



Smart RIOs PCD3.T66x

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0.1 Document-History

Version	Published	Changed	Remarks
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EN01	2011-06-14	-	PCD3.T660 removed
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EN04	2014-01-23	2014-01-23	Change of logo
EN05	2014-08-29	2014-08-29	General data added
EN06	2015-06-11	2015-06-11	New phone numbers
			Capacity of +V bus adjusted

0.2 Trademarks

Saia PCD® is a registered trademark of Saia-Burgess Controls AG.

Technical changes are subject to the state of technology

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1 Introduction

This quick start guide describes how to configure, program and commission Smart RIOs (PCD3.T665 and PCD3.T666) with PCDx.Mxxxx Smart Automation Managers.

For more details, refer to the online help in the PG5 «RIO Network Configurator»

1.1 System overview

Distributed Automation Net (DAN) system overview



Smart RIOs can be used either as simple remote I/O stations or as intelligent, distributed Smart Automation Stations capable of executing PG5 user programs.

In the latter case, central management of user programs in the Smart Automation Manager (PCDx.Mxxxx CPU) greatly simplifies the use of Smart RIOs and saves costs during engineering, commissioning and service.



The efficient Ether-S-IO protocol is used to exchange data between Smart RIOs and the Smart Automation Manager.



Data exchange between Manager and RIO can be configured in the PG5 «RIO Network Configurator» with just a few mouse clicks (simple steps). Once the configuration has been loaded into the Manager station, the operating system deals with data exchange autonomously, executing it as a background function. No further user programming is necessary.

1.2 System requirements

Smart RIOs: PCD3.T665, HW version A1 or higher, FW version 1.16.42 or higher PCD3.T666, HW version G or higher, FW version 1.16.42 or higher

Smart Automation Manager:

FW version 1.16.45 or higher for systems: PCD1.M2120, PCD3.M5560, PCD3.M6x60

FW version 1.16.42 or higher for systems: PCD2.M5540, PCD3.M2130, PCD3.M2330, PCD3.M3330, PCD3.M5340, PCD3.M5540, PCD3.M6x40.

PG5 engineering tool: PG5 2.0. SP2 (PG5 2.0.200) or higher

Technical data for the above systems can be found in annex A of this document.

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1.3 Steps to configure, program and commission a Distributed Automation Network (DAN)

The following is a brief list of the necessary steps. For details, refer to subsequent chapters.

- 1. Create a new project in PG5 2.0 Project Manager
- 2. Create a CPU which will be used as Smart Automation Manager
- Activate and configure the Ethernet interface of the Manager in the Device Configurator
 - a) Activate an Ethernet RIO network
- 4. Add RIO stations in the Project Manager
- 5. Configure RIO stations (I/O modules, media mapping, IP address, etc.) in the Device Configurator
- 6. Configure data exchange and any media mapping between Manager and RIO in the RIO Network Configurator
- 7. Create the user program for the Manager and the RIOs (if required)
- 8. Build and download the program in the Smart Automation Manager
- Before the RIO station can be used, configure the IP settings with the help of the built-in Configuration web page. This can be accessed using a PC browser via USB (in this case Web-Connect is required) or Ethernet interface (default IP address: 192.168.10.100)

Create a Smart RIO Network

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2 How to create a Distributed Automation Network (DAN)

2.1 Create a Smart RIO Network

- 1. Using Project Manager, add the Manager (Master) PCD to your project (Device / New).
- Open the Manager PCD's Device Configurator. and select the device type for the manager. It must be a PCD which supports Ethernet and the Ethernet RIO (also requires latest FW version).
- 3. Select the Device properties and ensure **S-Bus Support** is **Yes**.
- Select the Onboard Communications : Ethernet properties and set TCP/ IP Enabled to Yes, then set the Ethernet RIO Network property to Smart RIO (PCD3.T665/T666) as shown below.

Properties	ቱ ×
Onboard : Ethernet	
🗆 General	
MAC Address	Not available
TCP/IP	
Channel Number	9
TCP/IP Enabled	Yes
IP Node	0
IP Address	123.45.67.0
Subnet Mask	255.255.255.0
Default Router	0.0.0.0
Ethernet RIO Network	Smart RIO (PCD3.T665/T666) 💌
PGU Port	Yes
Slave	Yes
Network Groups	(Custom)

- 5. Close the Device Configurator and save the file.
 - In Project Manager, you should now see a new **Ethernet RIO Network** branch in the Manager's Project Tree:



2-1

6. Now you can start adding RIOs to your network

RIOs can be created from Project Manager: Right-click on the Ethernet RIO's branch in the Project Tree and select **New RIO...**

T RI	New RIO Station	
	Сору	Ctrl+C
	Paste	Ctrl+V
	Delete All Stations	

Each RIO must have a unique name, i.e. it cannot have the same name as any other device in the project. (Copy/Paste of an existing RIO is also supported.)

🖁 New RIO
<u>B</u> IO Name:
M1_RI0_00
Description:
IP Address:
192.168.10.101 🗌 Has Program 🗹 Enabled
Device File Path:
\M1_RI0_00\M1_RI0_00.
Number of RIOs to create: 1
Help OK Cancel

The above screen can be used to set a RIO's IP address. If the RIO has a program, the check box "Has Program" must be selected. Chapter 4 explains how to use RIOs that have a program.

Close the window by pressing the OK button.

Create a Smart RIO Network

The RIO that has just been added should now appear as follows in the RIO Network Configurator and the Project Manager.

RIO	Network	Configurator:
-----	---------	---------------

88	RIO Network Con	figurator - M1			
File	Edit View Network	RIO Tools H	lelp		
i 🗅	Pa 🖬 X Pa 🙉	မ က 🚰 🖉	5		
Net	work - 1 RIO				→ ╄ ×
	^ RIO Name	IP Address	RIO Type	Description	Program Enat
	M1_RI0_00	192.168.10.100	PCD3.T665		No Yes
<		Ш			>
Med	dia Mapping				▼ ₽ ×
	Master Symbol		Master A	Master Comment	Rate
	Ether-S-IO Network	<			
	🔄 Master: M1				
	😐 🗄 Diagnostic Fla	ags			
	 M1_RIO_00, PC 	D3.T665			
<					>
1.44					.
: Mes	ssages				• ₽ ×
Ready	/				NUM OVR

Project Manager:



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Configuration in the Device Configurator

3 Configuration and Build of Smart RIO stations without program

3.1 Configuration in the Device Configurator

The RIO's Device Configurator can be opened either by double clicking on the RIO in the RIO Network Configurator or by opening the Device Configurator from the Project Manager.

M1 - PCD3.M5540 - 192.168.12.78, S-Bus Stn 0
 Properties
 Online Settings
 Device Configurator
 Build Options
 Program Files
 Listing Files
 Documentation Files
 Ethernet Smart RIO Network
 RIO Network Configurator
 M1_RIO_00 - PCD3.T665 - 192.168.10.100
 Properties
 Device Configurator

In the Device Configurator the RIO type and IP address can be changed if necessary.

