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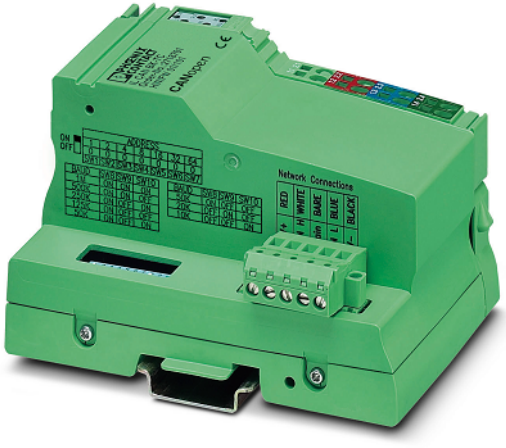
INSPIRING INNOVATIONS

# IL CAN BK-TC-PAC

Quick Start




Designation: UM QS EN IL CAN BK-TC-PAC

Revision: 00

Order No.: 7099

This guide is valid for:

IL CAN BK-TC-PAC
Order No. 27 18 70 1

# General Information

Unless mentioned otherwise, all information in this guide refers to the bus coupler IL CAN BK-TC-PAC.

When using this guide, please observe the following notes:

The *attention* symbol refers to an operating procedure which, if not carefully followed, could result in damage to equipment or personal injury. The symbol is always located to the left of the text to be noted.

The *note* symbol gives you tips and advice on hardware and software optimization. It also informs you of conditions that must be strictly observed to achieve error-free operation. The symbol is also used to clarify terms.

The *text* symbol refers you to detailed sources of information (manuals, data sheets, literature, etc.) on the subject matter, product, etc. This text also provides helpful information for the orientation in the manual

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# 1 Configuring a CANopen System Using SyCon

In this example project, the bus configuration consists of the following Phoenix Contact modules:

– S-MAX 5006 CE CO as a controller board
– IL CAN BK-TC as a bus coupler
– IB IL 24 DI 16 as a digital input module
– IB IL 24 DO 8 as a digital output module
– IB IL AI 2/SF as an analog input module
– IB IL AO 1/U/SF as an analog output module

For further information on S-MAX 5006, please refer to the UM QS EN S-MAX 5006 quick start, Order No. 26 99 74 9.

## 1.1 Reading the Bus Configuration

The CANopen bus coupler must read the bus configuration prior to parameterization to ensure correct operation. Proceed as follows:

- Set DIP switches 1 to 7 of the device address to "0" (OFF).
- Switch on the voltage for the bus coupler with all required I/O modules.
  If the "RUN" LED on the bus coupler is permanently on (green), the I/O configuration is saved in the station flash memory.
- Switch off the voltage for the bus coupler.
- Set the device address and the baud rate via the DIP switches (see Section "Importing the EDS File" on page 6).
- Switch the voltage for the bus coupler back on again.

## 1.2 Creating a New Project

– Open SyCon via "Start... Programs... SyCon System Configurator... SyCon".
– Create a new project via the "File... New" menu.
– Select the fieldbus system (in this case, CANopen):

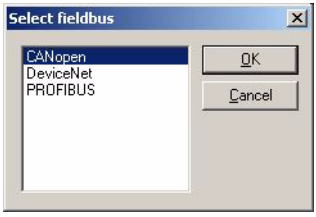


Figure 1 Select fieldbus

- Confirm with "OK".

## 1.3 Inserting the CANopen Master

- Save the project.
- Click on the first row in your worksheet.

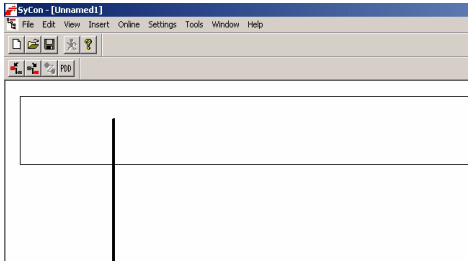


Figure 2 Inserting the CANopen master

- Select the "Insert... Master" menu.
- Click on the first row using the "M" cursor. A selection menu for the CANopen master is opened.

- Select "COM-C-COM" under "Available devices".
- As soon as you click "Add", the selected master appears in the "Selected devices" field on the right-hand side.

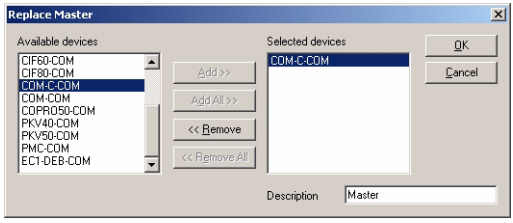


Figure 3 Replace master

- Confirm with "OK".

