

EqcoLogic HD-SDI Repeaters for long-haul digital HD-CCTV

Extend HD-CCTV links up to 1.0km with power over cable and camera control link over single coax cable

EqcoLogic's EQCO-SDI30-7501 is an extender solution for HD-SDI links, operating with 75Ω coax cable.

Each unit receives a HD-CCTV signal that may be attenuated by up to 220m of coax cable.



The repeater contains three critical components to correct and then retransmit the signal:

- ◆ Adaptive Equalizer to return the signal to its original amplitude and modulation
- ◆ Reclocker to resynchronize the signal—bringing it back to its original condition
- ◆ Cable Driver to retransmit the signal with its original characteristics restored

Furthermore, the repeater design allows for two unique benefits:

- ◆ Power can be transmitted from the recorder (DVR) side to the camera over the coax cable.
- ◆ Up to 6 repeaters may be powered from the coax cable; if only one or two repeaters are used, the power may also be adequate to power the SDI camera.
- ◆ A control signal (RS485) can be transmitted from the recorder (DVR) side to the camera over the coax cable

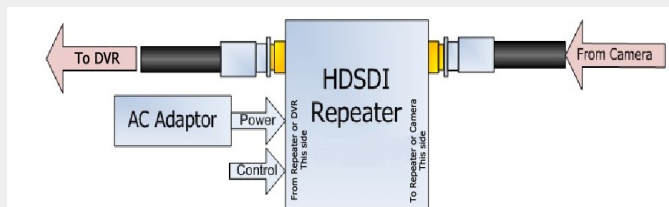
Repeater enables simultaneous signal transmission, camera control and power over a single cable.

Implementation

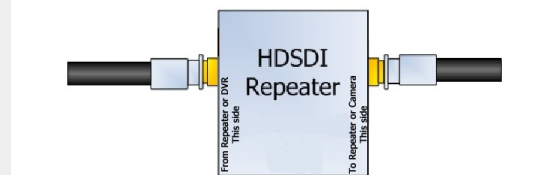
Each repeater supports a data-rate of 2.97 Gbit/s (3G-SDI). A link of up to 220m can be achieved with a data-rate of 1.485 Gbit/s (depending on cable quality*).

Longer lengths can be supported with lower speed cameras: for example, 720m for SDI cameras.

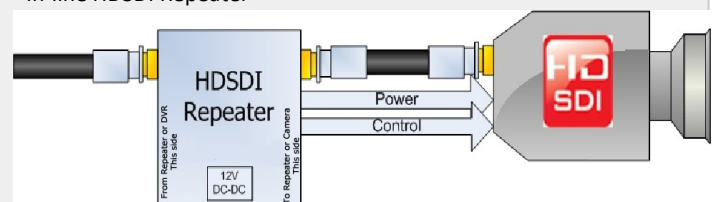
Up to 5 repeater units can be daisy-chained together, all powered over the coax cable by power injected to the first repeater.



DVR side Repeater including Link Power and Control Channel



In-line HSDSI Repeater



Camera side HSDSI Repeater with Power and Control

Camera control signals and the system power can be injected at the first repeater (nearest the recorder). Control signals and camera power (if appropriate) can similarly be taken from the repeater nearest to the camera and fed into the camera itself.

The camera control is via RS485, the most commonly used protocol and a control signal bandwidth of up to 38.4 kbps is supported.

Technical Specifications

HD-SDI Interface

Connectors	BNC True 75Ω
Cable Impedance	75Ω ± 3Ω
Data Throughput	270Mbps, 1.485 Gbps, 2.97 Gbps

Aux Interface

Connector (Head End)	RJ45 (Cat 3)
Cable Type	Category 3 or above
Signaling	RS485 in (Pair 1) RS485 out (Pair 2), Gnd (Pair 3), +24V (Pair 4)

Power Supply Input (Head End input)

Aux Power in via RJ45	24V @ 720mWatts, plus any concatenated repeaters
DC Feed via Coax	Min 9V – 24V DC, rated current 0.5 – 2A

Power Supply Output (Camera Side output)

Aux Power out via RJ45	V_{IN} @ Head End -1V -Coax DC drop (varies with cable type/length)
DC Feed via Coax	V_{IN} @ Head End – 1V - Coax DC drop per hop (varies with cable type/length)

Environmental

Operating Temperature	0°C to 50°C
Relative humidity	Up to 85% non-condensing
Storage Temperature	-20°C to 70°C

Performance Specifications

Performance by coax type	Max coax length for error free operation @1.5Gbps	Max coax length for error free operation @3.0Gbps	Cable/Power Budget	
			Max # Repeaters (total length)	DC power after 2 repeaters
RG6 Sample 1 (16dB/100m) (Belden 1694A)	220 meters / 720 feet	120 meters /390 feet	5 (1km)	6W
RG6 Sample 2 (16dB/100m) (Carol Brand)	220 meters / 720 feet	120 meters /390 feet	3 (600 m)	1.8W
5C-HFBT Sample (16dB/100m) (Amphenol)	220 meters / 720 feet	120 meters /390 feet	5 (1km)	6W
RG59 Sample (23dB/100m)	153 meters / 502 feet	83 meters/ 272 feet	5 (700 m)	6.5W
3C-2V Sample 1 (41dB/100m) (Hangzhou Linan Tongda Cable Co.,Ltd)	85 meters / 280 feet	47 meters / 154 feet	5 (390 m)	6.5W
RG11 Sample (10dB/100m) (CommCcope F1160BVV)	350 meters / 1150 feet	192 meters / 630 feet	4 (1.3 km)	4W



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