TELEDYNE LECROY
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# ENET
## Data Layer Decode


*Ethernet decoding provides protocol awareness to the oscilloscope for fast debugging.*

## Key Features

- **Ethernet Data Layer Decode for 10BASE-T and 100BASE-TX**
- **Color-coded decode highlights key elements of Ethernet packet such as address or error information**
- **Decoded information is intuitively overlaid directly on top of the waveform**
- **Decode information expands as the timebase is adjusted or zoomed**
- **Convenient table display with quick "zoom to message" capability**
- **Quick search capability for specific Ethernet frames**

## Decode Annotation Complements Physical Layer Views

The Ethernet 10BASE-T and 100BASE-TX protocol information is decoded and displayed on the physical layer waveform. Various sections of the protocol, such as Destination and Source Address or CRC Errors, are color-coded to make it easy to understand. Decode annotation information condenses or expands depending on the timebase/zoom ratio setting. The decode operation is fast—even with long acquisitions. Data transferred in a frame is not only displayed on the frame level but also on individual byte level. Look at the big picture while focusing on details at the same time.

Decode annotation provides the ability to view protocol traffic on the oscilloscope and verify that the link is alive and transmitting properly as it quickly decodes waveform data instantaneously. It also aids in debugging problems that are not solely analog or digital in nature, such as interoperability issues, uncertain error causes, and physical layer issues not evident with a protocol analyzer.

## Convenient Table Display and Search

Long oscilloscope acquisition memory provides long capture times of Ethernet transmissions. Decoded information is conveniently shown in an interactive table, any table entry can be selected for a closer look. The search capabilities help identify and isolate protocol specifics such as CRC errors, data size errors and more. In addition, table data may be exported as .csv files for offline analysis.

## Support on Multiple Oscilloscope Platforms

The Ethernet 10BASE-T and 100BASE-TX decode option is available on a wide range of oscilloscope models with real-time bandwidths from 200 MHz to 65 GHz.

# SPECIFICATIONS AND ORDERING INFORMATION

| | ENET |
|---|---|
| | **Definition** |
| **Protocol Setup** | Selection for source channels. Supports Single (differential probe) or dual (two single-ended probes) input(s) for decoder. Detects auto negotiation (option for 100BASE-TX). |
| | **Decode Capability** |
| **Format** | Ethernet 10BASE-T and 100BASE-TX Protocol Decode (Hexadecimal). |
| **Decode Setup** | Selection for source inputs. |
| **Decode Input** | Any analog Channel, Memory or Math trace. |
| **# of Decode Waveforms** | Up to 4 unique lanes may be decoded at one time.<br>In addition, zooms can be displayed (with decoded information). |
| **Location** | Overlaid over waveform, on Grid |
| **Visual Aid** | Color Coding for Frame, Group Primitives, Data words, Primitive words, and important frame fields such as address and Ethernet type. Decode information is intelligently annotated based on timebase setting. |
| | **Search Capability** |
| **Pattern Search** | Search by the following: Any, Frame, Idle, Source Address, Destination Address, FLP Burst, Electrical Idle,<br>Protocol Errors: Any, Missed Terminate, Missed Start of Frame, Frame Length Error, Preamble Value Error, Start of Frame, Delimiter Value Error, CRC Error, Data Size Error |
| | **Other** |
| **Compatible With...** | Fully compatible with HDO6000, HDO4000, WaveSurfer® Xs/Xs-A/Xs-B Series, WaveRunner® 6 Zi Series, WaveRunner® Xi/Xi-A Series, WavePro® 7 Zi/Zi-A Series, WaveMaster® 8 Zi/Zi-A Series, LabMaster 9Zi-A Series, and LabMaster 10Zi Series. Bandwidth of oscilloscope must be equal to bit rate with a minimum oscilloscope sample rate of 4x the bit rate. |

## Ordering Information

### ENET Decode Options

| Product Description | Product Code |
|---|---|
| ENET Decode Option for HDO4000 | HDO4K-ENETbus D |
| ENET Decode Option for HDO6000 | HDO6K-ENETbus D |
| ENET Decode Option for WaveSurfer Xs/Xs-B | WSXs-ENETbus D |
| ENET Decode Option for WaveRunner 6 Zi | WR6Zi-ENETbus D |
| ENET Decode Option for WaveRunner Xi/Xi-A | WRXi-ENETbus D |
| ENET Decode Option for WavePro 7 Zi/Zi-A | WPZi-ENETbus D |
| ENET Decode Option for WaveMaster 8 Zi-A | WM8Zi-ENETbus D |
| ENET Decode Option for LabMaster 9 Zi-A | LM9Zi-ENETbus D |
| ENET Decode Option for LabMaster 10 Zi | LM10Zi-ENETbus D |

### Recommended Accessories

| Product Description | Product Code |
|---|---|
| 200 MHz, 3.5 pF, 1 MOhm Active Differential Probe, ±20 V | ZD200 |
| 500 MHz, 1.0 pF Active Differential Probe, ±8 V | ZD500 |
| 1 GHz, 1.0 pF Active Differential Probe, ±8 V | ZD1000 |
| 10/100/1000Base-T Compliance Test Fixture | TF-ENET-B |

### Customer Service

Teledyne LeCroy oscilloscopes and probes are designed, built, and tested to ensure high reliability. In the unlikely event you experience difficulties, our digital oscilloscopes are fully warranted for three years and our probes are warranted for one year. This warranty includes:

- No charge for return shipping
- Long-term 7-year support
- Upgrade to latest software at no charge

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