**Configuring the CANopen Master**

- Double-click on the master. The following window is opened:


Figure 4 Master configuration

- Click on "Master Settings..." and make the following settings:

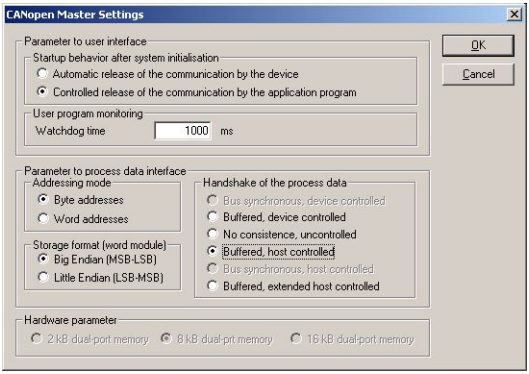


Figure 5 CANopen master settings

– "Controlled release of the communication by the application program" means that the bus is only started after a cold or warm restart of the application program.
– The "Watchdog time" specifies the time after which the watchdog is triggered (minimum value: 125 ms)
– "Byte addresses" means that byte-oriented addressing is enabled. This is also the case in MULTIPROG.
– "Buffered, host controlled" must be enabled so that the ProConOS IO driver can process the bus data correctly.
– Under "Storage format (word module)" you can specify whether bytes are to be transmitted first with the high or low byte. This setting must be made.

- Confirm with "OK".

- Click on "Global Settings" in the "Master Configuration" window and deactivate the "Enabled" item, i.e., process data addressing is **not** carried out automatically.

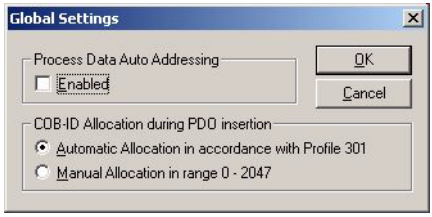


Figure 6 Global settings

- Confirm with "OK".
- Close the "Master Configuration" window with "OK".

### Importing the EDS File

Before the IL CAN BK-TC bus coupler can be integrated into the project, the appropriate EDS file must be imported.

Always use the latest EDS file.
It can be downloaded from the Internet at www.download.phoenixcontact.com. In addition, the EDS file is included on a disk that is supplied as standard with the CANopen bus coupler.

Set a valid CANopen address at DIP switches 1 to 7 of the IL CAN BK-TC (here: station address = 3, see Figure 7).

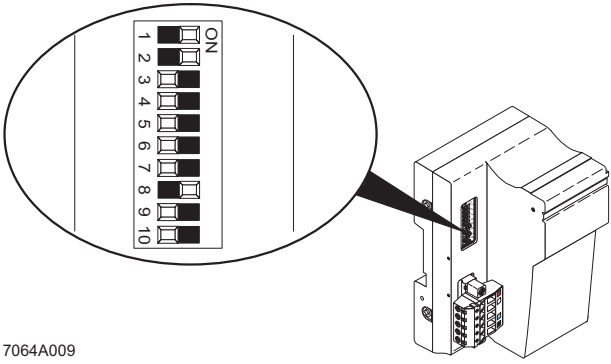


Figure 7 Setting the DIP switches

- Download the EDS file from the Internet or the disk and extract it to the desired directory.
- Select the EDS file via the "File...Copy EDS" menu.
- Select the path of the extracted EDS file.

- Select the EDS file and click "Open".

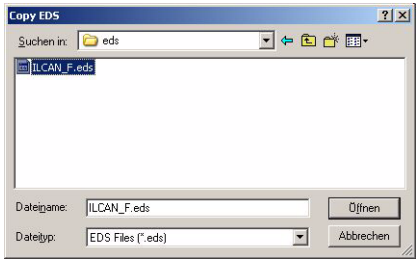


Figure 8 Copy EDS

- You are asked whether the relevant bitmap files are to be imported.
- Click "Yes".
- Confirm the message that appears with "OK".

If older EDS files are used, error messages may occur, however they have no effect.

Acknowledge these messages by clicking "Cancel".

In this case, download the latest version at www.download.phoenixcontact.com.

- Save the project via the "File... Save" menu.

