Evaluating the ADIN2111, 10BASE-T1L Daisy-Chain Evaluation Platform Board with Power Forwarding and Fail-Safe Data Bypass

FEATURES

- ADIN2111 2-port industrial 10BASE-T1L switch
- Power forwarding
- Power fail-safe circuitry
- On-board Arm® Cortex®-M4

EVALUATION KIT CONTENTS

- EVAL-ADIN2111D1Z evaluation board
- USB-A to USB-C 3.0 cable (1m)

EQUIPMENT NEEDED

- EVAL-ADIN1100EBZ or DEMO-ADIN1100D2Z evaluation board media converter
- Single-pair cable (1.5mm^2 max./AWG 16 to fit connector)
- 5V to 58V DC power supply (optional)
- Host PC with USB interface for management, monitoring, and diagnostics

DOCUMENTS NEEDED

- ADIN2111 and ADIN1100 data sheets

SOFTWARE NEEDED

- FTDI USB Virtual Com Port driver for selected Host
- Serial COM port terminal software
- Web browser

GENERAL DESCRIPTION

The EVAL-ADIN2111D1Z is a compact evaluation node board designed for daisy-chaining both power and data, which features the ADIN2111 2-port 10BASE-T1L switch and MAX32690 microcontroller.

The board can be locally powered or powered by the 10BASE-T1L data line when power over the line is available. This board also features a fail-safe circuit that ensures communication even if a node in the daisy-chain network loses power.

The board includes an on-board temperature sensor and a PMOD connector that integrates I^{2}C, SPI, and UART connectivity for external sensors.

Full specifications on the ADIN2111 are available in the ADIN2111 data sheet available from Analog Devices, Inc., and may be consulted with this user guide when using the EVAL-ADIN2111D1Z evaluation board.

