

Ultra-Broadband 0.5 to 40 GHz Downconverter Systems

**Patented 1/3 RU
Space Saving
Configuration!**

Available Only From MITEQ



DC-0.5/40H System



DC-0.5/40G System

This unique design allows expansion of up to two additional 1/3 RU modules in the same rack space. Select from MITEQ's full range of 1/3 RU, SATCOM high performance modules:

- Fiber Optic Transmitter
- Fiber Optic Receiver
- Redundant Switchover Unit
- Low Noise Wideband Amplifiers

Both the DC-0.5/40G or H systems are ultra-broadband downconverter configurations offering precise, high frequency resolution of 2 Hz step size over the entire 0.5 to 40 GHz RF frequency range. The new H series saves considerable space over the G version without compromising performance.

The DC-0.5/40G system is composed of the DC-0.5/20G (2RU) and the DC-20/40G (1RU) downconverters. Together the two units provide continuous, seamless coverage from 500 MHz to 40 GHz and operate as one integrated unit.

The DC-0.5/40H system is a patented space saving, ultra-broadband downconverter configuration composed of the DC-0.5/20H and the DC-20/40H downconverter. The DC-0.5/20H is a 1RU high, standard rack width and the DC-20/40H is only 1/3 of a standard rack width. Together the total rack space used is only 1-1/3 RU. These two units provide continuous, seamless coverage from 500 MHz to 40 GHz and operate as one integrated unit.

The DC-0.5/40G and DC-0.5/40H both provide one selectable IF output of either 70, 140 or 160 MHz and one L-band output at 1200 MHz. The frequency conversion sense of both the outputs can be independently programmed as inverted or noninverted. Independent gain programming range of 42 dB in 1 dB steps is provided for both outputs. The superb phase noise makes this system ideal for most applications including the stringent requirements of high order QAM. All system parameters are locally programmable via the front panel keypad or remotely programmable via RS422/RS485/RS232 and an Ethernet interface.

System Features

- 2 Hz tuning resolution
- Excellent phase noise
- 1200 ±250 MHz L-band output
- Selectable IF output of 70 MHz, 140 MHz, and 160 MHz
- Gain range of 42 dB adjustable in 1 dB steps
- Independent conversion gain and sense programming of IF and L-band outputs
- Noise figure 15 dB typical
- Output IP³ +25 dBm minimum
- Local programming via full keypad entry
- Ethernet programmable for remote operation

Options

- Built in self-test and diagnostic features
- Combination of up to eight different bandwidth IF filters centered at 70, 140 and 160 MHz
- Programmable 30 dB in 10 dB steps front end attenuator for high power input signals

Outdoor configurations are available, please contact MITEQ.

Specifications	DC-0.5/40G: 3 RU	DC-0.5/40H: Space Saving
Input characteristics		
Input frequency	0.5–40 GHz	
Level	to -35 dBm maximum operational	
Impedance	50 ohms, reference	
Input VSWR	2.5:1 maximum	
Noise figure	15 dB typical, 18 dB maximum at maximum gain	
Output characteristics		
IF output (selectable from these IF bands)		
IF center frequency	70 MHz	
3 dB bandwidth	±20 MHz minimum	
Gain flatness	±0.4 dB typical, ±0.8 dB maximum	
IF center frequency	140 MHz	
3 dB bandwidth	±40 MHz minimum	
Gain flatness	±0.6 dB typical, ±1.2 dB maximum	
IF center frequency	160 MHz	
3 dB bandwidth	±40 MHz minimum	
Gain flatness	±0.8 dB typical, ±1.2 dB maximum	
L-band output	1200 MHz	
3 dB bandwidth	±250 MHz minimum	
Gain flatness	±0.9 dB typical, ±1.6 dB maximum, 0.5 to 20 GHz ±1.2 dB typical, ±2.4 dB maximum, 20 to 40 GHz	
Impedance	50 ohms, reference	
Output VSWR	2:1 maximum	
Signal monitor	-20 dBc nominal	
Transfer characteristics		
Conversion sense programming	Inverted or noninverted, selectable	
Fine tuning step size	2 Hz nominal	
Tuning speed	<100 ms	
Gain programming range		
L-band and IF outputs	42 dB minimum	
Programming resolution	1 dB nominal	
Level stability	< ±0.5 dB/day maximum at constant temperature	
Image rejection	65 dB typical, 60 dB minimum, 0.5 to 20 GHz, 55 dB typical, 50 dB minimum, 20 to 40 GHz	
LO leakage at input	-70 dBm maximum	
Group delay variations	3 ns p-p, typical over 80% of 3 dB bandwidth, 6 ns p-p, maximum over 80% of 3 dB bandwidth (does not include group delay of the IF switchable filters)	
Third order intercept (output)	+25 dBm minimum at maximum gain	
Spurious outputs		
Spurious-free dynamic range	>60 dBc, 8 to 20 GHz, 55 dBc typical, 50 dBc minimum, 0.5 to 8 and 20 to 40 GHz	
LO spurious rejection	-70 dBm typical, -65 dBm maximum	
Independent spurs at 20 dB gain	>60 dBc 0.5 to 20 GHz, >55 dBc 20 to 40 GHz	
Frequency stability	±2 x 10 ⁻⁸ , 0 to 50°C fixed temperature after 24 hours power-on	
Frequency reference		
10 MHz reference	Internal, external or auto selectable	
External reference input	10 MHz, 0 dBm ±2 dBm	
Internal reference output	10 MHz, 0 dBm ±2 dBm	
Phase noise	Offset from carrier	dBc/Hz (typ.)
	100 Hz	-62 dBc
	1 kHz	-87 dBc
	10 kHz	-95 dBc
	100 kHz	-102 dBc
	1000 kHz	-122 dBc

Specifications are subject to options selected.

