CANopen Getting Started



CANopen network on Premium and Micro PLCs





Index

Getting started	3
Presentation	3
Introduction	3
Presentation of the configuration example	3
Required Equipment	4
Main Steps of Configuration	4
Basics of CANopen	5
CANopen specific terms	5
EDS files	5
CO files	5
PDO	5
SDO	5
Transmission Types	5
COB-ID	5
Hardware Configuration	6
Steps of Hardware configuration	6
Assemble the STB devices	6
Assemble the Premium	9
Prepare and install the CANopen cable	.10
Software Configuration	.11
Steps of Software configuration	.11
Create the Advantys STB configuration	.11
Create the CANopen configuration	.14
Create the PL7 Application	.19
Debugging	.21
Appendix	.23
Configuration of Altivar 58	.23
Configuration of Lexium	.25
More than 4 PDOs required for a node	.31

Getting started

Presentation

Introduction

This is a Getting started guide for setting up a CANopen network on a Premium or Micro PLC.

It is intended to support customers being not familiar with CANopen on their first steps to set up CANopen devices on a Premium or Micro PLC.

It will explain how to set up the hardware and which software tools must be used for which purpose during the process of software configuration. Default settings are kept wherever it is possible to facilitate the way through the configuration process and to prevent the user from loosing his orientation inside this guide.

Presentation of the configuration example

We set up the following CANopen network with two Advantys STB on a Premium PLC.

Note: Premium is chosen for this example, but all that is described in this guide also apply to Micro.



Node #2 consists of a STBNCO2212 CANopen interface module, a STBPDT310 power supply module, a STBDDI3410 4 bit input module, and a STBDDO3410 4 bit output module.

Node #3 is like Node #2, but has additionally 2 analog modules, the STBAVI1270 two channels analog input module and the STBAVO1250 two channels analog output module.

For both nodes, the outputs are wired to the inputs then:

- the digital input one goes on when output one is set, etc ...
- the analog inputs read back the value set from the analog outputs

Presentation

Required Equipment	 Hardware: CANopen master : TSX CPP 110 (PCMCIA card type III, DS 301 V4.01 standard) On Premium P572xxx to 574xxx: CPU ≥ V5.0 On Premium P571xxx: CPU ≥ V5.6 On Micro : CPU (TSX 372x) ≥ V6.0 2 CANopen STB Network Interface Modules : STB NCO 2212 2 STB power supply modules STB PDT 3100 STB I/O modules as listed in the description of the configuration example 3 CANopen connectors and cable Programming cable for PLC Software : Advantys : to configure the STB island SyCon V2.8 : to configure the PLC
Main Steps of Configuration	The following list performs an overview for the steps required. A detailed description will follow in the chapters "Hardware Configuration" and "Software Configuration".
Hardware Configuration	 Set up the hardware Prepare the CANopen cable
Software Configuration	 Create the Advantys EDS files and Software Configuration (Advantys tool) Create the CANopen configuration (SyCon tool) Create the PLC application (PL7 pro tool) Commissioning and Debugging

Basics of CANopen

CANopen specific terms	The following terms and abbreviations are helpful for understanding the communication principals in a CANopen network.
EDS files	EDS = Electronic Data Sheet. An EDS file is describing the communication properties of a device (baudrates, transmission types, I/O offer,). It is used in the configuration tool to configure a node (like a driver in a Windows operating system).
CO files	*.CO files are configuration files generated by the SyCon tool. They are imported into PL7 and contain all necessary information the TSXCPP110 needs to configure the CANopen nodes and to exchange I/O data.
PDO	 PDO = Process Data Object. CANopen frame containing I/O data. We distinguish between: Transmit-PDOs (TxPDOs with data provided by a node) and Receive PDOs (RxPDOs with data to be consumed by a node).
	The transmission direction is always seen from a node's point of view. A PDO does not necessarily contain the whole data image of a node (for both TxPDO and RxPDO). Normally, analog input data and discrete input data are divided onto different TxPDOs. The same is true for outputs.
SDO	SDO = Service Data Object. CANopen frames containing parameters. As the data of PDOs is automatically handled by the CANopen nodes (according to the configuration in SyCon) SDOs must be launched by function blocks through the application. As we can set up our example configuration without using SDOs, for further explanation refer to the TSX CPP100/CPP110 user manual (reference TSX DM CPP100/110 CAN open, available on PL7 documentation CD).
	SDOs are typically used to read parameters from / write parameters to drives while the application is running.
Transmission Types	CAN open frames can be either sent cyclically, on change of state, or on remote request. For each PDO you can define a transmission type (in SyCon). This reduces the network load. (In this guide we use the default settings and do not go deeper into this subject. For more information refer to the TSX CPP100/CPP110 user manual).
COB-ID	COB-ID = Communication Object Identifier. Each CANopen frame starts with a COB-ID and plays herewith the role of the Identifier in a CAN frame. During the configuration phase each node is receiving the COB-ID(s) for the frame(s) he is providing and for the frames he has to consume.
	In a CANopen PDO you won't find the node ID of a provider or consumer as it is common for other networks. This role is taken over by the COB ID and this enables to spread the I/O image of a node over more than one PDO.
	Each of this PDO can be sent with a different transmission type and different priority. This also enables to have more than one consumer for a PDO (they only have to be sensitive to the same COB-ID).
	For more details about COB-IDs assignment, refer to Appendix at the end of this document.

Steps of Hardware configuration	 Assemble the modules incl. wiring network address,) Assemble the Premium PLC incl. Prepare and install the CANopen 	g and hardware settings (baud rate, TSX CPP 110 (for this example) cable
Assemble the STB devices	Connect the STB hot swap bases and listed below. Changing the sequence the I/O addresses in the state RAM of	d mount the modules in the sequence of the I/O modules has an impact of the PLC.
Step 1 Assemble the modules	 Node #2: Network interface <i>STBNCO2212</i> Power supply <i>STBPDT3100</i> Digital input module <i>STBDDI3420</i> Digital output module <i>STBDDO3410</i> Termination plate <i>STBXMP1100</i> 	 Node #3: Network interface <i>STBNCO2212</i> Power supply <i>STBPDT3100</i> Digital input module <i>STBDD13420</i> Digital output module <i>STBDDO3410</i> Analog input module <i>STBAVI1270</i> Analog output module <i>STBAVO1250</i> Termination plate <i>STBXMP1100</i>

Step 2

Field wire the devices

Wire the Advantys STB. The following illustration is showing the wiring of Node #3. The wiring of Node #2 is similar (only the last two modules are missing)



Note that we recommend to have a separate power supply for the outputs. For testing purpose, however, you can have one common power supply for inputs, outputs and logic supply (as shown in the figure above).

