MicroComm DXL

DXL Troubleshooting using Logs

April 2010

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1 Introduction

This quick guide should give you some basic information on how to use the DXL Logging features to troubleshoot the system.

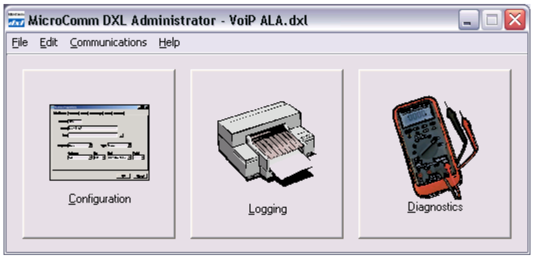
You should have some knowledge of the DXL Administrator Software before using this guide. Troubleshooting host/touchscreen operation may require some knowledge of the DXL Host Interface Specifications as well.

2 Using the Logging Functions

2.1 Functions of the Log Viewer

2.1.1 Opening the Log Viewer

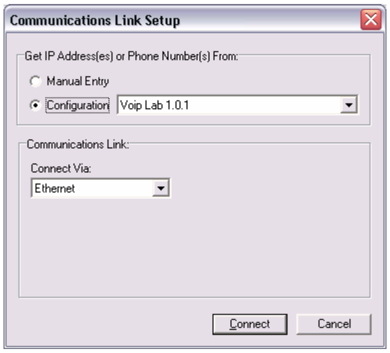
You can open the Log Viewer window by clicking on the Logging button on the MicroComm DXL Administrator. This option lets you view the different types of events that are logged by the system and the log message content of each event. Once you press this button, the program displays a window with a menu from which you can select various options.



2.1.2 Connecting to the Exchanges

If the computer is not already connected to any Exchange(s) on the DXL system and you open the DXL Log Viewer then a Communications Link Setup window appears. In this window, use the Configuration option to connect to the Exchange(s) on the DXL system. This window is the same as the window that appears when you try to open the File Manager window through the DXL Configuration Editor.

Note that if the computer is already connected to the Exchange(s) on the DXL then the program will skip the Communications Link Setup window and will directly display the Select Exchanges window, which is discussed next.


Communications Link Setup

Get IP Address(es) or Phone Number(s) From:

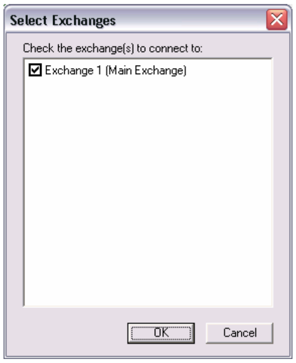
○ Manual Entry

● Configuration: Voip Lab 1.0.1

Communications Link:

Connect Via: Ethernet

When you click on the Connect button in the Communications Link Setup window, the Select Exchanges window appears with checkmarks beside all the Exchanges that the computer will try to connect to and download logs from. You can select the check marks on the exchanges you want to view logs from (normally, all of the exchanges).

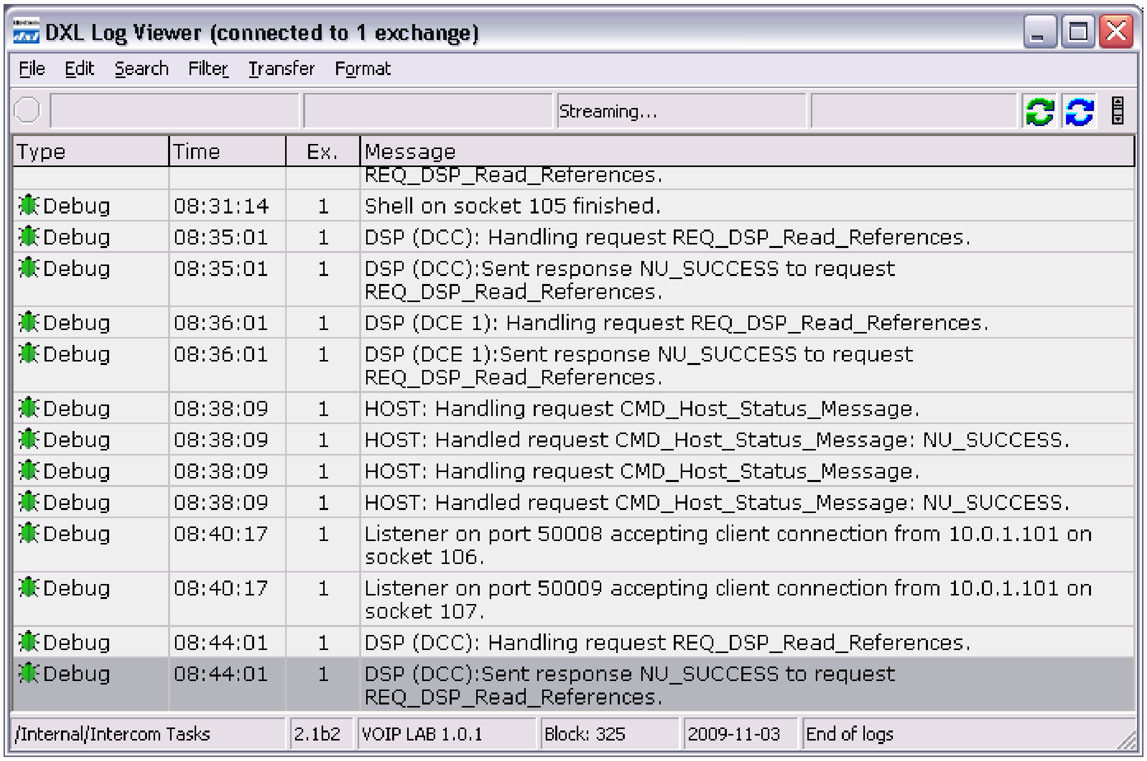

Select Exchanges

Check the exchange(s) to connect to:

☑ Exchange 1 (Main Exchange)

2.2 Adjusting Settings in the Log Viewer Window

An example Log Viewer window is shown below. The Log Viewer window by default shows all log messages, which in a busy system can become too much information for efficient troubleshooting.



```
Type      Time      Ex.  Message
                         REQ_DSP_Read_References.
Debug     08:31:14  1    Shell on socket 105 finished.
Debug     08:35:01  1    DSP (DCC): Handling request REQ_DSP_Read_References.
Debug     08:35:01  1    DSP (DCC):Sent response NU_SUCCESS to request
                         REQ_DSP_Read_References.
Debug     08:36:01  1    DSP (DCE 1): Handling request REQ_DSP_Read_References.
Debug     08:36:01  1    DSP (DCE 1):Sent response NU_SUCCESS to request
                         REQ_DSP_Read_References.
Debug     08:38:09  1    HOST: Handling request CMD_Host_Status_Message.
Debug     08:38:09  1    HOST: Handled request CMD_Host_Status_Message: NU_SUCCESS.
Debug     08:38:09  1    HOST: Handling request CMD_Host_Status_Message.
Debug     08:38:09  1    HOST: Handled request CMD_Host_Status_Message: NU_SUCCESS.
Debug     08:40:17  1    Listener on port 50008 accepting client connection from 10.0.1.101 on
                         socket 106.
Debug     08:40:17  1    Listener on port 50009 accepting client connection from 10.0.1.101 on
                         socket 107.
Debug     08:44:01  1    DSP (DCC): Handling request REQ_DSP_Read_References.
Debug     08:44:01  1    DSP (DCC):Sent response NU_SUCCESS to request
                         REQ_DSP_Read_References.
/Internal/Intercom Tasks  2.1b2  VOIP LAB 1.0.1  Block: 325  2009-11-03  End of logs
```

2.2.1 Setting the Auto-Download, Streaming, and Scrollbar Options

First of all, set the status of the three icons in the top right corner of the window to match the above example. Make sure both the green circular arrow icon and blue circular arrow icon are "pressed in", and the scroll bar icon is not "pressed in".

The function of the green circular arrow icon on the left is "Toggle Auto-Download Mode". If this option is on ("pressed in"), this means that if you scroll off the screen and there are no more logs that are already downloaded on the PC computer, that the Log Viewer will download logs from the DXL Exchange(s) to keep viewing.

The function of the blue circular arrow on the right is "Toggle Stream Mode". If this option is on ("pressed in"), this allows the log Log Viewer to automatically show new log entries as they occur, otherwise you would need to "refresh" the logs to see new logs.

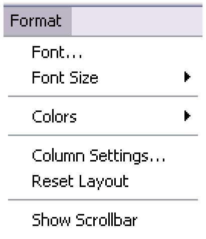
The function of scrollbar icon on the very top right is "Toggle Scrollbar". If this option is on ("pressed in"), this allows you to scroll the logs with a scrollbar. However, to know how long the scrollbar should be, the PC will need to read all of the logs, which can take a very long time. Hence it is normally recommended to turn the scrollbar off.

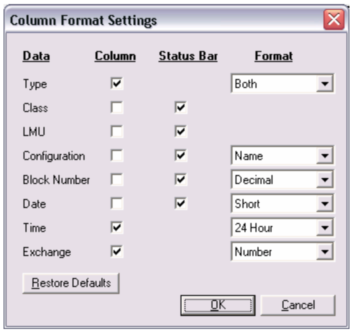
2.2.2 Setting the Column Format Settings

Once you have matched the above example, you can adjust the ColumnFormat settings to only show the columns that you are interested in and how to display these columns.

First of all, you can shorten the "Type" messages by using only icons in the "Type" column.

Select the "Format" menu option, then "Column Settings…"





Data	Column	Status Bar	Format
Type	☑		Both
Class	☐	☑	
LMU	☐	☑	
Configuration	☐	☑	Name
Block Number	☐	☑	Decimal
Date	☐	☑	Short
Time	☑		24 Hour
Exchange	☑		Number

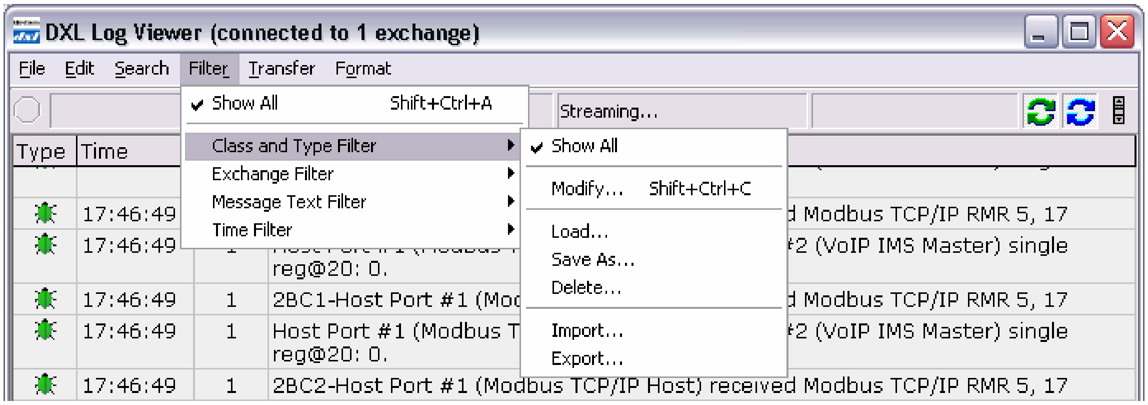
From this screen you can select which columns to view, and select format of certain columns. In this case, to show only icons, in the "Format" selector box across from the "Type" row, select "Icon".

