

IO Adapter Board

User Guide

SUMMARY: The Atmosic IO Adapter Board assists with the development and debugging of Atmosic evaluation boards or reference designs. It is designed to physically connect between this target hardware and an Atmosic Interface Board, Production Test Board, or Download Board. This guide describes the IO Adapter Board hardware and gives examples of its features and usage.



Atmosic™

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Table of Contents

1. Overview	4
2. IO Adapter Board Description	4
3. User Scenario Examples	6
3.1 Atmosic Interface Board and EVB	6
3.2 Atmosic Interface Board, Evaluation Board and Jlink Debugger	8
3.3 Atmosic Interface Board and PV Beacon	8
3.4 Atmosice Interface Board with Keyboard Reference Design Board	9
3.5 Atmosic Interface Board with PV Keyboard Reference Design Board	10
3.6 Atmosic Interface Boards with Remote Control Reference Design Board	12
3.7 Atmosic Interface Board and PV Remote Control Reference Design Board	13
Appendix A	14
A.1 IO Adapter Board Circuit Description	14
Revision History	18

List of Figures

Figure 1 - IO Adapter Board and Cables

Figure 2 - IO Adapter Board Connectors and Jumpers

Figure 3 - Atmosic Interface Board, IO Adapter Board and Evaluation...

Figure 4 - Debug Information Only Configuration for Interface and IO Adapter Board

Figure 5 - Atmosic Interface Board, IO Adapter Board, EVB, and Jlink Debugger

Figure 6 - Atmosic Interface Board, IO Adapter Board and PV Beacon Reference Board

Figure 7 - Atmosic Interface Board, IO Adapter Board, and Keyboard Reference Board

Figure 8 - Atmosic Interface Board, IO Adapter Board, and PV Keyboard Reference Board

Figure 9 - Atmosic Interface Board, IO Adapter Board, and Remote Control Board

Figure 10 - Interface Board, IO Adapter Board and PV Remote Control Board

List of Tables

Table 1 - IO Adapter Board Description

1. Overview

The IO Adapter Board (IOAB) is designed to assist with test and debug of various Atmosic evaluation platforms and reference designs. It can also be used with Atmosic based customer designs during development or productions.

The IO adapter board is consists of a series of connectors and jumpers that can break out signals from the Atmosic Interface Board, Atmosic Production Tester (APT) or Download Board (DL) to various Atmosic based hardware designs including any version of the ATM2/ATM3 Evaluation Board (EVB), Remote Control reference design board, or Keyboard reference design board. Customer DUT hardware can also be used with the IO adapter board if designed to be compatible with a connector on the IO adapter board.

The IO Adaptor Board supports the following features:

- Firmware Download from Serial Wire Debug (SWD) or Jlink interface to target hardware
- Debug UART connection to USB
- 4-wire HCI UART communication to target hardware
- 2-wire UART communication in Direct Test Mode (DTM)
- Reset/Powerdown (PWD) and Boot Mode signal breakout
- Control of DUT TMC and P0 signals with Atmosic Keyboard reference design hardware

Specific examples of these features will be covered in the sections that follow.

2. IO Adapter Board Description

The IO Adaptor board is provided with a set of three cables that connect to the specific connectors as shown in [Figure 1](#).

