

Evaluating the ADIN1140 10BASE-T1S Industrial Multidrop Evaluation Platform Board

FEATURES

- ▶ User friendly evaluation for the [ADIN1140](#) MAC-PHY features
- ▶ 10BASE-T1S to 10BASE-T1L media converter
- ▶ USB to 10BASE-T1S bridge
- ▶ LwIP web server and MQTT operation
- ▶ On-board Arm® Cortex®-M4 [MAX32690](#) microcontroller

EVALUATION KIT CONTENTS

- ▶ EVAL-ADIN1140D1Z industrial-10BASE-T1S MAC-PHY evaluation board
- ▶ USB-A to USB-C cable
- ▶ Connector adapter EV-ADIN114XADPTZ

EQUIPMENT NEEDED

- ▶ PC running Windows® 10 or higher
- ▶ Optional: [MAX32625PICO](#) board for firmware updates

DOCUMENTS NEEDED

- ▶ ADIN1140 data sheet
- ▶ ADIN1140 tech ref
- ▶ ADIN1140 register control manual

SOFTWARE NEEDED

- ▶ FTDI USB virtual COM port driver for selected host
- ▶ Serial COM port terminal software
- ▶ Web browser
- ▶ ADI MQTT Manager

GENERAL DESCRIPTION

The EVAL-ADIN1140D1Z is a platform for evaluating the ADIN1140 10BASE-T1S MAC-PHY, which provides half-duplex 10Mbps Single Pair Ethernet (SPE) connectivity to devices compliant with the IEEE 802.3cg Ethernet standard.

The EVAL-ADIN1140D1Z includes firmware that enables it to function as a USB to 10BASE-T1S media converter, a 10BASE-T1L to 10BASE-T1S media converter, or as a sensor node supporting MQTT communication.

When used as a USB to 10BASE-T1S media adapter, simply connect the evaluation board to a host PC via USB. Once connected, the PC recognizes the board as a new network adapter. This adapter can then be configured to access the 10BASE-T1S network connected to it.

When configured as a 10BASE-T1L to 10BASE-T1S media converter, the Ethernet frames flows seamlessly from the 10BASE-T1L port to the 10BASE-T1S port and vice versa using on-board MAX32690.

When configured as a sensor node, the board runs an MQTT application and a web server that can be accessed via the board's IP address. The board publishes its on-board temperature sensor data and other board information over MQTT, which can be viewed using the provided Windows application.

Full specifications on the ADIN1140 are available in the ADIN1140 data sheet available from Analog Devices, Inc., and must be consulted with ADIN1140 tech ref, ADIN1140 register control manual, and this user guide when using the EVAL-ADIN1140D1Z evaluation board.

EVAL-ADIN1140D1Z EVALUATION BOARD PHOTOGRAPH

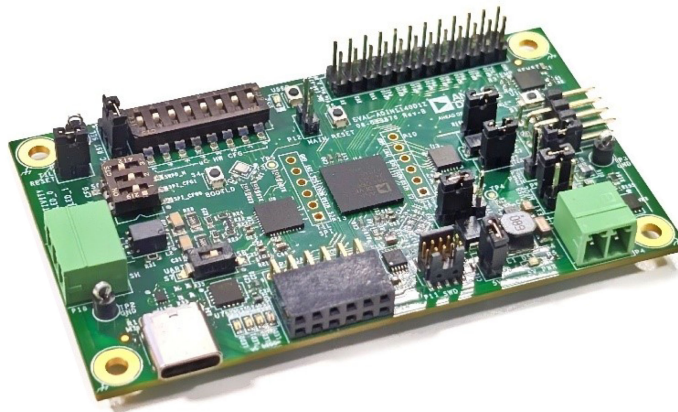


Figure 1. EVAL-ADIN1140D1Z Evaluation Board Photograph

TABLE OF CONTENTS

Features.....	1	10BASE-T1S to 10BASE-T1L Media	
Evaluation Kit Contents.....	1	Converter [Mode 3].....	8
Equipment Needed.....	1	MQTT and LWIP Web Server [Mode 1].....	9
Documents Needed.....	1	MQTT Application Quick Start.....	11
Software Needed.....	1	ADI MQTT Manager.....	12
General Description.....	1	MQTT Configuration Page.....	12
EVAL-ADIN1140D1Z Evaluation Board		Network Page.....	12
Photograph.....	1	Debugging and COM Port.....	15
Evaluation Board Overview.....	3	Appendix.....	16
Hardware.....	4	ADI MQTT Manager Installation.....	16
Power Supplies.....	4	PC Ethernet Adapter Configuration.....	17
Hardware Configuration Setup.....	4	Troubleshooting.....	18
Board Modes of Operation.....	6		
10BASE-T1S to USB Media Converter			
[Mode 0].....	6		

