GS12190

Bidirectional 12G UHD-SDI Reclocking Adaptive Cable Equalizer/Cable Driver

Key Features

- Single bidirectional 75Ω cable interface with on-chip termination
- On-die connection between equalizer and cable
- SMPTE ST 2082-1, ST 2081-1, ST 424, ST 292-1 and ST 259 compliant input/output
- Multi-standard operation from 1Mb/s to 11.88Gb/s
- Supports reclocking for DVB-ASI at 270Mb/s and MADI at 125Mb/s
- 3D Input Signal Eye Monitor
- PRBS Generator and Checker
- Automatic cable equalization. Typical equalized cable lengths of Belden 1694A cable:
  - 70m at 11.88Gb/s
  - 90m at 5.94Gb/s
  - 170m at 2.97Gb/s
  - 240m at 1.485Gb/s
  - 400m at 270Mb/s
- **Cable Equalizer Mode Features:**
  - Improved reach with stress patterns
  - Manual or automatic power-down on loss of signal
  - Programmable carrier detect with squelch threshold adjustment
  - Manual and automatic Cable Equalizer Bypass
- **Cable Driver Mode Features:**
  - Wide swing control
  - Pre-emphasis to compensate for significant insertion loss between device output and BNC
  - Manual or automatic power-down on loss of signal
  - Manual or automatic Mute or Disable on LOS
- **Trace Equalizer Features:**
  - Integrated 100Ω differential input termination
  - Manual or automatic power-down on loss of signal
  - Adjustable carrier detect threshold
  - DC-coupling from 1.2V to 2.5V CML logic
  - Trace Equalization to compensate for up to 20" FR4 at 11.88Gb/s
  - Automatic input offset compensation
- **Trace Driver Features:**
  - Integrated 100Ω differential output termination
  - DC-coupling from 1.2V to 2.5V CML logic
  - Trace Driver data output pre-emphasis to compensate for up to 20" FR4 at 11.88Gb/s
  - Manual or automatic Mute or Disable on LOS
- **Reclocker features:**
  - Manual or automatic rate modes
  - Manual or automatic Reclocker Bypass
  - Wide-range Loop Bandwidth control
  - Reclocking at the following data rates: 125Mb/s, 270Mb/s, 1.485Gb/s, 2.97Gb/s, 5.94Gb/s, and 11.88Gb/s. This includes the f/1.001 rates.
- **Additional Features:**
  - Single 1.8V power supply for analogue and digital core
  - 2.5V for Cable Driver output supply
  - 1.2V, 1.8V, or 2.5V for Trace Driver output supply
  - GSPI serial control and monitoring interface
  - Four configurable GPIO pins for control or status monitoring
  - Wide operating temperature range: -40°C to +85°C
  - Small 6mm x 4mm 40-pin QFN
  - Pin compatible with the GS12090 and GS3590
  - Pb-free, Halogen-free, RoHS / WEEE compliant

Applications

Next-generation 12G UHD-SDI infrastructures designed to support UHDTV1, UHDTV2, 4K D-Cinema and 3D HFR and HDR production image formats. Typical applications: Cameras, Switchers, Distribution Amplifiers and Routers.

Description

The GS12190 is a low-power, configurable multi-rate reclocking Cable Equalizer/Cable Driver supporting rates up to 12G UHD-SDI. It can be configured to equalize or drive signals over 75Ω coaxial cable. It includes DC restoration to compensate for the DC content of SMPTE pathological test patterns. Since the GS12190 is a reclocking device, extremely low output jitter is achievable even at extended cable/trace lengths.

The integrated Eye Monitor provides non-disruptive mission mode analysis of the post-equalized input signal. The 256x128 resolution scan matrix allows accurate signal analysis to speed-up prototyping and enable field analysis.

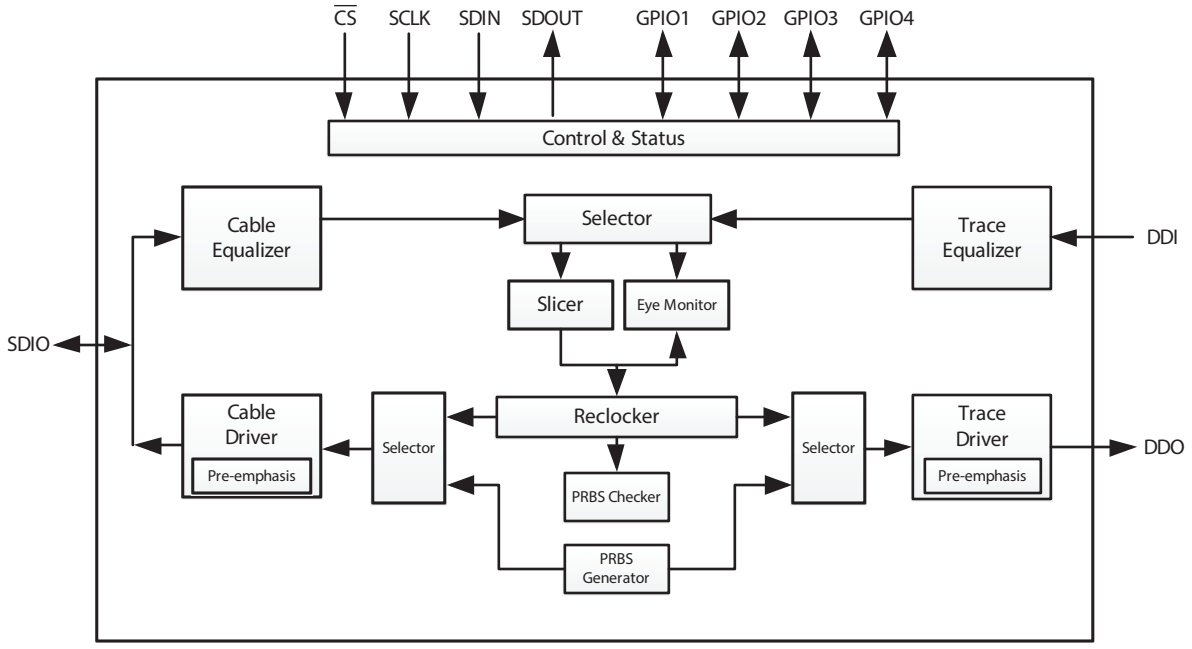
Built-in macros enable customizable cross section analysis and quick horizontal and vertical eye opening measurements.

With high phase consistency between scans and configurable space and time thresholds, algorithms can be deployed in the field to analyse long-term signal quality variation (Bathtub Plot) to reduce costly system installation debug time for intermittent errors.

Each output has highly-configurable pre-emphasis and swing controls to compensate for long trace and connector losses.

Additionally, automatic and user selectable output slew rate control is provided for the Cable Driver output.

The GS12190 is pin compatible with the GS12090 and GS3590 Bidirectional 3G-SDI Reclocking Adaptive Cable Equalizer/Cable Driver.



GS12190 Functional Block Diagram

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