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GW390-1 CONTROL CONSOLE AND GW390-3C INTERFACE OPERTION MANUAL

PROVEN PERIMETER PROTECTION

GEOQUIP LIMITED
Kingsfield Industrial Estate, Derby Road
Wirksworth, Matlock, Derbyshire, DE4 4BG
Tel : 01629 824891 Fax : 01629 824896
Int. tel : +44 1629 824891 Int. fax : +44 1629 824896

Defensor

Document Number:	QA274	Prepared by:	P Cook
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1.1 GENERAL

This manual covers the installation, connection, commissioning and testing of the Geoquip Ltd GW390 Control Console and the GW390-3C Interface unit designed for perimeter protection.

The GW390 system is designed to operate on normally manned sites. The Control Console provides both a visual and audio indication with automatic prealarm (30%) and full alarm (60%) levels. At full alarm level individual alarm contacts are available for remote connection to other equipment. The Control Console can also provide an optional printout facility for prealarm, full alarm, disable, reset and time/date information. The basic system consists of six standard components.

1. GW390-1 Control Console - six zone unit

2. GW390-2 Zone Monitor - one per zone

3. GW390-3C Interface - one per zone

4. GDALPHA Sensor

5. GDELT End of line termination box

6. GQFC-2 or GQFC-1 Feeder cable

There are various additional accessories that are available for use in conjunction with the basic system to assist in overcoming site requirements i.e. junction boxes, gate loops, physical protection etc. For details of these accessories see the sensor installation manual QA189.

The basic system configuration is as shown in Figure 1.
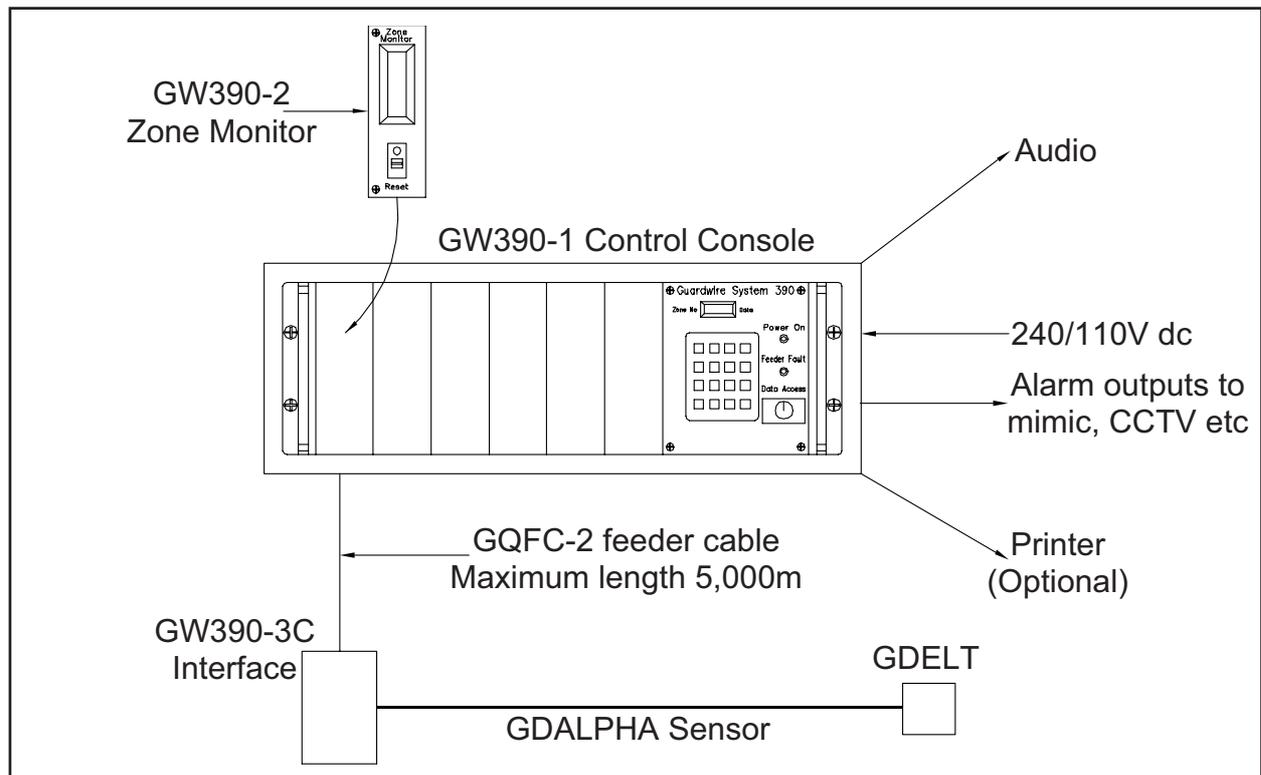
Figure 1

1.2 STATEMENT OF COMPLIANCE

The equipment described in this manual complies with all relevant sections of EMC Directive 89/336/EEC introduced in January 1996.

