

D9010EKR

10/100GBASE-KR 64b/66b and Link Training Decode and Trigger Software for Infiniium Oscilloscopes

The D9010EKR software package for Infiniium oscilloscopes gives you the ability to trigger and decode 10GBASE-KR and 100GBASE-KR 64b/66b and Link Training signals. This package applies to all Infiniium Oscilloscopes.

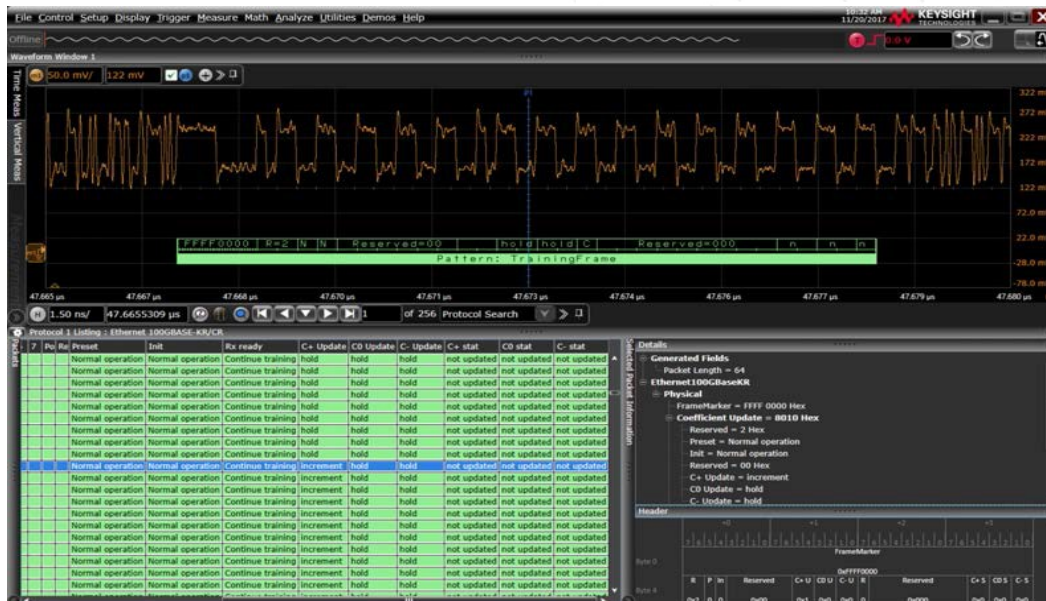


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Product overview

64b/66b encoding is a principal line code that is used in data networking and transmission. 64b/66b encoding is the principal encoding scheme behind the 10GBase-KR (x1/x4) technology as it achieves DC balance across a serial stream. The 64b/66b encoding also has less overhead than the 8b/10b encoding scheme.

The D9010EKR Protocol Viewer software for 10/100GBase-KR Ethernet provides time-correlated views of physical layer and transaction layer errors. You get packet-level decode for 10/100GBase-KR 64b/66b and link training decode Ethernet signals built into a real-time oscilloscope. This software provides you with a fast, easy way to isolate signal integrity problems from logic-level coding errors simultaneously on up to four lanes of serial data streams. This capability allows you to test, debug and characterize your designs to the logic and link layer. The N8815A Infiniium protocol decoder software is designed to work with 10GBase-KR Ethernet technologies. It also comes with the unique ability to identify PRBS signal lengths to verify the correct signals are being passed through the DUT.

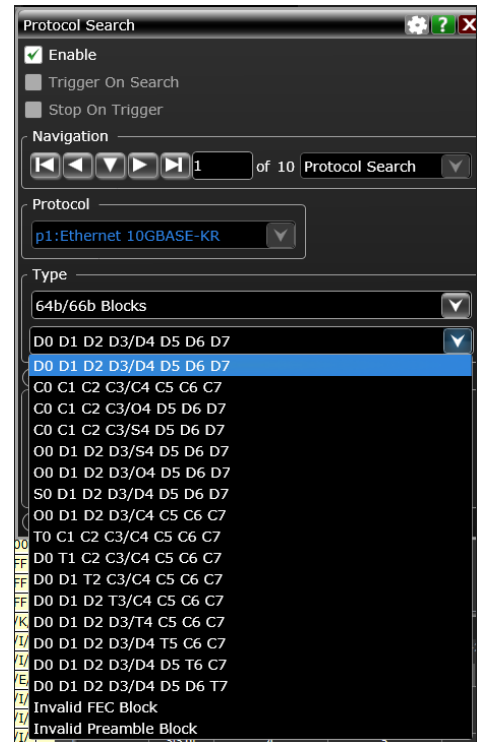


Figure 1. Advanced search capabilities on various 64b/66b blocks

Features

The N8815A Infiniium protocol decoder software offers several features to simplify the validation of your 10GBASE-KR 64b/66b designs:

- Setup wizard for quick setup, configuration and test
- Packet-level decode of primitives as well as link and transaction layers
- Serial data analysis with 64b/66b bit streams
- Differential Manchester Encoding (DME) capability for link training decode
- Training Frame Decode
- Serial data analysis with PRBS detect
- Decode of scrambled and unscrambled symbols
- Quad-directional symbol and packet level decode
- Simultaneous display of packet/symbol lists and waveform overlay
- Capability to save symbol and packet data lists to .csv and .txt files
- Packet decode details tab provides detailed information on packets
 - Channel information
 - Listing index
 - Link primitive type
 - Control symbols
 - Reserved-bit settings
 - Data payload popup
 - CRC
 - Packet length
- Payload display shows data payload
- Unique packet-waveform correlation marker “blue line” makes it easy to scroll through waveforms to view synchronized packet and symbol lists
- Comprehensive serial search capabilities
 - Trigger and stop on search
 - Primitive, control symbol and packet search capability

Comprehensive Decode Capability

With D9010EKRP, you can use the same oscilloscope you use for everyday debugging and signal quality testing to perform protocol-level viewing. The software automatically decodes symbols, packets and primitives and provides informative results. It includes decode of reserved bit settings during training sequences and speed negotiation, greatly simplifying debugging of link training failures.

Some of the difficulties in validating 10/100GBase-KR communication links are determining if link failures or instability is due to electrical problems or logic-level problems. This package allows you to analyze the root cause of these issues with a single piece of test equipment.

