

R&S® RTE-K57 100BASE-T1 triggering and decoding option



Real-world signal debugging



► For more information, visit <https://www.rohde-schwarz.com/229523>

The perfect choice for

- Debugging 100BASE-T1 communications
- Boot time measurements
- Finding and fixing bus failures
- Bus timing analysis

Key specifications	
Signal types	one channel differential, two channels single-ended, optional additional use of reverse channels for signal improvement
Symbol rate	66-6667 Msymbols/s, adjustable for testing
Thresholds	upper/lower, assisted threshold configuration
Trigger	frame start, MAC frame, idle frame, error conditions
MAC frame setup	destination address source address frame length/type frame check data
Error condition	preamble, CRC, SFD error

Real-world signal debugging

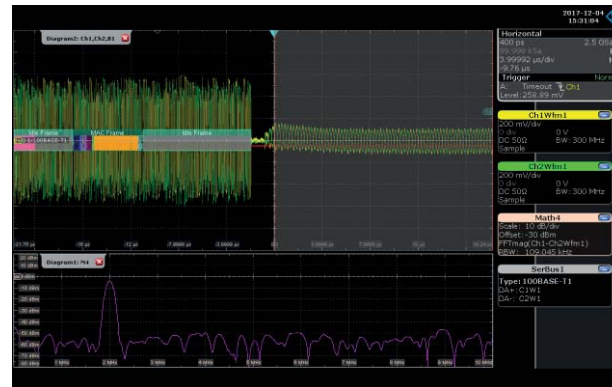
The 100BASE-T1 triggering and decoding option permits decoding on single-ended or differential real-world bus signals. Just connect the Ethernet probing fixture to the Ethernet cable and start decoding. You can debug 100BASE-T1 bus communications by analyzing the real electrical bus signals time-correlated with the decoded data.

Your benefit	Features
Direct debugging of real-world bus signals	<ul style="list-style-type: none"> Decoding is time-correlated to real bus signal Decoding on single-ended or differential signals Reverse channel correction can compensate directivity of directional couplers for accurate results
Comprehensive decoding analysis capabilities	<ul style="list-style-type: none"> Decode both idle and Ethernet frames MAC frames include decoding of destination, source address, frame ID, data and correct CRC Various decoding layers displayed: unscrambled, scrambled bits, ternary Decode table tools such as QuickMeas, fingertip zoom and undo/redo
Trigger capability	<ul style="list-style-type: none"> Start of frame Idle frames MAC frames, Destination and source address Frame ID Data Telegram errors: preamble, CRC, SFD

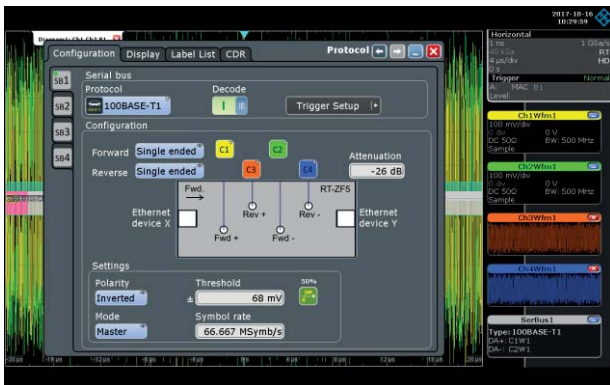




You can debug real-world signals. You see what's happening directly on the bus and isolate specific signals by triggering e.g. on the frame address or on bus errors. Decoding can be shown as a ternary signal, scrambled or descrambled.



You can combine protocol decoding with other analysis tools. This spurious communications breakdown shows good data until it stops. The reason for the breakdown is a 2 MHz signal as seen in the FFT at the bottom part of the screen.



100BASE-T1 decoding permits decoding of both data streams of full duplex communications by adding directivity couplers to the probing fixture. The directivity of the fixture can be corrected with the reverse channel compensation for accurate decoding on real signals.

OSI	Automotive Ethernet
7 Application	Applications: FTP, SOME/IP, HTTP, SMTP...
6 Presentation	
5 Session	
4 Transport	TCP, UDP
3 Network	IP
2 Data link	100BASE-T1
1 Physical	100BASE-T1

100BASE-T1 decoding introduces the same test capability as CAN bus testing. You can now test for bus errors and check the ECU boot or wake-up time by connecting the oscilloscope to the data stream. The analysis of bus errors is now much easier because you can see the electrical bus signal in the error situation.

- Error-free communication
- Validate sleep/wake-up cycles
- Test EMI resistance
- Correct latency
- Correct boot time

Recommended configuration	
Oscilloscope	Type
R&S®RTO2004 4 channels, 600 MHz or higher	R&S®RTO2004
R&S®RTE1054 4 channels, 500 MHz or higher	R&S®RTE1054
Serial triggering and decoding option	
100BASE-T1 triggering and decoding	R&S®RTO-K57 R&S®RTE-K57
Ethernet probing fixture	R&S®RT-ZF5
Trigger and decode bundle	R&S®RTE-TDBNDL
Optional compliance test	
100BASE-T1 compliance test option	R&S®RTO-K24
100BASE-T1 compliance test option	R&S®RTO-K87
Please check at www.rohde-schwarz.com for a complete compliance test setup including vector network analyzer and test fixture	

Complete solution

Ethernet probing fixture enables simultaneous decoding of both data streams

100BASE-T1 probing requires directional couplers to separate full duplex communications. The R&S®RT-ZF5 Ethernet probing fixture separates the two data streams and permits simultaneous decoding.