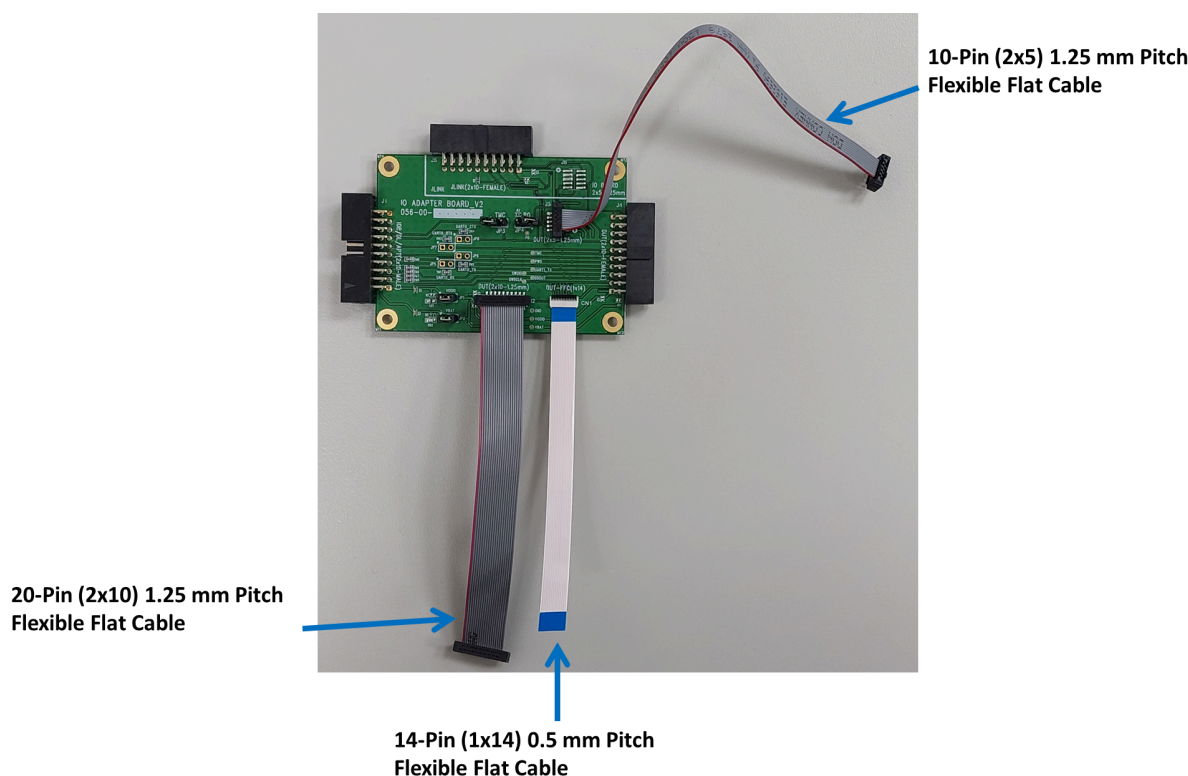


Figure 1 - IO Adapter Board and Cables

The connectors and jumpers on the IO adapter board are shown in [Figure 2](#), with a brief description provided in [Table 1](#).

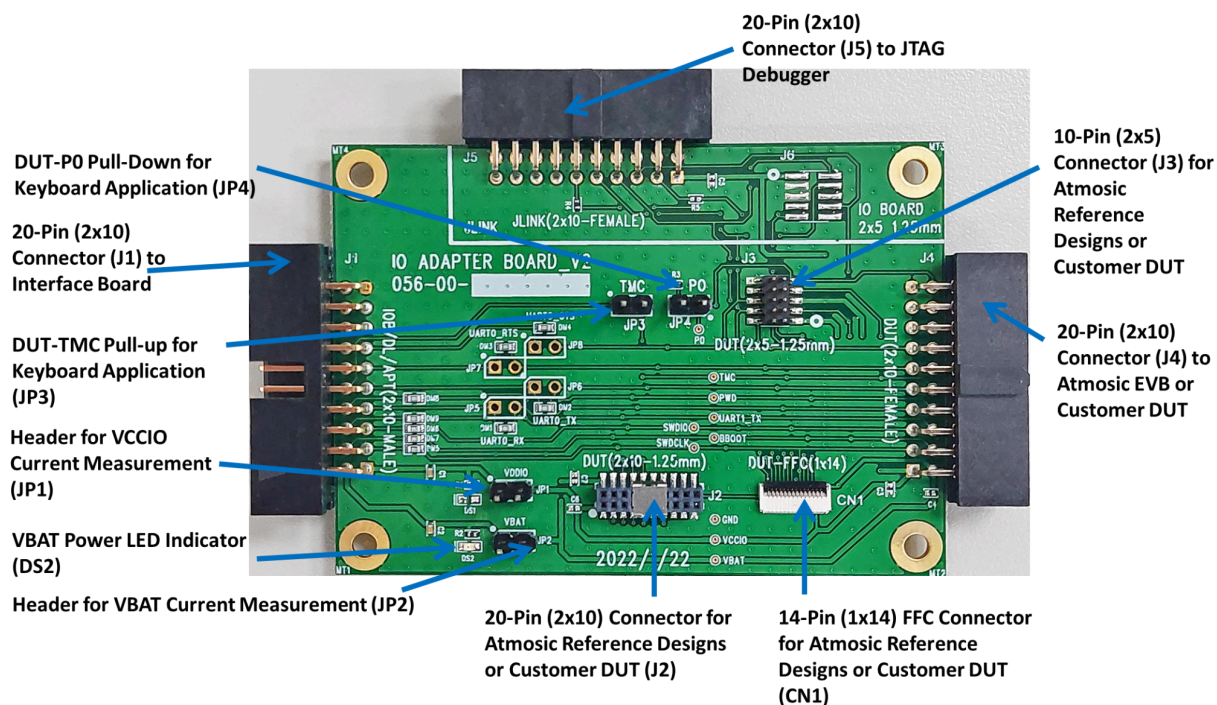


Figure 2 - IO Adapter Board Connectors and Jumpers

Table 1 - IO Adapter Board Description

Reference	Description
J1	2x10 (2.54mm) connector. Connection to Atmosic Interface Board, APT or DL.
DS2	VBAT power LED indicator. VBAT power comes from J1.
JP2	2.54 mm header for VBAT current measurement. Jumper is connected by default.
JP1	2.54 mm header for VCCIO current measurement. Jumper is connected by default..
JP3	DUT-TMC pull-up for keyboard application. The pull-up signal comes from J1. Not installed for non-keyboard connections.
JP4	DUT P0 pull-down for keyboard application. Not installed for non-keyboard applications.
J2	2x10 (1.25 mm) connector for Atmosic reference designs or customer DUT
CN1	1x14 (0.5 mm) FFC connector for Atmosic reference designs or customer DUT
J4	2x10 (2.54 mm) connector for Atmosic EVB or customer DUT.
J3	2x5 (1.25 mm) connector for Atmosic reference designs or customer DUT.
J5	2x10 (2.54 mm) connector for JTAG debugger

3. User Scenario Examples

3.1 Atmosic Interface Board and EVB

The setup for this configuration is shown in [Figure 3](#). The interface board is connected to J1 of the IO Adapter Board, but this board could also be the APT or DL boards. The ATM2/ATM3 EVB is connected to J4 of the IO Adapter Board.

In this configuration SWD FW download, debug UART and 4-wire HCI UART or 2-wire for Direct Test Mode (DTM) are supported.