The "reset output enable" option can be activated if required. For non-programmable RIOs, it is not necessary to change the other property settings.

🔎 🛛 . Device (onfigurator		
File Edit Vi	w Online Tools Window Help		
i 🗅 📽 🗞			
$\frac{1}{2}$ Selec	M1_RIO_00.	Properties	
Digital I/O Module		Device : PCD3.T665	
Analogue I/O Mo		Options	
Special Function	Type Description	Communication Timeout [ms]	1000
Expansion Module	PCD3.T665 Ether-S-IO Remote IO with 4 I/O slots (expandable).	Start Without Manager	No
E Aparision modal		Reset Output Enable	No
	Onboard Communications	Input/Output Handling	
	Type Description	Input/Output Handling Enabled	Yes
	USB Universal Serial Bus port	Peripheral Addresses Definition	Auto (recommended)
	Ethemet Ethemet port	First Flag Input	0
		First Flag Output	512
	Diagnostics	First Register Input	0
		First Register Output	256
	Type Description	E Power Supply	071-000
	RIO Diagnostics Diagnostic configuration for Ether-S-IO.	Power Supply Specification	-25/+30%
		Current Available SV [mA]	600
	Onboard VO Slots	Current Available V+ [mA]	100
	Slot Type Description	Current Used SV [mA]	0
	Slot0	Current Used V+ [IIA]	
	Slot1		
	Slot 2		
	Slot 3		
	+	:	

3

Configuration in the Device Configurator

Configuring the RIO's I/O modules

I/O modules are now added from the module selector:



Ensure Media Mapping is enabled. It is not necessary to modify addresses or symbol definitions for RIOs that have no program.

The inputs/outputs of analogue modules and other special modules should be configured in the same way as for a standard PCD.

			Base Symbol Definitions	S.IO.Slot2.AnalogueInput	
_			Symbol Definitions	(Custom)	
_		Ξ	Analogue Input 0		
			Input 0 Range	010V in mV or % resolution 🛛 🛛 💌	
_			Minimum Value Input 0	010V in mV or % resolution	
_			Maximum Value Input 0	020mA in uA resolution	
		Ξ	Analogue Input 1	Pt 1000 (-50+400°C)	
tdr			Input 1 Range	Ni 1000 (-50+200°C)	
)r -5			Minimum Value Input 1	12 Bit resolution	_
Αa			Maximum Value Input 1	User defined range	=
		Ξ	Analogue Input 2		1
	1		Input 2 Range	010V in mV or % resolution	



The RIO configuration can be downloaded from the Device Configurator into the Smart RIO station (Must never be downloaded with Firmware version < FW 1.16.xx).

The I/O configuration is downloaded with the user program in the Manager Station. The Manager automatically sends the configuration to the RIOs after startup. For details refer to chapter 3.3.

A RIO's IP address can be set using the PC browser via a built-in web page in the RIO station. For details refer to chapter 5.

3.2 Media Mapping in the RIO Network Configurator

After saving the RIO's I/O module configuration from the Device Configurator, the RIO's I/O symbols used in the Manager are listed in the Media Mapping view as shown below.

52	RIO Network Confi	gurator - M1									
File	Edit View Network	RIO Tools Help									
Г		6 G 1 C G	5								
			<u> </u>								
Ne	twork - 1 RIO										
	^ RIO Name	IP Address F	RIO Type	Description	Program	Enabled	RIO #	RIO ID	Diag ID	Device Fi	le Path
	M1_RI0_00	192.168.10.100 F	CD 3. T 665		No	Yes	0	4	0	\M1_RIO_	_00\M1_RI0_00.saia
Me	dia Mapping										
	Master Symbol		Master A	Master Comment	Rat	te Dir	RIO Sym	bol	1	RIO Adds	RIO Comment
	Ether-S-IO Network										
	Haster: M1										
	Diagnostic Flag	\$									
	EM1_RI0_00, PCD	3.T665									
	Slot 0, PCD3.E	110, 8 Digital Inputs, 2	4VDC	5 11	100						
	S.HIU.M1_	HIU_UU.SlotU.Digitali	F 16[8]	Base address	100r	ns 🗧					
		I U_UU.SlotU.Digitalin	F 16	Digital input U		- I-					
		IO_00.Slot0.Digitalin	F 17	Digital input 1 Digital input 2		- 1					
		IO_00.Slot0.Digitalin	F 10	Digital input 2		- 2					
		IO_00.Slot0.Digitalin	F 13	Digital input 3		- 2					
		IO_00.Slot0.DigitalIn	F 21	Digital input 5							
		D 00 Slot0 DigitalIn	F 22	Digital input 6		- i i i i i i i i i i i i i i i i i i i					
		D 00 Slot0 DigitalIn	F 23	Digital input 7		-					
	Slot 1, PCD3,A	400, 8 Digital Outputs,	Transistor								
	- S.RIO.M1_	RIO_00.Slot1.Digital	F 24[8]	Base address	100r	ns 🔸					
	- RI0.M1_RI	0_00.Slot1.Digital0	F 24	Digital output 0		-					
	— RIO.M1_RI	0_00.Slot1.Digital0	F 25	Digital output 1		-					
	- RIO.M1_RI	0_00.Slot1.Digital0	F 26	Digital output 2		-					
	- RIO.M1_RI	0_00.Slot1.Digital0	F 27	Digital output 3		-					
	- RIO.M1_RI	0_00.Slot1.Digital0	F 28	Digital output 4		-					
	RIO.M1_RI	0_00.Slot1.Digital0	F 29	Digital output 5		-					
	■ RI0.M1_RI	0_00.Slot1.Digital0	F 30	Digital output 6		-					
	⊢ RIO.M1_RI	0_00.Slot1.Digital0	F 31	Digital output 7		-					
	Slot 2, PCD3.W	/340, 8 Analogue Inpu	ts, 0+10V, 02	0mA or Pt/Ni 1000							
	E— Slot 3, PCD3.W	/400, 4 Analogue Outp	outs, 0+10V								
	2 3101 3, PLD 3.W	reuu, e Analogue Uulp	uus, u+10V		_						

Symbols used on the Manager

Symbols used on the RIO are not present for a RIO without programm

The absolute addresses of Manager media are allocated by the RIO Network Configurator. Only the base address can be changed.

		🔀 Renumber Master Media Addresses 🛛 🛛 🔀
RIO Network Configurate File Edit View Network RIO RIO RIO RIO	r - M1 Tools Help Rerumber IP Addresses	Renumbers the addresses of all symbol arrays in the Master, consecutively from the start addresses entered below.
Network - 1 RIO ^ RIO Name IP Aq M1_RIO_00 192.1	Renumber RIO Media Addresses Renumber RIO Media Addresses Renumber IDs Rename Master Symbols Rename RIO Symbols	Elag Start Address Flag End Address 31 31
Media Mapping Master Symbol	Symbol Tag Names Dtrl+E Data Transfer Rates Overview Default RID Configuration Options	Begister Start Address Register End Address 0 11
M1_RIO_00, PCD3.T665		Help OK Cancel

The symbol name can be modified if required. Allocated symbols are shown in the Symbol Editor under the "All Publics" Tab and can be used in user programs.

