

ROBOTICS

Application manual PROFIBUS Controller



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Application manual PROFIBUS Controller

RobotWare 6.10.01

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Overview of this manual

About this manual	This manual describes the option <i>969-1 PROFIBUS Contr</i> instructions for the configuration.	oller and contains
Usage	This manual should be used during installation and configuration as well as during upgrading of the PROFIBUS option.	ration of the PROFIBUS,
Who should read th	is manual?	
	This manual is intended for	
	 personnel that are responsible for installations and co network hardware/software 	nfigurations of industrial
	 personnel that configure the I/O system 	
	system integrators.	
Prerequisites	The reader should have the required knowledge ofthe PROFIBUS systemI/O system configuration	
References		
ABB documents		
	References	Document ID
	Application manual - PROFIBUS Anybus Device	3HAC050965-001
	Application manual - Controller software IRC5	3HAC050798-001
	Operating manual - IRC5 with FlexPendant	3HAC050941-001
	Operating manual - RobotStudio	3HAC032104-001
	Product manual - IRC5	3HAC047136-001
	Product manual - IRC5 Panel Mounted Controller	3HAC047137-001
	Technical reference manual - RAPID Instructions, Functions and Data types	3HAC050917-001

Technical reference manual - RAPID Overview	3HAC050947-001
Technical reference manual - RAPID kernel	3HAC050946-001
Technical reference manual - System parameters	3HAC050948-001

Other references

References	Description
International standard IEC 61158 Type 3 International standard IEC 61784	The PROFIBUS industrial network standard is described in the international standards.
PROFIBUS Technical Guideline	Installation Guideline for PROFIBUS-DP/FMS (Version 1.0, September 1998)

Continues on next page

Continued

References	Description
User Manual PROFIBUS Configurator	Manual for the PROFIBUS configuration tool (PC software)
ET200S Distributed I/O System Manual	Manual from Siemens
www.profibus.com	The web site of PROFIBUS International

Revisions

Revision	Description
-	First edition. Beleased with BobotWare 6.0.
A	 Released with RobotWare 6.01. Added step 9 in <i>PROFIBUS configurator setup on page 39</i> of section 4. Minor corrections. System parameter <i>Connection</i> removed from <i>Industrial Network</i>.
В	 Released with RobotWare 6.02. Updated the path to the GSD files, see GSD files on page 27.
С	Released with RobotWare 6.10.01. Cfg name removed from entire manual.

Product documentation

Categories for user documentation from ABB Robotics

The user documentation from ABB Robotics is divided into a number of categories. This listing is based on the type of information in the documents, regardless of whether the products are standard or optional.

All documents can be found via myABB Business Portal, <u>www.myportal.abb.com</u>.

Product manuals

Manipulators, controllers, DressPack/SpotPack, and most other hardware is delivered with a **Product manual** that generally contains:

- · Safety information.
- Installation and commissioning (descriptions of mechanical installation or electrical connections).
- Maintenance (descriptions of all required preventive maintenance procedures including intervals and expected life time of parts).
- Repair (descriptions of all recommended repair procedures including spare parts).
- · Calibration.
- Decommissioning.
- Reference information (safety standards, unit conversions, screw joints, lists of tools).
- Spare parts list with corresponding figures (or references to separate spare parts lists).
- References to circuit diagrams.

Technical reference manuals

The technical reference manuals describe reference information for robotics products, for example lubrication, the RAPID language, and system parameters.

Application manuals

Specific applications (for example software or hardware options) are described in **Application manuals**. An application manual can describe one or several applications.

An application manual generally contains information about:

- The purpose of the application (what it does and when it is useful).
- What is included (for example cables, I/O boards, RAPID instructions, system parameters, software).
- How to install included or required hardware.
- How to use the application.
- Examples of how to use the application.

Continued

Operating manuals

The operating manuals describe hands-on handling of the products. The manuals are aimed at those having first-hand operational contact with the product, that is production cell operators, programmers, and troubleshooters.

Safety

Safety of personnel

When working inside the robot controller it is necessary to be aware of voltage-related risks.

A danger of high voltage is associated with the following parts:

- Devices inside the controller, for example I/O devices, can be supplied with power from an external source.
- The mains supply/mains switch.
- The power unit.
- The power supply unit for the computer system (230 VAC).
- The rectifier unit (400-480 VAC and 700 VDC). Capacitors!
- The drive unit (700 VDC).
- The service outlets (115/230 VAC).
- The power supply unit for tools, or special power supply units for the machining process.
- The external voltage connected to the controller remains live even when the robot is disconnected from the mains.
- Additional connections.

Therefore, it is important that all safety regulations are followed when doing mechanical and electrical installation work.

Safety regulations

Before beginning mechanical and/or electrical installations, ensure you are familiar with the safety regulations described in *Operating manual - General safety information*¹.

¹ This manual contains all safety instructions from the product manuals for the manipulators and the controllers.

Network security

Network security

This product is designed to be connected to and to communicate information and data via a network interface. It is your sole responsibility to provide, and continuously ensure, a secure connection between the product and to your network or any other network (as the case may be).

You shall establish and maintain any appropriate measures (such as, but not limited to, the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB Ltd and its entities are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

Terminology

Terms

Term	Explanation
Controller	The PROFIBUS master is referred to as PROFIB- US controller.
Device	In this manual the term <i>device</i> is used to describe a physical unit.
External Controller or Device	The term <i>external</i> is used to describe a controller or device on the PROFIBUS network connected to the IRC5 controller.
GSD file	A GSD file contains information about a PROFIB- US device.
Internal master	The term <i>internal</i> is used to describe when the IRC5 controller acts as a controller on the PROFIBUS network.
LAN	Port/connector for Local Area Network.
Master	See term Controller
PROFIBUS configuration file	The GSD file created using an external PROFIBUS configuration tool.
Slave	See term <i>Device</i>
Softing PROFIBUS Configurator	An external PROFIBUS configuration tool to con- figure PROFIBUS network. This tool is recommen- ded by ABB.
WAN	Port/connector for Wide Area Network.

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1 Introduction

1.1 What is PROFIBUS?

General		-		
	PROFIBUS is a ver range of applicatio It is maintained, up	ndor independent open industrial network standard for a wide ns, particularly in the fields of factory and process automation. odated and marketed by PROFIBUS International.		
	PROFIBUS is suitable for high-speed time critical applications as well as for complex communication tasks.			
Standardization				
	The PROFIBUS con <i>Type 3</i> , which inclu devices should be interoperability and	mmunication is specified in the international standard <i>IEC 61158</i> udes the entire range of PROFIBUS versions. All PROFIBUS certified by the PROFIBUS User Organization (PNO) to ensure d conformance.		
Communication	protocols			
	DP (Decentralized Periphery) is the simple, fast, cyclic and deterministic			
	communication protocol between a network controller and the assigned devices. The forerunner of DP was FMS (Fieldbus Message Specification), which is obsolete today.			
	The original version of DP, DP-V0, provides cyclic data exchange and diagnostics. DP-V1 extends DP-V0 with acyclic data exchange and DP-V2 offers direct device-to-device data exchange and clock synchronization. These versions are all backward compatible			
	The following table	The following table specifies a number of PROFIBUS-DP data.		
	Network type Multi-Controller/Device communication system			
	Installation	Linear network, terminated at both ends. Shielded twisted pair cables. 9-pin D-sub or M12 connectors.		
	Speed	9.6 Kbps - 12 Mbps		

Electronic device data sheet

The configuration process is based on electronic device data sheet (GSD files), which are required for each PROFIBUS device. GSD files are provided by the device manufacturers and contain electronic descriptions of all relevant communication parameters of the PROFIBUS device.