## 1.4 Inserting a CANopen Node

- Select the "Insert... Node" menu.
- Click on the row below the master using the "N" cursor. A selection menu for the CANopen node is opened.
- Select the "IL CAN BK-TC" under "Available devices".

- As soon as you click "Add", the selected device appears in the "Selected devices" field on the right-hand side.

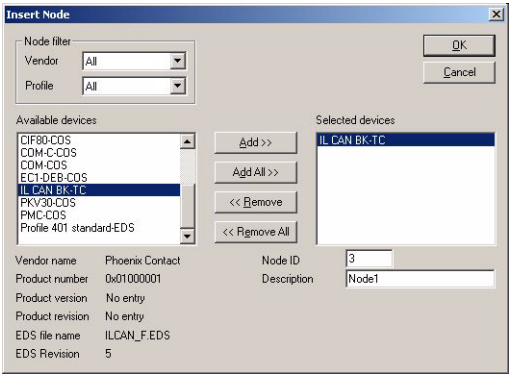


Figure 9 Insert node

- Enter the address "3" that has been set via the DIP switch in the "Node ID" field.
- Confirm with "OK".

The bus configuration is as follows:

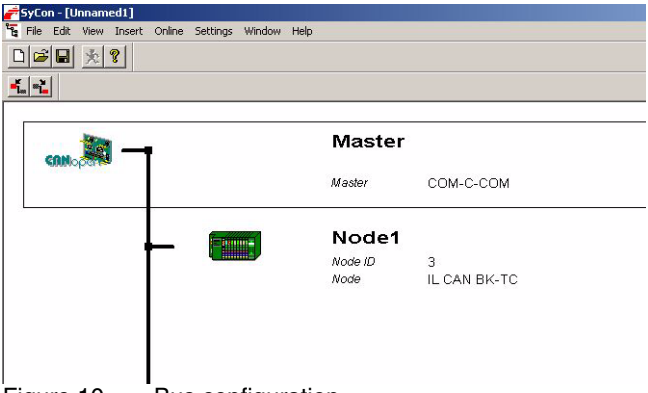


Figure 10 Bus configuration

## 1.5 Configuring the CANopen Node

- Double-click on the node you have just inserted.
  The "Node Configuration" window is opened.

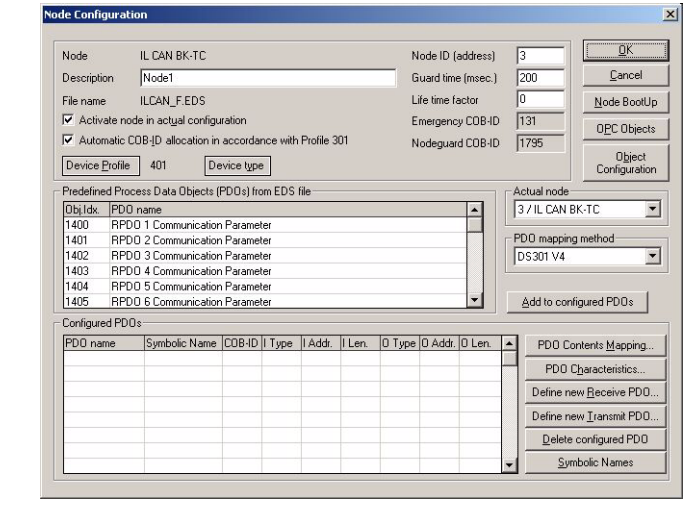


Figure 11 Node configuration

### Activating Devices

- Click on "Device type".
- Select all four selection options in the "Device Type" window that opens.
- Confirm with "OK".

### Inserting Process Data Objects

A list of RPDO (**R**eceive **P**rocess **D**ata **O**bject) output modules and TPDO (**T**ransmit **P**rocess **D**ata **O**bject) input modules can be found under "Predefined Process Data Objects (PDOs) from EDS file".

- Insert an RPDO for each output module in the bus configuration and a TPDO for each input module as a wildcard.
  To do this, proceed as follows for each individual object.

**RPDO 1:**

- In the "Predefined Process Data Objects (PDOs) from EDS file" list, double-click on the "RPDO 1 Communication Parameter" object that applies to the first output module (IB IL 24 DO 8).
  The RPDO 1 object is transferred to the "Configured PDOs" list at the bottom.
- Confirm the "Node receive PDO characteristics, master output process data" window that opens with "OK". Modifications must not be made in this window.

