FIBER FENCE
SECURITY SYSTEM™

FIBER FENCE INSTALLATION INSTRUCTIONS

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FIBER FENCE
SECURITY SYSTEM™

COMPONENTS NEEDED FOR INSTALLATION

Zone Control Unit

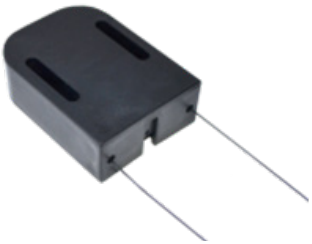
Connectorized Fiber Cable

Fiber Fence Rack (1-4 units)

Mini Mouse Trip

Splice Kit

Corner Guard



Opti-Mag Proximity Sensor

Standard Mouse Trip (Optional)

Zone Mapping Software (Optional)

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PART I: PLANNING ZONE AND MOUSE TRIP LOCATIONS

Step 1: Carefully prepare a sketch or map of your intended layout showing zone location(s) along the fence line or area to be protected. The fiber cable for each zone must loop back to the zone Control Unit if using a single (simplex) strand of fiber; or a double strand (duplex fiber). See Fig. A & B

A zone can be a continuous loop around a perimeter, a single fence boundary line, or fiber connection to a single point attached to a sensor such as a gate, door, cover, etc.).

The plan should also indicate the place (central station) where the Zone Control Unit(s) will be monitored and requires access to 110v AC power.

Fig A: One zone using simplex fiber cables (Single loop)

