



## INTRODUCTION

Comtech EF Data's SDR-54A is a versatile L-band receiver/demodulator for satellite data broadcast applications.

Two different enclosure versions are currently available:

- Desktop unit
- Rack mount unit

The SDR-54A supports symbol rates from 9.6 to 2500 kbps. This allows for data rates from 9.6 to 4000 kbps, in 1 bps increments, depending on demodulation type and code format.

The received data is provided in a standard, serial data format.

The SDR-54A is available with several options to permit matching of functions to applications. The options include:

- 4-channel DEMUX (field installable)
- 8-channel DEMUX (field installable)
- DC power supplies (48 or 24 VDC)
- Reed-Solomon Decoder

The SDR-54A supplies power (+24 VDC) to the LNB via the IF input port.

## FUNCTIONALITY

The SDR-54A receives L-band (950 through 1550 MHz) input directly from a C- or Ku-band phase locked LNB mounted on the antenna feed. The demodulator detects and decodes the receive signal, and sends the data stream to a serial data output port.

The demodulator receive frequency is tuned in 10 kHz steps, and receive data rates are variable in 1 bps steps.

## HIGH PERFORMANCE

The SDR-54A employs the latest digital technology to deliver high performance at a low cost.

The demodulator uses coherent detection to recover BPSK- or QPSK-modulated signals at code rates 1/2, 3/4, or 7/8. The result is a 3 dB improvement in  $E_b/N_0$  performance over differential detection techniques. Advantages of this enhanced performance include:

- Larger threshold margins
- Smaller receive antennas

## CONCATENATED CODING

As the threshold BER is approached, the uncorrectable error distribution is bursty. The optional Reed-Solomon Decoder can be installed to correct the burst errors resulting in a BER of  $1 \times 10^{-10}$  at 5.0 dB  $E_b/N_0$ . This allows for either extra link margin or smaller antennas.

## FEATURES

A highly sophisticated microprocessor performs all M&C functions for the SDR-54A. The demodulator is controlled and monitored via an EIA-232 port, on the front and rear panels of the SDR-54A, and allows for utilization of a standard ASCII terminal.

The SDR-54A also includes:

- Front panel M&C Remote Connector
- LNB power (DC) ON/OFF switch
- Satellite Link Remote Control (SLRC). This permits remote programming of the SDR-54A over the satellite link. SLRC operates in a special fail-safe mode that prevents erroneous programming.

## COMPLEMENTARY PRODUCTS

Comtech EF Data offers a full line of satellite products to complement the SDR-54A, including:

- SDM-300A satellite modem with optional multiplexer
- CLNB(p) C-band phase locked block converter
- KLN(p) Ku-band phase locked block converter



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## SYSTEM

|                            |   |
|----------------------------|---|
| Input Frequency            | 950 to 1550 MHz, in 10 kHz steps                        |
| IF Input Impedance         | 75Ω   |
| IF Input Return Loss       | -90 to -30 dBm (typical)<br>-80 to -30 dBm (guaranteed) |
| IF Connector               | Type F  |
| IF Input Level * See Notes | -90 to -30 dBm (typical)<br>-80 to -30 dBm (guaranteed) |
| LNB Power                  | +24 ± 1 VDC at 500 mA maximum with On/Off control       |
| Demodulation Types         | BPSK, QPSK (selectable)                                 |
| Baseband Filtering         | 4-Pole Butterworth, EF Data Closed, Intelsat open       |
| Digital Data Rates:        | (Variable in 1 bps steps)                               |
| BPSK                       | 4.8 to 1250 kbps  |
| QPSK                       | 9.6 to 4000 kbps  |
| Data Interface * See Notes | Synchronous EIA-232, EIA-422, or EIA-530 (selectable)   |
| Connector type             | 25 pin D-sub (female)                                   |