Step 3

Step 4

Step 5

configuration

Load the Advantys STB

Set up the CANopen baud rate to 250 Kbit



Both baud rate and node address are set with the two rotary switches in the middle of the NCO module.

To set the baud rate, proceed as follows :

- 1. Check that the power is off
- 2. Set the upper rotary switch (TENS) to position 4
- 3. Set the bottom rotary switch (*ONES*) to "Baud Rate" (= any position after 9)
- 4. Power on

Note that the baud rate will be taken into account after power on and only when the bottom rotary switch is on position "Baud Rate". The baud rate is selected with the upper rotary switch (0 = 10 Kbit, 1 = 20 Kbit, 2 = 50 Kbit, 3 = 125 Kbit, 4 = 250 Kbit, 5 = 500 Kbit, 6 = 800 Kbit, 7 = 1 Mbit).

Set up the CANopen node address
1. Check that the power is off
2. Select 0 on the upper switch (*TENS*)
3. Select 2 on the lower switch (*ONES*) for the module with the CANopen address 2 and 3 for the module with the CANopen address 3
4. Power on
Note: The 2 switches represent the address value. For a CANopen address of 16: select 1 on upper switch (TENS) and 6 on lower switch (ONES).
Note that the node address will be taken into account only after power on. When changing the address without a power cycle, the module will keep the old address until the next power cycle takes place.

The node address is set with the same two rotary switches:

Use the Auto-Configuration feature (no SIM card) of the NCO module as follows:

- 1. Check that the power is on and remove the SIM card if inserted
- 2. Press the reset button which is located under the door in the bottom of the NCO module for about 5 seconds

Now the Advantys STB is booting. The hardware configuration is read from the backplane and stored into a flash memory.

Note that an Advantys STB is always trying to load the configuration from the SIM card. When no SIM card is inserted, the configuration is taken from the flash. When the current configuration is different from the one in the flash, push the reset button to update the flash. Always push the reset button after a configuration change or when the flash configuration is unknown.

7/32

Step 6 Last check	Now the Advantys STB is properly set up and the devices are ready to communicate with the CPP110 CANopen master.
	 The LEDs must show the following status: NCO module: "RUN" and "PWR" are set to on, "CANRUN" is blinking PDT module: "IN" and "OUT" are set to on I/O modules: "RDY" is set to on, on every I/O module
Possible ErrorsConfiguration mismatch	When the configuration in the flash is different from the actual configuration, the LED status is as follows:
	 NCO module: "RUN" and "PWR" are set to on, "CANRUN" is blinking green, "ERR" and "CANERR" are blinking red PDT module: "IN" and "OUT" are set to on I/O modules: "RDY" is blinking on every module which does not match with the configuration from flash, "RDY" is on for every other I/O module
Module Error	Some modules can display an error condition (e.g. DDO3230, when output voltage supply is missing). In this case, "RDY" is on and "ERR" is blinking on the module, while the NCO module is healthy ("RUN" and "PWR" are set to on, "CANRUN" is blinking).

Assemble the Premium

Assemble the PLC as shown in the figure below.

- Ensure that the power supply module is powered off
- Mount all Premium modules in the backplane
- Insert the TSX CPP 110 card into the PCMCIA slot of the processor (1)
- Fix the TAP on a DIN rail (2)
- Wire the power supply module

It is mandatory for the PCMCIA card to be installed in the slot located in the processor module. As a result, only one CANopen bus is available for each PLC CPU.

Note that when the PCMCIA card is inserted the PLC must be powered off.



Now the Premium is properly set up and can be powered on and software configured.

Prepare and install the CANopen cable

For CANopen, special connectors and cable are available from the market (refer to CANopen cabling document).

For the present configuration, you need to prepare a cable with 3 female SUB D 9 connectors:

Example of CANopen cable is available by **Selectron** under the product ref: • DCA 701 (article number 44170014)

For any additional information, consult http://www.selectron.ch/

Example of cable from Lapp: http://www.lappcable.com/products/

 UNITRONIC BUS CAN 2170261: 120 Ohms shielded double twisted pair cable

Example of connectors from ERNI: http://www.erni.com/

- 1 x ref 103668 for daisy chain (plugged on Node 2)
- 2 x ref 103643 for the end of the bus (includes the line termination; plugged on the TSXCPP110 tap and on Node 3)

CANopen connectors normally have screw type terminals and must be assembled manually, according to the following pin out:

Pin N°	Signal	Description
2	CAN_L	CAN_L bus Line
3	CAN_GND	CAN ground
7	CAN_H	CAN_H bus Line

Shield (to the connector)

Pin 2, 3, and 7 must be connected.

Steps of Software configuration	 The software configuration consists of three major steps: Create the Advantys STB configuration and generate an EDS file for each node (Advantys software) Create the CANopen configuration (SyCon software) Create the PLC application (PL7 software) and transfer the project to the PLC.
	Hereafter, the whole system is running and you can write outputs to / read inputs from the CANopen devices.
Create the Advantys STB configuration	 The main purpose of the Advantys tool is: To modify the default parameters of the I/O modules (i.e. switching off behavior of outputs,) To load the Advantys configuration into the SIM card (if any) To generate the EDS files
	As we work in our example with the modules' default settings and we already have loaded a configuration from flash (refer to section Hardware configuration), we only use this tool to generate an EDS file for each of our nodes. These EDS files are providing all information on the nodes needed by SyCon to configure the bus.
	Note that the Advantys tool is not mandatory. You can also use the generic EDS file, which is available in SyCon. This, however, requires deeper CANopen knowledge and advanced usage of the SyCon software. EDS files created from the Advantys software are dedicated to the individual configuration of each node and reduce the configuration work to a minimum. Note: In case you want to load the configuration through the Advantys tool,
	use the menu Online/Connect then Online/Download into the island (in this case, specific cable is required).
Steps to create the Advantys configuration Advantys tool - Step 1 Create a new workspace	Start the Advantys tool, create a new workspace and enter name and path.
•	A New Workspace
	Workspace File
	Name: Name:
	Quick Start
	Location: Name with path:
	D:\Advantys_Projects
	Name with path:
	In our example, we have chosen the path D:\Advantys_Projects\Quick Start.

In our example, we have chosen the path D:\Advantys_Projects\Quick Start. The name of the project file is Quick Start.aiw and the name of the Advantys STB is Node_2 (referring to its CANopen node address). All the Advantys STB on the same bus must be declared in the same workspace. Default workspace path is C:\program Files\Schneider Electric\Advantys\Project\ Advantys tool - Step 2 Configure the STB nodes After that, a workspace with a DIN rail for Node #2 is opened. Now configure Node #2 according to its hardware configuration by drag and drop the modules from the hardware catalog on the right side of the screen. Do not forget the Termination plate (Ref STB XMP 1100). Then, create a new node ("Add new Island" from the "File menu"), name it Node_3 and configure it according to the hardware configuration of Node #3.