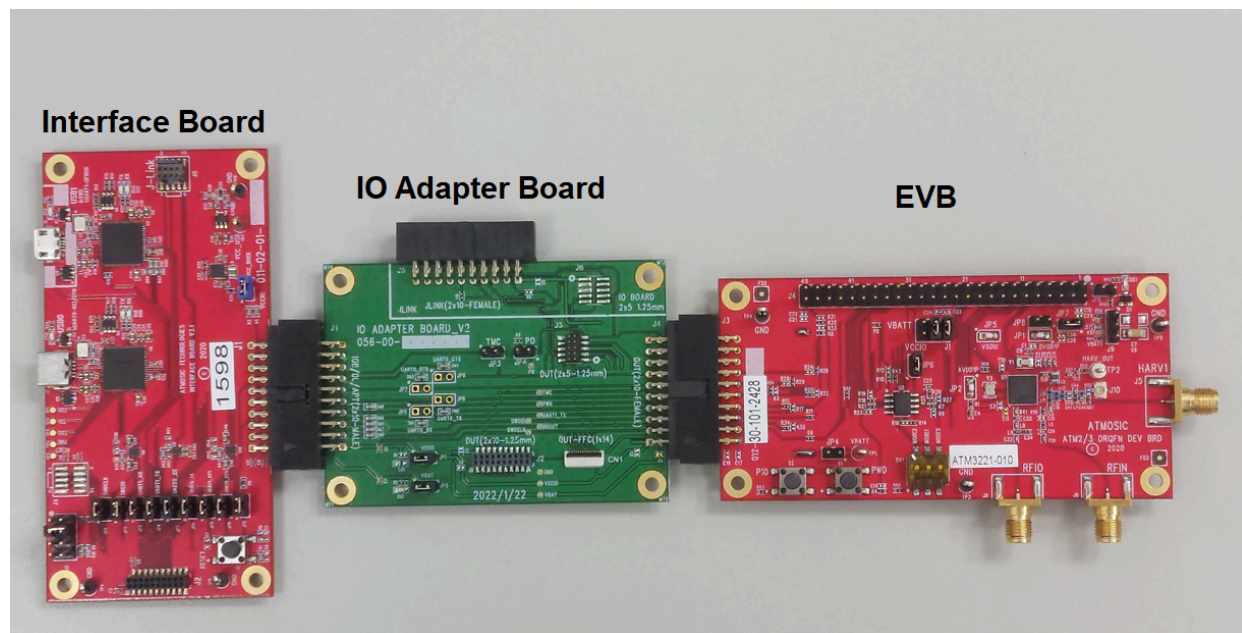


Figure 3 - Atmosic Interface Board, IO Adapter Board and Evaluation Board (EVB)

This hardware setup can be used to support the UART1_Tx debug interface when the EVB (or target hardware) is being powered from another source (VBAT input). Removing the JP2 (VBAT) jumper on the IO Adapter Board will disconnect the VBAT source from the interface board. The JP1 (VCCIO) jumper of the IO adapter board remains installed to support the debug interface. The interface board keeps only jumper JP4 (UART1_TX) and removes all other jumpers in this application. The setup for this configuration is shown in [Figure 4](#).

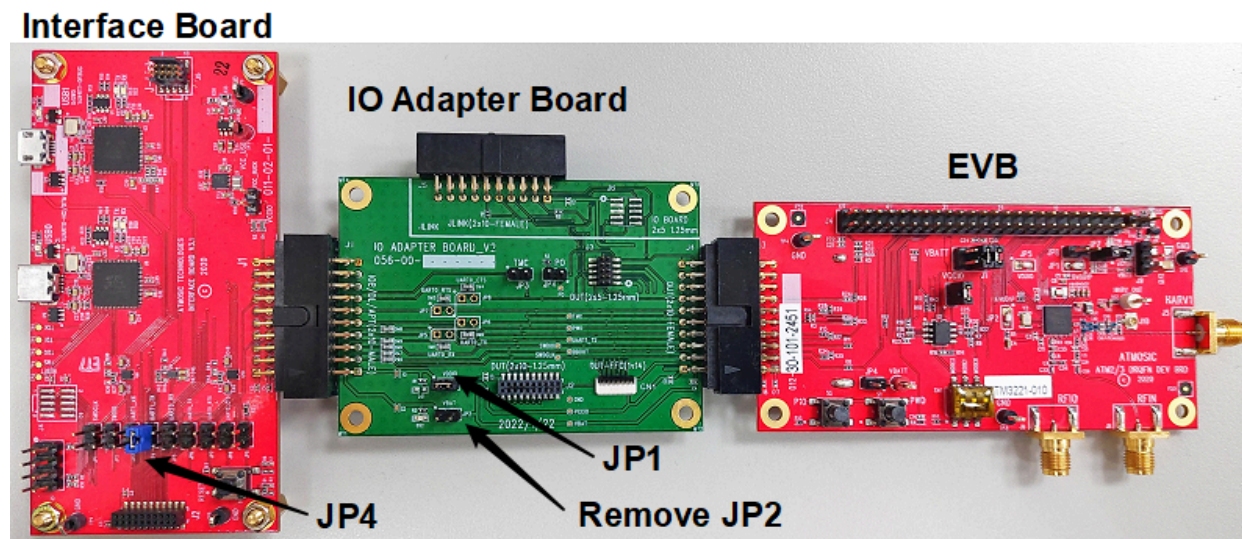


Figure 4 - Debug Information Only Configuration for Interface and IO Adapter Board

3.2 Atmosic Interface Board, Evaluation Board and Jlink Debugger

This setup is shown in [Figure 5](#). The Atmosic interface board is connected to J1 of the IO Adapter Board, with the EVB connected to J4 and the Jlink debugger connected to J5.

When used with Atmosic Interface Board V3.x it is necessary to remove the JP18, JP19 and JP22 jumpers on the interface board.

