IMS2000™

(Invetex Monitoring System Model 2000)

Installation and Operations Manual

Version 2.2

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IMS2000™ Installation and Set-Up

Systems Capabilities

IMS2000™ (Invetex Monitoring System) alerts personnel when your computer server room or other protected area is exposed to water in the ceiling or if temperature extremes are reached. When hooked up to an auto-dialer, a security system, or other systems, **IMS2000™** can call designated numbers in response to a potential problem, inform your security system of problems, or provide other assistance. In addition you can link **IMS2000™** to a computer, and any actions that change the system will be automatically recorded.

IMS2000™ will differentiate among:
1. Water leaks that may damage computers or other equipment,
2. High temperatures that may cause harm to electronic devices, and
3. Cold temperatures.

In addition once an operator reacts to an initial water alarm, **IMS2000™** will also recognize a spreading water leak. Further, if a system gets wet, **IMS2000™** will also emit a chirp to recognize when the system has dried and is again in the alarm mode.

IMS2000™ can direct your auto-dialer, computer, or other system to call up to four phones to alert people at two different alarm levels (that **IMS2000™** calls Red Alarm and Yellow Alarm), and also sound a local audible alarm when temperature extremes exist, water is detected, or other selected problems occur. In addition **IMS2000™** sounds a local alarm when user-set conditions are met such as loose or disconnected wires.

To start, read the basic information section that starts on the next page and if, during installation or set-up, you have a question concerning the names of parts, where things go, or how they connect, refer to the following "Basic System Information" section.

After you have set-up the **IMS2000™**, as outlined starting on the next page, you, your computer support company, alarm system representative, or your internet provider can also establish a wide variety of other support actions using the **IMS2000™** two-channel, RJ-11 contact closure interface. This is covered in the "Support Systems" section at the end of this set of instructions.

A **red alarm** is the most critical alarm. Two red alarms are automatically set in **IMS2000™**: 1. Water detection by a Halotile™, and 2. If the tile falls to 0˚C (32˚ F). The temperature limit is set to prevent the freezing of pipes that might burst and flood the detected area. The installer can raise the temperature threshold above these preset limits but can not eliminate or lower the limit below 0˚C (32˚ F). In addition the installer can select a red alarm for disconnected cables and for high temperatures, which might detect the failure of an air conditioner in a computer server room or other critical area.

A **yellow alarm** is for lesser problems that still need to provide for rapid notification. An example is notification for errors such as disconnected cables when the company wants to call a different number (or numbers) from the red alarm.

Basic System Information

The Master Controller Box includes an 8-line screen, four controller buttons below the screen, and three status lights to the right. A Master Controller Box is shown to the right.

The 4 buttons are "hot" buttons, that is, the function changes for different screens. The button function name always appears immediately above each active button. If a button does not have a name, for that screen the button has no function.

IMS2000™ can support up to 200 Halotiles. A repeater is required for approximately every 50 tiles.

Master Controller Box

The top "Poll" light is blue and illuminates when the **IMS2000™** Master Controller Box has power. When it is rapidly blinking it shows that the system is polling the Halotiles™. The center button is yellow and illuminates in the event of a yellow alarm. The lower light is red and it illuminates during a red alarm.


Power supply

The power supply plugs into the Master Controller Box bottom.

The power supply (shown above) plugs into either a standard 110 volt, 60 cycle AC or 220/240 volt, 50 cycle AC source and the single end plugs into the Master Controller bottom as shown (above right). To adapt **IMS2000™** to use 220/240 volts, simply replace the flat two-prong plug on the power supply with a round two-prong plug by pressing the button near the prongs and sliding in the new plug.

To provide back-up power to **IMS2000™** the system should be plugged into a universal power supply. This will ensure continual operation in the case of a power failure.

Water leaking onto a ceiling is detected by Halotiles™ placed on top of standard 2x2 or 2x4 ceiling tiles. A Halotile™ is shown below.
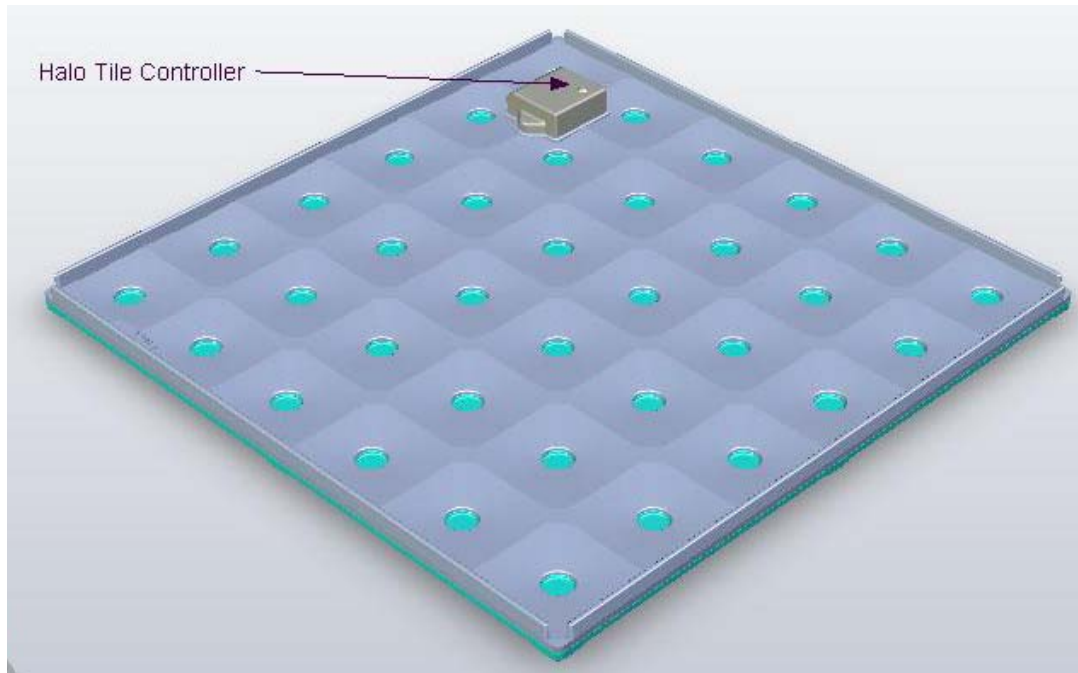
Halotile™

Clip Light™

The **IMS2000™** comes with Clip Lights™ that turn very bright when a Halotile™ is wet or the area around the tile is at 32º F. These clip lights will blink at a low light level when the system is functioning to show **IMS2000™** is operating. If desired, this "normal operation" blinking function may be turned off.

Left: clip light. The arrow on the clip points to the protected tile. A light emitting diode is in the arrow's center.

Halotile™ controller boxes connect to each other using four-wire RJ-11 cables that are specially marked to assist with connections. A colored coded RJ-11 cable also connects the first Halotile™ controller to the **IMS2000™** Master Controller Box. The black end goes into the Master Controller Box and the red end goes into the first Halotile™.

In the event of a power failure of 30 minutes or less, **IMS2000™** will automatically return to its previous condition when power is restored. Should power be our more than 30 minutes it may be necessary to restart the **IMS2000™** system.

Installation

The following sections describe step-by-step installation procedures. It is best to first locate where the master controller will be installed. Install the Master Controller Box on the wall near a power outlet. Halotiles™ will be daisy chained together, one after the other. The **IMS2000™** will automatically recognize and number each tile in sequence. The Halotile™ connected to the Master Controller Box will be Halotile™ 1, the tile connected to it will be Halotile™ 2, etc.

Install Master Controller Box

The Master Controller Box must be installed near a power outlet and also be near the first Halotile™. Mount the two screws 4 inches apart and parallel to the floor. Insert the screws so 5/32 inch remains exposed. Slide the Master Controller Box onto the screws. Plug the Master Controller Box into a power outlet and hold the 'On" button down for one second, then release the button. The Master Controller Box should show:

Halotiles™

Halotiles™ are 23-3/4 inches square and are designed to fit on top of normal 2ft x 2 ft or 2 ft x 4 ft ceiling panels. For non-standard ceiling tiles, such as near a wall, or fitting around pipes, Halotiles™ may be cut to fit. **CAUTION** - Special procedures are required to properly cut Halotiles™. See "Cutting Halotiles™," on pages 8 and 9.

