

BR-MOD-1-9-B

Embedded Beacon Receiver Module



- Track CW Beacon Carrier and BPSK Carrier
- CEPT Carrier-Edge-Power-Track for DVB Carrier
- For Integration in On-The-Move Applications
- Monitoring & Control (M&C) via Multiple Interfaces
- Extended Temperature Range
- Low SWaP (Size, Weight, and Power)
- Multiple Inputs Available
- L-Band and Extended Frequency Band Options

The BR-MOD-1-9-B is a satellite beacon receiver designed on a completely new platform to meet today's system challenges. This robust product features many capabilities to provide rugged and reliable operation in embedded applications.

A CW satellite beacon carrier can be acquired quickly and tracked in On-the-Move, as well as in fixed-site applications. The receiver can lock on and track BPSK-type carrier signals and is uniquely capable of locking on and tracking DVB-like carriers utilizing an exclusive Avcom-only Carrier- Edge-Power-Tracking (CEPT) function. In addition, it provides a voltage output from 0 to 10 VDC proportional with the input signal.

A unique feature of this beacon receiver is that when the beacon receiver function is not in use it can be used as a full-function spectrum analyzer. This allows systems to track on a beacon and monitor a carrier without the need for a separate device.

The beacon receiver can be connected via ethernet, USB, or serial, and supports communication with a WEB-GUI, POSIX-C API, text-based API, and Avcom's EVO GUI. This wide range of options makes the unit ideal for interfacing with large complex M&C systems or simple microprocessor-based systems.

For more information and support, please contact salesrfq@avcomofva.com.

BR-MOD-1-9-B

TECHNICAL SPECIFICATIONS

RF SPECIFICATIONS			
INPUT CONNECTORS:	SMA		
NOMINAL INPUT IMPEDANCE:	50 Ω (SMA)		
MAX DC INPUT VOLTAGE:	25V		
INPUT FREQUENCY RANGE:	MODEL	MIN (MHz)	MAX (MHz)
	2290 (Default)	900	2200
	3040	400	3000
	6070	70	6000
MAX SPAN WIDTH:	1300 MHz		
MIN TUNING STEP SIZE:	1 kHz		
RESOLUTION BANDWIDTH:	1 kHz, 3 kHz, 10 kHz, 30 kHz, 100 kHz, 300 kHz, 1 MHz		
REFERENCE LEVELS:	-40 dBm, -30 dBm, -20 dBm, -10 dBm		
MAXIMUM INPUT POWER LEVEL:	-10 dBm		
RF SENSITIVITY (-40 REF LVL):	-100 dBm		
SPUR FREE DYNAMIC RANGE (3kHz RBW):	60 dB		
NOISE FLOOR (-40 REF LVL, 3kHz RBW):	-100 dBm, -134 dB/Hz		
NOISE FLOOR (-10 REF LVL, 3kHz RBW):	-70 dBm, -104 dB/Hz		
ISOLATION BETWEEN INPUTS:	>40 dB typical		
AMPLITUDE ACCURACY:	+/- 1 dB typical		
FREQUENCY ACCURACY:	+/- 1 kHz typical		
PHASE NOISE (2 GHz):	OFFSET FREQUENCY	PHASE NOISE (dBc/Hz)	
	10 kHz	-100	
	100 kHz	-100	
	1 MHz	-109	

BEACON RECEIVER SPECIFICATIONS	
DETECTION BANDWIDTH:	10 to 750 kHz
TRACKING BANDWIDTH:	10 to 150 kHz
DETECTED LEVEL FILTERING:	Low-Pass, User-Select: 0.25 Hz, 0.5 Hz, 1.0 Hz, 2.0 Hz, 3.0 Hz
SEARCH/TRACK RATE:	User-Selectable: 10 Hz, 25Hz, 100Hz
ACQUISITION TIME:	<1 second typical
ADJUSTABLE DELAY BEFORE LOCK:	0 to 5000 milliseconds
ACQUISITION/TRACKING LEVEL:	Minimum C/No, 39 dB-Hz
BEACON/CARRIER TYPE:	CW, BPSK (No Demod), CEPT(Carrier-Edge-Power-Track) on DVB (No Demod)
SPECIAL FEATURE:	Spectrum Analyzer features are available when Beacon Receiver is not running

