

I3C BasicSM Protocol Analyzer Plugin for Saleae Logic
Getting Started Guide

Revision 2.2

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1 Table of Contents

1 Table of Contents	1
2 Compatibility	2
3 Licensing Flow	2
4 Analyzer Package Contents	3
5 Getting Started	4
Step 1: Launch Logic 2.x Desktop Software Application	4
Step 2: Open the software Preferences window	4
Step 3: Configure the Custom Low-Level Analyzers Directory	5
Step 4: Restart the Saleae Logic desktop application.	6
Step 5: Open an Example I3C Capture	7
Step 6: Add the I3C Basic Protocol Analyzer to the session	8
Step 7: Configure the I3C Basic Protocol Analyzer Channels	9
Step 8: Provide License Information	10
Flex/On-Demand License Setup	10
Node-Locked License Setup	10
Step 9: Activate the I3C Basic protocol analyzer license	11
6 I3C Transactions HLA	12
Step 1: Open the Extensions tab in Saleae Logic	12
Step 2: Import the I3C Transactions HLA into Logic	13
Step 3: Add the I3C Transactions HLA to the Session	13
Step 4: Activate the I3C Transactions HLA	14
Step 5: Optimize Display Colors & Configuration	15
7 License Activation Errors	17
8 Frequently Asked Questions	19
9 Customer Support	20
10 Revision Log	22

2 Compatibility

The I3C BasicSM analyzer plugin is provided as a **.dll** file for Windows, **.so** for MacOS, and **.so** for Linux. These files will work with both Logic 1.2.29+ and Logic 2.3.43+ versions of the desktop software application.

Note: This analyzer plugin requires hardware and software from Saleae in order to be useful. Saleae Logic desktop software is available free-of-charge for use with their hardware devices. Saleae hardware can be purchased on their website here, or use the devices that you already own.

Please consult our I3C BasicSM Analyzer Plugin Product Datasheet for additional information regarding hardware device compatibility.

3 Licensing Flow

The analyzer licensing is implemented in a lightweight and flexible manner such that there is no IT burden to get up and running quickly. Flexible/On-Demand Licenses are available for PCs which have internet access. Node-locked file-based licenses are available for off-line / air-gapped PCs in labs that do not have internet access and can use the analyzer plugin. The basic licensing flow is as follows:

1. Load the I3C BasicSM Analyzer Plugin in Logic desktop software.
2. Add the I3C BasicSM Analyzer to the capture session.
3. Configure the license key:
 - a. Flex/On-Demand licenses → Simply enter your license key into the License Key field and click 'Save'. Skip ahead to Step 6 below.
 - b. Node-Locked licenses → Click "Browse.." to point to your license key file. Click 'Save' and skip ahead to Step 6 below. If you do not have a license key file for this PC, please write in to support with the "Unique ID" and follow steps 4 and 5.
4. Customer support will activate the license and provide the license file for the Unique ID.
5. Place the license file on the PC you're using, open the analyzer settings and set the path to the license file.
6. The I3C plugin is now activated for use on that PC.

There are several tiers of licensing which may lock/unlock various features as desired. Licenses can be time-limited or perpetual. Please see our website for up-to-date information on the various license packages available: <https://binho.io/pages/i3c-basic-protocol-analyzer>

4 Analyzer Package Contents

The I3C BasicSM analyzer plugin is distributed in a zipped folder containing the analyzer plugin binaries (compiled for Windows / MacOS / Linux for both Logic 1.x and Logic 2.x), High Level Analyzer extensions for I3C Transaction-Level decoding, and example python scripts demonstrating how to use the I3C BasicSM analyzer with Saleae's Automation API. Lastly, a set of example capture files are included in the distribution, along with the PDF datasheet and this Getting Started Guide.

Binho I3C Basic Protocol Analyzer File Package

- Example Captures
 - Out-of-Box Demo with DK-42605.sal
 - I3C Bus Capture Example 1.sal
 - I3C Bus Capture Example 2.sal
 - I3C Bus Capture Example 3 - Hotjoin.sal
 - I3C Bus Capture Example 4 - SPD.sal
 - I3C Bus Capture Example 5 - HDR-DDR.sal
- I3c-analyzer-hla
 - I3c-transaction-hla
- I3c-analyzer-plugin
 - [Release Version Number]
 - Logic1.txt
 - Logic 2
 - Win
 - MacOS
 - arm64
 - x86
 - Linux
- I3c-automation-api
 - I3c_automation_example_live_capture.py
 - I3c_automation_example_load_capture.py
 - I3c-basic-automation-demo-capture.sal
 - readme.md
- Plugin Software License Agreement [PDF]
- Plugin Datasheet [PDF]
- Getting Started Guide [PDF]

The example captures distributed in the package can be used with Logic 2 desktop software to evaluate the performance of the analyzer in case an I3C test circuit is not readily available.

The High-Level Analyzer extensions (HLA) provided work with the I3C Basic analyzer plugin to perform transaction-level decoding.

The analyzer plugin binaries are compiled for each of the supported platforms (Win, MacOS, and Linux). The correct analyzer plugin binary file can be copy/pasted to anywhere on your drive that makes sense. The next section of this guide will show you how to point Logic desktop software to the plugin file. Note that binaries for Logic 1.x are available to licensed customers upon request.

The python scripts included in the automation-api folder demonstrate how to use the Saleae Logic Automation API with Logic 2 to perform automated testing with the I3C Basic protocol analyzer plugin.

Updated versions of the datasheet and Getting Started Guide (this document) are included within the release file package.

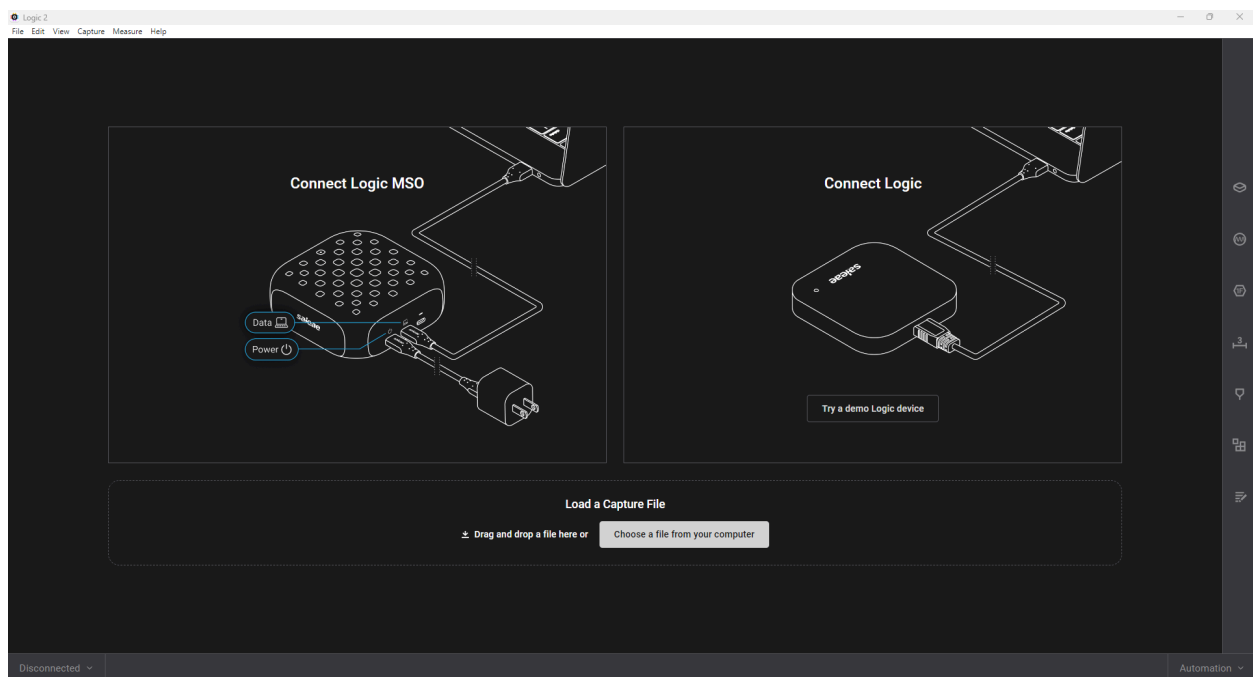
5 Getting Started

The I3C BasicSM plugin for Saleae Logic works with both Logic 2.3.43+ and Logic 1.2.29+ versions of the Saleae Logic Desktop Software on all [supported operating systems](#). Please see the “Analyzer Features” section in our I3C BasicSM Analyzer Plugin Product Datasheet to learn more about the differences in functionality between Logic 2.x and Logic 1.x.

