

Examples of use for the PC Worx Control System

Documentation of Phoenix Contact examples of use

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1 Introduction

Control programs are created in the PC Worx programming environment. The source code can be divided into programs, blocks and functions with the help of logical program organization units (POU). Numerous function blocks and functions are already contained in the editor wizards of the programming environment. Each one is provided with a short description and online help. Additional blocks as extensions to the input/output terminal blocks or as technology functions are compiled into libraries by Phoenix Contact and can be added to a project, if required. They can be obtained from the Phoenix Contact homepage.

The examples of use show the handling of the blocks by connecting them to other blocks or by programming an example application. The examples are executable projects that must be compiled for and loaded into the controller used. Typically, a particular highlighted variable is set to the value "true" in online mode to trigger an action. The source code of the examples can be viewed and also be used as the basis for own applications.

The examples of use are created with different versions of the development environment. The projects can be used with the software version used to create the example or following versions. When opening the project a conversion is done into the used version of the programming environment.

If blocks from the library are used in the example of use, the corresponding libraries are also part of the example project and are automatically installed. Please observe that the parts of the library must be compiled before being used in the project. Please change to the Library folder of PC Worx, open the library there and compile as usual. Examples of use for blocks that need a license are indicated accordingly but can be used without a license for a limited period of time. Please observe the information in the documentation on the corresponding blocks.

2 Overview

Name	Description	Version
AnalogTechnology	Examples of use of blocks of the analog technology library.	1.21
AsynCom	Examples of use of blocks of the asynchronous communication library (AsynCom).	1.10
Axiocontrol	Examples of use of functions of the controller class AxioControl.	1.30
Building	Examples of use of dealing with building technology.	1.30
CAN	Examples of use of blocks of the CAN library.	1.20
ComSerial	Examples of use of blocks of the serial communication library (ComSerial).	1.30
Database	Examples of use of blocks of the database library (DBFL_SQL).	1.30
DataLogger	Examples of use of blocks of the library for the logging of variable values (DataLogger).	1.00
General	Examples of use to function blocks contained in PC Worx.	1.40
HART	Examples of use of blocks of the HART library	1.00
ILC191ME	Examples of use of functions and blocks of the controller class ILC 191 ME.	1.00
IO-Link	Examples for commissioning and diagnosing IO-Link devices	1.00 new
IP communication	Examples of use of communication via the Internet Protocol (IP).	1.60 new
IT LIB	Examples of use of blocks of network protocols (IT library).	1.31
MCE	Examples projects to demonstrate the control of various converters using the MCE library and the PROFIdrive library	1.00
Modbus	Examples of use of blocks of the library Modbus.	2.10 new
PDPI	Examples of use dealing with the subject of control technology (PDPI Basic and PDPI Pro library).	1.01
PowerMeasurement	Examples of use of blocks of the Power Measurement library.	1.01
PowerSupply	Examples of use for the integration of products from the field of power supplies in the control application.	1.00
PROFIdrive	Example of use of blocks of the library PROFIdrive.	1.00
PROFIenergy	Example of use explaining PROFIenergy.	1.01
PROFINET	Examples of use dealing with PROFINET.	1.51
Programming	General programming examples	1.00
Radioline	Examples of use for the access to components of the product line Radioline.	1.10
Redundancy	Examples of use dealing with controller redundancy.	1.10
Security	Examples of use of blocks for encryption.	1.01

Examples of use for PC Worx

SNMP	Examples of use of blocks for the Simple Network Management Protocol version 2 (SNMP library).	1.50 new
SNMPv3	Examples of use of blocks for the Simple Network Management Protocol version 3 (SNMP3 library).	2.00 new

3 Examples of use

3.1 Library Analog Technology

Example Analog Technology		v1.21
Example	Description	Version
AI8_Para	The example of use demonstrates parameterization of the IB IL AI 8/SF terminal and reading of the analog input values. (PC WORX 5.20 SP4; block IL_AI_8; language FBD).	1.00
HART_PassThrough	The example of use demonstrates a bidirectional communication between the controller and a sensor supporting the protocol HART via the module IB IL AI2-HART (PC WORX 5.20 SP4; language FBD).	1.00
TEMP_4_8_RTD_Para	The example of use demonstrates parameterization of the IB IL TEMP 4/8 RTD terminal and reading of the analog input values. (PC WORX 5.20 SP4; block IL_TEMP_4_8_RTD; language FBD).	1.00

