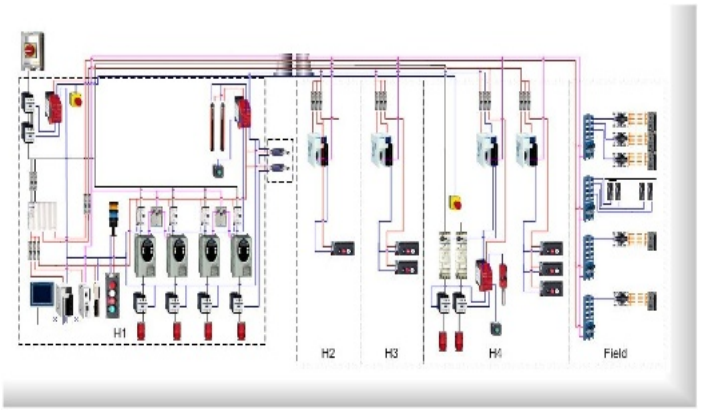
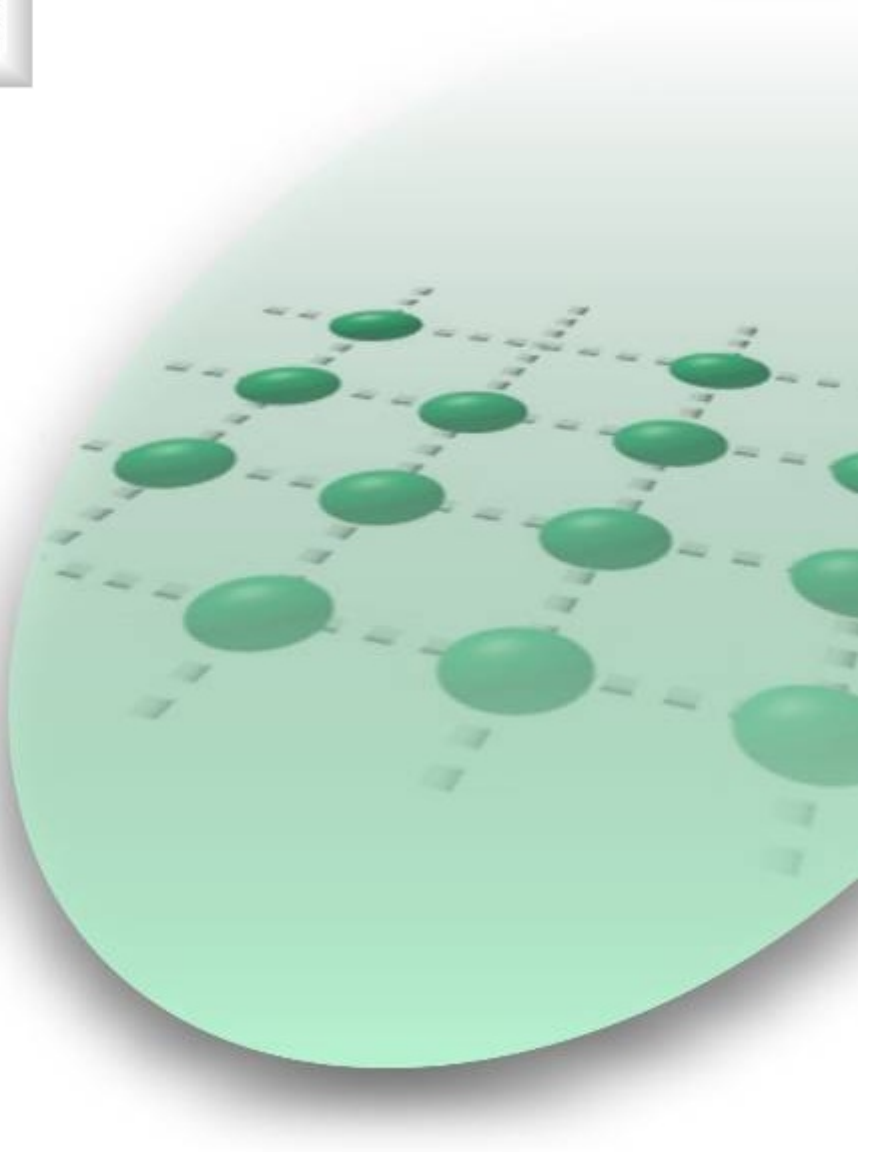
Twido and Altivar Magelis & OTB FTB

System User Guide

[source code]



Preferred Implementation:
Distributed CANopen Optimized



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Telemecanique

Schneider Electric
Building a New Electric World

Sep 2006

Contents

Introduction

This document is intended to provide a quick introduction to the described System.
It is not intended to replace any specific product documentation. On the contrary, it offers additional information to the product documentation, for installing, configuring and starting up the system.

A detailed functional description or the specification for a specific user application is not part of this document. Nevertheless, the document outlines some typical applications where the system might be implemented.

Abbreviations

Word / Expression	Signification
AC	Alternating Current
Advantys	SE product name for a family of I/O modules
Altivar (ATV)	SE product name for a family of VSDs
CANopen	Name for a communications maschine bus system
CB	Circuit Breaker
CoDeSys	Hardware-independant IEC 61131-3 programming software
ConneXium	SE product name for a Family of Transparent Factory devices
DC	Direct Current
EDS	Electronic Data Sheet
E-OFF, E-STOP	Emergency Off switch
Harmony	SE product name for a family of switches and indicators
HMI	Human Machine Interface
I/O	Input/Output
IclA (ICLA)	SE product name for a compact drive
Lexium/Lexium05/LXM	SE product name for a family of servo-drives
Magelis	SE product name for a family of HMI-Devices
MB - SL	SE name for a serial Modbus communications protocol
Micro	SE product name for a middle range family of PLCs
NIM	SE product name for a Network Interface Module
PC	Personal Computer
Phaseo	SE product name for a family of power supplies
PLC	Programmable Logic Computer
Powersuite	An SE software product for configuring ALTIVAR drives
Premium	SE product name for a middle range family of PLCs
Preventa	SE product name for a family of safety devices
PS1131 (CoDeSys)	SE Product name for PLC programming software with CoDeSys
PS	Power Supply
SE	Schneider Electric
Sycon	SE product name of a Field bus programming software
Telefast	SE product name for a series of distributed I/O devices
TesysU	SE product name for a decentralised I/O System
Twido	SE product name of a middle range family of PLCs
TwidoSoft	SE product name for a PLC programming software
TwidoSuite	SE product name for a PLC programming software
Unity (Pro)	SE product name for a PLC programming software
Vijeo Designer	An SE software product for programming Magelis HMI devices
VSD	Variable Speed Drive
WxHxD	Dimensions : Width, Height and Depth
XBT-L1000	An SE software product for programming Magelis HMI devices

Application Source Code

Introduction

Examples of the source code and wiring diagrams used to attain the system function as described in this document can be downloaded from our website under **this** link.

The example source code is in the form of configuration, application and import files. Use the appropriate software tool to either open or import the files.

Extension	File Type	Software Tool Required
AIW	Configuration File	Advantys
CNF	**C**onfiguratio**n** **F**ile	Sycon
CO	**C**AN**o**pen definitions file	Sycon
CSV	**C**omma **S**eperated **V**alues, Spreadsheet	Twidosoft
CTX		Unity
DCF	**D**evice **C**onfiguration **F**ile	Advantys
DIB	**D**evice **I**ndependent **B**itmap	Sycon
DOC	**Doc**ument file	Microsoft Word
DOP	Project File	Magelis XBTL
EDS	**E**lectronic **D**ata **S**heet – Device Definition	Industrial standard
FEF	Export file	PL7
GSD	EDS file (**G**eraete **S**tamm **D**atei)	Profibus
ISL	**Isl**and file, project file	Advantys
PB	**P**rofi**b**us definitions file	Sycon
PDF	**P**ortable **D**ocument **F**ormat - document	Adobe Acrobat
PS2	Export file	Powersuite export file
RTF	**R**ich **T**ext **F**ile - document	Microsoft Word
SPA	Schneider Product Archive	TwidoSuite
STU	Project file	Unity Pro
STX	Project file	PL7
TLX	Project file	Twinline control tool
TWD	Project file	TwidoSoft
VDZ	Project file	Vijeo Designer
XEF	Export file	Unity Pro
XPR	Project File	TwidoSuite
ZM2	Project File	Zeliosoft

Typical Applications

Introduction

Here you will find a list of the typical applications, and their market segments, where this system or subsystem can be applied:

Industrial
- Small automated machine or plant components
- Remote automation systems used to supplement large and medium-sized machines

Buildings/Services
- Conveyor belt with turntable
- Irrigation systems for greenhouses

Infrastructure
- Air-conditioning/ventilation for tunnel systems

Food & Beverage/Pharmaceuticals
- Control and monitoring of pumps and valves

Application	Description	Image
Conveyor belt with turntable	These plant components are often connected upstream of a larger packaging or filling plant as feeder system components. Sorting is possible using photo barriers or weight sensors.	
Irrigation systems for greenhouses	This application controls irrigation in greenhouses. Temperature, light and humidity sensors permit the correct irrigation of all types of plants.	
Air-conditioning/ ventilation for tunnel systems	Tunnel systems must be ventilated according to weather and traffic conditions. Small-scale systems can control turbines and valves in ventilation shafts and monitor carbon monoxide levels and air quality.	
Control and monitoring of pumps and valves	As part of an overall plant or external station in a water supply/drainage system. Pressure sensors, flow meters and level measuring (e.g., inductive measurements) can be used to adjust delivery according to demand.	

System

Introduction

The system chapter describes the architecture, the dimensions, the quantities and different types of components used within this system.

Architecture

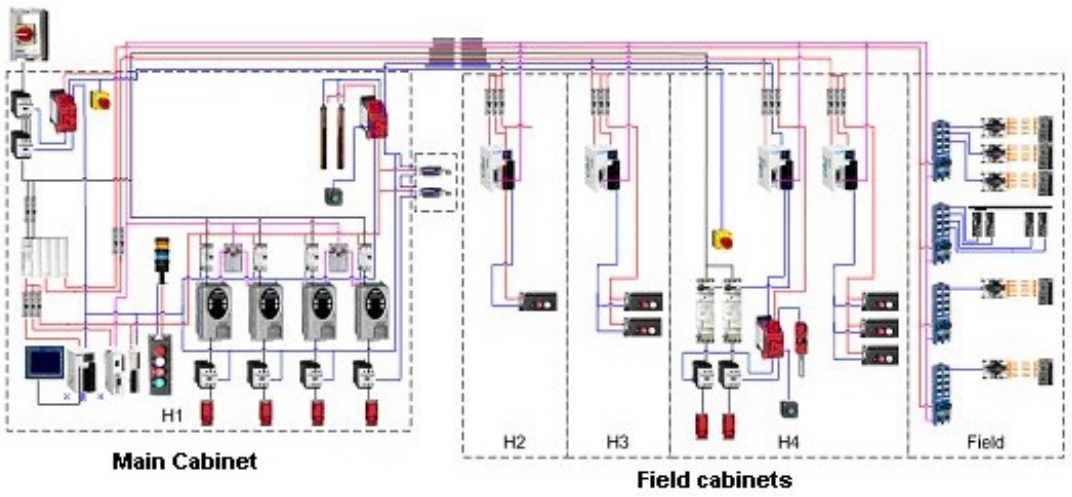
General

The control section of this application consists of a Twido PLC, which can be controlled via a connected Magelis HMI panel. The load section is implemented using Altivar 31 VSDs, which are connected to the control system via the CANopen bus system and two TeSys U-line starter-controllers with reversing contactors.

The solution illustrated below offers three optional safety packages: a Preventa evaluation unit featuring an emergency-off function that can be accessed via 2 tamper-proof emergency-off buttons, and an evaluation unit of the same type that ensures door safety within the context of this application by using safety limit switches. A Preventa evaluation unit is also used to monitor a light curtain.

Four other OTBs are used as digital I/O for the remote locations H2-H3. Four FTBs are used for sensor acquisition in the field.

Layout



Components

Hardware:

- Emergency Off Master switch, 3-pole, 20A, 7.5KW (VCF 02GE)
- Motor fuse protector Multi 9 21107
- Altivar ATV31 variable speed drive with CANopen interface
- Motor starter, TeSysU-line type
- XALK locking-type emergency-off button with rotary unlocking (tamper-proof)
- Emergency-off switching devices, Preventa type
- Phaseo ABL7 RE power supply unit
- Modular/compact Twido PLC with CANopen module
- Magelis XBT-G compact color display terminal
- Advantys OTB and FTB modules for CANopen
- ZB5 pushbuttons and indicator lamps
- OSI family sensors (Osiprox, Osiswitch, Osiris)
- Standard AC motors

Software:

- TwidoSuite Version 1.0
- Advantys Lite Version 1.4
- PowerSuite 2.3
- Vijeo Designer V4.4

Quantities of Components

For a complete and detailed list of components, the quantities required and the order numbers, please refer to the components list at the rear of this document.

Degree of Protection

Not all the components in this configuration are designed to withstand the same environmental conditions. Some components may need additional protection, in the form of housings, depending on the environment in which you intend to use them. For environmental details of the individual components please refer to the list in the appendix of this document and the appropriate user manual.

Technical Data

Supply voltage	400 V AC
Total supply output	~ 11 kW
Drive rated powers	4 x 0.37 kW
Motor brake	None
Connector cross-section	5 x 2.5mm² (L1, L2, L3, N, PE)
Safety category	Cat. 3 (optional)

Safety notice

The standard and level of safety you apply to your application is determined by your system design and the overall extent to which your system may be a hazard to people and machinery.

As there are no moving mechanical parts in this application example, category 3 (according to EN954-1) has been selected as an optional safety level.

Whether or not the above safety category should be applied to your system should be ascertained with a proper risk analysis.

This document is not comprehensive for any systems using the given architecture and does not absolve users of their duty to uphold the safety requirements with respect to the equipment used in their systems or of compliance with either national or international safety laws and regulations

Dimensions

The dimensions of the devices used for H1 (e.g., the PLC, variable speed drive and the power supply) are suitable for installation inside a small control cabinet measuring 800x600x300 mm (WxHxD).

In addition, the display and control elements (e.g., start/emergency-off acknowledgment) can be integrated into the control cabinet door along with the Magelis HMI.

The Advantys OTB devices for H2 and H3 with their connection components should be installed directly on site in two small cabinet measuring 300x300x250mm (WxHxD). The buttons can be fed through or, with greater depths (300mm), installed inside the cabinet.

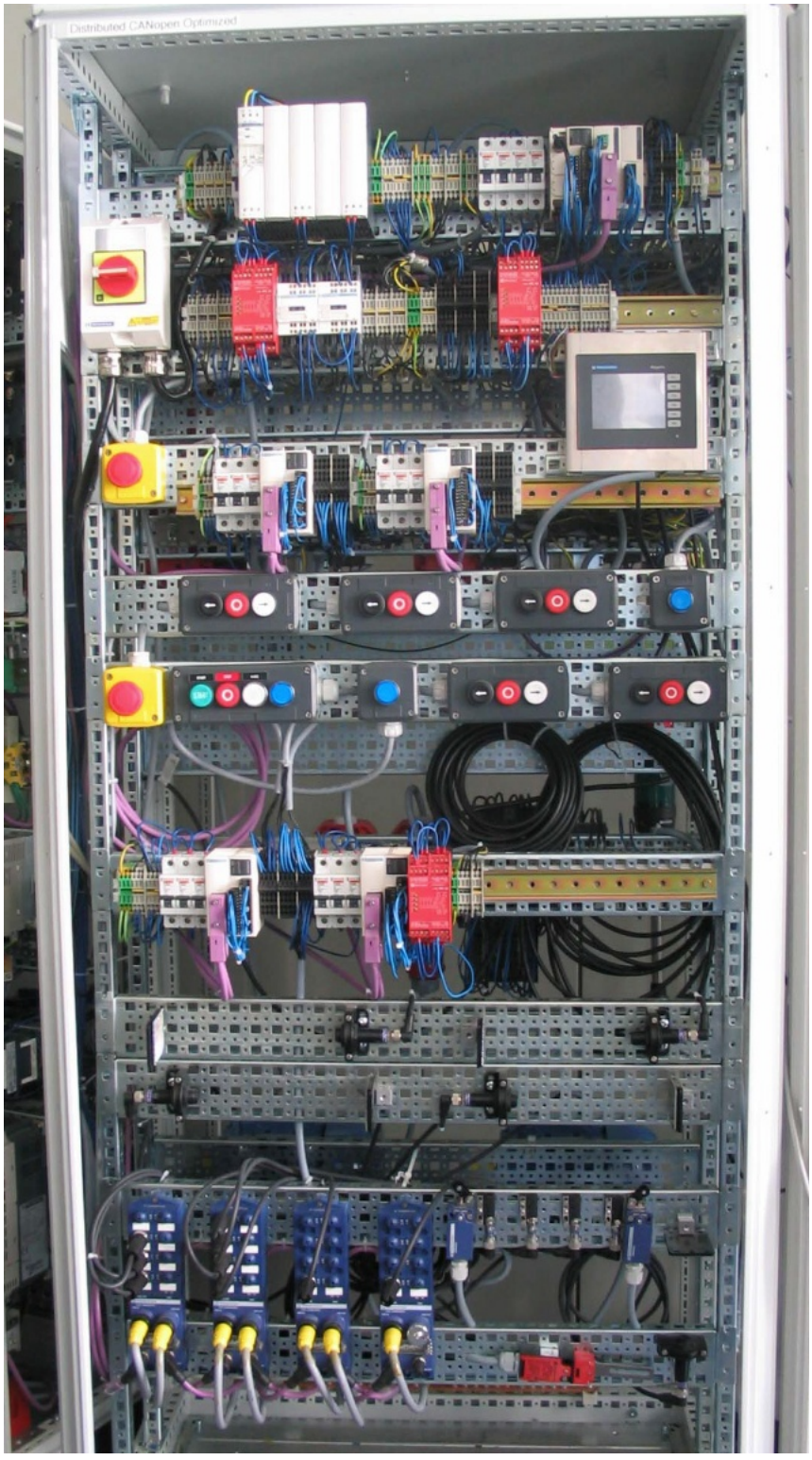
The Advantys OTB devices combined with the TeSys U units in H4 should be installed in a cabinet measuring 600x600x300mm (WxHxD). In addition, the display and control elements (e.g., start/emergency-off acknowledgment) can be integrated into the control cabinet door.

Installation

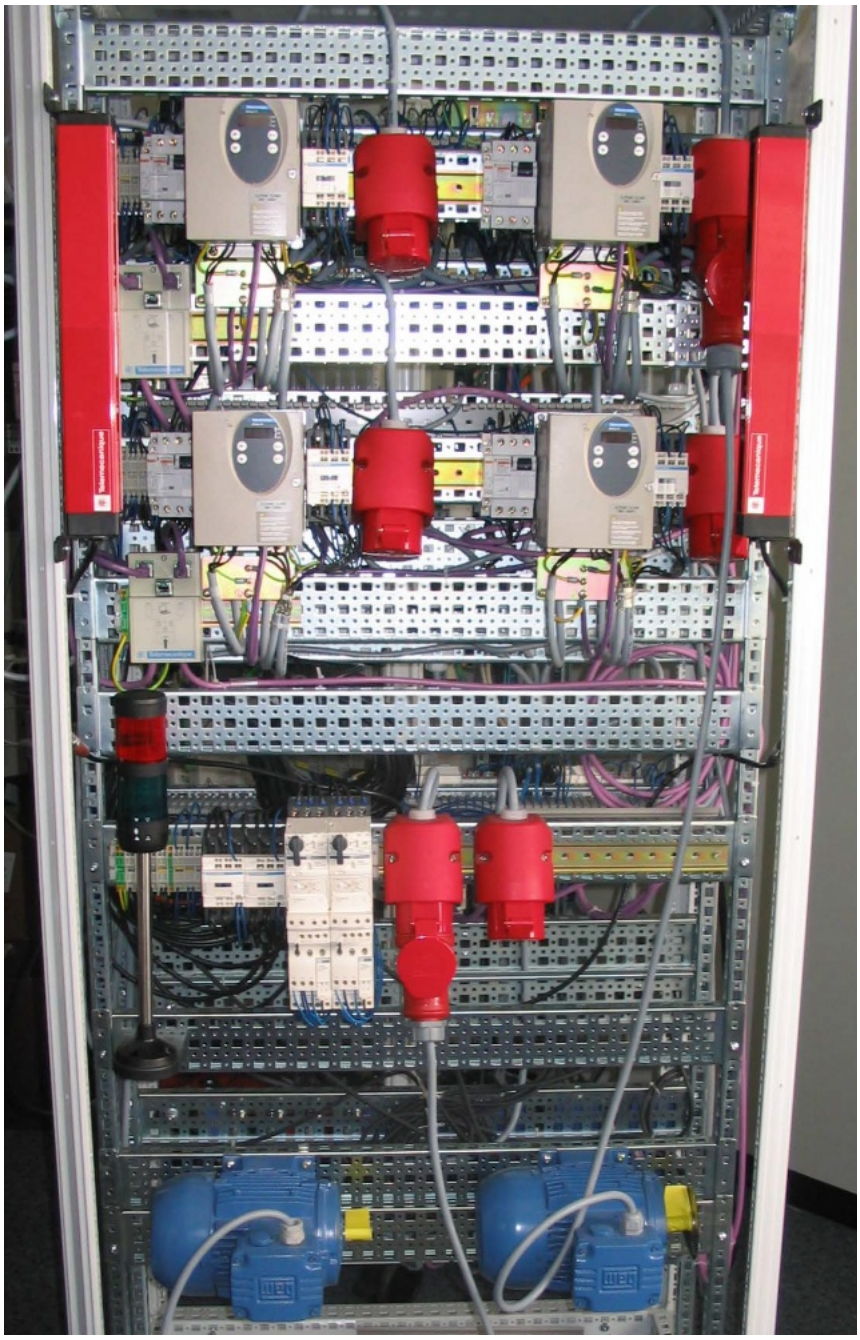
Introduction

This chapter describes the steps required to assemble the hardware and install the software in order to solve the application task concerned.

Assembly



Assembly
Contd.



Note

The configuration used for this application is based on the example of a pallet conveyor system with a turntable.

The components and I/O points listed below represent a cross-section of the components and signals that are essential for control and display purposes, and a number of optional inputs and outputs that can be used in this application with the architecture described.

Wiring of the Control Inputs and Outputs

Twido PLC inputs	%I 0.0 %I 0.1 %I 0.2 %I 0.3 %I 0.4 %I 0.5 %I 0.6 %I 0.7 %I 0.8 %I 0.9 %I 0.10 %I 0.11 %I 2.0 %I 2.1 %I 2.2 %I 2.3 %I 2.4 %I 2.5 %I 2.6 %I 2.7	Emergency-off Preventa activated Emergency-off switch 1 pressed Emergency-off contactor activated Light curtain activated Light curtain Preventa activated Motor contactors 1-4 controlled Acknowledge button error Start button Stop button Manual mode button Free Free Limit switch 1 activated Limit switch 2 activated Emergency-off switch 2 pressed Free Belt 1 fuse OK Belt 2 fuse OK Belt 3 fuse OK Turntable fuse OK
Twido PLC outputs	%Q 1.0 (Trans) %Q 1.1 (Trans) %Q 1.2 %Q 1.3 %Q 1.4 %Q 1.5 %Q 1.6 %Q 1.7	Free Free Signal lamps – green - Running Signal lamps – yellow - Manual mode Signal lamps – red - Fault Button – blue - Running Button – white - Manual mode Button – blue – Acknow. light curtain
Twido power supply	Com (inputs) -V Com (+) Com 1 Com 2 Com 3	0 V DC reference voltage 0 V DC reference voltage +24 V DC +24 V DC +24 V DC +24 V DC

Wiring of OTB1

Advantys OTB inputs	%IWC1.8.0:X0	Reverse belt 1
	%IWC1.8.0:X1	Stop belt 1
	%IWC1.8.0:X2	Forward belt 1
	%IWC1.8.0:X3	Free
	%IWC1.8.0:X4	Free
	%IWC1.8.0:X5	Free
	%IWC1.8.0:X6	Free
	%IWC1.8.0:X7	Free
	%IWC1.8.1:X0	Free
	%IWC1.8.1:X1	Free
	%IWC1.8.1:X2	Free
	%IWC1.8.1:X3	Free
Advantys OTB outputs	%QWC1.8.0:X0 Trans	Free
	%QWC1.8.0:X1 Trans	Free
	%QWC1.8.0:X2	Free
	%QWC1.8.0:X3	Free
	%QWC1.8.0:X4	Free
	%QWC1.8.0:X5	Free
	%QWC1.8.0:X6	Free
	%QWC1.8.0:X7	Free
Advantys OTB power supply	Com (inputs)	0 V DC reference voltage
	-V	0 V DC reference voltage
	Com (+)	+24 V DC
	Com 1	+24 V DC
	Com 2	+24 V DC
	Com 3	+24 V DC
	CANopen	

Wiring of OTB2

Advantys OTB inputs	%IWC1.9.0:X0	Reverse belt 2
	%IWC1.9.0:X1	Stop belt 2
	%IWC1.9.0:X2	Forward belt 2
	%IWC1.9.0:X3	Reverse belt 3
	%IWC1.9.0:X4	Stop belt 3
	%IWC1.9.0:X5	Forward belt 3
	%IWC1.9.0:X6	free
	%IWC1.9.0:X7	free
	%IWC1.9.1:X0	free
	%IWC1.9.1:X1	free
	%IWC1.9.1:X2	free
	%IWC1.9.1:X3	free
Advantys OTB outputs	%QWC1.9.0:X0 Trans	free
	%QWC1.9.0:X1 Trans	free
	%QWC1.9.0:X2	free
	%QWC1.9.0:X3	free
	%QWC1.9.0:X4	free
	%QWC1.9.0:X5	free
	%QWC1.9.0:X6	free
	%QWC1.9.0:X7	free
Advantys OTB power supply	Com (inputs)	0 V DC reference voltage
	-V	0 V DC reference voltage
	Com (+)	+24 V DC
	Com 1	+24 V DC
	Com 2	+24 V DC
	Com 3	+24 V DC
	CANopen	

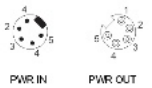
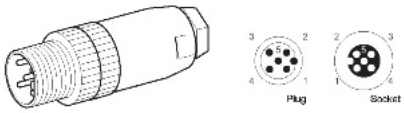
Wiring of OTB3

Advantys OTB inputs	%IWC1.10.0:X0	free
	%IWC1.10.0:X1	Reverse belt turntable
	%IWC1.10.0:X2	Stop belt turntable
	%IWC1.10.0:X3	Forwards belt turntable
	%IWC1.10.0:X4	Reverse belt process
	%IWC1.10.0:X5	Stop belt process
	%IWC1.10.0:X6	Forwards belt process
	%IWC1.10.0:X7	Reverse turntable
	%IWC1.10.1:X0	Stop turntable
	%IWC1.10.1:X1	Forwards turntable
	%IWC1.10.1:X2	free
	%IWC1.10.1:X3	free
Advantys OTB outputs	%QWC1.10.0:X0 Trans	free
	%QWC1.10.0:X1Trans	free
	%QWC1.10.0:X2	free
	%QWC1.10.0:X3	free
	%QWC1.10.0:X4	free
	%QWC1.10.0:X5	free
	%QWC1.10.0:X6	free
	%QWC1.10.0:X7	free
Advantys OTB power supply	Com (inputs)	0 V DC reference voltage
	-V	0 V DC reference voltage
	Com (+)	+24 V DC
	Com 1	+24 V DC
	Com 2	+24 V DC
	Com 3	+24 V DC
	CANopen	

Wiring of OTB4

Advantys OTB inputs	%IWC1.11.0:X0	Free
	%IWC1.11.0:X1	Free
	%IWC1.11.0:X2	Free
	%IWC1.11.0:X3	Door safety contactor
	%IWC1.11.0:X4	Door safety Preventa Module
	%IWC1.11.0:X5	Belt Turntable in reverse
	%IWC1.11.0:X6	Belt Turntable running forwards
	%IWC1.11.0:X7	Belt Process in reverse
	%IWC1.11.1:X0	Belt Process running forwards
	%IWC1.11.1:X1	free
	%IWC1.11.1:X2	free
	%IWC1.11.1:X3	free
Advantys OTB outputs	%QWC1.11.0 :X0 Trans	free
	%QWC1.11.0 :X1Trans	free
	%QWC1.11.0:X2	Belt Turntable command reverse
	%QWC1.11.0:X3	Belt Turntable command forwards
	%QWC1.11.0:X4	Belt Process command reverse
	%QWC1.11.0:X5	Belt Process command reverse
	%QWC1.11.0:X6	free
	%QWC1.11.0:X7	free
Advantys OTB power supply	Com (inputs)	0 V DC reference voltage
	-V	0 V DC reference voltage
	Com (+)	+24 V DC
	Com 1	+24 V DC
	Com 2	+24 V DC
	Com 3	+24 V DC
	CANopen	

Wiring of FTB1

Advantys FTB	%IWC1.4.0:X0 %IWC1.4.0:X1 %IWC1.4.0:X2 %IWC1.4.0:X3 %IWC1.4.0:X4 %IWC1.4.0:X5 %IWC1.4.0:X6 %IWC1.4.0:X7	light curtain belt 1 light curtain belt 2 light curtain belt 3 free free free free free
	%QWC1.4.0 %QWC1.4.1	free free
Advantys FTB power supply	CANopen	On FTB 1CN modules, the power supply is connected by means of a 5-pin 7/8" Mini-Style connector.  PWR IN PWR OUT Fig. 5-4: Power supply 5-pin 7/8" Mini-Style connector The table below shows pin assignment: Pin 1: 0 V Pin 2: 0V Pin 3: PE Pin 4: Sensor & bus power supply Pin 5: Actuator power supply On FTB 1CN modules, the CAN Bus is connected by means of a 5-pin, M12 connector.  Plug Socket Fig. 5-2: Bus connection 5-pin 7/8" connector The table below shows pin assignment: 1 Screen Screen Bridge, plug-socket and PE socket 2 NC Red Not connected 3 V - Black Bridge, plug-socket 4 CAN_H White Bridge, plug-socket 5 CAN_L Blue Bridge, plug-socket

Wiring of FTB2

Advantys FTB	%IWC1.5.0:X0 %IWC1.5.0:X1 %IWC1.5.0:X2 %IWC1.5.0:X3 %IWC1.5.0:X4 %IWC1.5.0:X5 %IWC1.5.0:X6 %IWC1.5.0:X7	Proximity sensor Pos1 Proximity sensor Pos1.2 Proximity sensor Pos2 Proximity sensor Pos2.2 free free free free
	%QWC1.5.0 %QWC1.5.1	frei frei
Advantys FTB power supply	CANopen	See FTB1

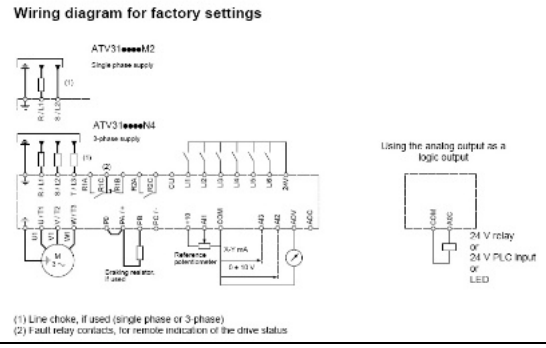
Wiring of FTB3

Advantys FTB	%IWC1.6.0:X0 %IWC1.6.0:X1 %IWC1.6.0:X2 %IWC1.6.0:X3 %IWC1.6.0:X4 %IWC1.6.0:X5 %IWC1.6.0:X6 %IWC1.6.0:X7	Photo barrier belt turntable free free free free free free free
	%QWC1.6.0 %QWC1.6.1	frei frei
Advantys FTB power supply	CANopen	See FTB1

Wiring of FTB4

Advantys FTB	%IWC1.7.0:X0 %IWC1.7.0:X1 %IWC1.7.0:X2 %IWC1.7.0:X3 %IWC1.7.0:X4 %IWC1.7.0:X5 %IWC1.7.0:X6 %IWC1.7.0:X7	Photo barrier belt sequence free free free free free free free
	%QWC1.7.0 %QWC1.7.1	free free
Advantys FTB power supply	CANopen	See FTB1

Wiring of VSD1

ATV31	CANopen	

Wiring of VSD2

ATV31	CANopen	See VSD1

Wiring of VSD3

ATV31	CANopen	See VSD1

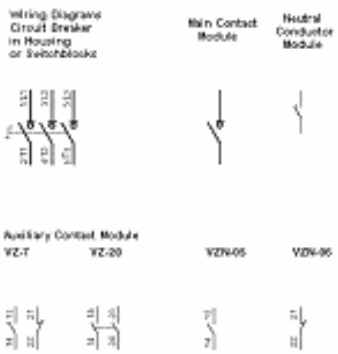
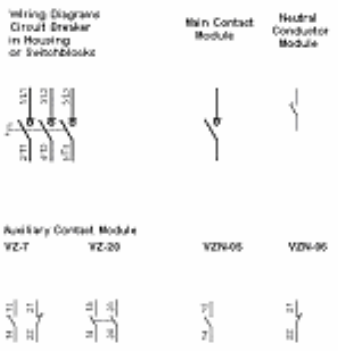
Wiring of VSD4

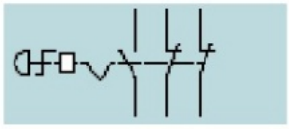
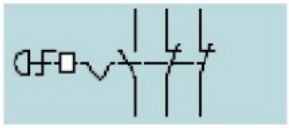
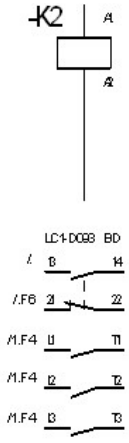
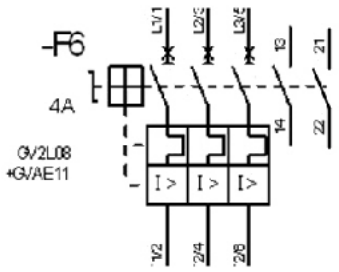
ATV31	CANopen	See VSD1

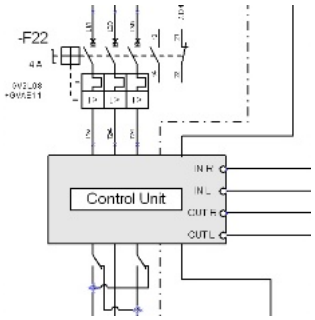
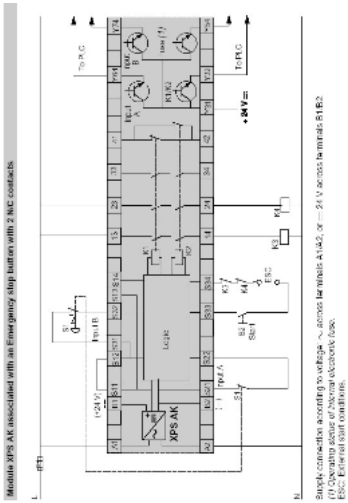
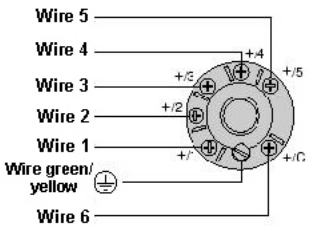
Hardware

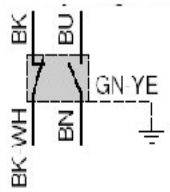
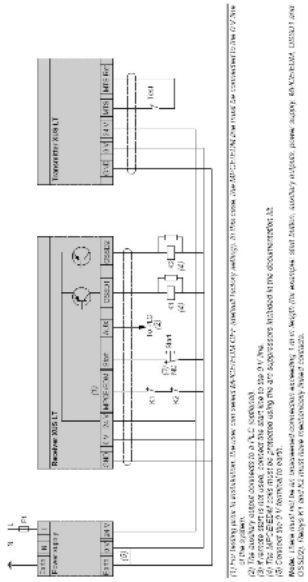
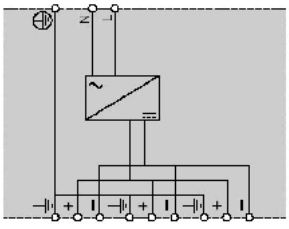
General

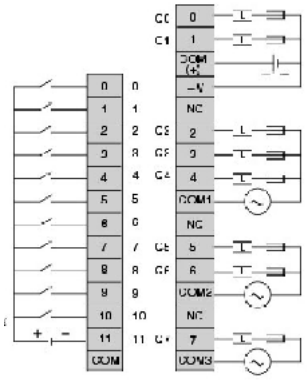
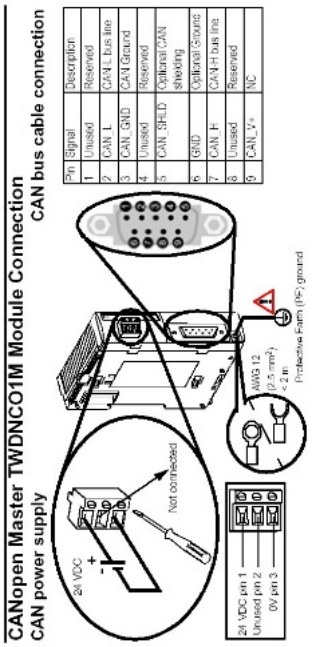
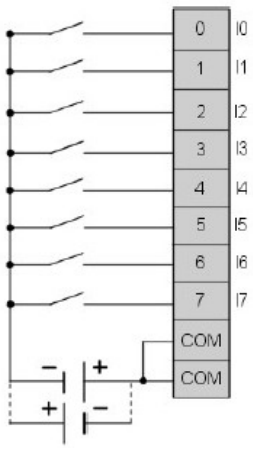
- The components designed for installation in a control cabinet, i.e., master switch, Twido PLC, Phaseo power supply unit, emergency-off switching device, line circuit breaker, contactors and motor circuit breaker, can be snapped onto a 35 mm DIN rail.
- The Altivar variable speed drive can also be snapped onto a DIN rail using an adapter, but can also be screwed directly onto the mounting plate without the need for an adapter plate.
- The emergency-off and door-safety switches, indicator bank as well as the housing for display and acknowledge indicators, are designed for backplane assembly in the field; with the exception of the door-safety switch, all switches can also be installed directly in a control cubicle (e.g., in cubicle door) without their enclosing housings.
- There are two options for installing XB5 pushbuttons or indicator lamps: These pushbuttons or switches can be installed either in a 22 mm hole, e.g., drilled into the front door of the control cabinet, or in an XALD-type housing suitable for up to 5 pushbuttons or indicator lamps. The XALD pushbutton housing is designed for backplane assembly or direct wall mounting.
- The individual components must be interconnected in accordance with the detailed circuit diagram in order to ensure they function correctly.

