🌿 Manuals+

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User Guide | EVAL-ADIN1110

UG-2314

Evaluating the ADIN1110 Robust, Industrial, Low Power 10BASE-T1L Ethernet MAC-PHY

FEATURES

- User friendly access to all ADIN1110 features
- Standalone hardware configured operation
- Flexible power supplies and prototyping options
- On-board ARM Cortex-M4 STM32L4S5QII3P ultra-low power microcontroller

EQUIPMENT NEEDED

- Link partner with 10BASE-T1L interface
- Recommended to use the EVAL-ADIN1110EBZ (RJ45 Ethernet interface to use as the media converter between 10BASE-T1L and 10BASE-T)
- 10BASE-T1L compatible single pair cable: 1.5mm² maximum/16 American wire gauge (AWG) to fit screw terminal connector

- Power supply source: 5V DC to 32V DC, 0.6W, or USB as power for the board
- Optional: PC running Windows 7 and upwards with USB interface
- Optional: ST-LINK programmer

EVALUATION KIT CONTENTS

- EVAL-ADIN1110EBZ
- 2× plugin screw-terminal connectors for 10BASE-T1L cable and external power supply
- USB-A to Micro USB-B cable (1 meter)

SOFTWARE (OPTIONAL)

- FTDI USB Virtual COM Port Driver (available from FTDI website)
- Serial port terminal software (for example, CompuPhase Termite)

DOCUMENTATION NEEDED

- ADIN1110 data sheet
- ADIN1111 data sheet
- EVAL-ADIN1100EBZ

GENERAL DESCRIPTION

The EVAL-ADIN1110EBZ is a flexible platform enabling quick evaluation of the ADIN1110 (40-pin)/ADIN1111 (32-pin), robust, low-power 10BASE-T1L MAC-PHY. It provides 10Mbps single pair Ethernet (SPE) connections with devices across 1.7km of cable.

The ADIN1111 offers the same functionality as the ADIN1110 but in a smaller 32-pin package with integrated hybrid and termination resistors. The EVAL-ADIN1110EBZ evaluation board is an ideal platform for assessing the 10BASE-T1L functionality, behavior, and performance of the ADIN1111.

The evaluation board offers two modes of operation for maximum flexibility. Connected to a PC via USB port, the full set of ADIN1110 register settings and features, such as link quality monitoring and diagnostics, can be accessed over the USB using serial command interface. The evaluation board also provides an Arduino interface.

Alternatively, the evaluation board can operate in standalone mode where it is configured by setting hardware configuration links and switches. On-board LEDs provide status indication.

The SPI interface provides configuration and data access to the ADIN1110.

A small prototyping area and test points are provided for experimentation with alternative cable connection topologies including isolation transformers and/or power coupling inductors.

Full details about the ADIN1110 are available in the ADIN1110 data sheet, which may be consulted when using the EVAL-ADIN1110EBZ.

EVALUATION BOARD PHOTOGRAPH
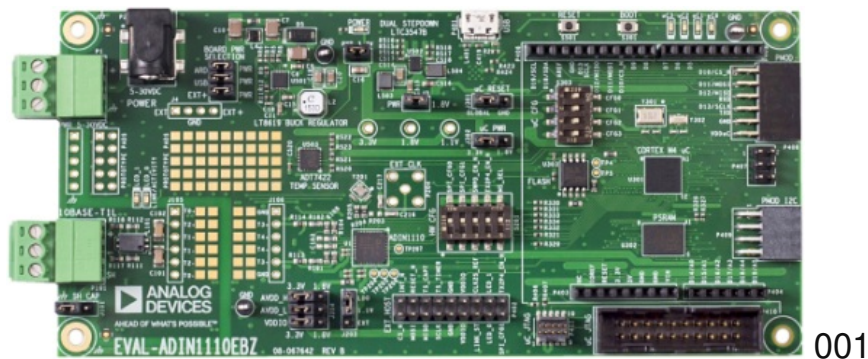
Figure 1. EVAL-ADIN1110EBZ Evaluation Board

PLEASE SEE THE LAST PAGE FOR AN IMPORTANT WARNING AND LEGAL TERMS AND CONDITIONS.

REVISION HISTORY
3/2025—Revision A: Initial Version

EVAL-ADIN1110EBZ SIMPLIFIED BLOCK DIAGRAM
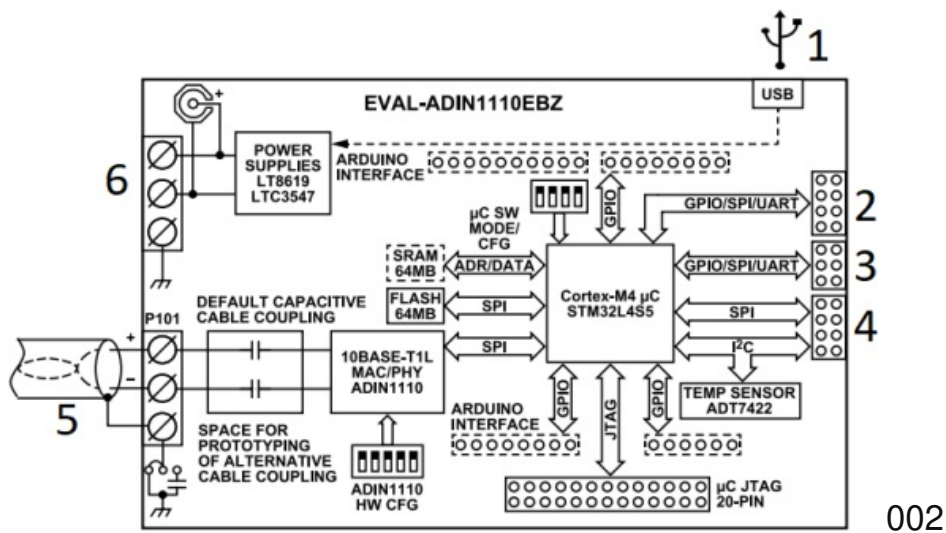
Figure 2. EVAL-ADIN1110EBZ Simplified Block Diagram