This configuration support Jlink firmware downloading, debug UART and 4-wire HCI UART or 2-wire for Direct Test Mode (DTM).

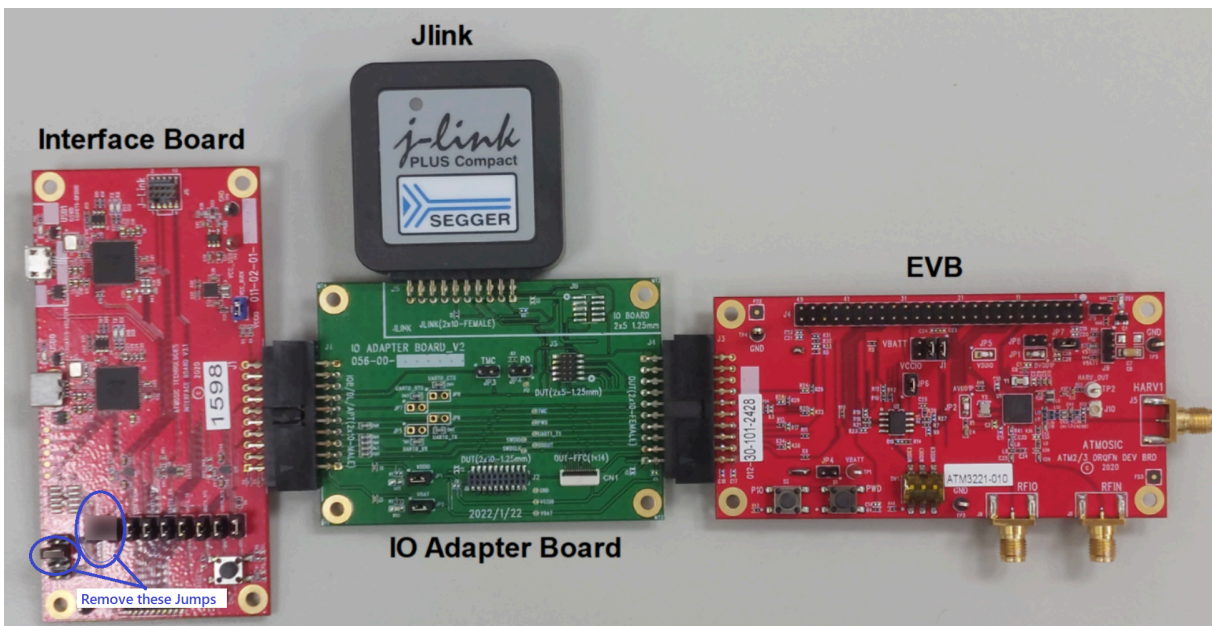


Figure 5 - Atmosic Interface Board, IO Adapter Board, EVB, and Jlink Debugger

3.3 Atmosic Interface Board and PV Beacon

This setup is shown in [Figure 6](#). The Atmosic Interface Board is connected to J1 of the IO Adapter Board with the PV Beacon connected to J3 via the 10 pin ribbon cable. This configuration supports SWD firmware downloading and the debug UART.

Note: The APT or DL hardware can be used in place of the Atmosic Interface Board in this configuration.

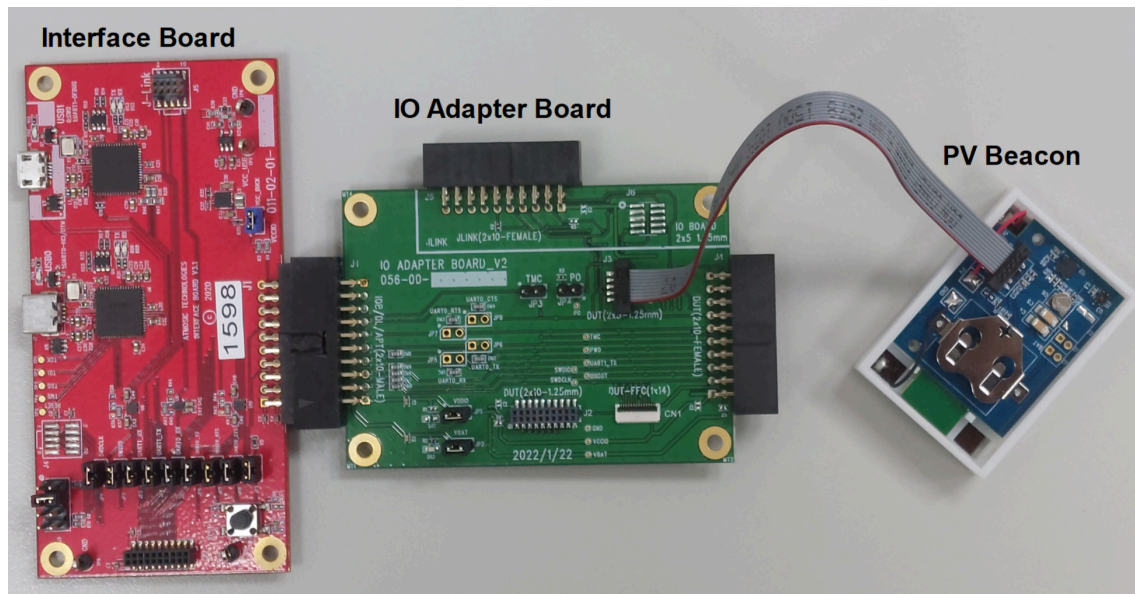


Figure 6 - Atmosic Interface Board, IO Adapter Board and PV Beacon Reference Board

3.4 Atmosic Interface Board with Keyboard Reference Design Board

This setup is shown in [Figure 7](#). The Atmosic interface board is connected to J1 of the IO Adapter Board with the Keyboard reference design board connected to J3. This configuration supports firmware download via the SWD interface and the debug UART.

