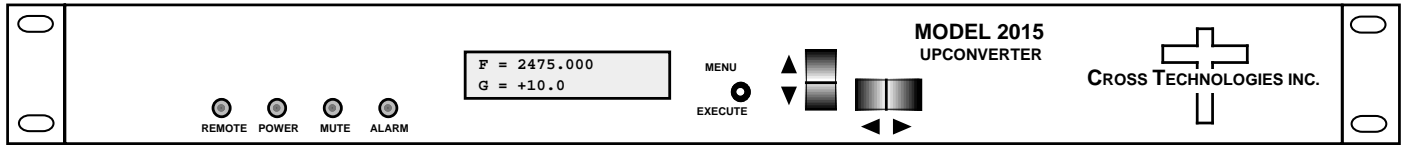


2015-25 Upconverter, 70 MHz to 2.0 - 2.5 GHz

The 2015-25 S-band Upconverter converts 70 ± 18 MHz to 2000 to 2500 MHz in 1 MHz steps (**0.5 MHz to 1 kHz step options available**) with low group delay and flat frequency response. Synthesized local oscillators (LO) provide frequency selection. Push button switches select the RF frequency, gain, and other parameters. Front panel LEDs provide indication of DC power (green), PLL alarm (red), remote operation (yellow) or the TX carrier is muted (yellow). Variable attenuators for the IF input and output provide a gain range of -10 to +30 dB as adjusted by the front panel push-button switches. Remote operation allows selection of frequency and gain. Parameter selection and frequency and gain settings appear on the LCD display. Connectors are BNC female for RF, IF and the optional external reference input and output. The **-E external 10 MHz option** includes a 10 MHz output connector which contains either the internal or external 10 MHz reference signal. A **-H high stability** (±0.01ppm) option is also available. The unit is powered by a 100-240 ±10% VAC power supply, and housed in a 1 3/4" X 19" X 16" rack mount chassis.



Front Panel

EQUIPMENT SPECIFICATIONS*

Input Characteristics (IF)

Impedance / Return Loss 75Ω / 18dB
Frequency 70 ± 18 MHz
Input Level Range -40 to -10 dBm

Output Characteristics (RF)

Impedance / Return Loss 50Ω / 12dB
Frequency 2.0 to 2.5 GHz
Output level -20 to 0 dBm
Output 1 dB compression +5 dBm

Channel Characteristics

Gain range (adjustable) -10 to +30 dB
Image Rejection > 50 dB, min.
Frequency Response ±1.5 dB, 2.0-2.5 GHz ; ± 0.5 dB, 36 MHz BW
Spurious Response < -50 dBc, in band
Group Delay, max **0.015 ns/MHz²** parabolic; **0.05 ns/MHz** linear; 1 ns ripple
Frequency Sense Non-inverting

Synthesizer Characteristics

Frequency Accuracy ± 1.0 ppm internal reference (±0.01 ppm, option H)
Frequency Step 1.0 MHz (**0.5 MHz to 1 kHz step options available**)
10 MHz In/Out Level 3 dBm ± 3 dB (option -E)

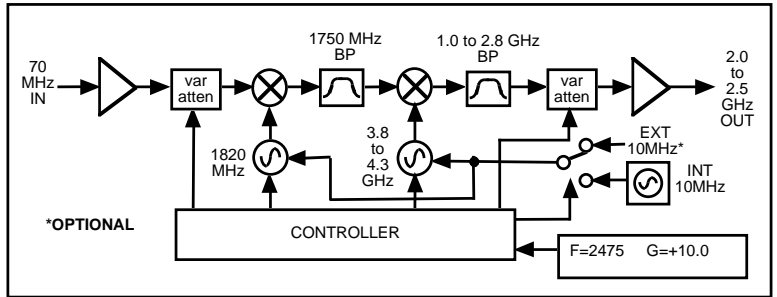
Phase Noise @ F (Hz) >	10	100	1K	10K	100K	1M
dBc/Hz	-55	-70	-70	-80	-95	-105

Controls, Indicators

Freq/Gain Selection direct readout LCD; manual or remote selection
Pwr; Alarm; Rem; Mute Green LED; Red LED; Yellow LED; Yellow LED
Remote RS232C, 9600 baud (**RS485, Ethernet Optional**)

Other

RF, IF Connectors 50Ω BNC (female), 75Ω BNC (female)
10 MHz Connectors BNC (female), **75Ω, works with 50 or 75 ohms** (option E)
Alarm/Remote Connector DB9 (female) - NO or NC contact closure on Alarm
Size 19 inch, 1RU standard chassis 1.75" high X 16.0" deep
Power 100-240 ±10% VAC, 47-63 Hz, 45 W max. (**24 and 48 VDC Optional**)



Block Diagram

Available Options

E - External 10 MHz ref input & output
H - High Stability (±0.01ppm) Internal Ref
Z5 - Attenuator 0.5 dB ± 0.5 dB Steps
-5 - 0.5 MHz Frequency Steps
X - 125 kHz step size
X1004 - 1 kHz step, includes option -H

Comm. Interface/Standard RS232

Q - RS485 Remote Interface
W8 - Ethernet; w/Web Browser (WB)
W18 - Ethernet; w/WB & SNMP
W28 - Ethernet; w/TCP/IP, Telnet