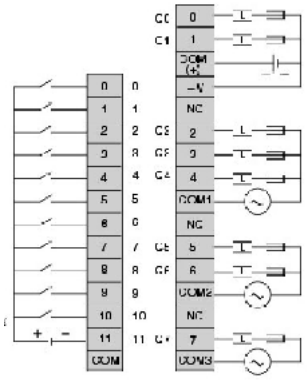
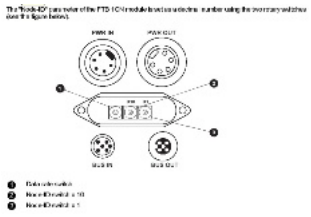
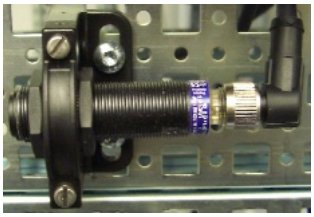
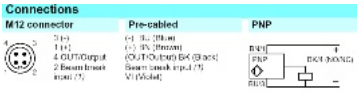
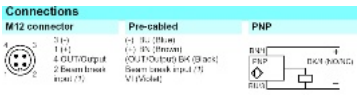
Master switch complete **VCF02GE**		
Option **for Cabinet door** **Emergency OFF** **Master Switch** **VCD0**		

EMERGENCY-OFF switch (tamper-proof) **XALK174G**		
Option for Cabinet door **Emergency OFF Switch (Tamper Proof)** **XB5AS8445**		
Contactor TesysD **LC1D093BD**		
Contactor TeSys **GV2L08 +GV2AE11** (Maintenance Switch)		

TeSys U-line module **contactor** **LUB12** **+** **LU2B12BL** **+** **LUA1C11** **+** **LUFN11** **+** **LUCA05BL**		
Preventa **safety relay** **XPS AK331144P**		
Indicator Beacon **XVB-C**		

Position switch OsiSwitch **XCKD2121P16**		
Light curtain **XUSLTR5A0350** + cable extensions **XSZTCR10** **XSZTCT10**		
Safety limit switch with door safety operating lever **XCSPL751**		2-pole N/C + N/C slow break 
Phaseo power supply unit **ABL7RE2410**		ABL-7RE2410 

Twido PLC modular power base **TWDLMDA20DRT**		
Twido PLC interface module CANopen master **TWDNCO1M**		
Twido DC IN module 8x DC IN **TWDDDI8DT**	TWDDDI8DT 	

Twido OTB **OTB1C0DM9LP** CANopen module 12x DC IN/6x DC OUT/2x AC OUT		
FTB module 8 IN/diagnostic 8 OUT **FTB1CN08E08S**		**Sensor and actuator connections**  Pin 1 : +24 V Pin 2 : I0 to I7 diagnostic or function input or output Pin 3 : 0 V Pin 4 : Q0 to Q7 function input or output Pin 5 : PE 
Light Curtain **XUB1APANM12**		
Proximity sensor **XS608B1PAM12**		

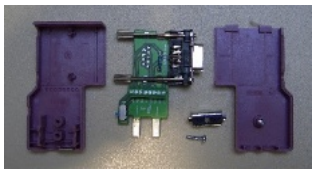
Cable for photo barriers and proximity sensor

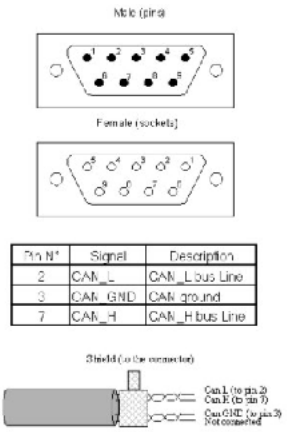
XZCP1264L2

Only 1x M12 connector for sensor: other side must be extended with connector XZCC12FDM40B

CANopen connector

TSX CANKCDF90TP
(additional contact for bus analysis) or
TSX CANKCDF90T
Both incl. terminating resistor for connection to Twido CANopen Master





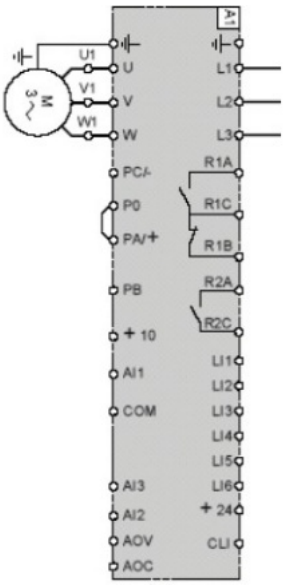
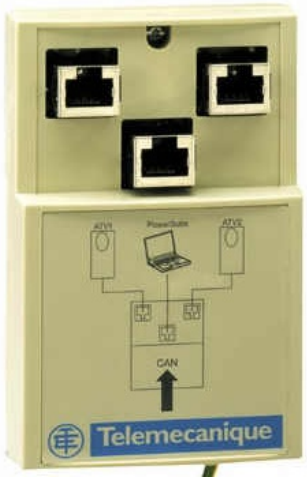
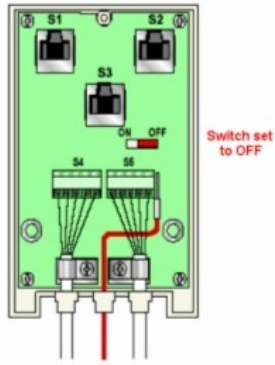
CANopen cable TSXCANCA50

Magelis operator terminal

XBTGT1100

And on the rear panel:
1 A removable screw terminal for ⎓ 24 V power supply.
2 A RJ45 connector for RS 232 C or RS 485 serial link to PLCs (COM1).
3 A 8-way female mini-DIN connector for application transfer cable.
4 A polarization switch for serial link used in RS 485 Modbus.

On XBT GT1130 only
5 A RJ45 connector for Ethernet TCP/IP (10BASE-T) link .

Variable speed drive Altivar ATV31 **ATV31H037N4**		
CANopen TAP **VW3CANTAP2**		 Pin | Signal | Description 1 | GND | Ground 2 | CAN_L | CAN_L bus line 3 | SHLD | Optional shield 4 | CAN_H | CAN_H bus line 5 | (V+) | Optional supply (1)

Software

General

The software is primarily used for programming the Twido PLC and configuring CANopen communication, as well as for visualization.

The TwidoSuite programming tool is used for programming the PLC.

The HMI application on the XBT-GT 1100 Magelis display terminal is configured using Vijeo Designer software.

Although Altivar 31 variable speed drives can be parameterized via the front panel, the PowerSuite software is a more user-friendly option. As well as providing a convenient means of setting drive parameters, this software also enables data to be saved and archived. These functions are extremely useful as they mean that parameters can be restored rapidly whenever service tasks need to be performed. The software can also help you to optimize the parameters online. The software is supplied with the drive.

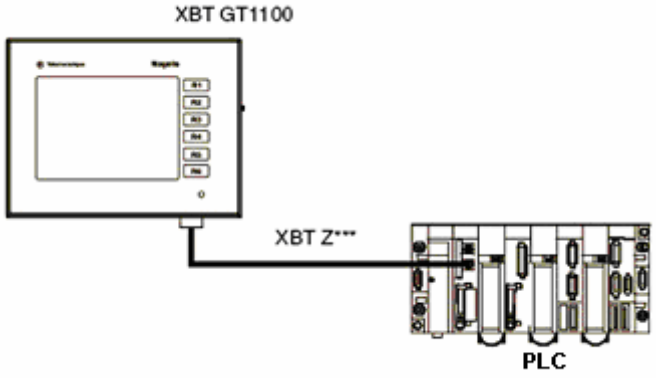
To use the software packages, your PC must have the appropriate Microsoft Windows operating system installed:

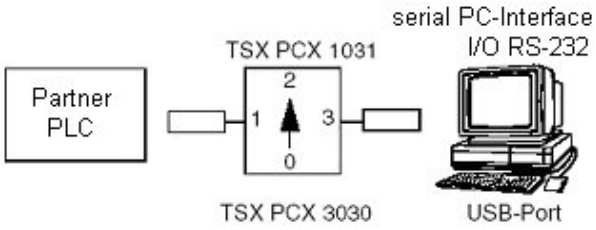
- Windows 2000 *or*
- Windows XP

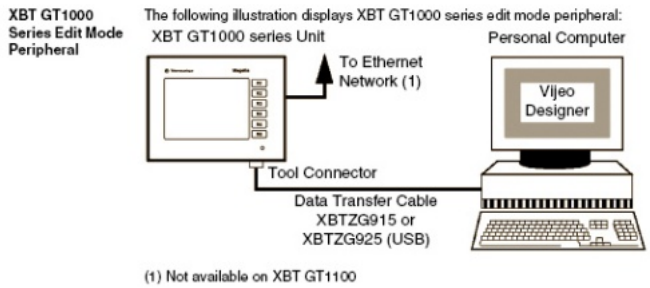
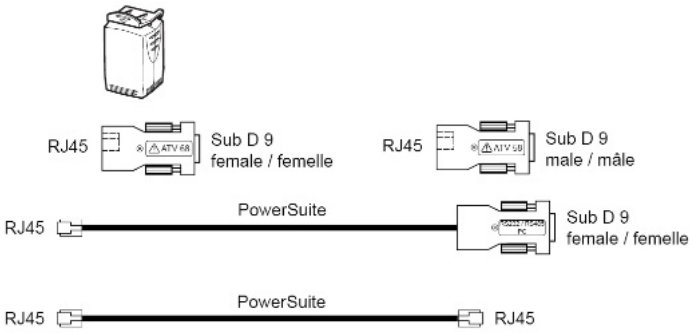
The software tools have the following default install paths:

- TwidoSuite
  C:\Program Files\Schneider Electric\TwidoSuite
- Advantys
  C:\Program Files\Schneider Electric\Advantys
- Vijeo Designer
  C:\Program Files\Schneider Electric\VijeoDesigner
- PowerSuite ATV31
  C:\Program Files\Schneider Electric\PowerSuite

Communication

HMI <> Twido	A Modbus connection is used to exchange data between the Magelis terminal and the Twido PLC. The XBTZ9780 communication cable shown below is needed to connect these two devices. The software driver required for Modbus communication is already contained in the software packages for the Magelis panel and the Twido.
Magelis communication cable **XBTZ9780**	

Twido <> PC	A TSXPCX1031 (serial) or TSXPCX3030 (USB) communication cable is used to exchange data between the Twido PLC and the programming PC. An extra driver must be installed for the USB cable. The driver for the serial cable is integrated into the TwidoSoft tool. Ensure that switch position 2 is set on the cable. Port 1 must be set/configured on the control system for point-to-point communication.
Twido programming cable **TSXPCX1031 (serial) or TSXPCX3030 (USB)**	

HMI <> PC	An XBTGZ915 communications cable is used to exchange data between the HMI XBTGT 1100 and the programming PC. This is contained in the Vijeo Designer software package.
XBTG programming cable **XBTGZ915**	
ATV31 <> PC	Programming the Altivar is done using the cable **VW3A8106** and the Powersuite cable RJ45<>SubD9 (black).
ATV31-Programming Cable **VW3A8106**	

CANopen

The data transfer between the individual bus clients can be implemented with either self made or pre-confectioned cable. Below you will find a component description.

CANopen Master Module

TWDNCO1M

The CANopen-Interface-Module is plugged into the Twido PLC and has a Sub-D-9 CANopen connection

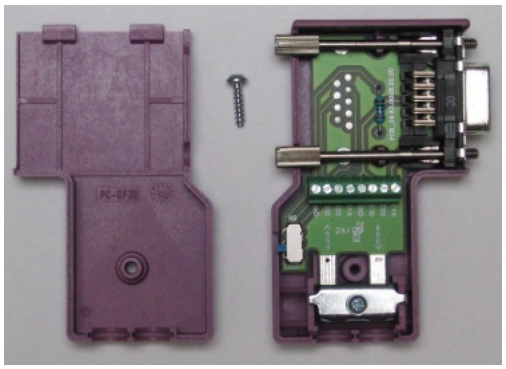
CANopen Plug

TSXCANKCDF90T

Use this plug on the **TWDNCO1M**. Plug includes a terminal resistor.

CANopen-Kabel TSXCANCD50

Flexibles Kabel

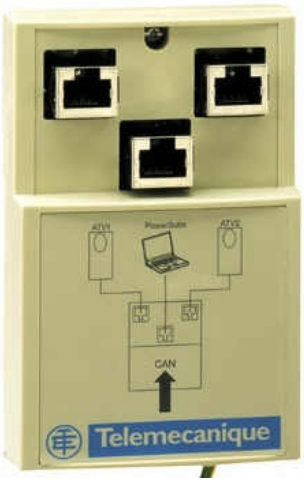


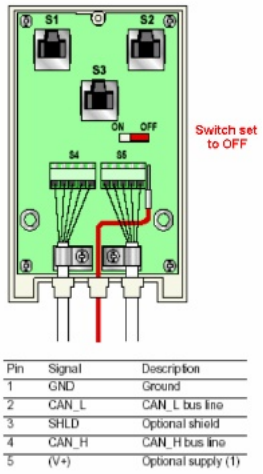
CANopen-TAP

VW3CANTAP2

Connection for 2 drives of type Altivar 31. Configuration port for use with PowerSuite. Terminal resisitor can be selected using the ON /OFF switch.

The image shows the resistor set to OFF.





Pin	Signal	Description
1	GND	Ground
2	CAN_L	CAN_L bus line
3	SHLD	Optional shield
4	CAN_H	CAN_H bus line
5	(V+)	Optional supply (1)

CanOpen Branch Cable

VW3CANRR1

Connects the TAP to the Altivar 31 with two RJ54 plugs**.**

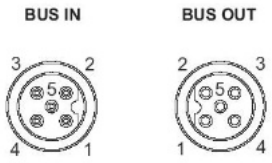
Bus Cable CANopen

FTXCN3210

Connect the FTB modules in serie starting with the

CANopen-Tap

VW3CANTDM4.

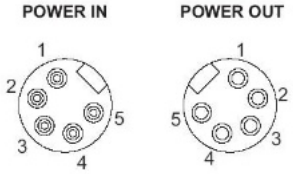


PIN	Signal	Colour
1	Shld	-
2	V+	Red
3	GND	Black
4	CAN_H	White
5	CAN_L	Blue

Power Supply Cable

FTXDP2210

the FTB power supply cables are linked in serie from one module to the next.



PIN	Signal	Cable
1	0V	1
2	0V	2
3	PE	Green/Yellow
4	+24V DI	3
5	+24V DO	4

Advantys FTB Terminal Resistor CANopen

FTXCNTL12

Connect to the last FTBModule in the series on the BUS OUT-Socket.

Implementation

Introduction

The implementation chapter describes all the steps necessary to initialise, to configure, to program and start-up the system to achieve the application functions as listed below.

Function

This is a simple function which has been selected to illustrate all of the components used in a practical application and to demonstrate their functions.The function can of course be modified to your own requirements.

General

The conveyor belt system consists of five belts. The packets are delivered via the chute onto the first belt. The first three belts, operating at different speeds, increase the distance between the packets and are controlled by the first three VSDs. The next stage is a short belt on a turntable. The turntable alters the direction of transport by 90°. The packet is finally conveyed via a fifth belt to the exit. Here the packet is passed onto the next section by a robot.

Photo barriers are used to isolate the packets so that at any time there is only one packet in a segment/belt. All three belts are controlled by variable speed drives (VSD) to permit differing speeds.

Belt 4 only accepts packets from belt 3 in the “Receive” position, during which belt 4 is driven then stopped as soon as the photo barrier is broken. The turntable then moves to the next position, “Release”. As soon as the turntable reaches the “Release” position, the belt is restarted and then runs for a certain time to ensure that the packet has left the belt. The turntable then returns to the “Receive” position.

The turntable is controlled by a fourth VSD and monitored by four proximity sensors as position indicators and two limit switches as impact protection devices..

Belt 5 receives the packet in the “Receive” position and conveys it until it has passed the photo barrier. If the photo barrier is then opened, the belt is run as “Empty”.

Belts 4 and 5 are both controlled by a TeSys U. The belts are thus run at a constant speed.

Manual & Auto

There are 3 operation modes: Manual and Automatic and HMI. A pushbutton is provided to change between manual and automatic. It reacts to a rising edge.

The individual buttons for motor control are only enabled in manual mode but the buttons in the 4-button housing and the two individual acknowledge buttons are excluded from this pre-condition. The HMI mode can only be selected and de-selected on the Magelis XBTG device.

Safety devices

the Emergency-off buttons switch the power off for the complete plant. This excludes all PLC components and sensors. This is registered and displayed as a fault on the illuminated beacon. As long as the fault is present, the acknowledge button blinks, turning to permanent when the emergency off buttons have been unlocked.

When activated, the **light curtain** isolates all four VSDs from the motors. This is signaled and displayed as a fault on the illuminated beacon. Although an acknowledgement is possible, the acknowledge button for the light curtain assumes that the fault is still active and blinks permanently.

The **door switch** disconnects the two belt motors from the TeSys U units when the door is opened. Although an acknowledgement is possible, the acknowledge button for the door switch assumes that the fault is still active and blinks permanently.

All switch-off operations are performed on the hardware itself, only the relevant fault signaling must be performed in the PLC.

Push Buttons

The buttons as described here and in the assembly model, are housed in an external housing. They could, however, be built into a cabinet door. If you decide on this option, the buttons require a 22mm diameter hole and you do not need to order the separate button housing.

The quadruple button housing is for the buttons **Start**, **Stop**, **Man/Auto** und **Acknowledge**.

Start ➔ CANopen Master Reset on Slave fault
Stop ➔ Error reset for ATV31 Devices after CANopen Initialisation.
Man/Auto ➔ Automatic Mode (white LED off) / Manual Mode (white LED blinks)
Acknowledge1 ➔ **E-OFF button 1** and **E_OFF button 2**

Acknowledge button 2 ➔ Light curtain
Acknowledge button 3 ➔ Door switch

All **Preventa modules** send Information to the **PLC**.

Manual mode provides 3 control buttons for all belts:

Button 1 ➔ reverse belt
Button 2 ➔ stop belt
Button 3 ➔ belt forwards

Illuminated beacon

The **illuminated beacon** displays the various states. It consists of three indicator lamps.

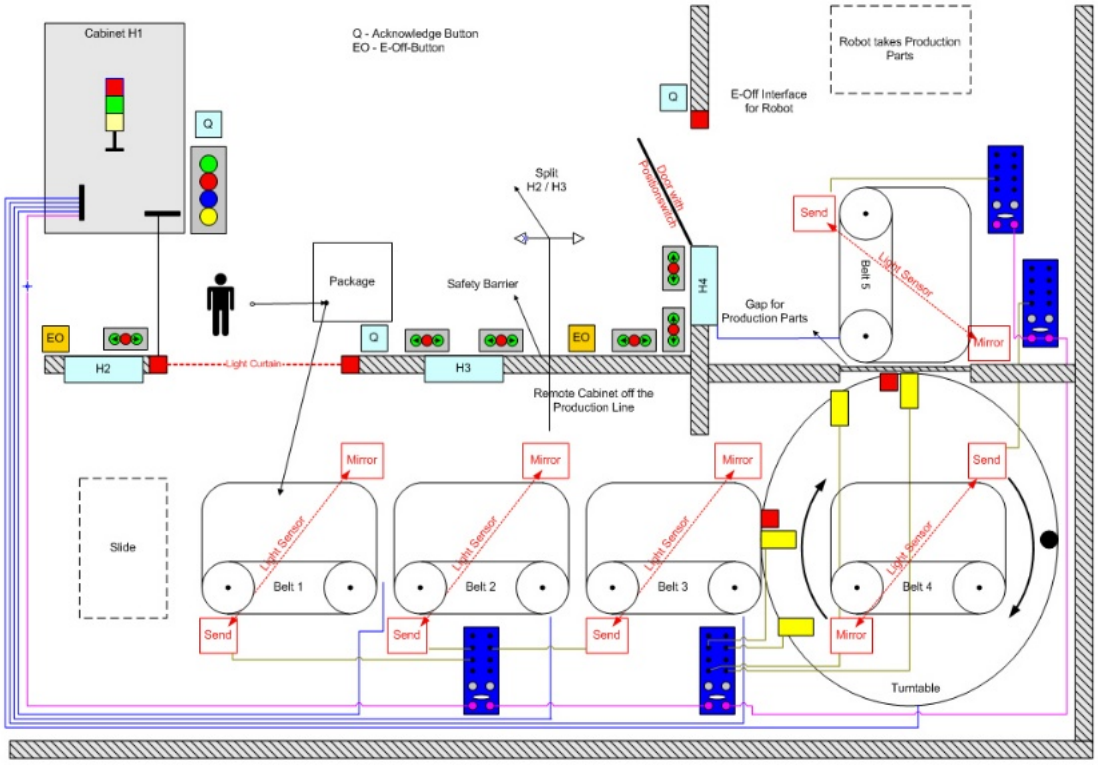
The **green** lamp indicates **Run**. It is permanently lit when the plant is operating normally.

The **red** lamp indicates a **Fault**. The lamp flashes for **emergency-off/safety violations**; for other faults caused by logic- or component-related problems, the light should burn continuously.

The **yellow** lamp indicates Manual or HMI mode.

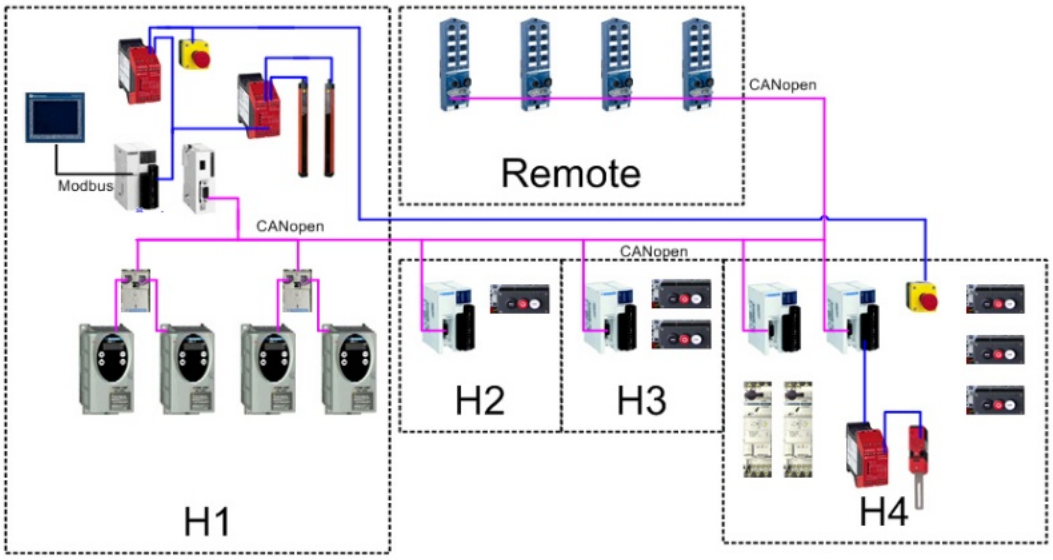
Plant Example

Conveyor belt system



CANopen

Layout



Communication

Introduction

This lists the individual points between which data is exchanged via the bus systems (e.g., CANopen, Modbus Plus or TCP/IP) that are not directly linked to digital or analog hardware interfaces.

This list contains:

- The devices concerned in each case
- The direction of transfer
- The symbolic name *and*
- The direct bus address on the device concerned.

Device Links

The Modbus and CANopen bus systems are used in this application.
The devices below are networked via **CANopen**:

- a Twido PLC, bus address 127 (fixed setting)
- four Altivar variable speed drives, bus addresses 1..4
- four FTBs, bus addresses 5..8
- four OTBs, bus addresses 9..12

Only two devices are interconnected via **Modbus**:

- Magelis-Panel XBT-G, bus address 1
- Twido PLC, bus address 2

Datalink Drive_1 <> PLC

Twido PLC *(CANopen master, #127)*		**Altivar 31, Drive_1** *(CANopen slave #1)*	
Data direction ATV -> PLC			
Address	**Name**	**Index**	**Designation**
%IWC1.0.0	D_STATUS_DRIVE_1	6041	Drivecom status register
%IWC1.0.1	D_CONTROL_DRIVE_1	6044	Control effort
%IWC1.0.2	D_IERROR_DRIVE_1	603F	Error Code
Data direction PLC -> ATV			
Address	**Name**	**Index**	**Designation**
%QWC1.0.0	D_COMMAND_DRIVE_1	6040	Drivecom command register
%QWC1.0.1	D_TARGET_DRIVE_1	6042	Target velocity

Datalink Drive_2 <> PLC

Twido PLC *(CANopen master, #127)*		**Altivar 31, Drive_2** *(CANopen slave #2)*	
Data direction ATV -> PLC			
Address	**Name**	**Index**	**Designation**
%IWC1.1.0	D_STATUS_DRIVE_2	6041	Drivecom status register
%IWC1.1.1	D_CONTROL_DRIVE_2	6044	Control effort
%IWC1.1.2	D_IERROR_DRIVE_2	603F	Error Code
Data direction PLC -> ATV			
Address	**Name**	**Index**	**Designation**
%QWC1.1.0	D_COMMAND_DRIVE_2	6040	Drivecom command register
%QWC1.1.1	D_TARGET_DRIVE_2	6042	Target velocity

Datalink Drive_3 <> PLC

Twido PLC *(CANopen master, #127)*		Altivar 31, Drive_3 *(CANopen slave #3)*	
Data direction ATV -> PLC			
Address	**Name**	**Index**	**Designation**
%IWC1.2.0	D_STATUS_DRIVE_3	6041	Drivecom status register
%IWC1.2.1	D_CONTROL_DRIVE_3	6044	Control effort
%IWC1.2.2	D_IERROR_DRIVE_3	603F	Error Code
Data direction PLC -> ATV			
Address	**Name**	**Index**	**Designation**
%QWC1.2.0	D_COMMAND_DRIVE_3	6040	Drivecom command register
%QWC1.2.1	D_TARGET_DRIVE_3	6042	Target velocity

Datalink Drive_4 <> PLC

Twido PLC *(CANopen master, #127)*		Altivar 31, Drive_1 *(CANopen slave #4)*	
Data direction ATV -> PLC			
Address	**Name**	**Index**	**Designation**
%IWC1.3.0	D_STATUS_DRIVE_4	6041	Drivecom status register
%IWC1.3.1	D_CONTROL_DRIVE_4	6044	Control effort
%IWC1.3.2	D_IERROR_DRIVE_4	603F	Error Code
Data direction PLC -> ATV			
Address	**Name**	**Index**	**Designation**
%QWC1.3.0	D_COMMAND_DRIVE_4	6040	Drivecom command register
%QWC1.3.1	D_TARGET_DRIVE_4	6042	Target velocity

Datalink FTB1 <> PLC

Twido PLC *(CANopen master, #127)*		FTB1 *(CANopen slave #5)*	
Data direction FTB -> PLC			
Address	**Name**	**Index**	**Designation**
%IWC1.4.0	FTB_IN_1	6000	Digital Input 8 Bits
Data direction PLC -> FTB			
Address	**Name**	**Index**	**Designation**
%QWC1.4.0	Test_FTB1	6200	Write Outputs 1 to 8

Datalink FTB2 <> PLC

Twido PLC *(CANopen master, #127)*		FTB2 *(CANopen slave #6)*	
Data direction FTB -> PLC			
Address	**Name**	**Index**	**Designation**
%IWC1.5.0	FTB _IN_2	6000	Digital Input 8 Bits
Data direction PLC -> FTB			
Address	**Name**	**Index**	**Designation**
%QWC1.5.0	Test_FTB2	6200	Write Outputs 1 to 8

Datalink FTB2 <> PLC

Twido PLC *(CANopen master, #127)*		FTB3 *(CANopen slave #7)*	
Data direction FTB -> PLC			
Address	**Name**	**Index**	**Designation**
%IWC1.6.0	FTB _IN_3	6000	Digital Input 8 Bits
Data direction PLC -> FTB			
Address	**Name**	**Index**	**Designation**
%QWC1.6.0	Test_FTB3	6200	Write Outputs 1 to 8

Datalink FTB4 <> PLC

Twido PLC *(CANopen master, #127)*		FTB4 *(CANopen slave #8)*	
Data direction FTB -> PLC			
Address	**Name**	**Index**	**Designation**
%IWC1.7.0	FTB _IN_4	6000	Digital Input 8 Bits
Data direction PLC -> FTB			
Address	**Name**	**Index**	**Designation**
%QWC1.7.0	Test_FTB4	6200	Write Outputs 1 to 8

