EXHIBIT 2

Theory Of Operation Statement

Working Principle of the IS-87 DIGITAL Motion Detector.

The microwave part of the detector consists in a M/A COM MA 86848/8 transceiver with a horn antenna. The GUNN diode oscillator inside the cell produces a microwave signal at the frequency of 24.125 GHz. Part of this signal is used as local oscillator for the two Schottky diode mixers, the remaining is fed to the antenna.

The horn antenna used has a gain of 17 dB, a 3dB E-plane aperture of 20° and a 3dB H-plane aperture of 22°. It ensures then a good directivity with a narrow lobe.

According to the Doppler effect, a moving target reflects back to the radar the incident signal produced by the GUNN oscillator. This signal is shifted in frequency by an amount proportional to the target speed. The shift will give a higher frequency when the target moves toward the radar and a lower one when it moves backward.

The two diode mixers will give an electric voltage having an audio frequency equal to the difference between the local oscillator and the received signal. The amplitude of this signal depends on the distance between the radar and the target and also on the angle between the target and the antenna axis. His frequency depends on the target speed, and the relative angle between the microwave beam and the target path.

It can be demonstrated that the phase relationship between the two mixer IF signals is related to the way of motion. A phase discriminator is then used to differentiate a vehicle moving toward the detector from another going away.

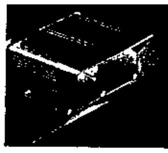
As can be seen on the bloc diagram, the detector is made of two amplifier lines feeding the microprocessor.

The latest makes all the signal processing for target detection and triggers a relay. This relay gives an isolation between the radar and the door operator. A switching power supply gives a constant +7.5V output with input between 12 and 24V AC/DC. It is followed by a linear regulator to give clean +5V to the GUNN diode and ensure spectral purity of the transmitter.

A "power on reset" is applied to the processor each time the sensor is put ON. Four DIP SWITCHES are used to tailor the sensor sensitivity and detection properties following the application. Sensitivity and hold time are adjustable through the use of two potentiometers.

BEA

We open up New Horizons



USER GUIDE FOR THE IS-87 DIGITAL

FCC ID: G9BIS87

MOTION SENSOR FOR INDUSTRIAL DOORS

TECHNICAL CHARACTERISTICS

Technology : microwave and microprocessor
Radiated frequency : 24.125 Ghz (24.200 Ghz in UK)
Protection index : IP65
Output power : 5mW
Mounting height for
- **IS-87 DIGITAL** : 3 to 6 m
- **IS-87 XL DIGITAL** : 2 to 3 m

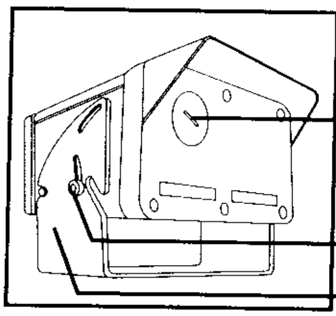
Tilt angle : 15° to 45°
Detection zone for IS-87 DIGITAL at 5m (height)
- adjustment vehicles : max. 4 m (W) x 6 m (D)
- adjustment pedestrians : max. 3 m (W) x 5 m (D)

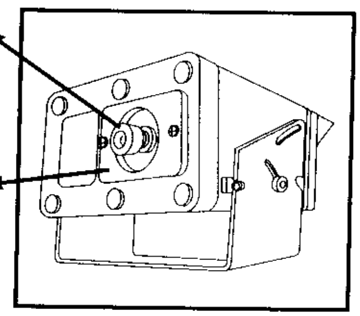
Mains frequency : 50 to 60 Hz
Power consumption : < 4W (VA)
Housing colour : black
Output : relay with switchover contact (voltage free)
- relay contact ratings (max. voltage) : 60 V DC / 125 V AC
- relay contact ratings (max. current) : 1 A (resistive)
- max. switching power : 30 W (DC) / 60 VA (AC

Output hold time : 0.5 s to 13 s (adjustable)
Adjustments
- sensitivity, hold time (by potentiometer)
- function configuration (by DipSwitches)
- dimensions and position of the sensing field (mechanically)

