

# INTREPID™ Model 336-33464

HIGH-RELIABILITY DIGITAL MICROWAVE LINK



INTREPID™ Model 336-33464 is a high-security standalone volumetric perimeter sensor for maximum-security sites such as nuclear power plants, government laboratories and military installations. Combining Southwest Microwave's field proven detection performance with advanced embedded Digital Signal Processing (DSP) to successfully discriminate between intrusion attempts and environmental disturbances, this Hi-Reliability sensor mitigates risk of site compromise and prevents nuisance alarms.

Designed for maximum protection against physical tampering and harsh environmental conditions, Model 336-33464 features heavy-duty components and packaging, integrated radome tamper switches and optional steel enclosures for external connections. Advanced dual EMI/RFI shielding at radome and circuit board protect sensor electronics against electromagnetic or radio frequency interference. Standalone configuration and on-board relay alarm outputs for monitoring deter the risk of hacking or other digital compromise.

Model 336-33464 operates at K-band frequency. Because K-band is 2.5 times higher than X-band, the multipath signal generated by an intruder is more focused, enhancing detection of stealthy intruders. K-band frequency also limits susceptibility to interference from air/seaport radar or other microwave systems.

Model 336-33464 features 6 crystal-controlled, field-selectable modulation channels with narrow-band filtering to prevent interference between sensors. Units can be dual, triple or quad-stacked with Model 334-33465 Digital Microwave Links for optimal protection against prone crawling or bridging attack.

Antenna beam width is approximately 3.5 degrees in the horizontal and vertical planes. A true parabolic antenna assures long range operation, superior beam control and predictable Fresnel zones. Advanced receiver design increases detection probability by alarming on partial or complete beam interruption, increase / decrease in signal level or jamming by other transmitters.

An extended burn-in cycle of 5 days at 125° F (52° C) and full temperature testing from -40° to +150° F (-40° to +66° C) maximizes reliability.

## KEY FEATURES

- RANGE: 183 M (600 FT)
- EMBEDDED DIGITAL SIGNAL PROCESSING FOR HIGH PD / LOW NAR
- SOFTWARE-CONTROLLED SETUP
- LOW POWER CONSUMPTION
- FRESNEL SUPPRESSION ALGORITHMS SUPPRESS OUTER FIELD DISTURBANCES
- SUPERIOR EMI / RFI SHIELDING AND SURGE PROTECTION
- EXTENDED BURN-IN AND TEMPERATURE TESTING
- RUGGEDIZED AGAINST MECHANICAL ABUSE AND CLIMATIC EXTREMES



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## PRINCIPLES OF OPERATION AND DETECTION

