ASCLIN_LIN_Master_1 for KIT_AURIX_TC297_TFT

LIN master communication via ASCLIN module

AURIX™ TC2xx Microcontroller Training
V1.0.0

Please read the Important Notice and Warnings at the end of this document

Scope of work

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.

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Introduction

- 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

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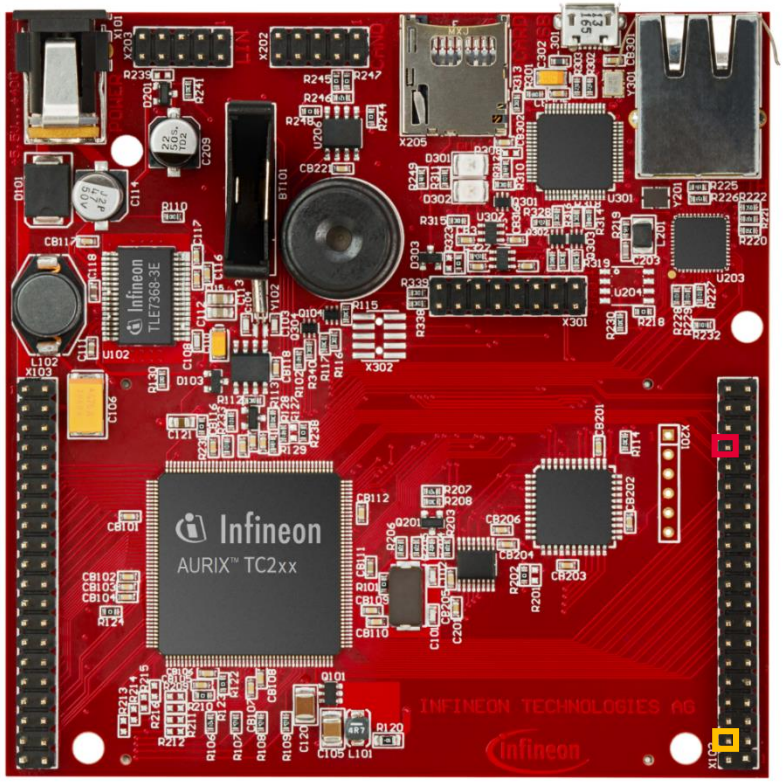
Hardware setup

This code example has been developed for the board KIT_AURIX_TC297_TFT_BC-Step.
The port pin P15.5 (LIN-TX/RX) should be connected to an oscilloscope probe.



		X102		
	P14.5	40	39	P14.4
	P20.10	38	37	P20.9
	P15.7	36	35	P15.6
TX/RX	P15.5	34	33	P15.4
	P15.3	32	31	P15.2
	P22.3	30	29	P22.2
	P22.1	28	27	P22.0
	P33.11	26	25	P23.4
	P23.3	24	23	P23.2
	P23.1	22	21	P23.0
	P33.6	20	19	P33.8
	P33.12	18	17	P33.1
	P33.2	16	15	P33.3
	P33.4	14	13	P33.5
	AN0	12	11	AN8
	AN2	10	9	AN3
	AN32	8	7	AN33
	AN20	6	5	AN21
Ground	GND	4	3	GND
	V_UC(+5V)	2	1	VCC_IN

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Implementation

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 baud rate 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***.

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Implementation

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***.

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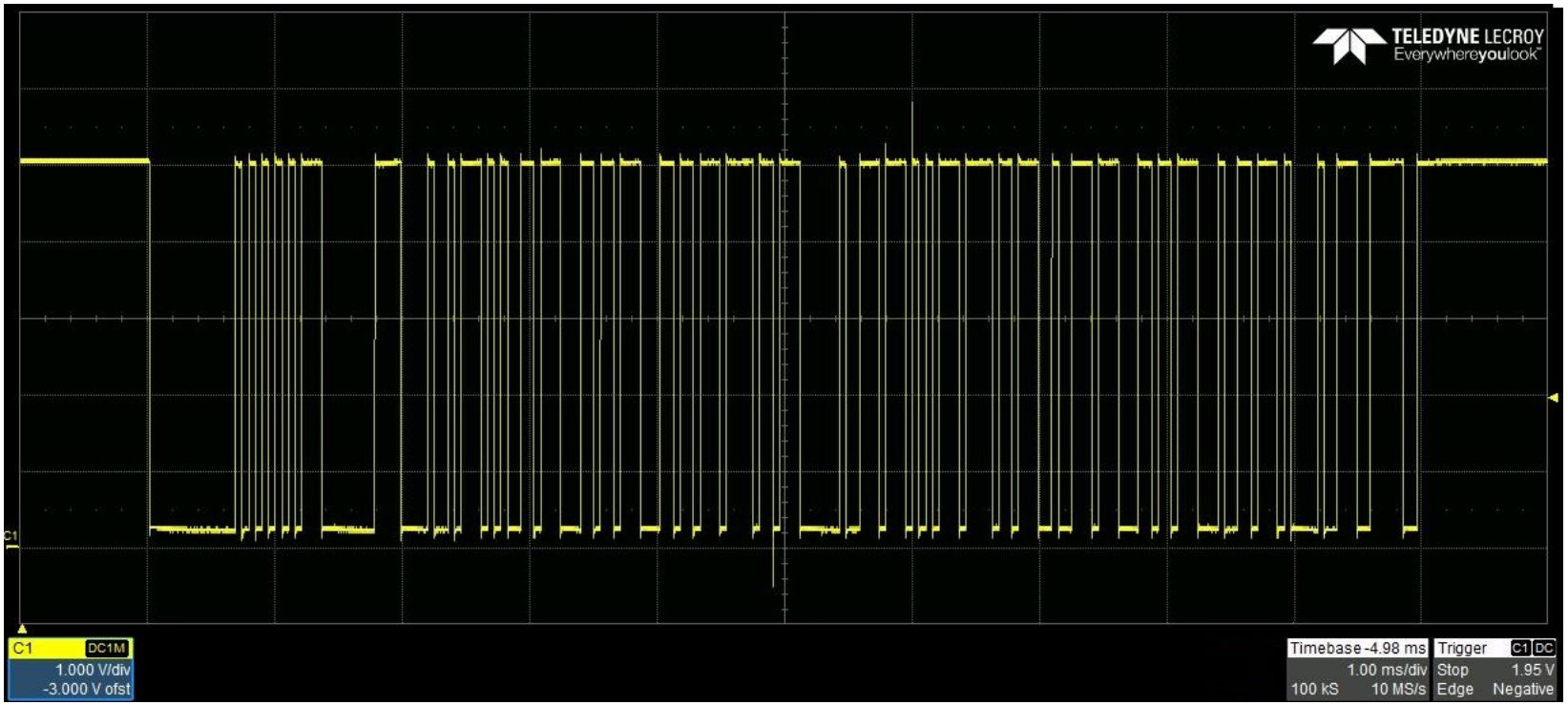
Run and Test

