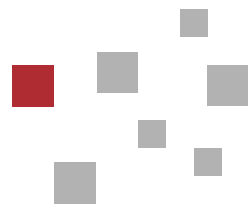




A Rohde & Schwarz Company



# RelayCaster Encoder

With RelayCaster, reliability and data rates of contributing and distributing live content can be greatly improved, and packet loss issues can be solved efficiently.

RelayCaster allows for replacing expensive satellite links or expensive contracts with CDN service providers.

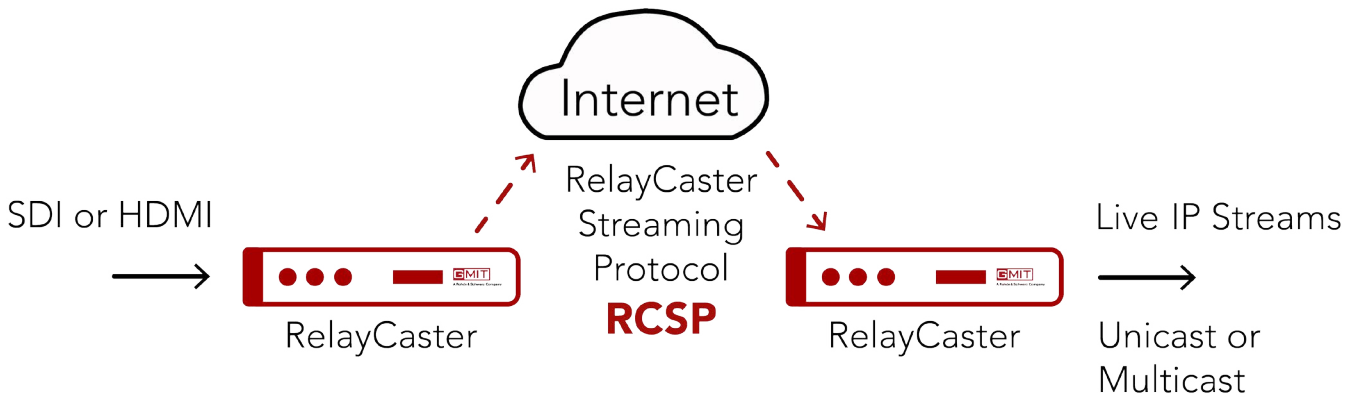
In contrast to these services, RelayCaster is not limited to certain regions or data centers. RelayCaster enables distribution of your content across any distance, to any place that is reachable by Internet infrastructure. With optional encryption your streams will be protected between all senders and receivers.

Being compatible with existing gateways, transcoders, conditional access systems, streaming servers, and set-top boxes, RelayCaster appliances can be seamlessly integrated into your existing infrastructure: Input and output streams of RelayCaster support standard compliant protocols.

RelayCaster Encoder is a 19-inch rack-mountable server appliance combining SDI or HDMI encoding with RelayCaster contribution.

## Application Areas

- Encoding from SDI or HDMI
- Optimized distribution and contribution of live content
- Improved reliability and higher bandwidths on long distance Internet links
- Fixes packet loss up to 50%
- Replacement for expensive satellite links and CDN contracts



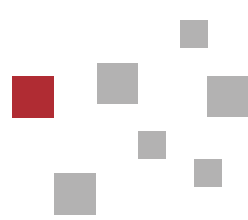
Using the RelayCaster Streaming Protocol (RCSP) as streaming protocol between two RelayCaster servers allows for the optimized transmission of live IP streams to remote company sites, data centers, or networks.

Compared to streaming with UDP or RTP, RCSP greatly reduces packet loss. Compared to content distribution with TCP or higher-level protocols, such as FTP or HTTP, GMIT's RCSP offers much higher bandwidths for transmission of live content over lossy long distance links.

This approach can be scaled. You can create your own Content Delivery Network (CDN) of

RelayCaster servers: Live IP streams from a central data center are re-distributed to various intermediate and terminating data centers that are spread around the world.

Over-The-Top (OTT) streaming, adaptive bitrate streaming (ABR), and RelayCaster work together nicely: In each data center, streams received by RelayCaster are forwarded to OTT streaming servers providing streams to end users' devices that are 'nearby' (in terms of Internet distance). To this end, RelayCaster helps 'pushing' streams close to end users.



## Encoder

- Video encoding H.264/AVC or MPEG-2 Video
- Profiles and Levels
  - H.264/AVC High, Main, Constrained Level: 3, 3.1, 3.2, 4, 4.1
  - MPEG-2 Video High, Main, Simple Level: High, High 1440, Main
- Video format 525i, 625i, 720p, 1080i, 1080p up to p30
- Sample format 8-bit 4:2:0
- Encoded bitrate 256kbps to 25Mbps
- Audio encoding AAC-LC, HE-AAC, MPEG-1 Layer II, Pass-through
- A/V input HD-SDI (75-Ω BNC) or HDMI 1.4a



## IP Streaming

- 2x Ethernet interfaces supported
  - 1x Mgmt (Management and Streaming)
  - 1x GbE (Streaming only)
- MPEG Transport Stream (MPEG-TS)
  - MPEG-SPTS (Single Program Transport Stream)
  - MPEG-MPTS (Multi Program Transport Stream)
  - Support for common audio/video codecs
- Protocols
  - Unicast / Multicast / Broadcast
  - UDP, RTP over UDP
  - RelayCaster Streaming Protocol (RCSP)
- Fixes packet loss rate of up to 50%
- One output stream, up to 25 Mbps



## Stream Protection

- Encryption and decryption with AES
- 128, 192 and 256 bits



## Administration

- Linux system, Responsive Web interface (http/https)
- ssh
- Free Software Developer Kit (SDK) for XML-RPC and PHP



## Hardware

- 1 U, 19" rack mountable
- 1x SSD (Hot swap carriers)
  - Option: Redundant disk array (RAID1, 2x SSD)
- VGA port, keyboard port, mouse port for KVM
- Height x Width x Depth
  - 43 mm (1.7") x 426 mm (16.8") x 495 mm (19.5")
- Voltage: 100V – 240V AC, 50-60 Hz
- Weight: 9 kg
- Power consumption:
  - < 4 W (standby), 45 W (idle) to 55 W (loaded)
  - Option: Redundant power supply
- High-quality server appliance assembled in Germany