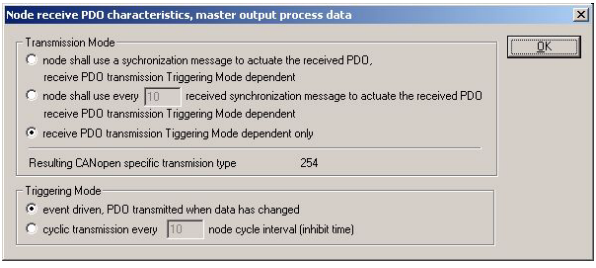


Figure 12 Node receive PDO characteristics

Only 8 bits are required for the IB IL 24 DO 8. However, CANopen objects are always inserted with 64 bits = 8 bytes.

- Select the RPDO 1 in the list at the bottom of the "Node Configuration" window and click on "PDO Contents Mapping..." on the right-hand side.

- In the "PDO Contents Mapping Object Index 1600" window that opens, delete all rows up to the first row ("1. Digital Output 8-Bit") in the "Mapped Object dictionary" list at the bottom by double-clicking on the rows to be deleted.

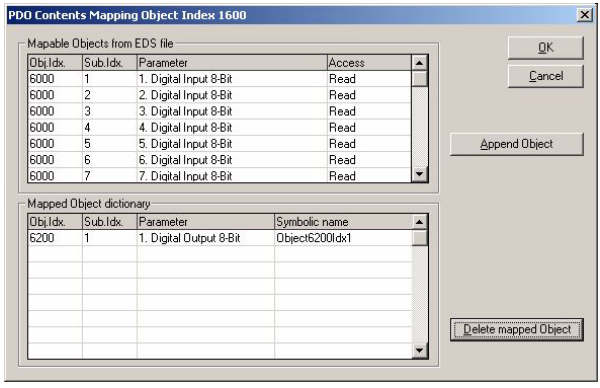


Figure 13 PDO contents mapping object index 1600

An 8-bit digital output module (IB IL 24 DO 8) has now been selected for the RPDO 1.

- Confirm with "OK".

**RPDO 2:**

- In the "Predefined Process Data Objects (PDOs) from EDS file" list, double-click on the "RPDO 2 Communication Parameter" object that applies to the second output module (IB IL AO 1/U/SF).
  The RPDO 2 object is transferred to the "Configured PDOs" list at the bottom.
- Confirm the "Node receive PDO characteristics, master output process data" window that opens with "OK". Modifications must not be made in this window.

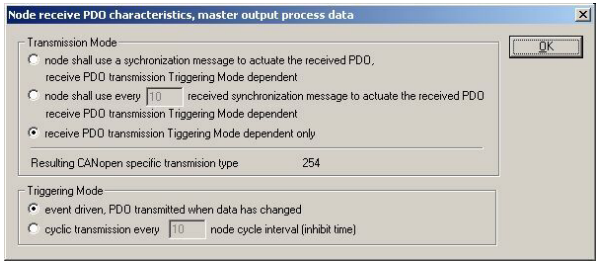


Figure 14 Node receive PDO characteristics

2 bytes are required for the IB IL AO 1/U/SF. However, CANopen objects are always inserted with 64 bits = 8 bytes.

- Select the RPDO 2 in the list at the bottom of the "Node Configuration" window and click on "PDO Contents Mapping..." on the right-hand side.
- In the "PDO Contents Mapping Object Index 1601" window that opens, delete all rows **up to the first row** ("1. Analog 2 Byte Output") in the "Mapped Object dictionary" list at the bottom by double-clicking on the rows to be deleted.

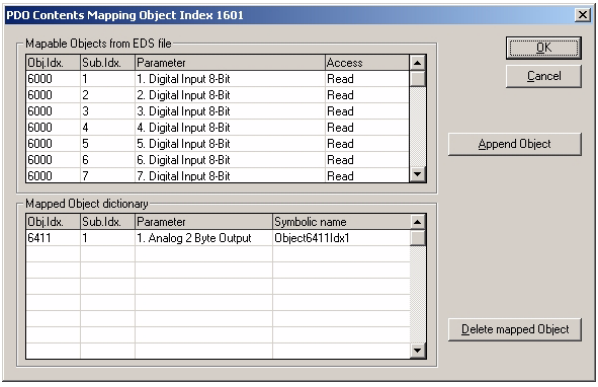


Figure 15 PDO contents mapping object index 1601

A 2-byte analog output module (IB IL AO 1/U/SF) has now been selected for the RPDO 2.

- Confirm with "OK".