Note: The APT or DL boards can be used in place of the Atmosic interface board.

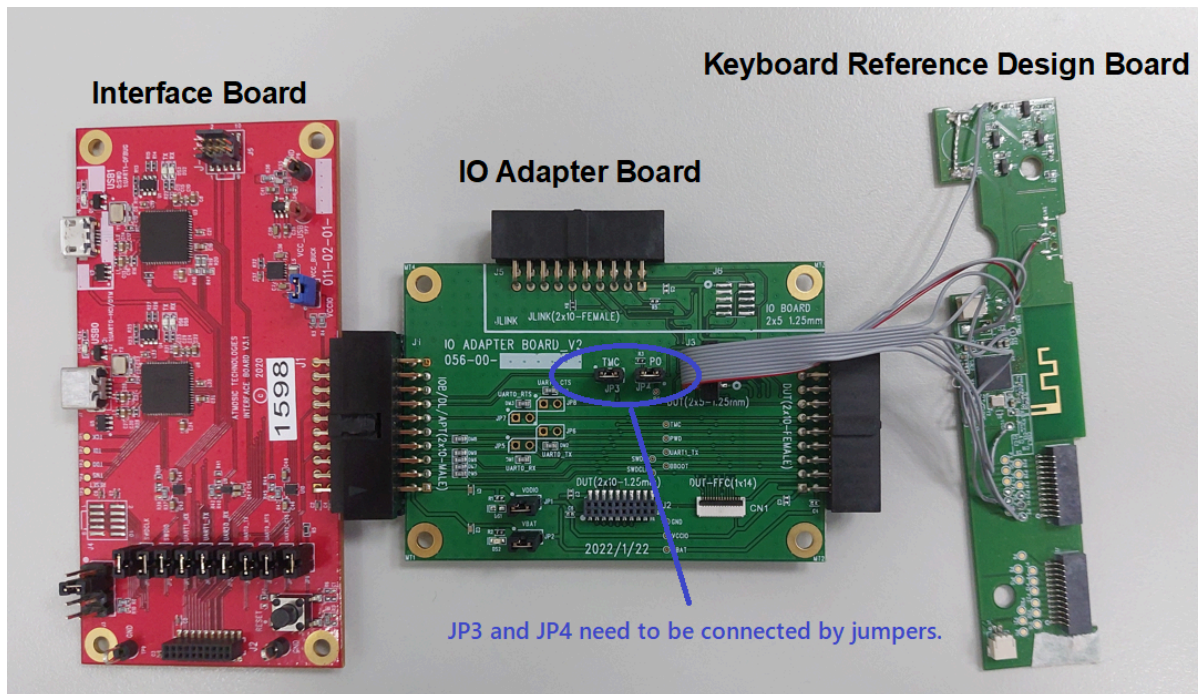


Figure 7 - Atmosic Interface Board, IO Adapter Board, and Keyboard Reference Design Board

3.5 Atmosic Interface Board with PV Keyboard Reference Design Board

This setup is shown in [Figure 8](#). The Atmosic interface board is connected to J1 of the IO Adapter Board with the PV Keyboard reference design board connected to CN1 via the FCC ribbon cable. Install jumpers JP3 and JP4 of IO Adapter Board.

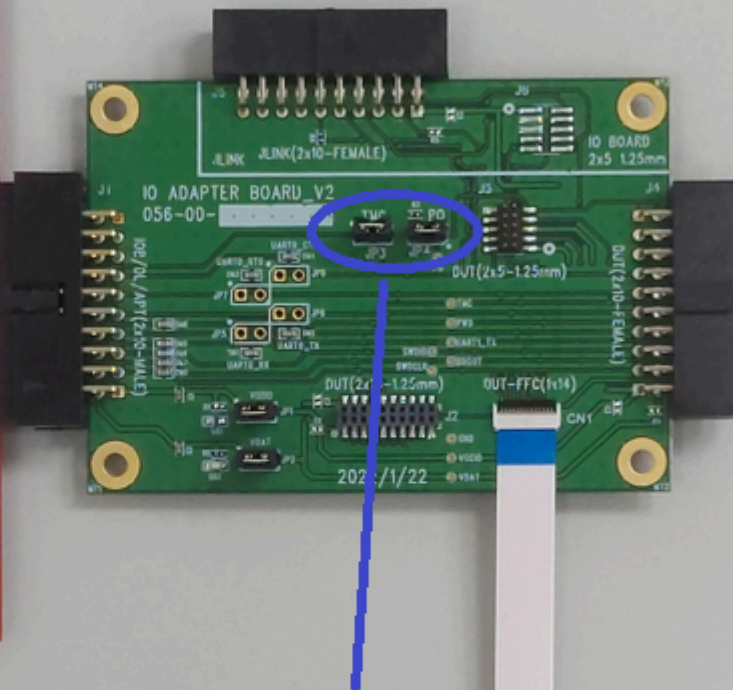
This configuration supports firmware download via SWD, the debug UART interface, and either 4-wire HCI UART or 2-wire for Direct Test Mode (DTM).

Note: The APT or DL boards can be used in place of the Atmosic interface board.

Interface Board



IO Adapter Board



JP3 and JP4 need to be connected by jumpers.

