

Operator manual



KONGSBERG

Gas Leak Detection using MS1000

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***Gas Leak Detection Using
MS1000
Operators Manual***

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About this document

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Document history

Draft 0.1	First draft Describes Ethernet installation procedures and MS1000 Gas Leak Detection function.
Draft 0.2	Describes enabling gas leak alarm, the configuration of the sequential operation.
Draft 0.3	Decoupled gas leak detection function and the sequential operation function. Added DelayStartup field in the DefaultConfig.ini file, used in high latency network to wait for the head TCP/IP connection.

Feedback

To assist us in making improvements to the product and to this manual, we welcome comments and constructive criticism. Please send all such – in writing or by Email to:

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1 INTRODUCTION

This manual describes the components for the Gas Leak Detection system using MS1000. Instructions are provided here to install and setup the MS1000 for a Gas Leak Detection System.

1.1 Gas Leak Detection using MS100 Overview

The Gas Leak Detection System using MS1000 incorporates the following components:

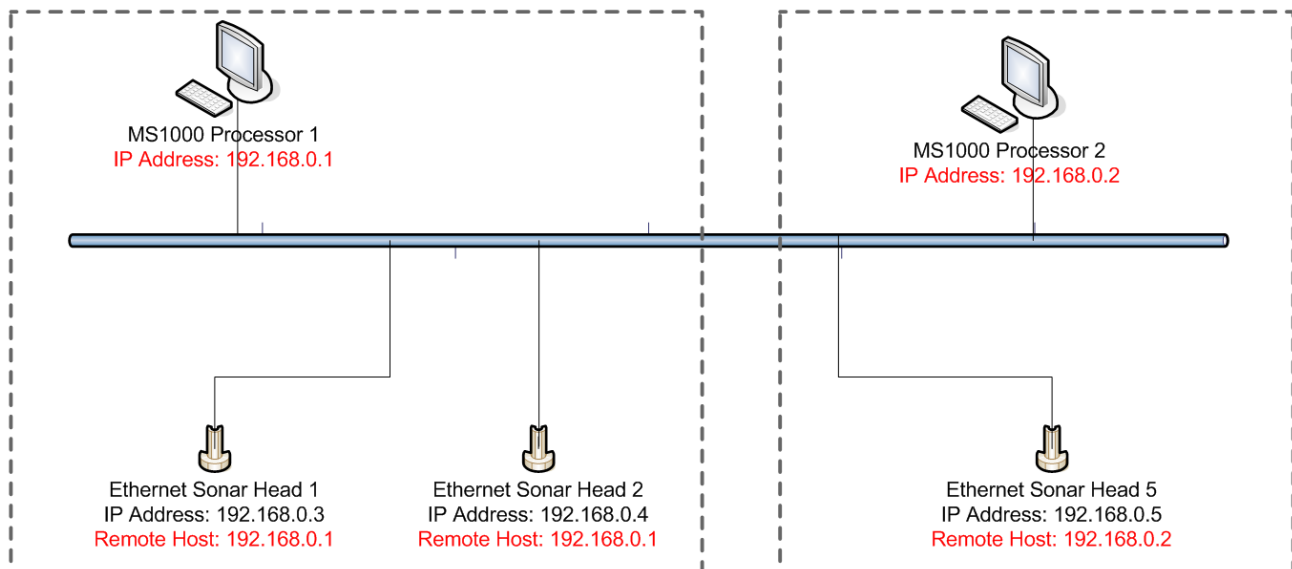
- 6 fix mounted horizontally scanning (HSH) 1171 dual-frequency Ethernet sonar heads
- 2 vertically scanning (VSH) 1171 dual-frequency Ethernet sonar heads (to be mounted on pan devices)
- 2 rotator devices (Kongsberg single-axis rotators)
- A HSH MS1000 Processor and a VSH MS1000 Processor

