Spyglass-Pro-Dual Product Manual

Spyglass-Pro Dual Analog AV

Spyglass-Pro Dual HD/SD-SDI Embedded audio

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Section 1.   Spyglass-Pro Dual Product Overview

The Spyglass-Pro Dual is a version of the Spyglass TV channel failure detector product line that includes a web microcontroller that provides web status and control, and two CFD channel failure detector modules. Each CFD module monitors the primary channel audio and video, and the back-up secondary channel audio and video. The Spyglass also includes audio and video bypass switching.
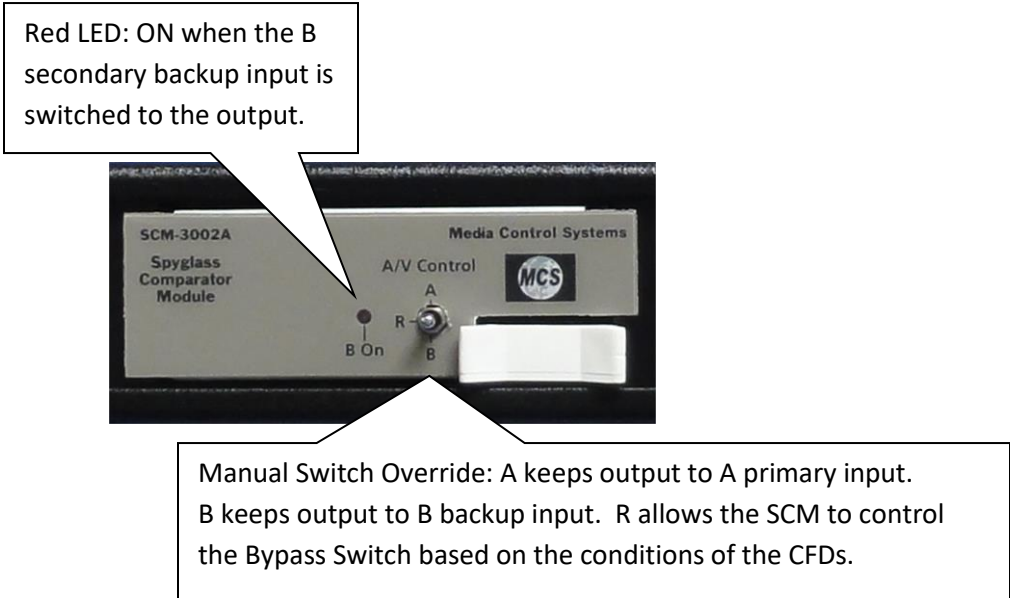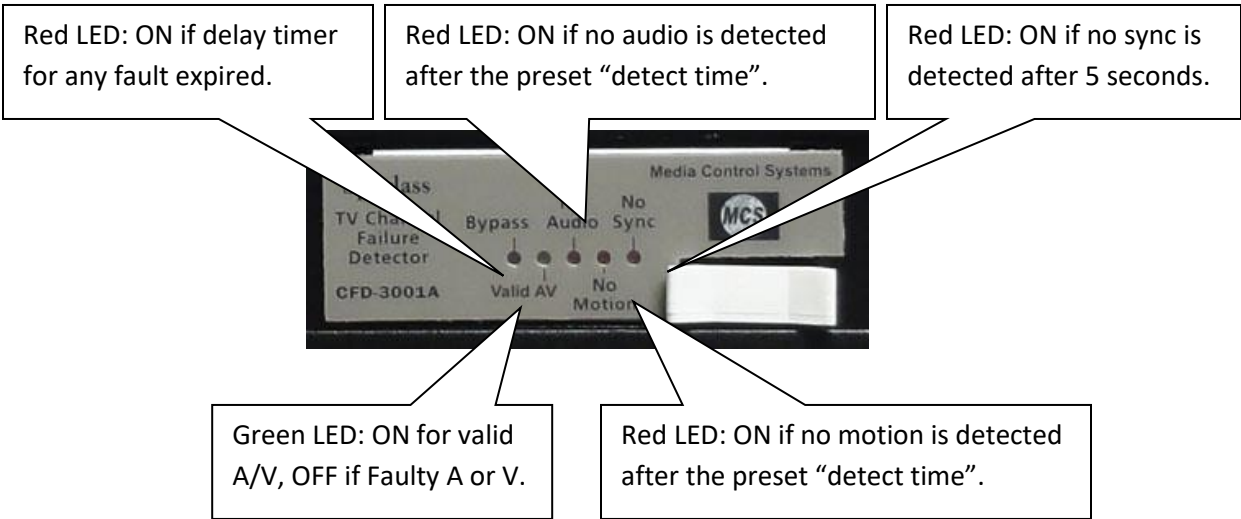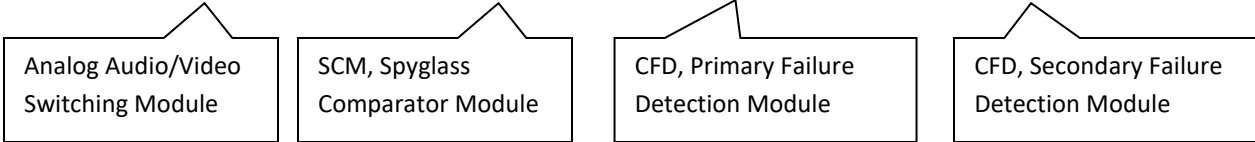
The Spyglass-Pro Dual is available in analog audio and video, and HD/SD-SDI with embedded audio.
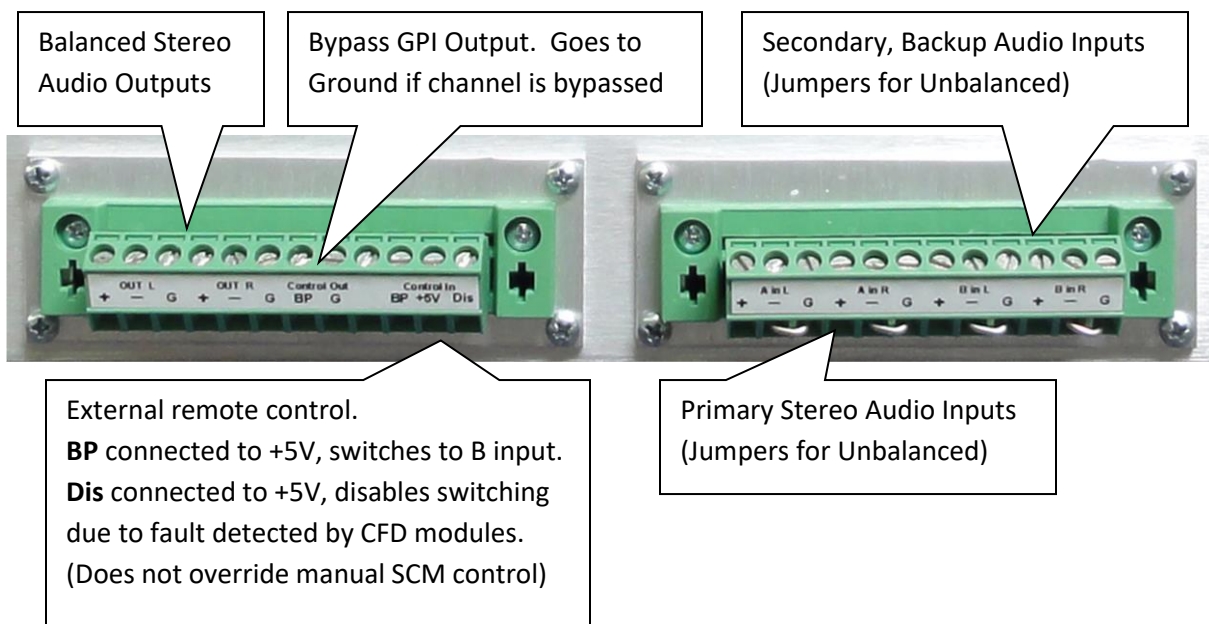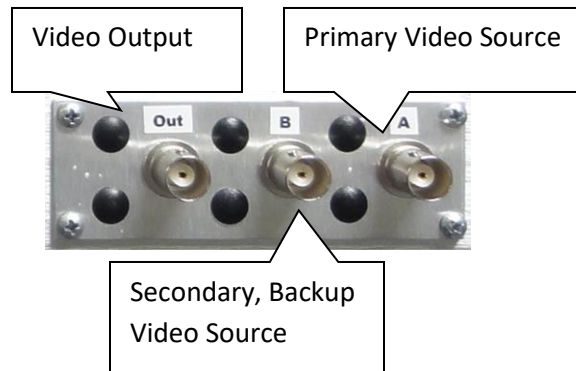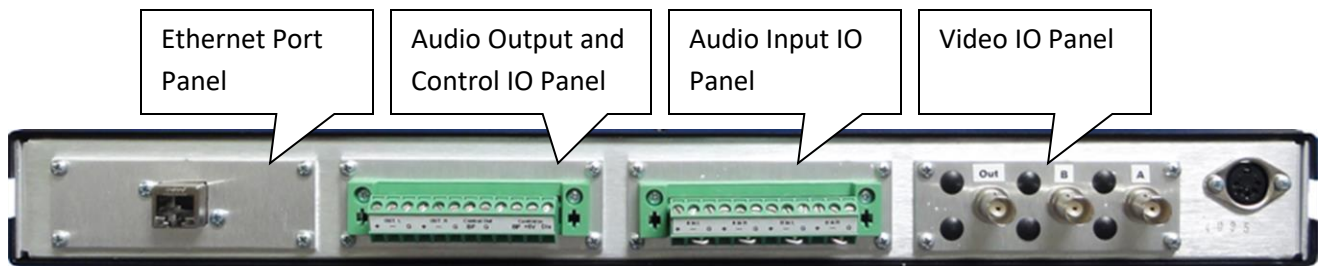
The Spyglass-Pro Dual includes a SCM, Spyglass Comparator Module that monitors the output status of each CFD module. The SCM provides switching control and includes an audio mixer that mixes balanced stereo to a mono signal to each of the CFD modules.