REVISION HISTORY

3/2026—Revision 0: Initial Version

EVALUATION BOARD OVERVIEW

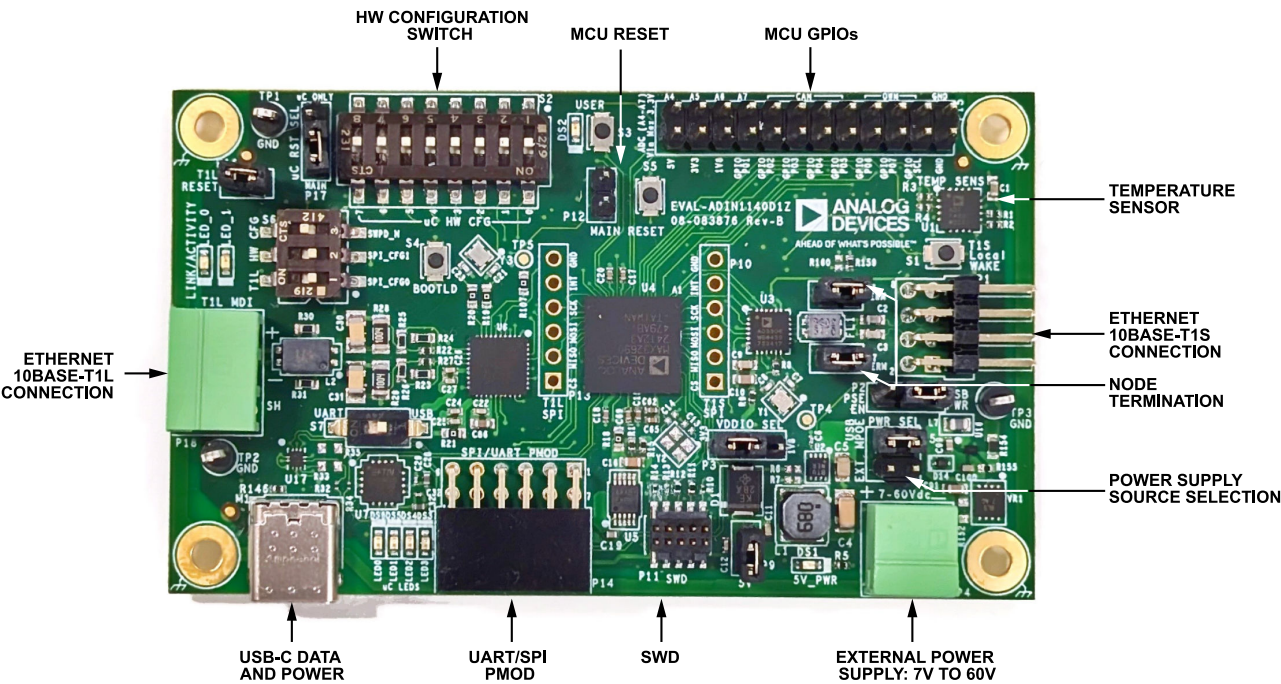
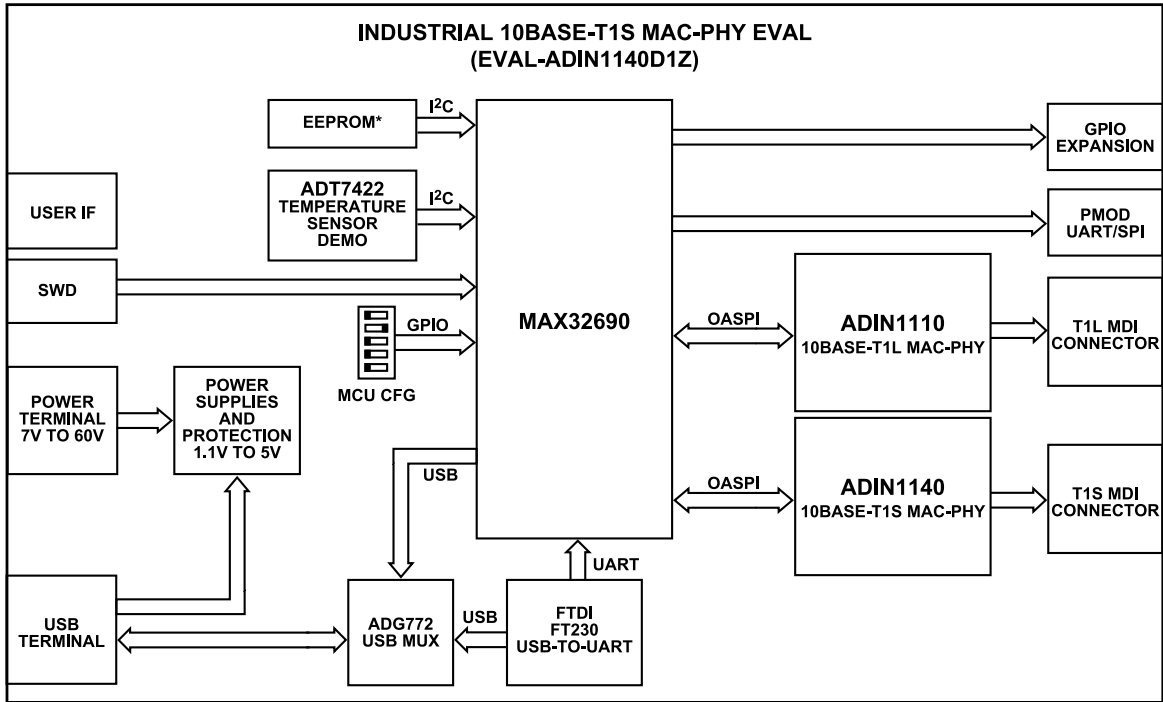


Figure 2. EVAL-ADIN1140D1Z Hardware Connectivity



*OPTIONAL

Figure 3. EVAL-ADIN1140D1Z Simplified Block Diagram

HARDWARE

POWER SUPPLIES

The EVAL-ADIN1140D1Z board provides flexible power options for both input and digital supplies.

Input Voltage Supply

To power the EVAL-ADIN1140D1Z evaluation board, use the following inputs:

- ▶ USB cable connected to USB-C connector M1.
- ▶ External 7VDC to 60VDC power supply input either from:
 - ▶ P4 terminal block.
 - ▶ P1 (V_MPOE Pin 2, GND_MPOE Pin 8).

The PWR SELECTION header (P5) along with protection diode bypass jumper (P2) that can be used to select the input voltage source to power up the board are shown in [Table 1](#).

Table 1. Input Supply vs. Jumpers' Location

P5 Location	P2 Location	Input Supply Source
USB/MPOE	USB PWR	5V from USB cable connected to M1.
EXT	N/A ¹	External 7VDC to 60VDC input to P4.
USB/MPOE	N/A ¹	External 7VDC to 60VDC input to P1 (V_MPOE Pin 2, GND_MPOE Pin 8).

¹ N/A means not applicable.

Digital/Host Supply

Set the VDDIO voltage level by using the P3 (VDDIO_SEL) to either 1.8V or 3.3V.

HARDWARE CONFIGURATION SETUP

The EVAL-ADIN1140D1Z hardware configuration is determined by links (jumpers) and configuration switches on the board. The descriptions and the default hardware configurations of these links and switches are shown in [Table 2](#).

Table 2. Board Jumpers, Connectors, and Switches

Reference	Name	Description
P6/P7	Node Termination	Set or remove the 100Ω line termination to the 10BASE-T1S bus. P6 and P7 must be set at the first node and the last node on the bus only. These jumpers must not be set in any other node on the same bus.
P5	PWR SELECT	Selects the voltage source for the board, as shown in the Input Voltage Supply section. Default: USB/MPOE position.
P2	PSE_EN/USB PWR	When set to USB PWR, it enables board to be supplied from USB connector. When set to PSE_EN, it bypasses the input voltage polarity protection diode on the board. Default: USB PWR position.
P9	VCC_5V	Connects the regulated 5V generated on board to the rest of the board circuitry. Default: Set.
P3	VDDIO_SEL	Sets the VDDIO voltage on the board to either 1.8V or 3.3V. Default: 3V3.
S2[1-6]	CFG0-7	CFG6 and CFG7 set the board mode of operation as follows (CFG6-CFG7): ▶ Mode 0 (OFF-OFF): 10BASE-T1S to USB media converter (default). ▶ Mode 1 (ON-OFF): MQTT + web server example. ▶ Mode 2 (OFF-ON): Reserved. ▶ Mode 3 (ON-ON): 10BASE-T1L/10BASE-T1S media converter. CFG0-5 sets the PLCA ID, IP address and last octet of MAC address of the ADIN1140 . Note that CFG5/S2[6] is MSB and CFG0/S2[1] is LSB.
S6	T1L_CFG	Hardware configuration for ADIN1110 T1L MACPHY: SWPD_N, SPI_CFG0-1. Default (Mandatory for T1L-T1S media converter mode): S6[1-2-3] OFF-OFF-ON.
S7	UART/USB	Configures the USB-C connector interface either to the on-board MAX32690 MCU directly (USB), or to UART-to-USB interface. Default: USB (mandatory for USB media converter mode).
P12	MCU RESET	Reset push button connected to the host MCU MAX32690.
P16	T1L RESET	Reset jumper for T1L (ADIN1110). When connected, the ADIN1110 is in reset. Make sure to remove it for 10BASE-T1L/10BASE-T1S media converter mode. Default: Not connected.

