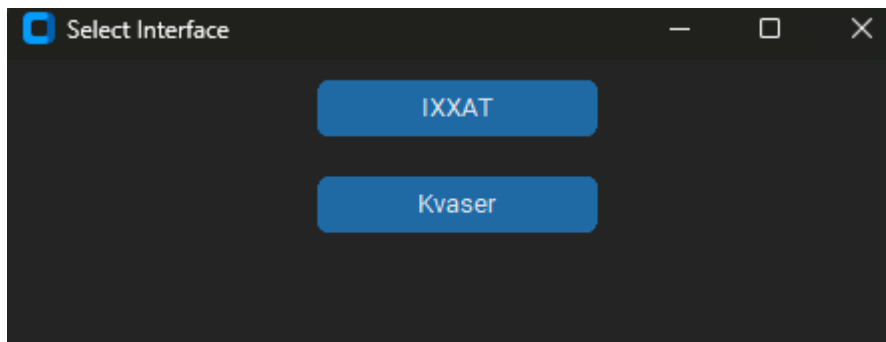


PDOMapper quick start guide (AC Drive)

The PDO mapper tool was made as a bridge between the DSElite and the canopen protocol. Giving an easy to use quick way to map CANopen PDOs to the no. tags shown in the DSElite configuration. Since then, the PDO mapper has expanded to be able to map PDO on the GVI drive as well. This is a quick guide on how the mapper works.

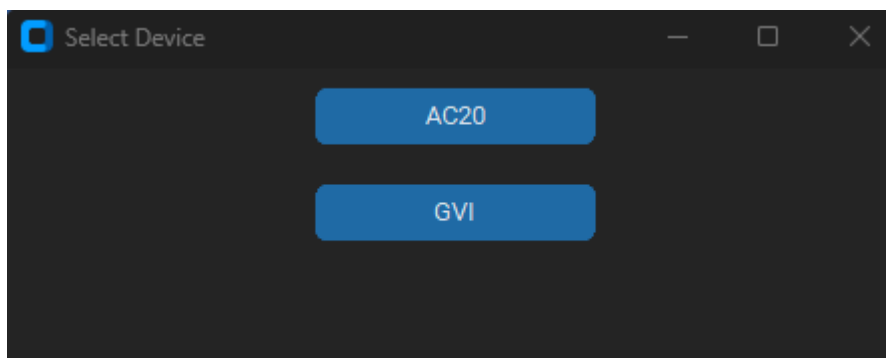
Interface selection

The interface selection screen (see below) lets you select between the USB – CAN interfaces. Currently IXXAT and KVASER devices are the ones supported. The development has mostly been done using the KVASER leaf light V2.



Device selection

The device selection screen (see below) lets you select between different CANopen devices to configure. The functionalities of the mapper do not change significantly with the device due to the CANopen standard applying to all of them, but the way some data is shown is different to help with the ease of use and entering parameters from the respective configurators used for those devices.



Main window

Node ID: Bitrate: 125kbps Send empty maps Save Open Get current maps Clear fields

No. TAG	Length (bits)	
		☐
		☐
		☐
		☐
		☐
		☐
		☐
		☐

Send mapping Store parameters Heartbeat Preoperational Operational Reset node

After selecting the CANopen device the main window opens. At the top of the main window a bar with setting fields and buttons is shown. At the very left the Node ID field needs to be filled with the Node ID of the device being communicated with. When configuring the AC Drive with the DSElite this would be the NODE ADDRESS set to the Options Comms Config in the AC drive parameters.

Next to the Node ID a bitrate selection dropdown menu can be found. The current options in the mapper are 125kbps, 250kbps and 500kbps. These are also made to match with the selection in DSE.

Parameter	Value
COMMS REQUIRED	CANOPEN
ADDR ASSIGNMENT	EXTERNAL
SET IP ADDRESS	0.0.0.0
SET SUBNET MASK	0.0.0.0
SET GATEWAY ADDR	0.0.0.0
ACCESS	0x001F
NODE ADDRESS	30
CANOPEN BAUD	125 KBPS
MODBUS BAUD RATE	19200 BPS
PARITY	EVEN 1 STOP
HIGH WORD FIRST	FALSE
ACTIVE TIMEOUT	0 s
MASTERMAPPING	TRUE

With these parameters set, the mapper should now be able to communicate with the AC drive through the CAN bus. To start the configuration, the AC drive should be set to preoperational state and the heartbeat should be set to active. These can be done using the respective state buttons at

the bottom of the screen. These will automatically set the Drive to a state where mapping PDOs will be possible.

Mapping the AC drive

To map the wanted parameters to the AC drive the specific No. tags for the parameters need to be found and entered into the mapping tool.

Below is an example on how to map the COMMS SETPOINT parameter into the first 32 bits of the RPDO1. First locate the parameter in the DSElite.

When finding the function block (on the left) with the right parameter you can open a help section (on the right). In the help section you can find the parameter's number tag. For the COMMS SETPOINT it would be 458.

