ply	ר	Can	cel
	0	512	1024 1536 2048 2560	30	72	358	4	00	21/	0 (JK		Ap	piy		Can	sei

6. The selected modules are deleted on the *ibaCom-L2B* card and converted into compatible modules on the *ibaBM-DP* device.



7. The conversion is finished. Apply the new configuration with <OK>.

Note



L2B Request-S7 modules can also be converted if they are filed under the "unmapped" modules. This is e.g. the case if the existing I/O configuration incl. L2B Request S7 modules is loaded on a new *ibaPDA* computer, that does not have an *ibaCom-L2B* anymore, but only the combination of *ibaFOB-D* and *ibaBM-DP*.



6.7 Error codes of Request blocks

The Request blocks deliver the following possible error codes.

FB140/141/...

Value ERROR_STATUS	Description
1	datablock ibaREQ_DB is write protected
2	datablock ibaREQ_DB invalid (DB =0 or > limit of cpu)
3	datablock ibaREQ_DB does not exist
4	datablock ibaREQ_DB undefined error
5	datablock ibaREQ_DB too short
6	datablock ibaREQ_DB too short for ibaREQ_UDP
9	internal error (RD_SINFO)
10	no access to datablock ibaREQ_DB (read)
11	no access to datablock ibaREQ_DB (write)
20	initialization not finished



Value	Description		
21			
22	Wrong SZL_ID		
23	wrong or invalid index of SZL		
24	error while reading I&M data from cpu		
25	error while reading plc data		
31	initialization canceled with error		
32	initialization not completed		
41	too many pointers (ibaREQ_DB too small)		
42	too many pointers in one command (>128)		
44	invalid command id		
45	operand invalid (not defined)		
46	operand invalid (datatype)		
47	operand invalid (memory area)		
200	no connection to PN device / DP slave		
300	version of ibaREQ_UDPact does not match with ibaREQ_M (ID)		
301	version of ibaREQ_UDPact does not match with ibaREQ_M (FB)		
302	version of ibaREQ_UDPact does not match with ibaREQ_M (DB)		
303	type of transmit agent does not match with configured request type in ibaPDA		
305	PROFIBUS DP slave hardware configuration is invalid		
306	configured peripherial address is invalid		
310	no access to datablock ibaREQ_DB (read)		
311	no access to datablock ibaREQ_DB (write)		
315	error while masking of synchronous faults		
316	error while demasking of synchronous faults		
320	operand invalid (datatype)		
321	operand invalid (pointer)		
401	ADR_SLOT / ADR_SLOT_0 invalid hw-id		
402	ADR_SLOT / ADR_SLOT_0 invalid hw-id, no IO-Device or DP-Slave		
403	ADR SLOT / ADR SLOT 0 invalid hw-id, is no PROFIBUS or PROFINET		
406	ADR SLOT / ADR SLOT 0 invalid configuration slot (0)		
407	ADR SLOT / ADR SLOT 0 invalid configuration slot (0)		
409	ADR_SLOT_1 invalid configuration slot 1		
410	no connection to PN device / DP slave or error		
411	ADR SLOT 1 invalid hw-id		
412	ADR_SLOT_1 invalid hw-id, no IO-Device or DP-Slave		
413	ADR_SLOT_1 invalid hw-id, is no PROFIBILS		
416	ADR_SLOT_1 invalid configuration slot 1		
0x8v/v/	errorcode of inner TUSEND / AG_SEND / AG_ISEND		
σλογγγ			

Table 14:Error codes of Request blocks FB140/141/...