HARDWARE

10BASE-T1S MDI Connection

ETH- and ETH+ are connected to Pins (3, 4) and Pins (5, 6), respectively, of the P1 connector. The external adapter EV-ADIN114XADPTZ, as shown in [Figure 4](#), is provided for the use of screw-in connectors.

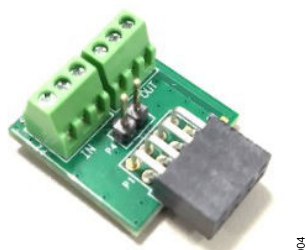


Figure 4. External Adapter for 10BASE-T1S Interface

BOARD MODES OF OPERATION

10BASE-T1S TO USB MEDIA CONVERTER
[MODE 0]

When configured in Mode 0 using S2, as shown in Table 3, the board functions as a USB to 10BASE-T1S adapter, which connects the 10BASE-T1S network to the host PC. The 10BASE-T1S nodes connected to this network may be accessed through the host PC.

Once the EVAL-ADIN1140D1Z board is connected to the PC via its USB-C port, the device appears as network adapter, as shown in Figure 5. This adapter may then be configured with a fixed IP address and other typical network settings.

Table 3. Hardware Configuration for 10BASE-T1S to USB Mode

Reference	Name	Settings
P6/P7	Node Termination	Connect the jumpers only on the first and the last nodes in the bus.
S2	CFG6-CFG7	Set both to OFF.
S7	UART/USB	Set to USB.

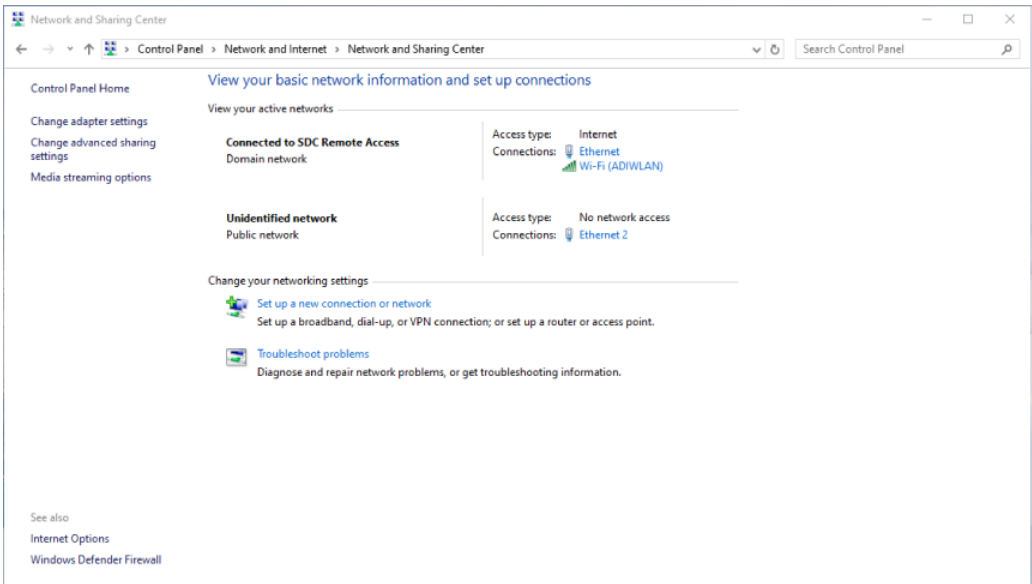


Figure 5. Network Connections

BOARD MODES OF OPERATION

PLCA and MAC Address Configuration

In this mode, the [ADIN1140](#) MAC-PHY operates in PLCA mode with a PLCA Node count set to 64. This allows up to 63 other nodes to be connected to the same 10BASE-T1S bus. The PLCA ID and MAC address of a given board is determined by the DIP switch (S2) as follows:

- The PLCA ID of the device is mapped to the binary value of S2 [CFG5-0], where ON = 1 and OFF = 0.

- The MAC address of the board is defined by 00:E0:22:3A:66:XY, where the first 5 octets are fixed and last octet of MAC address (XY) is equivalent to the node's PLCA ID, set by S2 [CFG5-0].

[Table 4](#) shows examples for S2 [CFG5-0] configuration and the equivalent settings.

Table 4. Device Address and ID Configuration Example for USB Media Converter Mode

S2 [CFG5:0] (ON = 1, OFF = 0)	CFG5:0 Hex	PLCA ID	MAC Address	IP Address
OFF-OFF-OFF- OFF-OFF-OFF	0x00	0x00 (d'0) - PLCA Coordinator	00:E0:22:3A:66:00	Set through Windows network configuration (see the PC Ethernet Adapter Configuration section).
OFF-OFF-OFF- OFF-OFF-ON	0x01	0x01 (d'1)	00:E0:22:3A:66:01	
ON-OFF-ON-OFF-ON-OFF	0x2A	0x2A (d'42)	00:E0:22:3A:66:2A	
ON-ON-ON-ON-ON-ON	0x3F	0x3F (d'63)	00:E0:22:3A:66:3F	

BOARD MODES OF OPERATION

10BASE-T1S TO 10BASE-T1L MEDIA CONVERTER [MODE 3]

When configured for Mode 3, the board operates as a 10BASE-T1L to 10BASE-T1S media converter. This allows the seamless transmission and reception of Ethernet frames between the 10BASE-T1S connector P1 and the 10BASE-T1L connector P18.

A typical usage of this mode combines the long reach point to point 10BASE-T1L and the short reach multidrop 10BASE-T1S, as shown in [Figure 6](#).

The board uses the [ADIN1110](#) 10BASE-T1L MAC-PHY and the ADIN1140 10BASE-T1S MAC-PHY, connected through the [MAX32690](#) MCU to create an Ethernet bridge between both Ethernet interfaces. In this mode, the device's MAC address and PLCA ID are set similarly to Mode 0, as shown in the [PLCA and MAC Address Configuration](#) section.

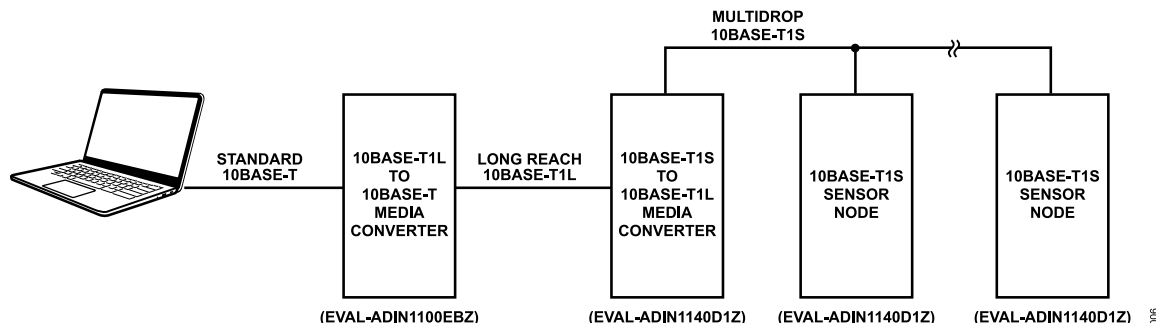


Figure 6. Sample Network 10BASE-T1L and 10BASE-T1S using EVAL-ADIN1100EBZ and EVAL-ADIN1140D1Z

BOARD MODES OF OPERATION

MQTT AND LWIP WEB SERVER [MODE 1]

When the board is configured for Mode 1 as per [Table 5](#), the board operates as a 10BASE-T1S sensor node that hosts a web server and runs an MQTT application, which publishes the node information through MQTT frames to the 10BASE-T1S bus. The published MQTT information can then be monitored using the [ADI MQTT Manager](#).