2.3 Setting up Logging Filters

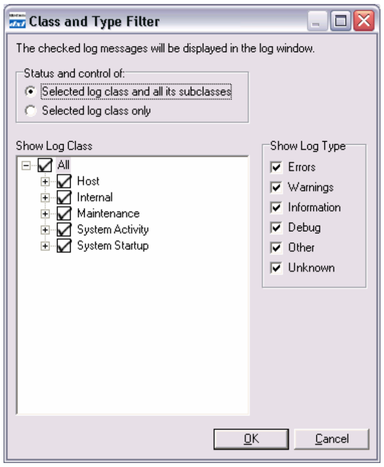
2.3.1 Setting up Class and Type Filters

Once you have matched the above example, you can set up log filters to allow easier troubleshooting by showing only log entries that you are interested in.

To remove most of the debugging messages not necessary for field troubleshooting, you can also use the "Filter" option. Select the "Filter" menu option then "Class and Type Filter" then "Modify…"



```
17:46:49                                    d Modbus TCP/IP RMR 5, 17
17:46:49   1                                #2 (VoIP IMS Master) single
               reg@20: 0.
17:46:49   1   2BC1-Host Port #1 (Moc       d Modbus TCP/IP RMR 5, 17
17:46:49   1   Host Port #1 (Modbus T       #2 (VoIP IMS Master) single
               reg@20: 0.
17:46:49   1   2BC2-Host Port #1 (Modbus TCP/IP Host) received Modbus TCP/IP RMR 5, 17
```



The checked log messages will be displayed in the log window.

● Selected log class and all its subclasses
○ Selected log class only

- ☑ All
  - ☑ Host
  - ☑ Internal
  - ☑ Maintenance
  - ☑ System Activity
  - ☑ System Startup

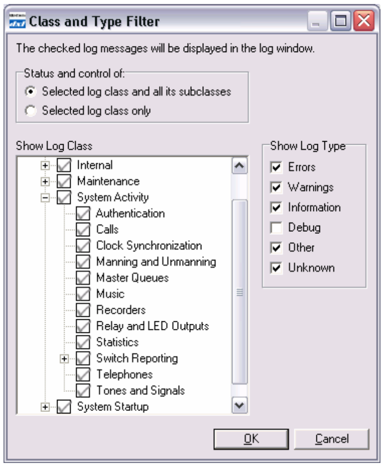
- ☑ Errors
- ☑ Warnings
- ☑ Information
- ☑ Debug
- ☑ Other
- ☑ Unknown

This will bring up the "Class and Type Filter" window.

This window allows you to select which logs you are interested in both by log type (whether it is a warning, error, normal information message, or detailed debugging message) and by the log class (the specific system functions you want to log).

Check marks in this window indicate which types and classes of logs can be disabled. A black check mark means that all logs of that type or class will be shown. A grey check mark means that only some of these logs will be shown. An empty check box means that none of these logs will be shown.

Log classes will have a plus sign next to them. This indicates that you can select sub classes within them individually. For example, since "System Activity" has a plus sign next to it, you can click the plus sign to see more classes of messages that are a sub-class of "System Activity" so you can individually select or de-select them.



Class and Type Filter

The checked log messages will be displayed in the log window.

Status and control of:
● Selected log class and all its subclasses
○ Selected log class only

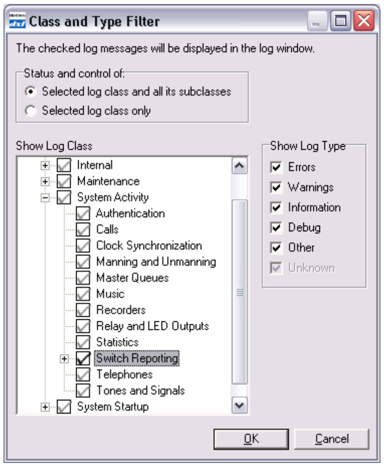
Show Log Class
+ ☑ Internal
+ ☑ Maintenance
− ☑ System Activity
  ☑ Authentication
  ☑ Calls
  ☑ Clock Synchronization
  ☑ Manning and Unmanning
  ☑ Master Queues
  ☑ Music
  ☑ Recorders
  ☑ Relay and LED Outputs
  ☑ Statistics
  + ☑ Switch Reporting
  ☑ Telephones
  ☑ Tones and Signals
+ ☑ System Startup

Show Log Type
☑ Errors
☑ Warnings
☑ Information
☐ Debug
☑ Other
☑ Unknown

For “types” of logs, for the most part, the “Debug” type of logs is usually only useful for Harding engineering staff. You can turn off the debug message type for all message classes by first clicking the text “All” to select all classes, then un-check the “Debug” option to turn off debugging logs for all messages.

However, there are some debug messages that are useful for installers and programmers, so to select only the useful ones, you can go further into the class tree.

Click the plus sign next to “System Activity” and you will see further class information for System Activity.



Class and Type Filter

The checked log messages will be displayed in the log window.

Status and control of:
● Selected log class and all its subclasses
○ Selected log class only

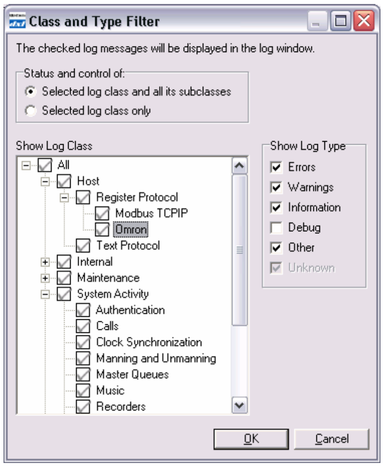
Show Log Class
+ ☑ Internal
+ ☑ Maintenance
− ☑ System Activity
  ☑ Authentication
  ☑ Calls
  ☑ Clock Synchronization
  ☑ Manning and Unmanning
  ☑ Master Queues
  ☑ Music
  ☑ Recorders
  ☑ Relay and LED Outputs
  ☑ Statistics
  + ☑ Switch Reporting
  ☑ Telephones
  ☑ Tones and Signals
+ ☑ System Startup

Show Log Type
☑ Errors
☑ Warnings
☑ Information
☑ Debug
☑ Other
☑ Unknown

For some troubleshooting, it is useful to know when a station call request switch or other switch is pressed. Select the check box next to “Switch Reporting”.

This should change to a solid black check mark rather than a grey check mark, indicating that all logs will be selected for this class., as shown in the window on the left.

You will notice on the right side of the window that the “Debug” option is now checked for this branch of the class tree.



Class and Type Filter

The checked log messages will be displayed in the log window.

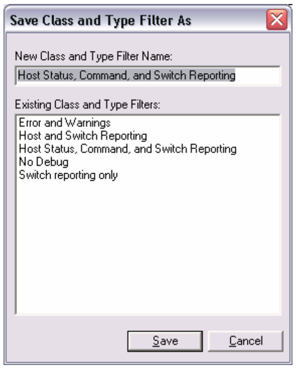
Status and control of:
● Selected log class and all its subclasses
○ Selected log class only

Show Log Class
− ☑ All
  − ☑ Host
    − ☑ Register Protocol
      ☑ Modbus TCPIP
      ☑ Omron
    ☑ Text Protocol
  + ☑ Internal
  + ☑ Maintenance
  − ☑ System Activity
    ☑ Authentication
    ☑ Calls
    ☑ Clock Synchronization
    ☑ Manning and Unmanning
    ☑ Master Queues
    ☑ Music
    ☑ Recorders

Show Log Type
☑ Errors
☑ Warnings
☑ Information
☐ Debug
☑ Other
☑ Unknown

Another class of logs that you may want further information on is the “Host” messages. Click on the plus sign next to Host. Select the check mark next to Host to select all Host messages. This will show all Host (PLC/Touchscreen) related messages; however there are some messages which are necessary only for Harding detailed diagnostics and would clog the logs up otherwise. To not show these logs, click the plus sign next to Register Protocol, then select the text “Modbus TCP/IP” and un-check Debug, then select the text “Omron” and un-check Debug. The completed Class and Type Filter should be similar to the window detailed to the right.

When complete, click on the “OK” button to return to the main Log Viewer window.



Save Class and Type Filter As

New Class and Type Filter Name:
Host Status, Command, and Switch Reporting

Existing Class and Type Filters:
Error and Warnings
Host and Switch Reporting
Host Status, Command, and Switch Reporting
No Debug
Switch reporting only

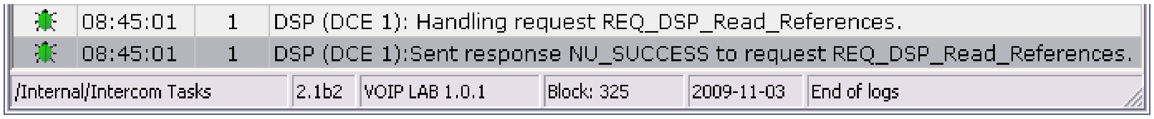
You can save a particular set of filter settings using the “Filter” menu option then “Class and Type Filter” then “Save As…”

This will bring up a new window prompting you for a description you want to call this filter, with the bottom showing the filter settings already saved.

For further information, if you want to know what class a message is so that you can include or exclude it, first ensure that “Class” is checked under “Status Bar” of the Column Status Settings window. If this is enabled, you can select the message in the main log viewer window and look at the information status bar at the bottom of the window which will show this information.