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:



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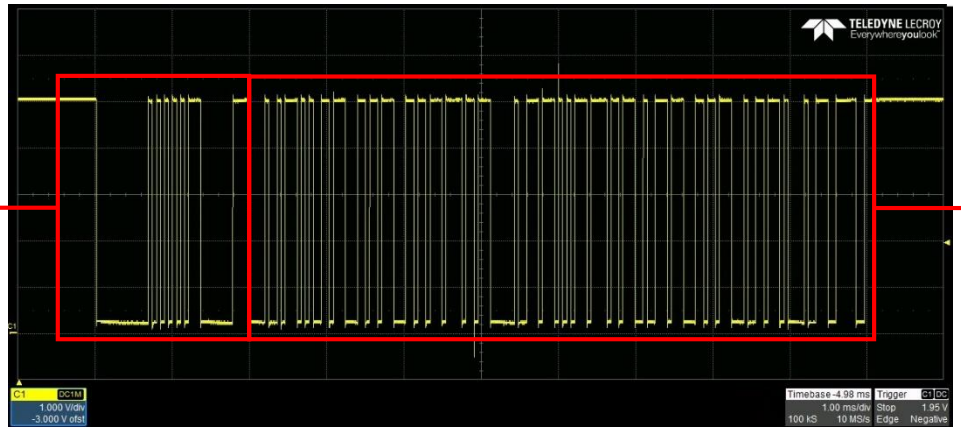
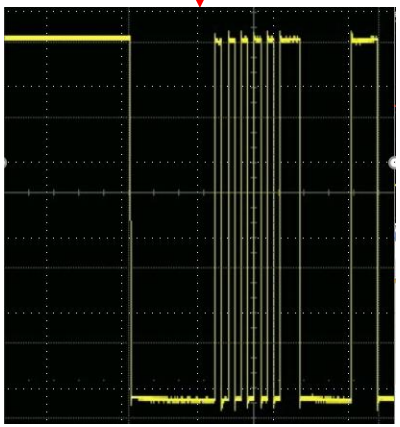
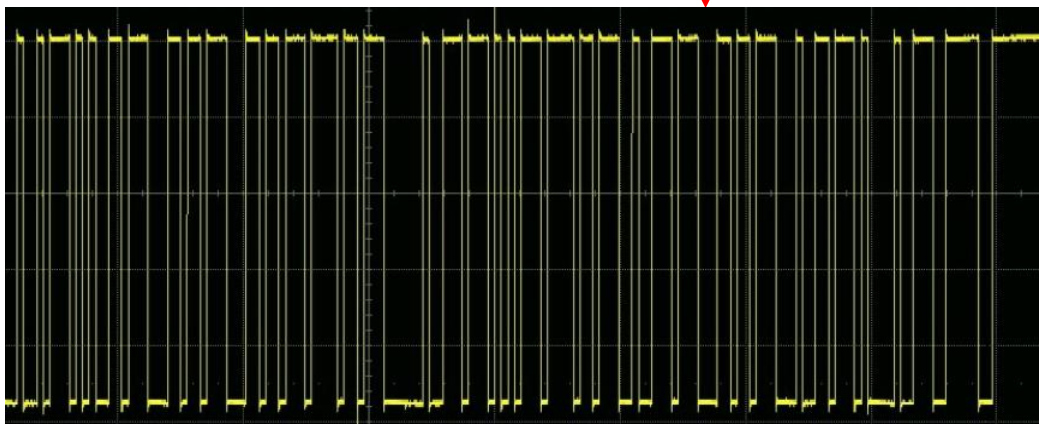
Run and Test

› In the signal both the header and the frame „Hello World!“ can be observed:





› Header



› Frame „Hello World!“

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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

- For additional trainings, visit our webpage:
- https://www.infineon.com/aurix-expert-training

- For questions and support, use the AURIX™ Forum:
- https://www.infineonforums.com/forums/13-Aurix-Forum

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