The SCM includes a front panel toggle switch that allows the operator to place the A/V switch in the A primary position, B secondary position or R remote controlled by the SCM. The SCM allows switching to the back-up channel only if the back-up channel has good audio and video.

The Spyglass-Pro Dual is used to monitor the outputs of two videoservers or other redundant feeds. Each Spyglass-Pro Dual monitors one output from each videoserver. If the primary output fails the Spyglass switches the system output to the back-up source. If neither of the videoserver outputs is scheduled to play video, the Spyglass keeps the video switch on the primary A input. This is important to prevent seeing the return switch from B to A when the server starts to play and is switched on air by the Broadcast stations routing switcher.

Section 2.   Spyglass-Pro Controls, Indicators, and IO

Analog Audio/Video Switching Module

SCM, Spyglass Comparator Module

CFD, Primary Failure Detection Module

CFD, Secondary Failure Detection Module

Red LED: ON if delay timer for any fault expired.

Red LED: ON if no audio is detected after the preset "detect time".

Red LED: ON if no sync is detected after 5 seconds.

Green LED: ON for valid A/V, OFF if Faulty A or V.

Red LED: ON if no motion is detected after the preset "detect time".

Red LED: ON when the B secondary backup input is switched to the output.

Manual Switch Override: A keeps output to A primary input. B keeps output to B backup input. R allows the SCM to control the Bypass Switch based on the conditions of the CFDs.

Ethernet Port Panel

Audio Output and Control IO Panel

Audio Input IO Panel

Video IO Panel

Video Output

Primary Video Source

Secondary, Backup Video Source

Balanced Stereo Audio Outputs

Bypass GPI Output. Goes to Ground if channel is bypassed

Secondary, Backup Audio Inputs (Jumpers for Unbalanced)

External remote control.
BP connected to +5V, switches to B input.
Dis connected to +5V, disables switching due to fault detected by CFD modules.
(Does not override manual SCM control)

Primary Stereo Audio Inputs (Jumpers for Unbalanced)

Section 3. Spyglass-Pro Web Status and Control

The status of the Spyglass-Pro can be accessed using a web browser after the IP address has be set up on the Spyglass web microcontroller. Setup instructions can be found in this section.

Switch the Secondary B Input to the Output. (Override your channel for maintenance.)

Disable ability for CFD to switch inputs due to A/V fault. (Prevent bypass switching for programs with more than 17-minutes of no motion.)