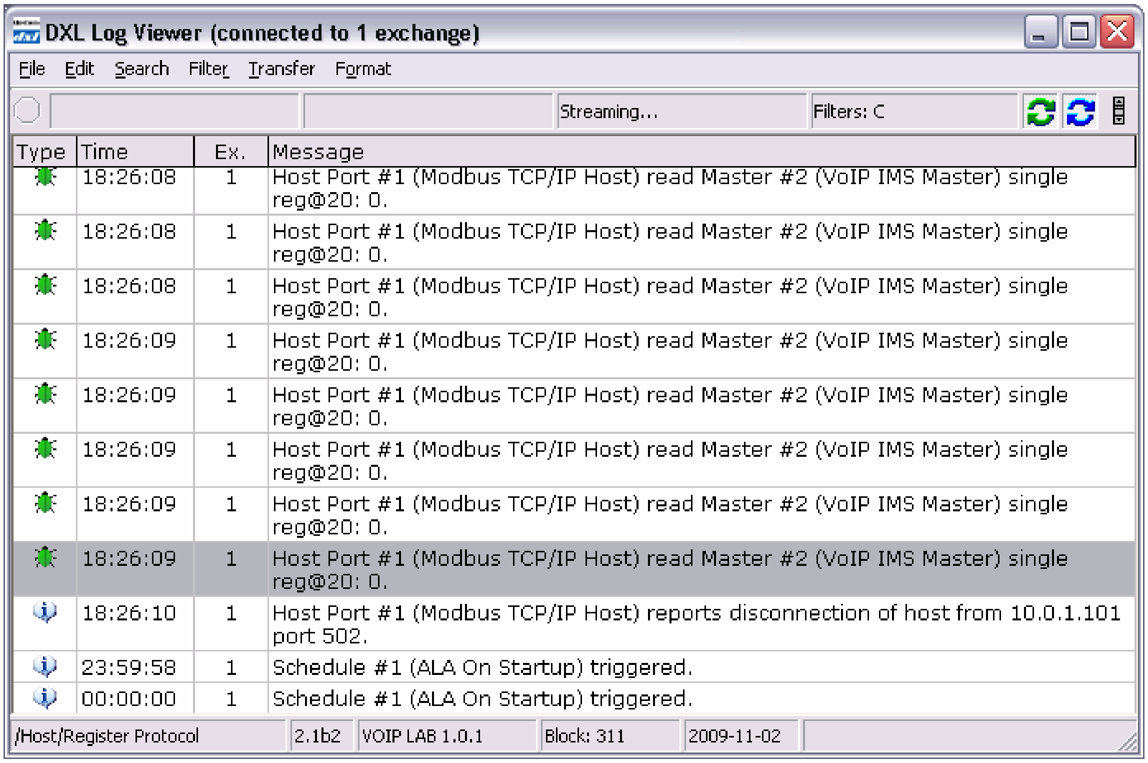
This information bar also shows other selected items that were checked under “Status Bar” in the Column Status Settings window.

In the below example, the selected grey Debug message is of class “Internal/Intercom Tasks”, the database version number of the DXL logging software on the DXL DCC was “2.1b2”, the configuration name was “VOIP LAB 1.0.1”, the “block number” of the log was 325, and the date that line of the log was taken was 2009-11-03.



```
08:45:01   1   DSP (DCE 1): Handling request REQ_DSP_Read_References.
08:45:01   1   DSP (DCE 1):Sent response NU_SUCCESS to request REQ_DSP_Read_References.
/Internal/Intercom Tasks   2.1b2   VOIP LAB 1.0.1   Block: 325   2009-11-03   End of logs
```

Once the filter settings above were applied, the following messages are shown.



```
Type  Time      Ex.  Message
      18:26:08  1    Host Port #1 (Modbus TCP/IP Host) read Master #2 (VoIP IMS Master) single
                     reg@20: 0.
      18:26:08  1    Host Port #1 (Modbus TCP/IP Host) read Master #2 (VoIP IMS Master) single
                     reg@20: 0.
      18:26:08  1    Host Port #1 (Modbus TCP/IP Host) read Master #2 (VoIP IMS Master) single
                     reg@20: 0.
      18:26:09  1    Host Port #1 (Modbus TCP/IP Host) read Master #2 (VoIP IMS Master) single
                     reg@20: 0.
      18:26:09  1    Host Port #1 (Modbus TCP/IP Host) read Master #2 (VoIP IMS Master) single
                     reg@20: 0.
      18:26:09  1    Host Port #1 (Modbus TCP/IP Host) read Master #2 (VoIP IMS Master) single
                     reg@20: 0.
      18:26:09  1    Host Port #1 (Modbus TCP/IP Host) read Master #2 (VoIP IMS Master) single
                     reg@20: 0.
      18:26:09  1    Host Port #1 (Modbus TCP/IP Host) read Master #2 (VoIP IMS Master) single
                     reg@20: 0.
      18:26:10  1    Host Port #1 (Modbus TCP/IP Host) reports disconnection of host from 10.0.1.101
                     port 502.
      23:59:58  1    Schedule #1 (ALA On Startup) triggered.
      00:00:00  1    Schedule #1 (ALA On Startup) triggered.
/Host/Register Protocol   2.1b2   VOIP LAB 1.0.1   Block: 311   2009-11-02
```

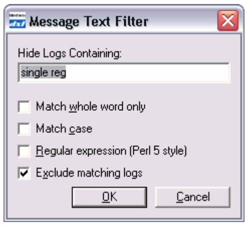
2.3.2 Setting up Message Text Filters

The screen above still shows that there are a lot of messages in the logs which can prevent clearly seeing the system activity. In these cases the logs are generated by the Modbus TCP/IP register protocol used by a touchscreen interface. This interface polls the DXL system multiple times per second to determine new system activity. This will generate a large number of logs which will always be present. In this case, if all messages of “Host/Register Protocol” class were removed with the “Class and Type” filter, some useful messages will also be removed.

Hence we can use a new type of filter, “Message Text Filter” to remove only messages with a certain text message in them. The messages we want to remove all have “single reg” in them so we can remove this register by excluding all messages which contain “single reg”.

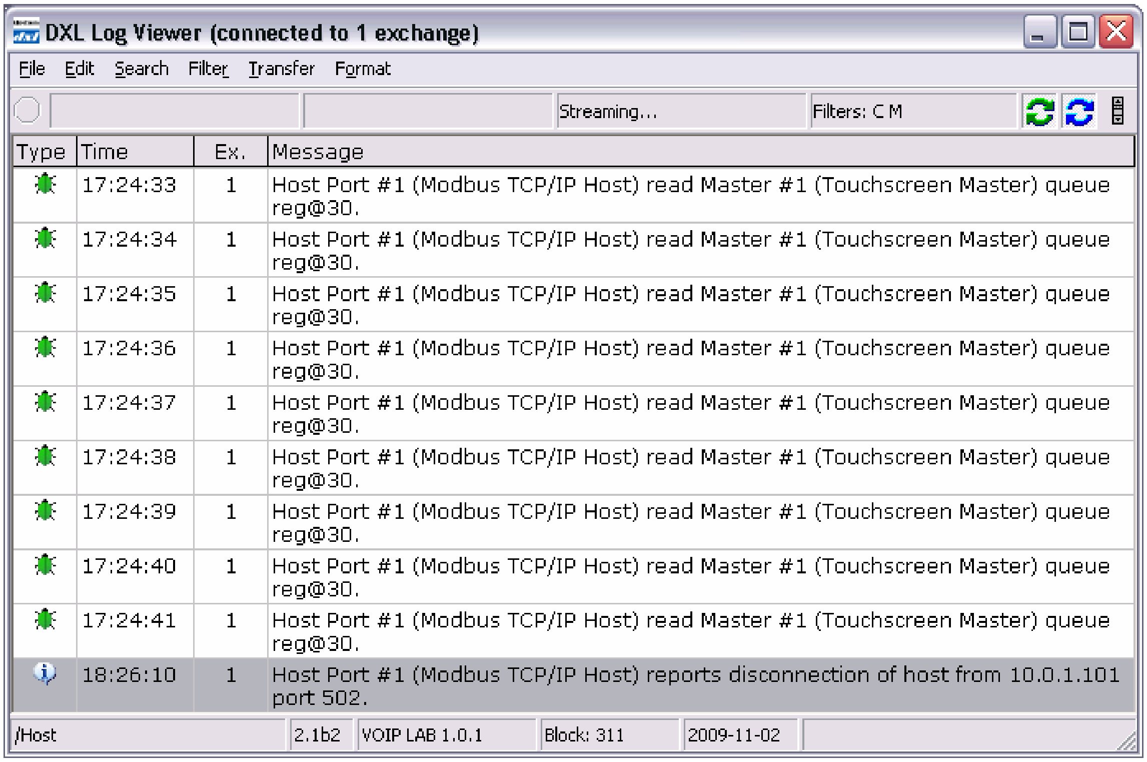
Select the “Filter” menu option then “Message Text Filter” then “Modify…”

In this case, we want to exclude logs. Check mark the “Exclude matching logs” button, then enter the text “single reg” in the “Hide Logs Containing” text box at the top and click “OK”.



Hide Logs Containing: single reg

☐ Match whole word only
☐ Match case
☐ Regular expression (Perl 5 style)
☑ Exclude matching logs

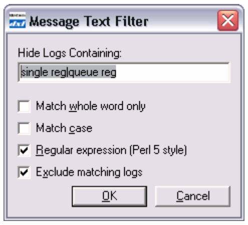

DXL Log Viewer (connected to 1 exchange)
File Edit Search Filter Transfer Format
Streaming...
Filters: C M

```
Type  Time      Ex.  Message
      17:24:33  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) queue
                     reg@30.
      17:24:34  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) queue
                     reg@30.
      17:24:35  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) queue
                     reg@30.
      17:24:36  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) queue
                     reg@30.
      17:24:37  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) queue
                     reg@30.
      17:24:38  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) queue
                     reg@30.
      17:24:39  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) queue
                     reg@30.
      17:24:40  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) queue
                     reg@30.
      17:24:41  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) queue
                     reg@30.
      18:26:10  1    Host Port #1 (Modbus TCP/IP Host) reports disconnection of host from 10.0.1.101
                     port 502.
/Host  2.1b2  VOIP LAB 1.0.1  Block: 311  2009-11-02
```

The resulting logs have more extraneous information, this time containing the text “queue reg”. You can further refine the message text filter.