1. USB POWER SUPPLY PC SOFTWARE

2. PMOD/SPI/UART

3. ARDUINO INTERFACE

4. PMOD I²C

5. ETHERNET 10BASE-T1L

6. 5Vdc TO 32Vde POWER SUPPLY

OVERVIEW
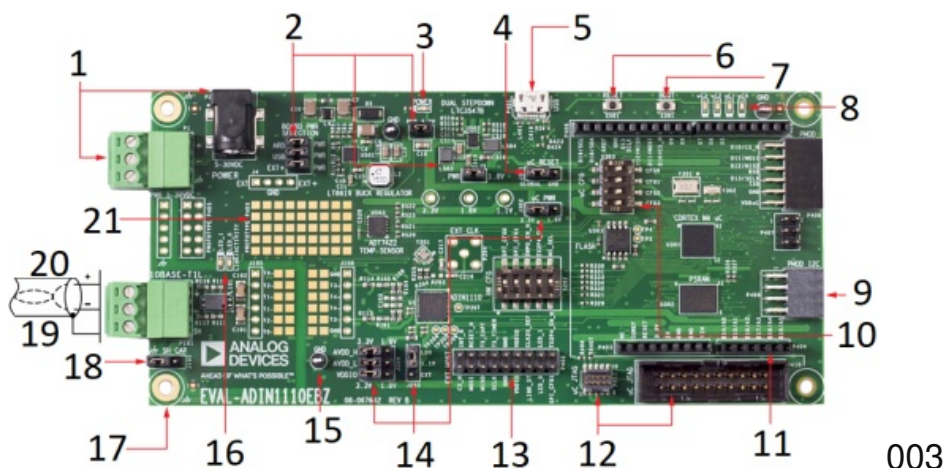
Figure 3. EVAL-ADIN1110EBZ Quick Start Info

1. EXTERNAL POWER SUPPLY:

   BOARD: 5vdc TO 32vdc

2. JUMPER J1, J2 AND J3 BOARD POWER:

   FROM USB CONNECTOR

   FROM EXT. POWER SUPPLY

3.3V AND 1.8V

3. PWR LED:

   GREEN = POWER

4. J302 CHIP POWER SELECTION

5. MICRO USB CONNECTOR:

   CAN BE USED AS COM PORT + POWER

6. RESET BUTON:

   FOR IF SOMETHING IS WRONG

7. BOOT BUTON:

   STM32 FIRMWARE UPDATES

8. µC LEDs:

   • µC0 GREEN (LINKED, on = both links are up)

   • µC1 RED (ERROR, on = something is wrong)

   • µC2 ORANGE (HEARTBEAT, blinking = µC alive)

9. CONNECTION P409:

   USED FOR MANAGING EXTERNAL PHYs

10. MODE SWITCH:

    IF YOU DON'T KNOW BETTER KEEP IT AT DEFAULT MODE 5.

11. ARDUINO SHIELD

12. 10-PIN AND 20-PIN µC JTAG

13. HEADER P402 DIGITAL SIGNALS ACCESS:

    MII/RMII/RGMII, SPI, RESET, CLOCKS, LEDs, STATUS

14. JUMPERS J204 AND J203, J302 CHIP POWER SELECTION

15. GND TEST POINTS

16. 10BASE-T1L STATUS LEDs:

    • LINK GREEN (on = link up)

    • ACTIVITY YELLOW (on = idle, blinking = data)

17. MOUNTING HOLE:

    3.2mm FOR M3 SCREW "EARTH" GROUND (FOR EMC)