1.2 PROFIBUS for IRC5

1.2 PROFIBUS for IRC5

General

The PROFIBUS network for IRC5 is running on a single channel PCI Express board in the IRC5 main computer.

The PROFIBUS board, DSQC1005, requires the main computer DSQC1000.

Hardware overview

The hardware of the PROFIBUS-DP industrial network consists of a master unit, DSQC1005, and distributed devices.

The DSQC1005 unit is connected to the PCIe network of the IRC5 robot controller. The slave devices are attached to the industrial network. The DSQC1005 unit supports PROFIBUS-DP with DP-V0, which means that DP-V1 is *not* supported.



Slave functionality is not supported by the PCI express board. If PROFIBUS slave functionality is required, then the option *PROFIBUS Anybus Device* can be used. For more information see *Application manual - PROFIBUS Anybus Device*.

Slave devices

The slave devices can be I/O devices with digital and/or analog signals. They are all controlled via the DSQC1005 unit.

1.2 PROFIBUS for IRC5 Continued

The PROFIBUS-DP network

The illustration below is an overview of the hardware, and shows the PROFIBUS network.



Configuration program

The configuration program *PROFIBUS Configurator* (from Softing), together with RobotStudio is used for the correct configuration of the industrial network.

The configuration program must be executed on a PC according to the manual for the program.

Some of the Profibus network settings will have to be done twice, both in PROFIBUS Configurator and in RobotStudio. PROFIBUS Configurator can generate a binary

1.2 PROFIBUS for IRC5 Continued

> configuration file that can be interpreted by the PROFIBUS board. RobotStudio will create the system parameters to be interpreted by RobotWare.

PB1 (Local) ×						
/CONFIG/EIO ×						
Туре	Name	Connection	Identification Label	Address	Configuration File	DeviceNet Communication Speed
Access Level	Local	LOC	Local		N/A	N/A
Cross Connection	PROFIBUS	PCIe Board	PROFIBUS Controller Netwo	ork	HOME/pbus_cfg.bin	N/A
Device Trust Level	Virtual	SIM			N/A	N/A
Industrial Network						
PROFIBUS Device						
Route						
Signal						
Signal Safe Level						
System Input						
System Output						
PROFIBUS Configurator [C:\ProgramData\Softing\PBOPCServer\Configuration.xml]						
<u><u> </u></u>	<u>File Edit View Options H</u> elp					
Computer Im 002 ET 2005 (IM151)						
Profibus Network2			I	lame		Туре
Profibus Segment1 □ ↓ 1 001_PBpro Master Select an item to view its			Select an item to view its	D CyclicDat	a	Cyclic Data Container



Specification overview, Master

Item	Specification
Industrial Network	PROFIBUS-DP master with DP-V0
Addressing	1-125
Number of devices con- nected to master	Maximum 20 I/O devices, see <i>Technical reference manual - System parameters</i> .
Number of signals	Maximum 12000 I/O signals, see <i>Technical reference manu-al - System parameters</i> .
Baudrate	The PROFIBUS Controller is configurable for all baudrates up to 12 Mbits.
PROFIBUS product ID	0x0BAA

1.3 Definition of I/O devices

1.3 Definition of I/O devices

General

It is possible to connect any type of PROFIBUS DP-V0 compliant I/O device on the DSQC1005 master network. All devices should comply with the PROFIBUS standard and be conformance tested by PNO/PI (PROFIBUS Nützer Organisation/PROFIBUS International).

For information about the available system parameter and settings, see *System parameters on page 53* and *Technical reference manual - System parameters*.

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2 Hardware overview

2.1 Main computer DSQC1000

Connections

The I/O network is connected to the PROFIBUS PCI Express board, DSQC1005, on the main computer.

The following figure illustrates the location of the PCI Express board in the main computer unit.



xx1300000691

	Description		Designation	Art. no.
Α		PROFIBUS DP Master	DSQC1005	3HAC044872-001

Installation of PCI Express board

For information on how to install and replace the PCI Express board, see *Product manual - IRC5*.

The PROFIBUS connector



xx0700000507

The following table describes the connections to the DSQC1005 board.

Pin	Signal	Description
1	Not used	

2 Hardware overview

2.1 Main computer DSQC1000 *Continued*

Pin	Signal	Description
2	Not used	
3	RxD/TxD-P	Receive/Transmit data; line B (red)
4	CNTR-P	Control of repeater direction
5	DGND	Data ground (reference voltage to VP)
6	VP	Power supply +5V (for example bus termination)
7	Not used	
8	RxD/TxD-N	Receive/Transmit data; line A (green)
9	Not used	
Housing	Cable shield	Internally connected to the protective earth via cable shield filters according to the PROFIBUS standard.

2.2.1 Connections

2.2 Cables and connections

2.2.1 Connections

General

All devices are connected in a network structure. Each network segment can have a maximum of 32 active devices. In order to connect a larger number of stations (controllers and devices), the network must be segmented. The segments are then interconnected with repeaters that amplify and refresh the data signals. Each repeater allows the PROFIBUS system to be extended by an additonal network segment.

The start and end of each segment is fitted with an active network terminator, see illustration in section *Termination on page 24*.

Cables and connectors

Cables used for connecting the PROFIBUS network must be according to the PROFIBUS specification, *IEC 61158 Type 3*. See also the *Installation Guideline for PROFIBUS-DP/FMS* published by the user organization of PROFIBUS (PNO).

Drop cables are not allowed for PROFIBUS, so special D-subs must be used when the PROFIBUS device is not the last in line. The connector must have the possibility to insert two PROFIBUS cables in the same D-sub.

2.2.2 Termination

2.2.2 Termination

General

To reduce the reflections on the data lines, it is very important that both ends of the PROFIBUS network are terminated.

The termination used by PROFIBUS is an active termination as showed in the following figure.



en0400001144

After connecting the PROFIBUS network always check that the termination is in place on both ends of the network, and that there are no other terminations on the network. If a termination is missing or an extra termination is added somewhere in the PROFIBUS network the communication will probably fail.

2.2.3 Selecting cables

2.2.3 Selecting cables

Cable parameters, PROFIBUS-DP

The cable parameters for the standard network cables result in the maximum length of each network segment for the respective data transfer rate. See details for cable type A in the following tables.