🗟 M1 - 💦 Fupla Editor - [Master_RIC).fup]			
Eile Edit View Device Online Mode	Bļock P <u>a</u> g	ie <u>W</u> indow <u>ł</u>	<u>H</u> elp	
in é Ro ié X Balo I	STH (3 ka 🖾	" 🖙 🔜 🐷 📰 🚺	
Master BIG for		w 1 w 10-		
				· · · · · · · · · · · · · · · · · · ·
				· · · · · · · · · · · · · · · .
	· · · · · · · ·			
RIO.M1_RIO_00.Slot0.DigitalInp	put00	8.	RIG M1 RIG 00 Slot1 I	
		°		
RIO.WIT_RIO_00.Slotu.DigitalIng		• • └── • • •		
<				>
- Europal Editor				ПY
: Symbol Edicol				
				-
	n a 🔎	Find: Type a su	ıbstring to find 🔷 🗣 🗣 🛛	+ •
E: E + + A C S T Symbol Name	⊨o ⊂a 🄎 Type	Find: Type a su Address/Val	Ibstring to find 🔹 📭 🍁 🛛	± • Tags
Image: symbol Name	Type	Find: Type a su Address/Val	Ibstring to find 🔹 🖙 中 🛛	+ • Tags
E: III + + A C S T Symbol Name Image: Symbol Participation Image: Symbol Partinitipation I	Type ROOT GROUP	Find: Type a su Address/Val	Ibstring to find	+ ▼ Tags ▲
Image: Symbol Name Image: S	Type ROOT GROUP GROUP	Find: Type a su Address/Val	Ibstring to find Comment	+ ▼ Tags
E: Image: A triangle of the second seco	Type ROOT GROUP GROUP GROUP	Find: Type a su	bstring to find	+ ▼ Tags
E: Image: A line Symbol Name Image: A line Image: A line Image: A line Image: A li	Type ROOT GROUP GROUP GROUP GROUP	Find: Type a su	bstring to find	Tags
E: III A C S T Symbol Name Image: All Publics Image: All Publics <td>Type ROOT GROUP GROUP GROUP GROUP GROUP</td> <td>Find: Type a su</td> <td>bstring to find</td> <td>Tags</td>	Type ROOT GROUP GROUP GROUP GROUP GROUP	Find: Type a su	bstring to find	Tags
Image: Symbol Name Image: All Publics Image: All Publics Image: All Publics Image: All Publics <td>Type ROOT GROUP GROUP GROUP GROUP GROUP F</td> <td>Find: Type a su Address/Val 16</td> <td>Digital input 0</td> <td>Tags</td>	Type ROOT GROUP GROUP GROUP GROUP GROUP F	Find: Type a su Address/Val 16	Digital input 0	Tags
Image: Symbol Name Image: Symol Name Im	Type ROOT GROUP GROUP GROUP GROUP GROUP F F F F	Find: Type a su Address/Val 16 17	bstring to find Comment Digital input 0 Digital input 1 Digital input 2	Tags
Image: Symbol Name I	Type ROOT GROUP GROUP GROUP GROUP GROUP F F F F F	Find: Type a su Address/Val 16 17 18 19	bstring to find Comment Digital input 0 Digital input 1 Digital input 2 Digital input 2 Digital input 3	Tags
Image: Symbol Name I	Type ROOT GROUP GROUP GROUP GROUP GROUP F F F F F F	Find: Type a su Address/Val 16 17 18 19 20	bstring to find Comment Digital input 0 Digital input 1 Digital input 2 Digital input 4	Tags
Image: Symbol Name I	Type ROOT GROUP GROUP GROUP GROUP GROUP F F F F F F F F	Find: Type a su Address/Val 16 17 18 19 20 21	bstring to find Comment Digital input 0 Digital input 1 Digital input 2 Digital input 3 Digital input 5	Tags
Image: Symbol Name I	Type ROOT GROUP GROUP GROUP GROUP GROUP F F F F F F F F F F F F F	Find: Type a su Address/Val 16 17 18 19 20 21 22	bstring to find Comment Digital input 0 Digital input 1 Digital input 2 Digital input 3 Digital input 5 Digital input 5 Digital input 6	Tags
Image: Symbol Name I	Type ROOT GROUP GROUP GROUP GROUP GROUP F F F F F F F F F F F F F	Find: Type a su Address/Val 16 17 18 19 20 21 22 23	bstring to find Comment Digital input 0 Digital input 1 Digital input 2 Digital input 3 Digital input 4 Digital input 5 Digital input 5 Digital input 6 Digital input 7	Tags Tags Tags S_RIO S_RIO
Image: Symbol Name I	Image: Second state	Find: Type a su Address/Val 16 17 18 19 20 21 22 22 23	bstring to find	Tags Tags Tags S_RIO S_RIO
Image: Symbol Name Symbol Name Image: All Publics Image: A	Image: Second	Find: Type a su Address/Val 16 17 18 19 20 21 22 23 23	bestring to find	Tags Tags S_RIO
Image: Symbol Name Symbol Name Image: All Publics Image: A	Image: Section 1 Type ROOT GROUP GROUP GROUP GROUP GROUP F F F F F F F F GROUP F F F GROUP F F F F F F F F F GROUP F GROUP F	Find: Type a su Address/Val 16 17 18 19 20 21 22 23 8	bistring to find	Tags Tags S_RIO
Image: Symbol Name Symbol Name Image: All Publics	Image: Second state sta	Find: Type a su Address/Val Address/Val 16 17 18 19 20 21 22 23 8	bestring to find	
Image: Symbol Name Symbol Name All Publics BIO M1_RIO_00 Image: Slot2 Image: Slot2 Image: Slot3 Im	Type ROOT GROUP GROUP GROUP GROUP F F F F F F F GROUP GROUP Image: Comparison of the state of the sta	Find: Type a su Address/Val Address/Val 16 17 18 19 20 21 22 23 8	bestring to find	Tags

Build and Download of the Smart RIO project

3.3 Build and Download of the Smart RIO project

The complete Smart RIO application is built and downloaded from the Manager station. Building and downloading the Manager station program also builds and downloads the RIO configurations and programs. It is not necessary to deal with individual RIOs.



After start-up, the Manager sends the configuration to all RIOs automatically. If a RIO is disconnected or powered off and then reconnected, it will automatically receive its configuration from the Manager.

4 Configuration and Build of Smart RIOs station with a program

To add a RIO which has a program, the check box "Has Program" must be selected as shown below.



This setting can be changed at any time by opening the RIO properties from the RIO Network Configurator.

