



DC SERIES

DC-0.8/18-70/140/160
DC-0.5/20-70/140/160-SP

HIGH PERFORMANCE ULTRA-BROADBAND DOWNCONVERTERS



FEATURES

- 0.5 to 20 GHz RF input
- 2 Hz tuning resolution
- Very low phase noise
- 1200 \pm 250 MHz L-band output
- 70 \pm 20 MHz, 140 \pm 40 MHz and 160 \pm 40 MHz selectable IF output
- Independent 42 dB gain programming in 1 dB steps of L-band and IF outputs
- Independent conversion sense programming of IF and L-band outputs
- Output IP³ > 25 dBm
- Remote/local programming via full keypad entry

The DC-0.8/18-70/140/160 and DC-0.5/20-70/140/160-SP are very high performance ultra-broadband 2 Hz step agile downconverters. These downconverters accept RF signals from 0.8–18 GHz and 0.5–20 GHz, respectively, and 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 all the outputs can be independently programmed as inverted or noninverted. Independent gain programming of 42 dB in 1 dB steps is provided for the 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. Front panel rotary knob programming is available for the DC-0.5/20-70/140/160-SP.

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 1 dB steps front end attenuator for high power input signals
- Ethernet programming

SPECIFICATIONS

INPUT CHARACTERISTICS

| | |
|------------------------------|---------------|
| Frequency band | |
| DC-0.8/18-70/140/160..... | 0.8–18 GHz |
| DC-0.5/20-70/140/160-SP..... | 0.5–20 GHz |
| Impedance..... | 50 ohms |
| Input VSWR | 2.5:1 maximum |

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, ±0.6 dB maximum |
| IF center frequency | 140 MHz |
| 3 dB bandwidth..... | ±40 MHz minimum |
| Gain flatness..... | ±0.6 dB typical, ±0.8 dB maximum |
| IF center frequency | 160 MHz |
| 3 dB bandwidth..... | ±40 MHz minimum |
| Gain flatness..... | ±0.6 dB typical, ±0.8 dB maximum |
| L-band output | |
| L-band center frequency..... | 1200 MHz |
| 3 dB bandwidth..... | ±250 MHz minimum |
| Gain flatness..... | ±0.9 dB typical, ±1.2 dB maximum |
| Impedance..... | 50 ohms |
| VSWR..... | 2:1 maximum |
| Signal monitor | -20 dBc nominal |
| Frequency inversion for all IF and L-band | Standard |

TRANSFER CHARACTERISTICS

| | |
|------------------------------------|---|
| Conversion sense programming | Inverted or noninverted |
| Fine tuning step size | 2 Hz |
| Tuning speed..... | < 100 ms |
| Gain (L-band and IF outputs)..... | 42 dB |
| Gain programming range | 42 dB |
| Programming resolution | 1 dB |
| Level stability..... | < ±0.5 dB/day maximum at constant temperature |
| Image rejection..... | 60 dB minimum |
| LO leakage at input..... | -90 dBm maximum |
| Noise figure | 15 dB 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 equalized filters) |
| IP ³ (output)..... | 20 dBm minimum |

SPURIOUS OUTPUTS

| | |
|-----------------------------------|--|
| Spurious-free dynamic range | 60 dB |
| LO spurious rejection | -55 dBm |
| Independent spurs | > 60 dB |
| Frequency stability | ±2 x 10 ⁻⁸ , 0 to 50°C fixed temperature after 24 hours power-on |

FREQUENCY REFERENCE

| | |
|-------------------------------|---------------------------------------|
| Reference LO..... | Internal, external or auto selectable |
| External reference input..... | 10 MHz, 0 dBm ±2 dBm |

SPECIFICATIONS (CONT.)

| | | |
|--------------------------------|----------------------------|----------------------|
| Internal reference output..... | 10 MHz, 0 dBm, ± 2 dBm | |
| Phase noise | <u>Offset from carrier</u> | <u>dBc/Hz (typ.)</u> |
| | 100 Hz | -68 dBc |
| | 1 kHz | -90 dBc |
| | 10 kHz | -96 dBc |
| | 100 kHz | -104 dBc |
| | 1000 kHz | -125 dBc |