Segment lengths and data rates, cable type A

Data rate in kbit/s	Maximum segment length in m
9.6	1200
19.2	1200
45.45	1200
93.75	1200
187.5	1000
500	400
1500	200
3000	100
6000	100
12 000	100

Other parameters, cable type A

Parameter	Value
Impedance	135 to 165 Ω
Capacity	≤ 30 pF/m
Loop resistance	≤ 110 Ω/km
Conductor cross-sectional area	≥ 0.34 mm ² (AWG 22)

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3.1 Information about the internal controller

3 Software overview

3.1 Information about the internal controller

General	To use the DDOE	DUC internal controller, the IDCE controller must be installed
	with the option <i>96</i>	9-1 PROFIBUS Controller.
	The PROFIBUS in	ternal controller can be used to:
	connect PR	OFIBUS device to the IRC5 controller.
	connect the	IRC5 controller to another IRC5 controller which acts as a device.
Predefined network		
	When the robot sy predefined networ	vstem is installed with the PROFIBUS Controller option, a rk with the name <i>PROFIBUS</i> is created at system startup.
GSD files		
	In order to configur tool, a GSD file fo contains vital info by the vendor/mat	re a PROFIBUS network with an external PROFIBUS configuration r each device needs to be imported into the tool. These files rmation about the PROFIBUS device and they shall be supplied nufacturer of the specific PROFIBUS module.
	The GSD files for	the IRC5 controller are available at the following locations:
	 In the Robo RobotWare_ 	tWare installation folder in RobotStudio:\RobotPackages\ _RPK_ <version>\utility\service\ioconfig\PROFIBUS\</version>
	On the IRC:	5 Controller: <systemname>\PRODUCTS\</systemname>
	<robotware< td=""><td>e_xx.xx.xxx>\utility\service\GSD\</td></robotware<>	e_xx.xx.xxx>\utility\service\GSD\
	Note	
	Navigate to the F by right-clicking selecting Open I	RobotWare installation folder from the RobotStudio Add-Ins tab, on the installed RobotWare version in the Add-Ins browser and Package Folder.
	The directory con	tains the following files:
	GSD-file	Description
	soft0baa.gsd	Softing DP-Master PBpro (DSQC1005)
	HMS 1811.gsd	PROFIBUS Anybus Device (DSQC 667)

3 Software overview

3.1 Information about the internal controller *Continued*

DSQC1005 firmware update

The firmware that is executing on the DSQC1005 board is included in the RobotWare software package. During a RobotWare upgrade, the DSQC1005 is automatically updated. No manual procedure is needed.



During an automatic firmware upgrade of the board, lock-files are created on the flash disk. The lock-files have names of the format *firmwareXY.lock*, where X and Y are figures in the range 0-9.

These are reserved filenames that must not be used by the user.

3.2.1 Softing PROFIBUS configurator

3.2 Software for configuring the master

3.2.1 Softing PROFIBUS configurator

Description	
	Softing PROFIBUS configurator is an external PROFIBUS configuration PC tool.
	The usage of the tool is described below.
Installation	
	For installation instructions refer to the Softing PROFIBUS Configurator Manual.
Bus parameter s	set - changing parameters
	All the parameters that are defined in the "PROFIBUS Bus parameter set" are possible to modify by using the <i>Softing PROFIBUS Configurator</i> . These parameters and default values for them (depending on the baudrate) are defined in the PROFIBUS specification. The default values are recommended and it is rarely necessary to modify these parameters.
	By selecting the desired baudrate, the <i>Softing PROFIBUS Configurator</i> can automatically select the default "PROFIBUS Bus parameter set" for the selected baudrate, either by clicking the Standard button on the bus parameter window or by using the Calculate/Check function.
	When the configuration of the master and all slaves is completed, it is recommended to use the Calculate/Check function in <i>Softing PROFIBUS Configurator</i> , and perform any changes that might be suggested. The Calculate/Check function can be executed by right-clicking the segment node in the treeview.
Slave paramete	r set - changing parameters
	By using the <i>Softing PROFIBUS Configurator</i> it is possible to change the parameters that are defined in the "Slave parameter set" according to the PROFIBUS specification. It is usually not necessary to modify the parameters in the "Slave parameter set", but in some cases it can be interesting to change parameters (like the Watchdog Time and the UserPrm Data).
	Description of how the parameters in the "Slave parameter sets" are modified is found in the manual for the <i>Softing PROFIBUS Configurator</i> .



Note

It is recommended not to change any of the parameters without a knowledge on PROFIBUS and how the changes affect the communication.

3 Software overview

3.2.1 Softing PROFIBUS configurator *Continued*

Importing GSD files

Use the following procedure to import a GSD file to the *Softing PROFIBUS Configurator*.

	Action	Note
1	Start the Softing PROFIBUS Configurator.	PROFIBUS Configurator (C/Program Data Softing) / BOPCServer/Configuration.xm(Profile Softing) / BOPCServer/Confi
2	Click Options and select Settings	
3	On the <i>Choose GSD</i> tab, Click Import	Properties Choose GSD_OPC Server OPC Properties Binary Format Endress + Hauser Name Ident Fhoreis Contact SiEMENS SiEMENS_AG Softing Softing AG Please click the 1mport' button to import GSD files. Igport_ OK Cancel Apply en1300000712
4	An Open dialog appears. Select the GSD- file and click Open . Note For information about the location of the GSD-files, see <i>GSD files on page 27</i> .	Corrorder Network File game: pottbaa god Open Cancel File game: pottbaa god Open Cancel File game: pottbaa god Open Cancel Corrorder Network Tile game: pottbaa god Open Cancel Corrorder Network Cancel File game: pottbaa god Open Cancel Corrorder Network Cancel
5	Now the imported GSD file appears in the list.	

3.2.1 Softing PROFIBUS configurator Continued

Setting up the bus

Use the following procedure to setup the bus using the *Softing PROFIBUS Configurator*.

For more specific examples, see *Examples on page 39*.

	Action	Note
1	Start the Softing PROFIBUS Configurator.	
2	Right-click on Computer and select New Network .	PROFIBUS Configurator [CAProgramData/Softing/PBOPCServer/Configuration.xml] Elle Édit View Options Help Delta Copy Ctri-C Paste Ctri-V Cut Ctri-V Delete Del Rename F2 Activate F5 Deactivate Shift+F5 Properties Alt+Enter Scan Objects F6 New network Ctri+1
3	Right-click on the added network node and select Insert Segment .	PROFIBUS Configurator (CAProgramData\Softing\PBOPCServe\Configuration.xml) File Edit View Options Help Computer Computer Computer Computer Computer Computer Cot Cotrl Corl Corl V Delete Cot Cotrl Corl Corl V Delete F5 Deactivate
4	Right-click on the added segment and se- lect Master	PROFIBUS Configurator (C\ProgramData\Softing\PBOPCServer\Configuration.xml) Elle Edit View Options Help Computer A the control of the cont