The following figure is showing the Node #3 properly configured.

Note: You can also read out the configuration when you are in online mode. In this case, the power supply module and the termination plate are missing as they cannot be detected on the island's backplane. You must add them manually.

Advantys tool - Step 3 Display the Fieldbus I/O image Open the fieldbus I/O image from the menu I/O image overview. Select Node #3, click on the TAB "Fieldbus image" and select PDO alignment as shown in the screen below.

Do the same for Node #2. Make a print screen from both screens as it helps to understand the IO mapping.

In the PLC memory, Node #3 assigns 3 words of output data and 5 words of input data. The table is read as follows: You can find the input of slot 1 (DDI module) in the input word 1 (low byte), the I/O of slot 2 (DDO module) in input word 1 and output word 1,

General mapping rules are:

- First a block with discrete I/O, then the block with analog I/O
- Within the blocks, the I/O points are sorted by the physical sequence of the I/O modules.
- Discrete I/O points are mapped into the discrete block, sorted by number. First the I/O points, after, the echo (outputs only) and then the status. Analog channels are sorted by number. The input/output values are mapped into the analog input/output block, the status bytes are mapped into the discrete input block.

		Input Da	ta	
Word	1512	118	74	30
1	Status bits- slot 2	Echo bits- slot 2	Status bits- slot 1	Input bits- slot 1
2	Status by	tes- slot 3	Status by	tes- slot 3
3	Status by	tes- slot 4	Status by	tes- slot 4
4		Input chan	inel - slot 3	
5		Input chan	inel - slot 3	
		Output Da	ata	
Word	1512	118	74	30
1				Output bits- slot 2
2		Output cha	Innel- slot 4	
3		Output cha	innel- slot 4	

Detailed mapping interpretation of Node #3

Advantys tool - Step 4 Create the EDS files	Select node 2 and create the EDS file by "File" ->"Export". Select "Node_2" as name for the EDS file.
	Do the same for node 3.
	In our example the files will be exported on the following directory : D:\Advantys_Projects\Quick Start*.eds.
	Now the Advantys STB configuration is complete. You have generated the EDS files as output and you are now ready to start the CANopen configuration with SyCon.
Create the CANopen configuration	With the CANopen configuration, we generate an electronical description of the CANopen fieldbus. This description contains all information that PL7 needs to configure the CPP110 CANopen master.
	Perform the following steps:
SyCon tool - Step 1 Create a new SyCon project	Start the SyCon tool (it can be opened from the PL7 configuration screen, see: PL7 tool – Step 1) and open a new CANopen project. Save the empty project as\Demo_cfg.co. The default path is\SyCon\Project\.
	You will have to know the path and the filename as PL7 needs it during the PLC configuration.
SyCon tool - Step 2 Import the EDS files	From Menu "File" then "Copy EDS", Copy the EDS files node_2.eds and node_3.eds you have generated with the Advantys tool. Refuse the import of the bitmap file (those files don't exist). Files to be imported are localized in this example into the following directory (refer to Advantys tool - Step 4) : D:\Advantys_Projects\Quick Start*.eds.
SyCon tool - Step 3	Insert the CANopen master TSX CPP 110 (Insert -> Master).
	Keep the node address #1. SyCon is offering as a default value.

SyCon tool - Step 4 Insert the nodes "Node_2" and "Node_3" Insert Node #2 (Insert -> Node ... and choose Node_2 from the list of available devices). Keep the node address #2 SyCon is offering as default value then click on "Add>>" button and valid the screen by OK.

Do the same for Node #3.

iserenoue			4
Node filter			OK Cancel
Profile All		•	
Available devices		Selected devices	
IcIA D065 IcIA-IFS CANope LEXIUM17D Node 3 node_2 PKV30-COS PMC-COS Profile 401 stand TwinLine CANoc	n ard-EDS en	Add >> node_2 Node_3 Add All >> << Remove <<< Remove All	
Vendor name	Telemecanique	Node ID 3	
Product number	0x33001546	Description Node3	
Product version	No entry		
Product revision	No entry		
EDS file name	NODE 3.EDS		
EDS Bevision	0		

Configuration screen in SyCon

Now SyCon is showing the following CANopen configuration screen. SyCon has taken the names Node_2 and Node_3 from the names of the EDS files.

SyCon - [M:\Projekte\COPAM\Quick Start\Demo_ct Eile Edit View Insert Online Settings Window H 1 2 9 9	nf.co] elp
GMM-200-	Master Node ID 1 Master TSX CPP 110
	Island_2 Node ID 2 Node Node_2
	Island_3 Node ID 3 Node Node_3

SyCon tool - Step 5 Set the Baud rate to 250 kBit Simple click on the TSX CPP 110 and then select "Settings" -> "Bus Parameter" in the menu. Adapt the Baud rate to 250 kBit/s (value previously set on the Advantys STB hardware.).

laster Node ID	1		0K
audrate	250 1	<bit∕s th="" ▼<=""><th>Cancel</th></bit∕s>	Cancel
Master stops in case	of Node Guard	d or Heartbeat	Error
Oisabled		\bigcirc Enabled	
Synchronisation Obj	ect (SYNC)		
COB-ID		12	8
Communication Cyd	le Period	10	0 msec
Heartheat Euroction			
Enable			
Master Producer He	artbeat Time	20	0 msec
🔽 Enable Global S	art Node		
29 Bit Selection entri	es		
🔲 Enable 29 Bit Se	lector		
	28		0 Bit
Acceptance Code	00 00	00 00	Hex
			11-11

SyCon tool - Step 6 Configure the PDOs for Node #2 Double click on Node_2. The Node configuration screen opens and is showing two PDOs in the "Predefined Process Data" grid. The first PDO is a Receive-PDO (RxPDO) to configure the output data for Node #2, the second is a Transmit-PDO (TxPDO) to configure the input data from Node #2. (The transmission direction is always seen from the node's point of view.)

