



SpectraView™
Network Monitoring System

Single-Slot Video/Audio/Data/Contact Mapping

ST/SR-1Wxxx/xxx series
and
SXA/SXB-xxx/xxx series

Internal Channel Testing Procedures

*SpectraView*TM Network Monitoring System

Description:

Meridian's SpectraView Network Monitoring System is built into Meridian's DigiSlim, 1-slot, digitally-encoded fiber optic transmission product system. SpectraView provides real-time monitoring of the video signal and fiber continuity. In addition, remote and local loop-back testing as well as individual Transmit & Receive automatic channel testing is available to verify functionality of any audio, data and contact mapping channels on the respective DigiSlim modules.

The capabilities of each of these individual monitoring & test functions are as follows:

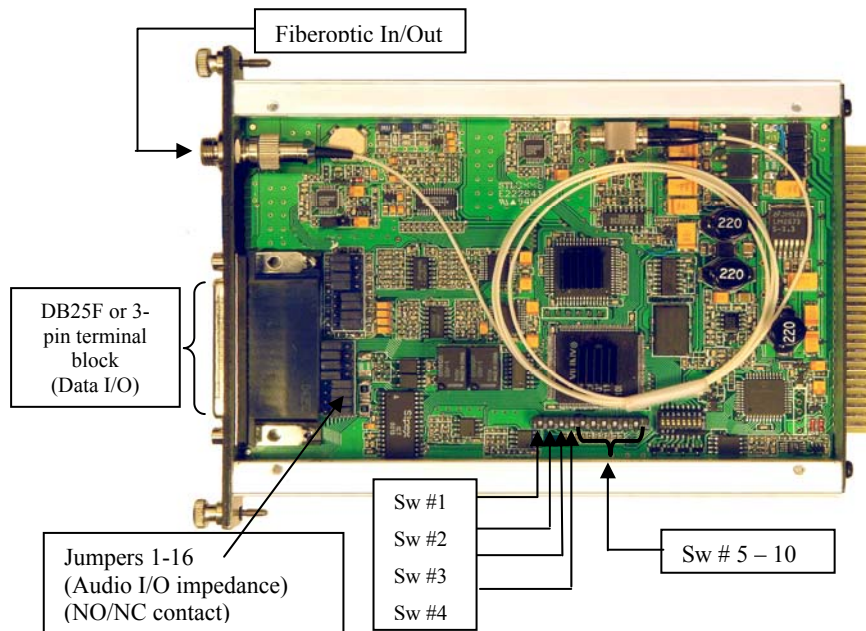
CCTV Video Status (real-time monitoring):

Under normal operation, the live video from the CCTV camera will be displayed on the respective monitor at the receive side. There are two SpectraView 'alarm' modes - one for loss of video sync and one for loss of optical signal. When one or the other of these alarm modes is present, the monitor will display the following:

- Loss of video sync - 4 vertical gray-scale bars across the monitor screen
- Loss of optical signal - 8 vertical gray-scale bars across the monitor screen

Module Test Mode Functions

Each DigiSlim module has a bank of 10 DIP switches located on the bottom of the circuit board. See the figure below for location information.



The table below lists the function of each of these switches (numbered from left to right) and identifies how to set the various diagnostic test modes.

Test Switch	Local Loop Back	Remote Loop Back	Transmit Test	Receive Test	Video Test	Video Bars Enabled
SW1 – SW3 – Data format selection switches						
SW4 - Reserved						
SW5	ON	OFF	OFF	OFF	OFF	OFF
SW6	OFF	ON	OFF	OFF	OFF	OFF
SW7	OFF	OFF	ON	OFF	OFF	OFF
SW8	OFF	OFF	OFF	ON	OFF	OFF
SW9	OFF	OFF	OFF	OFF	ON	OFF
SW10	OFF	OFF	OFF	OFF	OFF	ON

Note: To turn a switch “ON”, move the switch in the down position. Likewise, to turn a switch “OFF”, move it in the up position.