EVALUATION BOARD PHOTOGRAPH

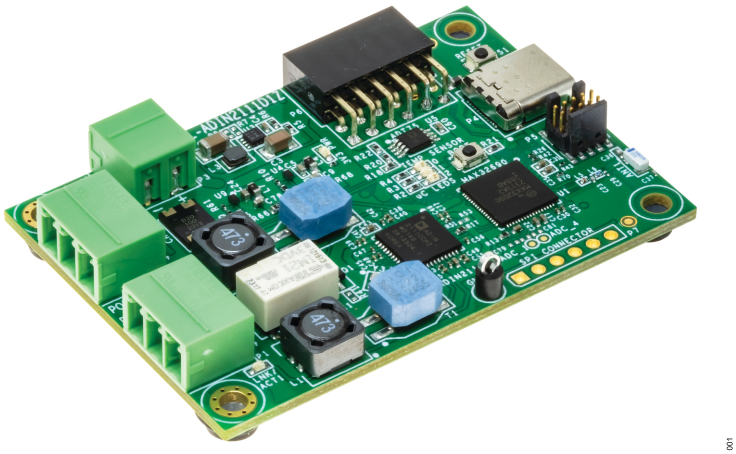

Figure 1. EVAL-ADIN2111D1Z Board Photograph

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REVISION HISTORY

2/2025—Revision 0: Initial Version

OVERVIEW

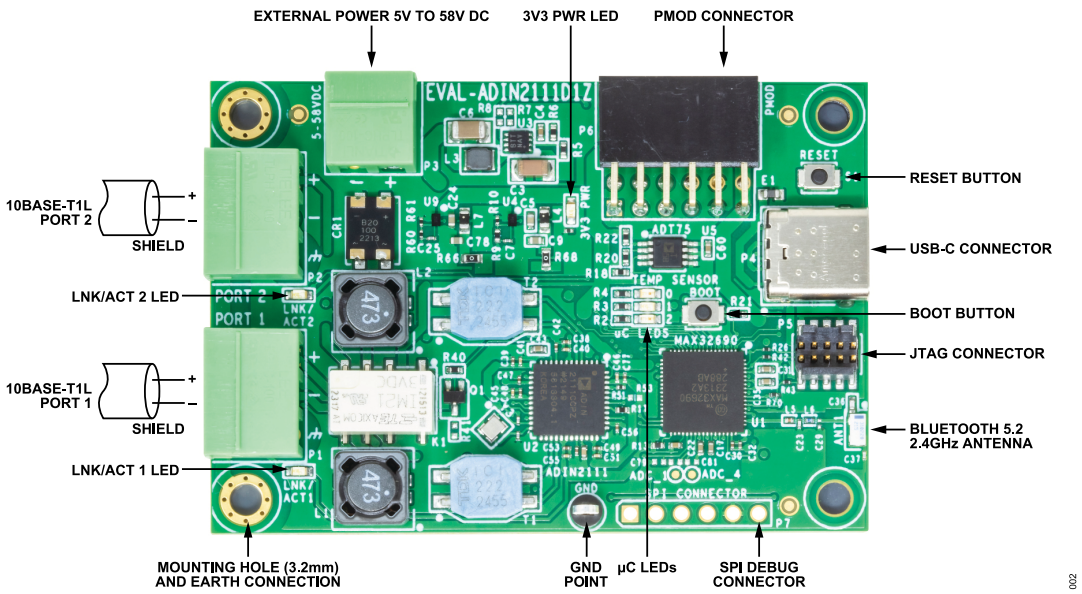

Figure 2. Board Connectors and Controls

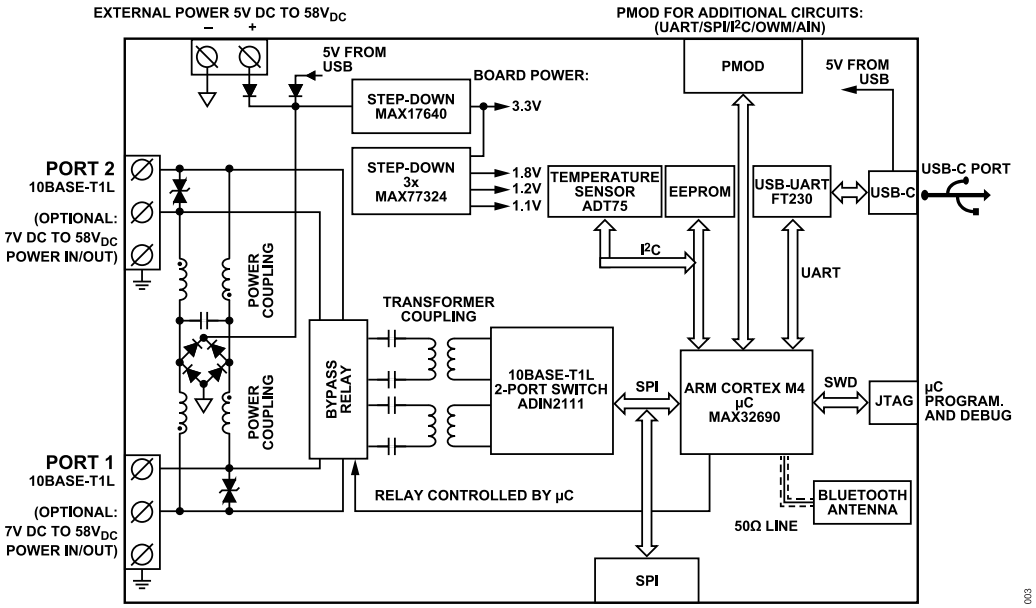

Figure 3. Simplified Block Diagram

OVERVIEW

Table 1. Board Interface Components

Reference	Name	Description
P1	PORT 1	10BASE-T1L Port 1, PoDL 7V to 58V DC in/out.
P2	PORT 2	10BASE-T1L Port 2, PoDL 7V to 58V DC in/out.
P3	External Power	Local 3.3V power. 5V to 58V DC external power supply connected to P3 terminal block. Polarity protection.
P4	USB-C	Board power from the USB, optional COM port for board management and diagnostics.
P5	JTAG/SWD	10-pin JTAG/1-wire connector for microcontroller software programming and debugging.
P6	PMOD	12-pin PMOD connector, 3.3V signal levels.
P7	SPI	SPI signals for optional debug access, 1.8V signal levels.
S1	RESET	Push button for board hardware reset.
S2	BOOT	Push button for future microcontroller boot load mode.
GND	GND	Test point for ground.

Table 2. Board LED Indicators

Reference	Name	Color	Description
3V3 PWR	LED	Green	Board local 3.3V power. Turns ON when the board is powered from any source.
LNK/ACT1	Link/Activity	Green	ADIN2111 PORT 1 link activity LED.
			ON: 10BASE-T1L link established.
			Flashing: 10BASE-T1L link activity.
			OFF: No link/link down.
LNK/ACT2	Link/Activity	Green	ADIN2111 PORT 2 link activity LED.
			ON: 10BASE-T1L link established.
			Flashing: 10BASE-T1L link activity.
			OFF: No link/link down.
µC_LED_0	LED	Red	Reserved for future use or user functions.
µC_LED_1	LED	Green	Flashing: Waiting for dynamic IP address assigned by DHCP Host.
			ON: Dynamic IP address assigned by DHCP Host.
µC_LED_2	LED	Yellow	Heartbeat. Yellow LED blinking indicates that the microcontroller firmware is operating.

BOARD OPERATION

HARDWARE SETUP

Figure 4 shows a typical setup that uses either the EVAL-ADIN1100EBZ or DEMO-ADIN1100D2Z media converter board to access the EVAL-ADIN2111D1Z node boards connected in a daisy-chained configuration.

Each EVAL-ADIN2111D1Z runs a lwIP stack that hosts a web server that can be accessed via the board's IP address (for more details, see the Application Quick Start − Demo Web Page section).

Note that to have multiple EVAL-ADIN2111D1Z boards in the same line, each board must have a unique MAC address and IP address.

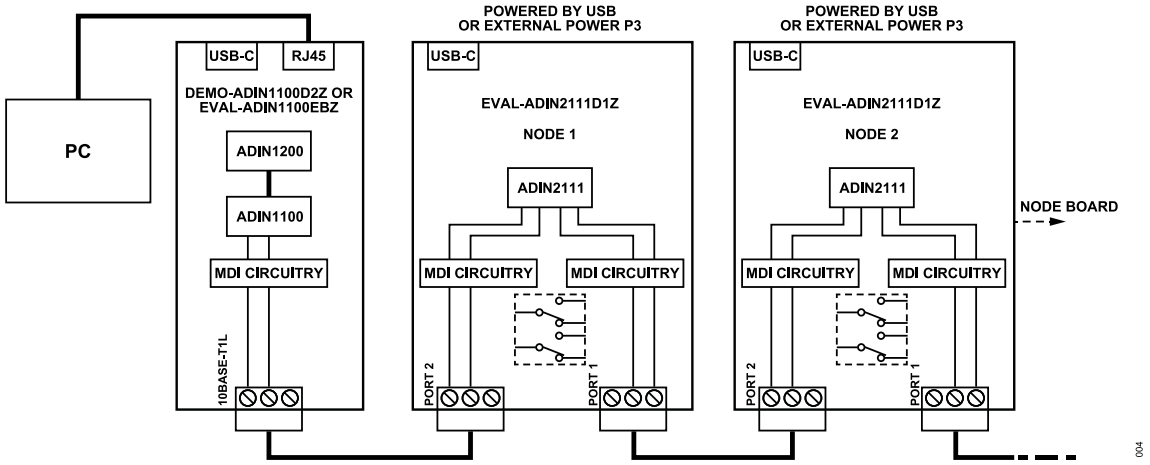

Figure 4. Block Diagram Showing a Typical Hardware Setup with Multiple EVAL-ADIN2111D1Z Boards in a Daisy-Chained Configuration

BOARD OPERATION

APPLICATION QUICK START − DEMO WEB PAGE

The EVAL-ADIN2111D1Z firmware hosts a web server that can be accessed via its IP address using a web browser.