3.2 Library Asynchronous Communication

Examples AsynCom		v1.10
Example	Description	Version
AsynCom_Busy	Example of use to demonstrate the management of asynchronous communication between PROFINET Controller and PROFINET IO Devices (PC WORX 6.10.200; library AsyCom; language FBD).	1.00
AsynCom_SendParam	Example of use to fort he configuration of io modules by acyclic services (PC WORX 6.30.767; library AsynCom; language FBD, ST).	1.00

3.3 Topic: controller class Axiocontrol

Examples Axiocontrol		v1.30
Example	Description	Version
AXC_BusStartup	The example of use demonstrates the startup of the local bus of a controller of the class Axiocontrol out of program (PC WORX 6.30.767; language FBD, ST).	1.10
AXC_EventPowerFail	This example shows the options for response to a power failure, offered by the controller of the class Axiocontrol (PC WORX 6.30.601; language FBD, ST).	1.00
AXC_FastCounter	The example shows the handling of the fast counter of the controller AXC 3050 (PC WORX 6.30.767; language ST).	1.00

3.4 Topic: Building Technology

Examples Building Technology		v1.30
Example	Description	Version
DALI_LightControl	The example of use demonstrates communication between a controller and the bus system DALI by using the module IB IL DALI/MM (order no. 2700605) (PC WORX 6.30.1202 AddOn v1; library "DALI_Basic"; language FBD).	1.00
DMX_GW	The example of use demonstrates communication between a controller and a DMX Gateway of the type LAN-DMX STAGE-PROFI by the company DMX4ALL GmbH (PC WORX 5.20 SP4; block IP_Connect; language FBD).	1.00
KNX_GW	This example of use demonstrates communication between a controller and a KNX Gateway (AX2009-595). (PC WORX 6.0 SP3; library Lib_AX2009-595; language FBD).	1.00
MB_Client_ICS	This example of use demonstrates the communication from a controller by Phoenix Contact to an InlineControlServer by the company SysMik GmbH using MODBUS/TCP (PC Worx 6.0 SP3; library communication; language FBD).	1.00

3.5 Library CAN

Examples CAN		v1.20
Example	Description	Version
CANopen_Write	Example of use for the communication with CANopen devices (PC WORX 6.10.200 (SP2); library "CANbus"; language FBD).	1.20
IL_CAN_MA	Example of use for access to fieldbus CAN by using the function block CAN_COMM. The controller communicates via the module IB IL CAN-MA (Order NO. 2700196) with CANopen devices like the bus coupler IL CAN BK-TC (Order NO. 2718701) (PC WORX 6.10.200 (SP2); library "CANbus"; language FBD).	1.20

3.6 Library Serial Communication

Examples ComSerial		v1.30
Example	Description	Version
RS232_TagReader	The example of use demonstrates reading of a RFID transponder via an RFID reader device. The TAG Key (Order No. AX2008-15) and a TAG Reader (Order No. AX2008-14) are used in the example project. Serial communication of the controller with the TAG Reader takes place via the IB IL RS 232-PRO module (Order No. 2878515) (PC WORX 5.20 SP4; library Communication; language FBD).	1.01

3.7 Library Database

Examples Database		v1.20
Example	Description	Version
MySQL_Example	Example of use for the MySQL function block (PC WORX 5.20 SP4; SQL Library / requires license; language FBD).	1.10
MsSQL_Example	Example of use for the MS SQL function block (PC WORX 5.20 SP4; SQL Library / requires license; language FBD).	1.10

3.8 Library DataLogger

Examples DataLogger		v1.00
Example	Description	Version
DataLogger_Basic	Example of use for the logging of variable values into a file in the file system of the controller (PC WORX 6.10.200; library "DataLogger"; language FBD).	1.00

