

# INTREPID™ Model 336

LONG RANGE DIGITAL MICROWAVE LINK



INTREPID™ Model 336 is a standalone volumetric perimeter detection sensor for fencelines, open areas, gates, entryways, walls and rooftop applications. Based on Southwest Microwave's field-proven microwave detection technology, advanced embedded Digital Signal Processing (DSP) discriminates between intrusion attempts and environmental disturbances, mitigating risk of site compromise while preventing nuisance alarms.

Designed for maximum protection against sabotage, Model 336 is a high-security detection solution for security-sensitive sites such as nuclear plants, correctional facilities or government / military installations. Heavy-duty components and packaging, integrated radome tamper switches and optional steel enclosures for external wiring and connections prevent physical abuse. Integrated EMI/RFI shielding protects sensor electronics against external electromagnetic or radio frequency interference. The unit's standalone configuration and on-board relay alarm outputs for monitoring eliminate the risk of hacking or other digital compromise faced by networked devices.

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

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.

Model 336 features 6 crystal-controlled, field-selectable modulation channels with narrow band filtering, preventing interference between sensors. Units can be dual, triple or quad-stacked for ultra-high security applications.

## KEY FEATURES

- RANGE: 457 M (1500 FT)
- RUGGED CONSTRUCTION WITHSTANDS MECHANICAL ABUSE AND CLIMATIC EXTREMES
- EMBEDDED DIGITAL SIGNAL PROCESSING (DSP) FOR HIGH PD / LOW NAR
- SOFTWARE-CONTROLLED SETUP
- LOW POWER CONSUMPTION
- FRESNEL SUPPRESSION ALGORITHMS REDUCE OUTER FIELD DISTURBANCES
- MONITORING VIA ON BOARD FORM-C RELAY ALARM OUTPUTS
- ADVANCED EMI / RFI SHIELDING AND SURGE PROTECTION



# INTREPID™ Model 336

## LONG RANGE MICROWAVE LINK

### PRINCIPLES OF OPERATION AND DETECTION

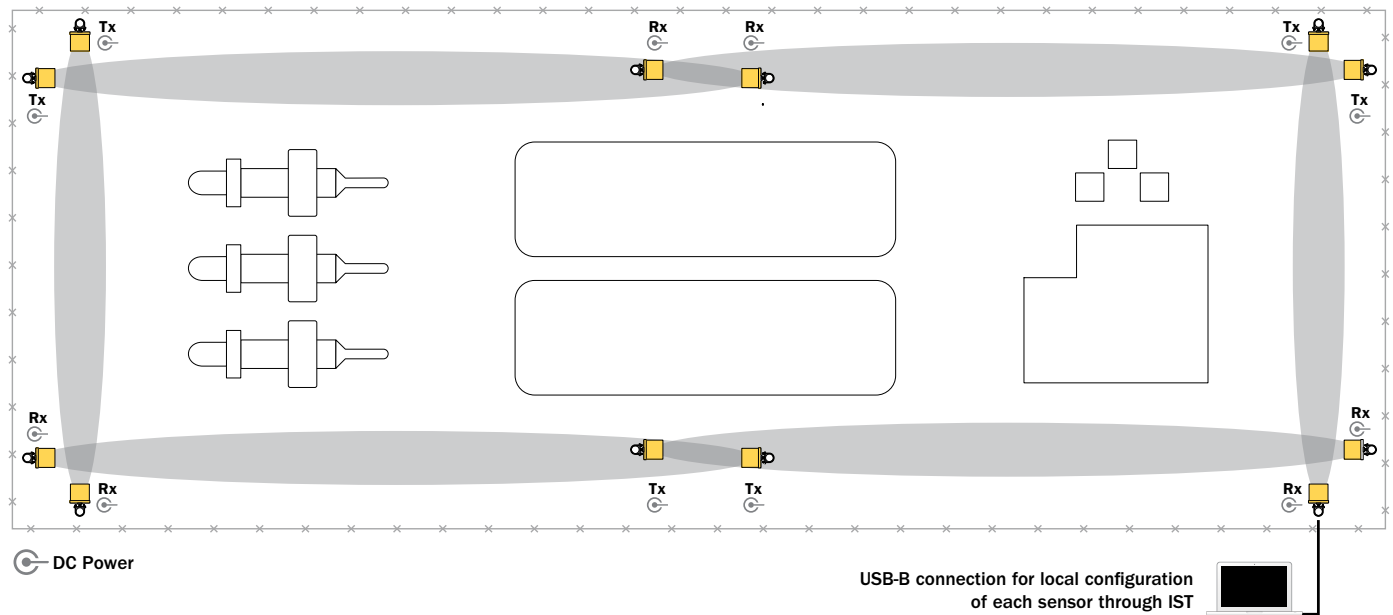
Intrusion detection, using a modulated amplitude sensitive system (not Doppler), takes place within the invisible pattern of microwave energy existing between transmitter and receiver. Changes in signal amplitude at the receiver are directly related to the object's size and density, allowing the sensor to discriminate between objects. Model 336 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 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 are mounted on a rugged metal base-plate and covered by a molded ABS radome for all weather operation. Heavy-duty metal pole-mounting bracket with steel swivel mount permits precise setup and provides firm lock against movement.