The web server hosted by the node may be accessed using a web browser by typing the board's IP address in the search bar, as shown in [Figure 7](#). By default, the board operates in fixed IP mode set by the firmware and the configuration switch S2 [CFG5-0].

Table 5. Hardware Configuration for MQTT and LwIP Mode

Reference	Name	Settings
P6/P7	Node Termination	Connect the jumpers only on the first and the last nodes in the bus.
S2	CFG6-7	CFG6 = ON, CFG7 = OFF.
S7	UART/USB	Set to USB (for debugging if needed).

Table 6. Device IP, MAC Addresses, and ID configuration Example for MQTT and lwIP Web Server Mode

S2 [CFG5:0] (ON = 1, OFF = 0)	CFG5:0 Hex	PLCA ID	MAC Address	IP Address
OFF-OFF-OFF- OFF-OFF-ON	0x01	0x01 (d'1)	00:E0:22:3A:66:01	192.168.1.101
ON-OFF-ON-OFF-ON-OFF	0x2A	0x2A (d'42)	00:E0:22:3A:66:2A	192.168.1.142
ON-ON-ON-ON-ON-ON	0x3F	0x3F (d'63)	00:E0:22:3A:66:3F	192.168.1.163

PLCA ID, IP, and MAC Addresses Configuration

The device IP Address, PLCA ID, and MAC address of a given board, are determined by the DIP switch S2, as follows:

- ▶ The PLCA and the MAC address are defined similarly to Mode 0, as shown in the [PLCA and MAC Address Configuration](#) section.
- ▶ The IP Address is set to 192.168.1.1XY, where XY value is determined by S2 [CFG5-0] dip switch.

[Table 6](#) shows the examples for the switch S2 [CFG5-0] configuration and the equivalent settings.

Additionally, the MQTT application's published data can be easily accessed using the [ADI MQTT Manager](#), as shown in [Figure 8](#).

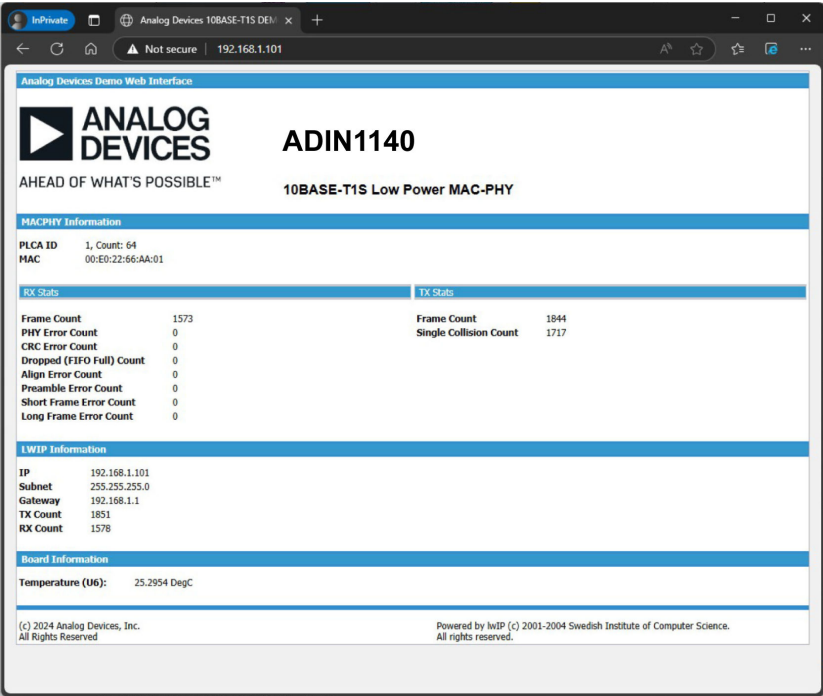


Figure 7. LwIP Web Server Running on 10BASE-T1S Node in Mode 1

BOARD MODES OF OPERATION

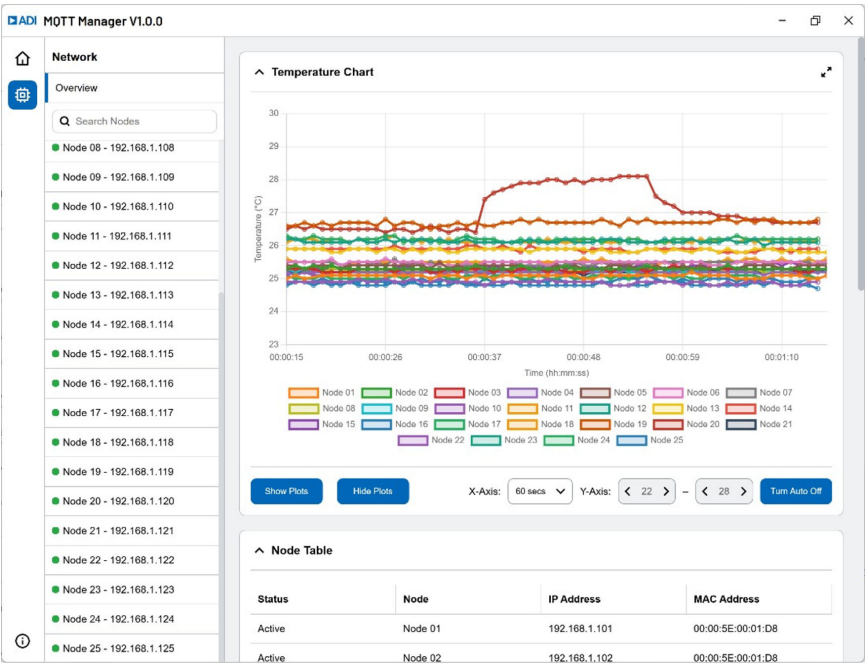


Figure 8. ADI MQTT Manager Plotting Temperature Data of Connected Nodes

MQTT APPLICATION QUICK START

The EVAL-ADIN1140D1Z boards offer a quick and easy way to evaluate and demonstrate the functionality of 10BASE-T1S technology, utilizing the board's 10BASE-T1S-USB adapter mode and MQTT sensor mode. [Figure 9](#) shows a typical 10BASE-T1S network using the EVAL-ADIN1140D1Z board.

