Project Documentation | EKTSDG-010101 Target Simulator Doppler Generator

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Handheld Radar Target Simulator Doppler Generator

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1 Data Sheet

The EKTSDG-010101 (Elektronic K-band Target Simulator/ Doppler Generator) is a battery powered handheld portable moving target simulator for K-band (24GHz) Radar sensors.

It can be used for:

- Alignment of sensors in the field at installation time
- Field or lab calibration and year-by-year inspection
- General functional testing in the field and in the lab

This device was specifically developed to work with Smartmicro 24GHz sensors. It is capable to simulate a moving target in static distances up to 100m and can for instance be placed close to a stop line of an intersection to check the alignment of one or multiple radar sensors.

A software generated modulation signal allows generation of low distortion and directional Doppler signals from 44Hz to 13,4kHz corresponding to any speeds from 1km/h to 300km/h.

1.1 Features

- Handheld K-Band Target Simulator Doppler Generator
- Programmable Speed Interval 1 ... 300km/h
- Programmable Movement Direction
- Programmable Signal Level
- Programmable Presets
- Rechargeable Accumulator
- Standalone or Hosted Operation
- USB Interface to Hostcomputer
- Compact and Rugged Construction
- EKTSDG-Remote PC Software included

1.2 Applications

- Mobile Test Equipments
- Production Final Inspection
- Incoming Components Inspection
- System Tuning and Adjustment

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1.3 Device Photograph



Figure 1: EKTSDG-010100

1.4 Configuration Software

The EKTSDG may be connected via USB to any Windows PC. The included Configuration Software allows real time remote controlling and configuring the presets of the EKTSDG.

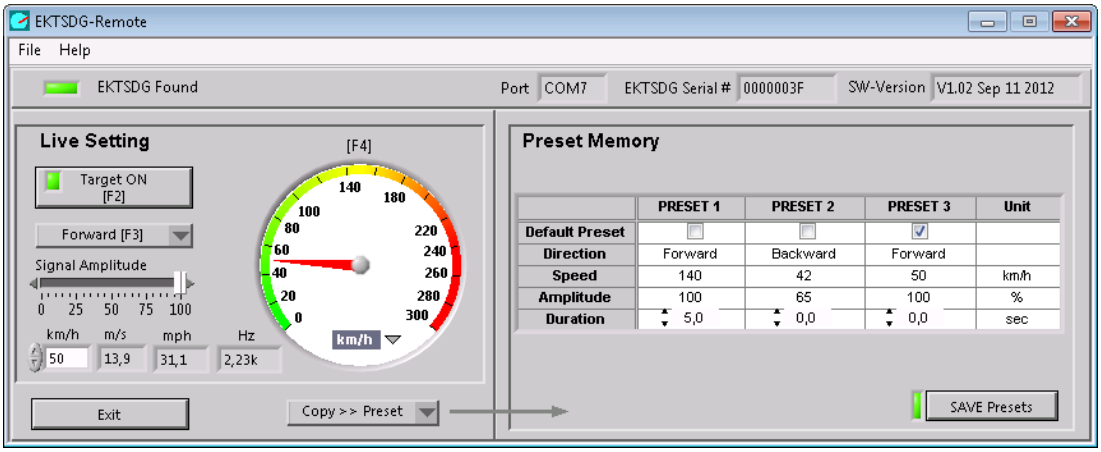


Figure 2: Configuration Software.

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1.5 EKTSDG-010101 Characteristics

Parameter	Conditions / Notes	Symbol	Min	Typ	Max	Unit
Operating conditions						
Supply voltage	Battery	V_{ccBatt}	4.5	5	5.5	V
	USB	V_{ccUSB}	3.5	3.7	4.1	V
External Supply current	Operating	I_{cc1}		300		mA
	Charging	I_{cc2}		50		mA
Battery Capacity	T=25°C	C_{LiPo}		1500		mAh
Battery Lifetime	Full charging cycles	-		500		Cycles
Operating temperature	non condensing	T_{op}	0		+60	°C
Storage temperature		T_{st}	-20		+80	°C
Doppler Simulator						
Frequency range	Transmit frequency	f_{TG}	24.000		24.250	GHz
Doppler frequency range	Digitally adjustable	$f_{Doppler}$	44		14300	Hz
Simulated speed range	Digitally adjustable	$v_{Doppler}$	1		300	km/h
Output power range	Adjustable signal level	P_{out}	1		100	%
Antenna gain	F=24.125GHz	G_{Ant}		15		dBi
Antenna polarization	Linear, vertical			V		
Horizontal -3dB beamwidth	E-Plane	W_{φ}		24		°
Vertical -3dB beamwidth	H-Plane	W_{θ}		27		°
Sidelobe level	E- and H-Plane	D			-15	dB
Overall gain	For linear polarized transceivers			65		dB
Aequivalent reflectivity	For linear polarized transceivers	RCS_{lin}		25		m^2
Frequency error Dopplersignal	Crystal controlled	$\Delta f_{doppler}$			1	%
Max. drift in overall gain					+/- 3	dB
Harmonics in generated Doppler[1]	$f_{doppler}$ = 1kHz	$H_{Doppler}$			-10	dBc
Harmonics in RF Spectrum	F_{RF} = 24.125GHz	H_{RF}		-30		dBm
Max. radiated Power	EIRP	P_{sat}		20		dBm
Host Interface						
USB	Serial USB, Mini-USB connector					
Body						
Outline Dimensions				68x128x24		mm^3
Weight	Including LiPo Battery			180		g
Accessories						
Protection case, Softcase, USB Cable, Windows Software "EKTSDG-Remote" as Download						

[1] Above ~200km/h simulated speed, the harmonics level in generated Doppler will degrade.

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