

CTx12 Evaluation Kit

- Tool Requirements Specifications -

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Document history:

February 01, 20xx:	Initial document
February 11, 20xx:	Updated CT1012 features (from preliminary datasheet) Added Internal Loop-back (Diagnostic) evaluation
March 16, 20xx:	Review and sign off

Contents

- Overview
- Objective
- Main features
- CTx12 Devices features overview
- Presentation of the kit
- Demo Scenarios
- Hardware description
- Software description
- User Interface
- Related Documentation

Overview:

This document describes a proposal for XYZ Company CTx12 devices evaluation kit.
The features set is based upon requests from customers, sales and FAEs.

Objective:

- to support worldwide sales
Software demo from XYZ Company web site

- to support Customer's development
reference design schematics
reference configuration (fast design debug kick-off)
system debug feature (plug-in CT System)

- to improve the technical support of XYZ COMPANY
configuration and capture files exchangeable by email for remote support (US, Europe, Asia)
applicable to CTx12 devices
assistance in identifying CTx12 related problems in customers prototype

Main features:

- PCI and cPCI evaluation
Basic features:
 - Timing generation (with test points for scope and/or logic analyzer);
 - "Slave-to-Local" mode (for multiple device implementation)
 - Time-Slot-to-Time-Slot connections (Local-to-Local and Local-to-CT Bus),
 - Stream-to-Stream connections
 - Rate Conversion (SC Bus and MVIP compatibility)
 - A-Law / μ -Law / Linear Conversion
 - Programmable Gain Control
 - Non-blocking operation (all transmitted time-slots are indeed received)
 - Message Channel Interface
 - Clock fallback (Timing Errors and Hot Swap):
 - Step1: set initial configuration
 - Step2: simulate timing error (toggle a switch on board)
 - Step3: read back and display recovery configurationLocal Bus data capture and Clock presence detectors for prototype debug support in system environment,
Message Channel Interface,
Pre-define configurations for debug kick-start (E1, T1, DS3, Ethernet, ATM)

- User interface
Although the example of user interface described further in this document is based upon standard Windows 95/98 or Windows NT, the CTx12 Evaluation Kit GUI may be developed in HTML, to run in a free browser (Netscape Communicator 4 and Microsoft Internet Explorer).
Downloadable software only demo ("hardware_present" flag in original software)
CD-ROM or diskette with standard install procedure

- Technical Support
Modular software structure
 - On-board ROM-resident "Root Code"
 - Downloadable "Operation Code" at boot-up (this code can be downloaded from web site for tool update, or sent via email for technical support)
 - Configuration files in text format

- Reference Design
Downloadable schematic and gerber files from XYZ Company web site
Pentium and/or Power PC

CTx12 Devices features overview:

- CT612 (ML53612)
 - Full H.100/H.110 compliant
 - SC Bus and MVIP compatible
 - 64 Full-duplex channels (64 Transmit plus 64 Receive)
 - 2-bits Local Input Bus
 - 2-bits Local Output Bus
 - 2 Local Clocks plus 2 Local Frame Syncs
 - Slave-to-Local mode on L_CLK_0/L_FS_0 or L_CLK_1/L_FS_1
 - 2 Local Network References
 - On-chip Analog (MTIE compliant) and Master/Slave Digital PLL
 - Hot-Swap compatible
 - A-Law / μ -Law / Linear conversion
 - Programmable Gain Control
 - 8-Channels CT Bus Stream Switch
 - CT Bus Message Channel Interface
 - Intel/Motorola interface
 - JTAG
 - 176-pins LQFP package
 - 3.3 Volts power supply

- CT812 (ML53812-2)
 - Full H.100/H.110 compliant
 - SC Bus and MVIP compatible
 - 256 Full-duplex channels (256 Transmit plus 256 Receive)
 - 8-bits Local Input Bus (two (2) groups of four (4) streams)
 - 8-bits Local Output Bus (two (2) groups of four (4) streams)
 - 2 Local Clocks plus 2 Local Frame Syncs
 - Slave-to-Local mode on L_CLK_0/L_FS_0 or L_CLK_1/L_FS_1
 - 8 Local Network References
 - On-chip Analog (MTIE compliant) and Master/Slave Digital PLL
 - Hot-Swap compatible
 - 8-Channels CT Bus Stream Switch
 - CT Bus Message Channel Interface
 - Intel/Motorola interface
 - 176-pins LQFP package
 - 3.3 Volts power supply

- CT1012 (ML531012) (preliminary)
 - Full H.100/H.110 compliant
 - 1,024 Full-duplex channels (1,024 Transmit plus 1,024 Receive)
 - SC Bus and MVIP compatible
 - 32-bits Local Input Bus (eight (8) groups of four (4) streams)
 - 32-bits Local Output Bus (eight (8) groups of four (4) streams)
 - 4 Local Clocks plus 4 Local Frame Syncs
 - Slave-to-Local mode on L_CLK_0/L_FS_0 only
 - 16 Local Network References
 - On-chip Analog (MTIE compliant) and Master/Slave Digital PLL
 - Hot-Swap compatible
 - 8-Channels CT Bus Stream Switch
 - CT Bus Message Channel Interface
 - Intel/Motorola interface
 - JTAG
 - 256-pins BGA package
 - 2.5 Volts power supply

Presentation of the kit:

The CTx12 Design Kit comes in as two versions: PCI and cPCI

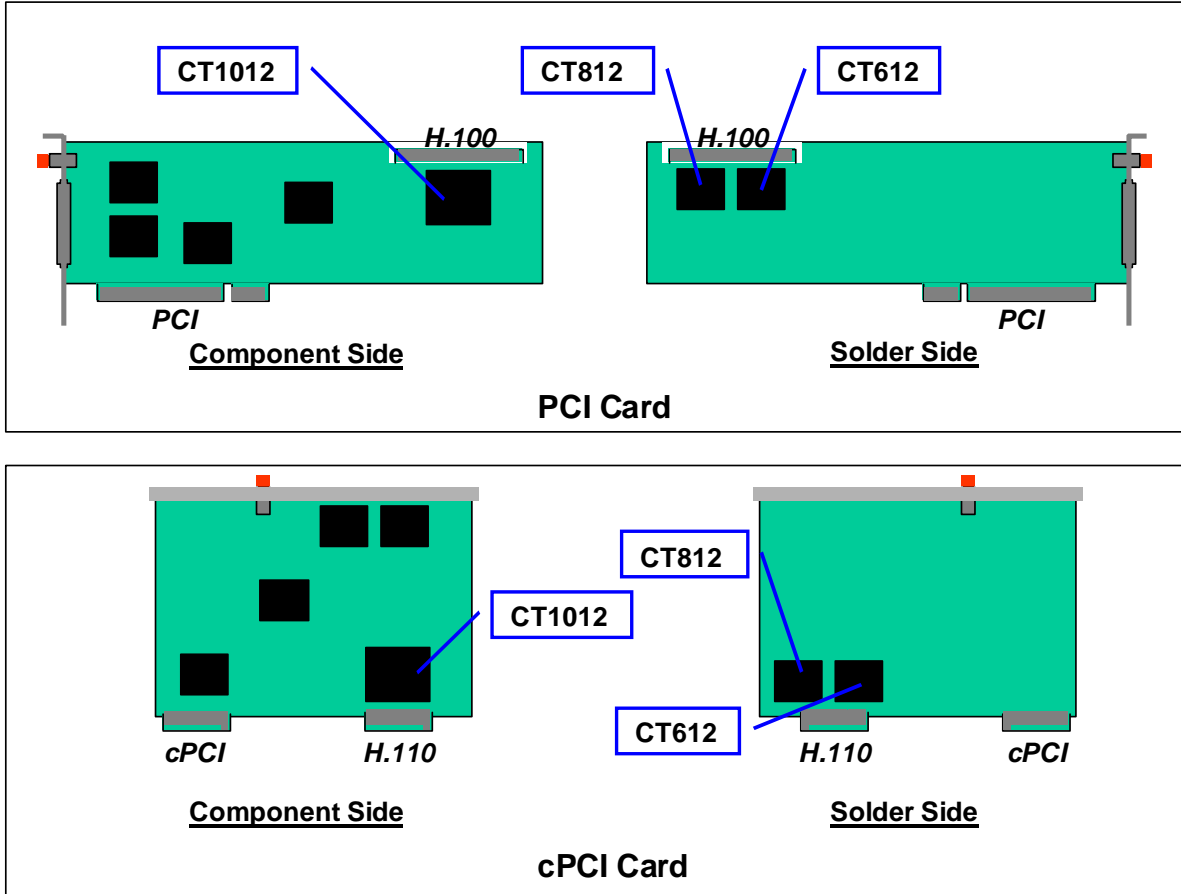


Figure 1: PCI and cPCI cards

The CT1012 is mounted on the component side of the cards, while the CT612 and CT812 are mounted on the solder side of the cards.

Each kit is made of:

- one PCI or one cPCI card
- one CD ROM (Application software, examples, help files and user's guide)

Demo Scenarios:

Configuration File	Demo	Operation
sampl01.cfg	Write and Read configuration	Configure devices and read back configuration.
sampl02.cfg	Basic Local-to-CT Bus Channel Routing	Send data out of Generator, onto CT812 Local Bus In, onto CT Bus, onto CT1012 Local Bus Out, to Collector; display sent and received data and show no loss of data
sampl03.cfg	Basic Local-to-Local Channel Routing	Send data out of Generator, onto CT812 Local Bus In, onto CT812 Local Bus Out, to Collector; display sent and received data and show no loss of data
sampl04.cfg	Micro-controller-to-Local Bus Channel Routing	Send data out of Micro-controller, onto CT812 Micro-controller Interface, onto CT812 Local Bus Out, to Collector; display sent and received data and show no loss of data
sampl05.cfg	Micro-controller-to-CT Bus Channel Routing	Send data out of Micro-controller, onto CT612 Micro-controller Interface, onto CT Bus, onto CT812 Local Bus Out, to Collector; display sent and received data and show no loss of data
sampl06.cfg	Programmable Gain Control	Send data out of Generator, onto CT612 Local Bus In (adjust Gain), onto CT Bus, onto CT1012 Local Bus Out, to Collector; display sent and received data and show gain adjust
sampl07.cfg	Channel Routing spread over several devices	Send data out of Generator, onto CT812 Local Bus In, onto CT Bus, onto CT1012 Local Bus Out and CT612 Local Bus Out, to Collector; display sent and received data and show no loss of data
sampl08.cfg	CT Bus Stream Switch	Send data out of Generator, onto CT812 Local Bus In, onto CT Bus, through CT612 Stream Switch, onto CT Bus, onto CT1012 Local Bus Out, to Collector; display sent and received data and show no loss of data
sampl09.cfg	Loop-back (Diagnostic Mode)	Send data out of Generator, onto CT812 Local Bus In, loop-back inside CT812, onto CT812 Local Bus Out, to Collector; display sent and received data and show no loss of data
Sampl10.cfg	A-Law / μ -Law / Linear conversion	Send data out of Generator, onto CT612 Local Bus In (perform A-Law / μ -Law / Linear conversion), onto CT Bus, onto CT1012 Local Bus Out, to Collector; display sent and received data and show A/ μ Law conversion
sampl11.cfg	Clock Fallback	Configure CT612 as Primary Master, CT812 as Secondary Master, CT1012 as Slave; send continuous data through CT612, CT812 and CT1012; simulate a timing error on CT612, and then read back the configuration of all devices; show "Auto Normal to Holdover", a new Master/Slave configuration
sampl12.cfg	Hot-Swap compatibility	Configure CT612 as Primary Master, CT812 as Secondary Master, CT1012 as Slave; send continuous data through CT612, CT812 and CT1012; pull-out and then plug-in back the card (Hot-Swap), and then read back the configuration of all devices; show default configuration
sampl13.cfg	Message Channel Interface	Configure CT612 as Primary Master, CT812 as Secondary Master, CT1012 as Slave; exchange message between devices using the Message Channel Interface
sampl14.cfg	E1/T1/DS3/ATM Routing example	To be defined

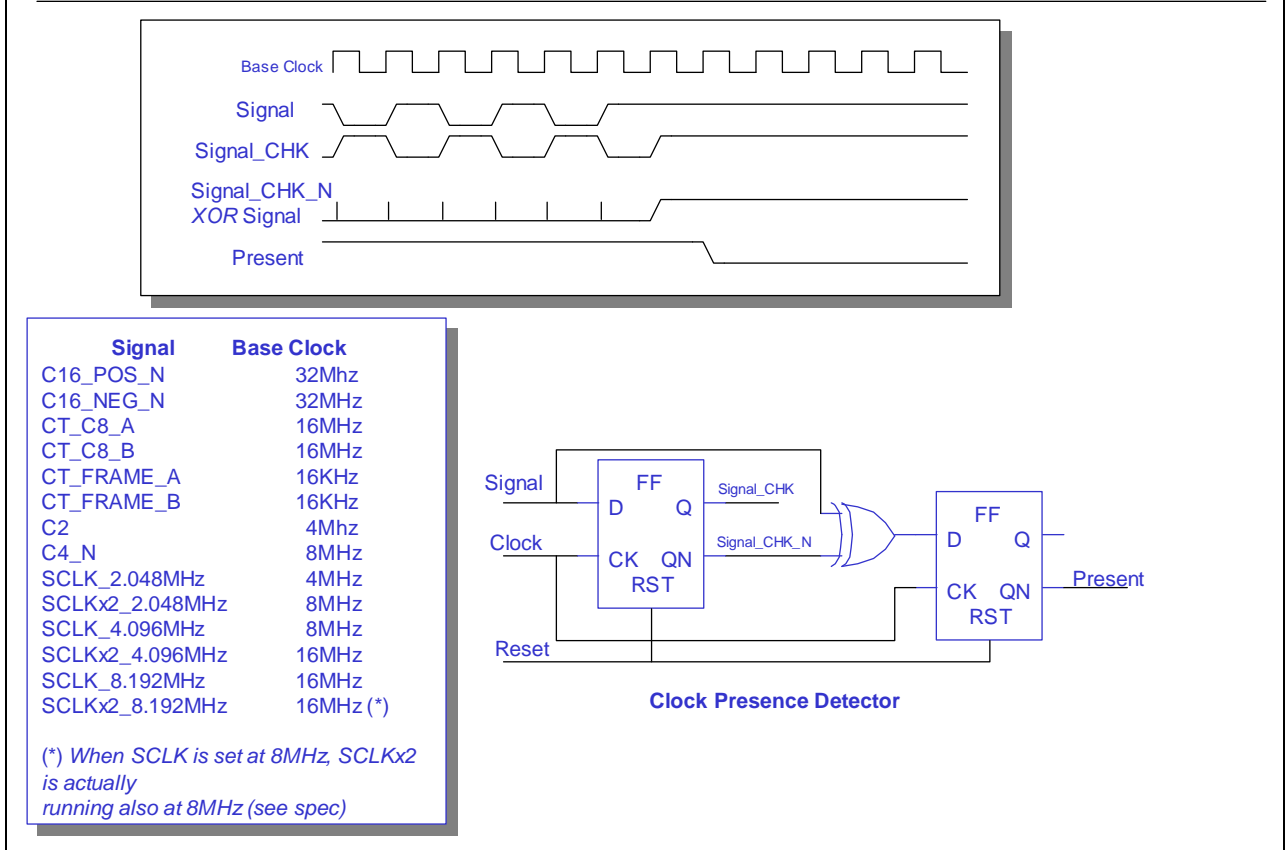


Figure 3: Clock presence detectors

The “present” signals can be fed to the micro-controller to be displayed in the user interface, or can be tied to LEDs indicators on the card.