Specifically, the equipment has been tested to the following standards:

BS EN 50082-1 1992 - Generic Immunity Standard

and

BS EN 50081-1 1992 - Generic Emission Standard

While the system complies with the standards listed above, it is still possible that certain high level interference sources can have an adverse effect on the system performance. The guidelines detailed later in this manual should be followed to minimise such problems.

A technical report detailing these tests and procedures is available from Geoquip Ltd. on request.

Additionally, to satisfy the requirements for CE marking of the product, the equipment complies with all other relevant standards for this type of equipment.

The GW390-3C receives, amplifies and filters the signal generated by the Alpha sensor cable and returns the audio signals back to the Control Console via the feeder cable.

2.1 INSTALLATION

The Interface is usually mounted directly onto the protected surface using the mounting bar kit supplied. It is important to place the Interface in an area which can be easily accessed for the purposes of commissioning of the system.

The Interface is provided with two PG9 glands to accept cable entries. The sensor should enter the Interface through the left-hand gland. The appropriate feeder cable is fitted through the right-hand gland.

2.2 POWER REQUIREMENTS

Power to the Interface is 48V ac, 30mA, and is supplied from the GW390-1 Control Console via one of the twisted pairs in the feeder cable.

If the length of the feeder cable exceeds 5,000m, power should be supplied locally to the Interface unit.

3.1 CABLE CONNECTIONS AND EARTHING

With the exception of the feeder cable screen, the connections between both Sensor and feeder cable and the GW390-3C Interface is via terminal blocks fitted directly to the printed circuit board assembly. The feeder cable screen must be connected directly to the earthing stud on the inside of the Interface box. A suitable screw terminal connector is provided specifically to facilitate this.

3.2 GDALPHA SENSOR CONNECTIONS

The Alpha Sensor is connected to the removable two way terminal located in the three way terminal block, labelled Sensor, at the bottom left of the PCB, see Figure 2. Initially the removable two way terminal header should be connected to the two left hand connectors on the three way terminal connector block. If, when the system is powered up, this causes a sensor polarity fault then the terminal header should be moved to the two right hand connectors. See Section 5.2.

> **IMPORTANT**
> **The Alpha Sensor should only be connected to the GW390-3C Interface after it has been tested as detailed in the sensor installation manual QA189.**

3.3 FEEDER CABLE CONNECTIONS

The feeder cable connections are made to the removable four way terminal block at the bottom right of the PCB, see Figure 2. The green and white twisted pair are connected to the two terminals labelled Audio and the red and black twisted pair are connected to the two terminals labelled Power. Note that the twisted pairs are not polarity dependent.

3.4 AUDIO OUTPUT FACILITY

The audio output from the Interface is a 600 0dB balanced line and is returned to the Control Console by a twisted pair cable within the feeder cable.

3.5 TAMPER ALARM

A microswitch within the Interface box ensures that, whilst the system is powered up, any attempt to remove the cover will result in a full alarm being generated on the GW390-1
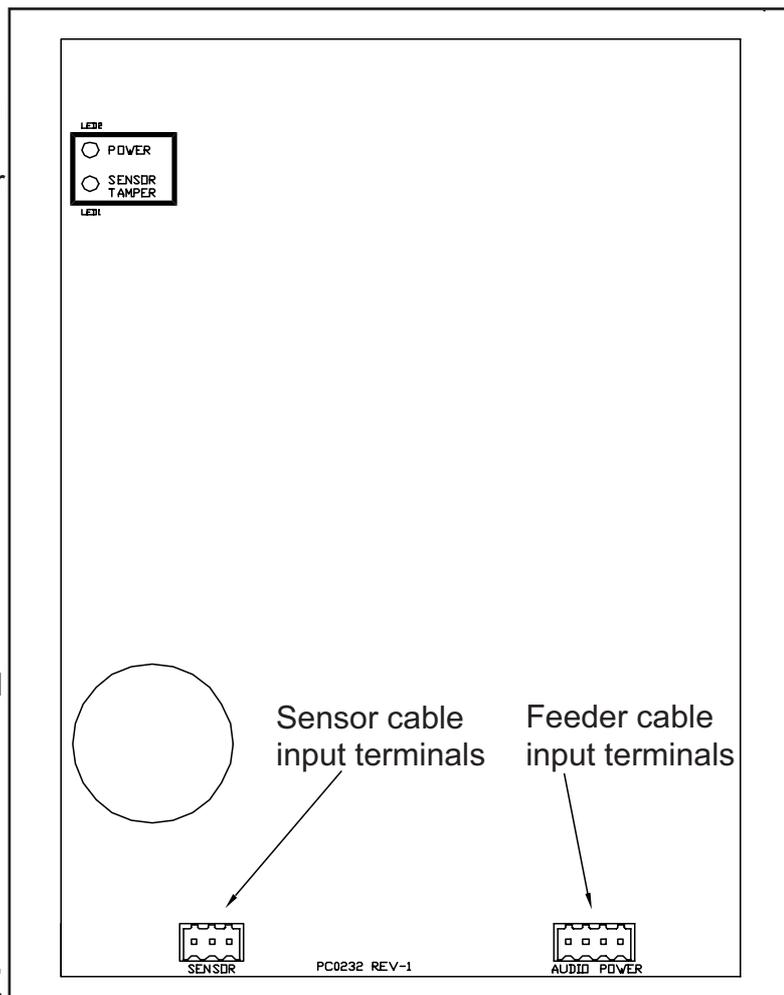
Figure 2

