Application Note

Astra™ Machina Foundation Series CAN Driver Module Hardware Connection

Abstract: This application note details the CAN Driver Module connection for core modules containing the SL16x0 SoC.

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1. Overview

The Astra™ Machina Foundation Series offers evaluation-ready kits that facilitate quick and straightforward prototyping with the Synaptics® SL-Series of embedded Linux® and Android™ processors. Featuring a modular design, these kits include interchangeable core compute modules, a standard I/O board and variety of daughter cards for connectivity, debugging, and various I/O configurations.

1.1. Scope

This document offers a CAN driver Module connection diagram specifically for core modules containing the SL16x0 SoC. It is designed to connect various CAN modules for industrial applications.

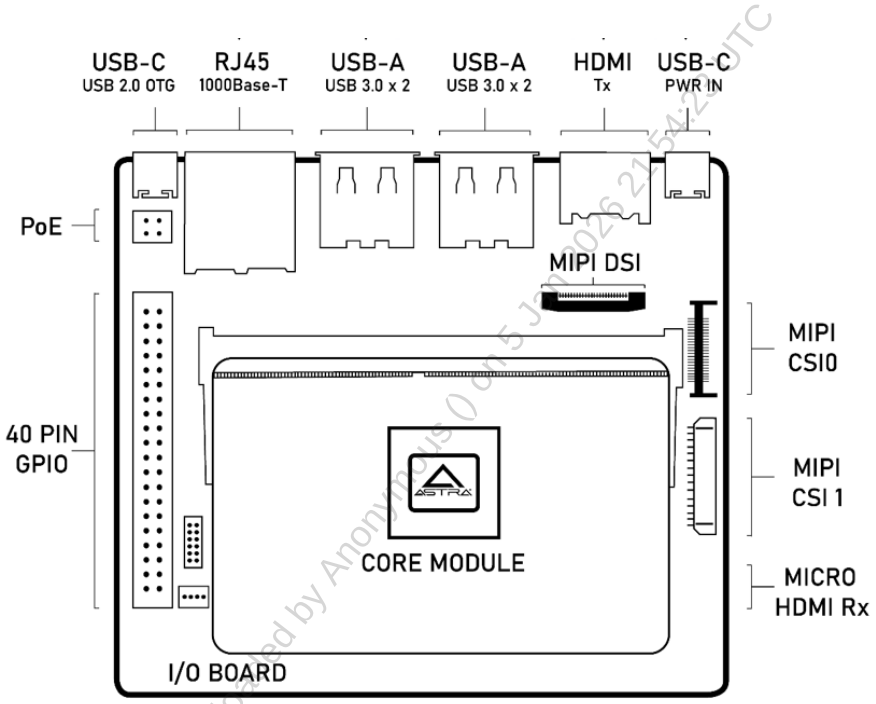

Figure 1: Overview of Astra Machina Foundation Series

1.2. Hardware Accessory Items Needed for CAN module interface

[a] Synaptics Astra Machina SL16x0 evaluation board.

[b] MIKROE-986 CAN SPI CLICK 3.3V Module (MCP2515 CAN Controller + SN65HVD230 CAN 3.3V Transceivers) can be found in below links:

- CAN SPI CLICK 3.3V Module Link-1
- CAN SPI CLICK 3.3V Module Link-2

- CAN SPI Click 3.3V is based on the MCP2515 and SN65HVD230 CAN transceiver.
- CAN V2.0B at 1Mbps, capable of transmitting and receiving standard and extended data and remote frames.
- CAN SPI Click 3.3V uses a standard 4-wire SPI serial interface to host supporting Mode 0 and Mode 3, with speeds up to 10MHz.
- 3.3V Single Supply, RST, and INT signals available on CAN SPI Click 3.3V.