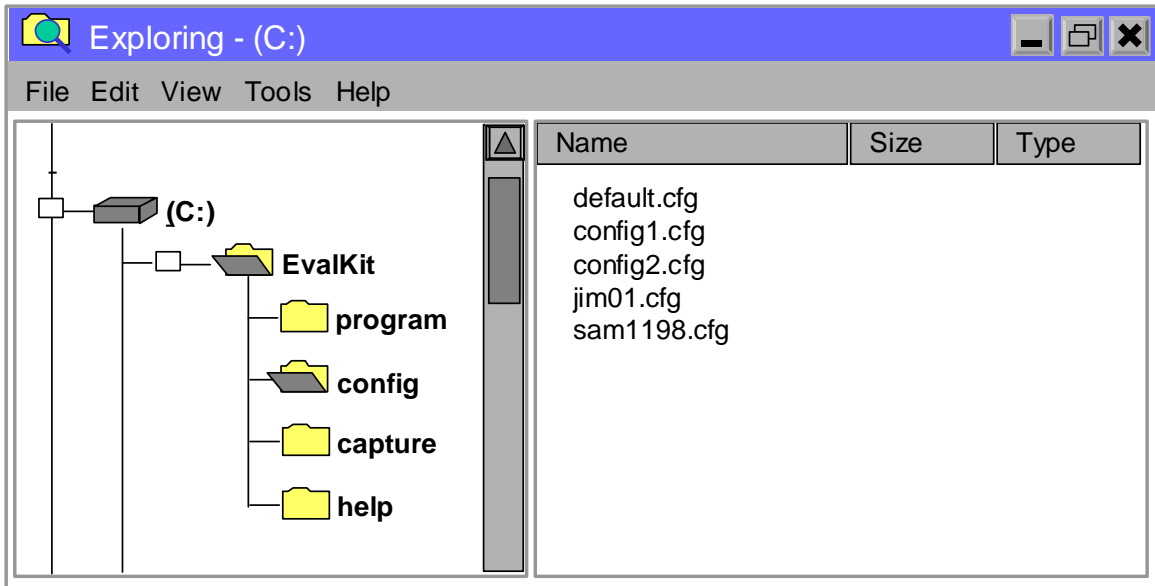


Figure 4: Directory structure – Configuration files

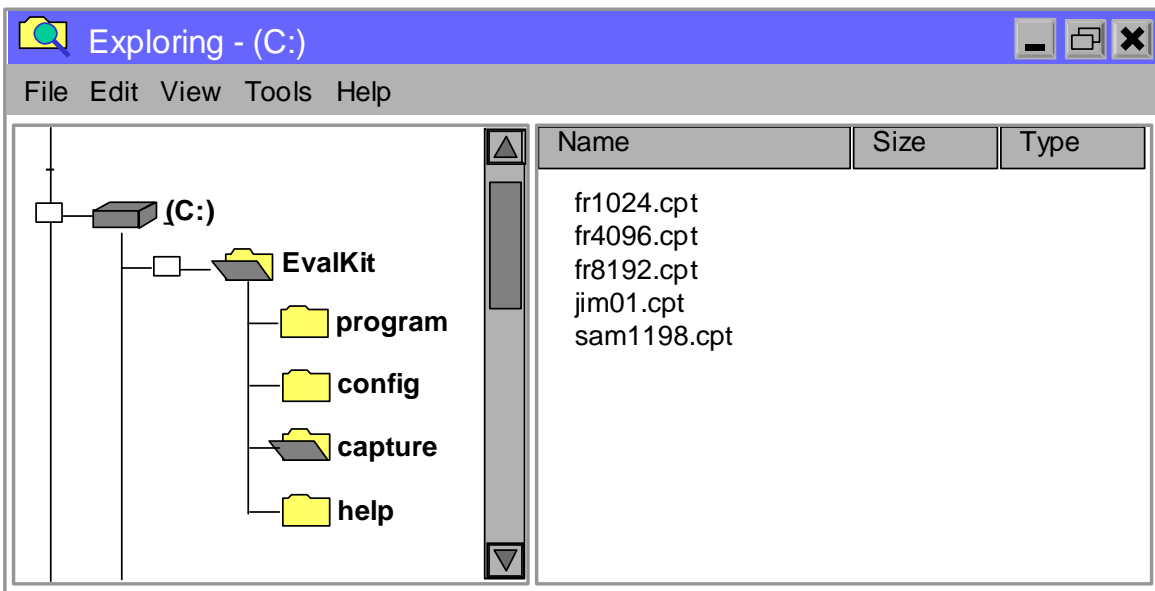


Figure 5: Directory structure - Capture files

The directory structure facilitates the file exchange for Technical Support and Tool Update

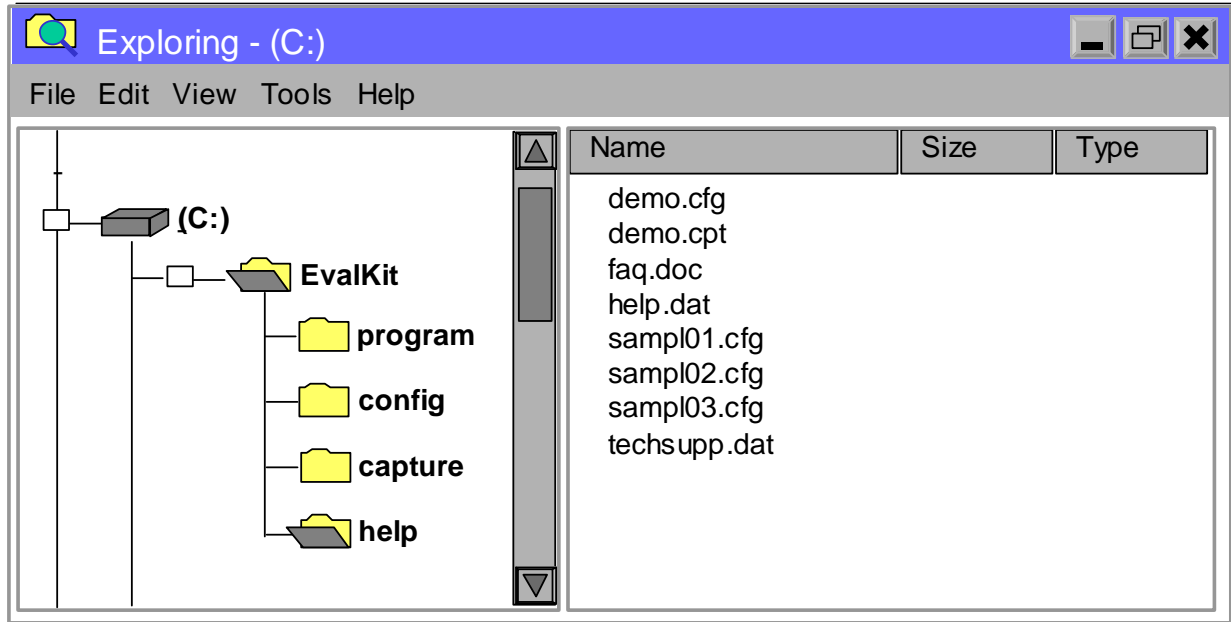


Figure 6: Directory structure - Help files

The Help directory holds the following files:

- “demo.cfg” and “demo.cpt”: demo configuration and capture files used when the hardware is not present (i.e. when the demo kit is downloaded from the web site or emailed)
- “faq.doc”: CTx12 devices related Frequently Asked Questions (regularly updated on the web site, an available for download)
- “help.dat”: help desk data
- “samplxx.cfg”: configuration files for demo scenarios
- “techsupp.dat”: contact information for Technical Support

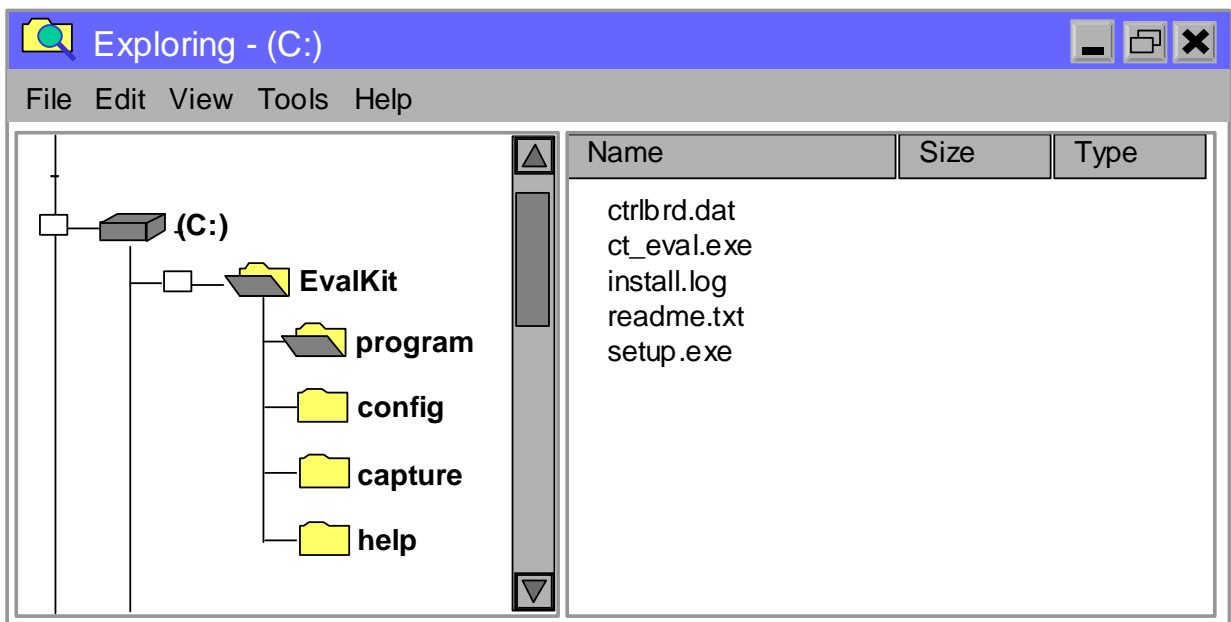


Figure 7: Directory structure - Board operation firmware

The board operation firmware file is accessible (ctrlbrd.dat) for email exchange with Technical Support, or download from web site.



Figure 8: Contact information for technical support

The contact information is located in the "techsupp.dat" file in the "help" directory; it can be customized for XYZ USA, XYZ Europe or any Distributor, and updated at any time.

