**L-BAND FREQUENCY CONVERTER**

Satellite communications, earth observation, navigation and positioning and control stations

**Specifications and Options**

**Back version (rack and system)**
- **RF to IF**
  - **Up converter**
    - IF signal input
  - **Down converter**
    - Optional: 10 MHz reference and DC (Imax: 2 A)

**L-band**
- **Tx Up converter**
  - L-band signal output
  - Optional: 10 MHz reference and DC (Imax: 1 A)
- **Rx Down converter**
  - L-band signal input
  - Optional: +10 MHz reference and DC (Imax: 2 A)

**OEM version**
- SMA female

**Rack version**
- N female (other optional)

**Radiofrequency Interfaces**

**Signals**
- **RF to IF**
  - Up converter IF signal input
  - Optional: 10 MHz reference and DC (Imax: 2 A)

**Attenuation**
- **SMA female**
  - Switchable, 0 to 31 dB (1 dB step)

**Monitoring and Control Options**
- RS232, Ethernet

**Human-machine Interface (HMI)**
- **Display**
  - VFD 2x40
- **Keypad**
  - 15-key
- **LEDs**
  - Power

**RF Bandwidth**
- 20/40/80 MHz

**Options**
- **Connectors**
  - SMA female
  - Rack version (other optional)
L-BAND FREQUENCY CONVERTER

Introduction

The 70L500 up- and down-converter is a convenient cost-effective solution with professional-level performance for those systems requiring a 70 or 140 MHz to L-band interface. The independently synthesized up and down converter employ a dual-stage conversion design, providing high-performance over a full 500 MHz bandwidth.

Additionally, the up- and down-converter can feed DC power and a 10 MHz reference out to the transmit and receive ports to supply either a phase-locked BUC or LNB. The 70L500 can be combined with most standard solid state power amplifiers, BUC or LNB, providing a high-performance, cost-effective transceiver solution for a wide variety of communications systems.

This high performance converter is the most effective solution at a low cost.

Key Features

- Independent up and down converter integrated in a compact module
- High-performance dual-stage synthesized converters
- DC power and 10 MHz reference capability
- Synthesizer locking state monitoring
- Two basic configurations available: OEM version with only the basic module, Standard 19 inch rack version including power supply, internal 10 MHz reference, and interface for monitoring and control

Up and down converter specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversion gain</td>
<td>4.5 ± 2 dB</td>
</tr>
<tr>
<td>Gain stability</td>
<td>1 dBpp (-10 to +50 °C)</td>
</tr>
<tr>
<td>Gain flatness (IF bandwidth)</td>
<td>1.5 dBpp</td>
</tr>
<tr>
<td>Gain flatness (L-band bandwidth)</td>
<td>1 dBpp</td>
</tr>
<tr>
<td>Output power @ P1dB</td>
<td>+7 dBm</td>
</tr>
<tr>
<td>Output spurious @ 0 dBm output</td>
<td>-70 dBc</td>
</tr>
<tr>
<td>Image frequency rejection</td>
<td>&gt;70 dB</td>
</tr>
</tbody>
</table>

L-band frequency converter solutions

The L-band frequency converter is available in two basic configurations:

**OEM version**
- Single module design
- Reduced dimensions and easy integration in compact VSAT terminals
- I2C control bus adaptable to any standard interfaces
- External 10 MHz frequency reference and DC power supply for ODU usage

**Standard 19 inch rack version**
- 1RU which integrates:
  - The frequency converter module
  - An internal 10 MHz frequency reference
  - The power supply
  - Human-machine interface

Monitoring and control

<table>
<thead>
<tr>
<th>Monitoring and control parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up and down converter specifications</td>
<td></td>
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<td>Monitoring and control</td>
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<td>Monitoring parameters</td>
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<tr>
<td>Control parameters</td>
<td></td>
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<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tx/Rx</td>
<td>Monitoring of transmit and receive frequency</td>
</tr>
<tr>
<td>Spurious</td>
<td>Up and down converter spurious output (over 1 kHz lower)</td>
</tr>
<tr>
<td>Gain</td>
<td>Down converter output and input frequency</td>
</tr>
<tr>
<td>Spectrum</td>
<td>Down converter spectrum at same (over 1 kHz lower)</td>
</tr>
</tbody>
</table>
L-BAND FREQUENCY CONVERTER

