

# Wideband Block Downconverter

Indoor / Outdoor



## Wideband 1 ... 40 GHz to L-Band Block-Downconverter



WORK Microwave's synthesized wideband block downconverters converting the full spectrum up to 40 GHz down to L-Band. Ideal use cases include monitoring compliance with licensed frequency bands and military and governmental applications, as well as research and development.

The fifth-generation frequency converter series is built with the most advanced technologies available to ensure outstanding performance, high reliability and a longer lifetime.

### 5<sup>th</sup>-generation enhancements

**Reduced phase noise:** Based on a powerful new synthesizer the frequency converters achieve a phase noise significantly beyond the recommended industry specification (Intelsat's IESS-308/309).

**Optional slope compensation up to +8 dB / GHz over L-band:** With slope compensation users can effectively balance the losses and negative slope of augmented cable runs to ensure that all signals entering the RF processing chain are at similar levels across all frequencies.

**Improved flexibility and usability:** Through a new USB port, operators can now access the converter via the back panel to make copies of parameter settings, replicate selected configurations on another device or save configuration settings for future reference. In addition, a user-friendly, Web-based interface offers an intuitive user experience. When coupled with the enhanced USB port, the customizable GUI also simplifies the installation of firmware updates.

### Housing options

The wideband downconverter is separated in two units, each 1 RU in height. The master converter covers the frequency range of 1 to 26 GHz whereas the second part acts as a slave unit while converting the rest of the 40 GHz band.

Outdoor versions with IP 67 degree of protection are also available.

The converters can be operated via the push buttons on the front panel using intuitive display menus or via remote control (RS232, RS422/485 and 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.

Remote monitoring and control through SNMP and a Web browser interface is also available.

### Customized products

In addition to standard products WORK Microwave offers custom tailored products and specialized products as follows:

- Modified or smaller housings to fit into your AC power switch on the front panel
- Existing design for mobile and portable applications.
- Different IF or RF frequency bands
- Customized M&C interface and control syntax.
- Extended storage or operating temperature range.
- Military versions for hostile environment (shock, vibration, humidity).

### Key features

- Long-term stability  $10^{-7}$  / year
- Output power +10 dBm (1 dB compression point)
- Automatic reference recognition (5 and 10 MHz)
- Digital gain compensation
- Operating temperature range either -30 °C to 60 °C (-22 °F to 140 °F), -40 °C to 60 °C (-40 °F to 140 °F) (VECD units) or 0 °C to 50 °C (32 °F to 122 °F)
- Remote control through RS232, RS422/485 (2-wire or 4-wire) interfaces. Packet command syntax supports RS485 bus systems and allows addressed operation.
- Remote control through Ethernet supporting a TCP/IP command interface, a Web browser interface and SNMP (MIBs are provided).
- AC power switch on the front panel
- Summary alarm output with dual change over switch contacts
- Transmit mute input
- CE compliant
- **3 years warranty**

### Orders information

WORK Microwave offers three series of 19" rack satellite converters:

Standard-, High- and Extra High Performance. The specifications are the same for all types except the operating temperature range. The High Performance type operates between -30 °C to 60 °C (-22 °F to 140 °F), the Extra High Performance type between -40 °C to 60 °C (-40 °F to 140 °F) and the Standard type between 0 °C to 50 °C (32 °F to 122 °F). Therefore if you only need units for inside use, the standard unit is perfectly suited for this application.

### Open questions, demo units

If you need more information about WORK Microwave's synthesized frequency block converters or if you would like to have demo unit, please contact us via e-mail: [sales@work-microwave.com](mailto:sales@work-microwave.com) or call us. We are glad to assist you.