BR-MOD-1-9-B

TECHNICAL SPECIFICATIONS – CONTINUED

COMMUNICATION INTERFACE	
ETHERNET:	10/100, Magnetics on-board, DHCP or Static, 4-pin Molex
SERIAL:	RS422 or RS232 (Selectable via external select pin) 115200 8n1, 9-pin Molex
USB:	115200 8n1, 3-pin Molex
BEACON RECEIVER OUTPUTS:	Analog and Digital outputs, 6-pin Molex

M & C				
	EVO GUI	POSIX-C API SBS2API	TEXT-BASED API	WEB-GUI
ETHERNET:	Yes	Yes	N/A	Yes
SERIAL:	N/A	Yes	Yes	N/A
USB:	Yes	Yes	Yes	N/A

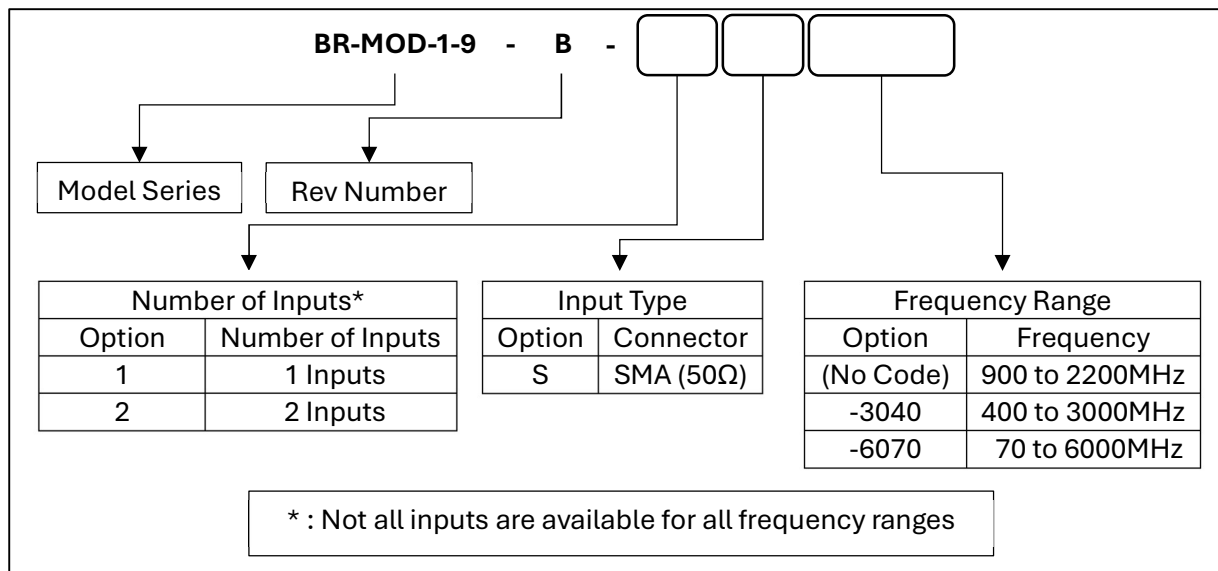
RECEIVER OUTPUTS	
CONNECTOR:	6-pin Molex
ANALOG SIGNAL STRENGTH INDICATOR OUTPUT:	0 to 10 VDC, 10 mA
ANALOG SLOPE:	0.1 to 3.0 V/dB
ANALOG SLOPE POLARITY:	Positive or Negative
ANALOG OUTPUT FILTERING:	Low-Pass, 0.5 Hz, fixed.
DIGITAL LOCK INDICATOR OUTPUT:	0 – 3.3 VDC
DIGITAL LOCK INDICATOR OUTPUT POLARITY:	Adjustable (H=LOCK or L=LOCK)

POWER	
CONNECTOR:	2-pin Molex
POWER SUPPLY:	8 - 33 VDC, < 3W with reverse polarity, surge, and spike protection

PHYSICAL	
DIMENSIONS:	3 in. x 3.5 in. x 1.062 in.
WEIGHT:	7.1 oz; 200 g

ENVIRONMENTAL	
OPERATING TEMPERATURE:	-40°C to 70°C
STORAGE TEMPERATURE:	-40°C to 85°C
HUMIDITY:	0 to 95%, non-condensing
MAX OPERATING ALTITUDE:	40,000 ft; 12,000 m

