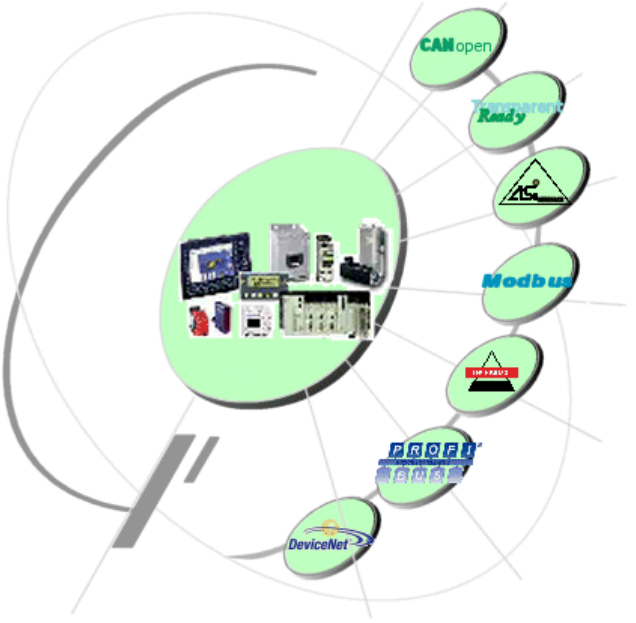
Application Description
Magelis XBT Terminals on Advantys STB

eng

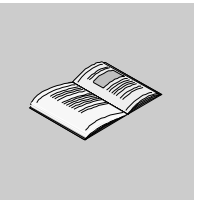


33003264.00

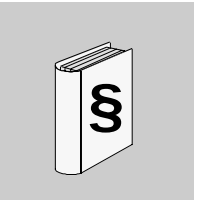
a brand of Schneider Electric

Telemecanique

Table of Contents



Safety Information



Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates an imminently hazardous situation, which, if not avoided, **will result** in death, serious injury, or equipment damage.

WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, **can result** in death, serious injury, or equipment damage.

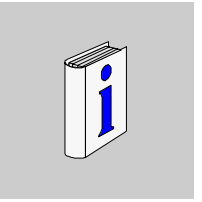
CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, **can result** in injury or equipment damage.

PLEASE NOTE

Electrical equipment should be serviced only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. This document is not intended as an instruction manual for untrained persons.

About the Book



At a Glance

Document Scope

This manual describes the requirements and procedures for connecting MMI terminals Magelis XBT to an Advantys STB Island taking into account the various fieldbuses that are supported by Advantys STB. Knowledge about the respective hardware, the programming software, the bus configuration tool and the MMI configuration tool is required. Additionally, the user should be familiar with the fieldbuses used.

Validity Note

This application description is valid for the Advantys software starting with Version 1.0, XBTL1000 V4.2, Vieijo Look V1.0, Sycon SPU LF• CD28 M (called SyCon below), CMD Tool starting with Version V4.5, Concept starting with Version 2.6 SR1, PL7 starting with Version 4.4, Unity Pro starting with Version 2.0.
Screen shots and procedures shown in this book refer to the versions of the abovementioned software programs.
Schneider Electric is not liable for any errors that may appear in this document. If you would like to make any suggestions for improvement or amendments or you have found errors in this publication, please notify us.

The data and illustrations found in this documentation are not binding. We reserve the right to modify our products in line with our policy of continuous product development. The information in this document is subject to change without notice and should not be construed as a commitment by Schneider Electric.

Related Documents

Title of Documentation	Reference Number
The Advantys STB Hardware Components Reference Guide	890USE17202
The Advantys STB Standard Profibus DP Network Interface Applications Guide	890USE17302
The Advantys STB Standard INTERBUS Network Interface Applications Guide	890USE17402
The Advantys STB Standard DeviceNet Network Interface Applications Guide	890USE17502
The Advantys STB Standard CANopen Network Interface Applications Guide	890USE17602
The Advantys STB Standard Ethernet Modbus TCP/IP Network Interface Applications Guide	890USE17702
The Advantys STB Standard Modbus Plus Network Interface Applications Guide	890USE17802
The Advantys STB Standard Fipio Network Interface Applications Guide	890USE17902
The Advantys STB System Planning and Installation Guide	890USE17102
The Advantys STB Configuration Software Quick Start User Guide	890USE18002
Concept User Manual	840 USE 503 02
PL7 Reference Manual	TLX DR PL7 xx eng
Magelis XBT-H/P/E/HM/PM Instruction Manual	XBT X000DE
Manuals of the respective bus configuration tools	

Product Related Warnings

Observe all pertinent state, regional, and local safety regulations when installing and using this product. For reasons of safety and to assure compliance with documented system data, only the manufacturer should perform repairs to components.
If controllers are used in applications with particular safety-technical requirements, please observe the appropriate instructions.
Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.
Failure to heed the product-relevant warnings can cause injuries or damage to devices.

User Comments

We welcome your comments about this document. You can reach us by e-mail at techpub@schneider-electric.com

MMI terminals Magelis XBT• to Advantys STB Island

I

Overview

What will you find in this part?

This part contains general information and an overview for the application description via the connection of MMI terminals Maglis XBT• to an Advantys STB Island taking into account the various fieldbus systems.

What's in this Part?

This part contains the following chapters:

General overview

1

At a Glance

Introduction

In this chapter you will find a brief overview for the connection of a Magelis terminal to an Advantys STB Island.

What's in this Chapter?

This chapter contains the following topics:

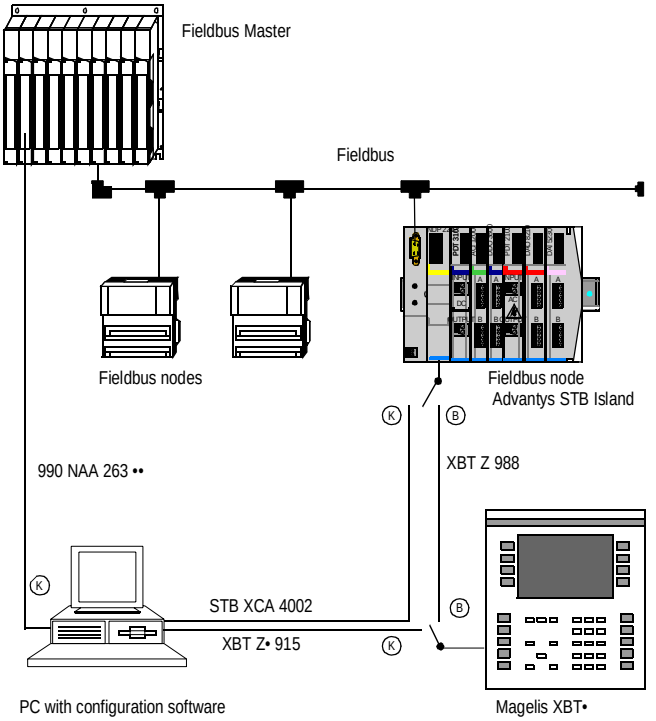
Connecting a Magelis terminal to Advantys STB Island

Overview

You can connect an MMI terminal of the type Magelis XBT• to an Advantys STB Island directly via the CFG interface of the network interface module (NIM) and configure it in the context of the island bus. Communication occurs via Modbus protocol.

Configuration example

The following figure shows a sample configuration:



K Connections for the transfer of the configurations and programs

B Connection for the operation of the MMI terminal to Advantys STB Island

Principal procedure for connecting an MMI terminal to Advantys STB Island

Overview

Several steps are required to connect an MMI terminal of the type Magelis XBT• to an Advantys STB Island.
First you must provide the physical requirements for operating the application, that is, all hardware components:

- Fieldbus master
- the individual fieldbus nodes including the Advantys STB Island, MMI terminal,
- fieldbus cabling
- connection cable for configuring

Then the configuration and programming of the individual application parts takes place with the appropriate software.

Basic flow of the configuration

The table below describes in brief the basic flow that must be carried out to connect an MMI terminal Magelis XBT•:

Phase	Software	Description
Provision of the required hardware and software	-	The following components must be provided: ● Fieldbus master ● Advantys STB Island hardware with the desired network interface module ● MMI terminal Magelis XBT• ● cable for configuration and operation of the applications ● Software for the configuration and programming For additional information, see the sections *Hardware requirements, p. 18* and *Software requirements, p. 26*.
Configuration of Advantys STB Island and MMI connection	Advantys Configuration Software	Specify the Advantys STB Island hardware configuration and the communication with an MMI terminal for: ● ProfibusDP Communication (See *Configuration of the Advantys STB Island with Profibus DP communication, p. 36*) ● INTERBUS Communication (See *Configuration of the Advantys STB Island mit INTERBUS communication, p. 90*) ● CANopen Communication (See *Configuration of the Advantys STB Island with CANopen communication, p. 126*)
Configuration of the fieldbus	SyCon or CMD (depending on the fieldbus master selected)	Configuration of the fieldbus used: ● ProfibusDP Communication (See *Bus configuration for Profibus DP, p. 41*) ● INTERBUS Communication (See *Bus configuration for INTERBUS, p. 94*) ● CANopen Communication (See *Bus configuration for CANopen, p. 132*)

Phase	Software	Description
PLC Configuration	Concept, PL7 or Unity Pro	Configuration, bus configuration and programming of the PLC used with the appropriate software program: ● TSX Quantum with Concept for Profibus DP Communication (See *Configuration using Concept, p. 56*) ● TSX Quantum with Concept for INTERBUS Communication (See *Startup of the INTERBUS Master 140 NOA 622 00, p. 98*) ● TSX Premium with PL7 for CANopen Communication (See *CANopen configuration under PL7, p. 148*)
Configuration of the MMI terminal Magelis XBT•	Configuration software XBTL 1000 or Vijeo-Designer (for Magelis XBT G•)	Creating and configuring the application for the human-machine dialog for: ● ProfibusDP Communication (See *Configuration of a Magelis XBT for connection to an Advantys STB Island with Profibus DP network interface, p. 77*) ● INTERBUS Communication (See *Configuration of a Magelis XBT for connection to an Advantys STB Island with INTERBUS network interface, p. 114*) ● CANopen Communication (See *Configuration of a Magelis XBT for connection to an Advantys STB Island with CANopen network interface, p. 159*)
Load and start the individual applications	Advantys XBTL 1000 Concept/PL7/ Unity Pro	● Load the previously-created configurations and programs into the appropriate devices. ● Start the individual applications
Create the hardware connection between Advantys STB Island and Magelis	-	The XBTZ988 connection cable is inserted between the Advantys STB Island and the Magelis XBT•.
Documentation	Advantys XBTL 1000 Concept/PL7/ Unity Pro SyCon	Print various information concerning the bus configuration and the projects

Hardware and software requirements

2

At a Glance

Introduction

This chapter lists the requirements for hardware and software for the application example MMI terminal to Advantys STB Island.

What's in this Chapter?

This chapter contains the following topics:

Hardware requirements

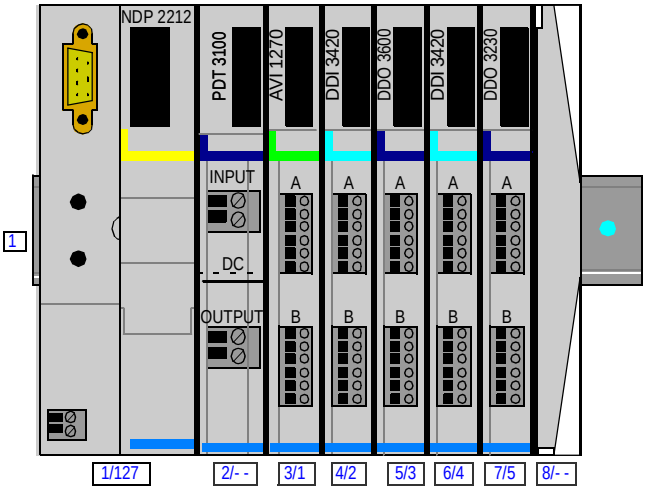
What hardware is required?

The following components are required:

- Advantys STB Island with the desired network interface module for the fieldbus used (See *Advantys STB Island configuration, p. 19*)
- PLC with corresponding fieldbus master, e.g. TSX Quantum with 140 CRP 811 00 for Profibus DP or with NOA 622 for INTERBUS (See *TSX Quantum with fieldbus master for Profibus DP or INTERBUS, p. 20*) or TSX Premium with TSX CPP 110 for CANopen. (See *TSX Premium with fieldbus master for CANopen, p. 21*)
- PC for the configuration and programming software (See *PC for configuring the system components, p. 22*)
- MMI terminal (See *MMI terminal, p. 23*)
- various cables for the fieldbus operation and the loading and operation of the applications (See *Cable, p. 23*)

Advantys STB Island configuration

Configuration of the Advantys STB Island:

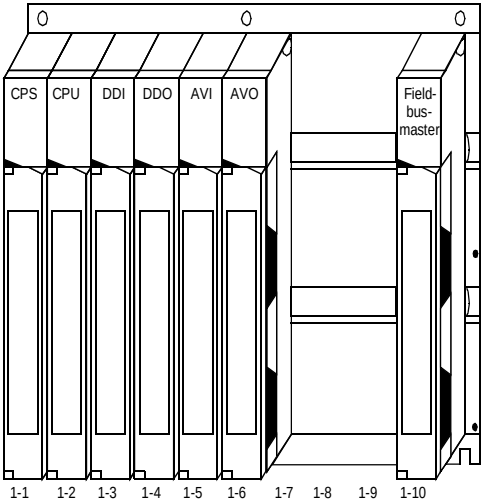


Modules of the Advantys STB Island:

Physical address	Island Bus Address	Module
1	127	STB NDP 2212; network interface module for Profibus DP (examplary) When connecting to another fieldbus, the corresponding network interface module must be used here.
2	-	STB PDT 3100; power distribution module 24 VDC
3	1	STB AVI 1270 Analog inputs (2 channels, -10V ... +10V), 24 VDC
4	2	STB DDI 3420; dig. Inputs (4 channels), 24 VDC
5	3	STB DDO 3600; dig. Outputs (6 channels), 24 VDC
6	4	STB DDI 3420; dig. Inputs (4 channels), 24 VDC
7	5	STB DDO 3230; dig. Outputs (2 channels), 24 VDC
8	-	STB XMP 1100; bus termination

TSX Quantum with fieldbus master for Profibus DP or INTERBUS

For the application examples, a Quantum controller with 140 CRP 811 00 is selected as Profibus DP master or 140 NOA 622 00 as INTERBUS master.

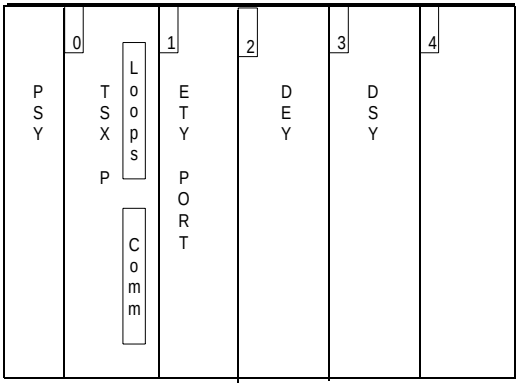


Modules of the TSX Quantum:

Rack slot	Module
1-1	140 CPS 214; power supply module 24 VDC
1-2	140 CPU 213 04; CPU
1-3	140 DDI 353 00; 32 digital inputs, 24 VDC
1-4	140 DDO 353 00; 32 digital outputs, 24 VDC
1-5	140 AVI 030 00; bipolar analog input module (8 channels)
1-6	140 AVO 020 00; analog output module (4 channels)
...	Not configured
1-10	140 CRP 81100; Profibus DP Master module or 140 NOA 622 00; INTERBUS Master module

TSX Premium with fieldbus master for CANopen

For the application example, a Premium controller with TSX CPP 110 is selected as CANopen master.



Modules of the TSX Premium:

Rack slot	Module
-	TSX PSY 1610; power supply module 24 VDC
0	TSX P572623; processor with TSX CPP 110, PCMCIA card for CANopen communication
1	TSX ETY interface
2	TSX DEY 08D2; digital input module with 8 channels, 24 VDC
3	TSX DSY 08T2; digital output module with 8 channels, 24 VDC
4	free

PC for configuring the system components

Depending on the software used, the following system requirements are recommended for the PC:

Requirement for	Advantys Configuration Software	XBT L 1000 (configuration Magelis terminal)	Concept V2.6 SR1	PL7 V4.4	Unity Pro V2.0
computer	Pentium III or higher	Pentium 90	Pentium or higher	Pentium 500 MHz	Pentium 1.2 GHz
Microsoft operating system	Windows 98, Windows NT SP6 or Windows 2000	Windows 95/98 or Windows NT 4.X	Windows 98, Windows 2000, Windows XP Professional or Windows NT SP5	Windows XP Professional or Windows 2000 SP2	Windows XP Professional or Windows 2000
RAM	256 MB of RAM	24 MB of RAM	24 MB	128 MB	512 MB
free hard disk space	150 MB	30 MB	150 MB	80 MB for software and 25 MB for temporary directories	4 GB
Drive	CD-ROM	CD-ROM	CD-ROM	CD-ROM	CD-ROM
Graphics adapter	VGA Resolution 1024x768	VGA	VGA Resolution min. 800x600	SVGA (24 bit) Resolution 800x600	VGA Resolution 1024x768
Pointing device	Microsoft-compatible mouse	Microsoft-compatible mouse	Microsoft-compatible mouse	Microsoft-compatible mouse	Microsoft-compatible mouse
Internet browser	Microsoft Internet Explorer 4.01 or higher	-	-	-	Microsoft Internet Explorer 5.5 or higher

Your PC must fulfill the highest requirements for all programs that you use.

MMI terminal

The following can be used as MMI terminal:

- Magelis XTB-F
- Magelis XBT-H / P / E / HM / PM
- Magelis XBT-N (except XBT-N200 and XBT-N400)
- Magelis XBT-G

In the application example, an MMI terminal of the type Magelis XBT-PM 027010 is used.

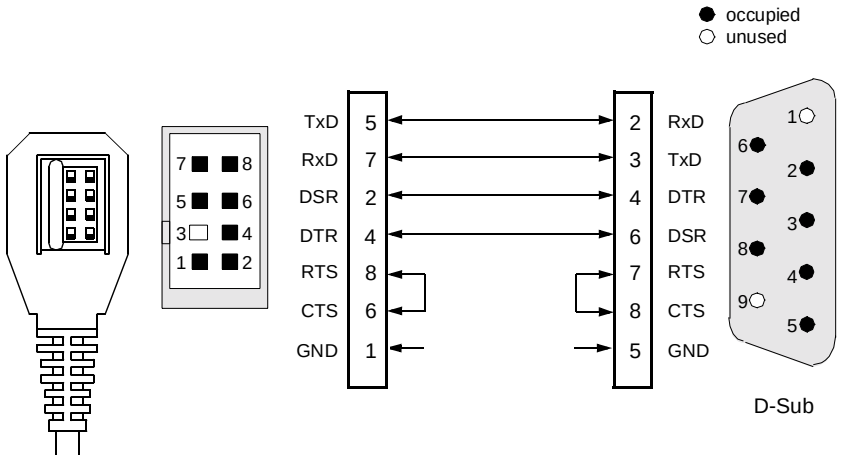
Cable

The following cables are required:

Item name	Description
STB XCA 4002	Configuration cable for Advantys STB Island (RS232 SUBD/HE13): ● Connection between PC and KFG interface of the network interface module ● Connection between Magelis XBT-G and CFG interface of the network interface module for operating the Magelis terminal
XBT Z915	Configuration cable for Magelis XTB-F, XBT-H / P / E / HM / PM, XBT-N (except XBT-N200 and N400)
XBT ZG915	Configuration cable for Magelis XTB-G
990 NAA 263••	Configuration cable for TSX Quantum (Modbus) and programming cable for 140 NOA 622 00
XBT Z988	Cable for operating Magelis XBT-F, XBT-H / P / E / HM / PM, XBT-N (except XBT-N200 and N400) as well as XBT-G on the CFG interface of Advantys STB Island
XBT Z9710	Cable for operating Magelis XBT-F, XBT-H / P / E / HM / PM, XBT-N (except XBT-N200 and N400) as well as XBT-G on a PLC
fieldbus cabling	Depending on the fieldbus used Refer to the corresponding fieldbus documentation for further information.

Cable STB XCA 4002

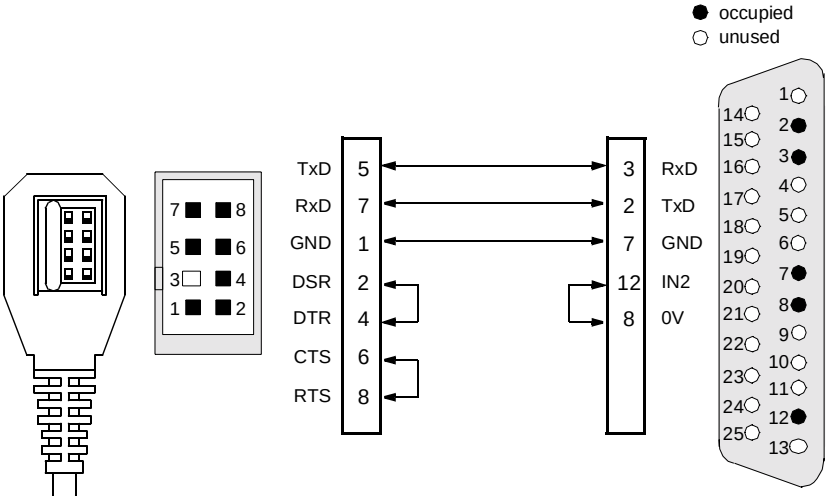
Pin assignment cable STB XCA 4002, length 2.5 m:



Legend

Signal Name	Meaning
TxD	Transmit Data
RxD	Receive Data
DSR	Data Set Ready
DTR	Data Terminal Ready
RTS	Request to send
CTS	Clear to send
GND	Ground

Cable XBTZ988 Pin assignment cable XBTZ988, length 2.5 m:



HE13, 8-pin, connector
Advantys STB

D-sub, 25-pin, keys
Magelis XBT

Legend

Signal Name	Meaning
TxD	Transmit Data
RxD	Receive Data
DSR	Data Set Ready
DTR	Data Terminal Ready
RTS	Request to send
CTS	Clear to send
GND	Ground

Software requirements

What software is required for configuration?

For configuration of the individual system components you will need the following software:

System component	Software	version
Advantys STB Island	Advantys Configuration Software	≥V1.0
Magelis XBT (except Magelis XBTG•)	XBTL 1000	Version 4.2
Magelis XBTG•	Vijeo-Designer	Version 1.0
Fieldbuses and fieldbus master master	see section *Software for configuration of the fieldbuses, p. 26*	

Software for configuration of the fieldbuses

For the configuration of the various fieldbuses and fieldbus master you will need the following software:

Fieldbus	Configuration software	Fieldbus master	Programming Software
Profibus DP	SyCon Version 2.8	Quantum with 140 CRP 811	Concept Version 2.6 SR1
		Premium with TSX PBY100	PL7 Version 4.4 or Unity Pro XL Version 2.0
INTERBUS	SyCon Version 2.8	Quantum with 140 NOA 622	Concept Version 2.6 SR1
	CMD-Tool Version 4.41	Quantum with 140 NOA 611	Concept Version 2.6 SR1
		Premium with TSX IBY 100 / TSX IBX 100	PL7 Version V4.3 or higher or Unity Pro XL Version 2.0
CANopen	SyCon Version 2.8	Premium with TSX CPP 100/ 110	PL 7 Version 4.3 or higher or Unity Pro XL Version 2.0
Ethernet	Concept Version 2.6 SR1 or Unity Pro XL Version 2.0	Quantum with 140 NOE 7••	Concept Version 2.6 SR1 or Unity Pro XL Version 2.0
Fipio	PL7 Version 4.4	Premium with TSX P 57453-CPU	PL7 Version 4.4 or Unity Pro XL Version 2.0

Applications examples for the various fieldbuses

II

Overview

What will you find in this part?

This part describes the application examples for the various fieldbuses that can be used with Advantys STB Island.

What's in this Part?

This part contains the following chapters:

Application example for connecting an MMI terminal to Advantys STB Island with Profibus DP-NIM

3

At a Glance

Introduction

In this chapter you will find the application description for the connection of an MMI terminal Magelis XBT• to an Advantys STB Island with Profibus DP network interface.

What's in this Chapter?

This chapter contains the following sections:

3.1 Application with Profibus DP communication

Introduction

Overview

This section provides a brief overview of the hardware for the Profibus DP communication and of the applications.

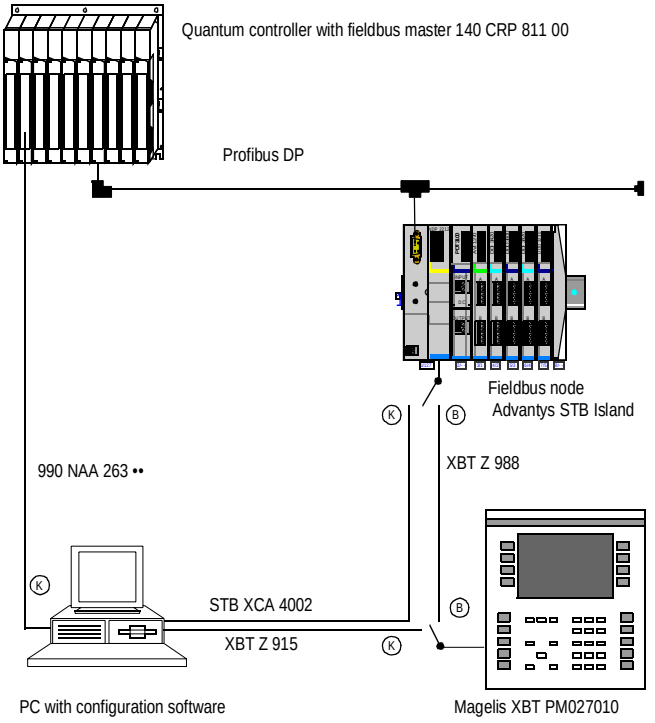
What's in this Section?