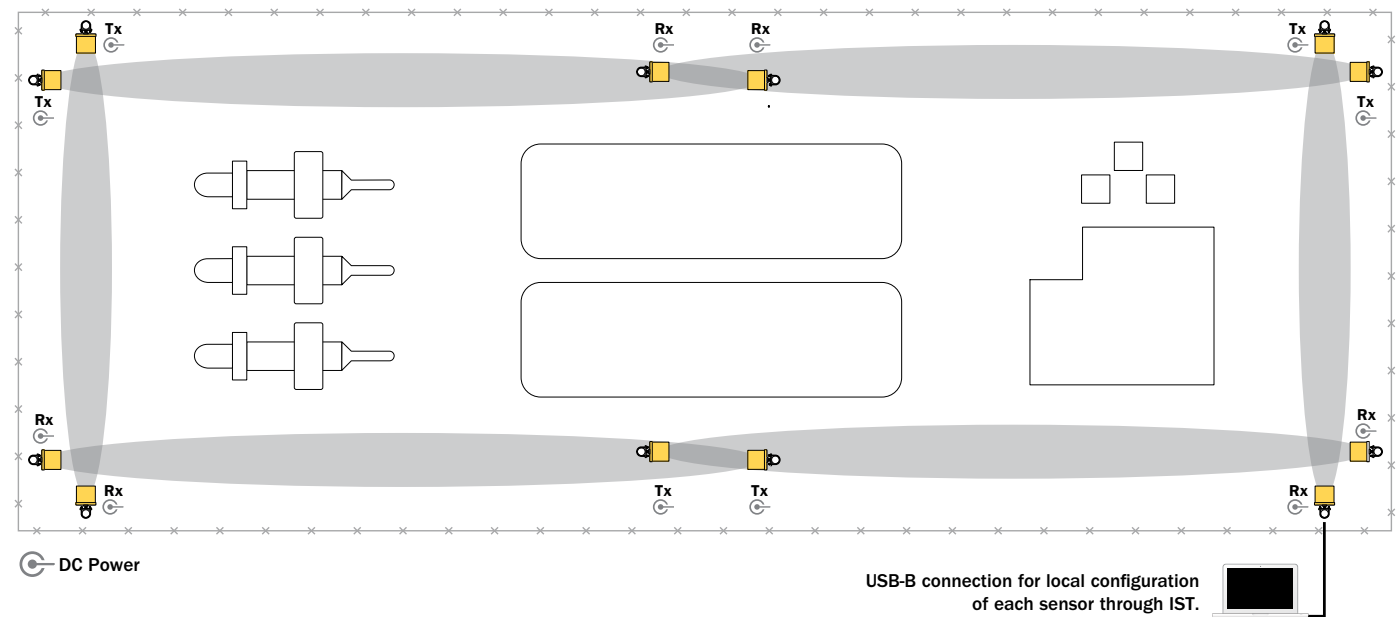
Intrusion detection, using a modulated amplitude sensitive system (not Doppler), takes place within the invisible pattern of microwave energy existing between transmitter and receiver. Changes in signal amplitude at the receiver are directly related to the object's size and density, allowing the sensor to discriminate between objects. Model 336-33464 will alarm on average sized humans walking, running, crawling on hands and knees or prone crawling through the pattern. Local or remote adjustments can provide alarm on smaller, faster or slower targets, depending on the specific application.

INTREPID™ Model 336-33464 employs proprietary digital signal processing algorithms to classify disturbances to the detection field in real time to optimize detection performance. Intruders walking, jumping or crawling through the field are identified and detected, while common environmental disturbances are suppressed, preventing nuisance alarms.

The fully-shielded electronics module and precisely-focused parabolic antenna of Model 336-33464 are mounted on a sturdy metal baseplate and covered by a molded ABS radome for all weather operation. Heavy-duty, position-locking pole-mounting brackets with stainless steel swivel mount permit precise setup and provide firm lock against movement.

For detailed information on application, installation and adjustment, consult Model 336-33464 Technical Manual.

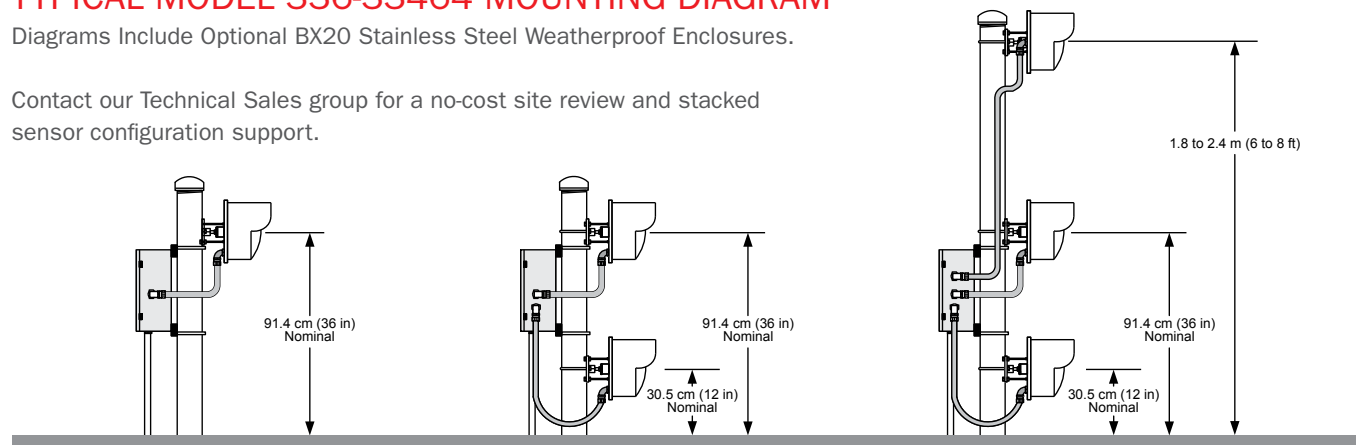
## TYPICAL MODEL 336-33464 CONFIGURATION DIAGRAM