The I3C BasicSM analyzer plugin can be installed by following the guides provided by Saleae on their [support website](#). The procedure below demonstrates the process from start to finish using Saleae Logic 2.3.54 on Windows 11. Installation on other OS'es and with other versions of Saleae Logic are extremely similar.

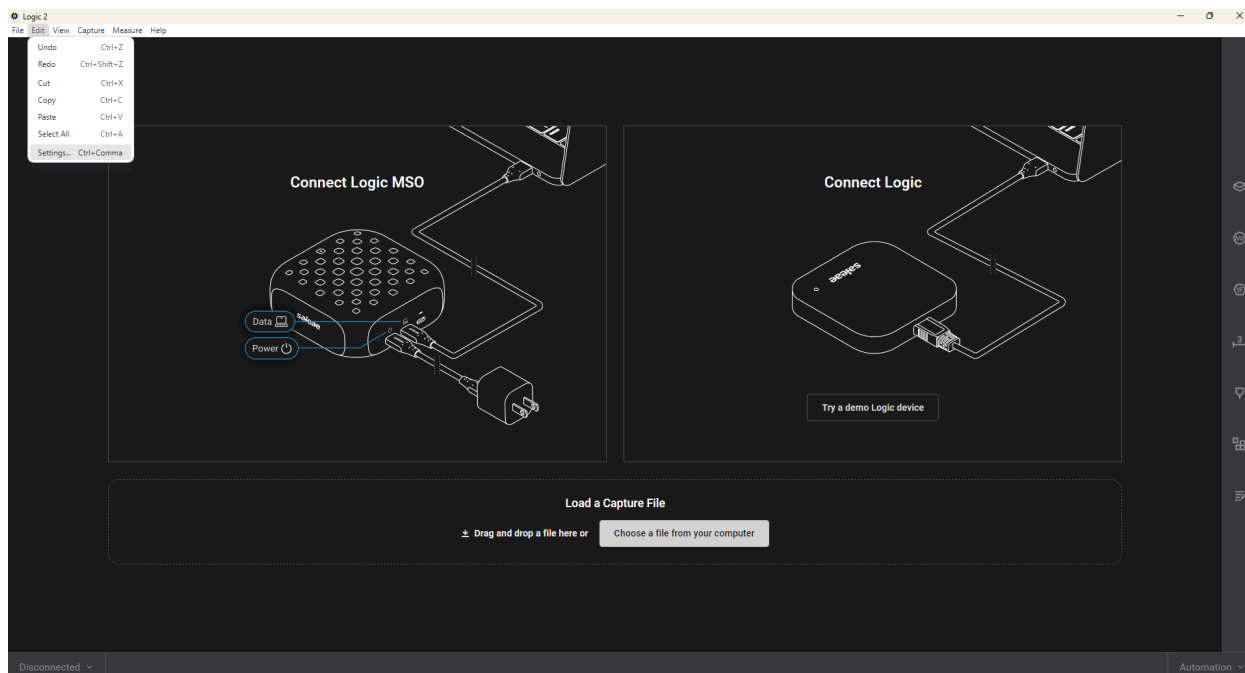
Step 1: Launch Logic 2.x Desktop Software Application

The first thing that needs to be done is to open up the Saleae Logic desktop application. As soon as it's loaded, you'll see the screen below.



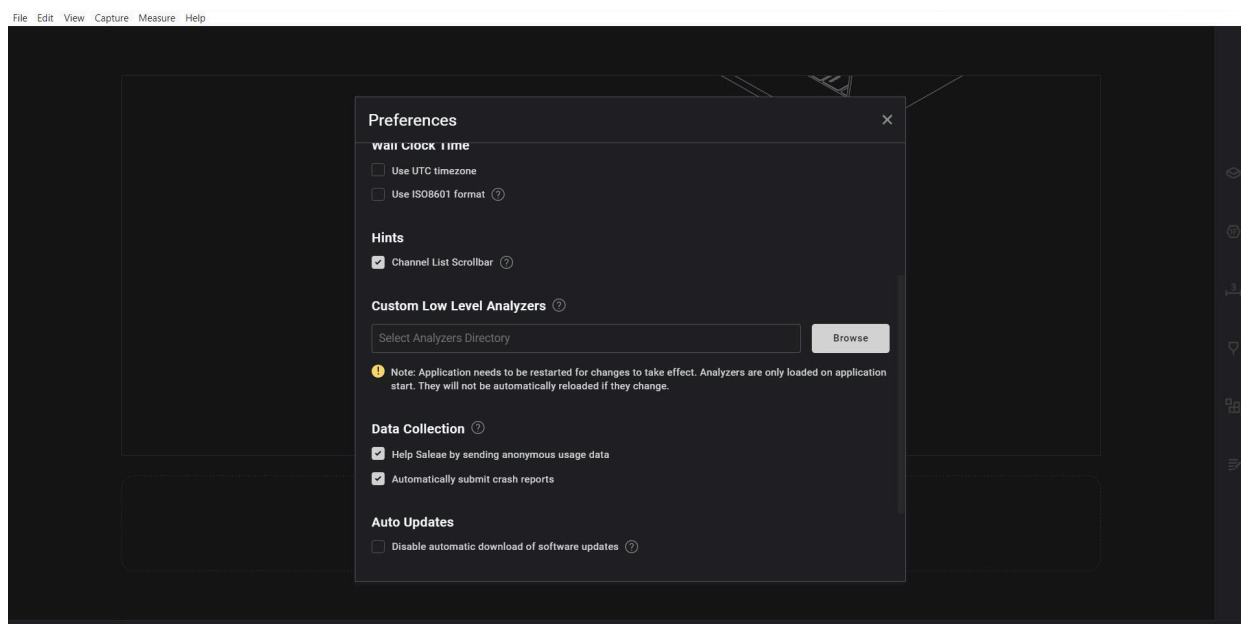
Step 2: Open the software Preferences window

Click the *Edit* menu from the toolbar at the top of the window and select *Settings* from the dropdown list, as shown in the screenshot below.



Step 3: Configure the Custom Low-Level Analyzers Directory

In the Preferences window, scroll down to the section titled *Custom Low Level Analyzers* as shown below.

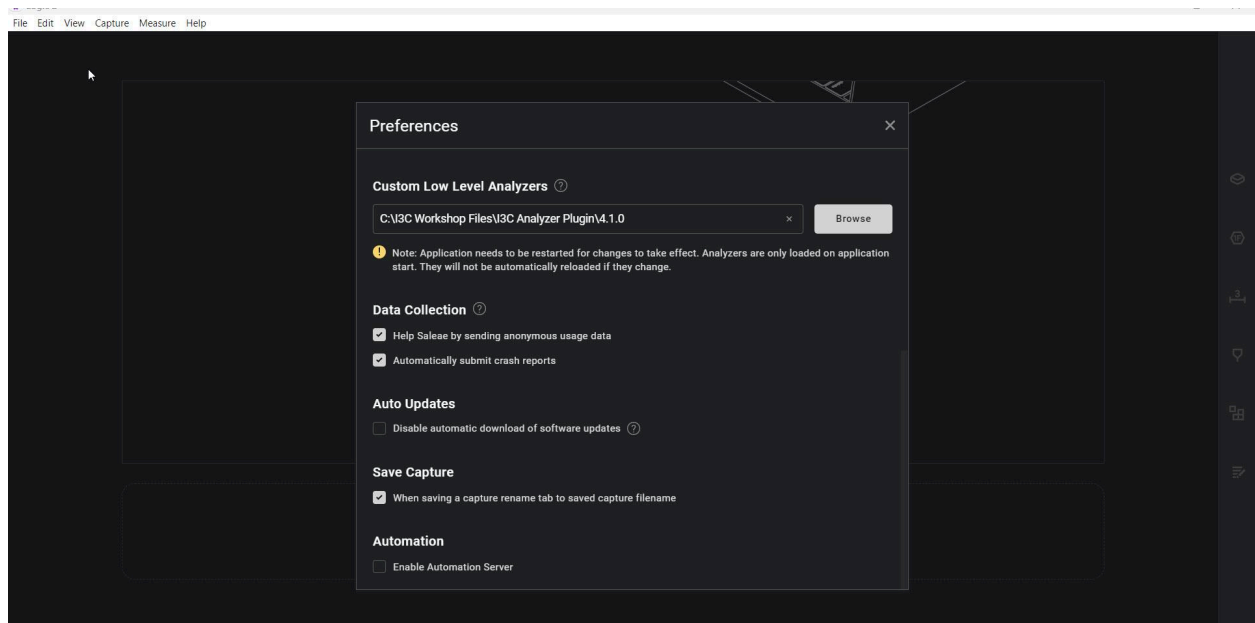


Then use the *Browse* button to navigate* to the folder** containing the I3C plugin.

