ASCLIN_LIN_Master_1
for KIT_AURIX_TC297_TFT
LIN master communication via ASCLIN module

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.
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
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.
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`. 
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`. 
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:

![Oscilloscope Graph]

Copyright © Infineon Technologies AG 2020. All rights reserved.
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

› 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
## Revision history

<table>
<thead>
<tr>
<th>Revision</th>
<th>Description of change</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1.0.1</td>
<td>Update of version to be in line with the code example’s version</td>
</tr>
<tr>
<td>V1.0.0</td>
<td>Initial version</td>
</tr>
</tbody>
</table>
IMPORTANT NOTICE
The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffenheitsgarantie").

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer’s compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer’s products and any use of the product of Infineon Technologies in customer’s applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer’s technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office (www.infineon.com).

WARNINGS
Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies’ products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.