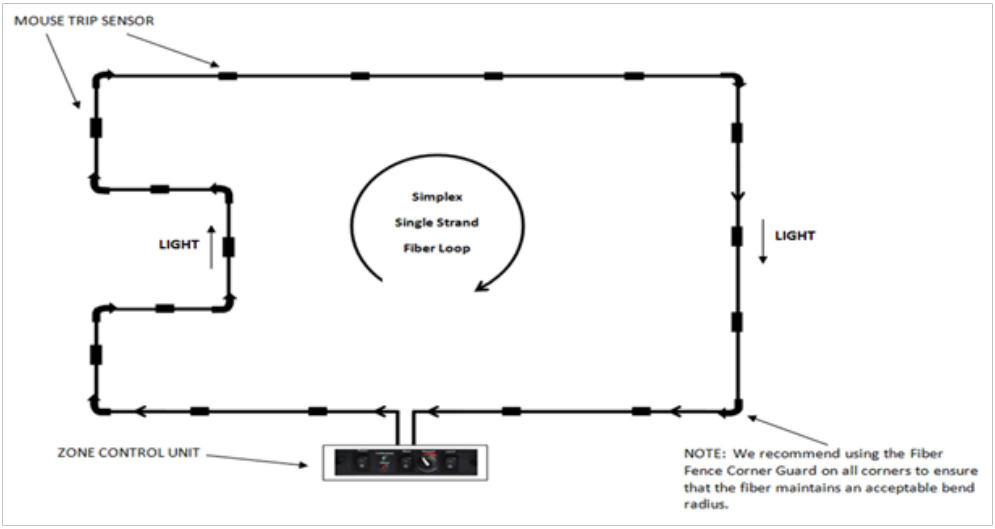
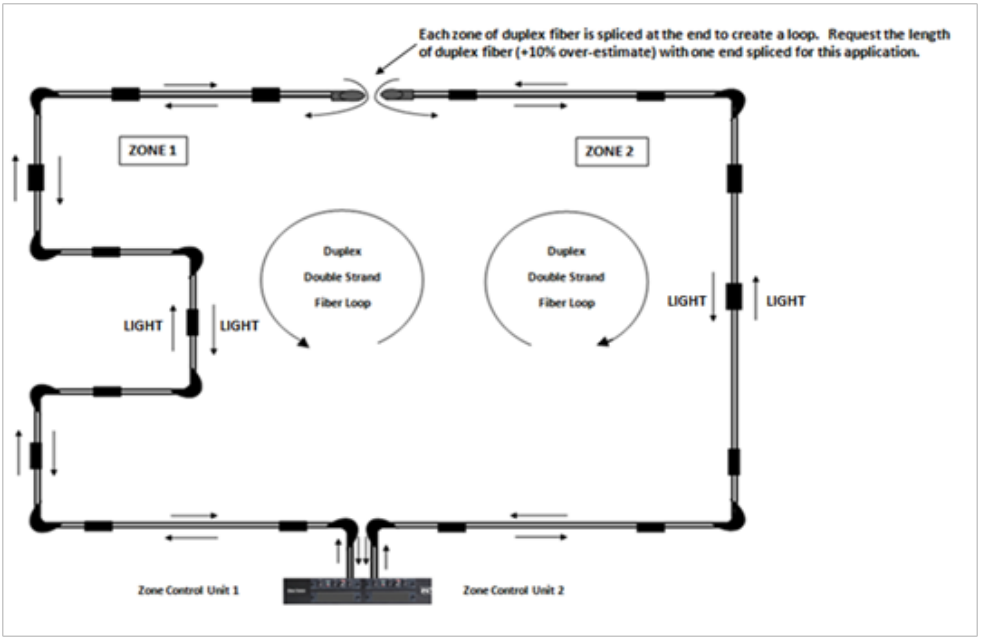
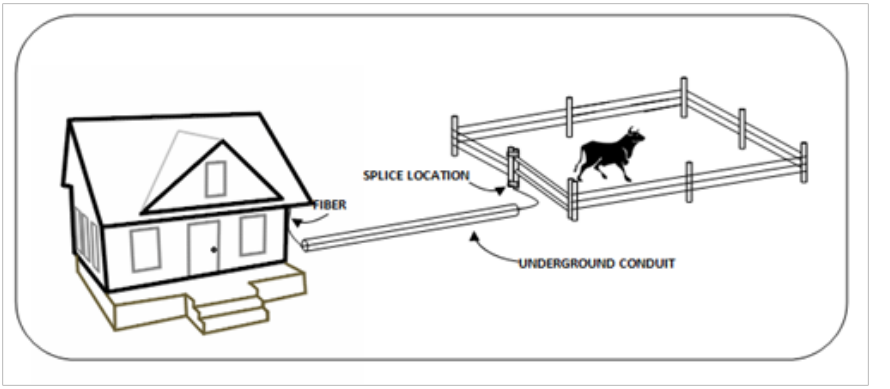


Fig B: Two zones with two duplex fiber cables (Two loops)



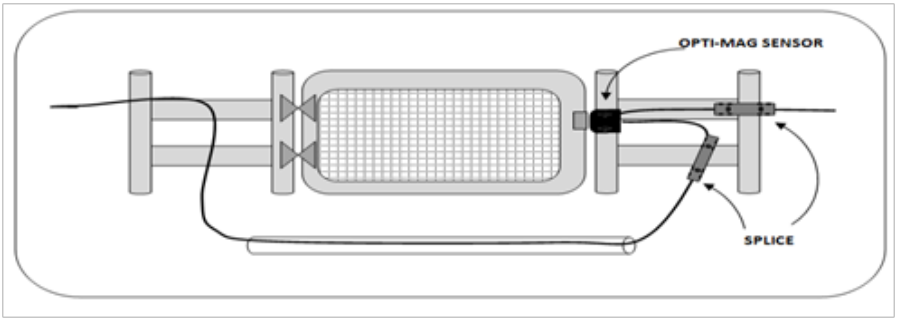
Step 2: The cable from the office or control station area to the fence should be protected. A popular method is to bury conduit and pull the connected fiber through the conduit. Aerial installation may be accomplished by wrapping and securing the fiber cable around a steel cable. Zone Control Units may also be mounted outside in a NEMA rated box with 110v AC with an attached alarm horn, bell and/or light if outdoor temperature variations are not too extreme. Direct buried cable is also an option that will require fiber splicing.