2 CONFIGURE THE SYSTEM

2.1 Configure the TCP/IP

All the Kongsberg Mesotech Ethernet heads are factory-programmed with IP address 192.168.0.254. If multiple of Ethernet sonar heads are installed on the same network, the IP addresses of the Ethernet sonar heads need to be reprogrammed to avoid IP address conflicts. Each Ethernet head can be programmed to communicate with a dedicate MS1000 processor. Following is the diagram of the MS1000 and Ethernet heads connection:

Each Ethernet sonar head has its own IP address and a programmable “Remote Host” IP address field. The Ethernet head will only communicate with the MS1000 processor that has the IP address the same as programmed in the “Remote Host” field.



2.1.1 Configure the Ethernet Heads

The Ethernet Head uses chip manufactured by Lantronix®. It can be programmed through a web browser. Open a web browser such as Microsoft® Internet Explorer, Firefox, etc. and follow the following steps:

- **Step 1:** enter 192.168.0.254 in the web browser address field if the Ethernet head IP address has not been reprogrammed, otherwise, enter the previously programmed IP address, a log in message box will appear. There's no user name and password were set from the factory, click OK to continue. If a user name and password is set by the user, the user is responsible to record the log in information.



- **Step 2:** Enter the IP address for the Ethernet Head and click OK. Click “Apply Settings” if this is the only setting needs to be programmed, otherwise, go to “Channel 1” → “Connection” page.
Note: “OK” button has to be clicked before clicking “Apply Settings”, otherwise, the content on the settings page will not be applied.

LANTRONIX® Firmware Version: V6.5.0.7
MAC Address: 00-20-4A-95-C4-E8

Network Settings

Network Mode:

IP Configuration

Obtain IP address automatically

Auto Configuration Methods

BOOTP: Enable Disable

DHCP: Enable Disable

AutoIP: Enable Disable

DHCP Host Name:

Use the following IP configuration:

IP Address:

Subnet Mask:

Default Gateway:


Ethernet Configuration

Auto Negotiate

Speed: 100 Mbps 10 Mbps

Duplex: Full Half

- Step 3:** On the “Connection” page, only two fields should be reprogrammed as need, “Remote Port” and “Remote Host”. In the “Remote Host” field, enter the IP address of the MS1000 processor for which this Ethernet head will be connected to. In the “Remote Port” field, enter the TCP/IP socket port number to be the same as configured in the MS1000. See page 7 Configure TCP/IP Server Socket Port for detail. The MS1000 default TCP/IP socket port number for Ethernet head is 6000. Click “OK” and “Apply Settings”



Firmware Version: V6.5.0.7
MAC Address: 00-20-4A-95-C4-E8

Connection Settings

Home

Network

Server

Serial Tunnel

Hostlist

Channel 1

Serial Settings

Connection

Email

Trigger 1

Trigger 2

Trigger 3

Configurable Pins

Apply Settings

Apply Defaults

Channel 1

Connect Protocol

Protocol:

Connect Mode

<p>Passive Connection:</p> <p>Accept Incoming: <input type="text" value="Yes"/></p> <p>Password Required: <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>Password: <input type="text"/></p> <p>Modem Escape Sequence Pass Through: <input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>Active Connection:</p> <p>Active Connect: <input type="text" value="Auto Start"/></p> <p>Start Character: 0x <input type="text" value="0D"/> (in Hex)</p> <p>Modem Mode: <input type="text" value="None"/></p> <p>Show IP Address After RING: <input checked="" type="radio"/> Yes <input type="radio"/> No</p>
---	---

Endpoint Configuration:

Local Port: Auto increment for active connect

Remote Port: Remote Host:

Common Options:

Telnet Com Port Cntrl: Connect Response:

Terminal Name: Use Hostlist: Yes No LED:

Disconnect Mode

On Mdm_Ctrl_In Drop: Yes No Hard Disconnect: Yes No

Check EOT(Ctrl-D): Yes No Inactivity Timeout: : (mins : secs)

- **Step 4:** Wait for the unit to reboot. To get updated information, close and open the browser, enter the IP address of the Ethernet Head (new IP address if the IP address has been reprogrammed) to the address field and check if all the fields are reprogrammed correctly.

