# C-Band Synthesized Frequency Up-Converter

***Single***
***FCS101***

## Standard Features

- **Built-in instrumentation RMS output detector**
- **Adjustable output power threshold alarms**
- Outperforms IESS 308/309 phase noise by 5dB
- Superior linearity
- 125 kHz step size
- 40dB attenuation control range
- On-site reference aging correction capability
- Intuitive front panel user interface
- RS232 terminal and RS485 packet mode remote interface
- 10 operating gain and frequency presets

## Operating Bands

| Model Number | RF Output | IF Frequency |
|---|---|---|
| ARUN-70CS-A | 5.850 – 6.425 GHz | 70 MHz (36 MHz BW) |
| ARUN-70CX-A | 5.850 – 6725 GHz | |
| ARUN-140CS-A | 5.850 – 6.425 GHz | 140 MHz (72 MHz BW) |
| ARUN-140CX-A | 5.850 – 6.725 GHz | |

## Overview

Converters from FCS101 series are packaged in a compact standard 1RU enclosure.

Their built-in instrumentation detector associated with discrete power thresholds alarms allows evolved system monitoring configurations.

The straightforward front panel operation, and RS232 terminal mode enables quick on-site setup

Offered remote management interfaces ensure complete flexibility of integration into existing or new installations. The user-friendly front panel or the RS485 remote interface will provide full set-up and fault monitoring facilities Ethernet option will allow the operator to pilot system operation either through SNMP or Web based interface.

Delivered spectral purity, low phase noise and stability exceed the requirements of all major international satellite network operators.

The system reference guaranteeing conversion function's accuracy can optionally be provided externally, internally as a highly stable temperature compensated oscillator, or with auto-detection capacity that will use internal reference only in the absence of an externally provided one.

## Application

The FCS101 range of converters operates in VSAT, SCPC Networks, DSNG/SNG, DVB-RCS and Hub systems. This makes them an ideal choice for large earth stations requiring cost effective solutions while maintaining equipment configuration flexibility. The lightweight and compact design makes the FCB100 converter as an ideal solution for mobile truck or flyaway DSNG systems. It's rugged construction can even meet the demands of military installations. The FCB100 range of converters provides an industry leading MTBF of over 120,000 hours.

## Options

- 1kHz step size
- 30dB maximum gain
- 75 ohms IF impedance
- Group Delay equalization
- Ethernet port with SNMP and Web interface
- Autosensing Internal /External Reference
- Input Monitor and Output Monitor
- 1:1 Redundant Ready
- 1:N Redundant Ready

## Redundancy

The FCS-100 converter series redundancy options allow their incorporation in redundant system from 1:1 up to 1:12. 1:1 redundancy is performed with an additional redundancy shelf for a system size of 3RU. Higher order redundancy operates through a redundancy controller shelf with the extra benefit of a single bus for complete system M&C. Given each Switch Panel can handle up to four (4) converter units; a complete 1:12 system requires a space of 17U.

## Associated documents

- 1:N Switch Controller for Frequency Converters
- 1:1 Redundancy for Frequency Converters

# C-Band Synthesized Frequency Up-Converter

## Technical Specifications

### Up-Converter

| IF Input | |
|---|---|
| Impedance | 50 Ω (75Ω *) |
| Input Connector | BNC (female) |
| Return loss | 18 dB |
| Input monitor coupling* | 20dB +/- 1dB |
| Input monitor connector* | BNC (female) |

| RF Output | |
|---|---|
| Output level | 0 dBm at P1dB |
| IMD3 (two tone) | -40 dBc max @ -10 dBm output |
| Output connector | Type N (female) |
| Connector Impedance | 50 Ω |
| Return loss | 18 dB |
| Output monitor coupling* | 24 +/- 1dB |
| Output monitor connector* | SMA (female) |
| Power detection range | -25 to +11dBm, +/-1dB |

| Transfer Characteristics | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency range | | (See table on front page) | | | | | |
| Conversion Gain | | 20 dB (30dB option) | | | | | |
| Gain adjustment | | 40 dB (0.1 dB step size) | | | | | |
| Gain flatness | | 1.2 dB p-p max. 36 MHz<br>1.8 dB p-p max. 72 MHz | | | | | |
| Gain stability | | ±0.25 dB max. /24 hours<br>±1 dB over temp. range | | | | | |
| Spurious | | < -55 dBc related @ -10 dBm output<br>< -60 dBm non-related | | | | | |
| Group delay | | 8 ns p-p typical | | | | | |
| Group delay equalization* | 36MHz | Linear 0.03 ns/MHz | | Parabolic 0.01 ns/MHz$^2$ | | Ripple 1 ns p-p | |
| | 72MHz | Linear 0.025 ns/MHz | | Parabolic 0.003 ns/MHz$^2$ | | Ripple 1 ns p-p | |
| Phase noise (dBc/Hz) | | 100Hz | 1kHz | 10kHz | 100kHz | | |
| | | -65 | -75 | -85 | -100 | | |
| Synthesizer step size | | 125k kHz (1kHz option) | | | | | |

| Reference | |
|---|---|
| External Reference | 10 MHz, +/- 5 dBm input level |
| Internal reference stability | ± 2 x $10^{-8}$ over 0°C to +50°C |
| Aging | ± 2 x $10^{-10}$ / day<br>± 5 x $10^{-8}$ / year |

| Mechanical | |
|---|---|
| Dimensions | Width 19" (482.6 mm) |
| | Height 1U 1.75" (44.5 mm) |
| | Depth 22" (558.8 mm) |

| Environmental | |
|---|---|
| Operational | 0°C to +50°C standard |
| Storage | -55°C to +85°C |
| Humidity | Non-condensing |
| Altitude | 3,000m AMSL |

| Power Supply | |
|---|---|
| Voltage | 90 – 265 VAC (47 – 63 Hz) |
| Power | 40W (typical, single converter) |
| Connector | IEC 603320 10A |

| Monitor and Control | |
|---|---|
| RS 485 | DB9 |
| RS 232 | DB9 |
| Discrete | DB9 |
| Ethernet * | RJ45 F |

(*) offered as option


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