Fig C:



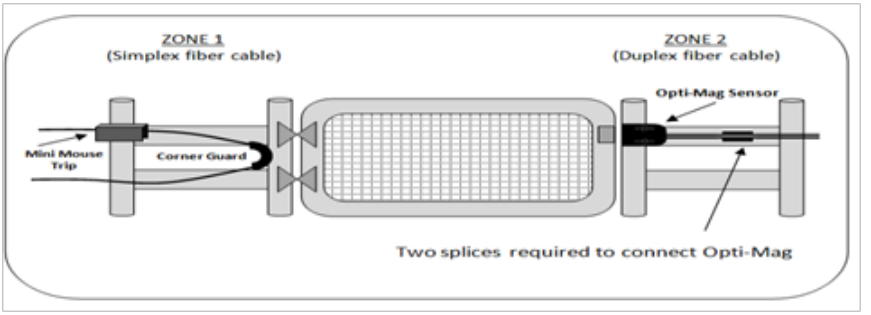
Step 3: At locations where there is an opening in the perimeter (gates, etc.), it is recommended conduit be buried in the ground as shown.

Fig D:



If possible, design the zone ends at an open location. Then it is not it is not necessary to pass other zone cables under the opening, so conduit may be eliminated.

Fig E:



Step 4: Using your prepared zone map, re-confirm a loop is created for each zone. It is important to use duplex fiber cable with the far end spliced when a complete loop is not accomplished. See Fig A & B above.

Step 5: Confirm the fiber cable lengths you received are longer than the zone length when connected to each Control Unit. Each zone requires one connectorized fiber. When you provide the actual lengths required, the factory will connectorize and splice cable as shown in Fig. F and G. Account for several extra feet that are

required to handle underground conduits and splicing to install gate sensors. Adding 10% to the total length should provide you the extra length you require.

Fig F:

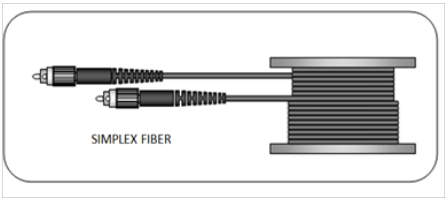
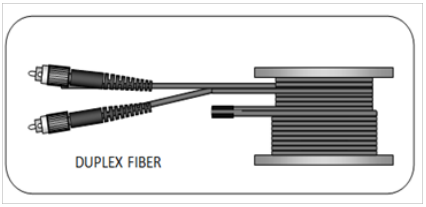


Fig G:



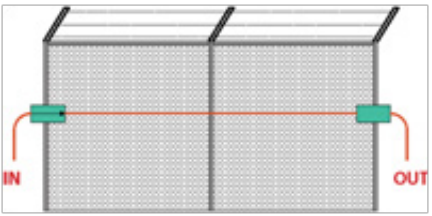
Step 6: Planning "Mouse Trip" locations

The "Mouse Trips" also require advance planning. Where possible, a Mouse Trip should be placed at least every 50 feet. Fence destruction requires only 1 level of protection (fiber and trips) usually at the mid height of the fence.

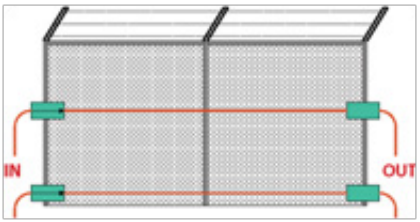
Additional layers for other security applications may include a ground level layer for protection from ground intrusions and at the top for climb over protection; or all of the above.

