

SRDO Configuration PlugIn

The CDE SRDO Configuration PlugIn can be used to configure SRDOs of CANopen Safety devices. It handles especially the most challenging task of the CRC calculation.

In order to use the CDE SRDO Configuration PlugIn, start the CDE, make sure it is connected to the CAN network and load the EDS file of the CANopen device which shall be configured.

The following introduction uses the emotas slave_srdo example, which uses a CANopen node-ID of 64 and has 2 SRDOs – one for transmission and one for reception.

After selecting the Node-ID 64 and loading the EDS file, the object dictionary in the object browser looks like this:

The screenshot shows the CDE SRDO Configuration PlugIn interface. At the top, there are tabs for 'Object Browser', 'Network', 'PDO Configuration', and 'PDO Tx & Rx'. Below the tabs, the 'Node-Id' is set to '64/0x40 - srdo producer' and the 'EDS' file is 'me/ged3/svn/01004/example_sl/slave_srdo/srdo.eds'. The 'Object Browser' on the left lists the following objects:

- Communication Segment
 - 0x1000 - Device Type
 - 0x1001 - Error Register
 - 0x1003 - Predefined Error Field
 - 0x1008 - Manufacturer device name
 - 0x1014 - COB ID EMCY
 - 0x1015 - Inhibit Time Emergency
 - 0x1016 - Consumer Heartbeat Time
 - 0x1017 - Producer Heartbeat Time
 - 0x1018 - Identity Object
 - 0x1029 - Error behaviour
 - 0x1200 - Server SDO Parameter
 - 0x1300 - Global Failsafe Command
 - 0x1301 - SRDO communication parameter
 - 0x1302 - SRDO communication parameter
 - 0x1381 - SRDO mapping parameter
 - 0x1382 - SRDO mapping parameter
 - 0x13FE - Configuration valid
 - 0x13FF - Safety configuration signature
- Manufacturer Segment
 - 0x2000 - Schalter 1
 - 0x2001 - Schalter 2
 - 0x2100 - LED 1
- Device Profile Segment

The 'Overview - Communication Segment' on the right shows a table with columns 'Sub', 'Name', and 'Value'. Below the table, there are buttons for 'Read', 'Write', 'Incr', and 'Decr', and a checkbox for 'Cyclic Read'. The text 'no description found' is displayed at the bottom.

Using a different device it would look different, but it should have SRDO configuration objects starting at 0x1301 in order to use SRDOs.

In order to verify that the CDE is able to communicate with the device, it is recommended to read the object 0x1000:0:

Objects

Communication Segment

0x1000 - Device Type

0 - Device Type

0x1001 - Error Register

0x1003 - Predefined Error Field

0x1008 - Manufacturer device name

0x1014 - COB ID EMCY

0x1015 - Inhibit Time Emergency

0x1016 - Consumer Heartbeat Time

0x1017 - Producer Heartbeat Time

0x1018 - Identity Object

0x1029 - Error behaviour

0x1200 - Server SDO Parameter

0x1300 - Global Failsafe Command

0x1301 - SRDO communication parameter

0x1302 - SRDO communication parameter

0x1381 - SRDO mapping parameter

0x1382 - SRDO mapping parameter

Index 0x1000 - Subindex 0x0

Attributes

Index	0x1000
SubIndex	0
Name	Device Type
Datatype	UNSIGNED32
Access	ro
PDO Mapping	no
Default Value	0

Current value

0x00000000 / 0

Status

Read successful

Profile: 0

☐Cyclic Read

Read

Write

One could use the CDE's object browser to manually configure the SRDO objects, but the SRDO configuration plugIn simplifies this task.

In order to open it, select PlugIns → SRDO Configuration and a new dialog will be opened. Check if the right node-ID is used and press 'Update' to read the data from the device.

Using our example, it will look like this:

SRDO Configuration

SRDO

SRDO 1 - Index 0x1301

SRDO Communication Settings - node 64 - SRDO 1

Direction	Transmit
Refresh Time/SCT	25 ms
SRVT	10 ms

COB-ID 1	0x00000107
COB-ID 2	0x00000180
Mapping	static
CRC	0x0000

Mapped Objects

	Index	Sub	Size	Name
1	0x2000	0x01	16	Schalter 1:normal
2	0x2001	0x01	16	Schalter 2:normal
3				
4				
5				
6				
7				

Update

Mapped Objects Inverted

	Index	Sub	Size	Name
1	0x2000	0x02	16	Schalter 1:inverted
2	0x2001	0x02	16	Schalter 2:inverted
3				
4				
5				
6				
7				

Verify

Send

NMT: Preop

SRDO: Set configuration valid

NMT: Start

	Time	ID	DLC	Data
SRDO	0.000000	0/0x000	0	
Inverted	0.000000	0/0x000	0	

With other devices, the PDO mapping, the CAN-IDs and the timings can be different. If the settings shall be modified, we can change e.g. the Safety Cycle Time to 1000ms, and the COB-IDs to 0x120 and 0x121. After that, the button 'Verify' can be pressed and it calculates the CRC for these values:

SRDO SRDO 1 - Index 0x1301

SRDO Communication Settings - node 64 - SRDO 1

Direction	Transmit	COB-ID 1	0x120
Refresh Time/SCT	1000	COB-ID 2	0x121
SRVT	10 ms	Mapping	static
		CRC	0x716f

Mapped Objects

Index	Sub	Size	Name	
1	0x2000	0x01	16	Schalter 1:normal
2	0x2001	0x01	16	Schalter 2:normal
3				
4				
5				
6				
7				

Mapped Objects Inverted

Index	Sub	Size	Name	
1	0x2000	0x02	16	Schalter 1:inverted
2	0x2001	0x02	16	Schalter 2:inverted
3				
4				
5				
6				
7				