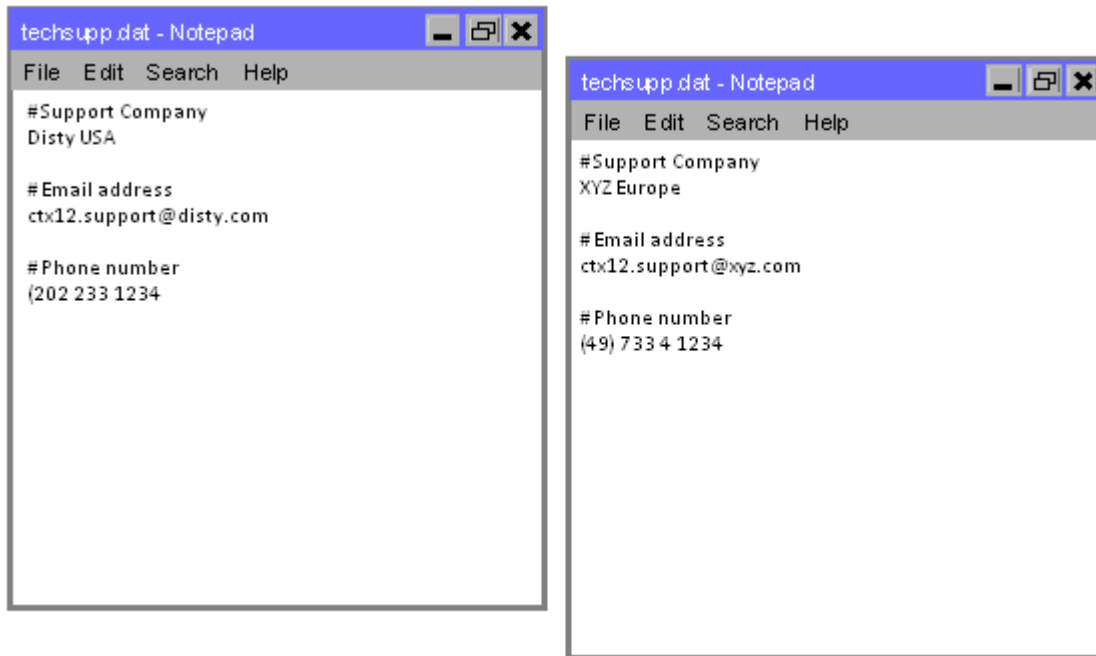


Figure 9: Examples of "techsupp.dat" files

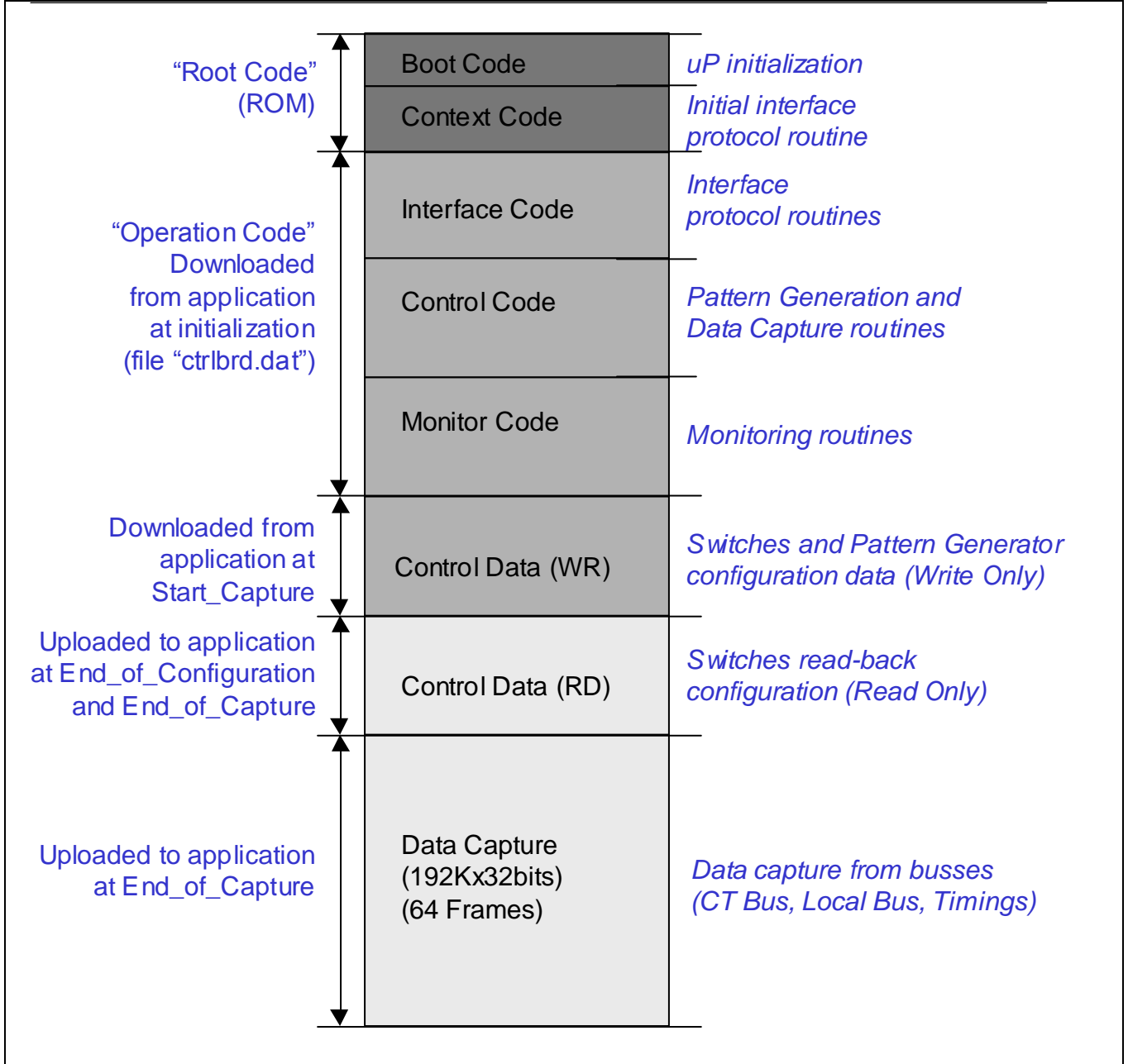


Figure 10: Evaluation Board Memory map proposal

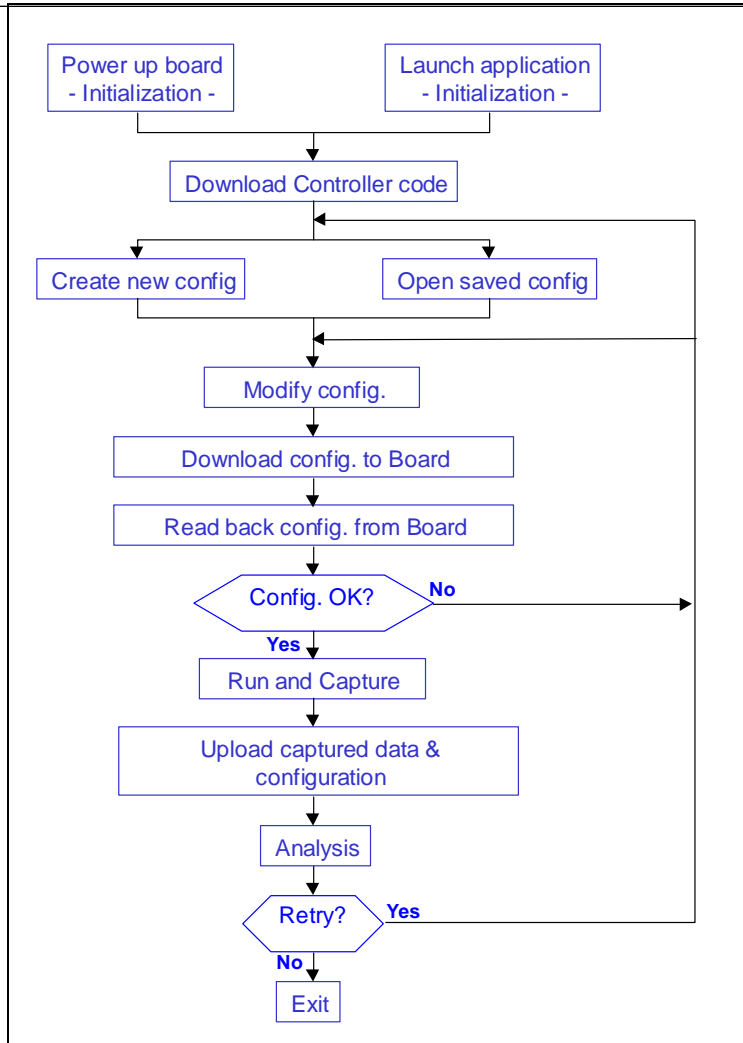


Figure 11: General operation flow diagram

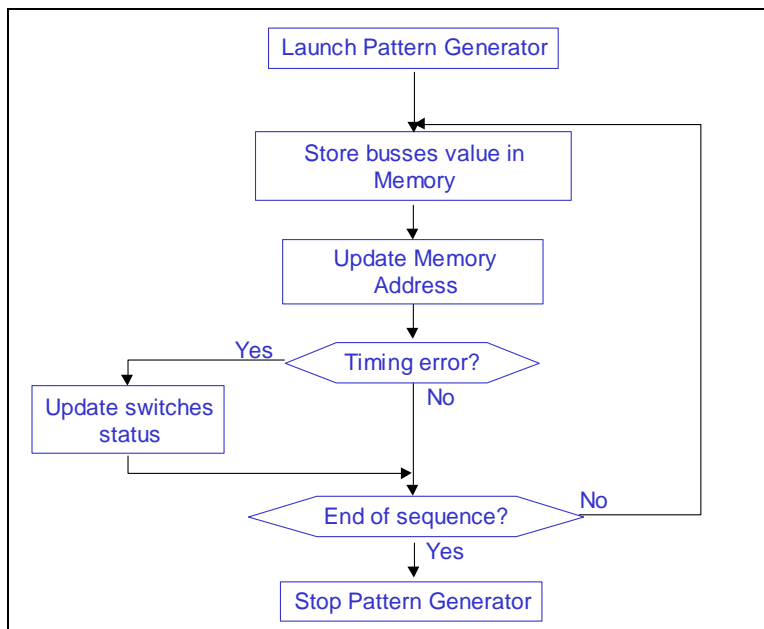


Figure 12: Capture operation flow diagram

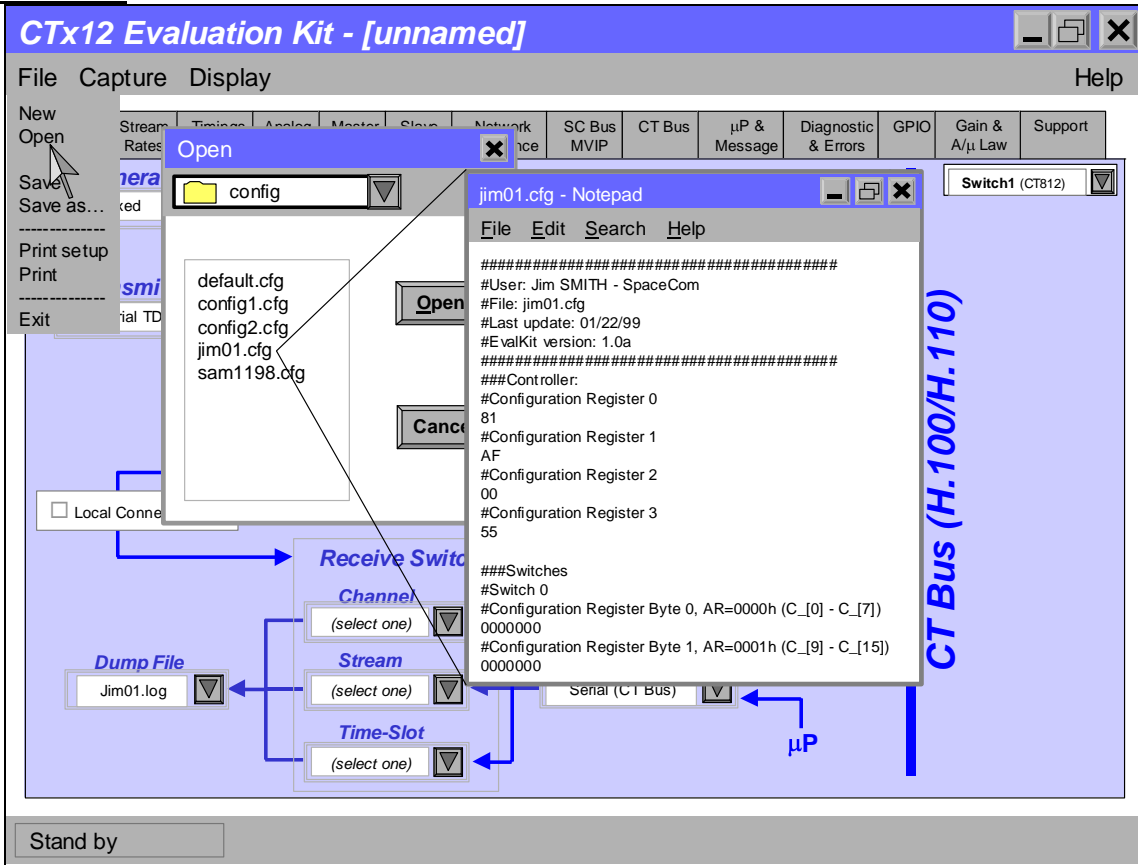


Figure 13: Configuration files are in text format for readability

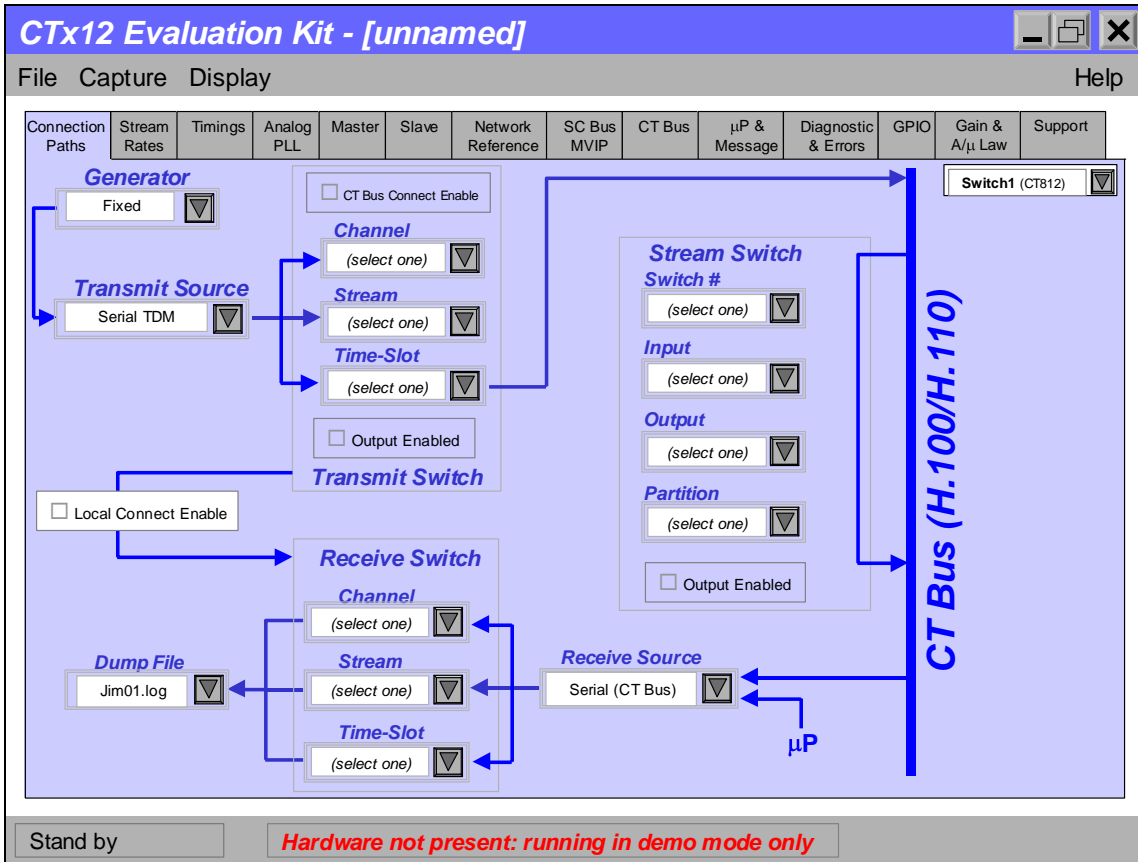


Figure 14: "Hardware" flag indicator in User Interface (bottom of the window)

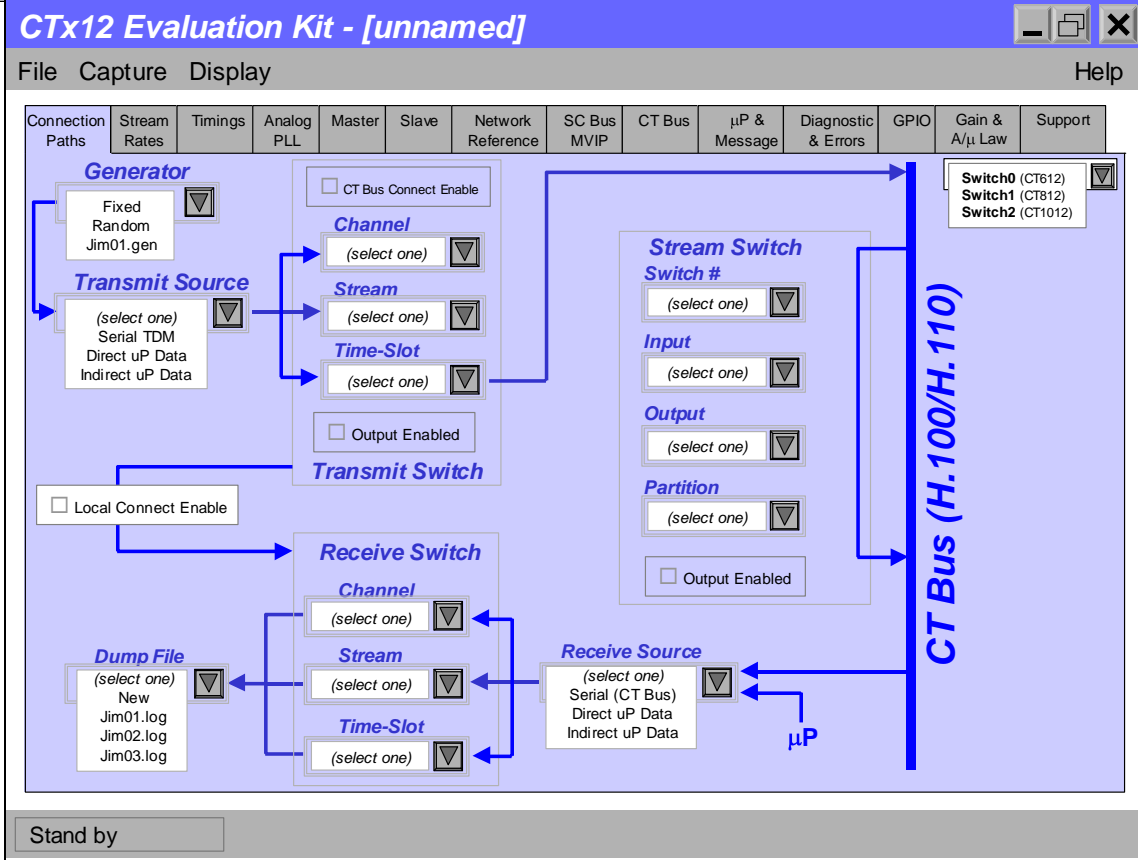


Figure 15: Example of Routing Configuration menu

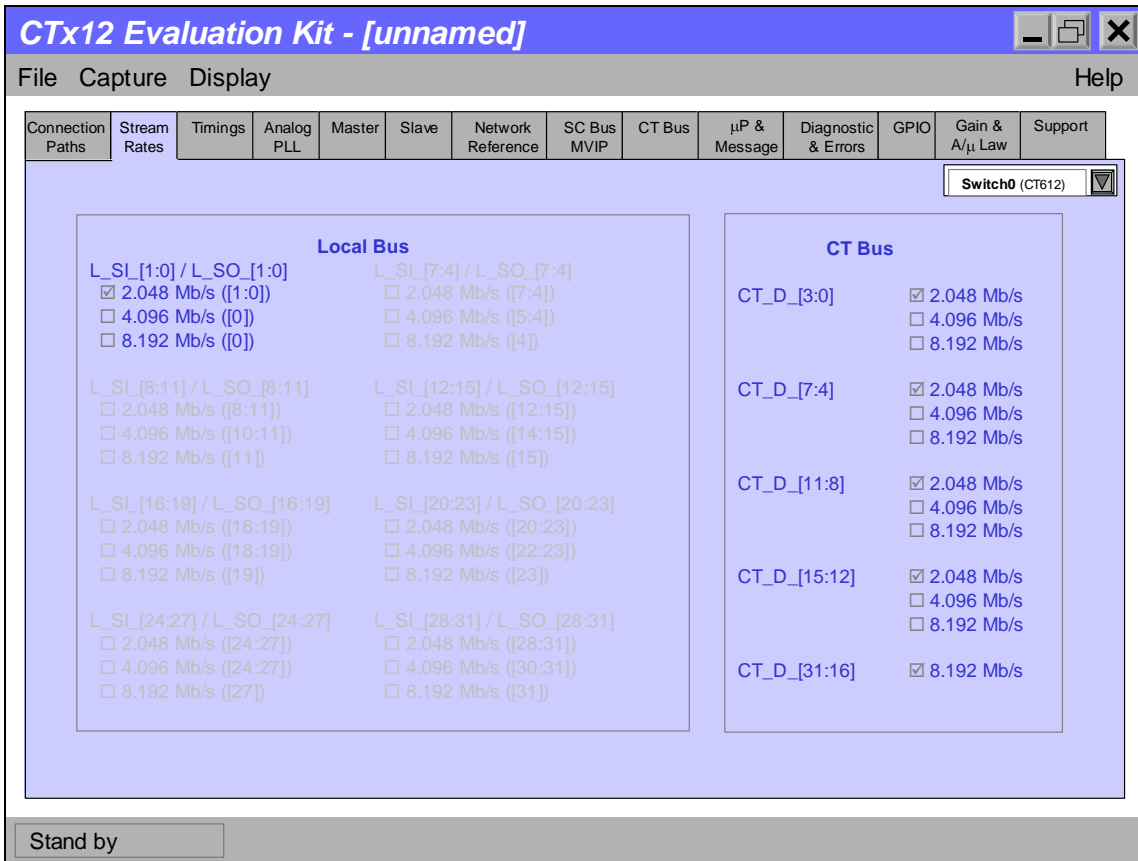


Figure 16: Example of Stream Rates menus (CT612)

