

# AN704 – LSS Protocol with Axiomatic CANopen® Products

## Introduction

LSS stands for Layer-setting service. The LSS protocol can be used to configure Node ID and/or the baud rate for Axiomatic CANopen® products.

### Setting Node ID:

- 1) Set the module to state LSS-Configuration by sending the following message:

Item	Value
COB-ID	0x7E5
Length	2
Data 0	0x04
Data 1	0x01

- 2) Set the node ID by sending the following message:

Item	Value
COB-ID	0x7E5
Length	2
Data 0	0x11
Data 1	Node-ID

\*Node ID is the desired Node ID as a hexadecimal number.

- 3) The module will send the following response (unless there is an error):

Item	Value
COB-ID	0x7E4
Length	3
Data 0	0x11
Data 1	0x00
Data 2	0x00

- 4) Save the configuration by sending the following message:

Item	Value
COB-ID	0x7E5
Length	3
Data 0	0x17

- 5) The module will send the following response (unless there is an error):

Item	Value
COB-ID	0x7E4
Length	3
Data 0	0x17
Data 1	0x00
Data 2	0x00

- 6) Set the module to state LSS-operation by sending the following message (Note - the module will reset itself):

Item	Value
COB-ID	0x7E5
Length	2
Data 0	0x04
Data 1	0x00

**Setting Baud rate with LSS:**

- 1) Set the module to state LSS configuration by sending the following message:

Item	Value
COB-ID	0x7E5
Length	2
Data 0	0x04
Data 1	0x01

- 2) Set the baud rate by sending the following message:

Item	Value
COB-ID	0x7E5
Length	3
Data 0	0x13
Data 1	0x00
Data 2	Baud rate Index

3) Where the baud rate index is one of the following:

Index	Baud rate	Index	Baud rate
0x00	1000 kbps	0x04	125 kbps
0x01	800 kbps	0x06	50 kbps
0x02	500 kbps	0x07	20 kbps
0x03	250 kbps	0x08	10 kbps

4) The module will send the following response (unless there is an error):

Item	Value
COB-ID	0x7E4
Length	3
Data 0	0x13
Data 1	0x00
Data 2	0x00

5) Activate the bit timing parameters:

Item	Value
COB-ID	0x7E5
Length	3
Data 0	0x15
Data 1	<delay lsb>
Data 2	<delay msb>

There will be a delay of <delay> milliseconds before the bit timing is changed, and another such delay before communications are enabled.

6) Send the following message to set the module to state LSS operation (Note - the module will reset itself):

Item	Value
COB-ID	0x7E5
Length	2
Data 0	0x04
Data 1	0x00

7) Set the module to state LSS operation:

Item	Value
COB-ID	0x7E5
Length	2
Data 0	0x04
Data 1	0x00

**LSS Command and Responses:**

	ID	Length	D0	D1	D2	D3	D4	D5	D6	D7	
Send	000	2	80	00	00	00	00	00	00	00	Preop. All Nodes
Send	7E5	8	04	01	00	00	00	00	00	00	Configuration State
Send	7E5	8	11	03	00	00	00	00	00	00	Set Node ID to 3
Response	7E4	8	11	00	00	00	00	00	00	00	Response: OK
Send	7E5	8	17	00	00	00	00	00	00	00	Store Configuration
Response	7E4	8	17	00	00	00	00	00	00	00	Response: OK
Send	7E5	8	04	00	00	00	00	00	00	00	Waiting State
Send	000	2	81	00							Reset Node - ID

**Setting Configuration Tool to 250kbps:**

Item	Value
COB-ID	0x7E5
Length	1
Data 0	0x17
Data 1	0x00

**Resetting the Module:**

Item	Value
COB-ID	0x7E5
Length	2
Data 0	0x04
Data 1	0x00

Version	Date	Authors	Comments
1.00	February 14, 2020	Antti Keranen / Sue Thomas	Initial Release
1.01	March 25, 2020	Gustavo Del Valle / Sue Thomas	Updated 'CAN open' to 'CANopen' ('CANopen' was later updated to 'CANopen®')
1.02	December 16, 2020	Gustavo Del Valle / Sue Thomas	Updated baud rate to 2 words.
1.03	July 6, 2023	Kiril Mojsov	Legacy Updates & Marketing Review

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