Select the “Filter” menu option then “Message Text Filter” then “Modify…”

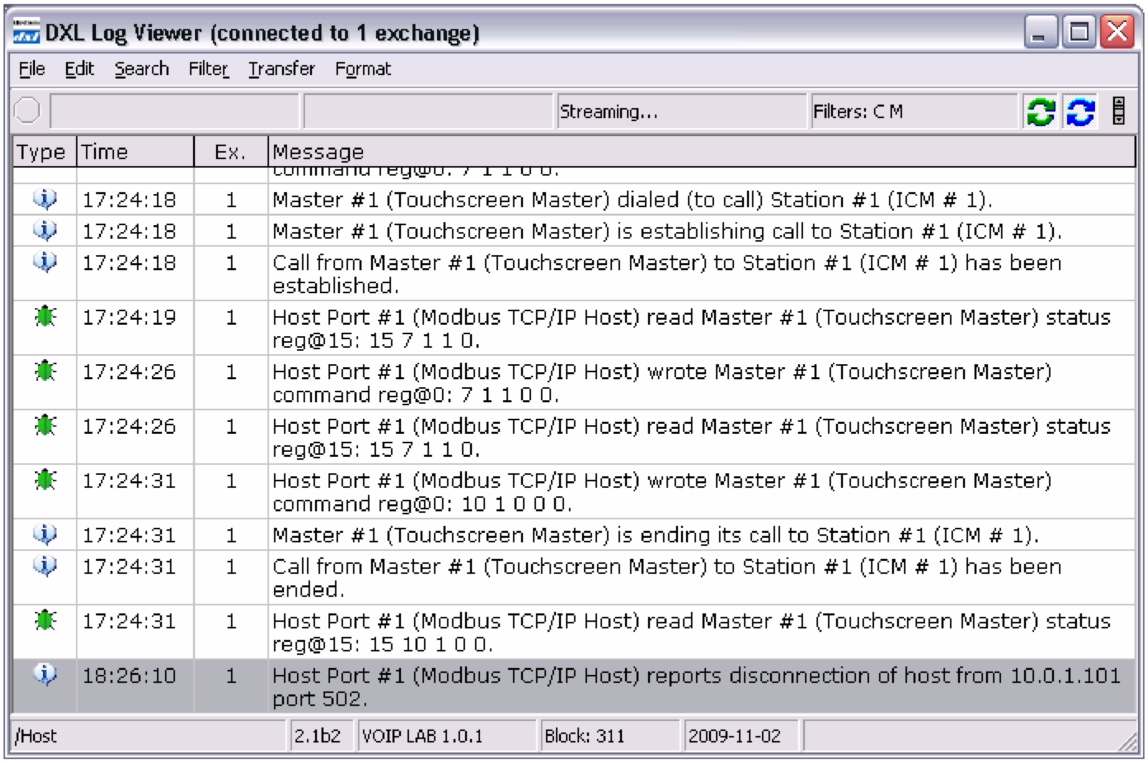
Keep the “Exclude matching logs” button, checked, but since we are going to use a more complex filter as we are going to use multiple strings to exclude, click the “Regular expression (Perl 5 style)” check box as well. The “regular expression” (search string) to include multiple strings is to use a vertical bar character (“|”) between strings. To exclude anything containing “single reg” or “queue reg”, enter the text “single reg|queue reg” in the “Hide Logs Containing” text entry box at the top of the window, then click “OK”.



Hide Logs Containing: single reg|queue reg

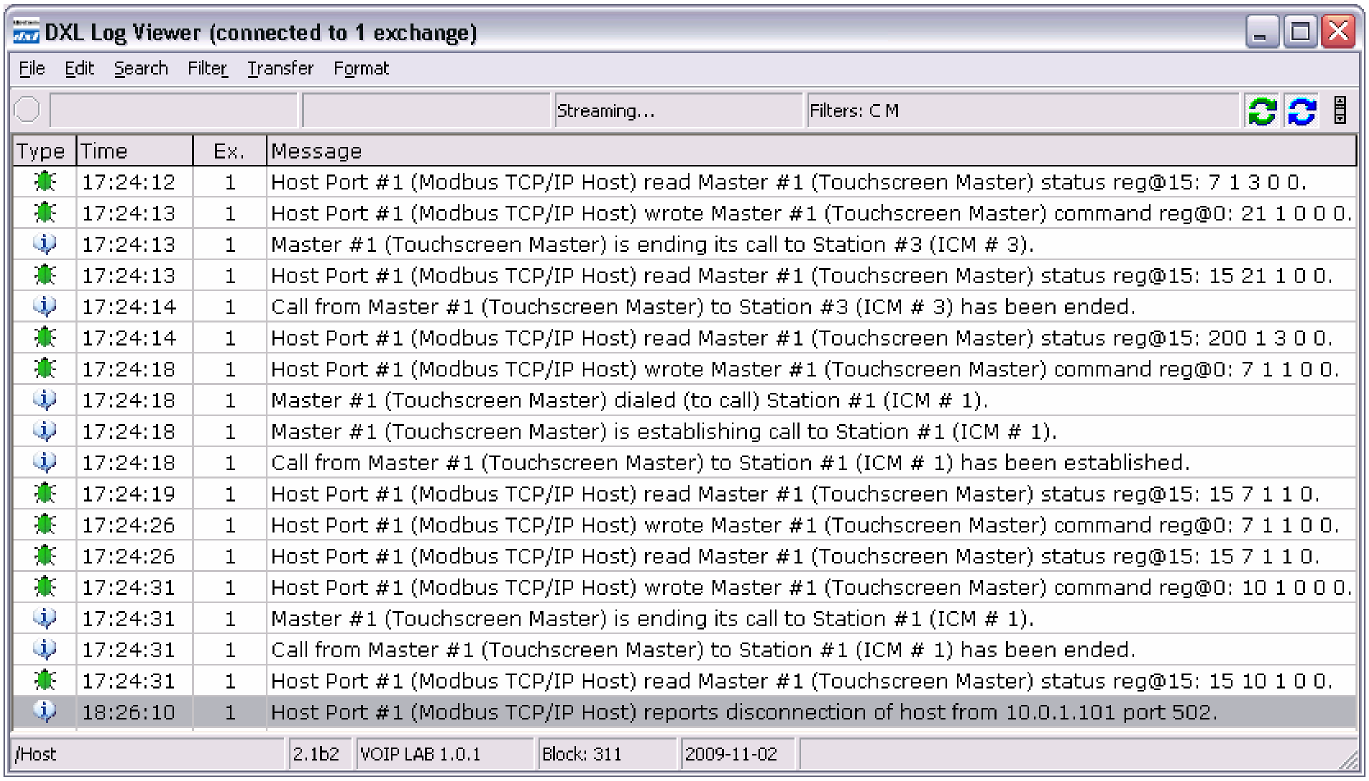
☐ Match whole word only
☐ Match case
☑ Regular expression (Perl 5 style)
☑ Exclude matching logs

The resulting log window is shown as follows. This window now shows only normal system activity which is useful for troubleshooting.


DXL Log Viewer (connected to 1 exchange)
File Edit Search Filter Transfer Format
Streaming...
Filters: C M
Type Time Ex. Message
/Host 2.1b2 VOIP LAB 1.0.1 Block: 311 2009-11-02

```
Type  Time      Ex.  Message
                     command reg@0: 7 1 1 0 0.
ℹ     17:24:18  1    Master #1 (Touchscreen Master) dialed (to call) Station #1 (ICM # 1).
ℹ     17:24:18  1    Master #1 (Touchscreen Master) is establishing call to Station #1 (ICM # 1).
ℹ     17:24:18  1    Call from Master #1 (Touchscreen Master) to Station #1 (ICM # 1) has been
                     established.
✱     17:24:19  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status
                     reg@15: 15 7 1 1 0.
✱     17:24:26  1    Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master)
                     command reg@0: 7 1 1 0 0.
✱     17:24:26  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status
                     reg@15: 15 7 1 1 0.
✱     17:24:31  1    Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master)
                     command reg@0: 10 1 0 0 0.
ℹ     17:24:31  1    Master #1 (Touchscreen Master) is ending its call to Station #1 (ICM # 1).
ℹ     17:24:31  1    Call from Master #1 (Touchscreen Master) to Station #1 (ICM # 1) has been
                     ended.
✱     17:24:31  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status
                     reg@15: 15 10 1 0 0.
ℹ     18:26:10  1    Host Port #1 (Modbus TCP/IP Host) reports disconnection of host from 10.0.1.101
                     port 502.
```

Some of the log entries are too long for one line to display at this window size. To see more logs and to make consistent viewing, you can stretch the window by clicking and dragging the resize portion of the window at the bottom right.

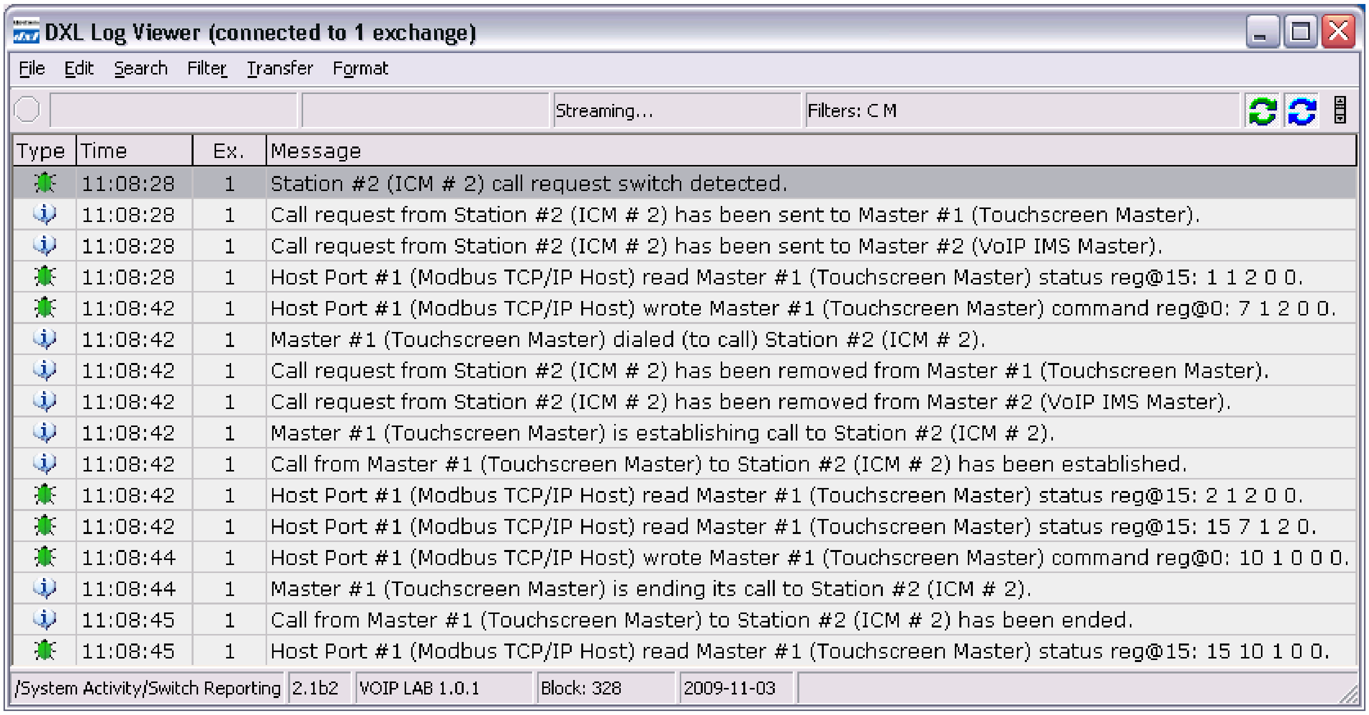

DXL Log Viewer (connected to 1 exchange)
File Edit Search Filter Transfer Format
Streaming...
Filters: C M
Type Time Ex. Message
/Host 2.1b2 VOIP LAB 1.0.1 Block: 311 2009-11-02

```
Type  Time      Ex.  Message
✱     17:24:12  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 7 1 3 0 0.
✱     17:24:13  1    Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 21 1 0 0 0.
ℹ     17:24:13  1    Master #1 (Touchscreen Master) is ending its call to Station #3 (ICM # 3).
✱     17:24:13  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 15 21 1 0 0.
ℹ     17:24:14  1    Call from Master #1 (Touchscreen Master) to Station #3 (ICM # 3) has been ended.
✱     17:24:14  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 200 1 3 0 0.
✱     17:24:18  1    Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 7 1 1 0 0.
ℹ     17:24:18  1    Master #1 (Touchscreen Master) dialed (to call) Station #1 (ICM # 1).
ℹ     17:24:18  1    Master #1 (Touchscreen Master) is establishing call to Station #1 (ICM # 1).
ℹ     17:24:18  1    Call from Master #1 (Touchscreen Master) to Station #1 (ICM # 1) has been established.
✱     17:24:19  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 15 7 1 1 0.
✱     17:24:26  1    Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 7 1 1 0 0.
✱     17:24:26  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 15 7 1 1 0.
✱     17:24:31  1    Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 10 1 0 0 0.
ℹ     17:24:31  1    Master #1 (Touchscreen Master) is ending its call to Station #1 (ICM # 1).
ℹ     17:24:31  1    Call from Master #1 (Touchscreen Master) to Station #1 (ICM # 1) has been ended.
✱     17:24:31  1    Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 15 10 1 0 0.
ℹ     18:26:10  1    Host Port #1 (Modbus TCP/IP Host) reports disconnection of host from 10.0.1.101 port 502.
```