3.9 Topic: General PC Worx

Examples General		v1.40
Example	Description	Version
DynlbsConfig	This example of use demonstrates the startup of the local bus and the INTERBUS by a controller of the class ILC and RFC during runtime of the controller program (PC WORX 6.10.200; language FBD / ST).	1.00
DynLocalBusConfig	This example of use demonstrates the startup of the local bus by a controller of the class 100 during runtime of the controller program (PC WORX 5.20; block IB_Control; language FBD / ST).	1.00
EventTask	This example of use shows the configuration of event tasks for the controllers of the class 300. Three different programs are event-driven with the INTERBUS cycle, an on-board input and a user-defined event processed (PC WORX 5.20; blocks EVENT_TASK and EVENT_TASK_INIT; language FBD).	1.00
File_CRC32	Calculation of the CRC32 checksum for a file out of the file system of the controller (PC WORX 6.30 AddOn v3; language FBD, ST).	1.00
FileHandling	This example of use demonstrates how to use the built-in PC Worx File blocks for writing data to a file and reading from a file (PC WORX 5.20; block FILE_OPEN, FILE_WRITE, FILE_SEEK; language FBD).	1.00
Logic Analysis	Application notes how to use the logic analysis in PC WORX.	1.00
Onboard_Serial_Interface	This example of use demonstrates the exchange of data via the serial onboard-interface of the controller type ILC1xx (PC WORX 5.20, block RS232_SEND, RS232_RECEIVE; language FBD).	1.00

3.10 Library HART

Examples HART		v1.00
Example	Description	Version
HART_BasicBlocks	Example for the access to the module IB IL AI 2-HART (PC WORX 6.10.200 (SP2); library HART_Basic; language FBD).	1.00

3.11 Topic: controller class ILC 191 ME

Examples ILC191ME		v1.00
Example	Description	Version
MB_RTU_ILC191ME_MA	Example of use for the realization of a MODBUS / RTU master on controllers of the class ILC 191 ME (PC WORX 6.30.767; library ILCME_MODBUS; language FBD).	1.00

3.12 Topic: IO-Link

Examples IO-Link		v1.00
Example	Description	Version
CBMC_IOL	Example for commissioning and diagnosing IO-Link modules of the following types: CBMC E4 24DC/1-4A+ IOL CBMC E4 24DC/1-10A IOL In the example an AXL E PN IOL8 DI4 M12 6P module serves as IO-Link master (PC WORX 6.30.1914; library „Function Modules“; language FBD).	1.00
ELR_IOL	Example for commissioning and diagnosing an IO-Link module of the following type: ELR H5-IES-PT/500AC-3-IOL In the example an AXL E PN IOL8 DI4 M12 6P module serves as IO-Link master (PC WORX 6.30.1914; library „Function Modules“; language FBD).	1.00

3.13 Topic: IP Communication

Examples IP Communication		v1.60
Example	Description	Version
CSharpClient_2_TcpServer	This example of use demonstrates the structure of an IP communication via TCP/IP (IP connect block). The server is implemented in the controller in the function block language. The client as high-level program in C# (PC WORX 5.20 SP4; IP_Connect block; language FBD; Visual Studio 2005; C#)	1.00
ILC_MGUARD	This example of use demonstrates the access from a computer through a VPN tunnel, via a NAT router and a firewall to a controller (PC WORX 5.20 SP4; WEBVISIT 5.14).	1.00
IP_CyclicCom	Example of use for cyclic ip communication between two controllers (PC WORX 6.30.1202; IP_Connect block; language FBD).	1.00
IP_Socket_Lib	Example for implementing the IP_Com library and the usage of the new socket concept (PC WORX 6.30.1202).	1.00
Telnet_TCP_IP	This example of use demonstrates the structure of an IP communication via TCP/IP (IP connect block). The controller can be operated as server or client (language FBD). A terminal program such as Hyperterminal serves the purpose of the remote peer (PC WORX 5.20 SP4; IP_Connect block; language FBD).	1.00
UDP_Communication	This example of use demonstrates the IP communication via UDP/IP (PC WORX 5.20 SP4; IP_connect block; language FBD).	1.00

3.14 Library IT

Examples IT Library		v1.31
Example	Description	Version
DHCP_Client	This example of use demonstrates the structure of a program to use the Dynamic Host Configuration Protocol (PC WORX 5.20 SP4; library „IT Library“; language FBD).	1.00
DNS_Client	This example of use demonstrates how to use the function block DNS to resolve a Domain Name into the corresponding IP address (PC WORX 5.20 SP4; library „IT Library“; language FBD).	1.00
FTP_FileWrite	The example of use demonstrates the implementation of the File Transfer Protocol in the control program (PC WORX 5.20 SP4; library „IT Library“ / requires license; language FBD).	1.00
SMTP_Client	This example of use demonstrates transmission of a mail with or without file attachment with the SMTP_Client block (PC WORX 5.20 SP4; library „IT Library“ / requires license; language FBD).	1.10
SNTP_GetnSetTime	This example of use demonstrates the structure of a program to read the current date and time from a SNTP time server by using the function block SNTP_Client and to set the time of the controller (PC WORX 5.20 SP4; library „IT Library“; language FBD).	1.00
SetClockByVisu	This example of use demonstrates how to set the realtime clock of the controller out of the visualization (library „IT Library“ v1.28; language FBD/ST, PC WORX 6.20.331, VISU+ 2.23, WEBVISIT 6.10).	1.00