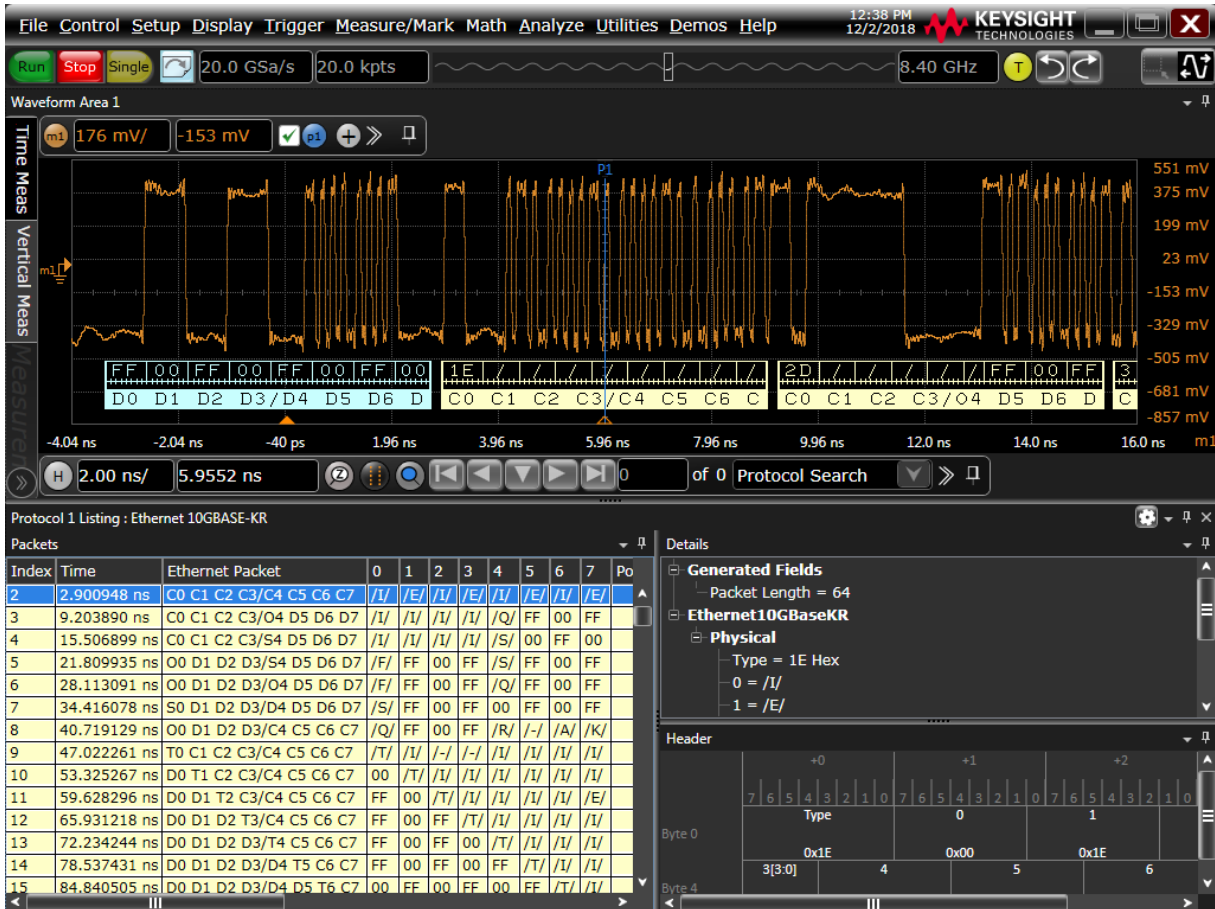


Figure 2. Protocol decoding view with time aligned decode, physical layer view, and packet table with details to the right. The blue line in the middle is referenced below.

Easy Measurement Setup

D9010EKRP uses the Serial Data Wizard to simplify setup of the clock recovery algorithm used to decode the various speeds of serial traffic that it supports. The wizard guides you quickly through the steps required to set up and perform symbol and packet-level decode.

Numerous clock recovery algorithms including first and second order PLL, constant, and explicit clock recovery are available. D9010EKRP is also compatible with Infiniium's Serial Data Equalization software, making it possible to decode signals even on equalized data.

To further simplify the decoding setup process, we include an AUTO SETUP button that will automatically setup clock recovery, memory depth, thresholds, and data rate. After the AUTO SETUP is complete, the setup can be adjusted using the manual setup button.

Synchronized Analog and Digital Display

The N8815A 10GBASE-KR 64b/66b and link training decode software provides the ability to perform 64b/66b bit and link training based packet decoding via a Keysight exclusive technique to capture and display serial data synchronized with the analog view of traffic of a serial data stream. Decode is displayed directly on the analog waveform as well as in the decode list with associated time and index displays.

In conjunction with the decode list, using the multi-grid waveform display you can simultaneously display analog bi-directional waveforms with corresponding decode listings.

The unique packet-waveform correlation marker “blue line” (see figure 2) allows for convenient and intuitive correlation of analog and digital domains. You can easily scroll to analog anomalies that are visually distinct, making navigating and checking for errors easy, even for industry leading record depths.

The expandable decode list provides an extendable indexed view of packet decode for users who are more accustomed to logic decoder “vertical style” packet decode traffic listings. The list includes color-coded packet types for easier visual searching of traffic patterns as well as a blue highlight that shows the packet that corresponds to the “blue line” in the waveform view. The side bar also shows how much of the waveform display is on the screen by providing a gray background on the index field, as shown in Figure 5.

Comprehensive Search Capabilities

The N8815A 64b/66b ethernet 10GBase-KR protocol software includes a powerful serial search tool which allows you to search for a pattern that is a primitive, control symbol or packet. The search capability also includes a comprehensive packet search and trigger capability that allows you to specify search conditions like errors or data packets. This allows you to specify desired trigger conditions and makes finding errors or packet types easy by eliminating the need to do manual searches of very long records.