Before you install Halotiles™, it is suggested that you plan where you will place each tile. You may want to make a sketch map numbering each tile with number 1 closest to the Master Controller Box. It is best to start installation with a row of tiles next to a wall. A sample map and a blank map that may be photocopied and then filled in is shown in the appendix.

After every 50 tiles the **IMS2000™** requires the addition of a power booster or repeater.

Each Halotile™ (except the last) will have a four-wire RJ-11 running from its black connection to the adjacent tile with the next higher number, where it will plug into the red

connection. This is important since **IMS2000™** will automatically number the tiles in the sequence in which they are connected.

To install a Halotile™, remove the ceiling tile adjacent to the location where you will install the detection. To start installation of a row next to a wall, remove ceiling tiles one row away from the wall. Place a Halotile™ on top of the ceiling tile next to the wall, as shown in the following figures.

To install a Halotile™ remove a ceiling tile that is adjacent to where you want the Halotile™ (left) and then insert the Halotile™ by bending the tile slightly (right). The Halotile™ will be installed on the ceiling tile next to the opening.

Some ceilings have insulation on top of tiles. In these cases, simply lift the insulation and slip the Halotile™ under the insulation, after hooking up the four-wire RJ-11 cable.
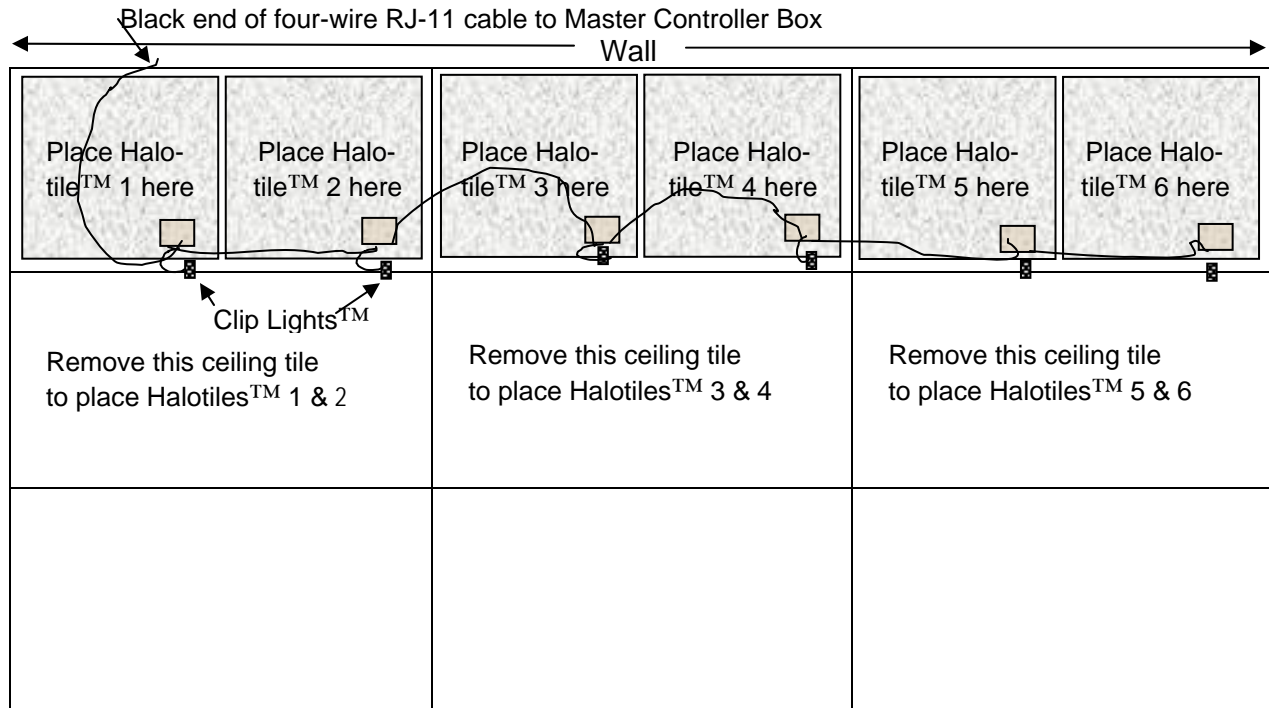

After installing the first Halotile™ in the ceiling, plug in the black end of the RJ-11 cable into the **IMS2000™** controller and the red end into the first installed Halotile™. The red end goes into the tile controller box near the red dot, as shown at the left. Plug the black end of the cable into the top of the **IMS2000™** Controller. The controller window should display for one second ERROR DETECTED and ATTEMPTING RECOVERY and beep once. The window will then show:

If any four-wire RJ-11 cables are installed other than with the lower numbered tile having the black connection running to the higher numbered tile red connection, the Master Controller window will show:

ERROR DETECTED
TURN OFF POWER AND
CHECK PLUGS

Attach a Clip Light™ on the ceiling suspension system with the arrow pointed towards the tile to which it is connected. This will require you to slightly lift the ceiling tile under the Halotile™. It is important that the clip light wire to go over the suspension system. Should the ceiling leak and a tile becomes wet, you want to lift up a dry tile. If the clip light wire is under the suspension system, it may prevent you from easily lifting a dry tile. Hook the wire from the clip light into the Halotile™ controller.

Black end of four-wire RJ-11 cable to Master Controller Box

Wall

Place Halo-tile™ 1 here	Place Halo-tile™ 2 here	Place Halo-tile™ 3 here	Place Halo-tile™ 4 here	Place Halo-tile™ 5 here	Place Halo-tile™ 6 here

Clip Lights™

Remove this ceiling tile to place Halotiles™ 1 & 2

Remove this ceiling tile to place Halotiles™ 3 & 4

Remove this ceiling tile to place Halotiles™ 5 & 6

Top view of 2 x 4 ceiling tiles and Halotiles™. Remove the ceiling tile adjacent to where the Halotile™ will be replaced. The same technique is used for 2 x 2 tiles. Clip Lights™ affix to the ceiling suspension rails.

After installation of each new Halotile™, hook it to the adjacent Halotile™ using a color-coded, four-wire RJ-11 cable. To do this, rotate the clear Halotile™ Controller cover to expose three receptacles. The small bubble on the tile controller, covers a light. This light blinks intermittently at a low level to show the system is operating. Halotile™ lights can be turned off if desired (this is will be covered later).

The center receptacle is for the clip light cable.

Each four-wire RJ-11 connecting cable has a red end and a black end. The ends are colored next to the connector. Each Halotile™ Controller Box has a receptacle with red dot nearby and a receptacle with a black dot. A red cable end goes into a red receptacle and a black cable end goes into a black receptacle.

The cables hook to adjacent tile control boxes, connecting each Halotile™ to its neighbor. For the tile nearest the master control panel, the black cable will be left hanging from the Halotile™ and it will be hooked into the Master Control Box top once all tiles are connected to each other. The last tile will not have a black connection cable.

A controller cable connects two Halotiles™ as shown. One cable end is red (upper tile) and one is black (lower tile).

This "daisy chain" system connects each Halotile™ to a neighboring tile. In this way all tiles are connected.
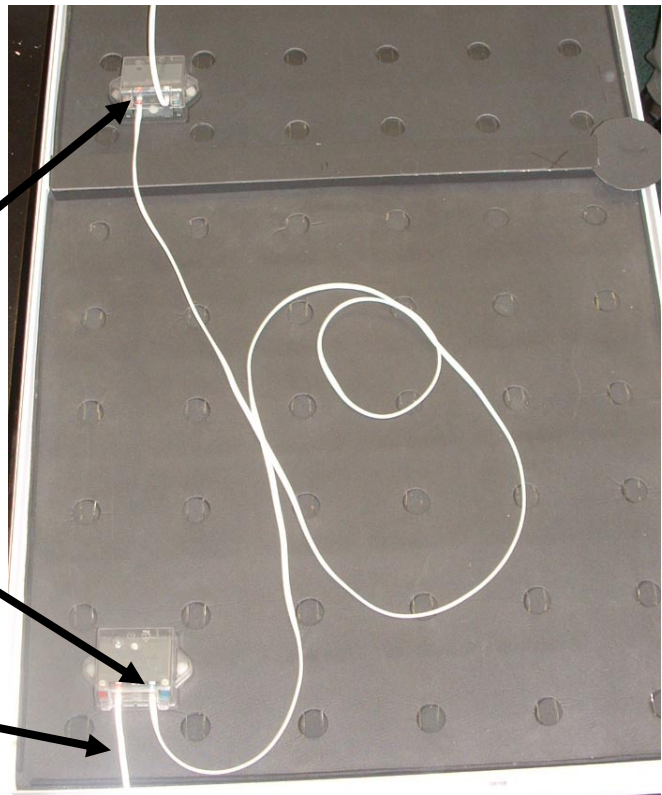
If the system has more than 50 Halotiles™, or if you have used longer than supplied RJ-11 cables, you need to install one or more power boosters. See **Power Booster** section, page 26.

