



UCS and DCS Series
High Stability, Low Noise Synthesized Converters

UCSU and DCSU Series
High Stability, Ultra Low Noise Synthesized Converters



- One rack unit high
- 1 kHz or 125 kHz steps
- 70 MHz or 140 MHz IF
- Non-inverting, dual-conversion
- Rugged MIC design for transportable environment
- Low phase noise or optional ultra low noise

FEATURES

- Excellent phase noise. Exceeds INTELSAT IESS 308/309.
- Non-volatile memory.
- 100 channel, user programmable memory for frequency and attenuator settings.
- Low noise figure.
- High dynamic range/low intermodulation distortion.
- Group delay equalized.
- Excellent amplitude flatness.
- 25 dB minimum gain adjustment from front panel or remote. Additional 25 dB adjustment on upconverters.
- HPA output displayed on upconverter.
- Internal detectors provide display of output power levels.
- IF/RF monitor, -20 dBc.
- High MTBF and easy field maintenance because of small number of MIC modules.
- Low microphonic design.

- Full monitoring and control through front panel or remote (RS-422).
- Built-in "over heat" protection.
- Alarm history information.

OPTIONS

- RS-485, RS-232 or IEEE M & C interfaces.
- External reference input.
- 50 ohm IF impedance.
- Power ON/OFF switch on front panel.
- Rack mount slides.

ALSO AVAILABLE

- 1:1, 1:2, 1:4 or 1:N redundancy protection switches.
- Racks equipped with converters, switches, etc.
- Frequency translators.
- Block converters.
- Fixed frequency converters.
- MIC Modules to support rack mount or "Outdoor" converter applications.
- Triband (C, X, + Ku) or dualband (C + Ku) (X + Ku) converters (1 kHz steps) in a 1 RU high package.
- Combined up and down converters with shared LO's.
- Test loop translators

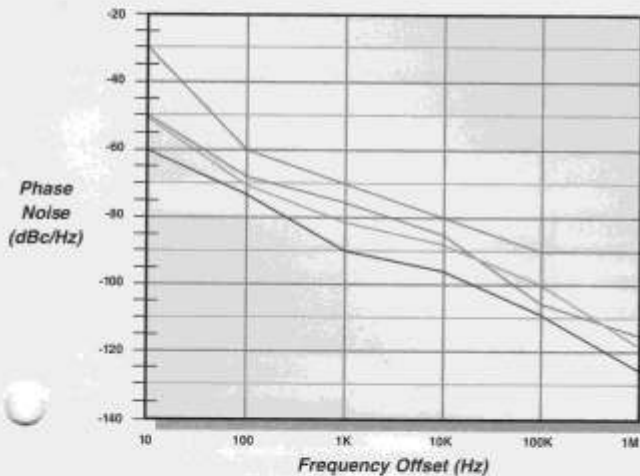
DOWN CONVERTERS		UP CONVERTERS	
Input Freq	Model No.*	Input Freq	Model No.*
L Band			
950-1450 MHz	DC90-004-1/2	950-1450 MHz	UC90-004-1/2
950-1525 MHz	DC90-005-1/2	950-1525 MHz	UC90-005-1/2
950-1750 MHz	DC90-010-1/2	950-1750 MHz	UC90-002-1/2
950-1850 MHz	DC90-006-1/2	950-1950 MHz	UC90-008-1/2
950-2150 MHz	DC90-008-1/2	C Band	
C Band		5800-8500 MHz	UC95-016-1/2
3400-3700 MHz	DC93-015-1/2	5845-6425 MHz	UC95-008-1/2
3400-4000 MHz	DC93-004-1/2	5800-6425 MHz	UC95-004-1/2
3600-4200 MHz	DC93-002-1/2	5800-6441 MHz	UC95-009-1/2
3605-4200 MHz	DC93-008-1/2	5800-6460 MHz	UC95-014-1/2
3700-4000 MHz	DC93-006-1/2	5800-6480 MHz	UC95-010-1/2
4500-4800 MHz	DC94-002-1/2	5800-6650 MHz	UC95-018-1/2
X Band		5800-6725 MHz	UC95-012-1/2
7250-7750 MHz	DC97-002-1/2	5825-6420 MHz	UC95-006-1/2
7250-7750 MHz	DC97-002-3	6417.5-6457 MHz	UC95-006-1/2
Ku Band		6425-6725 MHz	UC95-004-1/2
10.70-11.80 GHz	DC910-012-1/2	6700-7000 MHz	UC95-008-1/2
10.70-12.75 GHz	DC910-009-1/2	6725-7025 MHz	UC95-002-1/2
10.95-11.70 GHz	DC910-006-1/2	X Band	
10.95-12.20 GHz	DC910-002-1/2	7900-8400 MHz	UC97-002-1/2
10.95-12.75 GHz	DC910-004-1/2	7900-8400 MHz	UC97-002-3
10.95-12.80 GHz	DC910-010-1/2	Ku Band	
11.70-12.80 GHz	DC911-002-1/2	10.75 - 13.20 GHz	UC912-003-1/2
12.20-12.75 GHz	DC912-004-1/2	13.75-14.90 GHz	UC913-004-1/2
12.25-12.75 GHz	DC912-002-1/2	13.75-14.80 GHz	UC913-002-1/2
14.00-14.90 GHz	DC914-002-1/2	Kl Band	
Dual Band		17.30-18.10 GHz	UC917-002-1/2
3.400-4.200 GHz	DC900-002-1/2	17.30-18.40 GHz	UC917-004-1/2
10.95-12.75 GHz		17.30-17.90 GHz	UC917-006-1/2
Tri Band		Dual Band	
3.600-4.200 GHz	DC970-002-1/2	5.845-6.441 GHz	UC900-002-1/2
7.250-7.750 GHz		14.00-14.90 GHz	
10.95-12.75 GHz		Tri Band	
		5.850-6.435 GHz	UC970-002-1/2
		7.900-8.400 GHz	
		14.00-14.90 GHz	