Double click on the first PDO and validate the transmission type window. (We use the predefined settings from this screen.) Now you have configured the first PDO SyCon has got all necessary information from the EDS file you have created with the Advantys tool. Do the same for the second PDO and you have finished the PDO mapping for Node #2. Now the screen is looking as follows:

Node	Node_2				,	Node ID (address)			2	DK
Description	Island 2				-	Coefic	uration Fi			Cancel
	ame NODE_2.EDS					Control Protocol				Node BootU
Hemanne NUDE_22D5 ▼ Activate node in actual configuration ▼ Automatic COB+D allocation in accordance with Profile 301 Device Profile 401 Device type Digital Output, Digital Inpu					ŧ	Emergency COB-ID 13			30	0PC Object
					t tuontie	Nodeguerd COB-ID 1794				Dbject Configuration
1400 FixP 1800 TiiP	1001 Communication 1001 Communication	n Palameter n Peremeter						P	0 mapping	g məthad
1400 FivP	001 Communication 001 Communication	n Palameter n Peremeter					•	-R	00 mapping 15301 V4 Add to conf	gməthad j igwed PDOs
1400 RvP 1800 TvP Configured PD	D01 Communication D01 Communication D0	n Parameter n Peremeter	ura li Ada	11	D L	0.546	-		00 mapping IS301 V4 Add to cont	a mathed
1400 RxF 1800 T+P Configured PD PDD name 8xPD01	001 Communication 001 Communication 001 00 00 00 900 1400	CDBHD (17)	ype Addit	I Len.	O Type DR	0 Addr			00 mapping 15301 V4 Add to conf PD0 Co	g method
1400 RvF 1800 TvP Configured PD PDD name RxPD01 TvPD01	001 Communication 001 Communication 00 00 Symbolic Name PD0_1400 PD0_1800	CDB-ID IT 514 386 IB	ype lâddir. 0	I Len. 2	D Type 08	0 Add 0	0Len		00 mapping IS301 V4 Add to conf PD0 Co PD0 C	g mothed igwared PDOs nitents Mapping, Pherecleristics
1400 RvF 1800 TvP Configured PD PDD name RxFD01 TvPD01	001 Communication 001 Communication 00 Symbolic Name PD0_1400 PD0_1600	CD84D IT 514 386 IB	ype TAddit. D	l Len. 2	D Type 08	0 Add 0			Add to conf PDO Co PDO Co Define no	gmethod igwed PDOs ntents Mapping Aarectenstics w Receive PDO
1400 RxP 1800 TxP Configured PD PDD name RxPD01 TxPD01	001 Communication 001 Communication 00 Symbolic Name PD0_1400 PD0_1800	CDB-ID I T 514 386 IB	ype IAddir. O	l Len. 2	D Type 08	0 Addr 0	0Len.		Add to conf PDO Co PDO Co PDO Co PDD C Define no	g mothed igweed PDOs ntents Mapping Perectentstoon IN Transmit PDO
1400 RxF 1800 TxP Configured PD PDD name RxFD01 TxPD01	001 Communication 001 Communication 00 Symbolic Name PD0_1400 PD0_1600	CDB+D T 514 386 B	ype (IAdda D	I Len. 2	O Type OB	0 Addr 0		R	00 mapping (5301 V4 Add to conf PD0 Co PD0 C Define no Define no Define no	gmethod igwed PDOs ntents Mapping Therectenistics IN Receive PDO IN Transmit PDO configured PDO

Click on "OK" to valid and close the node configuration window.

SyCon tool - Step 7

Configure the PDOs for Node #3

Do the same with Node #3. For Node #3, SyCon is offering four predefined PDOs, two Receive PDOs and two Transmit PDOs.

- RxPDO1 is defining the PLC digital output data
- RxPDO2 is defining the PLC analog output data
- TxPDO1 is defining the PLC digital input data
- TxPDO2 is defining the PLC analog input data

Configure all 4 PDOs in the same way as you did it with Node #2.

Warning: You have to map all offered PDOs and perform no changes on these PDOs, otherwise your I/O mapping in PL7 doesn't correspond to the address table from Advantys tool.

SyCon tool - Step 8 Enable analog input transmission for Node #3 By default, the transmission of analog input values is disabled on the modules. Perform the following steps to enable analog input transmission:

- 1. Open the *Node configuration* window for Node #3
- 2. Press on the **Object Configuration** button
- 3. Double click on the object 6423 : Analog Input Global Enable in the list of Predefined supported Objects
- 4. Enter 1 in the Chosen Value to validate the analog input

ode	Node	1		Node1D (address)	3	-	QK
excription	lolary	4.3		Configuration Eng	11	1	ancel
le name Activate Autonal	NODE rock in ac its COBID	E_3 ED tyal co alocat	S riguration on accordance with Profile 301	Emergency CDB-D Nodeguard CDB-D	131 1735		e BootUp 170 - 41 Igent Agustation
Annan Erro	Object Co	nfigu	ation	sar, Digital Dalpaz, Digit	ai Input	-	
edefines bj.lds 400	Node Descrip	xion	Node_3 Island_3	Node	10 I		QK. Qenor
401	Predeby	red s.c	ported Objects in the EDS file				Access Filter
000	The deriv	1000			- 12		
800	Objida	Sub.	ds. Parameter	Default Value	Appears	-	al
800	Objida	Sub.	dik, Perameter Analog Input Block No. 1	Delauli Value (no default value)	Access read only	-	al
800	Objida	5ub 1 2	de, Perameter Analog Input Block No. 1 Analog Input Block No. 2	Deteol/Velue (no default value) (no default value)	Access read only read only	-	al
800	<u>Objida</u> 6411	1 2	ds. Peremeter Analog Input Block No. 1 Analog Input Block No. 2 analog 16 bit cutput blocks	Default Velae (no default value) (no default value)	Access read only read only	-	alDgoar
800 901 onligures	<u>Objida</u> 6411	1 2 0	Conneter Analog Input Block No. 1 Analog Input Block No. 2 analog 16 bit output block: number of out blocks fundes of out blocks	Delault Value (no default value) (no default value) 2	Access read only read only read only		alDgoin
900 901 onligures 00 nem	<u>Objida</u> 6411	5 ab 1 2 0 1 2	Parameter Analog Input Block No. 1 Analog Input Block No. 2 analog 16 bit curput blocks number of out blocks inumber of out blocks Analog Output Block No. 1 Analog Output Block No. 2	Detexil Velae (no defauit value) (no defauit value) 2 (no defauit value) (no defauit value)	Access read only read only read only neite only write only		di
800 801 201gures 00 nem 200 nem	<u>Objida</u> 6411	5 ub. 1 2 0 1 2	Parameter Analog Input Block No. 1 Analog Input Block No. 2 analog 16 bit curput block: number of out blocks Analog Output Block No. 1 Analog Output Block No. 2	Default Value (no default value) (no default value) 2 (no default value) (no default value)	Access read only read only read only reite anly reite anly		alDgoin
eoo enfigures 00 nem uPD01 uPD01 uPD01	Objida 6411	5ub 1 2 0 1 2 red 0b	Analog Input Block No. 1 Analog Input Block No. 1 Analog Input Block No. 2 analog 16 bit output blocks number of out blocks Analog Output Block No. 1 Analog Output Block No. 2 ects automatically writern while Node startup	Default Veise (no default value) (no default value) 2 (no default value) (no default value) sequence	Access read only read only read only reite only reite only		alDgoin
entigurez ontigurez 00 nem IvP001 sP001 sP001 sP001	Configu Objida	5ub 1 2 0 1 2 red 0b 5ub	de Parameter évalog Input Block No. 1 évalog Input Block No. 2 analog Input Block No. 2 analog T6 bit output Blocks avalog Output Block No. 1 évalog Output Block No. 2 ente automatically written while Node startup de Parameter	Detexit Value (no defauit value) (no defauit value) 2 (no defauit value) (no defauit value) sequence (chorcem Value)	Access read only read only read only write only write only PDD Dialo		elDgoin
800 801 00 nem PD01 sPD01 sPD02 sPD01 sPD02	Configu Dbilds Configu Dbilds 1400	5ub 1 2 0 1 2 red Db 5ub 6	Parameter Analog Input Block No. 1 Analog Input Block No. 2 analog 16 bio cuput Block No. 2 analog 16 bio cuput Block No. 1 Analog Output Block No. 1 Analog Output Block No. 2 acts submatically writen schile Node startup dx Parameter Dignal Input Block No. 6	Debault Value (no default value) (no default value) 2 (no default value) (no default value) sequence Chorcen Value 6000050	Access yead only lead only write anly write anly write anly FEO. Dialo		ofDyson
800 801 Infigures 00 mem WPD01 INFD02 WPD02 WPD02	Configu Dbilds Configu Dbilds 1400 1401	5 ab 1 2 0 1 2 red Db 5 ab 6 0	Parameter Analog Input Block No. 1 Analog Input Block No. 2 analog 16 bit output Block No. 2 analog 16 bit output Block No. 1 Analog Output Block No. 1 Analog Output Block No. 2 mote automatically written schile Node startup tick Parameter Dight Input Block No. 6 Number of mapped objectiv	Detault Value (no default value) (no default value) (no default value) (no default value) (no default value) esquerice (Chorcean Value) 2 2	Access lead only lead only lead only write only write only PDO Dialo		elDgom
800 801 00 minutes 00	Configu Dbilds 6411 Configu Dbilds 1400 1401 1401	5ub 1 2 0 1 2 red 0b 6 0 1	Parameter Analog Input Block No. 1 Analog Input Block No. 2 analog Input Block No. 2 analog Input Block No. 2 analog Input Block No. 1 Analog Output Block No. 1 Analog Output Block No. 2 peter automatically written schile Node startup tick Parameter Digital Input Block No. 6 Number of mapped objecto Analog Input Block No. 1	Detault Value (no default value) (no default value) 2 (no default value) ino default value) sequence (Chorcem Value) 2 (Chorcem Value) 2 2 40000608 2 4 40000608	Access lead only lead only write any write any PDO Dielo X X X		elDgoin