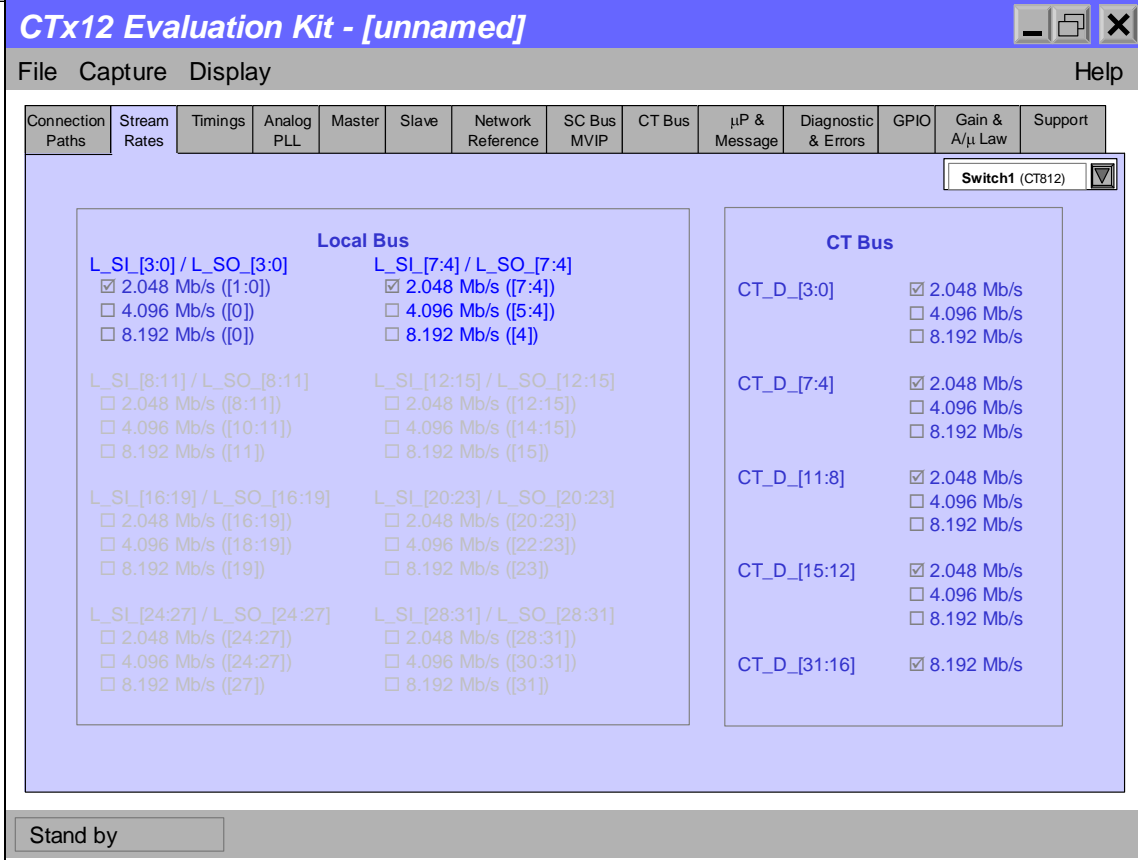


Figure 17: Example of Stream Rates menus (CT812)

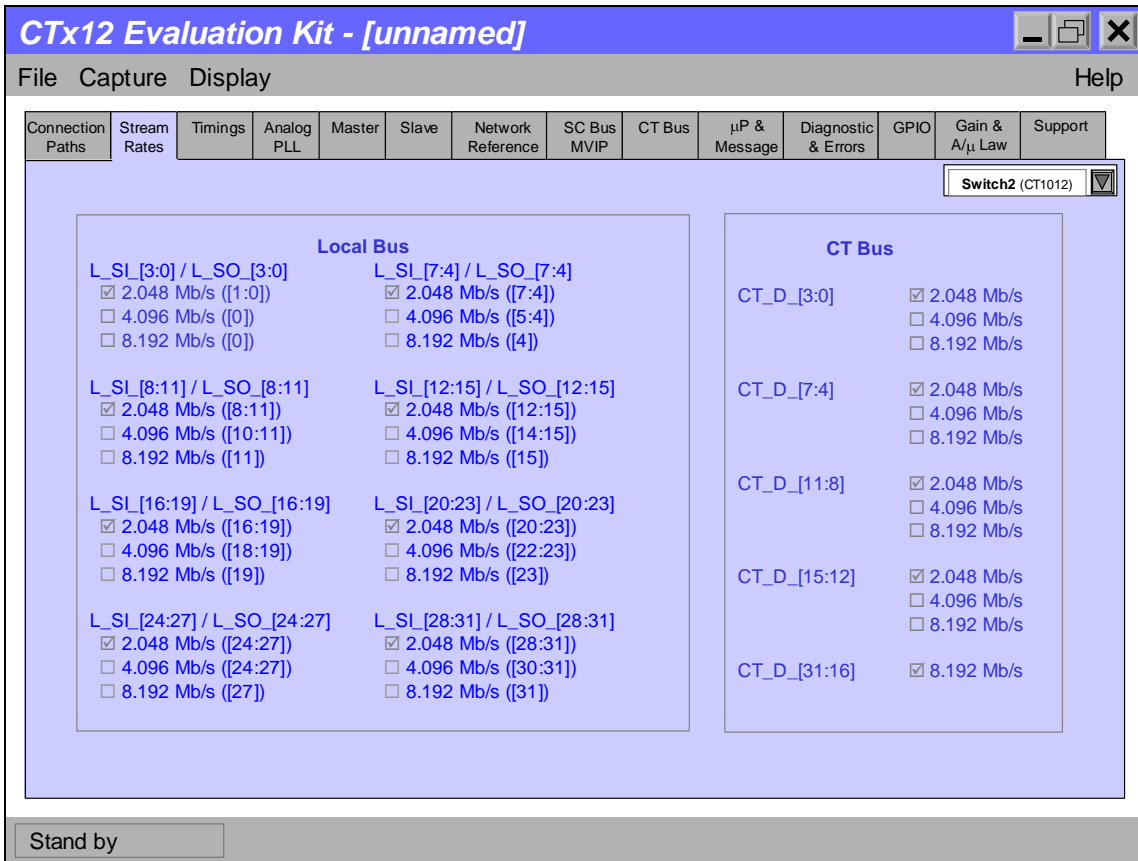


Figure 18: Example of Stream Rates menus (CT1012)

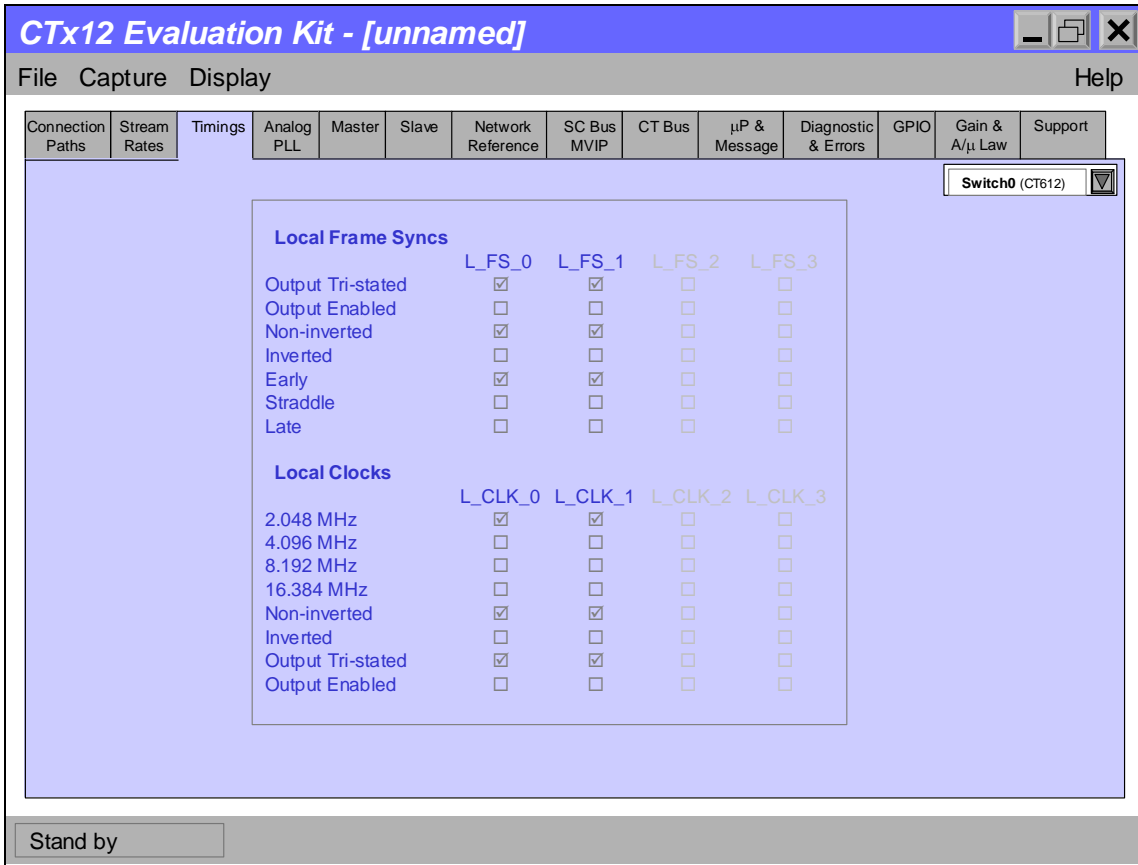


Figure 19: Example of Timing menu (CT612)

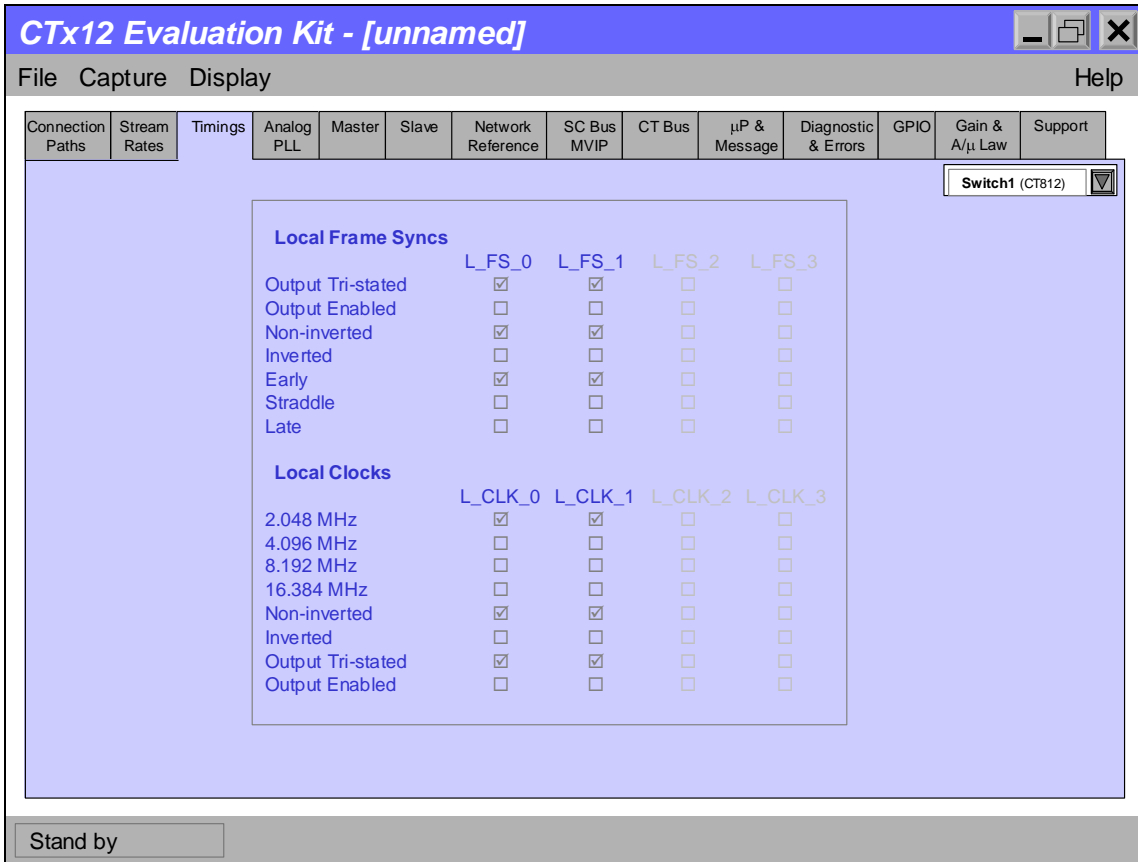


Figure 20: Example of Timing menu (CT812)

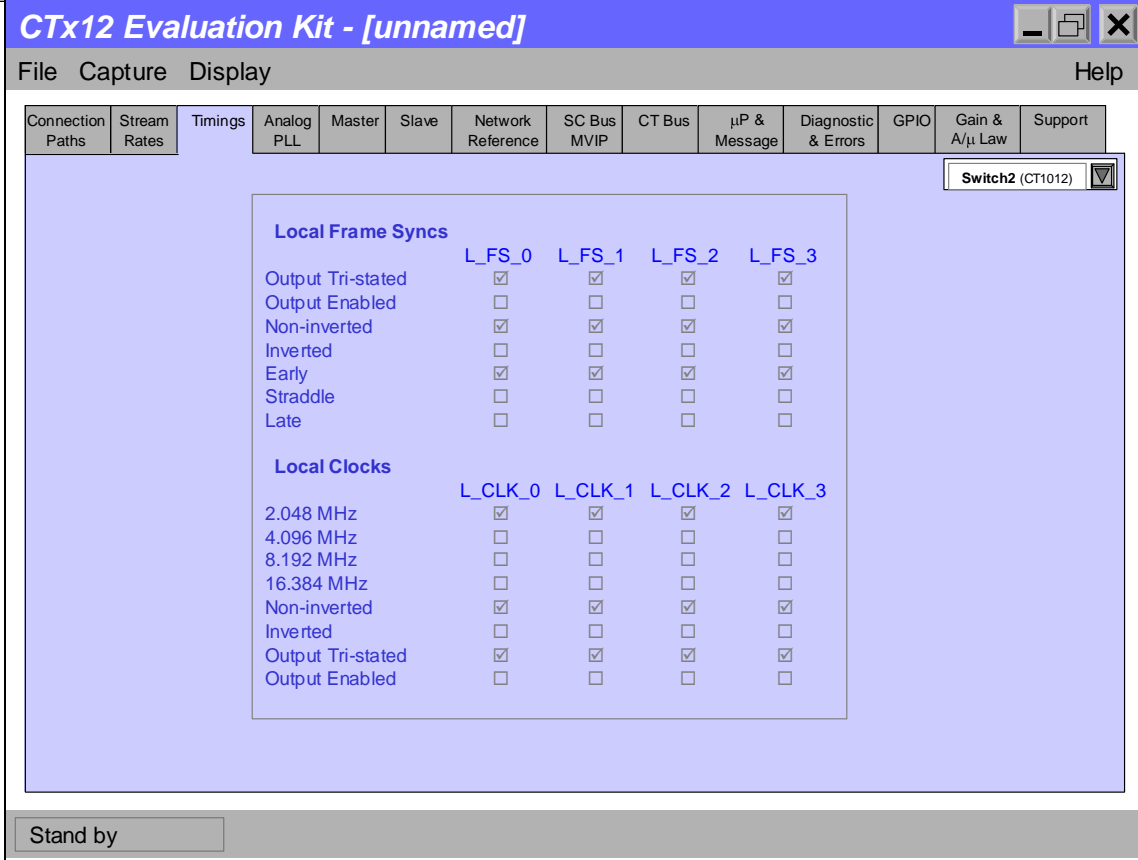


Figure 21: Example of Timing menu (CT1012)