* -1 Models are 140x40 MHz IF; -2 Models are 70x20 MHz IF; and -3 Models are 700x62.5 MHz IF



SPECIFICATIONS*		UPCONVERTER	DOWNCONVERTER
RF CHARACTERISTICS		OUTPUT	INPUT
Frequency range		Any frequency range listed on front page	Any frequency range listed on front page
Impedance		50 ohms SMA-Female (N-type, C-Band)	50 ohms SMA-Female (N-type, C-Band)
Return loss		21 dB min, 23 dB typ.	21 dB min, 23 dB typ.
RF monitor		-20 dBc nominal, 50 ohms SMA-Female	
Frequency selection		1 kHz or 125 kHz steps	1 kHz or 125 kHz steps
Frequency stability		$\pm 1 \times 10^{-7}$ /year $\pm 1 \times 10^{-9}$ /day $\pm 2 \times 10^{-8}$ 0-50° C	$\pm 1 \times 10^{-7}$ /year $\pm 1 \times 10^{-9}$ /day $\pm 2 \times 10^{-8}$ 0-50° C
IF CHARACTERISTICS		INPUT	OUTPUT
Frequency range	-1 Models -2 Models	140 \pm 40 70 \pm 20	140 \pm 40 70 \pm 20
Impedance		75 ohms BNC-Female (50 ohms, optional)	75 ohms BNC-Female (50 ohms, optional)
Return loss		28 dB min.	26 dB min.
IF monitor		-33 dBm nominal, 50 ohms BNC-Female	-20 dBc nominal, 50 ohms BNC-Female
RF/IF PERFORMANCE		INPUT TO OUTPUT	INPUT TO OUTPUT
Frequency sense		Positive (No spectrum inversion)	Positive (No spectrum inversion)
Gain at 0 dB attenuation		29-34 dB	46-50 dB
Gain adjustment: IF attenuation		0-25 dB min. in 0.1 dB steps (Local/Remote)	0-25 dB min. in 0.1 dB steps (Local/Remote)
L-Band attenuation		0-25 dB in 0.1 dB steps (Local/Remote)	
Output at 1 dB compression		+3 dBm min, +10 dBm typ.	+15 dBm min, +18 dBm typ.
Intermodulation distortion (third order)		40 dBc min, with two carriers at 0 dBm total output	54 dBc min, with two carriers at 0 dBm total output
Amplitude response across IF band		0.6 dB p-p max, 0.4 dB p-p typ.	0.6 dB p-p max, 0.4 dB p-p typ.
Amplitude response across RF band		1.5 dB p-p max, 1.0 dB p-p typ.	1.5 dB p-p max, 1.0 dB p-p typ.
Gain slope		0.02 dB/MHz max.	0.02 dB/MHz max.
Gain stability over any 10°C temp. change		± 0.25 dB/day max.	± 0.25 dB/day max.
Group delay: linear		0.006 ns/MHz typ.	0.010 ns/MHz typ.
-2 Models parabolic		0.004 ns/MHz ² typ.	0.006 ns/MHz ² typ.
ripple (residual)		1 ns p-p max.	1 ns p-p max.
AM/PM conversion		0.1°/dB max, to 0 dBm output	0.1°/dB max, to +5 dBm output
Noise figure		18 dB max, 16 dB typ.	8 dB max, 6 dB typ.
Spurious, non-carrier related		-80 dBm max. (L-Band attenuation \geq 5dB)	-75 dBm max., -80 dBm typ.
Spurious, carrier related		-60 dBc max, at 0 dBm output	-60 dBc max, at 0 dBm output
Image rejection			90 dB min.
AC Line Spurs, Fundamental		-50 dBc max.	-50 dBc max.
AC Line Spurs, Sum of all harmonics		-53 dBc max.	-53 dBc max.

*Specifications subject to change without notice.