Changes to yellow if no audio is detected.

Changes to yellow if no motion is detected.

Status showing an A/V fault on the A primary input. The B secondary input was switched to the output. Failure due to no audio and no motion.

Status shows Spyglass was manually switched into bypass from the Web interface. No fault was detected.
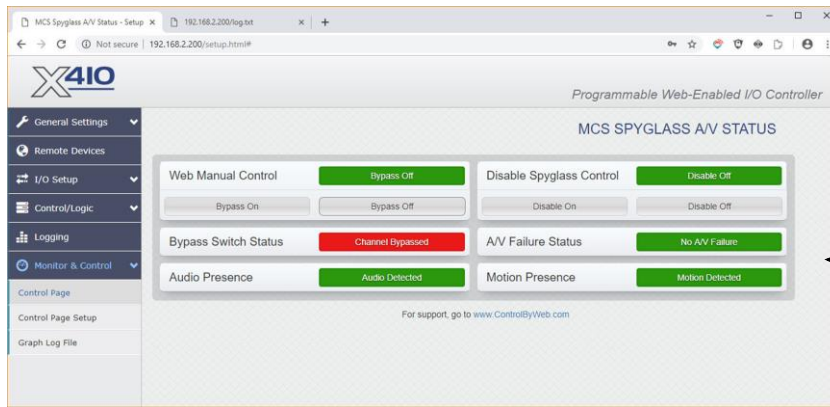
Status shows Spyglass was manually switched into bypass from the SCM toggle switch. No fault was detected. SCM switch set to B input.
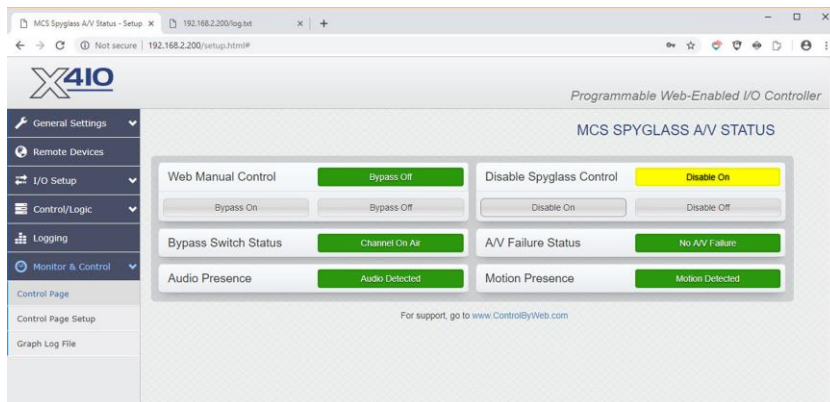
Status showing Spyglass was disabled from the Web interface. Spyglass will not go into bypass due to A/V Fault.

## Section 4.   Spyglass-Pro Web Controller Setup

The Spyglass-Pro uses the WEB Relay X-410 for status monitoring and control. This section covers the setup for the X-410.

The X-410 is controlled using a web browser and network connection. The IP address default from Control-by-Web is 192.168.1.2. To access the X-410 Setup, type 192.168.1.2/setup.html

The User Name is "admin" the Password is "webrelay".   The Relay Status screen is 192.168.1.2 | The Log is 192.168.1.2/log.txt | The system log is 192.168.1.2/syslog.txt. To see the Spyglass control and status screen just type in the IP address. 192.168.1.2

The following screen is used to change the IP address and email address. Cycling the power is required after changing the IP address. Date and Time is changed under the Date/Time tab.
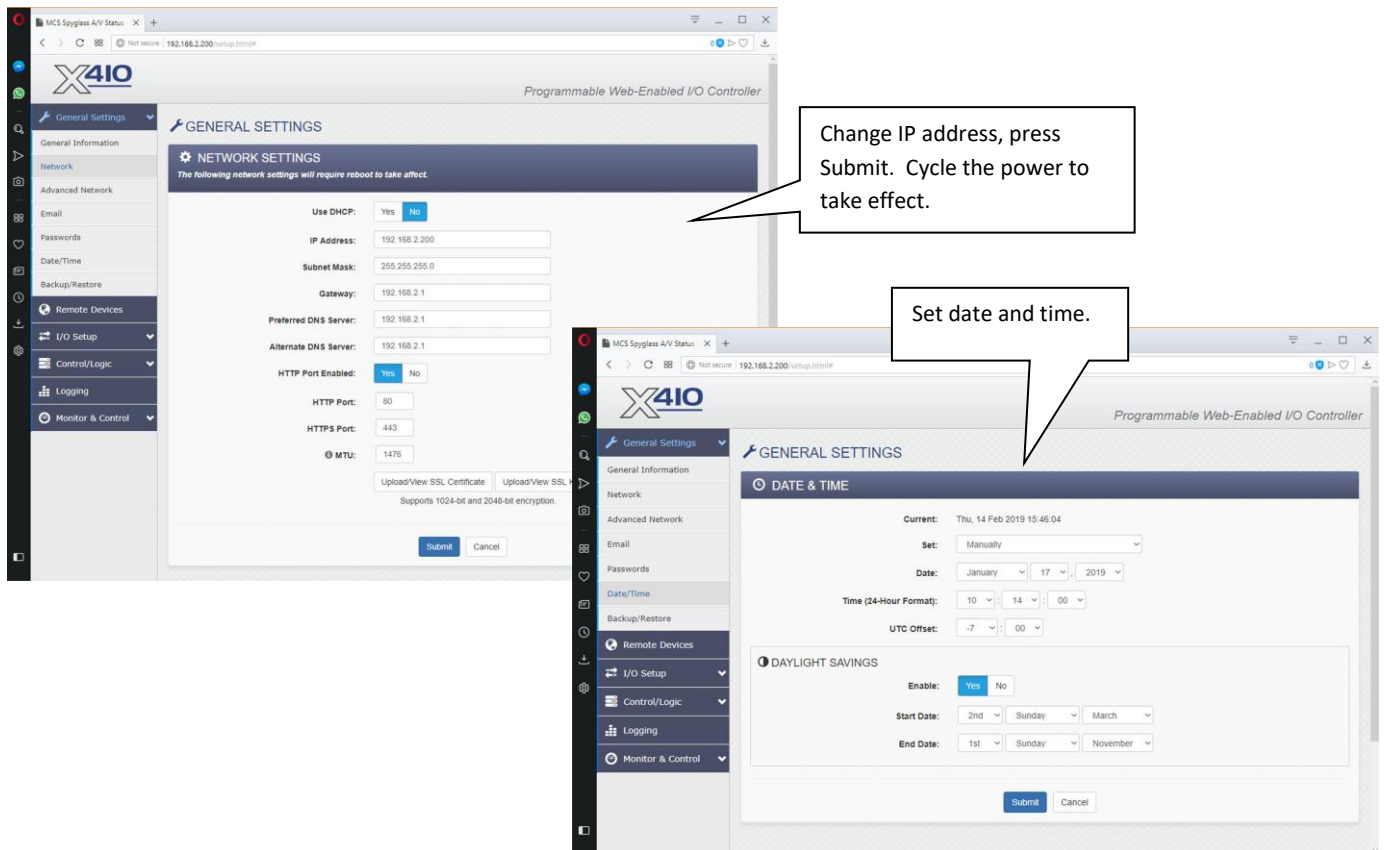
Change IP address, press Submit. Cycle the power to take effect.