The screenshot displays the LANTRONIX web interface. At the top left is the LANTRONIX logo. At the top right, it shows 'Firmware Version: V6.5.0.7' and 'MAC Address: 00-20-4A-95-C4-E8'. On the left side, there is a vertical navigation menu with the following items: Network, Server, Serial Tunnel (with sub-items Hostlist and Channel 1), Email (with sub-items Trigger 1, Trigger 2, and Trigger 3), Configurable Pins, Apply Settings (highlighted in yellow), and Apply Defaults. The main content area contains the text: 'Please wait while the configuration is saved... The unit will reboot in order for the settings to be applied.' Below this text is a progress bar consisting of a horizontal rectangle with six blue vertical bars of varying heights, indicating the progress of the configuration save process.

2.1.2 Configure the MS1000 Processor

Configure IP Address:

To communicate with an Ethernet head, the network adapter directly connected to the Ethernet head or the network need to have an IP address that matches the “Remote Host” IP address programmed in the Ethernet head. The Ethernet head factor default “Remote Host” IP address has been programmed to 192.168.0.1, so the MS1000 processor needs to have IP address 192.168.0.1 to communicate with the Ethernet head with factory default IP address 192.168.0.254.

Configure TCP/IP server Socket Port

The MS1000 is a TCP/IP server. The server socket opened for the Ethernet head by default is 6000. If 6000 is conflict with other TCP/IP server, this port number can be changed through an external “DefaultConfig.ini” file under the MS1000 installation folder ..\KML\MS1000_Vxxx, section “[Network], EthernetHead = ” . If the TCP/IP server socket port number is changed.

```
[HeadSettings]
; sector heading from 0 to 1599 in 0.225 degree unit
SectorHeading = 0
; sector width from 0 to 1599 in 0.225 degree unit
Sectorwidth = 1600
; valid step size 1, 2, 4, 8, 16, 32
Stepsize = 2
; gain from 1 to 255
Gain = 64
; scan direction: 0 clockwise, 1 counterclockwise
ScanDir = 0
; range: in meters
Range = 100
; transducer orientation: 0 down, 1 up
XDCRorientation = 0
; gain shift factor: 4 high, 5 med, 6 low
GainShiftFactor = 5;
; latency in millisecond
Latency = 100
; rotator speed: 0 (slow), 1 fast(default)
RotatorSpeed = 1
; moving current: 0 to 100%, default 30
RotatorMovingCurrent = 30
; The maximum time allowed to elapse between the arri
BytesInterval = 40
[Network]
; Ethernet Head Port
EthernetHead = 6000
; ROV HUB Port
ROVHUB = 7000
; Sonar Data Port
SonarData = 5000
; Gas Leak Msg report
GasLeakReport = 20012
```


3 RUN THE HSH SYSTEM

3.1 Before starting MS1000

```
; Sonar Limits in degrees (0 to 360)
LeftLimit = 210
RightLimit = 150
[Network]
; Ethernet Head Port
EthernetHead = 6000
; ROV HUB Port
ROVHUB = 7000
; Sonar Data Port
SonarData = 5000
; Gas Leak Msg report
GasLeakReport = 20012
[System]
; enable/disable start recording automatically when start the system (0: disable, 1: enable)
AutoRecording = 0
; delay startup in ms, used in Ethernet head or ROV HUB configuration in high latency network
DelayStartup = 0
```

