ROHDE&SCHWARZ

Make ideas real

R&S®LegacyPro

Instrument emulation – breathing new life into existing test systems

► Retain your current test system software
► Benefit from Rohde & Schwarz experience in code emulation
► Rely on Rohde & Schwarz long-term support

Brochure | Version 04.00

COMPATIBILITY MATRIXES

Signal and spectrum analyzers

R&S®	FSV, ESR	FSW, ESW	FSWP	FPL	FSV(A)3000	FPS
HP8560E, HP8561E, HP8562E, HP8563E, HP8564E, HP8565E	•	•		•	•	•
HP8566A, HP8566B	•	•		•	•	•
HP8568A, HP8568B	•	•		•	•	•
HP8591E	•	•		•	•	•
HP8594E, HP8594L	•	•		•	•	•
HP71100C, HP71100P	•	•		•	•	•
HP71200C, HP71200P	•			•	•	•
HP71209C, HP71209P	•			•	•	•
Agilent PSA series [1]	•	•	•	•	•	•
Agilent/Keysight PXA series		•			•	•
Agilent/Keysight EXA/CXA series			•			
R&S®FSEA, R&S®FSEB, R&S®FSEM, R&S®FSEK		•		•	•	
R&S®FSP, R&S®FSU, R&S®FSQ	•	•		•	•	
R&S®FSV, R&S®FSVA	•			•	•	•
R&S®FSL				•		
Keysight E5052A, E5052B			•			

Network analyzers

R&S®	ZVA, ZVB, ZVT	ZNA	ZNB, ZNBT, ZNC, ZND
HP8510 series	•	•	•
HP8530A	•	•	•
HP8714	•	•	•
HP8719 series, HP8722 series	•	•	•
HP8753 series, HP8720 series	•	•	•
Agilent/Keysight ENA series [2]	•	•	•
Agilent/Keysight PNA series [2]	•	•	•
R&S®ZVK, R&S®ZVM	•		•
R&S®ZVR	•	•	•
R&S®ZVA, R&S®ZVB, R&S®ZVT	•	•	•

Oscilloscopes

	R&S®RTO
Tektronix DPO7000	•
Tektronix TDS540	•
Tektronix TDS5000B	•

Audio analyzers

	R&S®UPV	R&S®UPP
HP8903B	•	•

Power meters

	R&S®NRX
Keysight E4418B, E4419B	• [3]
Keysight N432A	• [3]
Keysight N1911A, N1912A	• [3]
R&S®NRP2	•
R&S®NRP	•
R&S®NRT	•

[1] Support of I/Q read-out.
[2] Development ongoing.
[3] With R&S®NRX-K301 option.

R&S®ZNA vector network analyzer

R&S®ZNB vector network analyzer

R&S®FSW signal and spectrum analyzer

R&S®FSWP phase noise analyzer and VCO tester

Signal generators

	R&S®SMA100B	R&S®SMB100A	R&S®SMB100B	R&S®SMC100A	R&S®SMW200A	R&S®SMBV100B	R&S®SMCV100B
HP8340, HP8341		•	•			•	
HP8360, HP83622, HP83623, HP83624	•	•	•			•	
HP83620	•	•	•	•	•	•	
HP83630, HP83640, HP83650	•	•	•	•	•	•	
HP8373, HP83711, HP83712, HP83731, HP83732	•	•	•			•	
HP8642, HP8643	•	•	•			•	
HP8644, HP8645	• (+AVI)	•	• (+AVI)	•		• (+AVI)	
HP8647, HP8648, HP8656, HP8657	•	•	•	•		•	
HP8662, HP8663	•	•	•			•	
HP8664	•	•	•	•		•	
HP8665	• (+AVI)	•	• (+AVI)	•		• (+AVI)	
HP8673	•	•	•			•	
Agilent/Keysight E4421, E4422	•	•	•	•		•	
Agilent/Keysight E4428	•	•	•	•	•	•	
Agilent/Keysight E4438	•	•	•			•	
Agilent/Keysight E8257	•	•	•		•	•	
Agilent/Keysight E8663	•	•	•			•	
Agilent/Keysight N5161, N5181	•	•	•			•	
Agilent/Keysight N5162, N5182	•	•	•			•	
Agilent/Keysight N5171, N5173	•	•	•		•	•	
Agilent/Keysight N5172					•	•	
Agilent/Keysight N5183A	•	•	•		•	•	
AF2023, AF2024	•	•	•	•	•	•	
AF2030, AF2031, AF2032	•	•	•	•	•	•	
AF2040, AF2041	•	•	•	•		•	
AF2042	• (+ADF)	•	•	•	•	•	
AF2050, AF2051, AF2052							
AF3416					•	•	
Anritsu AN68017, AN68037	•	•	•	•		•	
Panasonic PA8303	•	•	•	•		•	
Racal Dana RC3102, RC9087	•	•	•	•		•	
R&S®SMA100A	•						
R&S®SME02, R&S®SME03, R&S®SME06	•	•	•	•		•	
R&S®SMF100A	•						
R&S®SMG, R&S®SMGU, R&S®SMH, R&S®SMHU	•					•	
R&S®SML01, R&S®SML02, R&S®SML03	•	•	•	•		•	
R&S®SMP02, R&S®SMP03, R&S®SMP04	•	•	•			•	
R&S®SMR20, R&S®SMR27, R&S®SMR30, R&S®SMR40	•	•	•	•		•	
R&S®SMT02, R&S®SMT03, R&S®SMT06	•	•	•	•		•	
R&S®SMV03						•	
R&S®SMY01, R&S®SMY02	•	•	•	•		•	
R&S®SFE, R&S®SFE100						•	
R&S®SMB100A			•				
R&S®SMBV100A						•	