2.4 Using Logs to troubleshoot station call request buttons that do not work

2.4.1 Log of normal system activity

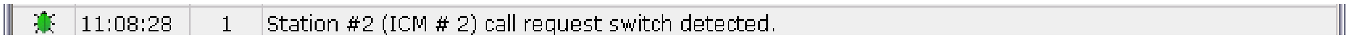
This section shows the normal course of activities for a typical call made using a touchscreen interface using the Modbus TCP/IP interface.



```
Type Time      Ex. Message
     11:08:28  1   Station #2 (ICM # 2) call request switch detected.
     11:08:28  1   Call request from Station #2 (ICM # 2) has been sent to Master #1 (Touchscreen Master).
     11:08:28  1   Call request from Station #2 (ICM # 2) has been sent to Master #2 (VoIP IMS Master).
     11:08:28  1   Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 1 1 2 0 0.
     11:08:42  1   Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 7 1 2 0 0.
     11:08:42  1   Master #1 (Touchscreen Master) dialed (to call) Station #2 (ICM # 2).
     11:08:42  1   Call request from Station #2 (ICM # 2) has been removed from Master #1 (Touchscreen Master).
     11:08:42  1   Call request from Station #2 (ICM # 2) has been removed from Master #2 (VoIP IMS Master).
     11:08:42  1   Master #1 (Touchscreen Master) is establishing call to Station #2 (ICM # 2).
     11:08:42  1   Call from Master #1 (Touchscreen Master) to Station #2 (ICM # 2) has been established.
     11:08:42  1   Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 2 1 2 0 0.
     11:08:42  1   Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 15 7 1 2 0.
     11:08:44  1   Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 10 1 0 0 0.
     11:08:44  1   Master #1 (Touchscreen Master) is ending its call to Station #2 (ICM # 2).
     11:08:45  1   Call from Master #1 (Touchscreen Master) to Station #2 (ICM # 2) has been ended.
     11:08:45  1   Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 15 10 1 0 0.
```

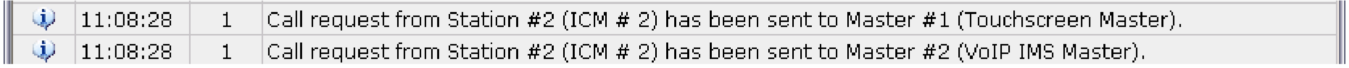
A break down of the logs for a typical call such as the above call will consist of the following entries:

1. A “call request” button is pressed at an intercom station



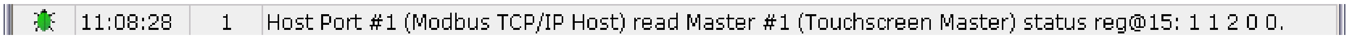
```
11:08:28  1  Station #2 (ICM # 2) call request switch detected.
```

2. The intercom system queues up a call request on the master or masters that it is designated to call into.



```
11:08:28  1  Call request from Station #2 (ICM # 2) has been sent to Master #1 (Touchscreen Master).
11:08:28  1  Call request from Station #2 (ICM # 2) has been sent to Master #2 (VoIP IMS Master).
```

3. The intercom system sends a call request command to the host (PLC or touchscreen) for the master or masters which have a host defined.

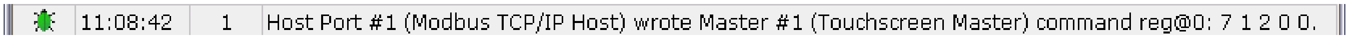


```
11:08:28  1  Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 1 1 2 0 0.
```

4. The graphic panel or touchscreen will indicate that the intercom is calling in.

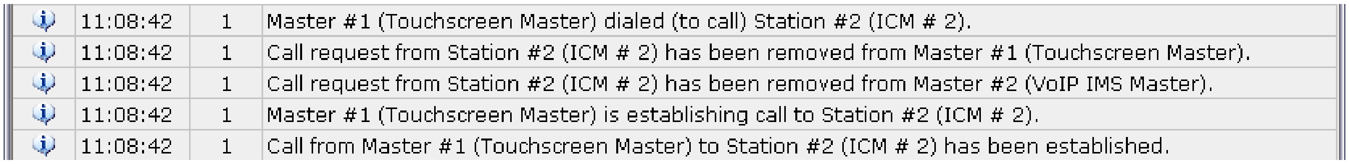
5. The staff member at a control room master will answer the call by pressing the button or touchscreen icon of the intercom station

6. The host (PLC or touchscreen) will send a command to the intercom system to connect the control room master to the intercom station.



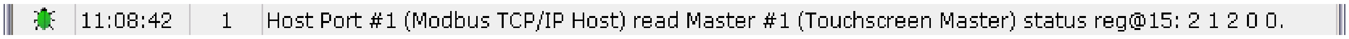
```
11:08:42   1   Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 7 1 2 0 0.
```

7. The intercom system will connect the audio path from the master to the intercom station.
   Note that if the station was calling in to this master, the call will be removed from the call queue at this time as well.



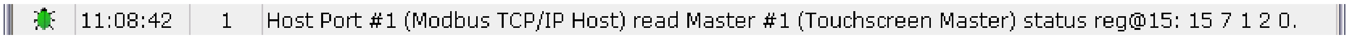
```
11:08:42   1   Master #1 (Touchscreen Master) dialed (to call) Station #2 (ICM # 2).
11:08:42   1   Call request from Station #2 (ICM # 2) has been removed from Master #1 (Touchscreen Master).
11:08:42   1   Call request from Station #2 (ICM # 2) has been removed from Master #2 (VoIP IMS Master).
11:08:42   1   Master #1 (Touchscreen Master) is establishing call to Station #2 (ICM # 2).
11:08:42   1   Call from Master #1 (Touchscreen Master) to Station #2 (ICM # 2) has been established.
```

8. If the intercom station was calling in to this master, the intercom system sends a call request cancel command to the host (PLC or touchscreen) for the master or masters which have a host defined, indicating the call is answered and no longer requires attention.



```
11:08:42   1   Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 2 1 2 0 0.
```

9. The intercom system sends a confirmation message to the host (PLC or touchscreen) indicating the audio path is established.

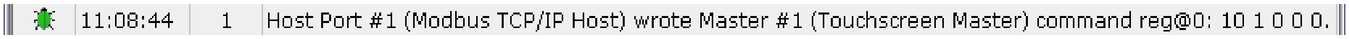


```
11:08:42   1   Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 15 7 1 2 0.
```

10. The staff member will be in an audio conversation with the person at the intercom station.

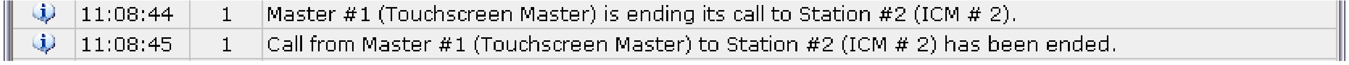
11. The staff member at the control room master will end the call by pressing the button or touchscreen icon of the intercom station or an “end call” button.

12. The host (PLC or touchscreen) will send a command to the intercom system to disconnect the control room master from the intercom station.



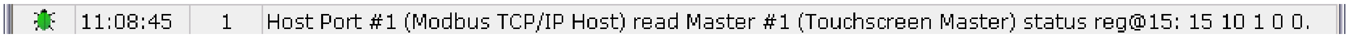
```
11:08:44   1   Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 10 1 0 0 0.
```

13. The intercom system will disconnect the audio path from the master to the intercom station



```
11:08:44   1   Master #1 (Touchscreen Master) is ending its call to Station #2 (ICM # 2).
11:08:45   1   Call from Master #1 (Touchscreen Master) to Station #2 (ICM # 2) has been ended.
```

14. The intercom system will send a confirmation message to the host (PLC or touchscreen) indicating the audio path is disconnected.



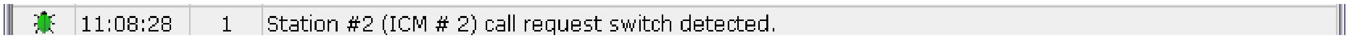
```
11:08:45   1   Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 15 10 1 0 0.
```

2.4.2 Determining where to look in case a call request is not detected

To identify where to look for a problem, you can look at the system logs while pressing the call request button on the station. You can compare the resulting logs to the “normal operation” logs above to determine at what point is the call request not making it through.

2.4.2.1 Check for a “call request switch detected” message

First, examine the logs for the “call request switch detected” log when the call request button is pressed. If this message is **not** present, then the system is not recognizing a button press. This message, if present, would look similar to the following:



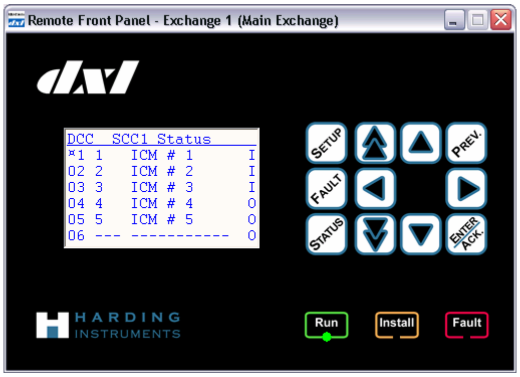
```
11:08:28   1   Station #2 (ICM # 2) call request switch detected.
```

Be sure that the log filter does not filter out debug messages for “System Activity/Switch Reporting”, otherwise these messages won’t be shown even if the call request switch is pressed.