XII New RIO	
<u>R</u> IO Name:	
M1_RIO_00	
Description:	
	~
IP Address:	
192.168.10.101	🔲 Has Program 🛛 🔽 Enabled
Device File Path:	
\M1_RIO_00\M1_	RIO_00.
	Number of DIDe to constant
Help	OK Cancel

After confirming with the OK button, the RIO should appear as follows in the Project Manager:



Please note that a RIO which has a program is presented in the Project Manager as a standard CPU (the icon is different) with its related files.

Configuration in the Device Configurator

4.1 Configuration in the Device Configurator

Presentation of RIO station which has a program in the Device Configurator:

🔑 🔄 Device (onfigurator		
File Edit Vie	w Online Tools Window Help		
🗅 😂 🗞			
Selec $ au imes$	M1_RIO_00. X	Properties	
Digital I/O Module		Device : PCD3.T665	
Analogue I/O Mo	Device	Options	
Special Function	Type Description	Communication Timeout [ms]	1000
Multi-Function Mc	PCD3.T665 Ether-S-IO Remote IO with 4 I/O slots (expandable).	Start Without Manager	No
Expansion moduli		Reset Output Enable	No
	Onboard Communications	Input/Output Handling	
	Type Description	Input/Output Handling Enabled	Yes
	USP Description	Peripheral Addresses Definition	Auto (recommended)
	Cibility of the set of	First Flag Input	0
		First Flag Output	512
	Disgnostics	First Register Input	0
	Diagnosecs	First Register Output	256
	Type Description	Power Supply	
	RIO Diagnostics Diagnostic configuration for Ether-S-IO.	Power Supply Specification	-25/+30%
		Current Available 5V [mA]	600
	Onboard VO Slots	Current Available V+ [mA]	100
	Clat. Time Description	Current Used 5V [mA]	
	alot Type Description	Current Used V+ [mA]	
	3013		

In addition to the configuration for a RIO without program, the following settings can/ should be modified if necessary.

Set the startup behaviour of the RIO when powering up without the Manager.

Properties		4 ×
Device : PCD3.T665		
🗆 Options		
Communication Timeout [ms]	1000	
Start Without Manager	No	~
Reset Output Enable	No	
🗆 Input/Output Handling	Yes	
Input/Output Handling Enabled	res	
Peripheral Addresses Definition	Auto (recommended)	
First Flag Input	0	
First Flag Output	512	
First Register Input	0	
First Register Output	256	
🗆 Power Supply		
Power Supply Specification	-25/+30%	

The base addresses for I/O handling must be checked and set. Make sure there are no conflicts with the RIO user program

The base address of RIO diagnostic elements must also be checked and set.

M1 RIO 00. ×	1	Properties		† ×
	I	/O 0 : RIO Diagnostics		
	E	🗄 Media Mapping Diagnostics		
Type Description		Peripheral Base Address For Diagnos	65500	
PCD3.T665 Ether-S-IO Remote IO with 4 I/O slots (expandable).		Peripheral Address Range For Diagno	1	
		Number Of Media	8	
Onboard Communications		Media Address	1000	
Type Description				
USB Universal Serial Bus port.				
Ethernet Ethernet port.				
Diagnostics				
Type Description				
RIO Diagnostics Diagnostic configuration for Ether-S-IO.				
Onboard VO Slots				

Configuration in the Device Configurator

Media Mapping and addresses for I/O modules.

Vindow Help		
M1_RI0_00. ×	Properties	4 ×
	Slot 1 : PCD3.A400, 8 Digital Ou	tputs, Transistor
Device	🗆 General	
Type Description	Base Address	16
PCD3.T665 Ether-S-IO Remote IO with 4 I/O slots (expandable).	Connector Type	Type A, Spring Terminals 10-pole
	Power Consumption	
Onboard Communications	Power Consumption 5V [mA]	25
Type Description	🗆 Media Mapping	
ISP Using Social Pus port	Media Mapping Enabled	Yes
Ethemet Ethemet nort	Media Type	Flag
	Number Of Media	8
Diagnostics	Media Address	512
L'ragiosics	Base Symbol Definitions	5.IO.Slot1.Digital/utput
Type Description	Symbol Definitions	(Custom)
RIO Diagnostics Diagnostic configuration for Ether-S-IO.		
Onboard I/O Slots		
Slot Type Description		
Slot 0 PCD3.E110 8 digital inputs, 1530VDC, 8ms, current draw 12mA at 5V.		
Slot 1 PCD3.A400 8 transistor outputs, 532VDC, 0.5A, electrically connected, 10us, current drav		
Slot 2 PCD3.W340 8 analogue inputs, 0. +10V/0. 20mA Pt 1000 for -50. +400°C or Ni 1000 for -50.		
Slot 3 PCD3.W400 4 analogue outputs, 0.8 transistor outputs, 5.32VDC, 0.5A, electrically connect	cted, 10us, current draw 15mA at	<u>5V.</u>
+		

Automatically generated symbol names for I/Os can be used or customized here.

IO Syr	mbol Editor					
	Symbol Name	Туре	Address/Val	Comment	Tags	Scope
		ROOT				
•	📔 🗕 🧇 10. Slot1. DigitalOut	.F	512	Digital output 0	S_10	Public
	📗 🔶 10.Slot1.DigitalOutp	.F	513	Digital output 1	S_10	Public
	📔 🔶 10.Slot1.DigitalOutp	.F	514	Digital output 2	S_10	Public
	📔 🔶 10.Slot1.DigitalOutp	.F	515	Digital output 3	S_10	Public
	📔 🔶 10.Slot1.DigitalOutp	.F	516	Digital output 4	S_10	Public
	📔 🔶 10.Slot1.DigitalOutp	.F	517	Digital output 5	S_10	Public
	📔 🔶 10.Slot1.DigitalOutp	.F	518	Digital output 6	S_10	Public
	📔 🧼 🖉 10. Slot1. DigitalOutp	.F	519	Digital output 7	S_10	Public
	Help Set Defaults				ОК	Cancel

4.2 Media Mapping in the RIO Network Configurator

Presentation of a RIO with program:

RIU Network Conne	urator - M1							
Edit View Network	HIU TOOIS H	eip						
	ଦେ ମା 📑 🎾	(5)						
vork - 1 RIO								
^ RIO Name	IP Address	RIO Type	Description	Program Enab	ed	RIO# RIOID Diag	JD Device F	ile Path
M1_RI0_00	192.168.10.100	PCD3.T665		Yes Yes		0 4 0	\M1_BI0	_00\M1_RIO_00.saia5pc
lia Mapping								
Master Symbol		Master A	Master Comment	Rate	Dir	RIO Symbol	RIO Adds	RIO Comment
Ether-S-IO Network								
🕂 Master: M1								
M1_RIO_00, PCD3	3.T665							
Slot 0, PCD3.E1	10, 8 Digital Inputs	, 24VDC						
— S.RIO.M1_F	RIO_00.Slot0.Digita	I F 16[8]	Base address	100ms	+	S.IO.Slot0.DigitalInput	F 0[8]	Base address
- RIO.M1_RI	0_00.Slot0.DigitalIr	F 16	Digital input 0		+	10.Slot0.DigitalInput0	FO	Digital input 0
RIO.M1_RI	D_00.Slot0.DigitalIr	F 17	Digital input 1		٠	10.Slot0.DigitalInput1	F1	Digital input 1
RIO.M1_RI	D_00.Slot0.DigitalIr	F 18	Digital input 2		٠.	IO.Slot0.DigitalInput2	F 2	Digital input 2
- RIO.M1_RI	D_00.Slot0.Digitallr	F 19	Digital input 3		+	IO.Slot0.DigitalInput3	F 3	Digital input 3
- RIO.M1_RI	D_00.Slot0.Digitallr	F 20	Digital input 4		+	IO.Slot0.DigitalInput4	F 4	Digital input 4
BIO.M1 BI	00.Slot0.Digitallr	F 21	Digital input 5		+	10.Slot0.DigitalInput5	F 5	Digital input 5
ВІО.М1 ВІІ	00. Slot0. Digitallr	F 22	Digital input 6		+	ID.Slot0.DigitalInput6	F 6	Digital input 6
RIO.M1_RI	0.Slot0.Digitallr	F 23	Digital input 7		+	IO.Slot0.DigitalInput7	F 7	Digital input 7
Slot 1, PCD3.A4	00, 8 Digital Outpu	ts, Transistor						
- S.RIO.M1 F	RIO 00.Slot1.Digita	F 24[8]	Base address	100ms	ŧ	S.IO.Slot1.DigitalOutput	F 512[8]	Base address
- RIO.M1 BI	00.Slot1.Digital0	F 24	Digital output 0		+	10.Slot1.DigitalOutput0	F 512	Digital output 0
— ВІО.М1 ВІІ	00.Slot1.Digital0	F 25	Digital output 1		+	ID.Slot1.DigitalOutput1	F 513	Digital output 1
BIO M1 BI	00 Slot1 Digital0	F 26	Digital output 2		+	ID Slot1 DigitalOutput2	F 514	Digital output 2
BIO M1 BI	00 Slot1 DigitalD	F 27	Digital output 3		+	ID Slot1 DigitalOutput3	F 515	Digital output 3
- BIO M1 BU	D 00 Slot1 Digital0	F 28	Digital output 4		+	ID Slot1 DigitalOutput4	E 516	Digital output 4
- BIO M1 BU	D 00 Slot1 Digital0	F 29	Digital output 5		+	ID Slot1 DigitalOutput5	E 517	Digital output 5
BIO M1 BU	D 00 Slot1 Digital0	F 30	Digital output 6		+	ID Slot1 DigitalOutput6	F 518	Digital output 6
	D_00.Slot1.Digital0	F 31	Digital output 7		-	ID Slot1 DigitalOutputZ	F 519	Digital output 7
F- Slot 2 PCD3W	340 8 Analogue In	pute 0 ±10V 0 2	0mA or Pt/Ni 1000		÷.	Totolor Tolgitalo apart	1 010	Digital output I
E Slot 3 PCD3W	400, 4 Analogue III	utpute 0 ±10V						
a 5100 3,1 003.99	400, 4 Andiogue U	atputs, 0±109						
						_		_
				-				
		-					-	
:	Symbols ι	used in the	e Manager			Svm	bols use	d in the RIO
	,					- ,		
				-	•			
		_						

In addition to Manager symbols, those used in the RIO station are also listed.

All symbols listed will be exchanged between Manager and RIO. This means that, for example, if a RIO's outputs are controlled by a user program in the RIO, they need to be disabled from data transfer. Otherwise, they will be overwritten by the Manager.

Cycle time can be set individually for every data transfer array. In this way, time-critical signals (e.g. alarms) can be exchanged faster than non time-critical signals (e.g. temperature values).



Select appropriate cycle times. Do not set times that are unnecessarily short, since this will increase network traffic and add to the load on the Manager station. In the worst case, telegrams may even be lost. For more information refer to chapter 6. "Troubleshooting and Diagnostics"

Data transfer cycle times

Number of RIOs	Minimum cycle time Data transfer
10	50 ms
20	100 ms
40	200 ms
80	400 ms
128	800 ms

2 different transfer cycle times can be set for each RIO station:

- a short cycle time for high-priority data

- normal cycle time for low-priority or slow data

How to disable data transfer

Right-click on the slot to be disabled and select "Disable Transfer".



After this, symbols for the slot will no longer be shown in Media Mapping.



Only the whole I/O slot can be disabled!

How to insert Data Transfer arrays

If you wish to exchange data other than I/O signals, it is possible to insert additional Data Transfer Arrays.

Right-click on the RIO station where the data array is to be inserted and select "New Data Transfer Array".



4

After insertion, the new array should appear as follows in the media mapping.

dia Mapping							
Master Symbol	Master A	Master Comment	Rate	Dir	RIO Symbol	RIO Adds	RIO Comment
Ether-S-IO Network							
📥 Master: M1							
Diagnostic Flags							
M1_RIO_00, PCD3.T665							
Slot 0, PCD3.E110, 8 Digital Inputs, 24	VDC						
 S.RIO.M1 RIO 00.Slot0.Digitall 	F 16[8]	Base address	100ms	-	S.IO.Slot0.DigitalInput	F 0[8]	Base address
- RI0.M1_RI0_00.Slot0.DigitalIn	F 16	Digital input 0		-	10.Slot0.DigitalInput0	FO	Digital input 0
— RI0.M1_RI0_00.Slot0.DigitalIn	F 17	Digital input 1		-	IO.Slot0.DigitalInput1	F1	Digital input 1
— BI0.M1_BI0_00.Slot0.DigitalIn	F 18	Digital input 2		-	10.Slot0.DigitalInput2	F 2	Digital input 2
— BIO.M1_BIO_00.Slot0.DigitalIn	F 19	Digital input 3		-	10.Slot0.DigitalInput3	F 3	Digital input 3
 RI0.M1_RI0_00.Slot0.DigitalIn 	F 20	Digital input 4		-	10.Slot0.DigitalInput4	F 4	Digital input 4
 RI0.M1 RI0 00.Slot0.DigitalIn 	F 21	Digital input 5		-	10.Slot0.DigitalInput5	F 5	Digital input 5
RI0.M1 RI0 00.Slot0.DigitalIn	F 22	Digital input 6		-	10.Slot0.DigitalInput6	F 6	Digital input 6
RIO.M1_RIO_00.Slot0.DigitalIn	F 23	Digital input 7		-	IO.Slot0.DigitalInput7	F 7	Digital input 7
 Slot 1, PCD3.A400, 8 Digital Outputs, 	Transistor [Tran	nsfer Disabled]					
Slot 2, PCD3.W340, 8 Analogue Inputs	, 0+10V, 020	0mA or Pt/Ni 1000					
Slot 3, PCD3.W400, 4 Analogue Output	its, 0+10V						
🗖 🗖 Data Transfer Array: Flag Transfer, Ma	aster F 24[8] ->	RIO F 8[8]					
 S.RIO.M1_RIO_00.Flag_Transfer 	F 24[8]	Data Transfer Array base address	100ms	+	S.RIO.Flag_Transfer	F 8[8]	Data Transfer Array base address
— RIO.M1_RIO_00.Flag_Transfer	F 24			-	RIO.Flag_Transfer00	F 8	
— RIO.M1_RIO_00.Flag_Transfer	F 25			-	RIO.Flag_Transfer01	F 9	
RIO.M1_RIO_00.Flag_Transfer	F 26			-	RIO.Flag_Transfer02	F 10	
— RIO.M1_RIO_00.Flag_Transfer	F 27			+	RIO.Flag_Transfer03	F 11	
— RIO.M1_RIO_00.Flag_Transfer	F 28			-	RIO.Flag_Transfer04	F 12	
RIO.M1_RIO_00.Flag_Transfer	F 29			-	RIO.Flag_Transfer05	F 13	
RIO.M1_RIO_00.Flag_Transfer	F 30			-	RIO.Flag_Transfer06	F 14	
🛏 RIO.M1 RIO 00.Flag Transfer	F 31			-	RIO.Flag Transfer07	F 15	