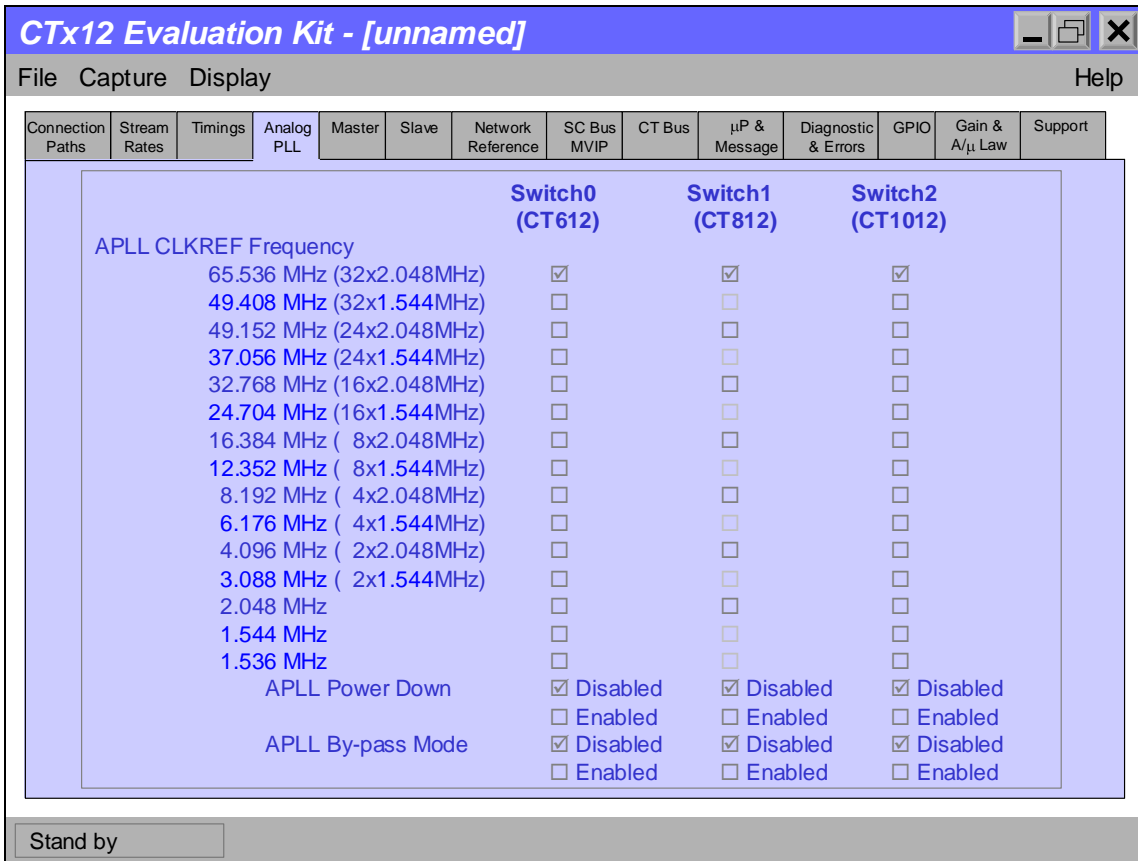


Figure 22: Example of Analog PLL menu

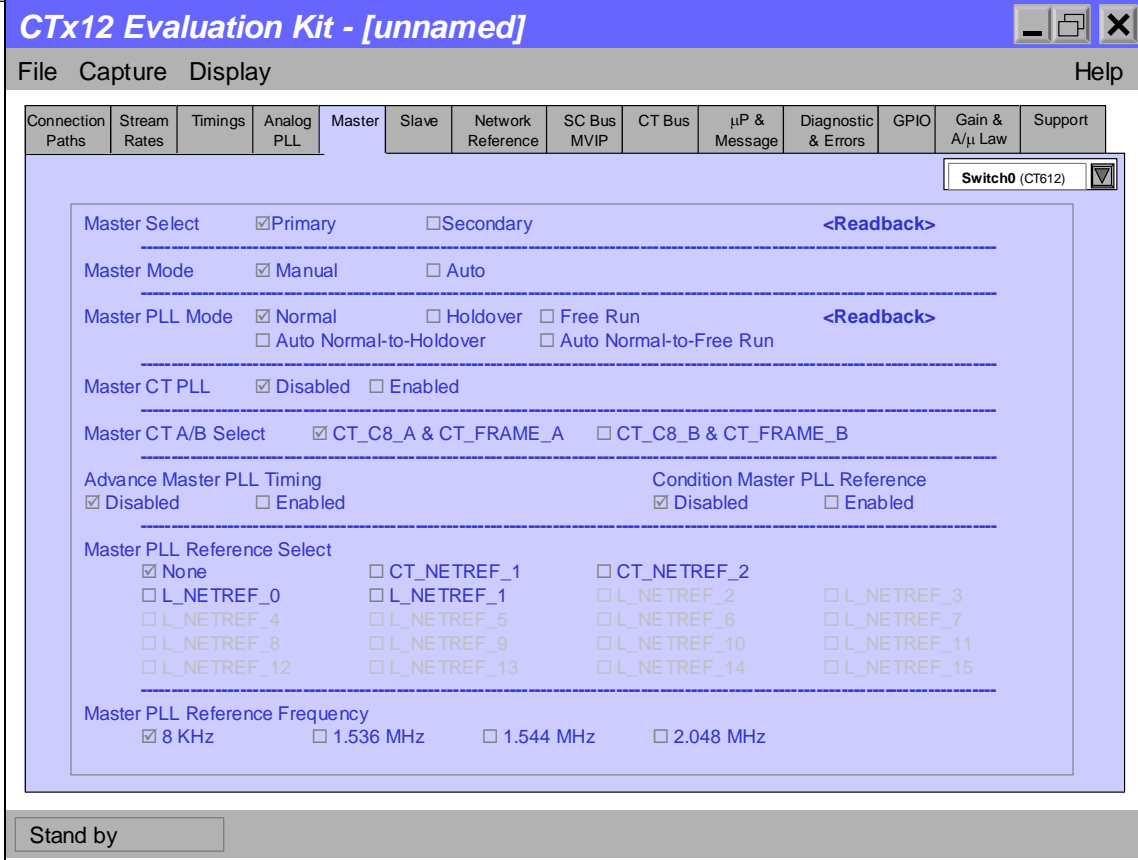


Figure 23: Example of Master menu (CT612)

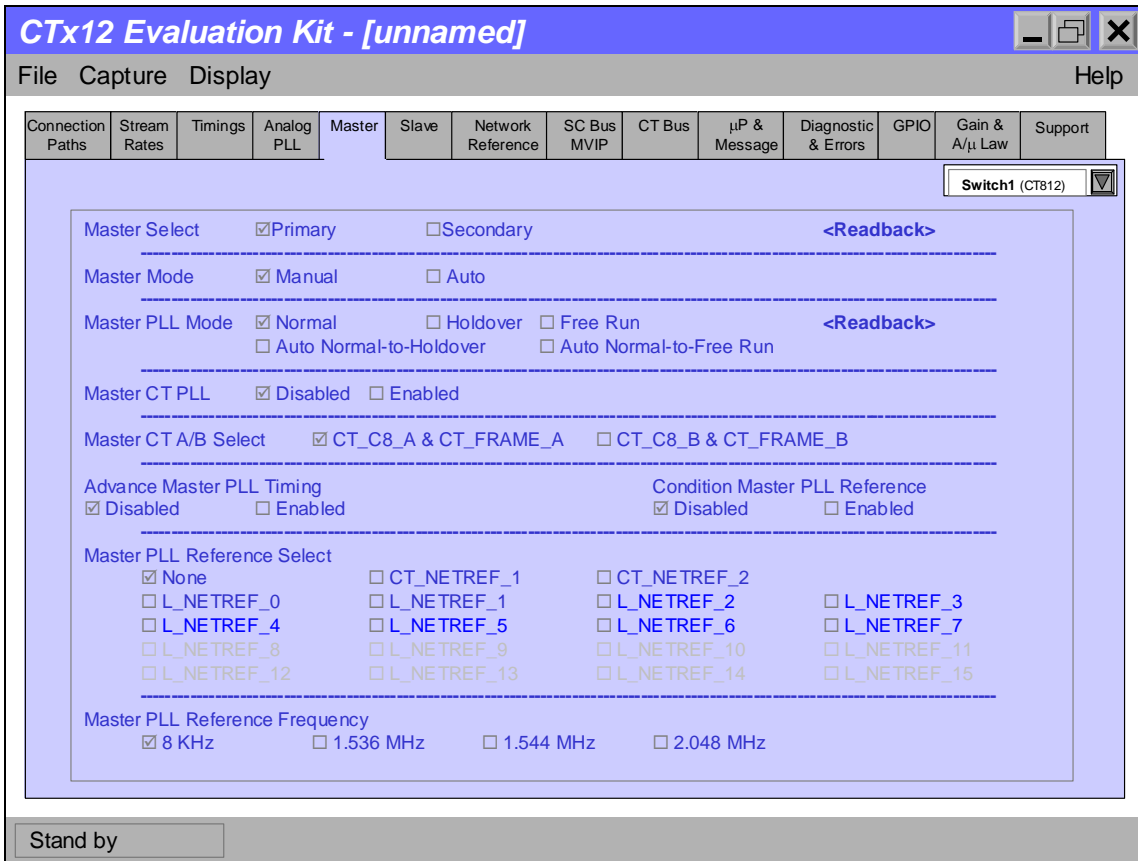


Figure 24: Example of Master menu (CT812)

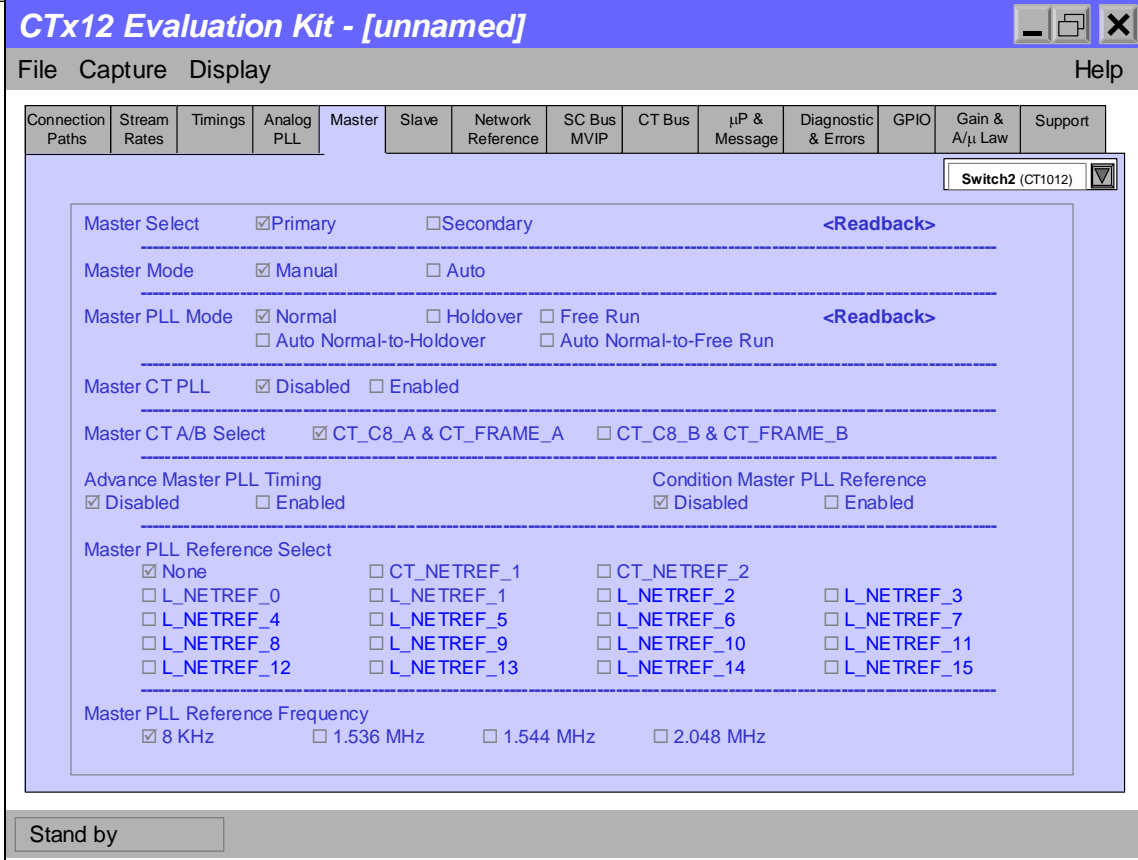


Figure 25: Example of Master menu (CT1012)

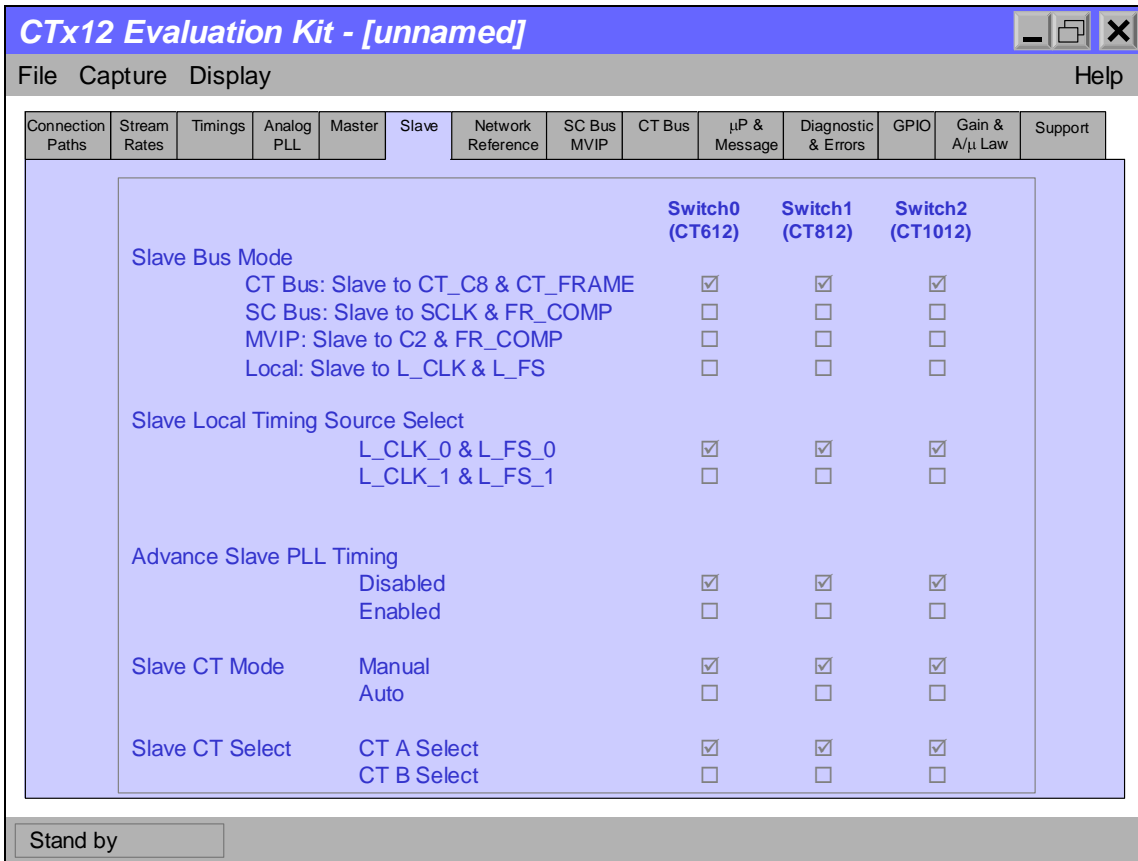


Figure 26: Example of Slave menu

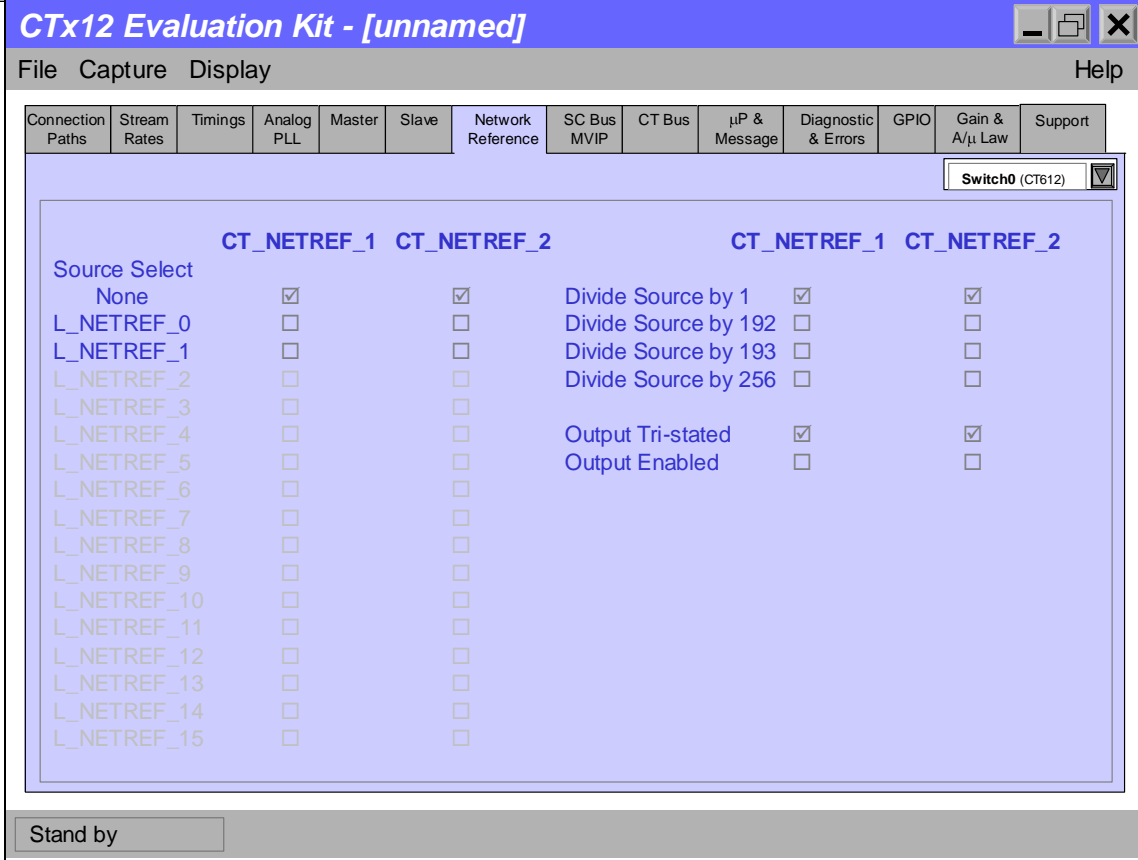


Figure 27: Example of Network Preference menu (CT612)