## TYPICAL MODEL 336-33464 MOUNTING DIAGRAM

Diagrams Include Optional BX20 Stainless Steel Weatherproof Enclosures.

Contact our Technical Sales group for a no-cost site review and stacked sensor configuration support.



# INSTALLATION SERVICE TOOL (IST)

The INTREPID™ Model 336-33464 Installation Service Tool (IST) software graphically controls and monitors sensor status, control parameters and signal strength with laptop convenience at each module via optically-isolated, surge-protected USB-B connection. Unique configuration security provides notification upon changes to device settings, ensuring that only approved changes are implemented. Remote adjustment via RS422 or TCP/IP\* connection is available.



Alignment Screen - Alignment Complete



Target Screen - Target Detection - Alarm

\*Requires third-party serial device server (Ethernet converter).

## PERFORMANCE FEATURES AND BENEFITS

- **DIGITAL SIGNAL PROCESSING (DSP)**  
Proprietary embedded DSP algorithms recognize the unique profiles of intruders walking, running, jumping or crawling through the detection field.
- **FRESNEL SUPPRESSION ALGORITHMS**  
Unique field-selectable algorithms limit outer field (Fresnel zones) disturbance detection, enhancing operation in challenging applications and reducing nuisance alarms.
- **RF PATH ALARM**  
Provides an alert when the RF pattern is altered by foreign objects moved into the detection field.
- **RF SHIELDING AND SURGE PROTECTION**  
EMI/RFI shielded radomes and sensor circuit boards protect against extreme sources of EMI and RFI and lightning-induced surges.
- **PARABOLIC DISH AND ANTENNA DESIGN**  
Assures long range operation, superior beam control and predictable Fresnel zones for high probability of detection (Pd) and low nuisance alarm rates (NAR).
- **RUGGED CONSTRUCTION**  
Heavy-duty industrial components, including metal base-plate / conduit fitting and molded ABS radome are highly resistant to mechanical abuse. 1 mm conformal-coated circuit board enables reliable operation in high humidity, corrosive atmospheres or harsh climactic extremes. A position-locking, corrosion-resistant mounting bracket reinforces against movement.
- **HI-REL PERFORMANCE**  
Sensors undergo an extended burn-in cycle at 52° C (125° F) and are temperature tested from -40° to +66° C (-40° to +150° F). Testing documentation is recorded and retained on file at Southwest Microwave company headquarters.

# INTREPID™ Model 336-33464 SPECIFICATIONS

**Equipment Supplied:** Model 336-33464 Transmitter, Model 336-33464 Receiver, RFI / EMI Shielded Radomes (2), MB65 Heavy-Duty Universal Swivel Ball Mounting Brackets (2), Installation Service Tool (IST).