***Note 1:** In the selection dialog box, you will not be able to see the actual .dll / compiled binary file displayed – it is filtered out from the view. This causes a lot of confusion because it appears that the folder is empty. Do not worry about this, the folder is not empty– select the folder and proceed to the next step.

****Note 2:** The compiled plugin binary file can be copied/pasted into another location on your file system. It does not need to remain within the unzipped folder from the analyzer file package you received. The binary file has no other dependencies within the package. This is important because you may be using other custom analyzer plugins, so you'll need to co-locate all the binaries for these custom analyzers within the same directory. This is not a problem; feel free to copy/paste our analyzer to a new location as you prefer.

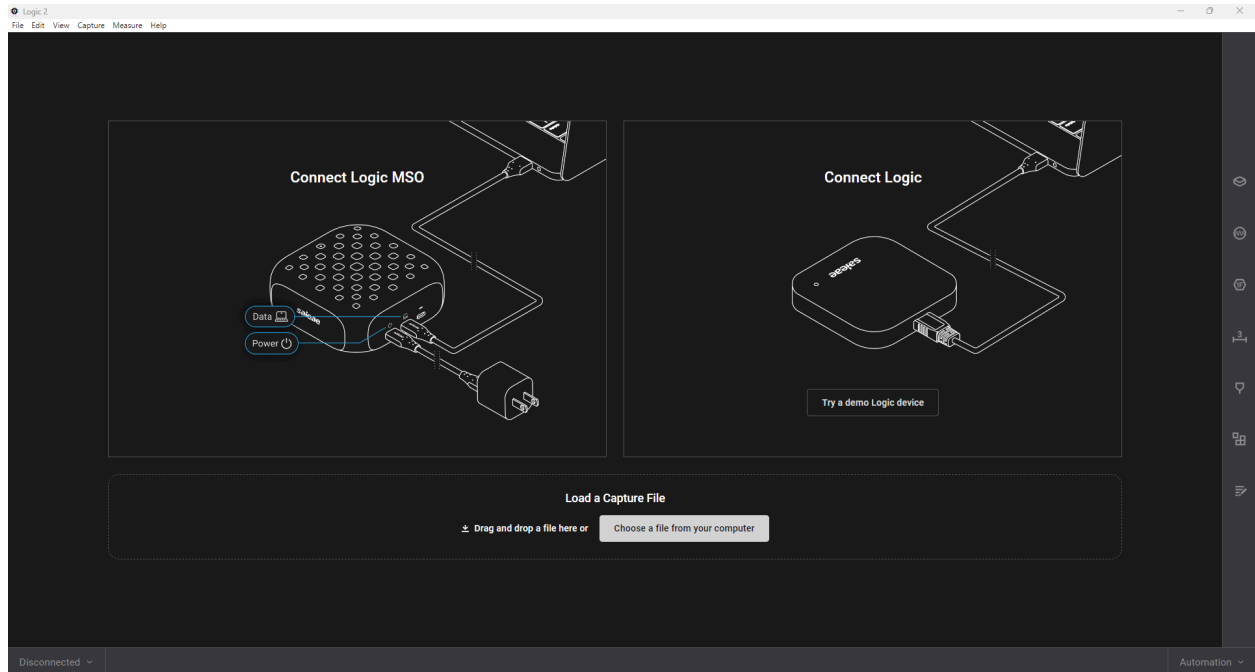
*****Note 3:** For MacOS users, the binary used will depend on which version of the Saleae Logic desktop software you have installed. If you are running the Intel Mac version of Saleae Logic, please use the x86 binary included in the MacOS folder of the analyzer release package. If you are running the Apple Silicon version of Saleae Logic desktop software, please use the arm64 binary.



Step 4: Restart the Saleae Logic desktop application.

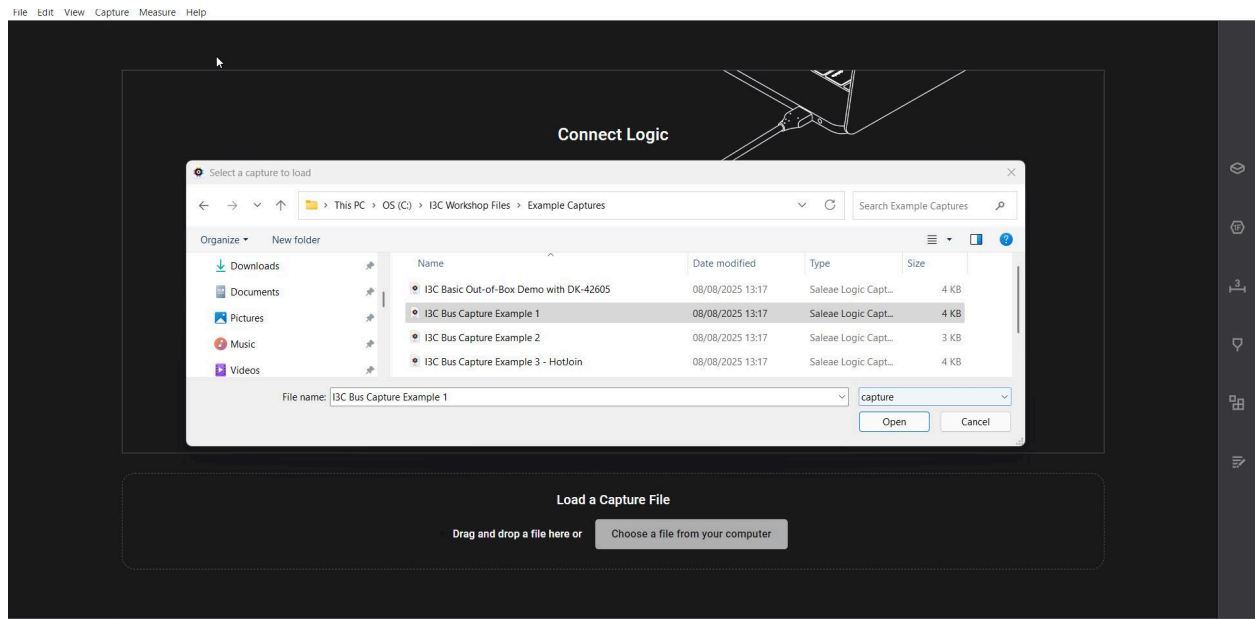
For the new settings to take effect, Logic needs to be closed and re-launched. Note that there is no need to click a Save or Apply button on the Preferences window before closing the window; the new/updated path is automatically saved. The screenshot below shows Saleae Logic after it's been reopened.