Figure 5 shows the EVAL-ADIN2111D1Z web page that displays the board information, link status for both ports, and on-board temperature sensor reading.

A media converter board (for example, EVAL-ADIN1100EBZ/DEMO-ADIN1100D2Z, for more details, refer to the user guides) may be used to interface the EVAL-ADIN2111D1Z to connect to a PC using an RJ45 cable.

To run the web page demo, do the following steps:

1. Connect an RJ45 cable from the media converter board to a local network adapter of a Host computer, or router.
2. Configure the local network adapter (for more details, see the PC Ethernet Adapter/Port Setup section):
   - IP address: 192.168.1.1.
   - Mask: 255.255.255.0.
3. Connect a single twisted pair between the EVAL-ADIN2111D1Z PORT 1 or PORT 2 and the 10BASE-T1L port of the media converter board.
4. Configure the media converter board in media converter mode (for more details, refer to the EVAL-ADIN1100EBZ/DEMO-ADIN1100D2Z user guides).
5. Connect a USB-C cable between the EVAL-ADIN2111D1Z and the Host computer.
6. Open a serial terminal connected to the EVAL-ADIN2111D1Z virtual COM port, as explained in Serial COM Port and Terminal section.
7. Press the **Reset** button on the EVAL-ADIN2111D1Z terminal, confirm that the welcome message is received, and link is up. Note that the LED LNK/ACT1 turns green when the 10BASE-T1L link is up.
8. By default, the EVAL-ADIN2111D1Z is in fixed IP mode. The default IP address is 192.168.1.50.
9. Open a web browser on the Host PC (for example, MS Edge) and enter the IP address of the board listed from the welcome message on the serial terminal.

Note that the LNK/ACT1 or LNK/ACT2 turn green when the 10BASE-T1L link is established and start blinking when web page is accessed, which indicates the 10BASE-T1L data activity. More nodes can be daisy-chained, as shown in Figure 4 and their web pages may be accessed as explained in step 7.

The web page shows basic information about the board, on-board temperature sensor reading, and link parameters for each channel.

If more than one EVAL-ADIN2111D1Z boards are daisy-chained and are in fixed IP mode, the IP address of each board must be unique. This can be done via UART, as explained in Running in Fixed IP Mode.

Both dynamic IP address (DHCP) or fixed IP address are supported. The default operation of the EVAL-ADIN2111D1Z runs in Fixed IP mode. For more details, see the Running in Fixed IP Mode or Running in DHCP Mode sections.

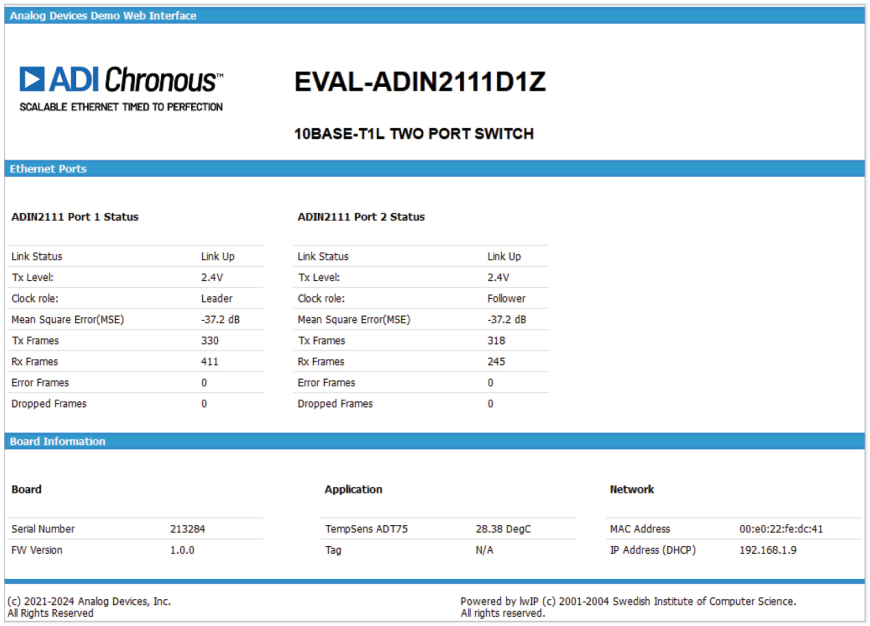

Figure 5. EVAL-ADIN2111D1Z Web Page Displayed on Host PC

BOARD OPERATION

DATA BYPASS

Figure 6 shows a block diagram of a daisy-chain topology, which shows the data bypass feature. The EVAL-ADIN2111D1Z boards labeled as Node 1, Node 2 and Node 3 are connected through cables C1 and C2 and are locally powered.

In normal operation, all nodes are powered on and have an active 10BASE-T1L link with the adjacent node or nodes.

