



LIN & SENT

FL3X Training

www.star-cooperation.com

LIN

Local Interconnect Network (LIN) is a broadcast serial communication containing a single master with up to 15 subsequent slaves. The LIN Master has complete control over the whole communication, transmitting the header on the bus based on the schedule tables. Additionally, it has the slave task of transmitting and receiving data. LIN slaves can also react by sending, receiving, or ignoring the frame response. LIN follows a fixed time sending scheme which is mapped in the LIN database LDF.

SENT

Single Edge Nibble Transmission (SENT) is a unidirectional point-to-point serial communication based on the successive falling edges. The SENT protocol is an asynchronous voltage interface which is predominantly used for data transmission between high resolution sensor modules in a series of pulses and the ECU.

SENT consists of two main Transmission protocols:

- Fast channel data transmission format
- Slow channel data transmission format

The basic concept of Slow channel is to transmit one bit corresponding to Slow channel within every Fast channel and complete one Slow channel data transmission with the help of many Fast channel frames. The field "status and communication nibble" is used to transmit Slow channel data within the Fast channel data.

AGENDA

09:00 – 09:15	Introduction to LIN
09:15 – 09:45	LIN Physical layer
09:45 – 10:00	Practical part I
10:00 – 10:30	Break
10:30 – 11:15	LIN Data Transmission/LIN Error Handling
11:15 – 11:30	Practical part II
11:30 – 13:00	Break
13:00 – 13:15	Introduction to SENT
13:15 – 13:45	SENT Physical layer
13:45 – 14:15	Break
14:15 – 15:00	SENT Data Transmission
15:00 – 15:15	Practical part III (SENT Data Transmission)
15:15 – 15:30	Practical part IV (SENT Physical layer)
15:30 – 16:00	Results/summary/open questions

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LIN TRAINING COVERS BOTH THE THEORETICAL & PRACTICAL PARTS

- **LIN Overview with respect to Automotive Domain**
- **LIN Physical layer**
 - LIN Bus Logic (Dominant & Recessive)
 - LIN Bus voltage
 - LIN Transceiver
 - LIN Serial Interface
 - LIN Connectors
 - LIN Bus Error Analysis in Oscilloscope
- **LIN Data Transmission**
 - LIN Master/Slave Tasks
 - The Principle of LIN Schedule Table
 - LIN Frame Format
 - LIN Frame Types
 - LIN Frame Header
 - LIN Frame Response
 - LIN Communication Workflow
 - PID/Checksum Calculation in the LIN Data frame format
- **LIN Error Handling**
 - LIN Error detection mechanisms

SENT TRAINING COVERS BOTH THE THEORETICAL & PRACTICAL PARTS

- **SENT Overview with respect to Automotive Domain**
- **SENT Physical layer**
 - SENT Physical Layer Topology
 - SENT Connectors
 - Bus Wiring Harshness and ECU Connectors
 - Oscilloscope traces of SENT Fast/Slow Channel transmission
- **SENT Data Transmission**
 - Basic Definition for SENT Terminology
 - SENT Fast Channel Data Frame Format
 - Standard Format
 - Single Secure Message Format
 - High Speed Format
 - SENT Slow Channel Data Frame Format
 - Short Serial Message
 - Enhanced Serial Message
 - Data Encoding Method for SENT Formats

FACTS/CONDITIONS

	At STAR	AT CUSTOMER location	ONLINE
Min. participants	3	6	1
Max. participants	20	20	20
Appointment	by arrangement	by arrangement	by arrangement
Incl. Lunch and drinks	•	-	-
Language	english	english	english
Language documents	english	english	english
Documentation	digital	digital	digital
Certificate	•	•	•
Location	Star Goeppingen	in Germany only	online
Praxis parts	•	•	•

ORDER INFORMATION

Product	Description	Order number
FL3X Training LIN, SENT (@ STAR)	1 day on LIN, SENT at STAR ELECTRONICS location	3-00202I01
FL3X Training LIN, SENT (@ Customer)	1 day on LIN, SENT at customers location	3-00202J01
FL3X Training LIN, SENT (Online)	1 day on LIN, SENT online	3-00202K01