Control Console. When this microswitch is activated an audio tone is generated and transmitted to the Control Console. This tone is passed to the loudspeaker and is of sufficient amplitude to trigger a full alarm. The fault is also indicated visually by one of the upper segments of the LED bar display being constantly illuminated. Interfering with the sensor cable will cause an identical condition. A tamper alarm can only be cancelled when the tamper fault is remedied.

3.6 LED INDICATORS

The interface PCB is fitted with two LEDs located at the top left of the PCB. The upper LED illuminates when 48V ac power is being supplied to the interface by the feeder cable and the lower LED illuminates in the event of a Sensor tamper fault.

3.7 GROUND STUD CONNECTIONS

A 5mm ground stud is provided on the outside of the box to allow the connection of a low impedance ground terminal to the system. *It is imperative that a ground is always fitted to comply with the safety regulations, to improve the rejection of electrical interference which may be induced into the sensor cable and to prevent damage from lightning strikes.*

4.1 GENERAL

The GW390-1 Control Console receives and processes the audio signals from the GW390-3C Interface and provides outputs to auxiliary devices. It also provides a visual and audio indication of the alarm status to the operator.

The Control Console should be situated in an area which is clean and dry, with stable temperature and humidity and without excessive vibration. Typical locations would be a guardhouse or a security control room. Figure shows the front and back panels of the Control Console. Most of the external connections are made to the rear panel. Do not connect to the mains supply at this stage.

4.2 CONNECTING THE FEEDER CABLES

All interconnections between the Interface units and the console are made with feeder cables. Each audio input to the Control Console is passed to one of the GW390-2 zone monitors, via individual zone sockets on the back panel.

Every feeder cable is to be terminated at the GW390-1 Control Console with a four pole XLR plug supplied with the GW390-3C Interface. The connections to each plug are as follows:
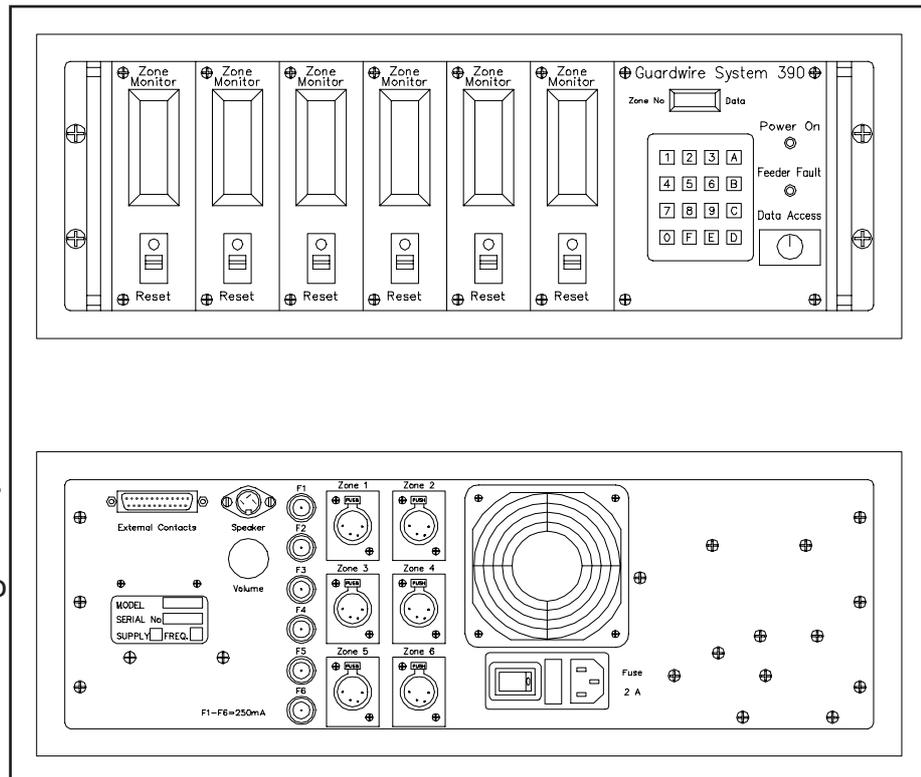
Figure 3

Pin number	Wire Colour	Usage
Pin 1	Red	Power
Pin 2	Black	Power
Pin 3	White	Audio
Pin 4	Green	Audio

The doublelapped screen is **not** connected and should be stripped back to the neck of the plug, and insulated with a heat shrink sleeve.