Fig H:

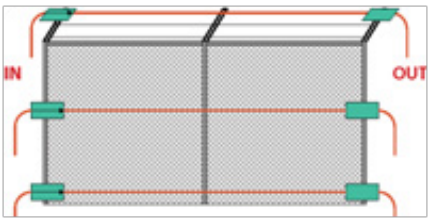
Fence Destruction



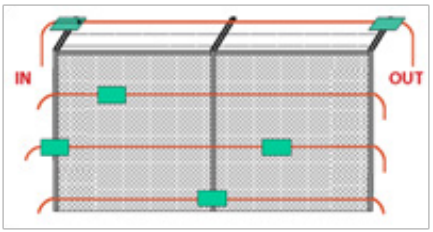
Ground Entry



Top Entry



Additional Security



When possible scatter the location of the mouse trips for additional protection. See Fig H "Additional Security."

NOTE: For material protection, mouse trips may be needed every few feet with additional loop of fiber.

PART II: CONFIRMING EQUIPMENT OPERATION

At this point, the locations of the Zone Control Units, zones and mouse trips are established. Now confirm that all devices are operational BEFORE taking the products into the field for the installation.

Step 1: Carefully unspool a few feet of the fiber. Take the connectorized fiber cable, remove the dust caps from the fiber connectors and the Control Unit connectors, and carefully plug the fiber into the connectors on the rear panel. Notice that the connectors have a key and keyway to be aligned carefully before screwing the connectors together.

Fig A:

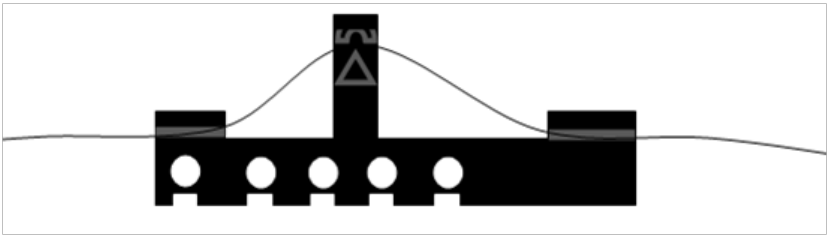
CAUTION: Keep the connector ends free from dust and dirt. Do not touch the ends and use only a lint free wipe or alcohol wipe to clean them. Always replace the connector dust caps when **disconnected.**

CAUTION: The Control Unit contains a Class 1 laser. Do not look directly into the connector when the Control Unit is powered on. Keep the cap on at all times when fiber is not attached.

Step 2: Install a single Mini Mouse Trip on the fiber cable. (If your installation requires standard Mouse Trips, see the separate instructions for installation and set-up.)
From the cable you unspooled, lay the fiber in the channel as shown.

The fiber is secured under the hinge (w/ double stick tape) on the right side, and should move freely under the clip on the left side.

Fig B:



Step 3: Plug in the power supply into the back panel of the Zone Control Unit. Establish either the simplex or duplex fiber cable connections cause a loop back to the Control Unit.

Fig C: Zone Control Unit front panel

1. Set the "Squelch" all the way to the left (counter clockwise) until it stops.

2. Turn on the "Power" switch. None of the indicators will light yet.

3. Slowly turn the "Squelch" to the right (clockwise) until the green "Calibrated" and red "Alarm" lights start to come on and flash.

4. You may also hear the built-in audible alarm sounding when the "Alarm" flashes; and the relay in the terminal block will click. There is nothing wrong. The Control Unit is functioning correctly.

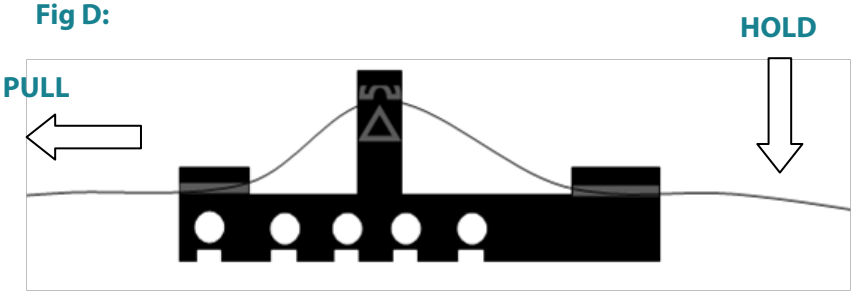
5. Continue to turn the "Squelch" until the "Alarm" light turns off. The green "Calibrated" light should stay on continuously.