Close the window and save the project. You have now finished the CANopen configuration with SyCon and created all necessary data PL7 needs to configure the TSX CPP110 module.

The information is available in a database, the default path for our example is\SyCon\Projects\demo_cfg.co.

You are now ready to start with the PL7 application.

Create the PL7 Application

PL7 tool - Step 1

T5X 57353 [RACK 0 POSI]	TION 0]	_ 0
onfiguration 🗾		
Designation: PROCESSOR TSX P 57	353	
сна Г	(2)	
CHANNEL 1 TSX CPP 100-11	10 CAN OPEN PCMCIA CARD	
CANopen	🔹 MAST 💌	(4)
Bus start up	Inputs	Outputs
Automatic 5		C Maintain 💿 RAZ (3)
C Sami Automatia (hug alana)	No.of words (%MW) 32	No. of words (MMM) 32
C Beneration and (bus alone)	Index of 1st %MW	
х by program		Index of 1st %MW
Configuration load mode		Watchdog
Select Database		C Astinated
Configuration size	13 words	(* Activated
PL7	() s	JCon C Disactived
Transmission speed		
SYNC Message COB-ID		- SyCon tool
SYNC Maccage Pariod		
o nuo message renou		
Auto-Clear		hilscher
	Bus configuration	

Start PL7, create the hardware configuration and double click on the PCMCIA slot of the CPU $\,$

- 1. Select the Channel 1
- 2. Select the TSX CPP100 110 card
- 3. Define the output behavior in case of PLC stop: Maintain or Reset By default:
- 4. "Mast" task is selected as rate of update of the storage area associated with the I/O
- 5. "Automatic" bus start up mode is selected

Note that SyCon tool could be launched from this screen.

PL7 tool – Step 2

Designation: PROCESSOR TSX P 5	7353		
HANNEL 1:			
HANNEL 1 💽 TSX CPP 100-	110 CAN OPEN PCMCIA CARD	•	
CANopen	🔹 MAST 💽]	
Bus start up Automatic Semi-Automatic (bus alone) By program Configuration load mode 1	Inputs No.of words (%MW) 32 22 Index of 1st %MW 0	Outputs C Maintain I RAZ No. of words (%MW) 32 Index of 1st %MW 50 Watchdog	-(
Select Database Select Database Onfiguration size Transmission speed	C:\Program Files\Schneider\SyCor 1256 words 1MBit/s 128	syCon	ted ived
SYNC Message COB-ID SYNC Message Period	100 ms	,	71

- 1. Click on *Select Database* to import the *.co file into PL7 (example : Demo_cfg.co)
- 2. Define the addresses of the Inputs and Outputs: Example:
 - 2a : Inputs: Array of 32 words (from %MW0 to %MW31) We keep default values.
 - 2b : Outputs: Array of 32 words (from %MW50 to %MW81).
- 3. Press on *Bus configuration* to see the list of nodes configured on the bus.

By default:

4. "PL7" mode is selected to have the CANopen configuration loaded together with the PL7 application into the PLC

Close the window, confirm all changes and save the project. You have now finished the PLC application with PL7 and created all necessary data the PLC needs to start the communication with the CANopen nodes.

You have now reserved 32 words as well as for inputs than for outputs. The input words start at %MW0, the output words at %MW50. As Node #2 is using one input word and one output word and Node #3 five input words and three output words, we have the following address assignment:

- Inputs Node #2: %MW0
- Outputs Node #2: %MW50
- Inputs Node #3: %MW1 to %MW5
- Outputs Node #3: %MW51 to %MW53

(Refer to Advantys tool - Step 3)

Transfer the application to the PLC and start the program.

PL7 Debug Screen

For debugging open the CPP110 debug screen

TSX 57303 (R/	ACK 0 POSITI	DN 0]					
ebug Designation: PROCE	SSOR TSX P 57303	Version: 5.0			DIAG		
CHANNEL 1:							
CHANNEL 1	TSX CPP 100 CAN C	PEN PCMCIA CARD			-		
CANopen		✓ MAST	-		DIAG		
ANopen Slaves stat	e			Data of CANopen	slave		
Adr. Equ 0002 0003	ipment Name Node_2 Node_3	Act. Life T.		Parameter 2dMW1 2dMW1 2dMW2 2dMW3 Output Value 6# 000F Outputs Parameter 2dMW51 2dMW53	Symbol 3 OK Symbol	¥alue 16#0F0F 16#0000 Base C Bin C Hex 16#000F 16#000F 16#3E80 16#3E80	Dec
Total No. Slaves	No.XMW inputs	No. XMW outputs	2	Slave information Node 3: Status=0 ◀ Request to send – Enter request	8h, Addinfo=00 Response re	115h, Profile=401, No	odeState

PL7 Debug - Step 1 Node overview

1. The node list provides an overview over all configured nodes. Node #2 is shown in red because it is not connected to the bus. Node #3 is working properly and therefore is black.

