## Interfaces

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX</td>
<td>Female BNC</td>
</tr>
<tr>
<td>RX</td>
<td>Radiofrequency input signal</td>
</tr>
<tr>
<td>REF</td>
<td>Female BNC</td>
</tr>
<tr>
<td>Rx2</td>
<td>Radiofrequency input signal (DVB-S2 additional optional input)</td>
</tr>
<tr>
<td>M and C</td>
<td>Asynchronous RS232 (Male DB-9)</td>
</tr>
<tr>
<td>C1 C2 C3 C4</td>
<td>Synchronous I/F (Female DB-25): V35,EIA530/A, RS449, V36, RS-232, X.21</td>
</tr>
<tr>
<td>VAC</td>
<td>Available upon request</td>
</tr>
</tbody>
</table>

**Options**

- **ELECTRICAL INTERFACE (X)**
  - Back: RJ-45 (10/100baseTX)
  - Female BNC
  - Female BNC (Female N optional)
  - Female DB-9
  - Female N
  - 4 x IPT02A8-4P (round)
  - Asynchronous RS232 (Male DB-9)

- **ENVIRONMENT (Y)**
  - 110-220 V 50-60 Hz
  - 110-220 V 50-60 Hz

- **MECHANICAL INTERFACE (Z)**
  - Female BNC
  - Female DB-9

**Ordering Information**

- **SR40**
  - Basic model SR40 + TCP/IP hardware acceleration and compression
  - SR40+ SR40 + DVB-S2 with ACM

**Location**

SPACE

SOFTWARE-RADIO SATELLITE COMMUNICATIONS IP MODEMS

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

Space

Indra company.com
# SOFTWARE-RADIO SATELLITE COMMUNICATIONS IP MODEM

## Multiwaveform IP router modem
**EPM and non-EPM modem ready for satcom OTM**

### Introduction

This modem is designed based on the core of the SRA4/SRS0 modem with different waveforms for each application. It is a software radio satellite communications modem that can handle a wide range of data rates and communication protocols, making it suitable for both broadcast and point-to-point applications. The modem is installed in a subframe 19” 1U, with 400 mm depth, ensuring it fits within standard rack configurations.

### Highlights
- Software-defined radio IP router modem
- EPM and non-EPM modem ready for satcom OTM
- Multiwaveform IP router modem
- MODEM
- COMUNICATIONS IP
- SOFTWARE-RADIO
- SNMP IP interface.

### System

- **SR40 / SR50**
- **Introduction**

<table>
<thead>
<tr>
<th>Waveform</th>
<th>Description</th>
</tr>
</thead>
</table>
| SCPC (DVB-S2) | Specification Based on IESS 308/309 and STANAG 4486 Waveform based on IESS 308/309, STANAG 4486 and DVB-S2 with ACM. Frequency hopping waveform based on DVB-S2 ACM. Fully automated IPAM waveform. MHz of user data rates from low bandwidth to high bandwidth user data rates. Compatibility with SCPC, MIP, 800 kbps, 1.2 Mbps, 1.5 Mbps. External sync and async user data interfaces. ABC (Without DRM) and ABC+ (With DRM) compatibility. Additional on-board controller and a processing board based on state-of-the-art DSP and FPGA. IF frequency at 70 MHz uses. Pilot FEC (fixed) Convolutional 1/2 Reed-Solomon Turbo codes 1/2 (option). Spreading factor 2, 4, 8, 16, 31, 63 and 127. Clock reference 10 MHz (internal or external). L band frequency 950 MHz to 1450 MHz or 950 MHz to 2150 MHz. IF frequency 70 MHz +/- 20 MHz. General specifications (all modes) Clock reference 10 MHz (internal or external). L band frequency 100 kHz to 1 GHz. IF frequency 20 kHz – 5 MHz. Roll-off factor 0.22, 0.3, 0.4. Clock reference 10 MHz (internal or external). L band frequency 950 MHz to 1450 MHz or 950 MHz to 2150 MHz. IF frequency 70 MHz +/- 20 MHz. General specifications (all modes)

**Specifications**

- **SR40 / SR50**
- **Introduction**

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<tr>
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SOFTWARERADIO SATELLITE COMMUNICATIONS IP MODEM

Multiwaveform IP router modem
EPM and non-EPM modem ready for satcom OTM

**Highlights**

- Software-defined radio IP router modem
- EPM and non-EPM modem ready for satcom OTM
- Multiwaveform IP router modem
- MODEM
- communicating through standard
- COMUNICATIONS IP
- SATellite
- SOFTWARE-RADIO

**Introduction**

The SR40 and SR50 are software radio IP router modems designed for use in various satellite communication scenarios. These modems are capable of supporting both EPM (Electronic Protection Measures) and non-EPM operations, making them versatile options for satcom OTM (On-The-Move) applications.