**TPDO 1:**

- In the "Predefined Process Data Objects (PDOs) from EDS file" list, double-click on the "TPDO 1 Communication Parameter" object that applies to the first input module (IB IL 24 DI 16).
  The TPDO 1 object is transferred to the "Configured PDOs" list at the bottom.
- Confirm the "Node receive PDO characteristics, master output process data" window that opens with "OK". Modifications must not be made in this window.

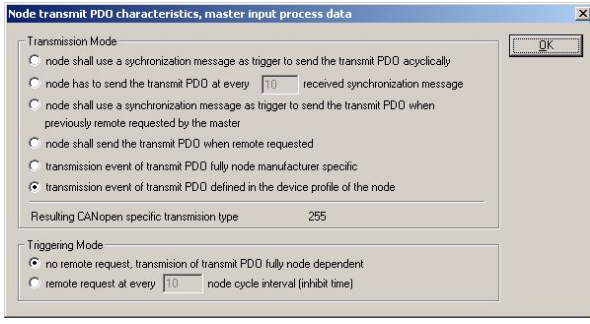


Figure 16 Node transmit PDO characteristics

Only 16 bits are required for the IB IL 24 DI 16. However, CANopen objects are always inserted with 64 bits = 8 bytes.

- Select the TPDO 1 in the list at the bottom of the "Node Configuration" window and click on "PDO Contents Mapping..." on the right-hand side.
- In the "PDO Contents Mapping Object Index 1A00" window that opens, delete all rows in the "Mapped Object dictionary" list at the bottom by double-clicking on the rows to be deleted.

- In the "Mappable Objects from EDS file" list at the top, double-click on the "1. Digital Input 16-Bit" entry for the IB IL 24 DI 16.

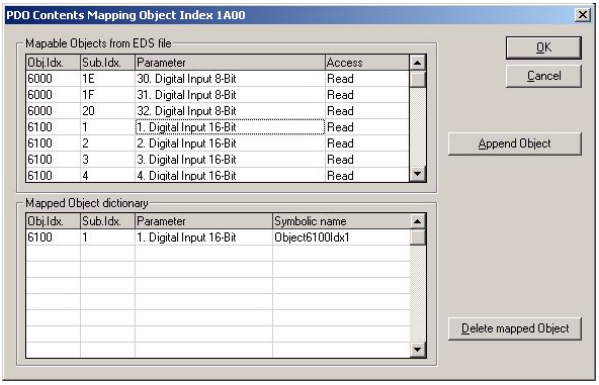


Figure 17 PDO contents mapping object index 1A00

A 16-bit digital input module (IB IL 24 DI 16) has now been selected for the TPDO 1.

- Confirm with "OK".

**TPDO 2:**

- In the "Predefined Process Data Objects (PDOs) from EDS file" list, double-click on the "TPDO 2 Communication Parameter" object that applies to the second input module (IB IL AI 2/SF).
  The TPDO 2 object is transferred to the "Configured PDOs" list at the bottom.
- Confirm the "Node receive PDO characteristics, master output process data" window that opens with "OK". Modifications must not be made in this window.

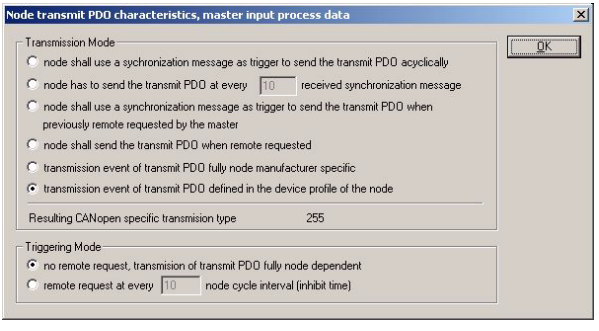


Figure 18 Node transmit PDO characteristics

Only 32 bits are required for the IB IL AI 2/SF. However, CANopen objects are always inserted with 64 bits = 8 bytes.

- Select the TPDO 2 in the list at the bottom of the "Node Configuration" window and click on "PDO Contents Mapping..." on the right-hand side.
- In the "PDO Contents Mapping Object Index 1A01" window that opens, delete all rows **up to the bottom two** in the "Mapped Object dictionary" list at the bottom by double-clicking on the rows to be deleted.