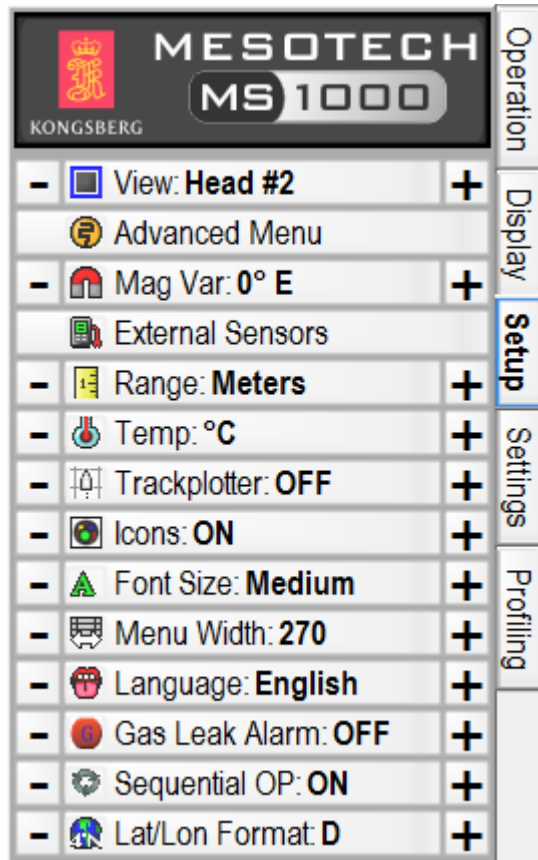
3.1.1 Enable/Disable Auto-Recording

This option allows the MS1000 automatically starts recording when starts to run the sonar heads. To enable this option, edit the external “DefaultConfig.ini” file under the MS1000 installation folder ..\KML\MS1000_Vxxx. Under section [System], set AutoRecording =1.

3.1.2 Set Delay-Startup

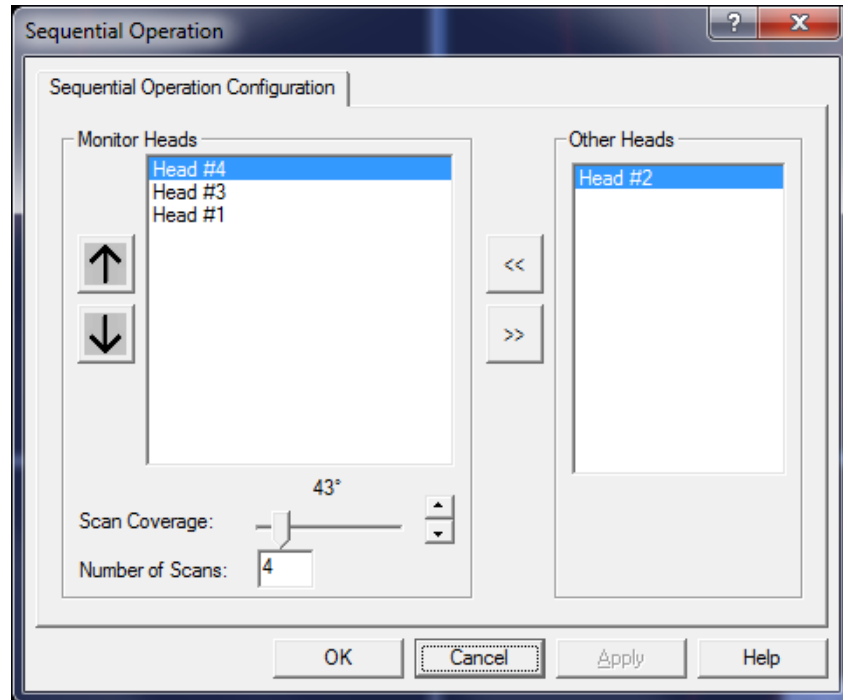
In high latency network, the Ethernet heads may need to take some time to connect to the MS1000 software. MS1000 software may start to confirm the saved sonar heads before the Ethernet heads socket connections are established. This will cause MS1000 failed to confirm the saved sonar heads. Adjust “DelayStartup” value in the “DefaultConfig.ini” file to delay MS1000 confirming the saved sonar heads and wait until the Ethernet heads establish the socket connection with MS1000. This value need to be experimented depends on the latency of the network.