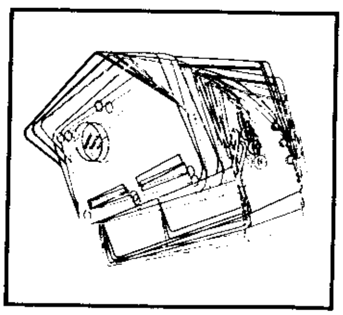
Temperature range : -30°C to + 60°C
Immunity : electromagnetic compatibility (CEN) according to 89/336/EEC and 92/31/EEC
Dimensions : 135 mm (W) x 70 mm (H) x 160 mm (D)
Weight : 0.7 kg
Material : Anodised Aluminium, ABS

DESCRIPTION OF THE SENSOR

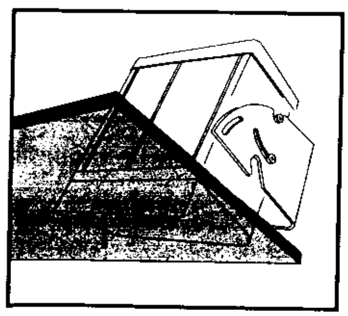




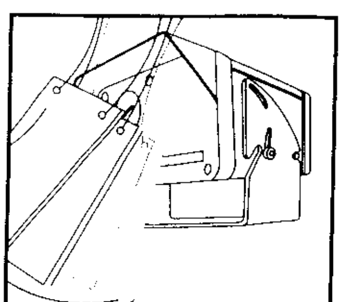
INSTALLATION TIPS



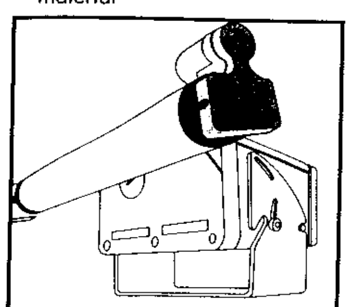
- The sensor must be fixed steadily and must not vibrate



- The sensor must not be placed behind a panel or any kind of material

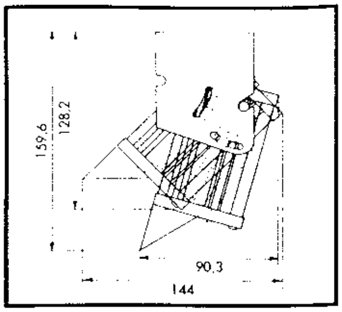


- No object which could move or vibrate must be present within the sensing field

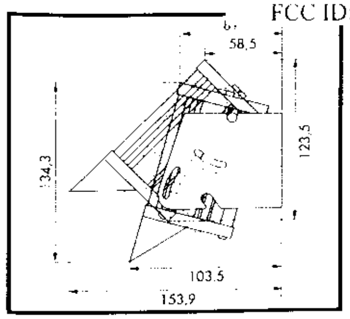


- No neon light within its sensing field

DIMENSIONS OF THE SENSOR

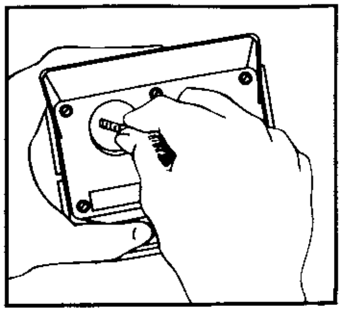


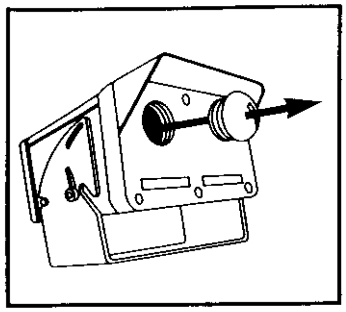
CEILING FASTENING



WALL FASTENING

FUNCTIONS CONFIGURATION



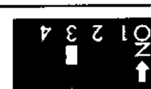
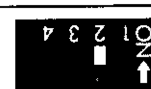


- Unscrew the front hatch

- DIPSWITCH configuration

DIP-SWITCHES are represented in front view, when the sensor is placed on its fastening support