To complete installation of a Halotile™, add a clip light to the ceiling tile support with the arrow pointed towards the Halotile™ where you plugged in the clip light wire. Insert the wire from the clip light into the Halotile™ controller to complete installation. When installed, the clip light will rapidly blink at a low level to show the system is operating. This "normal operation" blinking can be turned off if desired.

When all wires have been inserted into each Halotile™ Controller, rotate the cover closed to its original location. This will snap into place and help prevent the cables from becoming disconnected.

Once all Halotiles™ are installed and hooked to each other, the **IMS2000™** Controller screen will show ALL after the number of Halotiles™ installed.

Should the **IMS2000™** system detect wet, hot, or cold, the appropriate Clip Lights™ will illuminate, pinpointing the appropriate problem area.

Cutting Halotiles™ to Fit Along Walls

As an option to cutting, *one Halotile™ may overlap another with no operational problems*. Halotiles™ should only be cut in one direction. Cut Halotiles™ with standard scissors parallel to the two wires that are exposed in each Halotile™ cup. Leave at least ½ inch edge to a row of cups. Measure the Halotile™ so the part with the Halotile™ controller box will be the part you install. Discard the part of the Halotile™ that does not contain the Halotile™ controller.
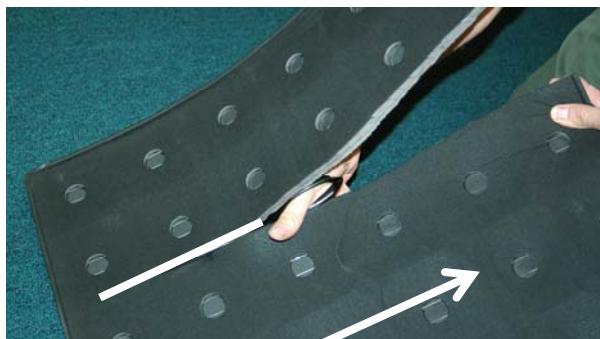
Cut parallel to the wires, ensuring the portion that is retained contains the controller box. Discard the unused part.

Cutting Halotiles™ to Fit Around Pipes

Whole Halotiles™ may have a small area removed to fit around pipes without effecting any system or detection changes, provided cuts are made only in the areas shown in green in the next diagram. To fit around pipes, make a single cut with a pair of scissors into the green area that will allow for the best fit. Note that the start of a cut can only be made from two places in each of two sides. Everything is determined from the location of the electronic controller box.
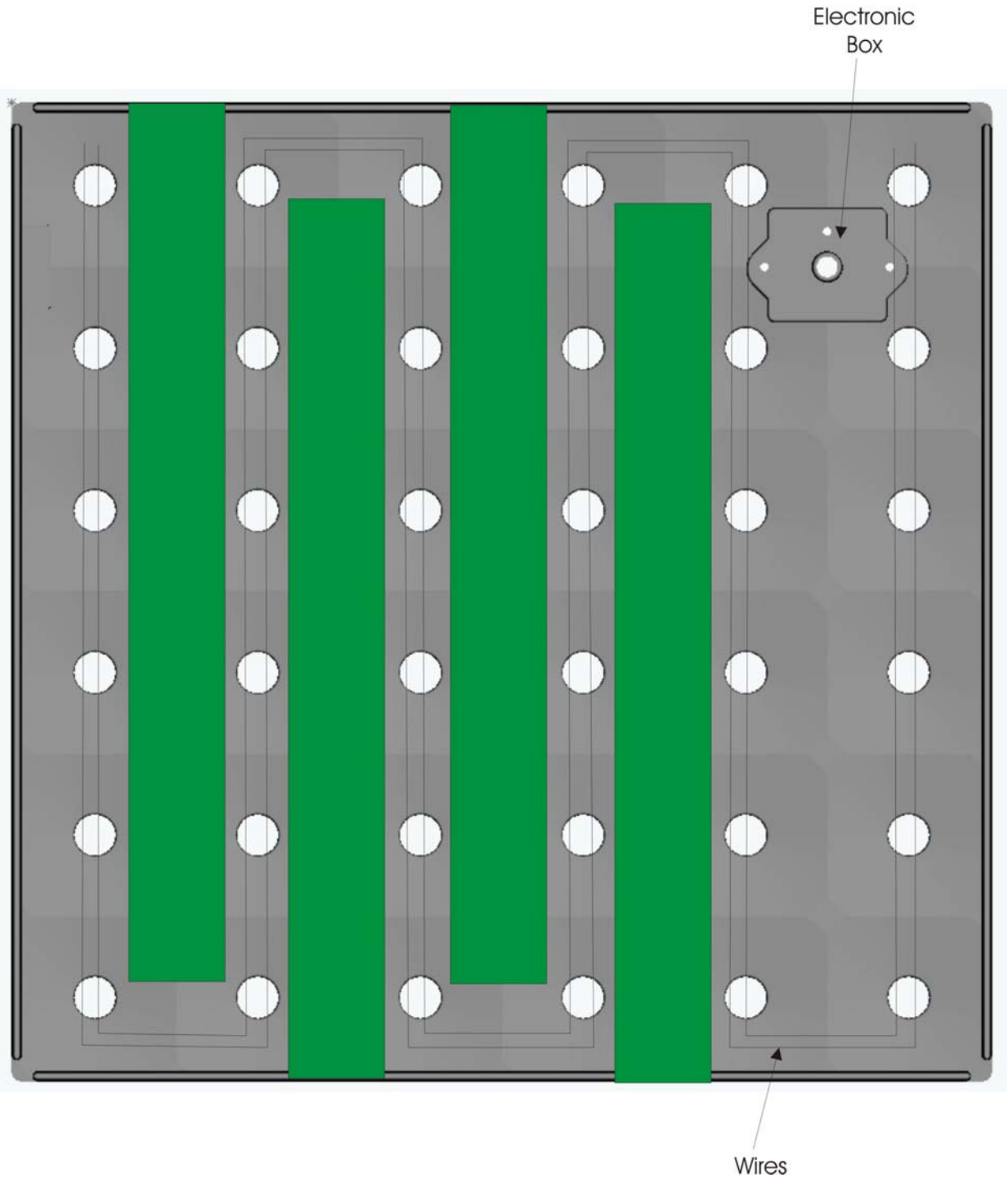
To allow a Halotile™ to fit around pipes, cut parallel to the wires only in the green areas. Make a single cut to the circular area that needs to be removed.

Aquapede/Aquapod Installation, General:

Aquapedes™ may be snapped together to make flexible detection lines. One Aquapede™ controller and between one and 20 Aquapedes™, when put together correctly, form one Pod. One or more Aquapod™ may go around objects such as pipes,

drains, and hot water heaters or a "straight" detection line can be curved around pipes, floor supports, wall corners, and the like.

The Aquapede^{TM} system is very flexible to fit any need.

Parts:

Starter Element

Large and Small Connectors

RJ-11 connector cables with colored ends

Power Supply

IMS2000 Controller

Aquapede^TM

Pod Controller

Assembly of the first Pod

Note that one or more Aquapedes connect with each other and a Pod Controller, to make a Pod. Up to 20 separate chains of Aquapods may be connected to one Pod Controller.

Open the bag containing the IMS2000 controller and the power cord if not previously installed. Determine where the IMS controller will be located on a wall near a power source that is also near the site to be alarmed. Verify that the power cord length is adequate, from a wall socket to the controller's location. The controller may be either hung on a wall or other accessible place. Plug the Power Supply into a wall socket. Plug the other end into the bottom of the IMS Controller.

Locate the Pod Controller in the bag marked "Aqua-Pod" and remove the Pod Controller. The Pod Controller has a cable attached that has one end coming from the center back of the controller.

Open the Aquapede bag, locate the starter element, and place it on the floor where it will be located when the system is in operation:

Plug the cable end that is running from the back of the Pod Controller into the starting

element. This is the end without any colored band at the plug, as shown at the left:

Locate an RJ-11 connector cable. Near one plug will be a red band and near the other end will be a black band. Plug the black end into the **IMS2000 Controller.** The Aquapede receptacle is at the bottom.