6. Turn the "Power" switch off then back on. After a few seconds you will see the "Calibrated" light flash and stay on.

Step 4: To test the Control Unit, hold the secure (right side) end of the fiber and gently pull the opposite end away from the mouse trip.

The alarm should sound. When you release and straighten the fiber the alarm should cease.

Fig D:



How It Works: The laser in the Zone Control Unit sends a continuous stream of infrared invisible light down the fiber. It returns to a detector inside the unit. When the fiber, mouse trips, and sensors are disturbed, bent, broken or activated, the light is reduced and sets off the alarm. If you are using the FIS Zone Mapping Software the USB will activate an alert. It also activates the normally open (NO) or normally closed (NC) relay on the rear panel of the Zone Control Unit activating any separate horn, bell, light or security monitoring system you have attached to it.

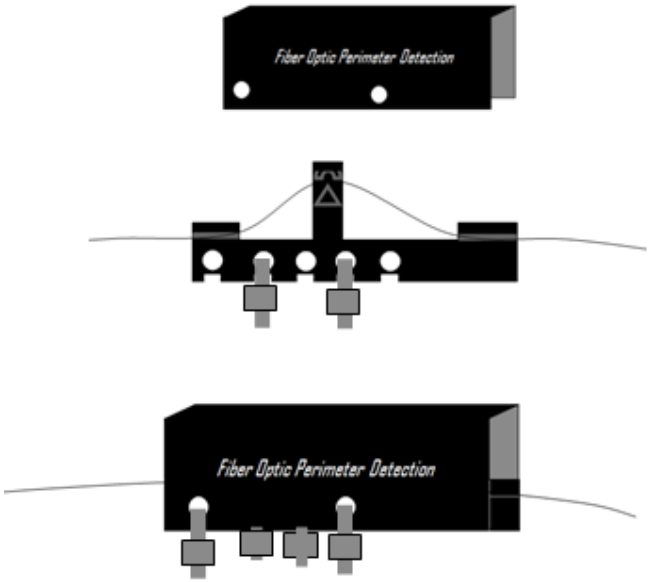
If you are unable to perform this test successfully, call FIS for technical assistance at 800-5000-FIS.

PART III: FIELD INSTALLATION

Step 1: Using your predetermined layout, begin mounting the Mini Mouse Trips* to the fence or wall utilizing cable ties, screws or nails depending on the material to be mounted against. Use the center holes in the base under the center post for mounting. Save the end 2 holes for attaching the cover. Install the trips no more than 50 feet apart from each other for ideal operation. On the first few, slide the cover over the top of the base to insure that your method of installation will allow the covers to be attached and secured with cable ties. Leave the covers off, installing all of the Mini-Mouse Trip bases in the zone. The fiber cable is not installed at this time but after the fiber is attached, the covers will go over the bases and be secured with cable ties and foam ends.

*See separate instructions for installing Standard Mouse Trips.

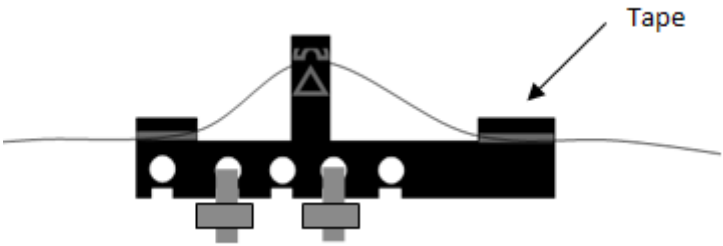
Fig A:



Step 2: Each corner should have a Corner Guard bracket installed. This will help prevent pulling and bending the fiber tightly around corners and disturbing the light. It can be attached to the post with cable ties or other fasteners through the holes provided. The fiber is laid in the Guard easing the cable around the corner and preventing a bend causing light loss and false alarms.