PV Keyboard Reference Design Board



Figure 8 - Atmosic Interface Board, IO Adapter Board, and PV Keyboard Reference Design Board

3.6 Atmosic Interface Boards with Remote Control Reference Design Board

This setup is shown in [Figure 9](#). The Atmosic interface board is connected to J1 of the IO Adapter Board with the Remote Control board connected to CN1 with the FCC ribbon cable.

This configuration supports firmware download via SWD, the debug UART interface, and either 4-wire HCI UART or 2-wire for Direct Test Mode (DTM).

Note: The APT or DL boards can be used in place of the Atmosic interface board.

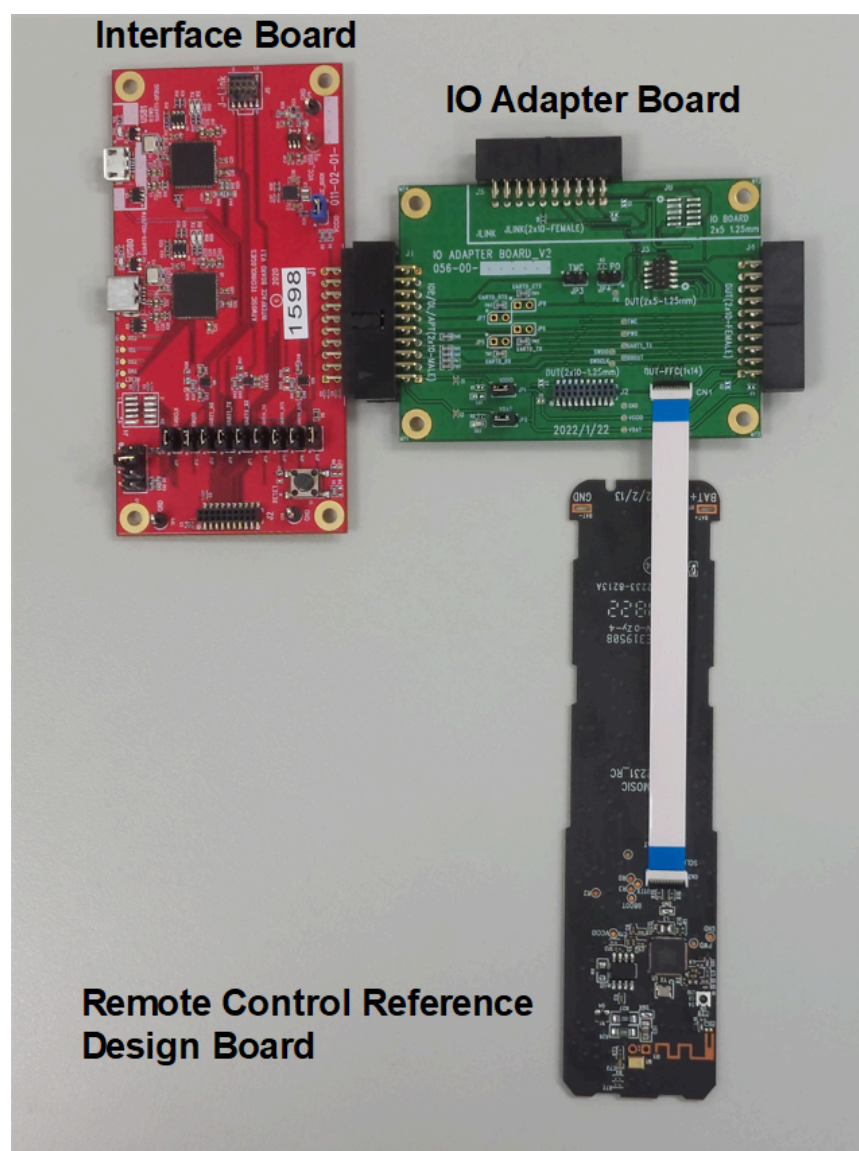


Figure 9 - Atmosic Interface Board, IO Adapter Board, and Remote Control Reference Design Board

3.7 Atmosic Interface Board and PV Remote Control Reference Design Board

This setup is shown in [Figure 10](#). The Atmosic interface board is connected to J1 of the IO Adapter Board with the PV remote control reference design board connected to J2 with a ribbon cable.

This configuration supports firmware download via SWD, the debug UART interface, and either 4-wire HCI UART or 2-wire for Direct Test Mode (DTM).

Note: The APT or DL boards can be used in place of the Atmosic interface board.