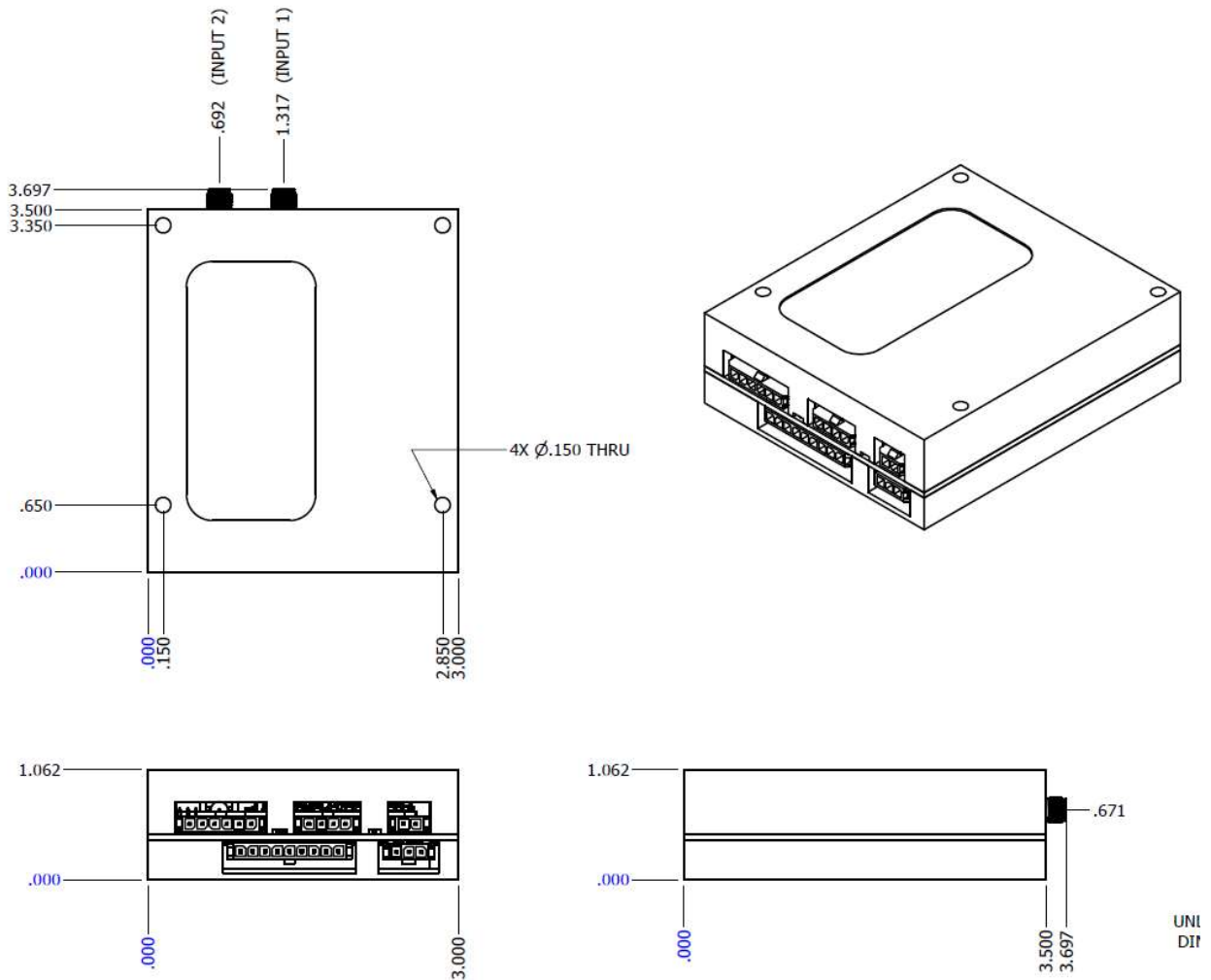
BR-MOD-1-9-B MODEL IDENTIFICATION



FULL MODEL NAME LIST

Connector	Number of Inputs	Frequency		
		900 to 2200MHz	400 to 3000MHz	70 to 6000MHz
SMA (50Ω)	1	BR-MOD-1-9-B-1S	BR-MOD-1-9-B-1S-3040	BR-MOD-1-9-B-1S-6070
	2	BR-MOD-1-9-B-2S	BR-MOD-1-9-B-2S-3040	N/A