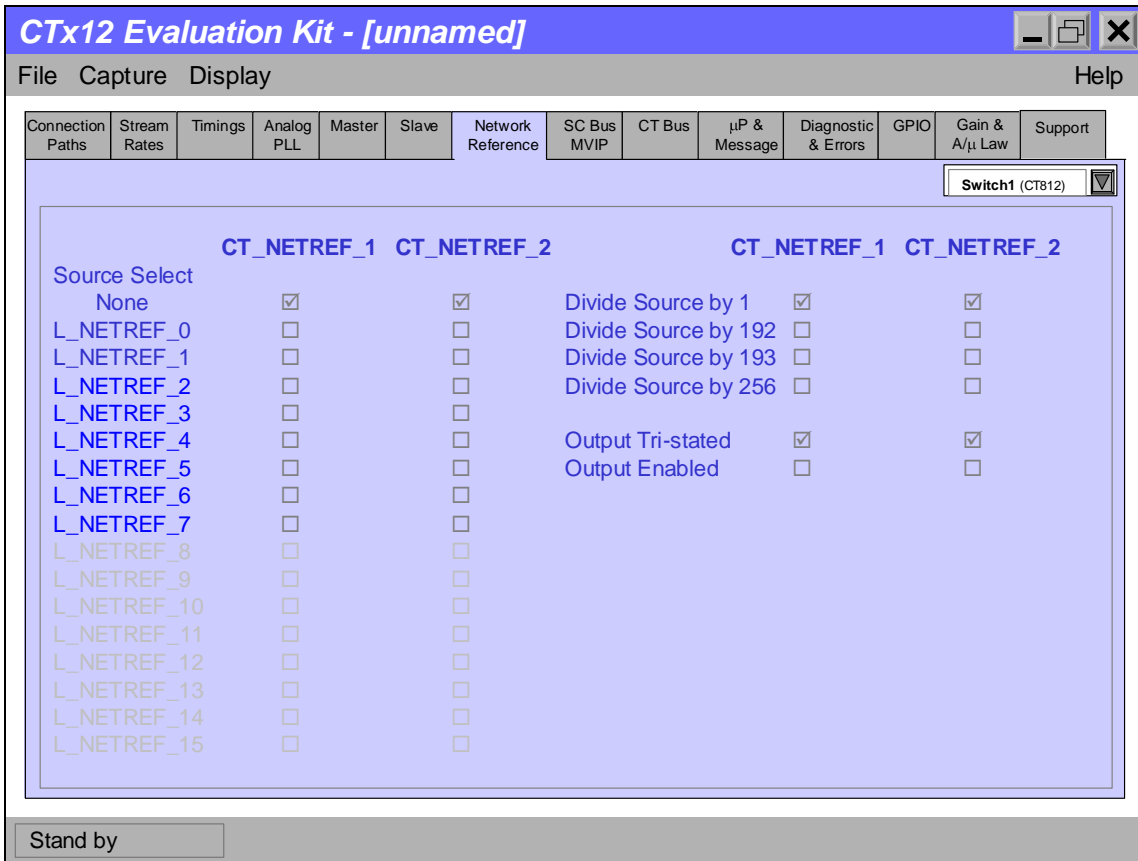


Figure 28: Example of Network Preference menu (CT812)

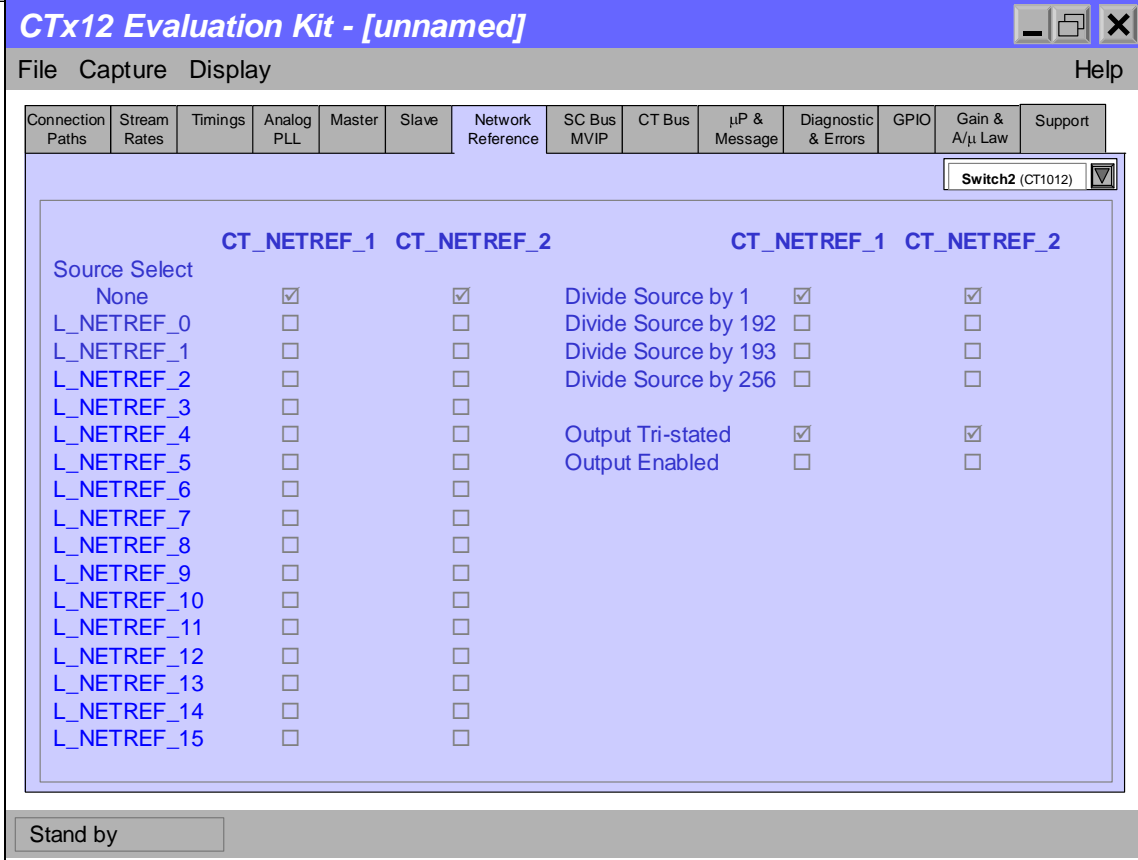


Figure 29: Example of Network Preference menu (CT1012)