18. JUMPER J101:

    10BASE-T1L CABLE SHIELD CONNECTED TO EARTH DIRECTLY OR VIA 4000pF

    CAPACITOR

19. SHIELD

20. ETHERNET 10BASE-T1L

21. PROTOTYPE:

TEST PADS FOR PROTOTYPING.
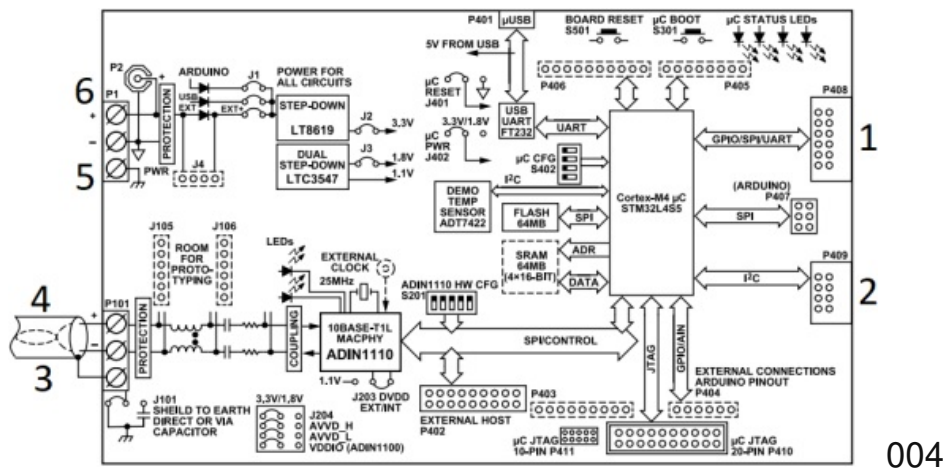
Figure 4. EVAL-ADIN1110EBZ Functional Block Diagram

1. PMOD SPI or UART

2. PMOD I²C

3. SHIELD

4. ETHERNET 10BASE-T1L

5. EARTH

6. EXTERNAL BOARD POWER SUPPLY

   5vdc TO 32vdc

HARDWARE

POWER SUPPLIES

The EVAL-ADIN1110EBZ can be powered from three different sources:

- 5V DC to 32V DC external power supply connected to P1 terminal bock or P2 barrel connector
- USB (5V DC) using the P401 micro-USB connector
- Arduino connector, P403 (VIN pin)

The power supply source can be configured using the J1 (labeled BOARD PWR SELECTION) link (three positions: EXT+, USB, and ARD). Note that the three power supplies can be simultaneously enabled on J1 (three jumpers inserted) as an internal common cathode diodes circuit selects the highest voltage source.

- The selected input power source is converted by the step-down converter, U501 ([LT8619](#)), to 3.3V.
- The link J2 is used to connect U501 output to the main 3.3V supply rail used on the board.
- The green POWER LED1 is ON when the 3.3V rail is present.
- The board power consumption depends on the mode of operation, with the maximum of approximately 0.5W.

10BASE-T1L CABLE CONNECTION

The 10BASE-T1L cable can be connected via pluggable screw-terminal block to connector P101. If more of the pluggable connectors are needed, for easy connecting/changing cables, additional connectors can be purchased from the vendor or distributors:

- Manufacturer: Phoenix Contact
- Manufacturer part number: 1803581
- Description: Pluggable Terminal Block, 3.81mm, 3 Ways, 28AWG to 16AWG, 1.5mm², Screw

GROUND CONNECTIONS

The EVAL-ADIN1110EBZ has an Earth node. Although this node may or may not be electrically connected to Earth ground, in a real device, this node is typically connected to the device metal housing or chassis. This Earth node can be connected as required in a wider demonstration system via Earth terminal of the power supply connector, P1, or via an exposed metal plating of two mounting holes in the left corners of the EVAL-ADIN1110EBZ board. (The third and fourth holes on the right do not have metal plating, and have no Earth connection.)

The shield of the 10BASE-T1L cable can be disconnected from this Earth node, connected directly, or connected via 4700pF capacitor (C104). The required connection is selected using jumper J101.

The local circuit ground, the external power supply (except the Earth terminal, P1), and the USB connector are connected to the Earth node via approximately 2000pF of

capacitance and approximately 4.7MΩ of resistance.

The EVAL-ADIN1110EBZ has been designed only as an evaluation board. It has not been designed nor tested for electrical safety. Any equipment, device, wire, or cable connected to this evaluation board must be already protected and safe to touch without danger of electric shock.

HARDWARE CONFIGURATION SETUP

The EVAL-ADIN1110EBZ board is provided with links (jumper) and dual in-line package (DIP) switches that can be used to set the ADIN1110 configuration. Table 1, Table 2, and Table 3 describe the links and switches functions.

Table 1. EVAL-ADIN1110EBZ Board Link Configuration

Link Ref.	Default Position	Description
J1	USB inserted, EXT+ inserted, ARD inserted	Board power supply source selection. All jumpers can be inserted simultaneously.
J2	Inserted	Board 3.3V power supply rail.
J3	Inserted	Board 1.8V power supply rail.
J101	Earth	SHIELD. Connect the shield of the cable to the Earth node either directly or via a 4nF capacitor.
J203	LDO	ADIN1110 1.1V power supply selection. LDO: using the ADIN1110 on-chip internal 1.1V linear regulator. EXT: using 1.1V output of the LTC3547 step-down regulator.

J204	AVDD_H: 3.3V, AVDD_L: 3.3V, VDDIO: 3.3V	ADIN1110 power supplies selection. Ensure VDDIO and uC Power rails are set to the same voltage level, 3.3V or 1.8V.
J301	Global	Microcontroller reset. Global: Microcontroller reset connected to S501 reset button. GND: Microcontroller reset connected to GND.
J302	3.3V	uC Power. 3.3V or 1.8V.