Set date and time.

Enter email server and email address info. May not work with all email servers.

Must choose email address when system goes into bypass and returns on-air.

Control/Logic – Task/Functions – Conditional - Edit

If in bypass sends email to this address.

If back on-air sends email to this address.

Section 5.   Spyglass-Pro Log Reports

Text log reports can be access using a web browser and accessing the IP address /log.txt   192.168.1.2/log.txt

The log shows the date and time of the logged event. Logged events are reported from the inputs and outputs of the web X410 controller.

Shows system is in bypass.
0 = fault state. 1 = OK state.
Columns match list in header.

Shows system back On-Air.

Log reports can be emailed on a periodic basis.
Settings found under Logging Menu

CHANGING ANY OTHER SCREEN SETTINGS CAN AFFECT THE INTENDED OPERTION OF THE SPYGLASS-PRO. CHANGING OTHER SETTINGS IS NOT RECOMMENDED

Section 6.   Channel Failure Detector Module (CFD)

The Spyglass Detector Module (CFD-3001A) looks at three signal parameters, valid video signal presence, video motion, and audio signal presence. Each of these signal parameters is evaluated in different ways to determine the type of failure and what the response time should be before action is taken. Delay timers are employed to prevent false triggering on valid programming material.

A video input signal is considered valid if vertical sync pulses are detected. If the input signal is just noise or if the input video is very low or not present at all, a failure is detected after an evaluation time of 5-seconds.

A valid program may have a period of time when no audio or no video motion is intended. Thus delay timers are used to determine how long a period is allowable for no audio and/or no motion. The default time is set for 10-minutes for no audio only, and 15-minutes of no motion only. The operator can adjust the timers if longer or shorter delay times are desired. If there is no audio and at the same time there is no motion, the default time before action is taken is 2-minutes. No motion only detection or no audio only detection can be disabled and these parameters will be ignored. (See figure 1.1)

Spyglass CFD Functional Block Diagram   Figure 1.1
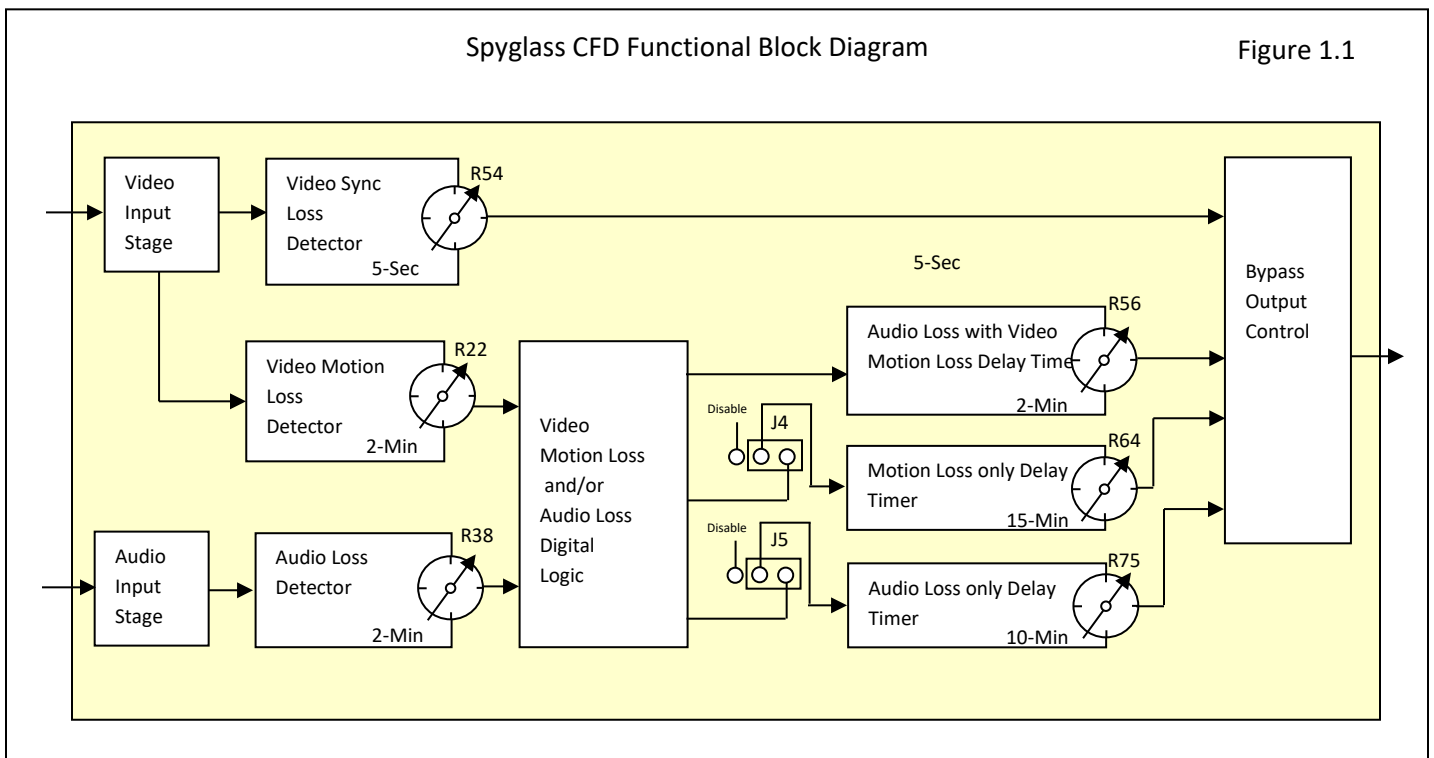
6.1 Failure Detection and Time Delay Parameters

Video Input Sync Detection
The CFD-3001A expects a 1V P-P Composite Video Input terminated at 75 ohms. Typically the video would be looped through the CFD's host frame and terminated at its final connection. If not a terminating resistor is required at the input connector of the frame.

