

# IQLDK30

## 3G/HD/SD-SDI Logo Inserter & Keyer

With the ability to handle a number of branding and informational elements, the IQLDK30 can replace a number of discrete logo and keying devices to save space and streamline workflows.

The IQLDK30 from Grass Valley provides a flexible and cost-effective linear or luma keying solution ideal for 3G/HD/SD live production and playout applications. With other key features including logos, clock and text crawl insertion, the IQLDK30 delivers space savings by including other common branding elements on a single card.

The unit is capable of adding any combination of up to six animated or static 10-bit color logos into the SDI stream at any point within 4:2:2 boundaries of the active picture. Keyer and logo control is via RollCall, GPI, RollTrack triggers or SNMP, allowing the IQLDK30 to easily interface with external systems. Logos can be efficiently downloaded over TCP/IP network via a standard web browser interface onto dedicated 32 GB microSD storage. This provides the ability to have up to 64 logos loaded in non-volatile memory ready for immediate keying.

The card provides a dedicated program output along with selectable pre-view/program outputs, which includes a clean feed option. Being transparent to ancillary data allows the IQLDK30 to pass any embedded audio or meta-data — this combined with a short signal delay makes the module suitable for all operational environments.

### KEY FEATURES

#### Keyer

- Linear and luma keyer with full level of opacity and mix controls
- 2x background, fill, and key inputs
- Dedicated program output, and two independently selectable auxiliary outputs, showing preview, program, program pre-fade, background 1&2 (clean feed), fill, key, processed key and pattern (black, color bars) signals
- Cut to black, cut to program and fade to black or on program output controls available with adjustable duration
- Self-key capability using fill input to provide key signal
- Key opacity control (0-50%)
- Optional digital clock with NTP or internal timing, and two independent crawl layers with local text insertion or file upload

#### Logo Inserter

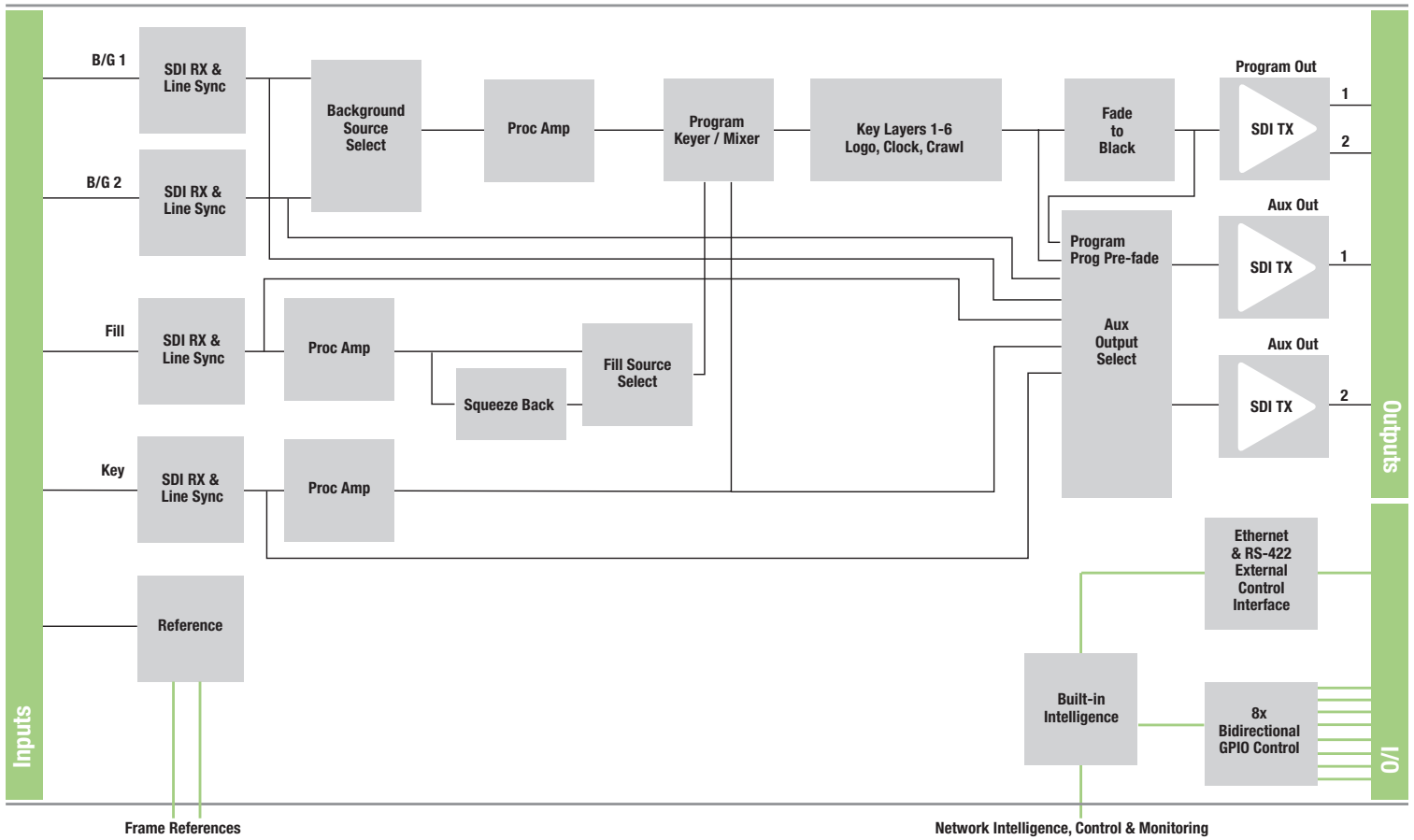
- 6 internal key layers for static or animated logos providing start, stop, pause and loop actions
- Each layer offers independent transition timers and mix, fade, take and combined fade/take options with smooth control of transparency, fade in/out time. Includes controls for background color and object position on per layer basis
- 32 GB on-board logo storage support, with dedicated large 1 GB active video memory for long animated sequences
- User-defined logos can be loaded over TCP/IP network with direct support for PNG-based files
- Video and alpha-channel processing at 10 bits to 4:2:2:4 resolution