This section contains the following topics:

Overview of hardware configuration with Profibus DP

Sample configuration

The following figure shows the configuration that is described in the application example:



K Connections for the transfer of the configurations and programs

B Connection for the operation of the MMI terminal to Advantys STB Island

Required components and cables

The configuration of the individual nodes, the required configuration software and the requirements of the PC are found in chapter *Hardware and software requirements, p. 17*.

The following table shows the required cable (overview, see section *Cable, p. 23*):

Cable for configuration and transfer

Type	Meaning
990 NAA 263 20	Modbus connection cable between PC and CPU of the Quantum
STB XCA 4002	Connection cable between PC and CFG interface of the network interface module of the Advantys STB Island
XBT Z915	Connection cable between PC and Magelis XBT PM027010 for the transfer of the application

Cable for operating the application:

Type	Meaning
XBT Z988	Connection cable between the Advantys XBT Island and the Magelis XBT PM027010 for operation of the application

Note:
If the abovementioned XBT cable Z988 is not available, you can also use the 3 following cables **together** to operate the Magelis on Advantys STB Island:

- XBT Z9710
- 990 NAA 263 20

  and
- STB XCA 4002

Profibus DP cable and connector

Type	Meaning
KAB PROFIB Belden 3079A (for up to 12 Mbit/sec)	Profibus cable (by the meter), Type "A", 02Y (ST) CY 2x0,64 mm^2
490 NAD 911 03	Profibus connector with connection (yellow)
490 NAD 911 04	Profibus connector node (gray)
490 NAD 911 05	Profibus plug node with interface for programming device (gray)
490 NAE 911 00	Profibus TAP
Siemens, BT200	Bus tester
Fa. 3M, Order No. 1183	Foil shielding Supplier : 3M Deutschland GmbH, Carl-Schurz-Straße 1, D-41453 Neuss, Germany

Note: For information about the preparation of the cables and the installation of the Profibus DP, see the ***Quantum PROFIBUS DP manual under Concept, 840 USE 487 00*** in the **Installation** section.

Description of the application for Profibus DP

Overview

The application describes the possibility of operating a Magelis terminal directly on the CFG interface of a network interface module of an Advantys STB Island. Here the data should be presented on the Magelis terminal that is sent and received via the fieldbus communication as well as data directly from the data image of the Advantys STB Island.

Description

First the individual steps are described that are necessary to establish fieldbus communication between master, Advantys STB Island, and Magelis terminal. Then there is a brief presentation of the necessary configuration and programming for the fieldbus master and the Magelis terminal.

3.2 Configuration of an Advantys STB Island with MMI connection and Profibus DP network interface

Introduction

Overview

This section describes the procedure for configuration of an Island configuration with Profibus DP network interface and MMI. For this you use the Advantys configuration software.

What's in this Section?

This section contains the following topics:

Configuration of the Advantys STB Island with Profibus DP communication

Overview

The following sections provide a brief description of the steps that are necessary for configuration of the Advantys STB Island with Profibus DP communication and a MMI connection.
The description is divided into the following sections:

- Setting up the workspace and Island
- Configuring the hardware
- Activating the MMI configuration

Setting up the workspace and Island

To set up the workspace and Island, proceed as follows:

Step	Action
1	Start the Advantys configuration software.
2	With **File** → **New Workspace** open the **New Workspace** dialog box.
3	In the **Workspace file** area and in the **Island file** area, enter the respective name for the new workspace and the Island in the **Name** field; for the example **STB_PB1**
4	In the **Workspace file** area, in the **Position** field, you can enter the location where you would like to store the workspace and Island. For the example, enter: `LW:\Schneider Application\Advantys_HMI_Profibus_DP`. Note: The data storage location and the file name are displayed in the **Name with Path** text box.
5	Confirm with **OK**. **Result:** The new workspace and the new Island are created.
6	Save the new workspace with **File** → **Save workspace**.

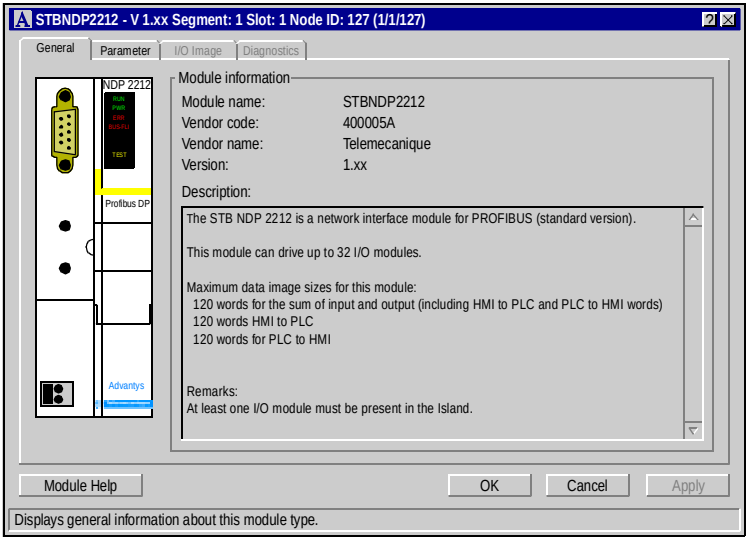
Configuration of the hardware

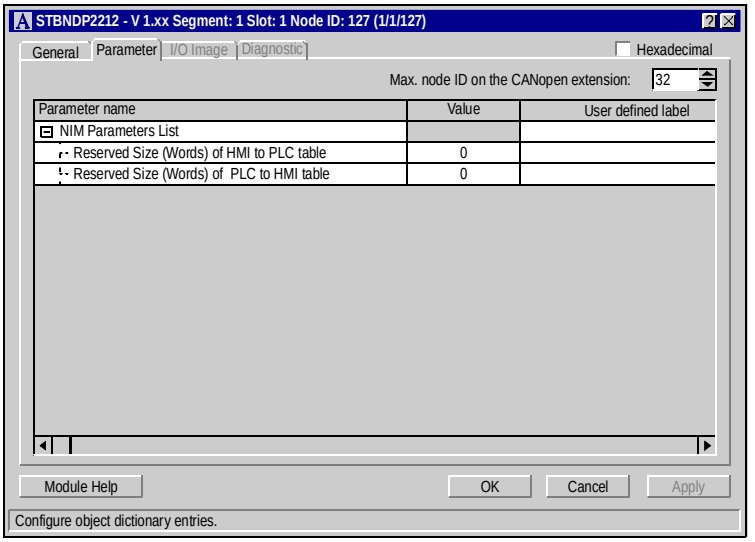
To configure the hardware, proceed as follows:

Step	Action
1	In the catalog browser, expand the module type **Networking**.
2	Double-click on the module **STBNDP2212**. **Result**: In the Island editor, the network interface module is stored in the position all the way to the left.
3	In the catalog browser, expand the module type **Power.**
4	Double-click on the module **STBPDT3100**. **Result**: In the Island editor, the module is stored in the next position to the right.
5	Repeat steps 3 (expansion of the required module type) to 4 until you have completed your Island configuration in accordance with section *Advantys STB Island configuration, p. 19*.
6	Save the configuration with **File** → **Save Island:STB_PB1**.

Activation of the MMI communication

To activate the MMI communication, proceed as follows:

Step	Action
1	Double-click on the network interface module (NIM) STB NDP 2212 **Result:** The module editor opens:  On the **General** tab you will find details about the configured network interface module (NIM) and about the data range lengths for input/output data and for the MMI communication. These areas depend on the configured NIM.

Step	Action
2	Change to the **Properties** tab:  In the **Value** column, enter the word count that you would like to reserve in the Advantys STB Island for the communication of a Magelis terminal to the fieldbus master (HMI to PLC table) and for the communication from the fieldbus master to a Magelis terminal (PLC to HMI table). For the example, enter 10 words for each communication direction. **Note:** For the sample configuration, (See *Advantys STB Island configuration, p. 19*) a maximum sum of 113 words can be configured for input direction (HMI to PLC table) and output direction (PLC to HMI table).
3	Close the module editor by clicking the **OK** button.
4	Save the parameter input with**File** → **Save Island:STB_PB1**.

Build and download the application in the Island

Build and Download the application

To build and download the application, proceed as follows:

Step	Action
1	With **Island** → **Build** execute the building of the application. If errors are reported here (display on the log window), remove these and then rebuild.
2	Under **Online** → **Connection settings** → **Settings...** configure the interface with which you would like to connect the Advantys STB Island to the PC (COM1 or COM2).
3	On the NIM STB NDP 2212 set the Profibus DP node address 2: the **upper** rotary switch is set to **0**, the **lower** to **2**.
4	Connect the Advantys STB Island to the corresponding PC interface with the STB XCA 4002 cable and switch the Advantys STB Island on.
5	Select **Online** → **Connect**. The **Data transfer** dialog box opens.
6	Click the **Download** button to download your configured application into the Island. **Result**: The application is downloaded in the Island. The result will appear in the log window.
7	Confirm the following query whether the Island should be put into the "running" state with **OK**. **Result**: The island is started.

3.3 Bus configuration for Profibus DP

Introduction

Overview

This section contains information concerning the configuration of the Profibus DP Master TSX Quantum 140 CRP 811with the SyCon configuration tool.

What's in this Section?

This section contains the following topics:

Introduction

Overview

The bus configuration tool SYC SPU LF• CD28M, called SyCon below, is used to configure the PROFIBUS DP network.

Note: Included with the SyCon Configurator software are some GSD files for PROFIBUS DP Master and Slave modules from Telemecanique and other manufacturers. You must still load the GSD file for the modular slave Advantys STB Island into the SyCon GSD directory.

Procedure

Follow these steps to create and export the bus configuration:

Step	Action
1	Provide the GSD file for Advantys STB Island
2	Create a bus project
3	Define and configure the master
4	Slave Configuration ● Define and address the slaves and assign them to the corresponding master. ● Configuration of the I/O modules (This includes empty slots with modular slaves)
5	Define bus parameters and save the bus project
6	Export the bus project

Notes

Note: The following description concerns the fundamental configuration steps only.
For detailed information, please refer to the online help for the SyCon Configurator and the corresponding help files on the installation CD.

Provide the GSD and BMP files for Advantys STB Island with Profibus DP communication

Procedure

To provide the GSD file and the associated bitmap files for the modular slave Advantys STB Island for the Profibus DP communication, you can proceed in 2 ways:

- *Copying the files with the help of SyCon, p. 43*
- *Simple copying of the files, p. 44*

Copying the files with the help of SyCon

To copy the GSD file and the associated bitmap files for the modular slave Advantys STB Island with the help of Sycon, proceed as follows:

Step	Action
1	Place the mini-CD included with the network interface module in the CD drive.
2	Open the bus configuration tool **SyCon**.
3	Select **File** → **New** from the main menu. The **Select fieldbus** dialog box opens.
4	Select **PROFIBUS**.
5	Select **File** → **Copy GSD** .
6	The **Copy GSD** dialog box opens. Select the drive in which you placed the mini-CD.
7	Open the directory **Device_Profiles** → **Profibus_DP**. Here you will find the required GSD file and three *.dib files.
8	Select the file ***.gsd** and click the **Open** button.
9	Answer the question **Do you want to import the corresponding bitmap files?** with **Yes**. **Result**: Now the *.gsd file and the three *.dib files are loaded into the corresponding directory under SyCon. Result: Now you have all files available in order to configure a Profibus DP configuration with the modular slave Advantys STB.

Simple copying of the files

To copy the GSD file and the associated bitmap files for the modular slave Advantys STB Island, proceed as follows:

Step	Action
1	Place the mini-CD included with the network interface module in the CD drive.
2	Open the directory **Device _Profiles** → **Profibus_DP**. Here you will find the required GSD file and three *.dib files.
3	Copy the *.gsd file into the directory **LW\...\Sycon\Fieldbus\Profibus\Gsd.**
4	Copy the three *.dib files into the directory **LW\...\Sycon\Fieldbus\Profibus\Bmp**. **Result**: Now you have all files available in order to configure a Profibus DP configuration with the modular slave Advantys STB.

Creating a bus project for Profibus DP

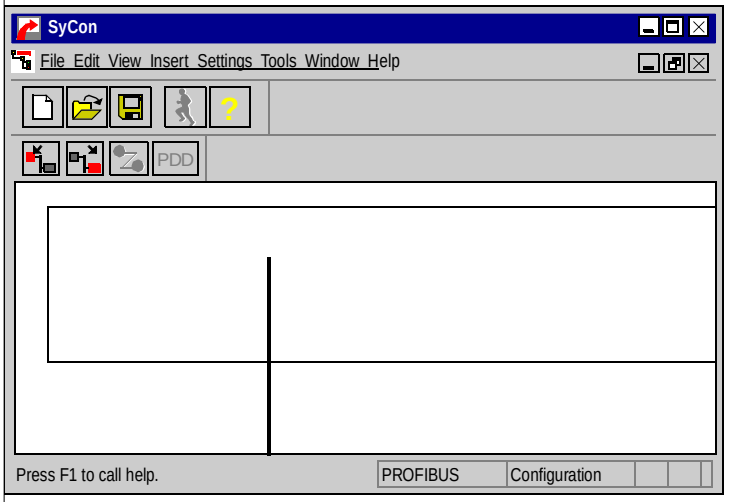
Define target directory

First define a target directory for your bus project:

Step	Action
1	Open the bus configuration tool SyCon.
2	Select **File** → **New** from the main menu. **Result**: The **Select fieldbus system** dialog box opens.
3	Select **PROFIBUS**.
4	From the main menu select **Settings** → **Path...**. **Result:** The **Path** dialog is opened and the path of the SyCon directory is shown as the default project directory (e.g. `C:\Programs\Schneider\Sycon\Project`).
5	In the **Project directory** text box, enter the path of the Concept project directory you have already set up, for the example `LW:\Schneider Application\Advantys_HMI_Profibus_DP\CC_PB1`. **Note:** The default can also be accepted. **Result:** Executing the menu commands **Save** and **Export** (on the main menu **File**) saves all files into the defined project directory (here your Concept directory).

Creating a bus project

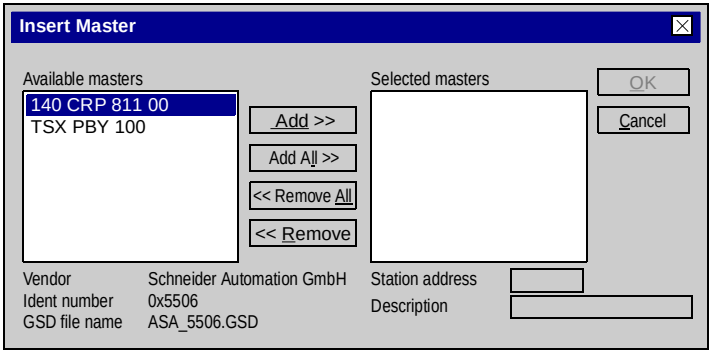
This table shows you the steps in setting up a bus project with SyCon.

Step	Action
1	Select **File** → **New** from the main menu. **Result**: The **Select fieldbus** dialog box opens.
2	Select **PROFIBUS**. Result: 
3	Select **File** → **Save** from the main menu. Result: The **Save as** dialog box opens.
4	Now under **Filename** enter the name for the project (for the example: `stb_pb1`) and confirm with **Save**. Result: Your new, still empty project is saved.

Define and configure the master for Profibus DP

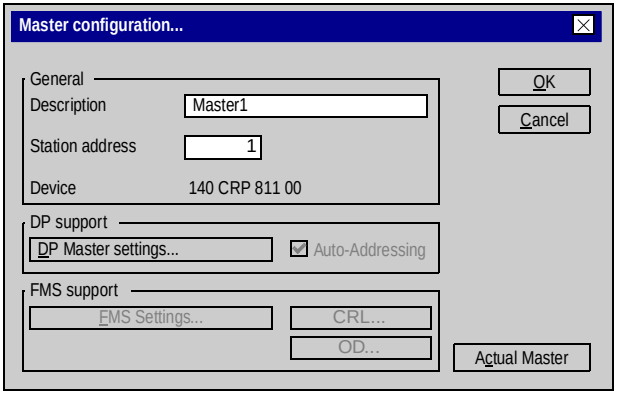
Define a master

This table shows you the steps for defining the Profibus DP master.

Step	Action
1	From the main menu, select **Insert** → **Master** and click the pointer on the rectangle at the beginning of the bus line. **Result:** You see a list of the available masters: 
2	Select **140 CRP 811 00** and click the **Add** button and then **OK**. **Result**: The module **140 CRP 811 00** is defined as the bus master.

Configuring the master

This table shows you the steps for configuring the Profibus DP master.

Step	Action
1	Selecting the Master
2	Select **Settings** → **Master Configuration...** from the main menu. **Result:** You will see the following dialog box:  Accept the defaults here.

Configuration of the modular slave Advantys STB Island on Profibus DP

Overview

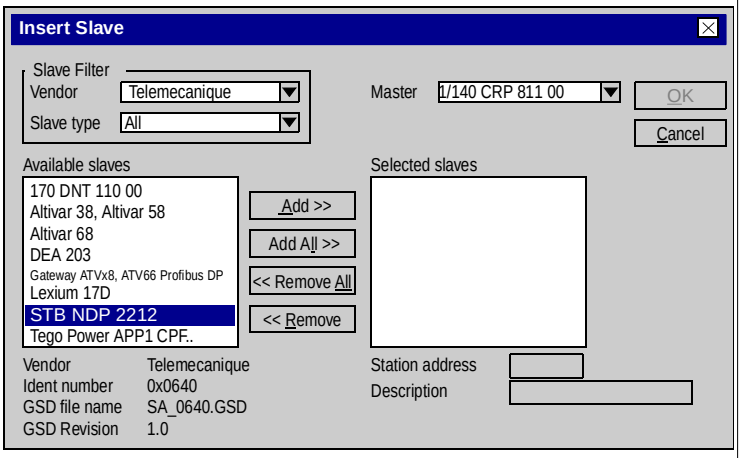
The table shows you the sample configuration of the modular Profibus DP slave Advantys STB Island:

Module	Island Bus Address	Meaning
STB NDP 2212	127	Network interface module Profibus DP
STB PDT 3100	-	24V power distribution module
STB AVI 1270	1	Analog inputs (2 channels, -10V...+10V), 24 VDC
STB DDI 3420	2	Digital inputs (4 channels), 24 VDC
STB DDO 3600	3	Digital outputs (6 channels), 24 VDC
STB DDI 3420	4	Digital inputs (4 channels), 24 VDC
STB DDO 3230	5	Digital outputs (2 channels), 24 VDC
STB XMP 1100	-	Bus termination

The following tables show you how the sample configuration is created in the SyCon Configurator.

Defining and addressing the slave module

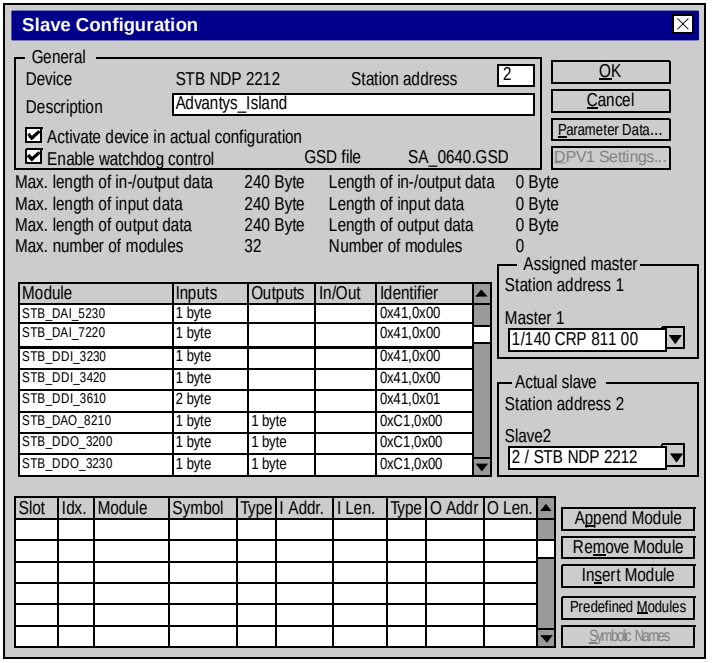
This table shows you the steps to define a slave module.

Step	Action
1	List the available slave modules with **Insert** → **Slave** **Result:** 
2	Select the slave **STB NDP 2212** and click **Add**.
3	Check, and if necessary change the **Station address**, it must match the address set by the hardware on the STB NDP 2212.
4	Enter `Advantys_Island_2` as **Description**.
5	Confirm the settings by clicking the **OK** button.

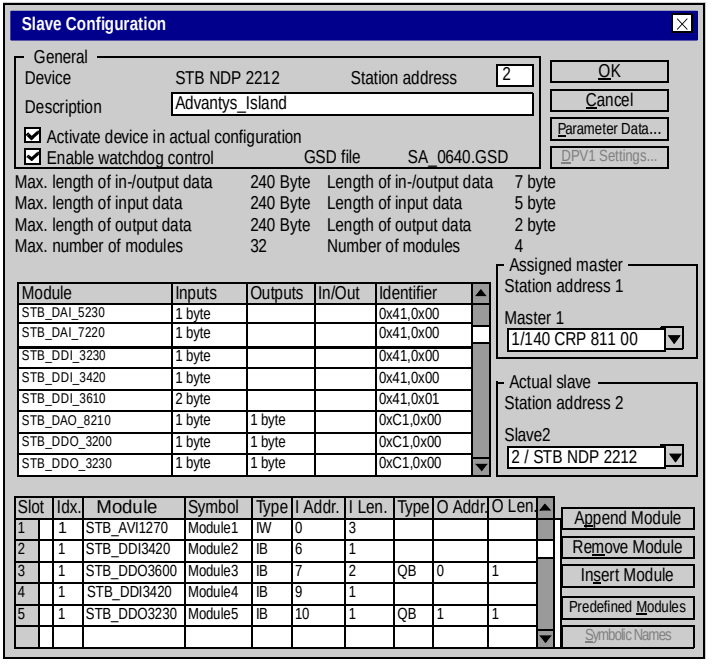
Configuration of the modular slave

This table shows you the steps to configure the modular slave:

Step	Action
1	Double-click on the slave **Advantys_Island_2**. **Result:** The **Slave configuration** dialog box opens.

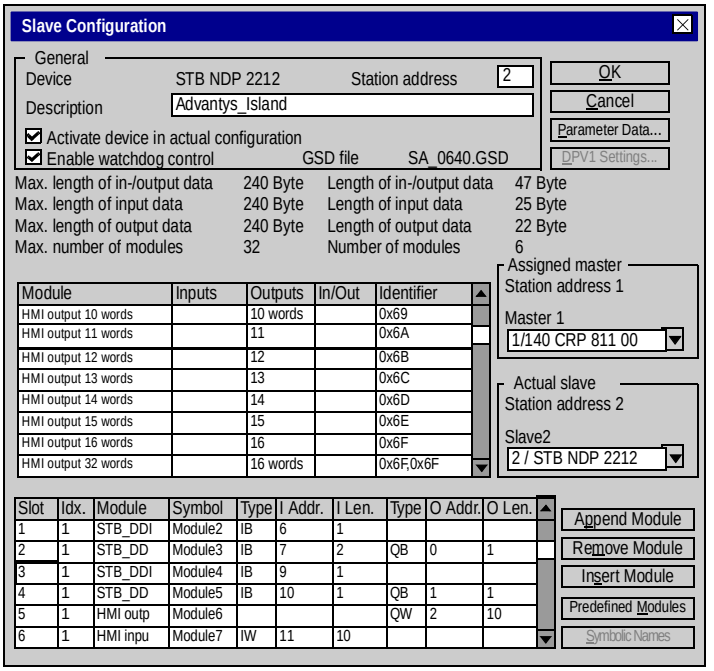


Step	Action
2	Configure this modular slave by double-clicking on the corresponding modules in accordance with the Advantys STB Island configuration. This is then entered in the lower area. **Result:**



Configuration of the MMI communication

To configure the MMI communication, proceed as follows:

Step	Action
1	Enter the number of HMI output words. To do this, double-click on the corresponding entry (**HMI output • words**) in the list above. This is then entered in the lower area.
2	Enter the corresponding number of HMI input words. To do this, double-click on the corresponding entry (**HMI input • words**) in the list above. This is then entered in the lower area. **Result:** 
3	Confirm the settings with the **OK** button.

CAUTION

No starting of the Profibus DP

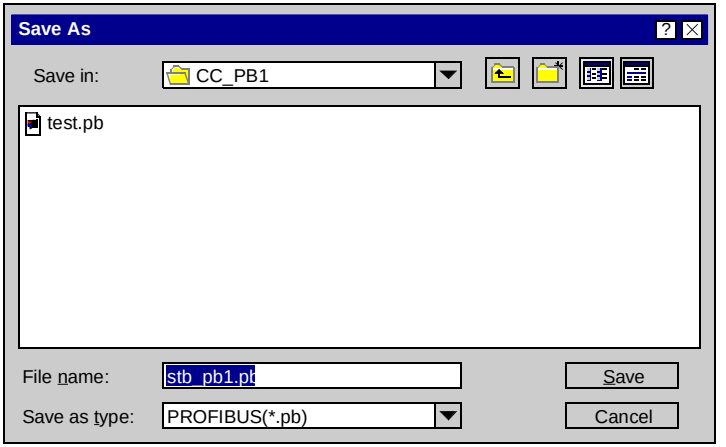
The HMI output and HMI input words must always be entered **after** the Advantys STB Island modules.
Furthermore, the corresponding number of input and output words must **match precisely** the number **configured** in Advantys STB. Only one entry with the precise number has to be made, entries can not be added in order to be able to communicate e.g. 20 words.
If this is not the case, the Profibus DP communication with Advantys STB Island will not start.

