

# Block Up Converter

## 6900 series

Codan's L-Band IF input 6900 series Ku-Band Block Up Converters (BUCs) offer a wide range of distinctive advantages and enhanced features for satellite communications systems. Available in a variety of models, the 6900 series BUCs provide industry-leading technical performance.

### KEY FEATURES

#### Configuration

The 6900 series compact L-Band IF input Block Up Converters (BUCs) are available in a range of RF output powers.

#### Durability

The 6900 series are designed and tested to meet their performance specifications over an ambient temperature range of -40°C to +55°C and up to 100% relative humidity, ensuring long term survival in extreme conditions. Field experience for Codan BUCs shows that MTBFs of greater than 100,000 hours can be expected.

#### RF performance

RF performance is superior, particularly: intermodulation performance, gain stability over temperature and flatness across the IF band. The 6900 series also boast industry leading spurious and harmonics specifications. Guaranteed RF performance ensures expensive system link margins do not have to be used to cope with RF transceiver variations.

#### CE compatible

While CE certified versions are available, all BUCs are designed to ensure that the customer can easily achieve CE certification at a system level for a transmission system in the EU.

All Codan BUCs are tested to the following standards:

#### EMI/EMC Directive

- EN 301 489 – 1 (as per Article 3.1b in the RTT&E Directive)
- EN 301 489 – 12 (as per Article 3.1b in the RTT&E Directive)

#### LV Directive

- EN60950 (as per Article 3.1a in the RTT&E Directive)
- CR 1999/519/EC and ICNIRP Guidelines

#### Power

Codan BUCs all feature low power consumption and low temperature rise, ensuring internal components do not suffer undue stress. DC-powered BUCs are powered either via the transmit IF cable or optional external DC power connector.

AC-powered BUC modules are AC mains powered via an external connector.

#### Internal protection

Internal protection against high temperature and short or open circuit RF output is standard. Input voltage detection ensures reliable shutdown and restart under brownout or blackout conditions.

#### External protection

The BUCs are completely protected from the elements, are without external user controls and are fully sealed, and pressure tested to 34 kPa (5 psi). Particle and moisture penetration is rated to IP67. High quality paint is used to protect the modules from corrosion.



Ku-Band Low power Block Up Converter

### ADVANCED FEATURES

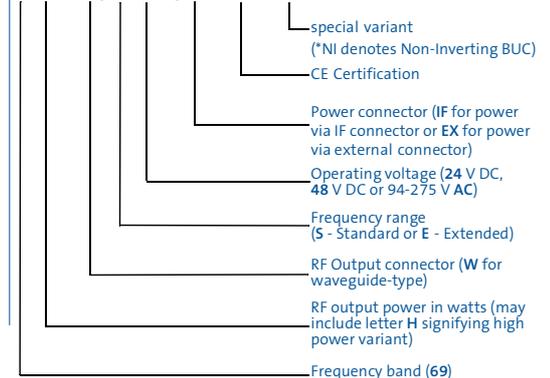
#### Enhanced monitor and control

All operating functions can be controlled and monitored via the serial M&C facilities. The standard output power meter facility features high accuracy and the ability to measure both CW and burst mode signals. The 6900 series is capable of operating with a PC without requiring proprietary software. The user has the choice of an FSK based M&C interface,

which is fed via the transmit IF cable for use with intelligent modems or separate RS232 or RS422/RS485 interfaces. Multiple M&C protocols are provided to enable integration into a number of network management systems.