Datalink OTB1 <> PLC

Twido PLC *(CANopen master, #127)*		OTB1 *(CANopen slave #9)*	
Data direction OTB -> PLC			
Address	**Name**	**Index**	**Designation**
%IWC1.8.0	OTB1 _IN_00_07	6000	Digital Input 0 to 7
%IWC1.8.1	OTB1 _IN_08_11	6000	Digital Input 8 to 11
Data direction PLC -> OTB			
Address	**Name**	**Index**	**Designation**
%QWC1.8.0	OTB1_OUT_00_07	6200	Write Outputs 0 to 7

Datalink OTB2 <> PLC

Twido PLC *(CANopen master, #127)*		OTB2 *(CANopen slave #10)*	
Data direction OTB -> PLC			
Address	**Name**	**Index**	**Designation**
%IWC1.9.0	OTB2 _IN_00_07	6000	Digital Input 0 to 7
%IWC1.9.1	OTB2 _IN_08_11	6000	Digital Input 8 to 11
Data direction PLC -> OTB			
Address	**Name**	**Index**	**Designation**
%QWC1.9.0	OTB2_OUT_00_07	6200	Write Outputs 0 to 7

Datalink OTB3 <> PLC

Twido PLC *(CANopen master, #127)*		OTB3 *(CANopen slave #11)*	
Data direction OTB -> PLC			
Address	**Name**	**Index**	**Designation**
%IWC1.10.0	OTB3 _IN_00_07	6000	Digital Input 0 to 7
%IWC1.10.1	OTB3 _IN_08_11	6000	Digital Input 8 to 11
Data direction PLC -> OTB			
Address	**Name**	**Index**	**Designation**
%QWC1.10.0	OTB3_OUT_00_07	6200	Write Outputs 0 to 7

Datalink OTB4 <> PLC

Twido PLC *(CANopen master, #127)*		OTB4 *(CANopen slave #12)*	
Data direction OTB -> PLC			
Address	**Name**	**Index**	**Designation**
%IWC1.11.0	OTB4 _IN_00_07	6000	Digital Input 0 to 7
%IWC1.11.1	OTB4 _IN_08_11	6000	Digital Input 8 to 11
Data direction PLC -> OTB			
Address	**Name**	**Index**	**Designation**
%QWC1.11.0	OTB4_OUT_00_07	6200	Write Outputs 0 to 7

Datalink HMI -> PLC

Twido PLC *(Modbus #2)*		HMI Magelis XBT-G *(Modbus #1)*	
Data direction HMI -> PLC			
Address	**Name**	**Address**	**Designation**
%M101	M_AUTO	%M102	Automatic mode
%M106	HMI_resetcanopen	%M106	Reset CANopen Master
%M107	HMI_resetaltivar	%M107	Reset Altivar31
%M121	M_HAND	%M122	Manual mode
%M131	M_HMI	%M131	HMI mode
%M200	Mhmi_D1_FWD	%M200	Drive 1 Forward HMI
%M201	Mhmi_D1_REV	%M201	Drive 1 Reverse HMI
%M202	Mhmi_D1_STOP	%M202	Drive 1 Stop HMI
%M205	Mhmi_D2_FWD	%M205	Drive 2 Forward HMI
%M206	Mhmi_D2_REV	%M206	Drive 2 Reverse HMI
%M207	Mhmi_D2_STOP	%M207	Drive 2 Stop HMI
%M210	Mhmi_D3_FWD	%M210	Drive 3 Forward HMI
%M211	Mhmi_D3_REV	%M211	Drive 3 Reverse HMI
%M212	Mhmi_D3_STOP	%M212	Drive 3 Stop HMI
%M215	Mhmi_D4_FWD	%M215	Drive 4 Forward HMI
%M216	Mhmi_D4_REV	%M216	Drive 4 Reverse HMI
%M217	Mhmi_D4_STOP	%M217	Drive 4 Stop HMI
%M220	Mhmi_D5_FWD	%M220	Drive 5 Forward HMI
%M221	Mhmi_D5_REV	%M221	Drive 5 Reverse HMI
%M222	Mhmi_D5_STOP	%M222	Drive 5 Stop HMI
%M225	Mhmi_D6_FWD	%M225	Drive 6 Forward HMI
%M226	Mhmi_D6_REV	%M226	Drive 6 Reverse HMI
%M227	Mhmi_D6_STOP	%M227	Drive 6 Stop HMI
%MW15	Manu_Velo_1	%MW15	Drive 1 Target Value
%MW16	Manu_Velo_2	%MW16	Drive 2 Target Value
%MW17	Manu_Velo_3	%MW17	Drive 3 Target Value
%MW18	Manu_Velo_4	%MW18	Drive 4 Target Value
%MW230	CAN_Failure_Slaves	%MW17	Failure bit for every Slave
%MW232	CAN_Failure_BUS	%MW18	Failure bit for the BUS

Datalink PLC -> HMI

Twido PLC *(Modbus #2)*		HMI Magelis XBT-G *(Modbus #1)*	
Data direction PLC -> HMI			
Address	**Name**	**Address**	**Designation**
%M101	M_auto	%M101	Automatic Mode
%M102	HMI_estop1	%M102	E-off 1 pressed
%M103	HMI_lightcurrtain	%M103	Light curtain active
%M104	HMI_door	%M104	Door Protection Triggered
%M105	HMI_estop2	%M105	E-off 2 pressed
%M140	M_no_error_drive1	%M140	Drive1 o.k.
%M141	M_no_error_drive2	%M141	Drive2 o.k.
%M142	M_no_error_drive3	%M140	Drive3 o.k.
%M143	M_no_error_drive4	%M140	Drive4 o.k.
%M144	M_no_error_drive5	%M140	Drive5 o.k.
%M145	M_no_error_drive6	%M140	Drive6 o.k.
%MW15	Manu_Velo_1	%MW15	Drive 1 Target Value
%MW16	Manu_Velo_2	%MW16	Drive 2 Target Value
%MW17	Manu_Velo_3	%MW17	Drive 3 Target Value
%MW18	Manu_Velo_4	%MW18	Drive 4 Target Value
%MW204	B1Actual	%MW204	Drive 1 Actual Value
%MW205	B2Actual	%MW205	Drive 2 Actual Value
%MW206	B3Actual	%MW206	Drive 3 Actual Value
%MW207	B4Actual	%MW207	Drive 4 Actual Value
%MW230	CAN_Failure_Slaves	%MW230	Failure bit for every Slave
%MW232	CAN_Failure_BUS	%MW232	Failure bit for the BUS

General Addressing

Various hardware addresses, as well as flags and flag words, are used in the PLC example program. To facilitate orientation, an overview of the addresses used appears below in list format.

Type	Address	Comment
Digital inputs	%Ir.m.x	Digital inputs are specified on a hardware basis: r indicates the rack number, m the slot and x the input number. Example: Emergency-off feedback %I0.3.0.
Digital outputs	%Qr.m.x	Digital outputs are specified on a hardware basis: r indicates the rack number, m the slot and x the output number. Example: Indicator lamp for manual mode %Q0.5.1.
Analog inputs	%IWr.m.c	Analog inputs are specified on a hardware basis: r indicates the rack number, m the slot and c the channel number. Example: Emergency-off feedback %IW0.3.0.
Analog outputs	%QWr.m.c	Analog outputs are specified on a hardware basis: r indicates the rack number, m the slot and c the channel number. Example: Emergency-off feedback %QW0.3.0.
CANopen inputs	%MW0 to %MW31	CANopen inputs are written to flag words; individual bits can be addressed via %MWi.x. Example: 2. ATV status word %MW2
CANopen outputs	%MW100 to %MW131	CANopen outputs are read by flag words; individual bits can be addressed via %MWi.x. Example: 3. ATV control word %MW104
Data for Viewer	%MW200 to %MW299	Data for Viewer is written to flag words. Individual bits are written via block BIT_TO_WORD. Example: Motor velocity %MW220
Data from Viewer	%MW300 to %MW399	Data from Viewer is read by flag words. Individual bits are extracted via block WORD_TO_BIT. Example: Motor velocity %MW220
CANopen status	%CHr.m.c	Status data for CANopen is read via data structure T_COM_CPP110 (IODDT). Channel address: r indicates the rack number, m the slot and c the channel number. Example: CANopen status %CH0.1.1

HMI

Introduction

This application features a Magelis XBT-GT1100 HMI device, which is connected to the PLC via Modbus protocol.

Vijeo Designer software is used to program and configure the terminal. The following pages describe how to create and upload a program.

Proceed as follows to integrate the HMI:

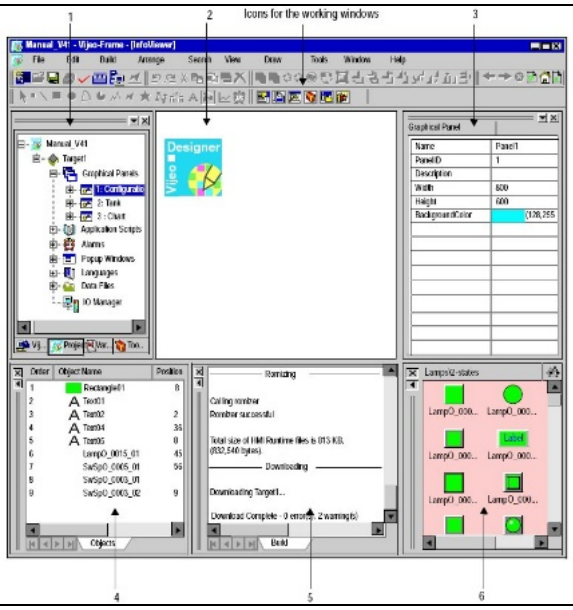
- Create a New Project
- Install the Correct Driver
- Configure the Programming Connection
- Configure the driver
- Linking Variables
- Create a Variable
- Import Project
- Creating Screens – examples
- Build the Project
- Download the Project

Preconditions

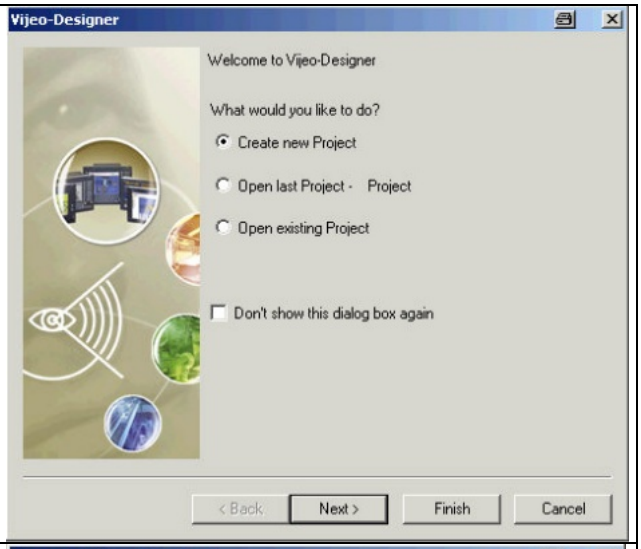
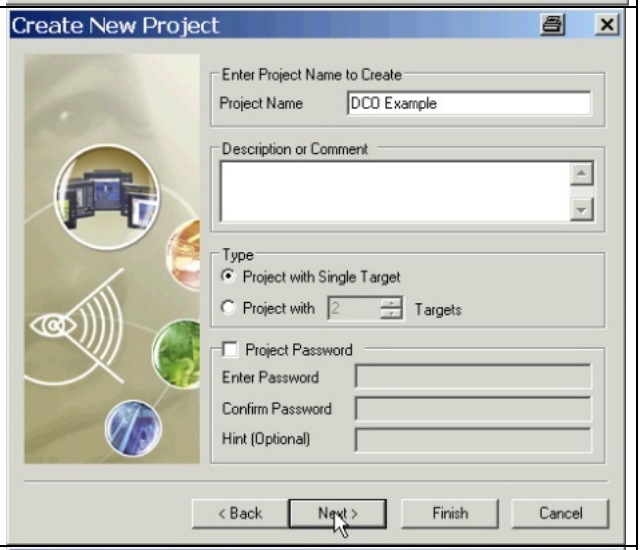
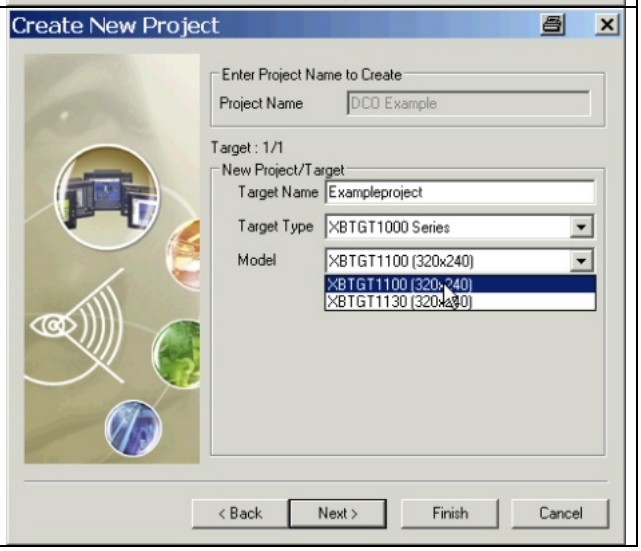
In order to work with Vijeo Designer you must first:

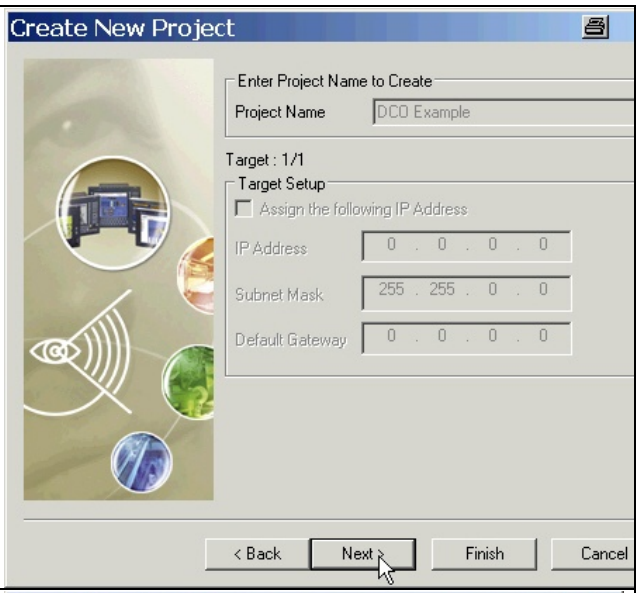
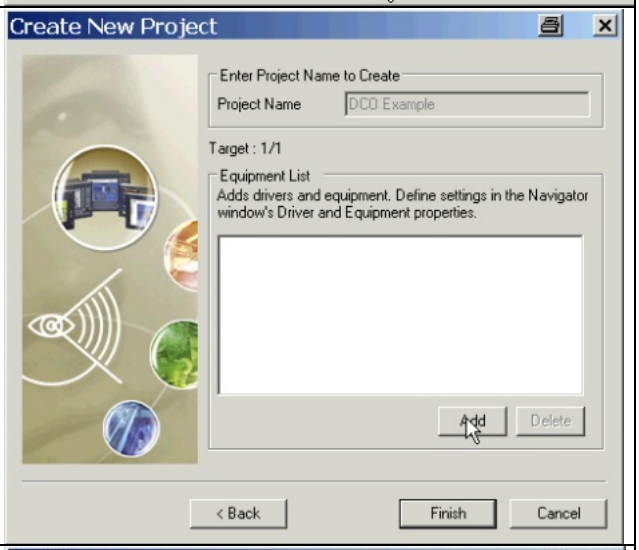
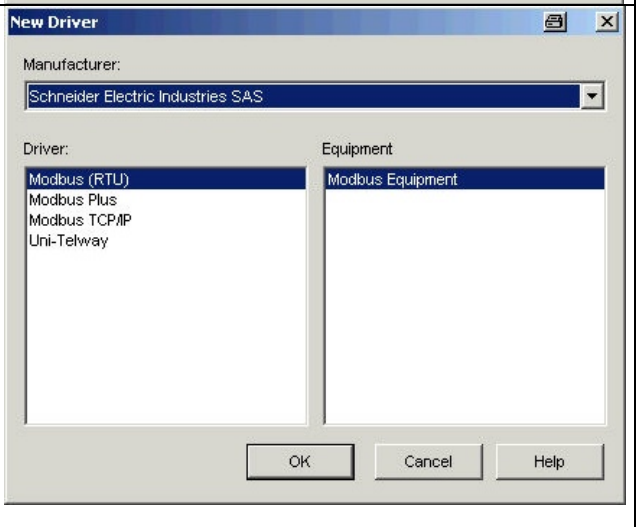
- Install Vijeo-Designer V4.4 on your PC.
- chaeck that the Magelis terminal is connected to a power supply and turned on
- Connect the Magelis terminal to the PC using the data cable **XBTZG925** (**USB**).

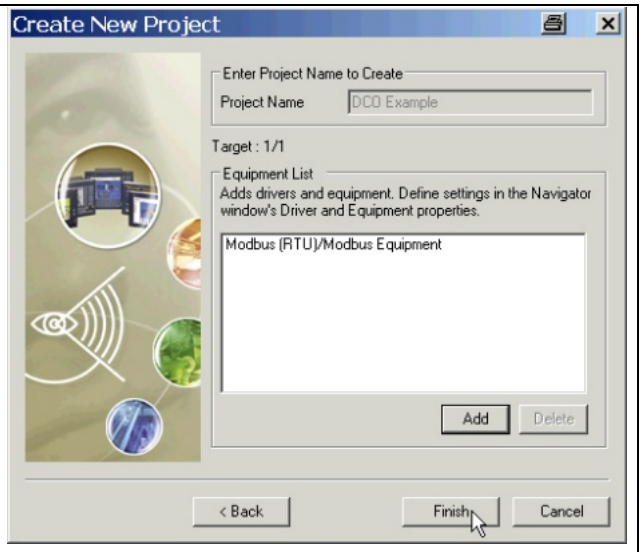
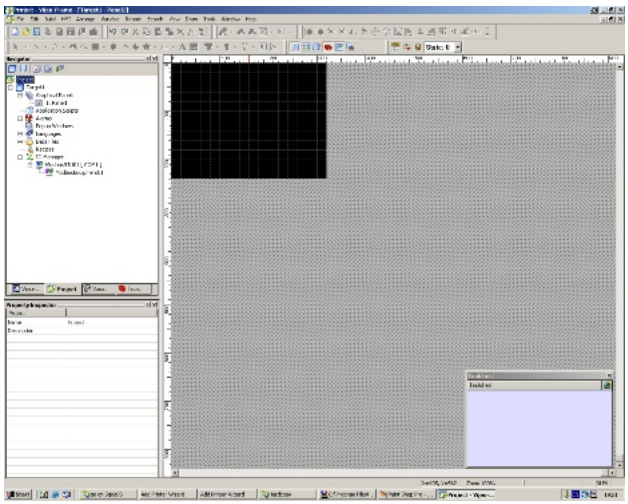
Vijeo Designer Layout

1	The Vijeo Designer environment consists of the following elements: 1 - Navigator 2 - Info display 3 - Inspector 4 - Data list 5 - Feedback zone 6 - Toolbox	

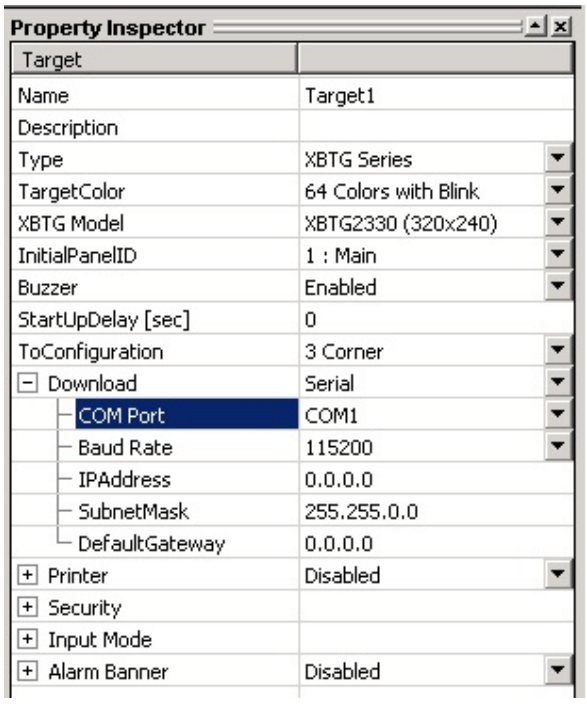
Create a new Project

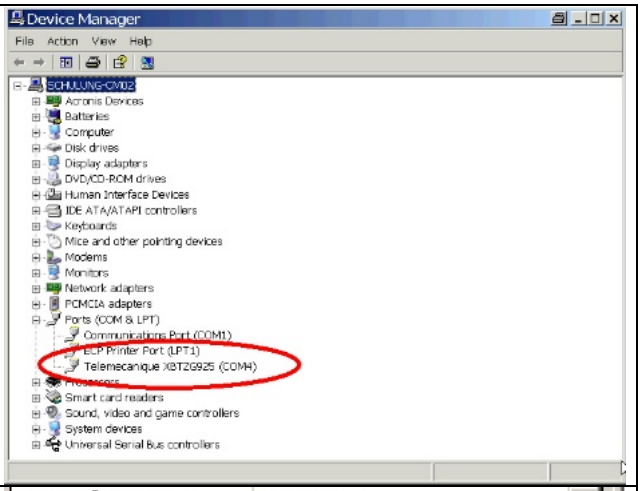
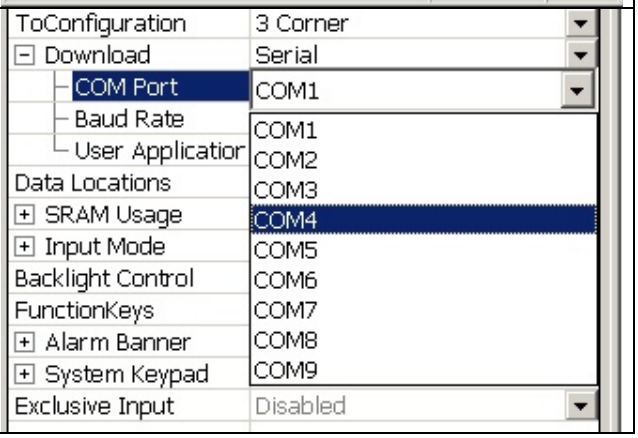
1	Start up Vijeo Designer and select **Create new Project**. You will be automatically guided through the subsequent steps. continue with **Next>**.	
2	Now enter the project name for the application, e.g., “DCO Example”. A more detailed description can be added in the **Description or Comment** box. No accented characters or umlauts (ö, ü, ä, etc.) are permitted. Continue with **Next>**.	
3	Select the target device to be used. Your **target name** can be any name you wish. Target Name: Exampleproject Target Type: **XBT–GT1000 Series** XBTG Model: **XBT-GT1100** Continue with **Next>**	

	4	The selected device has no Ethernet port, so you can go to the next screen using **Next>**.	
	5	In order to be able to exchange data with the PLC, the Magelis terminal requires a communication driver. In the **Create New Project** dialog, select: **Add** to go to the **New Driver** dialog.	
Install the correct driver	6	In the **New Driver** dialog select: **Schneider Electric Industries SAS** in the **manufacturer**'s list. Now transfer the **Modbus (RTU)** driver to the **Equipment** list as **Modbus Equipment** for communication with the Twido PLC. Confirm the settings with **OK**.	

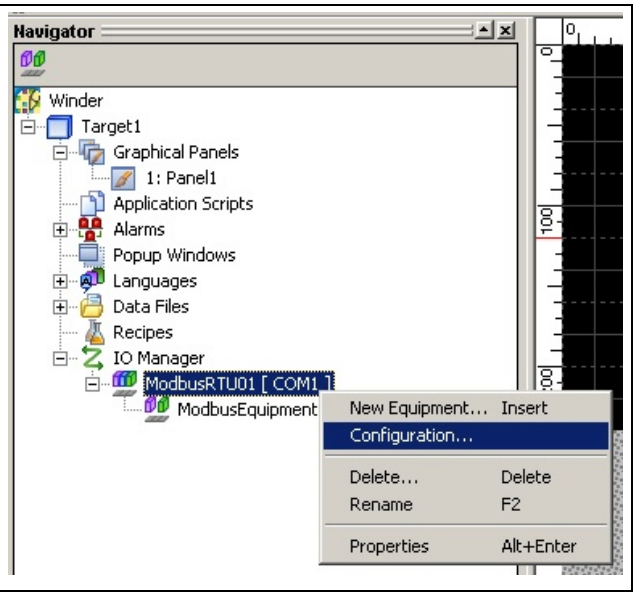
7	Once you have added the driver, exit the driver configuration process with **Finish**.	
8	Vijeo Designer now returns you to its work top, with an empty display and the project navigator A single mouseclick on **Target1** in the **navigator** lists the properties of target1 in **properties inspector** (or if the **properties inspector** is closed, a right mouseclick on Target1 and selecting **Properties** in the pop-up menu, opens up the **properties inspector**)	

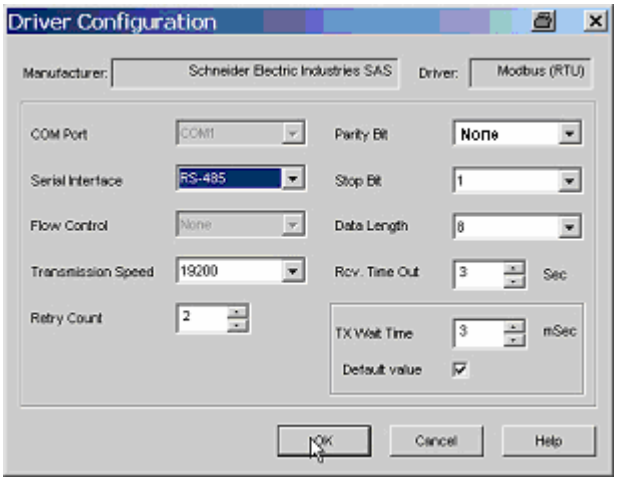
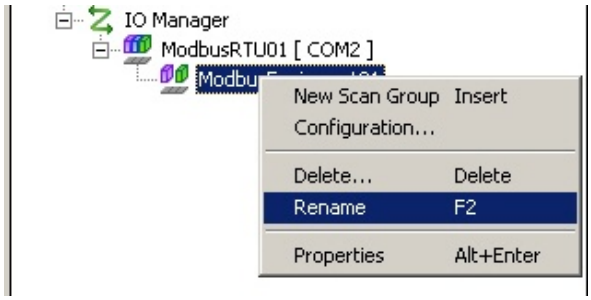
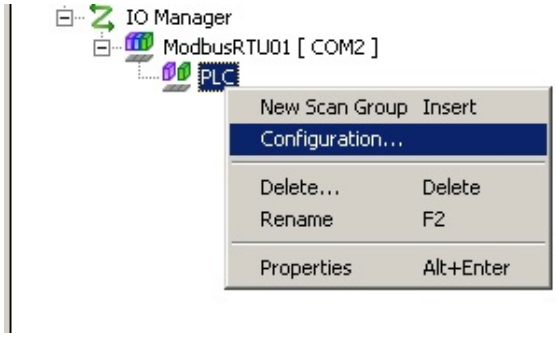
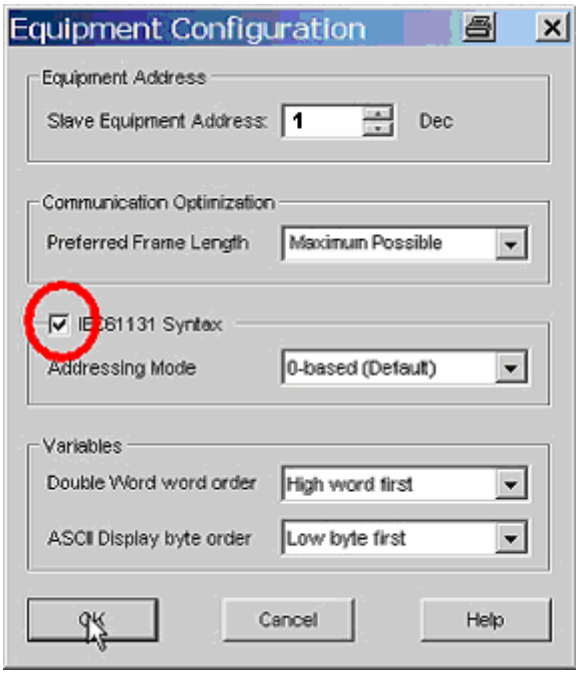
Configure the Programming Connection

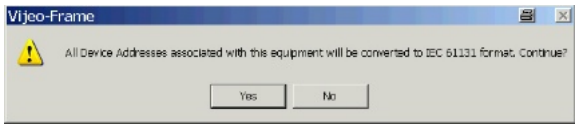
1	First check the setup for the USB programming cable **XBTZG925**. Check the properties of the project and in particular the properties of the **COM port**. As default it is set to serial and **COM1**. **As we are using a USB cable the connection must be changed**.	

2	First check in the **Windows Device Manager** which COM port is used for the USB connection. Here COM4 is used.	
3	In Vijeo Designer select the COM to match the Windows setup, in this case COM4, and input it as the **COM port**. Leave the connection type as it is, **Serial**.	

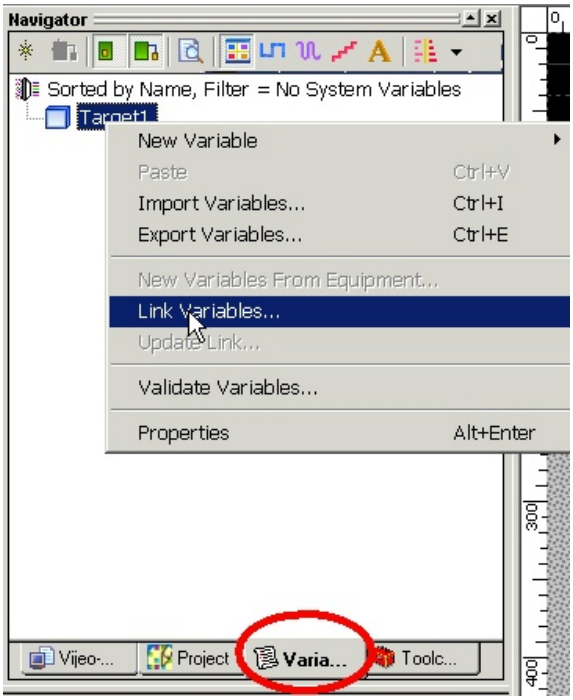
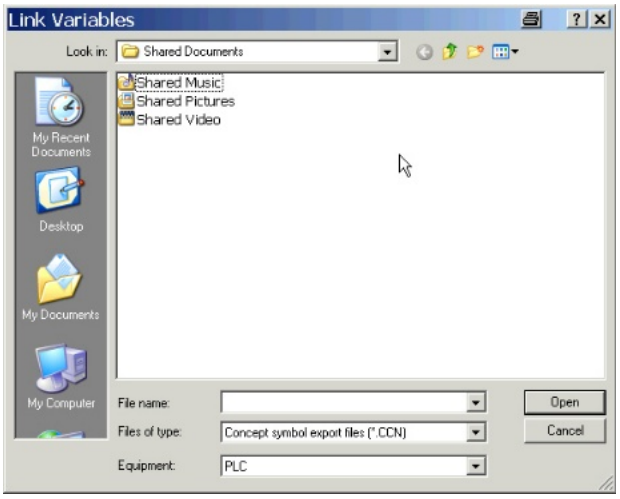
Configure the driver

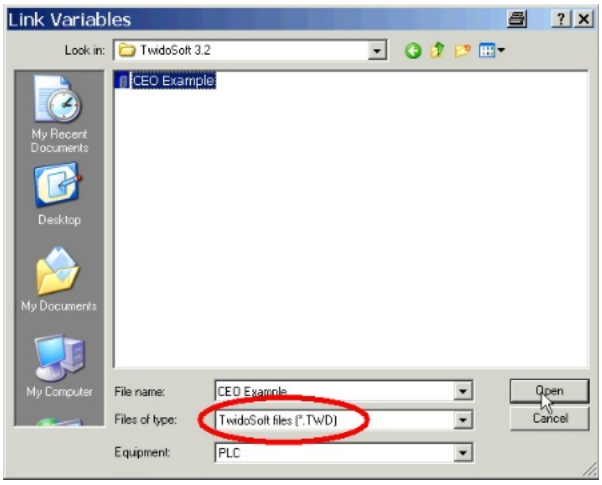
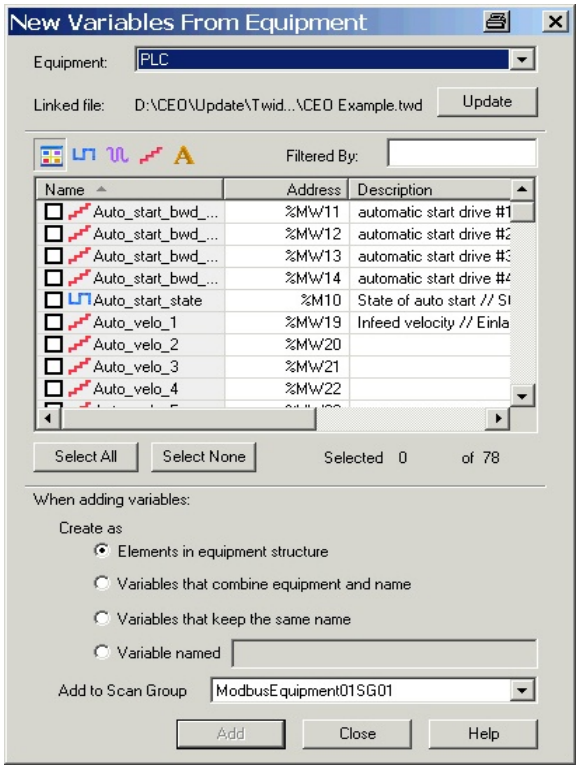
1	For the communications to work you must set up the parameters in the Modbus RTU-Driver. For this, right mouseclick on **ModbusRTU01** in the **Navigator** and select **Configuration...**	

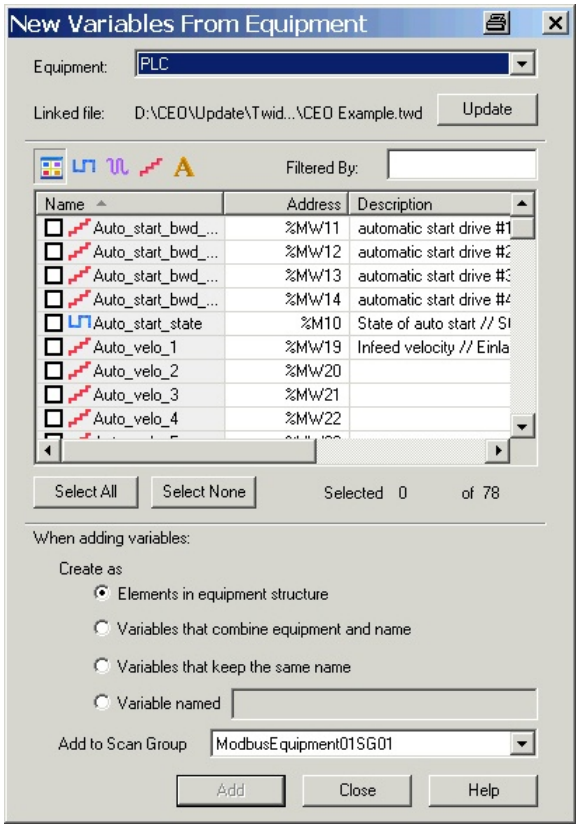
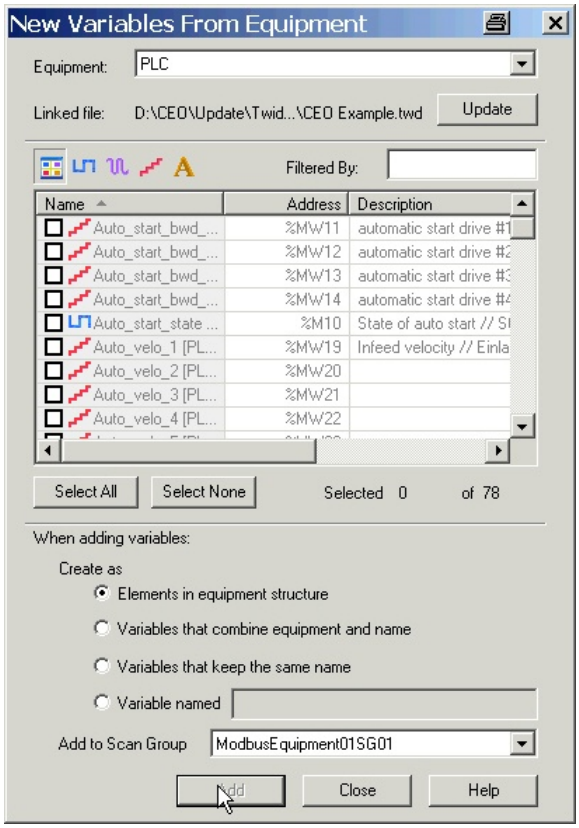
2	In the Driver Configuration dialog, input: - **19200 Baud** - **8 Data bits** - **1 Stop bit** - **No Parity** Note: The configuration must match the port definition on the Twido. Exit the dialog with **OK**.	
3	In the Navigator you can rename the configuration to **PLC** with a right mouseclick on the name and selecting **Rename**.	
4	Rightmouse click on **PLC** to go to the device configuration. In this configuration the HMI is slave, the PLC is master.	
5	In the Equipment Configuration dialog set the Slave Equipment Address to 2. and set the checkbox for **IEC61131 Syntax** you can leave the other inputs at their default values. Exit with **OK**.	