[Screenshot is on the following page]



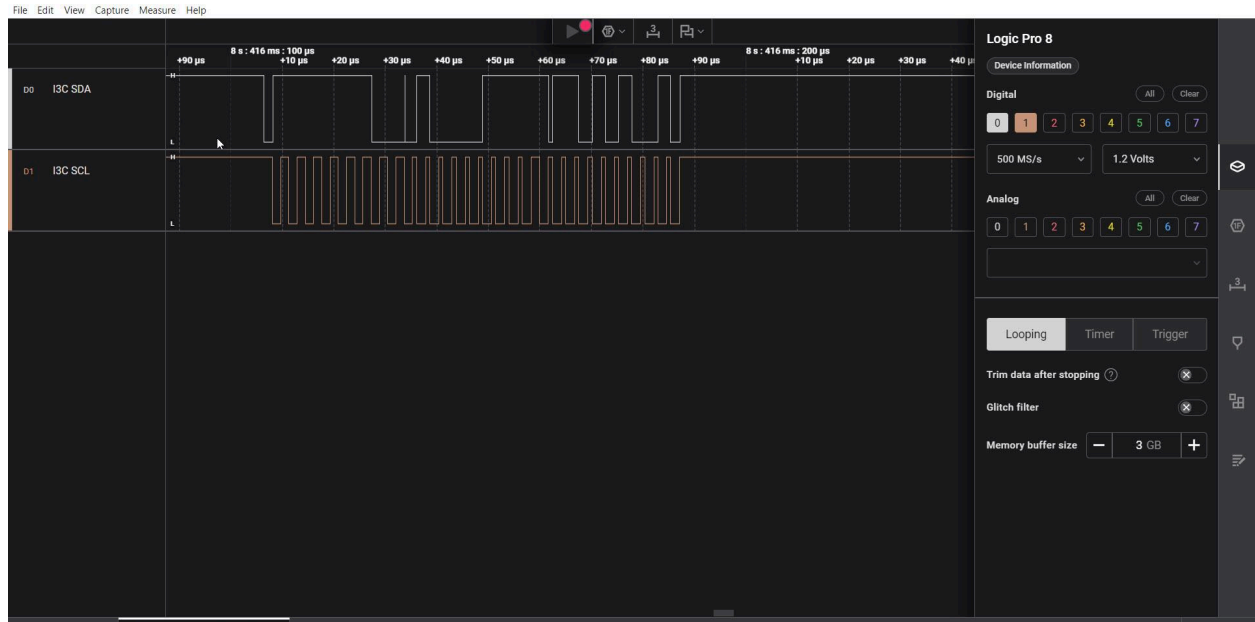
Step 5: Open an Example I3C Capture

On the opening screen, click on *Choose a file from your computer* to load an example I3C capture file. Several example capture files are included within the analyzer file distribution package you received. We'll use this to verify the analyzer plugin is installed, licensed, and working correctly. Select the *I3C Bus Capture Example 1.sal* file included with the analyzer plugin assets from the *Open File* dialog box and click *Open* as shown in the screenshot below.

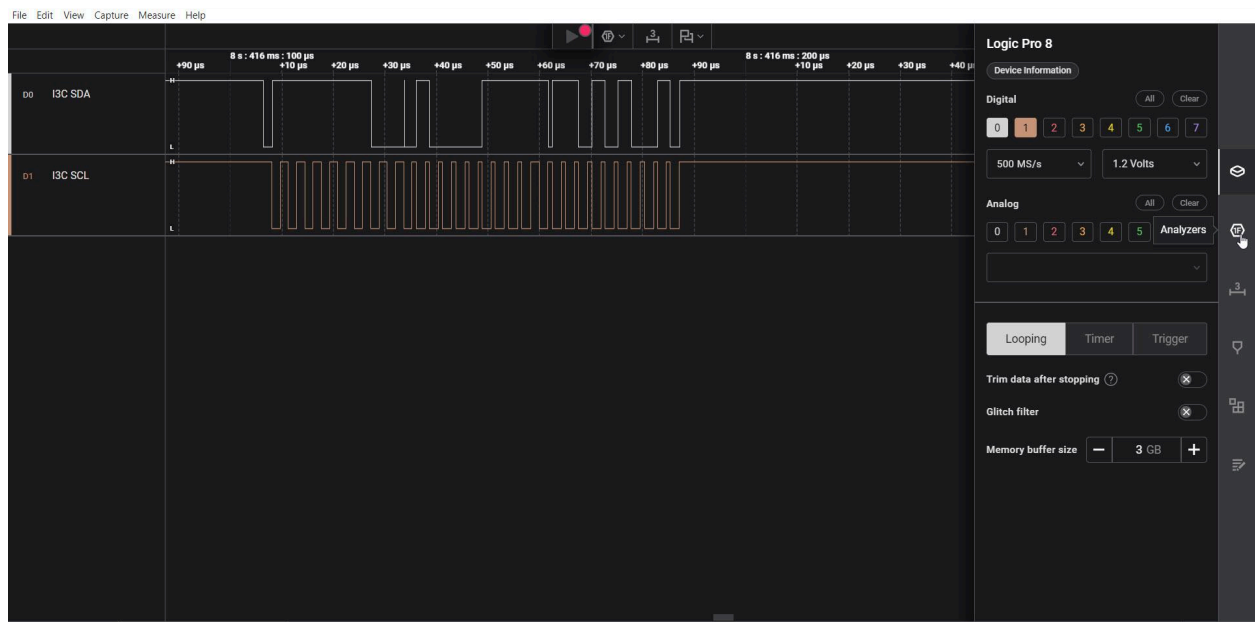


Step 6: Add the I3C Basic Protocol Analyzer to the session

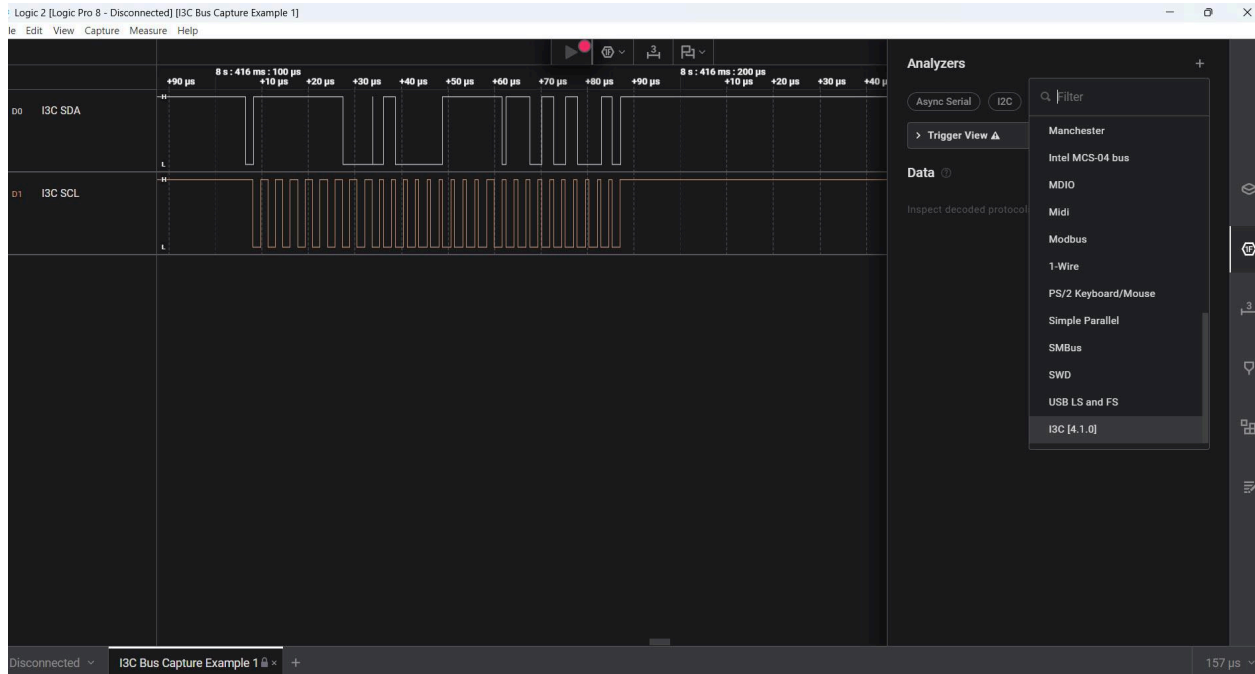
The captured waveform will be loaded and displayed as shown below, however, it will not be decoded. To do that, we'll need to add the I3C Basic protocol analyzer to the session.



From the buttons on the navigation bar on the right side of the main window, select the *Analyzers* button, second from the top, below the *Device Settings* button.



On the *Analyzer* panel, click the **+** button near the top right corner of the panel to display the list of available protocol analyzers. Scroll down the list to find the *I3C [x.y.z]* analyzer as shown below. Clicking on the analyzer name will add it to the session and automatically open up its *Settings* window.