Table 2. ADIN1110 Hardware Configuration, Schematics Ref. S201

Switch Position	Switch Name	Default Position	Description
1	SPI_CFG0	OFF	SPI Configuration 0. OFF: SPI CRC/Protection enabled. ON: SPI CRC/Protection disabled.
2	SPI_CFG1	OFF	SPI Configuration 1. OFF: Open Alliance SPI. ON: Generic SPI.
3	SWPD_EN_N	OFF	Software power down after reset. OFF: Software power down after reset enabled. ON: Software power down after reset disabled.
4	TX2P4_EN_N	OFF	Transmit 2.4V disable. OFF: Tx level 2.4V p-p or 1.0V p-p. ON: Tx level 1.0V p-p only.

| 5 | MS_SEL | OFF | Leader/Follower select.
OFF: Prefer Follower.
ON: Prefer Leader. |

Table 3. Board LED indicators

Name (Silkscreen)	Color	Schematics Reference	Description
uC0	Green	LED400	In media converter mode, uC0 indicates media converter is working and both PHYs links are up.
uC1	Red	LED401	OFF: No error. ON: Error detected by firmware.
uC2	Yellow	LED402	Short flash: Heartbeat. Long flash or ON: Receiving UART commands.
uC3	Blue	LED403	Reserved.
LED_0	Green	LED200	ON/Flashing: 10BASE-T1L link up/activity.
LED_1	Yellow	LED201	OFF: 10BASE-T1L Tx amplitude 1.0V p-p. ON: 10BASE-T1L Tx amplitude 2.4V p-p.
POWER	Green	LED1	Board 3.3V power supply is present.

The EVAL-ADIN1110EBZ can be used in various modes of operations implemented in the microcontroller firmware. Up to 16modes of operations can be selected by setting the four positions of the slide switch S303. The selected configuration is latched after the board is powered up or reset.

Therefore, to change the mode of operation, the board must be reset by pressing S501 RESET button or by applying a power cycle after changing the position of the slide switch S303. The available modes of operation are described in Table 4.

Table 4. Firmware Modes of Operation, S303 (Labeled uC CFG)

CFG[3:0][1]	Mode No.	Operating Mode[2]	Description
0 0 0 0	15	TCP/IP Stack and Web Server, DHCP client, MAC Addr1	The use of this mode is depicted in Figure 6. In this mode, the TCP/IP stack can be managed via UART using dynamic IP address allocation. The media converter board is then used to convert 10BASE-T1L to 10BASE-T Ethernet, for which common web browsers can be used to access the associated information. MAC Address 1 is used.
0 0 0 1	14	TCP/IP Stack and Web Server, Fixed IP, MAC Addr1	This is a similar mode to mode 15 except fixed IP address allocation is used. MAC address 1 is used.

0010	13	RESERVED	The uC makes no autonomous attempt to interact with the ADIN 1110 MAC-PHY.
0011	12	RESERVED	The uC makes no autonomous attempt to interact with the ADIN 1110 MAC-PHY.
0100	11	RESERVED	The uC makes no autonomous attempt to interact with the ADIN 1110 MAC-PHY.
0101	10	RESERVED	The uC makes no autonomous attempt to interact with the ADIN 1110 MAC-PHY.
0110	9	PHY Frame Generator/Checker	The PHY Frame Generator sends 10,000 frames and checks for number of frames received and potential errors. Output is shown on UART. System errors are indicted by the RED LED uC1 turning ON.
0111	8	PHY MAC Interface Remote Loopback, MSE reading enabled	The PHY is set in MAC Interface Remote loopback mode, and in parallel, MSE readings are shown on UART. Link LED is also enabled.

1 0 0 0	7	TCP/IP Stack and Web Server, DHCP client, MAC Addr2	In this mode, the TCP/IP stack can be managed via UART using dynamic IP address allocation. The media converter board is then used to convert 10BASE-T1L to 10BASE-T Ethernet, for which common web browsers can be used to access the associated information. MAC Address 2 is used.
1 0 0 1	6	TCP/IP Stack and Web Server, Fixed IP, MAC Addr2	This is a similar mode to mode 7 except fixed IP address allocation is used. MAC Address 2 is used.
1 0 1 0	5	RESERVED	The uC makes no autonomous attempt to interact with the ADIN 1110 MAC-PHY.
1 0 1 1	4	RESERVED	The uC makes no autonomous attempt to interact with the ADIN 1110 MAC-PHY.
1 1 0 0	3	RESERVED	The uC makes no autonomous attempt to interact with the ADIN 1110 MAC-PHY.
1 1 0 1	2	RESERVED	The uC makes no autonomous attempt to interact with the ADIN 1110 MAC-PHY.

1 1 1 0	1	RESERV ED	The uC makes no autonomous attempt to interact with the ADIN 1110 MAC-PHY.	
1 1 1 1	0	Reset MA C-PHY	Reset the ADIN1110.	

[1] Switch in ON position = signal Logic 0 for microcontroller (shorted to ground). Switch in OFF position = signal Logic 1 (pulled up by a resistor).

[2] RESERVED means the microcontroller and command line interface are active (serial port).

SOFTWARE

The EVAL-ADIN1110EBZ can be used as a standalone board, with the firmware already pre-programmed in the microcontroller flash memory. The mode of operation can be set using the S303 uC Config DIP switch, and the link status is indicated by LEDs. There is no software required for this standalone use case.

The EVAL-ADIN1110EBZ can also be interfaced with a host computer via the USB port. The full set of ADIN1110 PHY and MAC registers and features such as link quality monitoring can be accessed via the command line interface.