### BUC PART NUMBER FORMAT

#### 6FPP-X/Y-AA/BB-GG-ZZ



SPECIFICATIONS

Power rating	4 W	8 W		16 W				25 W		
Platform	DC-powered	DC-powered		DC-powered		AC-powered		DC-powered	AC-powered	
Model numbers (*NI denotes Non-Inverting BUC)	6904-W/E-24/IF-CE 6904-W/E-48/IF-CE	6908-W/S-48/IF 6908-W/E-48/IF-CE 6908-W/E-48/EX-CE 6908-W/E-48/IF-CE-NI 6908-W/E-48/EX-CE-NI		6916-W/S-48/IF 6916-W/S-48/EX	6916-W/E-48/IF 6916-W/E-48/EX	6916-W/S-AC/EX-CE	6916-W/E-AC/EX-CE	6925-W/S-48/IF 6925-W/S-48/EX	6925-W/S-AC/EX	6925-W/E-AC/EX
RF output frequency range	13750 to 14500 MHz	14000 to 14500 MHz	13750 to 14500 MHz	14000 to 14500 MHz	13750 to 14500 MHz	14000 to 14500 MHz	13750 to 14500 MHz	14000 to 14500 MHz	14000 to 14500 MHz	13750 to 14500 MHz
RF output connector	WR75, PBR120 flange with 4.2 mm through holes	WR75, PBR120 flange with 4.2 mm through holes		WR75, PBR120 flange with 4.2 mm through holes				WR75, PBR120 flange with 4.2 mm through holes	WR75, PBR120 flange with 4.2 mm through holes	WR75, PBR120 flange with 4.2 mm through holes
RF output VSWR	2.0:1 max	2.0:1 max	1.8:1 max	1.5:1 max				1.5:1 max	1.5:1 max	1.5:1 max
RF output power @ 1 dB GCP	+36.0 dBm min	+38.0 dBm min	+39.0 dBm min	+42.0 dBm min	+41.5 dBm min	+41.7 dBm min	+41.0 dBm min	+43.4 dBm min		+43.0 dBm min
RF output IMD ratio with 2 carriers each at 6 dB OPBO	-25 dBc min	-24 dBc min	-25 dBc min	-25 dBc min				-25 dBc min	-25 dBc min	-25 dBc min
LO frequency (*NI denotes Non-Inverting BUC)	15450 MHz	15450 MHz 12800 MHz NI Model		15450 MHz				15450 MHz	15450 MHz	15450 MHz
Reference frequency	10 MHz	10 MHz		10 MHz				10 MHz		
Reference frequency input	Multiplexed on transmit IF input	Multiplexed on transmit IF input		Multiplexed on transmit IF input				Multiplexed on transmit IF input		
Reference frequency level	-10 to +5 dBm	-10 to +5 dBm		-10 to +5 dBm				-10 to +5 dBm		
Reference frequency connector	Via transmit IF input	Via transmit IF input		Via transmit IF input				Via transmit IF input		
Frequency conversion	Spectrum inverting	Spectrum inverting		Spectrum inverting				Spectrum inverting		
Gain	67 dB nominal	70 dB nominal		73 dB nominal				74 dB nominal		
Gain flatness over any 40 MHz band	±1.50 dB max	±1.50 dB max	±0.75 dB max	±1.50 dB max		±0.75 dB max		±1.50 dB max	±0.75 dB max	
Gain flatness over full band	±2.50 dB max	±2.50 dB max	±1.50 dB max	±2.50 dB max		±2.0 dB max		±2.50 dB max	±2.0 dB max	
Gain stability over any 50°C temperature range	±1.50 dB max	±1.50 dB max		±1.50 dB max		±1.0 dB max		±1.50 dB max	±1.0 dB max	
Gain stability over entire temperature range when frequency set	±2.0 dB max	±2.0 dB max		±2.0 dB max				±2.0 dB max		
Gain stability over entire temperature range when frequency not set	±4.0 dB max	±4.0 dB max	±3.0 dB max	±3.0 dB max				±3.0 dB max		
Input frequency range	950 to 1700 MHz	950 to 1450 MHz	950 to 1700 MHz	950 to 1450 MHz	950 to 1700 MHz	950 to 1450 MHz	950 to 1700 MHz	950 to 1450 MHz		950 to 1700 MHz
Output power meter range	15 dB	15 dB		15 dB		10 dB		15 dB		
Output power meter absolute accuracy when compensation frequency set	±1.0 dB max	±1.0 dB max		±1.0 dB max				±1.0 dB max		
Output power meter absolute accuracy when compensation frequency not set	±2.0 dB max	±2.0 dB max		±2.0 dB max				±2.0 dB max		
Output power meter relative accuracy when compensation frequency set	±0.5 dB max	±0.5 dB max		±0.5 dB max				±0.5 dB max		
Output power meter relative accuracy when compensation frequency not set	±1.0 dB max	±1.0 dB max		±1.0 dB max				±1.0 dB max		
Power meter modes	CW and burst with adjustable threshold	CW and burst with adjustable threshold		CW and burst with adjustable threshold				CW and burst with adjustable threshold		
Power supply voltage @ 24 V	+17 V to +35 V DC via transmit IF input									
Power supply minimum turn-on voltage @ 24 V	+19 V									
Power supply voltage @ 48 V	+34 V to +60 V DC via transmit IF input	+34 V to +60 V DC via transmit IF input	+34 V to +60 V DC via transmit IF input or via external DC connector	+34 V to +60 V DC via transmit IF input or via external DC connector				+34 V to +60 V DC via transmit IF input or via external DC connector		
Power supply minimum turn-on voltage @ 48 V	+41 V	+41 V	+41 V	+41 V						
Power supply voltage (AC-powered BUCs only)						94 to 275 V AC via Amphenol T 3110 000			94 to 275 V AC via Amphenol T 3110 000	
Power supply consumption	80 W max	130 W max		150 W max		300 W max		250 W max	375 W max	
Volume (for waveguide output BUCs)	360 mm L x 182 mm W x 104 mm H	360 mm L x 182 mm W x 137 mm H		360 mm L x 182 mm W x 137 mm H		522 mm L x 182 mm W x 204 mm H		360 mm L x 182 mm W x 137 mm H	522 mm L x 182 mm W x 204 mm H	522 mm L x 182 mm W x 204 mm H
Weight	6.0 kg nominal	6.0 kg nominal		6.0 kg nominal		12.0 kg nominal		7.0 kg nominal	12.0 kg nominal	12.0 kg nominal