3.2.1 Softing PROFIBUS configurator *Continued*

5 Under Softing AG, select PBpro Master and click Next. 6 In the Standard Properties window, change station address to the desired value. 8 In the Standard Properties window, change station address to the desired value. Select the Local Master check box to load the bus parameters and slave parameters to the local master. Click Finish. 7 Right-click on the segment node and select 8 Properties		Action	Note
7 Right-click on the segment node and select Properties	5	Under Softing AG, select PBpro Master and click Next.	Insert new master Image: Choose GSD Choose GSD Select a GSD file Softing Name Softing AG PBpro Master UBAA UBAA
7 Pight-click on the segment node and select Properties			
 Click Finish. Right-click on the segment node and select Right-click on the segment node and select Right-click on the segment node and select 			Please click the Import' button to import GSD files.
 In the Standard Properties window, change station address to the desired value. Select the Local Master check box to load the bus parameters and slave parameters to the local master. Click Finish. Click Finish. Right-click on the segment node and select Right-click on the segment node and select Properties Properties 			en1300000703
Select the Local Master check box to load the bus parameters and slave parameters to the local master. Click Finish. Click Finish. Click Finish. Plocal Master Image: Station Address: Image:	6	In the Standard Properties window, change station address to the desired value.	Insert new master ? X Standard Properties
7 Right-click on the segment node and select Properties 8 Properties 9 Properties 9 Properties 9 Profibus Network1 9 Profibus Net		Select the Local Master check box to load the bus parameters and slave parameters to the local master. Click Finish .	Name: 001_PBpro Master Station Address: Image: Station address on the bus. If Local Master Image: Station address on the bus. Boardname: Node0 AutoClear In case of an error, the master automatically switches to operation mode 'Clear'
7 Right-click on the segment node and select Properties PROFIBUS Configurator (Cl)ProgramDatalSofting\PBOPCSever\Configuration.xm File Edit View Option Help Computer Image: Computer in the profibus Segment in the profib			Cancel Help en1300000704
bi-ligit our_reprovinses bi-ligit MasterData bi-ligit MasterData bi-ligit MasterData bi-ligit MasterData Cut Ctrl+V Cut Ctrl+V Delete Del Rename F2 Activate F5 Deectivate Shift-F5 Deectivate Shift-F5 Deectivate Ctrl+A Slave Ctrl+M Slave Ctrl+M Slave Ctrl+M	7	Right-click on the segment node and select Properties .	PROFIBUS Configurator (CAProgramData\Softing\PBOPCServer\Configuration.xml) File Edit View Options Help D
en130000804			en1300000804

3.2.1 Softing PROFIBUS configurator Continued

	Action	Note
8	Change the Baud Rate to the desired value.	Properties of Frofibus Segment.
9	Click OK to change the other parameters accordingly.	Error Rease change other parameters accordingly using "Calculate/Check" or "Standard"!
10	Click Standard and then change the other parameters to the desired values.	Properties of Profibus Segment1 General Gener
11	Click Apply and then click OK.	

The next step of the configuration is to add and configure I/O devices and create the binary file, see *Examples on page 39*.

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4.1 Recommended working procedure

4 Configuring the internal controller

4.1 Recommended working procedure

General

This section describes the recommended working procedure when installing and configuring the PROFIBUS controller. The working procedure helps to understand the dependencies between the different steps.

Basic steps

Use this procedure to install and configure the PROFIBUS controller.

	Action	See
1	Use an external PROFIBUS configura- tion tool to create a file that contains the configuration of the PROFIBUS network.	Creating the PROFIBUS configuration file on page 36
2	Download the PROFIBUS configuration file to the controller.	Configuring the IRC5 controller on page 37
3	Configure the I/O devices connected to the PROFIBUS network using RobotStudio or FlexPendant.	

Examples

See
Digital I/O configuration example (non modular station) on page 39
Modular station configuration example on page 42
Communication between two IRC5 controllers on page 47

4 Configuring the internal controller

4.2 Creating the PROFIBUS configuration file

4.2 Creating the PROFIBUS configuration file

General		
	To cre tool is indepe	eate the PROFIBUS configuration file, an external PROFIBUS configuration needed. This section describes the basic steps that needs to be performed endent of which tool is used.
Examples		
	The Se	ofting PROFIBUS configurator is the tool recommended by ABB. For specific
	examp	ples on how to use the tool, see <i>Examples on page</i> 39.
Basic steps		
Basic steps	This p	procedure describes the general steps that needs to be performed when
Basic steps	This p creatir	procedure describes the general steps that needs to be performed when ng a controller network configuration file, independent of which tool is used
Basic steps	This p creatir	procedure describes the general steps that needs to be performed when ng a controller network configuration file, independent of which tool is used. Action
Basic steps	This p creatir 1	procedure describes the general steps that needs to be performed when ng a controller network configuration file, independent of which tool is used Action Use the PROFIBUS configuration tool to: • Import the GSD files for all types of devices in the network.
Basic steps	This p creatin 1	Action Use the PROFIBUS configuration tool to: • Import the GSD files for all types of devices in the network. • Set the baud rate for the network.
Basic steps	This p creatir 1	Action Use the PROFIBUS configuration tool to: • Import the GSD files for all types of devices in the network. • Set the baud rate for the network. • Set the station address for the internal controller.
Basic steps	This p creatir 1	Action Use the PROFIBUS configuration tool to: • Import the GSD files for all types of devices in the network. • Set the baud rate for the network. • Set the station address for the internal controller. • Add the I/O devices into the network structure.
Basic steps	This p creatir 1	Action Use the PROFIBUS configuration tool to: • Import the GSD files for all types of devices in the network. • Set the baud rate for the network. • Set the station address for the internal controller. • Set the station address for all I/O devices in the network structure.

4.3 Configuring the IRC5 controller

4.3 Configuring the IRC5 controller

Description

This configuration example uses the PROFIBUS configuration file, *pbus_cfg.bin*, created in section *Creating the PROFIBUS configuration file on page 36*. It shows how to use the PROFIBUS configuration file and how to add the configuration definitions to the system parameters.

Internal controller configuration

Use this procedure to configure the PROFIBUS controller in the IRC5 controller, using the **Configuration Editor** in RobotStudio.