The CFD checks the input signal for vertical sync pulses. If sync pulses are present and are above 200-millivolts in amplitude the detector is satisfied. Should the input drop below 200-millivolts or lower, the 5-second sync detector timer is started. After a 5-second time-out the bypass output is activated. Should the signal return before the 5-second time-out the timer is stopped and no output is activated.

If the input signal is noise (snow) from a tuner or satellite receiver, no vertical sync pulses will be detected and the sync detect timer will be engaged.

The CFD is very tolerant of poor video quality, if any vertical sync pulses are present, even though intermittent, the detector will remain satisfied and will not bypass the channel.

The Sync timer can be adjusted from 2-seconds to 10-seconds. (See Figures 2.1, 2.2, 2.3, 2.4)

Timer Adjustment Locations — Figure 2.1

Audio Delay Timer
Motion Delay Timer
Audio Detector Level Set to 1.5V @ TP-4
Motion Loss with Audio Loss Delay Time
Sync Detect Time
Motion Detect Time
Audio Detect Time
TP-4
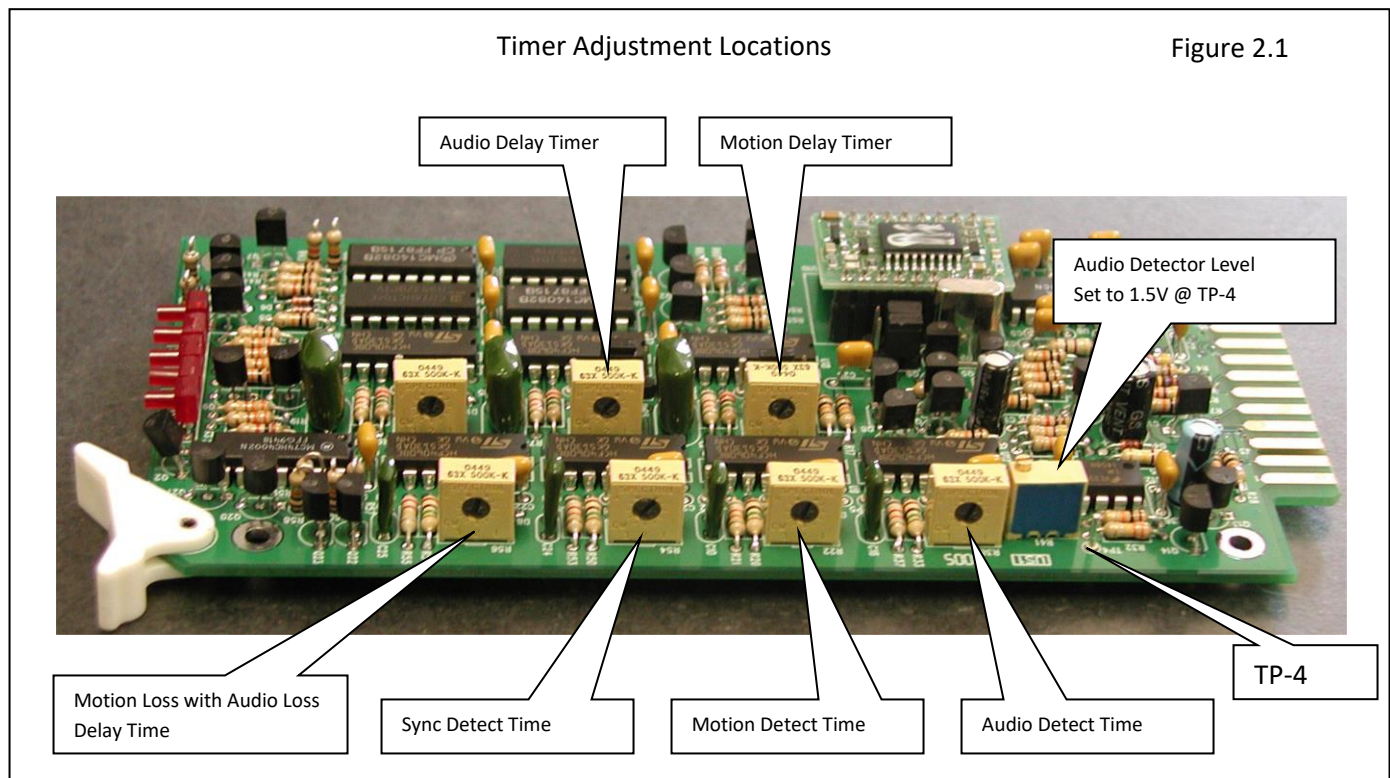
6.2 Video Motion Detection

Incorporated in the CFD is a very sophisticated video motion detector processor. The processor analyzes each frame of video and compares it to other frames in its buffer. If it detects that content in the frames has changed from frame to frame it provides a motion detection output. Movements of small objects may not be detectable so time is required to search for movement in video.

The default detect time is set at 2-minute. It is common for normal video programming to have very little motion for more than a minute. As a result the CFD incorporates two additional video delay timer functions after the detector timer has expired.

The first second-stage timer function looks at both audio presence and video motion together. If no audio is detected after 2-minutes and no motion is detected after 2-minutes a secondary timer is started and runs for an additional 2-minutes. If audio or motion hasn't returned after this combined 4-minutes the bypass output is activated.

Another second-stage timer is activated if no motion is detected after 2-minute and the audio is ok. This timer is set for 15-minutes. This time is adjustable from approximately 3-minutes to 18-minutes. This timer stage can be disabled with a jumper if you do not want this secondary timer to be engaged.

