



Since 1980, PROTECH has been designing, manufacturing, and marketing Perimeter Intrusion Detection Systems (PIDS) to protect personnel, property, and assets at sensitive sites. We manufacture systems that give early warning of potential threats at the perimeter. PROTECH offers a complete range of perimeter intrusion detection systems and technologies including – G-FENCE fence-mounted intrusion detection, infrared beam technology (invisible fences), PIRAMID dual technology motions sensors and video analytic object detection and tracking. Our technology can be integrated with monitoring applications including Protech’s MAXIBUS, Smart Bridge, or Spectra.

For additional information, contact:

PROTECH/Protection Technologies, Inc.
529 Vista Blvd.
Sparks, NV 89434

Phone: +1 775 856-7333 | Fax: +1 775 856-7658
protechsales@protechusa.com
www.protechusa.com

FENCE-MOUNTED INTRUSION DETECTION SYSTEM

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

MasterFormat 2020

28 31 21 Area and Perimeter Intrusion Detection

Notes to Specifier:

1. Where several alternative parameters or specifications exist, or where, the specifier has the option of inserting text, such choices are presented in **<bold text>**, where the **parameter specified in [brackets] is the normal default**.
2. Explanatory notes and comments are presented in *italic* text.

FENCE-MOUNTED INTRUSION DETECTION SYSTEM

PART 1 GENERAL

1.01 SUMMARY

- A. Section describes a perimeter fence-mounted intrusion detection system employing accelerometer technology.
- B. Product - A solar-powered fence-mounted cabling system with attached accelerometer sensors which detects all attempts at intrusion that use cutting, climbing or lifting of the fence, while disregarding meteorological phenomena such as wind, rain, snow, or other interference from vibration, up to 3200 m per system.
- C. Related Requirements
 - 1. 28 01 30 Operation and Maintenance of Security Detection, Alarm and Monitoring
 - 2. 28 06 30 Schedules for Security Detection, Alarm and Monitoring
 - 3. 28 31 31 Intrusion Detection Interfaces

1.02 REFERENCES

- A. Definitions and Abbreviations
 - 1. Application Programming Interface (API) - A software communication interface between two programs.
 - 2. Climbing event – An occurrence where one attempts to climb onto a fence.
 - 3. Cutting event – An occurrence where one attempts to cut the fence.
 - 4. MAXIBUS – A system to integrate and monitor one or more PIDS
 - 5. Modbus RTU – A serial master-slave communications protocol using RTU (Remote Terminal Unit) makes use of a compact, binary representation of the data for protocol communication.
 - 6. TCP - Transmission Control Protocol and Internet Protocol (IP) v4
 - 7. VMS- Video Management System
 - 8. Wind event – An occurrence where wind moves several fence panels.
 - 9. Zones – Logical groupings of sensing elements for the purpose of establishing specific identifiable areas of coverage.
- B. Reference Standards
 - 1. Electromagnetic compatibility - EU EMC Directives EN 55022, EN 55024
 - 2. IEEE 802.3 Ethernet
 - 3. Environmental
 - a. ANSI/ IEC60529 - Degrees of Protection Provided by Enclosures
 - b. International Electrotechnical Commission (IEC) - Ingress Protection Rating IP 44, IP 66, IP 67

1.03 SUBMITTALS

- A. Product Data
 - 1. Manufacturer's printed or electronic data sheets
 - 2. Manufacturer's installation and operation manuals
- B. Shop Drawings
 - 1. Termination points and enclosures

1.04 QUALIFICATIONS

- A. Manufacturer of system shall have a minimum of five (5) years' experience in the design, manufacture, and successful implementation of perimeter fence sensing systems.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver the equipment system in the manufacturer's original, unopened, undamaged container with identification labels intact.
 - 1. Ship and store the system protected from mechanical and environmental conditions as designated by the manufacturer and in a temperature environment of -40°F to +158°F (-40°C and +70°C)

1.06 WARRANTY

- A. The Manufacturer shall provide a limited warranty for the system to be free of defects in workmanship and material under normal operating conditions for a period of two years from the date of product shipment.