Mark each plug with the number of the zone to which it is connected, by reference to the Site Plan. Insert the plugs into the appropriate sockets Zone 1 to Zone 6 on the back panel of the Control Console. In cases where there are less than six zones Zone 1 must always be used.

4.3 MAINS CONNECTION

Check that the power switch (Figure) is in the 'Off' position. Using the mains connector supplied, connect this to the GW390-1 Control Console mains socket and the other end to a mains supply socket. The system is now ready for use. It should be noted that the GW390-1 Control Console has no internal battery backup system and therefore consideration should be given to providing a suitable UPS.

4.4 KEYPAD/DISPLAY PANEL

On the far right of the front panel is the keypad/display panel. In the centre of this panel is a keypad which allows the entry of various parameters and functions. Immediately above the keypad is a digital display, which indicates parameter settings. A full explanation of how programming is carried out and the meaning of the keys, is given in Section 7.1. To the right of the keypad are the Power On LED, the Feeder Fault LED and the Data Access keyswitch.

4.5 EXTERNAL CONTACTS

The External Contacts socket allows the connection of external systems such as flood lighting, closed circuit television and MIMIC displays. Single Pole Change Over (SPCO) relay contacts are rated at either 110V ac, 1A or 28V dc at 0.25 A. The set of relay contacts change state when a zone or zones go into alarm. They remain in the alarm state until the zone or zones are reset. The pin numbers are shown below.

Pin Numbers	Function
1 and 2	Zone 1 Full Alarm
3 and 4	Zone 2 Full Alarm
5 and 6	Zone 3 Full Alarm
7 and 8	Zone 4 Full Alarm
9 and 10	Zone 5 Full Alarm
11 and 12	Zone 6 Full Alarm
15 and 16	Common Full Alarm

The Control Console is supplied with normally open contact configuration although, with the exception of Common Full Alarm, a normally closed configuration can be implemented by changing link options within the console. Contact Geoquip Ltd. for details of these adjustments.

A three pin DIN socket allows the connections of an additional external 8 loudspeaker with a rating of up to 5W which works in conjunction with the internal speaker.

Beneath the loudspeaker socket is a rotary volume control which is used to adjust the loudspeaker volume during audio monitoring. It does not affect the volume of the alarm buzzer.

A fan is fitted in the top inner panel. This runs continuously to maintain air circulation within the Control Console.

5.1 POWERING UP

On the back panel of the GW390-1 Control Console set the power switch to the ON position. This will cause the following "self test" sequence to run.

1. The Power ON LED will light

2. The cooling fan will start

3. All the Zone Monitor bar LEDs will light at the top and "cascade" down to the bottom before extinguishing

4. All the Reset LEDs and the Feeder Fault LED will flash on/off six times

5. The Audio will beep once

6. The right hand digit of the display shows a 0

5.2 SENSOR CABLE POLARITY

If, after powering up, the Control Console indicates a tamper, as described in Section 3.5, then it could be caused by a sensor polarity fault. To reverse the polarity move the two way sensor terminal header on the GW390-3C Interface PCB from being connected to the two left hand terminals on the three way terminal block to the two right hand terminals on the same block. See Figure for the location of this terminal block.

If reversing the sensor polarity does not clear the tamper or any of the above self test events are not correctly performed then refer to Section 9.

5.3 VOLUME CONTROL

On the back panel there is a rotary volume control. This may be adjusted at any time during operation to suit the operator. Before proceeding with the initial checks, set this about one third of a turn clockwise.

5.4 INITIAL CHECKS

When the GW390-1 Control Console is being used for the first time a number of checks are necessary and some adjustments made. Once this has been done changes will only be necessary if the system is reconfigured or repaired.

5.5 ZONE MONITOR TESTING

Depress the Reset switch on the left hand Zone monitor to select audio monitoring. This should result in a faint hissing sound from the loudspeaker and cause the Reset LED to flash at about 2Hz.

Repeat this procedure for the other Zone Monitors, working from left to right. If there is a strong wind blowing or other disturbance to the fence, other sounds may be heard which can be disregarded.

If any of these checks do not give the required result, refer to Section 9.

5.6 NORMAL OPERATION

When all initial checks have been performed, the Data Access key may be returned to the vertical position and removed if desired.

Normal operation consists essentially of visual and/or audio monitoring of the zones. The procedures for responding to and reporting on alarms are a matter for the individual security organisation, and therefore do not fall within the scope of this manual.