	Action	Note			
1	Start RobotStudio and connect to the IRC5 controller. Request write access.				
2	Download the binary configuration file to the controller.	Use the File Transfer tool in RobotStudio or an external FTP client.		RobotStudio,	
	Note				
	The recommended filename is <i>pbus_cfg.bin</i> and the recommended directory is the <i>HOME</i> directory of the currently used Ro- botWare system.				
3	Click Configuration Editor and select I/O System.				
4	In the Type list, click Industrial Network and then right-click in the workspace on the <i>PROFIBUS</i> item and select Edit Indus- trial Network.	For more see <i>Syst</i> e	information a em paramete	bout th rs on p	ne parameters, <i>page 53</i> .
5	Enter the parameter values for the	3 Instance Editor	a Morali,	August Mark	
U.	PROFIBUS industrial network	Name	Value	Information	
	Configuration File shall be the noth	Name	PROFIBUS		
	Configuration File shall be the path	Identification Label	PROFIBUS Controller Network		
	to the binary file.	Configuration File	HOME/pbus_cfg.bin		
	Click OK	Simulated	O Yes		
		xx140000211	0		QK Cancel
6	In the Type list, click PROFIBUS Device .	All device also be d same set	es that are use lefined in the ttings.	∍d in th contro	ne binary must Iller, using the

4 Configuring the internal controller

4.3 Configuring the IRC5 controller *Continued*

	Action	N	lote				
7	Edit the parameter values for the device, if	ſ	linstance Editor			l	
	applicable. Name, same as in the configuration 		Name	v	alue		Information
			Name	D	evice		
	file.		Connected to Industrial Network PROFIBUS State when System Startup Activated		S		
	 Connected to Industrial Network, 				•		
	shall be PROFIBUS.		Trust Level	D	efaultTr	ustLevel 🔻	
	PROFIBUS Address, same as in the configuration file	1	Simulated	0	Yes No		
	Observe the defeative loss for largest		Vendor Name				
	Change the default values for input		Product Name				
	size and Output Size to the desired		Recovery Time (ms)	5	000		
			Identification Label				
			PROFIBUS Address	1	0		
			Input Size (bytes)	8			
			Output Size (bytes)	8			
						OK	Control
		L			-	UK	Cancel
		x	x1400002109				
8	In the Type list, click Signal .						
9	Add signals to the device	-	🐌 Instance Editor				
	• Name, user defined.		Name	Val	Je		Information
	 Type of Signal, select signal type 		Name	Му	DI1		
	 from the drop-down list. Assigned to Device, select from the list of previously defined devices. Device Mapping, specifies which bit 		Type of Signal	Dig	ital Inp	ut 🔻	
			Assigned to Device	Dev	ice	•	
			Signal Identification Label	_)	
			Device Mapping	0			
	the signal uses in the I/O memory of		Categony	-			
	the device.		Assess				
	Click OK.			Def	ault	•	
			Default Value	0			
			Filter Time Passive (ms)	0			
			Filter Time Active (ms)	0			
		8	Invert Physical Value	() Y () N	es Io		
			Safe Level	Def	aultSaf	eLevel 🔻	
						ОК	Cancel
		x	x1400002111				
10	Restart the IRC5 controller to apply all set-						
	tings.						

4.4 Examples

4.4.1 Digital I/O configuration example (non modular station)

Description

This is a detailed example of how to configure an ET200B 16 DI/16 DO device to the controller. The industrial network is configured using the *Softing PROFIBUS Configurator*, with the controller at address 2 and the slave device at address 10. The baudrate is 12 Mbits.

PROFIBUS configurator setup

The following procedure is a step-by-step description of how to set the configuration in the *Softing PROFIBUS Configurator*.

	Action	Note	
1	Start the Softing PROFIBUS Configurator.		
2	Import the GSD-files from the RobotWare DVD (that is, if the files have not been imported before).	See Importing GSD files on page 30 and GSD files on page 27.	
3	Import GSD-files for the I/O devices that shall be used.	The GSD-file is provided by the manufac- turer of the device.	
4	Setup the bus using the following values:Station address 2Baud Rate 12 MBit/s	See Setting up the bus on page 31.	
5	Right-click on the segment node and select Slave	#PROFIBUS Configurator [C\ProgramData\Softing\PBOPCServer\Configuration.xm File _Edit View Options Help File _Edit View Options Help Profibus SegmentI -rf Profibus SegmentI -rf Profibus SegmentI Copy Ctrl+C Paste Ctrl+V Cut Ctrl+X Delete Del Rename F2 Activate F5 Deactivate Shift+F5 Properties Alt+Enter Calculate/Check Ctrl+A Slave Ctrl+M Slave Ctrl+M	
		en1300000707	

4 Configuring the internal controller

4.4.1 Digital I/O configuration example (non modular station) *Continued*

	Action	Note
6	Click SIEMENS.	Insert new slave
		Endress + Hauser Name Ident HMS Industrial Networks Fhoerin Contact ET 2000 ([M153:1]) 801D Stemens CPU416:2 PCI 80CE 80CE Stemens_AG BeDV/800 HVA DP 0010 80CE Softing BeDV/800 DP 0008 84A0.2 DP 8018 B44/12 DP 8019 84/484.2 DP 8014 B-240//800 DP 0000E B-240//800.2 DP 000E B-340//20 DP 0000E B-340//20 DP 000E B-16D//16D0 DP 0006 B-16D//16D0 DP 0006
		Please click the 1mport' button to import GSD files.
		<back next=""> Finish Cancel Help</back>
7	Select the B-16DI/16DO slave device and click Next.	Insert new slave
		Endress + Hauser Name Ident HMS Induitial Networks FT 2004 (M153-11) 801D Phoenix Contact ET 2005 (V1 Slave 906E SIEMENS SIEMENS,AG 800/800 HVA DP 800C Softing 800/800 DP 0008 8-40/2 DP 8018 8-440-2 DP 8018 8-440-2 DP 8018 8-440-2 DP 8014 8-3200 DP 0000 8-340/800 DP 0000 E 8-340/800 DP 0000 E 8-400-42 DP 8014 8-320 DP 8000 E 8-400-42 DP 9005 8-340/800 DP 0000E 8-340/800 DP 0000F 8-340/800 DP 0000F 8-450/200 DP 0000F 8-450/200 DP 0000F 8-450/200 DP 0000F 8-450/200 DP 0000F 8-450/200 DP 0000A * * *160/1600 DP 000A * *
		< Back Next> Finish Cancel Help
		en1300000725
8	Change the station address to 10 in the Standard Properties window and click Finish.	Insert new slave
		Name: 001_8-16D1_16D0_DP
		Station Address: 10
		Assigned Master: 001_PBpro Master V Cyclic Master of the device.
		en1300000709

4.4.1 Digital I/O configuration example (non modular station) *Continued*

	Action	Note
9	Right-click on the Profibus Segment and select Calculate/Check from the drop-down list. The Verify segment settings dialog box opens. Select the option to calculate or check the configuration if required. Note It checks or corrects the default values set for the DP-Master and improves the com- munication.	PROFIBUS Configurator [C\ProgramData\Softing\PBOPCServer\pb_113] File Edit View Options Help Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer Image: Computer <
10	Save the configuration file. A binary file with extension <i>.bin</i> will be saved at the same location as the configur- ation file with extension <i>.xml</i> . Rename the binary file to <i>pbus_cfg.bin</i> .	Conjuster > Local Disk(C) + PogumData > Setting + PBOPCServer File Edit View Toxis Help Organize Include in likery State with International Configuration.bin State modified Type Serve Configuration.bin State Configurati
12	Download the PROFIBUS configuration file to the controller and configure the settings on the IRC5 controller.	See Configuring the IRC5 controller on page 37

4 Configuring the internal controller

4.4.2 Modular station configuration example

4.4.2 Modular station configuration example

Description

The ET200S is a modular device. You can choose which type of modules to use and in which order to connect them.