R&S®FSV3000 signal and spectrum analyzer

R&S®RTO oscilloscope

R&S®NRX power meter

R&S®SMW200A vector signal generator
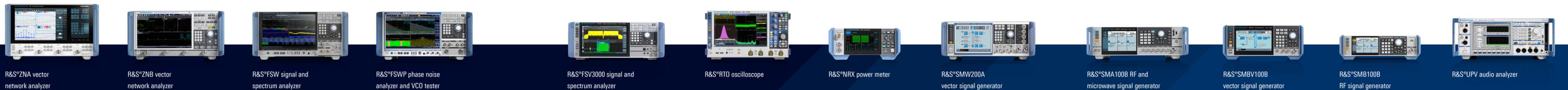
ACCOMPLISHING CODE COMPATIBILITY

Since its introduction in the 1990s, the standard commands for programmable instruments (SCPI) standard has revolutionized remote control and interchangeability of modern test instruments. However, test systems developed prior to the arrival of SCPI support legacy equipment that uses instrument-specific command sets that are incompatible with the modern standard.

R&S®LegacyPro from Rohde&Schwarz addresses the issue of code compatibility that arises when replacing an obsolete instrument with an up-to-date successor. Instruments supporting R&S®LegacyPro have a list of specific legacy test equipment that can be emulated. Selection is simple and once chosen, the tailored instrument emulation mode provides the following:

► An interpreting parser for the instrument to understand the legacy syntax and commands sent by the test system
► Responses to the test system from the instrument that are fully understood and mimic the legacy instrument, e.g. measurement results and query feedback
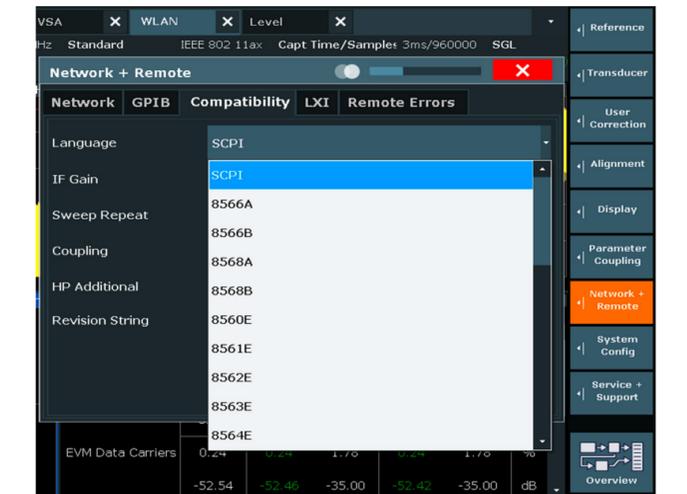
Drop-down menu list on the R&S®FSV, showing emulated HP analyzers

R&S®SMA100B RF and microwave signal generator

R&S®SMBV100B vector signal generator

R&S®SMB100B RF signal generator

R&S®UPV audio analyzer

DEALING WITH OBSOLESCENCE?

Test systems with an expected service life of more than 20 years are commonplace in aerospace and defense applications. Managing the maintenance and obsolescence of aging equipment in these test systems becomes increasingly critical and costly. Due to the dedicated applications of these test systems, complete replacement with a suite of latest version instruments is not always an option:

Certified test program set (TPS)
The TPS controlling the test system instruments is often certified and any changes to the TPS for supporting new instruments can have major consequences, introducing high costs, operational risk and re-certification.

Old TPS
Even if there is a desire to change the TPS, this may be prevented through lack of support or tools, e.g. compilers.

Bring your test system into the modern age…
Replacing obsolete test system equipment with the equivalent latest instruments should be straightforward, requiring minimum hardware and software changes. In reality, replacing obsolete instruments requires careful consideration of several important aspects to ensure complete backward compatibility:

Full emulation of legacy instrument
Modern instruments running emulation must correctly interpret and react to all of the existing TPS commands. Compatibility also necessitates a legacy hardware interface, e.g. GPIB.

Functional/behavioral compatibility
Most present-day instruments are digitally based and operate differently compared to their analog predecessors. These behavioral differences need to be accounted for in the emulation. For example, instrument preset settings need to match the legacy instrument.

…and reap the benefits
New instruments installed to replace and emulate old equipment in an existing test system offer further advantages:

Reduced cost of ownership
Improved reliability; faster testing, leading to higher throughput and better yield; and lower maintenance and service charges.

Mitigating risk
Improved overall system availability; minimum downtime for service and calibration; and plug-in replacement with no software changes.

Form-factor
New instruments are generally more compact than their predecessors and, for some applications, can combine the functionality of multiple legacy instruments into a single-box solution, saving space.

R&S®LegacyPro
R&S®LegacyPro is the culmination of extensive knowledge gained from emulating complex instruments and a history of working directly with users to successfully replace legacy instrumentation. In addition, all Rohde & Schwarz instruments use standard commands for programmable instruments (SCPI) in conformance with the international standard for syntax and style (e.g. DC power supplies). This ensures interoperability with existing systems.

R&S®LegacyPro instruments include network analyzers, spectrum analyzers, signal generators, oscilloscopes, power meters and audio analyzers. They support a comprehensive set of legacy test equipment vendors, including HP/Agilent/Keysight, IFR/Aeroflex, Anritsu and Rohde & Schwarz.

Need to know more? Visit the R&S®LegacyPro web page:
www.rohde-schwarz.com/legacy_pro

Rohde & Schwarz

The Rohde & Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

www.rohde-schwarz.com