Next open the Pod Controller's clear plastic cover to expose the receptacles with the red and black dots. You may need to use a flat-blade screwdriver to open the clear cover. (See left picture next.) The clear cover is hinged at the back (center picture next). Plug the red end of the RJ-11 connector cable into the Pod Controller at the receptacle near the red dot (right picture next). Later each Pod (except the last) will be daisy-changed with colored coded four-wire RJ-11 connector cables running one Pod Controller to another Pod Controller. Each is connected in the manner just described.

Open the clear plastic Pod cover (above left and center) and then insert the red cable into the port near the red dot (above right).

Turn on the controller by depressing and holding for at least one second, the "ON" button. The controller should come on and make no noise. The Aquapede (right) half of the IMS2000 screen should display ALL 001 and OK. The Halotile (left) half of the screen will display the appropriate numbers if they are installed. An example is to the right. This indicates the system is functioning properly.


Test the operation of the Aquapede system. Do this by slightly lifting the starter Aquapede and placing a wet paper towel on the floor and then putting the starter Aquapede on the towel, as shown. This simulates a water leak.
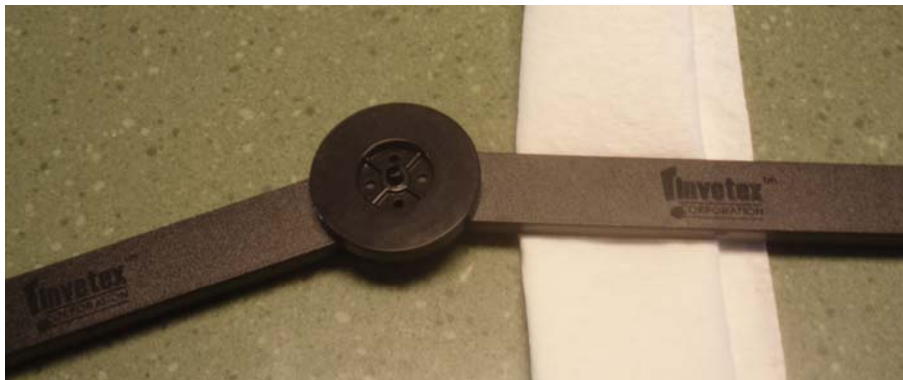
The controller should sound the alarm, showing the system is properly connected and functioning. Remove the damp paper towel and the alarm should stop. If the alarm does not sound, and for the IMS2000 the screen shows "RETRY," the system is not properly connected. Go back to the top of page 10, "Assembly of the First Pod" and reassemble the components in the proper sequence.

Build the detection line by connecting one Aquapede after another, beginning with the starter element. To do this place one small connector under the free end of the starter Aquapede, with the plastic center post facing up. Engage the Aquapede's lips on the lower side into the connector's grove. Add the next Aquapede to the small connector, using the end without the power wire and placing it onto the small connector's grove. Plug the power wire from the starter element into the new Aquapede:
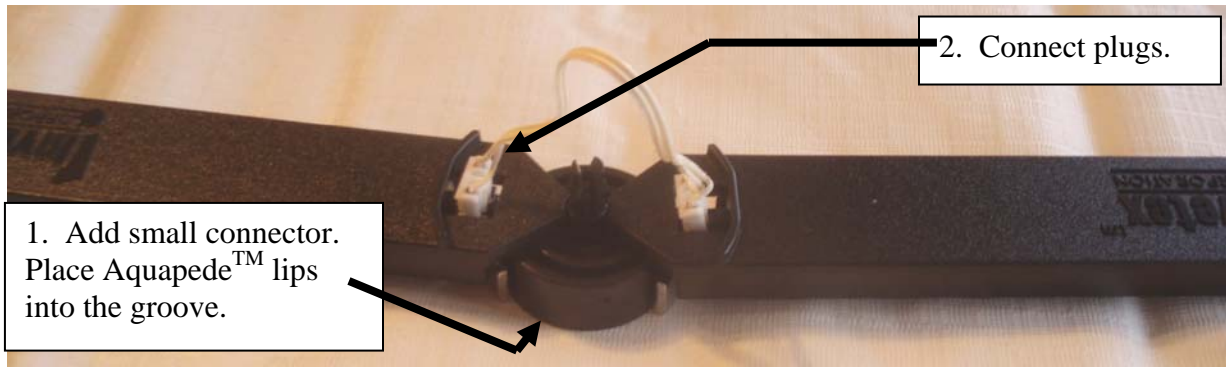
2. Connect plugs.

1. Add small connector. Place Aquapede^{TM} lips into the groove.

Snap the large connector on top of the small connector, covering the power wire.

Test the new Aquapede^{TM} as described above.

Continue to build your detection barrier by adding other Aquapedes^{TM}. Repeat testing after adding each Aquapede^{TM}.

The last Aquapede will not have a connector wire at the far end. The last Aquapede may either have the small and large connectors added with the end left free. The final Aquapede may be closed with the starter element to make a closed loop by removing the large connector disk and inserting the free end of the last Aquapede, then replacing the large connector disk, providing there are at least 5 Aquapedes in the system. There is no direct electrical connection between this last Aquapede and the starter element. Test each Aquapede after its installation.
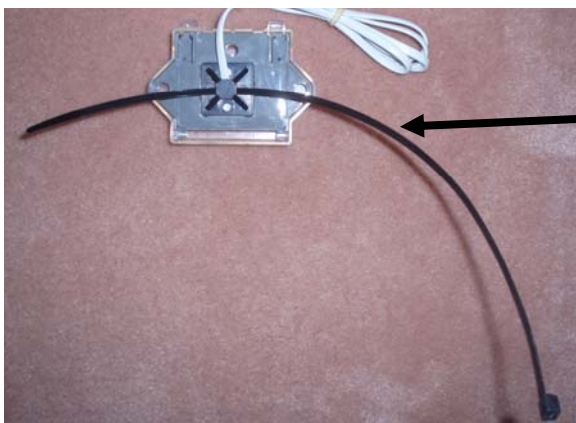
When a Pod is complete, use the tie

to anchor it in place. A pipe or raised floor support is an ideal anchor.

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Assembly of second and subsequent Pods

Take a colored-coded RJ-11 connector cable and insert the black end into the first Pod Controller using the receptacle with the black dot. Inset the red end of this same cable into the second starter Aquapede. Connect and build the second Pod in the same way as the first, testing each individual Aquapede.

To build a third Pod, connect the second Pod to the third, as just described; then connect the fourth Pod to the third, etc. After both red and black cables are inserted into the Pod Controller close the clear cover.

System Set-up and Alarm Log

Activate Master Controller and Basic System

If the system is not on, turn on the power by depressing the left-most button ("On") for one second. The **IMS2000™** will take about three seconds to initialize. When the power comes on, the Master Controller screen illuminates similar to that shown at the right. **Push the SETUP button to use the system set-up capability.**

System Response: The Master Controller Box will chirp for up to 20 seconds during the set-up. The chirp will stop whenever a button with a label above is pushed. The lower left of the initial screen, under the heading HALOTILE™, will show LAST= and a three digit number. This shows the number of tiles the system saw when it was turned on previously. For the initial installation this should be 000. Under the LAST line will be NOW = and a three digit number. The number shown should be the number of installed tiles, as described on page 4. If the NOW number is correct, push the YES (left most) button. This activates the **IMS2000™**.

If neither the YES or NO button is pushed, in approximately 20 seconds the Master Controller Box will stop chirping and the master controller will assume the **IMS2000™** has the proper number of Halotiles™.

The blue light on the Master Controller Box to the right of the window will rapidly blink, as do the lights on each Halotile™ or each Clip Light™. This indicates the system is functioning.

If the number is not correct, record the number shown. When the system is on, the third button has TIME above it. Bush the TIME button. This will cause another screen to appear. The fourth button will be FIND. When you push the FIND button the clip light for the first tile will light brightly so you can identify it. As the same time the screen will list the illuminated tile and under that, the number of tiles properly installed. To find each tile push INC (increase the tile number) or DEC (decrease the tile number). The tile associated with the number shown on the screen will illuminate brightly. If the total number is incorrect, then after pushing the FIND button, simple push DEC to find the highest number tile that is properly functioning.