Update

Verify

Send

NMT: Preop

SRDO: Set configuration valid

NMT: Start

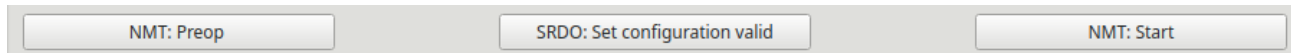
Using 'Send' the values can be sent by SDO to the device and it can be monitored in the CANopen Interpretation Window:

CANopen Interpretation							
Autoscroll		Relative time	Circular	Filter disabled	Refresh	HEX	
							Update Model Clear view
CAN Rx							Search ...
IF		Time Stamp	CAN-ID	Type	Node-Id	Data	Interpretation
2		883.308130	0x640	SDO	64 - srdo producer	2f 01 13 01 00 00 00 00	w Req exp 1301:1 Val 0x0 SRDO disabled
2		883.308182	0x5c0	SDO	64 - srdo producer	60 01 13 01 00 00 00 00	w Res - 1301:1
2		883.318437	0x640	SDO	64 - srdo producer	2b 01 13 02 e8 03 00 00	w Req exp 1301:2 Val 0x3e8 1000 ms
2		883.318485	0x5c0	SDO	64 - srdo producer	60 01 13 02 00 00 00 00	w Res - 1301:2
2		883.328750	0x640	SDO	64 - srdo producer	23 01 13 05 20 01 00 00	w Req exp 1301:5 Val 0x120
2		883.328834	0x5c0	SDO	64 - srdo producer	60 01 13 05 00 00 00 00	w Res - 1301:5
2		883.339052	0x640	SDO	64 - srdo producer	23 01 13 06 21 01 00 00	w Req exp 1301:6 Val 0x121
2		883.339093	0x5c0	SDO	64 - srdo producer	60 01 13 06 00 00 00 00	w Res - 1301:6
2		883.349405	0x640	SDO	64 - srdo producer	2f 01 13 01 01 00 00 00	w Req exp 1301:1 Val 0x1 Direction: Transmit
2		883.349453	0x5c0	SDO	64 - srdo producer	60 01 13 01 00 00 00 00	w Res - 1301:1
2		883.359635	0x640	SDO	64 - srdo producer	2b ff 13 01 6f 71 00 00	w Req exp 13ff:1 Val 0x716f
2		883.359674	0x5c0	SDO	64 - srdo producer	60 ff 13 01 00 00 00 00	w Res - 13ff:1

In order to start the device, we need to make sure that the 2nd SRDO is also configured with a valid CRC. In order to keep it simple, we just disable the 2nd SRDO by setting the Information Direction to "Disabled". After calculating the CRC, the settings can also be send to the device:

	Time Stamp	CAN-ID	Type	Node-Id	Data	Interpretation
2	1021.174046	0x640	SDO	64 - srdo producer	2f 02 13 01 00 00 00 00	w Req exp 1302:1 Val 0x0 SRDO disabled
2	1021.174093	0x5c0	SDO	64 - srdo producer	60 02 13 01 00 00 00 00	w Res - 1302:1
2	1021.185297	0x640	SDO	64 - srdo producer	2b 02 13 02 32 00 00 00	w Req exp 1302:2 Val 0x32 50 ms
2	1021.185353	0x5c0	SDO	64 - srdo producer	60 02 13 02 00 00 00 00	w Res - 1302:2
2	1021.195528	0x640	SDO	64 - srdo producer	23 02 13 05 01 01 00 00	w Req exp 1302:5 Val 0x101
2	1021.195561	0x5c0	SDO	64 - srdo producer	60 02 13 05 00 00 00 00	w Res - 1302:5
2	1021.205776	0x640	SDO	64 - srdo producer	23 02 13 06 02 01 00 00	w Req exp 1302:6 Val 0x102
2	1021.205807	0x5c0	SDO	64 - srdo producer	60 02 13 06 00 00 00 00	w Res - 1302:6
2	1021.225269	0x640	SDO	64 - srdo producer	2f 02 13 01 00 00 00 00	w Req exp 1302:1 Val 0x0 SRDO disabled
2	1021.225343	0x5c0	SDO	64 - srdo producer	60 02 13 01 00 00 00 00	w Res - 1302:1
2	1021.292094	0x640	SDO	64 - srdo producer	2b ff 13 02 00 00 00 00	w Req exp 13ff:2 Val 0x0
2	1021.292172	0x5c0	SDO	64 - srdo producer	60 ff 13 02 00 00 00 00	w Res - 13ff:2

After that the 'Configuration Valid' object can be set and the device can be started using the 2 buttons close to the bottom of the SRDO Configuration window:



After that, the SRDOs can also be seen in the CANopen Interpretation:

CAN Rx

Search ...

	Time Stamp	CAN-ID	Type	Node-Id	Data	Interpretation
2	1317.148655	0x121	SRDO	64 - srdo producer	7b 18 fe ff	~0x84 ~0x84
2	1317.178585	0x740	Error Control	64 - srdo producer	05	Operational
2	1317.648593	0x120	SRDO	64 - srdo producer	a8 bb 01 00	0xa8 0xa8
2	1317.648643	0x121	SRDO	64 - srdo producer	57 44 fe ff	~0xa8 ~0xa8
2	1317.678590	0x740	Error Control	64 - srdo producer	05	Operational
2	1318.148588	0x120	SRDO	64 - srdo producer	41 f0 00 00	0x41 0x41
2	1318.148647	0x121	SRDO	64 - srdo producer	be 0f ff ff	~0x41 ~0x41
2	1318.178583	0x740	Error Control	64 - srdo producer	05	Operational