If these logs are not filtered out, and you do not see any “call request switch detected” messages, then the intercom system does not recognize the switch, or the switch is not configured. You can determine the status of this station with the DXL Front Panel then selecting the exchange to look at.

Go to the front panel of the DCC of the exchange that this station should be connected to, or use the Remote Front Panel by selecting “Diagnostics” from the main menu, then “View” and “Remote Front Panel…”

Once at the front panel, press the “Status” button, then use the down arrow to select the box the station is on (“DCC”, “DCE1”, “DCE2”, etc.) and press ENTER. Then use the down arrow to select the station card the station is on (“SCC1” or “SCC2”) and press ENTER. You will then see a listing of stations on this card. You can use the down arrow to scroll the display until you see the station port you are interested in.



```
DCC  SCC1 Status
¤1 1   ICM # 1      I
02 2   ICM # 2      I
03 3   ICM # 3      I
04 4   ICM # 4      O
05 5   ICM # 5      O
06 --- -----------  O
```

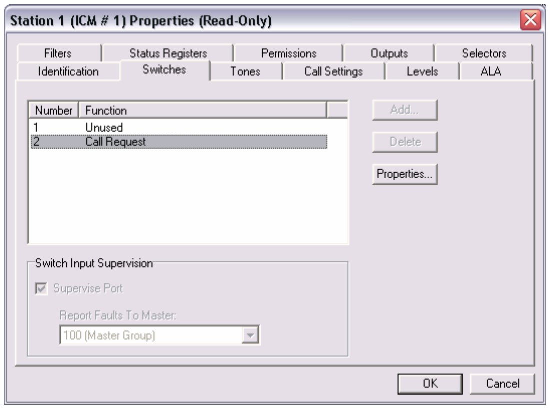
If the station port has “---“ in the number column (such as station port 06 shown here) then the station is not configured, and the call button will not work.

If the station has a number and name listed (such as station ports 01 through 05 shown here), the station is configured. The right column indicates the status of the station. A 400 series station should normally have the status “I” (Station is working and Idle) such as the states indicated by ports 01 through 03. A 300 series station should normally have the status “O” (the station switch wiring is Open, meaning the button is not pressed).

Any other state usually means that the station is not working properly or not wired up. Station port 04 here shows “O”, indicating the system detects an open circuit on this wiring pair.

If the station indicates normal (“I” for a 400 series station or “O” for a 300 series station), if you hold down the button on the station and keep it held down, you should see the status change. A 400 series station’s bottom button (button 2) should indicate “B” (switch B / switch 2) when pressed. A 300 series station’s button should indicate “S” (shorted) when pressed. If the status does not change when pressing and holding the button, the button is not working or the station is not working.

You can use the troubleshooting guide for further information.



Number	Function
1	Unused
2	Call Request

Switch Input Supervision

☑ Supervise Port

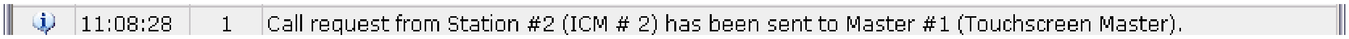
Report Faults To Master: 100 (Master Group)

If the station reads “B” but the “call request switch detected” log does not occur, verify that the DXL configuration has a switch associated with the station, and that the switch for that call request is switch 2 (if using the bottom right button on a 400 series station) or switch 1 (if using a 300 series intercom station).

The configuration to the right indicates a properly configured button on a 400 series station. If the button is configured for switch number “1”, then the intercom system is only looking for a button press on the top (“A”) button, which is not on a standard one button intercom. In this case the configuration must be changed to have the Call Request function on switch number 2, not switch number 1.

2.4.2.2 *Check for a “call request from station x has been sent to Master #y” message*

If the “call request switch detected” message is shown in the logs, next, examine the logs for the “call request from station x has been sent to Master #y” message following this. This message, if present, would look similar to the following:



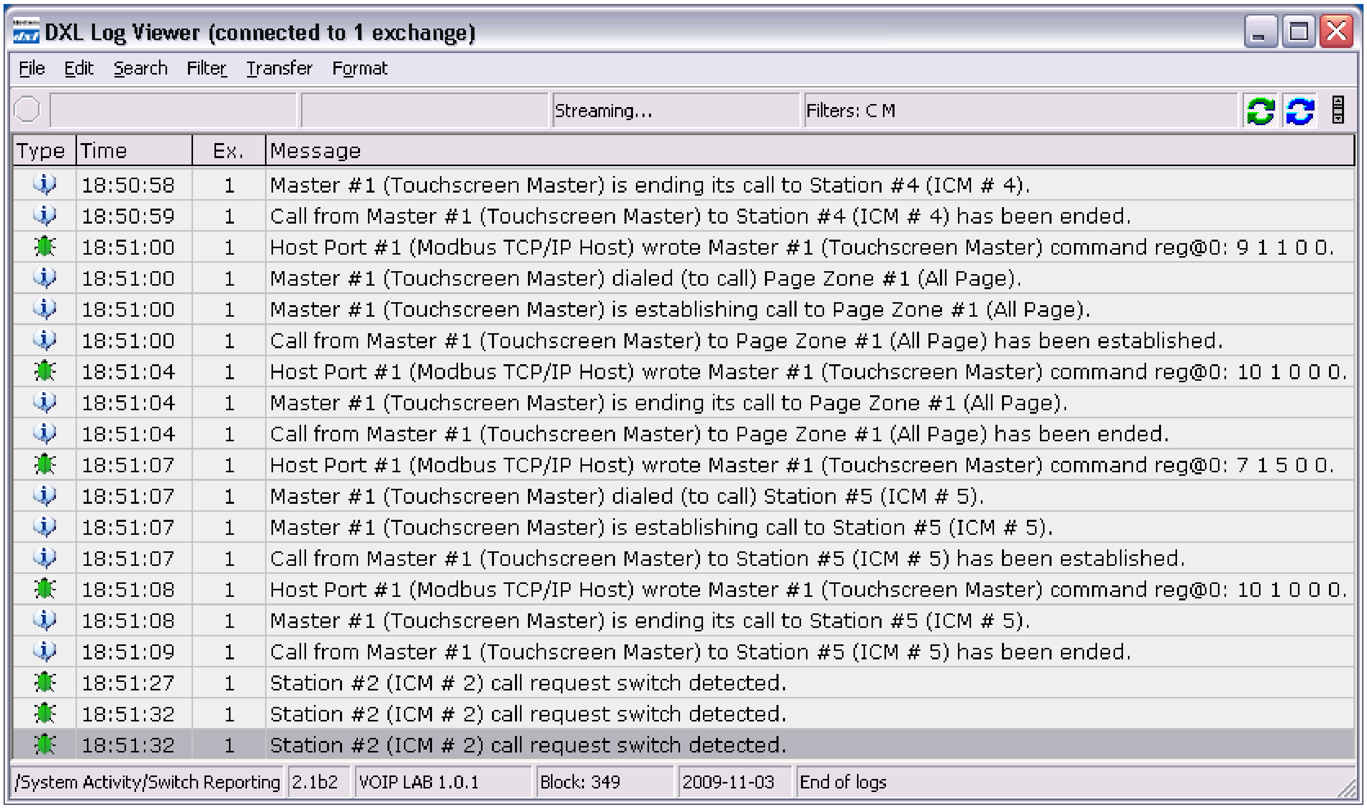
```
11:08:28   1   Call request from Station #2 (ICM # 2) has been sent to Master #1 (Touchscreen Master).
```

If this message is present, check that this message is going to the master you expect the call request to go to. If the message indicates that the call request is going to a master, but not the master it should go to, then you should check the configuration and correct the master it should be sent to, or if the facility has a flexible control system (sometimes called “task grouping” or “takeover mode”), verify that the touchscreen programming or take over functions are working properly.

If this message is **not** present, then the system is not sending the call request to any masters.

The usual cause for this behaviour is that the intercom system already has this call request queued on a master. If it is already on a master queue, it will not show a message indicating it is queued to a master, nor will it re-send this message to a host.

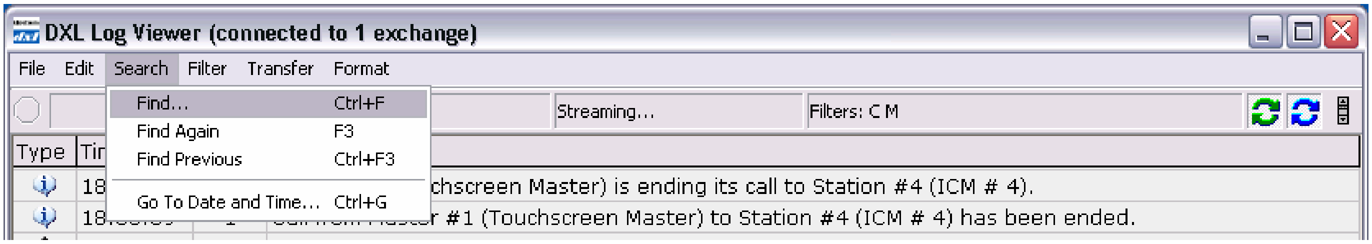
The below window shows an occurrence where pressing the call request button for station 2 does not generate a call request at the touchscreen.



```
Type Time      Ex.  Message
     18:50:58  1    Master #1 (Touchscreen Master) is ending its call to Station #4 (ICM # 4).
     18:50:59  1    Call from Master #1 (Touchscreen Master) to Station #4 (ICM # 4) has been ended.
     18:51:00  1    Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 9 1 1 0 0.
     18:51:00  1    Master #1 (Touchscreen Master) dialed (to call) Page Zone #1 (All Page).
     18:51:00  1    Master #1 (Touchscreen Master) is establishing call to Page Zone #1 (All Page).
     18:51:00  1    Call from Master #1 (Touchscreen Master) to Page Zone #1 (All Page) has been established.
     18:51:04  1    Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 10 1 0 0 0.
     18:51:04  1    Master #1 (Touchscreen Master) is ending its call to Page Zone #1 (All Page).
     18:51:04  1    Call from Master #1 (Touchscreen Master) to Page Zone #1 (All Page) has been ended.
     18:51:07  1    Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 7 1 5 0 0.
     18:51:07  1    Master #1 (Touchscreen Master) dialed (to call) Station #5 (ICM # 5).
     18:51:07  1    Master #1 (Touchscreen Master) is establishing call to Station #5 (ICM # 5).
     18:51:07  1    Call from Master #1 (Touchscreen Master) to Station #5 (ICM # 5) has been established.
     18:51:08  1    Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 10 1 0 0 0.
     18:51:08  1    Master #1 (Touchscreen Master) is ending its call to Station #5 (ICM # 5).
     18:51:09  1    Call from Master #1 (Touchscreen Master) to Station #5 (ICM # 5) has been ended.
     18:51:27  1    Station #2 (ICM # 2) call request switch detected.
     18:51:32  1    Station #2 (ICM # 2) call request switch detected.
     18:51:32  1    Station #2 (ICM # 2) call request switch detected.
/System Activity/Switch Reporting | 2.1b2 | VOIP LAB 1.0.1 | Block: 349 | 2009-11-03 | End of logs
```

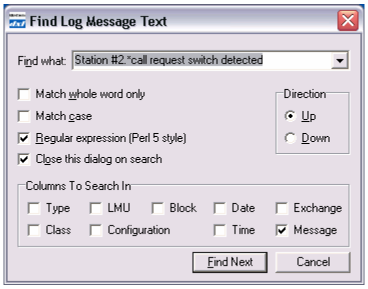
To determine what happened when the message was first put on the queue, you want to look backwards in the logs for that station to determine what happened at that time. You can search the logs looking for this occurrence.