The tile after this one is not working properly if the number of titles installed does not equal the number shown on the screen. The problem is with the connection between the listed tile and the subsequent tile. Correct the connection, then resume the check as noted above. Repeat this process until the proper number of tiles is shown. Once the correct number is right, depress the YES button one time.

Once **IMS2000™** has the correct number of tiles and the operator depresses the YES button, the normal status screen is displayed as shown on the next page. In this case the proper number of tiles is 48.

If, during set-up, you fail to push either the YES or NO button, after approximately 20 seconds the system will stop chirping and will temporally accept the number of tiles **IMS2000™** has found. However in the event of a power loss or loss of a connection, the system will return to set-up and chirp. The system is requesting a YES or NO regarding the number of tiles.

Normal Operation

The **IMS2000™** will notify you of water leaks or if temperatures fall below 32º F (a red alarm), of if set, the high temperature limit is reached, by sounding an audible alarm. In the case of a wet red alarm, an alarm sounds and the left part of the Master Controller window will high-light HALOTILE, RED, and WET (as shown at the left). In addition the Clip Light™ or the light on the Halotile™ controller will light up brightly to help you identify the wet tile(s). Directions for shutting off the alarm are in the section, "Alarm Response" starting on page 24. To view the wet tiles, push the VIEW button.

In the case of a freezing temperatures or cold red alarm, the Master Controller Box will sound an alarm and the left part of the Master Controller screen will high-light COLD, similar to the wet screen above. Should this occur, the operator should push the VIEW button. This will display the numbers of the cold tiles. An example is below. The cold tiles have a white box around them, as does the word COLD:

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Since the **IMS2000™** shown is connected to 48 tiles, to view the subsequent screen, depress the NEXT button. It will bring up the remaining tiles, thus:

In the case of a hot red alarm, an alarm sounds and the left part of the Master Controller screen will high-light HOT. A screen example is shown next. Once the VIEW button is depressed, the number of hot tiles will be displayed.

On several screens various hot buttons may display POFF (Power off). Anytime a POFF button is depressed the **IMS2000™** shuts down and turns off within 3 seconds. To restore power, depress the left most button ("On"). The system will power-up within 3 seconds.

Alarm Log

The Alarm Log will let you know the times and dates of the most recent 6 alarms. Once the alarm has been turned off, press the TIME button. When the next screen appears, press the ALOG button to see the alarm log. An example is below:

The log lists, from right to left, the month in two numbers, the date in two numbers, the time on the 24 hour clock, and then one of 6 letters: WHCWHC, followed by one of two letters: RY. The first three letters are for an Halotile and indicate the cause for the alarm: Wet, Hot, or Cold. The next three letters are for an Aquapod and indicate Wet, Hot, or Cold. The last two letters show the type of alarm-either Red or Yellow. The last three digits show the number(s) of Halotiles[TM] or Aquapods[TM] that caused the alarm. In the case of the picture above, Halotile[TM] number 6 was wet, followed by Haltile[TM] number 3.

By pushing one of the two buttons, the operator may go back to the previous screen (this preserves the alarm log) or may clear the log that erases the record and then go back to the previous screen.

Establish IMS 2000 Options

You may establish many options with the **IMS2000™** including directing an auto-dialer to call up to four numbers and automatically deliver up to four messages; interface with a computer; interface with a security system; and interact with other electronic systems. The **IMS2000™** may be directed to send data to a designated computer where the information will be stored, and/or automatically complete other functions.
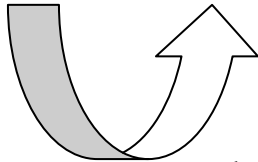
After powering up, the master controller will display the normal operation screen. To establish the options, depress the SETUP button. The first of two set-up pages will appear, as shown at the left.

The operator can return to the normal operation screen by depressing the MAIN button. Use the DOWN and UP buttons to toggle to the set-up action desired, which is shown by the arrowhead. The order in which the screens will appear by toggling down is:

ALARM
TIME DATE
LIGHT CONTROL
RS232 USB
TEMP LIMITS
DEFAULT
SECURITY   (if you continue
                                         to toggle down,
                                         the list will start
                                         at the top again.)

An operator may use the UP or the DOWN buttons to move by the most direct route to th next set-up function desired.

To access the second set-up page, toggle down past TEMP LIMITS, or up above ALARM and the second page will appear.

Depress the SEL (select) button to enter the set-up mode for the option selected. After each SET-UP screen is used, depress the BACK button.

Set up each of the option settings. When you return to the normal operational screen, (shown on page 10), the options you have selected will then become the settings that establish how the **IMS2000™** operates.

ALARM set-up

When ALARM is selected the operator can turn on or off a red alarm for high temperatures, for cold temperatures above 0° C, and for other problems such as a loose wire. This latter may occur if someone disconnects any of the Halotiles™ wires after installation. Use the DOWN or UP buttons to toggle through each of the choices. When you reach the alarm

setup you wish, press the SEL (select) button. Pushing the SEL button changes between ON and OFF.

The first red alarm choice is for ERROR. If this is turned ON, when an error occurs the **IMS2000™** sounds an audible alarm if a control cable is disconnected, a power surge occurs, or other operational problems appear. If ERROR is turned ON, the **IMS2000™** will also direct your auto-dialer, computer, alarm system, or other support system to call personnel or perform other option functions once you have established these options. If you select OFF you will not be notified in the event of these types of errors.

To toggle to HOT, depress the DOWN button. Turning ON this choice using the SEL button will result in a red alarm support system call (once that has been set up) and an audible alarm should **IMS2000™** detect a high temperature. (Selection of the actual temperature will be done later.) If you select OFF you will not be notified in the event of a high temperature.

To toggle to COLD, depress the DOWN button. Turning ON this choice will result in a red alarm support system call (once that has been set up) and an audible alarm should **IMS2000™** detect a low temperature that is above $0°$ C. (Selection of the actual temperature will be done later.) If you select OFF you will not be notified in the event the cold temperature limit is reached.

The first yellow alarm choice is for ERROR. If this is turned ON, the **IMS2000™** notifies your support system to initiate the directed options per the yellow alarm choice (once that has been set up) and sound an audible alarm should a control cable be disconnected, a power surge occurs, or other operational problems. If you select OFF you will not be notified in the event of an error.

To toggle to yellow HOT, depress the DOWN button. Turning ON this choice will result in a yellow alarm support system notification initiation (once that has been set up) and an audible alarm should **IMS2000™** detect a high temperature. (Selection of the actual temperature will be done later.) If you select OFF you will not be notified in the event of a high temperature.

To toggle to yellow COLD, depress the DOWN button. Turning ON this choice will result in a yellow alarm support system notification initiation and an audible alarm should **IMS2000™** detect a low temperature that is above $0°$ C. (Selection of the actual temperature will be done later.) If you select OFF you will not be notified in the event the cold temperature limit is reached.

The last yellow alarm choice is for WET. Should a Halotile™ detect water and the ON selection is made the activities on the yellow alarm support system will be initiated once that has been set up. If OFF is selected, only the red alarm WET support system notifications will be implemented.

An audible alarm will sound should a Halotile™ detect water regardless of the support system choices.

Once the choices have been made, depress the BACK button one time. This returns the operator to the set-up screen.

Time Date set-up

The hours are on a 24 hour clock system. That is, for p.m. time is shown from 13 to 24. Depress the SEL (select) button to set the various times and dates. INC (increment up) and DEC (decrement down) buttons move the system to HOUR, MIN, MONTH, DATE, and YEAR. To adjust any of these choices, depress the NEXT button and toggle through the various choices. When the correct number is reached, depress the BACK button. If you depress the BACK button

one time the **IMS2000™** returns the operator to the set-up screen. Depressing the BACK button back twice implements the time and date you have selected.

Light Control

In normal operation **IMS2000™** polls each and every tile every few seconds. (The time required for a total system poll depends upon the number of Halotiles™ or Aquapede™ installed.) Each time a poll occurs the light in each tile controller box or the associated clip light, blinks at a low level. This shows that the system is operating normally. In addition the blue light on the Master Controller Box blinks to show the entire system is operating normally. These lights may be turned off if desired, as described next.


SENSOR LIGHTS=ON keeps all lights operating. This is the normal mode. Should an operator desire to turn off the blinking Clip Light™ or the blinking lights on each Halotile™, change SENSOR LIGHTS to OFF using the CHGN (change) button. As soon as the operator depresses the BACK button the Halotile™ lights will turn off. This change does not change the Halotile™'s ability to detect water or hot or cold temperatures.

