## R&S®RTE-K57 100BASE-T1 triggering and decoding option Multi Real-world signal debugging

The perfect choice for

And Party and Pa					2017-10-16
A constrained of the second se	Diagram1: Ch1,Ch2,B1			1 ns 20 kSe 2 µs/d 2 µs/d 0 s	1 GSa/s s RT iv HD
Control of the second s	27.2 27.1	P 0:55%	veamble 55555555555	A:	MAC B1
Covering Cov		672 673 674 675 676 677 678 679 680 681 682	683 684 635 686 687 688 669 690 691 692 693 69		V/div 91.2456 mV Ω BW: 500 MHz
VVVVVV			(		Ch2Wfm1 V/div 91.2456 mV Ω BW: 500 MHz
	VV			V () ( DA+:0	100BASE-T1 21W1
Decode results B 1	Decode results B 1	199,2 m 1743 m 232,4 m	2005 m 340 5 m 4067 m	494.0 m 827 m	
Description         Start	I Idle Ok	stort         stop         Address[MAC           -9.989 μs         0 s            0 s         5.76 μs         11:22:33:44	Address[MAC Length Data Address[MAC Length Data Address[MAC Length Data Address[MAC Length Data Address[MAC Length Data	hex] COBD0142	
III Zeen caupling Shave details		Zoom coupling	Show details		

The perfect choice for					
Debugging 100BASE-T1 communications		Boot time measurements			
Finding and fixing bus failures		Bus timing analysis			
Key specifications					
Signal types	single-er optional	additional use of channels for signal			
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 realworld 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 timecorrelated with the decoded data.

Your benefit	Features
Direct debugging of real-world bus signals	<ol> <li>Decoding is time-correlated to real bus signal</li> <li>Decoding on single-ended or differential signals</li> <li>Reverse channel correction can compensate directivity of directional couplers for accurate results</li> </ol>
Comprehensive decoding analysis capabilities	<ol> <li>Decode both idle and Ethernet frames</li> <li>MAC frames include decoding of destination, source address, frame ID, data and correct CRC</li> <li>Various decoding layers displayed: unscrambled, scrambled bits, ternary</li> <li>Decode table tools such as QuickMeas, fingertip zoom and undo/redo</li> </ol>
Trigger capability	<ol> <li>Start of frame</li> <li>Idle frames</li> <li>MAC frames,</li> <li>Destination and source address</li> <li>Frame ID</li> <li>Data</li> <li>Telegram errors: preamble, CRC, SFD</li> </ol>

## ▷ For more information, visit

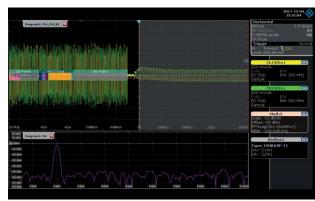
https://www.rohde-schwarz.com/\_229523



Test & Measurement Fact Sheet | 01.00 R&S®RT0/E-K57 100BASE-T1 Decoding

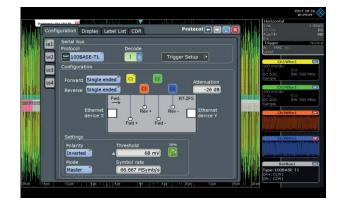


You can debug real-world signals. You see what's happening directly on the bus and isolate specific signals by triggering e.g. on the frame address or on bus errors. Decoding can be shown as a ternary signal, scrambled or descrambled.



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.

Recommended configuration				
Oscilloscope	Туре			
R&S <sup>°</sup> RTO2004 4 channels, 600 MHz or higher	R&S°RTO2004			
R&S <sup>°</sup> 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 <sup>°</sup> RT-ZF5			
Trigger and decode bundle	R&S <sup>®</sup> RTE-TDBNDL			
Optional compliance test				
100BASE-T1 compliance test option	R&S°RTO-K24			
1000BASE-T1 compliance test option R&S®RTO-K87				
Please check at <u>www.rohde-schwarz.com</u> for a complete compliance test setup including vector network analyzer and test fixture				



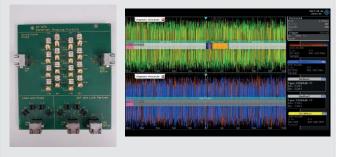
100BASE-T1 decoding permits decoding of both data streams of full duplex communications by adding directivity couplers to the probing fixture. The directivity of the fixture can be corrected with the reverse channel compensation for accurate decoding on real signals.

OSI	Automotive Ethernet	Error-free communication	
7 Application	Applications:	Validate sleep/wake-up	
6 Presentation	FTP, SOME/IP,	cycles	
5 Session	HTTP, SMTP	Test EMI resistance	
4 Transport	TCP, UDP		
3 Network	IP	Correct latency	
2 Data link	100BASE-T1		
1 Physical	1000BASE-T1	Correct boot time	

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.

## **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.

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