However, if a given node loses power, as shown in Figure 6, the system employs a fail-over bypass mechanism that establishes the communication between its two adjacent nodes. In the particular case shown in Figure 6, the Port 1 and Port 2 signal paths of Node 2 are disconnected from ADIN2111 and a relay connects both signal paths together, thus the cables C1 and C2 connect to each other, effectively bypassing the unpowered Node 2. This allows the 10BASE-T1L data to flow from Node 1 to Node 3. As a result, the communication is reestablished, which ensures uninterrupted data despite the power loss in Node 2.

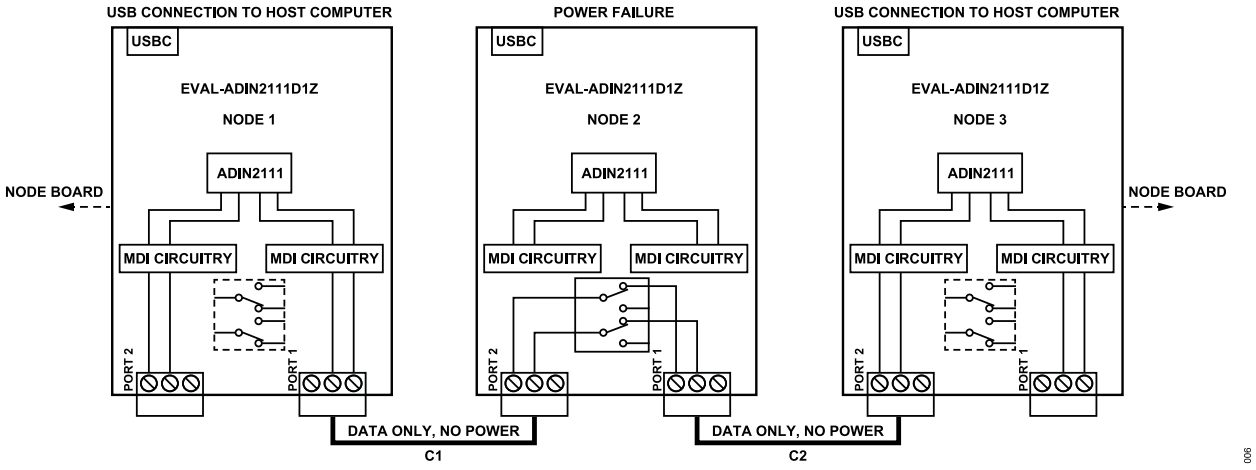

Figure 6. Block Diagram Showing Data Bypass Solution

POWER FORWARDING

Figure 4 shows a typical daisy-chain network with local power. However, the EVAL-ADIN2111D1Z can receive power over the line and forward it to the next node. The DEMO-ADIN1100D2Z board can be utilized to provide a fixed voltage to Node 1, as shown in Figure 4. Node 1 then, forwards the power to Node 2, which then forwards it to the next node. This is achieved through two coupled power inductors that couple and decouple the voltage from the line.

HARDWARE DESCRIPTION

ADIN2111 2-PORT SWITCH

The 2-port 10BASE-T1L switch ADIN2111 is set by default to operate in OA SPI (Open Alliance) mode, with the protection enabled.

The EVAL-ADIN2111D1Z has two LEDs, which indicates the status of the 10BASE-T1L for both Port 1 and Port 2. By default, the LEDs LNK/ACT1 and LNK/ACT2 are turned on if the 10BASE-T1L links are established. The LEDs start blinking upon data activity on the channel.

MICROCONTROLLER

The low-power Arm Cortex-M4 MAX32690 FPU microcontroller and the firmware that is programmed to it during board manufacturing provide all the control, diagnostics, and other functionalities described in this user guide.

The microcontroller handles all operations with the data on an Ethernet stack layer.

The EVAL-ADIN2111D1Z has three LEDs connected to the microcontroller MAX32690. A yellow LED, µC_LED_2 (DS1), indicates a heartbeat of the board. LEDs µC_LED_1/0 (green, red), can be used by the user.

DAISY-CHAIN NETWORK WITH POWER FORWARDING

In a daisy-chain network, power forwarding allows powering multiple nodes in a daisy-chain network over the same pair of wires as the data.

When power is supplied at Port 1, as shown in Figure 7, the power inductor L1 decouples the DC power component from the line, which allows it to be used locally for powering the board's circuitry. Simultaneously, the power inductor L2 then couples back this power and feeds it back to Port 2. Port 2 may connect to and power up another device.

Each coupled power inductor has an inductance of 47µH per coil and current ratings of 0.61A or 0.86A when both inductors are used.

