

The Calnex Analysis Tool (CAT) provides a range of pre-defined ITU-T masks to verify that the performance of network devices meets the relevant standards. This document explains what masks should be considered when testing to defined standards.



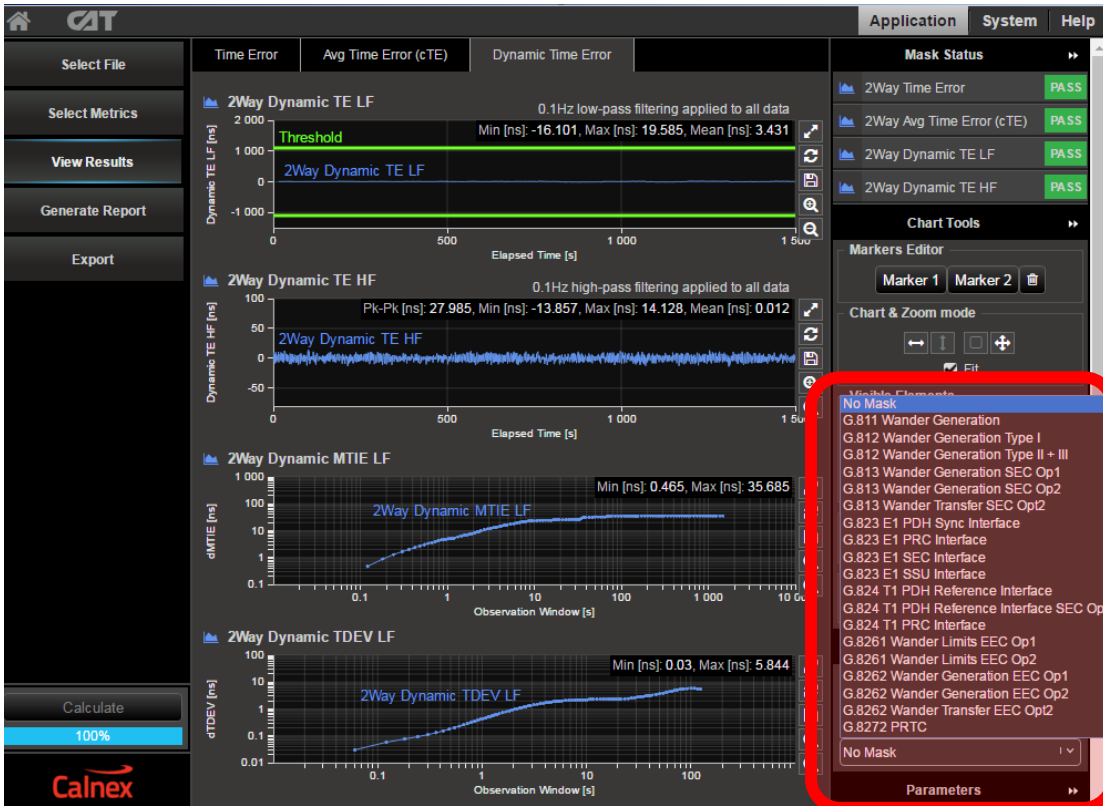
# A guide to MTIE/TDEV

## MASK SELECTION

A large, stylized logo for the Calnex Analysis Tool (CAT). The letters "CAT" are rendered in a bold, blocky, sans-serif font. The "C" and "A" are a light gray, while the "T" is a darker gray. The logo is set against a dark gray background that is part of a larger graphic design featuring blue and white geometric shapes on the left side of the page.

# Introduction

The Calnex Analysis Tool (CAT) lets you choose from a range of industry-standard masks against which you can analyse the wander results of MTIE and TDEV.



Before you decide what MTIE/TDEV mask to use, the first consideration is whether a piece of network equipment is being tested or a network is being tested. Each case is discussed separately below.

# MTIE/TDEV masks to use when testing Network Equipment

The ITU-T Standards provide different masks depending on how and where the equipment will be used in a network.

The first place to look, if possible, is the design specification for the equipment under test. The datasheet may state explicitly what the equipment is designed to do. If this is the case, then use the masks specified in the standards listed. The ITU-T or Telcordia Standard document number should be stated and hence used to find the appropriate mask.