MASTER LIGHT=BRIGHT is the normal mode. By toggling up or down to BRIGHT and then depressing the CHNG button, MASTER LIGHT=DIM appears. If DIM is instituted by depressing the CHNG button, then the top blue light to the right of the master controller window panel will dim considerably once you return to the normal operating screen. It does not go out completely since the presence of the light shows the system is operating.

The third choice in light setup is BACKLIGHT. If the operator selects AUTO by depressing the CHNG button, then the Master Controller Box screen will dim after approximately one minute. As soon as the SETUP button is depressed the screen light returns to normal so settings may be made. If BACKLIGHT=ON is selected then the screen light will always stay on when power is supplied to the **IMS2000™**.

Temperature Limits Set-up

When TEMP is selected, the below screen appears. Note that the left half is for Haltiles.
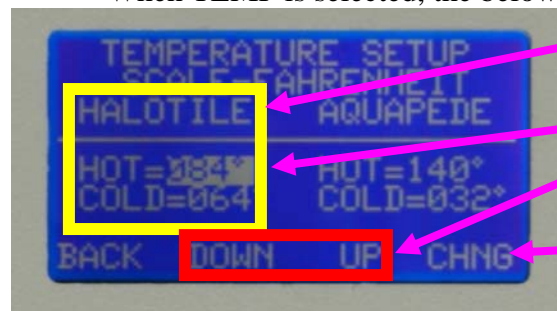
Select the highlighted temperature by toggling DOWN or UP.

To move the highlight to the next selection, push the CHNG button.

The preset alarm limits are 32° F (0° C) and 140°F (60°C). Upper and lower limits may be adjusted inside this range. On the temperature setup screen the SEL button move through the temperature set-up scale: Halotile™ HOT, Halotile™ COLD, Aquapede HOT, Aquapede

COLD, and SCALE choices. Use the INC (increment up) or DEC (decrement down) buttons to toggle through your choices.

Once the operator has chosen the temperature scale and the temperature limits, depress the BACK button. This establishes the temperature limits and returns the operator to the setup screen.

Default

This allows the operator to change all set-ups to the original factory settings in a single action. To restore all **IMS2000™** settings to the factory conditions, chose YES. A NO selection retains any operator-established options. Once you have made your selection, push the BACK button to return to set-up. Pushing the BACK button will implement the default selection chosen.

Security

During the initial set-up, you should establish a PIN (Personal Identification Number). Once established, the PIN must be entered first to change any options. It is imperative you record the PIN and store it in a secure location, since options can not be changed without using the PIN. Use of a PIN is not required, but without a PIN anyone can change settings on **IMS2000™**.

After selecting SECURITY on SET-UP PAGE 2, the operator has a choice of security OFF or ON. If OFF is selected anyone can access the **IMS2000™** and can change any settings. This may be appropriate if the Master Controller Box is in a secure area. If ON is selected then before any settings can be changed, the PIN you establish must be entered. If SECURITY=ON is selected then immediately a space for an eight digit PIN appears as shown at the left.

The established PIN must be entered to gain any subsequent access. Once the proper PIN is entered, the operator is free to make system changes.

To initially establish a PIN, enter an 8 digit number, with each number being 1, 2, 3, or 4. RECORD THIS PIN AND SAVE IT IN A SAFE PLACE. After entering the 8 digit PIN the PIN becomes active when the operator depresses the BACK button. To return to the SECURITY screen, choose SEL. The previously entered PIN will appear. To change the PIN, depress the NEW PIN button and enter the new PIN. Upon entering the new 8 digit PIN, depress the BACK button.

After entering a PIN, depressing the BACK button and then the MAIN button, implements the PIN. Whenever anyone wants to subsequently change any set-up, the established PIN must be entered first.

RS232 and Computer Connection

This interface and connection may require some knowledge of computer hardware and software beyond that of many lay people. A corporate software department/division may need to assist.

By installing a Gridconnect Net232 the **IMS™** system will, when properly installed and connected, allow selected recipients to receive custom-made messages alerting people you chose,

to a variety of potential problems. This will help you protect your high-value equipment, whether a computer server, a critical medical equipment, or one-of-a-kind files.

The overall Ethernet interface to the **IMS™** controller is shown below. Under the diagram are the steps needed to set up these interfaces.

**Ethernet Interface
to
IMS Controllers**
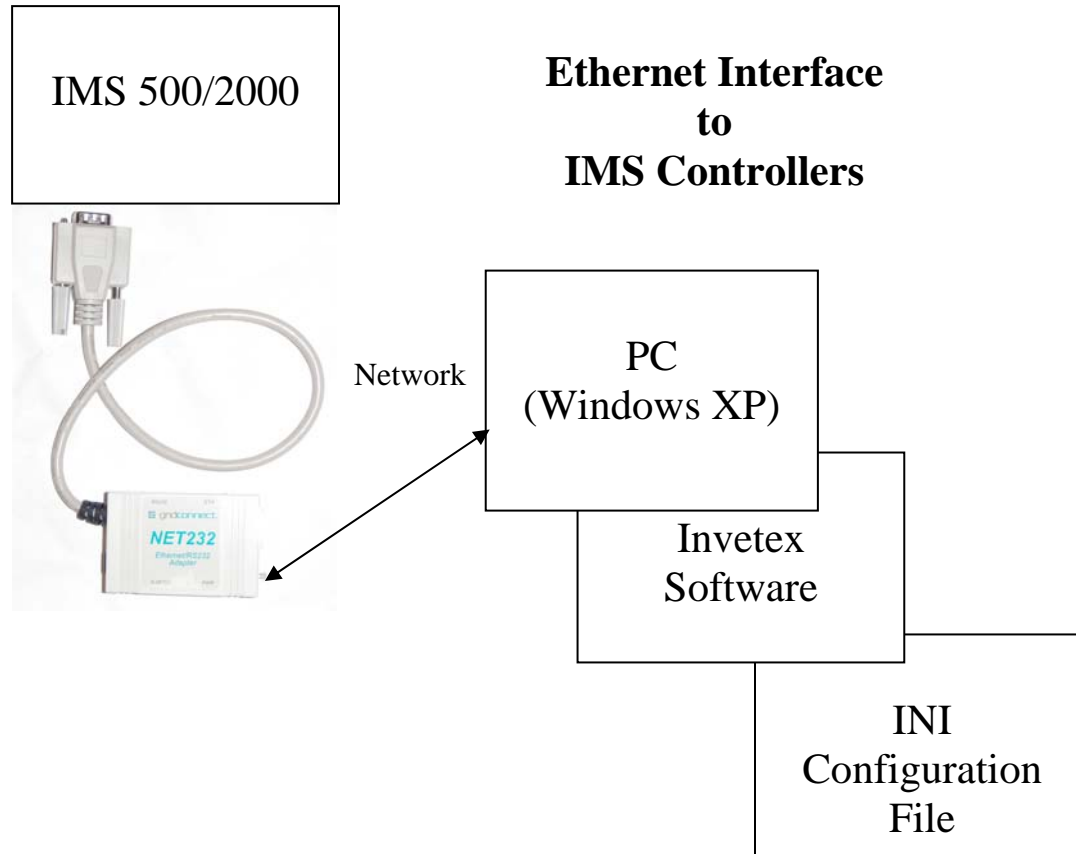
RS 232 Hardware Installation Steps:
1. Using the Gridconnect NET232 box, connect its RS232 cable to the **IMS™** controller.
2. Install the power supply to the Gridconnect NET232 box and plug in the power supply.
3. Connect the Gridconnect NET232 box to company computer network using an ethernet Cat5 cable.
4. Use the Gridconnect CD to install the driver software on the PC. Select only the required 232 driver from the several available.
5. Follow the Gridconnect instructions on the PC to install. Once installed, this will transfer the **IMS™** information to the COM port on the PC.
6. Using the Windows device manager on the PC, locate the COM port transferred by the Gridconnect Net232.
7. Set up the COM port, messages, and emails in the INI file. This can be done now or later, but must be accomplished for the system to send email notification. Details for this in the following section "Setting up the INI file."
8. Once the INI file is set up, test the system by running the program to receive emails on various alarm conditions.
9. The program must be running on the PC 24 hours, 7 days/week to provide monitoring.