Step 3: Once the Mini-Mouse Trip bases are installed you can install the fiber cable. The fiber optic cable will be laid into the base of each Mini-Mouse Trip. (Fig. B) The cable between 2 Mini Mouse Trips should be pulled and secured so there is no slack in the cable.

Fig B:



Zip ties can be used to secure the fiber to the fence between mouse trips.

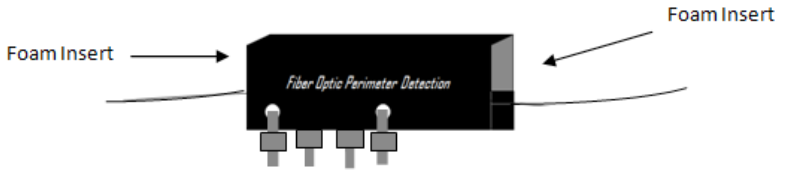
Starting from right to left, the cable is now secured in each Mini Mouse Trip by removing the protective tape cover from the tape under the right hinged cover, placing the fiber cable on the tape and pressing down tightly on the hinged cover securing the fiber. The opposite side of the Mouse Trip is designed to hold the fiber and allow it to move freely. Simply guide the fiber into the slot.

Pull the fiber cable tight eliminating sinking of the fiber between the Mouse Trips.

CAUTION: Over pulling and stretching the will damage the fiber cable.

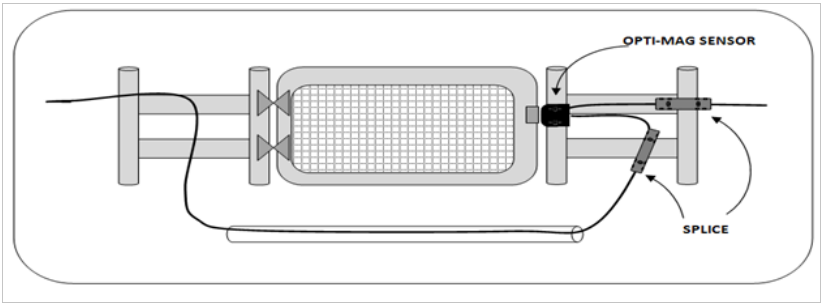
Upon securing the fiber cable the protective cover is now slid down from the top over the base and secured with cable ties through the 2 outside holes. Insert the foam pieces into the open ends of the Mini Mouse Trip to protect the fiber from insects and the weather.

Fig C:



IMPORTANT: The Opti-Mag Sensor locations (ie: gates, etc) are installed last. See Part V. Take notice when the fiber may be required to be pulled through a conduct. This is best be performed when the fiber optic cable is being installed. However, since the Opti-Mag installation requires splicing, a fiber cable may be pulled through a conduit during the Opti-Mag installation. It is important to loop and store several extra feet of fiber cable so that the conduit and splicing may be properly accommodated.

Fig D:



Step 4: Any excess length of cable should be coiled and stored. Tie wrapping the coil and hanging it on a curved wall bracket will avoid tangles and kinking. You can use a Fiber Fence Corner Guard for this purpose.

NOTE: If the cable is too short or does not reach the Zone Control Unit an extension patch cord may eliminate splicing an extra length of cable. If this connection is outside, a connector protection box is needed. Order custom patchcords and connector protection boxes from FIS.

Step 5: Upon the completion of each zone, confirmation of light connectivity is necessary. Make sure there are no extreme bends in the cable anywhere along the fence, at corners, or at transition areas.

The Zone Control Unit procedures followed in Part IV below will confirm a successful installation of each zone. Note that temperature change, high wind and ice may require adjusting the squelch (sensitivity) level.