## DEMODULATOR

|                              |   |
|------------------------------|---|
| Carrier Sense                | Normal or Inverted  |
| Acquisition Sweep Range      | 10 to ± 500 kHz, in 10 kHz increments   |
| Symbol Rate Range (variable) | 9.6 to 2500.0 kbps  |
| Decoding                     | Viterbi, K = 7<br>Viterbi, K = 7 with Reed-Solomon Decoder<br>CCITT V.35 INTELSAT modified. |
| Descrambling                 | Modified V.35 Self-Synchronizing (Closed Network R-S option)                                |
| <b>BER</b>                   | <b>R 1/2    R 3/4    R 7/8</b>  |
| Viterbi K=7                  |   |
| 1 x 10 <sup>-5</sup>         | 5.5    6.7    7.9   |
| 1 x 10 <sup>-7</sup>         | 6.7    8.2    9.2   |
| Viterbi K=7 with R-S Decoder |   |
| 1 x 10 <sup>-10</sup>        | 5.0    6.3    7.5   |
| Data Jitter                  | <2.0 dB jitter gain<br><4% RMS of 1/DR @ 7.0 dB E <sub>b</sub> /N <sub>0</sub>              |
| Unit-To-Unit Delay Variation | <1 μs for SR 19.2 to 800 ksps<br><2 μs for SR <19.2 ksps                                    |

## ENVIRONMENTAL AND PHYSICAL

|                                |  |
|--------------------------------|--|
| Operating Temperature          |  |
| Desktop                        | 0 to 50°C    (32 to 122° F)                                      |
| Rack mount                     | -20 to 60°C    (-4 to 140° F)                                    |
| Storage Temperature            | -40 to +70°C    (-40 to 158° F)                                  |
| Humidity                       | 0 to 95% non-condensing  |
| Prime Power                    | 90 to 132 VAC, or 175 to 264 VAC,                                |
| (automatically selected)       | 47 to 63 Hz (optional 48 or 24 VDC available – refer to Options) |
| Connector Type                 | IEC  |
| Frequency Stability (Standard) | ±15 ppm  |
| (High-Stability)               | ±0.5 ppm   |
| Dimensions (Desktop)           | 17.36W x 2.04H x 8.36D in.<br>(44.1W x 5.2H x 21.2D cm)          |
| (1 RU Rack Mount)              | 19.0W x 1.75H x 8.35D in.<br>(48.3W x 4.4H x 21.2D cm)           |
| Weight                         | < 10 lbs. (4.5 kg)   |

## OPTIONS

|                 |  |
|-----------------|--|
| DEMUX           | DEMUX options available upon request   |
| DC Power Supply | 48 VDC<br>24 VDC<br>(± 5% at TBDA)     |
| Chassis Option  | Desktop or rack mount models available |

## MONITOR AND CONTROL

|                         |   |
|-------------------------|---|
| Configuration Retention | Non-volatile  |
| Control Interface       | EIA-232, 9-Pin Female   |
| Control Access          | 9600 baud, even parity 1 start bit,<br>7 information bits, 2 stop bits  |
| SLRC                    | Programs demodulator functions over the link  |
| Dial Up Access          | Via EIA-232 port, VT100 compatible  |
| Control Signals         | Demodulator Frequency<br>Demodulator Data Rate<br>Reset Sweep<br>Sweep Range<br>Sweep Re-acquisition Time<br>Spectral Inversion<br>DEMUX Programming<br>SLRC Group Address<br>SLRC Individual Address |
| Monitored Signals       | Sweep Position Status<br>Demodulator Status<br>E <sub>b</sub> /N <sub>0</sub> Status<br>BER Status<br>Receive Signal Level  |
| Fault Indicators        | LEDs, Contact Closure, and TTL-OC   |

## CERTIFICATION

|     |  |
|-----|--|
| CE  | Radiated Emissions per EN55022.<br>Radiated immunity per EN50082.<br>Low voltage directive safety per EN60950. |
| FCC | FCC Part 15 Class B.   |

### \* Notes:

1. The typical minimum input level is -90 dBm
2. For Data rates <64 kbps, the maximum input level is -40 dBm.
3. For Data rates from 64 kbps to 2048 kbps, the desired input level is – 80 to –30 dBm guaranteed.
4. For Data rates >2048 kbps, the minimum input level is -75 dBm.
5. The EIA-232 interface has a maximum data rate of 64 kbps.



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