In order to enter the test modes on the module, it is necessary to actuate one of the above switches as described below:

Local Loopback test (SW5) (applicable to full-duplex transceiver modules (SXA-xxx & SXB-xxx only). These tests will test all of the bi-directional audio, data and contact closures installed on the module associated with the loopback test. Obviously, the channels that can be tested are determined by the type of channels associated with the particular module under test.

The following procedures can be used to properly perform the loopback testing on both the SXA & SXB series modules. Note that it is not necessary for both of the modules to be connected via fiber in order to perform the Local Loopback tests.

Note: Local loopback test is not available for RS-485 (2-wire) configuration or transmit/receive modules with a video channel.

Audio Test:

1. Place SW 5 in the ON (down) position
2. Apply an audio signal (compliant with the audio specifications) into the respective audio input (either Channel 1 or 2).
3. Connect an audio monitoring device (oscilloscope, audio line amp, etc.) to the respective audio output channel.
4. The output channel should be receiving the same audio signal that was input to the respective audio channel.
5. The front panel Audio Transmit & Receive LEDs (ATx & ARx) on the module’s audio channel under test should light.
6. If the module has a second audio channel, repeat steps 1 through 4
7. When complete, place SW5 in the OFF (up) position to return it to its normal operating mode

Data Test:

1. Place SW 5 in the ON (down) position
2. Use Switches 1-4 to select the appropriate data format to be tested
3. Apply an appropriate digital signal into the respective data input connector (either Channel 1 or 2).
4. Connect a data monitoring device (oscilloscope, BERT test equipment, etc.) to the respective data output channel.
5. The output channel should be receiving the same data signal that was input to the respective data input channel.
6. The front panel Data Transmit & Receive LEDs (DTx & DRx) on the module's data channel under test should light.
7. If the module has a second data channel, repeat steps 1 through 5
8. When complete, place SW5 in the OFF (up) position to return it to its normal operating mode

Contact mapping test:

1. Place SW 5 in the ON (down) position
2. Connect an input contact to one of the contact input channels. Contact actuation is caused when the contact input channel pin is connected to ground.
3. When each of the contact input channels is connected to ground, the appropriate channel's output contact will change state. Monitor with an ohmmeter to confirm proper operation.
4. The front panel Contact Transmit & Receive LEDs (CTx & CRx) on the module's contact mapping channel under test should flash in response to contact closure inputs
5. If the module has a second contact channel, repeat steps 1-3.
6. When complete, place SW5 in the OFF (up) position to return it to its normal operating mode

Remote Loopback Tests (SW6) - (applicable to full-duplex transceiver modules (SXA-xxx & SXB-xxx only). These tests will test all of the bi-directional audio, data and contact closures installed on the module associated with the remote loopback test. Obviously, the channels that can be tested are determined by the type of channels associated with the particular module under test.

Note: Remote loopback test is not available for RS-485 (2-wire) configuration or transmit/receive modules with a video channel.

The following procedures can be used to properly perform the loopback testing on both the SXA & SXB series modules. In order to perform the remote loop back tests, it is necessary to configure both the SXA & SXB modules as follows:

- Both the SXA & SXB modules must be connected together via fiber and power applied in order to perform the Remote Loopback tests.
- When testing the data channels, it is necessary that the data formats for both the SXA & SXB units be set the same (RS-232, RS-422, RS-485)
- The Remote Loopback test switch (SW6) on the remote module must be in the ON (down) position
- Test switches (SW5-10) on the local unit must be in the OFF (up) position

Audio Test:

1. Place SW 6 on the remote unit in the ON (down) position
2. Place SW6 on the local unit in the OFF (up) position
3. Apply an audio signal (compliant with the audio specifications) into the respective audio input of the local unit (either Channel 1 or 2).
4. Connect an audio monitoring device (oscilloscope, audio line amp, etc.) to the respective audio output channel of the local unit.
5. The output channel should be receiving the same audio signal that was input to the respective audio channel.
6. The front panel Audio Transmit LED (ATx) on the transmit module's audio channel under test should light as well as the Audio Receive LED (ARx) on the receiver module's front panel for each audio channel under test.
7. If the module has a second audio channel, repeat steps 1 through 4
8. When complete, place SW6 on the remote unit in the OFF (up) position to return it to its normal operating mode