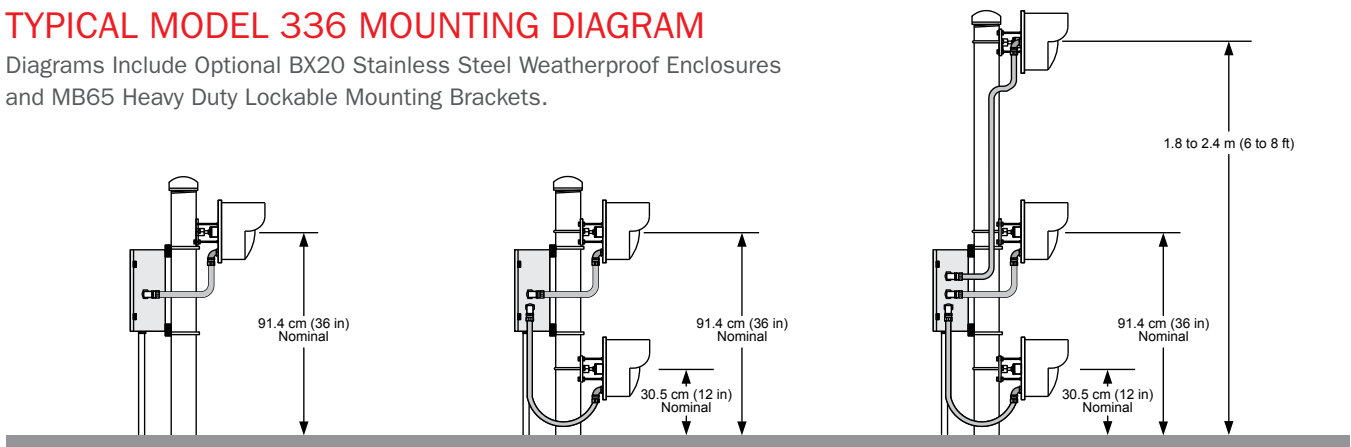
For detailed information on application, installation and adjustment, consult Model 336 Technical Manual.

### TYPICAL MODEL 336 CONFIGURATION DIAGRAM



### TYPICAL MODEL 336 MOUNTING DIAGRAM

Diagrams Include Optional BX20 Stainless Steel Weatherproof Enclosures and MB65 Heavy Duty Lockable Mounting Brackets.



