

PGY-NEGO KX/KR DME and Line Training Protocol Analysis Software



Features

- Automated KX/KR timing measurements and tests for Auto-Negotiation Phase
- Automated KR Line training timing measurements
- Protocol Aware Manchester violation and DME triggers simplifies signal capture
- Protocol decoding of DME Page
- Protocol Decoding Line training session
- Error checks for DME page and Line training Phase
- Automated Quiet time computation between DME to Line training Phase during Auto-Negotiation
- Bus diagram display of Protocol packet along with electrical waveform
- Long duration data decode support to capture more number of events
- Protocol analysis using live channel data as well as stored .Wfm files
- Search capabilities to locate protocol event
- Documentation by exporting data in CSV and TXT file format
- Report Generation

Engineers designing and validating backplane Ethernet need to monitor and debug multi-gigabit KR/KX protocol interface to ensure reliable operation of the system. In an emerging technology, engineers can test and debug designs with easy-to-use instruments such as oscilloscopes. Oscilloscopes normally provide extensive details about electrical characteristics of the signal. But engineers need more information such as protocol content at various protocol layers. In a versatile 1000Base KX/KR protocol standard, manually interpreting the protocol layer information using oscilloscope data is time consuming and prone to human error.

PGY-NEGO KX/KR Software runs on Tektronix DPO/DSA/MSO70000 oscilloscope series. PGY-NEGO Software KX/KR utilizes the hardware based real-time serial pattern trigger and long acquisition record length up to 200MB to provide superior DME and Line Training KX/KR Protocol Analysis Solution.

The industry's first oscilloscope-based PGY-NEGO KX/KR Protocol Analysis software lets you see every event in the KR/KX stream.

PGY-NEGO KR/KX Protocol Analyzer software performs the KR/KX DME and Line Training compliance tests as per IEEE 802.3ap Standard. It provides unmatched flexibility in analyzing, debugging, and correlating the test results from KR/KX Frame to physical layer analog waveforms to address the multi-gigabit KR/KX design challenges.

For efficient debugging, PGY-NEGO KX/KR software provides unique viewers, which comprises of Analyze view, DME Detail view, DME field view and Detail view. Automatic cross-linking between all these viewers enables you to see and correlate the data in different parts of the Gigabit KR/KX protocol stack.

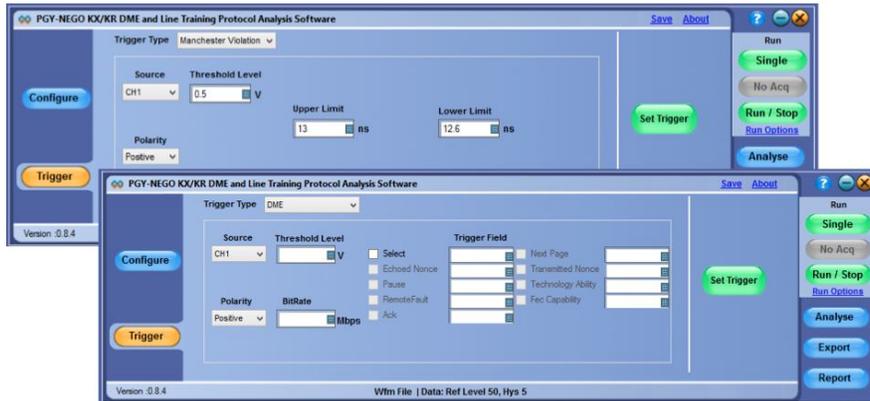
PGY-NEGO KR/KX Test Setup:

Clicking on PGY-NEGO KX/KR icon in oscilloscope desktop folder launches PGY-NEGO KX/KR Software installed in Tektronix oscilloscopes. Simultaneous view and control of oscilloscope waveform display as well as PGY-NEGO KX/KR Software. You can analyze KX/KR DME and Line training in single acquisition mode, in Repetitive mode and in No Acq mode. In No Acq Mode, KX/KR software analyses an already captured signal that is present in the acquisition memory of the oscilloscope.