Failure to follow this precaution can result in injury or equipment damage.

Saving and exporting a Profibus DP bus project

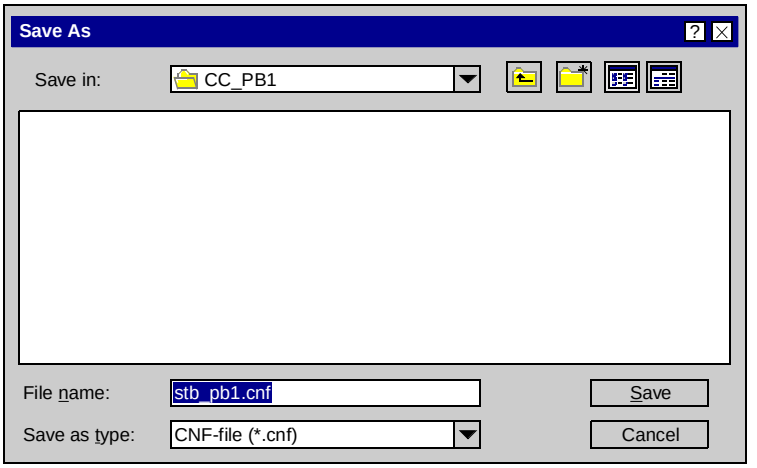
Saving the bus project

This table shows you the steps to save a Profibus DP bus project in SyCon .

Step	Action
1	Save the bus project with **File** → **Save As...** The following dialog box opens:  The configuration is stored in the defined directory as a database file `*.PB`.

Exporting the bus project

This table shows you the ASCII export of the file *.CNF.

Step	Action
1	Select the master whose configuration you want to export
2	From the main menu, select **File** → **Export** → **ASCII**:  **Result:** The configuration is stored in the ASCII file *.CNF within the defined directory.
3	Exit the SyCon Configurator.

Notes on saving

The configuration must always be saved as a database file *.PB first, because the ASCII file can only be generated from the saved *.PB file. Every change must therefore also be saved as a *.PB file before an ASCII file can be generated for the export.
The *.PB and *.CNF files should always be in the same project directory.

PROFIBUS DP Configuration in Concept

Following the configuration of the PROFIBUS DP nodes in SyCon, the PROFIBUS DP configuration has to be imported into the Concept I/O map. For additional information, see the section *Import of the bus configuration, p. 60*.

3.4 Configuration using Concept

Introduction

Overview

This section contains information concerning the software configuration for the TSX Quantum 140 CRP 811 PROFIBUS DP using Concept.

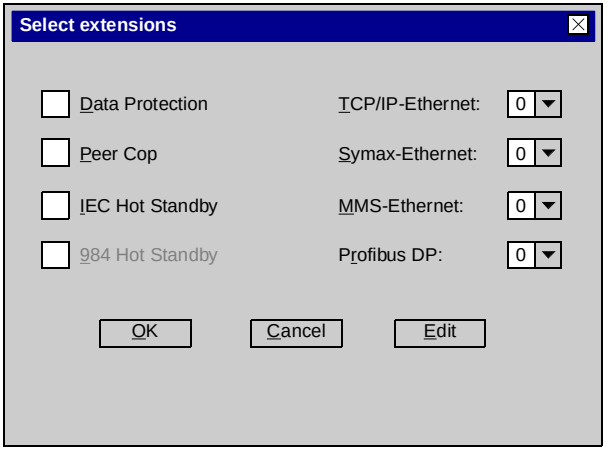
What's in this Section?

This section contains the following topics:

Configuration of the CRP 811

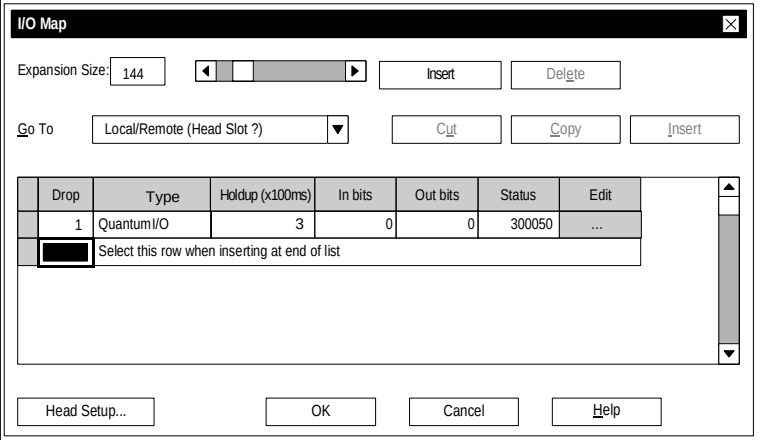
Enabling the Profibus DP

To activare the Profibus DP proceed according to the following steps:

Step	Action
1	Start Concept.
2	Open the corresponding Concept project; for the sample project: `LW:\Schneider Application\Advantys_HMI_Profibus_DP\CC_PB1\stb_pb1.prj`.
3	From the main menu, select **Project** → **Configurator** → **Config Extensions** → **Select extensions**. **Result:** The **Select extensions** dialog box opens: 
4	From the **Profibus DP** list box, select the number of the Profibus configurations you would like to activate. In the example, select the **1**. **Result:** The communication module is now listed on the **Local Quantum I/O station** dialog and can be used for I/O map.

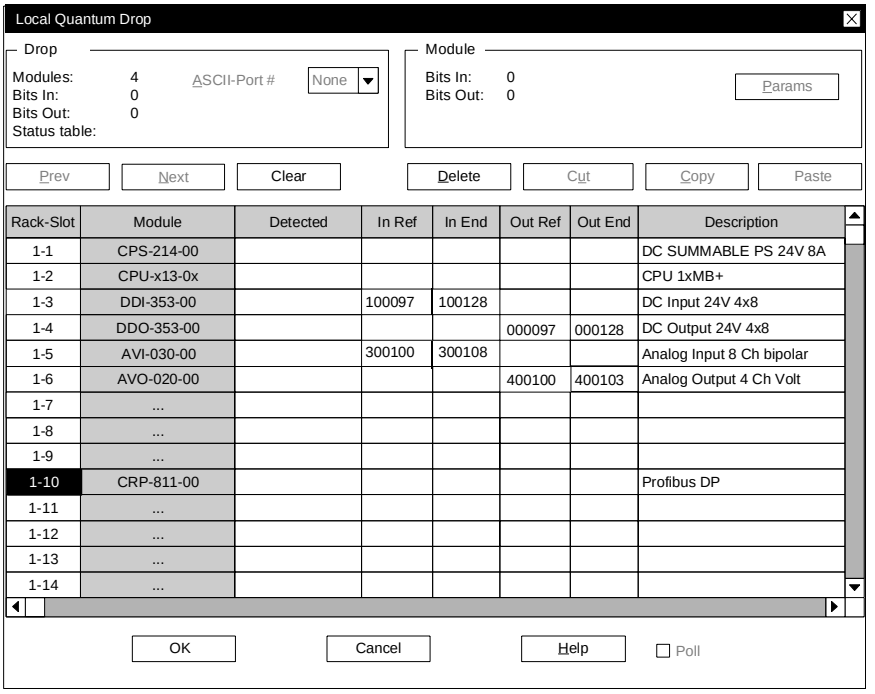
I/O Map with CRP 811

To equip the Quantum with the CRP 811, proceed as follows:

Step	Action
1	From the main menu, open **Project** → **Configurator** the **I/O map** dialog box. **Result:** The **I/O map** dialog is opened and the first I/O station (Drop) is entered into the table automatically. **Result:** 
2	Select the line with **Quantum I/O** . Select the command button **Edit....**. **Result:** You will see the **Local Quantum Drop** dialog box on which you enter the I/O map.
3	Double-click in line 1-10 (rack slot) at the column **Module** on the text field **...**. **Result:** The **I/O module selection** dialog is opened.
4	In the **Category** column, select the category **I/OAdapter** and then in the **Modules** column the module **CRP-811-00**. Now click the **OK** command button. **Result:** The 140 CRP 811 module is entered in the I/O map.

Dialog display

After defining the I/O map and assigning the references, the dialog box looks as follows:



Rack-Slot	Module	Detected	In Ref	In End	Out Ref	Out End	Description
1-1	CPS-214-00						DC SUMMABLE PS 24V 8A
1-2	CPU-x13-0x						CPU 1xMB+
1-3	DDI-353-00		100097	100128			DC Input 24V 4x8
1-4	DDO-353-00				000097	000128	DC Output 24V 4x8
1-5	AVI-030-00		300100	300108			Analog Input 8 Ch bipolar
1-6	AVO-020-00				400100	400103	Analog Output 4 Ch Volt
1-7	...						
1-8	...						
1-9	...						
1-10	CRP-811-00						Profibus DP
1-11	...						
1-12	...						
1-13	...						
1-14	...						

Importing a PROFIBUS DP Configuration

The import of the configured Profibus DP nodes is done using the parameter dialog for the CRP-811-00. For additional information, see section *Import of the bus configuration, p. 60*.

Import of the bus configuration

Requirement

1. The configuration of the Profibus DP-nodes was created with the SyCon Configurator and exported as `*.CNF` file.
2. The CRP 811 is enabled and added to the components of a local Quantum I/O station.

Note: To guarantee an error free transfer of the PROFIBUS DP configuration make sure that sufficient memory is available. To optimize memory allocation, open the dialog (**PLC Configuration** → **PLC Memory Partition**).

Bus Configuration Import

To import the configuration (`*.CNF`) into Concept follow these steps:

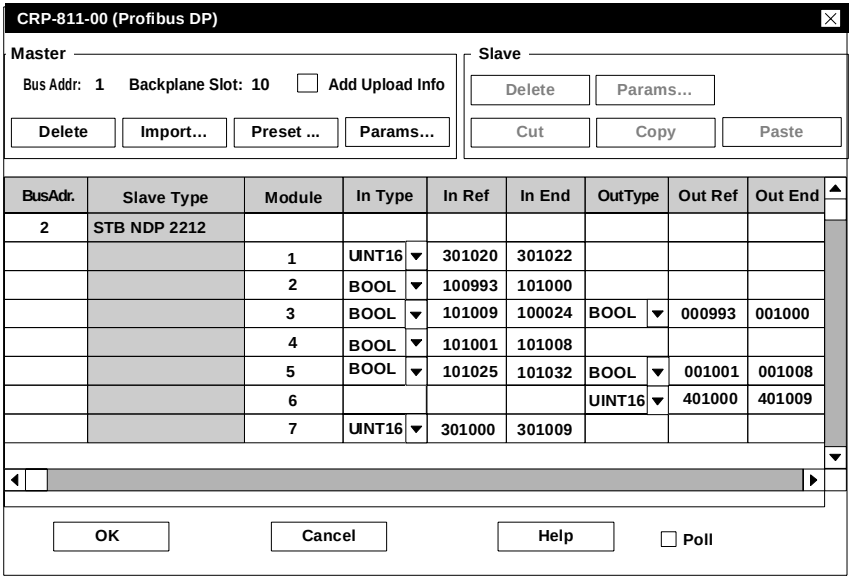
Step	Action
1	From the main menu, open **Configurator** to reach the **I/O map** dialog. **Result:** The **I/O map** dialog is opened and the first I/O station (Drop) is entered into the table automatically.
2	Select the line with **Quantum I/O** . Click the command button **Edit....**. **Result:** The module mapping appears.
3	Select the line for the corresponding bus controller (140 CRP 811) from the dialog and activate the command button **Params** . **Result:** The **CRP-811-00 (Profibus DP)** dialog opens.
4	With the command button **Import...** you will open the **Select source file** window.
5	Enter the path of the CNF file for importing and press the **OK** command button. **Result:** The PROFIBUS DP configuration is entered in the Concept I/O Map.
6	Assign the modules the appropriate data types.
7	Assign the modules the state RAM addresses. This can be done automatically by the system (See *Specifying I/O addresses automatically, p. 64*) or manually.

Dialog display

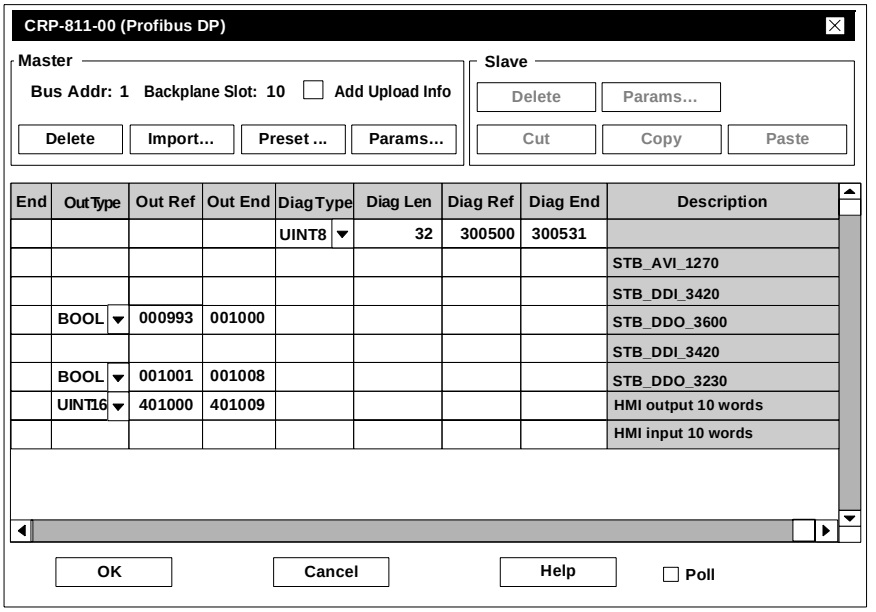
After importing the example configuration (see *Configuration of the modular slave Advantys STB Island on Profibus DP, p. 48*) the dialog appears as follows:
Data types and state RAM addresses are already assigned in the representation.

Note: Not all data types are always available for the individual I/O modules.

View scrolled to far left:



View scrolled to far right:



Parameters and Default Settings

Note: In the **Slave** area you will find the **Params...** command button for displaying the slave parameters.
In the **Master** area you will find the **Params...** command button for displaying and editing the master parameters. By activating the **Default...** command button the I/O addresses can be assigned automatically. Both dialogs can be found under *Master Parameterization and Automatic I/O Address Assignment for Profibus DP, p. 63* .

Master Parameterization and Automatic I/O Address Assignment for Profibus DP

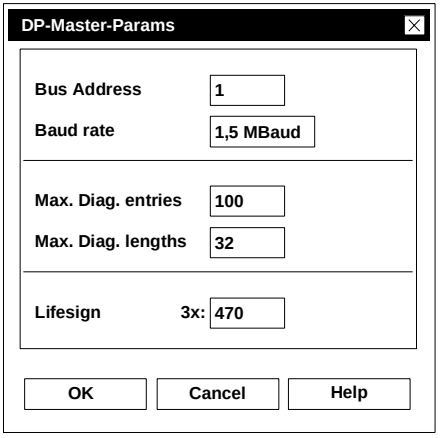
Overview

The following tables show the procedures to follow in defining the parameters for the master and the automatic I/O address assignment.

Note: More detailed information on the parameters can be found under *Master parameters, p. 65*

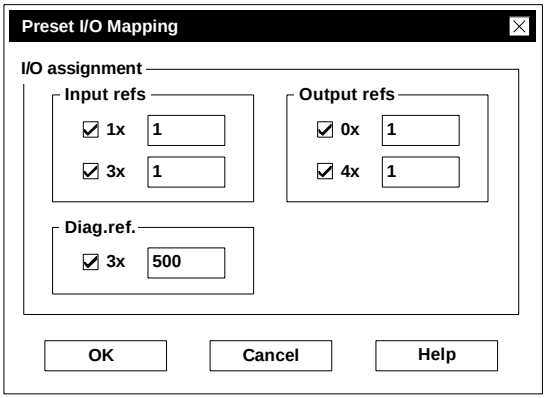
Master Parameterizing

To define parameters for the master, proceed as follows:

Step	Action
1	In the **Master** area, select the **Parameter...** command button. **Result:** The **DP-Master-Params** dialog opens. Dialog display 
2	Adopt the default settings as shown in the figure above or redefine them.
3	Exit the dialog box with **OK**. **Result:** You return to the **CRP-811-00 (PROFIBUS DP)** dialog.

Specifying I/O addresses automatically

To automatically define the I/O addresses proceed as follows:

Step	Action
1	Select the command button **Preset I/O Mapping**. The **Preset** dialog opens. Dialog display 
2	For **Input Refs** and **Output refs** enter `1000`.
3	Exit the dialog box with **OK**. **Result:** You return to the **CRP-811-00 (PROFIBUS DP)** dialog where the defined references are assigned automatically.

Master parameters

Introduction

The following is an explanation of the parameters as they are found in the *Master Parameterizing, p. 63* dialog.

Bus Address

The bus address of the configured PROFIBUS DP master as it was defined in the SyCon Configurator is shown in this text field.

Baud rate

The baud rate as it was defined in the SyCon Configurator is shown in this text field.

Max. Diag. Entries

The maximum number of diagnostic data entries made on the PCMCIA card is defined in this text field. The default is 100 (10 – 400 valid).
The value should be greater than 3 times the amount of slaves on the bus.
If the value that is defined here is too low then the master cannot start due to diagnosis-buffer-overrun.

Note: The following rule should be followed due to limited memory on the PCMCIA card: Max. Diag. entries x Max. Diag. length < 59520

Max. Diag. Length

The maximum number of diagnostic data bytes per slave that are buffered on the PCMCIA board is defined in this text field. The default is 32 (6 – 244 valid). The required minimum value is determined by the slave with the greatest number of diagnosis bytes. Slaves that exceed this value will not start up. The corresponding number of diagnostic bytes can be found in the manufacturer's documentation or the device data base.
Max. value entries means:
All diagnostics data will be received. The amount that is transferred to the PLC depends on the addressing however.
The following applies for Schneider slaves:

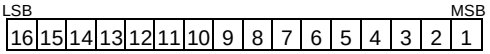
- Classic TIOs - max. 13 bytes diagnostics data
- Momentum - max. 19 bytes diagnostics data
- DEA203 - max. 22 bytes diagnostics data
- Advantys STB Island - max. 32 bytes diagnostic data

Note: The following rule should be followed due to limited memory on the PCMCIA card: Max. Diag. entries x Max. Diag. length < 59520

Lifesign

This text field defines a 3x address (a word) for the PROFIBUS DP status message.

Bit	Status message	Meaning
1-13	-	No significance
14	0 or 1	No slaves operating on PROFIBUS DP.
	Flashing	One or more slaves operating on PROFIBUS DP.
15	0 or 1	Not all the slaves are running on the PROFIBUS DP.
	Flashing	All the slaves are running on the PROFIBUS DP.
16	0 or 1	• CRP 811 has been removed from the backplane • CRP 811 is faulty. • Quantum is running on CRP 811 PROFIBUS DP, without slaves running.
16	Flashing	The CRP 811 runs on the backplane without problems.



Note: Diagnostic content is valid only if one slave was active at least one time.

3.5 Data storage in Advantys and Concept for communication with Profibus DP

Introduction

Overview

This section contains information about addressing I/O and MMI data in the Advantys configuration software and the Concept programming software and about the required program parts.

What's in this Section?

This section contains the following topics:

Addressing of the I/O modules in Advantys STB and Concept (Profibus DP communication)

Addressing

The following overview shows the address assignment for communication with Profibus DP in Advantys STB und Concept.
The address assignment in Advantys STB is done by the system and can be viewed under **Island** → **I/O Image Overview** → **Modbus Image** or **Island** → **I/O Image Overview** → **Fieldbus Image**.
The corresponding assignment in Concept is configured after import of the I/O configuration on the dialog box **CRP-811-00 (Profibus DP) (See *Dialog display, p. 61*)**.
The application configuration of the Magelis terminal with the XBTL1000 configuration software is based on the addresses in the Modbus format of the Advantys configuration software.

Data mapping in Concept

Use the following data types for addressing I/O modules:

I/O module type	Favored data type	Organization in state RAM
Binary	BOOL	Bitwise, as a multiple of 16 0x/1x or 3x/4x registers
Analog	UINT 16	Wordwise 3x/4x registers

Note: Mapping for a data range (input/output data or status) is not done using byte or word-spanning!
Depending on the module type, not all data types are always available.

Address assignment overview

For a PROFIBUS DP communication there are a total of 120 words available for the sum of the input and output data including the words for MMI communication.

The address assignments for the **Input data** (**Module alignment** checkbox for **Fieldbus Image** activated):

I/O module		**Addresses in:**			
Type	**Type of data**	**Advantys STB (Modbus format)**	**Advantys STB (Fieldbus format)**	**Concept**	
				Occupied	**Assigned range**
STB AVI 1270, 2 analog channels	Input data channel 1	R 45392, Bit 0 ... 15	W1, Bit 0 ... 15	MW 301020	MW 301020 ... 301022
	Input data channel 2	R 45394, Bit 0 ... 15	W2, Bit 0 ... 15	MW 301021	
	Input status channel 1	R 45393, Bit 0 ... 7	W3, Bit 8 ... 15	MW 301022, Bit 8 ... 15	
	Input status channel 2	R 45395, Bit 0 ... 7	W3, Bit 0 ... 7	MW 301022, Bit 0 ... 7	
STB DDI 3420, 4 digital input channels	Input data K1 ... K4	R 45396, Bit 0 ... 3	W4, Bit 0 ... 3	MB 100993 - 100996	MB 100993 - 101000
	Input status K1 ... K4	R 45397, Bit 0 ... 3	W4, Bit 4 ... 7	MB 100997... 101000	
STB DDO 3600, 6 digital ouput channels	Echo K1 ... K6	R 45398, Bit 0 ... 5	W5, Bit 0 ... 5	MB 101009 - 101014	MB 101009 - 101024
	Output status K1 ... K6	R 45399, Bit 0 ... 5	W5, Bit 8 ... 13	MB 101017 - 101022	
STB DDI 3420, 4 digital input channels	Input data K1 ... K4	R 45500, Bit 0 ... 3	W 6, Bit 0 ... 3	MB 101001 - 101004	MB 101001 - 101008
	Input status K1 ... K4	R 45501, Bit 0 ... 3	W6, Bit 4 ... 7	MB 101005 - 101008	
STB DDO 3230, 2 digital ouput channels	Echo K1 ... K2	R 45502, Bit 0 ... 1	W7, Bit 0 ... 1	MB 101025 - 101026	MB 101025 - 101032
	Output status K1 ... K2	R 45503, Bit 0 ... 1	W7, Bit 2 ... 3	MB 101027 - 101028	
HMI to PLC table	10 Words	R 49488 - 49497	W 8 ... 17	MW 301000 - 301009	MW 301000 - 301009

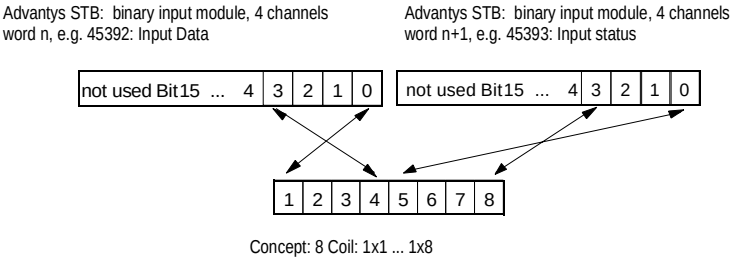
I/O module		Addresses in:			
Type	**Type of data**	**Advantys STB (Modbus format)**	**Advantys STB (Fieldbus format)**	**Concept**	
				Occupied	**Assigned range**
Legend					
K R W MW MB	Channel Register (Advantys Software, Modbus format) Word (Advantys Software, Fieldbus format) Input register (Concept, 3x references) Coil (Concept, 1x references)				

The address assignments for the **Output data** (**Module alignment** checkbox for **Fieldbus Image** activated):

I/O module		Addresses in:			
Type	**Type of data**	**Advantys STB (Modbus format)**	**Advantys STB (Fieldbus format)**	**Concept**	
				Occupied	**Assigned range**
STB DDO 3600, 6 digital ouput channels	Output data K1 ... K6	R 40001, Bit 0 ... 5	W1, Bit 0 ... 5	MB 000993 - 000998	MB 000993 - 001000
STB DDO 3230, 2 digital ouput channels	Output data K1 ... K2	R R40002, Bit 0 ... 1	W2, Bit 0 ... 1	MB 001001 - 001002	MB 001001 - 001008
PLC to HMI table	10 registers	R 44097 - 44106	W 3 ... 12	MW 401000 - 401009	MW 401000 - 401009
Legend					
K R W MW MB	Channel Register (Advantys Software, Modbus format) Word (Advantys Software, Fieldbus format) Output register (Concept, 4x references) Coil (Concept, 0x references)				

Binary input module, data type BOOL, mapping in 1x range

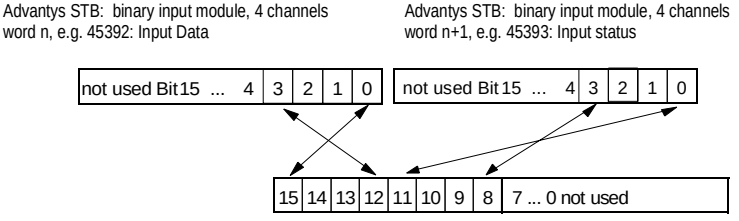
Addressing binary input modules for data type BOOL is done using data mapping in the 0x/1x range according to the following illustration:



Concept: 8 Coil: 1x1 ... 1x8

Binary input module, data type BOOL, mapping in the 3x range

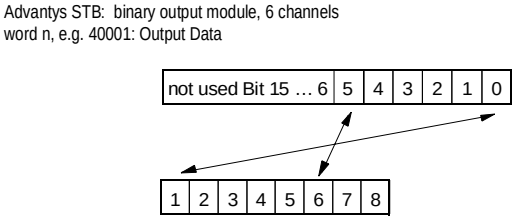
Addressing binary input modules for data type BOOL is done using data mapping in the 3x/4x range according to the following illustration:



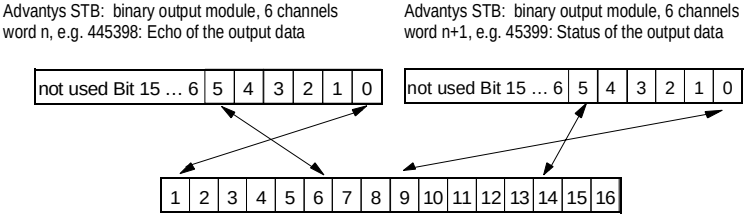
Concept: 1 coil word: 3xn

Binary output module, data type BOOL, mapping in the 0x/1x range

Addressing binary output modules for data type BOOL is done using data mapping in the 0x/1x range according to the following illustration:



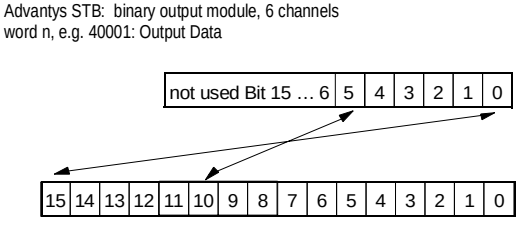
Concept: 8 Coil: 0x1 ... 0x8



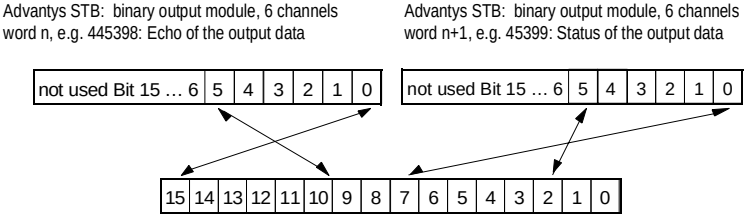
Concept: 16 Coil: 1x1 ... 1x16

Binary output module, data type BOOL, mapping in the 3x/4x range

Addressing binary output modules for data type BOOL is done using data mapping in the 3x/4x range according to the following illustration:



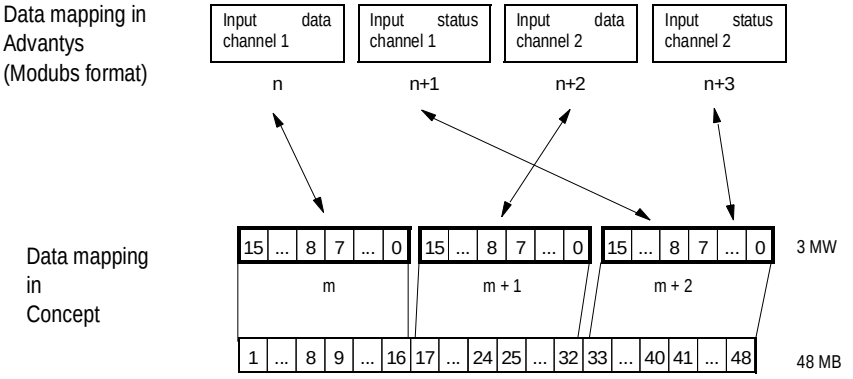
Concept: 1 coil word: 4x1



Concept: 1 coil word: 3x1

Analog input module, general information about data mapping

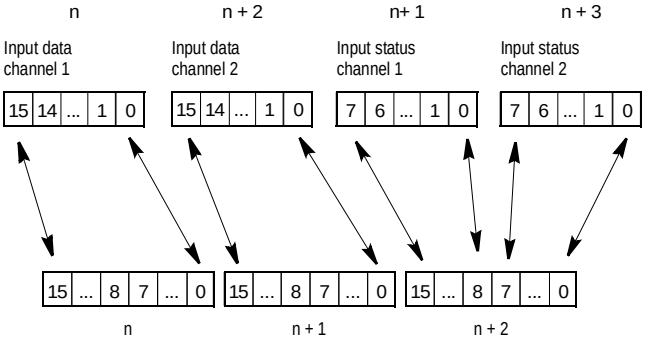
Note the following particularities for the data mapping of analog input modules:



Analog input module, data type UINT16, mapping in the 3x range

Addressing analog input modules for data type UINT16 is done using data mapping in the 3x/4x range according to the following illustration:

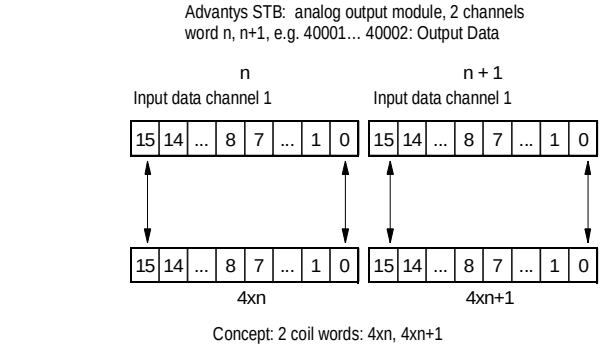
Advantys STB: analog input module, 2 channels, words n to n+3, e.g. 45392: 45395:



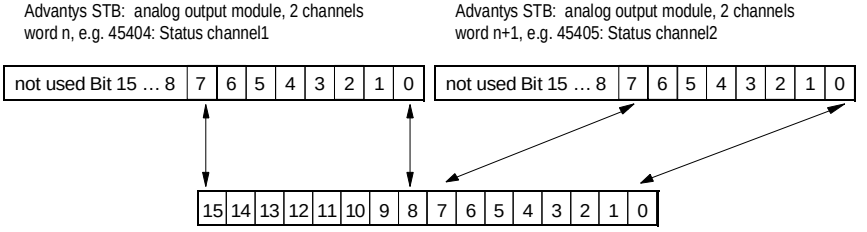
Concept: 3 coil words: 3xn ... 3xn+2

Analog output module, data type UINT16, mapping in the 3x/4x range

Addressing analog output modules for data type UINT16 is done using data mapping in the 3x/4x range according to the following illustration:



Concept: 2 coil words: 4xn, 4xn+1



Concept: 1 coil word: 3xn

Program description, variable list and section in Concept

Overview

For the fieldbus master, a counter must be configured whose setpoint and current values are sent to the Magelis terminal. The presetting of the setpoint is done using the Magelis terminal. The time of day that is available in the fieldbus master must also be prepared so that it is displayed on the Magelis terminal.
Furthermore, AND links must be configured that link inputs and outputs of the Advantys STB.
The following sections present a brief excerpt from the Concept configuration (section and variable list), which is necessary for the creation of the communication program.

Variable list

The following variables are defined:

Variable Name	address	Data type	Comments
reset_ctu	000101	Bool	Reset counter
PV_ctu	301000	INT	Presetting of the counter setpoint (specified to the PLC via MMI connected to Advantys STB Island)
ctrl_clock	402990	INT	Control word for the time of day
weekday	402991	INT	Day of the week (1 – 7; 1 = Sunday)
month	402992	INT	Month (1-12)
day	402993	INT	Day (1 - 31)
year	402994	INT	Year (00 – 99)
hour	402995	INT	Hours (0 – 23)
minute	402996	INT	Minutes (0 – 59)
second	402997	INT	Seconds (0 – 59)
MW1005	401005	INT	Hours (= 402995), presentation on MMI
MW1006	401006	INT	Minutes (= 402996), presentation on MMI
MW1007	401007	INT	Seconds (= 402997), presentation on MMI

For the complete assignment of the registers, see section *Address assignment overview, p. 69*.

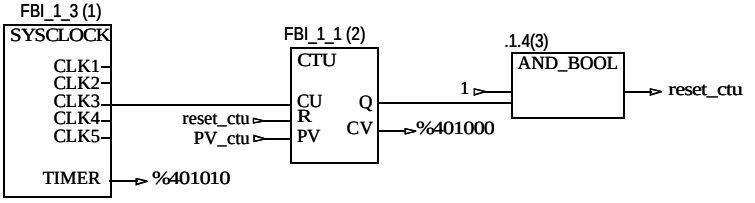
Delivery of the time

So that the time is available, you must activate the **Time of Day** checkbox. You will find it under **Project** → **Configurator** → **Specials**.
Now in the associated text field enter the register 4x**2990** as the first of 8 subsequent registers which are thus reserved for time of day.

Extract from the section

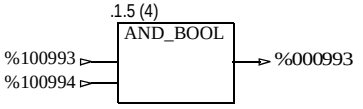
The following configuration is necessary to support the MMI communication:

Counter with setpoint presetting via the Magelis terminal

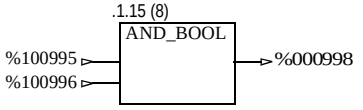


401000 1. Word PLC to HMI

Linking of inputs/outputs of Advantys STB Island

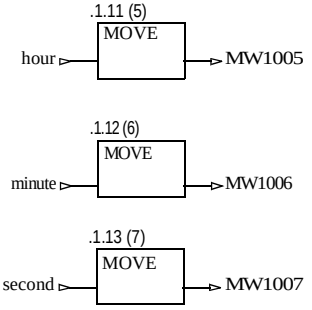


DDI3420 (bus address 2) channels 1 and 2
on
DDO3600 (bus address 3) channel 1



DDI3420 (bus address 2) channels 3 and 4
on
DDO3600 (bus address 3) channel 6

Presentation of the time (hours/minutes/seconds) on the Magelis terminal



3.6 Configuration of a Magelis XBT for connection to an Advantys STB Island with Profibus DP network interface

Introduction

Overview

This section describes the procedure of configuring a Magelis XBT to connect to an Advantys STB Island with Profibus DP network interface. For this you use the XBTL 1000 configuration software.

What's in this Section?

This section contains the following topics:

Configuration of the Magelis XBT PM 027010 on network interface module for Profibus DP communication

Overview

The following sections provide a brief description of the steps that are necessary for the configuration of the MMI application for Magelis XBT PM 027 010 for connection to an Advantys STB Island with a network interface module for Profibus DP.

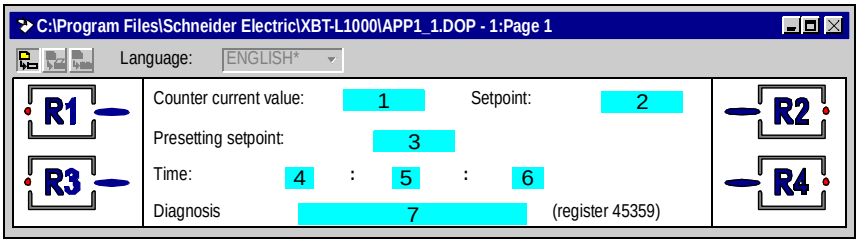
The description is divided into the following sections:

Presentation on the application page

The following data is presented on the application page:

- Diagnostic data directly from the Island bus data image
- Data that is sent and received via the fieldbus communication

The application page should look as follows:



Field 1 Display counter current value from master (Concept register 401000)

Field 2 Display setpoint (Concept variable PV_ctu (Concept register 301000))

Field 3 Presetting setpoint for counter in the master (Concept variable PV_ctu)

Fields 4-6 Display time from master (Concept variables MW1005, MW1006, MW1007)

Field 7 Display diagnostic register "network node configuration"(R 45359) of the Advantys STB Island

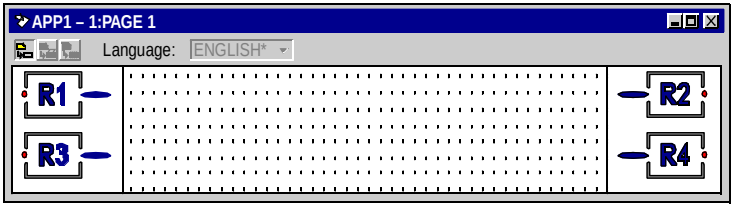
Configuration data for the individual fields:

Field	Associated variable (40001+i)		Format			Access	Modbus register in Advantys STB
	Equipment	i	Object	Type	length		
1	Master[1)]	4096	Word	Decimal	5	Read	44097 (PLC to HMI)
2	Master[1)]	9487	Word	Decimal	5	Read	49488 (HMI to PLC)
3	Master[1)]	9487	Word	Decimal	5	Write	49488 (HMI to PLC)
4	Master[1)]	4101	Word	Decimal	2	Read	44102 (PLC to HMI)
5	Master[1)]	4102	Word	Decimal	2	Read	44103 (PLC to HMI)
6	Master[1)]	4103	Word	Decimal	2	Read	44104 (PLC to HMI)
7	Master[1)]	5358	Word	Binary	16	Read	45359 (diagnostic STB)
1)	Here Master is the default of the XBTL1000 configuration software for the symbol of the Modbus slave connected to the Magelis terminal, in this case the Advantys STB Island with INTERBUS-NIM. The fieldbus master is not meant here.						

For the complete assignment of the registers, see section *Address assignment overview, p. 69*.

Setup of the application page

To set up the application page, proceed as follows:

Step	Action
1	Start the program **XBT-L 1000**. **Result**: The **Terminal type configuration** dialog box opens.
2	On this dialog box in the **Commercial references** area, select the terminal type **XBT-PM027010** by clicking it.
3	On this dialog box in the **Choose Protocol** area, select **Modbus** as the communication protocol.
4	Confirm the selection with **OK**. **Result**: The page editor opens with **Page 1** : 
5	Under **Configuration** → **Dialogue table**, deactivate the **Use dialogue table** checkbox.
6	Save your application with **File** → **Save**. The **Save As** dialog box is displayed.
7	Specify the place and name under which your application should be saved; for the example: `LW:\Schneider Application\Advantys_HMI_Profius_DP\Magelis_pb1\xbtl_pb1.dop`. Confirm with the **Save** command button.

Configuring the application page

To configure the following application page, proceed as follows:

Step	Action
1	Place the pointer at the beginning of the second line and enter the text `Counter Current Value: .`
2	Place the pointer in the position of field 1, see section *Presentation on the application page, p. 79*.
3	With **Edit** → **Insert variable field** → **Alphanumeric**, insert the field for displaying the current value of the counter. **Result**: The **Insert an alphanumeric field** dialog box opens.
4	Configure this field in accordance with the details in the table in section *Presentation on the application page, p. 79*. (You will find the selection for the **Access** under **"Options..."**).
5	Proceed with the configuration of the other fields 2 - 7 in accordance with the presentation of the application page and the table in section *Presentation on the application page, p. 79* by repeating steps 1 to 4.

Loading the application

To load the application in the Magelis XBT, proceed as follows:

Step	Action
1	Connect the configured PC interface using the **XBTZ915** cable with the Magelis XBT PN 027010.
2	Select **Send** → **Export** to send your application to the Magelis. **Result**: The application is sent to the connected Magelis terminal.

Operation of the Magelis XBT PM 027010

Operating the application

To operate the application in the Magelis XBT, proceed as follows:

Step	Action
1	Make sure that the fieldbus connections are plugged into your configuration and that the applications are started in the controller that contains the fieldbus master as well as in the Advantys STB Island.
2	Connect the CFG interface of the network interface module of the Advantys STB Island using the **XBTZ988** cable with the Magelis XBT PM 027010. **Result**: The configured application page is displayed on the terminal's screen. Now in the **Presetting setpoint** field you can specify the setpoint for the counter that is configured on the controller connected to the fieldbus.

Application example for connecting an MMI terminal to Advantys STB Island with INTERBUS-NIM

4

At a Glance

Introduction

In this chapter you will find the application description for the connection of an MMI terminal Magelis XBT• to an Advantys STB Island with an INTERBUS network interface.

What's in this Chapter?

This chapter contains the following sections:

4.1 Application with INTERBUS communication

Introduction

Overview

This section provides a brief overview of the hardware for the INTERBUS communication and of the applications.

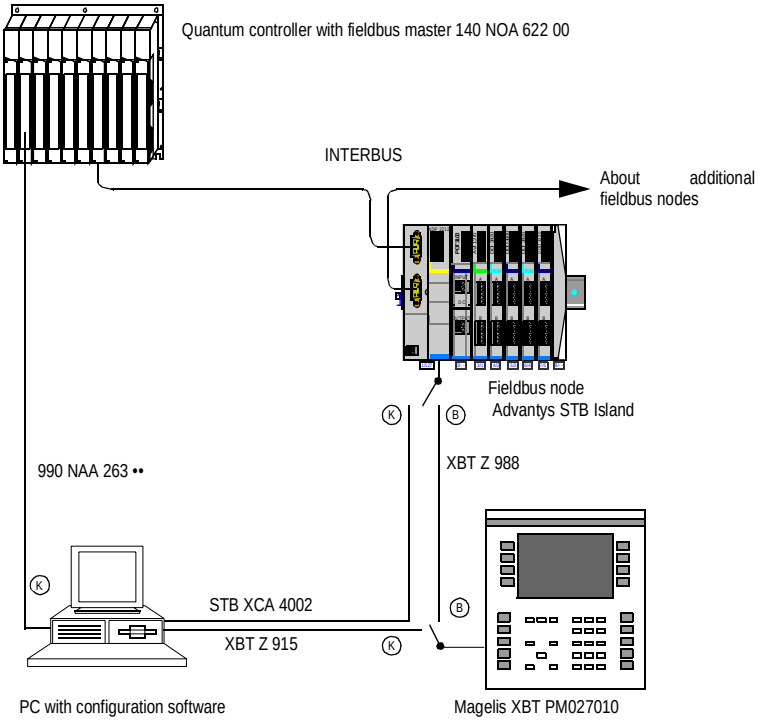
What's in this Section?

This section contains the following topics:

Overview of hardware configuration with INTERBUS

Sample configuration

The following figure shows the configuration that is described in the application example:



K Connections for the transfer of the configurations and programs

B Connection for the operation of the MMI terminal to Advantys STB Island

Required components and cables

The configuration of the individual nodes, the required configuration software and the requirements of the PC are found in chapter *Hardware and software requirements, p. 17*.

The following table shows the required cable (overview, see section *Cable, p. 23*):

Cable for configuration and transfer

Type	Meaning
990 NAA 263 20	Modbus connection cable between PC and CPU of the Quantum
STB XCA 4002	Connection cable between PC and CFG interface of the network interface module of the Advantys STB Island
XBT Z915	Connection cable between PC and Magelis XBT PM027010 for the transfer of the application

Cable for operating the application:

Type	Meaning
XBT Z988	Connection cable between the Advantys XBT Island and the Magelis XBT PM027010 for operation of the application

Note:
If the abovementioned XBT cable Z988 is not available, you can also use the 3 following cables together to operate the Magelis on Advantys STB Island:

- XBT Z9710
- 990 NAA 263 20
  and
- STB XCA 4002

INTERBUS cable and connectors

Model	Order No.
Programming cable for 140 NOA 622 00, 3.7 m (Modbus cable)	990 NAA 263 20
INTERBUS cable, 100 cm	170 MCI 100 00
Remote bus cable 100 m	TSX IBSCA 100
Remote bus cable 400 m	TSX IBSCA 400
Remote bus cable (by the meter), LiYCY 3x2x0.25 mm^2	KAB3225LI
INTERBUS plug set, 9 pin D-SUB, plug plus socket	170 XTS 009 00
Branch interface for remote bus branch, copper cable	170 BNO 671 0x
Interface for DEA station	AS BDEA 202

Note: For information about the connection occupation of the cables and the installation of the INTERBUS, see the ***Quantum 140 NOA 622 00, 840 USE 497 02*** user manual and the application manual for the ***Advantys STB Standard-INTERBUS network interface module, 890 USE 174 02***.

Description of the application for INTERBUS

Overview

The application describes the possibility of operating a Magelis terminal directly on the CFG interface of a network interface module of an Advantys STB Island. Here the data should be presented on the Magelis terminal that is sent and received via the fieldbus communication as well as data directly from the data image of the Advantys STB Island.

Description

First the individual steps are described that are necessary to establish fieldbus communication between master, Advantys STB Island, and Magelis terminal. Then there is a brief presentation of the necessary configuration and programming for the fieldbus master and the Magelis terminal.

4.2 Configuration of an Advantys STB Island with MMI connection and INTERBUS network interface

Introduction

Overview

This section describes the procedure for configuration of an Island configuration with INTERBUS network interface and MMI. For this you use the Advantys configuration software.

What's in this Section?

This section contains the following topics:

Configuration of the Advantys STB Island mit INTERBUS communication

Overview

The following sections provide a brief description of the steps that are necessary for configuration of the Advantys STB Island with INTERBUS communication and MMI connection.
The description is divided into the following sections:

- Setting up the workspace and Island
- Configuring the hardware
- Activating the MMI configuration

Setting up the workspace and Island

To set up the workspace and Island, proceed as follows:

Step	Action
1	Start the Advantys configuration software.
2	With **File** → **New Workspace** open the **New Workspace** dialog box.
3	In the **Workspace file** area and in the **Island file** area, enter the respective name for the new workspace and the Island in the **Name** field; for the example **STB_IB1**
4	In the **Workspace file** area, in the **Position** field, you can enter the location where you would like to store the workspace and Island. Accept the default here. Note: The data storage location and the file name are displayed in the **Name with Path** text box.
5	Confirm with **OK**. **Result:** The new workspace and the new Island are created.
6	Save the new workspace and Island with **File** → **Save workspace**.

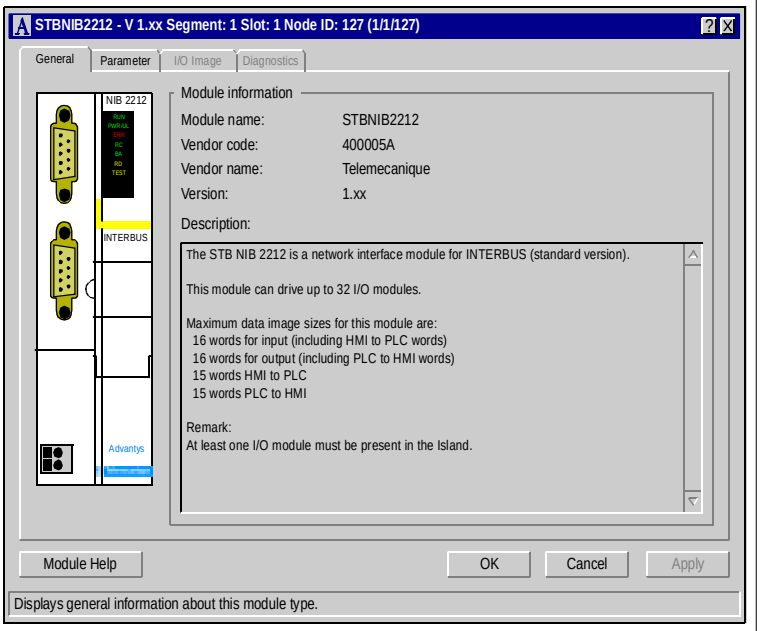
Configuration of the Hardware

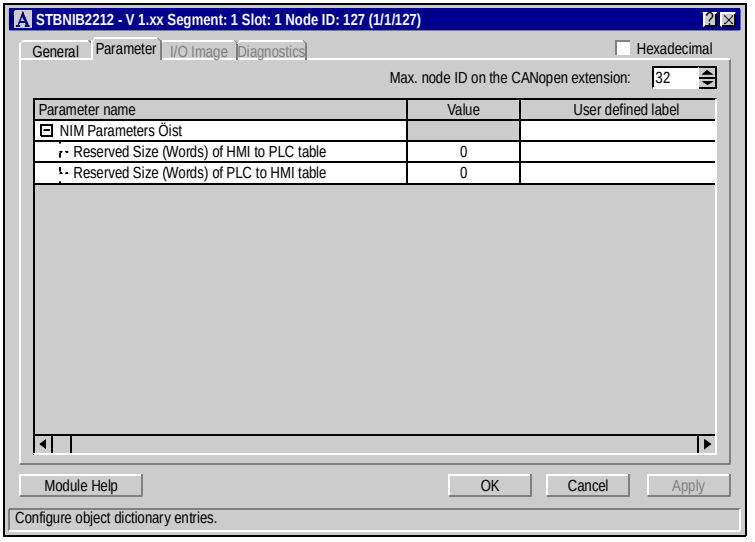
To configure the hardware, proceed as follows:

Step	Action
1	In the catalog browser, expand the module type **Networking**.
2	Double-click on the module **STBNIB2212**. **Result**: In the Island editor, the network interface module is stored in the position all the way to the left.
3	In the catalog browser, expand the module type **Power**.
4	Double-click on the module **STBPDT3100**. **Result**: In the Island editor, the module is stored in the next position to the right.
5	Repeat steps 3 (expansion of the required module type) to 4 until you have completed your Island configuration in accordance with section *Advantys STB Island configuration, p. 19*.
6	Save the configuration with **File** → **Save Island:STB_IB1**.

Activation of the MMI communication

To activate the MMI communication, proceed as follows:

Step	Action
1	Double-click on the network interface module (NIM) STB NIB 2212 **Result:** The module editor opens:  On the **General** tab you will find details about the configured network interface module (NIM) and about the data range lengths for input/output data and for the MMI communication. These areas depend on the configured NIM.