DRIVER FOR USB COM PORT

The EVAL-ADIN1110EBZ has an on-board USB-UART converter (FTDI FT232R).

Make sure that the appropriate virtual COM port driver is installed on the host platform before connecting the EVAL-ADIN1110EBZ to the host computer via the USB cable.

The drivers are available from FTDI website: https://ftdichip.com/drivers/vcp-drivers/.

COM PORT AND TERMINAL SETTINGS

When the EVAL-ADIN1110EBZ is connected to the host, it becomes available in the host system as a USB COM port, and 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-ADIN1110EBZ microcontroller communicates over a standard UART interface, with the following settings:

- Baudrate: 115200
- Data Bits: 8
- Stop Bits: 1
- Parity: none

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 host the firmware expects <CR>, <LF> or <CR> + <LF>.

(For information: <CR> .. "carriage return", ASCII code 0x0D, <LF> .. "line feed", ASCII code 0x0A)

TERMINAL SOFTWARE

The EVAL-ADIN1110EBZ firmware works with the common serial terminals. It has been tested on the Windows platform with PuTTY, RealTerm, Termite, and the Hyperterminal.

TERMINAL COMMANDS AND MESSAGES

The examples in the following sections were captured using Com-puPhase Termite.

INITIAL WELCOME MESSAGE

When the EVAL-ADIN1110EBZ is correctly connected via the USB Virtual COM Port using the terminal software, the firmware sends an initial welcome message:

```
================================================
ANALOG DEVICES 10BASE-T1L Demo Serial Interface
================================================
```

==

Firmware ver.: 1.1.0

Board Name: EVAL-ADIN1110EBZ

Board revision: B

Board Serial Number: AVAS146613

uC CFG3-2-1-0: OFF-OFF-OFF-OFF (Mode 15)

Board Configuration:TCP/IP Stack+Web Server,DHCP,MAC Addr1

SPI Access to ADIN1110: Success

MAC address: 00:e0:22:fe:da:c9

IP Address: not assigned Link status: Down

Leader/Follower: Not run

Tx Level: Not run

==

Type '<?>' for a list of commands

==

Note that a hardware reset of the board (using S501 RESET button) or the **info** command also displays the welcome message. This can be useful to check the ADIN1110 information and link status.

TERMINAL COMMANDS

The most important command is <?><new line>. On the host keyboard, type ? 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	Use

mac write	Writes to a MAC registers. <regAddress> and <Data> in hex.	macwrite <RegAddress>,<Data><newLine>
macr ead	Reads from a MAC registers. <regAddress> in hex.	macread <RegAddress><newLine>
phy write	Writes to a PHY registers. <regAddress> and <Data> in hex.	phywrite <RegAddress>,<Data><newLine>
phyr ead	Reads from a PHY registers. <regAddress> in hex.	phyread <RegAddress>,<Data><newLine>
mac hwre set	ADIN1110 Hardware Reset.	machwreset<newLine>
mac swre set	ADIN1110 Software Reset. Similar to hardware reset without the power-up sequence.	macswreset<newLine>
chan gem ac	Changes MAC address. Applies after **savetoflash** and reset. All digits in hex.	changemac <xx>:<xx>:<xx>:<xx>:<xx>:<xx><newLine>
chan geip	Changes IP address. Applies after **savetoflash** and reset. <xxx> digits in dec.	changeip <xxx>.<xxx>.<xxx>.<xxx><newLine>
chan gegw	Changes gateway, all numbers in dec. Applies after **savetoflash** and reset. <xxx> digits in dec.	changegw <xxx>.<xxx>.<xxx>.<xxx><newLine>

changenm	Changes network mask, all numbers in dec. Applies after **savetoflash** and reset. <xxx> digits in hex.	changenm <xxx>.<xxx>.<xxx>.<xxx><newLine>
changebrdname	Changes board name. Applies after **savetoflash** and reset. Warning: Predefined in factory. Lost if overwritten.	changebrdname <custom text><newLine>
changebrdrev	Changes board revision. Applies after **savetoflash** and reset. Warning: Predefined in factory. Lost if overwritten.	changebrdrev <custom text><newLine>
changebrdsn	Changes board serial number. Applies after **savetoflash** and reset. Warning: Predefined in factory. Lost if overwritten. Serial Number matches the label on the bottom of the board.	changebrdsn <custom text><newLine><newLine>
eraseflash	Erases the internal flash memory. Warning: Resets the board parameters to default values. Also erases board name, board serial number, and board revision.	eraseflash<newLine>
savetoflash	Saves configuration to flash.	savetoflash<newLine>
reset_dut	ADIN1110 Physical Hardware Reset.	reset_dut<newLine>
reset	Microcontroller software reset.	reset<newLine>
start	Starts sending periodic diagnostics. Also provides statistics when used in Frame Generator\checker mode (9).	start<newLine>

stop	Stops sending periodic diagnostics.	stop<newLine>
clear	Clears the diagnostics counters	clear<newLine>
temp read	Reads the ambient temperature from the on-board sensor. Result in °C.	tempread<newLine>
testr am	Executes the on-board RAM test.	testram<newLine>
mod e	Overwrites the board mode in software. After MCU reset or board reset, the mode is set to hardware configuration defined by the switch S303.	mode <number><newLine>
mod es	Lists the board modes available.	modes<newLine>
info	Displays the board information (welcome message).	info<newLine>
getb uildn b	Gets the firmware build number.	getbuildnb<newLine>
?	Displays the list of commands available.	?<newLine>

MICROCONTROLLER FIRMWARE UPDATE

The microcontroller (STM32L4S5QII3P) is programmed out-of-the box with the evaluation firmware. A binary image of the production firmware is also available to download from the ADIN1110 product web page. The default behavior of the configuration switches based on the pre-loaded firmware listed in Table 4. The revision of the programmed firmware can be checked using the serial terminal program and pressing the RESET button (S501) will display the welcome message.