3.15 Library MCE

Examples MCE		V1.00
Example	Description	Version
MCE_PDRV_S120	Example of use to demonstrate the control of a Siemens SINAMICS S120 frequency inverter with the help of the MCE and the PROFIdrive libraries. (PC WORX 6.30.1668, library MCE, library PROFIdrive, language FBD)	1.00
MCE_PDRV_VLT_FC200	Example of use to demonstrate the control of a Danfoss VLT FC200 frequency inverter with the help of the MCE and the PROFIdrive libraries. (PC WORX 6.30.1668, library MCE, library PROFIdrive, language FBD)	1.00
MCE_HCS01	Example of use to demonstrate the control of a Bosch Rexroth HCS01 frequency inverter with the help of the MCE library. (PC WORX 6.30.1668, library MCE, language FBD)	1.00

3.16 Library Modbus

Examples Modbus LIB		V2.10
Example	Description	Version
MB_RTU_ILModBK	Example for the communication between a PLC and an IL MOD BK DI8 DO4-PAC bus coupler	1.00
MB_RTU_MasterSlave_AXL	This example of use contains a MODBUS/RTU master and a slave for a RS485 network based on the terminal AXL F RS UNI 1H (PC WORX 6.30 AddOn v3; library Modbus; language FBD).	2.00
MB_RTU_MasterSlave_IL	This example of use contains a MODBUS/RTU master and a slave for a RS485 network based on the terminal IB IL RS 485/422-PRO (PC WORX 6.20 SP2; library Modbus; language FBD).	2.00
MB_TCP_Netfail	This example of use demonstrates a reset of the watchdog process data (Netfail) during communication via the PC Worx MODBUS/TCP-blocks with the FL IL 24 BK and IL ETH BK DI8 DO4 bus couplers (PC WORX 6.10 SP2; library Modbus; language FBD).	2.00
MB_TCP_ServerClient	This example of use demonstrates the communication between two controllers by using the protocol MODBUS/TCP. Therefore the function blocks MODBUS_Client and MODBUS_Server are in use (PC WORX 6.10 SP2; library Modbus; language FBD).	2.00

3.17 Library PDPI Basic und PDPI Pro

Examples PDPI		v1.01
Example	Description	Version
PDPI_Sim	This example of use shows how to use the function block PDPI_B_Controller (PC WORX 5.20 SP4; library PDPI; language FBD).	1.00

3.18 Library Power Measurement

Examples Power Measurement		v1.00
Example	Description	Version
PM_3P_N_BasicValue	Example of use shows the use of the blocks of the library PowerMeasurement to access the power measurement terminal IB II PM 3P/N/EF (PC WORX 6.20.331; library „PowerMeasurement“; language FBD).	1.00

3.19 Topic: Power Supply

Examples Power Supply		v1.00
Example	Description	Version
UPS_SNMP_Diag	The example of use shows how parameters can be read from an uninterruptible power supply (UPS) of type UPS-CP-1KVA/240AC via SNMP (PC WORX 6.30.1202; library „SNMP“; language ST).	1.00

3.20 Library PROFIdrive

Examples PROFIdrive		v1.00
Example	Description	Version
PDRV_Driver	This example of use demonstrates how to use the driver blocks of the PROFIdrive library for communication with PROFINET IO devices which support the PROFIdrive profile (PC WORX 6.30.767; library PROFIdrive; language FBD, ST).	1.01

3.21 Topic: PROFlenergy

Examples PROFlenergy		v1.01
Example	Description	Version
PE_Driver	This example project demonstrates the use of commands for accessing PROFINET devices from the controller described in the PROFlenergy application profile. (PC WORX 6.30.1668; blocks Read Record, Write Record; language FBD).	1.01