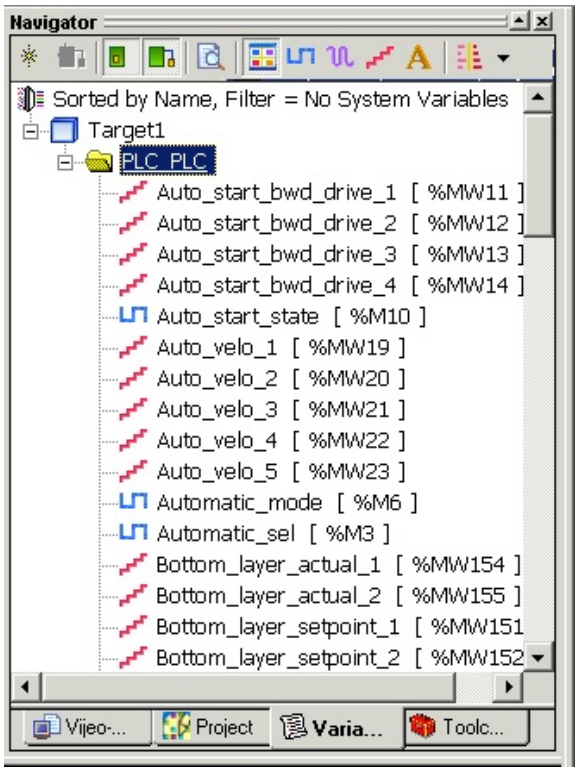
6	Acknowledge the confirm-ation for the **IEC61131 Syntax** with **YES.**	

Linking Variables

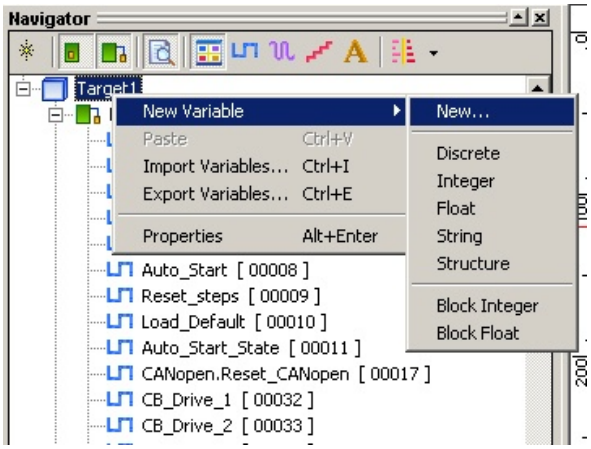
1	As the variables have already been input in TwidoSuite (or some other Schneider product) . Vijeo-Designer offers an option to link up to these variables. Select the **Variables** tab in the the **Navigator**. Right mouse click on the project name (here TARGET1) and select **Link Variables…** in the pop-up menu	
2	In the **Link Variables** window give the path to the file, the type of file and the **Equipment** type (here as named above PLC) Select the file and click on **Open**.	

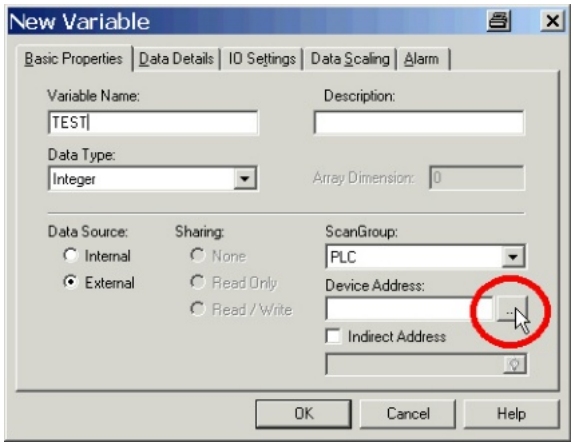
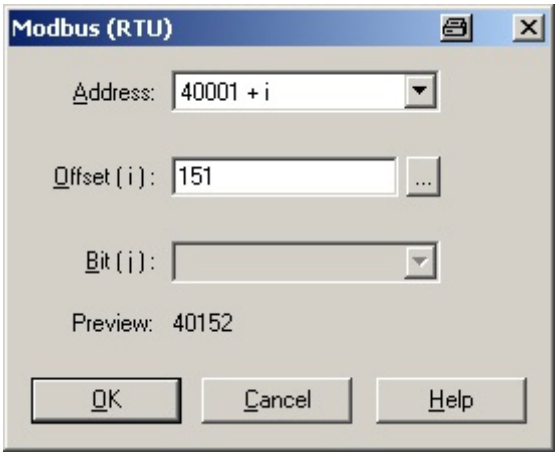
3	In this example the path was set to the TwidoSoft directory, the file type set to TwidoSoft and the **Equipment** set to PLC. Then a Twido file (*.twd) was selected and opened.	
4	Once the file was successfully opened you will be offered a selection list of the available variables	

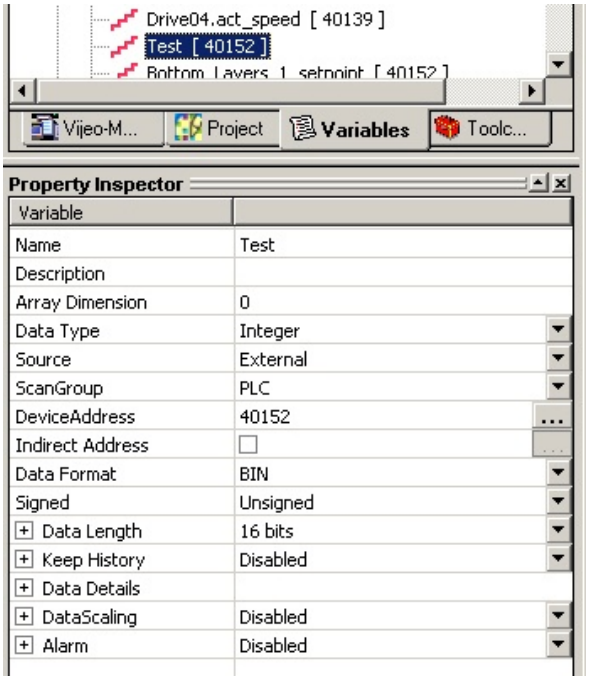
5	Mark the variables you wish to link to and click on **Add**.	
6	Linked variables are now de-activated with grey text. If you have finished linking the variables you require, exit the dialog with a click on **Close**.	

7	All variables can now be viewed in the **navigator** on the **Variables** tab.	

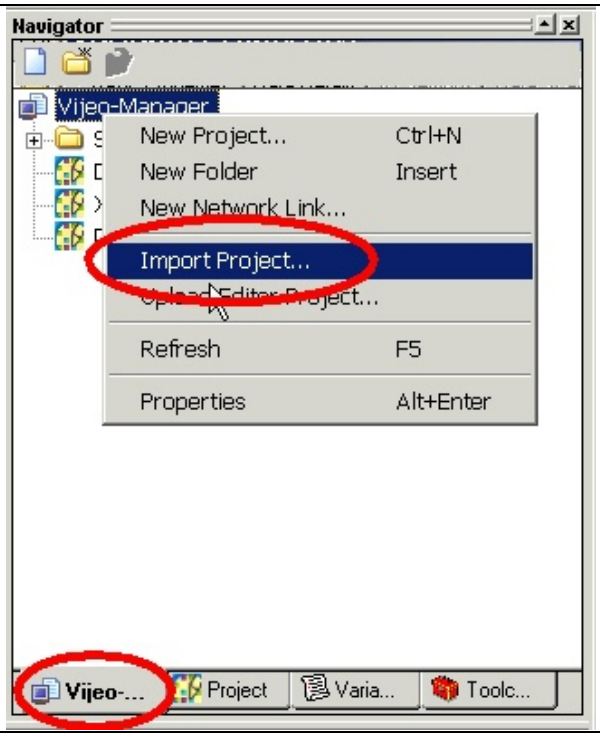
Creating a variable

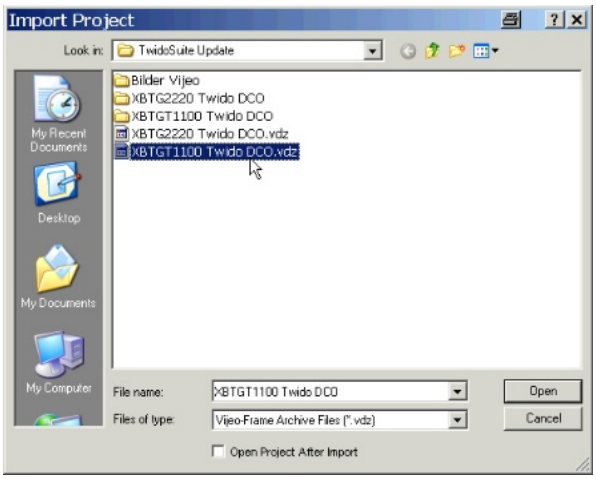
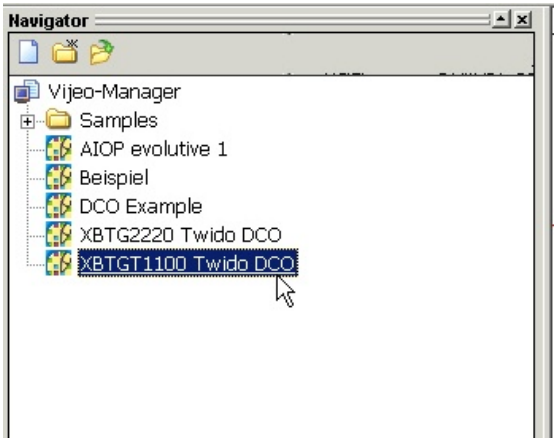
1	To create variables, click on the Tab **Variable** in the navigator. A right mouse click on **Target1** opens up the pop-up menu Click on : **New Variable -> New...** followed by the **datatype** required to go to variable definition dialog.	

2	To create a variable you must input a: • **Variable name** • **Data type** • **Data Source (External)** • Address in the **PLC** In the variable properties dialog you can enter the name and a description for the variable Important here is what device delivers the value if it comes from an external system. If this is the case you must enter a **ScanGroup** and a **Device Address**. The device address is not the hardware address. It is the memory address in the device that delivers the value. To select a device address click on the button at the right end of the list box. Device Address: Here you can address bits (%M..), memory words (%MW..) in the PLC.	
3	clicking on the **Device Address** opens up a dialog for the input of the address. PLC internal formats such as counters muss first be transferred to memory words before the Magelis can display them. Integers and Reals : 30001 + i and 40001 + I Discretes: 00001 + i and 10001 + i and 30001 + i, j and 40001 + i, j where „i“ represents the bit number or word number i.e. you address them with the appropriate offset.	

4	Examples: PLC %M106 HMI 00001 + 106 => 00107 PLC %MW207 HMI 40001 + 207 => 40208 PLC %MW100 Bit5 HMI 40001 + 100, 5 ⇨ 40101,05 The image shows the variable **Test** with its attributes listed in the **Property Inspector**.	

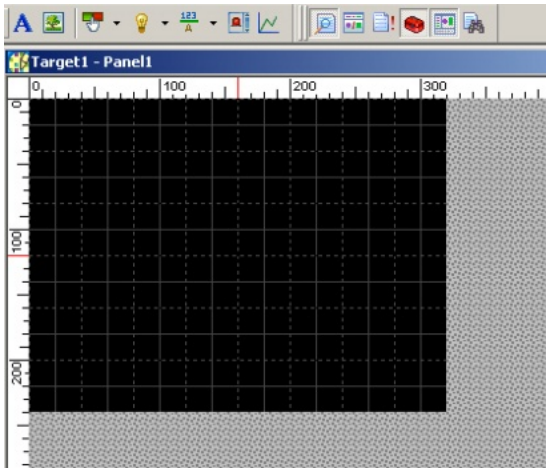
Import Project

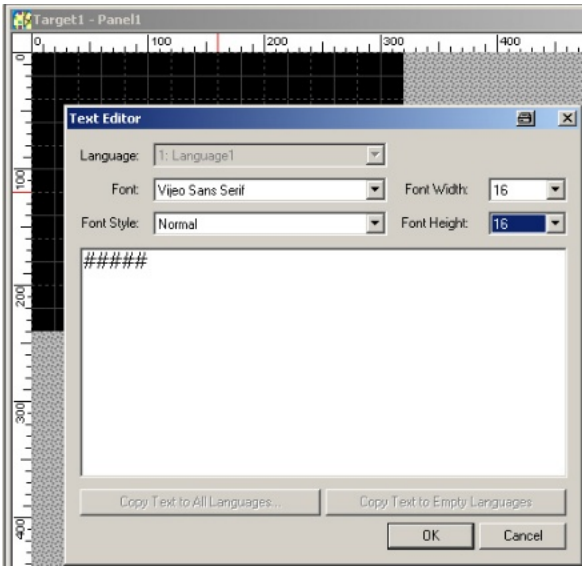
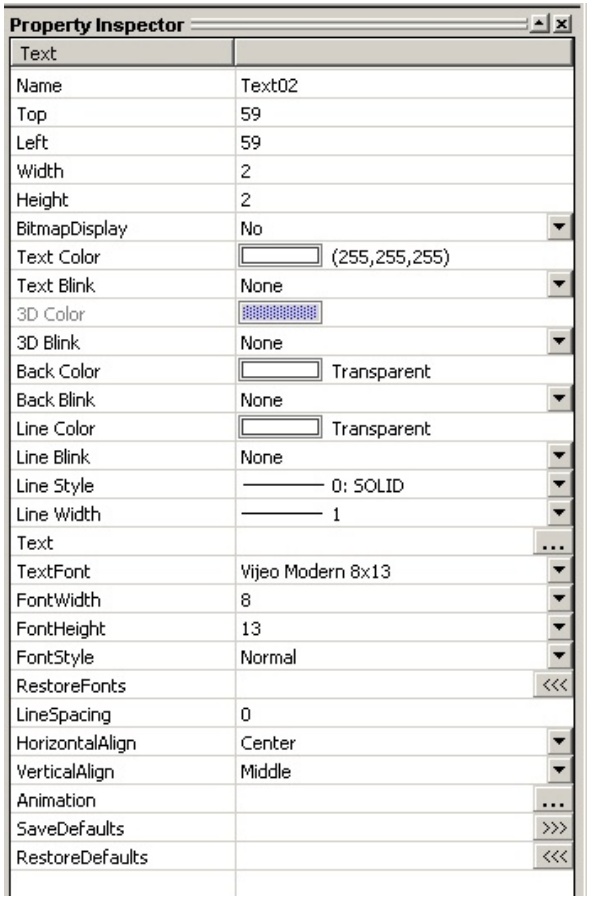
1	To import a project select the **Vijeo-Manager** tab in the Navigator. Right mouse click on **Vijeo-Manager** in the tab window opens a pop-up menu. select **Import Project..** If the function is de-activated (greyed) close any open projects first and re-try.	

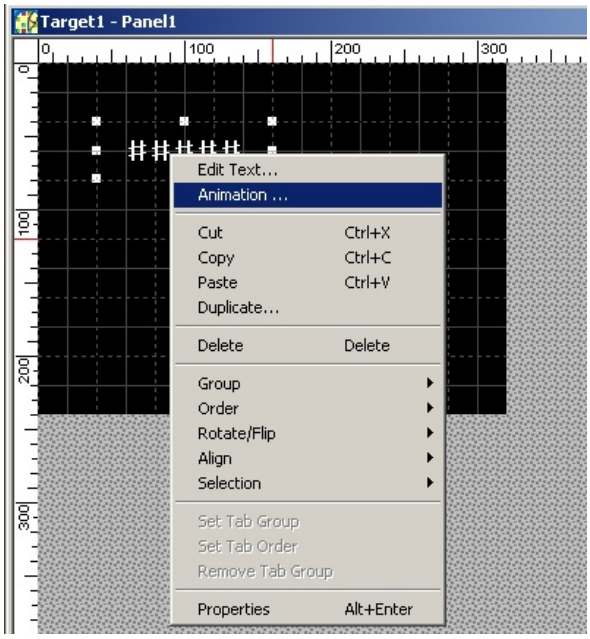
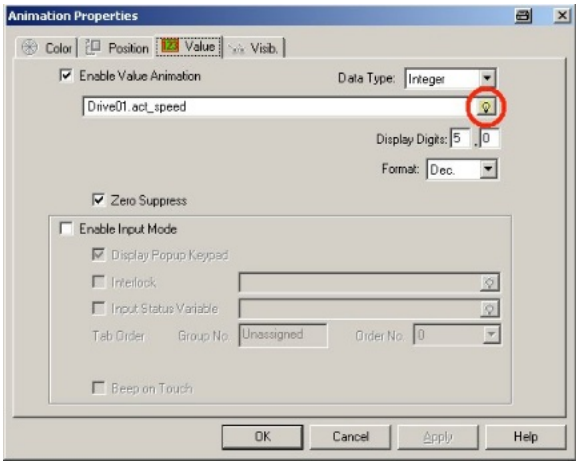
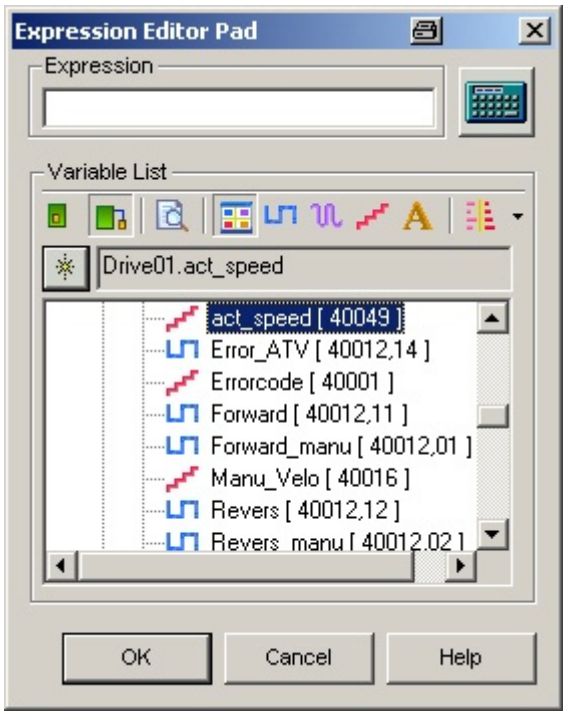
2	Enter the path to search in, the file type (***.VDZ**) and select a project file from the list offered. Import the project by clicking on **Open**.	
3	When the import is finished, acknowledge with **OK**.	
4	In the **Navigator** you can now see the project listed. Double click on it to open it.	

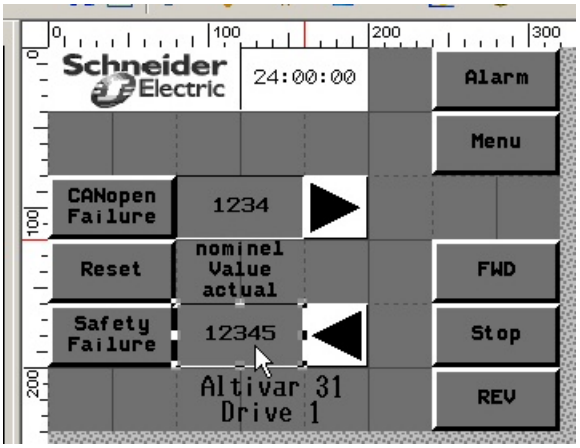
Creating Screens

Examples

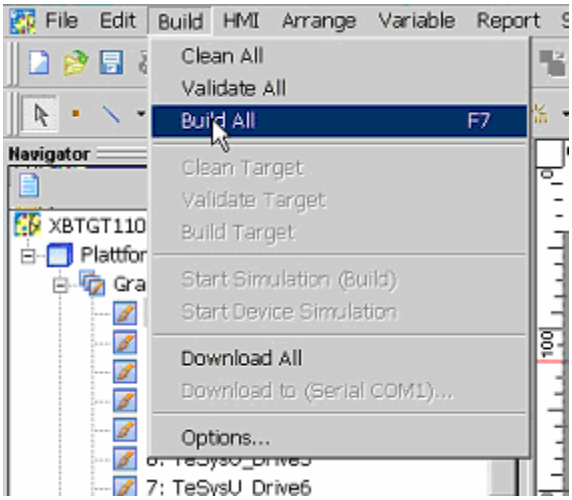
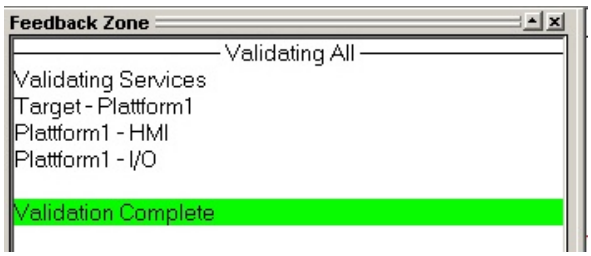
1	Example: Insert Text Select the text tool in the tool bar. The toolbar displays the toolbox with tools for editing the display.	

2	Example: Create Text With the text tool, position the text box on the display. You can adjust its size by „pulling“ on the box or by giving a value in the text editor dialog. Double click on the text box to open up the **text editor** dialog you can input the text to be displayed and define its size, font, etc.	
3	After inputting the text you can define/change the text characteristics in the **Property Inspector**	

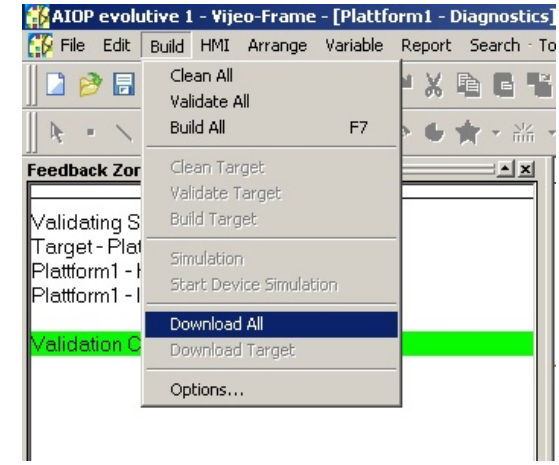
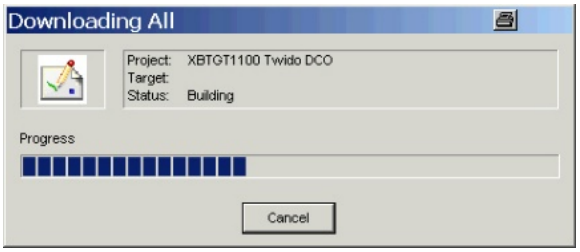
4	A right mouse click on the text object in the display leads to the **animation**. This is the same animation as seen in the property inspector (see image above) but in another format. Both formats contain the same attributes.	
5	Animation Properties: • Colour • Position • Value • Visibility For the variable used to animate this object, you can either manually input the variable or click on the lightbulb icon to browse the variable list and select a variable. If you input an unknown variable it is shown in red – the variable has yet to be defined Once activated variables can be selected and their display format defined. If the value requires further processing before use, such as trigonomic functions, you can select these via the calculator icon.	 

6	Text and Graphics examples.	
7	This picture shows one the finished configuration screens with some animations and buttons	

Build the project

1	Before you download the project to the Magelis you must validate it. With **Validate All** you can analyse your project. The **Feedback Zone** shows you the results of the analysis. You can invoke the project analysis using **Build All** too.	 

Download the Project

1	Before you can download the project you must **build the project** (see the section above) Downloading the project to the Magelis (HMI): Select the project in the **Navigator**. Use **Build->Download All** to transfer the project to the HMI device. The transfer is done using the configured protocol (modbus in this case). The download process is indicated with a progress bar.	 

PLC

Introduction

The PLC chapter describes how to initialize, parameterize and load the program to the PLC in order to implement the functional description described above.

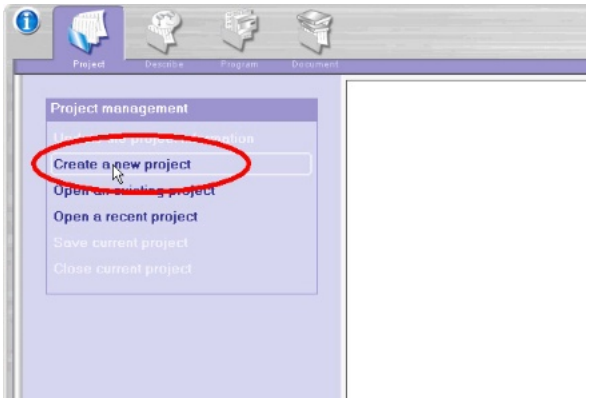
The PLC program is created using TwidoSuite.

Pre-conditions

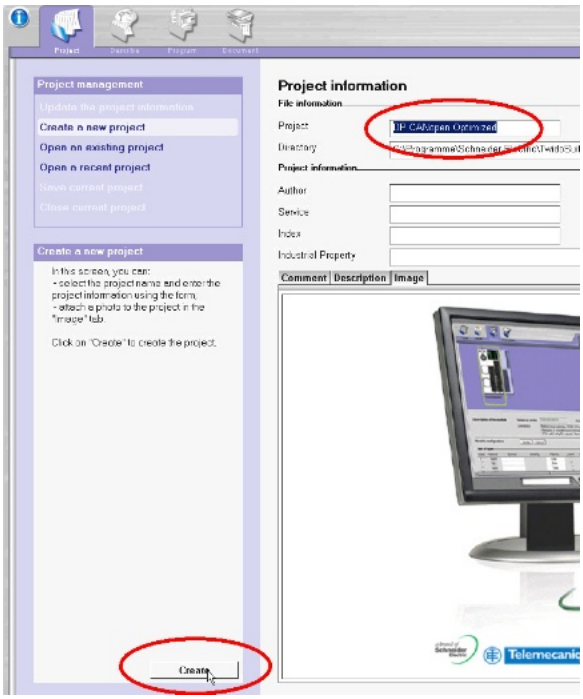
Before carrying out the steps described below, you must ensure the following:

- The TwidoSuite programming tool is installed on your PC
- The TwidoSuite example project is available
- The Twido PLC is switched on and supplied with power
- The PLC is connected to the PC with programming cable (TSXPCX1031)

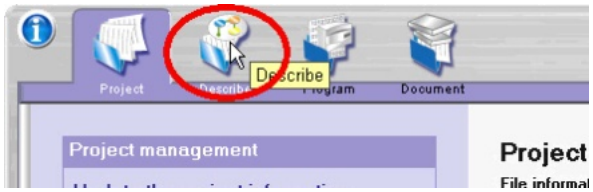
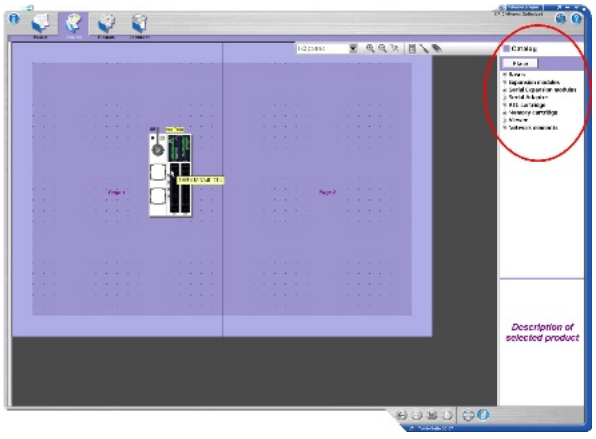
Starting Twidosuite

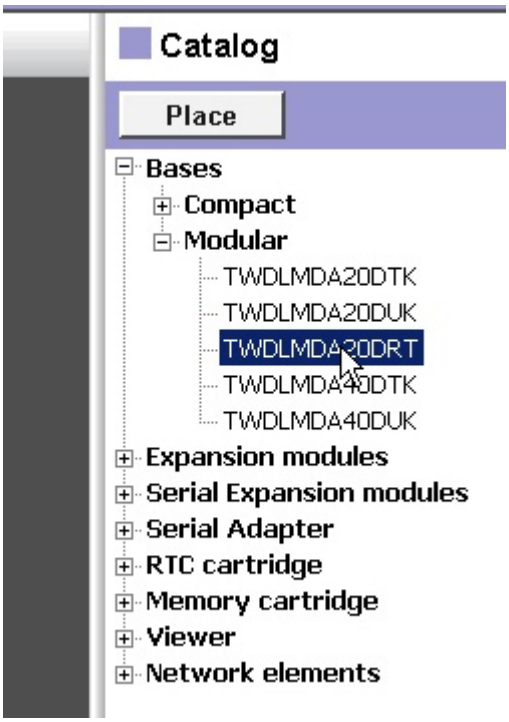
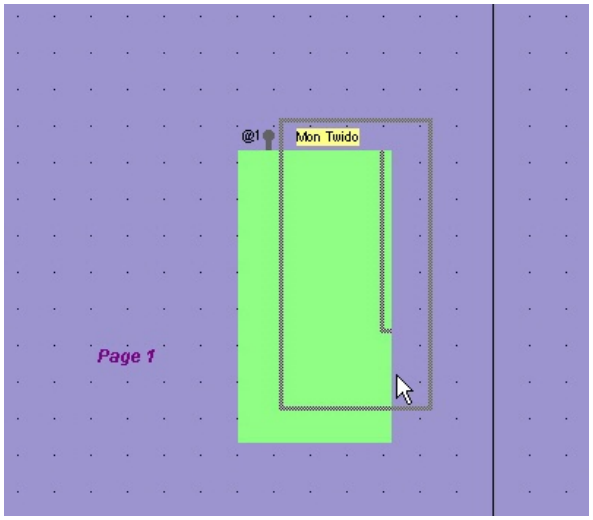
1	To start work with Twidosuite, click on: **Programming Mode** Use the language selection buttons to set the language for this session.	
2	The start up screen for the main menu is displayed. With **Create a new project** you can start a new project.	