The purpose of using motion detection is to detect a frozen frame from an MPEG-2 Decoder, frame synchronizer, and blue or black outputs from a failed or stopped media device.
(See Figures 2.1, 2.2, 2.3, 2.4)

Default Detection and Delay Time Settings   Figure 2.2

Detection Time   Delay Before Alarm Output

Sync Loss Detection Time: 5-Seconds   Delay Time: 0-Seconds
Audio Loss with Motion Loss: 2-Minute   Delay Time: 2-Minutes
Motion Loss Only: 2-Minute   Delay Time: 15-Minutes (disable option)
Audio Loss Only: 2-Minute   Delay Time: 10-Minutes (disable option)

All timers are adjustable but any changes should be made with the assistance of MCS factory personnel.

6.3 Audio Presence Detection

The CFD expects to receive an audio input of typical audio levels, .5V to 4V P-P. If the audio levels drop below 200-millivolts, a 2-minute detection timer is started. If the audio stays at a very low level for over 2-minutes, secondary delay timers are started.   The audio sensitivity level can be adjusted. The default level is set high enough to stay out of the noise floor but low enough to pickup very quite audio scenes.

Similar to the motion detection feature, the audio detector engages two secondary timers upon its expiration. One is the audio loss with motion loss timer and the other is an audio only loss timer. The audio only loss delay timer is set for 10-minutes. If audio doesn't return after the 2-minute detect time plus the 10-minute delay time the bypass output is engaged. The audio loss only delay timer is adjustable from approximately 3-minutes to 18-minutes. (See Figures 2.1, 2.2, 2.3, 2.4)
The audio only delay timer can be disabled with a jumper if this feature is not wanted.

6.4 Audio Loss with Video Motion Loss

The CFD has the capability of detecting in addition to blue or black screens, frozen picture outputs of digital MPEG decoders or frame synchronizers. Typically when these conditions occur there is no audio and a frozen picture. After the 2-minute detect time for the audio and motion detectors the secondary combined 2-minute A/V timer is started. When the 2-minute delay timer expires the bypass output is engaged. Both audio and video motion must return before the bypass output is disengaged. This prevents a premature return should a temporary glitch of video or audio noise glitch should occur under these bypass conditions.

Timer Adjustment Settings

Approximate Timer Adjustment Settings — Figure 2.3

Sync Detector
R54

5-Sec = .6ms/CC*
*Clock Cycle

| 2sec | 4sec | 5sec | 6sec | 7sec | 9sec | 10sec | Sec |
| .2ms | .4ms | .6ms | .8ms | .9ms | 1.1ms | 1.3ms | |

Motion Detector,
Audio Detector

R-22, R-38
2-Min = 14.4ms/CC

| 0:45 | 1:30 | 2:25 | 3:25 | 4:05 | 4:25 | 5:00 | Min:Sec |
| 5.2ms | 11ms | 17ms | 24ms | 28ms | 32ms | 37ms | |

Audio / Motion Loss Timer
R-56
2-Min = 15ms/CC

| 0:40 | 0:57 | 1:14 | 1:29 | 1:42 | 1:57 | 2:13 | Min:Sec |
| 5ms | 7ms | 9ms | 11ms | 13ms | 15ms | 17ms | |

Audio Timer,
Motion Timer,

R64, R75
10-Min = 75ms/CC
15-Min = 110ms/CC
3-Min = 23ms/CC

| 2:40 | 5:28 | 8:16 | 10:44 | 13:33 | 16:09 | 18:48 | Min:Sec |
| 20ms | 40ms | 60ms | 80ms | 100ms | 120ms | 140ms | |

Jumper and Timer Locations — Figure 2.4
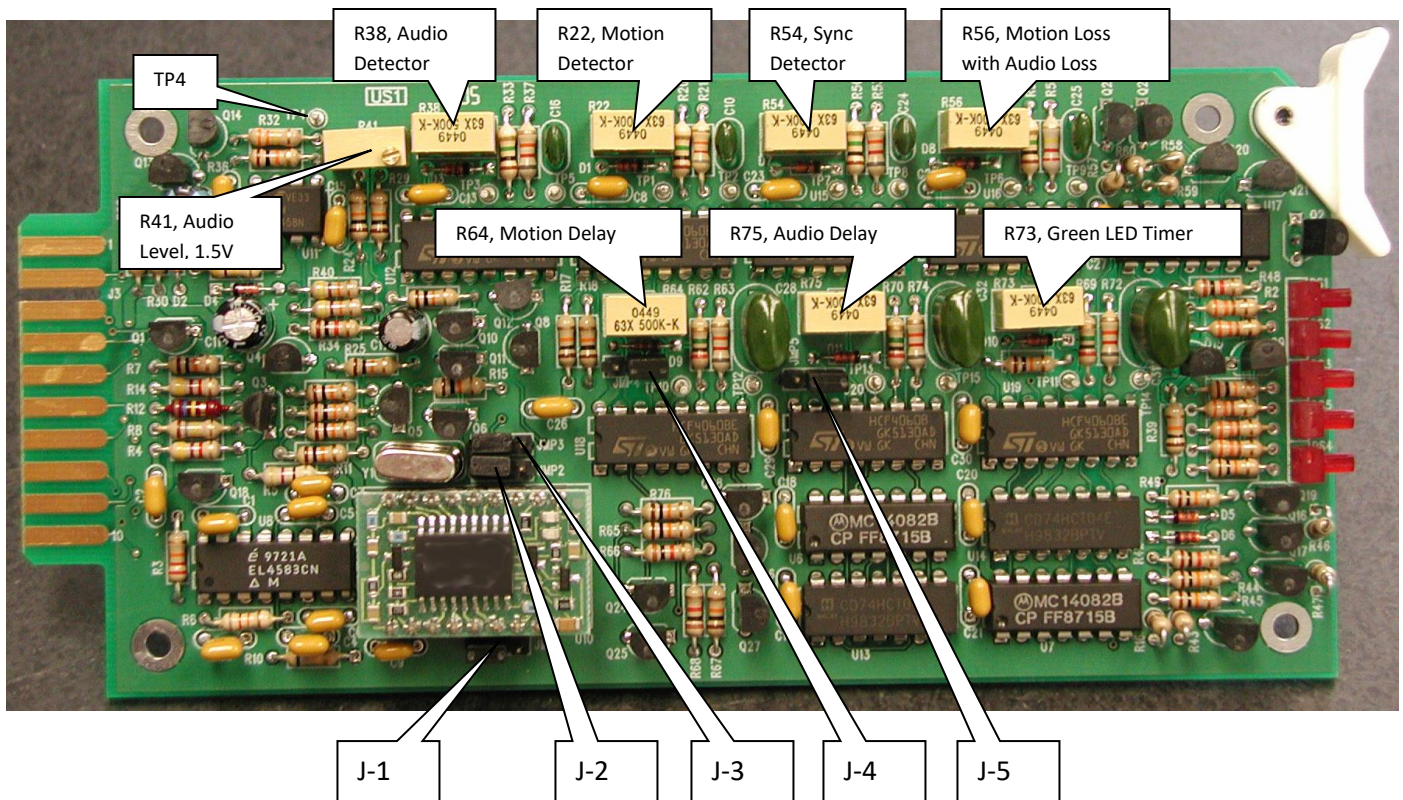
6.5 Motion Sensitivity Level Jumpers (*Factory Assistance Recommended*)