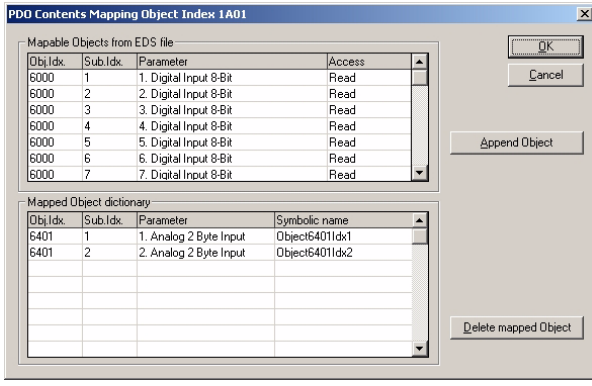


Figure 19 PDO contents mapping object index 1A01

A 32-bit analog input module (IB IL AI 2/SF) has now been selected for the TPDO 2.

- Confirm with "OK".

### Assigning Process Data Object Addresses

Once the PDOs have been inserted, assign the addresses:

The RPDO 1 object starts at output byte 0 and is 1 byte long, i.e., the RPDO 2 cannot start before byte 1.

- In the "Node Configuration" window, click in the "O Addr." column for RPDO 2 in the list at the bottom and write a "1" instead of the "0" (see Figure 20).
  The RPDO 2 now has the correct address.

The TPDO 1 object starts at input byte 0 and is 2 bytes long, i.e., the TPDO 2 cannot start before byte 2.

- In the "Node Configuration" window, click in the "I Addr." column for TPDO 2 in the list at the bottom and write a "2" instead of the "0" (see Figure 20).
  The TPDO 2 now has the correct address.

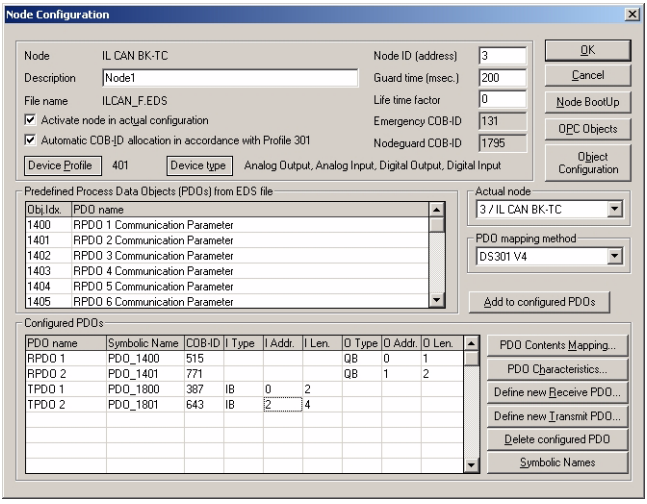


Figure 20 Assigning addresses

The node addresses are now assigned correctly.

- Click "OK" to apply the settings.

## 1.6 Parameterizing the Configured Bus Configuration

- Select the master in the bus configuration.
- Select the "Settings... Bus Parameter" menu.
- Set the baud rate according to DIP switches SW8 to SW10 on the IL CAN BK-TC.

| Baud Rate Switches | | | |
|---|---|---|---|
| SW8 | SW9 | SW10 | Baud |
| ON | ON | ON | 1M |
| ON | ON | OFF | 500K |
| ON | OFF | ON | 250K |
| ON | OFF | OFF | 125K |
| OFF | ON | ON | 50K |
| OFF | ON | OFF | 20K |
| OFF | OFF | ON | 10K |

Figure 21 Baud rate switches

- Set the baud rate to 125 kbps in the "Bus Parameter" window (DIP 8 = ON, DIP 9 = OFF, and DIP 10 = OFF).
- Select "Auto clear mode ON".

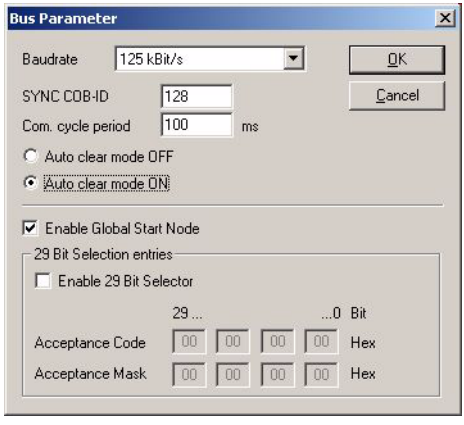


Figure 22 Bus parameters

- Confirm with "OK".
- Save the project via the "File... Save" menu.

**Download**

- Select the "Online... Download" menu to transmit the configuration to the parameterization memory of the IL CAN BK-TC-PAC.