3.2 Enable Sequential Operation






Run MS1000 on the HSH processor and select “Setup” tab. Click on the “Sequential OP” button and change it to “ON”

In the Sequential Operation Configuration page,



Click the  button to add the sonar head to the gas leak monitoring group.

Click the  button to remove the sonar head from the gas leak monitoring group.

Use  and  button to change the order of the sonar head for the sequential operation.

Scan Coverage: adjust for each head for its scan coverage.

Number of Scans: defines the number of scans to finish for a gas leak monitoring heads in the operation sequence before switch to the next sonar head.

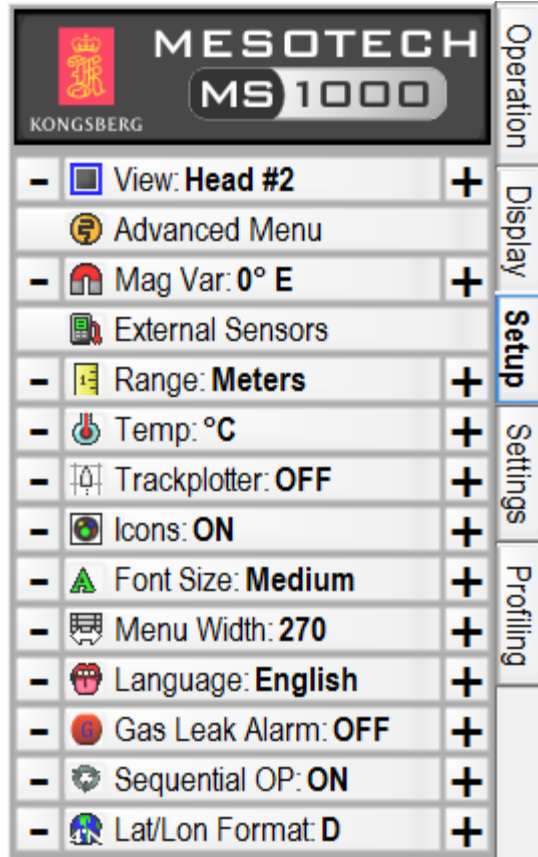
Click Apply to accept the configurations, click OK to exit the dialog and enable the Sequential Operation.

3.3 Enable the Gas Leak Alarm

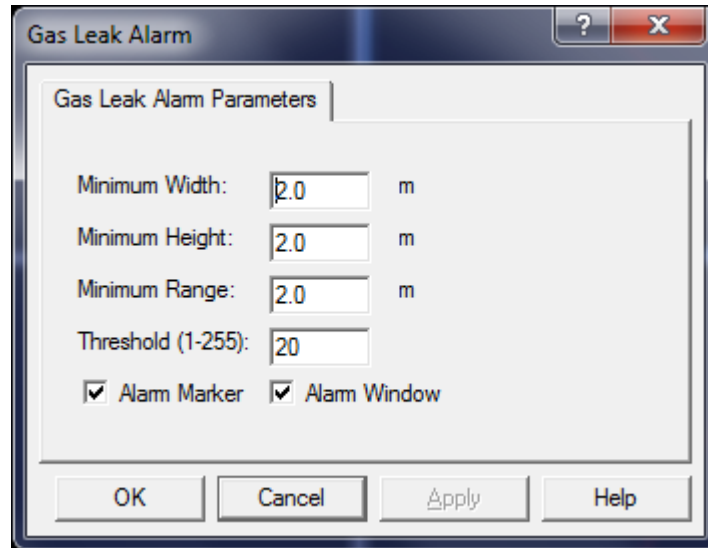
Refer to MS1000 Operator Manual to install and run MS1000 software.

A dongle with Gas Leak Detection option is required to enable the MS1000 Gas Leak Detection feature.