BR-MOD-1-9-B
PHYSICAL DIMENSIONS



NOTES:

1. REFER TO CAD MODEL FOR UNLISTED DIMENSIONS

UNLESS OTHERWISE STATED:
DIMENSIONS ARE IN INCHES

TOLERANCES:

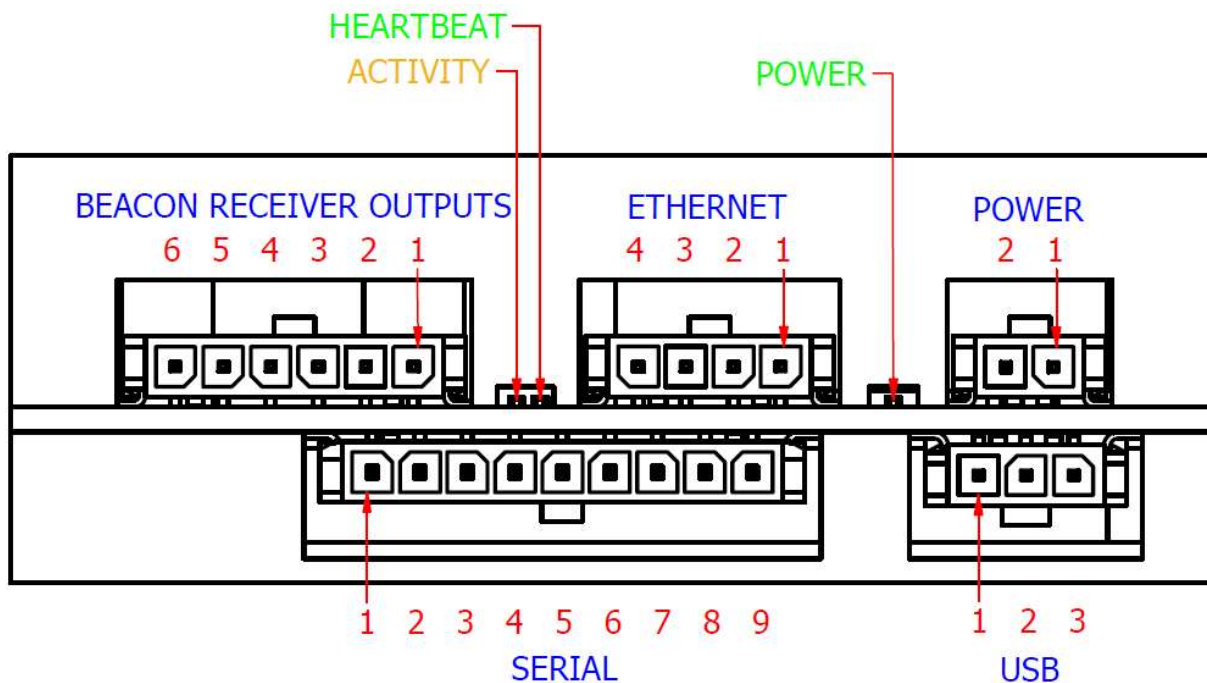
.XX = ± 0.01

.XXX = ± 0.005

.XXXX = ± 0.0002

ANGLES = $\pm 0.5^\circ$

BR-MOD-1-9-B PIN POSITIONS AND DESCRIPTIONS



BEACON RECEIVER OUTPUTS	
PIN	FUNCTION
1	GND
2	BR 0-10V OUT
3	RESERVED FOR FUTURE USE
4	BR RUN OUT
5	BR LOCK OUT
6	3.3V REF

ETHERNET	
PIN	FUNCTION
1	Ethernet TD1_N
2	Ethernet TD1_P
3	Ethernet TD0_N
4	Ethernet TD0_P