**EPM and non-EPM modem ready for satcom OTM**

- Software-defined radio IP router modem
- EPM and non-EPM modem ready for satcom OTM
- Multiwaveform IP router modem

**Description**

- MODEM
- communicating through standard
- SATellite
- SOFTWARE-RADIO

### General Specifications

#### Environmental Specifications

- **Humidity**: 5 - 95%
- **Temperature**: -15°C to +70°C
- **Vibration**: 0.22, 0.3, 0.4
- **Shock**: 31, 63, 127

#### Electrical Specifications

- **Supply Voltage**: 100 Kbps – 30 MSps
- **Bandwidth (BW)**: 500 kHz – 5 MHz

#### Modulation

- **Modulation**: QPSK, 8 PSK, 16 APSK

#### Frequency Range

- **L Band Frequency**: 950 MHz to 1450 MHz or 950 MHz to 2150 MHz
- **IF Frequency**: 70 MHz +/- 20 MHz

#### Performance

- **Power Consumption**: 15 W

#### Compatibility

- **Interfaces**: Ethernet, RS232, RS422, RS485, V35, V36, X.21

#### Compatibility with Standards

- **IEEE 802.3**: 100 Mbit/s
- **IEEE 1394**: 400 Mbit/s
- **IEEE 1355**: 1000 Mbit/s

### Modem Specifications

#### EPM SPECIFICATION

- **Performance**: Meets IESS 308
- **Modulation**: QPSK, 8 PSK, 16 APSK
- **User data rates**: 64 kbps – 2048 kbps

#### NON EPM SPECIFICATION

- **Performance**: Meets IESS 308
- **Modulation**: QPSK
- **User data rates**: 10 MHz

### Satellite Specifications

- **Bandwidth (BW)**: 20 kHz – 10 MHz
- **Modulation**: QPSK
- **User data rates**: 8 kbps – 256 kbps

### CDMA SPECIFICATION

- **Performance**: Meets IESS 308
- **Modulation**: QPSK
- **User data rates**: 8 kbps – 256 kbps

### FH-SCPC SPECIFICATION

- **Performance**: Meets IESS 308
- **Modulation**: QPSK
- **User data rates**: 8 kbps – 256 kbps

### DS-SCPC SPECIFICATION

- **Performance**: Meets IESS 308
- **Modulation**: QPSK
- **User data rates**: 8 kbps – 256 kbps

### SCPC SPECIFICATION

- **Performance**: Meets IESS 308
- **Modulation**: QPSK
- **User data rates**: 8 kbps – 256 kbps

### Additional Features

- **Sync and async user data interfaces**: RS232, Ethernet (EIA-530/A, RS449, V35, V36, X.21 and Ethernet)
- **Frequency bands**: 950 MHz to 2150 MHz
- **Power consumption**: 15 W
- **Humidity**: 5 - 95%
- **Temperature**: -15°C to +70°C
- **Vibration**: 0.22, 0.3, 0.4
- **Shock**: 31, 63, 127
## Interfaces

<table>
<thead>
<tr>
<th>Port</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>Female BNC</td>
<td>External Synchronization in/out signal</td>
</tr>
<tr>
<td>Rx</td>
<td>Female BNC</td>
<td>10 MHz input/output clock reference</td>
</tr>
<tr>
<td>Rx2</td>
<td>Female N</td>
<td>Radiofrequency input signal</td>
</tr>
<tr>
<td>Tx</td>
<td>Female N</td>
<td>Radiofrequency output signal</td>
</tr>
<tr>
<td>M and C</td>
<td>Female BNC</td>
<td>Radiofrequency (DVB-S2 additional optional input)</td>
</tr>
<tr>
<td>Data</td>
<td>Asynchronous RS232 (Male DB-9)</td>
<td></td>
</tr>
<tr>
<td>Aux</td>
<td>Female DB-9</td>
<td>User data</td>
</tr>
<tr>
<td>C1 C2 C3 C4</td>
<td>Female DB-9</td>
<td>Available upon request</td>
</tr>
</tbody>
</table>