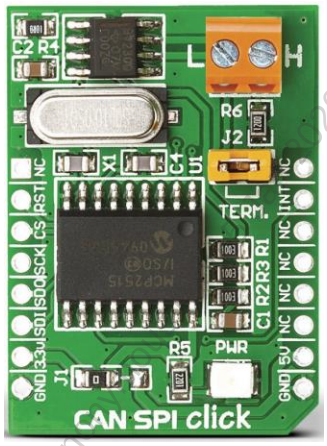

Figure 2. CAN SPI Click 3.3V module

Table 1. CAN SPI Click 3.3V module 16-Pin Definition

Notes	Pin	mikroBUS				Pin	Notes
	NC	1	AN	PWM	16	NC	
Reset	**RST**	2	RST	INT	15	**INT**	Interrupt
SPI Chip Select	**CS**	3	CS	RX	14	NC	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
SPI Data OUT	**SDO**	5	MISO	SCL	12	NC	
SPI Data IN	**SDI**	6	MOSI	SDA	11	NC	
Power Supply	**3.3V**	7	3.3V	5V	10	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

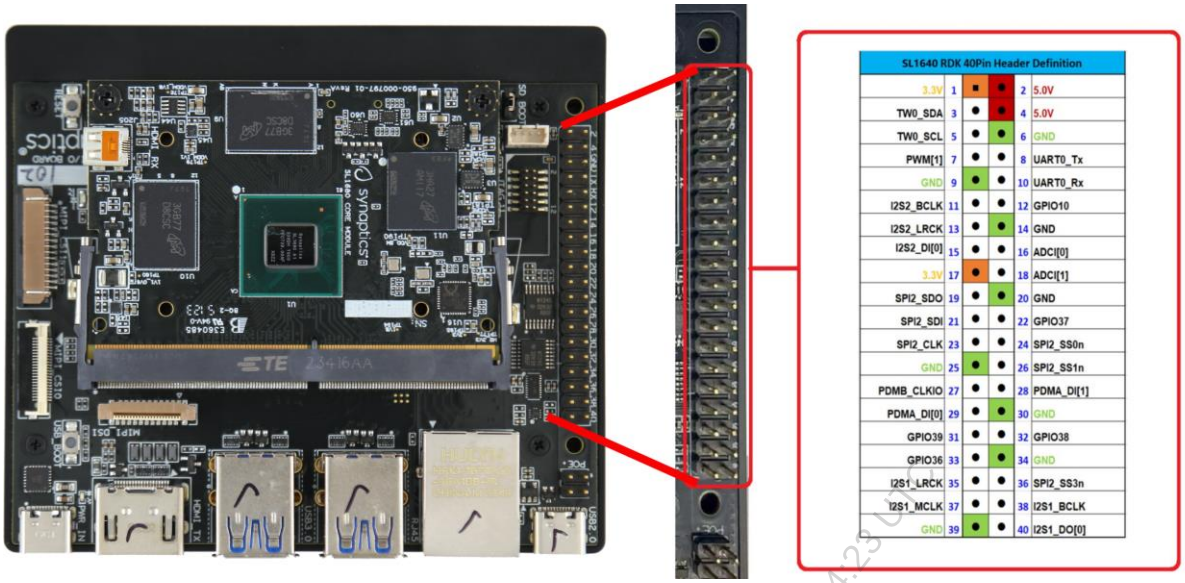

Figure 3. Astra Machina SL1640 Evaluation board 40-pin connector pin definition