For Flags, only arrays with multiples of 8 flags can be transferred.

For Registers, arrays with a single Register are possible.

Media Mapping							
Master Symbol	Master A	Master Comment	Rate	Dir	RIO Symbol	RIO Adds	RIO Comment
Ether-S-IO Network							
Master: M1							
Diagnostic Flags							
E _Π M1_RIO_00, PCD3.T665							
Slot 0, PCD3.E110, 8 Digital Inputs, 2	AVDC						
S.RIO.M1_RIO_00.Slot0.Digitall	F 16[8]	Base address	100ms	+	S.IO.Slot0.DigitalInput	F 0[8]	Base address
RI0.M1_RI0_00.Slot0.DigitalIn	F 16	Digital input 0		+	IO.Slot0.DigitalInput0	FO	Digital input 0
RI0.M1_RI0_00.Slot0.DigitalIn	F 17	Digital input 1		+	10.Slot0.DigitalInput1	F1	Digital input 1
RIO.M1_RIO_00.Slot0.DigitalIn	F 18	Digital input 2		+	10.Slot0.DigitalInput2	F 2	Digital input 2
RIO.M1_RIO_00.Slot0.DigitalIn	F 19	Digital input 3		+	10.Slot0.DigitalInput3	F 3	Digital input 3
RIO.M1_RIO_00.Slot0.DigitalIn	F 20	Digital input 4		+	IO.Slot0.DigitalInput4	F 4	Digital input 4
RIO.M1_RIO_00.Slot0.DigitalIn	F 21	Digital input 5		+	IO.Slot0.DigitalInput5	F 5	Digital input 5
RIO.M1_RIO_00.Slot0.DigitalIn	F 22	Digital input 6		+	10.Slot0.DigitalInput6	F 6	Digital input 6
BIO.M1_BIO_00.Slot0.DigitalIn	F 23	Digital input 7		+	10.Slot0.DigitalInput7	F 7	Digital input 7
 Slot 1, PCD3.A400, 8 Digital Outputs 	s, Transistor [Tra	nsfer Disabled]					
Slot 2, PCD3.W340, 8 Analogue Inpu	its, 0+10V, 02I	0mA or Pt/Ni 1000					
Slot 3, PCD3.W400, 4 Analogue Outp	puts, 0+10V						
🔁 🔁 Data Transfer Array: Flag_Transfer, M	laster F 24[8] ->	RIO F 8[8]					
S.RIO.M1_RIO_00.Flag_Transfer	F 24[8]	Data Transfer Array base address	100ms	+	S.RIO.Flag_Transfer	F 8[8]	Data Transfer Array base address
RIO.M1_RIO_00.Flag_Transfer	F 24			+	RIO.Flag_Transfer00	F 8	
BIO.M1_BIO_00.Flag_Transfer	F 25			+	RIO.Flag_Transfer01	F 9	
RIO.M1_RIO_00.Flag_Transfer	F 26			+	RIO.Flag_Transfer02	F 10	
RIO.M1_RIO_00.Flag_Transfer	F 27			+	RIO.Flag_Transfer03	F 11	
RIO.M1_RIO_00.Flag_Transfer	F 28			+	RIO.Flag_Transfer04	F 12	
RIO.M1_RIO_00.Flag_Transfer	F 29			+	RIO.Flag_Transfer05	F13	
RIO.M1_RIO_00.Flag_Transfer	F 30			+	RIO.Flag_Transfer06	F 14	
RIO.M1_RIO_00.Flag_Transfer	F 31			+	RIO.Flag_Transfer07	F 15	
Data Transfer Array: Register Transfer	er, Master R 12[2	2] <- RIO R 260[2]					
S.RIO.M1_RIO_00.Register_Tr	R 12[2]	Data Transfer Array base address	100ms	+	S.RIO.Register_Transfer	R 260[2]	Data Transfer Array base address
RIO.M1_RIO_00.Register_Tran	R 12			+	RIO.Register_Transfer00	R 260	
RIO.M1_RIO_00.Register_Tran	R 13			+	RIO.Register_Transfer01	R 261	



For every Data Transfer Array an individual transfer telegram will be generated.

It is therefore advisable to structure Data Transfer Arrays in a useful way.

4

Creating user programs for Smart RIOs

4.3 **Creating user programs for Smart RIOs**

In the Project Manager, a user program can be created with any standard editor (Fupla, IL or Graftec)



For RIOs the usable media (R, F, C, X, DB) are the same as with a standard CPU. The only limitation is in the space available for the user program (32 KB for PCD3.T665 and 128 KB for PCD3.T666).