The sensitivity of the motion detector processor can be changed for special applications. **It is not recommended to change the setting under normal conditions.** The motion detectors ability to detect video motion has four sensitivity levels. The levels can be changed using Jumpers JMP1, JMP2 and JMP3. (See figure 2.4 for the location of the jumpers)

Level 1	Level 2	Level 3	Level 4
Least Sensitive	Default		Most Sensitive
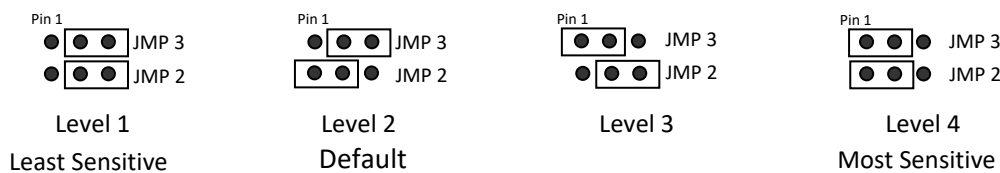
6.6 Motion Loss Only and Audio Loss Only Timer Disable Jumpers

If there is a concern that the CFD will false trigger on valid programming, these jumpers allow an operator to disable the audio loss only and video loss only delay timers. (See Figure 3 for the location of jumpers)

Note: Normal Spyglass operations expect both audio and motion to be present. For Audio only systems or video only systems, factory modifications are required.