3.22 Topic: PROFINET

Examples PROFINET		v1.51
Example	Description	Version
PN_AR_MGMT	Example of use for turning on and of the communication between PROFINET controller and PROFINET IO devices (AR's) by using the function block AR_MGT (PC WORX 6.20.331; block AR_MGT; language FBD)	1.01
PN_ILC_DeviceConf	Example of use demonstrates how to activate the function PROFINET IO Device of a controller of the class ILC 1x1 by using the block CPU_CONTROL (PC WORX 6.30.1668; block CPU_CONTROL; language FBD/ST).	1.01
PN_IM_Data	Access to the identification and maintenance data (I&M) of PROFINET IO devices (PC WORX 6.30 AddOn v3; blocks Read Record, Write Record; language FBD, ST).	1.00
PN_PortStat	Example for the access to the network port statistics of a PROFINET device (PC WORX 6.30.1202; block Read Record; language FBD).	1.00
PNIO_Alarm	Example of use demonstrates how to receive a PROFINET alarm send out by a PROFINET IO devices (PC WORX 5.20 SP 4; block RALRM; language FBD),	1.00
ProfinetReadRecord	Example of use for reading configuration data from PROFINET IO devices using acyclic PROFINET services (PC WORX 5.20 SP 4; block Read Record; language FBD).	1.00
Profisafe_Diag	This example of use shows how to access status of the safe control program of a controller RFC 470S PN 3TX out of the non-safe control program (PC WORX 6.30.1202; SafetyProg 3.30 Build 2248; language FBD).	1.00

3.23 Topic: Programming

Examples Programming		v1.00
Example	Description	Version
AS_Sequence	Example of use for the programming in sequential function chart (PC WORX 6.0 SP3; language AS).	1.00

3.24 Topic: Radioline

Examples Radioline		v1.10
Example	Description	Version
RAD_MB_RTU_COM	Communication between a controller and a Radioline network by MODBUS/RTU (PC WORX 6.30.1202; libraries "Radioline", "MODBUS" und "ComSerial"; language FBD).	1.10

3.25 Topic: Redundancy

Examples Redundancy		v1.00
Example	Description	Version
AsynCom_Red	Example of use illustrates the acyclic communication between a controller of the type RFC 460R and PROFINET IO Devices (PC WORX 6.10.200; library „AsynCom“; language FBD/ST)	
Redundancy_ASR_OPC	Example of use for the AX OPC Server 3.0 in applications with controller redundancy based on the applicative system redundancy (PC WORX 6.10.169; library Redundancy ASR language FBD).	1.00

3.26 Topic: Security

Examples Security		v1.01
Example	Description	Version
AES_TCP	Example of use for ciphering a communication between two controllers by using CFB-AES (PC WORX 5.20 SP4; blocks CFB_AES, IP_CONNECT; language FBD).	1.00

3.27 Library SNMP

Examples SNMP LIB		v1.50
Example	Description	Version
SNMP_Agent	Example of use for access to I/O signals of the controller using the SNMP_Agent block (PC WORX 6.30.1914; SNMP Library / requires license; language ST).	1.21
SNMP_Client	Example of use for access to SNMP objects from network devices by the controller using the SNMP_Client block (PC WORX 6.30.1914; SNMP Library / requires license; language ST).	1.20
SNMP_TRecv	Example of use for receiving event messages on the controller using the SNMP_TRecv block (PC WORX 6.30.1914; SNMP Library / requires license; language ST).	1.21
SNMP_TSend	Example of use for sending event messages by the controller using the SNMP_TSend block (PC WORX 6.30.1914; SNMP Library / requires license; language ST).	1.11
DeviceAvailability	Example project check the availability status of SNMP supporting devices (PC WORX 6.30.1668; SNMP Library / requires license; language ST).	1.00

3.28 Library SNMPv3

SNMPv3 LIB		V2.00
Example	Description	Version
SNMP3_Agent	Example of use for access to I/O signals of the controller using the SNMP3_Agent block (PC WORX PC WORX 6.30.1914; SNMP3 Library / requires license; language ST).	2.00
SNMP3_TRecv	Example of use for receiving event messages on the controller using the SNMP3_TRecv block (PC WORX PC WORX 6.30.1914; SNMP3 Library / requires license; language ST).	2.00
SNMP3_TSend	Example of use for sending event messages by the controller using the SNMP3_TSend block (PC WORX PC WORX 6.30.1914; SNMP3 Library / requires license; language ST).	2.00