

Arduino Form Factor to SDP/ QuikEval/PMOD Adapter

DESCRIPTION

Demonstration Circuit 2741 is an adapter shield that enables Analog Devices evaluation boards to interface with various Arduino-compatible platform boards for hardware prototyping and software development purposes. DC2741 is not intended to drive design decisions, but rather to speed the code development, evaluation, and prototyping process, if the eval board for the device being evaluated and the platform board are both compatible with the DC2741.

Assembly type A is specific to the Analog Devices DC2026 “Linduino” platform (an Arduino Uno clone with QuikEval expansion header). It allows the DC2026 to communicate with Analog Devices’ 120-pin System Demonstration Platform (SDP), PMOD SPI, and PMOD I²C-compatible eval boards. Level-shifted SPI, I²C, and general-purpose I/O signals from the DC2026 controller are routed to the 120-pin SDP connector and PMOD connectors, with a logic voltage level determined by the DC2026’s onboard level-shifting circuitry (jumper-selectable 2.5V, 3.3V, 5V, or externally supplied.) Some of the possible combinations include:

- Linduino (DC2026) to 120SDP (for example, EVAL-AD5686RSDZ)

- Linduino (DC2026) to SPI PMOD (for example, EVAL-ADXL355-PMDZ)

Assembly type B is compatible with most Arduino Uno form-factor platform boards, as well as small form-factor Due and Mega boards. SPI, I²C, and GPIO signals are routed directly from the Arduino headers. Thus, the logic level of these signals will be determined by the controller: 5V if a standard Arduino Uno R3 is used, 3.3V if an Arduino Zero is used, etc. Some of the possible combinations include:

- Small form-factor Arduino Due to QuikEval (for example, DC2025 for the LTC2668 DAC).
- EVAL-ADICUP3029 to QuikEval (for example, DC934 for LTC2607 and LTC2422)

WARNING: 5V CONTROLLERS WILL APPLY 5V SIGNALS TO THE CONNECTED DAUGHTERBOARD. GPIO SIGNALS HAVE PULLUP RESISTORS TO VIO, AND CAN BE DRIVEN OPEN-DRAIN. REVIEW ALL SIGNALS THOROUGHLY.

Design files for this circuit board are available.

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BOARD PHOTO

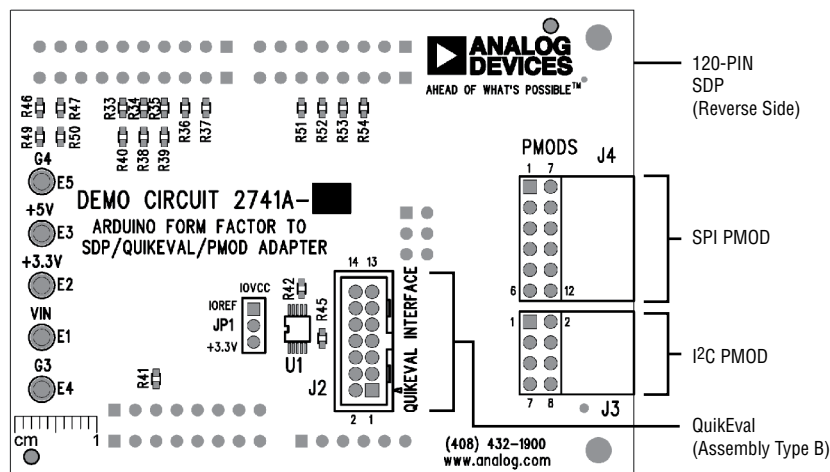


Figure 1. Basic Connections

QUICK START PROCEDURE

JUMPER SETTINGS

JP1: Select VIO voltage: IOREF (default for Assembly Type B), 3.3V, or removed (default for Assembly Type A). Both jumper options are derived from the Arduino platform board. Normally, shield boards use IOREF to set their own I/O voltage level for compatibility with the platform board. The 3.3V option is provided for cases where the

platform board's IOREF cannot supply enough current for the SDP/PMOD/QuikEval board, or if IOREF is otherwise non-compliant.

Remove JP1 when using assembly type A with a Linduino (DC2026); VIO is set by the Linduino's I/O voltage selection jumper.

HARDWARE SETUP

Set any jumpers, switches, or other hardware configuration options on the Arduino compatible board before installing the DC2741 (for example, JP3 I/O voltage selection on the Linduino.)

Install DC2741, carefully aligning socket J5 and all header rows, and paying attention to key gaps between headers. When mounting DC2741A-A to a DC2026 (Linduino),

make sure that DC2741 J2 (14-pin socket) aligns with Linduino J1.

Install the daughterboard to be tested. QuikEval boards typically connect via a 14-pin ribbon cable. SDP boards should be secured with screws after mating the connector. Refer to the daughterboard's documentation for any other power / connection requirements.