The IS-87 Digital basic configuration

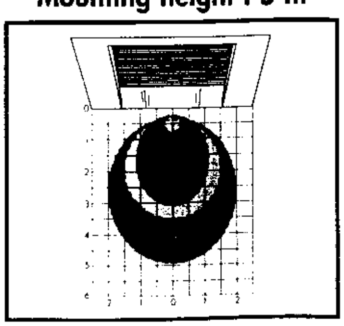
DIPSWITCH #4	DIPSWITCH #3	DIPSWITCH #2	DIPSWITCH #1
 In OFF* position : detection of vehicles	 In OFF position : unidirectional detection of approaching targets	 In OFF position : active output	 In OFF position : bidirectional mode
 In ON* position : detection of pedestrians and vehicles	 In ON position : unidirectional detection of targets going away from the sensor	 In ON position : passive output	 In ON position : unidirectional mode

*: This function can detect either vehicles only, or vehicles and pedestrians as long as the mounting height is higher than 4 meters

For the IS-87 XL Digital, the DIPSWITCH #4 must always be in the ON position

SETTING THE SENSING FIELDS DIMENSIONS

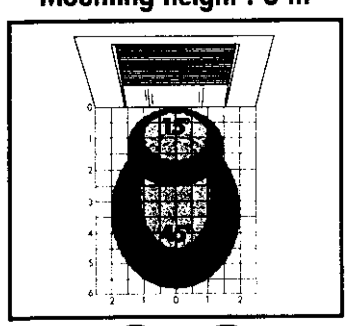
IS-87 DIGITAL
Mounting height : 5 m

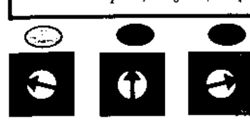


1/4 2/4 3/4

- Vehicle detection setting

IS-87 DIGITAL
Mounting height : 3 m





1/4 2/4 3/4

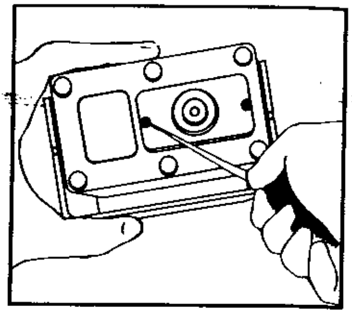
- Vehicle detection setting

Fields correspond to the following settings :

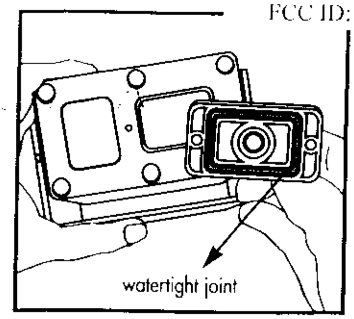
The sensing field can also be side oriented by turning the sensor to the left to the right in order to detect on the sides

FCC ID: G9BIS87

OPENING THE SENSOR

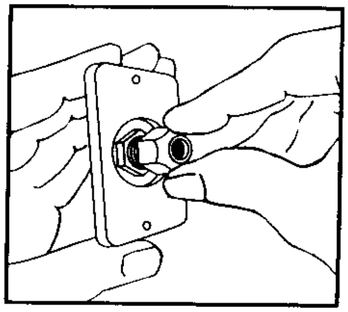


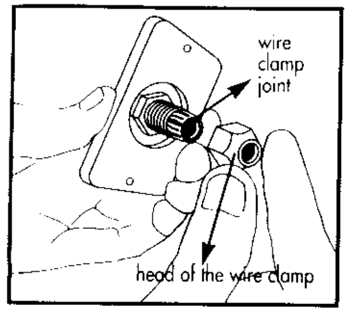
• Unscrew the back hatch



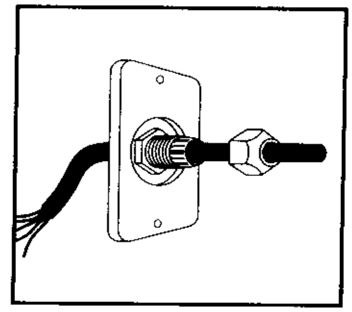
• Remove the back hatch
Watch out for the watertight joint