- Intelsat IESS 308/309 Phase noise spec
- Typical C, or X band converters (min 5 dB > Intelsat spec)
- Typical Ku band converters (min 7 dB > Intelsat spec)
- Typical Ultra low noise C or X band converters

General Specifications

Primary Power: Standard Chassis

90-264 VAC Switching
47-63Hz
100 VA max, 90 VA typ.

Physical: Standard Chassis

Weight: 15.3 lbs. typ.
Overall Dimensions: 19" x 1.75" high x 22" deep

Primary Power: Optional Chassis

85-264 VAC Auto Change
47-63Hz
80 VA max, 50 VA typ.

Physical: Optional Chassis

Weight: 12 lbs. max, 11 lbs. typ.
Overall Dimensions: 19" x 1.75" high x 18" deep

Summary Alarm:

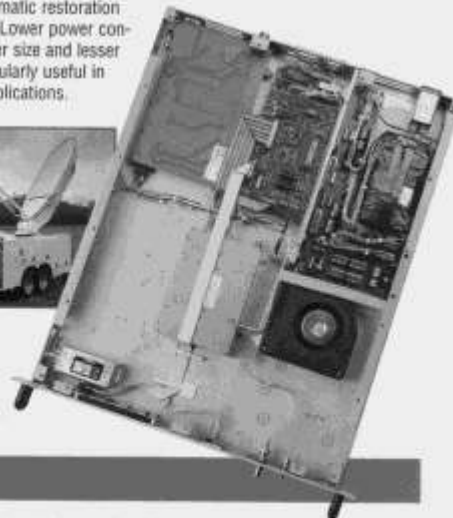
Form C contact closure, DB-9P

Environmental:

Temperature range, operating: 0°C to +50°C
non-operating: -50°C to +70°C
Humidity : 5% to 95%, non-condensing
Altitude operating: Up to 10,000 ft.
non-operating: Up to 40,000 ft.
Shock/vibration : As encountered in mobile trailer and commercial shipping environments.

Low Cost, High Reliability

Anghel Laboratories in-house design strengths have yielded a full line of Satcom converters that utilize a "modular" approach. Five basic field replaceable modules allow for low cost and simple maintenance. Because there is minimal cabling and interconnections, high MTBF is achieved. Self-checking software increases reliability. Working parameters are stored in NVRAM for automatic restoration after power off. Lower power consumption, smaller size and lesser weight are particularly useful in transportable applications.



Standard Configuration – all Models

- Single level menu
- Standard RS-422/485 bus (2 or 4-wire) for remote M&C
- 100 channel full capability memory
- Descriptive display of menu functions

Other Configurations

- 1 kHz step size
- Ultra low phase noise
- 18" chassis
- Outdoor package

Converter Options – all Models

1. 50 Ohm IF impedance
2. SMA RF connector for C band
3. TNC for IF connector, all bands
- 4a. -48 VDC input
- 4b. +48 VDC input
5. Rack slides
6. Front panel power switch
- 7a. RS-232 serial interface
- 7b. IEEE-488 remote interface
- 8a. 10 MHz internal or external clock with "U" loop for internal use, specify B for BNC or S for SMA connectors
- 8b. 5 or 10 MHz external input, with auto switchover to internal clock, specify B for BNC or S for SMA connectors; 5 for 5 MHz or 10 for 10 MHz
- 8c. 10 MHz external clock input only, specify B for BNC or S for SMA connectors

Dual and Triband Converters

2 Band coverage

UP	DOWN
C 5.845-6.425 GHz	3.400-4.200 GHz
Ku 14.00-14.50 GHz	10.95-12.75 GHz

3 Band coverage

UP	DOWN
C 5.850-6.425 GHz	3.600-4.200 GHz
X 7.900-8.400 GHz	7.250-7.750 GHz
Ku 14.00-14.50 GHz	10.95-12.75 GHz

- 1 rack unit (1.75" high)/ 21 lbs.
- Fully agile in 1 kHz steps
- Smaller vertical mount units available

Redundancy/Protection Switches

Two types of protection switches are offered:

The RS Series switches are compact 1 RU units that ensure continuous operation while a converter fault is repaired or routine maintenance is performed without disruption of signal transmission. Configurations include 1:1, dual 1:1, 1:2, 1:3 and 1:4. The 1:2 switch can be expanded at a later time by adding the 1:4 expander chassis.

The *STARswitch™* is the latest in high performance low cost switches that conserves rack space and has an improved MTBF. Each *STARswitch™* occupies 1 rack space for up to a 1:4, and 2 rack spaces for up to 1:8.



Test Loop Translators

- C, Ku, and X Band available
- 21 dB min. return losses
- 30 dB attenuation range
- 0.1 dB attenuation resolution
- Conversion loss 20 dB nom.
- 0 dBm third order Intercept
- One rack unit high
- Standard 10 MHz high stability reference.
- Optional rear panel RF in /RF out
- Multiple LO's available



Test Loop Translator



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