# INSTALLATION SERVICE TOOL (IST)

The INTREPID™ Model 336 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. Sensor auto discovery, guided navigation and forward propagation simplify set-up. 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

- **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 and packaging, including rugged metal base-plate / gland entry and molded ABS radome, are highly resistant to mechanical abuse. 1 mm conformal-coated circuit board enables reliable operation in 100% humidity, corrosive atmospheres or harsh climactic extremes.
- **RF PATH ALARM**  
Provides an alert when the RF pattern is compromised or distorted by foreign objects moved into the detection field.
- **RF SHIELDING AND SURGE PROTECTION**  
Sensor circuit board is 100% shielded against extreme sources of EMI and RFI and protected against lightning induced surges.
- **DIGITAL SIGNAL PROCESSING (DSP)**  
Proprietary embedded DSP algorithms recognize the unique profiles of intruders walking, running or jumping through the detection field as well as enhanced crawl and vehicle detection for superior probability of detection and low nuisance alarm rate.
- **FRESNEL SUPPRESSION ALGORITHMS**  
Unique field-selectable digital signal processing algorithms limit outer field (Fresnel zones) disturbance detection, enhancing operation in challenging applications and reducing nuisance alarms.
- **OPTIONAL HIGH-REL VERSION**  
For maximum security sites, Hi-Rel units are fitted with an RFI/EMI shielded radome, undergo an extended burn-in cycle at 52° C (125° F) and are temperature tested from -40° to 66° C (-40° to 150° F). A position-locking, non-corrosive, anodized aluminum and stainless steel mounting bracket reinforce against movement.

# INTREPID™ Model 336 SPECIFICATIONS

**Equipment Supplied:** Model 336 Transmitter, Model 336 Receiver, Installation Service Tool (IST), universal swivel ball mounting brackets.

**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:** 30.5 m to 457 m (100 to 1500 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 183m (600 ft) with flat terrain.

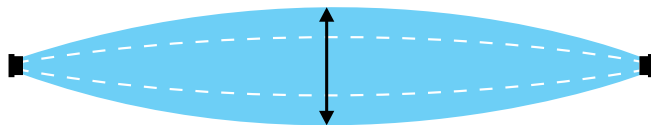
**Target Velocity:** 30 mm/sec to 15 m/sec (0.1 ft/sec to 50 ft/sec).

**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.

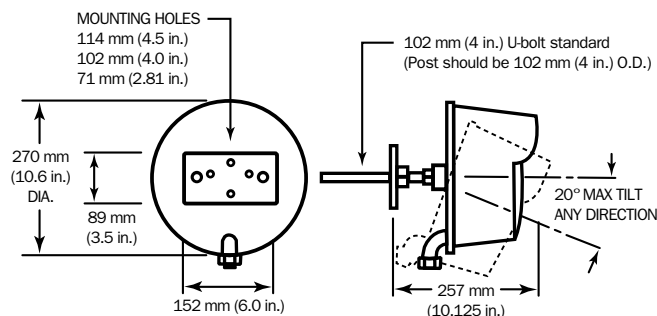
## Pattern

The detection pattern width is field adjustable from approximately 0.6 to 12.2 m (2-40 ft). Pattern height varies in conjunction with pattern width. The pattern width adjustment allows easy adaptation to the final installation site.



Pattern width adjustable from 0.6 - 12.2 m (2-40 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:** Tranzorb 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 / 115 mA

24 VDC: 60 mA / 65 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:** Locking ball swivel mount. 20° adjustment in any direction.

**Remote Test:** Applying momentary voltage turns off Transmitter modulation to provide alarm 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:

**48D45529-A01:** Enhanced Reflector Antenna (provides shorter dead zone).

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

**MB65:** Heavy-duty Lockable Mounting Bracket.

**BX20 / BX25:** NEMA 4X (SS) / NEMA 4 Weatherproof Enclosures. Consult factory for specific configuration details.

## Ordering Info:

Model 336

Model 336-33464 (High-Rel Version)



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



**USA (CORPORATE HEADQUARTERS):** Southwest Microwave, Inc., Arizona, USA | Telephone +1 (480) 783-0201

**EUROPEAN OFFICES:** Southwest Microwave Ltd., Worcestershire, UK | Telephone +44 1386 75 15 11