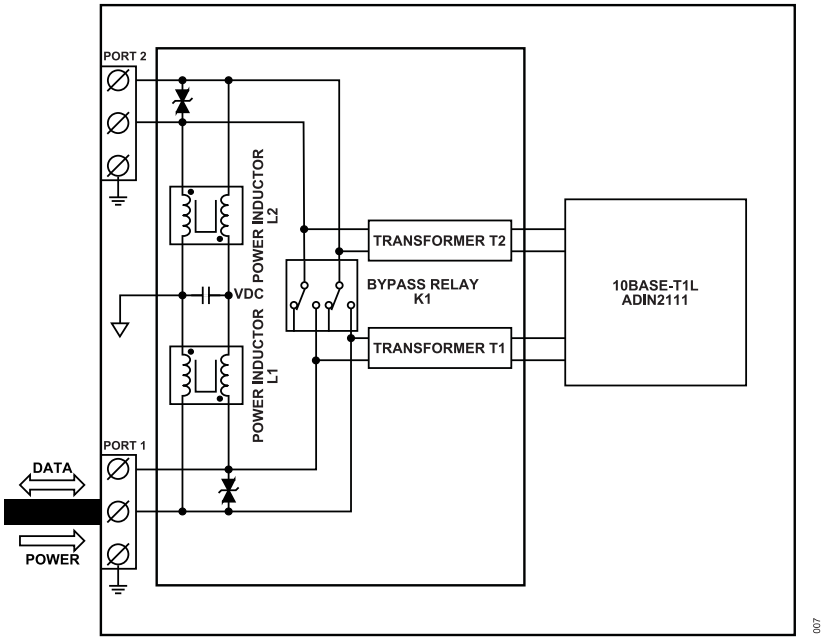

Figure 7. Power Forwarding in a Daisy-Chain Network

HARDWARE DESCRIPTION

BYPASS RELAY CIRCUITRY

The EVAL-ADIN2111D1Z board includes a relay-based bypass circuitry that allows reconnecting adjacent boards when power is lost. The relay is a double pole double throw (DPDT) and it is controlled via an N-FET transistor, which allows the microcontroller to manage its state.

When the board is powered, Port 1 and Port 2 are connected to ADIN2111 by default, which enables the normal data communication.

If the board loses power, the relay K1 is not energized, thus connecting Port 1 and Port 2 to each other, which bypasses the ADIN2111 and allows the data communication between the adjacent nodes.

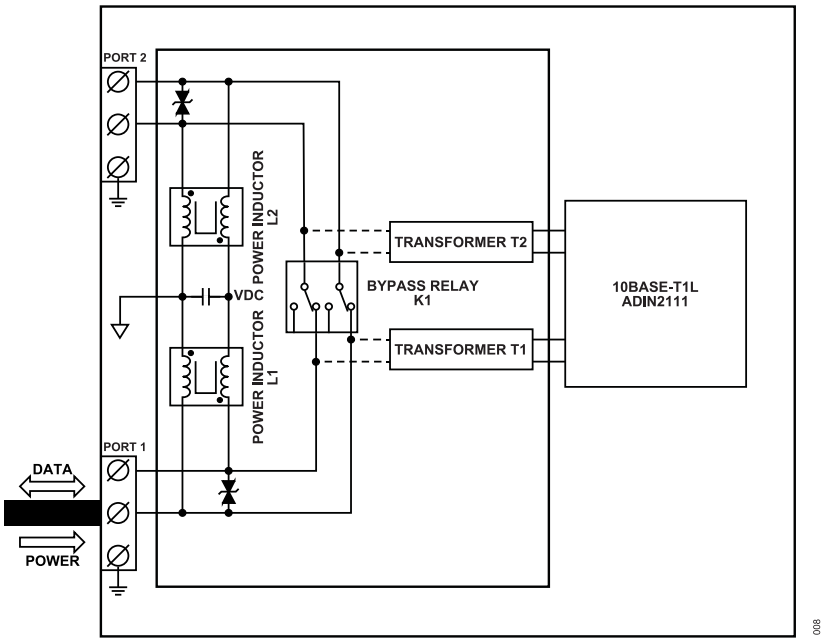

Figure 8. Bypass Relay Circuitry

HARDWARE DESCRIPTION

POWER SUPPLIES

The EVAL-ADIN2111D1Z board can be powered by an external power supply source with an output voltage between 5V DC and 58V DC, connected via the screw terminal connector, P3. Alternatively, the board can also be powered by the 5V supply from the USB-C connector P4 or from the 10BASE-T1L data line when power is available over this line

When powering the device over the same data line, the maximum current through P1 and P2 is limited by the saturation current of inductors L1 and L2, which is 0.61A.

The input voltage is converted by the MAX17640 step-down switching buck converter to 3.3V. Three other voltage rails of 1.8V, 1.2V, and 1.1V are derived from the 3.3V supply using MAX77324. The presence of the 3.3V power is indicated by the green LED (labeled 3V3 PWR).

The Ethernet PHYs, the microcontroller, and most of the other circuits on the board are supplied from 3.3V output from the step-down switching buck regulator MAX17640.

10BASE-T1L CABLE CONNECTION

The 10BASE-T1L cable can be connected via a pluggable screw terminal block to connectors P1 and P2.

ON-BOARD TEMPERATURE SENSOR

The EVAL-ADIN2111D1Z features the ADT75 temperature sensor. This sensor's temperature readings can be seen using a serial terminal on a PC connected to the board via the USB-C connector or can be accessed via the web server. This temperature sensor is connected using I^2C, operating at 3.3V logic levels. The device address is 0x48 as A2, A1, and A0 pins are held low. For more details, refer to ADT75 data sheet.

ON-BOARD EEPROM

The EVAL-ADIN2111D1Z includes a 64-Kbit (8192 x 8) I^2C EEPROM that operates at 400MHz in fast mode. The EEPROM uses I^2C, which operates at 3.3V logic levels and is configured with the device address 0x50.

The on-board EEPROM is used to store the board's MAC ad IP addresses, which ensures that this configuration is nonvolatile after a board reset or power cycle.

PMOD CONNECTIVITY

The EVAL-ADIN2111D1Z evaluation board features an on-board, 12-pin female PMOD connector that is compliant with the PMOD interface specification standard 1.2.0. The PMOD connector (P6) can be used to connect digital sensors via SPI, UART, or I^2C interfaces, which support various sensors such as temperature, pressure, light, and proximity sensors. Only one communication protocol can be used at a time. Additionally, Pin 9 and Pin 10 provide ADC access to the microcontroller MAX32690.