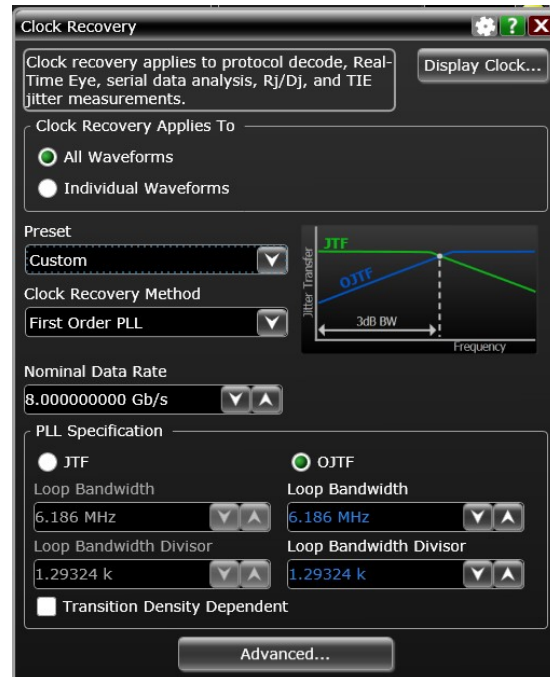


Figure 3: clock recovery setup dialog

Trigger and Decode Capabilities

Specifications and Characteristics	
Signal sources	Any analog channel Any waveform math Any waveform memory
Auto setup	Automatically configures trigger levels, decode thresholds, sample rate, memory depth, holdoff, and trigger
Decode options	64b/66b scramble/descramble FEC enable/disable PN-2112 scramble/descramble Correct FEC errors Decode patterns
Trigger options (via search)	64b/66b blocks (as defined by specifications) Pattern detection: square waves, PBRs, compliance Errors: unknown control sequence, unknown block type field, invalid ordered set, invalid FEC block, invalid preamble, unknown packet