Setting up the INI File to Send Emails:

Edit the IMSCOM INI file using windows Notepad or Wordpad. The file that will come up is shown below, along with notes giving directions for the type of data to be entered:

```
[Config]

NumberOfControllers = 1          ← Enter the number of
CustomerName = "Customer"          Controllers (COM
StreetAddress = ""                 ports)(usually one)
City = ""
State = ""                       ← Enter your company name
Zip = ""                           and address

; Main Loop Time in milliseconds, i.e 1000 = 1 sec
MainLoopTime = 5000

; Debug Flag, 0=No Debug Statements, 1=Verbose
Debug = 0

[User]
Name=INVETEX DETECTION           ← Enter free form name
  ;-----------------------------------------
  ; IMS2000 ZONE 1 Data Block
  ;-----------------------------------------
  [IMSDataBlock01]               Enter name & location of the
                                 controller
  ID = "IMS2000 ZONE 1"
  Location = "Top Left"          Enter the COM port assigned to this
  Description = "Zone 1"         controller.  Do not change remaining
                                 information (BAUD rate, etc)
  COMPort = "COM3"
  OpenCOM = "COM3:9600,n,8,1,ds0,cs0,rs"


  ;-----------------------------------------
  ; EMail Data
  ;-----------------------------------------   Enter :"from" email address
  FROMEMailAddress = "name@invetex.com"

  SMTPServer = smtp.invetex.com  ← Enter outgoing email server
  SMTPUserName =
  SMTPPassword =

  TOEMailAddress[1] = "Name@invetex.com"
  TOEmailAddress[2] =            Enter email address, up to 10,
                                 in this format

  ;CCEMailAddress[1] =
  ;CCEMailAddress[1] =
  ;CCEmailAddress[2] =           Enter email addresses, up to 10,
                                 in this format
  ;BCCEMailAddress[1] =
  ;BCCEmailAddress[2] =
```

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```
;--------------------------------------------------------
; EMail Messages Based on Alarm Conditions
;--------------------------------------------------------
; Alarm Code = 0 - No Alarms
EMailSubject[0] = "Message from IMS2000 Zone 1"
EMailMessage[0] = "No Alarms or Errors, All OK"

; Alarm Code = 1 - Water
EMailSubject[1] = "Alarm Message from IMS2000 Zone 1"
EMailMessage[1] = "Water Detected"

; Alarm Code = 2 - Hot
EMailSubject[2] = "Alarm Message from IMS2000 Zone 1"
EMailMessage[2] = "Hot Detected"

; Alarm Code = 3 - Water and Hot
EMailSubject[3] = "Alarm Message from IMS2000 Zone 1"
EMailMessage[3] = "Wet and Hot Detected"

; Alarm Code = 4 - Cold
EMailSubject[4] = "Alarm Message from IMS2000 Zone 1"
EMailMessage[4] = "Cold Detected"

; Alarm Code = 5 - Water and Cold
EMailSubject[5] = "Alarm Message from IMS2000 Zone 1"
EMailMessage[5] = "Wet and Cold Detected"

; Alarm Code = 6 - Hot and Cold
EMailSubject[6] = "Alarm Message from IMS2000 Zone 1"
EMailMessage[6] = "Hot and Cold Detected"

; Alarm Code = 7 - Water, Hot, and Cold
EMailSubject[7] = "Alarm Message from IMS2000 Zone 1"
EMailMessage[7] = "Wet, Hot, and Cold Detected"

; Alarm Code = 8 - Error Condition
EMailSubject[8] = "Alarm Message from IMS2000 Zone 1"
EMailMessage[8] = "Error Detected"

; Alarm Code = 9 - Power-On/Program Reset
EMailSubject[9] = "Message from IMS2000 Zone 1"
EMailMessage[9] = "Program Reset/Restart"

; Alarm Code = 10 - COM Port Error
EMailSubject[10] = "Alarm Message from IMS2000 Zone 1"
EMailMessage[10] = "COM3 Communications Error"

; Alarm Code = 11 - IMS2000 Communications Error
EMailSubject[11] = "Alarm Message from IMS2000 Zone 1"
EMailMessage[11] = "IMS2000 Zone 1 Communications Error"