5.7 DISABLING A ZONE

This function requires the Data Access key to be in position.

To disable a zone press D followed by the zone number, e.g. D 2 will disable zone 2. This will cause the Reset LED to illuminate continuously indicating the zone is disabled. Note that the LED bar display will still function although the alarm relays will not trigger. To re-enable the zone depress the reset button on the appropriate zone.

5.8 DISABLE AUDIBLE ALARM NOISE

The function key E is the only key which may be used by an operator without recourse to a data access key.

Pressing key E cancels the audible alarm buzzer on a zone that has gone into full alarm whilst still allowing the operator to "listen in" to the fence. The audible alarm buzzer facility is switched on again when the zone is reset or when another zone goes into full alarm.

Each zone monitor has a front panel which supports an LED bar display and a reset button with integral LED.

6.1 PRE ALARM

When the system is active, the LED bar display will indicate the level of mechanical activity on the fence. Should this activity exceed 30% of the display's full scale deflection, and the information content on the signal is such that the programme parameters are exceeded, then audio monitoring is automatically selected, and the Reset LED flashes at about 2Hz. When the activity drops below 30%, audio monitoring is automatically deselected after about 15 seconds.

6.2 FULL ALARM

Should the level of activity exceed 60% of the display's full scale deflection, and the information content on the signal is such that the program parameters are exceeded, an alarm buzzer will sound and the Reset LED will be illuminated continuously. The individual zone alarm can be cancelled by depressing the Reset button which will silence the audible alarm and extinguish the Reset LED.

6.3 MANUAL AUDIO MONITORING

Audio monitoring can be manually selected at any level of activity by depressing the Reset button. If audio monitoring is manually selected then it will remain on until either it is manually deselected by depressing the reset button, another zone is manually selected or a zone goes into alarm.

6.4 FEEDER FAULT

A fault in the zone feeder cable will cause the alarm buzzer to be pulsed on and off at about 2Hz in conjunction with the Reset LED for the affected zone and the Feeder Fault LED. To cancel the alarm buzzer, the reset button on the zone with the feeder fault should be pressed. This action will cancel the alarm buzzer but will leave the LED on the zone card and feeder fault LED pulsing. These will return to normal when the feeder fault is rectified and the zone is reset.

7.1 ZONE MONITOR SENSITIVITY ADJUSTMENT

The sensitivity of each individual Zone Monitor has a factory preset of 4, i.e. medium sensitivity. Each zone should be checked for the correct detection rate and the sensitivity setting adjusted accordingly.

IMPORTANT
Always switch off the Control Console *before* withdrawing any zone monitor cards for adjustment to avoid blowing the fuse or damaging other components. Full AntiStatic precautions should be observed when handling Electronic Components.

Do not adjust sensitivities just because alarms occur frequently. Carry out a thorough examination of the fence and only then experiment with sensitivity adjustments.

To gain access to the sensitivity switch, remove the power from the system. Loosen and remove the top and bottom screws on the Zone Monitor and withdraw the plug-in module. On the component side of the PCB is a blue slide switch assembly containing eight switches. Switch 4 will be "up" in the factory preset position. See Figure 4.

Switch 1 selects the lowest sensitivity, switch 8 selects the highest sensitivity. Only **one** switch should be in the "up" position at any one time. Select a new sensitivity using a fine screwdriver to operate the switch. Two switches in the "up" position will cause the higher sensitivity to be selected. No switches "up" will disable the zone.

Switch assembly

Figure 4

Replace the Zone Monitor, reconnect the power to the Control Console and switch the Power on. Check the response of the Zone Monitor LED bar by causing a disturbance on the zone.

Experimentation to set up the required level of detection may continue as necessary for the various zones. **Always ensure that the power is removed before withdrawing a Zone Monitor.**