USING THE MICROCONTROLLER BOOTLOADER

Once the USB COM port driver and programmer software are installed, use the

following steps to flash the binary (.hex) file:

1. Set the interface to UART.

2. Set the serial port settings:

- Set the serial port number to the one identified in COM Port and Terminal Settings section (refresh port list using the icon)
- Baudrate: 115200
- Data Bits:8
- Parity: Even
- Flow Control: OFF
- RTS: 0
- DTR:0
- Read Unprotect (MCU): Not selected

3. Open the **Erasing and Programming** menu.

4. Browse and select the firmware image file from your download location: **eval-ADIN1110EBZ-1_1_0.hex**. Click **Open**.

5. Reboot the microcontroller in Programming Mode:

- Press and hold the S301 (BOOT button) and S501 (RESET button) simultaneously on the board.
- Release S501 "RESET" button while holding the S301 "BOOT" button, release S301 "BOOT" after 1s.
- The Board is now in programming mode, the microcontroller LEDs (uC3-uC0) should be OFF

6. Click **Connect**. If connection fails, check if the serial COM port is correct as described in **Identify the Serial COM Port** section.
Also, make sure that there is no serial terminal connected to the serial port in use.

- Check that the target status is **Connected** (see Figure 5, top right corner).

7. Unselect the **Run after programming** option.

**8.** Click the **Start Programming** button.

9. Wait for the programming to be completed (~35s). Check that the blue progress bar is at 100%.

10. A message box appears: **File download completed**. Click **OK**.

11. Wait for ~30s. A message box pops up: **Download verified successfully**. Click **OK**.

12. Click the **Disconnect** button.

13. Power cycle the board by unplugging and plugin the USB cable and any other power supply connected.

- All four uCx LEDs (blue, orange, red, and green) flash once (LED health check).
- **Orange LED** uC2 is continuously blinking after (Board Heart Beat).

USING THE ST-LINK JTAG PROGRAMMER

The ST-LINK JTAG programmer provides a robust solution for programming and debugging source code. It is also faster to program the microcontroller using the JTAG interface.

- Connect the ST-LINK programmer to the EVAL-ADIN1110EBZ using the ARM-20 JTAG connector, P410 uC JTAG.
- Select the ST-LINK interface and follow the same instructions to program the board with the provided firmware.
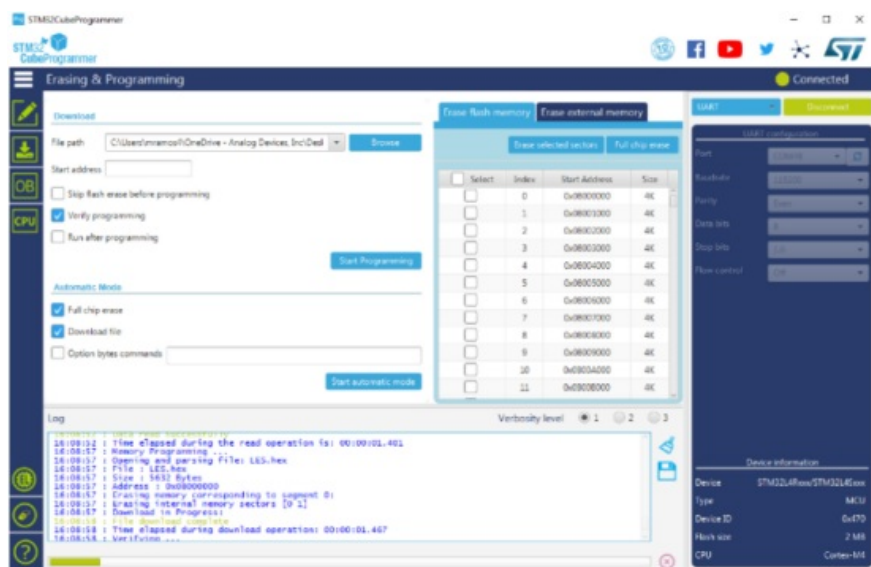
Figure 5. STM32CubeProgrammer

APPLICATION QUICK START

DEMO WEB PAGE

The EVAL-ADIN1110EBZ firmware runs a web server that can be used to access the Demo web page to visualize the board information, link status, and on-board temperature readings.

This feature demonstrates how the 10BASE-T1L MAC-PHY can be connected to a 10BASE-T network and accessed using conventional HTTP requests. A media converter board (for example, EVAL-ADIN1100EBZ, see the user guide for more details) is required to interface the EVAL-ADIN1110EBZ to a 10BASE-T network (using RJ45 cable). A simple setup is shown in Figure 6.