Key Features
- Independent up and down converter integrated in a compact module
- High-performance dual-stage synthesized conversions
- Cost-effective solution for working with standard LNBs and BUCs in VSAT applications
- Programmable functions:
  - IF frequencies (70/140 MHz)
  - L-band frequencies (950 to 1450 MHz)
  - Spectrum sense (inverting/non-inverting)
  - Tx power supply (on/off)
  - Synthesizers locking state monitoring
  - Two basic configurations available:
    - OER version with only the basic module
    - Standard 19 inch rack version including power supply and internal 10 MHz frequency reference
- Temperature compensated
- Options:
  - IF Bandwidth 20/40/80 MHz
  - DC voltage and 10 MHz reference for IDU or ODU configuration
  - Gain adjust with step attenuator
- Two basic configurations available:
  - OEM version with only the basic module
  - Standard 19 inch rack version including power supply and internal 10 MHz frequency reference

Introduction
The 70L500 up- and down-converter is a convenient cost-effective solution with professional-level performance for those systems requiring a 70 or 140 MHz to L-band interface. The independently synthesized up and down converters apply a dual-stage conversion design, providing high performance over a full 500 MHz bandwidth.

Additionally, the up- and down-conversions can feed DC power and a 10 MHz reference out to the transmit and receive ports to supply either a phase-locked BUC or LNB.

The 70L500 can be combined with most standard solid state power amplifiers, BUC or LNB, providing a high-performance, cost-effective transceiver solution for a wide variety of communications systems.

This high performance converter is the most effective solution at a low cost

L-band frequency converter solutions

The L-band frequency converter is presented in two basic configurations:

- OEM version: up and down frequency converter in a single module
- Reduced dimensions and easy integration in compact VSAT terminals
- I2C control bus adaptable to any standard interfaces
- External 10 MHz frequency reference and DC power supply for ODU usage

- Standard 19 inch rack version: up and down frequency converter in a 1RU module
- An internal 10 MHz frequency reference
- The power supply
- Human-machine interface
- Gain adjust
- RS-232/Ethernet monitoring and control

IF frequency
- 70/140 MHz
L-band frequency range
- 950 to 1450 MHz
IF signal bandwidth (at -1dB)
- 20/40 MHz
Conversion gain
- 4.5 ± 2 dB
Gain stability
- 1 dBpp (-10 to +50 ºC)
Gain flatness (IF bandwidth)
- 1.5 dBpp
Gain flatness (L-band bandwidth)
- 1 dBpp
Output power @ P1dB
- +7 dBm
Output spurious @ 0 dBm output
- -70 dBc
Image frequency rejection
- >70 dB

Monitoring and control
- Monitoring and control signals:
  - Up converter input and output frequency
  - Up converter spectrum sense (power/automatic power) or Tx/Rx
  - Down converter input and output frequency
- Down converter spectrum sense (power/automatic power) or Tx/Rx

Up converter specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
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<tbody>
<tr>
<td>Conversion gain</td>
<td>25 ± 2 dB</td>
</tr>
<tr>
<td>Gain flatness (IF bandwidth)</td>
<td>1.5 dBpp</td>
</tr>
<tr>
<td>Gain flatness (L-band bandwidth)</td>
<td>1.5 dBpp</td>
</tr>
<tr>
<td>Output power @ P1dB</td>
<td>+7 dBm</td>
</tr>
<tr>
<td>Output spurious @ -5 dBm output</td>
<td>-65 dBc</td>
</tr>
<tr>
<td>Image frequency rejection</td>
<td>&gt;70 dB</td>
</tr>
</tbody>
</table>

