**LIN Slave 4 Requirements.**

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| --- | --- | --- | --- | --- |
| **History** | | | | |
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| 1.1 | Draft  06-Aug-15 | Roberto Palos | Alexis Garcia /  Roberto Palos | Added Cover To File And History Table For Revisions.  Added table number and footnote.  Added Assumptions at the end of the file.  Added Scheduling Tables. |

LIN Module Requirements

The LIN module is the responsible for the communication between a master and a slave; the master sends commands for various actions for a led and receives a response for one of the slaves.

For this implementation it shall be 1 master and 4 slaves.

This module is the SLAVE 4, so only can accept commands sends to SLAVE4.

The messages Data Base is composed by the next table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Msg ID** | **Msg Name** | **Msg Data Len** | **Msg Publisher** | **Msg Subscribers** | **Msg Callback** |
| CF | MASTER\_CMD\_ALL | 1 | MASTER | SLAVE1, SLAVE2, SLAVE3, SLAVE4 | Auto |
| 50 | MASTER\_CMD\_SLV1 | 1 | MASTER | SLAVE1 | Auto |
| 11 | MASTER\_CMD\_SLV2 | 1 | MASTER | SLAVE2 | Auto |
| 92 | MASTER\_CMD\_SLV3 | 1 | MASTER | SLAVE3 | Auto |
| D3 | MASTER\_CMD\_SLV4 | 1 | MASTER | SLAVE4 | Auto |
| 20 | SLAVE1\_RSP | 2 | SLAVE1 | MASTER | Auto |
| 61 | SLAVE2\_RSP | 2 | SLAVE2 | MASTER | Auto |
| E2 | SLAVE3\_RSP | 2 | SLAVE3 | MASTER | Auto |
| A3 | SLAVE4\_RSP | 2 | SLAVE4 | MASTER | Auto |
| F0 | SLAVE1\_ID | 7 | SLAVE1 | MASTER | Auto |
| B1 | SLAVE2\_ID | 7 | SLAVE2 | MASTER | Auto |
| 32 | SLAVE3\_ID | 7 | SLAVE3 | MASTER | Auto |
| 73 | SLAVE4\_ID | 7 | SLAVE4 | MASTER | Auto |

1. - Messages Table.

There are 5 signal types:

* Stat: Enabled or disabled.
* Command: None command, LED on, LED off, LED toggle, Slave disable and Slave enabled.
* LED stat: LED is ON, LED is OFF and LED is Toggling.
* Target active: ACTIVE or INACTIVE.
* Boolean: TRUE and FALSE.

There are 21 possible signals including the 4 slaves

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Signal Name** | **Signal Msg** | **Signal Start Byte** | **Signal Start Bit** | **Signal Len (bits)** | **Signal Type** |
| master\_cmdForAll | MASTER\_CMD\_ALL | 0 | 0 | 4 | t\_cmdType |
| master\_cmdForSlave1 | MASTER\_CMD\_SLV1 | 0 | 0 | 4 | t\_cmdType |
| master\_cmdForSlave2 | MASTER\_CMD\_SLV2 | 0 | 0 | 4 | t\_cmdType |
| master\_cmdForSlave3 | MASTER\_CMD\_SLV3 | 0 | 0 | 4 | t\_cmdType |
| master\_cmdForSlave4 | MASTER\_CMD\_SLV4 | 0 | 0 | 4 | t\_cmdType |
| slave1\_LEDstat | SLAVE1\_RSP | 0 | 0 | 2 | t\_LEDstat |
| slave1\_enabled | SLAVE1\_RSP | 1 | 0 | 1 | t\_boolean |
| slave1\_supplier | SLAVE1\_ID | 0 | 0 | 8 | Scalar |
| slave1\_serial | SLAVE1\_ID | 1 | 0 | 48 | Array |
| slave2\_LEDstat | SLAVE2\_RSP | 0 | 0 | 2 | t\_LEDstat |
| slave2\_enabled | SLAVE2\_RSP | 1 | 0 | 1 | t\_boolean |
| slave2\_supplier | SLAVE2\_ID | 0 | 0 | 8 | Scalar |
| slave2\_serial | SLAVE2\_ID | 1 | 0 | 48 | Array |
| slave3\_LEDstat | SLAVE3\_RSP | 0 | 0 | 2 | t\_LEDstat |
| slave3\_enabled | SLAVE3\_RSP | 1 | 0 | 1 | t\_boolean |
| slave3\_supplier | SLAVE3\_ID | 0 | 0 | 8 | Scalar |
| slave3\_serial | SLAVE3\_ID | 1 | 0 | 48 | Array |
| slave4\_LEDstat | SLAVE4\_RSP | 0 | 0 | 2 | t\_LEDstat |
| slave4\_enabled | SLAVE4\_RSP | 1 | 0 | 1 | t\_boolean |
| slave4\_supplier | SLAVE4\_ID | 0 | 0 | 8 | Scalar |
| slave4\_serial | SLAVE4\_ID | 1 | 0 | 48 | Array |