If one or more nodes are red, the DIAG button (and the CPP error led) is red too. The Premium resets error led and DIAG button automatically when the faulty condition has gone. For the TSX Micro, it must be reset by a positive edge on bit %QW0.1:X2.

PL7 Debug - Step 2
 Node diagnostic
 2. Node diagnostic. To get more details, click on the red listed node. The diagnostic field is showing the string : Node 2: Status=01h, AddInfo=0000h, Profile=0, NodeState=127, Error= 34, EmcyEntries= 0
 Status = 01 indicates that Node #2 does not answer.

The diagnostic string of Node #3 is showing *Node 3: Status=08h, AddInfo=0015h, Profile=401, NodeState=5, Error= 0, EmcyEntries= 0* Status=8 indicates that the node is controlled by the TSX CPP 110.

For more details refer to the TSX CPP 100/110 user manual.

Debugging

PL7 Debug - Step 3 Set I/O points	3.	Set output word %MW51 to 16#000F, all four outputs will go on. You can see the echo of the outputs in the MSB (Most Significant Byte) of %MW1. As the outputs are wired to the inputs, you also see the inputs in the LSB (Less Significant Byte) of %MW1 too.
		Set output word %MW52 and %MW53 to 16000 (=16#3E80). The output channels put out 5 VDC and feed them back to the analog input channels. You can read this value back in the input words %MW4 and %MW5 (by using the scroll bar).
		Input word %MW2 is containing one Status byte for each of the two analog input channels, Input word %MW3 the Status bytes for the two analog output channels.

Refer Advantys tool - Step 4, where I/O mapping is described.

Configuration of	Insert the Altivar 58 into the CANopen configuration.
	In the Insert Node screen, you find 4 ATV58 devices:

- ATV58_E Altivar 58, EDS file is in English
- ATV58_F Altivar 58, EDS file is in French
- ATV58F_E Altivar 58F, EDS file is in English
- ATV58F_F Altivar 58F, EDS file is in French

Select the EDS file that corresponds to your Altivar device and your language preference, click on Add and then on OK.

In the Node configuration window, configure both PDO and click on OK to use the default transmission types.

lade ATV58_E						,	Node ID (address) 4			1	DK
lesciption	Noded						Contra astern Fare				Cancel
	10000 Proces			-	Control Protocol				Node BootUp		
rename A58_E.ED9 ▼ Activate node in actual configuration					ł	Emercency 00B-ID 132			132	OPD Objects	
Automatic COB4D allocation in accordance with Profile 301				,	ladeguer	d COB-ID	Ī	1796	Object		
Device Profile	402 De	evice type	Fre	quancy	Converte	6)					Configuration
1900 hans	nà PDD navamatar		www.ewv		******				-PI	00 macoing (method
1800 frans	mit PDD parameter									00 mapping i 05301 V4 Add to config	mathad Med FDOs
Configured PDC	nit PDD parameter)s	COBID	Tupe	Adda	l Len	D Tupe	0 Addr			20 mapping i 25301 V4 Add to config PD0 Core	mothod
Configured PDC PDD name receive PD01	nk PDD personster De Symbolic Name PDD_1400	CD84D 516	Пуре	I Addr.	I Len.	D Type 08	0 Addr 0	ULen 4		Add to config PDO Con	nothod xeed PDOs
Configured PDC PDD name receive PDD Itensmit PDD	nk PDD personster s Symbolic Name PDD_1400 PDD_1800	CDB-ID 516 368	I Type IB	I Addah D	Len. 4	D Type DB	0 Addr. 0	OLen 4		Add to config PDD Con PDD Con	wed PDOs
Configured FDC PDD name receive FDD1 trensmit FD0	nk PDD parameter S Symbolic Name PDD_1400 PDD_1800	CD840 516 388	l Type IB	I Addrin D	l Len. 4	D Type 08	0 Adt 0	0Len.		Add to config PDD Con PDD Con Define new	wed PDOs
Configured PDC PDD name receive PDO1 Isensmit PD0	nk PDD parameter Symbolic Name PDD_1400 PDD_1800	CDB-ID 516 388	l Type IB	Addat. D	l Len. 4	O Type OB	0 Addr 0	OLen 4		Add to config PDD Con PDD Con PDD Ch Define new Define new	mathad
Configured PDC PDD name receive PDD1 trensmit PDD	nk PDD parameter Symbolic Name PDD_1400 PDD_1800	CD84D 516 388	I Type IB	I Addin D	l Len. 4	D Type OB	0 Addr 0		PH I I	Add to config Add to config PDO Con PDD D Define new Define new Define new	wred PDOs

You have configured now two PDOs containing two words each:

- Transmit PDO: 1 word for the status, 1 word for the actual speed
- Receive PDO: 1 word for the command register, 1 word for commanded speed

Check that the baudrate and the node ID fit to the settings you have selected on the Altivar. If the Altivar is the last node, activate the termination resistor (switch on the Altivar's CANopen communication card).

Now save the Sycon project, import it into your PLC application and download it into the PLC (same steps as described above).

Appendix – Configuration of Altivar 58

For debugging and testing, open the TSX CPP 110 debug screen in PL7 and select the Altivar in the grid of configured nodes. In the right part of the screen, you can see the two input and output words the Altivar is using.

You can start the motor when you put the sequence 6, 7, 15 into the command register (1st output word) and a speed value into the second output word. If the Altivar is in error, you must reset the Altivar first (128 in the command register), then continue with the sequence 6, 7, 15.

The CANopen configuration of the Altivar 31 is described in a separate user manual: Altivar 31, Protocol CANopen.

Appendix – Configuration of Lexium

General- Lexium communication Wiring	 The Lexium wiring can be made through an adaptator (AM0 2CA 001 V000): screwed on the drive and connected to the CANopen cable(s) (This adaptator includes a line termination) For any other type of wiring refer to the Lexium CANopen documentation (available on "Motion tools" CD). 	
General- Lexium communication PDO	PDOs allow the implicit data management between the Micro or Premium PLC and the Lexium drive (by read/write words in the PL: Lexium drives use two kinds of PDOs: • Predefined PDOs: These PDOs are premapped in the Lexium with specific commands. Ex : PDO 22 of this appendix is mapped with : The request H2060 => Current or speed setpoint • Free PDOs: These PDOs are not mapped with specific commands, the configurat will be done by the application. Free PDOs are not described in this guide. The PDOs are exchanged using predefined channels: • 3 receiving channels* (H2600, H2601, H2602) • 3 transmitting channels* (H2600, H2A01, H2A02) The maximum size for data is 8 bytes per channel Coverview: • Communication • Communication • Construction • Communication • Construction • Communication • Construction • C	C).

