**Document information**

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<tbody>
<tr>
<td>Keywords</td>
<td>OM29110, NFC, Demo kit, Raspberry Pi, BeagleBone, Arduino</td>
</tr>
<tr>
<td>Abstract</td>
<td>This document is the user manual of the OM29110 NFC's SBC Interface Boards.</td>
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## Revision history

<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
<tr>
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<td>- Security status changed into COMPANY PUBLIC</td>
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<td>First official release of the document</td>
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## Contact information

For more information, please visit: [http://www.nxp.com](http://www.nxp.com)
1. Introduction

The present document describes the OM29110 Interface boards, which are used to connect NFC’s demo boards (e.g. OM5578 related to PN7150 NFC Controller) to Single-Board-Computer (like Raspberry Pi, BeagleBone…).

This document first describes the NFC generic interface implemented by the OM29110 interface boards.

Then, it gives printed circuit boards details.
2. Generic NFC Interface

2.1 Interface description

The Generic NFC interface exposes Single-Board-Computer physical interfaces required by the NFC’s boards. Those are:

- Usual power supplies (3.3V, 5.0V)
- Usual IC interfaces (I²C, SPI, UART)
- Generic GPIOs (can be used for different purposes depending on IC feature (field detect, interrupt, reset...)

2.2 Hardware description

In order to offer a robust and unambiguous assembly with NFC’s board 2 raw of 2+6 pins are used.

The connector model used is AGSP1-BCZ1.3 from Antelec (refer to [1]).

Below Fig 1 shows the connectors footprint position.

![Generic interface footprint](image)
2.3 Pinning description

Table 1. J1 – Supplies and GPIO

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.3V</td>
<td>3.3 V supply to the NFC board from the SBC</td>
</tr>
<tr>
<td>2</td>
<td>5V</td>
<td>5V supply to the NFC board from the SBC</td>
</tr>
<tr>
<td>3</td>
<td>Vout</td>
<td>Supply from the NFC board to the SBC (RF harvesting case)</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>GPIO0</td>
<td>General Purpose IO</td>
</tr>
<tr>
<td>6</td>
<td>GPIO1</td>
<td>General Purpose IO</td>
</tr>
<tr>
<td>7</td>
<td>GPIO2</td>
<td>General Purpose IO</td>
</tr>
<tr>
<td>8</td>
<td>GPIO3</td>
<td>General Purpose IO</td>
</tr>
</tbody>
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Table 2. J2 – Host interface

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I2C_SDA</td>
<td>I2C data line</td>
</tr>
<tr>
<td>2</td>
<td>I2C_SCL</td>
<td>I2C clock line</td>
</tr>
<tr>
<td>3</td>
<td>SPI_MOSI</td>
<td>SPI Master Output, Slave Input</td>
</tr>
<tr>
<td>4</td>
<td>SPI_MISO</td>
<td>SPI Master Input, Slave Output</td>
</tr>
<tr>
<td>5</td>
<td>SPI_NSS</td>
<td>SPI Slave Select</td>
</tr>
<tr>
<td>6</td>
<td>SPI_SCKI</td>
<td>SPI Serial Clock</td>
</tr>
<tr>
<td>7</td>
<td>UART_TX</td>
<td>SBC GPIO pin</td>
</tr>
<tr>
<td>8</td>
<td>UART_RX</td>
<td>SBC GPIO pin</td>
</tr>
</tbody>
</table>
3. OM29110 BeagleBone Interface Board

3.1 Overview

The BeagleBone Interface Board offers support for connection to BeagleBone board (refer to [3] for more details).

As such it integrates the NFC generic interface connectors allowing NFC’s board to be plugged on it, as well as connectors to be assembled on top of the BeagleBone board.

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Fig 2. OM29110 BeagleBone Interface Board overview
3.2 Schematics

Fig 3. OM29110 BeagleBone Interface Board schematics

3.3 Layout

Fig 4. OM29110 BeagleBone Interface Board top layer
4. OM29110 Raspberry Pi Interface Board

4.1 Overview

The Raspberry Pi Interface board offers support for connection to Raspberry Pi board (refer to [2] for more details).

As such it integrates the NFC generic interface connectors allowing NFC’s board to be plugged on it, as well as connectors to be assembled on top of the BeagleBone board.

Fig 5. OM29110 Raspberry Pi Interface Board overview
4.2 Schematics

**Fig 6. OM29110 Raspberry Pi Interface Board schematics**

4.3 Layout

**Fig 7. OM29110 Raspberry Pi Interface Board Top layer**
5. OM29110 Arduino Interface Board

5.1 Overview

The Arduino Interface board offers support for connection to any SBC board implementing Arduino™ connectors compatible with the 'Arduino UNO' platform (see [4]).

As such it integrate the NFC generic interface connectors allowing NFC's board to be plugged on it, as well as connectors to be assembled on top of an Arduino compatible Controller board like for instance LPC824 MAX LPCXpresso board (see [5]).

The board include a R1 footprint between the VOUT pin of the NFC Generic connector and the VIN pin of the Arduino connector. The purpose of it is to allow powering the Arduino compatible platform from the NFC Board in case both support it (for instance in the case of RF harvesting).

![Connectors to Arduino Board](image_url)
5.2 Schematics

Fig 9. OM29110 Arduino Interface Board schematics

5.3 Layout

Fig 10. OM29110 Arduino Interface Board Top layer
6. References

[1] Antelec AGSP1 connector:  

[2] The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python. It’s capable of doing everything you’d expect a desktop computer to do, from browsing the internet and playing high-definition video, to making spreadsheets, word-processing, and playing games.

For more information about it please visit http://www.raspberrypi.org/

[3] The BeagleBone is a low-cost, community-supported development platform for developers and hobbyists. It is a credit-card-sized Linux computer that connects to the Internet and runs software such as Android 4.0 and Ubuntu. With plenty of I/O and processing power for real-time analysis provided by an ARM® processor.

For more information about it please visit http://www.beagleboard.org/bone.

[4] The Arduino Uno is a microcontroller board with 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button.

For more information about it please visit www.nxp.com/redirect/arduino.cc/en/Main/ArduinoBoardUno.

[5] The LPC824 MAX LPCXpresso board with NXP's ARM Cortex-M0+ microcontroller has been designed to make it as easy as possible to get started with Cortex-M0+.

For more information about it please visit http://www.embeddedartists.com/products/lpcxpresso/lpc824_xpr.php.
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