FC122 (PROFIBUS)

Value	Description	
1	DB PDA is write protected	
2	DB PDA = 0 or > limit of cpu	
3	DP PDA does not exist	
5	 DB PDA too short	
11	DB_INTERN is write protected	
12	DB_INTERN = 0 or > limit of CPU	
13	DB_INTERN does not exist	
15	DB_INTERN too short	
16	error while reading identification data of CPU	
19	initialization not completed	
21	insufficient memory for system status list	
22	wrong or unknown system status list	
23	wrong or invalid index of system status list	
30	invalid OUTPUT_ADR_SLAVE	
31	OUTPUT_ADR_SLAVE no PROFIBUS DP slave	
100	bit number not 0	
101	bit number not 0-7	
103	operand invalid (memory area)	
104	operand invalid (datatype)	
105	operand invalid (datablock 0)	
106	datablock number > limit of cpu	
107	datablock does not exist	
109	datablock to short	
110	address does not exist	
111	initialization canceled with error	
112	initialization not completed	
150	request fragmentation not supported	
151	wrong number of requested values	
152	only <64 digital signals are supported	
153	only <64 analog signals are supported	
200	no connection to DP slave	

Table 15:Error codes of Request block FC122

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FC123

Value ERROR_STATUS	Description		
1	DB_PDA is write protected		
2	DB_PDA = 0 or > limit of cpu		
3	DP_PDA does not exist		
5	DB PDA too short		
11	DB_INTERN is write protected		
12	DB_INTERN = 0 or > limit of CPU		
13	DB_INTERN does not exist		
15	DB_INTERN too short		
16	error while reading identification data of CPU		
19	initialization not completed		
21	insufficient memory for system status list		
22	wrong or unknown system status list		
23	wrong or invalid index of system status list		
30	invalid OUTPUT_ADR_SLAVE		
31	OUTPUT_ADR_SLAVE no PROFIBUS DP slave		
32	RM: the parameterized "OUTPUT_ADR_SLAVE_BUS_0" ist wrong.		
33	RM: the parameterized "OUTPUT_ADR_SLAVE_BUS_0" is not assigned to a PROFIBUS DP slave		
34	RM: the parameterized "OUTPUT_ADR_SLAVE_BUS_1" ist wrong		
35	RM: the parameterized "OUTPUT_ADR_SLAVE_BUS_1" is not assigned to a PROFIBUS DP slave		
36	RM: SLAVE BUSO and SLAVE BUS1 do not have the same DP address		
100	bit number not 0		
101	bit number not 0-7		
103	operand invalid (memory area)		
104	operand invalid (datatype)		
105	operand invalid (datablock 0)		
106	datablock number > limit of cpu		
107	datablock does not exist		
109	datablock to short		
110	address does not exist		
111	initialization canceled with error		
112	initialization not completed		
150	request fragmentation not supported		
151	wrong number of requested values		
152	only <64 digital signals are supported		
153	only <64 analog signals are supported		

Value ERROR_STATUS	Description	
200	no connection to DP slave	
201	RM: slave bus 0 has failed	
202	RM: slave bus 1 has failed	
203	RM: slaves bus 0 + 1 have failed	
210	output modules of the slaves bus 0 and 1 are configured differently	

Table 16: Error codes of Request block FC123

6.8 Use of MPI/DP-TCP-adapters

Siemens S7 CPUs which do not have an Ethernet interface can be connected via MPI/DP-TCPadapters on their MPI interface.

Adapters, which convert the S7 communication from TCP/IP to MPI/PROFIBUS DP, are offered by different manufacturers.

Basically, these adapters can be used together with *ibaPDA*. Therefore, the connection on the *baPDA*-side must be configured as a TCP-connection.

The adapter can be accessed via an IP address that is set using the software supplied by the manufacturer.

In the connection configuration, enter "0" as frame and the MPI- or DP-address of the S7 CPU as slot.

For more information please refer to the corresponding device documentation.



7 Support and contact

Support

Phone:	+49 911	97282-14

Fax: +49 911 97282-33

Email: support@iba-ag.com

Note



If you need support for software products, please state the license number or the CodeMeter container number (WIBU dongle). For hardware products, please have the serial number of the device ready.

Contact

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