Step 7: Configure the I3C Basic Protocol Analyzer Channels

With the *Analyzer Settings* window open, go ahead and set the following parameters to get the analyzer up and running:

1. Assign the SCL and SDA channels to the corresponding Saleae device channels used to capture the bus traffic.
 - a. The configuration for SCL and SDA is mandatory
 - b. The SDA1, SDA2, and SDA3 signal channels are optional and used for Multi-Lane modes (Dual and Quad Lane).
2. Select the MIPI I3C specification version between *I3C Version 1.0*, *I3C Version 1.1*, *I3C Version 1.1.1*, or *I3C Version 1.2*.
3. Set the starting I3C mode. By default, the analyzer assumes the I3C traffic starts in SDR mode and auto-detects mode changes by decoding the corresponding ENTHDRn CCC. If the capture or the bus traffic begins mid-stream without an ENTHDRn CCC, the corresponding mode shall be set by the user.
4. Set the address display format for target addresses in I3C SDR and I2C legacy frames. Choose 7-bit or 8-bit (includes R/W bit).
5. Set the default decoding rule the analyzer must use to decode the train of events given by *START + Target Address/R* in I2C Legacy and I3C SDR modes. The available options are: *Presume In-Band Interrupts*, *Presume I2C Private Reads*, *Presume I3C Private Reads*.

- Set the default Multi-Lane mode used when no MLANE CCC is observed. Otherwise, the analyzer automatically detects the lane configuration from the MLANE CCC. This applies to HDR-BT mode only.

The screenshot shows the 'I3C [4.2.0]' configuration window. It has a dark theme. The settings are as follows:

- SCL *: 04. SCL
- SDA *: 08. SDA
- SDA1: 07. SDA1
- SDA2: Select Channel
- SDA3: Select Channel
- I3C Version: I3C Version 1.1.1
- Starting I3C Mode: SDR (auto-detect HDR modes)
- Address Display (SDR/I2C Legacy): 7-bit (without R/W bit)
- Default S+Addr/R Decoding: Presume In-Band Interrupts
- Default ML Coding (HDR-BT): Single Lane
- Unique ID: 5F6E3F18D1B3A6735BC94084D340BD106D3EE5C8BCI
- License Key: ILINU-DCDSM-VREEK-GGPSI
- Offline Mode: ☐
- Offline License File Path: Browse...
- ☒ Show in protocol results table
- ☒ Stream to terminal
- Buttons: Reset, Cancel, Save

Step 8: Provide License Information

As mentioned above, the analyzer plugin supports Flex/On-Demand online licenses as well as node-locked licenses for offline usage.

Flex/On-Demand License Setup

For Flex/On-Demand license usage, simply enter your license key in the text input field labeled *License Key*.

Node-Locked License Setup

For Node-locked license usage, you'll need to check the box for Offline Mode and then use the Browse button to select the path to your license file. Notice that the Unique ID field in the *Analyzer Settings* window displays your computer's unique ID. If you have not yet been given a license file, please send an email to techsupport@binho.io and copy/paste your computer's Unique ID as shown here into the message. We'll promptly respond with the license file generated for your computer's Unique ID.

[Screenshot is on the following page]

I3C [4.2.0]
✕

SCL *

04. SCL

SDA *

08. SDA

SDA1

07. SDA1

SDA2

Select Channel

SDA3

Select Channel

I3C Version

I3C Version 1.1.1

Starting I3C Mode

SDR (auto detect HDR modes)

Address Display
(SDR/I2C Legacy)

7-bit (without R/W bit)

Default S+Addr/R
Decoding

Presume In-Band Interrupts

Default ML Coding
(HDR-BT)

Single Lane

Unique ID

5F6E3F18D1B3A6735BC94084D340BD106D3EE5C8BC!

License Key

Offline Mode

☒

Offline License File
Path

Browse...

☒ Show in protocol results table

☒ Stream to terminal

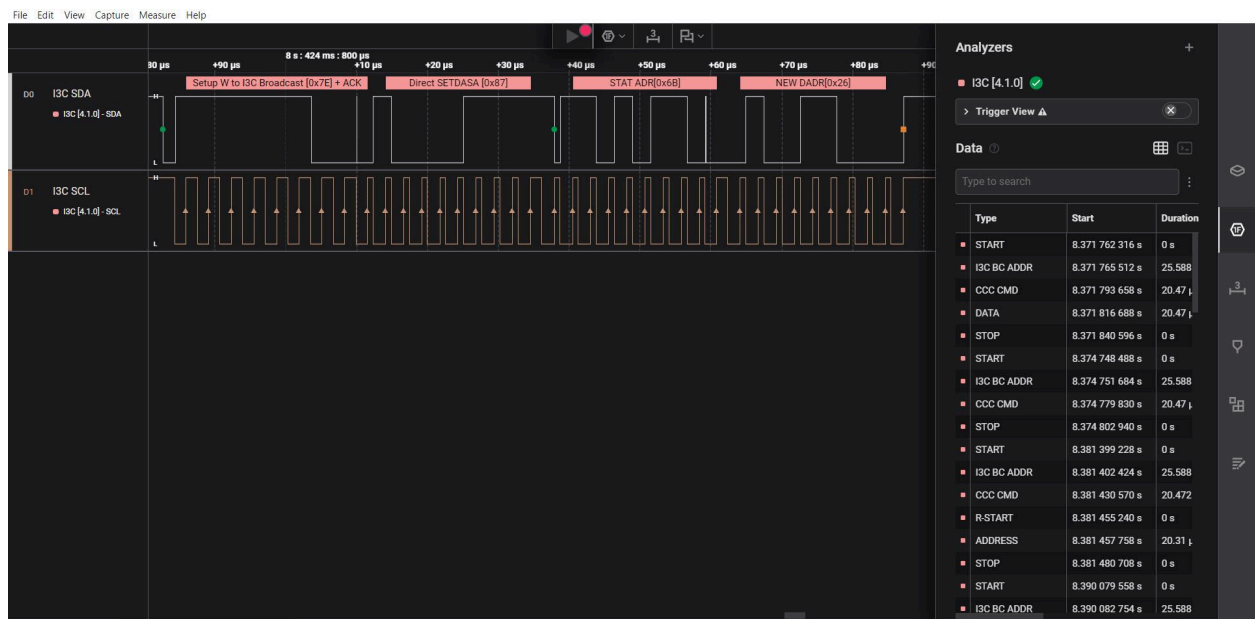
Reset

Cancel

Save

Step 9: Activate the I3C Basic protocol analyzer license

Click the *Save* button. As soon as the settings are saved, the example waveform will be decoded by the I3C Basic protocol analyzer. This confirms that the analyzer is properly configured in Saleae Logic and is ready for use. You can now use this waveform to explore the various features of the analyzer / software.



6 I3C Transactions HLA

In many situations, it becomes useful to examine the decoded data in the context of the entire transaction, rather than just looking at each decoded byte individually. The usage of Saleae Logic High-Level Analyzers allows us to have both types of decoded data available at the same time! The steps in this section will show you how to import and activate the I3C Transactions HLAs that are distributed along with the I3C Basic Protocol Analyzer plugin.

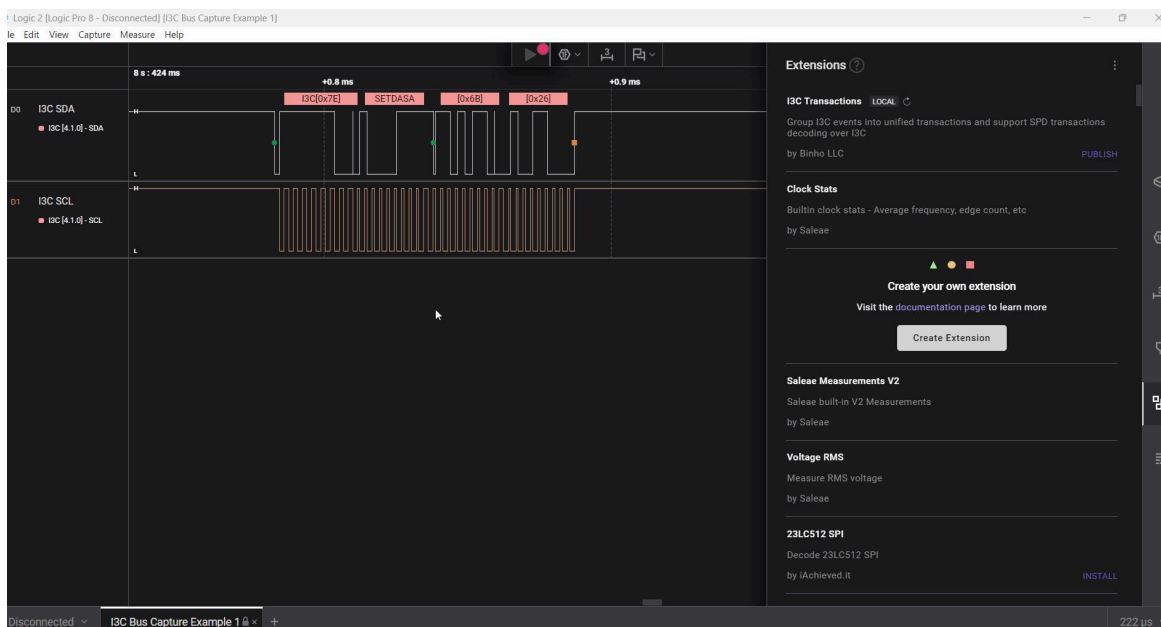
The I3C Basic protocol analyzer is distributed with an HLA that supports the following decoding options:

- I3C Transactions → This implements generic transaction-level decoding.
- I3C Transactions + SPD → This implements JESD300-5 Serial Presence Detect decoding.
- I3C Transactions + MCTP Packets → This implements MCTP over I3C packet-level decoding (DSP0233 v1.0.1). Each I3C transaction is shown with its MCTP header fields decoded.
- I3C Transactions + MCTP Messages → This implements MCTP over I3C message-level decoding (DSP0233 v1.0.1). Packets are reassembled into complete MCTP messages spanning multiple I3C transactions.

Aside from displaying the transactions in bubbles above the waveform, this also adds support for viewing the Data Table with a single row per transaction and implements a single row of output per transaction in the Terminal View. Finally, the I3C Transactions HLA also means that searches for multi-byte patterns can be performed from within the software.

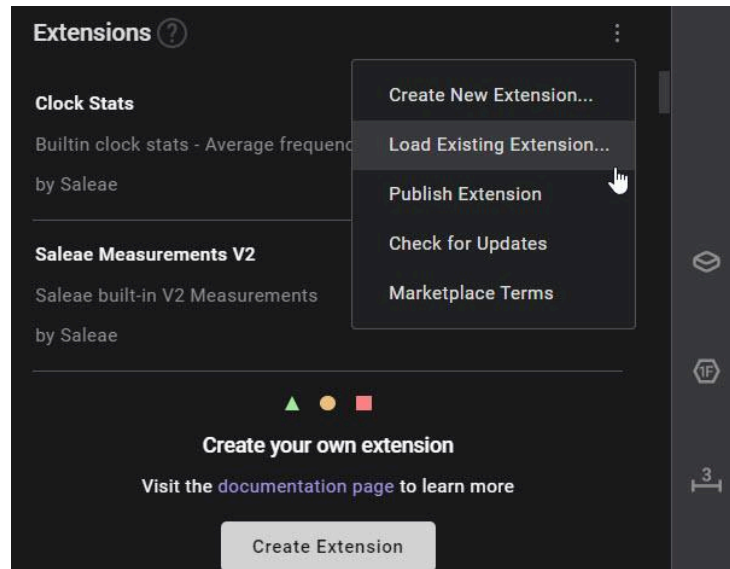
Step 1: Open the Extensions tab in Saleae Logic

Open the *Extensions* tab from the toolbar on the right side of Saleae Logic desktop software.

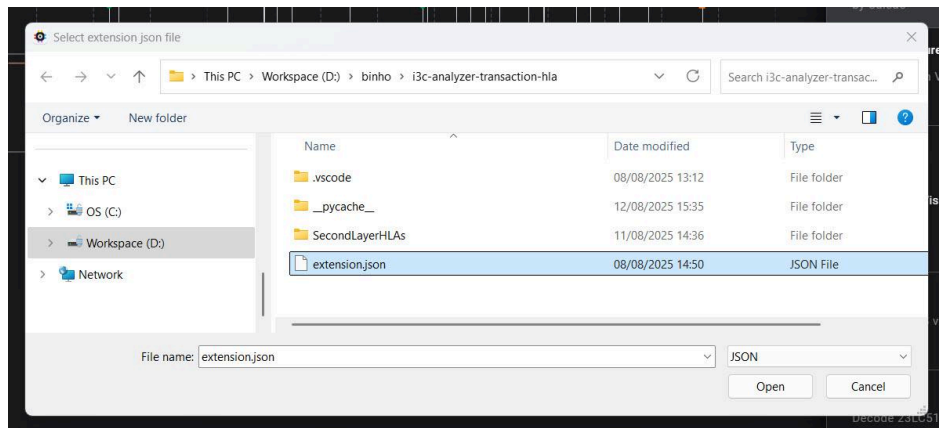


Step 2: Import the I3C Transactions HLA into Logic

Click the *Options* menu (represented by three vertical dots) in the upper right corner of the panel and select “Load Existing Extension...” item.



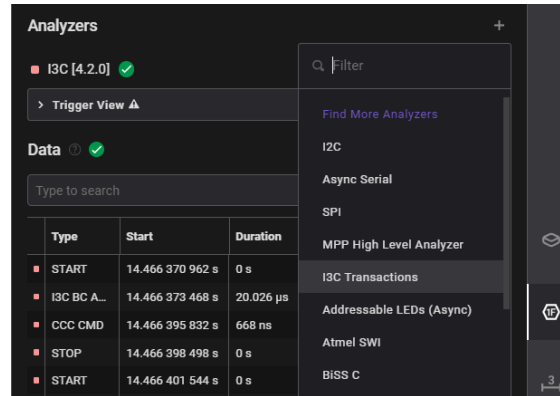
Navigate to the folder containing the HLA that was included within the I3C Basic Protocol Analyzer plugin zip folder and select the *extension.json* file.



Step 3: Add the I3C Transactions HLA to the Session

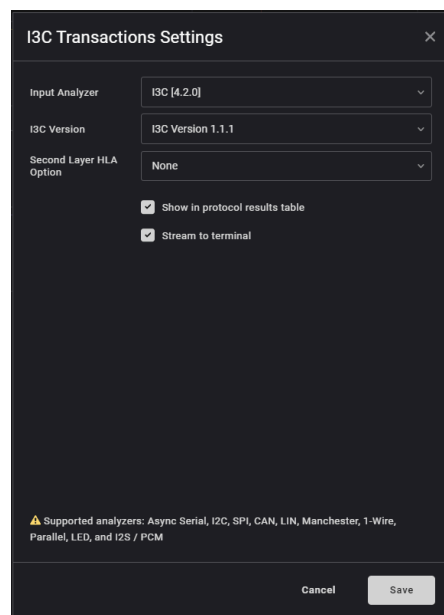
Navigate back to the Analyzer panel and select the “+” button. You will now see that the I3C Transactions analyzer is included in the list of available analyzers. Add it to the session by clicking on it.

[Screenshot is on the following page]



Step 4: Activate the I3C Transactions HLA

Once added, the Analyzer Settings dialog box will appear. The only settings that you need to configure are the *Input Analyzer* setting and the *I3C Version*. Please select the corresponding I3C low-level analyzer from the dropdown box and the expected I3C version. Optionally, select the desired Second Layer Analyzer option. Finally, click *Save*.