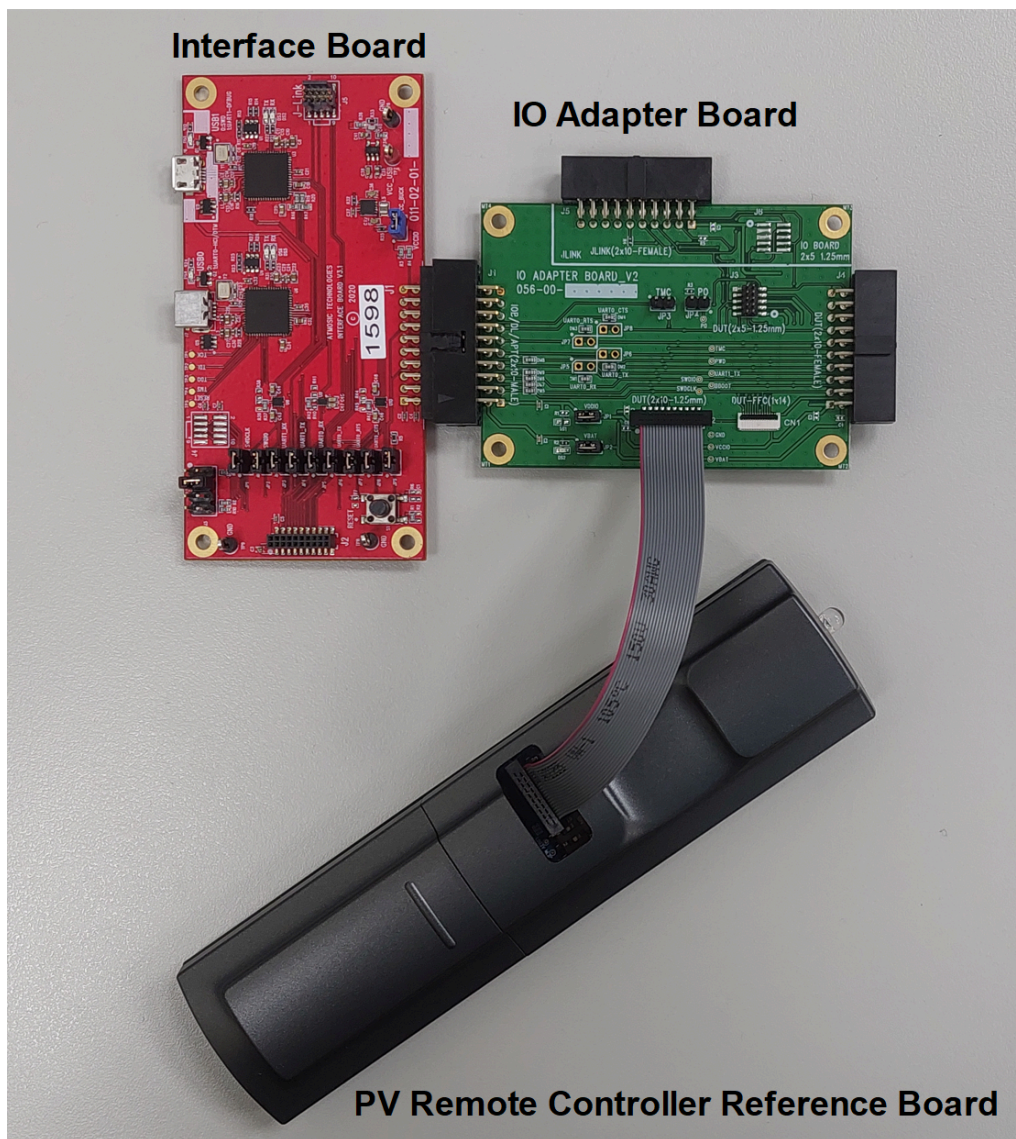
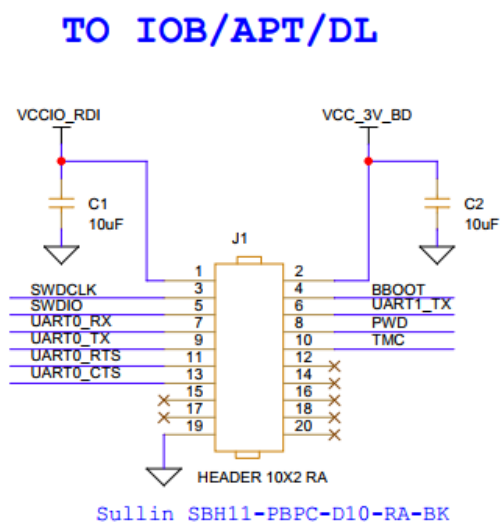


Figure 10 - Interface Board, IO Adapter Board and PV Remote Control Reference Design Board

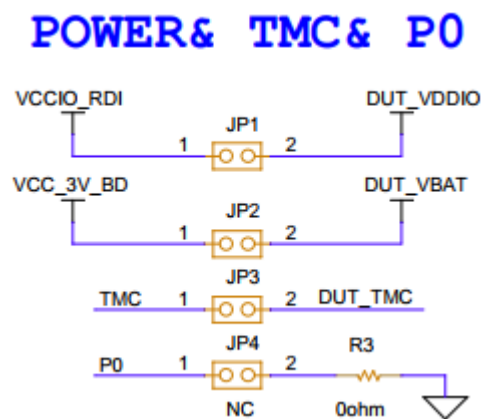
Appendix A

A.1 IO Adapter Board Circuit Description

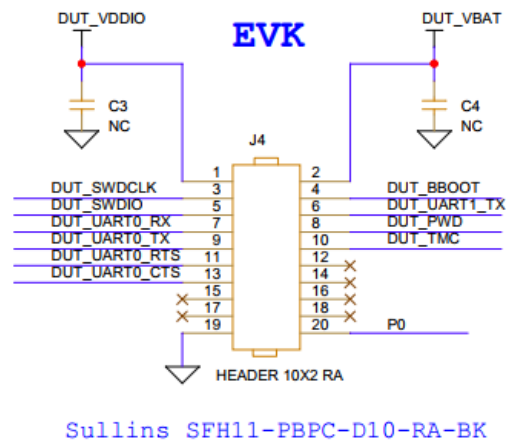
1. J1 connects to the Interface Board, APT and DL.