In the event the continuity is not achieved, you can do basic testing using the visual fault locator from the FIS Fiber Fence Splicing Kit. These tests will assist to identify and locate high loss regions. If you are unable to identify the high loss regions, additional testing and repairs can be performed by a recommended qualified fiber optic technician.

After zone continuity is confirmed gate sensors may be installed. This sensor requires cutting into the fiber and performing splicing of the fiber.

PART IV: CONNECTING THE ZONE CONTROL UNIT

Step 1: Back Panel The mouse trips and cable are now installed and you are ready to connect to the Zone Control Unit. On the Zone Control Unit back panel connect the installed fiber cable with connectors for each zone. The connectors on the back panel need to match the connectors attached to the sensing fiber. The factory has pre-installed connectors (FC style) that match the connectors on the back panel. Note the keyway before tightening the connectors. Always clean the connectors before installing.

Fig A:

Now connect the 9v power supply to a standard 110v AC outlet. If more than 1 Zone Control Unit is utilized, they may be installed in the Fiber Fence Rack. One power supply can be installed to power up to four Zone Control Units. A separate power supply with a 4 plug jack is available.

NOTE: The Zone Control Unit contains a Class 1 laser. Do not look directly into the adapters when the unit is on.

A 3-pin terminal block on the back panel is provided for your use. It provides a normally open (NO) or normally closed (NC) contact to trigger an external alarm device, light or security system. This connection is a switch capable of carrying 3 amps (3A) of current. Use the terminal blocks as you on/off switch to operate your separately purchased alert system. See "Zone Mapping Software Operation" Part VI to interface with cell phones, etc.

Step 2: Operation of the Zone Control Unit front panel

Fig B:

Steps for each Zone Control Unit:

1. Set the "Squelch" all the way to the left (counter clockwise) until it stops.

2. Set the Mute to Off (O), and the Latch to On (-)

3. Turn on the "Power" switch. None of the indicators will light yet.

4. Slowly turn the "Squelch" to the right (clockwise) until the green "Calibrated" and red "Alarm" lights start to come on and flash.

5. You may also hear the built-in audible alarm sounding when the "Alarm" flashes; and the relay in the terminal block will click. There is nothing wrong. The Control Unit is functioning correctly.

6. Continue to turn the "Squelch" until the "Alarm" light turns off. The green "Calibrated" light should stay on continuously. Turn it slightly further to the right.

NOTE: The "Squelch" takes up to 30 minutes to warm up. As it does warm up, it becomes more sensitive. You may hear static and a false alarm. Turn the dial a little further clockwise if needed until it stops.

7. Turn the Latch position to Off (O).

8. Turn the "Power" switch off then back on. After a few seconds you will see the "Calibrated" light flash and stay on.

The Control Unit is now tuned and calibrated to the conditions of the installation. Any additional attenuation applied to the fiber or sensors will cause the alarm to sound. High winds, extreme temperature change, ice, etc. may require the adjustment of the squelch control.

Step 3: Test the Control Unit by gently bending the fiber somewhere along the fence line; or by activating a mechanical sensor (Mouse Trip or Opti-Mag Sensor). The "Alarm" light will come on and the built-in audible alarm will sound. The relay will activate and trigger other security devices attached to the terminal block.

Notice if the Latch is on during an alarm the alarm will remain activated until the Latch is turned Off.

If the Control Unit will not sound an alarm, or is constantly in an alarm, there is a problem in the installation. Turn off the Control Unit and test the fiber loop. Correct and remove any excessive attenuation caused by dirty connections, excessive bends, poor splices, etc. and reset the controller as described above.

NOTE: In some cases, fixing the fiber loop may require testing and/or repairs by a qualified fiber optic technician.

Other Features on the Front Panel:

"Mute" switch: This switch turns the built-in audible alarm on or off.

