UNDERSTANDING AND SELECTING SDI FAILOVER SWITCHES

Ross offers a range of failover switches to protect critical SDI signal paths. All failover switches perform the basic function of automatically switching from a primary signal to a backup signal in the event of a failure, thereby protecting essential content and avoiding costly downtime. Failover functionality is often bundled with products that offer additional capabilities, ranging from simple signal distribution to advanced processing such as master control switching.

The capabilities and intelligence level of these switches vary, and choosing the right type of failover product is crucial to match your application's specific needs.

Ross failover switching functionality is available in two primary categories:

Simple Failover Switches

Simple failover functionality is found in products such as certain Ross distribution amplifiers, where automatic switching is a convenient and cost-effective built-in feature. These simpler devices operate primarily at the Physical Layer, meaning they recognize the electrical integrity of the incoming SDI signal. They determine a signal as "good" if it is electrically valid, can be locked onto, and successfully reclocked. They do not perform deeper analysis of signal contents. Therefore, simple failover switches only detect electrical issues, such as complete signal loss or electrical degradation as conditions warranting failover. If the SDI carrier is valid electrically but contains frozen video, black video, missing audio, or missing ancillary (VANC) data, a simple switch would still consider the signal acceptable and not trigger a failover.

Simple SDI failover products from Ross include:

- SRA-8901-R: 12G Bypass Relay Protection Switch with Output Distribution
- DRA-8902: 12G Distribution Amplifier with Input Failover
- SRA-8802: 3G Distribution Amplifier with Input Failover
- DRA-8804: 3G Distribution Amplifier with Input Failover
- Detour: Standalone 12G Bypass Relay Protection Switch with Output Distribution

Smart Failover Switches

In contrast, Ross products like the MC1-UHD and AAP-8644 offer advanced "smart" failover functionality, performing deeper analysis of the SDI content itself. These devices evaluate signal integrity beyond the Physical Layer, inspecting specific parameters within the signal such as video freeze, presence of audio groups, and the presence of ancillary data (VANC).

Because these smart switches perform more sophisticated signal processing, they can detect and respond to subtle signal issues such as bit errors, framing errors, or format inconsistencies. These conditions, which might be missed by simpler devices, can also trigger a failover.

Smart failover switches enable users to define granular criteria and customized combinations of these signal parameters that constitute failure conditions. For example, a valid electrical SDI carrier containing frozen video, missing audio groups, or missing VANC data could be appropriately identified as problematic, triggering automatic failover to a backup source.

Smart SDI failover products from Ross include:

- MC1-UHD: Mastercontrol, branding and smart failover switch for SDI up to 12G
- AAP-8644: Audio processor and smart failover switch for SDI up to 3G

Switching Path Considerations

Another critical consideration is the type of switching path used for failover transfers:

- Active Switching Path: Provides fast switching.
- Passive Bypass Relay: Ensures continuity of the backup signal even if the switch experiences hardware or power failure.

Ross offers the SRA-8901-R failover switch which utilizes a passive relay for switching. The product can function either as a standalone simple failover solution or be placed downstream from a smart failover device. This configuration adds a passive relay backup path, enhancing overall reliability and protecting the path from signal quality issues while still being able to carry a signal in the event of power or hardware failure.

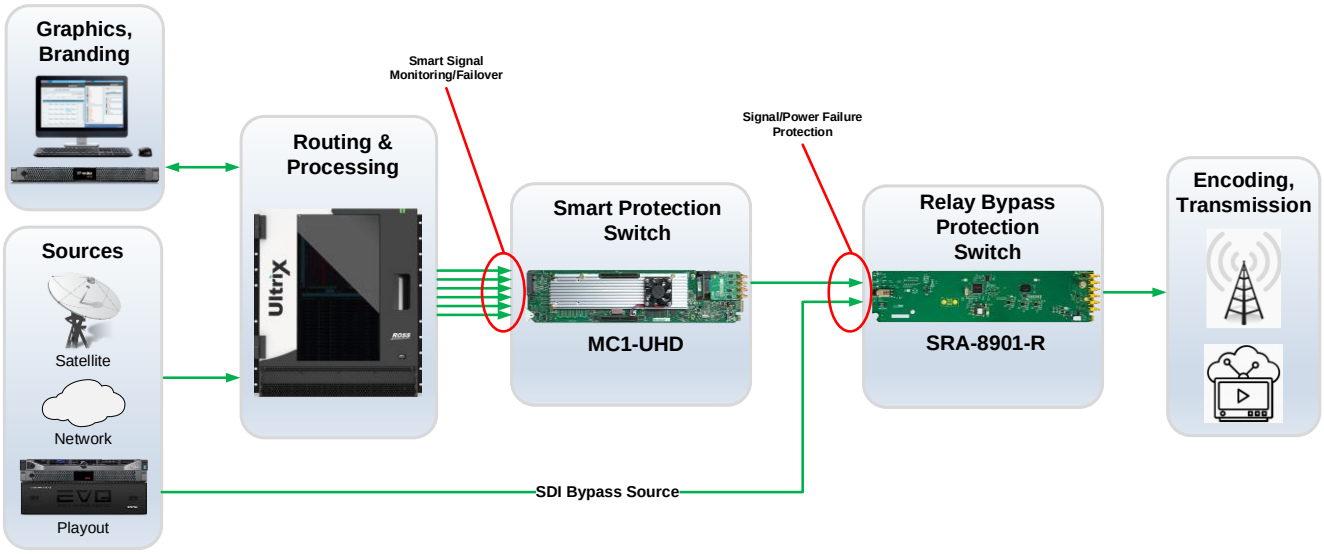

Figure 1 - Smart Failover Switching Augmented with Relay Bypass – Air Chain Sample Application

When selecting an SDI failover product, carefully consider the specific needs of your application, the desired depth of signal analysis, and the level of protection required to maintain continuous and reliable signal flow. The table below provides a list of available Ross failover switching products and individual failover criteria capabilities. For more detailed information, please visit the Ross website which provides additional product data and operation manuals.

		Smart Failover Switches		Simple Failover Switches				
		MC1-UHD	AAP-8644	SRA-8901-R	DRA-8902	SRA-8802	DRA-8804	Detour
Signal Support	12G SDI	✓		✓	✓			✓
	3G SDI	✓	✓	✓	✓	✓	✓	✓
	1.5G SDI	✓	✓	✓	✓	✓	✓	✓
	270M SDI	✓	✓	✓	✓	✓	✓	✓
	ASI			✓	✓	✓	✓	✓
Switching Parameters	Signal Loss	✓	✓	✓	✓	✓	✓	✓
	Cannot Lock	✓	✓	✓	✓	✓	✓	✓
	Video Freeze	✓	✓					
	Audio Group Presence	✓						
	Audio Silence		✓					
	VANC Parameter Presence	✓	Closed Captions Only					
Switching Features	Manual Switchback	✓	✓	✓				✓
	Auto Switchback	✓	✓	✓	✓	✓	✓	✓
	Adjustable Holdoff	✓	✓	✓				✓
	Active Switch	✓	✓		✓	✓	✓	
	Bypass Relay		✓	✓				✓