This is an example of how to configure an ET200S device to the controller. The industrial network is configured using the *Softing PROFIBUS Configurator*, with the master at address 1 and the slave device at address 10. The baudrate is 12 Mbit/s.

The ET200S device has 7 physical modules, and these are connected in following order:

- One power module
- Two modules with 2 DO in each module
- Two modules with 2 DI in each module
- One module with 2 AO
- One module with 2 AI

PROFIBUS configurator setup

The following procedure is a step-by-step description of how to setup the configuration in *Softing PROFIBUS Configurator*.

	Action	Note			
1	Start the Softing PROFIBUS Configurator.				
2	Import the GSD-files from the RobotWare DVD (that is, if the files have not been imported before).	See Importing GSD files on page 30 and GSD files on page 27.			
3	Import GSD-files for the I/O devices that shall be used.	The GSD-file is provided by the manufac- turer of the device.			
4	 Setup the bus using the following values: Station address 1 Baud Rate 12 MBit/s 	See Setting up the bus on page 31.			
5	Right-click on the segment node and select Slave	PROFIBUS Configurator [C:\ProgramData\Softing\PBOPCServer\Configuration.xn			
		<u>File Edit View Options Help</u>			
		Scan Nodes F6 Master Ctrl+ M Slave Ctrl+ K			
		Coupler Ctrl+O			
		en130000707			

4.4.2 Modular station configuration example *Continued*

	Action	Note
6	Action Click SIEMENS.	Insert new slave P Choose GSD Select a GSD file Finderss + Hauser Name HNS Industrial Networks ET 200X 4D0-6 DP Phoenix Contact ET 200X 4D0-5 DP SIEMENS_AG ET 200X 4D0-6 DP SIEMENS_AG ET 200X 4D0-6 DP Softing ET 200X 1DP/FMS ET 200S (M151/FDU) 8066 ET 200S (M151/FDU) 8067 ET 200S (M151/FDU) 8068 ET 200S (M151/FDU) 8066 ET 200S (M151/FDU) 8067
7	Select the <i>ET 200S (IM151)</i> slave and click Next.	En1300000715 Insert new slave Insert new slave Choose GSD Select a GSD file Endess + Hauser Insert new slave HMS Industrial Networks ET 200X 8016 DP 8030 Procerix Contact ET 200X 8015 DP 8030 SIEMENS SIEMENS SIEMENS 8009 SiEMENS ET 200X 400.6 DP 8030 Softing ET 200X 400.6 DP 8030 ET 200X 00.5 DP 8039 ET 200X 00.6 DP Softing ET 200X 00.6 DP 8030 ET 200X (M151-F0) 8068 ET 200X (M151-F0) ET 200X (M151-70) 8062 ET 200X (M151-70) ET 200X (M151-70) 8065 ET 200X (M151-70) ET 200X (M151-70) 8065 ET 200X (M153-21) ET 200X (M153-21) 8015 ET 200X (M153-21) </th
8	Change the station address to 10 in the Standard Properties window and click Finish.	en1300000726
		Station Address: 10 Image station address on the bus. Assigned Master: 001_P8pro Master Cyclic Master of the device. < Back Next> Finish Cancel Help en1300000709

4 Configuring the internal controller

4.4.2 Modular station configuration example *Continued*

	Action	Note
9	Right-click on the CyclicData node under	PROFIBUS Configurator [C:\ProgramData\Softing\PBOPCServer\Configuration.xml]
	the new slave and select Properties.	
		B Computer →r Profibus Segment1 b →r Profibus Segment1 b →r Profibus Segment2 b →f Profibus Segment1 b →f Profibus Segment2 b →f Profibus Segment2 b →f Select an item to view its description.
		to cyclictors Copy Ctrl+C Paste Ctrl+V Cut Ctrl+X Delete Del Rename F2 Activate Shift+F5 Properties Alt+Enter Insert variable Ctrl+I
10	Click Modules in the tree view to the left.	Properties of CyclicData
	Note When configuring the modules, make sure different modules are added in correct or- der. That is, the slot numbers depend on the physical order of the modules.	Image: Control Using CodeData C Page Control C Advise data and code page between slove and master C Muscle Page and the page between slove and master C Muscle Page and the page between slove and master C Muscle Page and the page between slove and master C Muscle Page and the page between slove and master C Muscle Page and the page between slove and master C Muscle Page between slove and the page between slove and master C Muscle Page between slove and the pa
		DK Cancel Apply Heb
		en1300000716
11	In the Available modules list, select the appropriate power supply module (6ES7 138-xxxxx-xxxx) and click Insert .	Properties of Cyclobas Image: Comparison of the cyclobase of the cy
		DK Cancel Apply Heb
		en1300000721
12	In the Available modules list, select the appropriate module with 2 DO (6ES7 132- xxxxx-xxxx) and click Insert .	Preperins of CycloDats Preperins of CycloDats Source of Source of Content S
		en130000722
13	Repeat the step to insert the second mod- ule with 2 DO.	
14	In the Available modules list, select the appropriate module with 2 DI (6ES7 131- xxxxx-xxxx) and click Insert .	
15	Repeat the step to insert the second mod- ule with 2 DI.	

Continues on next page

4.4.2 Modular station configuration example *Continued*

	Action	Note	
16	In the Available modules list, select the appropriate module with 2 AO (6ES7 134- xxxxx-xxxx) and click Insert .		
17	In the Available modules list, select the appropriate module with 2 AI (6ES7 134- xxxxx-xxxx) and click Insert .		
18	Save the configuration file. A binary file with extension <i>.bin</i> will be saved at the same location as the configur- ation file with extension <i>.xml</i> .	Compare + Local Disk(C) + PegramDute + Sotting + PBOPCSever File Ent View Tools Help Organize - Include in Blazey - Share with - Burn New Folder Y Favorites Destrop Doendoads Configurationand 5/12/2013.613 PM 304(Decomment 4 VB Recent Places PBConfigurationand 5/12/2013.613 PM 304(Decomment 1 VB en13000000710	
19	Rename the binary file to <i>pbus_cfg.bin</i> .	This is the default file name used by the predefined bus, <i>Profibus1</i> .	
20	Download the PROFIBUS configuration file to the controller and configure the settings on the IRC5 controller.	See Configuring the IRC5 controller on page 37 When creating the signals, use the unit mapping as described in <i>Physical signal</i> configuration on page 45.	

Physical signal configuration

According to the *ET200S Distributed I/O System Manual* (chapter 13.1.1, Analog value representation for measuring ranges with S7) from Siemens:

- The analog values are represented in complements of two.
- The values are represented with 16 bits.
- Physical max. value: 10 V is represented by the value 27648.
- Physical min. value: -10 V is represented by the value -27648.
- The high byte is sent first, byte swap is needed.

For the configuration procedure, refer to *Technical reference manual* - *System parameters*.

Device mapping

Device mapping is necessary when specifying which bit in the I/O memory map of the assigned device the signal is mapped to. All physical signals (i.e. signals connected to a physical device) must be mapped.