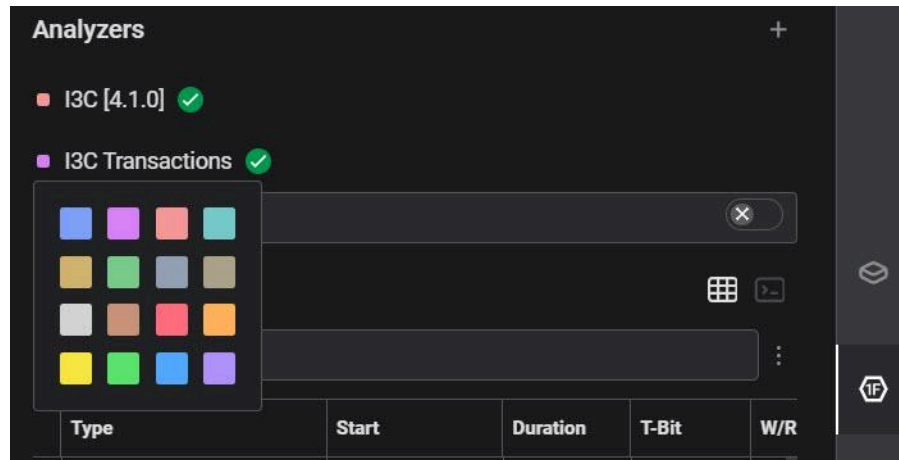


The Second Layer Analyzer option reflects the decoding mode, as stated before, the following decoding modes can be selected:

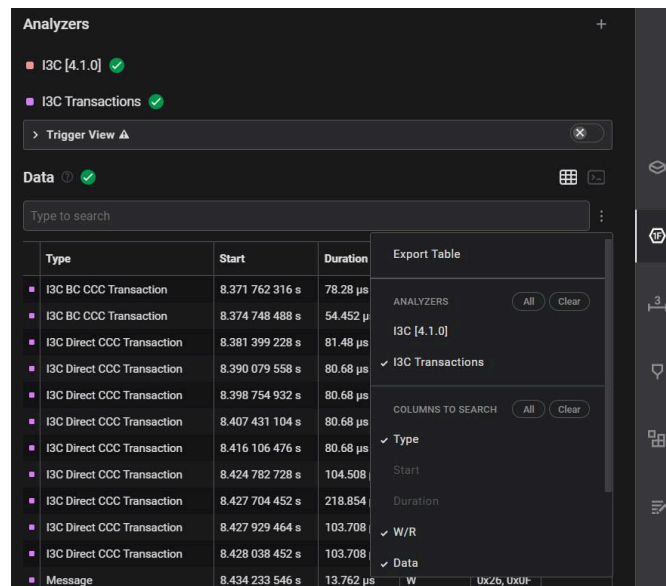
- None → This implements generic I3C transaction-level decoding.
- SPD → This implements JESD300-5 Serial Presence Detect decoding.
- MCTP Packets -> MCTP over I3C packet-level decoding per DSP0233 v1.0.1. Each I3C transaction is shown with its MCTP header fields decoded.
- MCTP Messages -> MCTP over I3C message-level decoding per DSP0233 v1.0.1. Packets are reassembled into complete MCTP messages spanning multiple I3C transactions.

Step 5: Optimize Display Colors & Configuration

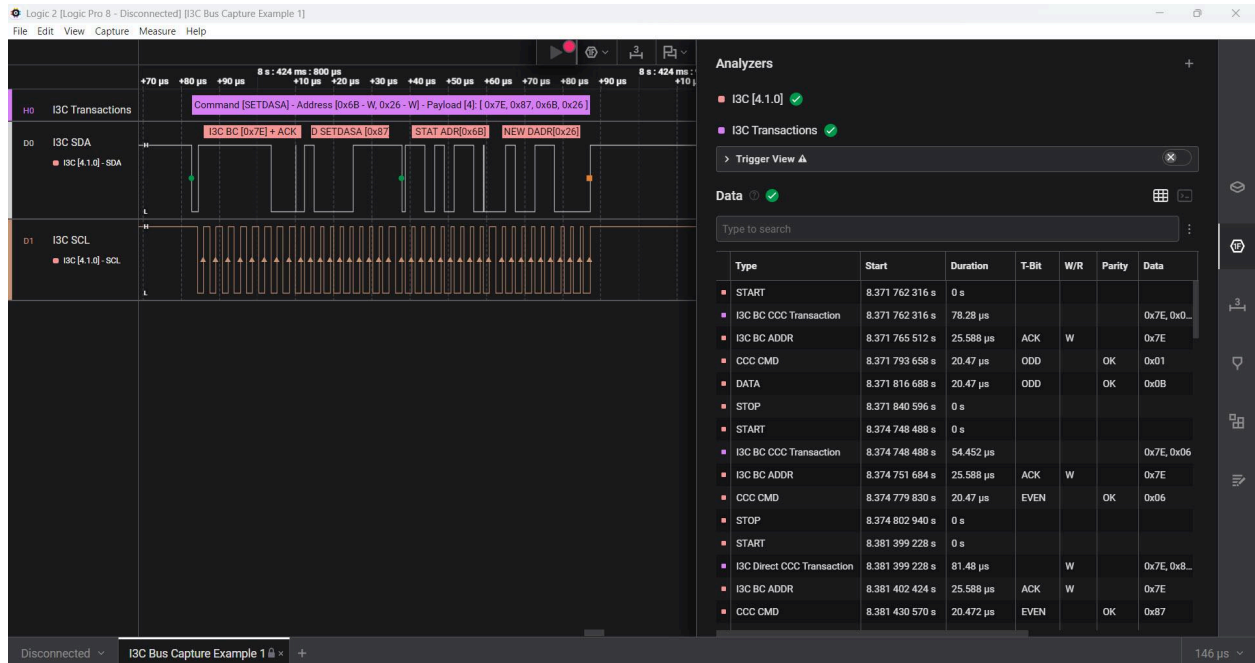
In most instances, the default colors chosen by Saleae Logic will not be optimal for easy differentiation between Byte-Level decoding and Transaction-Level Decoding. Thankfully, changing the color assignment for each analyzer can be done by clicking the colored box before the analyzer name, as shown below:



You may also wish to review data from just one of the analyzers in the Data Table, which can be done by selecting the Data panel options and enabling/disabling either of the analyzers from the pop-up list. Additionally, individual table columns can be turned on/off here as well.



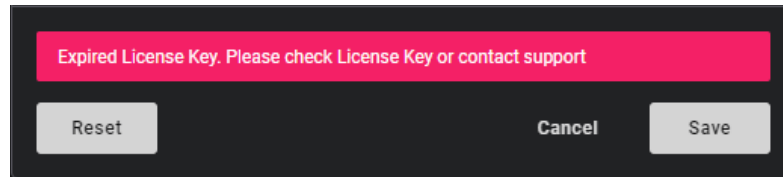
The end result can be tweaked per individual preference. The screenshot below demonstrates the UI when both analyzers are activated on the capture.



7 License Activation Errors

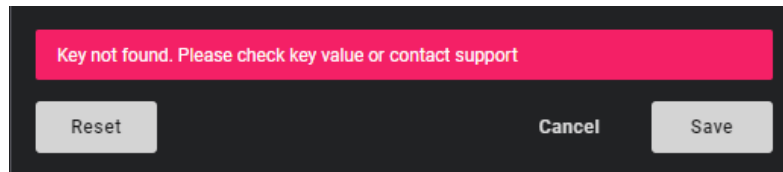
Seven common error messages may arise when trying to activate the license for the I3C Basic protocol analyzer which are discussed in detail below. Please feel free to reach out to customer support if you are experiencing these or any other issues while trying to activate your license.

1) Expired License Key.



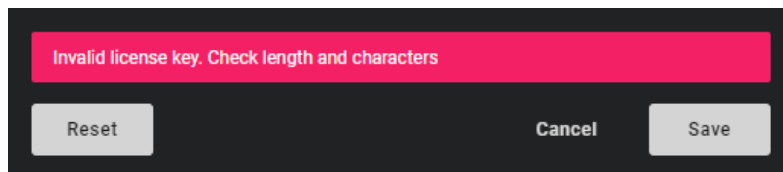
This error message is indicative that your online license is expired, to fix this problem please contact support so it can be renewed.

2) Key not found.



This error message is indicative that your license key might be outdated or might have a spelling error, try checking that the license key is correctly written, and in case this doesn't work please contact support so it can be looked into in depth.

3) Invalid license key.

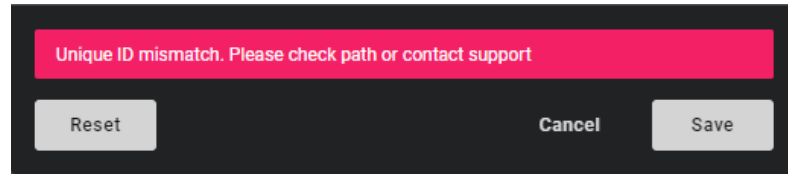


This error message indicates that your license key doesn't follow the correct format. The format should be the following:

XXXXX-XXXXX-XXXXX-XXXXX

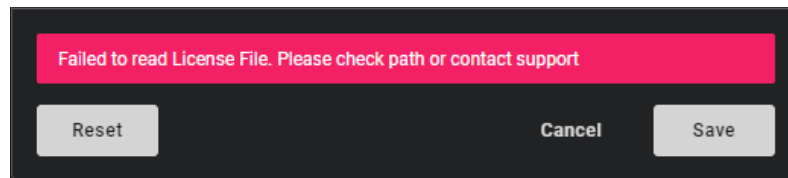
Where the X can be substituted with any upper case character.