LOCAL CONTROL

| | |
|------------------------------|---|
| DC-0.8/18-70/140/160..... | Via front panel keypad and LCD display |
| DC-0.5/20-70/140/160-SP..... | Via front panel keypad, LCD display and continuous-turn rotary control with self-contained push button selection switch |
| Programmable settings | Stored in nonvolatile memory |

LOCAL ALARMS

Power supply status
Three LO lock status
Fan failure
Programmable temperature warning
Programmable over temperature trip point

REMOTE INTERFACE RS422, RS485 and RS232, internet programming (optional)

REAR PANEL CONNECTORS

| | |
|-------------------------------|-----------------------------------|
| RF..... | SMA female |
| IF | BNC female |
| IF signal monitor..... | BNC female |
| Remote interface..... | DEM-9S for RS422, RS485 and RS232 |
| Summary alarm..... | DE-9P |
| External reference input..... | BNC female |
| Reference output..... | BNC female |
| Ethernet..... | RJ45 |

NOTE: Rear panel I/O mechanically protected.

OPTIONS

- DC1.** Up to eight switchable IF filters at 70, 140 or 160 MHz in any combination (consult factory for available filter bandwidths).
- DC2.** Programmable front end 30 dB attenuator for high power input signals.
- DC3.** Internet Programming
 - 10/100 mB 10base T interface
 - Web-browser-based configuration
 - SNMP 1.0 configuration
 - Alarm reporting via SNMP Trap
 - Telnet access
 - Password protection
- DC4.** DCBIT (Built in Test): Full frequency range sensitivity from noise to 50 dB above noise gain range (standard on DC-0.5/20-70/140/160-SP).
- DC5.** All system parameters programmable via continuous-turn rotary control with self-contained push button selection switch (standard on DC-0.5/20-70/140/160-SP).

HIGH PERFORMANCE ULTRA-BROADBAND DOWNCONVERTERS

PRIMARY POWER REQUIREMENTS

Voltage 95–260 VAC
Frequency 47–63 Hz

PHYSICAL

Weight 33.1 pounds (15 kg) nominal
Overall dimensions 19" x 3.5" (2RU) x 22" (48.3 cm x 8.98 cm x 55.9 cm) maximum

ENVIRONMENTAL

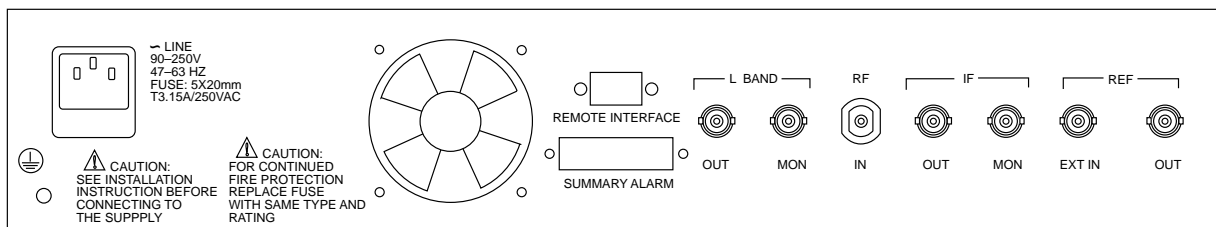
Operating

Ambient temperature 0 to 50°C (consult factory for other temperature ranges)
Relative humidity Up to 95% at 30°C, noncondensing
Atmospheric pressure Up to 10,000 feet (40,000 feet optional)

Nonoperating

Ambient temperature -30 to +70°C
Relative humidity Up to 95% at 40°C, noncondensing
Atmospheric pressure Up to 40,000 feet
Shock and vibration Rough handling

REAR PANEL VIEW



For additional information and technical assistance,
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