

# Dual Channel, Shared Oscillator Downconverter

S-, Ku-, Ka-Band

Also available as Outdoor Version



The satellite downconverters developed and manufactured by WORK Microwave are designed to meet the requirements of modern satellite transmission. Customers worldwide appreciate their reliability and high level of quality. These types of dual channel, shared oscillator converters can be used in systems, where an accurate phase relationship is required between two converter channels, as it e.g. the case for monopulse tracking system down conversion.

## Operating and control

The converters can be operated via the push buttons on the front panel using self-explanatory display menus or via remote control (RS232, RS422/485, TCP/IP over Ethernet).

Detailed monitoring of the system status and a summary alarm output (dual change over switch contacts) are provided. For the remote control either ASCII string based commands as well as addressable, packet based commands are provided.

## Housing options

The converters normally are delivered without fans and can be operated in environments, where at minimum 1 RU space for natural ventilation is available above each unit. This eliminates the fan as potential point of failure. For rack installations without any space in between the units a fan within the converter unit is recommended, which forces an airflow from the right side to left side of the units. Outdoor versions with IP67 degree of protection are also available.

## Key features

- Shared oscillator to guarantee excellent phase tracking in between channels
- 70 MHz or 140 MHz IF bands available
- Low power consumption
- Extreme low phase noise (< -60 dBc/Hz @ 10 Hz)
- Long- term stability  $10^{-7}$  / year
- Output power +10 dBm (1dB compression point)
- Automatic reference recognition (5 and 10 MHz)
- 0°C to 50°C (32°F to 122°F)
- Remote control through RS232, RS422/485 (2-wire or 4-wire) interfaces, TCP/IP over Ethernet (Indoor Version only).
- Packet command syntax supports RS485 bus systems and allows addressed operation.
- Test outputs on the front panel (Indoor version only):  
IF test at downconverters  
RF test at upconverters
- Summary alarm output (dual change over switch contacts)
- Internal Fan (Indoor Version only)
- CE compliant
- **3 years warranty**

# Dual Channel, Shared Oscillator Downconverter

<b>Downconverter Type:</b>	SCD-SST	SCD-KuKuT	SCD-KaKaT	
<b>RF-Input Frequency:</b>	S-Band 2.2...2.3 GHz	Ku-Band 10.70...12.75 GHz	Ku-Band 19.70...20.10 GHz	other frequency bands on request
<b>Intermediate Frequency:</b>	2450 MHz for 70 MHz IF Output 2440 MHz for 140 MHz IF Output	2150 MHz for 70 MHz IF Output 2140 MHz for 140 MHz IF Output	2150 MHz for 70 MHz IF Output 2140 MHz for 140 MHz IF Output	
<b>Phase Noise:</b>	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz 1 MHz	- 60 - 80 - 90 - 98 - 103 <sup>1)</sup> - 112 <sup>1)</sup>	- 50 - 70 - 80 - 90 - 95 <sup>1)</sup> - 105 <sup>1)</sup>	- 50 - 70 - 80 - 90 - 95 <sup>1)</sup> - 105 <sup>1)</sup>
	max. values in dBc/ Hz <sup>1)</sup> 0°C to 50°C, outside this temperature range degraded by max 5 dB.			
<b>Test Output (Fixed Oscillator):</b>	2520 MHz (70 MHz IF) 2580 MHz (140 MHz IF) -6 ± 3 dBm, Connector SMA female	2220 MHz (70 MHz IF) 2280 MHz (140 MHz IF) -6 ± 3 dBm, Connector SMA female	2220 MHz (70 MHz IF) 2280 MHz (140 MHz IF) -6 ± 3 dBm, Connector SMA female	
<b>Test Output (Microwave Oscillator):</b>	4.65...4.75 GHz (70 MHz IF) 4.64...4.74 GHz (140 MHz IF) -7 ± 3 dBm SMA female	12.85...14.90 GHz (70 MHz IF) 12.84...14.89 GHz (140 MHz IF) -7 ± 3 dBm SMA female	8.775...8.975 GHz (70 MHz IF) 8.78...8.98 GHz (140 MHz IF) -7 ± 3 dBm SMA female	
<b>Conversion Scheme:</b>	Dual down-conversion, no frequency inversion Two channels with shared oscillators: Same conversion frequency for both channels Gain setting individual for each channel			
<b>Phase Tracking between channels:</b>	<10 deg rms after 1 hour warmup, environmental temperature constant within 5 °C, constant gain setting, constant frequency setting, signal frequency constant within 10 kHz. Initial phase difference to be compensated externally.			
<b>Frequency Resolution:</b>	10 Hz			
<b>RF-Input Characteristics:</b>	Impedance: 50 Ω Return Loss: >20 dB Max. input level: < approx. -25 dBm (operational) < approx. +10 dBm (damage level) LO Leakage: -80 dBm max. RF-Connector: SMA female			
<b>IF-Output Characteristics:</b>	Frequency: 70 ± 20 MHz or 140 ± 40 MHz Impedance: 50 or 75 Ω Return Loss: 26 dB min 1 dB Compression Point: >10 dBm, 13 dBm typical Output Muting: >60 dB (by command or sense input or by alarm condition) IF-Signal Monitor: -20 dB of IF-output on front panel, SMA female (Standard on Indoor unit) -20 dB of IF output, SMA female (Outdoor unit with Option IFT) IF-Connectors: BNC female (Indoor Version) N female (Outdoor Version)			
<b>Transfer Characteristics:</b>	Max. Conversion Gain: 45 dB Attenuation Range: 0...30 dB, Step 0.1 dB (Conversion Gain 45...15 dB) Gain Accuracy: ± 2 dB Level Stability: ± 0.25 dB/day (constant temperature) Amplitude Response: ±0.2 dB / ± 18 MHz, ± 0.25 dB / ± 20 MHz, ± 0.4 dB / ± 40 MHz Image Rejection: >80 dB Noise Figure: <12 dB, 10 dB typical Isolation between channels: > 60 dB			
<b>Group Delay (± 18 MHz):</b>	Linear: 0.03 ns / MHz max. Parabolic: 0.01 ns / MHz <sup>2</sup> max. Ripple: 1 ns peak to peak max.			
<b>Group Delay (± 36 MHz):</b>	Linear: 0.015 ns / MHz max. Parabolic: 0.005 ns / MHz <sup>2</sup> max. Ripple: 2 ns peak to peak max.			
<b>Intermodulation (3<sup>rd</sup> Order):</b>	-60 dBc max (Δf <sub>in</sub> : 5 MHz, P <sub>in</sub> : 2 x -40 dBm, P <sub>out</sub> : 2 x -10 dBm)			
<b>AM / PM conversion:</b>	0.1° / dB (P <sub>out</sub> = 0 dBm)			
<b>Spurious Outputs:</b>	Signal related: < - 60 dBc (Δf < 1 MHz), < -70 dBc (Δf ≥ 1 MHz) Signal independent: < - 76 dBm (< - 80 dBm typical)			
<b>Frequency Stability:</b>	± 1 x 10 <sup>-7</sup> , 0°C to 50°C ± 2 x 10 <sup>-8</sup> , 0°C to 50°C (after 30 min warm up) ± 1.5 x 10 <sup>-9</sup> per day (fixed temperature after 24 h warm up)			
<b>Reference Input:</b>	Frequency: 10 MHz or 5 MHz Level: -3...10 dBm Modes: internal, external, auto (senses reference input) Connector: BNC female (Indoor Version) SMA female (Outdoor Version)			Standard on Indoor Version  With Option RIN on Outdoor Version
<b>Reference Output:</b>	Frequency: 10 MHz Level: 0 ± 3 dBm Connector: BNC female (Indoor Version)			on Indoor Version only

