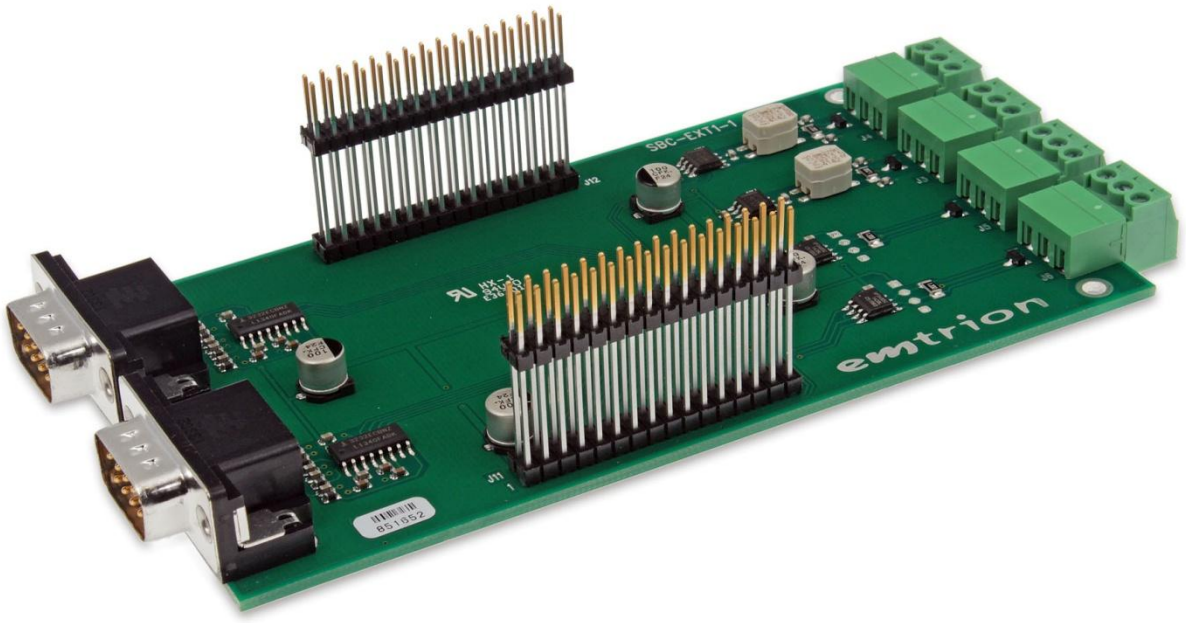
SBC-EXT1

Hardware Description

Rev3/02.10.2015



emtrion GmbH

Revision: **3 / 02.10.2015**

Rev	Date/Signature	Changes
1	17.12.2014/Bue	First revision
2	09.01.2015/Bue	UART number corrected in chapter 2.1
3	02.10.2015/Bue	Naming of UARTs corrected to USARTs

Content

1 Introduction

The SBC-EXT1 module is a simple serial extension module for the CPU module SBC-SAMA5D36.

It contains two RS232 interfaces with standard D-Sub 9 connectors, two RS485 interfaces and two CAN interfaces at 3 pin terminal blocks.

The module is plugged upside down onto the CPU module with 31 mm distance between the PCBs.

2 Functional Description

2.1 RS232 Interfaces

Two RS232 interfaces are available at connectors J1 and J2. The data lines RxD and TxD and the modem control lines RTS and CTS are available.

J1 is connected to USART1 of the CPU board SBC-SAMA5D36. J2 is connected to USART2 of the CPU board SBC-SAMA5D36.

To reduce electromagnetic radiation all lines are filtered by LC low pass filters. The signal lines withstand +/-15 kV ESD pulses according to HBM.

2.2 RS485 Interfaces

Two RS485 interfaces are available as half duplex interface at the terminal blocks J5 and J6. The direction is controlled by the RTS line of the USART. Auto flow control of the interface is supported by the CPU SAMA5D36.

J5 is connected to USART0 of the CPU board SBC-SAMA5D36. J6 is connected to USART3 of the CPU board SBC-SAMA5D36.

By default the signal lines are terminated by a 120 Ω resistor between A and B. For holes in a row are provided for the user to solder additional termination components. The contacts are:

Pin	Function
1	3V3
2	B
3	A
4	GND

The signal lines are protected by a bidirectional transil diode SM712.