PGY-NEGO Software running on Tektronix oscilloscope

PGY-NEGO Protocol Aware Trigger:



Protocol aware trigger menu

PGY-NEGO KX/KR Software provides powerful protocol-aware trigger based on DME page content. Manchester violation timing can be set to capture the DME signals. Similarly protocol content of DME page content can be set to capture DME signals.

Comprehensive PGY-NEGO KR/KX Protocol Analysis

For efficient debugging and troubleshooting the Gigabit KR/KX protocol, PGY-NEGO KX/KR Protocol analysis software offers Analyze view, DME detail view, DME field view and Waveform view.

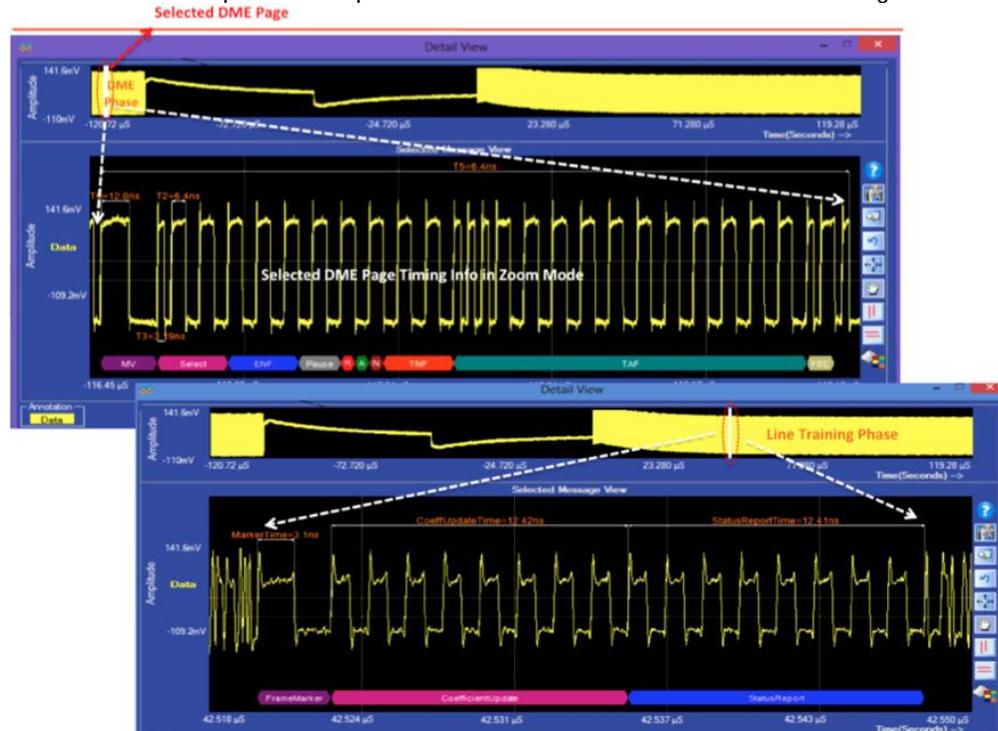
Analyze View: Provides complete timing details (T1, T2, T3, T4, T5 and T6) for all the DME pages used in the Auto-negotiation Phase with summary of pass/fail test results of the corresponding timing window. Analyze summary view enables to quickly navigate to the failure frames for detailed analysis.

Timing Parameter	Minimum	Mean	Maximum	Low Limit	High Limit	Result
T1	3.189ns	3.2ns	3.211ns	3.1996ns	3.2003ns	FAIL
T2	6.39ns	6.4ns	6.412ns	6.2ns	6.6ns	PASS
T3	3.189ns	3.199ns	3.209ns	3ns	3.4ns	PASS
T4	56	NA	63	51	100	PASS
T5	339.199ns	339.209ns	339.221ns	338.8ns	339.6ns	PASS
T6	12.792ns	12.801ns	12.809ns	12.6ns	13ns	PASS

