

# ASCLIN\_LIN\_Master\_1 for KIT\_AURIX\_TC375\_LK

LIN Master Communication via ASCLIN module

AURIX™ TC3xx Microcontroller Training  
V1.0.0



[Please read the Important Notice and Warnings at the end of this document](#)

## Scope of work

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**An ASCLIN module is configured as LIN master to send "Hello World!".**

The string "Hello World!" is sent via an ASCLIN module configured as LIN master. The signal can be visualized using an oscilloscope.

# Introduction

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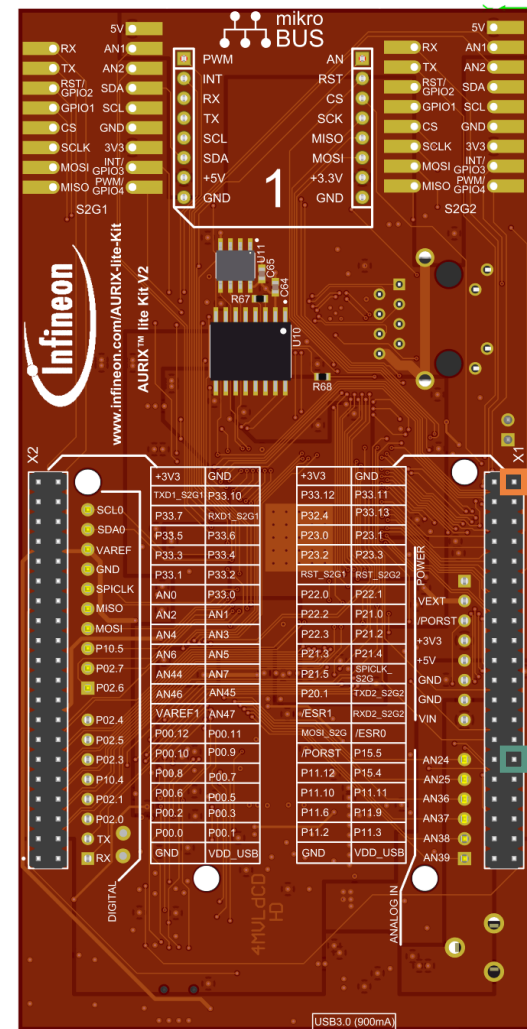
- › The Asynchronous/Synchronous Interface (ASCLIN) module provides asynchronous serial communication with external devices, using data-in and data-out signals only.
  
- › A LIN bus consists of one master and typically up to 15 slaves which are communicating together.
  
- › The LIN protocol configured as a master supports three transactions:
  - TxH – Transmission of Header
  - TxR – Transmission of Message
  - RxR – Reception of Message
  
- › A LIN frame consists of two parts:
  - The header, which is always sent by the LIN Master
  - The response, which is sent either by the LIN Master or the addressed LIN Slave

# Hardware setup

This code example has been developed for the board KIT\_A2G\_TC375\_LITE.

The port pin P15.5 (LIN-TX/RX) should be connected to an oscilloscope probe.

	X1		
+3V3	2	1	GND
P33.12	4	3	P33.11
P32.4	6	5	P33.13
P23.0	8	7	P23.1
P23.2	10	9	P23.3
RST_S2G1 - P23.4	12	11	P23.5 - RST_S2G2
P22.0	14	13	P22.1
P22.2	16	15	P21.0
P22.3	18	17	P21.2
MDIO - P21.3	20	19	P21.4
P21.5	22	21	P20.10 - SPICLK_S2G
P20.1	24	23	P20.0 - TXD2_S2G2
/ESR1	26	25	P20.3 - RXD2_S2G2
MOSI_S2G - P20.14	28	27	/ESR0
Reset - /PORST	30	29	P15.5
CLK50 - P11.12	32	31	P15.4
RX_D0 - P11.10	34	33	P11.11 - CRS_DV
TX_EN - P11.6	36	35	P11.9 - RX_D1
TX_D1 - P11.2	38	37	P11.3 - TX_D0
GND	40	39	VDD_USB



Ground

TX/RX

# Implementation

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## Configuration of the ASCLIN module:

The function ***init\_ASCLIN\_LIN\_master()*** is used to configure the ASCLIN module in master mode and is called once by CPU0. It contains the following steps:

1. The module configuration is created with the structure ***IfxAsclin\_Lin\_Config*** and filled in with default values using the function ***IfxAsclin\_Lin\_initModuleConfig()***.
2. The LIN module is configured to operate as master by setting the ***linMode*** parameter.
3. The desired baudrate is selected with the parameter ***brg.baudrate***.
4. The pin configuration is set using the predefined structure ***IfxAsclin\_Lin\_Pins***.
5. The ASCLIN module is initialized with ***IfxAsclin\_Lin\_initModule()***.

All functions required for the configuration of the ASCLIN module are provided by the iLLD header ***IfxAsclin\_Lin.h***.