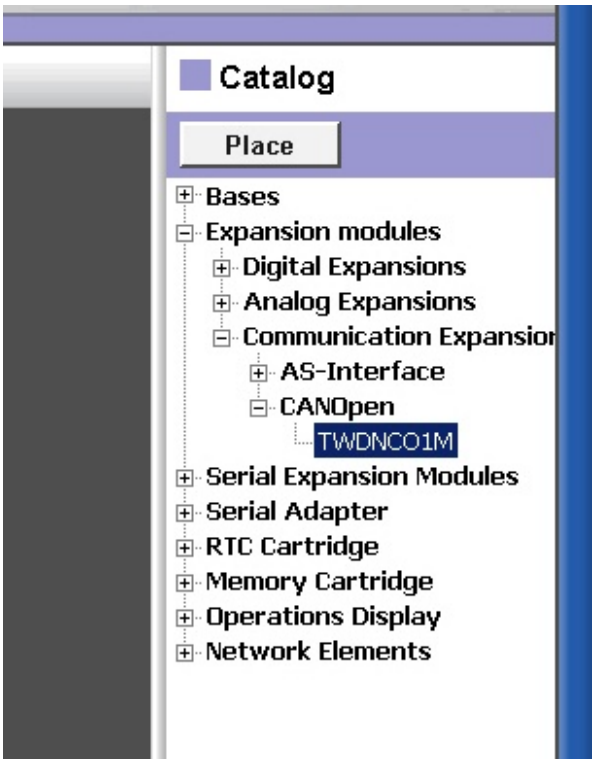
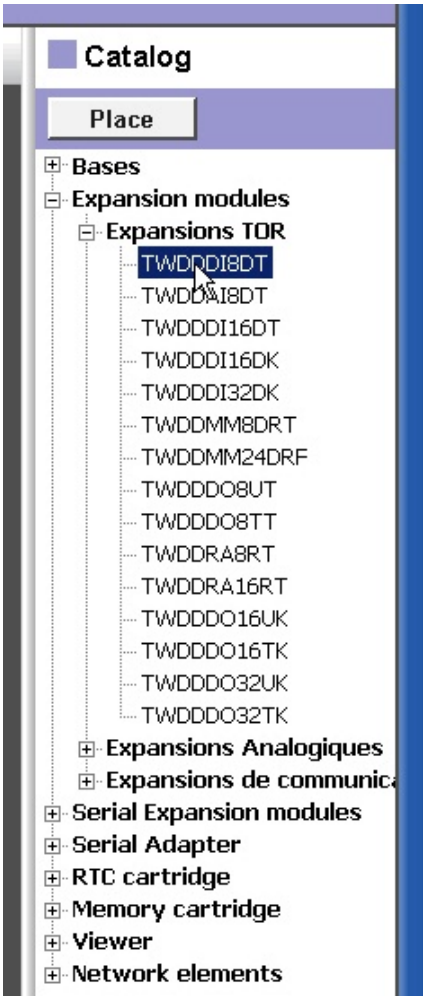
Create a new Project

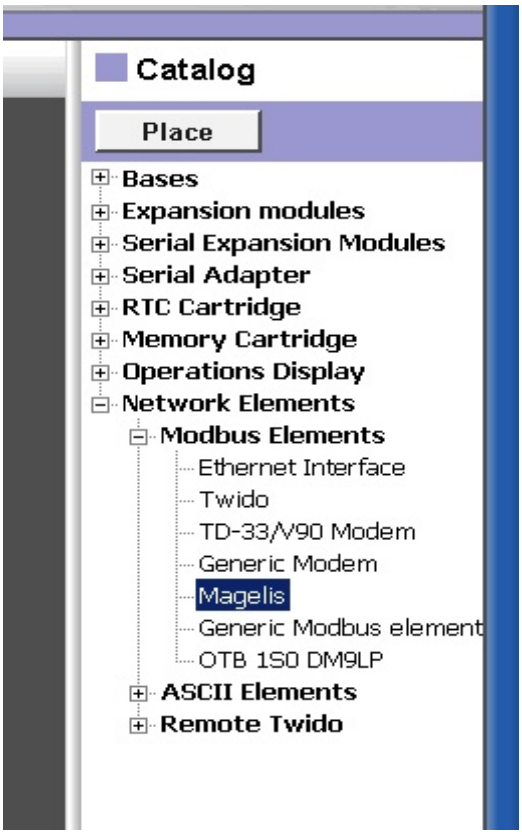
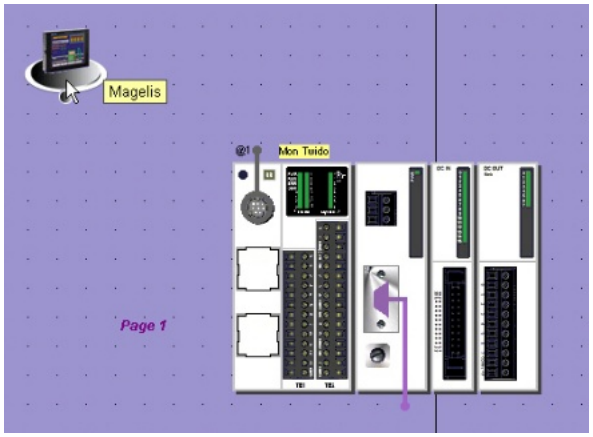
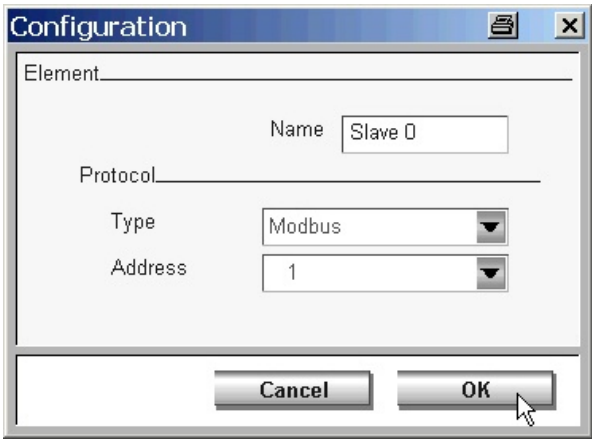
1	Once **Create a new Project** is selected, enter a **Project** name and select the **Directory** path to save it. You can enter **Project Information** if required but it is not mandatory. Confirm with **Create**.	

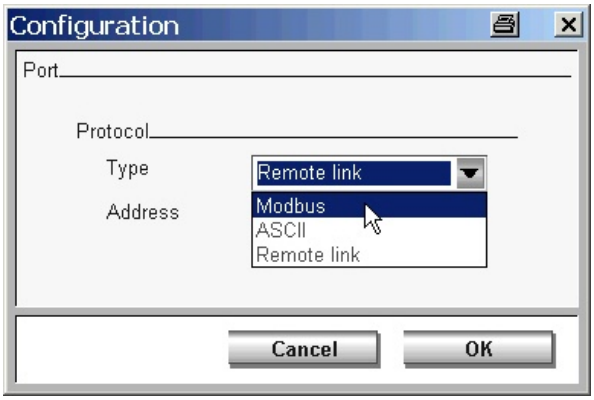
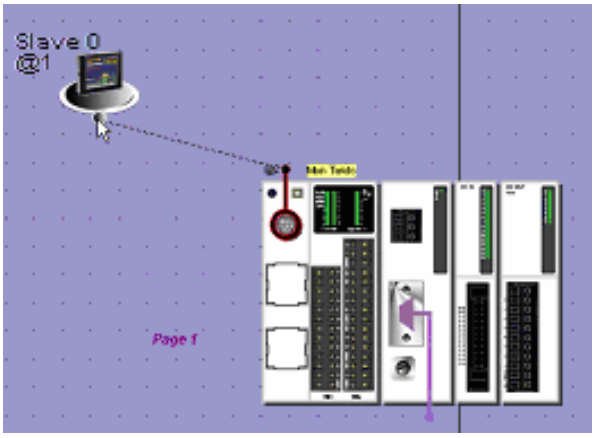
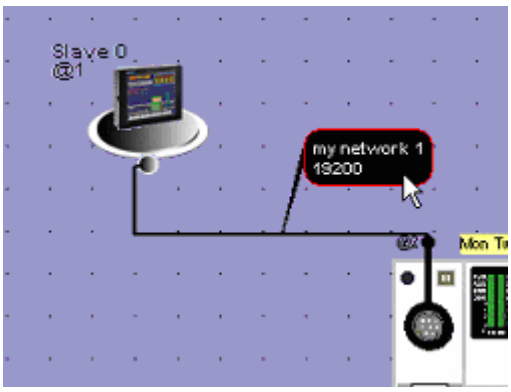
Select the Hardware

1	Now go to **Describe** to configure the hardware.	
2	In the configuration **Workspace** you will see a Twido PLC. In the Catalog on the RHS you can select the hardware/modules you wish to configure The Workspace offers you graphical documentation.	

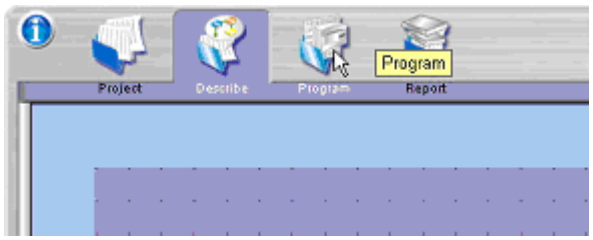
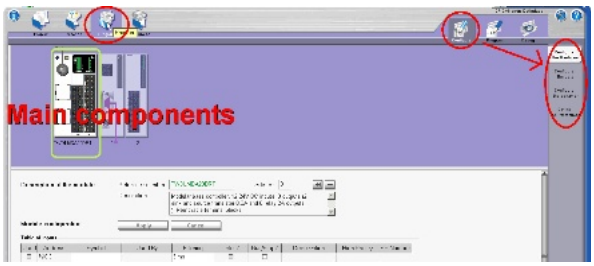
3	In the **Catalog**, first select the correct type of Twido **TWDLMDA20DRT**.	
4	Use Drag&Drop to drag the selection to the graphical image of the Twido. The grahical image will change to green. Drop the selected Twido while the mouse icon is in the green field.	

5	As next module select the CANopen Master **TWDNCO1M**. Use Drag&Drop to place it to the right of the Twido PLC in the graphical image.	
6	Now add the extra digital inputs module **TWDDDI18DT** Again, using drag&drop place it next to the CANopen Master.	

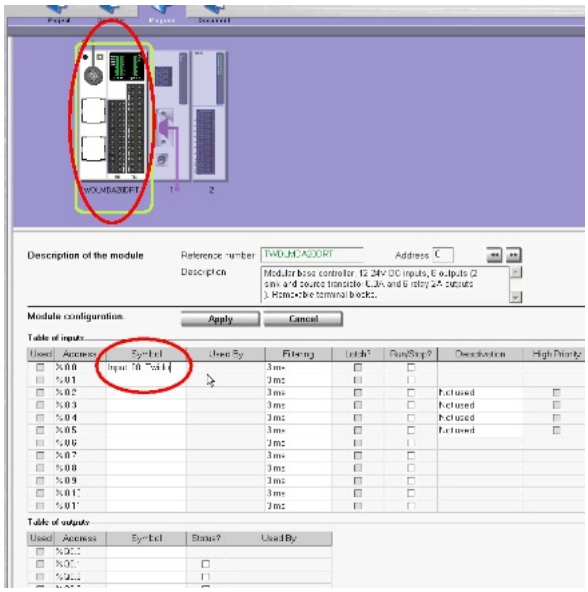
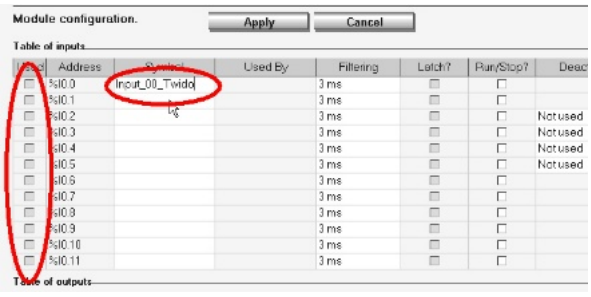
7	Now add the Magelis Terminal **XBTGT1100** For this add the general Magelis Modbus element to the configuration.	
8	The Workspace now shows a graphic display of the configured modules/devices. The connection HMI/PLC, via the Modbus interface, has still to be done.	
9	To confgure the HMI connection, move the mouse icon over the HMI until the mouse icon changes to a **screwdriver**. Now a doubleclick opens up the **configuration** dialog. Give the device a **Name** and check that the default Protocol **Modbus** at **Address 1** is offered. Confirm with **OK**.	

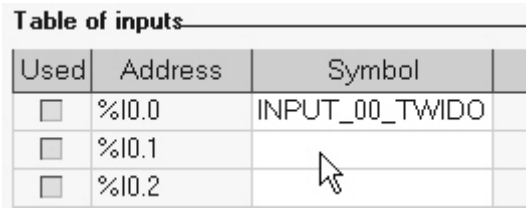
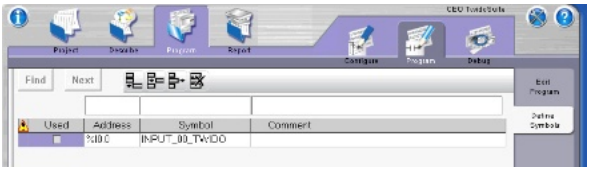
10	Name and Modbus address now appear in the graphic display next to the HMI device.	
11	Now do the same for the PLC modbus interface. Position the mouse icon on the modbus interface of the PLC. When the mouse icon changes to a screwdriver, doubleclick to open up the config-uration dialog. Change the Protocol type to **Modbus** and set the **Address** to **2**. Confirm with **OK**.	
12	Now connect the two devices in the graphics display by linking the white crosses that reperesent the linking points. To do this click on the white cross of one device and then the next so that the link is displayed.	
13	After linking the devices you can give the **network** a **name** and set the baud rate by double clicking on the connecting line or the network box. In this case we use the default values.	

Hardware Configuration

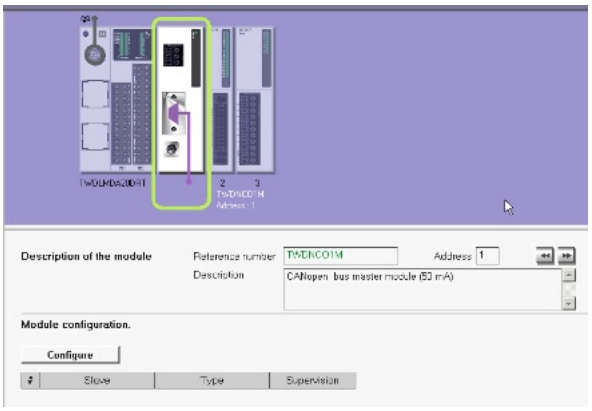
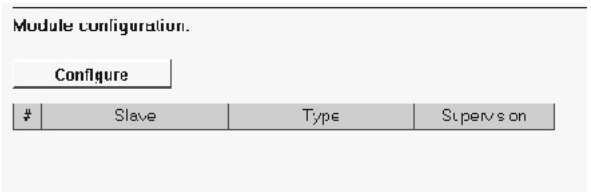
1	For the hardware configuration select the main menu **Program**.	
2	The screen shows the PLC rack. Note the menus on the RHS and bottom of the display area. Menus on the RHS are sub-menus to the main menu along the top.	

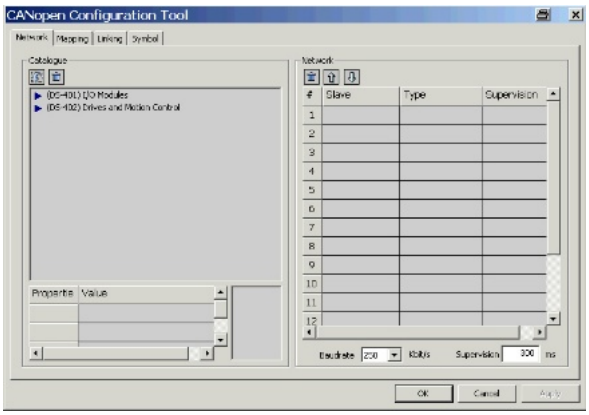
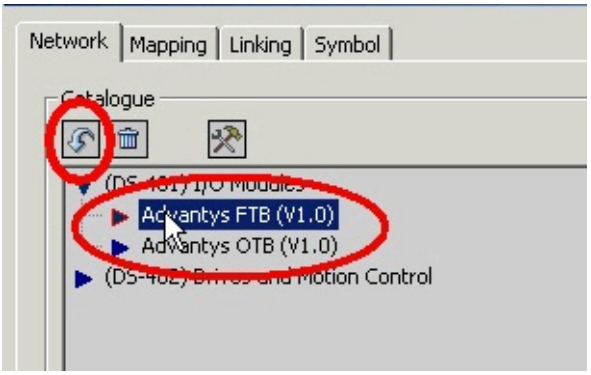
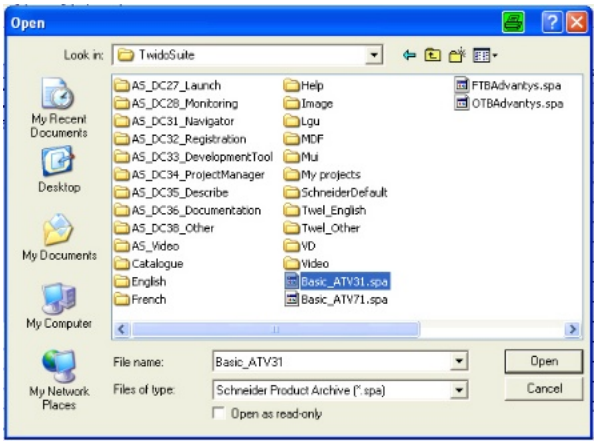
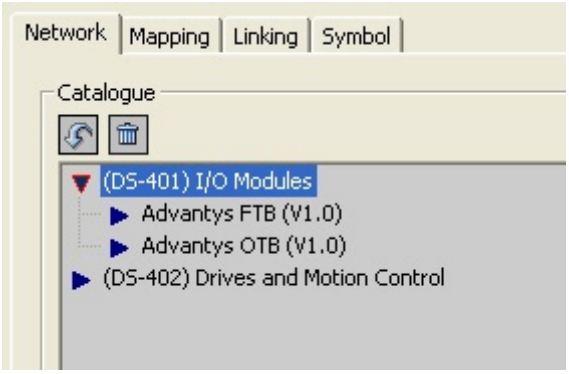
Twido SPS

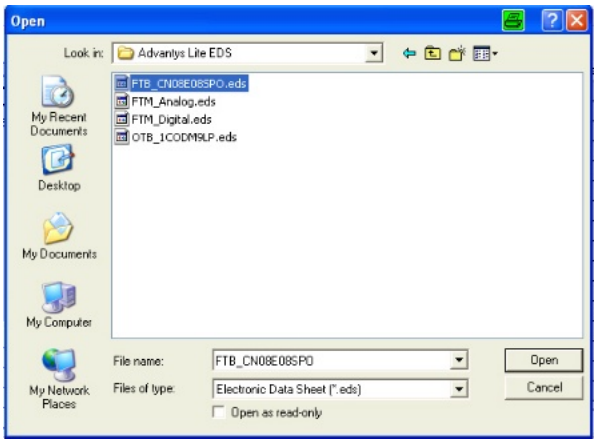
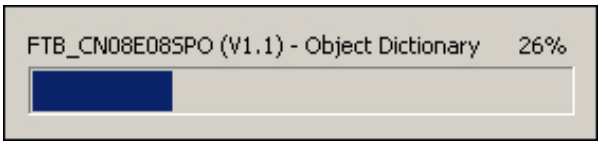
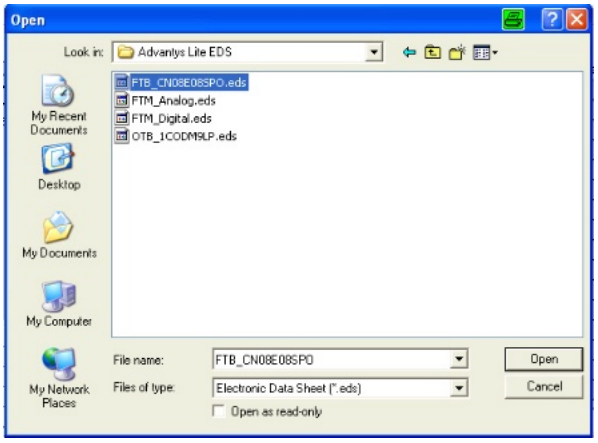
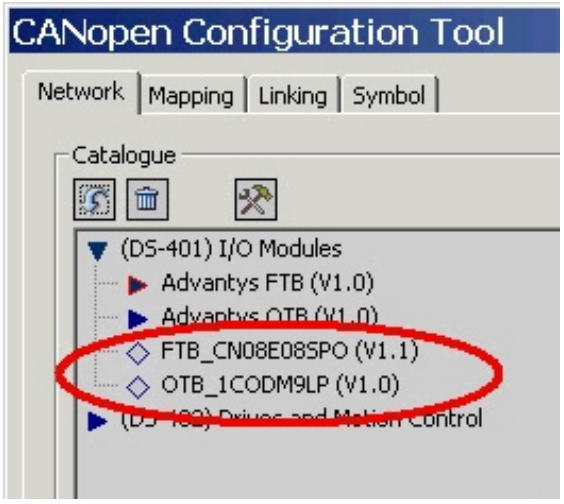
1	You can now configure all the I/O variables for the PLC. To name the variables click on the **Symbol** column for a particular I/O and input the new name.	
2	Spaces and special characters are not allowed in symbol names. If the variable is already in use in the program, the check box to the LHS is activated.	

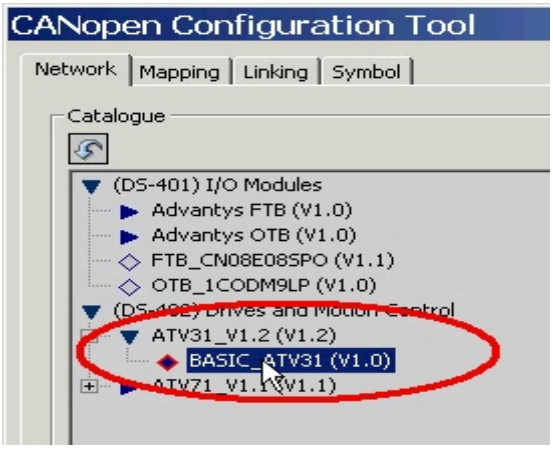
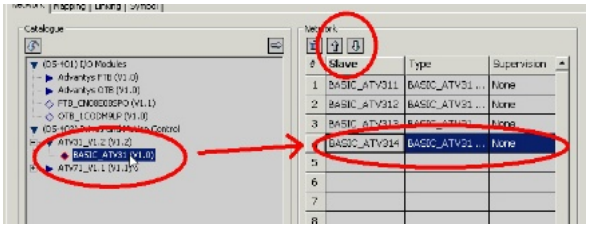
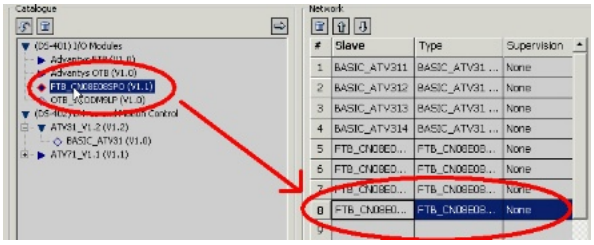
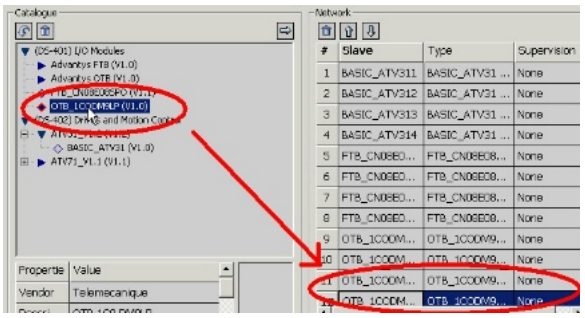
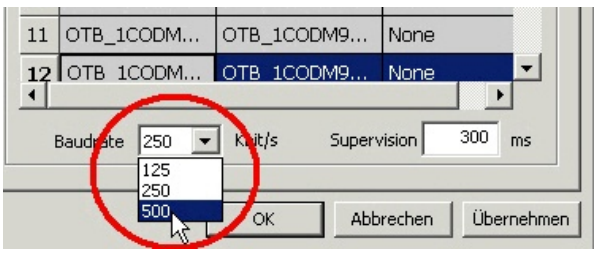
3	All symbol names are shown in uppercase.	
4	Changes are only made when the **Apply** button is pressed. If you try to exit the dialog without pressing **Apply**, you will be reminded.	
5	Symbols entered in the configuration are automatically inserted into the variable list.	

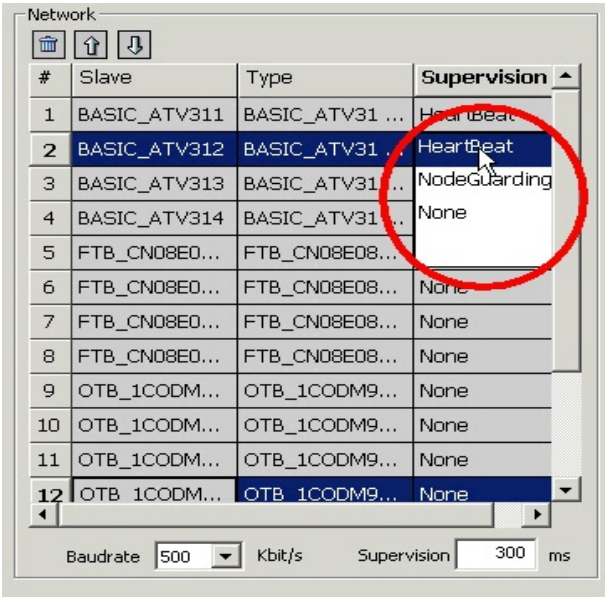
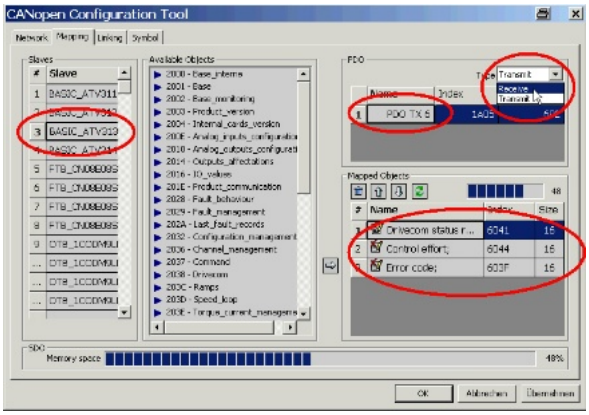
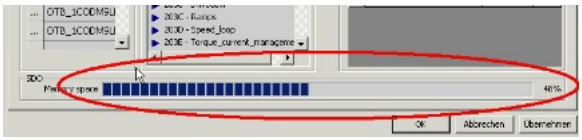
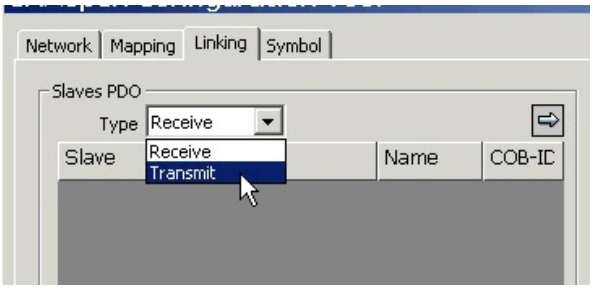
CANopen Master

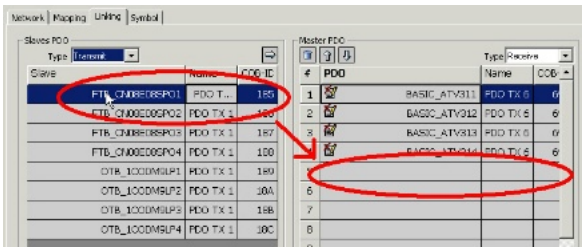
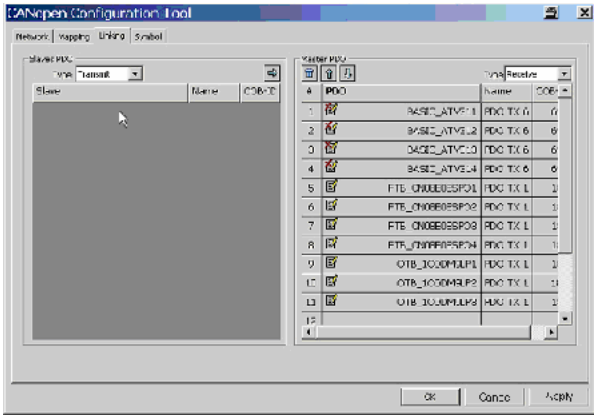
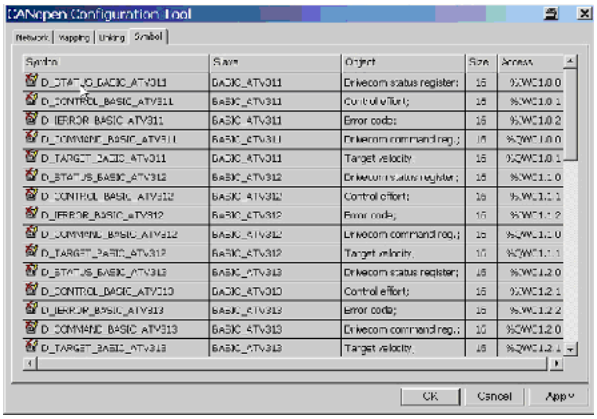
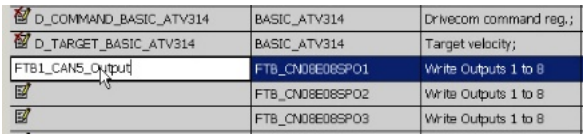
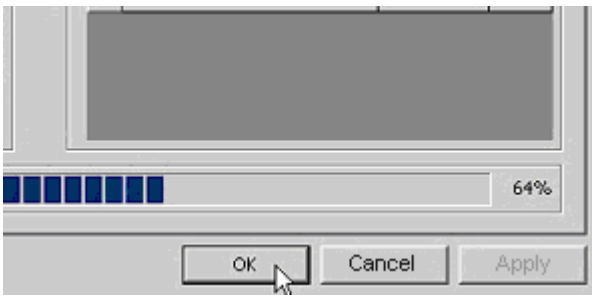
1	The next step is to configure the CANopen Master. Click on the CANopen module in the graphics image.	
2	Click on **Configure** in the **module configuration**.	

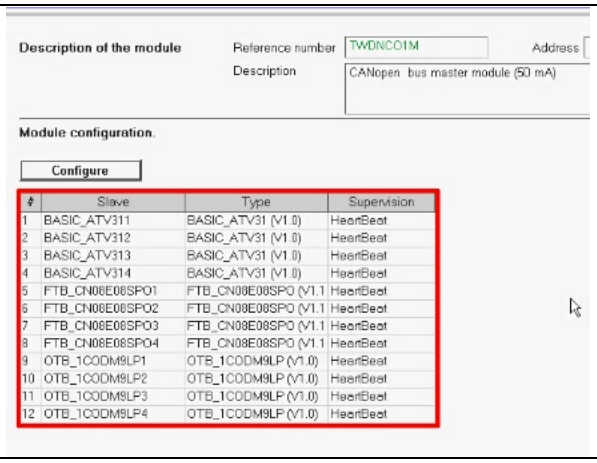
3	The **CANopen Configuration Tool** appears**.**	
4	If there is no entry in the **catalogue** for Advantys FTB or Advantys OTB, the SPA files have not been imported. The files are installed with Twidosuite. To import the files, click on the import/export function (arrow icon,top left) to go to the standard Windows **Open** dialog	
5	In the **open** dialog set the path to the required SPA (Schneider Product Archive) files: File type : ***.SPA** Path: Twidosuite	
6	Once the SPA files are imported they appear in the list under **DS-401** .	

7	Use the import function to import the **EDS** Files (Electronic Data Sheet) for the components. Here : **FTB_CN08E08SPO.eds** (See the example project)	
8	The import displays a progress bar.	
9	do the same for **OTB_1CODM9LP.eds**.	
10	After a successful import the components are listed as **DS-401 I/O Modules**.	

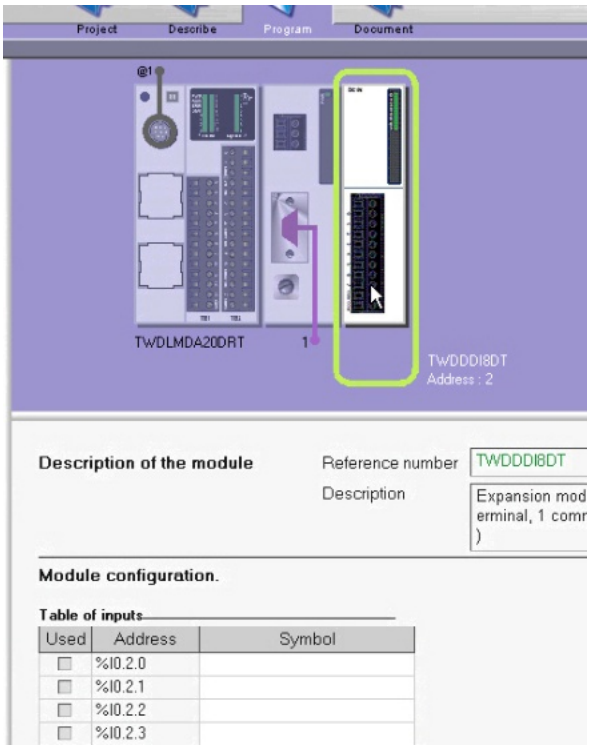
11	The configuration files for the Altivar 31 drives are already installed.	
12	For our example the first four slaves are used by the Altivars. To insert an Altivar as slave, double click on the Altivar entry in the **catalogue.** Use the arrow icons to move the entries up/down in the list.	
13	Slaves 5-8 are the FTB modules. .	
14	Ther OTB Modules are Slaves 9-12.	
15	Set the baudrate for the CANopen bus to: **500Kbit/s**	

16	Double click on the **Supervision** column for each slave and set the supervsion type to **heartbeat** **(**the default is normally set to **None)**	
17	In the **Mapping** tab you can edit the **Transmit** and **Receive PDOs.**	
18	**Note:** You do not need to change the PDOs. If you do however, bear in mind that the SDO memory requirement changes. The maximum SDO memory is fixed in the PLC and cannot be exceeded.	
19	Use the tab **Linking** to select the PDOs that are to be transferred. You must do this for both the **transmit** and **receive** direction.	