🗟 M1_RIO_00 - 🛛 Fupla Editor - [RIC	_Fupla.fup]		
Eile Edit View Device Online Mode	Block P <u>ag</u> e	e <u>W</u> indow <u>H</u>	elp	
i 🗅 🚅 🖬 🗿 🎒 👗 🖻 🛍 으 🍟	: 🗃 🍱 🕻) la 🗛 🖞	" : 😭 👼 📲 : 📐 " : 18	a ": :Q "
RIO Fupla.fup				4 Þ ×
<u> </u>				
				: : : : :
				· · · · •
			lot1 DigitalOutout0	
	~			
IO.Slot0.DigitalInput1				
· · · · · · · · · · · · · · · · · · ·				
				🗸
<				>
< 📖				> 7 ×
Symbol Editor ⋮ E:: :::::::::::::::::::::::::::::::::	မ က 🎾	Find: Type a sub	ostring to find 🛛 🔻 🕶	> 7 × + •
Symbol Editor E: Symbol Name	ျမားက ္စာ၊ Type	Find: Type a sub	ostring to find 💽 🖛 🗰	> 7 × + •
Symbol Editor	I NO CA DO Type ROOT	Find: Type a sub	ostring to find 🔹 📭 🗰	→
Symbol Editor	Type ROOT GROUP	Find: Type a sub Address/Val	ostring to find 💽 📭 💷	→
Symbol Editor Symbol Name All Publics 10 5lit2	Type ROOT GROUP GROUP	Find: Type a sub Address/Val	ostring to find Comment	> + ×
Symbol Editor Symbol Name Symbol Name All Publics 10 10 10 10 10 10 10 10 10 10	Type ROOT GROUP GROUP GROUP	Find: Type a sub Address/Val	ostring to find Comment	> + ×
Symbol Editor Symbol Name All Publics IO Slot2 Slot2 Slot2 Slot2 Slot2 Slot2 Slot2 Slot2	 ∞ ∞ Type ROOT GROUP GROUP GROUP GROUP GROUP 	Find: Type a sub	Distring to find	> + ×
Symbol Editor Symbol Name All Publics All Publics All Publics Siot2 Bot3 Definition Sold2 Definition Sold2 De	Type ROOT GROUP GROUP GROUP GROUP GROUP	Find: Type a sub	Disibilizza 0	7 ×
Symbol Editor Symbol Name All Publics All Publics Dot Slot2 Dot Slot2 Dot Slot0 Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Dot Doccess Docc	Type ROOT GROUP GROUP GROUP GROUP GROUP F C	Find: Type a sub	Digital input 0	> + ×
Symbol Editor Symbol Name All Publics All Publics Dot 2 Dot	Type ROOT GROUP GROUP GROUP GROUP GROUP F F F	Find: Type a sub Address/Val 0 1	Digital input 0	> + ×
Symbol Editor Symbol Name All Publics All	Type ROOT GROUP GROUP GROUP GROUP GROUP F F	Find: Type a sub Address/Val 0 1	Digital input 0	



There is no hardware clock

- There is no battery on the RIOs \rightarrow registers, flags, DBs and RAM texts are volatile!
 - → date and time must be transmitted from the Manager to the RIO using a data transfer array

Build and Download of Smart RIO project with user program

4.4 Build and Download of Smart RIO project with user program

The complete Smart RIO application is built and downloaded from the Manager station. Building and downloading the Manager station program also builds and downloads the RIO configurations and programs. It is not necessary to deal with individual RIOs.

For a quick check the RIO application can be built individually without the Manager project.

Select the RIO in the Project Manager:



.

The user program cannot (must not) be downloaded in the RIO station with the PG5 downloader.

Build and Download of Smart RIO project with user program

To build the complete Smart RIO Network project, the Manager station must be selected in the Project Manager and then the Build started.





If there are many RIO stations, a «Rebuild All Files» may take quite a long time.

To save time, «Build Changed Files» can be used. This will also include the RIO stations.

The Smart RIO Network application is downloaded with the Manager's user program.

After start-up, the Manager sends the configuration and user programs to all RIOs automatically. If a RIO is disconnected or powered off and then reconnected, it will automatically receive its configuration and program from the Manager.

Online functions and program debugging

4.5 Online functions and program debugging

A RIO station supports the online connection with PG5 via USB or Ethernet.

It does not support the online functions for program download and program debugging (Run, Stop, Restart, Single Step, Breakpoints etc.).

Other online functions are supported, such as Fupla Online Mode and Watch Window. These are useful for debugging the RIO user program.



Using the RIO's built-in Web-Server

4.6 Using the RIO's built-in Web-Server

The RIO includes the standard PCD Web-Server, which supports user web pages.

These web pages can either be stored in user program memory (using Web-Builder) or on the onboard file system.

The Web-Server supports standard HTML pages or web pages created with our Web-Editor.



Since user program memory is limited, the IMaster.jar applet should be copied to the onboard flash file system or a Web-Connect PC.

The flash file system can be accessed via the FTP server as with a standard PCD CPU.

4

5 Configuration of IP settings in a RIO station

Before a RIO station can be used its IP settings must be configured.

Connect the RIO to your Ethernet network and use the factory-default IP address 192.168.10.100 (or other IP address if you have changed it). Alternatively, you can use SBC.Net Web-Connect to connect to the RIO via the S-Bus USB port.

When using the USB interface, configure a connection for USB S-Bus in SBC.Net Web-Connect.

🗧 💦 - Web-Connect - Windows Internet Explorer 📃 🗖 🔀
🔄 🚭 🗸 🖍 http://localhost/setup
File <u>E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> ools <u>H</u> elp
🚖 🏟 🔡 🛪 🖓 Google Übersetz 💦 Net - W 🗙 🐴 🕈 🔝 🔹 🖶 🕇 🔂 🖉 Page 🔹 🎲 T <u>o</u> ols 🔹 🎽
SBC.Net
Web-Connect Help
Show: All Stations
▼ Station
Station Name: PCD3_USB
Group Name (Optional): Don't Group 💌 ->
Connection Type: USB S-Bus (SCorr 💌
✓ Connection
S-Bus Station: 0
Auto Station PGU Mode
Advanced Connection Settings (Change only if necessary)
Web-Connect per Station Settings (Change only if necessary)
Cancel Save
nne Siterat Aller

ia PCD Web-Server		
System		
Product	PCD3.T665	
FW Version	1.15.27	
HW Version	A	
HW Modification	1	
Production Date	10/37	
Serial Number	0334DFAA	
MAC Address	00:50:C2:CD:77	7:1D
r		
Status/Diagnostic		
RIO Status	Wait Config	
Program Status	HALT	
MasterlP	Not configured	
Global Diag	00000000	
Telegram Lost Diag	Not present	
	Clear Diagnos	stics
	-	
Ethernet / S-Bus Configu	ration	Now
IP Address	192.168.10.100	192.168.10.100
Subnet Mask	255.255.255.0	255.255.255.0
Default Gateway	0.0.0.0	0.0.0.0
S-Bus Address	100	100
	Factory Default	t Save

Connect to RIO station using the link to its web page:

Enter the Ethernet / S-Bus Configuration settings. For the standard Smart RIO Ether-S-IO protocol the S-Bus address is not used. It is only important if the Ether-S-Bus protocol is used (data exchange between RIOs).



If you change anything in the RIO using the web page then must make the same changes to the RIO with the Device Configurator or the RIO Network Configurator, so that the master will use the correct addresses.

6 **Troubleshooting and diagnostics**

6.1 **Diagnostic Flags**

The RIO Manager PCD contains Diagnostic Flags for the RIO network and for each individual RIO. It also contains a telegram lost counter for each RIO. RIOs with programs also contains Diagnostic Flags and a telegram lost counter which indicates the Manager's status.

Manager's Diagnostic Flags

The first 8 flags are for the Manager (but only the first three are currently used). Flags from 8 onwards are for each RIO. When adding RIOs with the RIO Configurator, it will increase the array size in multiples of 8 if it needs more Flags. This may cause an overlap with Flag addresses used by the RIO's I/Os, which can be corrected by using the Renumber Master Media Addresses command.

