LIGHTLOC®

The Leader in Underground Pathway Protection

SmartSwitch

SmartSwitch Overview

SmartSwitch is a non-electrical, non-contact sensor in the LightLOC family designed for monitoring manholes and handholes. In addition, this highly adaptable sensor offers a host of other monitoring solutions such as cabinet doors, junction boxes, and anywhere else movement of a barrier is necessary to gain access to an asset. It was developed to overcome the distance limits of copper-based contact switches and is capable of being monitored from up to 25km away. Monitoring devices include the LightLOC Network Level or Express Level systems. With the network level system, up to 25 sensors per line and up to eight lines are currently supported under a single software platform depending on the configuration.

Like all the LightLOC sensors and monitoring systems, SmartSwitch was designed to be a zero-false-alarm solution. It is extremely tamper-resistant, rugged, and sealed for use in damp or even submerged environments. Since it is fiber-optic based, it is immune to EMI and RFI transmissions as well as lightning strikes! No electrical power is needed at the location of the sensor allowing it to be installed where there is no power available or where power cannot safely be delivered.

Inside the sensor, there is a loop of fiber positioned between a powerful magnet and a spring/damper unit. When the ferrous target is present, the fiber is unaffected. When the target is removed, the spring-damper unit pulls the fiber loop creating a macrobend that is detected by the monitoring system. The damper has a built in reset delay to hold the fiber in the tripped position to allow time for detection to occur, even if the target is immediately placed on the sensor in an attempt to defeat it.

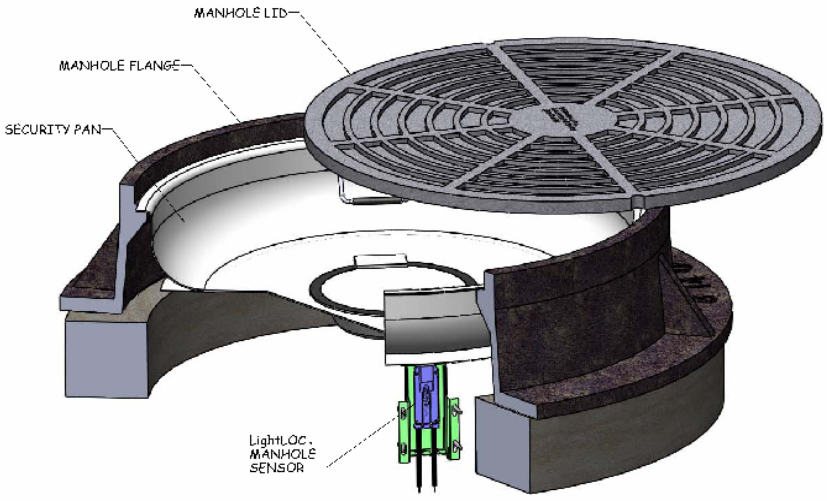
On the next page, installation of the sensor is detailed.

Standard Features

- Fiber-Optic Proximity Sensor
- For Use in Manholes, Handholes, Enclosures, or Doors
- Low False Alarm Rates
- Long-Range Monitoring to 25km Standard
- Power Not Required at Sensor
- Designed for Harsh Environments Including Salt and Fertilizer
- Electroless Nickel Plating over Aluminum Shell with Stainless Steel Internal Components
- Encapsulated with a Rugged Thermoplastic Polyurethane and Polyurea Mixture
- Water Submersible to 30 ft.
- No External Moving Parts that Corrode Over Time
- Adaptable to any Manhole/Hand Hole/Enclosure Type
- 1550nm Operation with Standard Single Mode Fiber
- -32C to 50C Operating Temperature Range
- Minimum Time Required to Trip – 0.7 Seconds
- Built in Sensor Reset Delay to Ensure Alarm Detection
- May be Installed in Conjunction with a Locking Pan to Provide both Detection and Delay

SmartSwitch:

Your Manhole Monitoring Solution



For additional information on the LightLOC® system, please contact Doug Piper at 864.963-5131 or dpiper@lightloc.com

Installation

LightLOC SmartSwitches are installed by splicing them into a standard, communications-grade fiber optic cable routed to each sensor location and mounting the sensor. Splices are stored in sealed splice enclosures, which are pre-loaded and included with each sensor. Typically, there are four splices at each sensor location. LightLOC can provide certified installers to perform an installation or training if a site's preferred installers are not certified. Splicing standards are very strict to allow optimal system performance.

Sensors are mounted using the provided mounting bracket. The bracket is customizable for unique applications, and standoffs of various sizes are used as needed for correct positioning.

The most common application for the SmartSwitch sensor is for monitoring communication manholes and handholes. For these cases, it is recommended to install the sensor in conjunction with a locking type pan as a deterrent to unauthorized entry. This combination provides both delay and detection. The sensor is then mounted beneath the pan inside each hole typically 0.10" to flush with the bottom of the pan. LightLOC can provide locking pans for manhole and handhole installations for both round and rectangular openings.

Technical Details

Monitoring Systems	LightLOC Network System LightLOC Express Processor LightLOC Multi-Port Express
Power Requirements	None in Field Monitoring System Powered As Specified
Sensor Shell Material	Electroless Nickel Plating over Aluminum
Sensor Component Material	Stainless Steel
Minimum Movement Detected	½ inch
Minimum Time Required to Trip	0.7 Seconds
Sensor Dimensions (without shroud)	1 ¾" W, 4" H, $^{7}/_{8}$" Thick
Maximum Sensors per Line	25 for Network Level System
Fiber Type	Single-mode
Monitored Wavelength	1550nm
Operating Temperature	-32C to 50C
Humidity	Immune/Submersible
Sensor Life	>10,000 Trips

Ordering Information

SmartSwitch systems are custom designed for customer applications. Please contact us for a quote.

LightLOC Overview

LightLOC is a patented, fiber-optic based security system providing the optimum in perimeter and access security. The system provides monitoring of remote access points and perimeters using a family of sensors and cables developed and made by LightLOC. Monitored items can include manholes, gates, doors, culverts, perimeter vehicle detection and vehicle denial cable systems, and custom applications. Monitoring is possible at distances of up to 25km without the need for electrical power at the monitored locations. The robustness of the system eliminates false alarms commonly seen with other fiber-based security systems, and LightLOC systems are inherently tamper resistant since altering or destroying optical components triggers alarms automatically.

For additional information on the LightLOC® system, please contact Doug Piper at 864.963-5131 or dpiper@lightloc.com