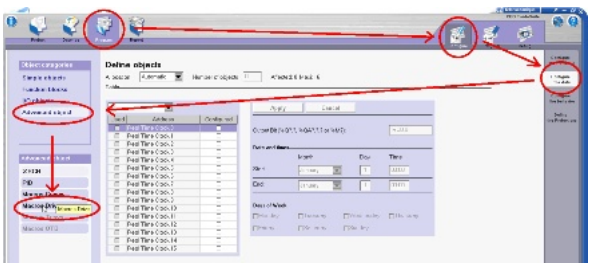
20	Under **receive AND transmit,** doubleclick on the PDO to move it from the slave to the master PDO. Note : all PDOs that are used must be moved. Normally you would move all PDOs. Those not moved are redundant	 
21	Us the **Symbol** tab give your I/O variables names. The Altivar 31 variables have standard names but can still be changed.	
22	Variables without names do not appear in the variable list. For ease of programming it is preferable to give the variables names.	
23	To save the configuration click on **Apply** then exit the dialog with **OK**.	

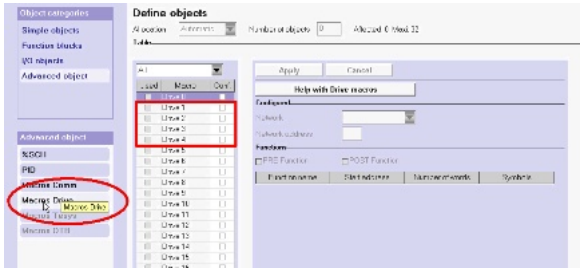
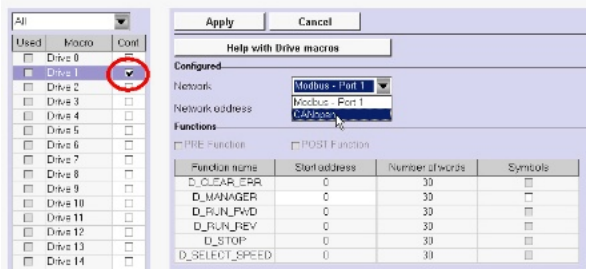
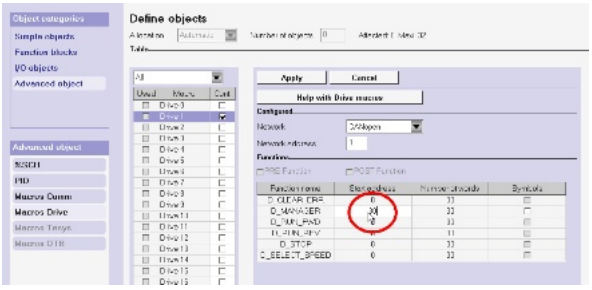
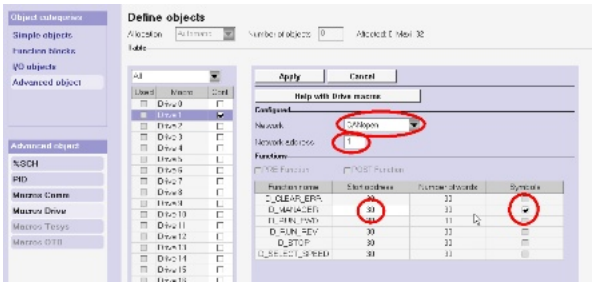
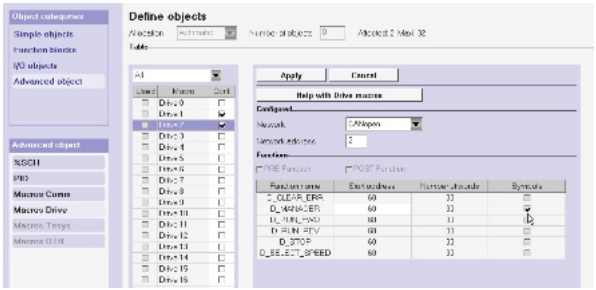
27	TwidoSuite now displays a table with all the configured CANopen slaves.	

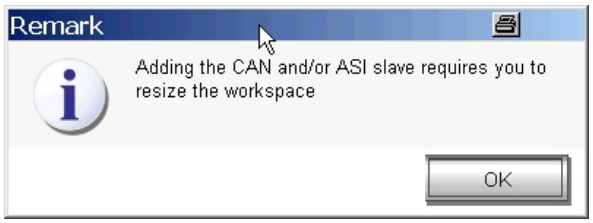
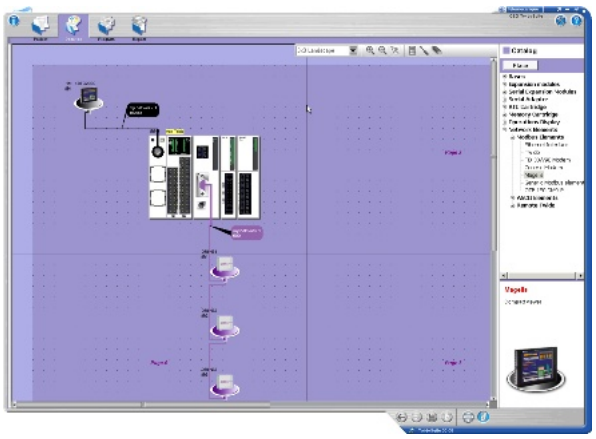
Digital Input-Modul

1	Click on the the digital input module in the graphic. The list of Inputs appears for the module. **Symbol** names can be input and applied. The variables are automatically inserted into the variable list	

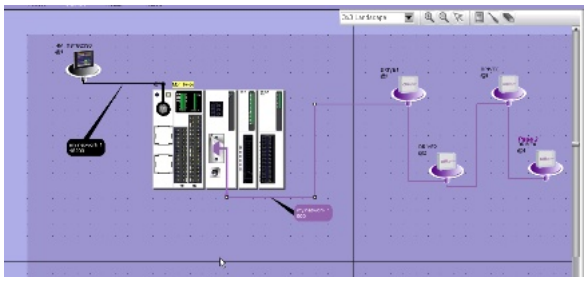
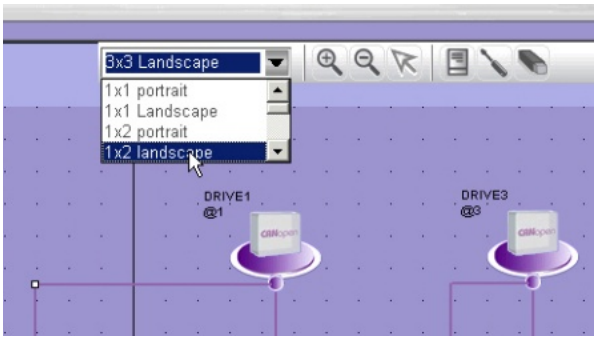
Drive Macros

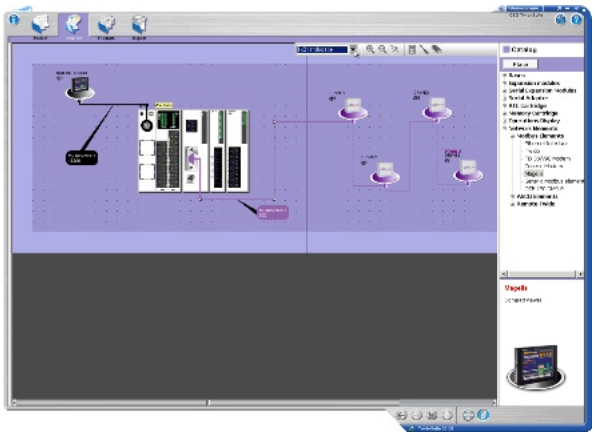
1	To use the TwidoSuite macros for the Altivar 31, they must first be configured. To do this select: **Program->** **Configure->** **Configure the Data->** **Advanced object->** **Macros drive**	

2	For legibility, the macros are given the same number as the slave addresses, i.e. 1 – 4.	
3	Select a macro to configure it by activating the check box. Set: Network: **CANopen** Network Address : **1**	
4	Reserve the memory words for the function in the entry **D_Manager**. In the example 30 words are reserved for macro drive 1, from MW30 to MW59, by giving the start address and the number of words required	
5	Setting the check box in the **Symbols** column allows the variables to be included in the variable list.	
6	Click **Apply** to implement the drive configuration. In the example drives 1-4 are set up with MW30, MW60, MW90 and MW120	

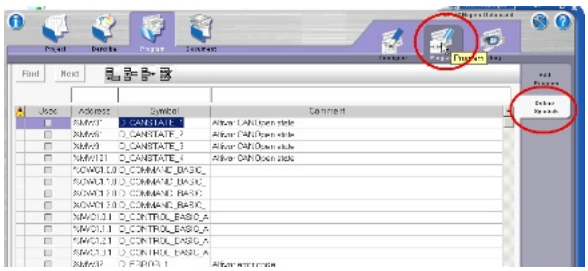
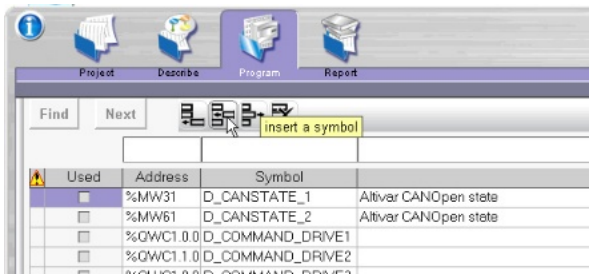
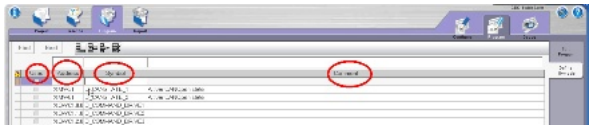
7	Change now to the main menu **Describe** and you will receive a request to resize the workspace. Acknowledge the message with OK.	
8	TwidoSuite has increased the workspace and the configured drives and CANopen bus are now shown in the graphics.	

Resizing Workspace

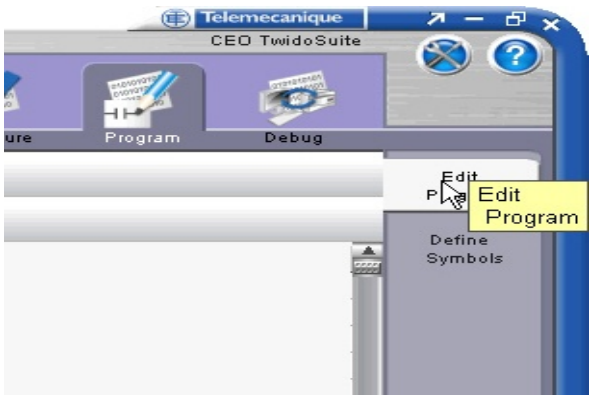
1	You can re-position objects in the graphic to save space and for better legibility. Note: if you now print the image for documentation purposes empty fields are printed too.	
2	To delete the empty fields, change the workspace format from 3x3 to 1x2.	

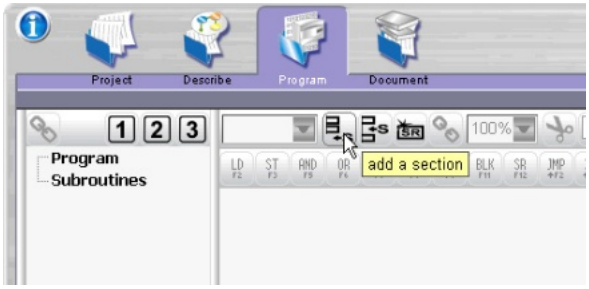
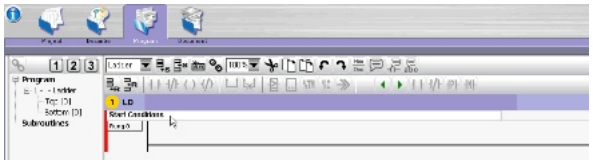
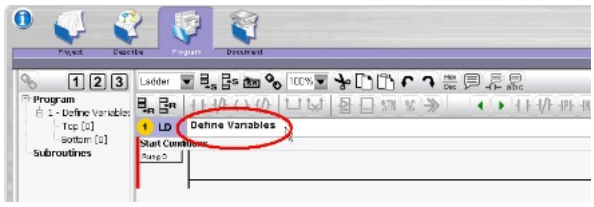
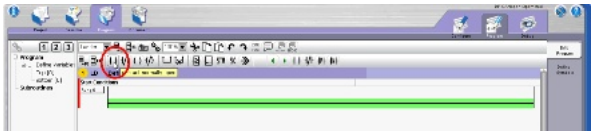
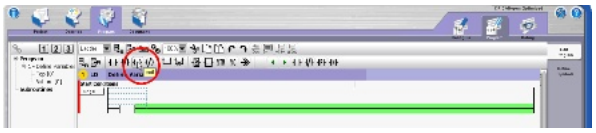
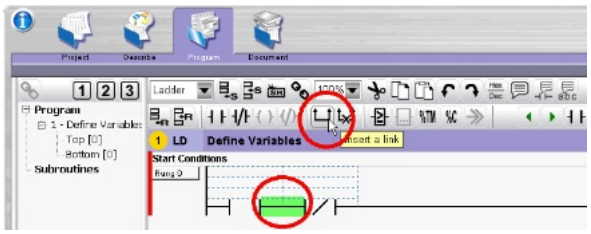
3	The re-sized workspace.	

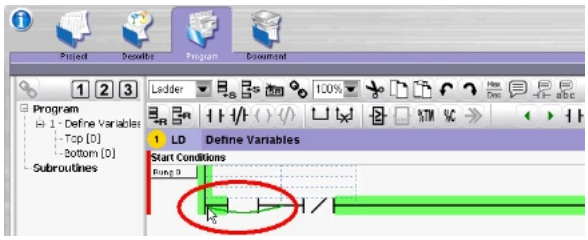
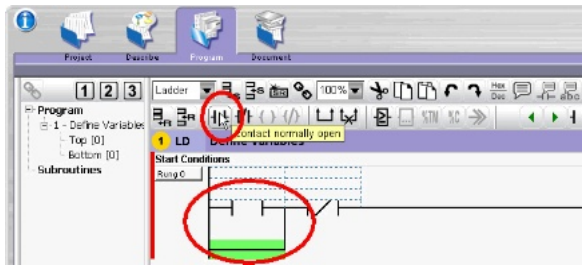
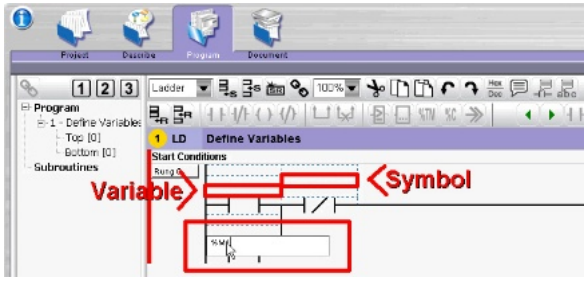
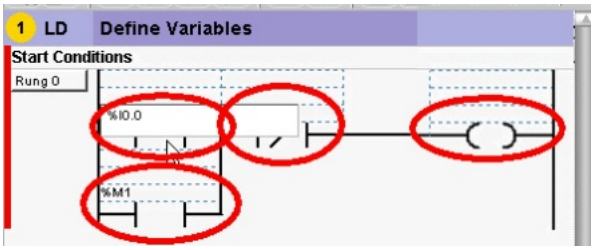
Variable List

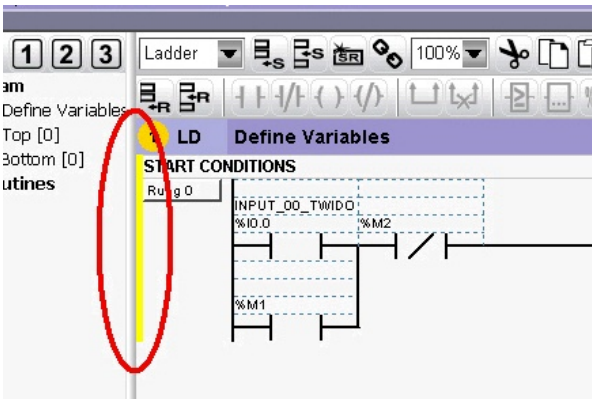
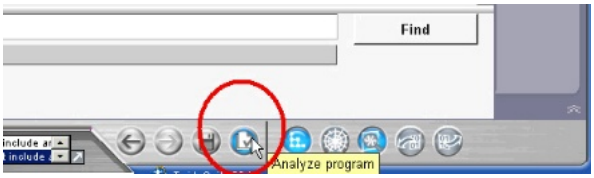
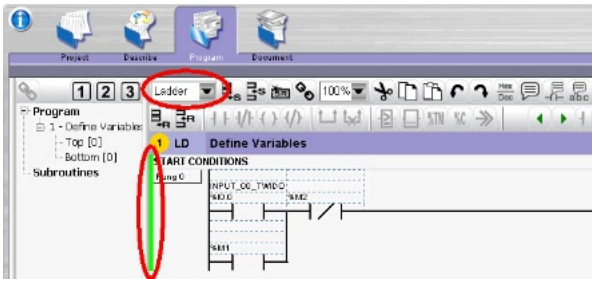
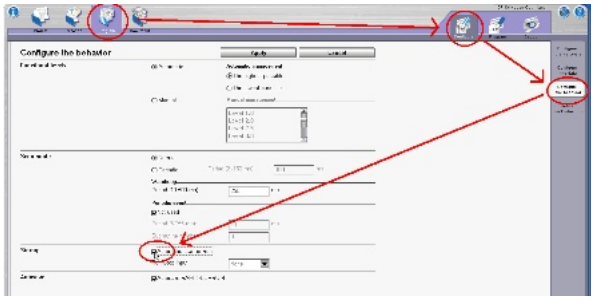
1	In the variable list you can add **symbol**s, give them a memory **address** and input a **comment** about them.	
2	To add a **symbol** click on the **insert** icon. First enter the symbol name. Now you can add the **address** and a comment.	
3	Use the different column headers as sort criteria to sort the table in alphabetical order.	

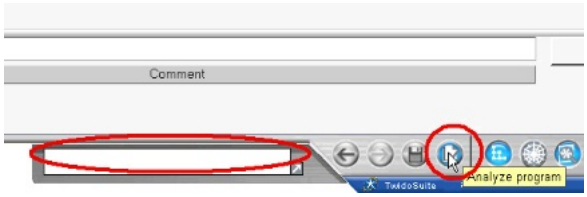
Create an application Program

1	Use the **Edit Program** function to go to the program editor. Starting a new program always begins with LADDER as the programming language. You can only view the program in LIST mode once the first rung has been completed and analysed.	

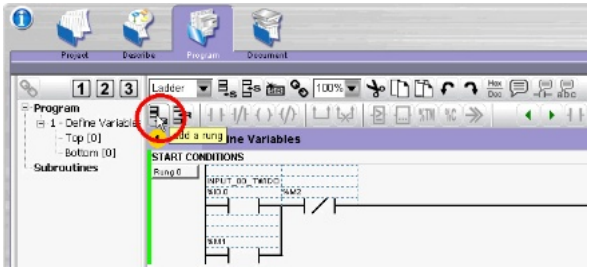
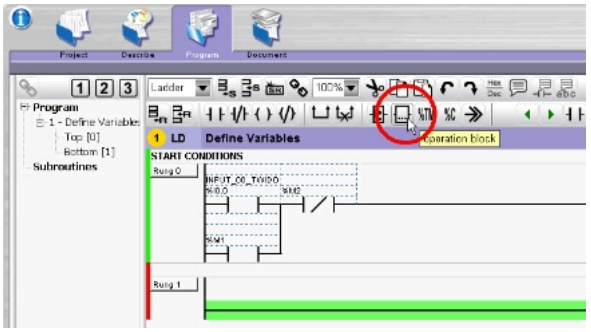
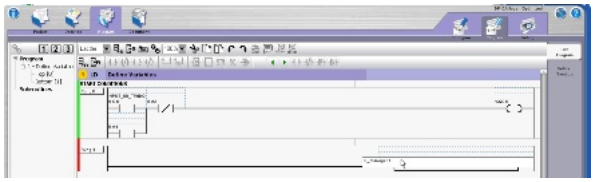
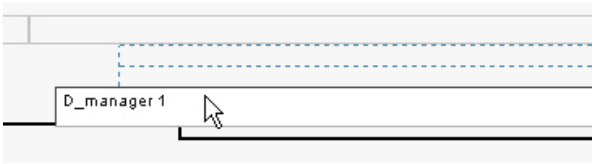
2	Starting with an empty program, **add a section**. This will create a section with empty rungs. The first rung is marked in red on the LHS to denote that it has logical errors.	
3	Click on the top of a rung to rename it.	
4	You can also rename the section	
5	Clicking on the rung changes its colour to green and indicates the current rung being edited. Clicking on an icon in the toolbar inserts the selected object at the first available place on the rung. So, you can add contacts…	
6	….and outputs, etc.	
7	To make a logical connection, simply mark the source and pull it to the destination. All possible connecting points are shown in green	

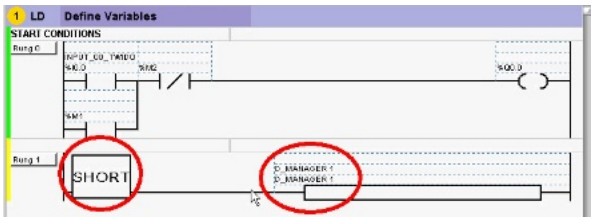
8	Once a link has been inserted you can add a contact to form the logical OR.	
9	To assign an object to an address or variable, click on the upper half of the object	
10	The editor automatically recognises whether a rung is syntactically complete and marks it in yellow. The rung, however,has not yet been analysed. The analyze program button is in the bottom right hand corner.	
11	The Analysis is done for all contacts.	

12	If the analysis is error free, the yellow band changes to green. You can now change the display mode to LIST if you wish.	 
13	If erros are found, these are listed at the bottom of the edit field. Click on the arrow icon to enlarge the display.	
14	A common error is **No Start In Run Was Selected**	
15	To fix this, select: **Program->** **Configure->** **Configure the behavior** In the **Configure the Behavior** dialog select: **Automatic start in Run** This is an operation mode that causes the PLC to start up automatically on return of power after a power failure.	

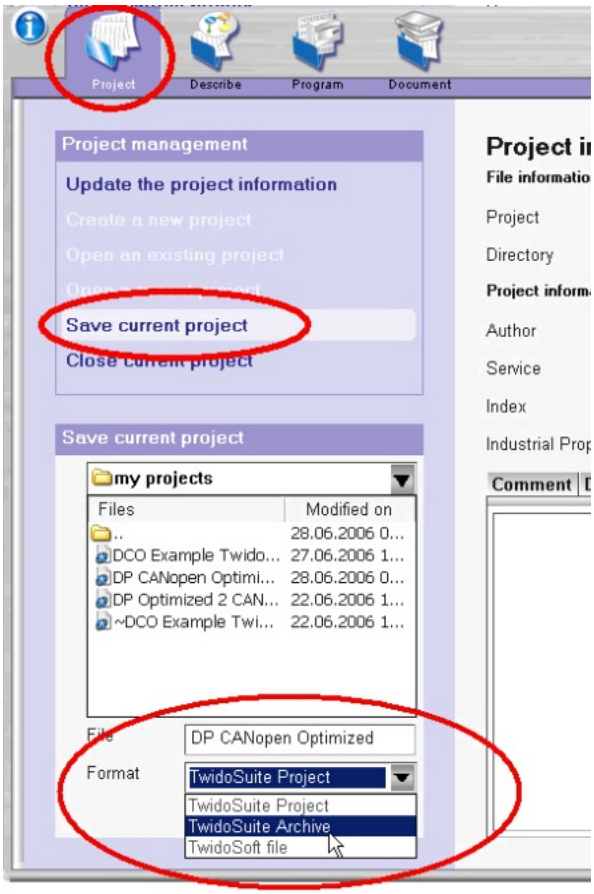
16	After restarting the analysis the error field is empty.	

Macro Drive

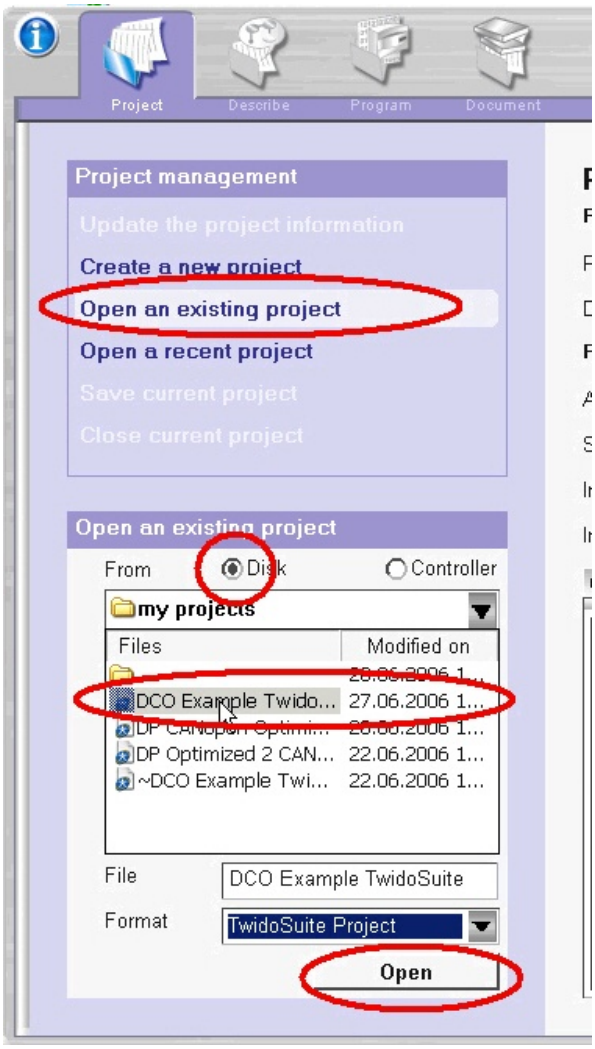
1	To use the macros for the drives, a second rung is added using the **add a rung** icon.	
2	Insert an **operation block** for the macro.	
3	To link the operation block to the macro drive input **D_manager 1**. **D_manager** is the macro function to access the drive and the 1 indicates Drive 1.	
4	The space between **D_manager** and the **1** is mandatory.	

5	As the macro is already configured, the address field also contains the symbolic macro name **D_MANAGER 1**. The **SHORT** seen here must be exchanged for a control variable. You can now repeat this for the other macros: **D_CLEAR_ERR** **D_RUN_FWD** **D_RUN_REV** **D_STOP und** **D_SELECT_SPEED** .	

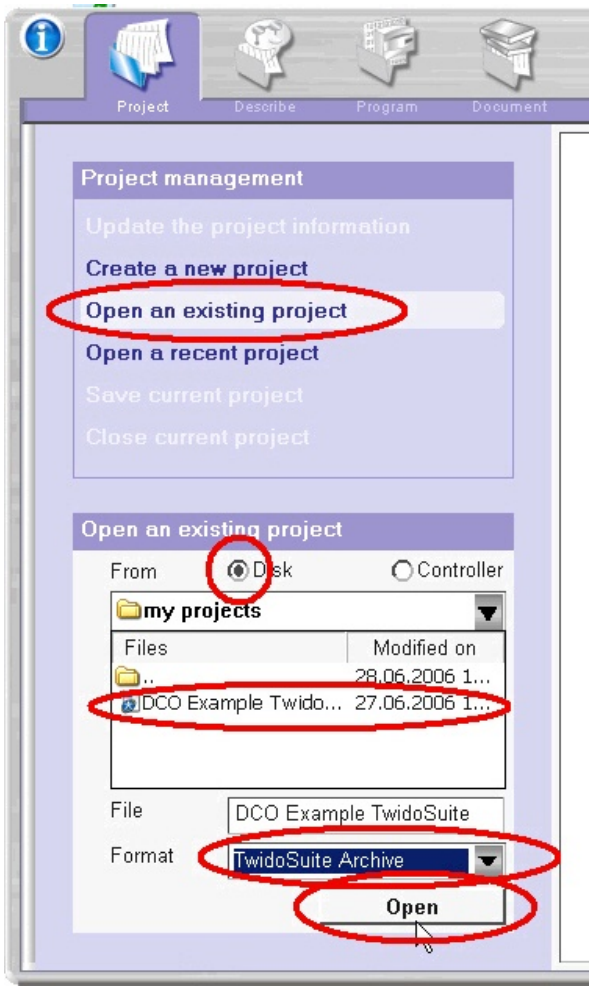
Save / export the project

1	To save the project select **Save current project** in the **Project** menu. In the **Save current project** window you can select the folder for the save, input the file name and designate the file **Format**. You can save the file as a normal **Project** file or as an **Archive** file. The Archive file has the advantage of being portable and is a single file.	

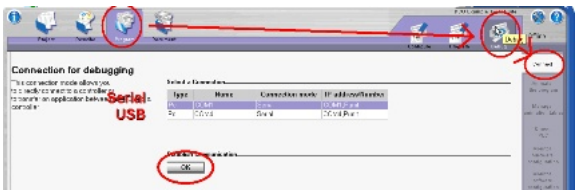
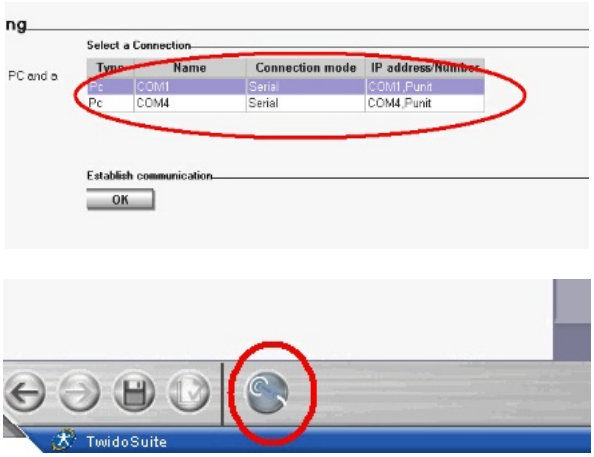
Open a Project

1	To open a project use the **Open an existing project** function in the **Project** menu. In the **open an existing project** window select the medium : **disk or Controller** Give the file type under **Format** (for a project file: Project), select the folder and select the file you wish to open. When ready, click on **Open** to open the project	

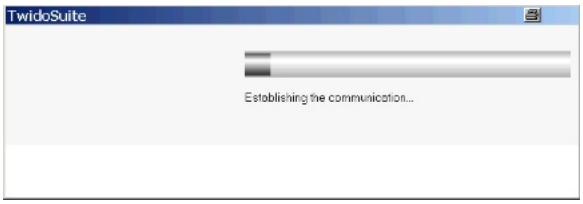
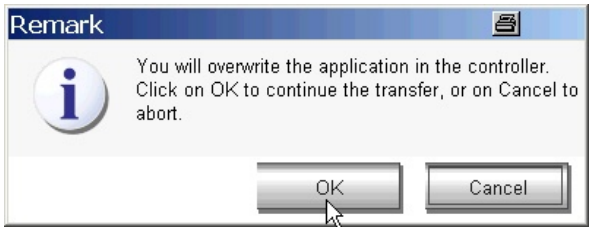
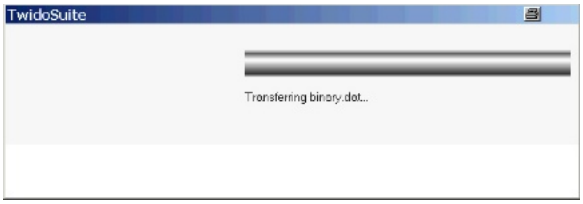
Import a Project

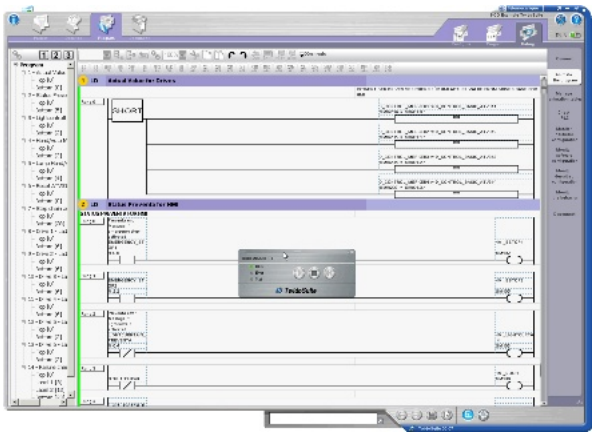
1	Proceed as for **Open a project** (above) except for import, the file type is **Archive**.	