Step	Action
2	Change to the **Properties** tab:  In the **Value** column, enter the word count that you would like to reserve in the Advantys STB Island for the communication of a Magelis terminal to the fieldbus master (HMI to PLC table) and for the communication from the fieldbus master to a Magelis terminal (PLC to HMI table). For the example, enter 9 words for each communication direction. **Note:** For the sample configuration (See *Advantys STB Island configuration, p. 19*), a maximum of 9 words can be configured for input direction (HMI to PLC table) and 14 words in output direction (PLC to HMI table).
3	Close the module editor by clicking the **OK** button.
4	Save the parameter input with **File** → **Save Island:STB_IB1**.

Build and download the application in the Island

Build and download the application

To build and download the application, proceed as follows:

Step	Action
1	With **Island** → **Build** execute the building of the application. If errors are reported here (display on the log window), remove these and then rebuild.
2	Under **Online** → **Connection settings** → **Settings...** configure the interface with which you would like to connect the Advantys STB Island to the PC (COM1 or COM2).
3	Connect the Advantys STB Island to this interface with the STB XCA 4002 cable.
4	Select **Online** → **Connect**. The **Data transfer** dialog box opens.
5	Click the **Download** button to downoad your configured application to the Island. **Result**: The application is downloaded in the Island. The result will appear in the log window.
6	Confirm the following query whether the Island should be put into the "running" state with **OK**. **Result**: The island is started.

4.3 Bus configuration for INTERBUS

Introduction

Overview

This section contains information concerning the configuration of the INTERBUS Master TSX Quantum 140 NOA 622 00 with the SyCon configuration tool.

What's in this Section?

This section contains the following topics:

Introduction

Overview

The bus configuration tool SYC SPU LF• CD28M, called SyCon below, is used to configure the INTERBUS network. However, SyCon is not started individually, but rather called from Concept (See *Selection of the INTERBUS in Concept, p. 98*).

Note: Included with the SyCon Configurator software are some EDS files for INTERBUS Master and Slave modules from Telemecanique and other manufacturers. You must still build the EDS file for the modular slave Advantys STB Island and load it into the SyCon EDS directory.

Procedure

Follow these steps to create the bus configuration:

Step	Action
1	*Creating the EDS file of the Advantys STB configuration for INTERBUS, p. 96*
2	Copy the EDS file into the corresponding SyCon directory
3	Creating the bus configuration with Concept and SyCon (See *Startup of the INTERBUS Master 140 NOA 622 00, p. 98*)

Notes

Note: The following description concerns the fundamental configuration steps only.
For detailed information, please refer to the online help for the SyCon Configurator and Concept and the corresponding help files on the installation CD.

Creating the EDS file of the Advantys STB configuration for INTERBUS

Creating the EDS file

You can create the EDS file for the INTERBUS configuration in two ways:

- Configuration-specifically via the Advantys configuration software (See *Creating the EDS file with Advantys configuration software, p. 96*)
  or
- with the SyCon (See *Creating the EDS file with SyCon, p. 96*) EDS Generator

Creating the EDS file with Advantys configuration software

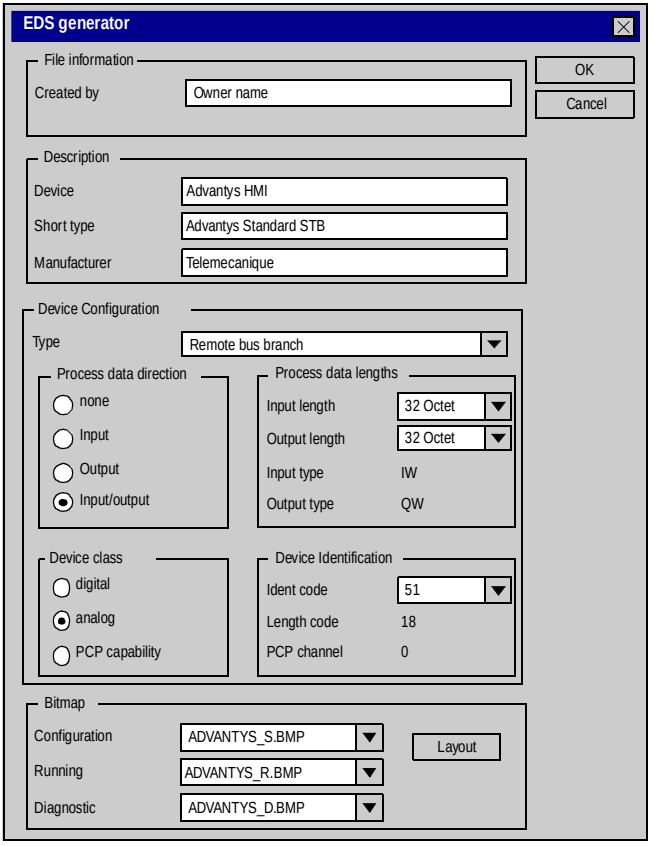
To create the EDS file for the INTERBUS configuration with the Advantys STB configuration software, proceed as follows:

Step	Action
1	Ensure that the configuration software is **not Online** → **Connected**.
2	Select **File** → **Export stb_ib1 ...**. The **Export** dialog box opens.
3	Under **Save** enter the path where the EDS file should be saved. **Note**: If you specify the directory in which all EDS files for INTERBUS in SyCon are stored here (e.g. LW:\...\SyCon\Fieldbus\Interbus\EDS), you do not have to copy the file into this directory again with SyCon.
4	Under **Filename** enter the name of the EDS file; for the example: **STB_IB1**
5	Click the **Save** command button. **Result**: The Advantys configuration software saves the Island, produces the configuration internally, and finally performs the export operation into the EDS file. **Note:** If an error occurs during saving or production, the export is cancelled. Remove the errors and execute another export. Display occurs in the log window.

Creating the EDS file with SyCon

To create the EDS file for the INTERBUS configuration with the SyCon EDS Generator, proceed as follows:

Step	Action
1	Start SyCon and create an INTERBUS project with **File** → **New**.
2	Select **Tools** → **EDS Generator...**. The **EDS Generator** dialog box opens.

Step	Action
3	On the **EDS Generator** dialog box, enter the following data: 
4	Click the **OK** command button. **Result**: The default dialog box **Save file as** opens.
5	Here you specify the directory and the name under which the EDS file should be saved. Accept the preset for the directory. Now enter the desired name (for the example **STB_IB1.eds**) and confirm with **Save**. **Result:** The file is saved in the specified directory and is available directly in SyCon if you have accepted the default.

Startup of the INTERBUS Master 140 NOA 622 00

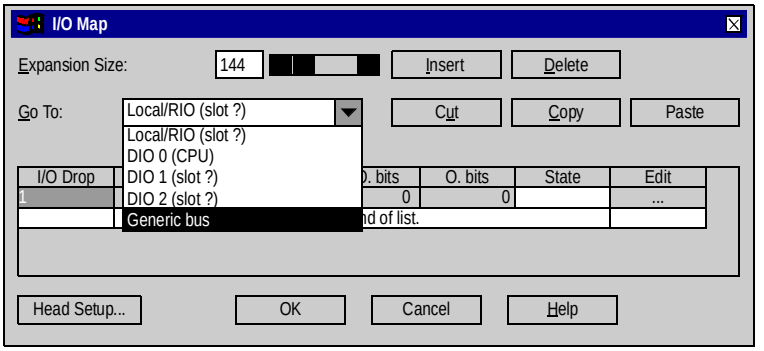
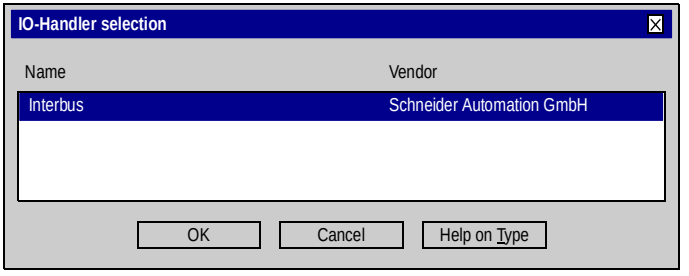
Overview

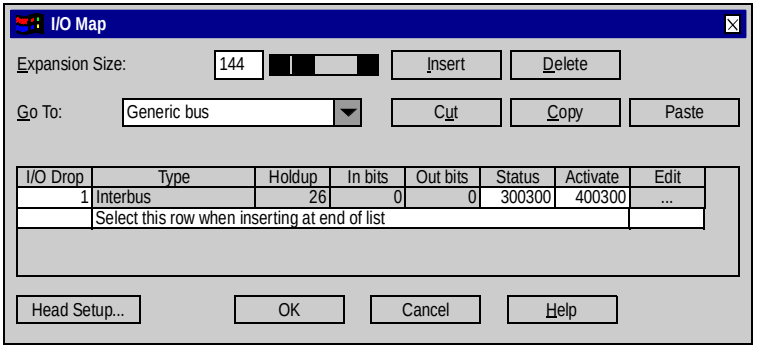
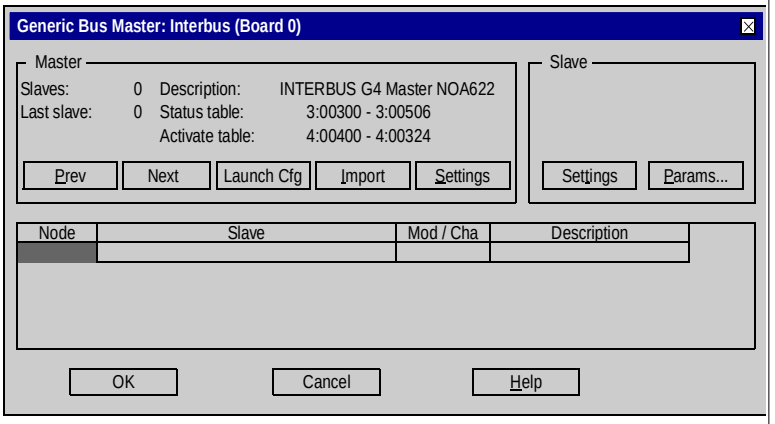
The following sections provide a brief description of the steps required for the startup and software configuration of the INTERBUS master 140 NOA 622 00.
The steps are divided into the following sections:

- *Selection of the INTERBUS in Concept, p. 98*
- *Evaluating the bus configuration with SyCon, p. 100*
- *Editing the bus configuration in Concept, p. 101*
- *Configuration of the 140 NOA 622 00 itself, p. 103*

Selection of the INTERBUS in Concept

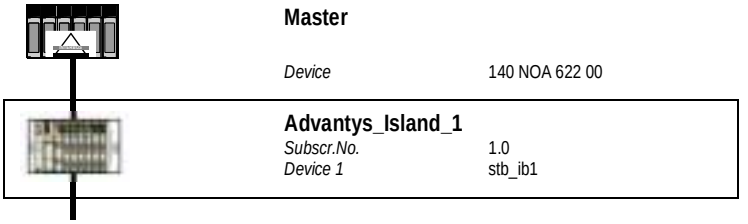
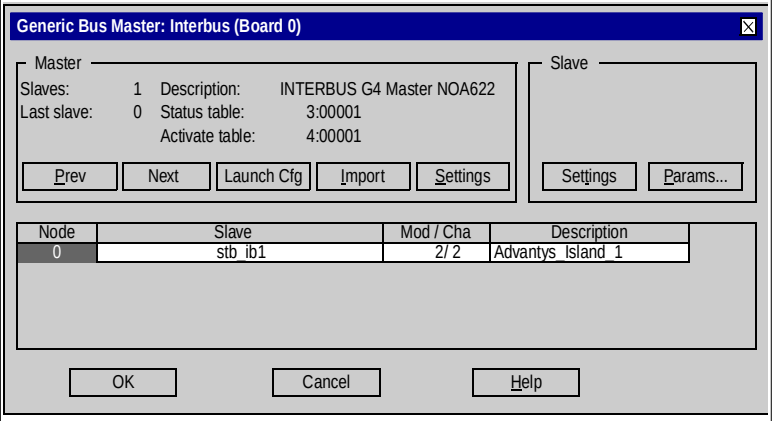
Proceed as follows to enter the INTERBUS in Concept for using the 140 NOA 622 00:

Step	Action
1	Open the respective project in Concept.
2	Select **Project** → **Configurator** → **I/O Map** → **Go to** the entry **Generic bus**. 
3	Click **Insert** and enter **Interbus** in the **I/O Handler selection** dialog box. 

Step	Action
4	Enter the initial addresses for the respective references in the **Status** box and **Activate**. For additional notes, see the section about ***Diagnostics and Setup via the Generic Bus*** in the ***Quantum 140 NOA 622 00*** User guide. 
5	Select the desired INTERBUS and continue with **Edit...**to the dialog box **Generic Bus Master: Interbus (Board x)** 
6	Start the SyCon program with **Launch cfg** for bus configuration (See *Evaluating the bus configuration with SyCon, p. 100*) **Note:** You can import a bus configuration with the command button **Import**. Here the Bus tables for the Generic Bus are created from scratch by the system. Therefore, you must also re-enter all address assignments in Concept even for the unchanged bus nodes. If you make a configuration change in SyCon using the command button **Launch Cfg**, as a rule the address assignments of unchanged INTERBUS nodes are retained. However, this must be checked.

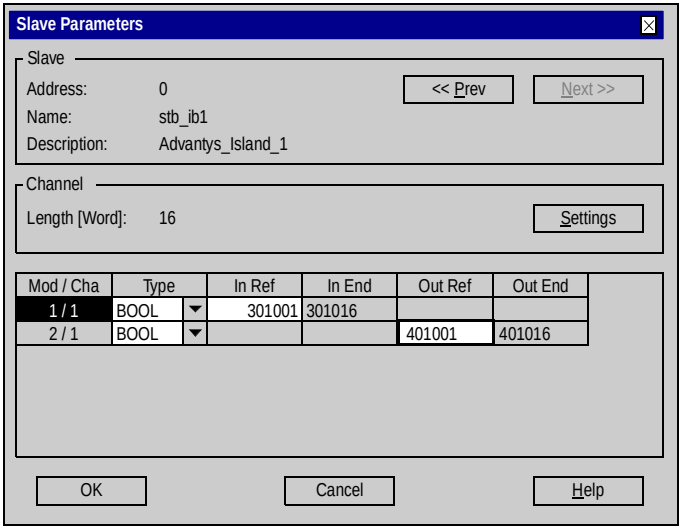
Evaluating the bus configuration with SyCon

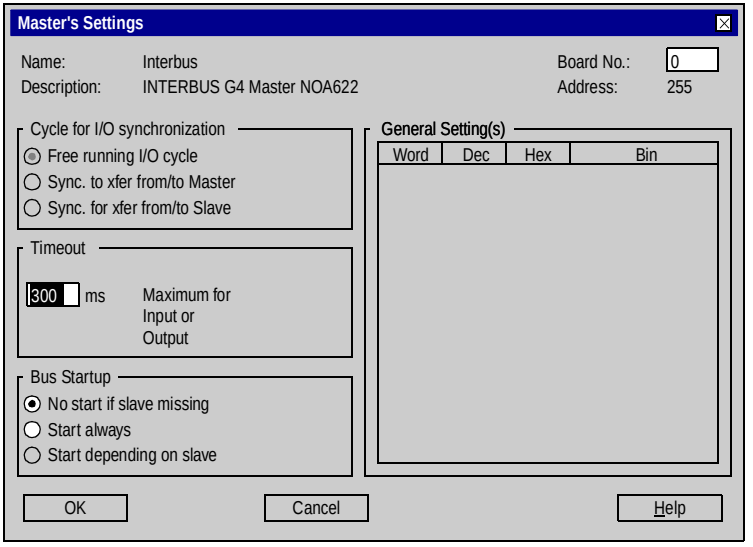
For evaluating the INTERBUS configuration using the SyCon bus configuration tool, proceed as follows:

Step	Action
1	There are the following possibilities for evaluating the INTERBUS configuration: ● Read the connected INTERBUS configuration using **Online** → **Automatic Network Scan** **Note** : Select the **CIF Serial Driver** and assign the appropriate COM interface. Connect the NOA 622 to the PC (for cable see *Hardware requirements, p. 18*). ● Enter the connected INTERBUS configuration ● For converting existing CMD projects of the Generation 4 to SyCon, see User's manual ***Quantum 140 NOA 622 00*** in the section ***Importing from CMD G4 Projects in SyCon***. **Note** : Further information on this can be found in the SyCon online help or in the documentation provided on the SyCon CD.
2	The following figure shows the configuration in SyCon: 
3	Save the project and close SyCon. **Result**: The INTERBUS configuration data is accepted by Concept when SyCon is closed. The list of nodes is displayed in the dialog box **Generic Bus Master: Interbus (Board x)**. 

Editing the bus configuration in Concept

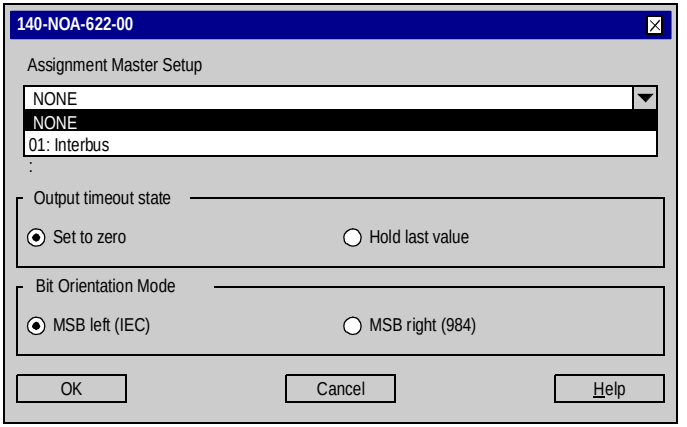
You must now make the following entries for the INTERBUS configuration in Concept:

Step	Action
1	Enter State RAM addresses for every IBS slave in **Slave** → **Params...** on the dialog box **Generic Bus Master: Interbus (Board x)**. You can switch between the individual slave nodes in the dialog box **Slave Parameter** using **<<Previous** and **Next>>**. 

Step	Action
2	Check, and if necessary change the settings for **Timeout** and **Bus startup behavior** in the **Master** area under **Settings**.  **Note:** The Timeout time selected for the NOA 622 must be larger than or equal to the CPU Watchdog Timeout to avoid an INTERBUS failure with a program that is still running. For larger configurations the CPU Watchdog Timeout and the Timeout time for the NOA622

Configuration of the 140 NOA 622 00 itself

Proceed as follows for entering the INTERBUS Master:

Step	Action
1	Select **I/O Map** → **Go To** the entry **Local/Remote Head (slot?)**
2	In the I/O map for the local backplane under **Project** → **Configurator** → **I/O map** → **Edit....** → **Module** enter module 140 NOA 622 00.
3	Assign the respective INTERBUS to the corresponding NOA using **Params** in the **140-NOA-622-00** parameter dialog box. 
4	In the **140-NOA-622-00** parameter dialog box, accept the default values for the **Output Timeout State** and the **Bit Orientation Mode**.
5	Confirm the settings with **OK**

4.4 Data storage in Advantys and Concept for communication with INTERBUS

Introduction

Overview

This section contains information about addressing I/O and MMI data in the Advantys configuration software and the Concept programming software and about the required program parts.

What's in this Section?

This section contains the following topics:

Addressing in Advantys configuration software and Concept (INTERBUS communication)

Addressing

The following overview shows the address assignment for the INTERBUS communication in Advantys configuration software and Concept.
The address assignment in the Advantys configuration software is done by the system and can be viewed under **Island** → **I/O Image Overview** → **Modbus Image** or **Island** → **I/O Image Overview** → **Fieldbus mage**.
The corresponding assignment in Concept is configured after import of the I/O configuration on the dialog box **Slave parameters (See *Editing the bus configuration in Concept, p. 101*)**.
The application configuration of the Magelis terminal with the XBTL1000 configuration software is based on the addresses in the Modbus format of the Advantys configuration software.

Data mapping in Concept

During INTERBUS communication, all input data and all output data are stored in Concept in sequential input and output registers according to the Fieldbus Image of the Advantys configuration software. When addressing the input and output registers in Concep

Address modes of the 140 NOA 622 00

The default of the address mode for the fieldbus master is **MSB left (IEC)**. If you select another setting here, under some circumstances this can have effects on the storage of the I/O data in Concept.
With the mixed Island occupation (digital and analog) shown in the example and with a purely analog occupation, the data storage in Concept is independent of the address mode of the 140 NOA 622 00 (IEC or 984).

Address assignment overview

You will find the address assignments for the input and output data here. For an INTERBUS communication there are a maximum of 16 words input and 16 words output data available (including the words for MMI communication).
The address assignments for the **input data**:

I/O module		**Addresses in:**		
Type	**Type of data**	**Advantys STB (Modbus format)**	**Advantys STB (Fieldbus format)**	**Concept**
STB NIB 2212	Status bit	-	W 1, Bit 0 ... 15	MW 301001
STB AVI 1270, 2 analog input channels	Input data channel 1	R 45392, Bit 0 ... 15	W 2, Bit 0 ... 15	MW 301002
	Input status channel 1	R 45393, Bit 0 ... 7	W 3, Bit 0 ... 7	MW 301003, Bit 0 ... 7
	Input data channel 2	R 45394, Bit 0 ... 15	W 4, Bit 0 ... 15	MW 301004
	Input status channel 2	R 45395, Bit 0 ... 7	W 5, Bit 0 ... 7	MW 301005, Bit 0 ... 7
STB DDI 3420, 4 digital input channels	Input data K1 ... K4	R 45396, Bit 0 ... 3	W 5, Bit 8 ... 11	MW 301005, Bit 8 ... 11
	Input status K1 ... K4	R 45397, Bit 0 ... 3	W 5, Bit 12 ... 15	MW 301005, Bit 12 ... 16
STB DDO 3600, 6 digital output channels	Echo K1 ... K6	R 45398, Bit 0 ... 5	W 6, Bit 0 ... 5	MW 301006, bit 0 .. 5
	Output status K1 ... K6	R 45399, Bit 0 ... 5	W 6, Bit 6 ...11	MW 301006, Bit 6 ... 11
STB DDI 3420, 4 digital input channels	Input data K1 ... K4	R 45400, Bit 0 ... 3	W 6, Bit 12 ... 15	MW 301006, Bit 12 ... 16
	Input status K1 ... K4	R 45401, Bit 0 ... 3	W 7, Bit 0 ... 3	MW 301007, Bit 0 ... 3
STB DDO 3230, 2 digital output channels	Echo K1 ... K2	R 45402, Bit 0 ... 1	W 7, Bit 4 ... 5	MW 301007, Bit 4 ... 5
	Output status K1 ... K2	R 45403, Bit 0 ... 1	W 7, Bit 6 ... 7	MW 301007, Bit 6 ... 7
HMI to PLC table	9 words	R 49488 - 49496	W 8 to 16	MW 301008 ... MW 301016

I/O module		Addresses in:		
Type	**Type of data**	**Advantys STB (Modbus format)**	**Advantys STB (Fieldbus format)**	**Concept**
Legend				
K R W MW	Channel Register (Advantys Software, Modbus format) Word (Advantys Software, Fieldbus format) Input register (Concept, 3x references)			

The address assignments for the **output data**:

I/O module		Addresses in:		
Type	**Type of data**	**Advantys STB (Modbus format)**	**Advantys STB (Fieldbus format)**	**Concept**
STB NIB 2212	Control bit	-	W 1, Bit 0 ... 15	MW401001
STB DDO 3600, 6 digital output channels	Output data K1 ... K6	R 40001, Bit 0 ... 5	W 2, Bit 0 ... 5	MW401002, Bit 0 ... 5
STB DDO 3230, 2 digital output channels	Output data K1 ... K2	R 40002, Bit 0 ... 1	W 2, Bit 6 ... 7	MW401002, Bit 6 ...7
PLC to HMI table	9 words	R 44097 - 44105	W 3 - 11	MW401003 ... MW 401011
Legend				
K R W MW	Channel Register (Advantys Software, Modbus format) Word (Advantys Software, Fieldbus format) Output Register (Concept, 4x references)			

Storage of the input data

The following table shows how the 16 words of the input process map of the sample configuration (See *Advantys STB Island configuration, p. 19*) is arranged in the Advantys configuration software (**Island → I/O Image Overview → Fieldbus Image)** as well as in Concept.

