TECHNICAL SPECIFICATIONS: PERIMETER INTRUDER DETECTION SYSTEM

Introduction

The Perimeters in the main consist of a Perimeter wall 8 ft high with a concertina coil overhang of 1 and ½ ft.

The existing perceived threat is that the Intruder will scale the wall to gain access to the Airport facility; therefore specific Electronic systems need to be designed to provide a stable Perimeter Intruder Detection System with a low false alarm rate.

The existing Perimeter Walls present some challenges as follows:

1. Built Up areas
2. General Public direct access to the Perimeter
3. Condition and application of the Physical Barrier protection
4. Environmental conditions
5. Broken perimeter wall and with gaps at places

To address the Security Requirement taking into consideration the existing parameters, it is proposed to install the following Perimeter Intruder Detection solution:

1. A Covert Radio Frequency Intruder Detection System to be buried between the Perimeter Wall and the Inner Access Perimeter Road.
2. A Secondary Active Infra Red Intruder Detection system to be located on the Airport side of the Inner Perimeter Access Road.
3. The Perimeter Intruder Detection System will be interfaced with a comprehensive CCTV surveillance system (each Perimeter Detection Zone will have a dedicated CCTV camera associated with it).

The total CCTV/PIDS solution will be connected to a Main Control Room within the Airport.

Primary Detection System

Radio Frequency Intruder Detection System

The Radio Frequency Intruder Detection system is a dual cable system, the cables are to be buried in the areas between the Perimeter Wall and the Airport Perimeter Access road. The cables are to be installed adjacent to each other with 2 meter spacing parallel to the Perimeter wall. Each detection zone should be associated with a CCTV camera view.

Application

Covert system to detect climb over on walls and movement of people on open ground

Detection Principle

The Radio Frequency Intruder Detection system will comprise of two radiating cables which are positioned in parallel, one connected to an RF transmitter module and the other connected to an RF receiver module. A radio frequency electromagnetic field is set up around the transmitter cable and disturbances in this field, caused by the presence of a human being, are detected by the adjacent receiver cable. The transmitter cable radiates an RF field, which is detected by the receiver cable and the resulting signal is fed to the analyzer.
An intruder moving through the electromagnetic field causes changes in the phase and amplitude of the received signal which are detected by the receiver module and passed to the signal processing system within the receiver unit. This change in signal is detected by the analyser, which then 'decides' if an alarm should be triggered.

**Zone Length:** Maximum upto 150m

**Area of Detection:** 3m X zone length (+/-0.5m)

**Configuration:** Each zone requires the following minimum equipment:

1. One analyzer / receiver unit
2. One transmitter module
3. One end of the line module
4. Two leaky feeder cables
5. 12v - 15v dc power supply @ 650mA

**Radiating Cable**

The radiating cables will be specially constructed and comprise an inner conductor separated and insulated from the outer screen by a di-electric sheath. The outer screen comprises a series of helically wound copper wires designed to allow RF energy to be radiated from the transmitter cable and detected by the receiver cable.

**Analyzer Housing**

Standard cast aluminium of dimension: 330 x 230 x 102mm. This unit may be customised as per on the site requirements.

**Transmitter Housing**

Standard cast aluminium of dimension: 260 x 160 x 90mm. This unit may be customised as per on site requirements

**End of line module**

Potted module of dimension: 30 x 20mm diameter.

**Operating Temperature**

-20° to +50°C or as defined by user

**Operating Frequency**

40 to 41MHz (16 possible options)

**Outputs**

Solid state Alarm and Tamper relays 250v, 120mA AC or DC

**Dead Feeder Cable**

Both the analyser and transmitter units can be located up to 50m away from the two main sensor cables by using standard non-radiating co-axial cable.

**Controls**

Sensitivity adjusted by local on-board push buttons with LCD Display.

**Connectors**

Specially adapted CW20 brass coupling with built in UHF male connector fitted
Secondary Detection System

Active Infra Red Beam Detection

The Active Infra Red Beam Detection System is a series to Transmit and Receive multi beam sets enclosed in a 2m external free standing beam tower. Each Tower is to be located in parallel to each Radio Frequency Intruder Alarm Detection zone and is to be interfaced with the Primary detection zone to provide a secondary verification detection zone. Each detection zone should be associated with a CCTV camera view.

Detection Principle

The Active Infra Red Beam Intruder Detection System operates by the use of Multi Active Infra Red Beams enclosed in an External Beam Tower, these Beam Towers transmit and receive Infra red signals and generate an invisible Infra Red Beam fence.

If the invisible ‘Fence’ is crossed and the Transmit and Receive beams are interrupted the system generates an alarm condition. The infra red external beam system will be immune to masking and offer a high level of external detection.

Each Beam tower is to be synchronized to the next by the use of a Synchronized Cable link and Sync line monitor. If the Synchronized line is interrupted this will generate an alarm condition. Each individual receiver will only respond to its own transmitter to avoid interference between units allowing for closer beam spacing.

The System is to also allow a transmitter at the bottom of a tower to be directed at a receiver at the top of another tower to overcome the effects of undulating ground and is to be capable of working effectively with uneven ground and unusually shaped compounds.

Beam Tower Configuration
- Beam Tower Height – 2m
- Number of TX Units – 6
- Number of RX Units – 6

Zone Length
External range: 0.5 to 150 metres
Internal range: 0.5 to 200 metres

Beam Characteristics
Beam transmitted and received angle: 5°
Horizontal adjustment: 200°
Vertical adjustment: 90°
Beam width: 40mm

Electrical Requirements
230V AC / 50 Hz

Infra Red: IR wavelength: 880nm

Weatherproof Rated
IP 54 rated
Temperature range: -20°C to + 55° (with heaters)
Relative humidity: 10% to 90%
Detection Criteria
Response time: > 20mS - <40mS
Alarm dwell: 800mS
Beam width: 40mm

Outputs
Potential free contact

Power supplies
230V AC/50Hz AC Single Phase

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