In this case, you want to look backwards until something happened when Station #2 (ICM #2) call request switch was detected. Use the “Search” menu item, then “Find…” (or press Control+F).



```
18      chscreen Master) is ending its call to Station #4 (ICM # 4).
18.     r #1 (Touchscreen Master) to Station #4 (ICM # 4) has been ended.
```

This will bring up a “Find Log Message Text” window to search.



Find what: Station #2.*call request switch detected

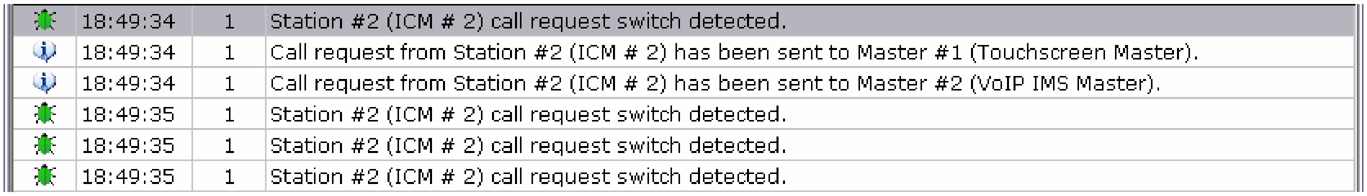
☐ Match whole word only
☐ Match case
☑ Regular expression (Perl 5 style)
☑ Close this dialog on search

Direction: ● Up ○ Down

Columns To Search In: ☐ Type ☐ LMU ☐ Block ☐ Date ☐ Exchange ☐ Class ☐ Configuration ☐ Time ☑ Message

Select the “Up” direction to search up towards older logs. Enter a text string to search. In this case we want to find call request switch detected messages for station number 2. You could enter the full text string (“Station #2 (ICM #2) call request switch detected”), or you can use a “regular expression” with a wildcard in it so you do not have to type in the full station name, and just the number. To match any characters, use the “.*” (dot star) characters. In this case, type “Station #2.*call request switch detected”, then click “Find Next”

This will take you to the previous occurrence of when the station 2 call request button was pressed. You can use the menu item “Search” then “Find Again”, or press F3 to find the next occurrence. Repeat until you see something happen after the Station 2 call request switch detected message.



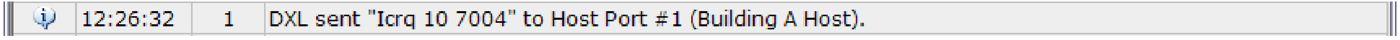
```
18:49:34   1   Station #2 (ICM # 2) call request switch detected.
18:49:34   1   Call request from Station #2 (ICM # 2) has been sent to Master #1 (Touchscreen Master).
18:49:34   1   Call request from Station #2 (ICM # 2) has been sent to Master #2 (VoIP IMS Master).
18:49:35   1   Station #2 (ICM # 2) call request switch detected.
18:49:35   1   Station #2 (ICM # 2) call request switch detected.
18:49:35   1   Station #2 (ICM # 2) call request switch detected.
```

This tells you what happened when the call request switch was first pressed.

In this case, when the switch was first pressed, the call request was queued, but no host messages were sent. See the below section for what could cause this.

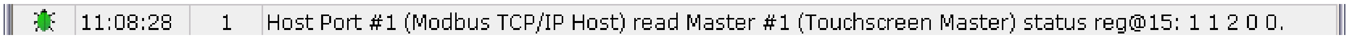
2.4.2.3 If the master is controlled by a PLC, check for a host call request message

If the “call request from station x has been sent to Master #y” message is in the logs, examine the logs for a host message indicating the call request was sent to the host.switch detected” message is shown in the logs, next, examine the logs for the “call request. This log will vary depending on the host. If the system is using a text host the message will indicate
‘DXL sent “Icrq <master> <station>” to Host Port #h (host h name)’.



```
12:26:32   1   DXL sent "Icrq 10 7004" to Host Port #1 (Building A Host).
```

or if the system is using a Modbus or Omron register based host, the message will indicate the host port number, master number, register number and a 5 register block starting with an address, with the first register in the block being 1 (Icrq) and the contents of the 5 block registers being ‘1 <master> <station> 0 0’, such as the below command.
‘Host Port #h (host h name) read Master #m (master name) status reg@r: 1 m s 0 0’ (polled host)



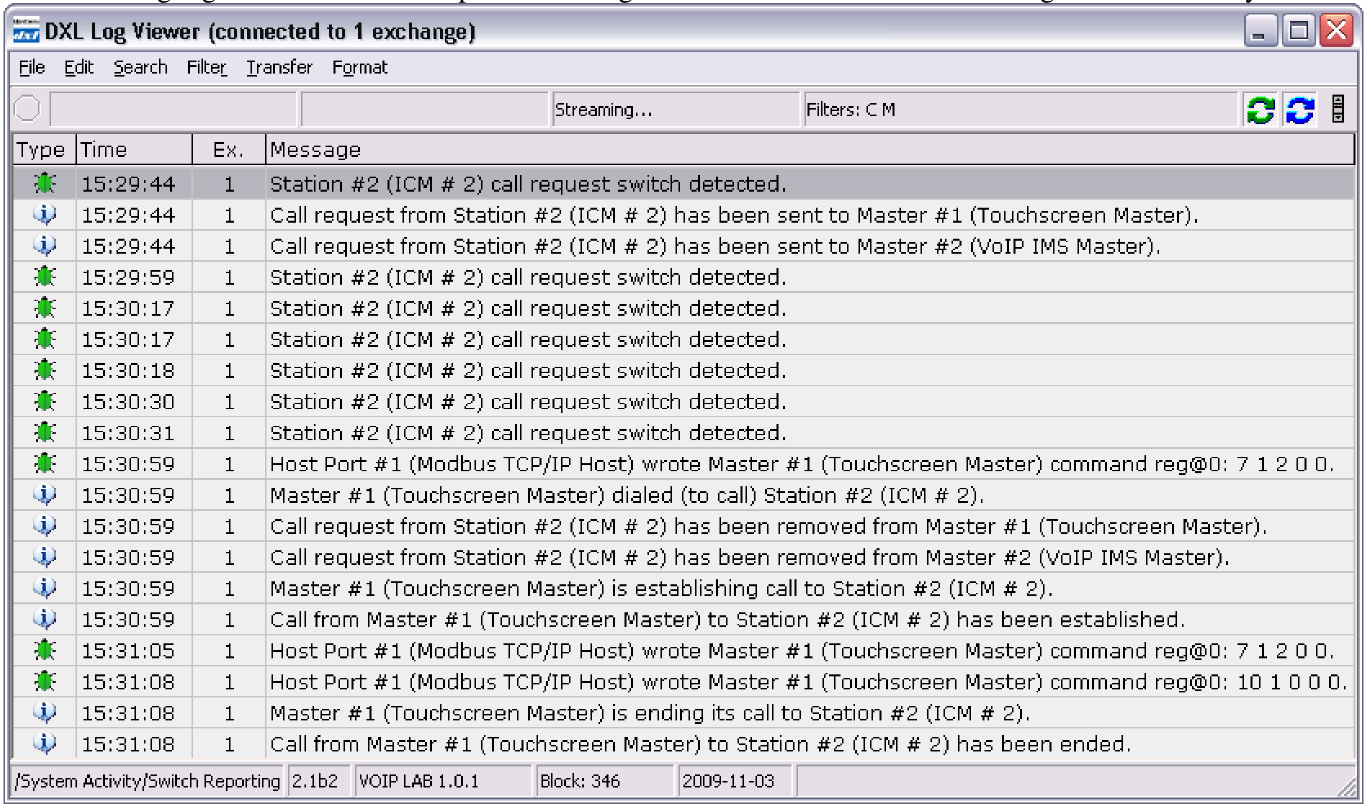
```
11:08:28   1   Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 1 1 2 0 0.
```

or
‘Host Port #h (host h name) wrote status reg@r: 1 m s 0 0’ (peer to peer host)

If there is no host call request message, then either the host is not configured properly (I.E. the master is not associated with a host, or the host is not configured), or the host (touchscreen/PLC) is not communicating with the DXL system.

2.4.2.3.1 Example logs when host is not communicating to the DXL system

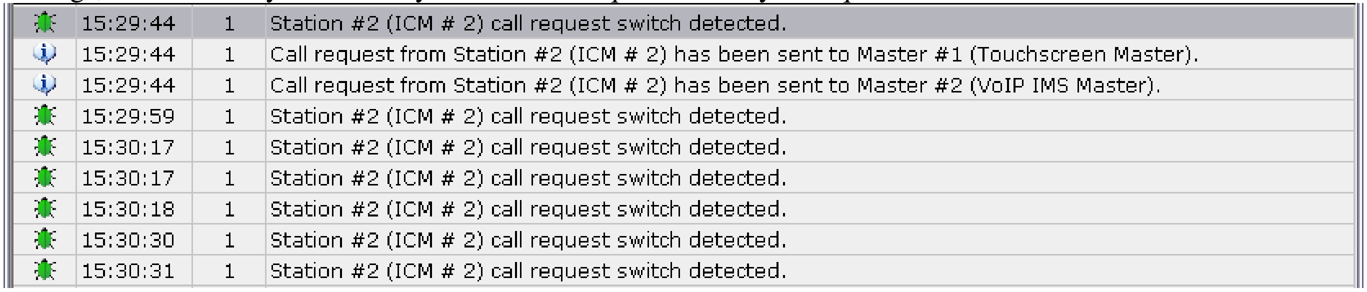
The following log screen shows a complete set of logs when a host is not communicating with the DXL system.



```
Type Time      Ex. Message
     15:29:44  1   Station #2 (ICM # 2) call request switch detected.
     15:29:44  1   Call request from Station #2 (ICM # 2) has been sent to Master #1 (Touchscreen Master).
     15:29:44  1   Call request from Station #2 (ICM # 2) has been sent to Master #2 (VoIP IMS Master).
     15:29:59  1   Station #2 (ICM # 2) call request switch detected.
     15:30:17  1   Station #2 (ICM # 2) call request switch detected.
     15:30:17  1   Station #2 (ICM # 2) call request switch detected.
     15:30:18  1   Station #2 (ICM # 2) call request switch detected.
     15:30:30  1   Station #2 (ICM # 2) call request switch detected.
     15:30:31  1   Station #2 (ICM # 2) call request switch detected.
     15:30:59  1   Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 7 1 2 0 0.
     15:30:59  1   Master #1 (Touchscreen Master) dialed (to call) Station #2 (ICM # 2).
     15:30:59  1   Call request from Station #2 (ICM # 2) has been removed from Master #1 (Touchscreen Master).
     15:30:59  1   Call request from Station #2 (ICM # 2) has been removed from Master #2 (VoIP IMS Master).
     15:30:59  1   Master #1 (Touchscreen Master) is establishing call to Station #2 (ICM # 2).
     15:30:59  1   Call from Master #1 (Touchscreen Master) to Station #2 (ICM # 2) has been established.
     15:31:05  1   Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 7 1 2 0 0.
     15:31:08  1   Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 10 1 0 0 0.
     15:31:08  1   Master #1 (Touchscreen Master) is ending its call to Station #2 (ICM # 2).
     15:31:08  1   Call from Master #1 (Touchscreen Master) to Station #2 (ICM # 2) has been ended.
/System Activity/Switch Reporting  2.1b2  VOIP LAB 1.0.1  Block: 346  2009-11-03
```