CONNECTING THE SENSOR

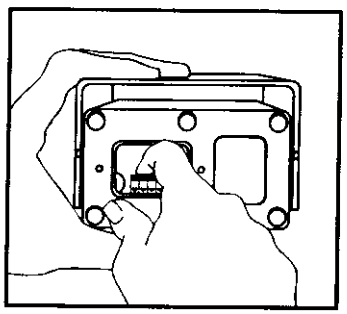




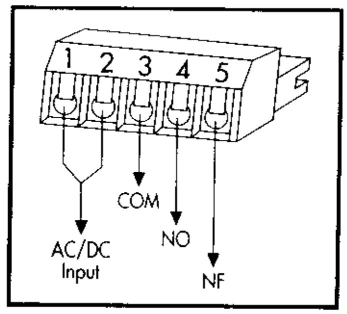
• Unscrew the head of the wire clamp



• Pass the cable (LIYY 4 x 0,34 mm², Ø 4.5 to 6mm) through the head of the wire clamp
• Pass the cable through the back hatch
Watch out for the wire clamp joint
• Bare the cable's extremity



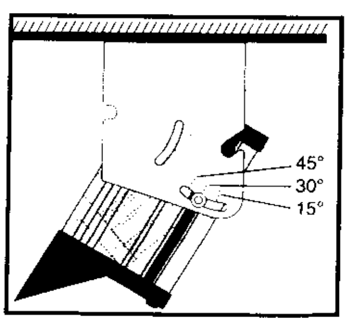
• Place the sensor on its upper side
• Remove the terminal block



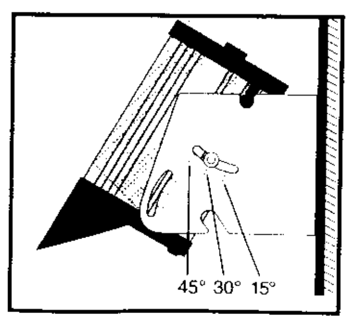
• Connect the terminal block
• Reinstall the terminal block
• Screw the back hatch (**Watch out** for the joints, screw tight)
• Screw the head of the wire clamp

MOUNTING THE SENSOR

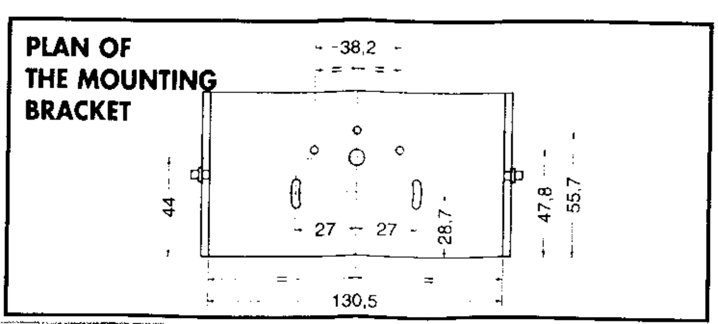
The sensor can be mounted at the ceiling or on the wall



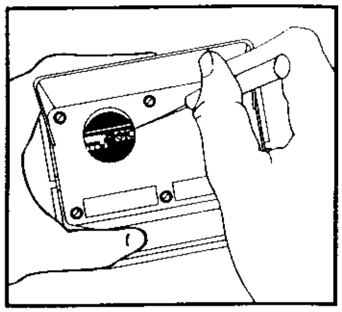
CEILING MOUNTING

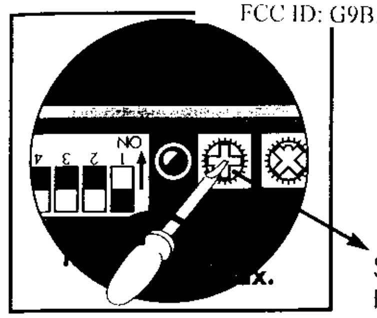


WALL MOUNTING



SENSITIVITY POTENTIOMETER

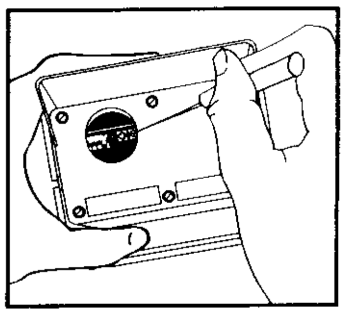


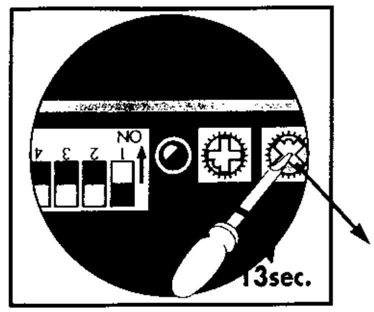


SENSITIVITY POTENTIOMETER

- Unscrew the front hatch
- To increase sensitivity, turn the potentiometer clockwise; to decrease it, turn counterclockwise