Data Test:

1. Place SW 6 on the remote unit in the ON (down) position
2. Use Switches 1-4 to select the appropriate data format to be tested.
3. Apply an appropriate digital signal into the respective data input connector on the local unit (either Channel 1 or 2).
4. Connect a data monitoring device (oscilloscope, BERT test equipment, etc.) to the respective data output channel on the local unit.
5. The output channel should be receiving the same data signal that was input to the respective data input channel.
6. The front panel Data Transmit LED (DTx) on the transmit module's data channel under test should light as well as the Data Receive LED (DRx) on the receiver module's front panel for each data channel under test.
7. If the module has a second data channel, repeat steps 1 through 5
8. When complete, place SW6 on the remote unit in the OFF (up) position to return it to its normal operating mode

Contact mapping test:

1. Place SW 6 on the remote unit in the ON (down) position
2. Connect an input contact to one of the contact input channels on the local unit. Contact actuation is caused when the contact input channel pin is connected to ground.
3. When each of the contact input channels is connected to ground, the appropriate channel's output contact on the same local unit will change state. Monitor with an ohmmeter to confirm proper operation.
4. The front panel Contact Transmit LED (CTx) on the transmit module's contact mapping channel under test should light as well as the Contact Receive LED (CRx) on the receiver module's front panel for each contact mapping channel under test.
5. If the module has a second contact channel, repeat steps 1-3.
6. When complete, place SW6 on the remote unit in the OFF (up) position to return it to its normal operating mode

Data/Audio/Contact Transmit Test (SW7) – (applicable to both full-duplex transceiver modules (SXA-xxx & SXB-xxx) and one-way data/audio transmission modules. The type and quantity of channels that can be tested are determined by the type of channels associated with the particular module under test.

In order to perform the transmit test, it is necessary to configure both the modules as follows:

- The ST or SR and SXA & SXB modules must be connected together via fiber and power applied in order to perform the Transmit tests.
- When testing the data channels, it is necessary that the data formats for both the modules be set the same (RS-232, RS-422, RS-485)
- The Transmit Test switch (SW7) on the module initiating the test must be in the ON (down) position
- Test switches (SW5-10) on the local unit must be in the OFF (up) position
- This test overrides any external audio or data that may be at the input terminals of the unit under test.

This test will inject the Audio, Data and Contact Closure test signals into the transmitter and will be sent over fiber to the associated receiver module. This test will perform diagnostic tests on all of the channels integrated in the module using the module's own internal test signals. In addition, the The internal frequency/data rate of the various internal tests is as follows:

Audio	-	1Khz square wave
Data	-	1Hz square wave
Contact closure	-	1Hz square wave

Once the Transmit test switch on the remote ST, SR, SXA or SXB module is switched ON, the above signals will be transmitted over fiber to the receiving unit. The outputs can be monitored by standard Audio, Data and Contact mapping measurement/monitoring techniques.

LED indicator status – During the test, the Tx channel indicator lights for the data and contact mapping (DTx & CTx) on the module initiating the test will flash at a 1Hz rate. The audio transmit light (ATx) will be ON continuously. This applies to each type and number of channels in the module. Likewise, each of the channel's front panel Rx channel indicator lights for the data and contact mapping (DRx & CTx) on the receiver module's front panel will flash at a 1Hz rate to indicate proper reception of the test signals while the audio receive light (ARx) will be ON continuously.

To disable the test, move SW7 on the ST, SXA or SXB switch to the OFF position.

Data/Audio/Contact Receive Test (SW8) - (applicable to both full-duplex transceiver modules (SXA-xxx & SXB-xxx) and one-way receiver modules. These tests will test all of the audio, data and contact closure transmission channels installed on the module associated with the remote loopback test. Obviously, the channels that can be tested are determined by the type of channels associated with the particular module under test.