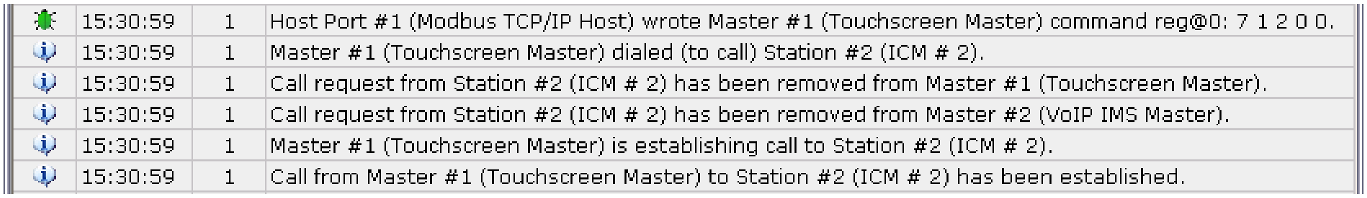
Note that the first time the call request switch is pressed, the “call request switch detected” message was shown and the call request was sent to masters 1 and 2, but no host messages were sent.

Subsequently when the call request switch was pressed, only the “call request switch detected” message shows in the logs, as the DXL system already had the call request in the system queue.



```
15:29:44  1   Station #2 (ICM # 2) call request switch detected.
15:29:44  1   Call request from Station #2 (ICM # 2) has been sent to Master #1 (Touchscreen Master).
15:29:44  1   Call request from Station #2 (ICM # 2) has been sent to Master #2 (VoIP IMS Master).
15:29:59  1   Station #2 (ICM # 2) call request switch detected.
15:30:17  1   Station #2 (ICM # 2) call request switch detected.
15:30:17  1   Station #2 (ICM # 2) call request switch detected.
15:30:18  1   Station #2 (ICM # 2) call request switch detected.
15:30:30  1   Station #2 (ICM # 2) call request switch detected.
15:30:31  1   Station #2 (ICM # 2) call request switch detected.
```

Also of note in these logs is that the touchscreen in this example was able to control the intercom system and make a call by writing a value into the master’s command register, and when the station was called, that the call request was removed from the master queues.

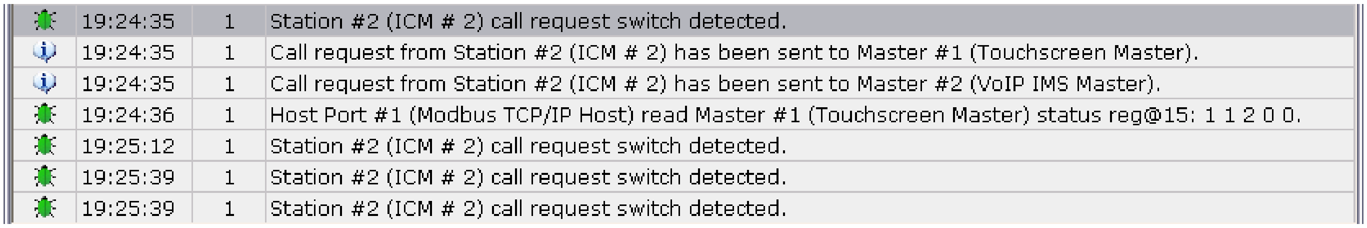


```
15:30:59  1  Host Port #1 (Modbus TCP/IP Host) wrote Master #1 (Touchscreen Master) command reg@0: 7 1 2 0 0.
15:30:59  1  Master #1 (Touchscreen Master) dialed (to call) Station #2 (ICM # 2).
15:30:59  1  Call request from Station #2 (ICM # 2) has been removed from Master #1 (Touchscreen Master).
15:30:59  1  Call request from Station #2 (ICM # 2) has been removed from Master #2 (VoIP IMS Master).
15:30:59  1  Master #1 (Touchscreen Master) is establishing call to Station #2 (ICM # 2).
15:30:59  1  Call from Master #1 (Touchscreen Master) to Station #2 (ICM # 2) has been established.
```

In this case, the touchscreen software was a polled Modbus system, but the touchscreen software was not set to poll the master status registers.

2.4.2.3.2 Example logs when host is communicating to the DXL system but the message is lost

Another possibility is that the PLC or touchscreen software did receive the message, but did not process it. This is indicated by the call request message being detected, the call request being queued on the master, and the message being read by the host, but not showing up on the touchscreen. The activity looks completely normal in this case, as the intercom system completely processes the message, but it is lost in communications or by the PLC or HMI software.



```
19:24:35  1  Station #2 (ICM # 2) call request switch detected.
19:24:35  1  Call request from Station #2 (ICM # 2) has been sent to Master #1 (Touchscreen Master).
19:24:35  1  Call request from Station #2 (ICM # 2) has been sent to Master #2 (VoIP IMS Master).
19:24:36  1  Host Port #1 (Modbus TCP/IP Host) read Master #1 (Touchscreen Master) status reg@15: 1 1 2 0 0.
19:25:12  1  Station #2 (ICM # 2) call request switch detected.
19:25:39  1  Station #2 (ICM # 2) call request switch detected.
19:25:39  1  Station #2 (ICM # 2) call request switch detected.
```

This could occur when:

1. A PLC or Data Acquisition Server (DA Server) is polling the registers, but the logic in the PLC or Touchscreen software is not processing the registers, or is not acting on the registers (perhaps due to the logic not executing under certain conditions)
2. A PLC or DA Server is polling the registers, but the logic in the PLC or Touchscreen software does not process the registers fast enough. For example, if a Wonderware DA Server is set to poll the master status registers twice per second, but the logic to process the status registers only executes once per second. In this case if two call requests happened at almost the same time, the first call request would be polled and the logic will start processing it, then the second call request would get polled, but not processed since the logic is still processing the first register. In this case the DA server could be set to poll slower, or the processing logic can be set to be executed more often.
3. A PLC or touchscreen interface is examining the wrong registers for the call request status information.

3 Common Logging Messages Useful for Troubleshooting

The following log messages and filters used to search for them may be useful for troubleshooting.

The first line indicates the search string you can use to find these errors, the second line shows a sample error message line.

Unless otherwise noted, the search string uses regular expressions.

3.1 Normal system activity

Station #<station>.*call request switch detected

Station #1285 (104B-H) call request switch detected.

Call request switch was pressed.

Call request from Station #<station>.*has been sent to Master #<master>

Call request from Station #1285 (104B-H) has been sent to Master #1 (Central).

Call request was queued to a master station

Master #<master>.*dialed.*Station #<station>

Master #1 (Central) dialed (to call) Station #1285 (104B-H).

Master station has initiated a connection command to call intercom station

Call request from station #<station>.*has been removed from Master #<master>

Call request from station #1285 (104B-H) has been removed from Master #1 (Central).

Call request has been removed from a master station queue

Master #<master>.*is establishing call to Station #<station>

Master #1 (Central) is establishing call to Station #1285 (104B-H).

Master is starting the connection to an intercom station

Call from Master #<master>.*to Station #<station>.*has been established.

Call from Master #1 (Central) to Station #1285 (104B-H) has been established.

Audio connection from master to station is connected

Master #<master>.*is ending its call to Station #<station>

Master #1 (Central) is ending its call to Station #1285 (104B-H).

Master is ending the connection to an intercom station

Call from Master #<master>.*to Station #<station>.*has been ended.

Call from Master #1 (Central) to Station #1285 (104B-H) has been ended.

Audio connection from master to station is disconnected

3.2 Normal host activity

```
Host Port #<host>.*read Master #<master>.*status reg.*1 <master> <station>
```

```
Host Port #1 (Modbus Host) read Master #1 (Central) status reg@105: 1 1 1285 0 0.
```

PLC host master received call request from station

```
Host Port #<host>.*wrote Master #<master>.*command reg.*7 <master> <station>
```

```
Host Port #1 (Modbus Host) wrote Master #1 (Central) command reg@100: 7 1 1285 0 0.
```

PLC host sent command to connect a master to a station

```
Host Port #<host>.*read Master #<master>.*status reg.*2 <master> <station>
```

```
Host Port #1 (Modbus Host) read Master #1 (Central) status reg@105: 2 1 1285 0 0.
```

PLC host master received call request cancel from station

```
Host Port #<host>.*read Master #<master>.*status reg.*15 7 <master> <station>
```

```
Host Port #1 (Modbus Host) read Master #1 (Central) status reg@105: 15 7 1 1285 0.
```

DXL completed master to station connection requested by host

```
Host Port #<host>.*read Master #<master>.*status reg.*7 <master> <station>
```

```
Host Port #1 (Modbus Host) read Master #1 (Central) status reg@105: 7 1 1285 0 0.
```

DXL completed master to station connection

3.3 Permission error

Rejected because *. is not on .* permission list

“Ical <master> <station>” rejected because <station> is not on <master>’s permission list.

The indicated master is not permitted to call the indicated intercom. To correct this you need to change the configuration in the DXL Administrator. Select “Configure:Masters”, double click the master number, go to the “Permissions” tab, select Function “Call Station”, and add the stations that this master should be allowed to call.

Alternatively, you can use select “Configure:System”, go to the “Master Operations” tab, and check-mark the “Disable Host command permission checks” check box to make all host-controlled masters able to call any intercom.

Similar messages will be shown for master to master call permissions, master to page zone permissions, etc., with the corrective action being to change the appropriate permission settings for that master.