To run the demo web page (fixed IP, mode 14):

1. Configure the EVAL-ADIN1100EBZ board in media converter mode by setting the CFG switch to mode 15 (refer to Table 6 in the EVAL-ADIN1100EBZ User Guide).

2. Configure the EVAL-ADIN1110EBZ board in fixed IP mode by setting the CFG switch to mode 14 (see Table 4).

3. Connect a micro-USB cable between the EVAL-ADIN1100EBZ media converter board and the host computer.

4. Connect a micro-USB cable between the EVAL-ADIN1110EBZ and the host computer.

5. Connect a single twisted pair between the EVAL-ADIN1110EBZ and the EVAL-ADIN1100EBZ media converter (10BASE-T1L).

6. Connect a RJ45 cable from the media converter board to a local area network (LAN), a host computer or a router (10BASET).

7. Open a serial terminal connected to the EVAL-ADIN1110EBZ virtual COM port.

8. Press the RESET button on the EVAL-ADIN1110EBZ terminal, confirm that the welcome message is received and the link is UP: **ADIN1100 Link Up** message received on terminal.
The LED_1 (orange/2.4V p-p mode) and LED_0 (green/link up) must be ON.

9. Open a web browser (for example, Mozilla Firefox) and enter the IP address of the board listed from the welcome message on the serial terminal (enter the **info** command in terminal to display the welcome message).
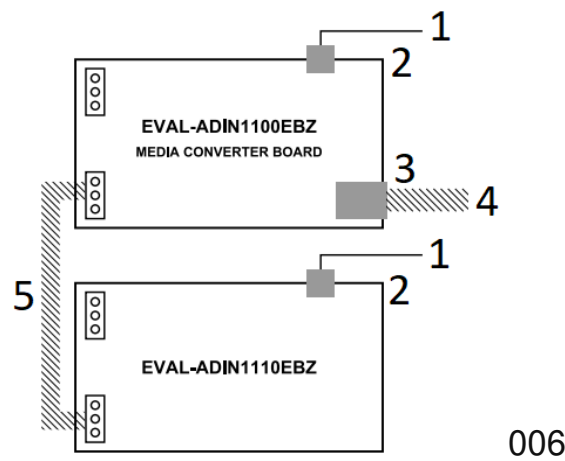
Figure 6. Block Diagram Showing Typical Hardware Setup to Access the Demo Web Page

1. USB CONNECTION TO HOST COMPUTER
2. MICRO-USB CABLE
3. RJ45 CABLE
4. 10BASE-T
   ETHERNET CONNECTION
   (HOST COMPUTER OR LAN)
5. TWISTED SINGLE PAIR +GND
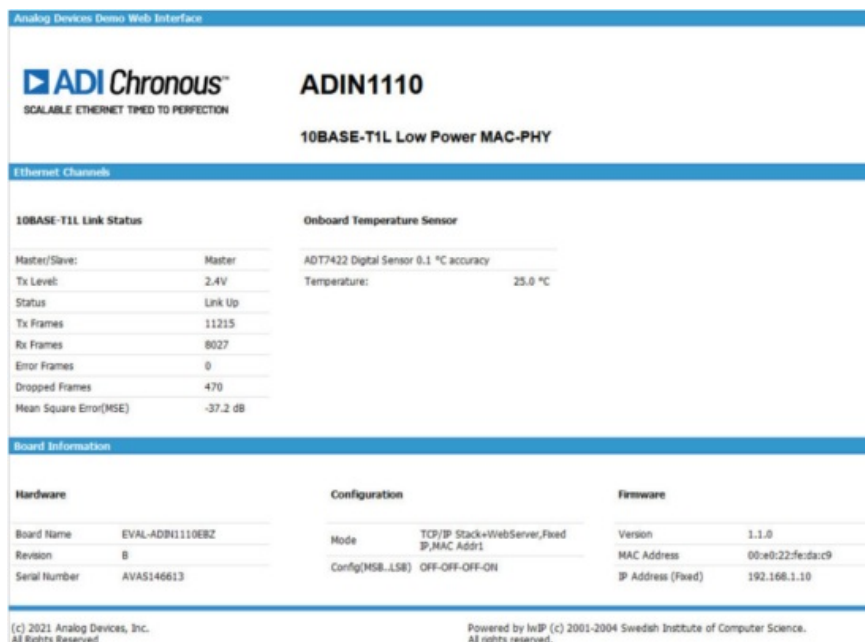
Figure 7. EVAL-ADIN2111EBZ Web Page Displayed on Host PC

FRAME GENERATOR/CHECKER

To run the frame generator/checker demo (mode 9):

1. Configure the EVAL-ADIN1100EBZ board in MAC remote loopback mode by setting the CFG switch to mode 13 (refer to Table 6 in the EVAL-ADIN1100EBZ User Guide).

2. Configure theEVAL-ADIN1110EBZ board in frame generator/checker mode by setting the CFG switch to mode 9 (see Table 4).