To access the sensor data of each sensor on the sensor boards, do the following steps:

1. Install MQTT app (for more details, see the [ADI MQTT Manager Installation](#) section).
2. Connect boards through a single pair cable via their 10BASE-T1S connection, as shown in [Figure 9](#).
3. Configure the first EVAL-ADIN1140D1Z board in **Mode 0** for USB to 10BASE-T1S Adapter mode as per the configuration shown in [Table 3](#) and configure its PLCA ID to 0 as per [Table 4](#) to be the PLCA coordinator.
4. Configure all other EVAL-ADIN1140D1Z boards in **Mode 1** for lwIP web server/MQTT sensor node, as shown in [Table 5](#). Make sure to change the IP of each board to a unique number, by using switch S2 [CFG5-0]. This switch also fixes the MAC address and PLCA ID to a unique number, as shown in the [PLCA ID, IP, and MAC Addresses Configuration](#) section.
5. Connect the first board to a host PC via its USB-C connector using a USB-C cable.
6. Configure the network adapter corresponding to the USB to 10BASE-T1S adapter. For more details, see the [PC Ethernet Adapter Configuration](#) section. Choose the following:
 - a. IP: 192.168.1.200
 - b. Mask: 255.255.255.0
7. Power each sensor node board either via their USB port M1 or external power connector P4 (for power supply configurations, see [Table 1](#)).
8. Open the previously installed [ADI MQTT Manager](#) app.
9. If properly powered, configured, and with acceptable 10BASE-T1S signal integrity, all connected nodes are automatically detected by the software, and listed in the left side panel with their IP addresses, as shown in [Figure 8](#).

All nodes' temperature sensor measurements over time can be observed in the main page, as shown in [Figure 8](#). Additionally, each individual board can be viewed and managed by clicking on the corresponding device in the list of detected devices on the left side panel of the application, as shown in [Figure 13](#). Each boards' hosted web server may also be accessed individually by entering the board's IP address (as defined in [Table 6](#)) in the search bar of a web browser (Chrome, Firefox, and MS Edge), as shown in [Figure 7](#).

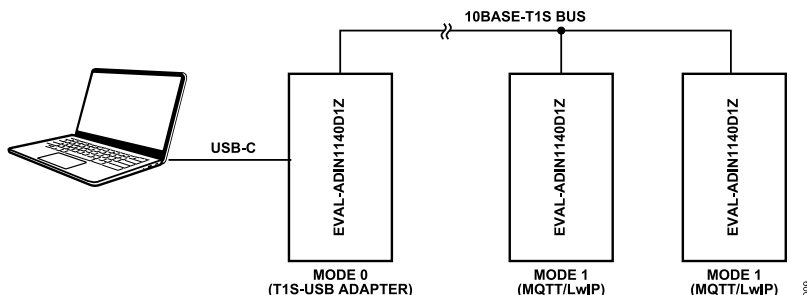


Figure 9. Sample Network Configuration using EVAL-ADIN1140D1Z

MQTT APPLICATION QUICK START

ADI MQTT MANAGER

The **ADI MQTT Manager** is a Windows based application designed to access the nodes data and manage the devices remotely via MQTT. The application acts as both an MQTT broker and a local client, handling the routing of messages and providing real-time information from the board to the user interface.

This section assumes that the **MQTT Manager** has been successfully installed on the host PC. For more details on how to install the **MQTT Manager**, see the [ADI MQTT Manager Installation](#) section.

MQTT CONFIGURATION PAGE

Once the **MQTT Manager** is running, it displays the home page for **MQTT Configuration**, as shown in [Figure 10](#).

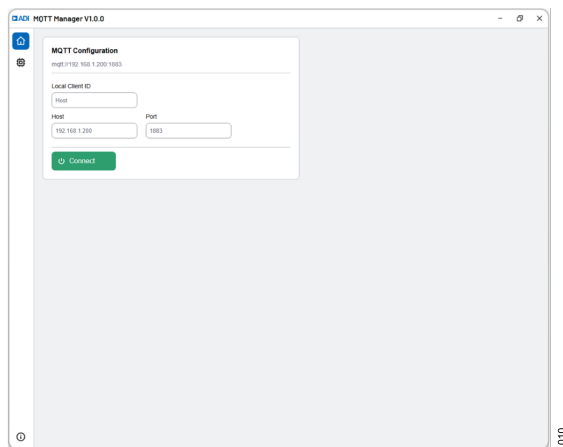


Figure 10. MQTT Configuration

As shown in [Figure 10](#), in the **MQTT Configuration** area, set the following parameters for the MQTT configuration:

- ▶ **Local Client ID:** Host.
- ▶ **Host:** 192.168.1.200 (this entry must match the network adapter IP address set in step 6, as shown in [MQTT Application Quick Start](#) section).
- ▶ **Port:** 1883.

Then, click **Connect**. If connection failure occurs, the application displays the following error message:

Failed to Start MQTT Broker.

NETWORK PAGE

The **Network** page displays all the data related to the MQTT network. The user can see an overview of the network that includes

data such as information about the nodes connected, temperature sensors data, register access control, and nodes' LED control, or the user can access detailed information about each node such as configuration, status, and individual temperature sensor data, as shown in [Figure 11](#), [Figure 12](#), and [Figure 13](#).

The **Overview** tab provides the following controls:

- ▶ **Plot Area:** The temperature sensor data from each node is plotted in °C over time. The time frame can be set from 60seconds to 24hours.
- ▶ **Graph Controls:** The user can customize the plot display area parameters using these controls to show/hide, adjust the y-axis minimum and maximum values or enable auto adjust mode.
- ▶ **Node Table:** Once any node is connected to the broker, it appears in **Node Table**, which shows its **Node ID**, **IP Address**, **MAC Address**, and its **Status** (**Active** or **Disconnected**).
- ▶ **Register Access:** The user can send read and write register commands to the nodes over the network. The user can perform the read/write operation either to each node separately or to all nodes at the same time. For more details on register access, refer to the [ADIN1140 register control document](#).
- ▶ **Register Access History:** This section logs all the read/write operations done by the user and also shows if the operation is done successfully or failed.
- ▶ **LED Control:** The EVAL-ADIN1140D1Z board features four LEDs (LED 0, LED 1, LED 2, and LED 3), which are controlled by the on-board MCU via MQTT commands over the 10BASE-T1S network. The user can control these LEDs either one by one for each node or all nodes at the same time to turn on, turn off, or toggle the current state.

The user can click a Node's ID or IP address in the left-hand node list to access detailed information, as shown in [Figure 13](#), and provides the following details:

- ▶ **Node Information:** Displays board details including hardware and firmware versions, PLCA and IP settings.
- ▶ **Web Server:** Opens the web server hosted on the remote node in a new web browser page.
- ▶ **MAC Status:** Shows the MAC status counters reported by the node.
- ▶ **Board Information:** Allows the user to save the board's schematics as a reference design.
- ▶ **Temperatures Chart:** Displays the single temperature plot for the selected node, with the same graph control features available in the **Overview** tab.