In order to perform the receive tests, it is necessary to configure both the modules as follows:

- The SR and SXA & SXB modules do not need to be connected together via fiber.
- The type of data output will be as per the data format selection switches 1 through 4 (RS-232, RS-422, RS-485)
- The Receive Test switch (SW8) on the module initiating the test must be in the ON (down) position

The receive test will perform diagnostic tests on all of the channels integrated in the module using the module's own internal test signals. The internal frequency/data rate of the various internal tests is as follows:

Audio - 1Khz square wave
Data - 1Hz square wave
Contact closure - 1Hz square wave

Once the Receive test switch on the ST, SR, SXA or SXB module is switched ON, the above signals sent to the appropriate electrical outputs on the same module. These signal outputs can be monitored by standard Audio, Data and Contact mapping measurement/monitoring techniques.

LED indicator status – During the test, each of the channel's front panel Rx channel indicator lights for the data and contact mapping (DRx & CTx) on the receiver module's front panel will flash at a 1Hz rate to indicate proper reception of the test signals while the audio receive light (ARx) will be ON continuously. This applies to each type and number of channels in the module.

To disable the test, move SW7 on the SR, SXA or SXB switch to the OFF position. This will restore operation to its normal mode.

Video Test (SW9) – (Applicable to one-way transmission modules (ST & SR units). This video test mode will allow the user to test the video transmission channel without the use of an external camera to generate a video signal.

There are two video tests available – Transmit video & Receive video. The following describes the test setup for each:

Transmit video test – This test injects a 4-bar video test pattern into the video transmitter and sends this signal over fiber to the associated receiver module.

In order to initiate the internal transmit video test it is necessary to configure the modules as follows:

- SW9 on the ST video Tx module must be set to the ON (down) position.
- SW9 on the SR video Rx module must be set to the OFF (up) position.
- The optical fiber between the ST & SR modules must be connected together
- Connect a standard video monitor to the output of the SR (Video Receiver) module
- 4 grey-scale vertical bars will be displayed on the monitor
- Receiver module LEDs – If a video monitor is not available, the activity of the transmit video test can be monitored on the receiver's front panel LEDs. When this test is activated, the receiver modules Video Sync & Video Present green LEDs (SYN & VID) will light.

Receive video test – This test injects a 8-bar video test pattern into the video receiver and sends it to the receiver output BNC for display on a video monitor.

In order to initiate the internal receive video test it is necessary to configure the modules as follows:

- SW9 on the ST video Tx module must be set to the OFF (up) position.
- SW9 on the SR video Rx module must be set to the ON (down) position.
- The optical fiber between the ST & SR modules must be connected together
- Connect a standard video monitor to the output of the SR (Video Receiver) module
- 4 grey-scale vertical bars will be displayed on the monitor

Bars Enabled (SW10) - (Applicable to one-way transmission modules with video (ST & SR units). This video mode will enable the vertical video bars to be displayed in the event that either the incoming video signal has been removed or if the optical signal from the transmitter has been interrupted.

To enable this video bars feature it is necessary to configure the modules as follow:

- SW10 on the SR (video Receiver) module must be set to the ON (down) position
- SW10 on the ST (video Transmitter) module must be set to the ON (down) position

Under normal operation, the video from the CCTV camera will be displayed on the respective monitor at the receive side. There are two ‘alarm’ modes - one for loss of video sync and one for loss of optical signal. When one or the other of these alarm modes is present, the monitor will display the following:

Loss of video sync - 4 vertical gray-scale bars across the monitor screen
Loss of optical signal - 8 vertical gray-scale bars across the monitor screen

Note: Modules equipment with Meridian’s SpectraSmart Network Diagnostic System option will have a slightly different video display. Instead of the vertical bars, the monitor will actually display a text message (as described below):

Loss of video sync error: will display the message “No Video Sync”
Loss of Optional signal error: will display – “No Optical Fiber”

This procedure concludes the testing of the video/audio/data/contact channels within Meridian’s DigiSlim (1-slot) fiber optic digitally-encoded transmission modules.

If you have any questions regarding the testing or operation of the modules, please call Meridian’s technical support at 516-285-1000.