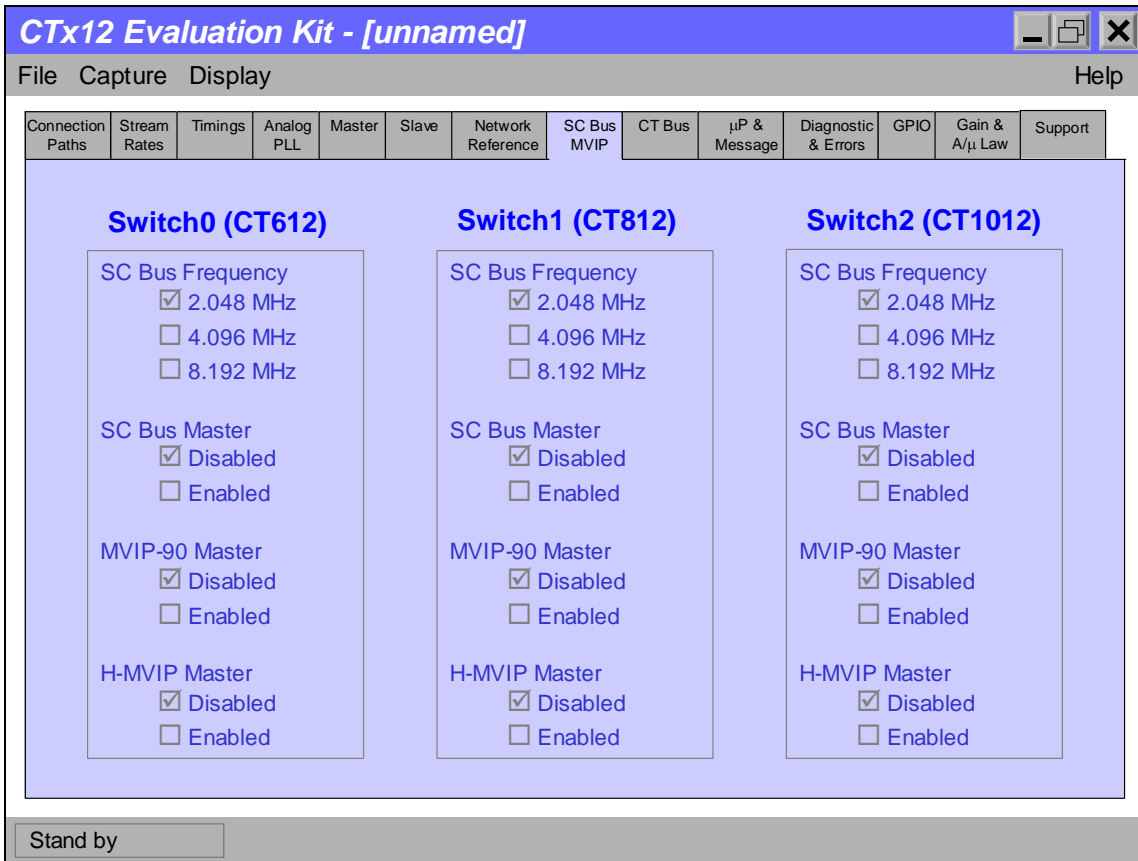


Figure 30: Example of SC Bus / MVIP menu

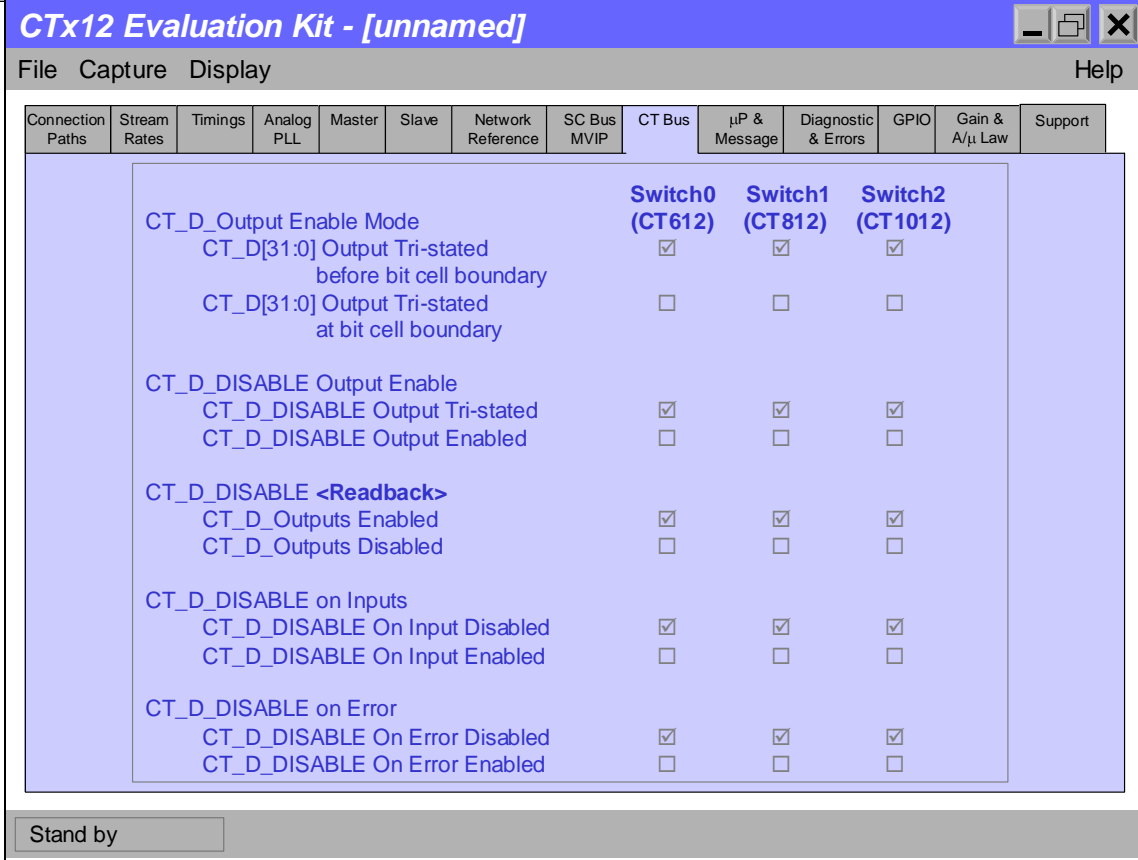


Figure 31: Example of CT Bus menu

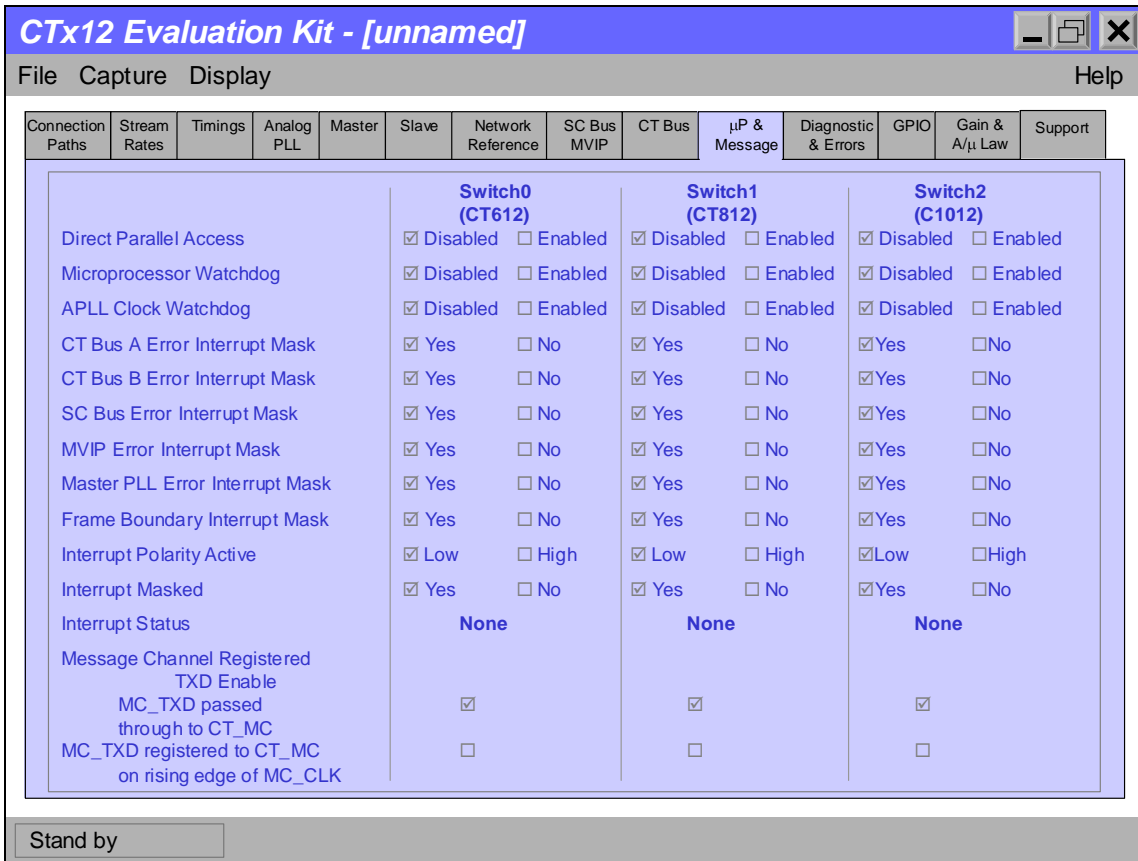


Figure 32: Example of uP & Message menu

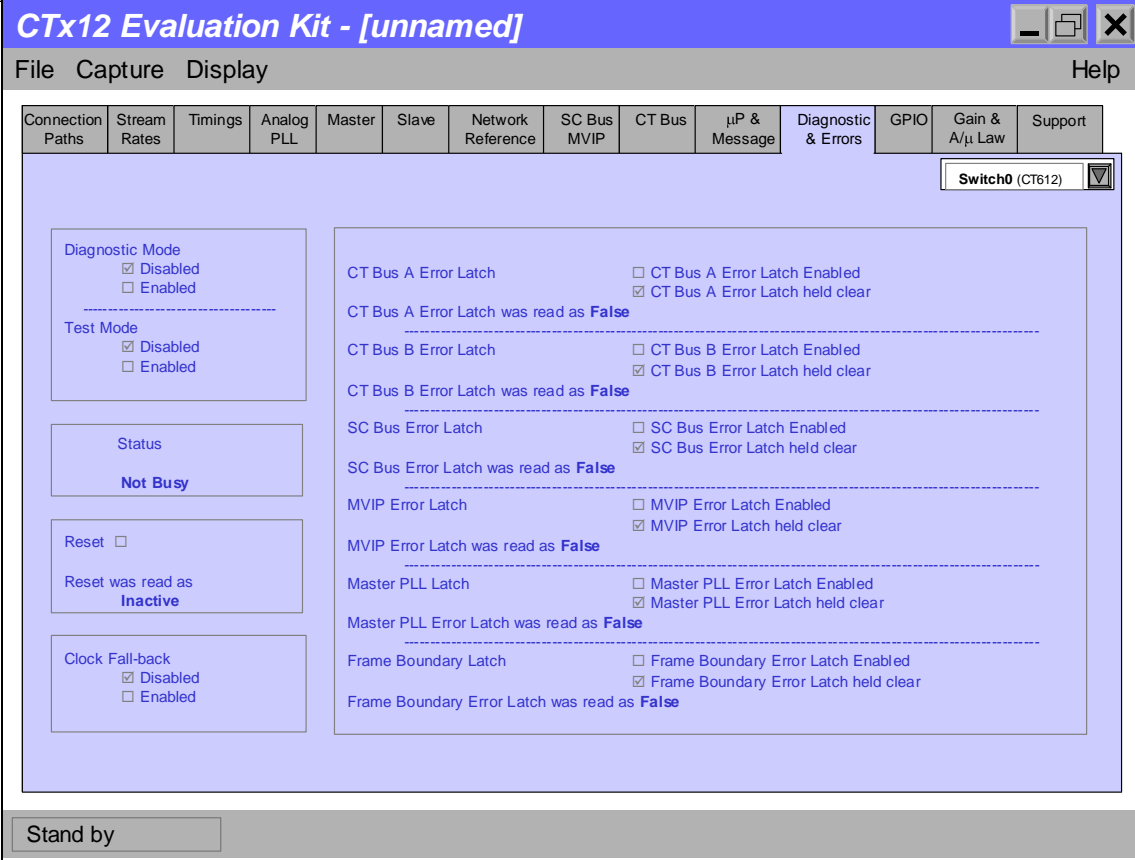


Figure 33: Example of Diagnostics & Errors menu (similar menu for CT812 and CT1012)

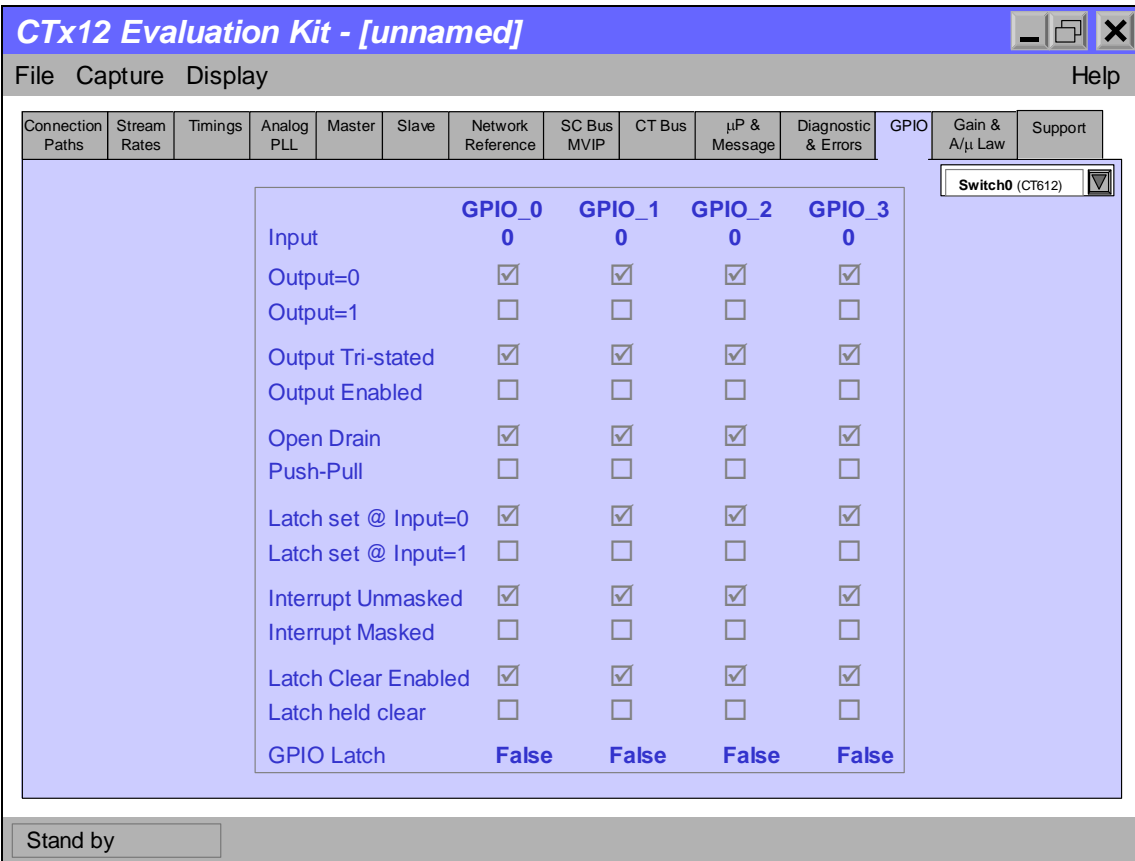


Figure 34: Example of GPIO menu (similar menu for CT812 and CT1012)

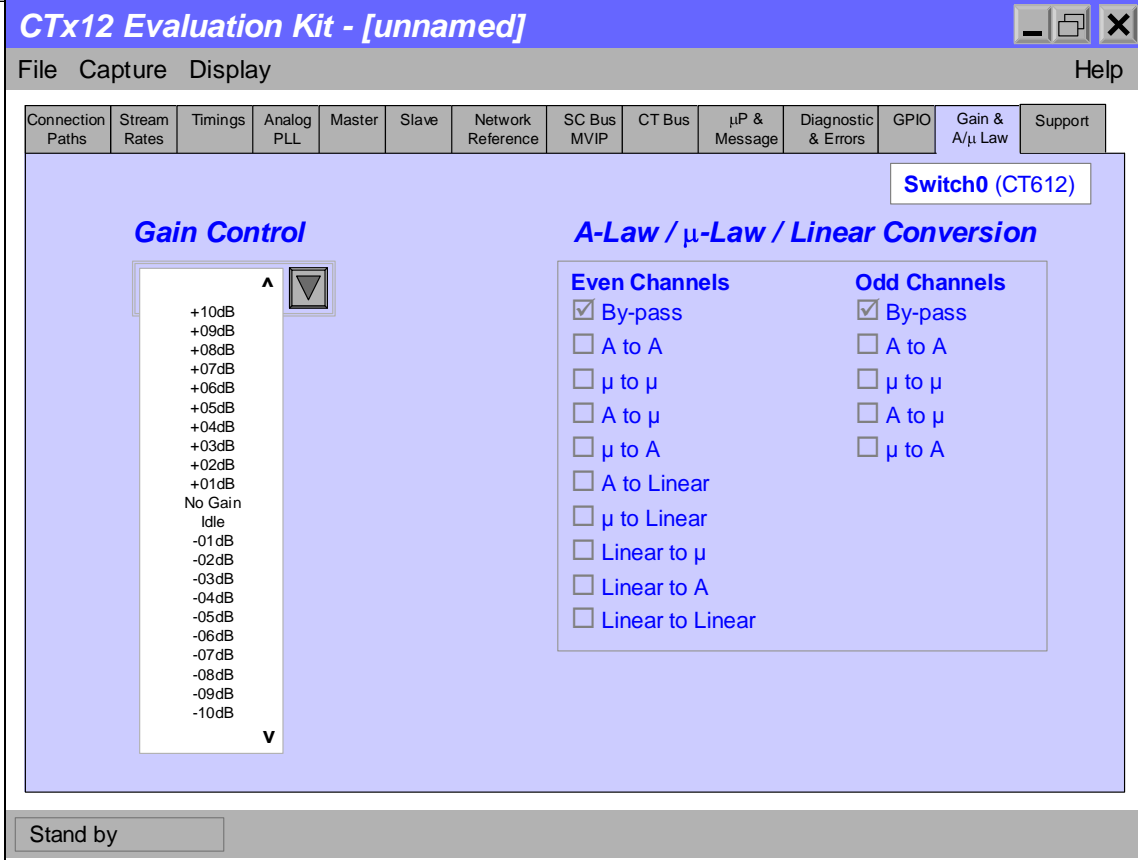


Figure 35: Example of Gain and A/μ Law menu (CT612 only)

The Gain Control is a roll-down and scroll type of menu (values are from -31dB to +31dB).