MQTT APPLICATION QUICK START

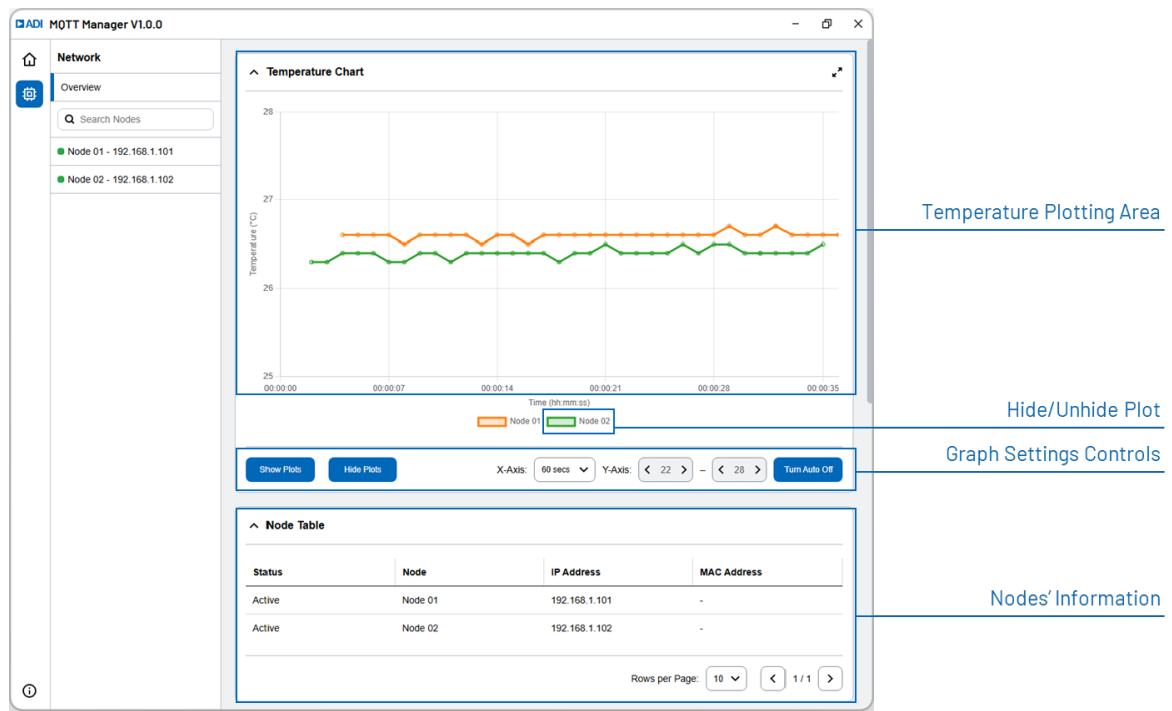


Figure 11. Temperature Sensor Plots and Nodes' Information

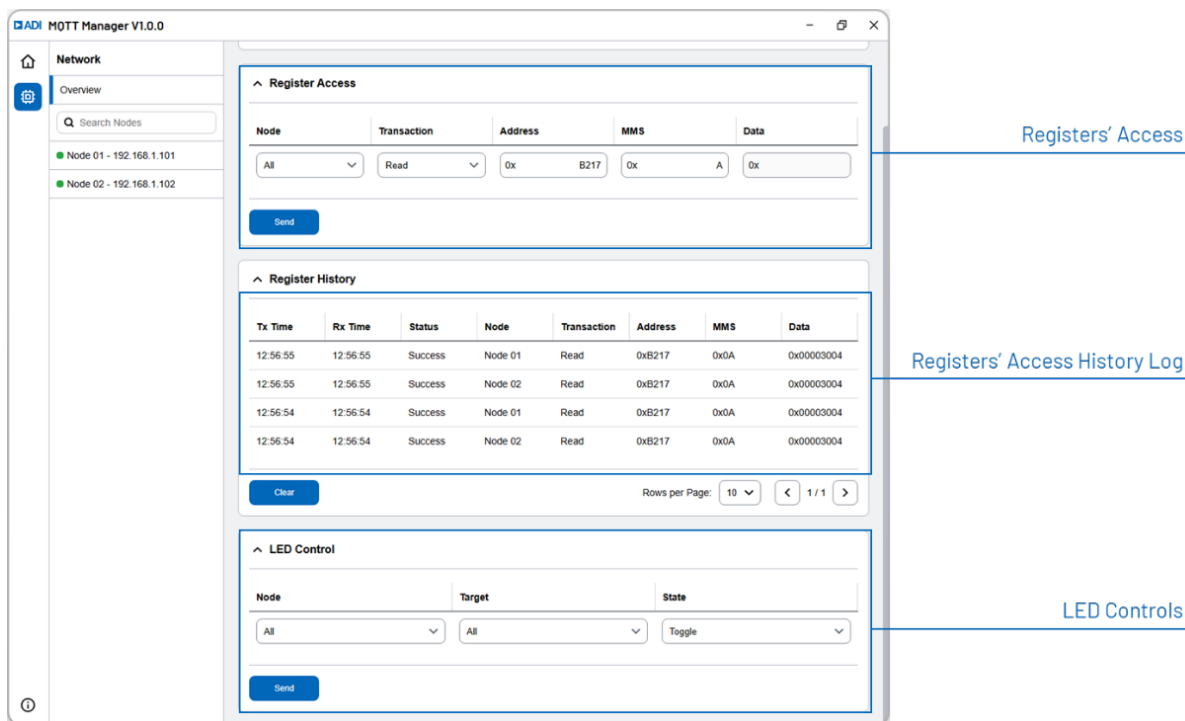


Figure 12. Nodes' Register and LED Controls

MQTT APPLICATION QUICK START

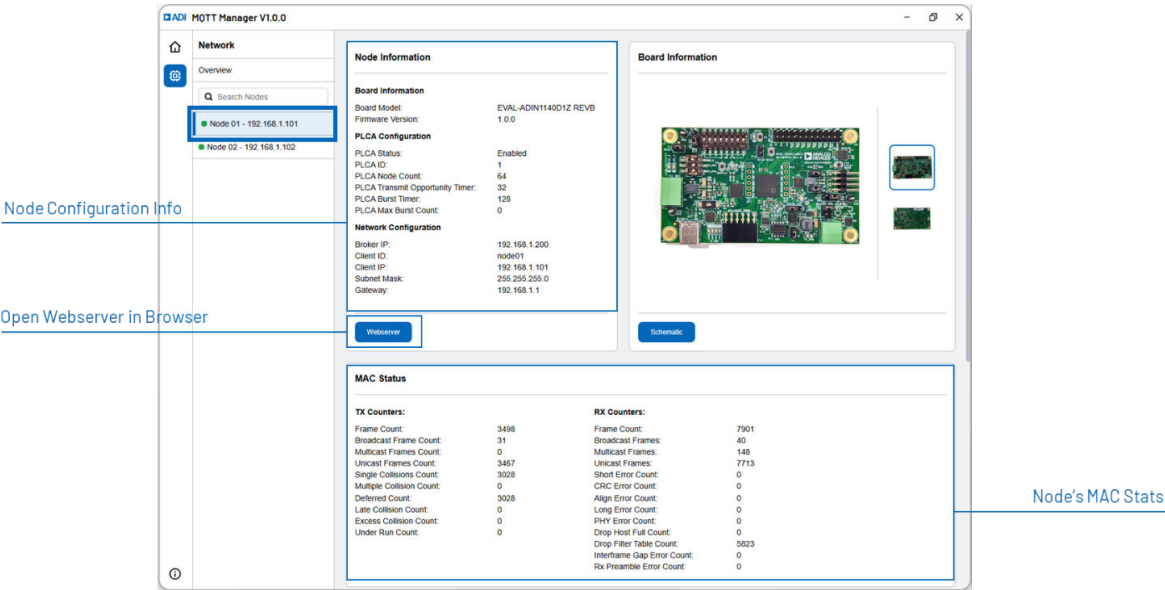


Figure 13. Nodes' Configuration and MAC information

DEBUGGING AND COM PORT

User can have access to UART signals for logs and debugging using COM port access using USB connector for Mode 1 and Mode 3, but for Mode 0 (10BASE-T1S to USB Adapter Mode) COM port can be accessed using SWD connector (P11) using [MAX32625PICO](#).

The logs show some basic information about board configuration after reset, such as MAC Address and PLCA settings. In media converter modes (10BASE-T1S to USB and 10BASE-

T1S to 10BASE-T1L), it shows continuous logging of statistics, which shows the number of received (RX) and sent (TX) frames via the 10BASE-T1S ([ADIN1140](#)) and USB/10BASE-T1L (RNDIS/[ADIN1110](#)) interfaces. The logs also include the count of dropped frames, indicated within angle brackets (<>).

The user can switch from logging mode to command mode using **Ctrl + R** (see [Figure 14](#)), list of supported commands using COM port are shown in [Table 7](#).

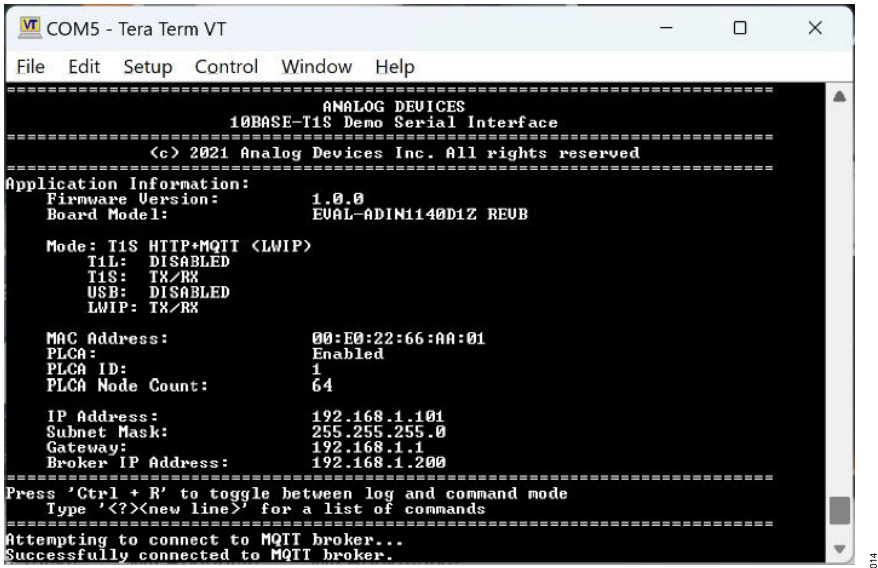


Figure 14. COM Port Logs

Table 7. COM Port Commands

Command	Description
help	List of supported commands.
info	Application information.
getbuildnb	Firmware version.
