

# R&S® SMU/SMATE/ SMJ/SMBV/AMU-K68

## Specifications

### TETRA digital standard

For the R&S® SMU-K68, R&S® SMATE-K68, R&S® SMJ-K68, R&S® SMBV-K68 and R&S® AMU-K68 options

TETRA digital standard		in line with ETSI EN 300 392-2 digital standard (V3.2.1) and TETRA conformance testing specification ETSI EN 300 394-1 (V3.1.1)
<b>General settings</b>		
Link direction	not available in T3 mode	downlink, uplink
Channel type	test channel (NOT logical channel) only in T1 and T4 mode	see Test modes
Sequence length	The sequence length can be entered in multiframe and is highly dependent on the settings made. With default values (T1) the user has 14.28 multiframe/Msample. Example: An R&S® SMU200A with 64 Msamples can generate 913 multiframe.	
Baseband filter	default others	root raised cosine (roll-off factor 0.2) available
Impulse length		1 to 40
Sample rate		calculated internally as a function of filter and oversampling requirements
Clipping	setting of clipping value relative to highest peak in percent; clipping reduces the crest factor	
	modes	vector  i + j q  scalar  i ,  q
	clipping level	1 % to 100 %
Marker		restart
		slot start
		frame start
		multiframe start
		hyperframe start
		pulse
		pattern ON/OFF ratio
Power ramping	ramp function	cos <sup>2</sup> , linear
	ramp time	1 symbol to 16 symbols
	rise offset	-4 symbols to 0 symbols
	fall offset	0 symbols to 4 symbols
Settable slot attenuation		0.0 dB to 50.0 dB, 5 different levels simultaneously possible (full level and 4 attenuated levels)

<b>Test modes</b>		
T1	downlink channels	0, 1, 2, 3, 4, 21, 22, 24
	uplink channels	7, 8, 9, 10, 11, 21, 23, 24
T2	TETRA interferer	phase modulation, QAM
T3	CW interferer	
T4	downlink channels	27
	uplink channels	25, 26
User-defined		see User-defined mode
<b>Frame configuration</b>		
Frames 1 to 17	slots	configurable with respect to test mode (logical channel, etc.), see User-defined mode different slot levels (OFF, attenuated, full)
Frame 18	slots	configurable with respect to test mode (logical channel, etc.), see User-defined mode different slot levels (OFF, attenuated, full)
<b>User-defined mode</b>		
In user-defined mode, the slots can be configured without restrictions. In all other test modes, the settings are limited by the test mode specification.		
Modulation type		phase modulation, QAM
Downlink burst type	only with phase modulation	continuous, discontinuous
<b>Slot settings</b>		
Slot level	full	not attenuated
	attenuated	1 of 4 attenuation levels
	OFF	inactive
Slot attenuation	A1 to A4	1 of 4 attenuation levels
Logical channel type  (burst types are controlled by the logical channels)	downlink, phase modulation  available burst types: normal continuous downlink synchronization continuous downlink normal discontinuous downlink synchronization discontinuous downlink	TCH/7,2 ( $\pi/4$ -DQPSK) TCH/4,8 ( $\pi/4$ -DQPSK) TCH/2,4 ( $\pi/4$ -DQPSK) TCH/F ( $\pi/4$ -DQPSK) TCH/H ( $\pi/4$ -DQPSK) STCH+TCH ( $\pi/4$ -DQPSK) STCH+STCH ( $\pi/4$ -DQPSK) SCH/F( $\pi/4$ -DQPSK) TCH-P8/10,8/F( $\pi/8$ -DQPSK) SCH-P8/F( $\pi/8$ -DQPSK) SCH/HD   SCH/HD ( $\pi/4$ -DQPSK) BSCH   SCH/HD ( $\pi/4$ -DQPSK) SCH/HD   BNCH ( $\pi/4$ -DQPSK) BSCH   BNCH ( $\pi/4$ -DQPSK) SCH-P8/HD   SCH-P8/HD ( $\pi/8$ -DQPSK)
	uplink, phase modulation  available burst types: normal uplink control uplink	TCH/7,2 ( $\pi/4$ -DQPSK) TCH/4,8 ( $\pi/4$ -DQPSK) TCH/2,4 ( $\pi/4$ -DQPSK) TCH/F ( $\pi/4$ -DQPSK) TCH/H ( $\pi/4$ -DQPSK) STCH+TCH ( $\pi/4$ -DQPSK) STCH+STCH ( $\pi/4$ -DQPSK) SCH/F( $\pi/4$ -DQPSK) TCH-P8/10,8/F( $\pi/8$ -DQPSK) SCH-P8/F( $\pi/8$ -DQPSK) SCH/HU   SCH/HU ( $\pi/4$ -DQPSK) SCH-P8/HU   SCH-P8/HU ( $\pi/8$ -DQPSK) SCH/HU ( $\pi/4$ -DQPSK)   SCH-P8/HU ( $\pi/8$ -DQPSK) SCH-P8/HU ( $\pi/8$ -DQPSK)   SCH/HU ( $\pi/4$ -DQPSK)