Specifications continued next page

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**Specifications continued:**

<b>Monitoring and Control Interface:</b>	TCP/IP over Ethernet (10 or 100 Mbit/s, auto sensing) RS232 or RS422/RS485 (Connectors DSUB09 female) (configurable by software) Alarm output: Two potential free contacts (DPDT, Connector DSUB09 female)	Indoor Version
	RS232 or RS422/RS485 Alarm output: Two potential free contacts (DPDT) 24 V DC output: max 0,3 A 6,5 V DC output: max 0,2 A Mute Input: TTL logic input with internal pull up (Connector type: MIL-C-26482: MS 3120 E 14-19 S)	Outdoor Version
<b>MTBF</b>	50000 hours (typical)	
<b>Internal Fan</b>	yes	Indoor Version only
<b>Temperature Range:</b>	0 °C to 50 °C operating - 30 °C to 80 °C storage	Indoor Version
	- 30 °C to 60 °C operating (10 minutes warmup at -30 °C)	Outdoor Version
<b>Relative Humidity:</b>	< 95 % non condensing	Indoor Version
	100 %	Outdoor Version
<b>User Interface:</b>	LCD-Display 2 x 40 characters, 4 cursor keys, 2 function keys Option: VFD-Display 2 x 40 characters, 4 cursor keys, 2 function keys	Indoor Version only
<b>Power Supply:</b>	85...264 V AC, 40...70 Hz	
<b>Power Consumption:</b>	Max: 37 VA / 24 W Typ: 33 VA / 21 W	
<b>Mains Power Input:</b>	IEC C14	Indoor Version
	Amphenol: C-16 male	Outdoor Version
<b>Mains Fuse:</b>	2 x 3.15 A time-lag fuse	Indoor Version only
<b>Dimension and Weight:</b>	483 x 44 x 500 mm, 1 RU (19") appr. 9 kg	Indoor Version
	391 x 111 x 402 mm	Outdoor Version
<b>Degree of Protection:</b>	IP 67 (acc. IEC 529)	Outdoor Version only

Specifications are subject to change

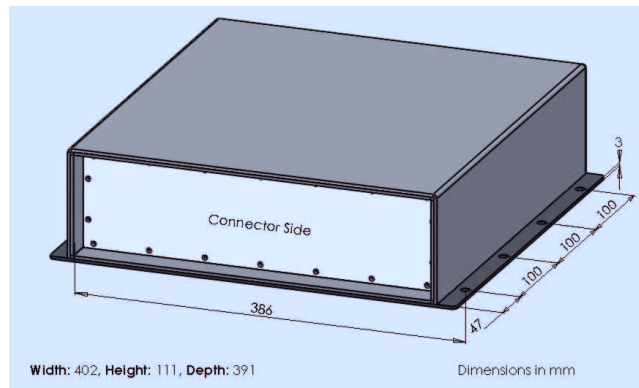
**Order Information:**

**SCD-SST-[IF Band in MHz]-[IF Imp in Ω]-[Options]**

**Possible Options are:** VFD (VFD display on Indoor Version)  
OD (Outdoor Unit)  
RIN (Reference input on Outdoor Version)  
IFT (IF test output on Outdoor Version)

**Examples:**

**SCD-SST-70-50**  
**SCD-SST-140-75-VFD**  
**SCD-KuKuT-70-50-VFD**



Dimensions of Outdoor Housing