(*) Available on the LEXIUM with a version >= SV5.51

Appendix – Configuration of Lexium

Lexium communication PDO 22	 The PDO configuration will be done in 3 different steps: PDO configuration with SyCon tool: definition of the channel, the exchange, the size and the PDO used CANopen configuration with PL7 tool: Database selection and definition of Input/Output exchange variables Lexium drive control through PL7 debug screen In this example we will define the different steps to use the Receive PDO 22 on the channel 1. When these steps will be done the drive values will be available directly in the CPU variables (%MW).
SyCon tool – Step 1 Insert Lexium Node	 PDO 22 is used on the Receive 1 channel. PDO 22 predefined configuration: Control word Current or speed setpoint
	With SyCon, Insert the Lexium into the CANopen configuration: Master Mode I Mode I Mode II Mode II Node II Mode II LEXIUM Node II LEXIUM 17D

SyCon tool – Step 2 Configuration of 1st receive PDO

x DK LEXIUM17D Node ID [address] 60 Node Cancel LEXIUM Description Configuration Error Control Protocol Node BoolUp LEXIUM.EDS. File name OPE Objects 🔽 Activate node in actual configuration Emergency COB40 168 ☑ Automatic COB-ID elocation in accordance with Profile 301 Nodeguard CDB40 1852 Object Configuration Bevice Profile 402 Device type Serva Drive Predstined Process Data Objects (PDDs) from EDS file Actual node 60 / LEXIUM17D Dbj.ldx. PDO name 1400 1st receive PDD parameter ٠ . 1 1401 2nd receive PDO param PDO mapping method-1900 1st transmit PCO parameter DS301 V4 • 2nd transmit PDO parameter 1801 2 Add to configured PDO: Configured P 3 4
 FDO name
 3
 ibblic Name
 COBHO
 Type
 I Addt
 I Len.
 0 Type
 O Addt
 0 Len.
 •

 1st investive PDot 100_1400
 572
 08
 0
 2

 PDO Contents Mapping PDO Characteristics Define new Receive PDO ... Define new Transmit PDD... Delete configured PDD Symbolic Names

- 1. Select the 1st receive PDO
- 2. Click on Add to configured PDOs
- 3. Select PDO name "1st receive PDO"
- 4. Click on PDO contents Mapping...

Define the length of this PDO (description of parameters to be exchanged) PDO Contents Mapping Object Index 1600

Obj.ldx.	Sub.Idx.	Parameter	Access	•	
2022	1	Position	Read / Write		Cancel
2022	2	Feed rate	Read / Write		
2022	3	Type of motion in motion task	Read / Write		
2022	4	Trajectory	Read / Write		
202 1	þ	ID number of the motion task	Read / Write		Append Object
2060	0	Feed rate or current command	Read / Write		
2070	1	Actual value 16/20 bits resolution	on per Read	-	
Mapped C)bject dictio	nary Parameter Su	mbolic name		
Mapped C Obj.Idx.)bject dictio Sub.Idx.	nary Parameter Syr	mbolic name	-	
Mapped C Obj.Idx. 6040)bject dictio Sub.Idx. 0	nary Parameter Syn Control word Ob	mbolic name ject6040Idx0	-	
Mapped C Obj.1dx. 6040 2060)bject dictio Sub.Idx. 0 0	nary Parameter Syr Control word Ob Feed rate or current Ob	mbolic name ject60401dx0 ject20601dx0		
Mapped C Obj.Idx. 6040 2060	Dbject dictio Sub.Idx. 0 0	nary Parameter Syr Control word Ob Feed rate or current Ob	mbolic name ject6040ldx0 ject2060ldx0		
Mapped C Obj.Idx. 6040 2060	Dbject dictio Sub.Idx. 0 0	nary Parameter Syr Control word Ob Feed rate or current Ob	mbolic name ject6040ldx0 ject2060ldx0		Delete mapped Objec

- 1. Select the parameter to be exchanged
- 2. Click on Append Object
- 3. Click on OK

Note: In this example we describe a receive PDO configuration. To see the status of the drive in the PLC you have to configure a Transmit PDO additionally.

SyCon tool – Step 3 Configuration of PDO parameters

X

Appendix – Configuration of Lexium

SyCon tool – Step 4 Define PDO value (PDO 22)

ode	LE	XIJN17D	Nodel	D (address)	0K
escription	IN IN	ode2	En	ninuration Exer	Cancel
			Č	antrol Protocol	Node Boottin
le nane	LE	XIUM EDS			neer rectop
Activat	e node ir	actual configuration	Emerg	ency COB-ID 130	OFC Objects
Automa	tie CDB-	ID allocation in accordance with Prof	it 301 Noder	000-000 1294	
			nous	man costo Tivas	Contiguistia 1
levice Pr	ofie	402 Device type 5ervo D	ive		conigation
ect Con	figurati	on			
Node		LEXIUM17D	Nod	eID 2	DK.
Descript	ion I	Node2			Caucal
Predefin	ed suppo	ited Objects in the EDS file	1990/00/00/00		Access Filter
Obj. ldv.	Sub.Ids	Parameter	Default Value	Access 🔺	al 🗡
	F	Ist - 121 - actual load	(no default value)	read only	
	10	Time of operation	ino default value)	read only	Decimal
	n	Extended status for transmit PDD	(no defauit value)	read only	
2500	n	2		and tools	
2601	U	TRIBORIA FDU SABO		read / write	Add to Configured Object
2001	-			<u> </u>	
Configure	ed Dbjed	ts automatically written while Node sta	stup sequence		
Obj. Ida.	Sub.Idi	Parameter	Choosen Value	PD0 Dialog +	
1400	1	CO84D	202	X	
	2	Transmission type	FF	×	
1400		Inhihit time	0	×	
1400 1400	3	THOMAS THIS			
1400 1400 1600	3 0	Number of mapped objects	2	- X 100	

- 1. Click on Object configuration
- 2. Select the "First receive PDO" of predefined object 2600 (refer to general Lexium paragraph)
- 3. Click on Add to Configured Objects

Descript	l tion î	EXUM17D Node2	Node ID	2	Cance
Piedefin	ed suppo	Ited Objects in the EDS file			- Access Filter
Obj.ldx.	Sub.ldk	Parameter	Default Value	Access	 al
22-22.00	10	Time of operation	(no default value)	read only	
	11	Extended status for transmit PD0	(no default value)	read only	Depin
2900					
2601		L	1877:		
	0	2nd receive PDO select	15	read / write	
2400					 Add to Configured Ub
Conligu Obi.ldx	ed Object Sub.ldk	s automatically written while Node startup Parameter	sequence Choosen Value	PDD Dialog	•
	1	Control word	60400010	х	
1600	2	Feed rate or current command	20600020	×	8
1600 1600	0	1st receive PDD select	22 1		<u> </u>
1600 1600 2600	u –			21 S	
1600 1600 2600	u				

- 1. Type "22" in "Choosen Value" of "1st receive PDO"
- 2. Click on OK to validate
- 3. Save the configuration in "..\SyCon\Project\demo_lexium.co" file

You are now ready to start with the PL7 application.