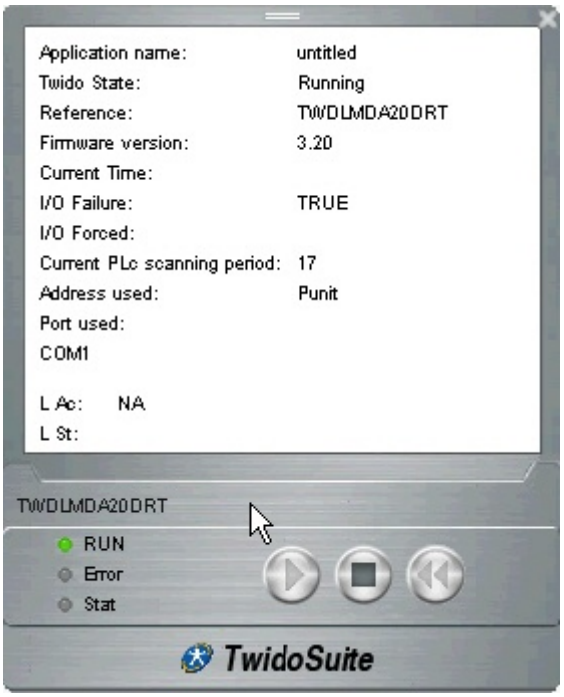
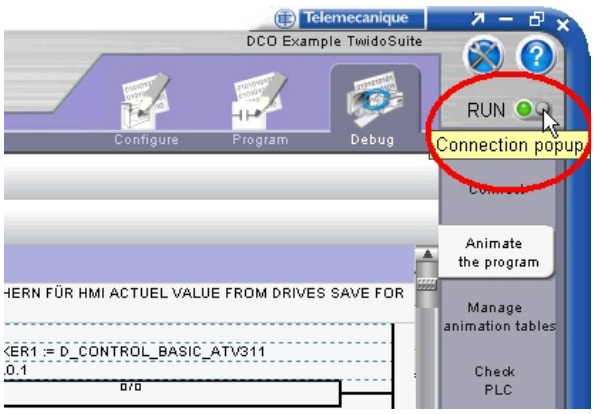
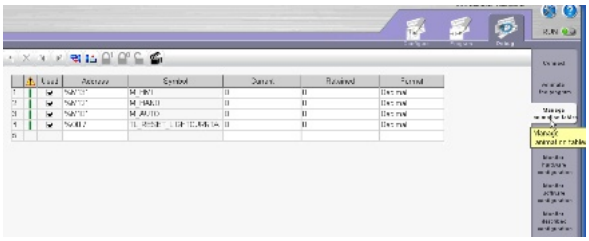
Connecting to the PLC

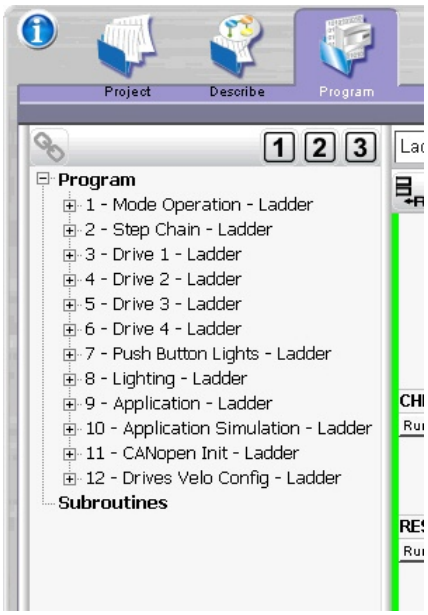
1	To connect the PC to the PLC select **Program** in the main menu, then **Debug** in the sub-menu to get access to the connect selection.	
2	You can now either configure a new connection (see menu at bottom of window) or select a pre-configured connection. To connect click on **OK**.	

Download a Program

3	you will be shown a progress bar while Twidosuite establishes the connection.	
1	After succesfully connecting to the Twido, Twidosuite compares the status of the project and the Twido PLC. Now you can either download your project or upload the contents of the PLC.	
2	To download the project select: **Transfer PC->controller** and confirm with **OK**	
3	If the Twido is already running it must be stopped first. Confirm with **OK** if you wish to proceed.	
4	You will be shown a warning that the contents of the PLc are about to be overwritten confirm with **OK** to continue.	
5	The download condition is indicated with a process bar.	

6	After a successful download, Twidosuite jumps automatically to the online viewing.	
7	A control panel appears in the foreground. Here you can start and stop the PLC. The upper button extends the window, offering more PLC status information	
8	If you start the PLC you will be asked to confirm the action If you wish to proceed with the start click on **OK**.	
9	After successfully starting the PLC the **RUN** LED changes from yellow to **green**.	

10	Here the expanded window with the PLC in run mode.	
11	If the online status window is closed, a click in the upper left hand corner of the main window opens it again.	
12	The sub-menu **Manage animation tables** allows acces to animation tables.	

13	Use the project browser to navigate through the program sections.	

Advantys OTB/FTB

Introduction

The OTB/FTB chapter describes how to address the Advantys OTB and Advantys FTB devices to fulfill the system functionality as described above.

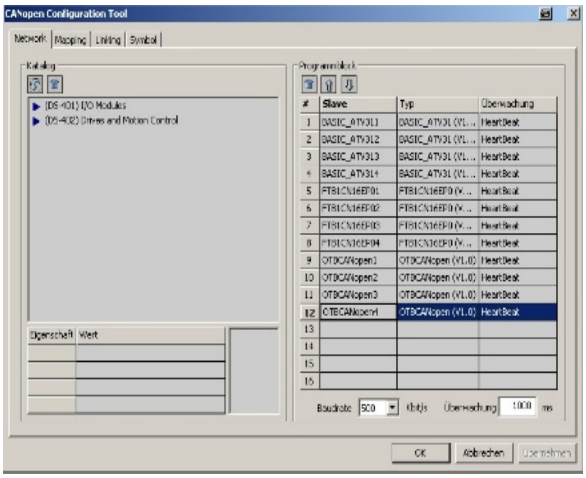
General

OTB and FTB addressing are performed in an identical manner on the device using a small screwdriver.

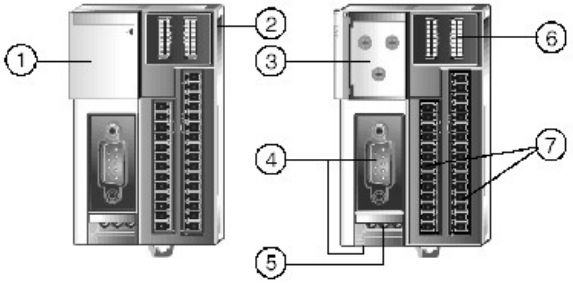
Since in our example the OTB and FTB devices operate with a CANopen bus which connects them to the Twido PLC, the addresses lie within the range 1-16.

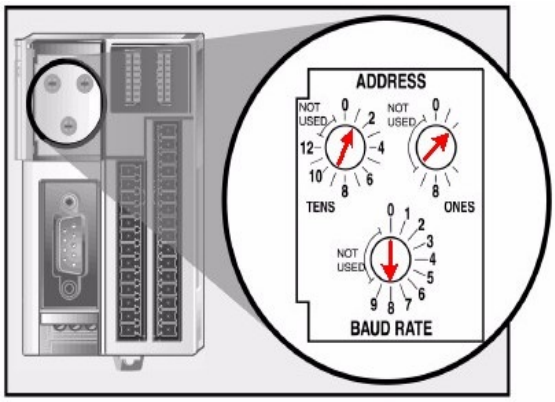
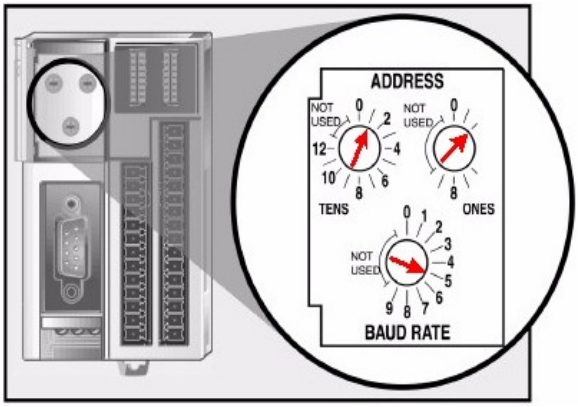
The CANopen bus can normally manage up to 128 slaves, but since a Twido is used for the master PLC in this example, only 16 slaves with addresses 1-16 can be used. Other bus components with higher addresses are neither detected nor addressed.

Setting the CANopen Address

1	During the TwidoSoft CANopen configuration process, an address is automatically assigned to the individual CANopen bus components in their order of installation. In our example there are four ATV31 drives on addresses 1-4, four FTBs on addresses 5-8 and four OTBs on addresses 9-12. We will use OTB4 with address 12 to illustrate how to assign addresses to the components. The individual components are addressed as follows in the software: For the first OTB with CANopen address 9, the input word is read in the form %IWC1.8.0. This means: • %IW = input word • C = CANbus • 1 = CANopen master slot • 8 = CANopen address -1 (9-1=8)	

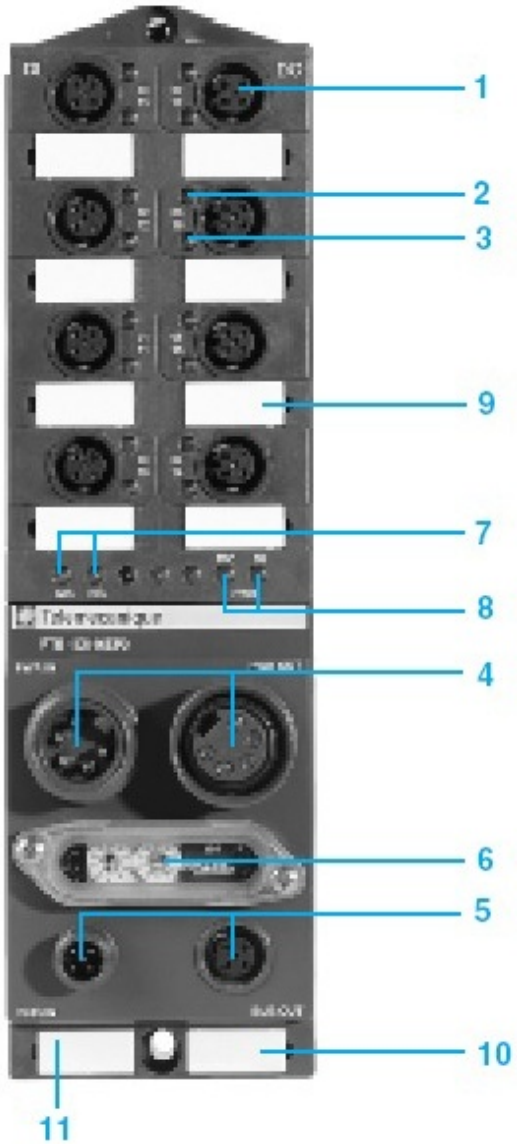
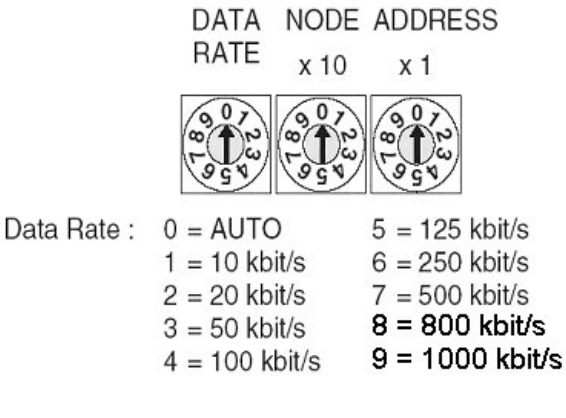
OTB

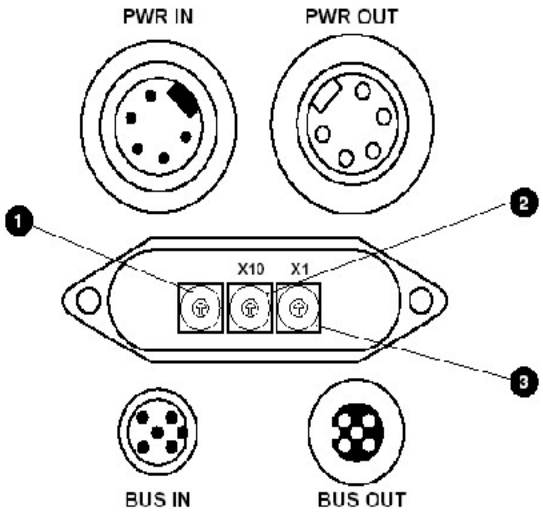
2	The OTB address is set using the rotating switches. The tens range from 0-12 which corresponds to 0-120 in steps of 1/10. The units ranges from 0-9. The baud rate is set using lower switch.	
3	Use a small screwdriver to adjust the settings. The slot in the adjuster screw has an arrow at one end to indicate the selected address.	
4	The first image shows the OTB cover closed. The second, the three adjuster switches with the OTB cover open.	

5	In this example, address 12 is set to automatic baud rate recognition (position 8). With automatic recognition, an attempt is made on initialization to synchronize each baud rate, from the highest value (1Mbps) to the lowest. Note: automatic baudrate recognition takes longer than manual input.	
6	In the table opposite, the relevant baud rate can be determined from the lower adjuster switch.	
7	In the table opposite, the relevant baud rate can be determined for the baud rate switch. In our example, a baud rate of 500 kbps is entered in TwidoSoft. Either **5** for **500** kbps or **8** for **automatic** must therefore be set on the OTBs.	

0	10 kBit/s
1	20 kBit/s
2	50 kBit/s
3	125 kBit/s
4	250 kBit/s
5	500 kBit/s
6	800 kBit/s
7	1 MBit/s
8	Auto
9	Standard-Baudrate (250 kBit/s)

FTB

1	The FTB is shown here. Point 6 shows the adjuster screws on the FTB. The setting area is protected by an IP67 cover. Before adjusting the settings, the cover must first be removed by loosening the two side screws.	
2	In the table opposite, the relevant baud rate can be determined for the baud rate adjuster. In our example, a baud rate of 500 kbps is entered in TwidoSoft. Either **7** for **500** kbps or **0** for **automatic** must therefore be set on the FTBs.	

3	Selector 1 here shows the baud rate setting . Selector 2 shows the “tens” position and selector 3 shows the “units” position. Setting is performed as for the OTB. The table for the baud rates and the adjuster screw positions are also identical. In our example, setting proceeds from left to right: - 7 for 500kbits/s baud rate - 0 for the tenths position - 5-8 for the four addresses of our FTBs	
4	Another configuration must be created in the software for the FTB modules. Particular output words must be set for this purpose. The FTBs have M12 connectors on which pin 4 stands for an input signal. Pin 2 can then be used for another sensor (with an inverted signal!) or for an alarm prompt.	**Object 2000H: Parameter input/diagnostic pin 2** On receipt of parameter information, the current parameter setting is compared with the new data. The FTB CANopen module is re-parameterized if data has changed. The FTB CANopen can be re-parameterized at any time. **Sub-Index / PDO-Mapping / Access / Data Type / Default Value / Description** 0 / no / ro / UNSIGNED8 / 01H / Number of entries 1 / yes / rw / UNSIGNED8 / FFH / Input functionality diagnostic (Pin2 only) **Sub-Index / Bit-No. / Status / Test** 1 / 0 to 7 / 1 / Pin 2, M12 socket 0 to 7: Diagnostic input 1 / 0 to 7 / 0 / Pin 2, M12 socket 0 to 7: Digital input ⚠ **Parameterization of manufacturer-specific device profiles must precede parameter assignment of device profiles**
5	The graphic opposite shows the configuration necessary for our four FTBs. Flag words are used here for an FTB with CANopen address 6 (corresponding to %QWC1.5.0/1) to simulate modifications to the configuration in Run mode. This configuration can be retransmitted at any time. The FTB is initialized only on reception of a new configuration.	LD ST AND OR XOR IN MPS BLK SR JMP %I %Q %M %S %TM F2 F3 F5 F6 F7 F8 F9 F11 F12 +F2 +F3 +F5 +F6 +F7 +F8 ---- SR (* INITIALISIERUNG FTB *) ---- (* INITZIALISATION FTB *) 0 LD 1 1 [FTB1_CONFIGWORD2 := 16#0000] 2 [FTB2_CONFIGWORD2 := %MW171] 3 [FTB3_CONFIGWORD2 := 16#0000] 4 [FTB4_CONFIGWORD2 := 16#0000] 5 LD 1 6 [FTB1_CONFIGWORD1 := 16#FFFF] 7 [FTB2_CONFIGWORD1 := %MW173] 8 [FTB3_CONFIGWORD1 := 16#FFFF] 9 [FTB4_CONFIGWORD1 := 16#FFFF] ---- (* ---------- *)

Devices

Advantys OTB

Introduction

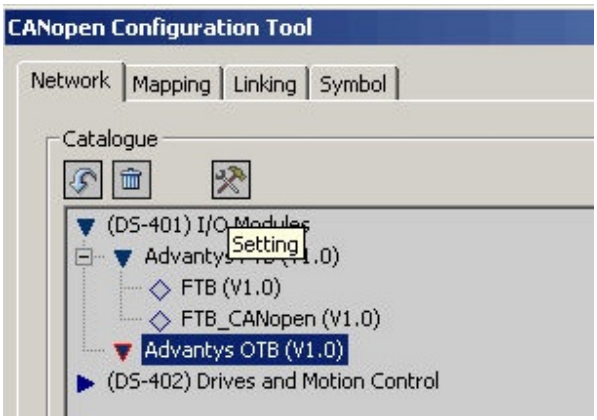
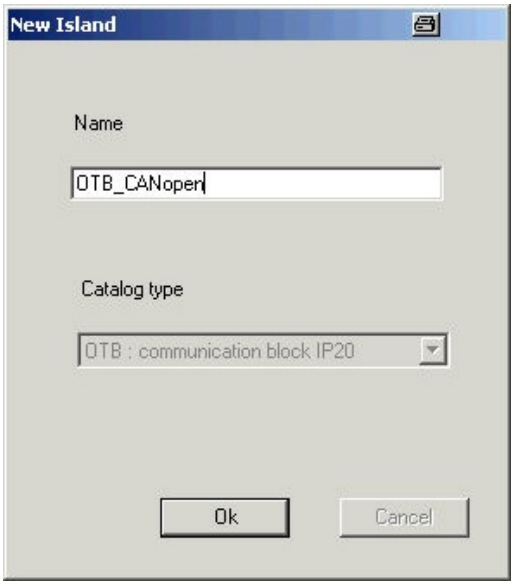
The Advantys OTB chapter describes how to add an OTB in TwidoSuite and how to create an EDS file.

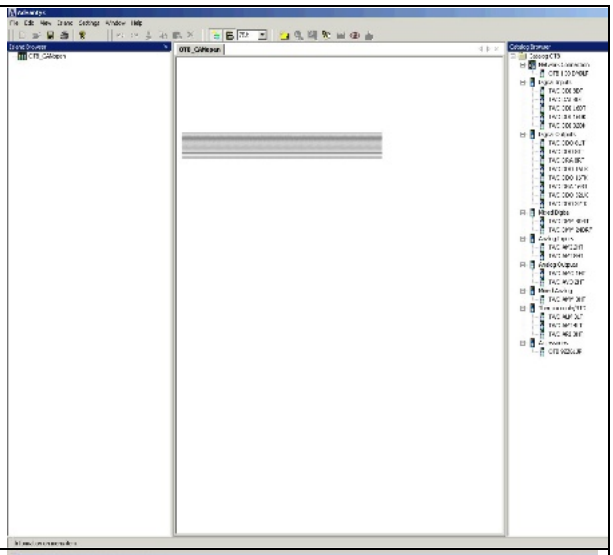
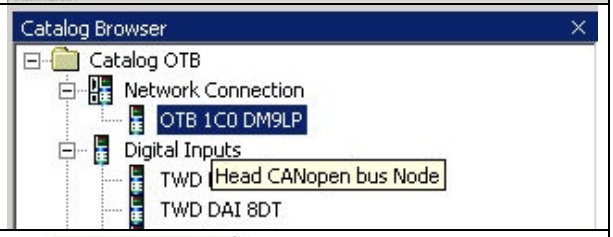
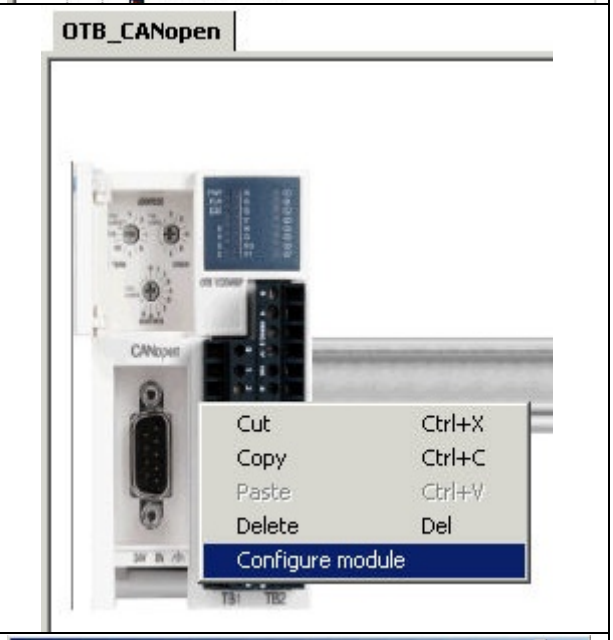
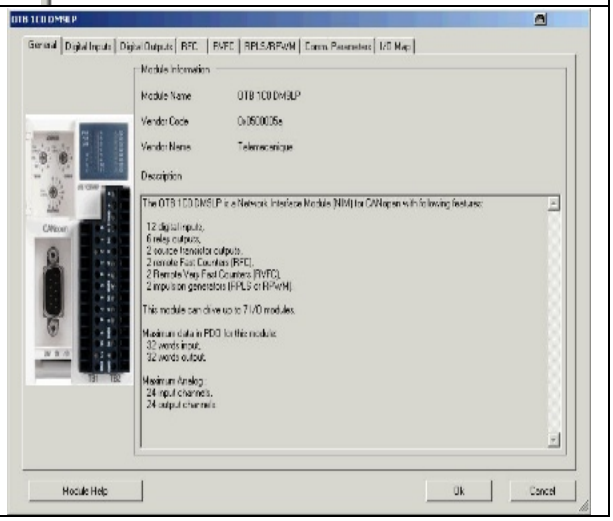
Pre-conditions

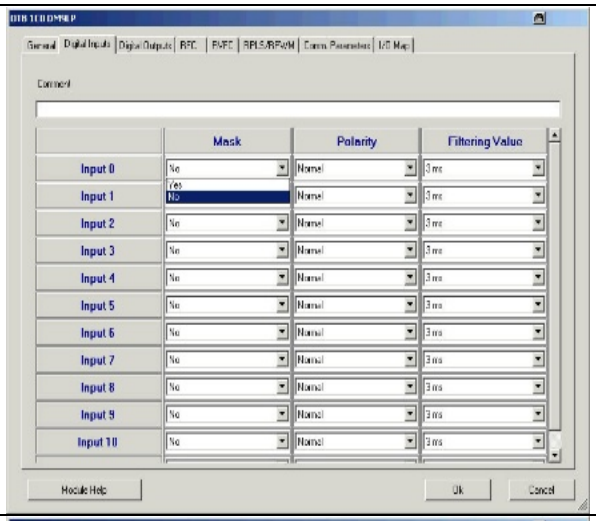
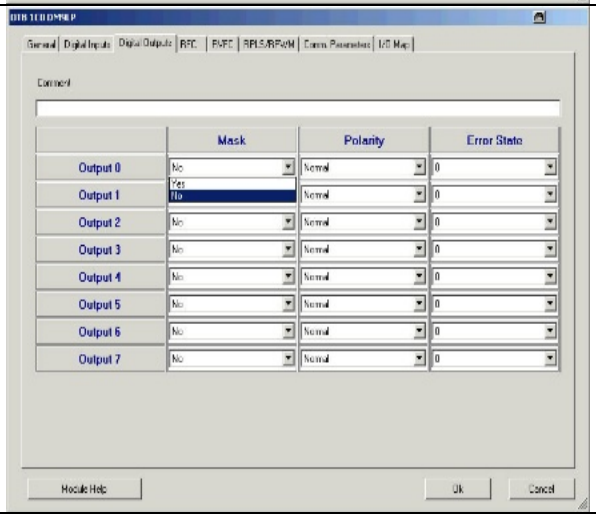
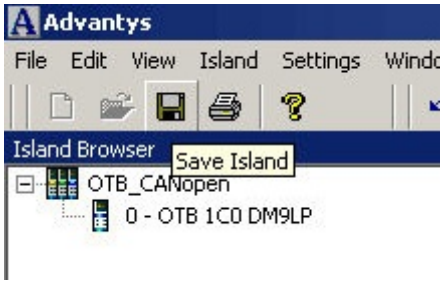
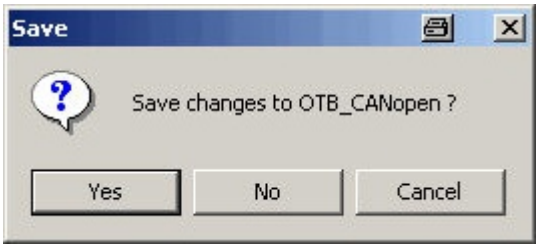
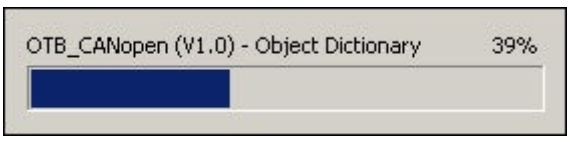
Before carrying out the steps described below, you must ensure the following:

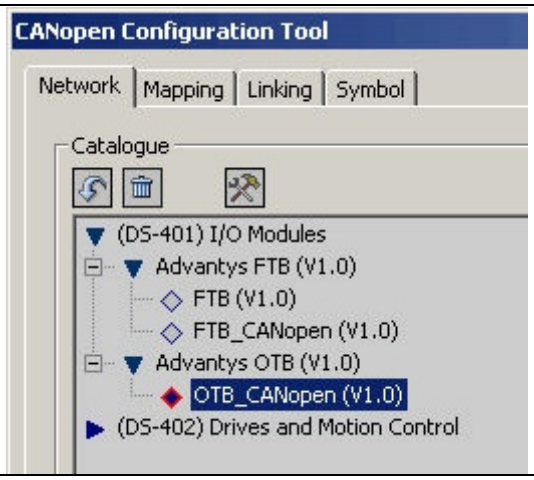
- The TwidoSuite programming tool is installed on your PC
- The OTB.spa file must already be in the TwidoSuite configuration
- The Advantys tool is installed on your PC

Starting Advantys for OTB

1	In order to start Advantys from the TwidoSoft program, select **Advantys OTB** after the **SPA** files have been loaded. Click on the icon with the hammer&spanner to start the Advantys tool for the OTB	
2	In the **New Island** dialog, assign a name. In our example this is: “OTB_CANopen”. Confirm with **OK**.	

3	A startup screen is then displayed. The middle field is the configuration area in which the OTB and its extension modules are created. All known OTB modules and extensions appear on the right-hand side in the **Catalog Browser**.	
4	Select the CANopen OTB used in our example, **OTB 1CO DM9LP**	
5	The OTB now appears as a graphics picture in the central area. Right-click on the image to open up a pop-up menu and select: **Configure module**.	
6	The window for the **OTB 1CO DM9LP** module opens and you are shown a general summary on the first page.	

7	The **Digital Inputs** tab allows you to define unused inputs. To do this, assign a **Yes** to the relevant bit (Input 0 = Bit 0, etc.) in the **Mask column**. Inputs marked **Yes** will not now be acquired. In our example, all inputs must be marked **No**.	
8	This is also the case for **Digital Outputs**. No modifications are required to any of the other tabs. Confirm with **OK**.	
9	To save the configuration and create a portable EDS file, click on the icon with the floppy disk. THe EDS file is saved to the **EDS** folder of the Advantys software.	
10	Now close the Advantys window using the system exit. You are automatically prompted to save the changes. confirm with **Yes**.	
11	The installation/save progress bar appears.	

11	Following the configuration process, the **CANopen Configuration Tool** re-appears. The OTB file that you have created now appears in the **Advantys OTB (V1.0)** entry.	

Advantys FTB

Introduction

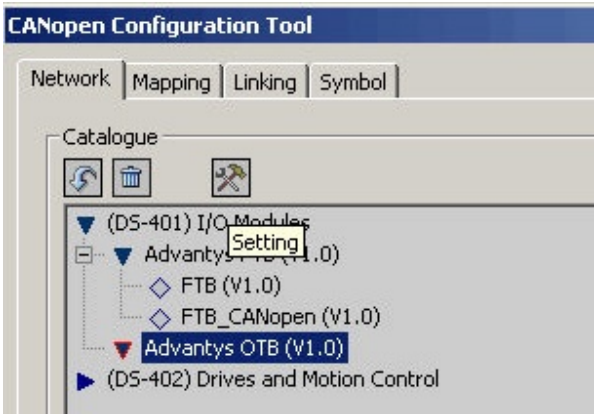
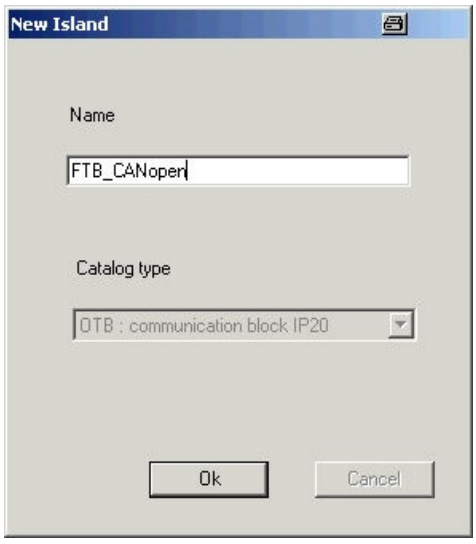
The Advantys FTB chapter describes how to configure the procedures required to add an FTB to the TwidoSoft.

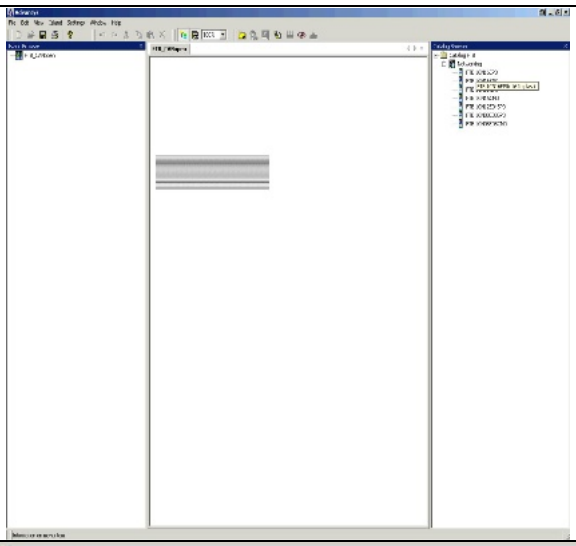
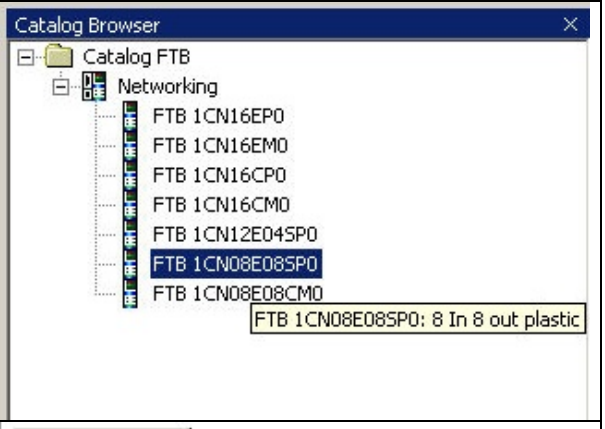
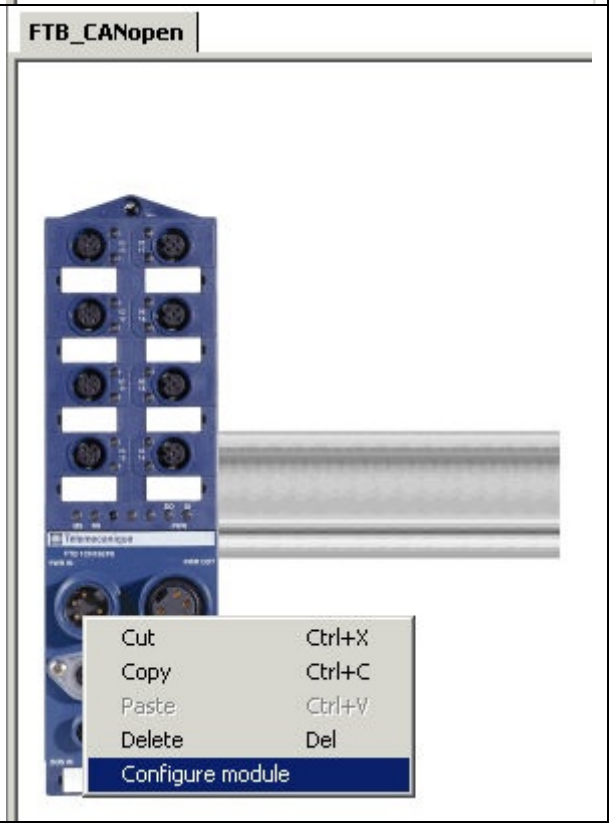
Preconditions

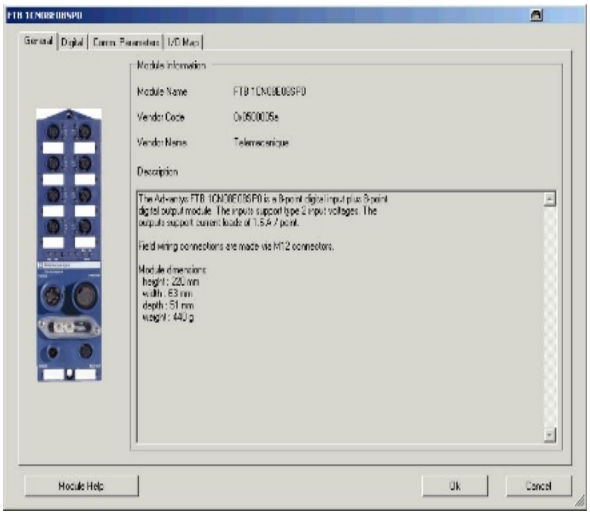
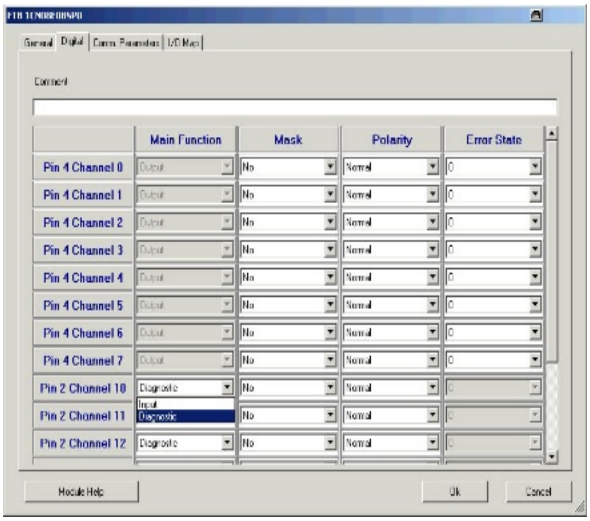
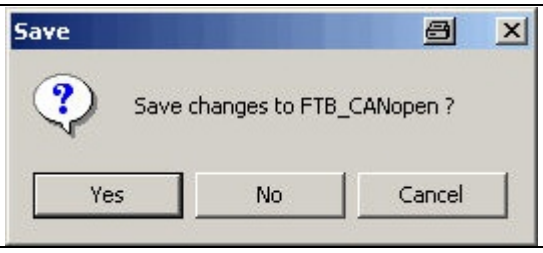
Before carrying out the steps described below, you must ensure the following:

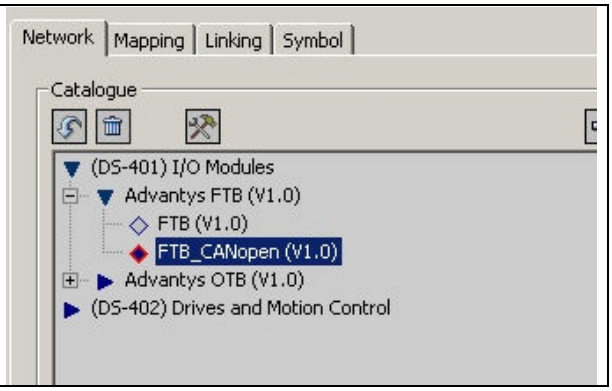
- The TwidoSuite programming tool is installed on your PC
- The FTB.spa file must already be in the TwidoSuite configuration
- The Advantys tool is installed on your PC

Adding an FTB Island to Twidosuite

1	In order to start Advantys from the TwidoSoft program, select **Advantys FTB** after the "*.spa" files have been loaded. Click on the icon with the hammer&spanner to start the Advantys tool for the FTB.	
2	In the **New Island** dialog, assign a name. In our example this is **FTB_CANopen**.	