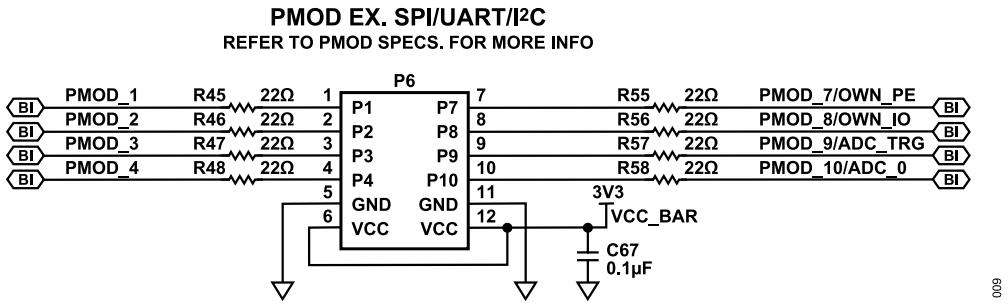

Figure 9. PMOD Connector Pinout

HARDWARE DESCRIPTION

Table 3. PMOD Pinout

Connector Pin#	Board Signal	SPI Pinout	UART Pinout	I²C Pinout	1-Wire Pinout	ADC Pinout
1	PMOD_1	CS	CTS	NC[1]	NC[1]	NC[1]
2	PMOD_2	SDO	TXD	NC[1]	NC[1]	NC[1]
3	PMOD_3	SDI	RXD	SCL	NC[1]	NC[1]
4	PMOD_4	SCLK	RTS (NC[1])	SDA	NC[1]	NC[1]
7	PMOD_7	INT (NC[1])	INT (NC[1])	NC[1]	OWM_PE	NC[1]
8	PMOD_8	RESET (NC[1])	RESET (NC[1])	NC[1]	OWM_IO	NC[1]
9	PMOD_9	CS2 (NC[1])	NC[1]	NC[1]	NC[1]	ADC_TRG
10	PMOD_10	CS3 (NC[1])	NC[1]	NC[1]	NC[1]	ADC_0

[1] NC = Not care if connected or not/can be left unused.

SOFTWARE DESCRIPTION

WEB SERVER AND IP ADDRESS

The EVAL-ADIN2111D1Z software running on the MAX32690 MCU hosts a web server that can be accessed from a PC using a web browser. For more details, see the Application Quick Start − Demo Web Page section. The IP address can be fixed or assigned by a DHCP server when in DHCP client mode.

RUNNING IN FIXED IP MODE

By default, the EVAL-ADIN2111D1Z is in fixed IP mode. The firmware comes with a default IP address 192.168.1.50 saved in the EEPROM.

The board's IP address can be modified via the USB COM port terminal using the following commands:

1. Type command **changeip** followed by the required new address (four decimal numbers with dots between them) followed by pressing the **Enter** key.
2. Type command **savetoflash** followed by pressing the **Enter** key to save the new address to the nonvolatile EEPROM/flash memory on the board.
3. Type command **reset** followed by pressing the **Enter** key, to reset the microcontroller firmware on the board for changes to take effect.

To change the IP mode from Fixed to DCHP mode, enable the DHCP mode by using the command **ipdhcp** as follows:

1. Type command **ipdhcp** followed by pressing **Enter** key.
2. Type command **savetoflash** (and **Enter** key), to save the mode to EEPROM.
3. Type command **reset** (and **Enter** key), which resets the microcontroller firmware on the board.

For more details, see the Running in DHCP Mode section.

To change the IP mode from DHCP to Fixed mode, enable the Fixed IP mode by using the command **ipfixed** as follows:

1. Type command **ipfixed** followed by pressing **Enter** key.
2. Type command **savetoflash** (and **Enter** key), to save the mode to EEPROM.
3. Type command **reset** (and **Enter** key), which resets the microcontroller firmware on the board.

RUNNING IN DHCP MODE

By default, the EVAL-ADIN2111D1Z does not use DHCP mode for IP assignment. To change this setting and configure the board to obtain an IP address via DHCP, see the DHCP Server section.

After the EVAL-ADIN2111D1Z is connected and linked correctly (via the 10BASE-T1L cable, the media converter, and the Ethernet cable) to the router, the DHCP server assigns an IP address.

The assigned IP address can be checked by connecting to the EVAL-ADIN2111D1Z board via its UART interface and sending the command **info**. For more details, see the Serial COM Port and Terminal section.

DHCP SERVER

If the EVAL-ADIN2111D1Z board(s) are in DHCP mode, a DHCP server is required on the server/PC to assign IP addresses to each device on the network. Do the following steps:

1. Download the DHCP server for Windows from the DHCP server website.
2. Click the latest link (V2.5.2) to begin the download. Once the download completes, extract the zip file and follow the configuration guide in the **readme** file provided.
3. Open the **dhcpwiz.exe** application found in the downloaded folder and set up the server on the selected Ethernet Port connected to the media converter adapter.
4. After setting up the DHCP server and having **.ini** file created, run the **dhcpsrv.exe** in admin mode (to be able to configure firewall settings that can block the DHCP tool). Click **Configure** followed by **Start** to run the DHCP server.
5. In the **DHCP Server** window, the status must change to **Configured** and **Running**, as shown in Figure 10.