getbrdver	Board model and revision.
regwrite <addr hex> <mms hex> <value hex>	Write to register.
regread <addr hex> <mms hex>	Read from a register.
netstats	Network statistics.
stats	Statistics.
plcastatus	Burst register read of PLCA status registers.
macstatus	Burst register read of MAC status registers.

APPENDIX

ADI MQTT MANAGER INSTALLATION

After downloading the **adi-mqtt-manager.exe** from **myAnalog** account, open the exe file and follow the instructions in installation wizard, as shown in [Figure 15](#), [Figure 16](#), and [Figure 17](#).

Note that to get access and download the **adi-mqtt-manager** installer using the **myAnalog** account, contact the local Analog Devices, Inc., sales representative.

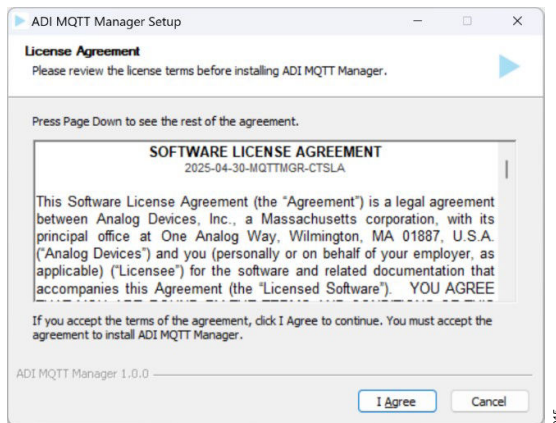


Figure 15. MQTT Manager Installation – License Agreement

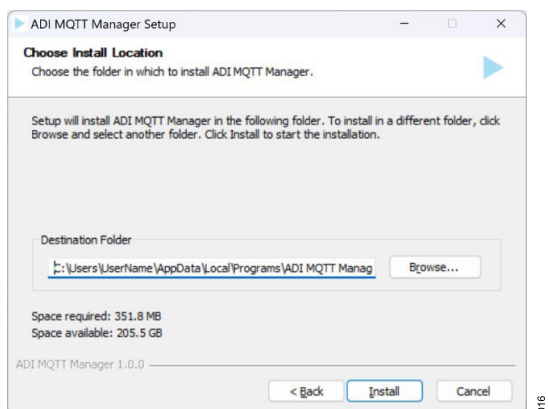


Figure 16. MQTT Manager Installation – Install Location

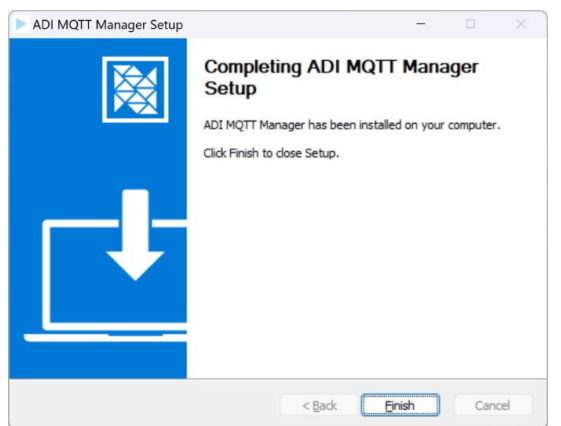


Figure 17. MQTT Manager Installation – Setup Confirmation

APPENDIX

PC ETHERNET ADAPTER CONFIGURATION

To configure the PC Ethernet adapter, do the following steps (see Figure 18):

1. Open the Network Connections settings from the Windows Control Panel.
2. Double-click on the relevant **Ethernet** adapter and open settings.
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**, that is, **192.168.1.200** and **Subnet mask**, that is, **255.255.255.0**. Click **OK** and close the settings.