Storage in the Advantys configuration software, Fieldbus Image

<table>
<tr><td colspan="17">Input Data</td></tr>
<tr><td rowspan="2">Word</td><td colspan="16">Bit</td></tr>
<tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td>1</td><td colspan="16">NIM status word (Sts)</td></tr>
<tr><td>2</td><td colspan="16">Input data channel 1, AVI 1270 (bus address 1)</td></tr>
<tr><td>3</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="8">Input status channel 1, AVI 1270 (bus address 1)</td></tr>
<tr><td>4</td><td colspan="16">Input data channel 2, AVI 1270 (bus address 1)</td></tr>
<tr><td rowspan="2">5</td><td colspan="4">Input status DDI3420 (bus address 2)</td><td colspan="4">Input data DDI3420 (bus address 2)</td><td colspan="8" rowspan="2">Input status channel 2, AVI 1270 (bus address 1)</td></tr>
<tr><td>K4</td><td>K3</td><td>K2</td><td>K1</td><td>K4</td><td>K3</td><td>K2</td><td>K1</td></tr>
<tr><td rowspan="2">6</td><td colspan="4">Input data DDI3420 (bus address 4)</td><td colspan="4">Output status DDO3600 (bus address 3)</td><td colspan="8">Echo of the output data DDO3600 (bus address 3)</td></tr>
<tr><td>K4</td><td>K3</td><td>K2</td><td>K1</td><td>K6</td><td>K5</td><td>K4</td><td>K3</td><td>K2</td><td>K1</td><td>K6</td><td>K5</td><td>K4</td><td>K3</td><td>K2</td><td>K1</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">-</td><td colspan="2">Output status DDO3230 (bus address 5)</td><td colspan="2">Echo of the output data DDO3230 (bus address 5)</td><td colspan="4">Input status DDI3420 (bus address 4)</td></tr>
<tr><td>K2</td><td>K1</td><td>K2</td><td>K1</td><td>K4</td><td>K3</td><td>K2</td><td>K1</td></tr>
<tr><td>8</td><td colspan="16">1st word MMI →PLC communication</td></tr>
<tr><td>9</td><td colspan="16">2nd word MMI →PLC communication</td></tr>
<tr><td>: : :</td><td colspan="16">: : :</td></tr>
<tr><td>15</td><td colspan="16">8th word MMI →PLC communication</td></tr>
<tr><td>16</td><td colspan="16">9th word MMI →PLC communication</td></tr>
</table>

Storage in Concept

Input Data																
Word	**Bit**															
	15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
301001	NIM status word (Sts)															
301002	Input data channel 1, AVI 1270 (bus address 1)															
301003	-	-	-	-	-	-	-	-	Input status channel 1, AVI 1270 (bus address 1)							
301004	Input data channel 2, AVI 1270 (bus address 1)															
301005	Input status DDI3420 (bus address 2)				Input data DDI3420 (bus address 2)				Input status channel 2, AVI 1270 (bus address 1)							
	K4	K3	K2	K1	K4	K3	K2	K1								
301006	Input data DDI3420 (bus address 4)				Output status DDO3600 (bus address 3)						Echo of the output data DDO3600 (bus address 3)					
	K4	K3	K2	K1	K6	K5	K4	K3	K2	K1	K6	K5	K4	K3	K2	K1
301007	-	-	-	-	-	-	-	-	Output status DDO3230 (bus address 5)		Echo of the output data DDO3230 (bus address 5)		Input status DDI3420 (bus address 4)			
									K2	K1	K2	K1	K4	K3	K2	K1
301008	1st word MMI →PLC communication															
301009	2nd word MMI →PLC communication															
: : :	: : :															
301015	8th word MMI →PLC communication															
301016	9th word MMI →PLC communication															

Storage of the output data

The following table shows how the 11 words of the output process map of the sample configuration (See *Advantys STB Island configuration, p. 19*) is arranged in the Advantys configuration software (**Island → I/O Image Overview → Fieldbus Image)** as well as in Concept.

Storage in the Advantys configuration software, Fieldbus Image

Output Data																
Word	**Bit**															
	15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
1	NIM control word (ctl)															
2	-	-	-	-	-	-	-	-	Output data DDO3230 (bus address 5)		Output data DDO3600 (bus address 3)					
									K2	K1	K6	K5	K4	K3	K2	K1
3	1st word PLC →MMI communication															
4	2nd word PLC →MMI communication															
: : :	: : :															
10	8th word PLC →MMI communication															
11	9th word PLC →MMI communication															

Storage in Concept

Output Data																
Word	**Bit**															
	15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
401001	NIM control word (ctl)															
401002	-	-	-	-	-	-	-	-	Output data DDO3230 (bus address 5)		Output data DDO3600 (bus address 3)					
									K2	K1	K6	K5	K4	K3	K2	K1
401003	1st word PLC →MMI communication															
401004	2nd word PLC →MMI communication															
: : :	: : :															
401010	8th word PLC →MMI communication															
401011	9th word PLC →MMI communication															

Program description, Variable list and Section in Concept

Overview

For the fieldbus master, a counter must be configured whose setpoint and current values are sent to the Magelis terminal. The presetting of the setpoint is done using the Magelis terminal. The time of day that is available in the fieldbus master must also be prepared so that it is displayed on the Magelis terminal.
Furthermore, AND links must be configured that link inputs and outputs of the Advantys STB.
The following sections present a brief excerpt from the Concept configuration (section and variable list), which is necessary for the creation of the communication program.

Variable list

The following variables are defined:

Variable Name	address	Data type	Comments
reset_ctu	000101	Bool	Reset counter
PV_ctu	301008	INT	Presetting of the counter setpoint (specified to the PLC via MMI connected to Advantys STB Island)
ctrl_clock	402990	INT	Control word for time of day
weekday	402991	INT	Day of the week (1 – 7; 1 = Sunday)
month	402992	INT	Month (1-12)
day	402993	INT	Day (1 - 31)
year	402994	INT	Year (00 – 99)
hour	402995	INT	Hours (0 – 23)
minute	402996	INT	Minutes (0 – 59)
second	402997	INT	Seconds (0 – 59)
MW1005	401005	INT	Hours (= 402995), presentation on MMI
MW1006	401006	INT	Minutes (= 402996), presentation on MMI
MW1007	401007	INT	Seconds (= 402997), presentation on MMI

For the complete assignment of the registers, see section *Address assignment overview, p. 106*.

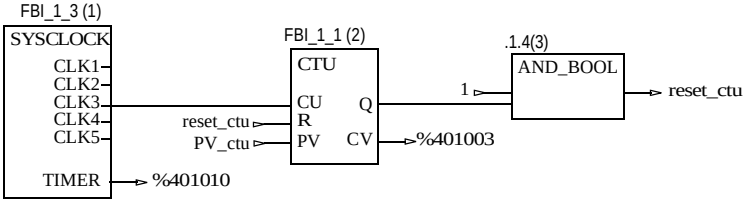
Delivery of the time

So that the time is available, you must activate the **Time of Day** checkbox. You will find it under **Project** → **Configurator** → **Specials**.
Now in the associated text field enter the register 4x**2990** as the first of 8 subsequent registers which are thus reserved for time of day.

Excerpt from the section

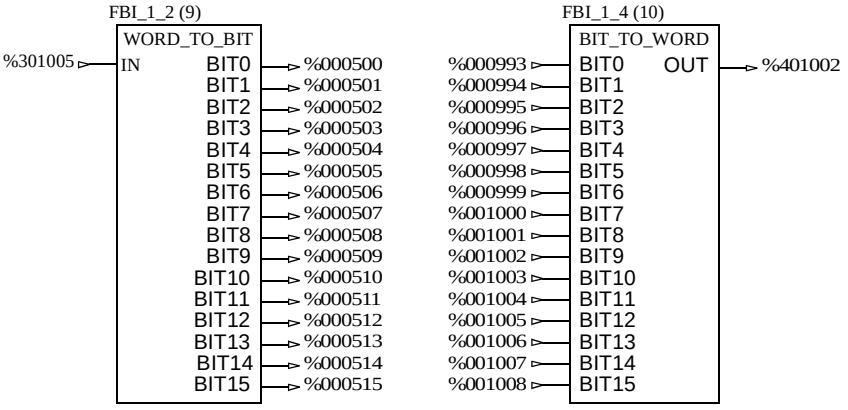
The following configuration is necessary to support the MMI communication:

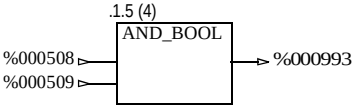
Counter with setpoint presetting via the Magelis terminal



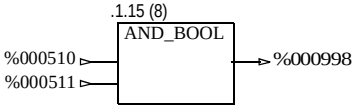
401003 1st word PLC to HMI

Linking of inputs/outputs of Advantys STB Island





DDI3420 (bus address 2) channels 1 and 2
on
DDO3600 (bus address 3) channel 1

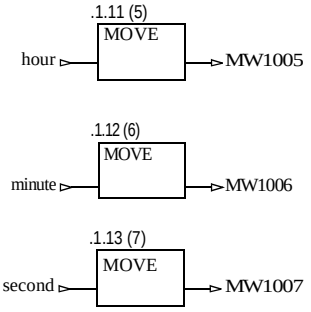


DDI3420 (bus address 2) channels 3 and 4
on
DDO3600 (bus address 3) channel 6

301005 5th word input data

401002 2nd word output data

Presentation of the time (hours/minutes/seconds) on the Magelis terminal



4.5 Configuration of a Magelis XBT for connection to an Advantys STB Island with INTERBUS network interface

Introduction

Overview

This section describes the procedure of configuring a Magelis XBT to connect to an Advantys STB Island with INTERBUS network interface. For this you use the XBTL 1000 configuration software.

What's in this Section?

This section contains the following topics:

Configuration of the Magelis XBT PM 027010 on network interface module for INTERBUS communication

Overview

The following sections provide a brief description of the steps that are necessary for the configuration of the MMI application for Magelis XBT PM 027 010 for connection to an Advantys STB Island with a network interface module for INTERBUS.

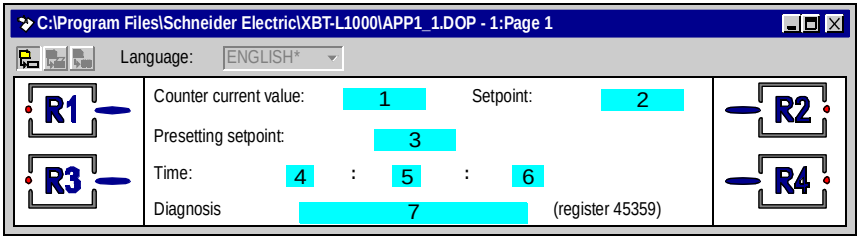
The description is divided into the following sections:

Presentation on the application page

The following data is presented on the application page:

- Diagnostic data directly from the Island bus data image
- Data that is sent and received via the fieldbus communication

The application page should look as follows:



Field 1 Display counter current value from master (Concept register 401003)

Field 2 Display setpoint (Concept variable PV_ctu (register 301008))

Field 3 Presetting setpoint for counter in the master (Concept variable PV_ctu)

Fields 4-6 Display time from the master (Concept variables MW1005, MW1006, MW1007)

Field 7 Display diagnostic register "network node configuration"(R 45359) of the Advantys STB Island

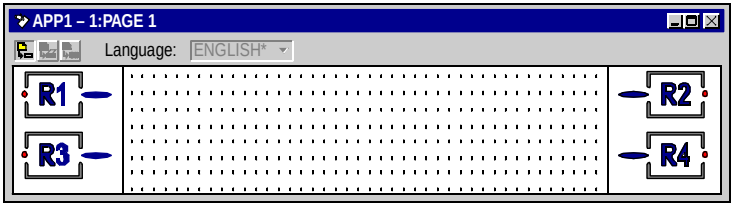
Configuration data for the individual fields:

Field	Associated variable (40001+i)		Format			Access	Modbus register in Advantys STB
	Equipment	i	Object	Type	length		
1	Master[1)]	4096	Word	Decimal	5	Read	44097 (PLC to HMI)
2	Master[1)]	9487	Word	Decimal	5	Read	49488 (HMI to PLC)
3	Master[1)]	9487	Word	Decimal	5	Write	49488 (HMI to PLC)
4	Master[1)]	4098	Word	Decimal	2	Read	44099 (PLC to HMI)
5	Master[1)]	4099	Word	Decimal	2	Read	44100 (PLC to HMI)
6	Master[1)]	4100	Word	Decimal	2	Read	44101 (PLC to HMI)
7	Master[1)]	5358	Word	Binary	16	Read	45359 (diagnostic STB)
1)	Here Master is the default of the XBTL1000 configuration software for the symbol of the Modbus slave connected to the Magelis terminal, in this case the Advantys STB Island with INTERBUS-NIM. The fieldbus master is not meant here.						

For the complete assignment of the registers, see section *Address assignment overview, p. 106*.

Setup of the application page

To set up the application page, proceed as follows:

Step	Action
1	Start the program **XBT-L 1000**. **Result**: The **Terminal type configuration** dialog box opens.
2	On this dialog box in the **Commercial References** area, select the terminal type **XBT-PM027010** by clicking it.
3	On this dialog box in the **Choose Protocol** area, select **Modbus** as the communication protocol.
4	Confirm the selection with **OK**. **Result**: The page editor opens with **Page 1** : 
5	Under **Configuration** → **Dialogue table**, deactivate the **Use dialogue table** checkbox.
6	Save your application with **File** → **Save**. The **Save As** dialog box is displayed.
7	Specify the place and name under which your application should be saved; for the example: `LW:\Schneider Application\Advantys_HMI_INTERBUS\Magelis_IB 1\xbtl_ib1.dop`. Confirm with the **Save** command button.

Configuring the application page

To configure the following application page, proceed as follows:

Step	Action
1	Place the pointer at the beginning of the second line and enter the text `Counter Current Value: .`
2	Place the pointer in the position of field 1, see section *Presentation on the application page, p. 116*.
3	With **Edit** → **Insert variable field** → **Alphanumeric**, insert the field for displaying the current value of the counter. **Result**: The **Insert an alphanumeric field** dialog box opens.
4	Configure this field in accordance with the details in the table in section *Presentation on the application page, p. 116*. (You will find the selection for the **Access** under **"Options..."**).
5	Proceed with the configuration of the other fields 2 - 7 in accordance with the presentation of the application page and the table in section *Presentation on the application page, p. 116* by repeating steps 1 to 4.

Loading the application

To load the application in the Magelis XBT, proceed as follows:

Step	Action
1	Connect the configured PC interface using the **XBTZ915** cable with the Magelis XBT PN 027010.
2	Select **Transfer** → **Export** to send your application to the Magelis. **Result**: The application is sent to the connected Magelis terminal.

Operation of the Magelis XBT PM 027010

Operating the application

To operate the application in the Magelis XBT, proceed as follows:

Step	Action
1	Make sure that the fieldbus connections are plugged into your configuration and that the applications are started in the controller that contains the fieldbus master as well as in the Advantys STB Island.
2	Connect the CFG interface of the network interface module of the Advantys STB Island using the **XBTZ988** cable with the Magelis XBT PM 027010. **Result**: The configured application page is displayed on the terminal's screen. Now in the **Presetting setpoint** field you can specify the setpoint for the counter that is configured on the controller connected to the fieldbus.

Application example for connecting an MMI terminal to Advantys STB Island with CANopen NIM

5

At a Glance

Introduction

In this chapter you will find the application description for the connection of an MMI terminal Magelis XBT• to an Advantys STB Island with a CANopen network interface.

What's in this Chapter?

This chapter contains the following sections:

5.1 Application with CANopen communication

Introduction

Overview

This section provides a brief overview of the hardware for the CANopen communication and of the applications.

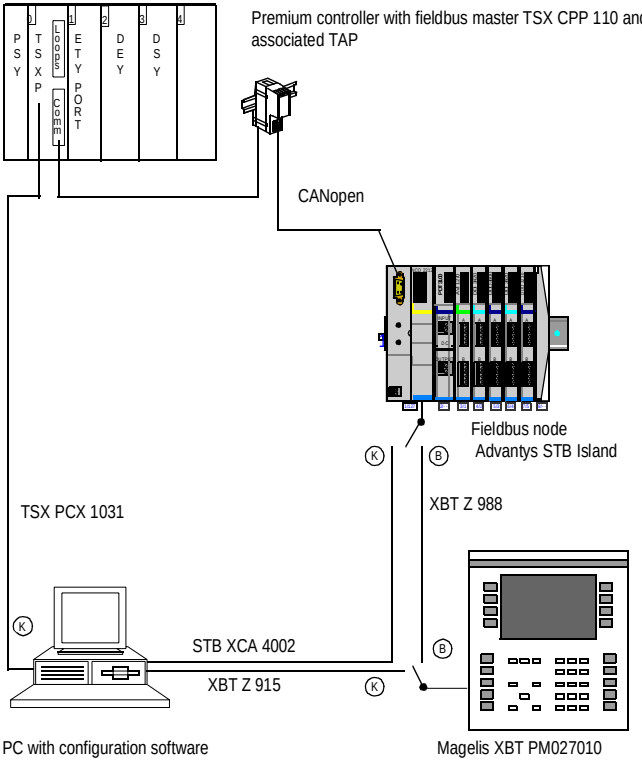
What's in this Section?

This section contains the following topics:

Overview of hardware configuration with CANopen

Sample configuration

The following figure shows the configuration that is described in the application example:



K Connections for the transfer of the configurations and programs

B Connection for the operation of the MMI terminal to Advantys STB Island

Required components and cables

The configuration of the individual nodes, the required configuration software and the requirements of the PC are found in chapter *Hardware and software requirements, p. 17*.

The following table shows the required cable (overview, see section *Cable, p. 23*):

Cable for configuration and transfer

Type	Meaning
TSX PCX 1031	Multifunctional communication cable between PC and CPU of the Premium
STB XCA 4002	Connection cable between PC and CFG interface of the network interface module of the Advantys STB Island
XBT Z915	Connection cable between PC and Magelis XBT PM027010 for the transfer of the application

Cable for operating the application:

Type	Meaning
XBT Z988	Connection cable between the Advantys XBT Island and the Magelis XBT PM027010 for operation of the application

Note:
If the abovementioned XBT cable Z988 is not available, you can also use the 3 following cables **together** to operate the Magelis on Advantys STB Island:

- XBT Z9710
- 990 NAA 263 20

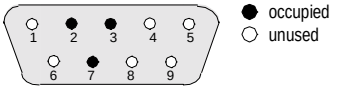
  and
- STB XCA 4002

Cable and connectors for the CANopen bus

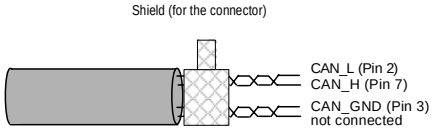
For CANopen there are no pre-converted cables available; for this special connectors and cables are available on the market. The performance capability of the CANopen bus depends on the type of cable used.
The following components have been used for this sample configuration:

Model	Supplier	Order No.
Data cable DCA 701 for CANopen, 2x2x0.22mm^2, twisted pair, shielded	Selectron www.selectron.ch	44170014
CANopen connector with bus termination (connect to TAP and Advantys NCO 2212 or the last bus node)	Erni www.erni.com	103643
Standard CANopen connector without bus termination		103668

The CANopen connectors have screw clamps and must be connected as follows by the user:



D-sub, 9-pin, connector



PIN	Signal	Description
2	CAN_L	CAN bus low
3	CAN_GND	CAN bus reference (ground)
7	CAN_H	CAN bus high

Description of the application for CANopen

Overview

The application describes the possibility of operating a Magelis terminal directly on the CFG interface of a network interface module of an Advantys STB Island. Here the data should be presented on the Magelis terminal that is sent and received via the fieldbus communication as well as data directly from the data image of the Advantys STB Island.

Description

First the individual steps are described that are necessary to establish fieldbus communication between master, Advantys STB Island, and Magelis terminal. Then there is a brief presentation of the necessary configuration and programming for the fieldbus master and the Magelis terminal.

5.2 Configuration of an Advantys STB Island with MMI connection and CANopen network interface

Introduction

Overview

This section describes the procedure for configuration of an Island configuration with CANopen network interface and MMI. For this you use the Advantys configuration software.

What's in this Section?

This section contains the following topics:

Configuration of the Advantys STB Island with CANopen communication

Overview

The following sections provide a brief description of the steps that are necessary for configuration of the Advantys STB Island with CANopen communication and MMI connection.
The description is divided into the following sections:

- Setting up the workspace and Island
- Configuring the hardware
- Activating the MMI configuration

Setting up the workspace and Island.

To set up the workspace and Island, proceed as follows:

Step	Action
1	Start the Advantys configuration software.
2	With **File** → **New Workspace** open the **New Workspace** dialog box.
3	In the **Workspace file** area and in the **Island file** area, enter the respective name for the new workspace and the Island in the **Name** field; for the example: **STB_CO1**:
4	In the **Workspace file** area, in the **Position** field, you can enter the location where you would like to store the workspace and Island. Accept the default here. Note: The data storage location and the file name are displayed in the **Name with Path** text box.
5	Confirm with **OK**. **Result:** The new workspace and the new Island are created.
6	Save the new workspace with **File** → **Save workspace**.

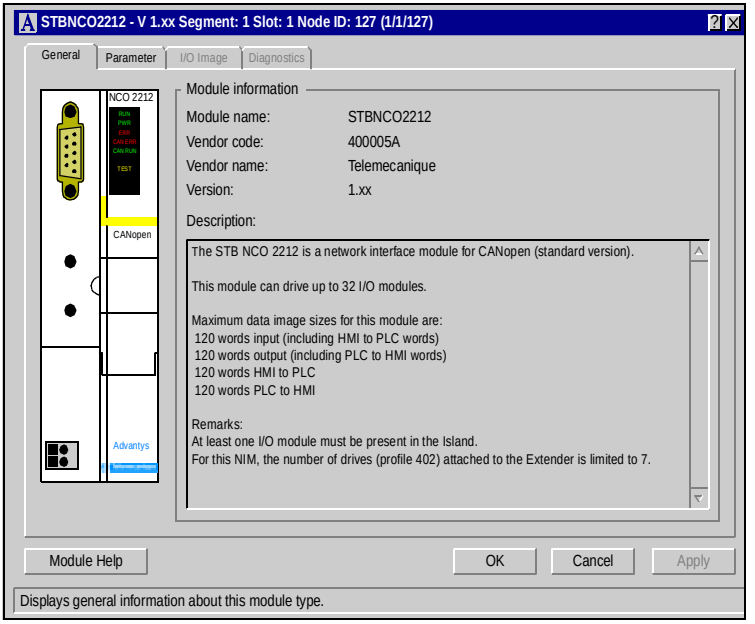
Configuration of the hardware

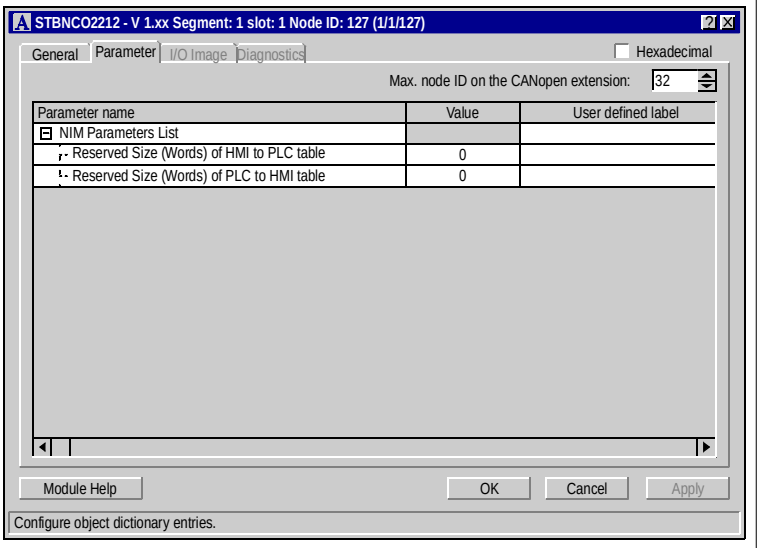
To configure the hardware, proceed as follows:

Step	Action
1	In the catalog browser, expand the module type **Networking**.
2	Double-click on the module **STBNCO2212**. **Result**: In the Island editor, the network interface module is stored in the position all the way to the left.
3	In the catalog browser, expand the module type **Power**.
4	Double-click on the module **STBPDT3100**. **Result**: In the Island editor, the module is stored in the next position to the right.
5	Repeat steps 3 (expansion of the required module type) to 4 until you have completed your Island configuration in accordance with section *Advantys STB Island configuration, p. 19*.
6	Save the configuration with **File** → **Save Island:STB_CO1**.

Activation of the MMI communication

To activate the MMI communication, proceed as follows:

Step	Action
1	Double-click on the network interface module (NIM) STB NCO 2212 **Result:** The module editor opens:  On the **General** tab you will find details about the configured network interface module (NIM) and about the data range lengths for input/output data and for the MMI communication. These areas depend on the configured NIM.

Step	Action
2	Change to the **Properties** tab:  In the **Value** column, enter the word count that you would like to reserve in the Advantys STB Island for the communication of a Magelis terminal to the fieldbus master (HMI to PLC table) and for the communication from the fieldbus master to a Magelis terminal (PLC to HMI table). For the example, enter 10 words for each communication direction. **Note:** For the sample configuration (See *Advantys STB Island configuration, p. 19*) , a maximum of 114 words can be configured for input direction (HMI to PLC table) and 119 words in output direction (PLC to HMI table).
3	Close the module editor by clicking the **OK** button.
4	Save the parameter input with **File** → **Save Island:STB_CO1**.

Setting the bus parameters, build and download the application in the Island

Setting the baud rate

The **Baud rate** is set with the two rotary switches on the front side of the NIM. To do this, proceed as follows:

Step	Action
1	Bring the power down on the Advantys STB Island.
2	With a small screwdriver, set the bottom rotary switch (ONES) in the range **Baudrate** (to any position after 9).
3	With a small screwdriver, set the upper rotary switch (TENS) to position 4 (250k bits).
4	Switch the Advantys STB Island on so that the baud rate setting is taken over. **Note:** The baud rate setting is only taken over if the lower rotary switch is in the **Baud rate** area and the voltage is switched on.

Setting of the network node address

The **network node address**is also set with the two rotary switches on the front side of the NIM. To do this, proceed as follows:

Step	Action
1	Bring the power down on the Advantys STB Island.
2	With a small screwdriver, set the upper rotary switch (TENS) to position 0.
3	With a small screwdriver, set the lower rotary switch (ONES) to position 2. This corresponds to the network node address 2 on the CANopen bus, which must be taken into account during the bus configuration with SyCon.
4	Switch the Advantys STB Island on so that the network node address is taken over. **Note:** The address setting and a change of the setting are only taken over when voltage is switched on.

Build and download the application

To build and load the application, proceed as follows:

Step	Action
1	With **Island** → **Build** execute the building of the application. If errors are reported here (display on the log window), remove these and then rebuild.
2	Under **Online** → **Connection settings** → **Settings...** configure the interface with which you would like to connect the Advantys STB Island to the PC (COM1 or COM2).
3	Connect the Advantys STB Island to this interface with the STB XCA 4002 cable.
4	Select **Online** → **Connect**. The **Data transfer** dialog box opens.
5	Click the **Download** button to download your configured application into the Island. **Result**: The application is downloaded in the Island. The result will appear in the log window.
6	Confirm the following query whether the Island should be put into the "running" state with **OK**. **Result**: The island is started.