Comment = "Comment..."
```
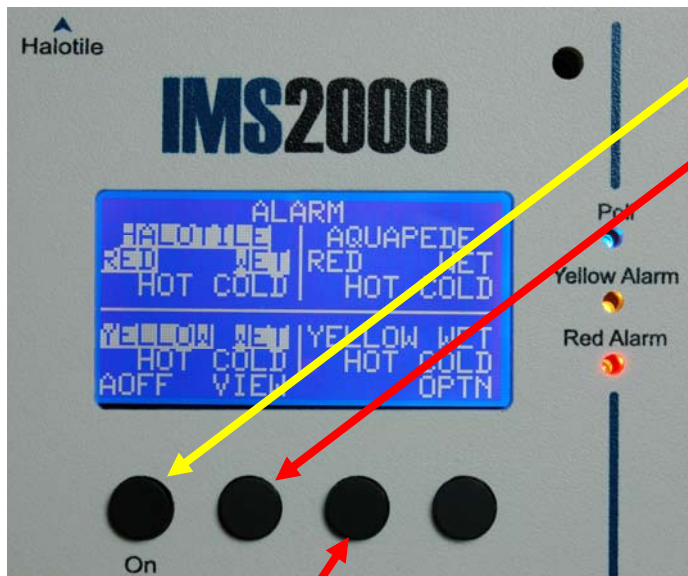
Each message will be sent to all email address above

}

Edit short messages as desired, maintaining this format

Repeat the above procedure for each controller connected to the PC (via COM port). Each controller will send separate messages to the email addresses associated with that controller

Alarm Responses and Operation

Turn off Alarm

To turn of the audible alarm depress the left-most button ("AOFF").

This use of the second button ("VIEW") allows the operator to locate all of the wet tiles using the Halotile™ map and the number(s) of the wet tiles highlighted on the screen. In addition the light on the Halotile™ controller box will brightly illuminate as shown below, or the light clip associated with each wet tile will light up.

For Aquapedes™, use the same technique, however VIEW will appear above the third button and the right portion of the upper screen will be illuminated.

For systems with more than 42 tiles, depress the NEXT button to go to the subsequent screens and identify any wet tiles. This is described at the top of page 16.

After identifying the wet, hot, and/or cold Halotiles™ and turning off the alarm, push the BACK button. Depressing the OPTN (options) button allows the operator to suspend the sensors that were activated by wet, hot, and/or cold. If the operator depresses the YES button, the **IMS2000™** system will continue to operate but without the tiles or Aquapods that caused the alarm. This allows the **IMS2000™** to use the remaining sensors and detect any other leaks onto your ceiling or floor. After each tile or Aquapod has dried, it will automatically rejoin the system after 24 hours. If the operator selects the NO button, the system continues to operate with all components active.

Alarm Log Operation

The **IMS2000™** automatically records several of the most recent alarms. The alarm log records the day, month, and time of recent alarms. Associated with each alarm the **IMS2000™** also records the reason for each alarm: Halotiles™ or Aquapede™. For either system the log also records whether the reason was being wet (shown by W), hot (shown by H), or cold (shown by C), or a combination of these, and also whether the alarm was red (shown by R) or yellow (shown by Y).

To view the alarm log press the TIME button:
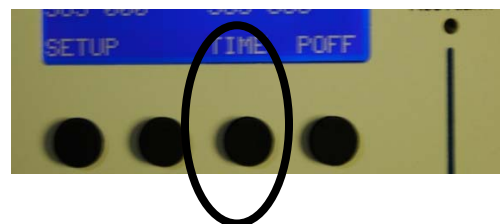
To view the alarm log, press the ALOG button:
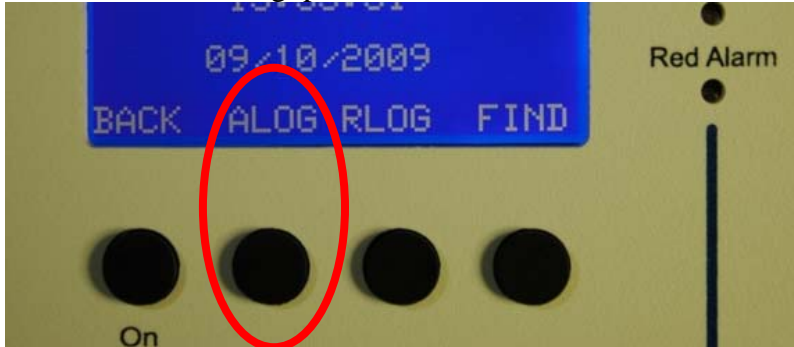
The alarm log screen will then appear. The recorded information will appear. A sample is:

ALOG Screen

Month-Day

Alarming Tile

Most Recent Alarm

Time (24 Hour)

Halotile
WET-HOT-COLD
WHC

Aquapede
WET-HOT-COLD
WHC

Alarm Type
Red/Yellow
RY

Finding the Alarmed Halotile(s)™ or Aquapede(s)™
The **IMS2000™** will physically direct you to the Halotile(s)™ or Aquapede(s)™ that have alarmed so you can easily find the source of the alarm. **In the case of a wet alarmed Halotile™, lift up an adjacent Halotile™ to avoid dumping any water that is on the alarmed tile(s)**.

To locate the alarmed system:
1. Press the TIME button
2. Press the FIND button
3. Choose Halotile™ or Aquapede™ if both are present. If only one system is present that is all that will show.
4. The system will initialize on the Halotile™ or Aquapede™ number 1. The Halo Clip for the component will flash.
5. The user can increment or decrement to the other components to get them to flash. If the user decrements the system it will automatically roll to the last component.

The above will allow the user to quickly locate all Halotiles™ and/or Aquapedes™.

Other information related to the FIND option:
1. If no buttons are pushed after implementing the FIND option, the IMS™ will return to the home screen and all flashing will cease on the Halotile(s)™ or Aquapede(s)™.
2. When a user is scanning Halotile(s)™ or Aquapede(s)™ the system will continue to screen for additional alarms. If a new alarm occurs, it will override the FIND screen.
3. This FIND system is an easy way to make a map of your system. Instructions for constructing a map are on page 28 and a blank map is on page 29.

Power Booster Installation

A Power Booster is necessary every 50 Halotiles™ and for each fraction of Halotiles™ above 50 (e.g., 64 . Halotiles™ requires one Power Booster at the 50th Halotile™ and another after the 64th Halotile™). The scheme for the Power Booster is shown below:
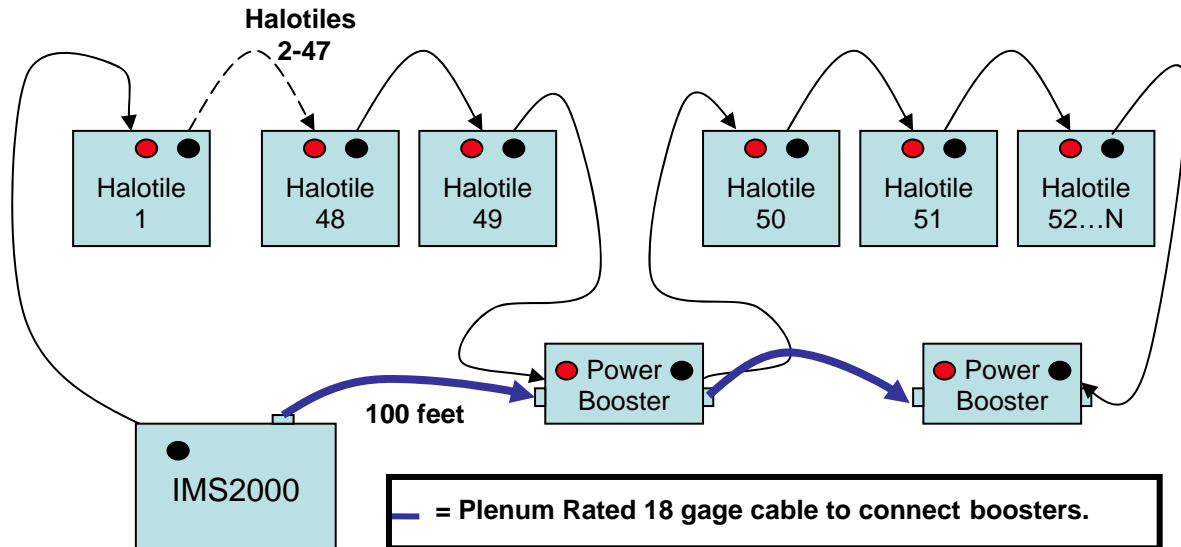
A Power Booster (right) connects to the top of the IMS2000:

Contact Closures

The "Autodialer" port on the bottom of the Master Controller Box is a standard RJ-11 connection that is designed to support two pairs of contact closures. One pair is designated as Red Alarm and the second as Yellow Alarm. These can be connected to alarm systems. The contacts are NC (normally closed) when the controller is not alarming. When the controller enters the alarm state, both sets of contacts open. (These contacts are low current and cannot directly drive shut off valves or other high power devices.) If you use Inventex[TM] color-coded connecting cables, the red and black lines are to the yellow alarm and the yellow and green lines are the red alarm contacts.
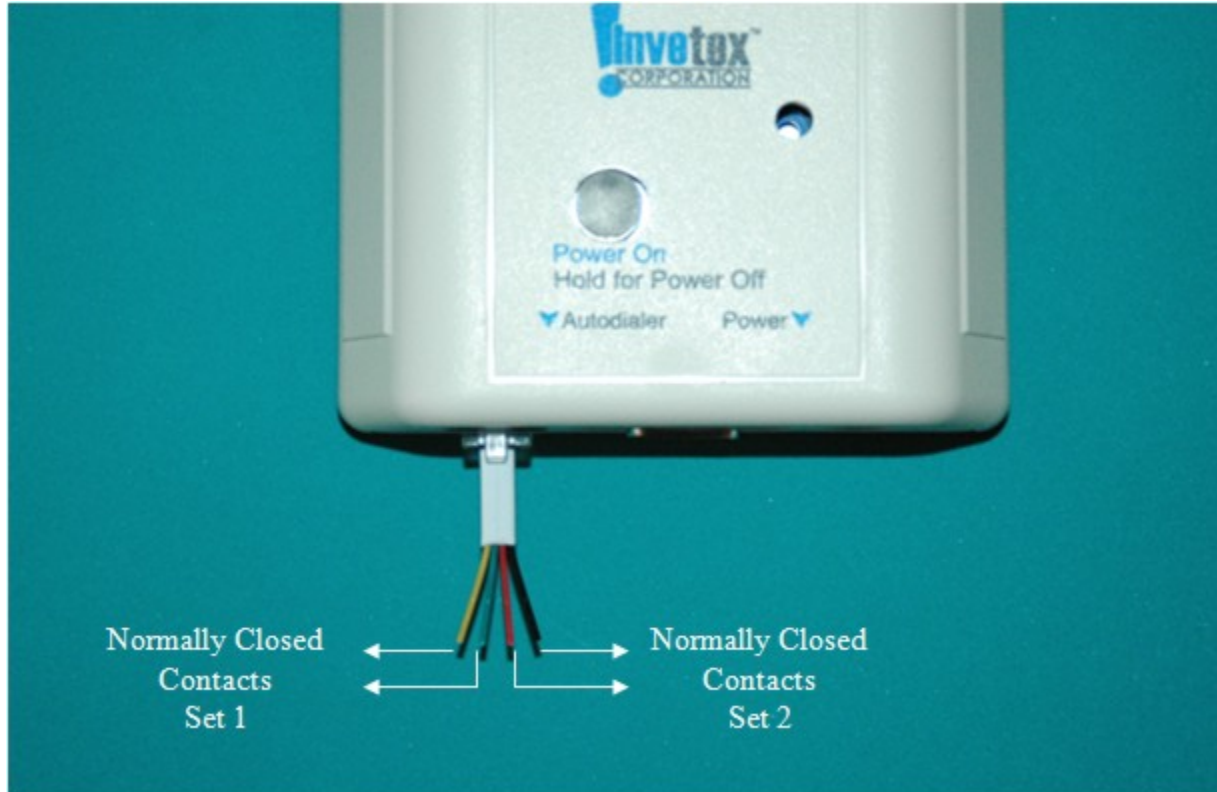
Any line connecting the Master Controller Box and an alarm system should be less than 75 feet, unless otherwise approved by your alarm service provider.

Map Template

Use a copy of the grid on the next page, record Halotile™ locations and numbers. A sample completed map follows.

X - Master Controller

1	2	3	4	5	6	7	8	9	10	11
24	23	22	21	20	19	18	17	16	15	12
									14	13
25	26	27	28	29	30	31	32	33	34	35
50	49	48	47	46	45	44	43	42	41	36
									40	37
									39	38
51	52	53	54	55	56	57	58	59	60	61

Sample completed map showing the numbered HalotilesTM**.**