Note that if the same IP address is used previously on another network interface, it is recommended to disconnect it or modify the IP address for the unused interface.

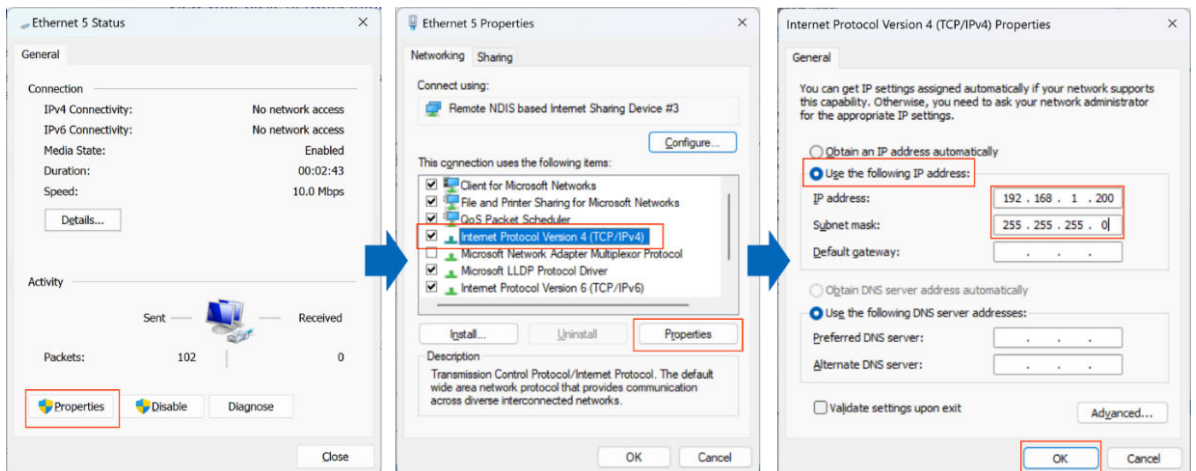


Figure 18. Change IP Address for USB to 10BASE-T1S Adapter

APPENDIX

TROUBLESHOOTING

Table 8. Issues and Troubleshooting

Issue	Solution
Board set in Mode 0 (USB to 10BASE-T1S Media converter) and disappear from network adapters after Windows goes to sleep.	Hit the reset button on the board (S5) to re-register the network adapter on Windows.
Changed the mode switch of the board but is not reflected.	A reset (power cycle) is required after board mode change.
Getting error Failed to Start MQTT Broker when trying to connect in MQTT Manager .	Set the MQTT configuration in ADI MQTT Manager to settings shown in Figure 10 . If still showing the same error, then confirm the network adapter settings is set, as shown in step 6 in the MQTT Application Quick Start section.
ADI MQTT Manager can connect to host, but no node is listed under the Network tab.	Confirm the IP required (as shown in step 6 in the MQTT Application Quick Start section) is mapped to the USB to 10BASE-T1S adapter interface not to another network interface connected to the PC. If still not showing, confirm that all nodes have different IP/PLCA ID assigned to them using S2 [CFG5-0]. If all nodes' IDs are unique, check the physical connection of the 10BASE-T1S bus.

**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.

Legal Terms and Conditions

By using the evaluation board discussed herein (together with any tools, components documentation or support materials, the "Evaluation Board"), you are agreeing to be bound by the terms and conditions set forth below ("Agreement") unless you have purchased the Evaluation Board, in which case the Analog Devices Standard Terms and Conditions of Sale shall govern. Do not use the Evaluation Board until you have read and agreed to the Agreement. Your use of the Evaluation Board shall signify your acceptance of the Agreement. This Agreement is made by and between you ("Customer") and Analog Devices, Inc. ("ADI"), with its principal place of business at One Analog Way, Wilmington, MA 01887-2356, U.S.A. Subject to the terms and conditions of the Agreement, ADI hereby grants to Customer a free, limited, personal, temporary, non-exclusive, non-sublicensable, non-transferable license to use the Evaluation Board FOR EVALUATION PURPOSES ONLY. Customer understands and agrees that the Evaluation Board is provided for the sole and exclusive purpose referenced above, and agrees not to use the Evaluation Board for any other purpose. Furthermore, the license granted is expressly made subject to the following additional limitations: Customer shall not (i) rent, lease, display, sell, transfer, assign, sublicense, or distribute the Evaluation Board; and (ii) permit any Third Party to access the Evaluation Board. As used herein, the term "Third Party" includes any entity other than ADI, Customer, their employees, affiliates and in-house consultants. The Evaluation Board is NOT sold to Customer; all rights not expressly granted herein, including ownership of the Evaluation Board, are reserved by ADI. CONFIDENTIALITY. This Agreement and the Evaluation Board shall all be considered the confidential and proprietary information of ADI. Customer may not disclose or transfer any portion of the Evaluation Board to any other party for any reason. Upon discontinuation of use of the Evaluation Board or termination of this Agreement, Customer agrees to promptly return the Evaluation Board to ADI. ADDITIONAL RESTRICTIONS. Customer may not disassemble, decompile or reverse engineer chips on the Evaluation Board. Customer shall inform ADI of any occurred damages or any modifications or alterations it makes to the Evaluation Board, including but not limited to soldering or any other activity that affects the material content of the Evaluation Board. Modifications to the Evaluation Board must comply with applicable law, including but not limited to the RoHS Directive. TERMINATION. ADI may terminate this Agreement at any time upon giving written notice to Customer. Customer agrees to return to ADI the Evaluation Board at that time. LIMITATION OF LIABILITY. THE EVALUATION BOARD PROVIDED HEREUNDER IS PROVIDED "AS IS" AND ADI MAKES NO WARRANTIES OR REPRESENTATIONS OF ANY KIND WITH RESPECT TO IT. ADI SPECIFICALLY DISCLAIMS ANY REPRESENTATIONS, ENDORSEMENTS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, RELATED TO THE EVALUATION BOARD INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, TITLE, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. IN NO EVENT WILL ADI AND ITS LICENSORS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES RESULTING FROM CUSTOMER'S POSSESSION OR USE OF THE EVALUATION BOARD, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DELAY COSTS, LABOR COSTS OR LOSS OF GOODWILL. ADI'S TOTAL LIABILITY FROM ANY AND ALL CAUSES SHALL BE LIMITED TO THE AMOUNT OF ONE HUNDRED US DOLLARS (\$100.00). EXPORT. Customer agrees that it will not directly or indirectly export the Evaluation Board to another country, and that it will comply with all applicable United States federal laws and regulations relating to exports. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the substantive laws of the Commonwealth of Massachusetts (excluding conflict of law rules). Any legal action regarding this Agreement will be heard in the state or federal courts having jurisdiction in Suffolk County, Massachusetts, and Customer hereby submits to the personal jurisdiction and venue of such courts. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement and is expressly disclaimed. All Analog Devices products contained herein are subject to release and availability.