Connectors/Impedance

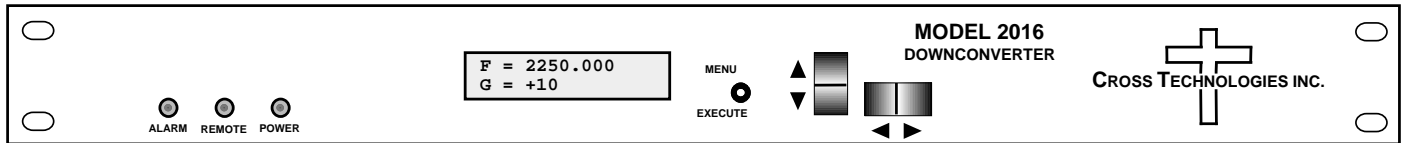
B - 75Ω BNC (RF), 75Ω BNC (IF)
D - 50Ω BNC (RF), 50Ω BNC (IF)
N - 50Ω N-type (RF), 75Ω BNC (IF)
M - 50Ω N-type (RF), 50Ω BNC (IF)
SS - 50Ω SMA (RF), 50Ω SMA (IF)

Contact Cross for other available options

*10°C to 40°C; Specifications subject to change without notice

2016-25 Downconverter, 2.0 - 2.5 GHz to 70 MHz

The 2016-25 Downconverter converts 2000 to 2500 MHz to 70 ± 18 MHz in 1 MHz step (**0.5 MHz to 1 kHz step options available**) with low group delay and flat frequency response. Synthesized local oscillators (LO) provide frequency selection. Push button switches select the RF frequency, gain, and other parameters. Front panel LEDs provide indication of DC power (green), remote operation (yellow), and PLL alarm (red). Variable attenuators for the RF input provide a gain range of 0 to +50 dB as adjusted by the front panel pushbutton switches. Remote operation allows selection of frequency and gain. Parameter selection and frequency and gain settings appear on the LCD display. Connectors are BNC female for RF, IF and the optional external reference input and output. The **-E external 10 MHz option** includes a 10 MHz output connector which contains either the internal or external 10 MHz reference signal. A **-H high stability (±0.01ppm)** option is also available. The unit is powered by a 100-240 ±10% VAC power supply, and housed in a 1 3/4" X 19" X 16" rack mount chassis. .



Front Panel

EQUIPMENT SPECIFICATIONS*

Input Characteristics (RF)

Impedance/Return Loss 50Ω / 12 dB
Frequency 2.0 to 2.5 GHz
Noise Figure, max. 15 dB (max gain)
Level Range -70 to -20 dBm

Output Characteristics (IF)

Impedance/Return Loss 75Ω / 18 dB
Frequency 70 ± 18 MHz
Level Range -30 to -20 dBm
Output 1 dB compression -15 dBm

Channel Characteristics

Gain range (adjustable) 0.0 to +50.0 dB
Image Rejection > 50 dB, min.
Frequency Response ±1.5 dB, 2.0 - 2.5 GHz; ± 0.5 dB, 36 MHz BW
Spurious Response < -45 dBc, in band
Group Delay, max **0.015 ns/MHz parabolic; 0.05 ns/MHz linear; 1 ns ripple**
Frequency Sense Inverting or Non-inverting (selectable)

Synthesizer Characteristics

Frequency Accuracy ±1.0 ppm internal reference (±0.01 ppm, **option H**)
Frequency Step 1.0 MHz (**0.5 MHz to 1 kHz step options available**)
10 MHz In/Out Level +3 dBm ± 3 dB (**option E**)

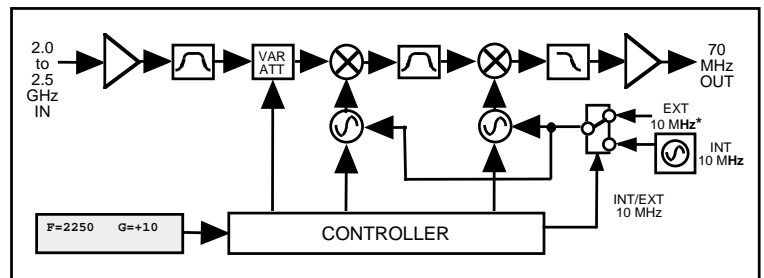
Phase Noise @ F (Hz) >	10	100	1K	10K	100K	1M
dBc/Hz	-55	-70	-70	-80	-95	-105

Controls, Indicators

Freq/Gain Selection direct readout LCD; manual or remote selection
Pwr; Alarm; Rem; Mute Green LED; Red LED; Yellow LED; Red LED
Remote RS232C, 9600 baud (**RS485, Ethernet Optional**)

Other

RF, IF Connectors 50Ω BNC (female), 75Ω BNC (female)
10MHz Connectors BNC (female), **75Ω, works with 50 or 75 ohms** (option E)
Alarm/Remote Connector DB9 (female) - NO or NC contact closure on Alarm
Size 19 inch, 1RU standard chassis 1.75" high X 16.0" deep
Power 100-240 ± 10% VAC, 47-63 Hz, 45 Watts max. (**24 and 48 VDC Optional**)



Block Diagram

Available Options

E - External 10 MHz ref input & output
H - High Stability (±0.01ppm) Internal Ref
-5 - 0.5 MHz Frequency Steps
X - 125 kHz step size
X1004 - 1 kHz step, includes option -H

Comm. Interface/Standard RS232

Q - RS485 Remote Interface
W8 - Ethernet; w/Web Browser (WB)
W18 - Ethernet; w/WB & SNMP
W28 - Ethernet; w/TCP/IP, Telnet

Connectors/Impedance

B - 75Ω BNC (RF), 75Ω BNC (IF)
D - 50Ω BNC (RF), 50Ω BNC (IF)
N - 50Ω N-type (RF), 75Ω BNC (IF)
M - 50Ω N-type (RF), 50Ω BNC (IF)
Contact Cross for other available options

*10°C to 40°C; Specifications subject to change without notice