Signal	Unit map	Description	
DO_1	0	Digital output signal.	
00_2	1	Digital output signal.	
00_3	8	Digital output signal.	
DO_4	9	Digital output signal.	
DI_1	0	Digital input signal.	
DI_2	1	Digital input signal.	
DI_3	8	Digital input signal.	
DI_4	9	Digital input signal.	

The table shows an example of device mapping:

45

4 Configuring the internal controller

4.4.2 Modular station configuration example *Continued*

Signal	Unit map	Description
AO_1	24-31, 16-23	Analog output signal. Byte swap is needed.
AO_2	40-47, 32-39	Analog output signal. Byte swap is needed.
AI_1	24-31, 16-23	Analog input signal. Byte swap is needed.
AI_2	40-47, 32-39	Analog input signal. Byte swap is needed.

4.4.3 Communication between two IRC5 controllers

Description

The following example demonstrates how two IRC5 systems can be configured to communicate with each other, one as the controller and one as a device. The controller system uses the PROFIBUS PCI Express board (DSQC1005) and the device system uses the PROFIBUS anybus device (DSQC 667).

The industrial network is configured using the *Softing PROFIBUS Configurator*, with the controller at address 2 and with baudrate 12 Mbits. The address of the PROFIBUS anybus device is set to 10 and the input size and output size are set to 8 bytes.

Illustration

The figure illustrates communication between two IRC5 controllers.



xx1500000758

А	IRC5 PROFIBUS controller
в	IRC5 PROFIBUS device
С	PROFIBUS PCI Express board, DSQC1005, configured as a controller
D	PROFIBUS anybus device, DSQC667, configured as a device

Basic steps

	Action	Note/Info
1	Configure the controller B as a <i>PB_Intern-al_Anybus</i> device.	Device system configuration on page 48

4 Configuring the internal controller

4.4.3 Communication between two IRC5 controllers *Continued*

	Action	Note/Info
2	Create the binary configuration file for the controller A as controller system using <i>Softing PROFIBUS Configurator</i> .	PROFIBUS configurator setup on page 49.
3	Add a device (controller B) in the controller system (controller A).	Controller system configuration on page 51

Device system configuration

Use this procedure to configure the PROFIBUS Anybus Device in the IRC5 controller, using the **Configuration Editor** in RobotStudio.

	Action	Note	
1	Start RobotStudio and connect to the IRC5 controller. Request write access.		
2	Click Configuration Editor and select I/O System.		
3	In the Type list, click PROFIBUS Internal Anybus Device, and select PB_Intern- al_Anybus.	An I/O device is required to create the sinals attached to the internal device. The predefined network <i>PROFIBUS_An</i> bus and the internal anybus device name <i>PB_Internal_Anybus</i> are created at system startup, when the robot system is install	ig- ed em ed
		with <i>PROFIBUS Anybus Device</i> option i controller B.	in
4	 Edit the parameter values for the internal anybus device, if applicable. Input Size and Output Size, change the values to the desired size. This step is optional. Click OK. 	Instance Editor Imformation Name Value Information Name P8_Internal_Anybus Imformation Connected to Industrial Network PROFIBUS_Anybus Imformation Vendor Name AB8 Robotics Imformation Product Name PROFIBUS Internal Anybus Device Identification Label Input Size (bytes) 8 Imformation Output Size (bytes) 8 Imformation Output Size (bytes) 8 Imformation Xx1400002214 Imformation Imformation	n
5	In the type list, click Signal.		

4.4.3 Communication between two IRC5 controllers Continued

	Action	Note
6	Add signals to the internal anybus device. • Name, user defined.	S Instance Editor
	 Name, user defined. Type of Signal, select signal type from the drop-down list. Assigned to Device, select the previously defined device (<i>PB_Internal_Anybus</i>). Device Mapping, specifies which bit the signal uses in the I/O memory of the I/O device. Click OK. 	Name Value Information Name MyDI3 Type of Signal Digital Input Assigned to Device PB_Internal_Anybus Signal Identification Label Device Mapping 2 Category Access Level Default Default Value 0 Filter Time Passive (ms) 0 Invert Physical Value Yes Ø No Safe Level DefaultSafeLevel
		OK Cancel
7	Restart the controller B to apply all settings.	

PROFIBUS configurator setup

The following procedure is a step-by-step description of how to set the configuration in the *Softing PROFIBUS Configurator*.

	Action	
1	Start the Softing PROFIBUS Configurator.	
2	Import the GSD-files from the RobotWare DVD, if the files have not been imported before.	See Importing GSD files on page 30 and GSD files on page 27.
	The GSD-file for the PROFIBUS Anybus Device is called HMS_1811.gsd.	
3	 Setup the bus using the following values: Station address 2 Baud Rate 12 MBit/s 	See Setting up the bus on page 31.

4 Configuring the internal controller

4.4.3 Communication between two IRC5 controllers *Continued*

	Action	
4	Right-click on the segment node and select	PROFIBUS Configurator [C:\ProgramData\Softing\PBOPCServer\Configuration.xn
	Slave	
		Computer
		Profibus Segment1
		Copy Ctrl+C on.
		Paste Ctrl+V
		Cut Ctrl+X
		Delete Del
		Rename F2
		Activate F5
		Deactivate Shift+F5
		Properties Alt+Enter
		Calculate/Check Ctrl+A
		Scan Nodes F6
		Master Ctrl+ M
		Slave Ctrl+K
		Coupler Ctrl+O
		en1300000707
5	Click HMS Inductrial Natworks and salast	Insert new slave
5	the Anythus CC DECEIPLIC DE V1 alove	Change GSD
	lie Allybus-CC PROFIBUS DF-VI slave.	Select a GSD file
	Click Next.	
		Endrace + Hauser Ident
		HMS Industrial Networks Anybus-CC PROFIBUS DP-V1 1811
		Phoenix Contact SIEMENS
		SIEMENS_AG
		Softing
		Please click the 'Import' button to import GSD files. Import
		< Back Next > Finish Cancel Help
		en1300000717
6	Change the station address to 10 in the	Insert new slave
	Standard Properties window and click	Standard Properties
	Finish.	
		Name: 001_Anybus-CC PROFIBUS DP-V1
		Currie Address on the
		Statuti Audiess, 110 - Onderstation address on the bus.
		Assigned <u>M</u> aster: 001_PBpro Maste ▼ Cyclic Master of the device.
		< Back Next > Finish Cancel Help
		en1300000718