# Wideband Block Downconverter

Indoor / Outdoor

## Wideband 1 ... 40 GHz to L-Band Block-Downconverter Indoor

<b>Downconverter Type:</b>	VSSBD-WB-FAN-S0121 + VSBD-WB-FAN-S0122	
<b>RF-Input Frequency:</b>	1.00 ... 40.00 GHz	
<b>IF-Output Frequency:</b>	1200 ±250 MHz (3 dB Bandwidth: ±250 MHz)	
<b>Phase Noise:</b>	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz 1 MHz 3 MHz	-50 -70 -85 -90 -100 -105 -115
	max. values in dBc/Hz	
<b>Conversion Scheme:</b>	Block down conversion, no frequency inversion	
<b>Frequency Resolution:</b>	100 Hz	
<b>RF-Input Characteristics:</b>	Impedance: 50 Ω Return loss: > 10 dB Maximum Aggregate Input Level: 10 dBm (damage Level) LO leakage: < -60 dBm Connector: K (female)	
<b>IF-Output Characteristics:</b>	Impedance: 50 Ω Return loss: > 18 dB 1 dB compression point: > 10 dBm <sup>1)</sup> Output muting: > 75 dB (by command or sense input or by alarm condition) Connector: SMA (female)	
<b>Transfer Characteristics:</b>	Max. Conversion Gain: 35 dB ±1 dB Attenuation range: 0 ... 30 dB, 0.1 dB steps Gain Variation over Temp.: ±1.0 dB Gain Flatness over 250 MHz: ±1.5 dB max. (1200 ±125 MHz) Gain Flatness over 40 MHz: ±1 dB Image Rejection: > 70 dB Noise Figure: < 18 dB <sup>1)</sup>	Importend: applies to the entire device combination of preconverter and synthesized converter
<b>Group Delay:</b>	Ripple, Slope:	1 ns peak to peak / 40 MHz 2 ns peak to peak / 250 MHz
<b>Spurious Outputs:</b>	Signal related: < -50 dBc <sup>1) 2)</sup> Output harmonics: < -40 dBc <sup>1) 2)</sup> LO-Leakage: < -75 dBm	
<b>Output Intercept Point 3<sup>rd</sup> Order:</b>	OIP3:	> 20 dBm <sup>1)</sup>
<b>Internal Frequency Stability:</b>		±1 x 10 <sup>-7</sup> , -30 °C ... 60 °C ±1 x 10 <sup>-8</sup> , -30 °C ... 60 °C (after 30 min warm up) ±1 x 10 <sup>-9</sup> per day (fixed temperature after 24 h warm up)
<b>Reference Input:</b>	Frequency: 5 or 10 MHz sine wave Level: 5 dBm ±5 dB Modes: auto/extern/intern Connector: BNC (female)	
<b>Reference Output:</b>	Frequency: 10 MHz Level: 0 dBm ±3 dB Connector: BNC (female)	
<b>Monitoring and Control Interface:</b>	Protocol: SNMP Connection: UDP over Ethernet (10 or 100 Mbps, auto sensing), connector RJ-45 Protocol: HTTP (web browser interface) Connection: TCP/IP over Ethernet (10 or 100 Mbps, auto sensing), connector RJ-45 Protocol: Multipoint packet format commands Connection: RS232 or RS422/RS485 (configurable), connector DSUB09 female or TCP/IP over Ethernet (10 or 100 Mbps, auto sensing), connector RJ-45	
<b>Alarm Interface:</b>	Two potential free contacts (DPDT), Connector DSUB09 female	
<b>Temperature Range:</b>	0 °C ... 50 °C operating, -30 °C ... 80 °C storage	
<b>Relative Humidity:</b>	< 95 % non condensing	
<b>User Interface:</b>	LCD-Display 2 x 40 characters, 4 cursor keys, 4 function keys	
<b>Mains Power Input:</b>	100 ... 240 V AC nominal, 90 ... 264 V AC max., 50 ... 60 Hz	
<b>Mains Power Consumption:</b>	Max: 120 VA / 75 W	
<b>Mains Power Input Connector:</b>	IEC C14	
<b>Dimension and Weight:</b>	483 x 88 x 508 mm <sup>3</sup> (WxHxD), 2 RU (19"), approx. 12 kg	