Reference

LOCAL SETPOINT	0 %
SPEED DEMAND	0 %
SPEED SETPOINT	0 %
REFERENCE	33 %
LOCAL REVERSE	FALSE
REMOTE SETPOINT	0 %
SPEED TRIM	0 %
MAX SPEED CLAMP	110 %
MIN SPEED CLAMP	-110 %
TRIM IN LOCAL	FALSE
LOCAL MIN SPEED	0 %
MAX SPEED	1500 rpm
COMMS SETPOINT	0 %

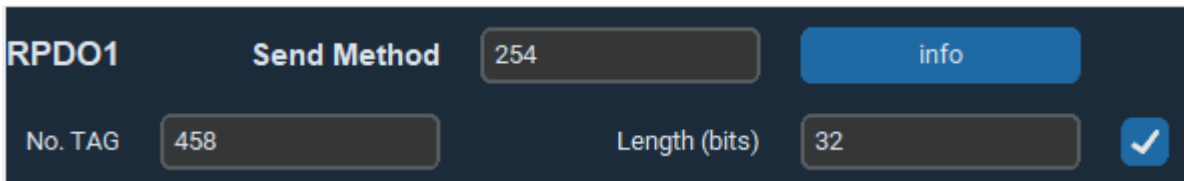
Help

Function Block Inputs

Parameter Name	No.	Default Value	Range	Units	Type	Writable
REMOTE SETPOINT	451	0	-110 to 110	%	REAL	ALWAYS
This is the target reference, that the drive will ramp to in remote reference mode (not including trim), direction is taken from REMOTE REVERSE.						
SPEED TRIM	452	0	-300 to 300	%	REAL	ALWAYS
Speed setpoint added to the output of the ramp to form SPEED DEMAND (in local mode Speed Trim only is added, when Trim In Local is TRUE).						
MAX SPEED CLAMP	453	110	0 to 110	%	REAL	ALWAYS
Maximum value for Speed Demand.						
MIN SPEED CLAMP	454	-110	-110 to 0	%	REAL	ALWAYS
Minimum value for Speed Demand						
TRIM IN LOCAL	455	FALSE			BOOL	ALWAYS
When TRUE, the trim is added to the ramp output in local mode.						
LOCAL MIN SPEED	456	0	0 to 100	%	REAL	ALWAYS
The magnitude of the minimum setpoint that will be used when running in Local Mode.						
MAX SPEED	457	1500	0.1 to 100000	rpm	REAL	ALWAYS
Speed in rpm that matches 100% setpoint. Attention: Changing parameter P1006 'Nominal Supply' via keypad or webpage resets this parameter to the default value for the selected supply voltage/frequency. Note: I) Parameter P0457 can be modified while motor is running, but only by +/-10% (of value of P0457 Max speed): P0457_while_running = 0.9*P0457_start_running ... 1.1*P0457_start_running. II) The max electrical setpoint frequency applied to the motor is additionally limited to the lower of 590Hz, stack_pwm_frequency_KHz*125 (Ind. motor) or stack_pwm_frequency_KHz*166.66 (PMAC motor).						
COMMS SETPOINT	458	0	-110 to 110	%	REAL	ALWAYS
Reference from Fieldbus. This setpoint is the target reference in 'Remote Reference Comms' mode (not including trim). A positive value indicates a forward direction. 'Remote Reference Comms' mode is activated by setting bit 11 'use comms reference' in parameter 0436 'Comms Command'. Comms Setpoint should not be written to using a DSElite link or direct value entry. It is intended to be set over comms only. The value is not saved at power off and is reset to zero if drive leaves operational mode or at power on.						

We also need to know the length of the parameter so the PDO can be mapped to the right bits. This is in the Type section of the help page. Each type has a corresponding length. The COMMS SETPOINT is a Type REAL which has 4 Bytes so 32 bits. A full list of Types and their lengths can be found at the end of this document.

With the No. tag and parameter length now known they are entered to the field in the mapper. The maps will always be applied in order within each PDO. To map the first 32 bits to the COMMS SETPOINT we will need to fill in the first field. For subsequent bits in the CANbus data field for that PDO we would follow up with the bits following these 32 on the next row in a similar way.



RPDO1	Send Method	254	info
No. TAG	458	Length (bits)	32
			☒

In the picture above we have the fields filled in. Each PDO has a send method. For this message we have chosen 254 (0xFE) for continuous transmission. TPDOs have a field for Event time so the send frequency for continuous transmission can be set. Lastly, we must check the box at the end of the row so the row is marked to be sent, otherwise, the mapper will skip it.

Finally, to send the mapping to the AC drive press the “Send mapping” button below. If you want the maps to be saved to the permanent memory of the device, check the “Store parameters” checkbox. Otherwise, the maps will be deleted when powering down.



Send mapping ☒ Store parameters

After sending the PDO is now mapped. The COMMS SETPOINT can be now used to set the motor speed by sending the value to with the identifier 0x200 + node ID (RPDO1) with the first 32 bits being the value of the setpoint.

Other functionalities:

“Send empty maps” – Empties all the PDO maps set in the device

“Save” – Saves the current fields in the mapper into a .json file

“Open” – Fills the fields with the data saved into a .json file

“Get current mapping” – Asks the device to send the mapping currently in the device. Fills the fields with the mapping received.

“Clear fields” – Empties all the input fields

“Operational” – Puts the device in operational state

“Reset node” – sends the device the node Reset request

Data Type	Description	Data Type	Bytes
BOOL	Boolean	BOOL	1
SINT	Short integer	SINT	1
INT	Integer	INT	2
DINT	Double integer	DINT	4
USINT	Unsigned short integer	USINT	1
UINT	Unsigned integer	UINT	2
UDINT	Unsigned double integer	UDINT	4
REAL	Floating point	FLOAT	4
TIME	Duration	UDINT	4
DATE	Date	UDINT	4
TIME_OF_DAY	Time of day	UDINT	4
DATE_AND_TIME	Date and time of day	UDINT	4
STRING	String	SHORT_STRING**	<i>n</i>
BYTE	Bit string length 8	USINT	1
WORD	Bit string length 16	UINT	2
DWORD	Bit string length 32	UDINT	4