HOLD TIME POTENTIOMETER

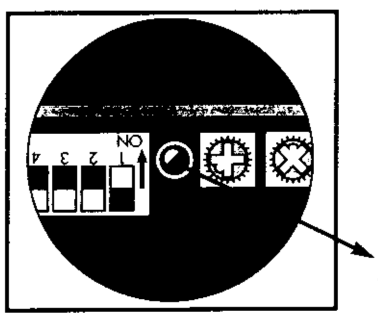




HOLD TIME POTENTIOMETER

- Unscrew the front hatch

SIGNAL LED



SIGNAL LED

- The LED blinks for a few seconds at startup
- The LED lights up when the sensor is detecting

TROUBLE-SHOOTING

SYMPTOM	PROBABLE CAUSE	CORRECT ACTION
The door does not open	The sensor power is off	a. check the supply cable b. check the supply voltage
The door opens and closes continuously	1. The sensor «sees» the door's movement	a) increase tilt angle b) decrease the sensitivity
	2. When closing the door, vibrations occur which are detected by the sensor	a) check the stability of the sensor's support b) decrease the sensitivity c) choose the unidirectional mode by switching the DIPSWITCH #1 to the ON position
The door opens and closes after a while for no apparent reason	The sensor detects the movement of vehicles outside its sensing field	a) decrease the sensitivity b) reduce the sensor's tilt angle
The sensor does not detect close enough to the door	Tilt angle is too high	Reduce tilt angle

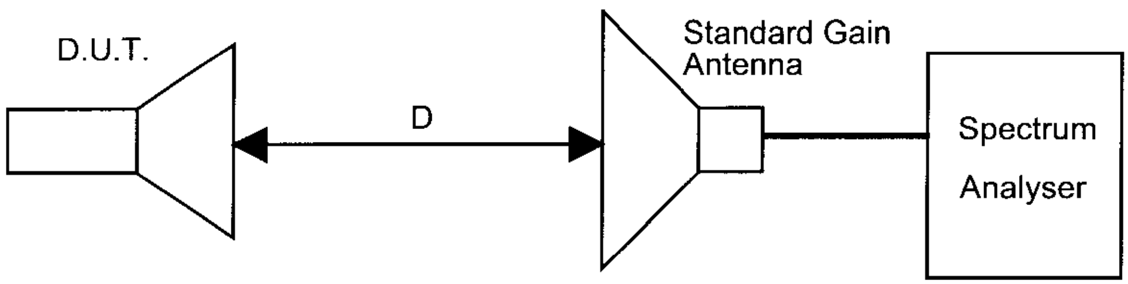
Summary of the IS 87 Motion Detector Specifications.

Transmitter Frequency	:	24.125 GHz
EIRP (Fundamental 24.125 GHz)	:	< + 25 dBm
EIRP (Harmonic Frequencies)	:	< - 30 dBm
Mechanical Tuning Range	:	± 25 MHz
Frequency Drift with Temperature	:	<1MHz / °C
Maximum Frequency Drift with temperature	:	< 35MHz (-25° to +55°C)
Power Consumption	:	< 2W
Supply Voltage	:	12-24 V ± 10% AC/DC
Detection Pattern (max)	:	4 m x 5 m for installation height of 5m
Sensitivity	:	Adjustable
Hold time	:	0.5s. to 9s adjustable
Output relay specs	:	contacts, free of potentials
Max contact voltage	:	50 V AC/DC
Max contact current	:	1A (resistive)
Max Cutting power	:	30W (DC) or 60 VA (AC)
Temperature Range	:	-25°C to +55°C

K Band Detectors Test Procedure.