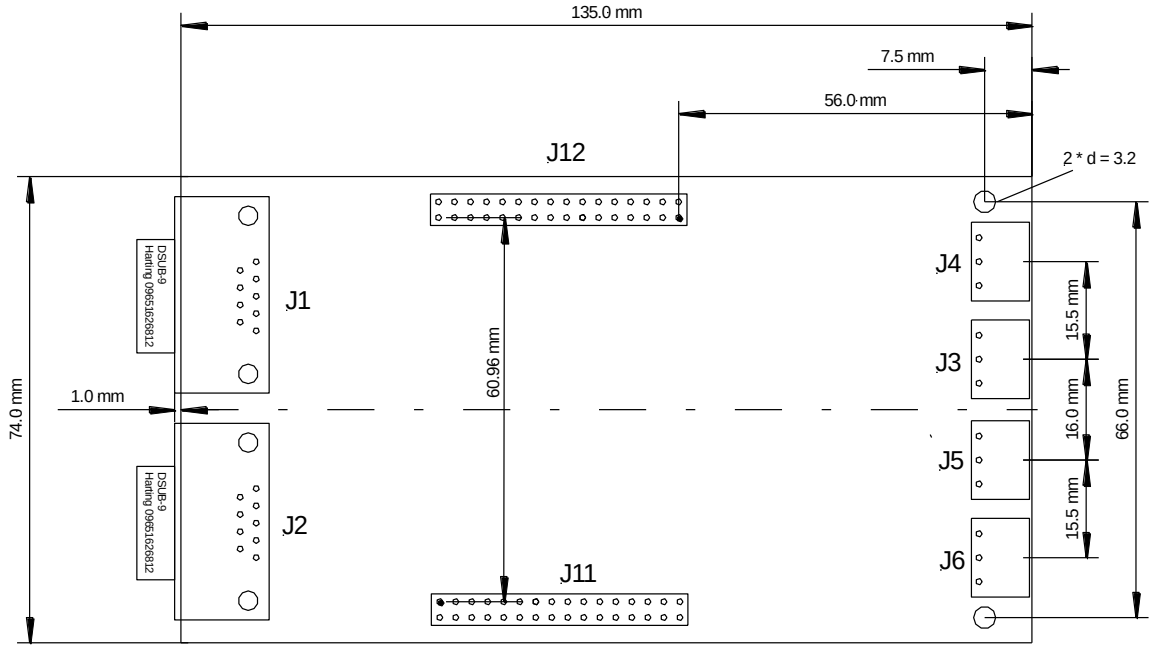
2.3 CAN Interfaces

Two CAN interfaces are available at the terminal blocks J3 and J4.

J3 is connected to CAN0 of the CPU board SBC-SAMA5D36. J4 is connected to CAN1 of the CPU board SBC-SAMA5D36.

The signal lines are terminated by a 120 Ω resistor between CANL and CANH. A common mode choke and capacitors are used to reduce common mode and differential noise on the signal lines. The signal lines are protected by a bidirectional transil diode SM712.

3 Dimensions



4 Connectors

4.1 J1, J2, RS232 Connector

Type D-Sub 9, male

Function	Pin		Function
n/c	1	6	n/c
RxD	2	7	RTS
TxD	3	8	CTS
n/c	4	9	n/c
GND	5		

4.2 J3, J4, CAN Connector

Type Terminal block, 3.5 mm pitch

Pin	Function
1	CANH
2	CANL
3	GND

4.3 J5, J6, RS485 Connector

Type Terminal block, 3.5 mm pitch

Pin	Function
1	B
2	A
3	GND

4.4 J11

Type 16 * 2 pin header, 2.54 mm pitch

Function	Pin		Function
-	1	2	3V3
GND	3	4	GND
-	5	6	-
GND	7	8	-
CANRX1	9	10	-
CANTX1	11	12	-
CANRX0	13	14	-
CANTX0	15	16	-
RTS0	17	18	-
RXD0	19	20	RTS3
TXD0	21	22	RXD3
-	23	24	TXD3
CTS1	25	26	CTS2
RTS1	27	28	RTS2
RXD1	29	30	RXD2
TXD1	31	32	TXD2

4.5 J12

Type 16 * 2 pin header, 2.54 mm pitch

Function	Pin		Function
-	1	2	-
GND	3	4	GND
-	5	6	-
-	7	8	-
-	9	10	-
-	11	12	-
-	13	14	-
-	15	16	-
-	17	18	-
-	19	20	-
-	21	22	-
-	23	24	-
-	25	26	-
-	27	28	-
-	29	30	-
-	31	32	-

5 Technical Characteristics

5.1 Electrical Specifications

Supply voltage	3.3 V, +/-5%
Current consumption	0.16 A (no connector plugged)

5.2 Environmental Specifications

Operating temperature	Standard: 0°C ... +70°C -ET: -40°C ... +85°C
Storage temperature	-40 ... +125°C
Relative humidity	0 ... 95 %, non-condensing

5.3 Mechanical Specifications

Weight	approx. 80 g
Board	Glasepoxi FR-4, UL-listed, 4 layers
Dimensions	135 mm x 74.0 mm x 35.0 mm