Timing Parameter	Minimum	Mean	Maximum	Low Limit	High Limit	Result
T5	339.199ns	339.209ns	339.221ns	338.8ns	339.6ns	PASS
T6	12.792ns	12.801ns	12.809ns	12.6ns	13ns	PASS
QuietTime	112.234ps	112.234ps	112.234ps			
FrameTime	3.094ns	3.1ns	3.106ns	2.903ns	3.303ns	PASS
CoeffUpdate	12.41ns	12.415ns	12.43ns	12.21ns	12.61ns	PASS
StatusReport	12.405ns	12.413ns	12.618ns	12.21ns	12.61ns	FAIL
TrainingPattern	396.993ns	397.199ns	397.211ns	390ns	405ns	PASS
TotalTime	425.117ns	425.127ns	425.139ns	425ns	435ns	PASS

DME and Line Training Timing Parameter Result

Detail view: This feature helps the you to navigate from each DME page with flexibility of viewing the waveform, timing detail and 48bit field information for each DME page used in auto negotiation phase. This view correlates the waveform with annotated timing measurements, protocol packets of DME and Line training events.



Correlation of waveform with protocol data and timing parameter

Auto negotiation (DME) and Line Training Timing Measurements:

Timing Parameter	Description
T1	Transition position spacing (period)
T2	Clock Transition to Clock Transition
T3	Clock Transition to Data Transition (data =1)
T4	Transition in a DME page
T5	DME page width
T6	DME Manchester delimiter width
Quiet Time	Time between end of Auto negotiation and start of Line Training is indicated by the "Quiet time"
Frame Marker	Frames are delimited by the 32-bit pattern, hexadecimal FFFF0000
Coefficient Update	Frame Marker have been identified and transferred , then it is followed by 16 Octets (128 bits) for the coefficient update field
Status Report	128 bits of Status Report Field data is followed after the Coefficient update field data
Training Pattern	The training pattern is a 512 octet pattern consisting of 4094 bits from the output of a pseudo-random bit sequence of order 11 (PRBS11) generator followed by two zeros

Documentation of DME and Line Training Analysis:

PGY-NEGO KX/KR DME and Line Training Analysis software provides the flexibility of exporting the decode data in txt and csv file format. Report Generation allows you to have different waveforms images including the oscilloscope screenshot in the report. Report header, comments and Test attributes can be added.

Oscilloscopes Supported:

The following Tektronix Oscilloscopes are supported:

DPO70000 Series Oscilloscope

MSO70000 Series Oscilloscope

DSA70000 Series Oscilloscope

It is recommended to have option 20XL (Maximum of 250M record length per channel) for protocol compliance testing.

Ordering Information

PGY-NEGO KX/KR DME and Line Training Analysis Software (Shipment includes PGY-NEGO Software CD)

Contact details

Prodigy Technovations Pvt. Ltd

2145, 2nd Cross, 17th Main

HAL II Stage, Indiranagar

Bangalore 560008

E- Mail: Contact@prodigytechno.com

Web: www.prodigytechno.com

Phone: +91-80-42076546

Prodigy Technovations Pvt Ltd (www.prodigytechno.com) is a leading global technology provider of Protocol Decode and PHY layer testing solutions on test and measurement equipments. The company's ongoing efforts include successful implementation of innovative and comprehensive protocol decode solutions as well as PHY Layer testing solutions that span the serial data, telecommunications, automotive, and defense electronics sectors worldwide.

- HDMI and MHL Protocol Compliance Test Software
- UniPRO and LLI Protocol Decode Software
- UFS Protocol Decode Software
- MIPI-HSI Electrical Validation and Protocol Decode Software
- eMMC/SD/SDIO Electrical validation and Protocol decode Software
- I2C Electrical validation and Protocol Decode Software
- SPI Electrical Validation and Protocol Decode Software
- I2S Electrical, Audio, and Protocol Testing Software
- UART/RS232 Protocol Decode Solution
- FlexRay Protocol and SI Analysis Software
- USB2.0 Protocol Decode Software
- HSIC Protocol Analysis Software
- RFFE Protocol Analysis Software