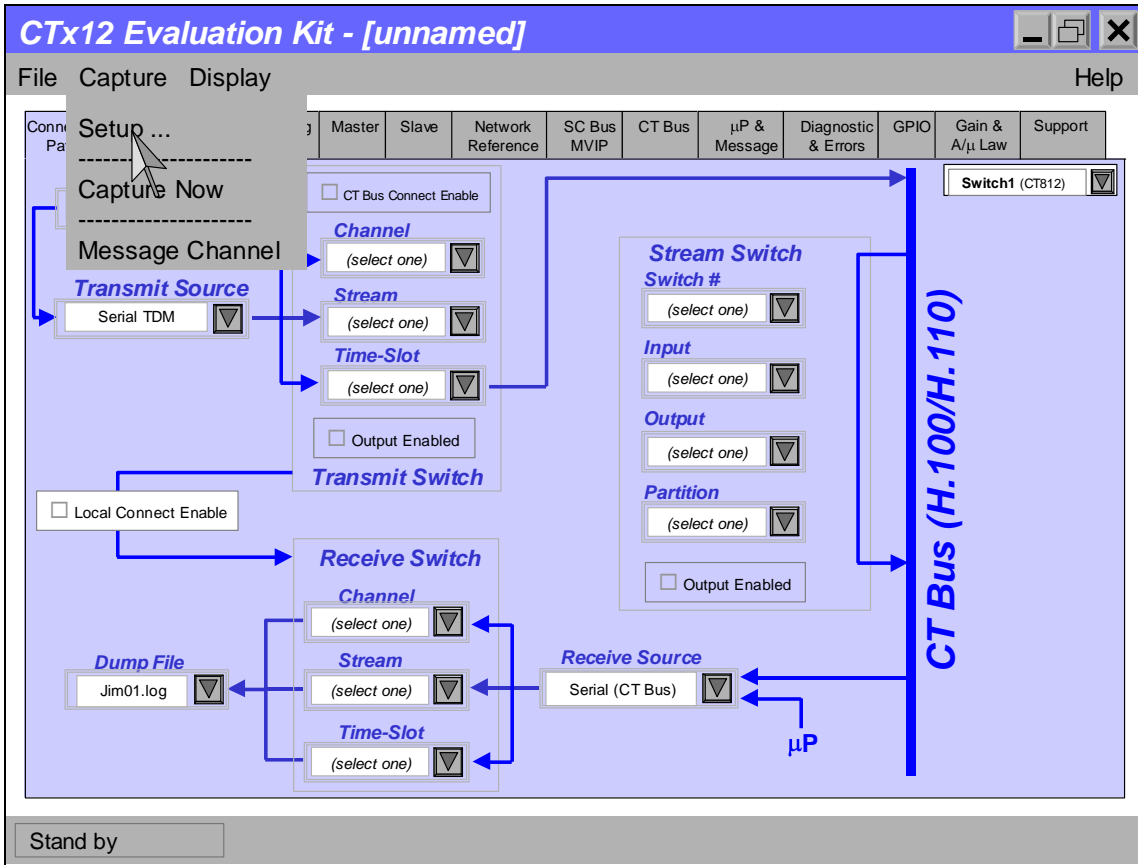


Figure 36: Example of Capture roll-down menu

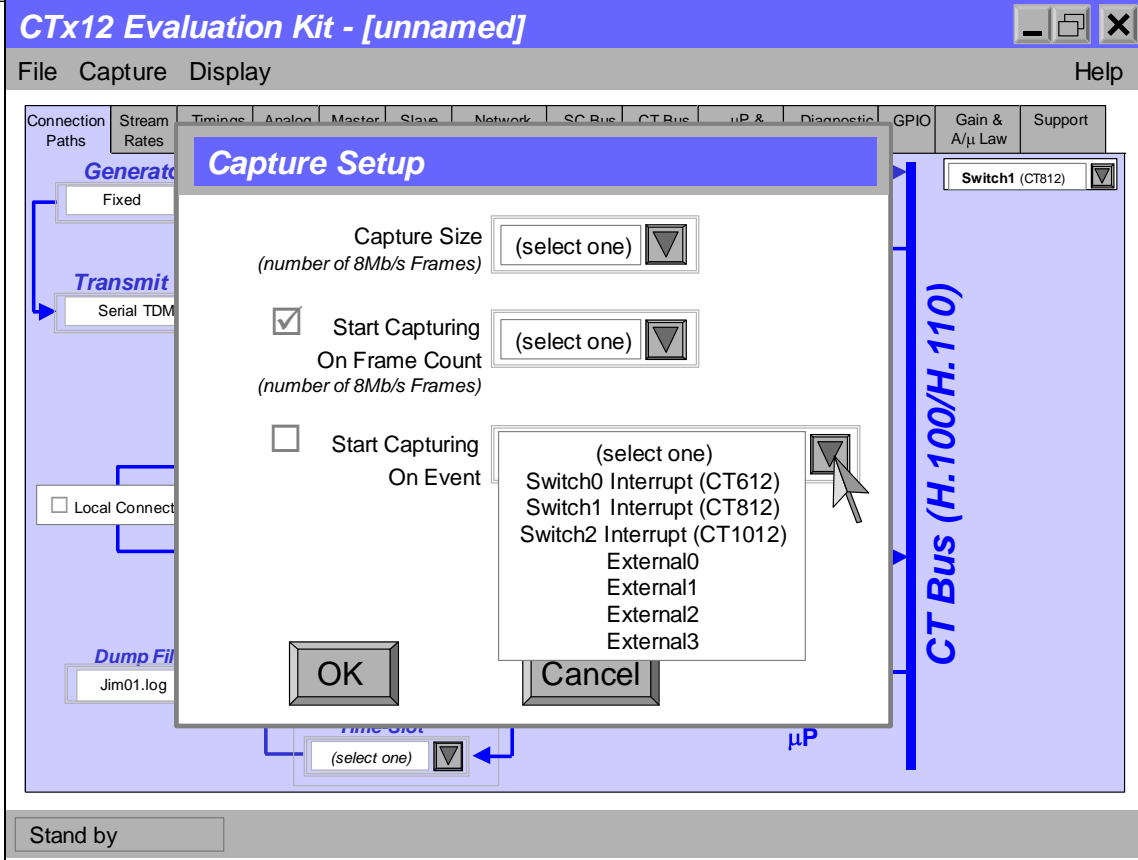


Figure 37: Example of Capture Setup menu

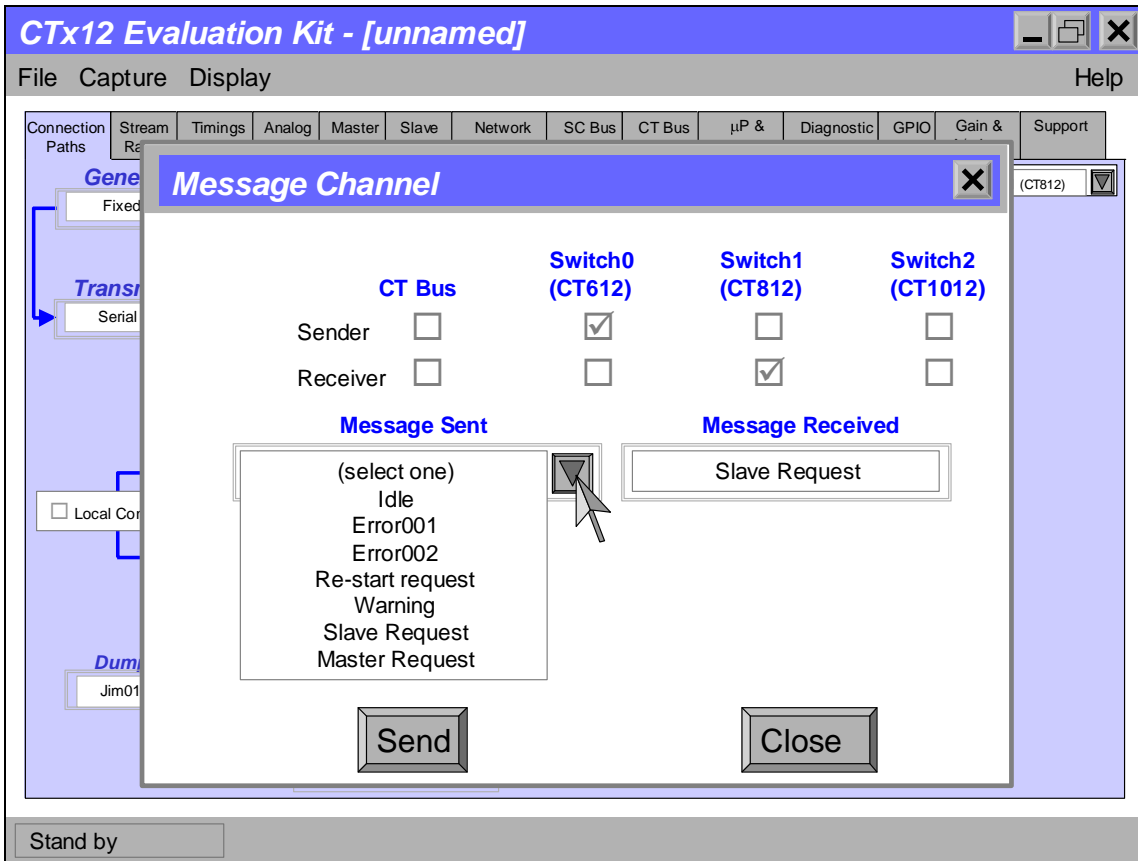


Figure 38: Example of Message Channel Interface menu

The messages are arbitrarily coded (in the operation code (ctrlbrd.dat)).

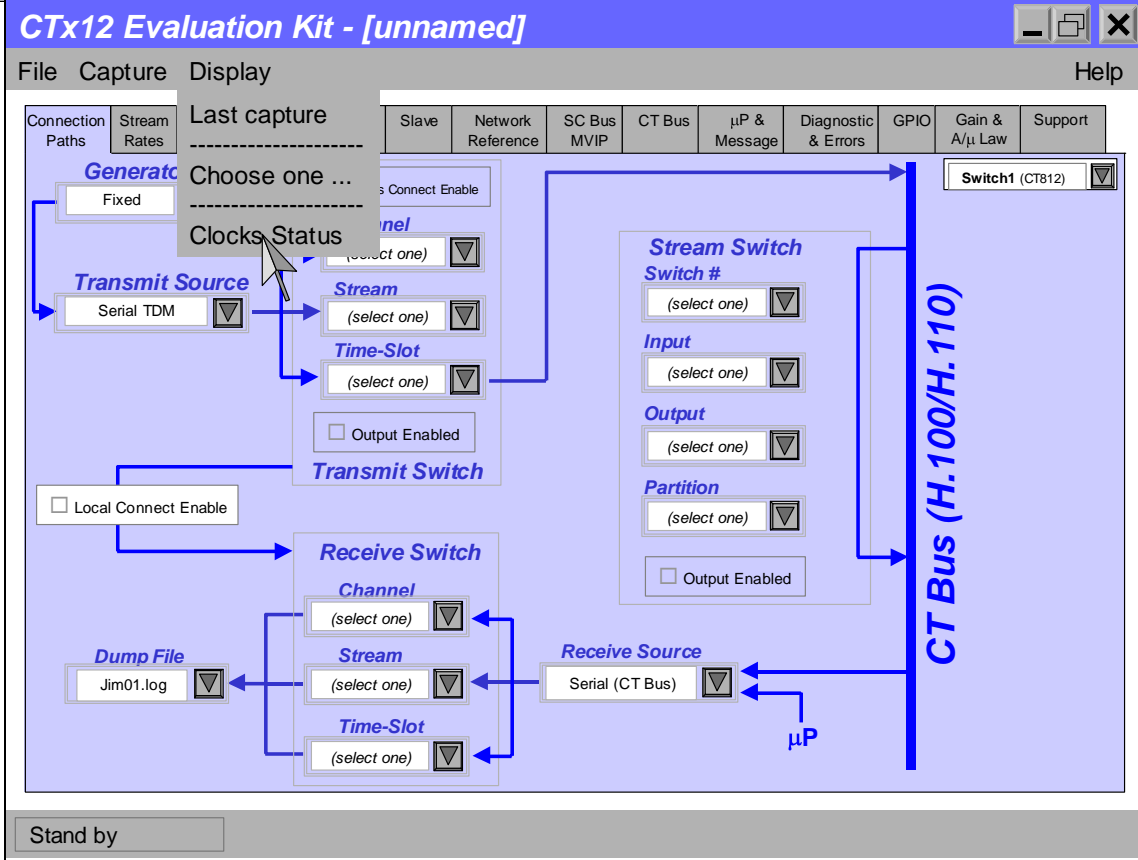


Figure 39: Example of Display roll-down menu

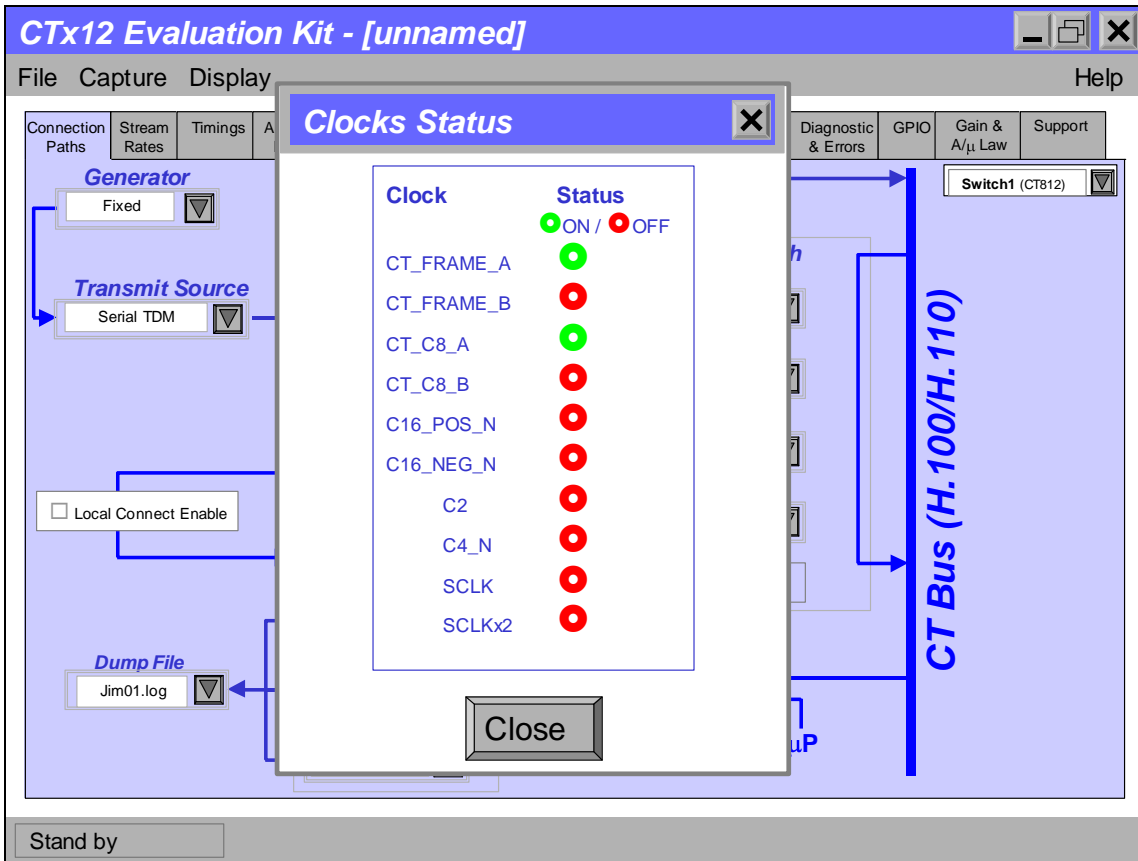


Figure 40: Example of Clock status Display

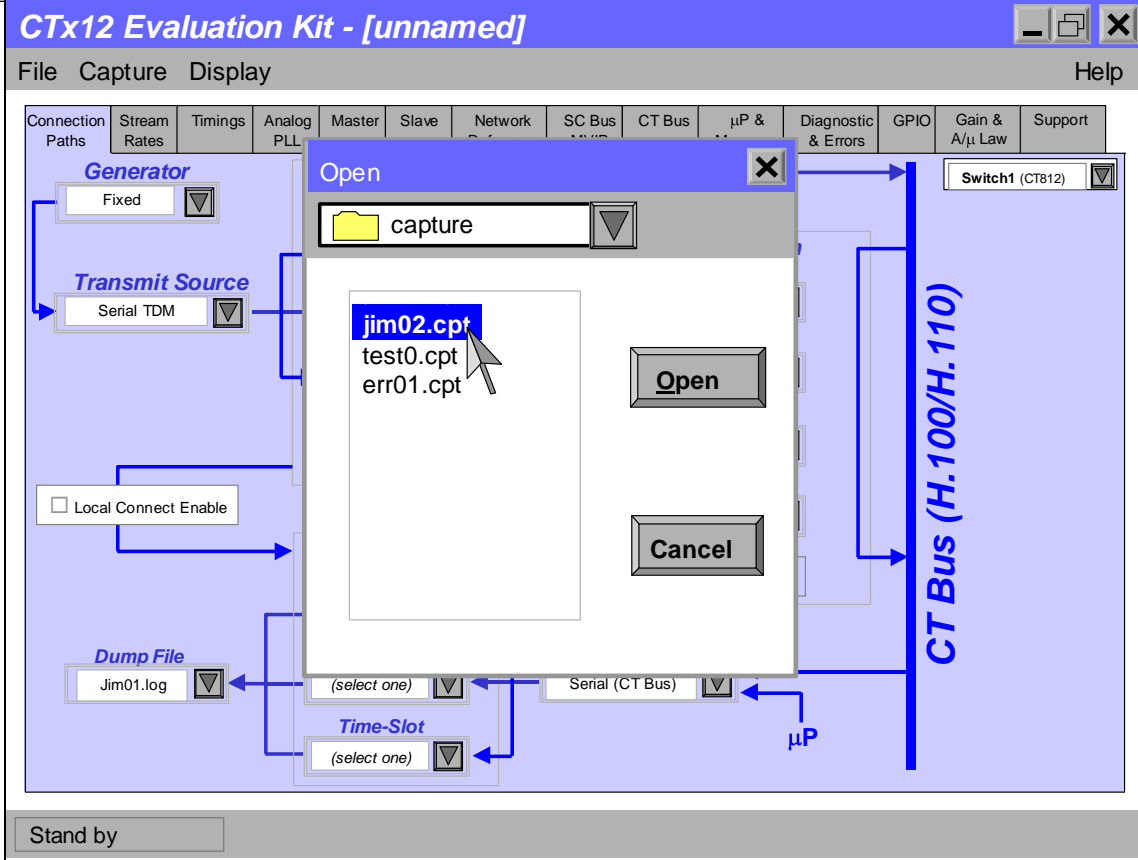


Figure 41: Example of Display menu

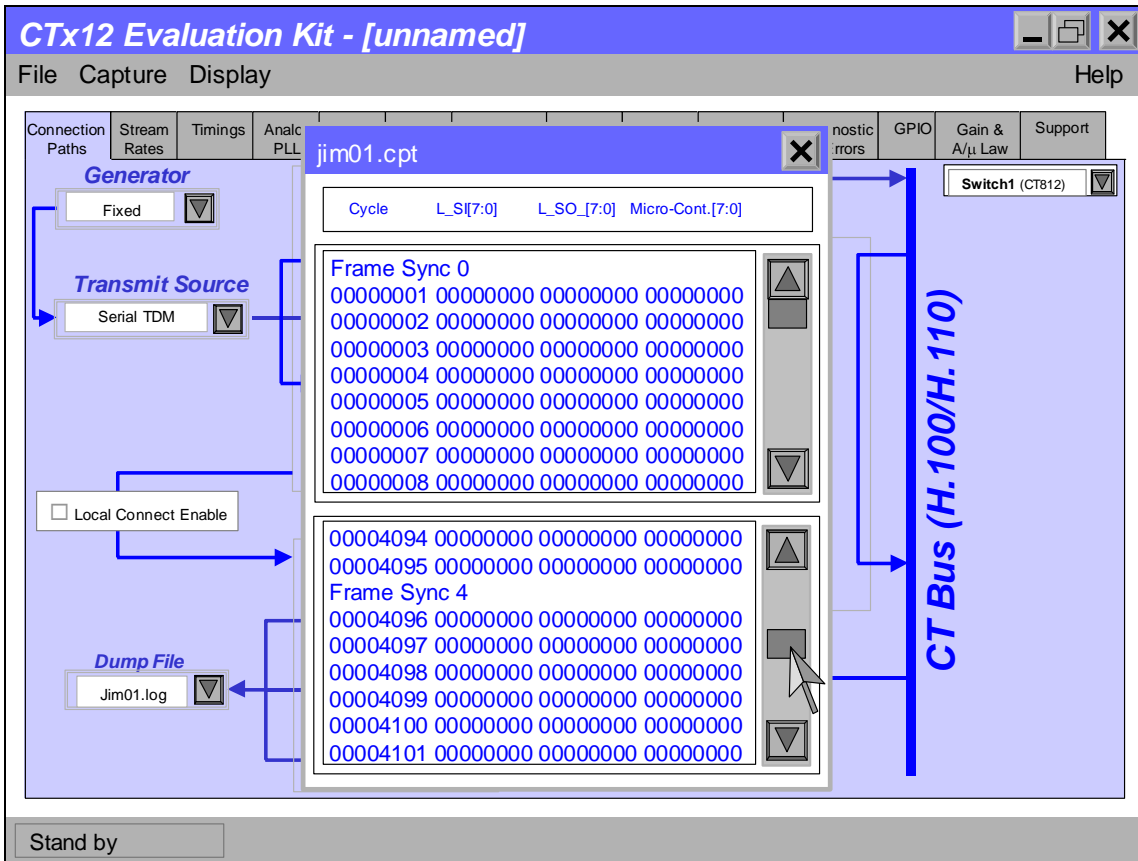


Figure 42: Example of split display window

The display window also needs to allow the demo of the pre-defined configurations.

Related Documentation:

CTx12 Datasheet

Application Note for Hot-Swap

Application Note for Multiple Device Implementation

ECTF H.100/H.110 Specifications: <http://www.ectf.org/ectf/tech/download.htm>