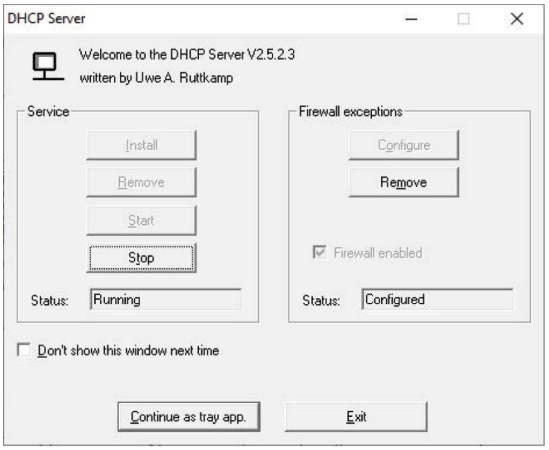

Figure 10. DHCP Server Configuration

6. Click **Continue as tray app.**
7. Right-click the tray icon in taskbar and click **Open Status**, the **DHCP Server Status** window appears, as shown in Figure 11.

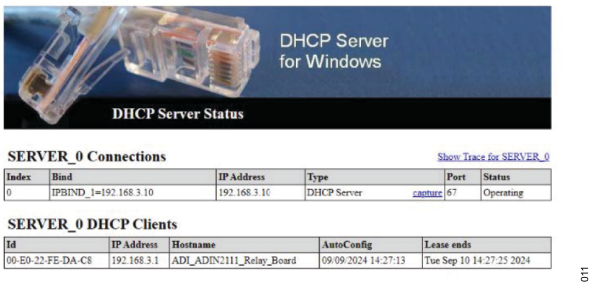

Figure 11. DHCP Server Status

SOFTWARE DESCRIPTION

If the external device is connected to the Host device via Ethernet and is searching for an IP, a notification must pop-up that **dhcpserv.exe** is assigning an IP address to that device.

PC ETHERNET ADAPTER/PORT SETUP

To configure the local network adapter, do the following steps:

1. Open the Network Connections settings from the Windows control panel.
2. Double-click the relevant **Ethernet adapter** and click **Properties**.
3. Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.
4. Select **Use the following IP address** and for instance, fill in the IP address **192.168.1.1** and subnet MASK **255.255.255.0**.
5. Click **OK** and close the settings.

This makes the Ethernet adapter working with a fixed IP address 192.168.1.1, and on the same network subnet as the EVAL-ADIN2111D1Z with default IP address of 192.168.1.50.

If the Ethernet adapter IP address/subnet require to be different, then change the EVAL-ADIN2111D1Z IP address to be on the same subnet, or vice versa.

DRIVER FOR USB COM PORT

The EVAL-ADIN2111D1Z uses the FTDI FT230 for the USB COM port connectivity.

Make sure that the appropriate virtual COM port driver is included or installed on the Host PC before connecting the EVAL-ADIN2111D1Z to that Host via a USB cable. The PC USB port requires to be version 2.0 or higher for using the USB COM Port management and diagnostics function.

Note that the FTDI virtual COM port drivers are available from the FTDI website.

SERIAL COM PORT AND TERMINAL

When the EVAL-ADIN2111D1Z is connected to the Host, it becomes available in the Host system as a USB COM port, and it is assigned a COM port number. The number depends on the system settings, on the COM port devices previously connected and assigned in the system, and on the FTDI driver settings.

The EVAL-ADIN2111D1Z microcontroller firmware communicates over a standard UART interface, with the following settings:

- Speed = 115,200 baud rate
- One start bit
- Eight data bits
- No parity
- One stop bit

The protocol is based on ASCII text commands and messages. Each message sent from the firmware to the Host is finished by both <CR> and <LF> characters. For the commands received from the Host, the firmware expects <CR> or <LF>, or both <CR> and <LF> as <new line> (see Table 4).

Table 4. Board Indicator Components

Character	ASII Code	Description
<CR>	0x0D (13 decimal)	Carriage return.
<LF>	0x0A (10 decimal)	Line feed.

TERMINAL SOFTWARE

The EVAL-ADIN2111D1Z bare-metal firmware works with the common serial terminals. It has been tested on the Windows platform with PuTTY, RealTerm, TeraTerm, Termite, and the old HyperTerminal. The examples in the following sections are captured using CompuPhase Termite.

INITIAL WELCOME MESSAGE

When the EVAL-ADIN2111D1Z is connected to the terminal software using the settings defined in the Serial COM Port and Terminal section, the firmware sends the following initial welcome message after power on or after pressing the **S1 RESET** button:

```
================================================
ANALOG DEVICES EVAL-ADIN2111D1Z DEMO FIRMWARE
================================================
(c)2021-24 Analog Devices Inc.All rights re▶
served
================================================
Firmware ver.  : 1.0.0
Board SerialNo : 206582
================================================
Type '<?><new line>' for a list of commands
================================================
FW mode     :  FIXED_IP
MAC Addr    :  00:e0:22:fe:da:da
IP Address  :  192.168.1.50
Tag         :  Roof temp
================================================
Port 1 Mode :  prefer Leader
Port 2 Mode :  prefer Follower
================================================
Port 1         :  Link Up, Leader, 2.4V
Port 2         :  Link Up, Follower, 1.0V
```

SOFTWARE DESCRIPTION

TERMINAL COMMANDS

The most important command is **<?><new line>** or **<help><new line>**.

On the Host keyboard, type **?** or **help** followed by the **Enter** key, and the firmware sends a list of all commands implemented in this version of firmware (see Table 5).