5.3 Bus configuration for CANopen

Introduction

Overview

This section contains information concerning the configuration of the CANopen Master Premium TSX CPP 110 with the SyCon configuration tool.

What's in this Section?

This section contains the following topics:

Introduction

Overview

The bus configuration tool SYC SPU LF• CD28M, called SyCon below, is used to configure the CANopen network.

Note: Included with the SyCon Configurator software are some EDS files for CANopen Master and Slave modules from Telemecanique and other manufacturers. You must still build the EDS file for the modular slave Advantys STB Island and load it into the corresponding SyCon EDS directory.

Procedure

Follow these steps to create and export the bus configuration:

Step	Action
1	*Creating the EDS file of the Advantys STB configuration for CANopen, p. 134*
2	Loading the EDS file into the corresponding SyCon directory
3	Create a bus project
4	Define and configure the master
5	Slave Configuration • Defining and addressing the slave • Configuration of the PDOs
6	Define bus parameters and save the bus project

Notes

Note: The following description concerns the fundamental configuration steps only.
For detailed information, please refer to the online help for the SyCon Configurator and PL7 and the corresponding help files on the installation CD.

Creating the EDS file of the Advantys STB configuration for CANopen

Creating the EDS file with Advantys configuration software

To create the EDS file for the CANopen configuration with the Advantys STB configuration software, proceed as follows after configuring the hardware:

Step	Action
1	Ensure that the configuration software is **not Online** → **Connected**.
2	Select **File** → **Export stb_co1...**. The **Export** dialog box opens.
3	Under **Save** enter the path where the EDS file should be saved. **Note**: If you specify the directory in which all EDS files for CANopen in SyCon are stored here (e.g. LW:\...\SyCon\Fieldbus\CANopen\EDS), you do not have to copy the file into this directory again with SyCon.
4	Under **Filename** enter the name of the EDS file; for the example: **STB_CO1**:
5	Click the **Save** command button. **Result**: The Advantys configuration software saves the Island, produces the configuration internally, and finally performs the export operation into the EDS file. **Note** If an error occurs during saving or building, the export is cancelled. Remove the errors and execute another export. Display occurs in the log window.

Create a CANopen bus project

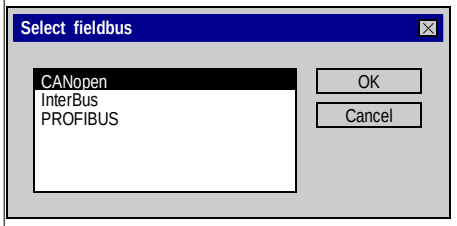
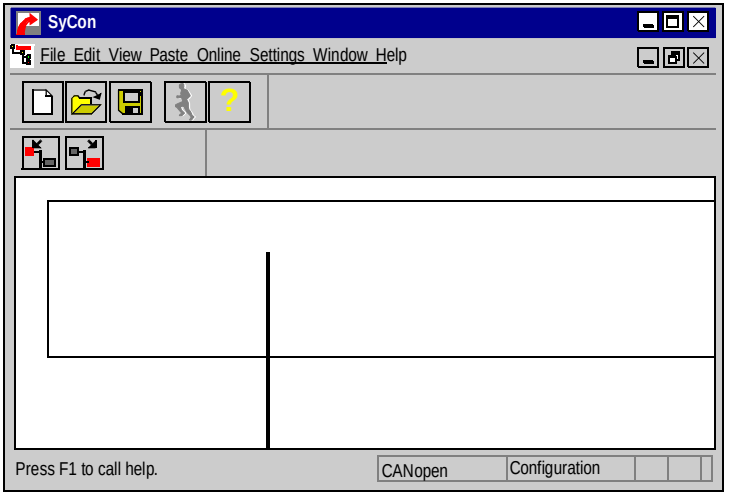
Define target directory

First define a target directory for your bus project:

Step	Action
1	Open the bus configuration tool SyCon either directly or from PL7. To open from PL7, on the Premium PL7 configuration window of the TSX CPP110 card, click the tool button  **Result:** The SyCon tool appears in the window.
2	From the main menu select **Settings** → **Path...**. **Result:** The **Path** dialog is opened and the path of the SyCon directory is shown as the default project directory (e.g. `C:\Programs\Schneider\Sycon\Project`).
3	In the **Project directory** text box, enter the path of the PL7 project directory you have already set up, for the example `C:\Schneider Application\Advantys_HMI_CANopen\PL7_CO1`. **Note:** The default can also be used. **Result:** Executing the menu commands **Save** and **Export** (on the main menu **File**) saves all files into the defined project directory (here your PL7 directory).

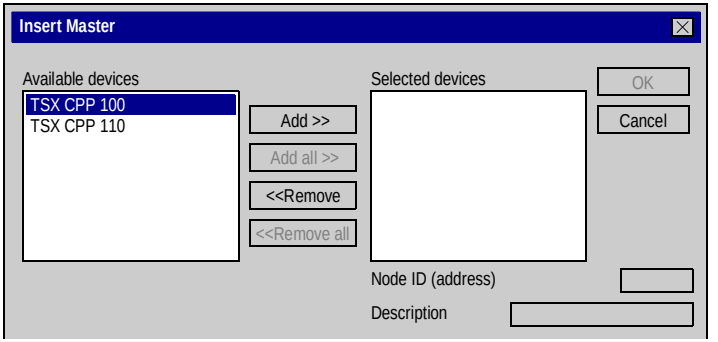
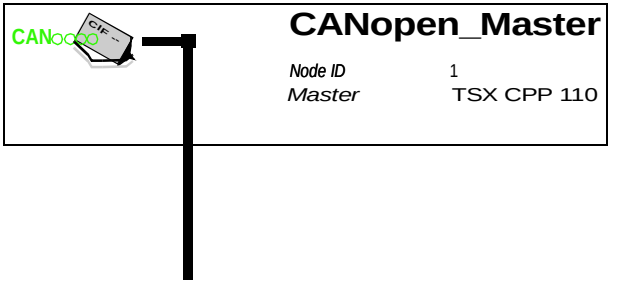
Create a bus project

This table shows you the steps in setting up a bus project with SyCon.

Step	Action
1	From the main menu, select the **File** → **New** command **Result:** The **Select fieldbus** dialog box opens. 
2	Select **CANopen** and confirm with **Ok**. **Result:** An empty structure appears in the window. 
3	Select **File** → **Save** from the main menu. Result: The **Save as** dialog box opens.
4	Now under **Filename** enter the name for the project (for the example **stb_co1**) and confirm with **Save**. Result: Your new, still-empty project is saved.

Defining the CANopen master and configuring the bus

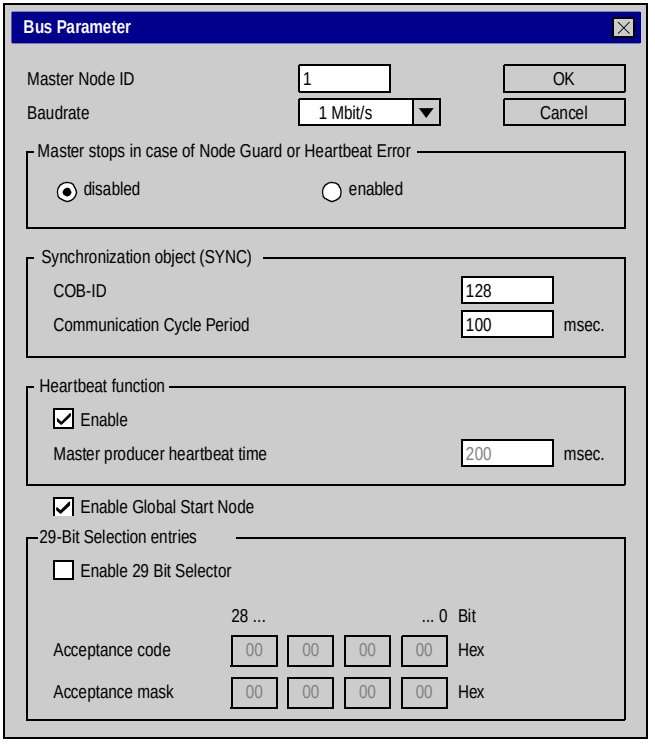
This table shows you the steps for defining the CANopen master:

Step	Action
1	Select the **Insert** → **Master** command **Result:** The following dialog box opens: 
2	● Select **TSX CPP 110**, ● Click **Add**, ● Enter a master module name in the **Description** field, **Annotations:** The name may contain neither empty spaces nor special characters and is limited to a maximum of 32 characters. ● Confirm with **Ok**. **Result:** The following structure appears: 

Configuration of the bus

The table shows you the various steps for configuring the CANopen bus:

Step	Action
1	Selecting the CANopen master TSX CPP 110.

Step	Action
2	Select the command **Settings** → **Bus Parameter...**. **Result:** The following window appears: 
3	Configure: ● the speed to 250 kbit/s **Note:** This value must correspond to the hardware setting on the Advantys hardware STB NCO 2212. ● the value of **SYNC COB-ID** to 128 (default value), ● the period time to 100 ms (default).
4	Select **Disabled** for **Master stops in case of node guard or heartbeat error occurs**.
5	Select **Enabled** for **Heartbeat function**.
6	As **Master producer heartbeat time** select 200 ms (default).
7	Select **Enable global start node**.
8	Confirm with **Ok**.

Configuration of the modular slave Advantys STB Island on CANopen

Overview

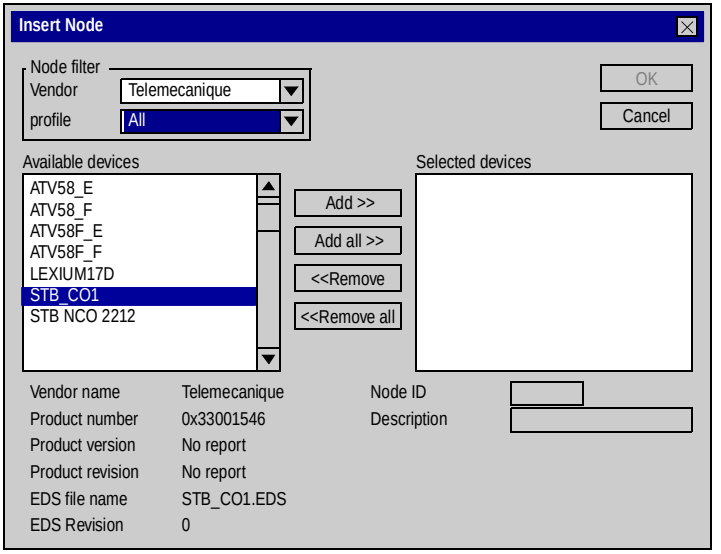
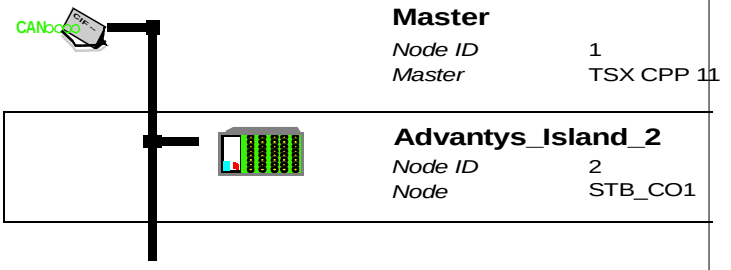
The table shows you the sample configuration of the modular CANopen slave Advantys STB Island:

Module	Island Bus Address	Meaning
STB NCO 2212	127	CANopen network interface module
STB PDT 3100	-	24Vpower distribution module
STB AVI 1270	1	Analog inputs (2 channels, -10V...+10V), 24 VDC
STB DDI 3420	2	Digital inputs (4 channels), 24 VDC
STB DDO 3600	3	Digital outputs (6 channels), 24 VDC
STB DDI 3420	4	Digital inputs (4 channels), 24 VDC
STB DDO 3230	5	Digital outputs (2 channels), 24 VDC
STB XMP 1100	-	Bus termination

The node-specific EDS file was produced from this sample configuration with the Advantys configuration software, see *Creating the EDS file with Advantys configuration software, p. 134*. The following tables show you how to create the slave configuration in SyCon.

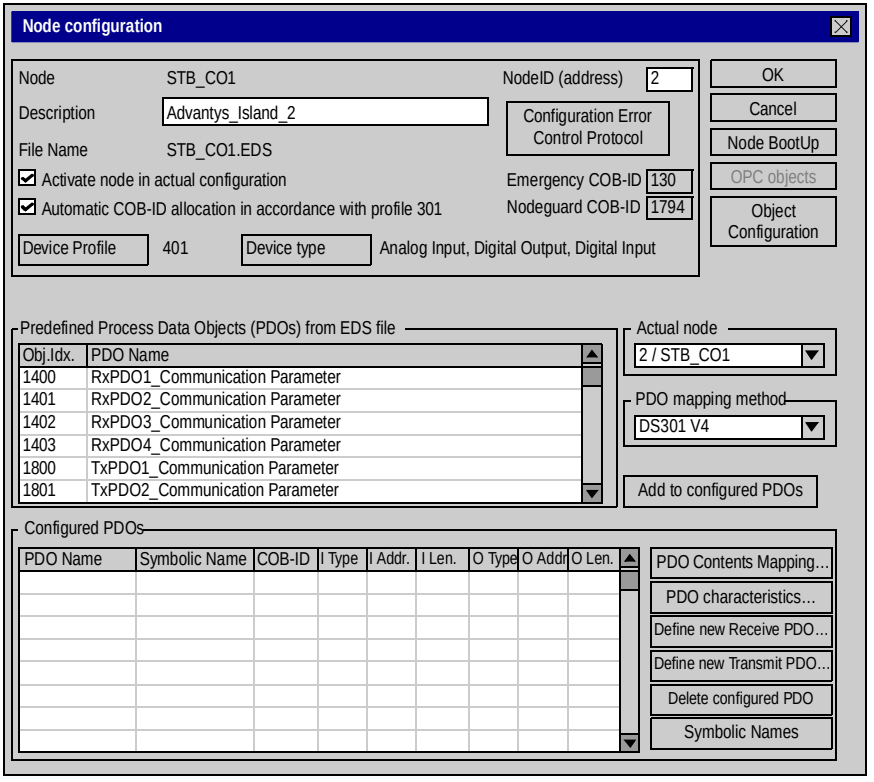
Defining and addressing the node

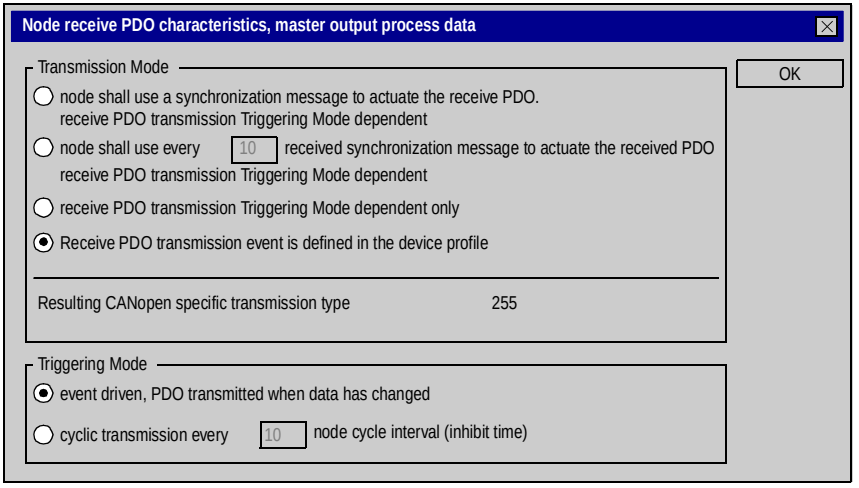
This table shows you the steps in defining a node.

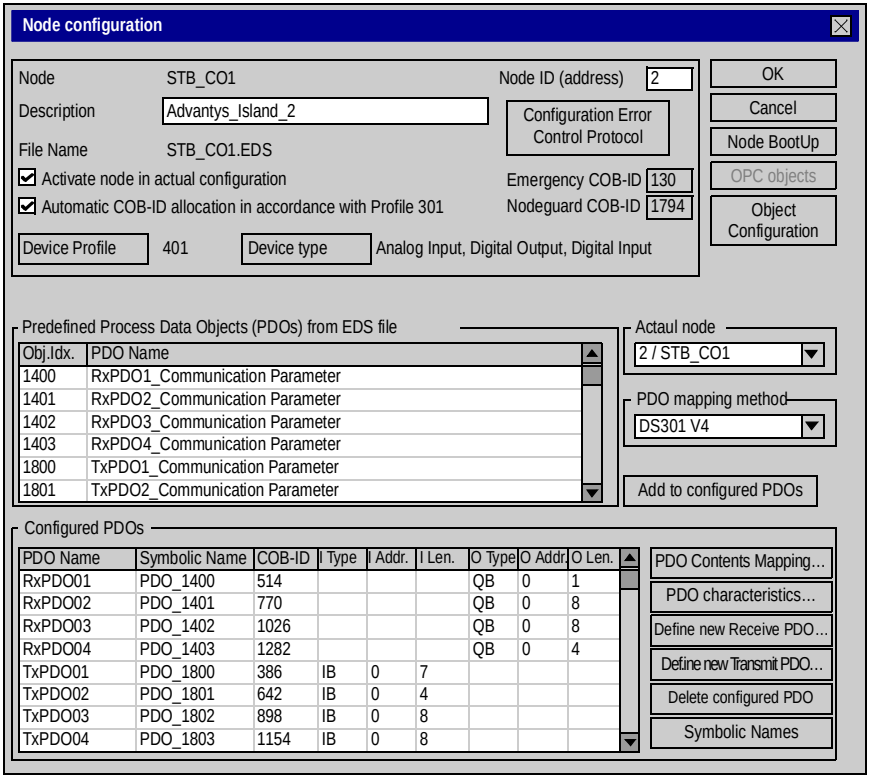
Step	Action
1	List the available nodes with **Insert** → **Node**. **Result:** 
2	Select the device **STB_CO1** and click **Add**.
3	Check, and if necessary change the **Node ID**, it must match the address set by the hardware on the STB NCO 2212. In the example, **Node ID 2** is set.
4	Enter `Advantys_Island` as **Description**.
5	Confirm the settings by clicking the **OK** button. **Result:** The following structure appears: 

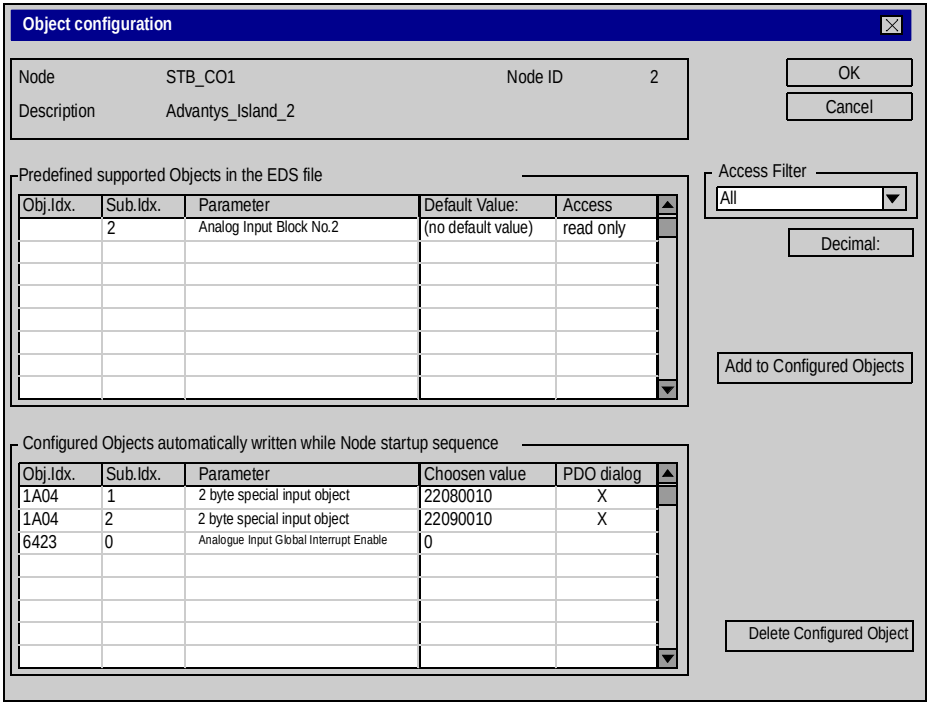
Configuration of the PDO for the node

The table shows you the various steps for configuring the slave **Advantys_Island_2**:

Step	Action
1	Double-click on the slave **Advantys_Island_2**. **Result:** The following window appears: 

Step	Action
2	Select the first pre-defined object Receive- PDO **1400 RxPD01Commmunication Parameter** and click the **Add to configured PDOs** button. **Result:** The following window appears: 
3	Accept the defaults and confirm with **OK** .

Step	Action
4	Repeat the steps 1 to 3 for all PDOs that are displayed in the range **Predefined process data objects (PDOs) from EDS file**. **Note:** You must configure all listed PDOs from the range **Predefined process data objects (PDOs) from EDS file**. You are not allowed to change the configuration and mapping of the PDOs, otherwise the I/O assignment in PL7 will no longer match the I/O assignment of the Advantys configuration software. **Result:** The following window appears:  **Caution:** When adding the fifth Transmit PDO **TxPDO05** you will see a message indicating that no standard COB-ID is available. You must absolutely change the COB-ID entered automatically by hand, see step 5 to step 6. There is an explanation of the individual PDOs in the section *Process data objects, p. 145*.
5	Remove the checkmark in the **Automatic COB-ID allocation according to CANopen profile 301** checkbox.

Step	Action
6	For the fifth configured transmit PDO **TxPDO05**, delete the COB-ID that was entered automatically in the **COB-ID** column (here 2028) and enter the free COB-ID **1664**.
7	To release the transmission of analog input signals, click the **Object configuration** button on the **Node configuration** dialog box. **Result:** The **Object configuration** dialog box opens.
8	Double-click in the **Predefined supported objects in the EDS file** area on the **Obj.Idx 6423** (Analogue Input Global Interrupt Enable). **Result:** The associated elements are displayed in the lower area **Configured objects automatically-written while Node startup sequence**. **Result:** The following window appears: 
9	For **Analogue Input Global Interrupt Enable** under **Choosen Value** enter **1**.
10	Confirm the object configuration window by clicking **OK**.
11	Confirm the node configuration window by clicking **OK**.

Process data objects

The following Process data objects are required for the sample configuration:

PDO	COB-ID	Type	Adr.	Length (in bytes)	Explanation
RxPDO1	514	QB	0	1	Binary output data
RxPDO2	770	QB	1	8	SPS -> HMI communication
RxPDO3	1026	QB	5	8	SPS -> HMI communication
RxPDO4	1282	QB	9	4	SPS -> HMI communication
TxPDO1	386	IB	0	7	Binary input data, status of the analog and binary inputs as well as status and echo of the binary outputs
TxPDO2	642	IB	4	4	Analog input data
TxPDO3	898	IB	6	8	HMI -> SPS communication
TxPDO4	1154	IB	10	8	HMI -> SPS communication
TxPDO5	1664	IB	14	4	HMI -> SPS communication
Legend					
RxPDO	Receive PDO: PDO is sent by the fieldbus master and received by the CANopen slave Advantys STB Island.				
TxPDO	Transmit PDO (send): PDO is sent by the slave Advantys STB Island and received by the fieldbus master.				

Assignment to the Advantys output data (**PDO alignment** checkbox activated):

PDO	Length (in bytes)	Advantys fieldbus image	Explanation
RxPDO1	1	W1	Binary output data
RxPDO2	8	W 2... 5	SPS -> HMI communication
RxPDO3	8	W 6 ... 9	SPS -> HMI communication
RxPDO4	4	W 10 ... 11	SPS -> HMI communication

Assignment to the Advantys input data (**PDO alignment** checkbox activated):

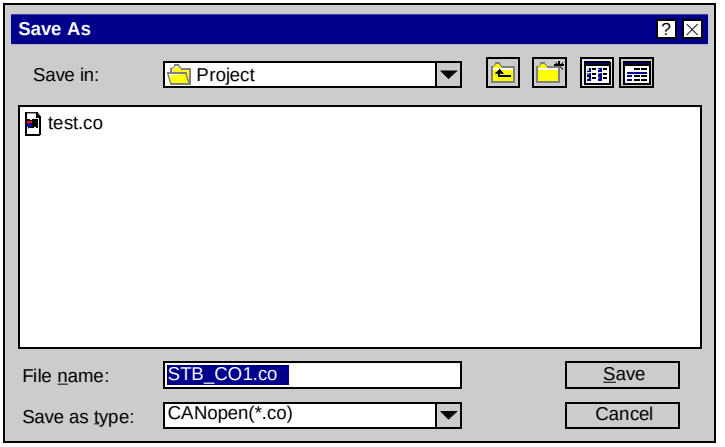
PDO	Length (in bytes)	Advantys fieldbus image	Explanation
TxPDO1	7	W 1 ... 4	Binary input data, status of the analog and binary inputs as well as status and echo of the binary outputs
TxPDO2	4	W 5 ... 6	Analog input data
TxPDO3	8	W 7 ... 10	HMI -> SPS communication
TxPDO4	8	W 11 ... 14	HMI -> SPS communication
TxPDO5	4	W 15 ... 16	HMI -> SPS communication

For the complete assignment of the registers, see *Address assignment overview, p. 155* section.

Saving the CANopen bus project

Saving the Bus Project

This table shows you the steps to save a CANopen bus project in SyCon .