7.2 SYSTEM PARAMETER ADJUSTMENT

The GW390-1 comes preprogrammed to reflect typical operating conditions. During initial setting up or operation it may be desirable to alter this programming to aid the detection of particular types of disturbance on a fence. Altering the time and counts with the key pad programming is another way of changing the sensitivity of a zone. *Such alteration should only be made by the commissioning engineer or a security supervisor with an in depth understanding of the system operation.*
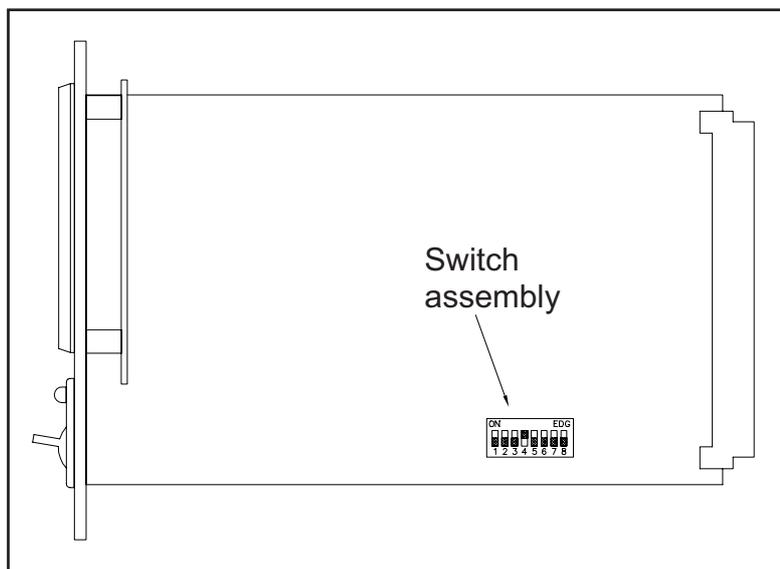
The *time window* is the period of time in which a set number of *counts* must occur in order for the Control Console to trigger either pre or full alarm. The *counts* are the number of frequency peaks and troughs which are generated by the vibration of the protected surface.
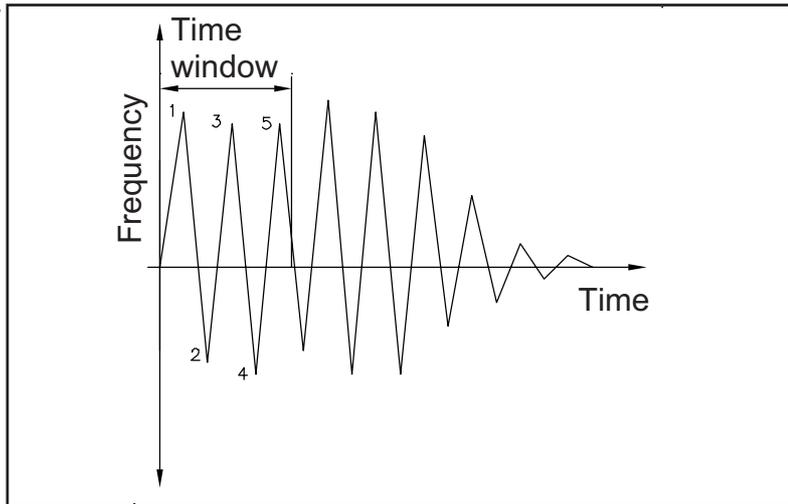
Figure 5

With reference to Figure 5, which shows a graph of frequency against time, five counts have occurred in the given time window. Therefore, if the counts had been set at five or less the Control Console would have triggered an alarm.

These two settings (i.e. pre and full alarm) can be uniquely programmed for each zone. They have the following factory presets.

	Time window	Counts
30%, pre alarm	1.5 secs	15
60%, full alarm	3.0 secs	10

If the counts are increased it will be more difficult to put the zone into alarm. If the counts are decreased it will be easier to put the zone into alarm. The opposite applies with the time window. The bigger the window the easier it is for the zone to go into alarm. The smaller the window the more difficult it is to go into alarm.

7.3 TIMER AND COUNTS CONTROL

Data access is only possible after inserting the key in the keyswitch on the console front panel and turning the key 90 degrees clockwise.

Keys A to F, 1 and 2 are Function Keys defined as follows:

Key	Function
A	Set time window
B	Set counts
C	Clock setting (Optional)
D	Disable zone
E	Disable audible alarm
F	Enter
1	Select 30% Alarm Threshold
2	Select 60% Alarm Threshold

7.4 SETTING TIME WINDOW

1. Press key A to select time window programming.

2. Press the key relative to the time window to be set e.g. press key 1 to set 30% alarm threshold time window.

3. Enter the number of the zone to be set e.g. 2.

i.e. A 1 2

The number displayed in the digital display shows the selected zone number followed by the current time window setting in tenths of a second e.g. 2 015 indicates zone 2 has a time window of 1.5 seconds.

The time window may now be altered by keying in the required value in tenths of a second, followed by key F, e.g. 035F would reprogramme the time window to 3.5 seconds. If the current time window setting displayed is adequate press key F to exit time window programming.

IMPORTANT
A full alarm condition must be created on the respective zone for the above adjustments to be registered in the Control Console.

7.5 SETTING COUNTS FUNCTION

1. Press key B to select counts programming.

2. Press the key relative to the count to be set e.g. press key 2 to set 60% alarm threshold counts.

3. Key in the number of the zone to be set e.g. 1.

i.e. B 2 1

The number displayed in the digital display shows the zone number followed by the number of counts e.g. 1 010 indicates zone 1 has a count of ten.

The count number may now be altered by keying in the required number, followed by key F e.g. 004F would reprogramme the counts to four. If the count setting displayed is adequate press key F to exit counts programming.

7.6 INCORRECT ENTRY

Entering incorrect values of either 000 or a number greater than 255 will cause EEE to be displayed. In this event re-enter an appropriate value between 000 and 256 followed by an F.