1. FUNDAMENTAL FREQUENCY POWER MEASUREMENTS.

The complete test procedure is represented in the figure below. What is measured is the Equivalent Isotropic Radiated Power of the transmitter (EIRP). This is equal to the power delivered by the source + the antenna gain.



The EIRP of the Device Under Test is given by the following formula :

EIRP = Measured Power + Path Loss - Receiving Antenna Gain.
Path Loss = 20 LOG ($4\pi D/\lambda$)

The EIRP values are calculated from the specified field values at the specified distance given by the regulation. It is calculated with the following formula :

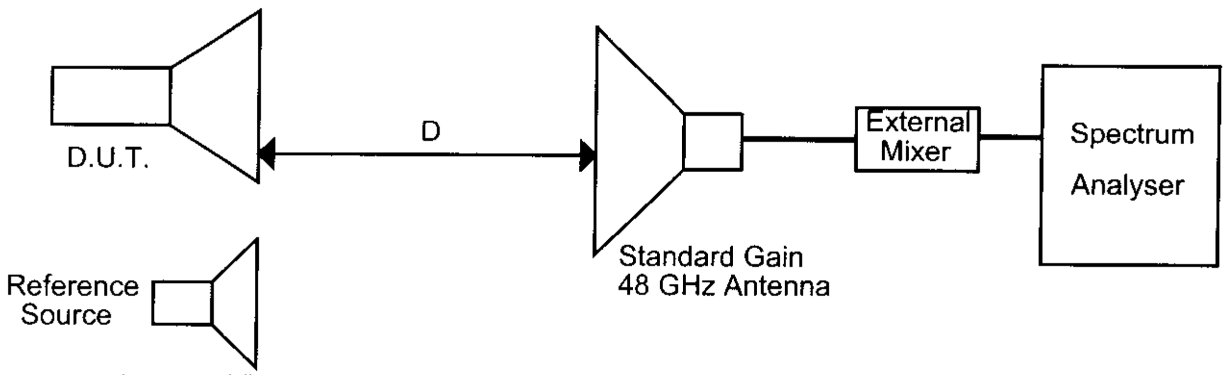
$$EIRP(dBm) = 10\ LOG\left[\frac{4\pi R^2 E^2}{120\pi}\right] + 30$$

The specification is to have a field value of less then 2500 mV/m at 3m. This corresponds to an EIRP of **+32.7 dBm**.

Today spectrum analysers provide good frequency measurements accuracy as their local oscillator is synthesized. The HP 8563E used has a built in frequency counter whose accuracy is excellent.

2. SPURIOUS AND HARMONIC EMISSION POWER MEASUREMENTS

Another test set up is necessary in this case. The K band antenna is removed for a 48GHz antenna and an external mixer for the spectrum analyser must be used. Calibration tables given with the mixer provide good accuracy but it is best to use a reference 48 GHz source of known power to check calibration. The comparison between the two removes many errors.



The specification is to have a field value of less then 25 mV/m at 3m. This corresponds to an EIRP of **-7.3 dBm**.

3. FREQUENCY DRIFT WITH SUPPLY VOLTAGE.

As the sensor is specified with an input voltage between 12 and 24 V AC/DC +/- 10%, a test has been made to verify that the frequency change is insignificant when using the sensor in the whole range of input voltage.

4. TEMPERATURE CHARACTERISTICS OF MICROWAVE TRANSMITTER.

The device under test is the radar within its case. It is put ON at low temperature and maintained during the whole measurement duration. It is put into a climatic room where the temperature is varied between -20 and +60 °C. A frequency counter with a receiving antenna picks the transmitted signal and display the frequency automatically.

5. OTHER SPURIOUS RADIATED INTERFERENCES.

As the sensor uses different internal clock, the frequency of each possible radiation have been listed and special care has been put to try verify that all related spurious are lower then the acceptable level.

6. CONDUCTED RF NOISE OF THE MICROWAVE SENSOR.

Tests have been made using a Line Impedance Stabilisation Network following the specifications of the norm. The spectrum analyser has been used in Peak value detection and a security margin has been taken to take care of measurements inaccuracies.