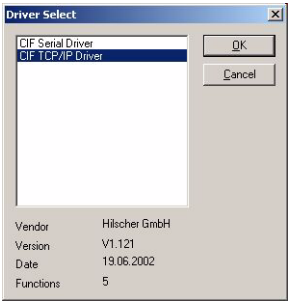


Figure 23 Driver selection

- Select the "CIF TCP/IP Driver" connection and confirm with "OK".

If a connection cannot be established, a timeout is generated. In this case, proceed as follows:

- Correct the IP address, if required (see Figure 24).
- Establish a new connection via the "Connect to Server" button.

If all selection boxes and the "Connect to Server" button are grayed out, exit SyCon and restart the program.

All detected master boards are displayed in the "Board Selection" list. Communication is established with the selected board.

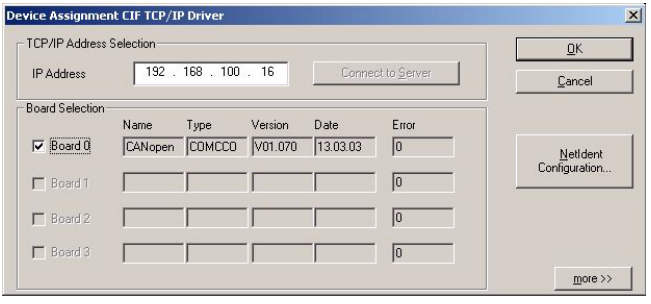


Figure 24 Device assignment CIF TCP/IP driver

- Confirm with "OK".

Data download is visualized via a progress indicator.

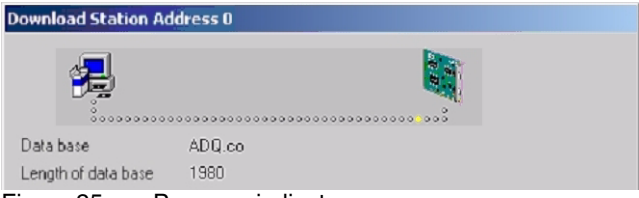


Figure 25 Progress indicator

As soon as the progress indicator reaches the right-hand side, the master board is ready for operation.

- Start parameterization via the "Online... Communication" menu.

**Overview of Address Data**

The module address data is combined into groups under MULTIPROG.

Therefore, the module inputs and outputs must also be combined into groups in SyCon.

The order of the above groups and therefore of the address areas is specified as follows in MULTIPROG in the "I/O Configuration" window:

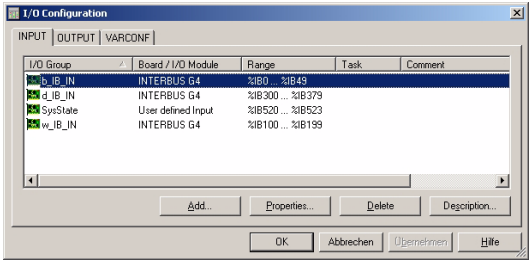


Figure 26 I/O configuration in MULTIPROG

- Select the "View... Address Table" menu to obtain an overview of the Inline terminal addressing in SyCon.

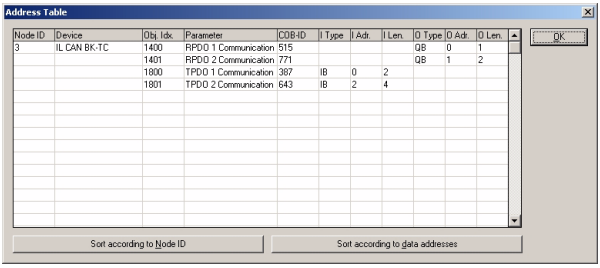


Figure 27 Address table

The output byte addresses of RPDO 1 (IB IL 24 DO 8) start at output byte O Addr. = 0 and have a length of O Len. = 1 byte (see object index 1400).

The output byte addresses of RPDO 2 (IB IL AO 1/U/SF) start at output byte O Addr. = 1 and have a length of O Len. = 2 bytes (see object index 1401).

The input byte addresses of TPDO 1 (IB IL 24 DI 16) start at input byte I Addr. = 0 and have a length of I Len. = 2 bytes (see object index 1800).

The input byte addresses of TPDO 2 (IB IL AI 2/SF) start at input byte I Addr. = 2 and have a length of I Len. = 4 bytes (see object index 1801).

The CANopen bus configuration has now been read and parameterized.

Close the "SyCon System Configurator" software via "File... Exit".