- END OF SECTION -

PART 2 PRODUCT

2.01 EQUIPMENT

- A. Manufacturer: PROTECH/Protection Technologies, Inc.
529 Vista Blvd.
Sparks, NV 89434
Phone: +1 775 856-7333 | Fax: +1 775 856-7658
protechsales@protechusa.com
www.protechusa.com
- B. Models: G-Fence 3000
MAXIBUS
MAXIBUS is the alarm information hub for G-Fence.
PORTALIS
PORTALIS is an optional infrared barrier for gates to connect to G-Fence.
- C. Alternates: None

2.02 GENERAL DESCRIPTION

- A. The fence-mounted intrusion detection system (IDS) shall employ a passive detector cable installed on the fence. Upon an intrusion, accelerometer-based technology sensors shall detect vibrations on the fence (caused by cutting, climbing or lifting) and send information to the control unit(s), which analyze the information before triggering an alarm.
- B. The IDS shall employ accelerometer-based technology sensors which detect vibrations on the fence (caused by cutting, climbing or lifting) and send information to the control unit(s), which analyze the information before triggering an alarm.

2.03 SYSTEM COMPONENTS - The IDS shall have a maximum system length of 2 Miles (3200m) and be comprised of fence cabling with integrated sensor elements, termination units, and one or more control units, as follows:

- A. A section of sensing/detection cable, maximum 100 m long, which integrates up to 40 detector sensors, attached to a fence, and is connected to a control unit.
1. Maximum number of sensors per direction 40
 2. Sensor type: X-Y-Z accelerometer
 3. Configuration: Individual sensitivity settings
 4. Diagnostic: integrated LED in sensor
- B. Control unit(s) which analyze and process the data from up to two detector cable sections and communicate status upstream.
- a. Power: solar energy with battery storage
 - b. Detection cables per control unit: 2 maximum
 - c. Detection zones per control unit: up to 8
 - d. Maximum control units per system: 16
 - e. Auxiliary inputs per control unit: 2

- f. Sensor sensitivity
- g. Impacts per zone
- h. Technical fault recovery time
- i. Settings via PC through Maxibus hub:
 - 1) Zone set-up
 - 2) Control unit Modbus ID
- C. Link termination unit which terminates the detection cable in an open loop configuration or terminates and bridges two detection cables between adjacent control units.
- D. Lightning Surge Protection, replaceable surge protector for the RS-485 line.
- E. Graphical set-up software tool
 - Mandatory with G-Fence 3000 to set up and create zones.*
- F. The Maxibus hub which accommodates 8 miles (13 km) of protection by aggregating signal streams from up to 16 control units per communication port (up to 4) and communicating to mapping software or a VMS system via Modbus protocol.
 - 1. The Hub shall provide alarm management and incorporate graphic software for configuration and maintenance of detection zones.
 - 2. Communication from IDS: RS-485 using secure Modbus protocol.
 - 3. The information hub shall allow integration with third party software.
 - MAXIBUS is PROTECH's information hub. See separate specification document.*
- G. Infrared Barrier – The IDS shall offer an optional add-on product to provide pulsed infra-red optical barrier protection at gates, with the following properties:
 - 1. Five (5) dual-beam cells for gates of 2.5 m or 3 m height.
 - 2. Maximum range: 30 m /100 ft.
 - 3. Power: Solar with battery pack
 - 4. Alarm connection: via Control unit aux input contacts
 - 5. Alignment tools: Integrated
 - 6. Selectable channels: 4
 - 7. Integrated anti-climbing cap
 - Protech's infrared barrier for this application is PORTALIS.*
- H. RS485 maximum wire length: 1200 m

2.04 PERFORMANCE

- A. The system shall be capable of detecting and localizing a cutting event to within 3 meters (9.8 feet).

The actual protected length is a function of the width of the fence panel. Typically, one sensor per panel is employed. For example, 40 sensors, each on an 8 ft. (2.5 m) panel, cover a protected length of 320 ft. (100 m)

- B. Maximum Coverage: Up to 2 miles (3200 meters)
200 m per control unit.
- C. Number of perimeter zones: Up to 128, without limitations on size or location
- D. Calibration: Auto
- E. Cable cut response time: 5 seconds to 30 seconds
- F. Alarm conditions: intrusion, auxiliary contact inputs (2), low battery, tamper
- G. Event log History: 1000 events

2.05 ELECTRICAL

- A. Power: Solar with battery or optional 12VDC input
1. Detection cable(s): bidirectional from control unit
2. Auxiliary inputs: 2 – via external contact closure
3. Alarm outputs: 1 RS-485 (Modbus protocol), 2 wires data, 2 wires 12 VDC power

2.06 MECHANICAL

- A. Mounting: Integral hooks or wall mounting
- B. Security: Tamper switch for control unit cover.
- C. Cable Jacket: Polyethylene
- D. Weight:
1. Control Unit: 3.8 lb./ 1.7 Kg
2. Termination/Link Unit 0.5 lb./0.2 Kg
3. Detector cable: 13 lb./ 5.6 Kg
- E. Cable Reel Dimensions: See Attachment A