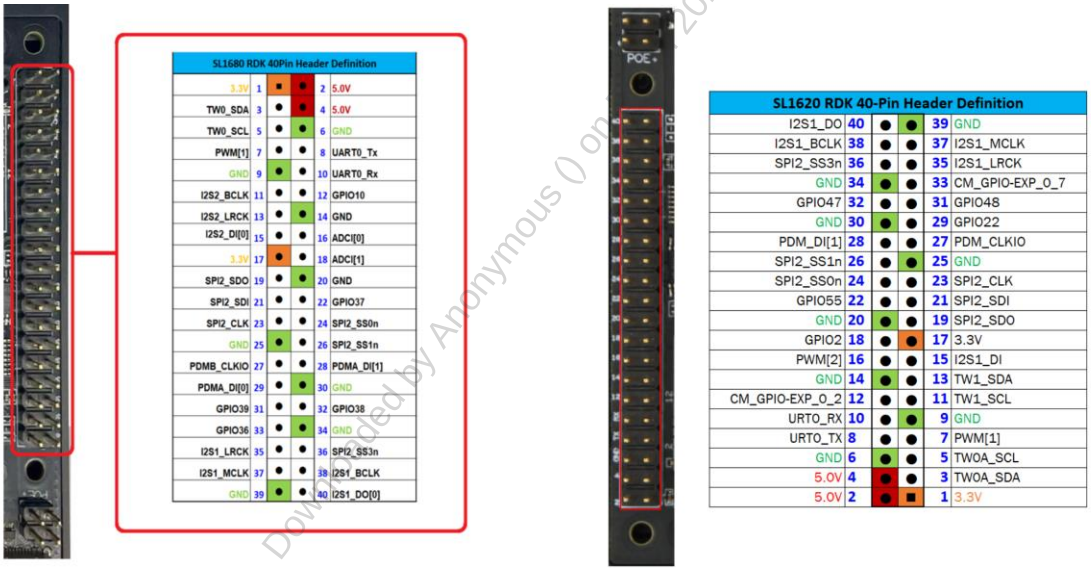

Figure 4. Astra Machina SL1680 and SL1620 Evaluation board 40-pin connector pin definition

1.2.1. CAN Driver Hardware connection with SL16x0 Evaluation Board

Figure 5 shows MIKROE-986 CAN SPI CLICK 3.3V Module interface to SL1680 Astra Machina Module using jumper wires.

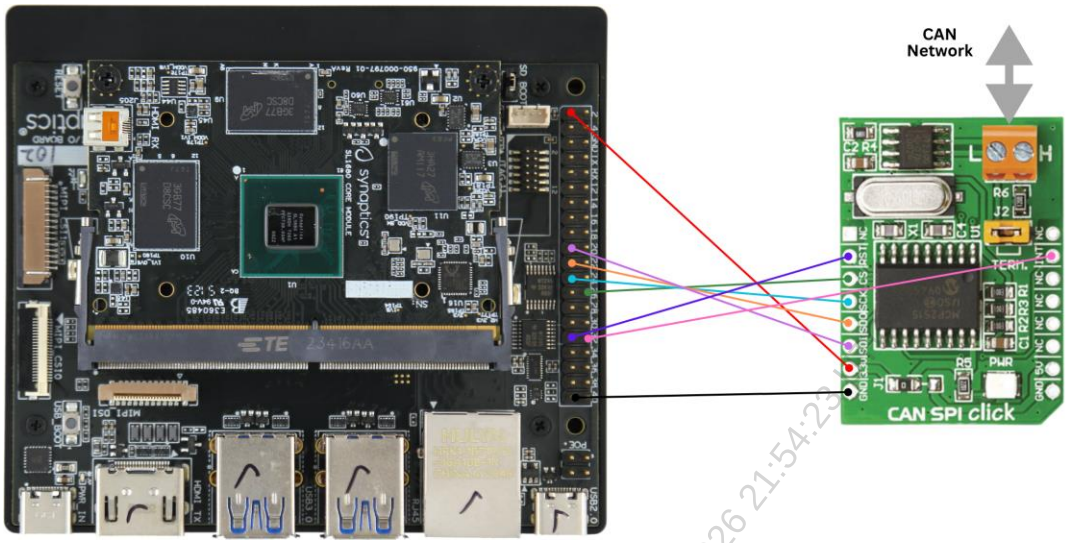

Figure 5. Astra Machina SL16x0 Evaluation board Hardware Interface to CAN SPI Click 3.3V module.

1.2.2. CAN Driver Hardware connection with SL16x0 SoC

Figure 6 shows CAN controller and Transceiver interface to SL16x0 SoC.