## Options

- **Back**
  - **SYNC Type**
    - Female BNC
  - **Signals**
    - External Synchronization in/out signal
  - **REF Type**
    - Female BNC
  - **Signals**
    - 10 MHz input/output clock reference
  - **Rx Type**
    - Female BNC (Female N optional)
  - **Signals**
    - Radiofrequency input signal
  - **Rx2 Type**
    - Female N
  - **Signals**
    - Radiofrequency input signal (DVB-S2 additional optional input)
  - **Tx Type**
    - Female BNC (Female N optional)
  - **Signals**
    - Radiofrequency output signal
  - **M and C Type**
    - Female BNC
  - **Signals**
    - Radiofrequency (DVB-S2 additional optional input)
  - **Data Interf. Type**
    - Asynchronous RS232 (Male DB-9)
  - **Signals**
    - Data and M and C
  - **AUX Type**
    - Female DB-9
  - **Signals**
    - Available upon request
  - **C1 C2 C3 C4 Type**
    - Female DB-9
  - **Signals**
    - Available upon request
  - **VAC Type**
    - Female BNC
  - **Signals**
    - Power supply

## Interfaces

<table>
<thead>
<tr>
<th>Port</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETH</td>
<td>Rj-45 (10/100baseTX)</td>
<td>Data, M and C and maintenance</td>
</tr>
<tr>
<td>USB</td>
<td>USB 1.1</td>
<td>Firmware download</td>
</tr>
<tr>
<td>TEL</td>
<td>RJ-11</td>
<td>Telephone (available upon request)</td>
</tr>
</tbody>
</table>

## Ordering Information

<table>
<thead>
<tr>
<th>MODEL NAME</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR40</td>
<td>Basic model</td>
</tr>
<tr>
<td>SR40+</td>
<td>SR40 + TCP/IP hardware acceleration and compression</td>
</tr>
<tr>
<td>SR50</td>
<td>SR40 + DVB-S2 with ACM</td>
</tr>
</tbody>
</table>
**SOFTWARE-RADIO SATELLITE COMMUNICATIONS IP MODEM**

**Introduction**

This modem is designed based on the software radio paradigm to provide flexibility and efficiency in satellite communications. The waveform can be selected through the keypad or display. SR40 and SR50 can work both as part of a fully automated DAMA network (requires external sync interfaces for PPS or blanking) or setting up point to point links. In both scenarios, the modem can be integrated into existing SONET/SDH and ATM transport networks.

**Features**

- **Firmware update on-site remotely**
- **Sync and async user data interfaces:** RS232, Ethernet, EIA-530/A, RS449, V35, V36, X.21 and broadband satellite modes.
- **Low pressure (air transportation):** MIL-STD-810-F
- **Operating humidity:** 0-95%*, non-condensing (*with coating, 90% without)
- **Dimensions:** 1U 19” frame 400 mm depth
- **Storage and transport temperature:** -25ºC < T < 70ºC
- **Operation temperature:** -15ºC < T < +55ºC
- **General specifications (all modes):**
  - **Clock reference:** 10 MHz (internal or external)
  - **L band frequency:** 950 MHz to 1450 MHz or 950 MHz to 2150 MHz
  - **IF frequency:** 70 MHz +/- 20 MHz
  - **Spreading factor:** 31, 63, 127
  - **Roll-off factor:** 0.22, 0.3, 0.4
  - **Modulation:** QPSK, 8 PSK, 16 APSK
  - **Performance:** CCM/VCM/ACM
  - **FEC:** LDPC/BCH
  - **User data rates:** 100 Kbps – 30 MSps
  - **Transmit power:** 100 mW – 200 mW
  - **BW:** 5 kHz – 5 MHz
  - **Sync and async user data interfaces:** RS232, Ethernet, EIA-530/A, RS449, V35, V36, X.21 and broadband satellite modes.
  - **Environmental specifications:** MIL-STD-810-F
  - **General specifications:** MIL-STD-810-F