4.4.3 Communication between two IRC5 controllers Continued

	Action	
7	Right-click on the CyclicData node under the new slave and select Properties .	Properties of Cycloba Image: Constraint of models: Image:
		en1300000719
8	Click on Modules in the treeview to the left.	
9	In the list of available modules, first select <i>Input 4 words</i> and click Insert , and then select <i>Output 4 words</i> and click Insert .	Properties of CycleData Properties of CycleData As runtier of module: Properties of CycleData C Pape Comment As runtier of module: Properties of C Pape Comment As runtier of Pape Comment As runt
10	Save the configuration file. A binary file with extension <i>.bin</i> will be saved at the same location as the configur- ation file with extension <i>.xml</i> .	File Edit View Tools Holp Organize Include in Bitary Share with * Burn New folder Organize Include in Bitary Share with * Burn New folder Pointop Include in Bitary Share with * Burn New folder Desitop Include in Bitary Share with * Star Star Image: Desitop Include in Bitary Star Star Star Image: Desitop Include in Bitary Star Star Star Image: Desitop Include in Bitary Star Star Star Image: Desitop Image: Configuration.xml Star Star Star Image: Desitop Image: Configuration.xml Star Star Star Image: Beconfigure Star Star Star Star Star Image: Beconfigure Star Star Star Star Star Star Image: Beconfigure Star Star Star Star Star Star Star Image: Beconfigure Star Star </th
11	Rename the binary file to <i>pbus_cfg.bin</i> .	This is the default file name used by the predefined bus, <i>Profibus1</i> .
12	Download the PROFIBUS configuration file to the controller A and configure the set- tings on the controller A.	See Configuring the IRC5 controller on page 37

Controller system configuration

Use this procedure to configure the PROFIBUS controller in the controller A, using the **Configuration Editor** in RobotStudio.

	Action	Note
1	Start RobotStudio and connect to the con- troller A. Request write access.	
2	Download the <i>pbus_cfg.bin</i> configuration file to the <i>HOME</i> directory of the currently used RobotWare system.	Use the File Transfer tool in RobotStudio, or an external FTP client.
3	Click Configuration Editor and select I/O System.	
4	In the Type list, click Industrial Network and then right-click in the workspace on the <i>PROFIBUS</i> item and select Edit Indus- trial Network.	For more information about the parameters, see <i>System parameters on page 53</i> .

4.4.3 Communication between two IRC5 controllers *Continued*

	Action	Note	
5	Enter the parameter values for the <i>PROFIBUS</i> network.	For more information, see Internal control ler configuration on page 37.	
6	In the Type list, click PROFIBUS Device.		
7	Add the anybus device and enter the	🕥 Instance Editor	
8	 In the Type list, click PROFIBUS Device. Add the anybus device and enter the parameter values. Name, user defined. Connected to Industrial Network, shall be <i>PROFIBUS</i>. PROFIBUS Address, shall be 10, same as in the configuration file and in the slave controller. Input Size and Output Size, same as defined in controller B. Click OK. 	Instance Editor Image Name Value Information Name Device Information Connected to Industrial Network PROFIBUS State when System Startup Activated Trust Level DefaultTrustLevel Yes Simulated Yes Product Name Product Name PROFIBUS Address 10 Input Size (bytes) 8 Output Size (bytes) 8 Value OK Cancel	
	Note Input signals to the <i>PB_Internal_Anybus</i> device in the controller B, are configured as outputs from the device on the controller A, and vice versa.	troller B (as device). The digital output is the corresponding signal on the controller A (as controller):	

5 System parameters

5.1 Introduction

About the system parameters

There are both PROFIBUS specific parameters and more general parameters. This chapter describes all PROFIBUS specific system parameters. The parameters are divided into the type they belong to.

For information about other parameters, see *Technical reference manual - System parameters*.

PROFIBUS system parameters

Industrial Network

These parameters belong to the type Industrial Network in the topic I/O System.

Parameter	For more information, see
Name	Technical reference manual - System parameters
Configuration File	Configuration File on page 54
Identification Label	Technical reference manual - System parameters
Address	Technical reference manual - System parameters
Simulated	Technical reference manual - System parameters

PROFIBUS Device

These parameters belong to the type PROFIBUS Device in the topic I/O System.

Parameter	For more information, see
Name	Technical reference manual - System parameters
Connect to Industrial Net- work	Technical reference manual - System parameters
Identification Label	Technical reference manual - System parameters
Trust Level	Technical reference manual - System parameters
State when System Startup	Technical reference manual - System parameters
Simulated	Technical reference manual - System parameters
Vendor Name	Technical reference manual - System parameters
Product Name	Technical reference manual - System parameters
Recovery Time	Technical reference manual - System parameters
PROFIBUS Address	PROFIBUS Address on page 55
Input Size	Input Size on page 56
Output Size	Output Size on page 57

5.2.1 Configuration File

5.2 Type Industrial Network

5.2.1 Configuration File

Parent	
	Configuration File belongs to the type Industrial Network, in the topic I/O System.
Description	
	<i>Configuration File</i> specifies the path to a PROFIBUS configuration file located on the IRC5 system.
Usage	
	The <i>Configuration File</i> system parameter is used to locate the PROFIBUS configuration file, created by using the <i>Softing PROFIBUS Configurator</i> tool, to DSQC1005.
	If the configuration file is placed in the HOME directory of the system, it will also be included in backups.
Prerequisites	
	The PROFIBUS Controller option must be installed.
Default value	
	The default value is HOME/pbus_cfg.bin
Allowed values	
	A-Z
	a-z
	_
	/

5.3.1 PROFIBUS Address

5.3 Type PROFIBUS Device

5.3.1 PROFIBUS Address

Parent	
	PROFIBUS Address belongs to the type PROFIBUS Device, in the topic I/O System.
Description	
	The parameter <i>PROFIBUS Address</i> specifies the address of the device on the network.
Usage	
-	PROFIBUS Address specifies the address that the device uses on the network, to which the controller should try to setup a connection.
Prerequisites	
	The PROFIBUS Controller option must be installed.
Default value	
	The default value is 125.
Allowed values	
	Allowed values are the integers 0-125.

5 System parameters

5.3.2 Input Size

5.3.2 Input Size

Parent	
	Input Size belongs to the type PROFIBUS Device, in the topic I/O System.
Description	
	The parameter <i>Input Size</i> is used to configure the input slot configuration of the PROFIBUS device.
Usage	
	The parameter <i>Input Size</i> is used to configure the input slot size for the PROFIBUS device. This size must match the connecting PLC's or other PROFIBUS master's defined output slot size.
Prerequisites	The option <i>PROFIBUS Controller</i> must be installed.
Default value	The default value is 1 bytes (8 signal bits).
Allowed values	
	Allowed values are the integers 0-64 (0-512 signal bits), specifying the data size in bytes.

5.3.3 Output Size

5.3.3 Output Size

Parent	<i>Output Size</i> belongs to the type <i>PROFIBUS Device</i> , in the topic <i>I/O System</i> .
Description	
	The parameter <i>Output Size</i> is used to configure the output slot configuration of the PROFIBUS device.
Usage	
	The parameter <i>Output Size</i> is used to configure the output slot size for the PROFIBUS device. This size must match the connecting PLC's or other PROFIBUS master's defined input slot size.
Prerequisites	The option PROFIBUS Controller must be installed.
Default value	The default value is 1 bytes (8 signal bits).
Allowed values	
	Allowed values are the integers 0-64 (0-512 signal bits), specifying the data size in bytes.

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