## COMMON SPECIFICATIONS

IF input connector	N-type
IF input impedance	50 Ω
IF input VSWR	1.5:1 max
Transmit attenuator steps	0 dB to 12 dB in 4 dB steps
Spurious output @ 3 dB OPBO	-50 dBc max
Harmonic output @ 3 dB OPBO	-60 dBc max
AC-powered BUC fault monitor connector	Transmit IF input
AC-powered BUC fault monitor polarity	+ve on centre conductor
AC-powered BUC fault monitor no fault state	>23 mA @ 48 V DC
AC-powered BUC fault monitor fault state	<20 mA @ 48 V DC
* Maximum phase noise (SSB) of reference frequency:	
100 Hz	-135 dBc/Hz
1 kHz	-145 dBc/Hz
10 kHz	-155 dBc/Hz
100 kHz	-155 dBc/Hz
Phase noise (SSB) of BUC with frequency reference defined above *:	
100 Hz	-63 dBc/Hz
1 kHz	-73 dBc/Hz
10 kHz	-83 dBc/Hz
100 kHz	-93 dBc/Hz
Group Delay	
Linear (over any 10 MHz band)	2 nsec <sub>pp</sub> max
Parabolic (over any 80 MHz band)	0.00025 nsec/MHz <sup>2</sup> <sub>pp</sub> max
Ripple (over full band)	1 nsec <sub>pp</sub> max
AM/PM conversion	2.0°/dB max @ 2 dB OPBO
Monitor & Control	
FSK data format	User selectable
FSK data transmitter frequency	650 kHz ±1%
FSK data transmitter deviation	±60 kHz ±1%
FSK data transmitter sense	+60 kHz=mark; -60 kHz=space
FSK output level	-3 dB nominal
FSK start tone time	10 ms minimum
FSK data receiver nominal frequency	650 kHz
FSK data receiver locking range	±30 kHz
FSK data receiver input sensitivity	-15 dBm minimum
Digital data format RS232	9600 bps, 8 bits, no parity, 1 stop bit, ASCII protocol
Digital data format RS485	User selectable
Digital connector	MIL-C-26482 12-14S socket
Operating temperature range	-40 to +55°C
Relative humidity	100%
Weatherproofing	Sealed to 34 kPa

## CODAN QUALITY AND SERVICE

All BUCs are built and tested in Codan's ISO9001 quality certified manufacturing facility, and undergo burn in and performance monitoring over the temperature range specified. Codan's fully trained staff and agents provide in-factory and in-country training services and complete installation and on-site assistance. This service is backed by a 24-hour customer service line

and a warranty of three years on manufacturing, design or component defects.



C-Band Medium power Block Up Converter

## CONFIGURATION OPTIONS

Refer to the Specifications on this data sheet for allowed combinations of configuration options.

For accessories and options, please refer to the Block Up Converter Accessories data sheet (Codan part number 12-20185-EN).

Equipment descriptions and specifications are subject to change without notice or obligation.

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