<sup>1)</sup> at max. conversion gain

<sup>2)</sup> Pout = 0 dBm

Specifications are subject to change

## Wideband 1 ... 40 GHz to L-Band Block-Downconverter Outdoor

<b>Downconverter Type:</b>	VHSBD-WB-OD-RIN-S01143 + VHBD-WB-OD-RIN-S00834	
<b>RF-Input Frequency:</b>	11.00 ... 28 GHz	
<b>IF-Output Frequency:</b>	1200 ±250 MHz (3 dB Bandwidth: ±250 MHz)	
<b>Phase Noise:</b>	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz 1 MHz	-50 -70 -85 -90 -97 -102
	max. values in dBc/Hz	
<b>Conversion Scheme:</b>	Block down conversion, no frequency inversion	
<b>Frequency Resolution:</b>	100 Hz	
<b>RF-Input Characteristics:</b>	Impedance: Return loss: Maximum Aggregate Input Level: LO leakage: Connector:	50 Ω > 10 dB 10 dBm (damage Level) < -60 dBm K (female)
<b>IF-Output Characteristics:</b>	Impedance: Return loss: 1 dB compression point: Output muting: Connector:	50 Ω > 18 dB > 10 dBm <sup>1)</sup> > 75 dB (by command or sense input or by alarm condition) N (female)
<b>Transfer Characteristics:</b>  Importend: applies to the entire device combination of preconverter and synthesized converter	Max. Conversion Gain: Attenuation range: Gain Variation over Temp.: Gain Flatness over 250 MHz: Gain Flatness over 40 MHz: Image Rejection: Noise Figure:	35 dB ±1 dB 0 ... 30 dB, 0.1 dB steps ±1.0 dB ±1.5 dB max. (1200 ±125 MHz) ±0.5 dB max. > 70 dB < 18 dB <sup>1)</sup>
<b>Group Delay:</b>	Ripple, Slope:	1 ns peak to peak / 40 MHz 2 ns peak to peak / 250 MHz
<b>Spurious Outputs:</b>	Signal related: Output harmonics: LO-Leakage:	< -50 dBc <sup>1) 2)</sup> < -40 dBc <sup>1) 2)</sup> < -75 dBm
<b>Output Intercept Point 3rd Order:</b>	OIP3:	> 20 dBm <sup>1)</sup>
<b>Internal Frequency Stability:</b>		±1 x 10 <sup>-7</sup> , -30 °C ... 60 °C ±1 x 10 <sup>-8</sup> , -30 °C ... 60 °C (after 30 min warm up) ±1 x 10 <sup>-9</sup> per day (fixed temperature after 24 h warm up)
<b>Reference Input:</b>	Frequency: Level: Modes: Connector:	5 or 10 MHz sine wave 5 dBm ±5 dB auto/extern/intern SMA (female)
<b>Combined Monitoring and Control Interface and Alarm Interface:</b>	Protocol: Connection:  Alarm output:  Connection type: Mute Input:	Multipoint packet format commands RS232 or RS422/RS485 (configurable), connector MIL-C-26482: MS 3120 E 14-19-S  Two potential free contacts (DPDT) 24 V DC output: max. 0.3 A MIL-C-26482: MS 3120 E 14-19-S TTL logic input with internal pull up
<b>Monitoring and Control Interface:</b>	Protocol: Connection: Protocol: Connection: Protocol: Connection:	SNMP UDP over Ethernet (10 or 100 Mbps, auto sensing), connector RJ-45 HTTP (web browser interface) TCP/IP over Ethernet (10 or 100 Mbps, auto sensing), connector RJ-45 Multipoint packet format commands TCP/IP over Ethernet (10 or 100 Mbps, auto sensing), connector RJ-45
<b>Temperature Range:</b>	-30 °C ... 60 °C operating, (10 minutes warm up at -30 °C)	
<b>Relative Humidity:</b>	< 100 %	
<b>Mains Power Input:</b>	100 ... 240 V AC nominal, 90 ... 264 V AC max., 47 ... 63 Hz	
<b>Mains Power Consumption:</b>	Max: 120 VA / 75 W	
<b>Mains Power Input Connector:</b>	Amphenol C16-1 (3+PE) male	
<b>Dimension and Weight:</b>	412 x 74 x 505 mm <sup>3</sup> (W x H x D)	
<b>Degree of Protection:</b>	IP 67 (acc. IEC 529)	

<sup>1)</sup> at max. conversion gain

<sup>2)</sup> P<sub>out</sub> = 0 dBm

Specifications are subject to change