2. - Signals Table.

The endianness for the module shall be Little Endian.

Scheduling Tables.

|  |  |
| --- | --- |
| **Table Name** | **Can be Interrupted** |
| sched\_SlvIDs | Yes |
| **Msg** | **Size Ticks** |
| SLAVE1\_ID | 12 |
| SLAVE2\_ID | 12 |
| SLAVE3\_ID | 12 |
| SLAVE4\_ID | 12 |

3. - sched\_SlvIDs table.

|  |  |
| --- | --- |
| **Table Name** | **Can be Interrupted** |
| sched\_SlvCmdAndStats | Yes |
| **Msg** | **Size Ticks** |
| MASTER\_CMD\_SLV1 | 10 |
| SLAVE1\_RSP | 5 |
| MASTER\_CMD\_SLV2 | 10 |
| SLAVE2\_RSP | 5 |
| MASTER\_CMD\_SLV3 | 10 |
| SLAVE3\_RSP | 5 |
| MASTER\_CMD\_SLV4 | 10 |
| SLAVE4\_RSP | 5 |

4. - sched\_SlvCmdAndStats table.

|  |  |
| --- | --- |
| **Table Name** | **Can be Interrupted** |
| sched\_AllCmd | No |
| **Msg** | **Size Ticks** |
| MASTER\_CMD\_ALL | 10 |
| SLAVE1\_RSP | 5 |
| SLAVE2\_RSP | 5 |
| SLAVE3\_RSP | 5 |
| SLAVE4\_RSP | 5 |

5. - sched\_AllCmd table.

|  |  |
| --- | --- |
| **Table Name** | **Can be Interrupted** |
| sched\_testing | No |
| **Msg** | **Size Ticks** |
| SLAVE1\_ID | 12 |
| SLAVE2\_ID | 12 |
| SLAVE3\_ID | 12 |
| SLAVE4\_ID | 12 |
| MASTER\_CMD\_SLV1 | 10 |
| SLAVE1\_RSP | 5 |
| MASTER\_CMD\_SLV2 | 10 |
| SLAVE2\_RSP | 5 |
| MASTER\_CMD\_SLV3 | 10 |
| SLAVE3\_RSP | 5 |
| MASTER\_CMD\_SLV4 | 10 |
| SLAVE4\_RSP | 5 |
| MASTER\_CMD\_ALL | 10 |
| SLAVE1\_RSP | 5 |
| SLAVE2\_RSP | 5 |
| SLAVE3\_RSP | 5 |
| SLAVE4\_RSP | 5 |

6. - sched\_testing table.

Assumptions:

* The LIN version used for this implementation shall be LIN 2.0 (for more information you can go to <http://www.intron-tech.com/downfile%5CCANcriterion%5CLIN%20v2.0_L.pdf>)
* The baud rate used for the LIN protocol shall be 19 200 kilobits per second.
* In the signals table (Table 2).The “slave4\_enabled” the type must be “t\_target\_active” not “t\_boolean”. This allows a better code understanding at the time of read code. And the same for all “slaveX\_enabled” where “X” means the number of the slave.