Motion Loss Timer — J-4 — Enable (Default) / Disable

Audio Loss Timer — J-5 — Enable (Default) / Disable
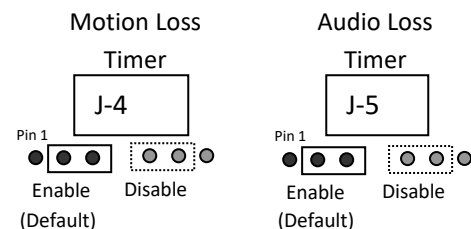
Spyglass-Pro Dual Analog Audio and Video Block Diagram
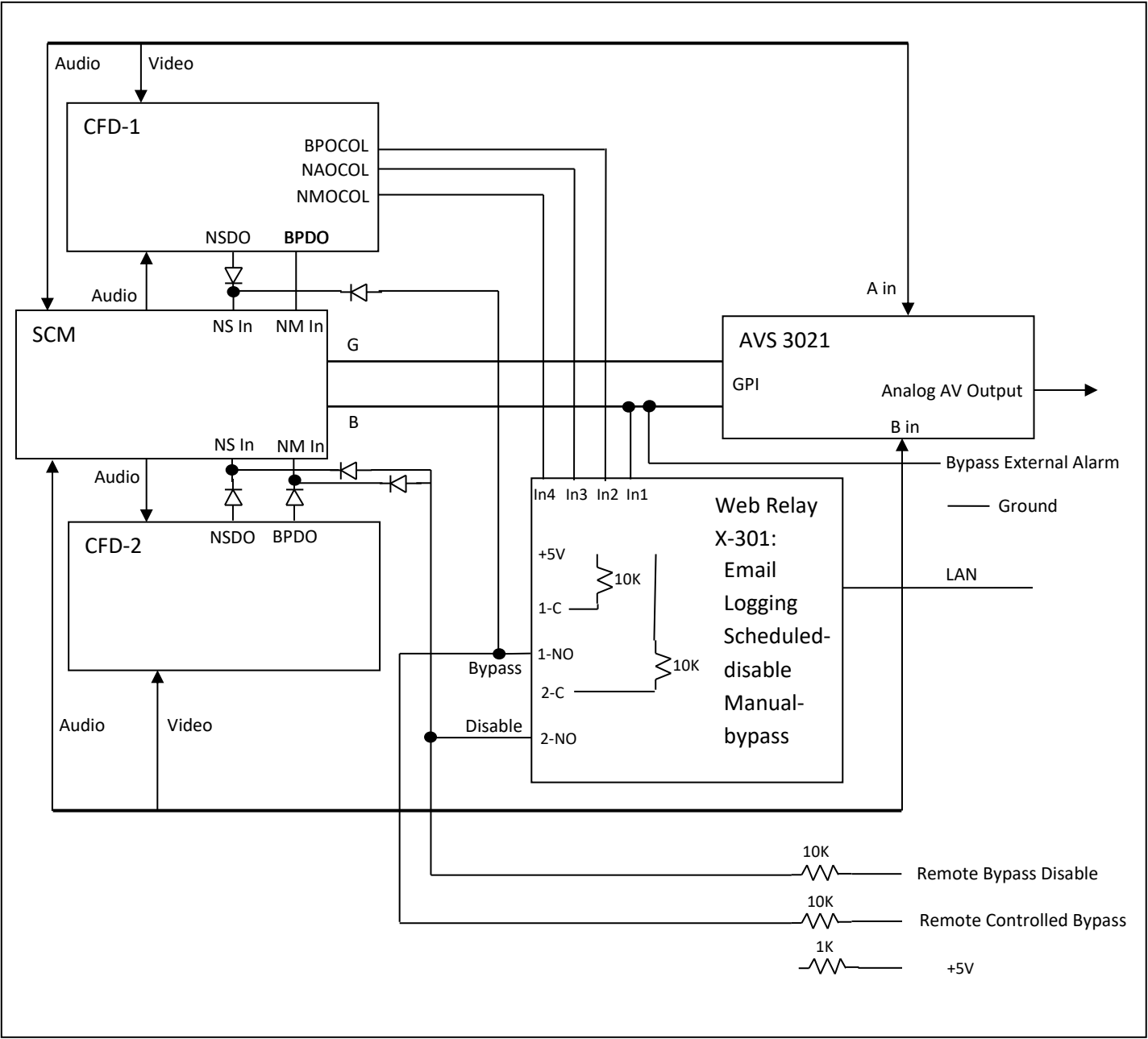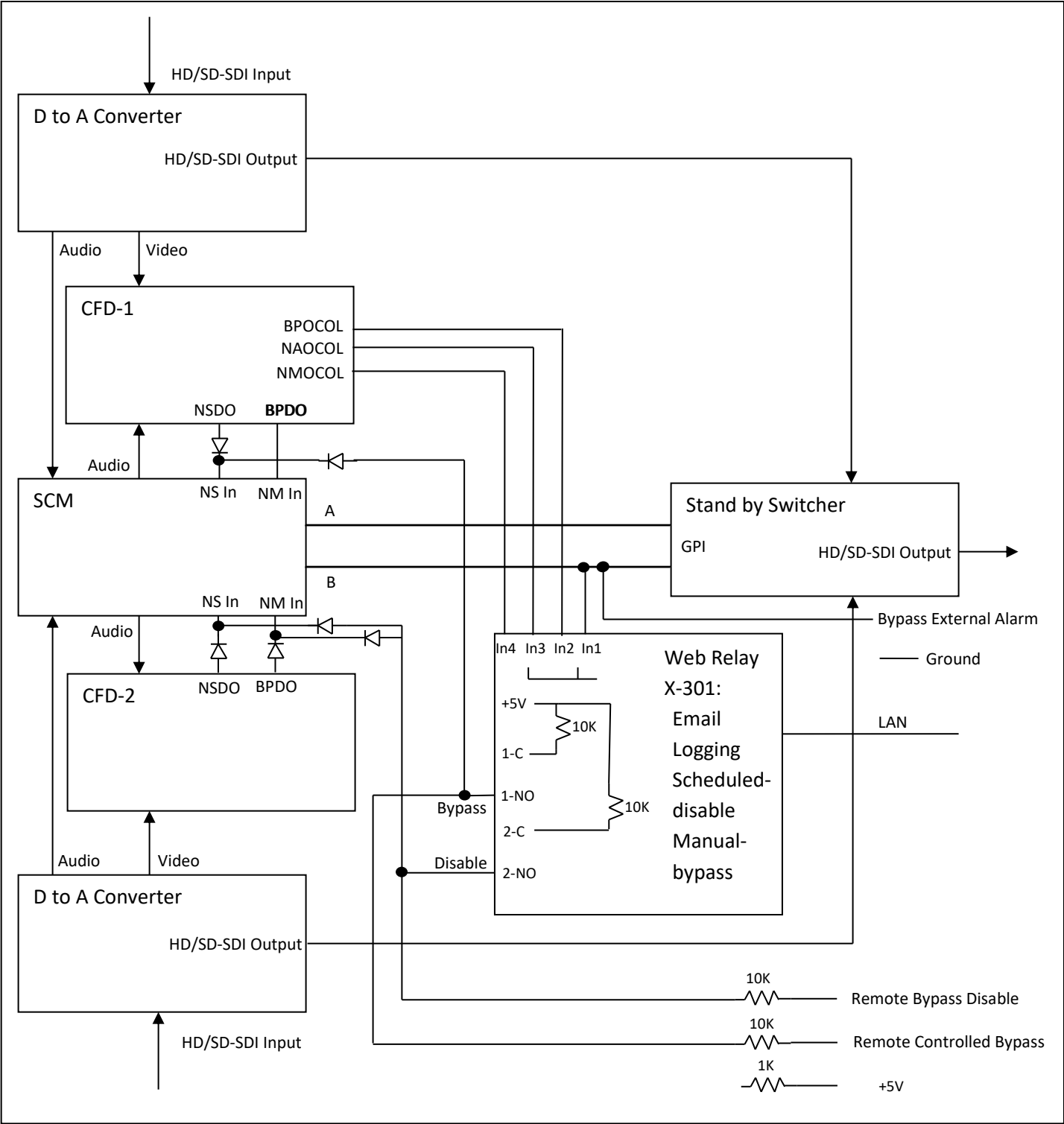
Spyglass-Pro Dual HD/SD-SDI with Embedded Audio Block Diagram

Limited Warranty

MEDIA CONTROL SYSTEMS, LLC, Warrants each new product manufactured by it to be free of defective materials and workmanship, and agrees to remedy any such defect by repair or replacement at no extra charge for a period of one (1) year from the original date of purchase.

This warranty does not extend to any MCS product subject to misuse, neglect, accident, improper wiring or installation, or used in violation of MCS instructions. Nor does it extend to equipment that has been altered outside MCS's factory without prior written approval, nor to equipment that has had the serial number removed, nor to accessories used herewith, which were not manufactured by MCS. Fuses and batteries are specifically excluded from this Warranty. Equipment sold by but not manufactured by MCS is warranted by the original equipment manufacturer.

The owner must deliver equipment covered by this warranty with all transportation charges prepaid, to the MCS factory for examination. If examination discloses, by MCS's judgment, that this is thus defective, the equipment will be repaired or replaced at no charge. Equipment returned prepaid under warranty and repaired in MCS's factory will be returned with all transportation charges, surface freight only, paid by MCS. Units that fail under conditions cited above, as being outside of the warranty extension will be repaired on a time-and-material basis after notification to and approval by owner. All freight incurred in repairing equipment not under warranty will be the responsibility of the owner.

In respect to any and all equipment furnished by MCS, this warranty is in lieu of any other warranty, obligation, or liability expressed or implied including warranty of merchantability or fitness for a particular purpose. No person, including a company representative, is authorized to assume for MCS any other liability in connection with the sale of its products.

Under no circumstances shall MCS be liable in contracts or in tort for any economic loss, including any loss of profits, or for any special or consequential damage.

All inquires relating to either product operation or warranty service should be directed to:

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