

Experiment 3

Name	NURUL ATIRAH SOLEHAH BT MAZLAN
Group Number	HB17002
Date	15 JUNE 2020

3.1. Introduction

a) How is a LIN message set up?

All data is sent in a Frame Slot which contains a Header, a Response and some Response Space so the Slave will have time to answer. Every frame is sent in a frame slot determined by the LIN Description File (LDF). Messages are created when the Master node broadcasts a frame containing a header. The Slave node(s) then fills the frame with data depending on the header sent from the Master. The data that are exchanged in the frames are referred to as Signals.

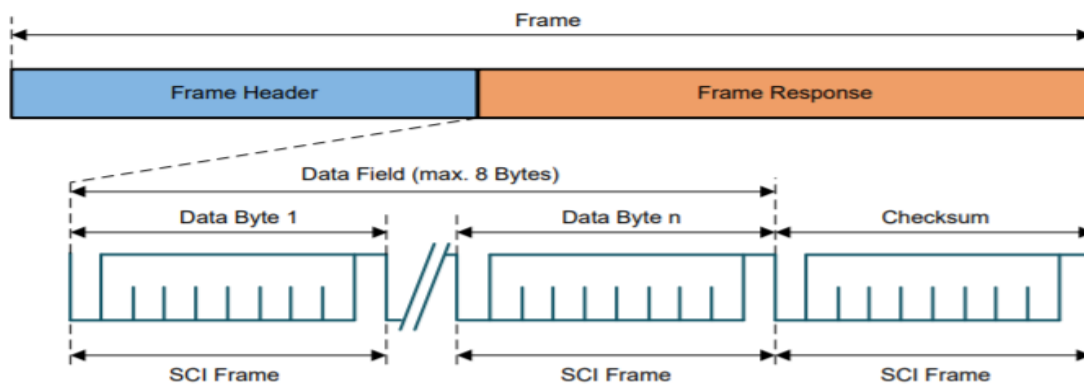


Figure 6. LIN® Frame Response

b) What does start bit and stop bit mean and what is their polarity?

Two bytes are sent, each consisting of a start bit, followed by eight data bits (bits 0-7), and one stop bit, for a 10-bit character frame. The last data bit is sometimes used as a parity bit.



The **start bit (LOW)** is used to signal the beginning of a frame. The **stop bit (HIGH)** is used to signal the end of a frame. The data is contained in the data bits and the parity bit is an extra bit that is often used to detect transmission errors.

Stop bit is required so that there is always a transition at the leading edge of the start bit. Otherwise, if the last data bit on the previous character happened to be of the same polarity as a start bit, the receiver wouldn't be able to see the start bit if a new character was sent immediately.

c) What are the roles of the master and the slave in the LIN network?

LIN is a broadcast serial network comprising 16 nodes (one master and typically up to 15 slaves). All messages are initiated by the master with at most one slave replying to a given message identifier. The master node can also act as a slave by replying to its own messages.

The slave waits for synch break and then the synchronization between master and slave begins on synch byte. Depending on the identifier sent from the master the slave will either receive or transmit or do nothing at all. A slave that should transmit sends the number of bytes which the master has requested and then ends the transmission with a checksum field.

d) What are the signals' levels that are defined in the LIN bus?

The LIN protocol is byte oriented, which means that data is sent one byte at a time. One byte field contains a start bit (dominant), 8 data bits and a stop bit (recessive). The data bits are sent LSB first. The synch break is the beginning of a Message Frame. It contains at least 13 bits of dominant value including the start bit followed by at least 1 bit long recessive break delimiter. The synch byte or the synch field is used to determine the time between two rising edges to determine the transmission rate which the master node uses.

e) What are the electrical connections needed for the LIN bus?

- Low-cost silicon implementation based on common UART/SCI interface hardware, an equivalent in software or as a pure state machine.
- Self-synchronization without a quartz or ceramics resonator in the slave nodes
- Low cost, single-wire to connect automotive electronic control units (ECUs)
- Bit rate speed up to 20 kbit/s