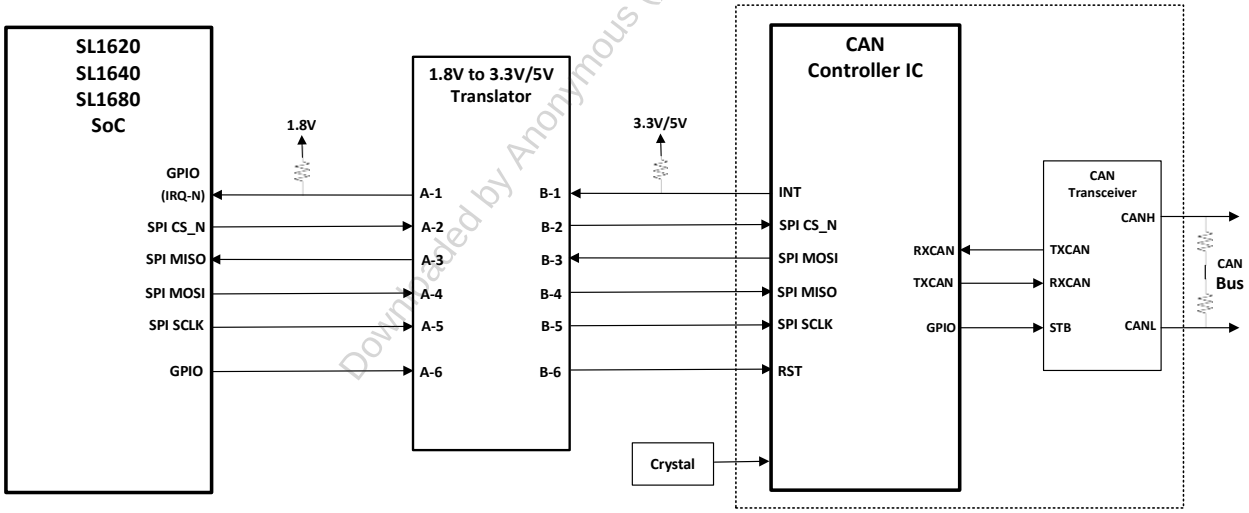

Figure 6. SL16x0 SoC Hardware Interface to CAN Controller and Transceiver

There are two options to for CAN bus Controller Interface to SL16x0 SoC:

a. CAN controller with Integrated CAN Transceiver in single package.
   - Option is to supply single 5V.
   - All interface signals to SL16x0 SoC need 1.8V to 5V voltage translators.
   - Popular CAN bus controller options are: MCP25625 (5V), TCAN4550 (3.3V + 6-24V), TCAN4551-Q1 (1.8V-5V + 6V-24V).

b. CAN controller and CAN Transceiver in two separate packages.
   - Option is to supply 3.3V or 5V CAN controller IC.
   - Options to supply, 3.3V, 5V, 12V or 24V to CAN Transceiver IC.
   - Popular CAN controller options are: MCP2515 (3.3V/5V), HT45B3305H (3.3V/5V), HT45B3315 (3.3V/5V).
   - Popular CAN Transceiver options are: SN65HVD230(3.3V), MCP2542FD (5V), TJA1050 (5V), TJA1042T (5V), ADM3051CRZ (5V), MAX33042E (5V), ADM3051 (5V), TCAN1044A-Q1 (5V).

2. References

- *Astra Machina Foundation Series Quick Start Guide* (PN: 511-001404-01)
- *Astra Machina SL1620 Developer Kit User Guide* (PN: 511-001407-01)
- *Astra Machina SL1640 Developer Kit User Guide* (PN: 511-001405-01)
- *Astra Machina SL1680 Developer Kit User Guide* (PN: 511-001403-01)

3. Revision History

Revision	Description
A	Initial release.
B	Minor update to correct trademarking.
C	Minor update to trademarked items.

PN: 506-001597-01 Rev C