	downlink, QAM  available burst types: normal downlink	SCH-Q/D-4H (4QAM, high protection) SCH-Q/D-16H SCH-Q/D-64H SCH-Q/D-64M (64QAM, mid-protection) SCH-Q/D-16U (16QAM, unprotected) SCH-Q/D-64U BNCH-Q/4H BNCH-Q/16H BNCH-Q/64H BNCH-Q/64M BNCH-Q/16U BNCH-Q/64U
	uplink, QAM  available burst types: normal uplink control uplink random access	SCH-Q/U-4H SCH-Q/U-16H SCH-Q/U-64H SCH-Q/U-64M SCH-Q/U-16U SCH-Q/U-64U SCH-Q/HU-4H   SCH-Q/HU-4H SCH-Q/HU-16H   SCH-Q/HU-16H SCH-Q/HU-64H   SCH-Q/HU-64H SCH-Q/HU-64M   SCH-Q/HU-64M SCH-Q/HU-16U   SCH-Q/HU-16U SCH-Q/HU-64U   SCH-Q/HU-64U SCH-Q/RA   SCH-Q/RA
Data sources (in all data modes)		all 0, all 1, PRBS 7 to PRBS 23, pattern, data list
Scrambling		ON, OFF
Training sequence TSC	only in phase modulation	default user-defined
AACH-Q configuration – AACH-Q mode	only in QAM	ACCESS-ASSIGN PDU reserved element
ACCESS-ASSIGN PDU	only in downlink	header: 2 bits field 1: 6 bits field 2: 6 bits
<b>BSCH/BNCH/T settings</b>		
Main carrier frequency calculation	carrier bandwidth	25 kHz, 50 kHz, 100 kHz, 150 kHz depending on modulation type
	main carrier number	0 to 4096
	frequency band	100 MHz to 900 MHz in 100 MHz steps
	offset	0 kHz, -6.25 kHz, 6.25 kHz, 12.5 kHz
	duplex spacing	0 MHz, 1.6 MHz, 4.5 MHz
	downlink/uplink reversal	ON, OFF
Content settings	system code	0 to 7
	sharing mode	continuous transmission carrier sharing MCCH sharing traffic carrier sharing
	TS reserved frames	1, 2, 3, 4, 6, 9, 12, 18
	U-plane DTX	allowed, not allowed
	frame 18 extension	allowed, not allowed
	cell service level	cell load unknown low cell load medium cell load high cell load
	late entry	supported, not supported
	MS_TXPWR_MAX_CELL	15 dBm to 45 dBm in 5 dBm steps
	ACCES_PARAMETER	-23 dBm to -53 dBm in 2 dBm steps
	Tx_On	reception ON, transmission ON
	Tx_Burst_Type	normal uplink burst, control uplink burst
	T1_T4_Burst_Type	most of the channels mentioned under Logical channel type
	loopback	ON, OFF
	error correction	ON, OFF
	Neighbor cell broadcast	D-NWRK-BROADCAST broadcast
D-NWRK-BROADCAST enquiry		supported, not supported

Scrambling	base color code	1 to 63
	mobile country code	0 to 1023
	mobile network code	0 to 16383

## Ordering information

Designation	Type	Order No.
TETRA Digital Standard	R&S <sup>®</sup> SMU-K68	1408.8217.02
	R&S <sup>®</sup> SMATE-K68	1404.8664.02
	R&S <sup>®</sup> SMJ-K68	1409.3102.02
	R&S <sup>®</sup> SMBV-K68	1415.8490.02
	R&S <sup>®</sup> AMU-K68	1403.0601.02

For product brochure, see PD 0758.0197.12 (R&S<sup>®</sup>SMU200A), PD 0758.1893.12 (R&S<sup>®</sup>SMATE200A), PD 5213.5074.12 (R&S<sup>®</sup>SMJ100A), PD (R&S<sup>®</sup>SMBV-K68), PD 5213.7954.12 (R&S<sup>®</sup>AMU200A) and [www.rohde-schwarz.com](http://www.rohde-schwarz.com)

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PD 5214.1008.22 | Version 01.00 | January 2010 |

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