7.7 CLOCK SETTING

The internal clock would only require to be set if a printer is connected to the Control Console. For details of clock setting see Section 8.2.

7.8 SAVING THE CONFIGURATION

Switch the Control Console off. Removing the Keypad panel reveals four PCB's, one of which has a large ribbon cable on the front. By removing the ribbon this board can be withdrawn to reveal four DIL switches which can be switched in order to save any configuration changes made. When replacing this PCB ensure that it is correctly orientated i.e. with the heatsink it towards the back. See Figure 6 for position of the DIL switches and the heatsink.
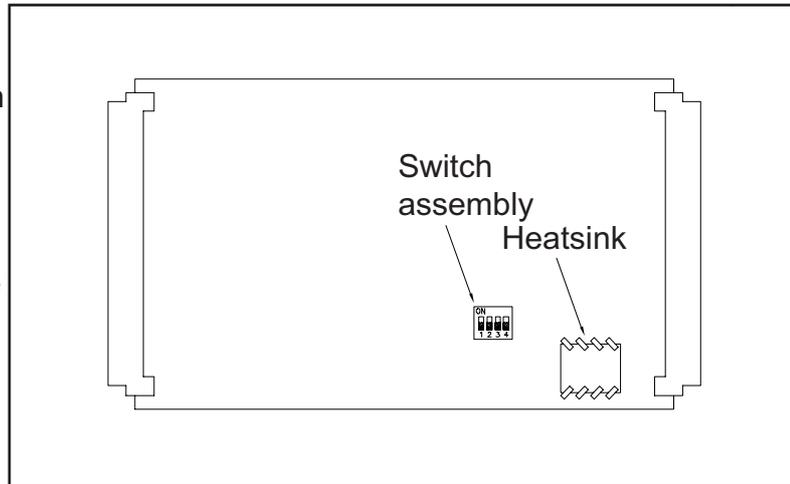
Figure 6

Switches 1 and 2 are used to save any programmable changes made and select auto reset of full alarm as follows. The words in **BOLD** indicate factory presets.

Switch 1   ON   Configuration changes saved on powering down

            OFF   Defaults to factory presets after powering down

Switch 2   ON   Auto reset of full alarm after 20 seconds

            OFF   Manual reset of full alarm

This section is only relevant if the Control Console has been connected to a printer using the optional PCB.

8.1 ALARM LOGGING

To complement the comprehensive alarm reporting features of the GW390-1, an additional kit can be fitted in the Control Console to provide a means of logging alarms.

When connected to a printer the system will log the date, day of the week and time of any pre or full alarm condition, operator response, system power down, zone enable/disable and full alarm auto reset.

The logging of full alarm auto reset will only operate if this feature has been selected in the Control Console, see Section 7.1.

The PCB includes a battery backup for the clock to ensure preservation of data at power down and under conditions of power failure.

8.2 CLOCK SETTING

In order for the logging to reflect actual occurrences the internal clock must be set to the correct time, day and date. This is done using the following procedure.

With the Control Console turned on insert and turn the Data Access Key.

1. Press the C key followed by the 0 key. This will stop the clock and initialise the time registers prior to programming.

2. Enter a two digit number corresponding to the number of the current year. All the entries will be echoed on the digital display.

3. Press the F key. This will enter the data and clear the digital display.

4. Enter a number between 0 and 3 corresponding to the number of years since the last leap year. The internal clock will then be able to add the leap day when necessary.

5. Press the F key.

6. Enter a number corresponding to the current month i.e. 1 = January, 12 = December.

7. Press the F key.

8. Enter the date of the month.

9. Press the F key.

10. Enter a number corresponding to the day of the week i.e. 1 = Monday, 7 = Sunday.

11. Press the F key.

12. Enter a number corresponding to the hour of the day, using 24 hour clock notation.

13. Press the F key.

14. Enter a number corresponding to the minute of the hour that the clock will be started.

15.Press the F key.

The clock registers are now fully programmed but the clock is not yet running. To start the clock press the F key again at the minute past the hour programmed in step 14 using an external time signal as a reference. Starting the clock in such a manner will ensure synchronicity with external clocks.

8.3 EXAMPLE OF CLOCK SETTING

To set the clock running at 3:15pm, on Tuesday, July 1, 1997 the following keys would be pressed on that day prior to the time being reached.

Keys pressed   Explanation

   C O   Stop clock and initialise registers

 97 F   Number of year

  1 F   One years after leap year

  7 F   July is seventh month

  1 F   First day of the month

  2 F   Tuesday is second day of the week

 15 F   3 pm on the 24 hour clock

 15 F   Minutes past the hour

When an external clock indicates precisely 3:15pm press the F key again to start the clock.

8.4 SEASONAL TIME CHANGES

To ensure that the alarm logging is a reflection of any external clocks, the internal clock may need to be reprogrammed, as above, twice a year due to seasonal time changes.