POWER	
PIN	FUNCTION
1	POWER IN
2	GND

SERIAL	
PIN	FUNCTION
1	RS422 TX_P
2	RS422 TX_N
3	RS422 RX_P
4	RS422 RX_N
5	GND
6	RS232 TX
7	RS232 RX
8	GND
9	COM SELECT

USB	
PIN	FUNCTION
1	GND
2	USB DATA_N
3	USB DATA_P

BR-MOD-1-9-B PIN INTERFACE

MATING CONNECTORS		
BEACON RECEIVER OUTPUTS	6-pin	Molex: 0436450600
ETHERNET	4-pin	Molex: 0436450400
POWER	2-pin	Molex: 0436450200
SERIAL	9-pin	Molex: 0436450900
USB	3-pin	Molex: 0436450300
CRIMP PIN		Molex: 0430300002
CRIMPING TOOL		Molex: 0638190000
WIRE		20-24 AWG

Connector Name	Pin Number	Function Name	I/O Type	Recommended Interface Circuit/Voltage	Limiting Voltages and Protection Notes
BEACON RECEIVER OUTPUTS	1	GND	Ground Reference	0 V	--
	2	BR 0-10V OUT	Analog Output 0 V to 10 V	Analog Input with 1kohm or Greater Input Impedance	Protected to +/- 40 V. Short-to-Ground Protected.
	3	RFU	--	--	--
	4	BR RUN OUT	Digital Output 0 V to 3.3 V	Digital Input with 1 kΩ or Greater Input Impedance	Protected to +/- 40 V. Short-to-Ground Protected.
	5	BR LOCK OUT	Digital Output 0 V to 3.3 V	Digital Input with 1 kΩ or Greater Input Impedance	Protected to +/- 40 V. Short-to-Ground Protected.
	6	3.3V REF	3.3 V Voltage Reference Out	Connect to circuit with 330 Ω or greater resistance to ground.	Voltage reference only. 10 mA output max.
ETHERNET	1	Ethernet TD1_N	Communications I/O	Ethernet 10/100	Galvanically Isolated. Magnetics on unit.
	2	Ethernet TD1_P			
	3	Ethernet TD0_N			
	4	Ethernet TD0_P			
POWER	1	POWER IN	Power Supply Input	8.0 V to 33.0 V DC Power	DC Reverse Polarity Protected to -100 VDC. Surge Protected to +100 V.
	2	GND	Power Supply Ground	0V	

BR-MOD-1-9-B
PIN INTERFACE - CONTINUED

Connector Name	Pin Number	Function Name	I/O Type	Recommended Interface Circuit/Voltage	Limiting Voltages and Protection Notes
SERIAL	1	RS422 TX_P	Communications Output	Connect to User Equipment RS422 RX P	-8 V Absolute Min to 12.5 V Absolute Max Voltage. Limited by Transceiver IC.
	2	RS422 TX_N		Connect to User Equipment RS422 RX N	
	3	RS422 RX_P	Communications Input	Connect to User Equipment RS422 TX P	
	4	RS422 RX_N		Connect to User Equipment RS422 TX N	
	5	GND	Ground Reference	0 V	--
	6	RS232 TX	Communications Output	Connect to User Equipment RS232 RX	-0.03 V Absolute Min to 6.0 V Absolute Max Voltage. Limited by Transceiver IC
	7	RS232 RX	Communications Input	Connect to User Equipment RS232 TX	+/- 25 V Absolute Max Voltage Input. Limited by Transceiver IC
	8	GND	Ground Reference	0 V	--
	9	COM SELECT	Digital Input	Pulled High Internally. Leave Pin Floating for RS422. Connect Pin to Ground for RS232.	Protected to +/- 40 V.
USB	1	GND	Ground Reference	USB 2.0 0 V to 5 V	0 V Min. 5 V Max. Limited by USB ESD steering diode array and power rails for USB IC.
	2	USB DATA_N	Communications I/O		
	3	USB DATA_P	Communications I/O		

BR-MOD-1-9-B
REVISION NOTES

VERSION	RELEASE DATE	CHANGES
1.4	2/14/2025	• Initial Release
1.5	5/28/2025	• Add Additional RF Specifications • Add 6070 model option • Add references to spectrum analyzer features • Update Model Identification and Full Model Name List • Update Descriptions (summary, and abbreviations) • Add Revision Notes