**Frequency:** K Band. 24.125 GHz (USA) conforms to F.C.C. Part 15.

**Output Power:** 4 mW peak, 2 mW average, square wave modulated.

**Range:** 3 to 183 m (10 to 600 ft).

**Target Size:** 35 kg (77 lbs) human walking, running, hands and knees crawling or jumping. Prone crawling or rolling 35 kg (77 lbs) human, or simulated with a 30.5 cm diameter metal sphere, detected at maximum range of 183 m (600 ft) with flat terrain.

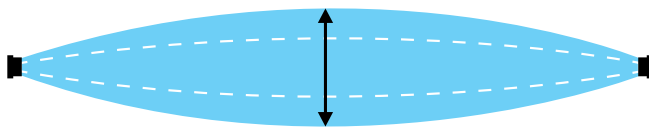
**Target Velocity:** 30 mm/sec to 15 m/sec (0.1 ft/sec to 50 ft/sec).

**Probability of Detection:** 0.99 minimum.

**Automatic Range Adjustment:** Link automatically adjusts to slow changes in path loss due to rain, snow, etc. AGC range -54 dB.

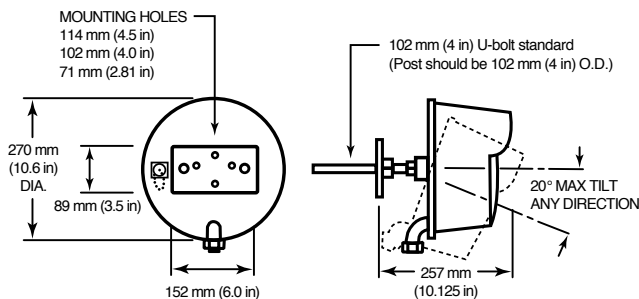
## Pattern

The detection pattern width is field adjustable from approximately 0.3-5.5 m (1-18 ft). Pattern height varies in conjunction with pattern width.



Pattern width adjustable from 0.3-5.5 m (1-18 ft).

## Dimensions:



**Modulation Channels:** 6, field selectable.

**Polarization:** Vertical (E) or Horizontal (H).

**Path Alarm:** Generated if RF power at Receiver is changed.

**False Alarm Rate:** 1/unit/year based on signal to noise ratio.

**Operating Environment:** -40° C to +66° C (-40° F to +150° F)  
0-100% Relative Humidity.

**Lightning Protection:** Transorb discharge devices on all inputs and outputs, including power. ESD Rating of Class 3 (> 16 kV) per Human Body Model (HBM), Peak Power - 600 W @ 1.0 ms.

**DC Input (Tx/Rx):** 10.5-60 VDC

12 VDC: 105 mA / 85 mA

24 VDC: 60 mA / 50 mA

48 VDC: 35 mA / 35 mA

**Communications Ports (for IST Configuration Only):**

1 x Optically-isolated USB-B, 1 x RS422.

**Alarm Output:** SPDT-Form C, 2 amps at 28 VDC

**Path Alarm Output:** SPDT-Form C, 2 amps at 28 VDC

**Tamper Switch:** SPDT-Form C, 2 amps at 28 VDC

**Self Supervision:** Alarm on failure and remote test.

**Mounting:** Heavy-duty position-locking non-corrosive ball swivel mount. 20° adjustment in any direction.

**Remote Monitor:** Alignment, sensitivity and power supply voltage monitored with RM83 Performance Test Set at Receiver.

**LED Indicators:** Internally located LEDs – Power On and Switch Error at Transmitter. Power On, Channel Fault, Alarm, Jamming Signal, Switch Error and Comm Status at Receiver.

**Weight / Shipping Weight:** 2.04 kg (4.5 lb) per unit / 8.2 kg (18 lb) total.

## Options:

**02A15483-A01:** Radome Latch Kit (replaces screws).

**BX20 / BX35:** NEMA 4X (SS) / NEMA 4 Weatherproof Enclosures. Consult factory for specific configuration details.

## Ordering Info:

Model 336-33464



INTREPID™ is a trademark of Southwest Microwave, Inc. Specifications subject to change without notice.

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