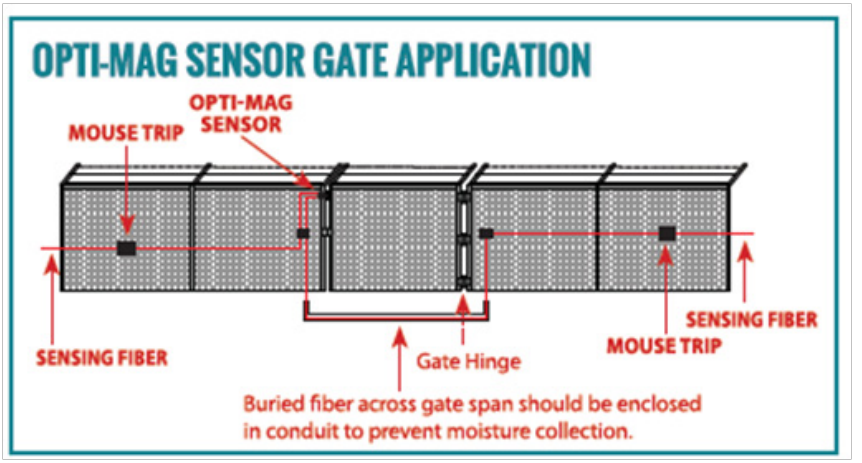
"Latch" switch: When the "Latch" is on, the alarm will continue to sound as long as the Zone Control Unit is on. The operator has the option to select the latch position monitoring the protected area.

PART V: INSTALLING THE OPTI-MAG PROXIMITY SENSOR

The FIBER FENCE Opti-Mag Sensor is mounted in a stationary position to non-magnetic surface such as a post or a wall next to a magnetic target such as a gate, cover or lever. When the target moves away from the sensor (gate opens, cover lifts) the Sensor will attenuate the Sensing Fiber and set off an alarm at the Zone Control Unit.

Step 1: The installation of the Opti-Mag Sensor requires cutting the fiber cable where the sensor is to be mounted.

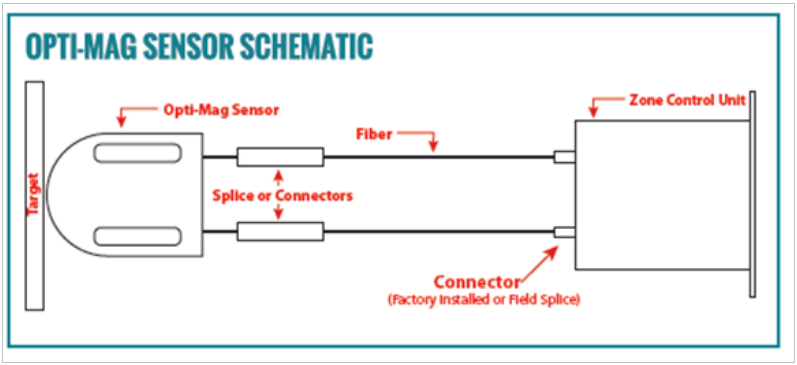
Fig A.



Step 2: The cut fiber cable must be spiced onto the two fiber cables protruding from the back side of the fiber sensor. (See Fig. B)

Step 3: Use the Fiber Fence Splicing Kit, carefully following the instructions provided in the kit. A recommended fiber optic contractor may be used for this operation.

Fig B:



Step 4: Install the splice protection sleeves provided with the splice kit to protect against weather.

Step 5: Mount the Sensor to the stationary post. The target must be no more than 1/32" (0.040") from the sensor.

Step 6: If the target material is not magnetic, a metal plate (included with the Sensor) must be installed.

OPTIONAL ZONE MAPPING SOFTWARE

The Zone Mapping Software is an optional purchase for monitoring the fiber Fence using a computer. If the computer has access to the internet, the software can also send remote messages by email and/or text. Call us for more details.

Notes:

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