Table 5. UART Terminal Commands

Command	Description	Format
macwrite	Writes to a MAC register, all numbers in hex.	'macwrite <RegAddr>,<RegData>'<newLine>
macread	Reads from a MAC register, all numbers in hex.	'macread <RegData>'<newLine>
adin2111reset	Resets the ADIN2111 MAC and PHY.	'adin2111reset <newLine>
phywrite	Writes to a PHY register, all numbers in hex.	'phywrite <PortNo><RegAddr><RegData>'<newLine>
phyread	Reads from a PHY register, all numbers in hex.	'phyread <PortNo><RegAddr>'<newLine>
start	Starts sending periodic diagnostics.	'start'<newLine>
stop	Stops sending periodic diagnostics.	'stop'<newLine>
clear	Clears diagnostics counters.	'clear'<newLine>
framegen	Configures Frame Generator: 1 = Port 1, 2 = Port 2. Reset after test.	'framegen <PortNo>' <newLine>
loopback	Configures MAC Remote Loopback Mode: 1 = Port 1, 2 = Port 2. Reset after test.	'loopback <PortNo>'<newLine>
prodtest	Configures Framegen 1, Loopback 2, start, stop after 5000 frames.	'prodtest'<newLine>
reset	Resets µC only.	'reset'<newLine>
relay	Sets Bypass Relay: 0 = OFF (Bypassed), 1 = ON (Board Active).	'relay <0/1>' <newLine>
tempread	Reads the on-board temperature sensor.	'tempread' <newLine>
pmodtest	Sets Production Test: Toggles PMOD pins. Hardware reset to exit test.	'pmodtest'<newLine>
ipfixed	Sets FW mode to Fixed IP. Applies after Save to flash and reset.	'ipfixed' <newLine>
ipdhcp	Sets FW mode to DHCP. Applies after Save to flash and reset.	'ipdhcp' <newLine>
changebrdsn	Changes board serial number. Applies after Save to flash and reset.	'changebrdsn <serialNum>' <newLine>
changeip	Changes IP address. Applies after Save to flash and reset.	'changeip <IP address>' <newLine>
changemac	Changes MAC address. Applies after Save to flash and reset.	'changemac <MAC address>' <newLine>
changenm	Changes Netmask. Applies after Save to flash and reset.	'changenm <netmask>' <newLine>
changegw	Changes gateway. Applies after Save to flash and reset.	'changegw <netmask>' <newLine>
savetoflash	Saves to flash.	'savetoflash' <newLine>
adin2111txdis	Sets PHY TX Disabled: 1 = Port 1, 2 = Port 2.	'adin2111txdis <PortNo>'<newLine>
adin2111test1	Sets PHY Test 1 − Jitter: 1 = Port 1, 2 = Port 2.	'adin2111test1 <PortNo>'<newLine>
adin2111test2	Sets PHY Test 2 − Droop 1: = Port 1, 2 = Port 2.	'adin2111test2 <PortNo>'<newLine>
adin2111test3	Sets PHY Test 3 − Idle: 1 = Port 1, 2 = Port 2.	'adin2111test3 <PortNo>'<newLine>
getfwversion	Gets the firmware version.	'getfwversion'<newLine>
changetag	Updates the tag string. Applies after Save to flash and reset.	'changetag' <tag name> <newLine>
info	Shows the board information.	'info'<newLine>
help	Shows the list of commands.	'help'<newLine>

MICROCONTROLLER FIRMWARE UPDATE

USING THE JTAG PROGRAMMER

The Arm Cortex-M4 MAX32690 FPU microcontroller is programmed before shipping the EVAL-ADIN2111D1Z board. Therefore, there is no need to program the MAX32690 unless a new version of firmware is available that must be updated on the EVAL-ADIN2111D1Z board.

The MAX32625PICO JTAG programmer is required to program the microcontroller using the latest firmware provided.

To program the microcontroller, install the following software packages on the PC:

1. Install the **MaximMicroSDK.exe** for Windows (download from Maxim Micro SDK (Windows)). The Maxim SDK must be installed in its default location: **C:\MaximSDK**.
2. Download and install the **MinGW-w64** toolchain MinGW-w64 - for 32 and 64 bit Windows from the SOURCEFORGE website. Add the ***MinGW\bin*** to the system path. To add, do the following steps:
   a. Open the **System Properties** dialogue and click **Environment Variables**.
   b. Under **System Variables**, select **Path** and click **Edit**.
   c. Click **New** and add ***C:\MinGW\bin***.

Once the required software is installed, do the following steps to flash the binary (.elf) file:

1. Connect the board (P4) via USB-C to the PC.
2. Connect the MAX32625PICO board to the (P5) JTAG connector on the board.
3. Open MinGW, change the directory to the binary file location and run the following command:

```
openocd -s $MAXIM_PATH/Tools/OpenOCD/scripts -
f interface/cmsis-dap.cfg -f tar▶
get/max32690.cfg -c "program ADIN2111D1Z.elf"
```

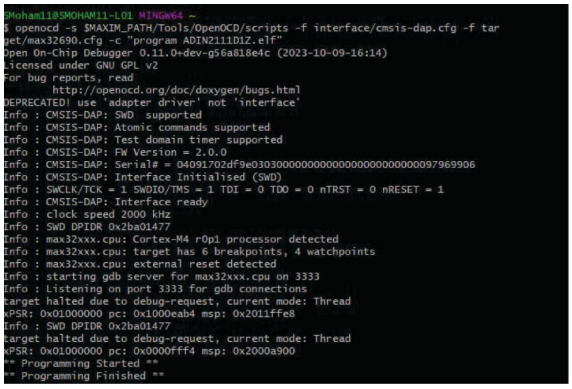

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Figure 12. Microcontroller Firmware Update

MICROCONTROLLER FIRMWARE UPDATE

NOTES

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.