4) Unique ID mismatch.



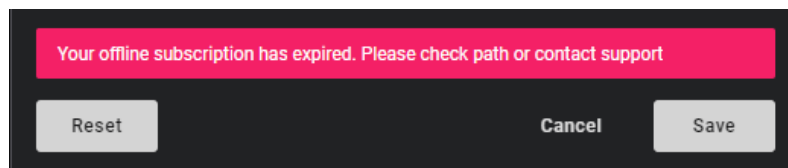
This error message indicates that your offline license was created for another device, please make sure that the selected license is the correct one for your device. In case a change for the offline license is needed please contact support.

5) Failed to read License File.



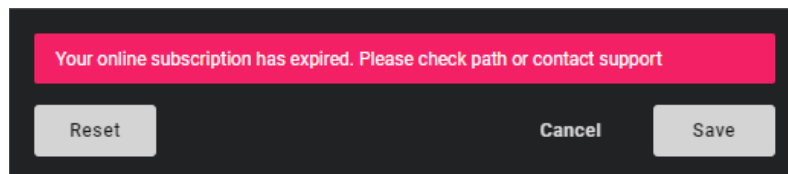
This error message is indicative that there is a problem with the path to the license file. Please check that the path entered is the correct location for the license file on your hard drive. Note that the path must be the fully-qualified path including the file name of the license file – this error message will show up if the entered path is only to the directory which contains the file and does not include the name of the file itself.

6) Offline subscription expired.



This error message indicates that the offline license has expired, all offline licenses have a 30-day validity, and after that period, it becomes disabled. To update the offline license please contact support.

7) Online subscription expired.



This error message indicates that the license product is expired, and as a result, the offline license created from it is disabled. Please contact support to update your license key.

8 Frequently Asked Questions

This section includes answers to the most common questions we receive from customers.

How does the Flex/On-Demand license work?

Our Flex/On-Demand licensing scheme is implemented as follows:

- The license may be used from an unlimited number of host computers.
- The license may be used with any Saleae Logic hardware device.
- The only limitation is on the MAX number of simultaneous users (1 simultaneous user per license). If a new user tries to use the license, they will receive an error message that the license is not available, the original user will not be booted or otherwise interrupted.
- A license is automatically 'checked out' when the I3C Analyzer plugin is added to a session in the Saleae Logic desktop software. The license is 'released' back to the pool within 5 minutes from either (a) when the I3C Analyzer plugin is removed from the capture session, or (b) the Saleae Logic desktop software application is closed.

As such, a single license is typically sufficient for a team of 2-3 engineers working on I3C projects. Please note that Flex/On-Demand licenses require the host PC to have an active internet connection. In case internet access is not available, we can support node-locked licenses for Offline PCs.

How does the Node-Locked license work?

Our Node-Locked licensing scheme works as follows:

- The license is created for a specific device with a duration of 30 days, this means that only that device will be able to use that specific device.
- The license may be used with any Saleae Logic hardware device.
- A license is automatically 'checked out' when the I3C Analyzer node-locked license file is created. The incense is 'released' back to the pool within 30 days after its creation.
- After the 30-day validity period the Node-Locked license file will be disabled, to extend its validity please contact support so that a new license file can be created.

The main advantage of this license type is that it doesn't require any internet to work, allowing offline decoding. Please remember that this license is device-specific, so the same license file won't work on multiple machines.

Can I trigger on a particular I3C message / transaction type?

Unfortunately no. The triggering system of Saleae Logic is very basic, so it's not possible to do complex triggers beyond a signal byte value. That said, the lack of complex triggering does not prevent anyone from performing certain testing. This is because the Saleae Logic hardware is streaming the captured

waveform to the computer and the data is being compressed and stored in PC RAM. As such, the capture length can be extremely long. Since the device is not limited to a small on-board hardware buffer, there isn't a need to spend time to create a very complex trigger in order to capture the event of interest. Instead with Saleae Logic it's possible to capture for minutes, hours, or even days, and then simply search for the event/transaction after the capture has been completed.

What is the maximum capture length possible?

The maximum capture duration depends on many factors, but the dominant factor is the amount of available RAM on the host PC. The next factor is the density of edges/transitions in the captured waveform. The data is compressed when stored in RAM, so the actual sample rate doesn't have as much influence on the amount of memory needed, rather it's by how frequently transactions are sent on the bus during the capture. For example, on a very busy I3C bus, it's observed that 1GB of RAM gets filled up every 4 minutes. That means a PC with 32GB of RAM could capture dense I3C bus traffic for about 2 hours. If the transactions are much less frequent, this can be days before it fills up.

Why am I getting an error message when I try to add the I3C analyzer to a capture session on MacOS?

More than likely, this error is related to referencing the I3C analyzer binary built for Intel Mac (x86) from the Apple Silicon version of Saleae Logic, or conversely, referencing the I3C analyzer binary built for Apple Silicon from the Saleae Logic 2 application built for Intel Mac. In either case, the resolution will be to confirm that you're importing the correct binary based on the version of Saleae Logic desktop software you are running on your computer.

Have a question that hasn't been answered yet? Please don't hesitate to reach out to us at support@binho.io.

9 Customer Support

We're committed to the success of our customers and take pride in our products. We strive to provide quick responses via email and can be available for phone/video calls as necessary to support active license holders.

Something's not working / I think I found a bug? Please help!

We fully believe that our analyzer has reached a reasonable level of maturity and is quite robust, however software is never bug-free. We'll be quick to help debug and resolve any issues with the analyzer as soon as they are reported. Updated versions of the analyzer with bug fixes will be made available to all active license holders without any charge.

The I3C BasicSM Protocol Analyzer plugin generates a debug log file in the same directory that Saleae

Logic produces its logs. Together with screenshots, capture files, and this debug log, we'll be able to quickly get to the bottom of any mysteries that may arise while analyzing I3C transactions.

This is great, but it'd be even better if it could do more...

Our team is available to perform customizations and enhancements to tailor the I3C BasicSM Analyzer Plugin to the needs of your project. Please contact Customer Support to inquire about our development services.

10 Revision Log

Rev	Description of Changes	Date
1.0	Initial Release	3/23/22
1.1	Updated to demonstrate the latest versions of Saleae Logic and the I3C Basic Analyzer Plugin	6/11/22
1.2	Updated to specifically mention the minimum versions of Saleae Logic desktop software required to use the analyzer plugin.	6/17/22
1.3	Formatting Improvements Updated for Flex/On-Demand licensing support	7/12/22
1.4	Updated for I3C Transaction HLA Support by inserting a new section.	8/1/22
1.5	Improved clarity and added details	8/15/22
1.6	Added Analyze File Package Contents section Updated I3C Transaction HLA for Serial Presence Detect support Added Licensing FAQ section	9/26/22
1.7	Updated Node-Locked license description Updated all possible License loading errors Image quality improvements Formatting Improvements Deleted unused Logic 1 screenshot	7/26/23
1.8	Updated logo and address and document formatting	3/2/24
1.9	Updated the analyzer file package to match recent changes. Updated the guide for support of Apple Silicon version of Saleae Logic.	4/26/2024
2.0	Updated office address Updated screenshots for v4.x release	8/12/2025
2.1	Added the option in the settings panel to set the starting I3C mode. Added support for HDR-BT in both Single and Multi Lane modes (Compatible Mode only), in the LLA as well as in the HLA. Added address display format setting for I3C SDR and I2C Legacy address frames to display the addresses as 7-bit or 8-bit values. Added shortest bubble-text strings variants for SDR and HDR-BT decoders. Added MCTP Packets and MCTP Messages Second Layer HLA options Updated screenshots of the settings panel to showcase changes applied	06/08/2026

	to this version.	
2.2	Update customer support email address	06/08/2026