The table below discusses the masks most likely to be specified. As stated above, it is ultimately down to the equipment designers to determine what is appropriate for the target applications for their equipment so the following table is provided as guidance to the most likely masks/standards specified.

The table approaches the problem by firstly identifying the interface format to be tested, and then identifying the appropriate Standards.

Note: In all ITU-T synchronization standards, “Option 1” refers to networks designed to conform to the 2.048Mbit/s / E1 hierarchy. “Option 2” refers to networks designed to conform to the 1.544Mbit/s / T1 hierarchy. Equipment developed for the global market is likely to conform to both sets of requirements.

Interfaces	MTIE / TDEV Masks	Notes
<b>E1 / 2M Clock</b>	G.8262 EEC Opt.1 or G.813 SEC Opt.1	Use G.8262 for equipment supporting SyncE, otherwise use G.813 e.g. a 1588v2 slave. Both standards define an identical mask.  Mask “Opt.1 + Temp” as defined in G.813 defines performance when the temperature changes by greater than $\pm 1K$ over the measurement period.
<b>T1</b>	G.8261 EEC Opt.2 or G.813 SEC Opt.2 and/or GR-1244	Use G.8262 for equipment supporting SyncE, otherwise use G.813 e.g. a 1588v2 slave. Both standards define an identical mask.  Mask “Opt.1 + Temp” as defined in G.813 defines performance when the temperature changes by greater than $\pm 1K$ over the measurement period.  GR-1244 is often required when equipment is supplied into North America. It may be necessary to test against this as well as one of the other two.
<b>1GbE / 10GbE SyncE</b>	G.8262	Use EEC Opt. 1 or EEC Opt.2 depending on the network into which the equipment will be deployed.
<b>10MHz</b>	If Opt 1 equipment, same as E1 If Opt 2 Equipment, same as T1	

# MTIE/TDEV masks to use when testing a network

The following table lists the masks to use when you are evaluating a network.

The table approaches the problem by firstly identifying the interface format to be tested, and then identifying the appropriate Standards.

Note: In all ITU-T synchronization standards, “Option 1” refers to networks designed to conform to the 2.048 Mbit/s / E1 hierarchy. “Option 2” refers to networks designed to conform to the 1.544 Mbit/s / T1 hierarchy.

Interfaces	MTIE / TDEV Masks	Notes
<b>E1 / 2M Clock</b>	G.8261 EEC Opt.1 or G.8261.1 or G.823 E1 Interface or G.823 PDH/PRC/SEC/SSU	G.8261: Output from equipment used for Packet Network synchronization using <b>SyncE</b> for frequency.  G.8261.1: Output from equipment used for Packet Network synchronization using <b>1588v2</b> for frequency.  E1 Interface: E1 Traffic interface.  PDH: Clock output from a PDH network.  PRC: Clock output from a Primary reference Source e.g. a 1588v2 Master.  SEC: Clock output from SDH Equipment.  SSU: Clock Output from a Synchronization Supply Unit.
<b>T1</b>	G.8261 EEC Opt.2 or {G.8261.1} or G.824 T1 Interface or G.824 T1 PRC	G.8261: Output from equipment used for Packet Network synchronization e.g. 1588v2 Slave or a SyncE EEC.  {G.8261.1: Currently 'For Further Study' in the Standard.}  T1 Interface: T1 Traffic Interface.  PRC: Clock output from a Primary reference Source e.g. a 1588v2 Master.
<b>1Gbe/ 10GbE SyncE</b>	G.8261 EEC Opt.1 or Opt.2	Use EEC Opt. 1 or EEC Opt.2 depending on network equipment will be deployed in.
<b>10MHz</b>	If Opt 1 equipment, same as E1  If Opt 2 Equipment, same as T1	

For more information on Calnex products and to take advantage of Calnex’s extensive experience in sync and packet testing technologies, please contact Calnex Solutions on +44 (0) 1506 671 416 or email: [info@calnexsol.com](mailto:info@calnexsol.com)



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