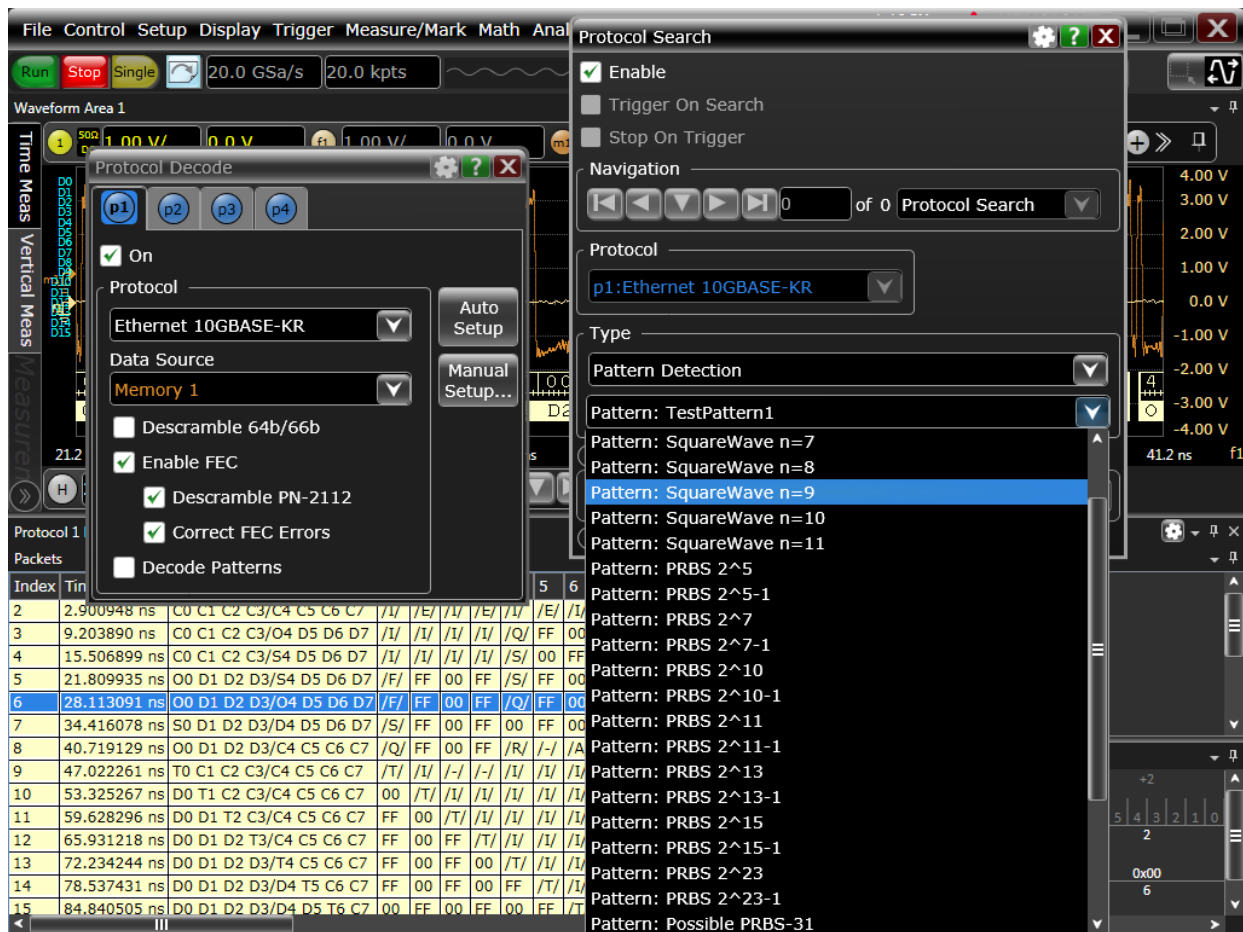


Figure 4: Selecting one of many different pattern detection search options

Ordering Information and Related Literature

Required hardware

The protocol triggering and decode software is compatible with Keysight Infiniium V-Series, Z-Series, and UXR-Series oscilloscopes with operating software revision 6.30 or higher.

Flexible Software Licensing and KeysightCare Software Support Subscriptions

Keysight offers a variety of flexible licensing options to fit your needs and budget. Choose your license term, license type, and KeysightCare software support subscription.

License Terms

Perpetual – Perpetual licenses can be used indefinitely.

Time-based – Time-based licenses can be used through the term of the license only (6, 12, 24, or 36 months).

License Types

Node-locked – License can be used on one specified instrument/computer.

Transportable – License can be used on one instrument/computer at a time but may be transferred to another using Keysight Software Manager (internet connection required).

USB Portable – License can be used on one instrument/computer at a time but may be transferred to another using a certified USB dongle (available for additional purchase with Keysight part number E8900-D10).

Floating (single site) – Networked instruments/computers can access a license from a server one at a time. Multiple licenses can be purchased for concurrent usage.

KeysightCare Software Support Subscriptions

Perpetual licenses are sold with a 12 (default), 24, 36, or 60-month software support subscription. Support subscriptions can be renewed for a fee after that.

Time-based licenses include a software support subscription through the term of the license.

KeysightCare Software Support Subscription provides peace of mind amid evolving technologies.

- Ensure your software is always current with the latest enhancements and measurement standards.
- Gain additional insight into your problems with live access to our team of technical experts.
- Stay on schedule with fast turnaround times and priority escalations when you need support.

Selecting your license

- Step 1.** Choose your software product (eg. D9010EGRP).
- Step 2.** Choose your license term: perpetual or time-based.
- Step 3.** Choose your license type: node-locked, transportable, USB portable, or floating.
- Step 4.** Depending on the license term, choose your support subscription duration.

Examples

If you selected:	Your quote will look like:	
D9010EGRP node-locked perpetual license with a 12-month support subscription	Part Number	Description
	D9010EGRP	10G/100GBASE-KR 64b/66b and Link Training Decode/Trigger Software
	R-B5P-001-A	Node-locked perpetual license
	R-B6P-001-L	KeysightCare software support subscription, node-locked–12 months
D9010EGRP transportable time-based 6-month license	Part Number	Description
	D9010EGRP	10G/100GBASE-KR 64b/66b and Link Training Decode/Trigger Software
	R-B4P-001-F	6-months, node-locked KeysightCare software support subscription

To configure your product and request a quote:

<http://www.keysight.com/find/software>

Contact your Keysight representative or authorized partner for more information or to place an order:

www.keysight.com/find/contactus

Related literature

Type	Description / URL
Brochure	Infiniium S-Series (500 MHz to 8 GHz real time oscilloscope)
Brochure	Infiniium V-Series (8 GHz to 33 GHz real time oscilloscope)
Data Sheet	Infiniium UXR Series (13 GHz to 110 GHz real time oscilloscope)
Brochure	30 Things Only Infiniium Oscilloscopes Can Do

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