8.5 SETTING UP THE PRINTER

Prior to powering up the system it is necessary to set up the printer so that it does not print on the perforations. Align the perforations of the first page with the print head, switch the printer on and then set the Top of form. (For more details of this procedure see the manual supplied with the printer)

Turn the Control Console on. Once this has finished the self test procedure it will advance the printer paper by one page and then print a seven line header followed by the time and date of power on. The system will then log any subsequent occurrences or interventions.

8.6 MULTIPLE CONSOLE SYSTEMS

If more than one Control Console is connected to a system it is necessary to have a printer switch which automatically selects the active Control Console. In this case Control Console 1 should be designated as the master and as such will print the header on powering up. See below for details on configuring the additional Control Consoles as slave units.

Control Console 1 should be connected to the Computer 1 connector on the printer switch, Control Console 2 to Computer 2 connector and so on for the additional Control Consoles. The printer switch should then be connected to the printer with the cable provided.

If more than one Control Console is trying to log an occurrence then a short delay will occur between the separate logs. Whilst the printer is serving one Control Console any other Control Consoles will store the data until the printer becomes free thus ensuring that no data is lost.

The exception to this is during powering up sequence when each console will do nothing until it has logged on to the printer. When powering up the system, the Control Console, the print switch and the printer should all be turned on together to avoid any system problems.

8.7 CONFIGURING SLAVE CONTROL CONSOLES

In a multiple Control Console system the additional Control Consoles need to be configured as "slaves". To do this switch the Control Consoles off. Removing the Keypad panel reveals four PCBs, one of which has a large ribbon cable on the front. By removing the ribbon this board can be withdrawn to reveal four DIL switches which can be switched in order to designate master or slave Control Console status. When replacing this PCB ensure that it is correctly orientated i.e. with the heatsink towards the back. See Figure for the position of the DIL switches and heatsink.

Switches 3 and 4 are used to reallocate zone numbers when more than one Control Console is being used on any one site. The zones are numbered as follows. The words in BOLD indicate the factory presets.

Switch number

3	4	Zone numbers
OFF	**OFF**	1 6, master console
ON	OFF	7 12, slave console
OFF	ON	13 18, slave console
ON	ON	19 24, slave console

9.1 ZONE MONITOR FAULTS

Symptom	Possible Cause	Remedy
Control console has no LED lights on.	Mains supply failure or mains fuse blown.	Check the mains supply. Check the mains fuse. If the problem persists or the fuse blows again return the Control console to Geoquip Ltd.
Feeder Fault and Reset LEDs flashing.	Feeder fault or zone monitor failure.	Switch off. Reconnect the zone plug to another zone monitor. Switch on. If the feeder fault LED remains on there is a feeder fault on the zone. If the Reset LED on the original zone monitor remains on replace the zone monitor.
Feeder Fault and Reset LEDs flashing continued.		If a feeder fault exists check all plugs, sockets, terminal blocks, fuses and connections on the affected zone. Repair and replace as necessary and reset. Reset at the Console. If fault persists replace the appropriate Interface box. If faults still exists replace the entire feeder cable.
Audio stays on.	Zone monitor fault.	If audio can not be manually cancelled or does not cancel automatically, replace the zone monitor.
Continuous full alarm.	Interface lid is not fastened properly. Sensor fault. Faulty Interface.	Check that the Interface lid is fastened. Disconnect the sensor and check as described in the installation manual. If the correct values are obtained then check the interface. Remove sensor tails from the Interface terminal block and replace with a 1k resistor. If fault persists return the Interface for repair.

Symptom	Possible Cause	Remedy
Zone monitor bar LED display high and/or persistent zone alarms	Fence damage causing alarms or faulty zone monitor.	Switch console off and replace zone monitor. If fault persists check the fence for damage. If fault clears replace zone monitor.
No audio output	Volume turned to low. Zone monitor fault.	Turn up the volume control. If the audio on a particular zone monitor cannot be selected using the Reset switch and/or is not automatic ally selected at 30% full scale deflection, replace the zone monitor.
Zone monitor LEDs or Reset switch faulty	Damaged parts.	If zone monitor functions correctly but the Reset button or LED or the bar display LED is damaged repairs to the zone monitor can be made. Switch console off and remove zone monitor. Contact Geoquip Ltd. for requisite spare parts.

9.2 DATA ACCESS PANEL FAULTS

Symptom	Possible Cause	Remedy
No audible alarm on display panel.	Faulty console.	Return console to Geoquip Ltd.
Unable to display settings on display panel.	Faulty console.	Return console to Geoquip Ltd.
Data Access keyswitch damaged.		Return console to Geoquip Ltd.
Data Access key(s) lost or stolen		Write to Geoquip Ltd. giving key number, if possible, and Control Console serial number.