SOFTWARE AND TESTING

Verify functionality with a basic test program. Some of the combinations tested with the DC2741 are:

1) EVAL-AD5686RSDZ (SPI DAC, SDP-compatible eval board) mounted to a Linduino (DC2026) with DC2741A-A, code available at:

<https://github.com/analogdevicesinc/Linduino/blob/master/LTSketchbook/Part%20Number/ADI-Parts/EVAL-AD5686R/EVAL-AD5686R.ino>

2) EVAL-AD5696RSDZ (I²C DAC, SDP-compatible eval board) mounted to a Linduino (DC2026) with DC2741A-A, code available at:

<https://github.com/analogdevicesinc/Linduino/blob/master/LTSketchbook/Part%20Number/ADI-Parts/EVAL-AD5696R/EVAL-AD5696R.ino>

3) EVAL-ADT7420-PMDZ (I²C temperature sensor, PMOD-compatible board) mounted to a Linduino (DC2026) with DC2741A-A, code available at:

<https://github.com/analogdevicesinc/Linduino/tree/master/LTSketchbook/Part%20Number/ADI-Parts/EVAL-ADT7420>

4) DC2025A-A (LTC2668-16 SPI DAC, QuikEval-compatible) mounted to a small form-factor Arduino Due, code available at:

<https://github.com/analogdevicesinc/Linduino/blob/master/LTSketchbook/Part%20Number/2000/2600/2668/DC2025A/DC2025A.ino>

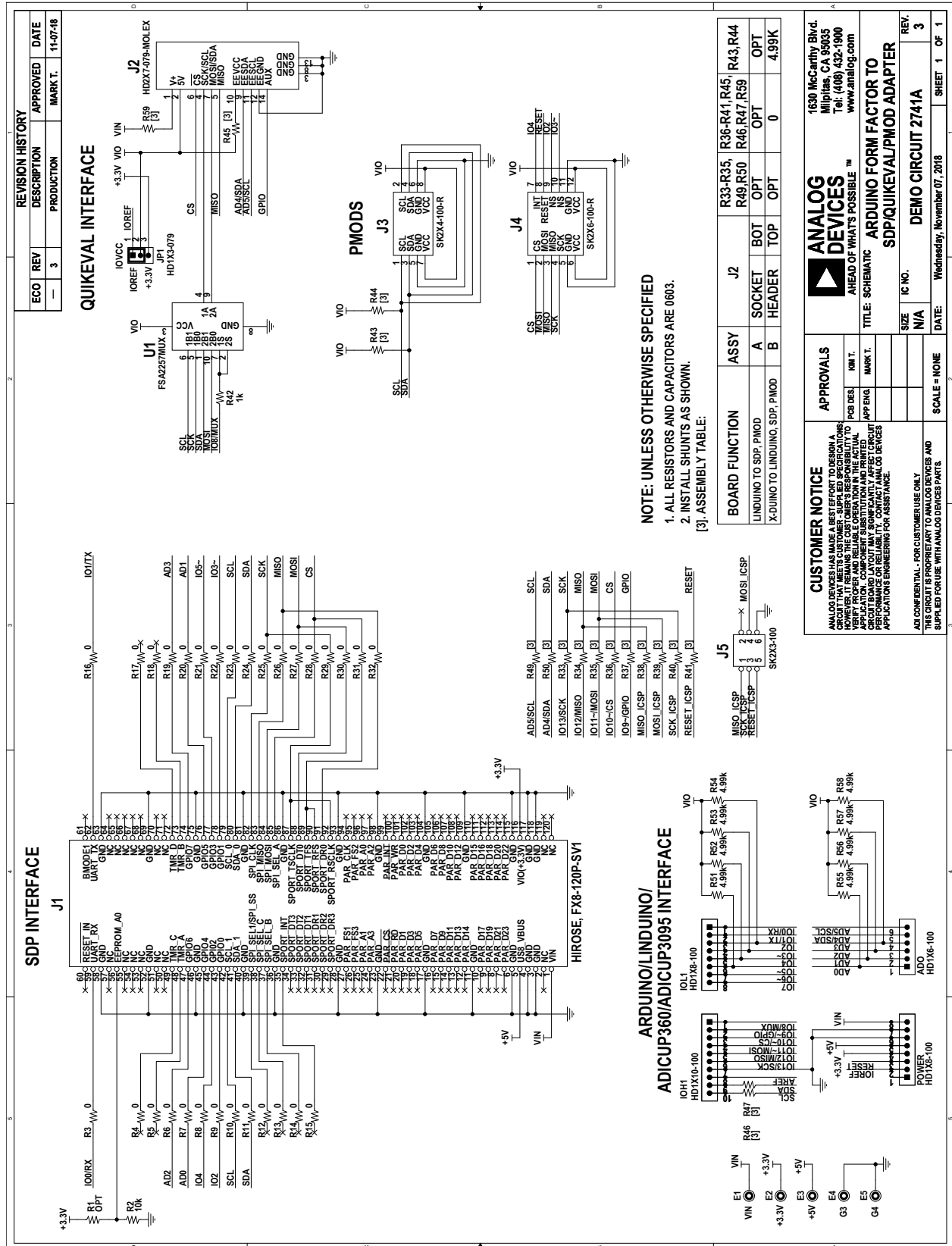
5) DC1012A-A (LTC2499 16-bit I²C ADC, QuikEval-compatible) mounted to a small form-factor Arduino Due, code available at:

<https://github.com/analogdevicesinc/Linduino/blob/master/LTSketchbook/Part%20Number/2000/2400/2499/DC1012AA/DC1012AA.ino>

6) DC1012A-A (LTC2499 16-bit I²C ADC, QuikEval-compatible) mounted to an Arduino Zero (Same code as number 5)

Other combinations of boards should be thoroughly reviewed for supply voltage and signal voltage compatibility.

SCHEMATIC DIAGRAM



DEMO MANUAL DC2741



ESD Caution

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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