Ultra-Broadband 0.5 to 40 GHz Downconverter Systems

Specifications	DC-0.5/40G: 3 RU	DC-0.5/40H: Space Saving
Physical		
Overall rack space	3 RU	1 and 1/3 RU
Overall system dimensions	19" [482.6mm] x 5.25" [133.35mm] x 22" [558.8mm]	19" [482.6mm] x 3.5" [88.9mm] x 22" [558.8mm]
Overall base system weight	52 lbs. (23.6 kg) nominal	
Rear panel connectors:		
RF in	2.92 mm female	
L-band output	SMA female	
IF	BNC female	
IF signal monitor	BNC female	
Remote interface	DEM-9S for RS422/485/232	
Summary alarm	DE-25P	
External reference input	BNC female	
Reference output	BNC female	
Ethernet	RJ45	
System includes:		
Interface cables	Includes all system and ordered option cables	
Power cables	Includes all system and ordered option cables	
1/3 rack mount frame	N/A	1 three slot Model: OL-TR3-20 <i>2 open slots will accept 2 additional MITEQ 1/3 rack mount units (see additional system configuration options)</i>

General Specifications

Local Control

DC-0.5/40G
 DC-0.5/40H Via front panel keypad and LCD display
 Programmable settings Stored in nonvolatile memory

Local Alarms Power supply status,
 LO lock status,
 Fan failure,
 Programmable temperature warning,
 Programmable over temperature trip point

Remote Interface RS422, RS485 and RS232, Ethernet programming

Primary Power Requirements

Voltage 90–250 VAC
 Frequency 47–63 Hz
 Power consumption..... 148 W typical, after warm up

Environmental

Operating
 Temperature..... 0 to 50°C
 Full compliance temperature range 10 to 40°C
 Relative humidity Up to 95% at 30°C, noncondensing
 Atmospheric pressure..... Up to 10,000 feet (40,000 feet optional) above sea level
 Nonoperating
 Temperature..... -30 to +70°C
 Relative humidity Up to 95% at 40°C, noncondensing
 Atmospheric pressure..... Up to 40,000 feet above sea level
 Shock and vibration Rough handling/nominal shipment shock and vibration

Options

DC-0.5/40G System Options

- DCG1.** Up to six switchable IF filters at 70, 140 or 160 MHz available.
 - DCG1A.** Up to two additional filters. Refer to "Filter Selection Chart" below to specify additional filters.
 - DCG1B.** Up to six additional filters. Refer to "Filter Selection Chart" below to specify additional filters.
- DCG2.** Programmable front end 30 dB attenuator for high power input signals selectable in 10 dB steps (RF input up to -5 dBm).
- DCG4.** DCBIT (Built in Test): Built in microwave self-test. Self test frequencies 0.5 to 20 GHz.
- DCG7.** Memory sanitization option.

DC-0.5/40H System Options

- DCH1.** Up to six switchable IF filters at 70, 140 or 160 MHz available.
 - DCH1A.** Up to two additional filters. Refer to "Filter Selection Chart" below to specify additional filters.
 - DCH1B.** Up to six additional filters. Refer to "Filter Selection Chart" below to specify additional filters.
- DCH2.** Programmable front end 30 dB attenuator for high power input signals. Programmable in 10 dB steps (RF input up to -5 dBm).
- DCH3.** Input 500 MHz to 40 GHz LNA. Occupies one open 1/3 RU slot.
- DCH4.** DCBIT (Built in Test): Built in microwave self-test. Self-test frequencies 0.5 to 20 GHz.
- DCH5.** Redundant switchover.
 - Note:** Total redundant system height is 3 RU when used in a redundant configuration of two DC-0.5/40H systems and one 1/3 RU redundant switchover unit.
- DCH7.** Memory Sanitization Option.
- DCH8.** Fiber Optic Interface.
 - DCH8A.** Front End Fiber Optic Receiver. Occupies one open 1/3 RU slot. Please consult factory for details.
 - DCH8B.** Output Fiber Optic Transmitter. Occupies one open 1/3 RU slot. Please consult factory for details.

Note: DC-0.5/40H system can accommodate up to 2 additional 1/3 RU expansion units (standard) without adding additional rack height. Additional 1/3 1RU slots may be added by ordering Rack Mount Frame OL-TR3-20.

Filter Selection Chart (Options DCG1/DCH1)

Select the letter code from the following table of available IF filter bandwidth to form part number with this option (see sample part number below).

Code	Bandwidth (MHz)	70 MHz	140 MHz	160 MHz
A	0.25		X	
B	0.50		X	
C	2.5		X	
D	5.0		X	
E	8.0		X	
F	20.0	X		X
G	24.0		X	
H	40.0	STD	X	
J	80.0		STD	STD

STD = Included in standard model; X = Available optional bandwidths for corresponding IF frequencies.

Ordering Information

Specify system by its model number. Example of a full model number:
DC-0.5/40G-DCG1B-70F140ABCD160F-DCG2-DCG4

This means base system DC-0.5/40G features Option DCG1B with IF Filter Bandwidth F available at 70 MHz and 160 MHz, and IF Filter Bandwidths A, B, C, and D available at 140 MHz (in addition to the IF Filter Bandwidths included in the base system.) The system also features Options DCG2 and DCG4 as described above.



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