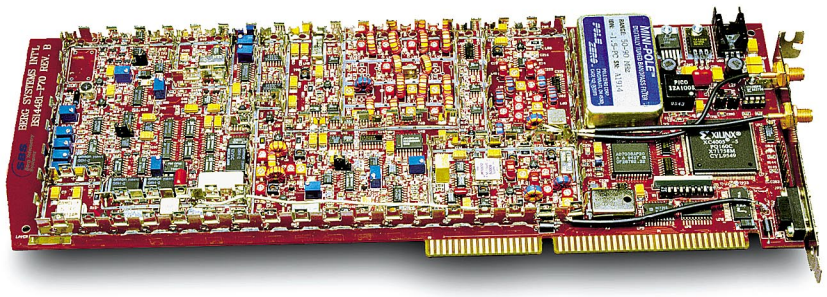
SBS Technologies, Inc.

MODEL 4481-P70/Q
IF Receiver

Features:

- **Input Frequency 50 - 90 MHz (70 MHz Nominal)**
- **20 kHz Tuning Resolution**
- **-65 to -10 dBm Operating Input Dynamic Range**
- **Linear PM, BPSK & QPSK Demodulations On-board, Unbalanced QPSK Optional**
- **Five Selectable Data Filters, 1 kbps to 5 Mbps**
- **Four Selectable IF Filter Bandwidths up to 8 MHz**
- **Analog Signal Strength & Loop Stress Status**
- **Implementation Loss 1.0 dB Maximum**



Model 4481-P70/Q is a tunable IF telemetry receiver module for the ISA bus. When combined with SBS Technologies Model 4422-PCI Telemetry Module, all of the functions of a satellite ground station are provided in just two PC bus slots.

The receiver's tunable input pre-selector and superhetrodyne-based design yields superior rejection of image and spurious frequencies. The Model 4481-P70/Q features four software-selectable IF bandwidths to optimize operation with data rates up to 5.5 Mbps.

For satellite applications, SBS Technologies has incorporated a tracking loop into the Model 4481-P70/Q to compensate for anomalies such as Doppler Shift and Transponder Offset. To handle phase inversion ambiguities, the Model 4481-P70/Q offers a programmable feature that swaps and/or inverts the I and Q outputs of the receiver.

QPSK demodulation in the Model 4481-P70/Q is implemented via a Costas Loop design with 3 loop bandwidths for bit rates up to 5.5 Mbps and acquisition down to 8 dB E_b/N_o. BPSK demodulation on the Model 4481-P70/Q also employs a Costas Loop deisgn with 3 loop bandwidths for bit rates up to 5.5 Mbps and acquisition down to 3 dB E_b/N_o.

All setup parameters for the 4481-P70/Q, such as input frequency, IF bandwidth, filter bandwidths, ect. are programmable via the ISAbus. Readback of the synchesizer lock, demodulator lock, signal and loop stress are available on the same bus.

Model 4481-P70/Q Specifications

Performance

Input Frequency Range	50.0 MHz to 90.0 MHz (70.0 MHz Nominal)
Tuning Resolution	20 kHz increments (Finer resolution is optional)
Input Impedance	50 Ohms
Input VSWR	$\leq$ 2.0 : 1 (Typically 1.5:1)
Noise Figure	Typically < 10 dB (12 dB Maximum)
Dynamic Range	-65 to -10 dBm Maximum
Overload Protection	Up to +10 dBm
Image Rejection	$\geq$ 60 dB
IF Rejection	$\geq$ 70 dB
Spurious Rejection	$\geq$ 60 dB
IF Bandwidths	350 kHz, 700 kHz, 2 MHz & 8 MHz (Other IF Bandwidths available, Contact Factory)
AFC Range	Selectable from $\pm$ 10 kHz to $\pm$ 1.5 MHz with sweep-rate control
Baseband Filter Bandwidths	100 kHz, 200 kHz, 260 kHz, 1.5 MHz & 3 MHz (Other band widths available, Contact Factory)
PM Demodulator	Linear with phase deviation range 0.2 to 2.0 radians (Gain programmable for 1 V p-p into 50 Ohms)
BPSK Demodulator	Costas Loop with 3 loop bandwidths for bit rates of 1 kbps to 5.5 Mbps & acquisition down to 3 dB E_b/N_o (Nominal 1.5 V Output into 50 Ohms)
QPSK Demodulator	Costas Loop with 3 loop bandwidths for bit rates to 5.5 Mbps and acquisition to 8 dB E_b/N_o (Nominal 1.5 V Output into 50 Ohms)
Implementation Loss	$\leq$ 1.0 dB
External 10 MHz Input Level	0 dBm $\pm$ 10 dB
I/Q Swap & Invert Control	The I & Q outputs can be swapped and/or inverted under software control to assist in phase inversion ambiguity resolution
Programming	Via the ISA bus including: input source, input frequency, IF bandwidth, filter bandwidths, AFC, AGC time constant, demodulator mode (Phase, BPSK or QPSK), and PM detector output gain
Status Readback	Via the ISA bus including: synthesizer lock, demodulator lock, signal present, signal strength, loop stress & A/D (busy)

Mechanical

Form Factor	Single full-size PC bus module
Connectors	SMA-type (for RF inputs & base-band outputs)
Technology	Hybrid of standard size components and Surface Mount Technology (SMT)

Environmental

Operating Temperature	0° to 50° C
Humitity	0 to 90% (non-condensing)
Non-Operating Temperature (in proper packaging)	-25° to +70° C Humidity Must prevent contact with moisture & contaminants

Options

Option-X:	Narrow-band, 50 kHz Crystal (IF filter)

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Telemetry & Communications Products

5791 Van Allen Way, Carlsbad, CA 92008 / Phone (877) 727-2374 / Fax (760) 438-0056

E-mail info.telemetry@sbs.com / Internet www.sbs.com