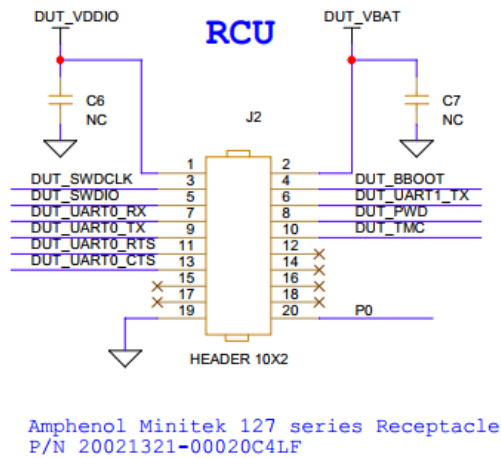
2. Power supply for VBAT and VDDIO. TMC and P0 settings.



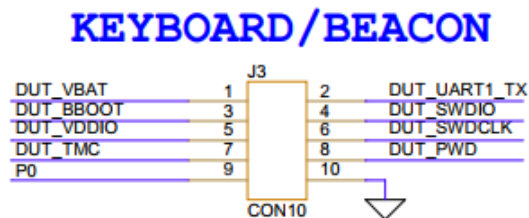
3. J4 connects to the EVB.



4. J2 connects to the Atmosic RC reference board.

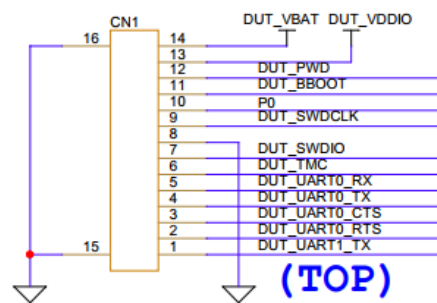


5. J3 connects to the Atmosic Keyboard or PV beacon reference board.



6. CN1 connects to the Atmosic RC reference board.

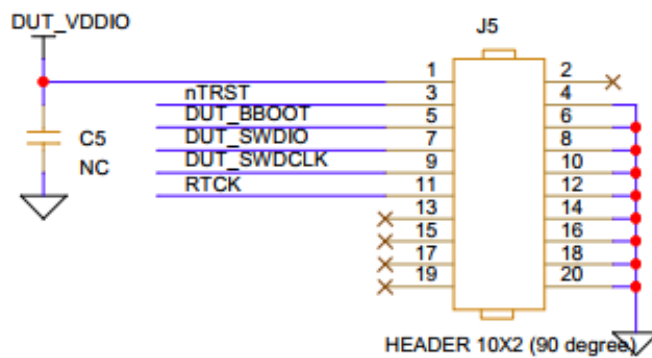
14PIN FFC (0.5mm pitch)



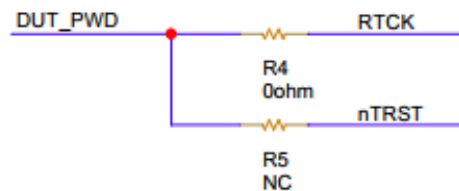
7. J5 connects to the JTAG interface.

J-link

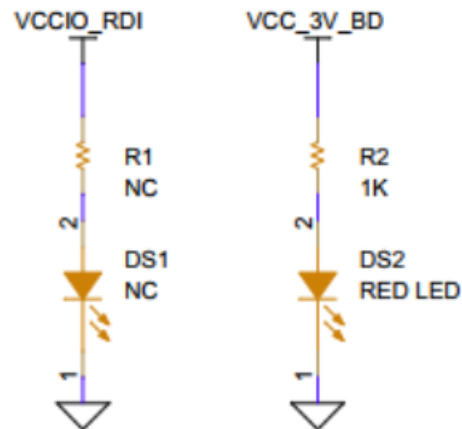
20-pin J-link (SEGGER)



Sullins SFH11-PBPC-D10-RA-BK

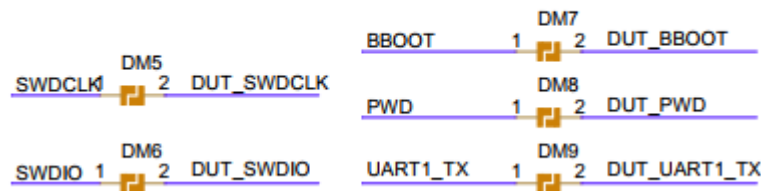


8. LEDs

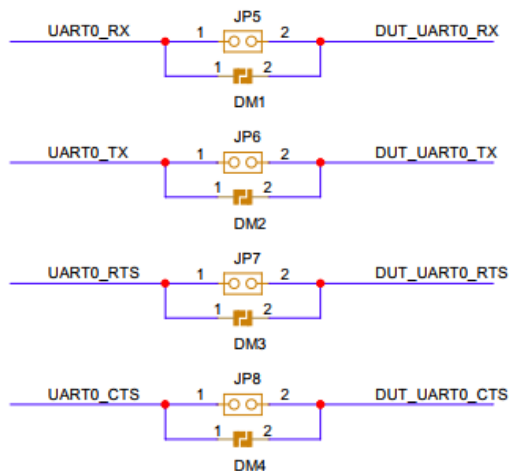


9. Test points and Dummy 0603 footprint for SWD, Uart1_TXD debug message, Uart0 signals.

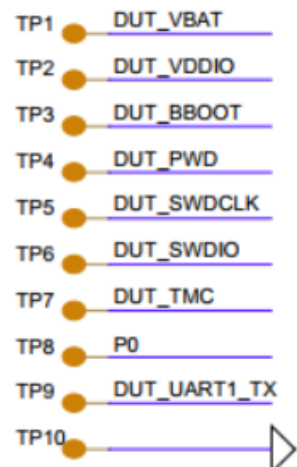
CTRL&SWD&UART1



UART0



TEST POINT



Revision History

Date	Version	Description
May 13, 2022	0.50	Initial version created



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