Step	Action
1	Save the bus project with **File** → **Save As...** Result: The configuration is stored in the defined directory as a CANopen file *.co. **Result:**  With the *.co file, all data is available that is required by PL7 for additional configuration.

CANopen configuration in PL7

After configuration of the CANopen nodes in SyCon, the CANopen must be imported in PL7. For additional information, see the section *Configuration of the CANopen connection, p. 150*.

5.4 CANopen configuration under PL7

Introduction

Overview

This section contains information concerning the software configuration for the TSX Premium TSX 572623 with CANopen master TSX CPP 110 under PL7.

What's in this Section?

This section contains the following topics:

Configuration of the CANopen master

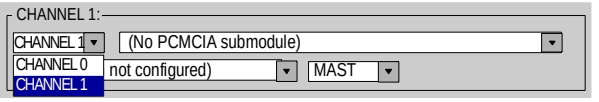
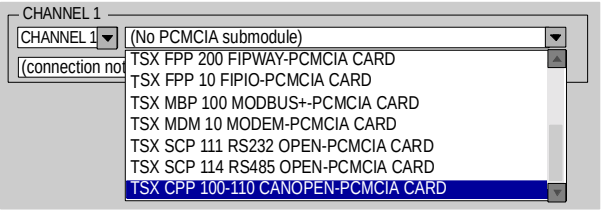
How to proceed

To configure the CANopen communication with PL7 proceed as follows:

- Configuration of the CANopen master TSX CPP 110 (See *Configuration of the master, p. 149*)
- *Configuration of the CANopen connection, p. 150*

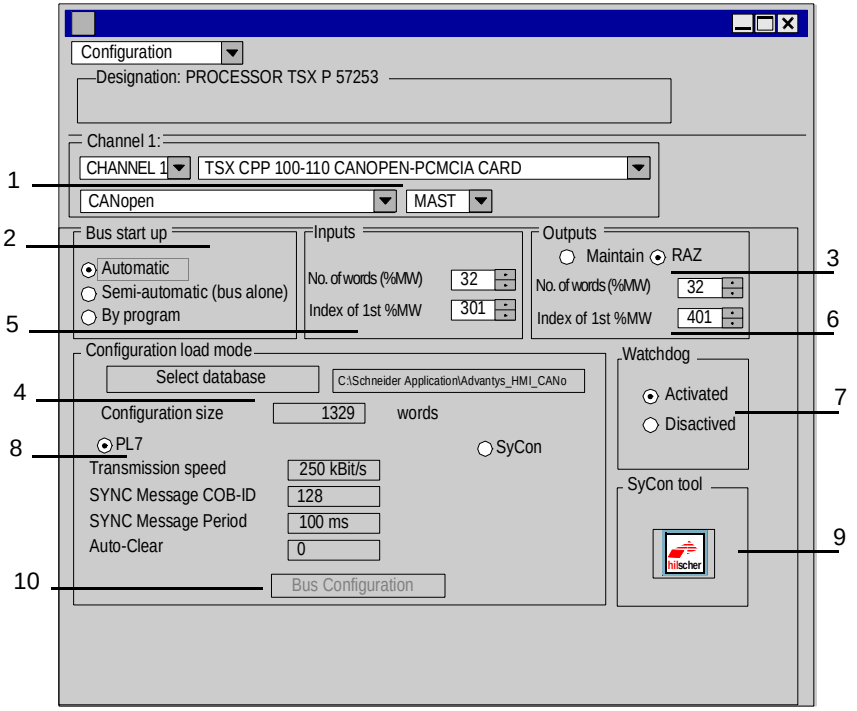
Configuration of the master

With the following steps you configure a TSX CPP 110 card in the Type III PCMCIA slot of the processor as CANopen master:

Step	Action
1	Open the hardware configuration editor in the application browser.
2	Open the configuration window of the processor communication channel by double-clicking on the **Comm** area of the processor.
3	Select the communication channel **CHANNEL 1** from the drop-down menu. **Example:** 
4	From the drop-down menu select the PCMCIA card TSX CPP 100-110: **Example:**  **Result**: The configuration window (See *Configuration of the CANopen connection, p. 150*) for the CANopen bus is displayed.

Configuration of the CANopen connection

On the CANopen configuration window, make the declaration of the communication channel and configure the parameters of a CANopen connection:



The following settings are required:

Number	Function
1	Accept the default **MAST**, that is, the MAST task serves as the update interval of the storage areas linked with the I/O.
2	Accept the default **Automatic** as the bus start behavior.
3	Specify the behavior of the outputs on stopping of the bus: **Maintain** or **RAZ** (default)
4	Click the **Select database** command button to import the file STB_CO1.co in PL7. For the example, select: `LW:\Schneider Application\Advantys_HMI_CANopen\PL7_CO1\stb_co1.co`
5	A number of 32 words is set. For the inputs as **Index of the 1.%MW** enter the value **301**.
6	A number of 32 words is set. For the outputs as **Index of the 1.%MW** enter the value **401**.
7	Accept the default **Activated** for the watchdog of the CANopen bus: The watchdog is triggered if the PCMCIA card cannot manage the bus correctly anymore, the outputs of the slaves are then set to null.
8	Accept the default **PL7**: The CANopen configuration is loaded together with the PL7 application into the PLC.
9	This button enables the start of the **Sycon** software if this software is installed on the PC.
10	If you click the **Bus configuration** command button, you get an overview of the CANopen bus configuration with the parameters of all configured nodes.

Starting CANopen communication

How to proceed

To start the CANopen configuration, you must carry out the following steps:

- Save the PL7 application
- Upload the application and the CANopen configuration in PLC

Saving the PL7 application

Proceed as follows to finish the application:

Step	Action
1	Confirm the entries for the bus configuration and close the hardware configuration window.
2	After selecting **Program** → **MAST-Task** → **Sections** create the necessary program for the application with **Edit** → **Create** (see *Program description, variable list and sections in PL7, p. 157*) .
3	Confirm the settings and save the application with **File** → **Save**.

Loading the PL7 application

To load the application in the Premium PLC, proceed as follows:

Step	Action
1	Connect the programming device to your Premium PLC using a TSX PCX 1031 cable.
2	Select **PLC** → **Connect**. **Result**: A connection between the programming device and the PLC is established.
3	Select **PLC** → **Transfer program**. **Result**: The **Program transfer** dialog box opens.
4	Select **PC -> PLC** and confirm with **OK**.

5.5 Data storage in Advantys and PL7f or communication with CANopen

Introduction

Overview

This section contains information about addressing I/O and MMI data in the Advantys configuration software and the PL7 programming software and about the required program parts.

What's in this Section?

This section contains the following topics:

Addressing in Advantys STB and PL7 (CANopen communication)

Addressing

The following overview shows the address assignment for communication with CANopen in Advantys STB und PL7.
The address assignment in Advantys STB is done by the system and can be viewed under **Island** → **I/O Image Overview** → **Modbus Image** or **Island** → **I/O Image Overview** → **Fieldbus Image**.
The corresponding assignment in PL7 is configured after import of the I/O configuration on the **Configuration window**.
The application configuration of the Magelis terminal with the XBTL1000 configuration software is based on the addresses in the Modbus format of the Advantys configuration software.

Data storage in PL7

During the CANopen communication all input data and all output data is stored in sequential input and output words in PL7.
If in the Advantys configuration software on the **I/O Image Overview** → **Fieldbus map** tab you have activated the **PDO alignment** checkbox, you will see the display of the input and output data as it is also displayed in PL7.

Address assignment overview

You will find the address assignments for the input and output data here. For a CANopen communication there are a maximum of 120 words input and 120 words output data available (including the words for MMI communication).
The address assignments for the **input data**:

I/O module		**Addresses in:**		
Type	**Type of data**	**Advantys STB (Modbus format)**	**Advantys STB (Fieldbus format)**	**PL7**
STB AVI 1270, 2 analog input channels	Input status channel 1	R 45393, Bit 0 ... 7	W 1, Bit 0 ... 7	%MW301, Bit 0 ... 7
	Input status channel 2	R 45395, Bit 0 ... 7	W 1, Bit 8 ... 15	%MW301, Bit 8 ... 15
STB DDI 3420, 4 digital input channels	Input data K1 ... K4	R 45396, Bit 0 ... 3	W 2, Bit 0 ... 3	%MW302, Bit 0 ... 3
	Input status K1 ... K4	R 45397, Bit 0 ... 3	W 2, Bit 4 ... 7	%MW302, Bit 4 ... 7
STB DDO 3600, 6 digital output channels	Echo K1 ... K6	R 45398, Bit 0 ... 5	W 2, Bit 8 ... 13	%MW302, Bit 8 ... 13
	Output status K1 ... K6	R 45399, Bit 0 ... 5	W 3, Bit 0 ...5	%MW303, Bit 0 ... 5
STB DDI 3420, 4 digital input channels	Input data K1 ... K4	R 45400, Bit 0 ... 3	W 3, Bit 8 ... 11	%MW303, Bit 8 ... 11
	Input status K1 ... K4	R 45401, Bit 0 ... 3	W 3, Bit 12 ... 15	%MW303, Bit 12 ... 15
STB DDO 3230, 2 digital output channels	Echo K1 ... K2	R 45402, Bit 0 ... 1	W 4, Bit 0 ... 1	%MW304, Bit 0 ... 1
	Output status K1 ... K2	R 45403, Bit 0 ... 1	W 4, Bit 2 ... 3	%MW304, Bit 2 ... 3
STB AVI 1270, 2 analog input channels	Input data channel 1K1 ... K4	R 45392, Bit 0 ... 15	W 5, Bit 0 ... 15)	%MW305, Bit 0 ... 15
	Input data channel 2K1 ... K4	R 45394, Bit 0 ... 15	W 6, Bit 0 ... 15	%MW306, Bit 0 ... 15
HMI to PLC table	10 words	R 49488 - 49497	W 7 to 16	%MW 307 ... 316

I/O module		Addresses in:		
Type	**Type of data**	**Advantys STB (Modbus format)**	**Advantys STB (Fieldbus format)**	**PL7**
Legend				
K R W %MW	Channel Register (Advantys Software, Modbus format) Word (Advantys Software, Fieldbus format) Word (inputs, PL7)			

The address assignments for the **output data**:

I/O module		Addresses in:		
Type	**Type of data**	**Advantys STB (Modbus format)**	**Advantys STB (Fieldbus format)**	**PL7**
STB DDO 3600, 6 digital output channels	Output data K1 ... K6	R 40001, Bit 0 ... 5	W 1, Bit 0 ... 5	%MW 401, Bit 0 ... 5
STB DDO 3230, 2 digital output channels	Output data K1 ... K6	R 40002, Bit 0 ... 1	W 1, Bit 6 ... 7	%MW 401, Bit 6 ... 7
PLC to HMI table	10 words	R 44097 - 44106	W 2 - 11	%MW 402 ... 411
Legend				
K R W %MW	Channel Register (Advantys Software, Modbus format) Word (Advantys Software, Fieldbus format) Word (outputs, PL7)			

Program description, variable list and sections in PL7

Overview

For the fieldbus master, a counter must be configured whose setpoint and current values are sent to the Magelis terminal. The presetting of the setpoint is done using the Magelis terminal. The time that is available in the fieldbus master must also be prepared so that it is displayed on the Magelis terminal.
Furthermore, AND links must be configured that link inputs and outputs of the Advantys STB.
The following sections present a brief excerpt from the PL7 configuration (sections and variable list), which is necessary for the creation of the communication program.

Variable list

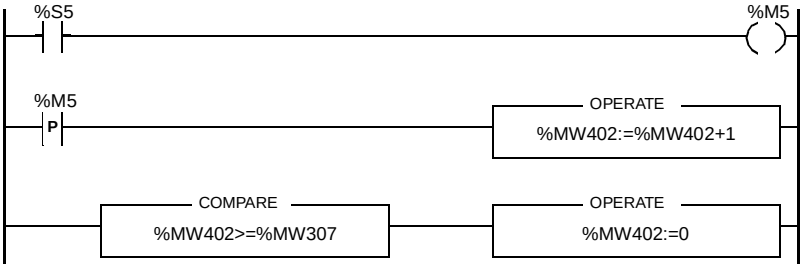
The following variables are defined:

Symbol	address	Data type	Comments
Counter_Clock	%M5	EBOOL	Count tick
Counter_Value	%MW402	WORD	Counter current value
PV_ctu	%MW307	WORD	Presetting of the counter setpoint (specified to PLC via MMI connected to Advantys STB Island)
Hour	%MW407	WORD	Hours: Presentation on MMI
Minute	%MW408	WORD	Minutes: Presentation on MMI
Second	%MW409	WORD	Seconds: Presentation on MMI

For the complete assignment of the registers, see section *Address assignment overview, p. 155*.

Excerpt from the sections

The following configuration is necessary to support the MMI communication:
stb_co_count: Counter with setpoint presetting via the Magelis terminal

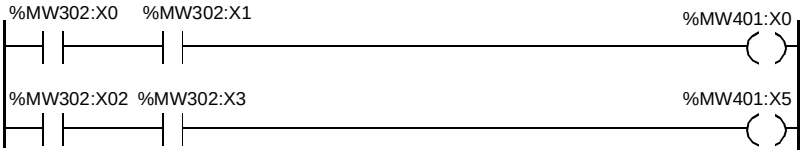


%MW307 1st word HMI to PLC table (counter setpoint)

%MW402 1st word PLC to HMI table (counter current value)

stb_co_and:
Linking of inputs/outputs of Advantys STB Island

DDI3420 (bus address 2) channels 1 and 2 on DDO3600 (bus address 3) channel 1



DDI3420 (bus address 2) channels 3 and 4 on DDO3600 (bus address 3) channel 6

stb_co_time:
Presentation of the time (hours/minutes/seconds) on the Magelis terminal

```
! (* Sekunden %MW409 *)
  %MW50:=ROL(%SW50,8);
  %MW409:=BCD_TO_INT(%MW50);

  (* Minuten %MW408 *)
  %MW51:=%SW51 AND 16#00FF;
  %MW408:=BCD_TO_INT(%MW51);

  (* Stunden %MW407 *)
  %MW52:=%SW51 AND 16#FF00;
  %MW53:=ROL(%MW52,8);
  %MW407:=BCD_TO_INT(%MW53);
```

5.6 Configuration of a Magelis XBT for connection to an Advantys STB Island with CANopen network interface

Introduction

Overview

This section describes the procedure of configuring of a Magelis XBT to connect to an Advantys STB Island with CANopen network interface. For this you use the XBTL 1000 configuration software.

What's in this Section?

This section contains the following topics:

Configuration of the Magelis XBT PM 027010 on network interface module for CANopen communication

Overview

The following sections provide a brief description of the steps that are necessary for the configuration of the MMI application for Magelis XBT PM 027 010 for connection to an Advantys STB Island with a network interface module for CANopen.

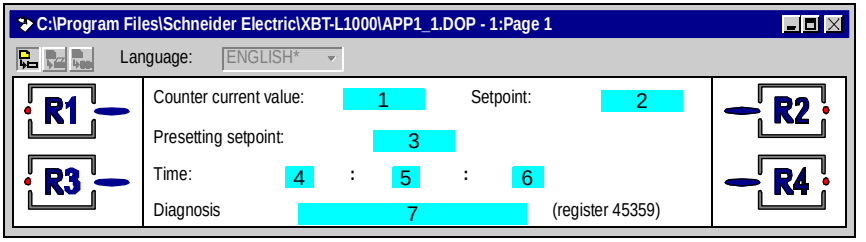
The description is divided into the following sections:

Presentation on the application page

The following data is presented on the application page:

- Diagnostic data directly from the Island bus data image
- Data that is sent and received via the fieldbus communication

The application page should look as follows:



Field 1 Display counter current value from master (PL7 variable Counter_Value)

Field 2 Display counter setpoint from master (PL7 variable PV_ctu)

Field 3 Presetting setpoint for counter in the master (PL7 variable PV_ctu)

Fields 4-6 Display time from master (PL7 variables hour, minute and second)

Field 7 Display diagnostic register "network node configuration"(R 45359) of the Advantys STB Island

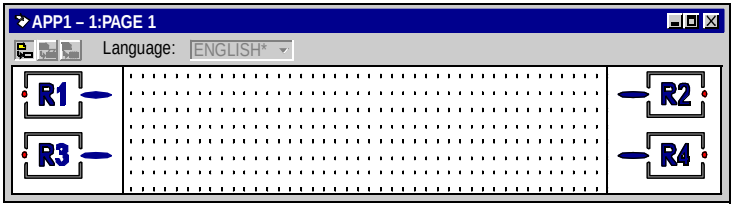
Configuration data for the individual fields:

Field	Associated variable (40001+i)		Format			Access type	Modbus register in Advantys STB
	Equipment	i	Object	Type	length		
1	Master[1)]	4096	Word	Decimal	5	Read	44097 (PLC to HMI)
2	Master[1)]	9487	Word	Decimal	5	Read	49488 (HMI to PLC)
3	Master[1)]	9487	Word	Decimal	5	Write	49488 (HMI to PLC)
4	Master[1)]	4101	Word	Decimal	2	Read	44102 (PLC to HMI)
5	Master[1)]	4102	Word	Decimal	2	Read	44103 (PLC to HMI)
6	Master[1)]	4103	Word	Decimal	2	Read	44104 (PLC to HMI)
7	Master[1)]	5358	Word	Binary	16	Read	45359 (diagnostic STB)
1)	Here Master is the default of the XBTL1000 configuration software for the symbol of the Modbus slave connected to the Magelis terminal, in this case the Advantys STB Island with CANopen NIM. The fieldbus master is not meant here.						

For the complete assignment of the registers, see section *Address assignment overview, p. 155*.

Setup of the application page

To set up the application page, proceed as follows:

Step	Action
1	Start the program **XBT-L 1000**. **Result**: The **Terminal type configuration** dialog box opens.
2	On this dialog box in the **Commercial reference** area, select the terminal type **XBT-PM027010** by clicking it.
3	On this dialog box in the **Choose Protocol** area, select **Modbus** as the communication protocol.
4	Confirm the selection with **OK**. **Result**: The page editor opens with **Page 1** : 
5	Under **Configuration** → **Dialogue table**, deactivate the **Use dialogue table** checkbox.
6	Save your application with **File** → **Save**. The **Save As** dialog box is displayed.
7	Specify the place and name under which your application should be saved; for the example: `LW:\Schneider Application\Advantys_HMI_CANopen\Magelis_co1\xbtl_co1.dop`. Confirm with the **Save** command button.

Configuring the application page

To configure the following application page, proceed as follows:

Step	Action
1	Place the pointer at the beginning of the second line and enter the text `Counter Current Value: .`
2	Place the pointer in the position of field 1, see section *Presentation on the application page, p. 161*.
3	With **Edit** → **Insert variable field** → **Alphanumeric**, insert the field for displaying the current value of the counter. **Result**: The **Insert an alphanumeric field** dialog box opens.
4	Configure this field in accordance with the details in the table in section *Presentation on the application page, p. 161*. (You will find the selection for the **Access** under **"Options..."**).
5	Proceed with the configuration of the other fields 2 - 7 in accordance with the presentation of the application page and the table in section *Presentation on the application page, p. 161* by repeating steps 1 to 4.

Loading the application

To load the application in the Magelis XBT, proceed as follows:

Step	Action
1	Connect the configured PC interface using the **XBTZ915** cable with the Magelis XBT PN 027010.
2	Select **Transmit** → **Export** to send your application to the Magelis. **Result**: The application is sent to the connected Magelis terminal.

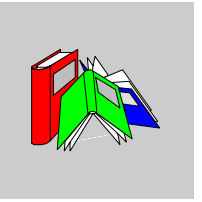
Operation of the Magelis XBT PM 027010

Operating the application

To operate the application in the Magelis XBT, proceed as follows:

Step	Action
1	Make sure that the fieldbus connections are plugged into your configuration and that the applications are started in the controller that contains the fieldbus master as well as in the Advantys STB Island.
2	Connect the CFG interface of the network interface module of the Advantys STB Island using the **XBTZ988** cable with the Magelis XBT PM 027010. **Result**: The configured application page is displayed on the terminal's screen. Now in the **Presetting setpoint** field you can specify the setpoint for the counter that is configured on the controller connected to the fieldbus.

Glossary



A

analog input — A module that contains circuits that convert analog DC input signals to digital values that can be manipulated by the processor. By implication, these analog inputs are usually direct—i.e., a data table value directly reflects the analog signal value.

analog output — A module that contains circuits that transmit an analog DC signal proportional to a digital value input to the module from the processor. By implication, these analog outputs are usually direct—i.e., a data table value directly controls the analog signal value.

application object — In CAN-based networks, application objects represent device-specific functionality, such as the state of input or output data.

C

CAN — *controller area network.* The CAN protocol (ISO 11898) for serial bus networks is designed for the interconnection of smart devices (from multiple manufacturers) in smart systems for real-time industrial applications. CAN multi-master systems ensure high data integrity through the implementation of broadcast messaging and advanced error mechanisms. Originally developed for use in automobiles, CAN is now used in a variety of industrial automation control environments.

CANopen protocol — An open industry standard protocol used on the internal communication bus. The protocol allows the connection of any standard CANopen device to the island bus.

CFG port The *configuration interface* on the network interface module (NIM) of an Advantys STB Island serves to connect a computer with the Advantys configuration software or to connect an MMI terminal.

COB *communication object.* A communication object is a unit of transportation (a message) in a CAN-based network. Communication objects indicate a particular functionality in a device. They are specified in the CANopen communication profile.

configuration The arrangement and interconnection of hardware components within a system and the hardware and software selections that determine the operating characteristics of the system.

D

digital I/O An input or output that has an individual circuit connection at the module corresponding directly to a data table bit or word that stores the value of the signal at that I/O circuit. It allows the control logic to have discrete access to the I/O values.

E

EDS *electronic data sheet.* The EDS is a standardized ASCII file that contains information about a network device's communications functionality and the contents of its object dictionary. The EDS also defines device-specific and manufacturer-specific objects.

F

Fieldbus format The data in the process data image is displayed in the respective format of the fieldbus protocol used. This is determined by the type of NIM used.

G

GSD — *generic slave data* (file). A device description file, supplied by the device's manufacturer, that defines a device's functionality on a Profibus DP network.

H

HMI — *human-machine interface* (man machine interface (MMI)). A usually graphic user interface for industrial devices.

I

INTERBUS protocol — The INTERBUS fieldbus protocol observes a master/slave network model with an active ring topology, having all devices integrated in a closed transmission path.

L

LSB — *least significant bit, least significant byte.* The part of a number, address, or field that is written as the rightmost single value in conventional hexadecimal or binary notation.

M

master/slave model — The direction of control in a network that implements the master/slave model is always from the master to the slave devices.

MMI — *man machine interface (human-machine interface (HMI))* A usually graphic user interface for industrial devices.

Modbus Modbus is an application layer messaging protocol. Modbus provides client and server communications between devices connected on different types of buses or networks. Modbus offers many services specified by function codes.

Modbus format The data in the process data map is displayed as it is exchanged within the physical island and with the MMI via the Island bus.

MSB *most significant bit, most significant byte.* The part of a number, address, or field that is written as the leftmost single value in conventional hexadecimal or binary notation.

N

NIM *network interface module.* This module is the interface between an island bus and the fieldbus network of which the island is a part. A NIM enables all the I/O on the island to be treated as a single node on the fieldbus. The NIM also provides 5 V of logic power to the Advantys STB I/O modules in the same segment as the NIM.

O

Object Dictionary Also called the *Object directory*. Part of the CANopen device model that provides a map to the internal structure of CANopen devices (according to CANopen profile DS-401). A device's object dictionary is a lookup table that describes the data types, communications objects, and application objects the device uses. By accessing a particular device's object dictionary through the CANopen fieldbus, you can predict its network behavior and build a distributed application.

P

PDM *power distribution module.* A module that distributes either AC or DC field power to a cluster of I/O modules directly to its right on the island bus. A PDM delivers field power to the input modules and the output modules. It is important that all the I/O clustered directly to the right of a PDM be in the same voltage group—either 24 VDC, 115 VAC, or 230 VAC.

PDO *process data object.* In CAN-based networks, PDOs are transmitted as unconfirmed broadcast messages or sent from a producer device to a consumer device. The transmit PDO from the producer device has a specific identifier that corresponds to the receive PDO of the consumer devices.

PE *protective earth.* A return line across the bus for fault currents generated at a sensor or actuator device in the control system.

PLC *programmable logic controller.* The PLC is the brain of an industrial manufacturing process. It automates a process as opposed to relay control systems. PLCs are computers suited to survive the harsh conditions of the industrial environment.

Profibus DP *Profibus decentralized peripheral.* An open bus system that uses an electrical network based on a shielded two-wire line or an optical network based on a fiber-optic cable. DP transmission allows for high-speed, cyclic exchange of data between the controller CPU and the distributed I/O devices.

R

Repeater An interconnection device that extends the permissible length of a bus.

Rx *reception.* For example, in a CAN-based network, a PDO is described as an RxPDO of the device that receives it.

S

SDO *Service data object.* In CAN-based networks, SDO messages are used by the fieldbus master to access (read/write) the object directories of network nodes.

STB Smart Terminal Block

SyCon **SYstem CONfigurator** is software for configuring fieldbuses.

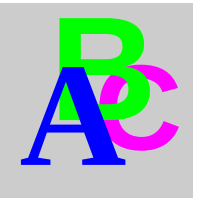
T

Tx *transmission.* For example, in a CAN-based network, a PDO is described as a TxPDO of the device that transmits it.

W

watchdog timer A timer that monitors a cyclical process and is cleared at the conclusion of each cycle. If the watchdog runs past its programmed time period, it generates a fault.

Index



D

E

F

H

I

M

N

O

P

S

X