3	A startup screen is then displayed. The middle field is the configuration area in which the OTB and its extension modules are created. All known OTB modules and extensions appear in the **catalog browser** on the right hand side.	
4	Select the CANopen FTB used in our example **FTB1CN08E08SPO**	
5	The FTB now appears as a graphic image in the central area. Right-click on the image and in the pop-up menu, select **Configure module**	

6	The dialog for the **FTB1CN08E08SPO** module opens and displays a general summary on the first page.	
7	The **Digital** tab allows you to mask unused inputs. To do this, assign a **Yes** to the relevant channel in the **Mask** list. Inputs with a **Yes** will not be acquired. In our example, all inputs must remain at **No**. In addition, you can determine here whether the eight inputs definable with **FTB1CN08E08SPO** should be used as inputs or as diagnostics.	
8	To save the configuration, simply press the button with the floppy disk icon. Now close the window using the system exit.	
9	You are now prompted to save the changes to “FTB_CANopen”. Confirm with **Yes** and the installation progress bar appears.	

10	Following the configuration process, the CANopen Configuration Tool re-appears. The FTB file “FTB_CANopen” that you have created now appears in the Advantys FTB (V1.0) directory.	

Altivar 31

Introduction

The ATV31 Devices chapter describes how to initialize and parameterize the Altivar ATV31 devices in order to fulfill the system functionality described above.

PowerSuite software is used to initialize and parameterize the devices.

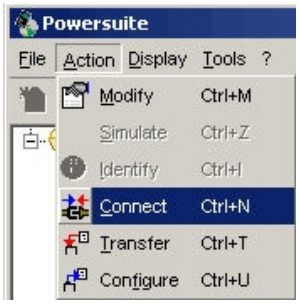
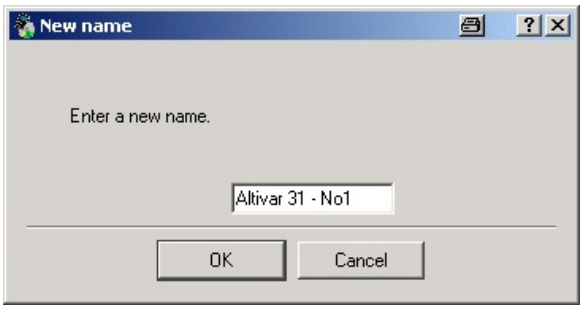
General

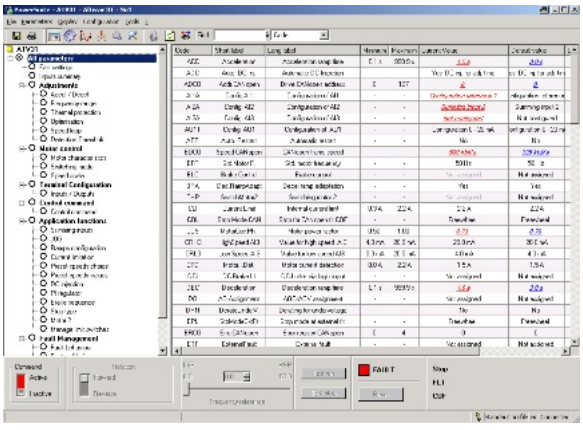
The ATV31 parameters can also be entered or modified via the front panel. The advantages of using PowerSuite are that you

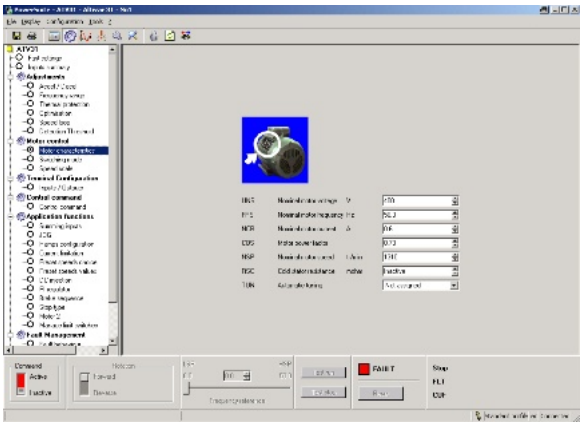
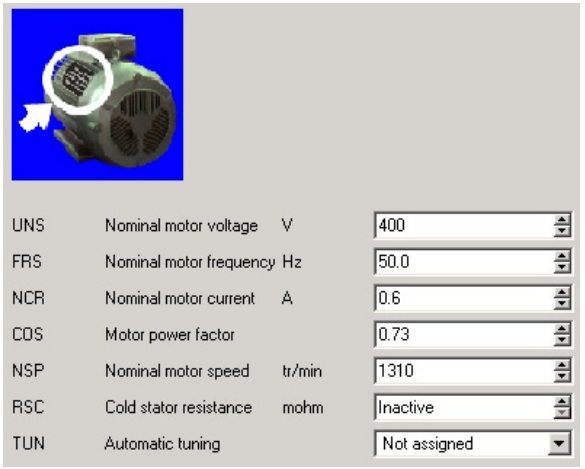
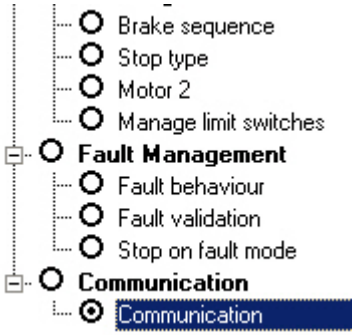
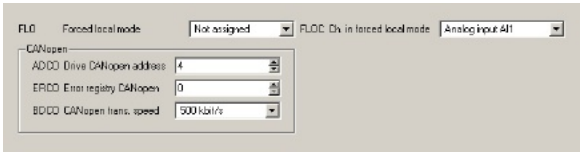
- Can save the data on your PC and copy it as you wish
- Can print out the documentation *and*
- Can be assisted in optimizing the parameters online.

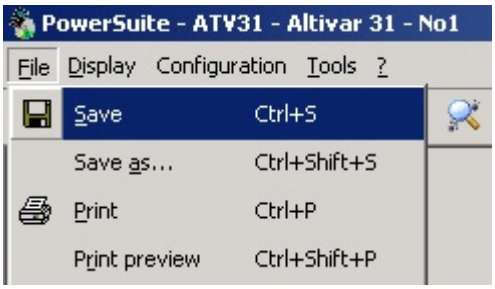
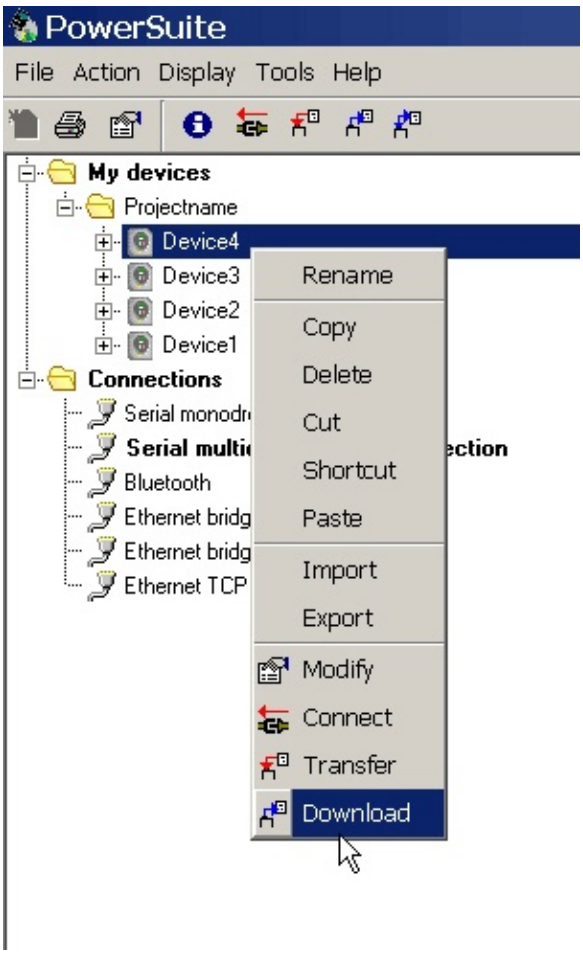
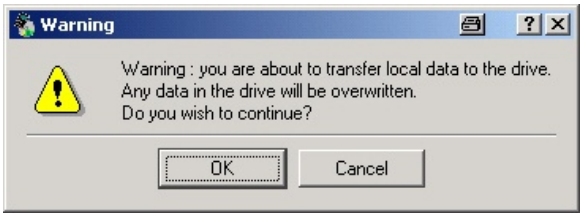
PowerSuite with ATV31

The Parameters can be configured with the Powersuite configuration software.
Here, the configuration was done using Powersuite V2.3

1	After starting Powersuite, select the entry **Example- folder**	
2	Via the menu **Action→Connect** try to connect to the device. Note: make sure the device is connected with thye proper cable.	
3	It will be confirmed that you are trying to connect to a new device. Click on **Create** to continue.	
4	In the **New name** dialog give the configuration for the device a name.	

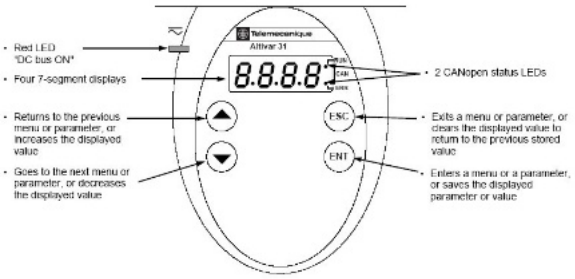
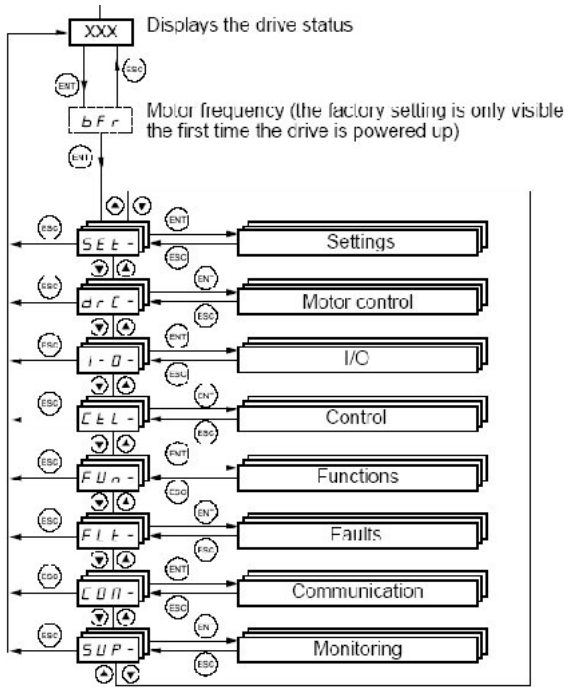
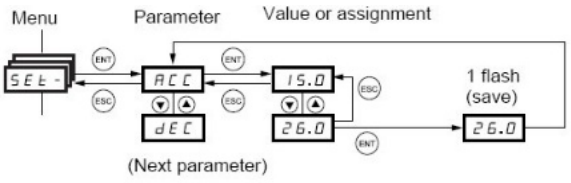
5	You will see a progress bar as the data is read from the altivar 31 device.	
6	When the transfer is complete complete, the device data is displayed.	 **Characteristics** Reference: ATV71H075N4* Nominal power: 0,75 kW Supply Voltage: 380 / 480 V Maximum transient current: 3,5 A Continuous output current: 2,3 A **Structure** Card / Reference / Serial number / Version / Vendor name Device / ATV31H037N4 / XXX5 11 C21 076 / V .2IE03 / TELEMECANIQUE Control Board / / XXXYYMM / V .2IE03 / TELEMECANIQUE HMI Board / VX4A311/312(A) / XXXYYMM / V .1IE02 / TELEMECANIQUE
7	You can view the parameter in list form or ...	

8	... in an input mask which can be viewed via: **Adjustments->** **Motor control ->** **Motor Charakteristics**	
9	Enter the Motor data of the type of motors used.	
10	In the entry **Communication** enter the **CANopenAddress** (for this application **1** to **4)** and select : **Baudrate: 500 kbit/s**.	 

11	**Save** the data..	
12	To transfer the new parameters to an individual device, right mouse click on the entry for the device and select: **download** in the pop-up menu.	
13	Confirm the warning message with **OK** .	

Manual Input using the Altivar Front Panel

You can configure the ATV 31 by inputting the parameters using the front panel display and buttons on each Altivar, as follows:

1	The CANopen-Address and Baudrate can be input using the buttons on the front panel of the Altivar.	
2	Using the buttons on the front panel, select the sub-menu **Communication** auszuwählen.	
3	In the **Communication** sub-menu input the CANopen address in the parameter **AdC0.** In the example application the adresses for the four controlers are 1 to 4.	
4	Also in the **Communication** sub-menu, in the parameter **BdC0,** set the baudrate to **500.0** (kBits).	
5	Alternatively you can use the PowerSuite software to configure the CANopen addresses and baudrates.	
6	**To activate the downloaded bus parameters (address and baudrate) you must now switch off the controller (display goes off). On switching back on, the new parameters are ready.**	

Performance

Scan time and cycle time

A cycle time of 2 ms was not exceeded with the present configuration including the required application code. The memory utilization of the Twido PLC specified and used in this SMD was 7% for system data and 2% for the logic component.

Trials with additional integrated extension modules (a digital I/O module with 16 inputs and 8 relay outputs as well as an analog module with 1 output and 2 inputs, which was used as the I/O level for 2 PID controllers) showed that the cycle time could be increased to a maximum of 6 ms. When using these two additional extension modules, memory usage for system data rose to 22% but, as expected, memory usage of the logic component did not change.

Appendix

Detailed Component List

Hardware components – Group 1: Master switch

Item	Qty	Description	Part no.	Rev./ Vers.
1.1	1	3-pole VARIO master switch, 10A at 400V	VCF02GE	
1.2	opt	Optional: E-OFF master switch 3-pole 25A with 400V Door mounting	VCD0	
1.3	1	Additional module protective conductor 10…32A	VZ14	
1.4	1	Additional module neutral conductor 10…32A	VZ11	

Hardware components – Group 2: Safety

Item	Qty	Description	Part no.	Rev./ Vers.
2.1	2	Emergency-off switch with overload protection	XALK178-G	
2.2	opt	**Optional:** E-OFF switch, tamper free **+** extra auxiliary switch block, door mounting	XB5AS8445+ ZBE102	
2.3	1	Safety light curtain 0.3…9m 35cm high	XUSLTR5A0350	
2.4	1	Receiver extension 10m	XSZTCR10	
2.5	1	Transmitter extension 10m	XSZTCT10	
2.6	1	Safety limit switch 2 N/C	XCSPL751	
2.7	2	OSIswitch position switch with roller tappet, lateral startup direction	XCKD2121P16	
2.8	3	Preventa safety relay 24V	XPSAK311144P	
2.9	8	Load contactor Tesys model D 4KW at 400V	LC1D093BD	
2.10	3	ACK and safety indicator pushbutton activated (blue)	XB5AW-363	
2.11	3	Single-pushbutton housing	XALD01	
2.12	5	Auxiliary switch block “N/O”	ZBE-101	
2.13	3	Lamp holder with LED 24V (white)	ZBV-B1	
2.14	3	Attachment flange	ZB5-AZ009	

Hardware components – Group 3: Display and signaling

Item	Qty	Description	Part no.	Rev./ Vers.
3.1	1	Indicator bank, connection element	XVBC12	
3.2	1	Connection element + cover	XVBC21	
3.3	1	Signal element green LED 24 VDC	XVBC2B3	
3.4	1	Signal element red LED 24 VDC	XVBC2B4	
3.5	1	Signal element yellow LED 24 VDC	XVBC2B8	
3.6	1	Colour Markings set	XVBC22	

Hardware components – Group 4: Control components				
Item	Qty	Description	Part no.	Rev./ Vers.
4.1	1	Twido modular device	TWDLMDA20DRT	V1.0
4.2	1	CanOpen card	TWDNCO1M	V1.03
4.3	1	CanOpen plug second contact	TSX CANKCDF90TP	
4.4	4	CanOpen plug normal	TSX CANKCDF90T	
4.5	1	CANopen cable 50 m	TSXCANCA50	
4.6	2	CANopen junction box	VW3CANTAP2	
4.7	4	CAN bus connection cable 1 m	VW3CANCARR1	
4.8	1	Twido input card 8 digital inputs	TWDDDI8DT	

Hardware components – Group 5: Magelis HMI				
Item	Qty	Description	Part no.	Rev./ Vers.
5.1	1	Magelis panel XBT-GT1100, without Ethernet	XBTGT1100	V1.0
5.2	1	Interface cable to Twido	XBTZ9780	

Hardware components – Group 6: 24 V power supplies				
Item	Qty	Description	Part no.	Rev./ Vers.
6.1	1	Primary fuse C60N, 2P, 3A	24518	
6.2	1	Power supply 240 VAC 1-phase, 24VDC10A	ABL7RE2410	
6.3	14	Secondary fuse C60N 1P 1A B curve (3 per OTB, 1x Twido, 1x Twido expansion)	24045	
6.4	1	Secondary fuse C60N 1P 2A B curve (1x Twido inputs and outputs)	24046	
6.5	2	Secondary fuse C60N 1P 4A (1x power supply for FTBs, 1x power supply for H2-H4 field)	24173	

Hardware components – Group 7: Variable speed drives and load components				
Item	Qty	Description	Part no.	Rev./ Vers.
7.1	4	Motor circuit breaker GV2 4,0A	GV2L08	
7.2	4	Motor circuit breaker auxiliary contact GV2	GV2AE11	
7.3	4	0.37 kW 3-phase AC variable speed drive	ATV31H037N4	1.2
7.4	2	ATV31 attachment plate for mounting on DIN rail	VW3A31852	

Hardware components – Group 8: Advantys OTB FTB				
Item	Qty	Description	Part no.	Rev./ Vers.
8.1	4	OTB distributed I/O	OTB1CODM9LP	
8.2	4	FTB I/O systems in block version IP67 8 inputs/8 outputs/diagnostic	FTB1CN08E08SPO	
8.3	1	Terminating resistor CANopen M12 IP67	FTXCNTL12	
8.4	3	FTB connection cable CANopen with M12 plug IP67 0.6m	FTXCN3206	
8.5	3	FTB connection cable 24V with 7/8 plug IP67 0.6m	FTXDP2206	
8.6	1	FTB connection cable 24V with 7/8 plug and one free end IP67 3m	FTXDP2130	
8.7	1	FTB connection cable CANopen with M12 plug IP67 and one free end 3m	FTXCN3230	
8.8	1	Cover cap 7/8 metal IP67	FTXC78B	
8.9	3	Cover cap M12 plastic IP67 (10 units)	FTXCM12B	

Hardware components – Group 9: Sensors				
Item	Qty	Description	Part no.	Rev./ Vers.
9.1	5	Photo barrier	XUB 1APANM12	
9.2	5	Reflectors 50x50	XUZC50	
9.3	5	Plastic fastener for photo barrier sensor	XUZA218	
9.4	4	Proximity sensor inductive 3-wire	XS608B1PAM12	
9.5	4	Attachment flange 8mm	XSZ B108	
9.6	9	Sensor connection cable 5m Preconfigured with M12 plug	XZCP1264L2	
9.7	9	Plug for connection to FTB	XZCC12FDM40B	

Hardware components – Group 10: TeSysU				
Item	Qty	Description	Part no.	Rev./ Vers.
10.1	2	Tesys U power base	LUB12	
10.2	2	Tesys U reversing contactor combination 12A 24V DC	LU2B12BL	
10.3	2	Auxiliary switch 1”N/C” 1”N/O”	LUA1C11	
		Control unit 1.25....5A 24 V DC	LUCA05BL	
10.5	2	VSD module auxiliary switch 1”N/C” 1”N/O”	LUFN11	

Hardware components – Group 11: Buttons and switches				
Item	Qty	Description	Part no.	Rev./ Vers.
11.1	6	Modular housing Style 5 with Harmony buttons (Run/Stop/Reverse) complete IP66	XALD324	
11.2	1	Modular housing Style 5 empty	XALD04	
11.3	1	Harmony button “I” green (Start)	ZB5AA331	
11.4	1	Harmony button “O” red (Stop)	ZB5AA434	
11.5	1	Harmony button, with light, white (Manual mode)	ZB5AW313	
11.6	6	Auxiliary switch block “N/C”	ZBE102	
11.7	6	Auxiliary switch block “N/O”	ZBE101	
11.8	3	Lamp holder with LED 24V (white)	ZBVB1	
11.9	6	Attachment flange	ZB5AZ009	

Software components – Group 12				
Item	Qty	Description	Part no.	Rev./ Vers.
12.1	1	TwidoSuite programming software	TWD BTU10EF	1.00
12.2	1	Twido programming cable serial	TSXPCX1031	
12.3	opt.	Twido programming cable USB	TSXPCX3030	
12.4	1	Programming software for Magelis XBT-GT	VJDSSDTGSV43M	4.4
12.5	1	Magelis programming cable	XBTZG915	
12.6	1	PowerSuite ATV31 parameterization software	VW3A8104	
12.7	1	Altivar set of connection accessories	VW3A8106	
12.8	1	Advantys configuration tool	Advantys	2.0

Cabinet Components – Group 13 (SAREL)				
Item	Qty	Description	Part no.	Rev./ Vers.
13.1	1	Cabinet, 800x600x300mm (HxWxD, with Mounting plate, Sarel)	ENN83357	
13.2	2	Cabinet, 300x300x250mm (HxWxD, with Mounting plate, Sarel)	ENN83303	
13.3	1	Cabinet, 600x600x300mm (HxWxD, with Mounting plate, Sarel)	ENN83330	
13.4	3	Filter Fan, 230V, 56 m³/h (Sarel)	ENN17901	
13.5	3	Filter for Fan (Sarel)	ENN17911	
13.6	2	Thermostat for filter fan, 0..60°C (Sarel)	ENN17562	

Component Protection Classes

Positioning Protection Class

Component	In Field, on Site			Cabinet		
				Front		inside
	IP54	IP65	IP67	IP55	IP65	IP20
Master switch in housing		X				
Emergency-off switch housing XALK		X				
Preventa modules XPAK311144P						X
Contactors, LC1D093BD, 3-pole AC 3, 1x N/O + 1x N/C						X
Safety light curtain compact model		X				
Safety limit switch			X			
Osiswitch position switch			X			
Indicator bank with all components					X	
Illuminated pushbuttons and lamps, all colors, flat					X	
Motor protection switch, all types and ratings						X
Phaseo power supplies 24 V DC, 20 A						X
Proximity sensors, all types			X			
Photo barriers, all types			X			
Twido PLC components						X
CANopen taps with CAN cable						X
Advantys OTB for CANopen						X
Advantys FTB for CANopen			X			
Altivar 31 variable speed drive, 3-phase power supply 380/500 V AC, all rating classes						X
Magelis XBTGT touch panel, all versions					X	

Component Features

Components

Twido PLC

The PLC used in this example comprises the power base of a Twido modular PLC and a programming set comprising software and a programming cable:

- 24 V DC
- 12 digital inputs
- 8 digital relay outputs
- Can be extended up to a maximum of 7 modules (analog and communication modules are also possible)

Three programming languages:

- Ladder Language (LD)
- Instruction List (IL)
- Sequential Function Chart/Grafcet (SFC)


TWD LMDA 20DRT

Predefined functions:

- Drum controller
- High-speed counter up to 5 kHz
- Very high-speed counter up to 20 kHz
- Frequency meter 1 to 20 kHz
- Register areas for LIFO/FIFO execution
- PWM/PCS output
- External PLC start
- PID controller

CANopen master module TWDNCO1M

Master interface module for Twido PLCs with the following technical specifications:

- Management of max. 16 slaves
- Baud rates supported 125/250/500 kbps
- Slave monitoring with NodeGuarding or Heartbeat
- Configuration tool integrated in TwidoSoft
- Bus parameterization via bus backplane module on PLC
- Integrated macros for rapid startup

Advantages when integrating or replacing module

- Slimline design
- Plug-in contacts
- PLC sends configuration every time the power supply is connected

Components
Contd.

TWDDDI8DT

8 x digital IN module TWDDDI8DT

Interface module for Twido PLCs with the following technical specifications:

- Bus parameterization via bus backplane module on PLC
- Integrated macros for rapid startup
- 8-channel input
- Removable screw terminal block

Advantages when integrating or replacing module

- Slimline design
- Plug-in contacts
- PLC sends configuration every time the power supply is connected

Preventa safety relays XPSAK331144P

- Safety block for monitoring emergency-off circuits, position switches, BWS systems, safety shut-off mats and connecting blocks
- Category 4 to EN 954-1
- 24V DC/240V AC
- 3+1 safety-oriented switching contacts
- 4 semiconductor output for PLC
- Emergency-off monitoring in accordance with EN418 and EN60204-1

Light curtain compact model XUSLTR5A0350

- With static outputs
- Detection capacity 30mm
- Switching distance 0.3…9m (20m also available)
- Response time 20ms
- Approvals: CE, TÜV, UL, CSA

Components Contd.

Safety limit switch type TCSPL751

- Convertible operating head
- Devices with 1 or 2 wiring configurations
- Tap hole PG11
- IP 67 in accordance with IEC 60529
- Operation: -25…+70°C Storage: -40…+70°C
- Approvals: UL, CSA, BG

Phaseo power supply unit: ABL7RE2410

- 100..240V AC/24V DC
- 10A secondary
- Slimline design
- Parallel connection possible
- Short-circuit-proof and protected against overload
- Approvals: UL, CSA, TÜV, Ctick (ABL7UPS: cULus, cRLus)

OTB distributed I/O OTB1CODM9LP

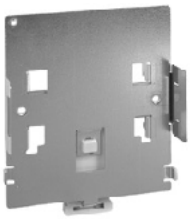
- Up to 7 expansion modules can be connected
- Very compact
- 12 digital inputs integrated
- 8 digital outputs integrated

Performance Contd.

Advantys FTB I/O module

- Suitable for use in harsh environments
- Also available with metal housing for extreme environments
- Communication possible via CANopen, DeviceNet, Profibus-DP or Interbus
- Combined input/output module
- Diagnostic state information via LEDs and via the bus for each channel and for the module so that faults can be pinpointed
- Possible to connect Desina sensors with integrated diagnostic function
- Outputs protected against short-circuits and overvoltages
- Temperature range: 0..+ 55°C
- Approvals: UL Listed

Altivar VSD: ATV31H037N4



- 0.37 kW, 380..500V AC three-phase
- Integrated class B EMC filter
- Temperature range: - 10..+ 50°C
- Speed range from 1 to 20 (0 to 200 Hz)
- Speed control with flow vector check
- Operation via Modbus or CANopen possible
- 2 analog inputs plus 1 analog output
- 6 digital inputs
- 2 or 3 digital status outputs possible
- Protection of drive and motor
- Compact design, side-by-side installation also possible on a DIN rail using bracket VW3A11852
- Approvals: UL, CSA, NOM 117, C-Tick

Performance Contd.

TeSys U-line module contactor

- Protection and switching of single or three-phase motors
- Protection against overcurrents, short-circuits and thermal overload
- Modules can be mounted safely and easily by snapping them onto the power base
- Power base for one or two directions of rotation
- Various control units, e.g., for application monitoring (running time, number of errors, motor-current values), log (error memory), alarms
- Communication modules for parallel wiring, AS-i and Modbus; FIPIO, Profibus-DP, DeviceNet also possible, for example, if gateway modules are used
- Use of additional auxiliary switches supported
- Temperature range: -25..+ 70°C (multifunctional control unit up to +55°C)
- Approvals: UL, CSA

Motor contactor LC1D093BD TeSys Model D contactors

- Up to 75 kW at 400 V, AC-3
- Integrated quick-acting auxiliary switch, 1 N/C contact, 1 N/O contact
- Various operating voltages, even with low power consumption
- Additional auxiliary-switch blocks can be mounted
- Approvals: UL, CSA

Motor Protection Switch GV2-L08

- Magnetic Activation as protection against short circuits
- Rotation switch can be door mounted
- Lockable
- Temperature range: - 25..+ 70°C
- Certificates UL, CSA, TSE, BV, GL, LROS, DNV

XAL-K pushbutton housing: EMERGENCY-OFF pushbutton

- Housing for 1-5 front elements, each able to accommodate a maximum of 3 auxiliary-switch blocks
- Can be mounted on front element or in housing base
- Front elements can be labeled however you want
- Approvals: UL Listed, CSA

Performance Contd.

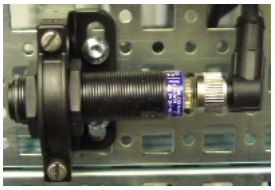
Emergency Off master switch in housing VFC02GE

- 3-pole switch disconnector, from 10A to 140A, with rotary drive, in accordance with IEC 947-4-1 and IEC 204
- Lockable handle (supplied without padlocks)
- Housing IP65 protection, lead-sealable and lockable
- Locking of housing cover in switch position “I” (ON) up to 63A

Position switch OSIswitch XCKD2121P16

- Operation: -25…+70°C, Storage: -40…+70°C
- IP 66 and IP67 in accordance with IEC 60529
- Individual components with variable configuration
- In metal or plastic capsule
- Approvals: UL, CSA

Photo barrier Osiris XUB1APANM12



- 3-wire technology
- Transistor output
- 0.6-5.5m reflective photo barrier
- Up to 20m unidirectional photo barrier
- IP67
- Operation: -25…+70°C Storage: -40…+70°C
- Certificates: UL, CSA, CE

Signal Beacon Harmony XVB

- Optical and accoustic signal, blink and flashing
- Temperature Range: -25…+50°C
  Storage: -40…+70°C
- element colours: green,red,orange,yellow,white
- Combination of max. 5 elements
- Simple wiring via flexible terminals in connection element
- Certificates: CSA, UL

Performance
Contd.

Magelis XBT-G2220 display terminal

- Touch panels (STN/TFT technology) with 24 V DC supply
- Brightness and contrast adjustment
- Supports communication via Uni-Telway, Modbus and (to some extent) Ethernet TCP/IP
- Flat design
- Memory expansion for application
- Temperature range: 0..+ 50°C
- Approvals: UL, CSA

CANopen junction box VW3CANTAP2

- 2 CANopen slaves can be connected via RJ45 (Altivar/Lexium)
- Third port enabling connection of a PC

Proximity sensor Osiprox XS608B1PAM12

- induction sensor
- Flush fitting
- Connector M12
- 3-wire technology
- Switching distance 0…2mm (up to 12 possible)
- IP67
- Operation: -25…+70°C Storage: -40…+85°C
- Certificates: UL, CSA, CE

Components

Optional

E-OFF Button

- for maximal 3 auxiliary switch blocks
- tamper free
- rotational locking
- Certificates UL Listed, CSA

Optional

E-OFF master switch for door mounting VCD0

- Power off switch 3pole, 10A to 140A, rotational, conforming to IEC 947-4-1 und IEC 204
- Lockable (padlock not included)

Contact

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