Appendix – Configuration of Lexium

PL7 tool – Step 1 Lexium configuration In PL7 configure your TSX CPP100-110 configuration.

HANNEL 1:			
HANNEL 1 💽 TSX CPP 100	-110 CAN OPEN PCMCIA CARD	•	
CANopen	MAST 💌	1	
Sus start up C Automatic C Semi-Automatic (bus alone) C By program	Index of 1st %MW	Maintain RAZ No. of words (%MW) 32 Index of 1at 4643 / 32	the later
Configuration load mode Select Database Configuration size	C:\Program Files\Schneider\SyCor	2 Watchdog nProject Activate SyCon Disactiv	ed :
Transmission speed SYNC Message COB-ID	1MBit/s 128 100 ms	- SyCon tool -	

- Click on Select Database to import the *.co file into PL7 (..\SyCon\Project\demo_lexium.co)
- 2. Default values are kept, Input/Output variables are configured in the words below:
 - Inputs: from %MW0 to %MW31 (not used, as no transmit PDO is configured)
 - Outputs: from %MW32 to %MW63

PL7 tool – Step 2 Drive control through debug screen

EX 57303 [RACK 0 POSITIO	DN 0]				_ 🗆 ×
Debug 🚽					
Designation: PROCESSOR TSX P 57303	Version: 5.0		DIAG		
CHANNEL 1:					
CHANNEL 1 TSX CPP 100 CAN O	PEN PCMCIA CARD		-		
CANopen	V MAST V	0	DIAG		
CANopen Slaves state		Data of CANoper	n slave		
Adr. Equipment Name 0060 LEXIUM17D	Act. Life T.	Parameter	Symbol	Yalue	
		Dutana Value		Bree	-
			ок	C Bin C Hex 💽 [Dec
		- Outputs	Sambol	Yaluo	
		Outputs Parameter %MW32	Symbol	¥alue 0	_
		Outputs Parameter %MW32 %MW33	Symbol	Value 0 0	
		Outputs Parameter %MV32 %MV33 %MV34	Symbol	Value 0 0 0	
		Outputs Parameter XMW32 XMW33 XMW34 Slave information	Symbol	¥alue 0 0 0	
		Outputs Parameter XMW32 XMW33 XMW34 Slave information Node 60: Status=	Symbol 08h, AddInfo=	Value 0 0 0 0 0 0002h, Profile=402, Node	
		Outputs Parameter 2:MW32 2:MW33 2:MW34 Slave information Node 60: Statuse	Symbol 	Value 0	
		Outputs Parameter XMW32 XMW33 XMW34 Slave information Node 60: Status=	Symbol 08h, Addinfo= Besponse r	Value 0 <td>Sa -</td>	Sa -
Total		Outputs Parameter XMW32 XMW33 XMW34 Slave information Node 60: Status=	Symbol 08h, Addinfo= Response r	Value 0 0 0 0 0 0002h, Profile=402, Node ceived	8ª -
Total No.Slaves No.%/W/inputs	No. XMW outputs	Outputs Parameter XMW32 XMW32 XMW34 Slave information Node 60: Status= Request to send- Enter request	Symbol 08h, Addinfo= Response r	Value 0 0 0 0 0 0002h, Profile= 402, Node	

Use the debug screen to control your drive.

The debug screen shows that the CANopen communication with the Lexium drive is running (ex "Status=08h" in the "Slave Information" field).

You can control the drive by changing the value of the output variables:

- %MW32: direct access to the operating modes of the drive (control word)
- %MD33: direct access to current or speed setpoint

Appendix – More than 4 PDOs required for a node

More than 4 PDOs
required for a node

You can simply configure up to 4 PDOs per direction per node. When you want to have more, some additional steps are required. This due to the following:

How COB-Ids are
assignedCOB-Ids for PDOs are in the range of 385 ... 1407 (hex 180 ... 57F). In
general, the user is free in the choice of the COB-ID for a given PDO. But
he has to take care to stay in this range and he should not use a COB-ID
twice. CANopen configuration tools normally provide an automatic COB-ID
allocation which is taking care of this.

Sycon is using the following algorithm which is in accordance with profile 301:

		Node #1 (decimal)	Node #2 (decimal)	 Node #127 (decimal)
1. TxPDO	16#180+Node-ID	385	386	 511
1. RxPDO	16#200+Node-ID	513	514	 639
2. TxPDO	16#280+Node-ID	641	642	 511
2. RxPDO	16#300+Node-ID	769	770	 895
3. TxPDO	16#380+Node-ID	897	898	 1023
3. RxPDO	16#400+Node-ID	1025	1026	 1151
4. TxPDO	16#480+Node-ID	1153	1154	 1279
4. RxPDO	16#500+Node-ID	1281	1282	 1407

As the COB-ID is determining the priority of a frame (the lower the ID is, the higher the priority will be), this has the following consequence:

The first PDO of a node is more prior than the second or the third Transmit PDO1 is more prior than Receive PDO1, Transmit PDO2 is more prior than Receive PDO2, ...

The lower the node ID is, the more prior PDOs will be.

Appendix – More than 4 PDOs required for a node

Steps to configure PDO5	Note that the range for COB-IDs allows each node to have 4 Transmit PDOs and 4 Receive PDOs. A 5 th PDO cannot get its COB ID automatically as there are no more free numbers left. Configure PDO5 in the Node configuration screen of Sycon. The following window opens:			
	No default COB-ID is available. Please switch off the automatic COB-ID allocated and enter the required COB-ID manually.	ation		

OK

Disable the automatic COB-ID allocation (node configuration screen). Now you can manually overwrite the COB-ID for PDO5, PDO6, ...

Use the following COB-IDs:

- Transmit PDO 5, 6, ... in the range of 1664 ... 1759 (Hex 680 ... 6DF)
- Receive PDO 5, 6, ... in the range of 1761 ... 1792 (Hex 6E1 ... 700)

Now you can close the node configuration screen and save your project.