The first two Flags are for the Manager, and have these symbol names:

RIO.GlobalDiagnostic	1=The diagnostic flag of one or more RIOs is set
RIO.TelegramLost	1=One or more telegrams have been lost
RIO.SendError	1=Transmission failed

From offset 8, there are two Flags for each RIO, which have symbol names like this: 1=Data exchange failed, 0=OK RIO.<rio name>.DataExchange RIO.<rio name>.Diagnostic

1=RIO has error, 0=OK

Media Mapping		
Master Symbol	Master A	Master Comment
Em Ether-S-IO Network		
Master: Device1		
Diagnostic Flags		
 S.RIO.DiagFlagBase 	F 100 [16]	Base address of RIO Diagnostic Flags
 S.RIO.GlobalDiagnostic 	F 100	Another RIO Diagnostic Flag is set
S.RIO.TelegramLost	F 101	One or more telegrams lost
S.RIO.SendError	F 102	Transmit failed
	F 103	(not used)
	F 104	(not used)
	F 105	(not used)
	F 106	(not used)
	F 107	(not used)
S.RIO.RIO_00.DataExchange	F 108	RIO_00 data exchange Flag
S.RIO.RIO_00.Diagnostic	F 109	RIO_00 Diagnostic Flag
S.RIO.RIO_01.DataExchange	F 110	RIO_01 data exchange Flag
S.RIO.RIO_01.Diagnostic	F 111	RIO_01 Diagnostic Flag
S.RIO.RIO_02.DataExchange	F 112	RIO_02 data exchange Flag
S.RIO.RIO_02.Diagnostic	F 113	RIO_02 Diagnostic Flag
	F 114	(not used)
	F 115	(not used)
È→ RIO_00, PCD3.T665		

Diagnostic Flags | Built-in web page

RIO Diagnostic Flags and Telegram Lost Counter

For each programmed RIO, 8 diagnostic flags have also been reserved, but only the first two are currently used.

They have been assigned the following system symbols, which can be used in the RIO program:

RIO.GlobalDiagnostic	1 = The Manager is not responding
RIO.TelegramLost	1 = One or more telegrams have been lost

6.2 Built-in web page

If problems occur, the system and status information provided on the built-in web pages can be used for trouble-shooting.

	Saia	a PCD Web-Ser	ver	
_		System		
(Product	PCD3.T665	
		FW Version	1.16.01	
		HW Version	A	
System information		HW Modification	1	
		Production Date	10/25	
		Serial Number	031347CF	
		MAC Address	00:50:C2:C9:C5:84	1
L L				
		Status/Diagnostic		
Status information		RIO Status	Data Exchange	
shows the DIO's		Program Status	RUN	
shows the RIUs		MasterIP	192.168.12.78	
actual status and		Global Diag	0000000	
diagnostics		Telegram Lost Diag	0	_
· · · ·			Clear Diagnostic	s
		Ethernet / S-Bus Configuration		
(Current	New
		IP Address	192.168.12.79	192.168.12.79
Ethernet/S-Bus con- figuration status		Subnet Mask	255.255.255.0	255.255.255.0
		Default Gateway	0.0.0.0	0.0.0.0
		S-Bus Address	0	0
ι			Factory Default	Save

6

6.3 LED display

The LED on the front indicates the status of the RIO.



RIO status	LED status/colour
WAIT FOR FIRST CONFIG	RED
CONFIG AND PROG RECEIVED	RED blinking if no Program RUN
DATA EXCHANGE	GREEN
INVALIDE CONFIG	RED/GREEN blinking

A Appendix

A.1 Icons

l	In manuals, this symbol refers the reader to further information in this manual or other manuals or technical information documents. As a rule there is no direct link to such documents.
	This symbol warns the reader of the risk to components from electrostatic discharges caused by touch. Recommendation : at least touch the Minus of the system (cabinet of PGU connector) before coming in contact with the electronic parts. Better is to use a grounding wrist strap with its cable attached to the Minus of the system.
•	This sign accompanies instructions that must always be followed.
Classic	Explanations beside this sign are valid only for the Saia-Burgess PCD Classic series
47	Explanations beside this sign are valid only for the Saia-Burgess PCD xx7 series.

Α

A.2 Technical Data

Property		PCD3.T665	PCD3.T666	
Number of inputs/outputs		64 in base unit extensible to 256^{-1})		
I/O-module slots		4 in base unit, extensible to 16^{-1}		
I/O-modules supported		PCD3.Exxx, PCD3.Axxx,	PCD3.Bxxx, PCD3.Wxxx	
Max. number of RIO stations	5	1	28	
Protocol for data transfer		Ethe	Ether-S-IO	
Ethernet connection		10/100 Mbit/s, full-duplex,	auto-sensing, auto-crossing	
Default IP configuration		IP address: 192.168.10.100 Subnet mask: 255.255.255.0 Default gateway: 0.0.0.0		
USB port for configuration and diagnostics		У	es	
Program memory		32 kByte	128 kByte	
Web server for configuration	n and diagnostics	yes		
Web server for user pages		yes		
Onboard file system for we	o pages and data	512 kByte		
BACnet [®] or LonWorks [®]		no	no	
Onboard interrupt inputs		2		
Onboard RS-485 interface		no	yes	
Special modules	for I/O-slot 0 only		PCD3.F1xx	
	for I/O-slots 03 (up to 4 modules)	PCD3.H1xx 	PCD3.H1xx counter PCD3.F26x DALI PCD3.F27x M-Bus	
S-Web alarming/trending		no	no	
Watchdog		no		
Real-time clock		no		
Software clock (not battery-powered)		yes, synchronized by the Manager		
Battery		no		
1) with PCD3.Cxxx I/O ext	ension modules			

Smart Automation Manager (master station)

Max. 16 RIO stations	PCD3.M2130, PCD3.M2330
Max. 32 RIO stations	PCD1.M212x, PCD3.M3330,
Max. 64 RIO stations	PCD1.M2160, PCD3.M5340, PCD3.M5540, PCD3.M6x40, PCD7.D457VT5F, PCD7.D410VT5F, PCD7.D412DT5F
Max. 128 RIO stations	PCD3.M5560, PCD3.M6560, PCD3.M6860

General data

Supply voltage	24 VDC $\pm 20\%$ smoothed or 19 VAC $\pm 15\%$ full-wave rectified
Capacity of 5 V bus / +V bus (24 V)	max. 600 mA/100 mA
Ambient temperature	0+55 °C or 0+40 °C (depending on mounting position)
Storage temperature	–20+70°C
Relative humidity	3095 % RH with no condensation
Mechanical strength	according to EN/IEC 61131-2

Ordering information

Туре	Description
PCD3.T665	Smart-RIO, Ether-S-IO data exchange, programmable 32 kB
PCD3.T666	Smart-RIO, Ether-S-IO data exchange, programmable 128 kB, serial interfaces

Company address of Saia-Burgess

A.3 Address of Saia-Burgess Controls AG

Saia-Burgess Controls AG

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Postal address for returns from customers of the Swiss Sales office :

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