Down converter specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Conversion gain</td>
<td>4.5 ± 2 dB</td>
</tr>
<tr>
<td>Gain stability</td>
<td>1 dBpp (-10 to +50 ºC)</td>
</tr>
<tr>
<td>Gain flatness</td>
<td>1.5 dBpp</td>
</tr>
<tr>
<td>Output power</td>
<td>+7 dBm</td>
</tr>
<tr>
<td>Output spurious</td>
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L-BAND CONVERTER
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Key features
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- High performance dual-stage synthesized conversions
- Cost effective solution for working with standard LNBs and BUCs in VSAT applications
- Programmable functions:
  - IF frequencies (70/140 MHz)
  - L-band frequencies (950 to 1450 MHz)
  - Spectrum sense (inverting/non-inverting)
  - Tx power supply output (on/off)
- Synthesizers locking state monitoring
- Two basic configurations available
- On power-up the basic module
- Standard 10 inch rack version including a DC power supply and 10 MHz frequency reference
- Temperature compensated
- Options:
  - IF Bandwidth 20/40/80 MHz
  - DC voltage and 10 MHz reference for IDU or ODU configuration
  - Gain adjust with step attenuator

L-band frequency converter solutions
This high performance converter is the most effective solution at a low cost.

Up and down converter specifications
- IF frequency
- 70/140 MHz
- L-band frequency range
- 950 to 1450 MHz
- IF output bandwidth (p-p @ 1 MHz)
- 20/40 MHz
- IF output power
- +7 dBm
- IF conversion gain
- 25 ± 2 dB
- IF gain flatness (IF bandwidth)
- 1.5 dBpp
- IF gain flatness (L-band bandwidth)
- 1.5 dBpp
- Output power @ P1dB
- +7 dBm
- Output spurious @ 0 dBm output
- -70 dBc
- Image frequency rejection
- >70 dB
- Temperature compensated
- Options:
- Synthetic step size
- Temperature compensated
- DC voltage and 10 MHz reference for IDU or ODU configuration
- Gain adjust with step attenuator

Down converter specifications
- IF frequency
- 70/140 MHz
- L-band frequency
- 950 to 1450 MHz
- IF output bandwidth (p-p @ 1 MHz)
- 20/40 MHz
- IF output power
- +7 dBm
- IF conversion gain
- 4.5 ± 2 dB
- IF gain stability
- 1 dBpp (-10 to +50 ºC)
- IF gain flatness (IF bandwidth)
- 1.5 dBpp
- IF gain flatness (L-band bandwidth)
- 1 dBpp
- Output power @ P1dB
- +7 dBm
- Output spurious @ -5 dBm output
- -70 dBc
- Image frequency rejection
- >70 dB
- Monitoring and control
- Monitoring parameters
- IF frequency
- IF gain
- IF bandwidth
- IF output power
- IF output spurious

Monitoring and control
- Monitoring parameters
- IF frequency
- IF gain
- IF bandwidth
- IF output power
- IF output spurious
- Control parameters
- Tx control
- Up and down converter input and output frequency
- Up and down converter input and output power
- Up and down converter input and output spurious
- Down converter input and output frequency
- Down converter input and output power
- Down converter input and output spurious
## L-BAND FREQUENCY CONVERTER

Satellite communications, earth observation, navigation and positioning and control stations

### Technical Specifications

**Radiofrequency Interfaces**

<table>
<thead>
<tr>
<th>Signals</th>
<th>Connectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF T/R</td>
<td>DIN female - SMA male (other optional)</td>
</tr>
<tr>
<td>IF T/R</td>
<td>DIN female - SMA male (other optional)</td>
</tr>
<tr>
<td>IF T/R</td>
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<td>IF T/R</td>
<td>DIN female - SMA male (other optional)</td>
</tr>
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</table>

### Human-machine Interface (HMI)

- Display VFD 2x40
- Keypad 15-key
- LEDs Power

### IF Bandwidth

20/40/80 MHz

### Gain adjust option

Step attenuator 0 to 31 dB (1 dB step)

### Monitoring and Control Options

RS232, Ethernet

### Rack version specifications and options

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Radiofrequency interfaces

<table>
<thead>
<tr>
<th>Connectors</th>
<th>Signal output</th>
<th>Signal input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port 1</td>
<td>L-band signal output</td>
<td>L-band signal input</td>
</tr>
<tr>
<td>Port 2</td>
<td>Optional: 10 MHz reference and DC (Imax: 1 A)</td>
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</tr>
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Monitoring and Control Options

RS232, Ethernet

Human-machine interface (HMI)

Display VFD 2x40
Keypad 15-key
Leds Power

Gain adjust option
Step attenuator 0 to 31 dB (1 dB step)

Connectors

SMA female
N female (other options)

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