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SCATTERGOOD & JOHNSON LTD
ELECTRICAL ENGINEERING & FLUID CONTROL DISTRIBUTORS
Est.1899

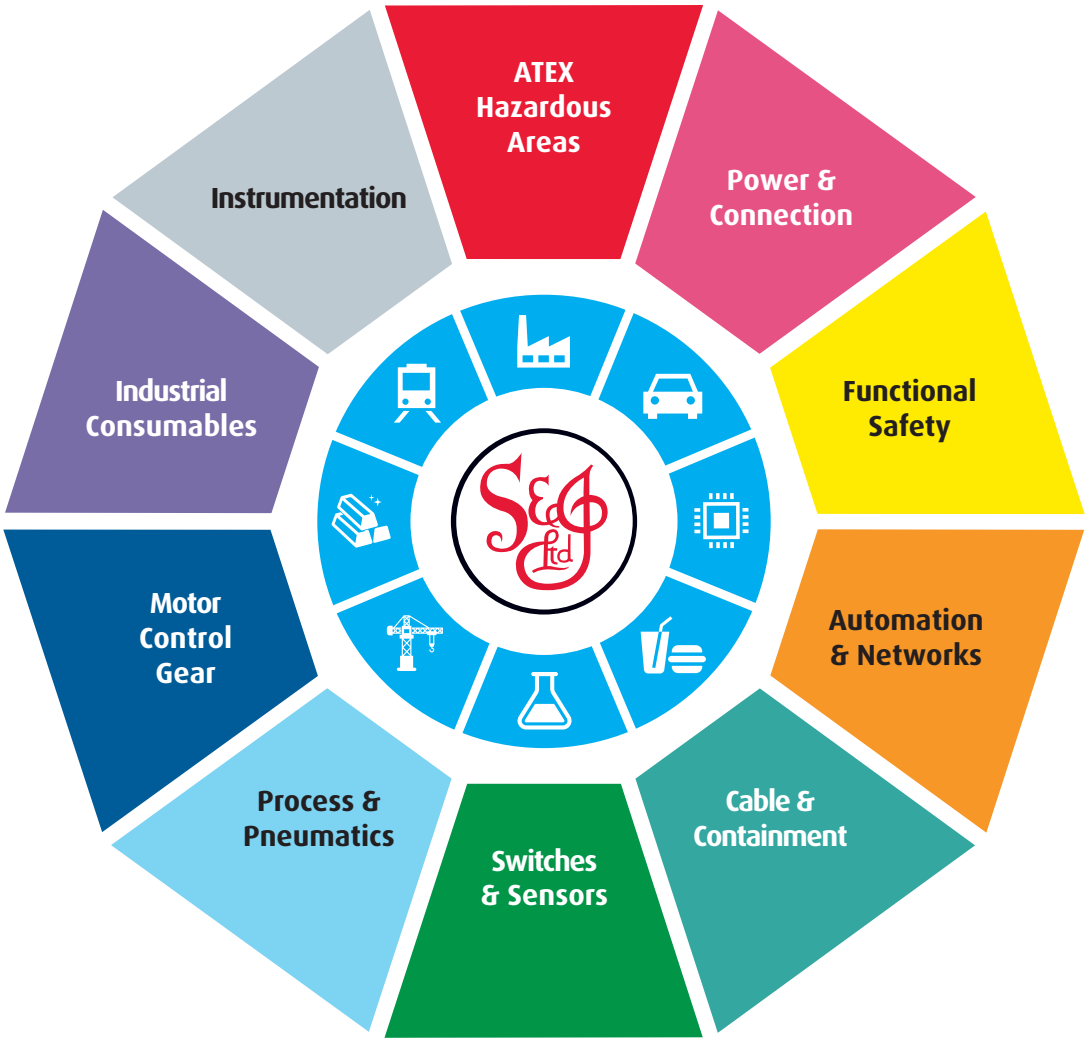
At Scattergood & Johnson Ltd, we pride ourselves on being a technical distributor to specialist industries.

Working with a range of quality product suppliers across a number of specialist markets, we are not your average 'box shifter' - we are your technical and supply chain partner.

We fully support every product we sell - for free! Our internal team and external sales engineers can answer any product or application question, no matter the complexity.

Backing up this technical ability is a range of 50,000+ products available from stock for nationwide next day delivery (same day if required!), or you can collect what you need from any of our trade counters around the UK.

Select your specialist interest below to learn more about how we can help.




Online, In Branch and On the Road - Scattergood & Johnson Ltd, there when you need us.

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