Run MS1000 on the HSH processor, click on a sonar display to select an active sonar head and select “Setup” tab. Click on the “Gas Leak Alarm” button and change it to “ON”



In the Gas Leak Alarm Parameters page, set up the gas leak alarm parameters.



Minimum Width: the minimum width of the pixels on the sonar image required to trigger the gas leak alarm.

Minimum Height: the minimum height of the pixels on the sonar image required to trigger the gas leak alarm.

Minimum Range: no gas leak alarm will be trigger below this range.

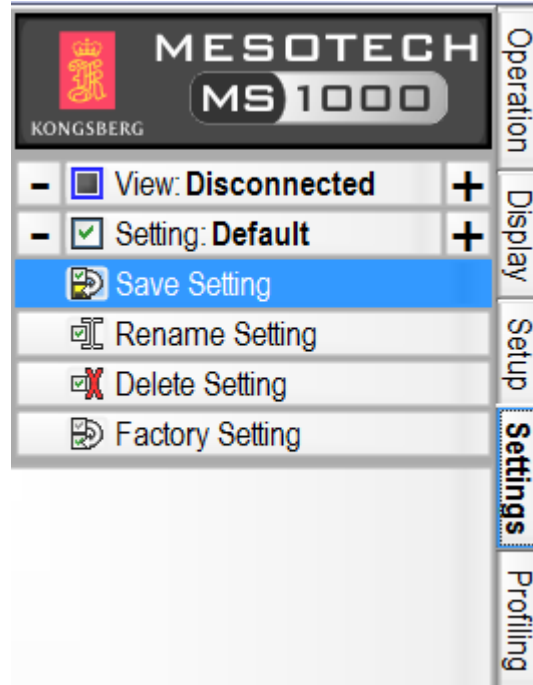
Threshold: the minimum intensity (1 to 255) of the pixels on the sonar image required to trigger the gas leak alarm.

Alarm Marker: check this to enable gas leak alarm marker when gas leak is reported.

Alarm Window: check this to enable gas leak alarm window and audible alarm when gas leak is reported.

Click Apply to accept the settings, and click OK to exit dialog and enable the Gas Leak Alarm.

The Gas Leak Alarm and parameters can be set independently for each sonar head. All the settings will be saved upon user clicks **Save Setting** button.



3.4 Gas Leak Monitor operation mode

When Gas Leak Alarm is enabled, the MS1000 software will go to the Gas Leak Monitor operation mode. All the HSH heads connected to the HSH MS1000 processor will start to scan sequentially.

User will be able to define the sequential scanning order of the HSHs, the number of scans before switching to the next HSH, disable specified HSH in the sequence.

The user defined operation parameters and sequence will be saved and can be reloaded when restart the system.

User can restore to the factory default settings by pressing the factory default button.

3.5 Gas Leak Alarm logging and reporting


If a gas leak is developed and detected by the system, a gas leak alarm marker will be placed at the estimated position. This marker will be recorded for replay if recording was started. A gas leak alarm flash window and an audible alarm will be trigger to get the operators attention.



The gas leak alarm report will be reported through TCP/IP, the default socket number is 20012. This can be configured in the "DefaultConfig.ini" file. See section 2.1.2 for detail.

If a HSH device is lost communication, the system will detect the failure and send Device Failure Report through TCP/IP, the same socket number for the gas leak alarm report.


Gas Leak Alarm Report



```
$NGIGLA,25,07132012,233034.385,0.00000012,N,0.00000000,E,9.95,9.95,53,  
$NGIGLA,26,07132012,233034.436,49.00000012,N,-122.00000000,E,9.95,9.95,85,
```

```
$NGIDS,Head #2,002,001,07132012,233036.687,0.000,N,0.000,E,  
$NGIDS,Head #2,002,001,07132012,233037.417,0.000,N,0.000,E,  
$NGIDS,Head #2,002,001,07132012,233037.418,0.000,N,0.000,E,  
$NGIDS,Head #2,002,001,07132012,233041.177,0.000,N,0.000,E,
```

Device Failure Report



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