**Specifications**

- **SR40 and SR50**
  - **Introduction**
  - **Multiwaveform IP router modem**
  - **EPM and non-EPM modem ready for satcom OTM**

**Highlights**

- Software-defined radio IP router modem
- EPM and non-EPM modem ready for satcom OTM
- Multiwaveform IP router modem
- SNMP IP interface.
- in existing M&C systems through standard both scenarios, the modem can be integrated into existing SONET/SDH and ATM transport networks.
- SR50 can be configured in both bridge and router modes in order to provide the greatest flexibility when integrated in existing networks.
- The waveform can be selected through the keypad or display. SR40 and SR50 can work both as part of a fully automated DAMA network (requires external sync interfaces for PPS or blanking) or setting up point to point links. In both scenarios, the modem can be integrated into existing SONET/SDH and ATM transport networks.

**Table of Specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SR40</strong></td>
<td>Physical dimensions: 1U 19” frame 400 mm depth.</td>
</tr>
<tr>
<td><strong>SR50</strong></td>
<td>Physical dimensions: 1U 19” frame 400 mm depth.</td>
</tr>
<tr>
<td><strong>SR40</strong></td>
<td>Processor: Intel Core i5-3337U.</td>
</tr>
<tr>
<td><strong>SR50</strong></td>
<td>Processor: Intel Core i5-3337U.</td>
</tr>
<tr>
<td><strong>SR40</strong></td>
<td>Memory: 8 GB DDR3.</td>
</tr>
<tr>
<td><strong>SR50</strong></td>
<td>Memory: 8 GB DDR3.</td>
</tr>
<tr>
<td><strong>SR40</strong></td>
<td>Storage: 256 GB SSD.</td>
</tr>
<tr>
<td><strong>SR50</strong></td>
<td>Storage: 256 GB SSD.</td>
</tr>
<tr>
<td><strong>SR40</strong></td>
<td>Power supply: 12 V DC.</td>
</tr>
<tr>
<td><strong>SR50</strong></td>
<td>Power supply: 12 V DC.</td>
</tr>
<tr>
<td><strong>SR40</strong></td>
<td>Operating temperature: -15ºC &lt; T &lt; +55ºC.</td>
</tr>
<tr>
<td><strong>SR50</strong></td>
<td>Operating temperature: -15ºC &lt; T &lt; +55ºC.</td>
</tr>
<tr>
<td><strong>SR40</strong></td>
<td>Storage and transport temperature: -25ºC &lt; T &lt; 70ºC.</td>
</tr>
<tr>
<td><strong>SR50</strong></td>
<td>Storage and transport temperature: -25ºC &lt; T &lt; 70ºC.</td>
</tr>
<tr>
<td><strong>SR40</strong></td>
<td>Environment: MIL-STD-810-F.</td>
</tr>
<tr>
<td><strong>SR50</strong></td>
<td>Environment: MIL-STD-810-F.</td>
</tr>
</tbody>
</table>

**Sync and async user data interfaces:**

- RS232
- Ethernet
- EIA-530/A
- RS449
- V35
- V36
- X.21
- Broadband satellite modes

**Network processor**

- Processor: Intel Core i5-3337U
- Memory: 8 GB DDR3
- Storage: 256 GB SSD
- Power supply: 12 V DC

**Network management**

- External sync interfaces for PPS or blanking
- Local (display) and remote (IP SNMP) M&C
- Power supply: 12 V DC

**Software radio**

- Waveform based on IESS 308/309, STANAG 4486 and DVB-S2 with ACM
- Single carrier using QPSK to IESS308 standard
- Frequency hopping waveform based on ST ANAG 4606
- Waveform based on ST ANAG 4606
- Fixed (convolutional 1/2 + RS)
- User data rates: 8 kbps – 1522 kbps
- Hopping rate: 2000 hops/second
- Spreading factor: 31, 63, 127
- Roll-off factor: 0.22, 0.3, 0.4
- Modulation: QPSK, 8 PSK, 16 APSK
- BW: 5 kHz – 5 MHz
- Performance: CCM/VCM/ACM
- FEC: LDPC/BCH
- User data rates: 100 Kbps – 30 MSps
- Transmit power: 100 mW – 200 mW