2.07 ENVIRONMENTAL

1. The system shall be rated for outdoor use.
2. Operating Temperature: -40°F to +158°F (-40°C to +70°C)
3. Relative humidity: 0 – 95% non-condensing
4. Ratings:
- a. Control unit: IP 44
- b. Termination link: IP 66/67
- c. Detector cable" IP 67

2.08 WEB SERVER AND PROGRAMMING

- A. The control unit shall be capable of being programmed locally.
Protech's alarm information hub is the Maxibus (see separate specification).
- B. Web Server
 - 1. The Maxibus hub shall have an integrated web server to support configuration and maintenance:
 - a. event log history
 - b. remote maintenance
 - 2. The Maxibus hub web server shall be accessed via an IP connection using the Internet browser.

- END OF SECTION -

PART 3 EXECUTION

3.01 INSTALLERS

- A. The Contractor's installers and technicians shall be factory trained and certified to install, service, and maintain the system.
- B. Contractor personnel shall comply with all applicable state and local licensing requirements.

3.02 INSTALLATION

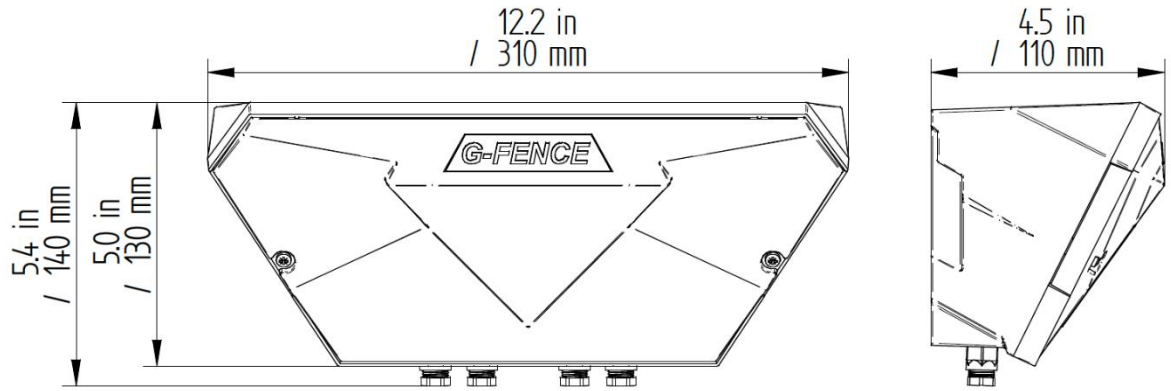
- A. The Contractor shall adhere to all Manufacturer's published installation procedures, diagrams, and guidance.
- B. Control units
 - 1. Control units shall be installed at a height of five to six feet.
- C. Detector cable
 - 1. Detector cables shall be installed the mid-height of the fence.

- END OF SECTION -

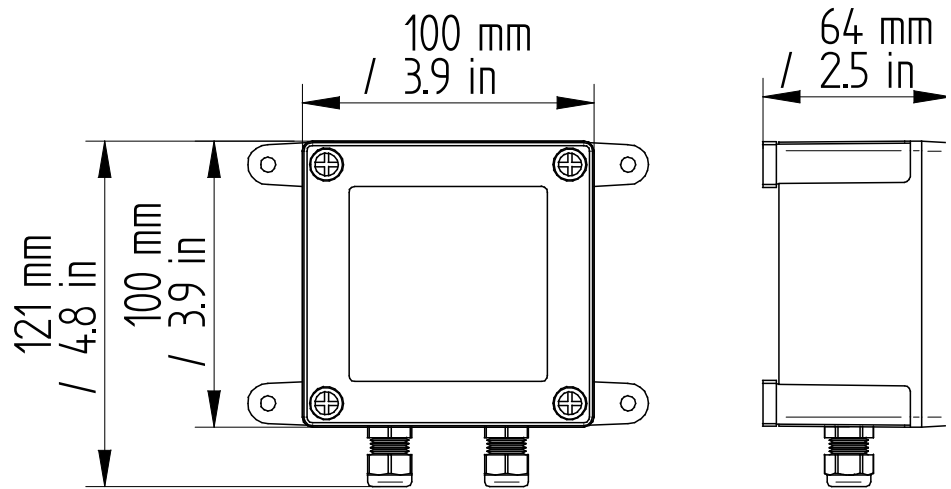
Attachment A

Exterior dimensions:

- Control Unit Housing



- Link / Termination Unit (UR/UT) housing



- Detector cable drum