3. Connect a micro-USB cable between the EVAL-ADIN1110EBZ media converter board and the host computer.

4. Connect a micro-USB cable between the EVAL-ADIN1110EBZ and the host computer.

5. Connect a single twisted pair between the EVAL-ADIN1110EBZ and the EVAL-ADIN1100EBZ media converter (10BASE-T1L).

6. Connect a RJ45 cable from the media converter board to a LAN, a host computer or a router. (10BASE-T).

7. Open a serial terminal connected to the EVAL-ADIN1110EBZ virtual COM port.

8. Press the RESET button on the EVAL-ADIN1110EBZ terminal, confirm that the welcome message is received, and the link is UP: **ADIN1100 Link Up** message received on terminal.

The LED_1 (orange/2.4V p-p mode) and LED_0 (green/link up) must be ON.

9. Enter the **start** command.

10. Enter the **stop** command to stop the test. The output must be as follows. Note that the test stops automatically once 10,000 frames have been received.

start
OK
MSE -37.2 dB Rx 0, Diff 0, Err 0
MSE -37.2 dB Rx 500, Diff 0, Err 0
MSE -37.2 dB Rx 1000, Diff 0, Err 0
MSE -37.2 dB Rx 1500, Diff 0, Err 0
MSE -37.2 dB Rx 2000, Diff 0, Err 0
MSE -37.2 dB Rx 2500, Diff 0, Err 0
MSE -37.2 dB Rx 3000, Diff 0, Err 0
MSE -37.2 dB Rx 3500, Diff 0, Err 0
MSE -37.2 dB Rx 4000, Diff 0, Err 0
MSE -37.2 dB Rx 4500, Diff 0, Err 0
MSE -37.2 dB Rx 5000, Diff 0, Err 0
MSE -37.2 dB Rx 5500, Diff 0, Err 0

MSE -37.2 dB Rx 6000, Diff 0, Err 0

MSE -37.2 dB Rx 6500, Diff 0, Err 0

MSE -37.2 dB Rx 7000, Diff 0, Err 0

stop

OK

TROUBLESHOOTING

It is recommended to check that the jumper configuration are all in default state as a starting point. Exception applies to the power selection on J1 that can be configured based on the required power source.

SERIAL PORT CANNOT BE OPENED ON HOST

Check the following if the serial port is not accessible:

- Make sure that the FTDI drivers are installed.
- Check which virtual COM port has been assigned to the board on the device manager (windows OS). A simple way to check it is to unplug/plug the evaluation board and check the port number listed (for example, COM1, COM2….).
- If there s no device enumeration and no virtual COM port has been assigned on the device manager, check the following:
    - Power is applied to the EVAL- ADIN2111EBZ.
    - The EVAL- ADIN2111EBZ USB port is connected to the host computer.
- If a virtual COM port s assigned, check that no other application is using it.

COMMAND LINE INTERFACE NOT WORKING

Check the following if the command line interface is not functioning properly:

- Ensure sure that the serial port can be opened properly (see the Serial Port Cannot Be Opened on Host section.
- Verify that the serial COM port selected in the terminal is the one assigned to the evaluation board (see the Serial Port Cannot Be Opened on Host section).
- Check if the serial port Baudrate, parity, start, and stop bits settings are configured properly.
- Perform a hardware reset using the S501 button. This must display the welcome

message.

- Double-check the jumper settings and make sure that if the board is only powered from USB, J1 jumper is set accordingly.
- Reprogram the board with the evaluation firmware.

NO LINK ESTABLISHED (TWO-BOARD SETUP)

Verify the following if no link is established between the two boards:

- Ensure that the command line interface is working (see the Command Line Interface Not Working section).
- Ensure that the EVAL-ADIN1110EBZ board and the link partner are powered properly.
- Ensure that the EVAL-ADIN1110EBZ on-board microcontroller power supply selection (J302) and the on-board ADIN1110 power supply selection (J204) are the same (1.8V or 3.3V).
- Ensure the ADIN1110 communication is working (as shown in the welcome message: SPI Access to ADIN1110:Success)
  - If the SPI access to the ADIN1110 reports a fault (from terminal welcome message), check that the ADIN1110 power rail selection matches the intended transmit level set on S201 pin 4 (TX2P4_EN_N).
  - Check that the SPI is configured to Open Alliance with protection on S201 pin 1 and pin 2.
- Ensure that the 10BASE-T1L cable is properly connected between P101 and the link partner board.
- Ensure that the hardware configuration is appropriate for the required linking arrangement.
  - Transmit level modes are compatible between the two boards (using TX2P4_EN_N switch on S201).
  - Recommendation to disable software power down after reset, specially if using a custom firmware (SWPD_N ON on S201).
  - Check the SPI Configuration on S201. The evaluation firmware uses open alliance SPI with protection enabled (SPI_CFG0 OFF, SPI_CFG1 OFF on S201).
  - Measure and verify the voltage at various points on the EVALADIN1110EBZ using the 3V3, 1V8, and 1V1 test points.

NOTES

![ESD Caution symbol] **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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Documents / Resources

	[ANALOG DEVICES EVAL-ADIN1110 Evaluation Board](#) [[pdf]](#) Owner's Manual ADIN1110, ADIN1111, EVAL-ADIN1110 Evaluation Board, EVAL-ADIN1110, Evaluation Board, Board

References

- [User Manual](#)

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🏷 ADIN1110, ADIN1111, Analog Devices, Board, EVAL-ADIN1110, EVAL-ADIN1110 Evaluation Board, Evaluation Board

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