# Implementation

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## Transmission of header and response by the master:

Sending the string "Hello World!" is implemented inside the function ***send\_ASCLIN\_message()*** which is called once after initialization of the ASCLIN module:

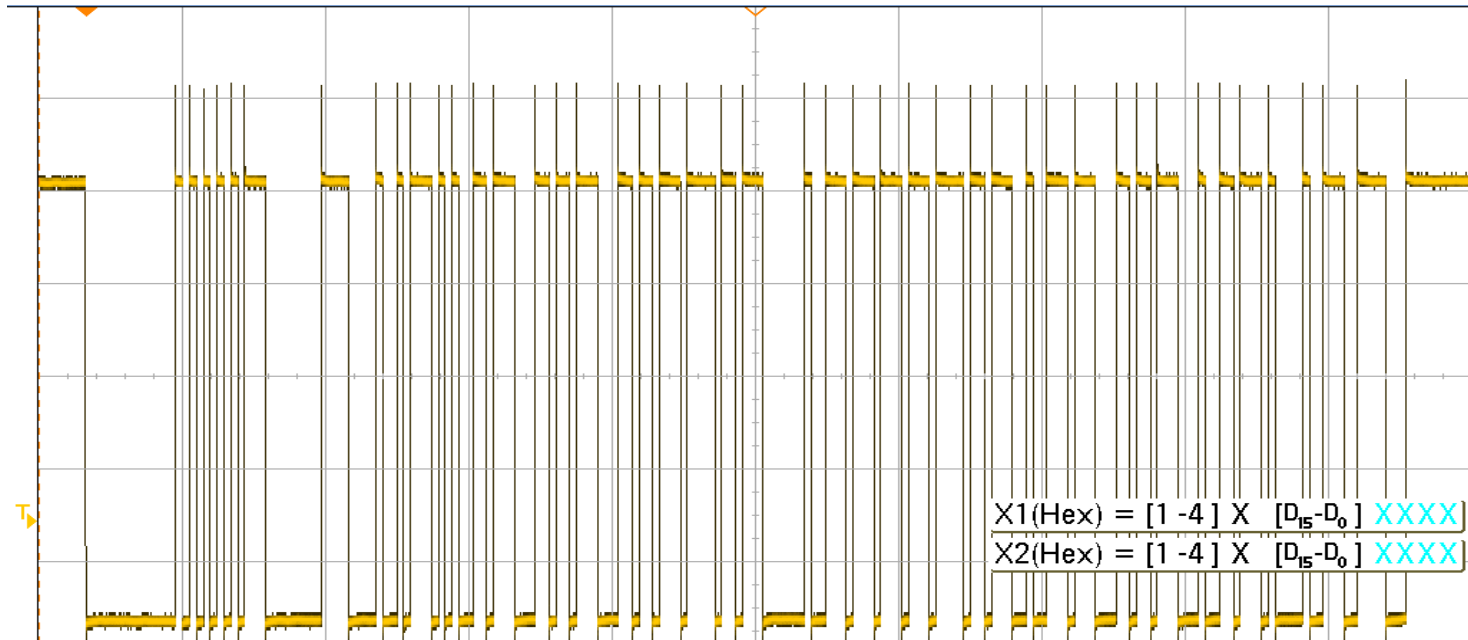
1. The ID byte is set to send a response after the header.
2. The frame "Hello World!" is defined.
3. The correct header is sent with the function ***IfxAsclin\_Lin\_sendHeader()***.
4. The transmission of header is checked by using the parameter ***txHeaderEnd*** of the structure ***acknowledgmentFlags***.
5. The frame is sent with the function ***IfxAsclin\_Lin\_sendResponse()***.

The functions above are provided by the iLLD header ***IfxAsclin\_Lin.h***.

# Run and Test

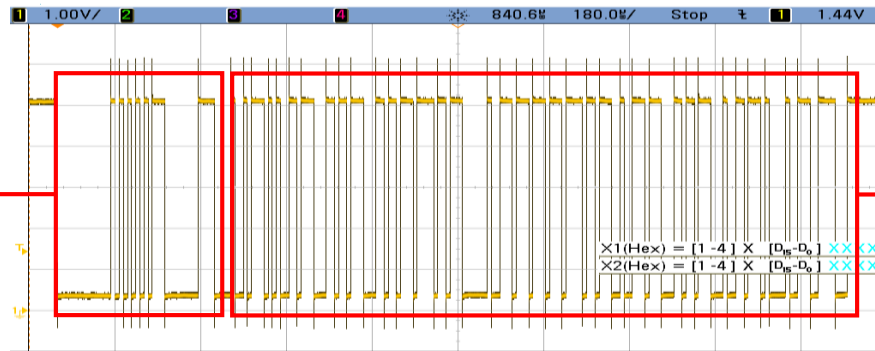
After code compilation and flashing the device, perform the following steps:

- > Connect the oscilloscope probe to the TX/RX pin (P15.5)
- > Reset and run the program by pressing the PORST push button
- > Check the oscilloscope for the LIN signal:

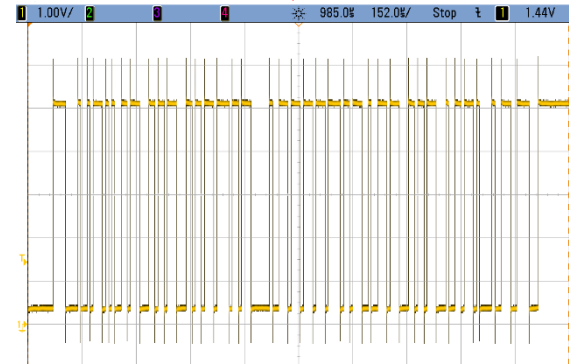


# Run and Test

- > In the signal both the header and the frame "Hello World!" can be observed:



> Header



> Frame "Hello World!"



# References



- › AURIX™ Development Studio is available online:
- › <https://www.infineon.com/aurixdevelopmentstudio>
- › Use the „*Import...*“ function to get access to more code examples.



- › More code examples can be found on the GIT repository:
- › [https://github.com/Infineon/AURIX\\_code\\_examples](https://github.com/Infineon/AURIX_code_examples)



- › For additional trainings, visit our webpage:
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**Edition 2021-03**

**Published by**

**Infineon Technologies AG  
81726 Munich, Germany**

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**Document reference**

**ASCLIN\_LIN\_Master\_1\_KIT\_TC375\_LK**

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