#### General

- 32x user memories and 32x display memories e.g., logo position and keyer settings
- Ancillary data can be passed from the background inputs, fill inputs or blanked
- Local Ethernet port for direct control and logo upload via standard web browser including RollCall and SNMP for remote C&M
- 8x GPIO ports configured for control or tally output (logo & key on/off) with keyer and logo control (cut in/out, smooth fade up/down and memories (user & display actions) via GPIO interface

#### Why should you choose this module?

- 6 key layers for adding multiple static or animated, full 10-bit, color logos at any point in the active picture, great for bug insertion on playout channels
- Linear and luma key modes provide keying for a variety of sources, ideal for down-stream keying around a switcher
- On-board storage for up to 64 logo files, and control of logo position, fade/cut, available from external or RollCall interfaces to enable maximum operational flexibility
- Display memory store/recall available for rapid changes between program logos and keyer settings
- Selectable clean feed (background) output for editing and archive purposes



Block Diagram for IQLDK30

## SPECIFICATIONS

### Inputs and Outputs

#### Signal Inputs

Serial digital inputs: 4x 3G/HD/SD serial digital

Background 1: 1x BNC terminated in 75Ω

Background 2: 1x BNC terminated in 75Ω

Key: 1x BNC terminated in 75Ω

Fill: 1x BNC terminated in 75Ω

Electrical:

3 Gb/s SDI, SMPTE ST 424

1.5 Gb/s HD-SDI, SMPTE ST 292

270 Mb/s SDI, SMPTE ST 259-C

Connector/format: BNC/75Ω panel jack on standard connector panel

Input cable length:

Input 1 (BG1) – SD: 325m Belden 8281

Input 1 (BG1) – HD: 140m Belden 1694A

Input 1 (BG1) – 3G: 90m Belden 1694A

Input 2 (BG2) – SD: 350m Belden 8281

Input 2 (BG2) – HD: 110m Belden 1694A

Input 2 (BG2) – 3G: 100m Belden 1694A

Input 3 (KEY) – SD: 350m Belden 8281

Input 3 (KEY) – HD: 150m Belden 1694A

Input 3 (KEY) – 3G: 100m Belden 1694A

Input 4 (FILL) – SD: 375m Belden 8281

Input 4 (FILL) – HD: 150m Belden 1694A

Input 4 (FILL) – 3G: 120m Belden 1694A

**Analog Reference (ref):** 1x BNC terminated in 75Ω

Standards: HD tri-sync/SD bi-sync, SMPTE ST 274, RS 170A

#### Signal Outputs

Serial digital outputs: 4x 3G/HD/SD serial digital

Program 1,2: 2x SDI program

Auxiliary 1, 2: 2x SDI monitoring (independently selectable) pre-view, program, program pre-fade, background 1&2 (clean feed), fill, key, processed key and pattern (black, color bars) signals

Electrical:

3 Gb/s SDI, SMPTE ST 424 (SMPTE ST 425 level A)

1.5 Gb/s HD-SDI, SMPTE ST 292/SMPTE ST 296

270 Mbit/s SDI, SMPTE ST 259-C

Connector/format: BNC/75Ω panel jack on standard connector panel

Return loss: Better than -15 dB to 3 GHz

Output timing jitter (SD): <0.2 UI

Output timing jitter (HD): <1 UI

Alignment jitter: <0.2 UI

Level: 800 mV +10%

#### Video Delay

Minimum processing delay locked to ref:

SD: 8.5 μs

HD: 2.2 μs

3G-A: 1.2 μs

3G-B: 37 μs

Input to output delay with locked to background input:

SD: 12 μs

HD: 2.8 μs

3G-A: 1.8 μs

3G-B: 38 μs

Note: Synchronizer OK timing window = 1H-0.6 μs for all standards and 1H-7 μs for SD standards.

#### Control Interface

GPIO:

8x bi-directional GPIO

Format: TTL/Open drain ports

Connector: 25-way D-type connector

Ethernet:

1x Ethernet interface

Format: 10/100 Mb/s

Connector: RJ45 Ethernet jack on standard connector panel

#### Important Information

Please note that in order to support the IQLDK30 module and provide the ability to download logos, it is essential to have an Ethernet connection to the unit or transfer logos to the on-board microSD card via an SD card reader.

#### Card Edge Indicators

**Power +:** OK (Green)/No Power (Off)

**Power -:** OK (Green)/No Power (Off)

**CPU OK:** OK (Flashing Green)/No Power (Off)

**Input OK:** OK (Green)/Timing or Std Error (Flashing Green)/No Input (Off)

**Ref OK:** OK (Green)/Std Error (Flashing Green)/No Input (Off)

**Status ERROR:** Active (Red)/BG Input Loss or Standard Error

**Status WARN:** Active (Yellow)/BG Input Timing Error

**Status OK:** Active (Green)/Unit Operating Correctly

**SPECIFICATIONS (CONT.)****RollCall Controls****Video Controls**

Input select: Background 1/background 2

Input status: Reports for each input, the input standard and timing status. Field reports input standard or 'loss'

Input timing: Field reports:

OK, input is safely within the synchronizer window

Warning, input is close to moving out of the synchronizer window, at which point there will be a shift up or down by 1 line

Error

"-", shown against the not-selected background input, any absent input or any input of incorrect standard

Input standards list:

1080 50p-A/59p-A/60p-A/50p-B/59p-B/60p-B

1080 50i/59i/60i

1080 23p/24p/25p/29p/30p

1080 23psf/24psf/25psf/29psf/30psf

720 50p/59p/60p/23p/24p/25p/29p/30p

525 59i/625 50i

**Output Controls**

Output standard: Manual select/follows input

Output standards list:

1080 50p-A/59p-A/60p-A/50p-B/59p-B/60p-B

1080 50i/59i/60i

1080 23p/24p/25p/29p/30p

1080 23psf/24psf/25psf/29psf/30psf

720 50p/59p/60p/23p/24p/25p/29p/30p

525 59i/625 50i

Default video output: Black/color bars/display memory

Program ANC source: Selected background/fill/none

Program fade: Fade to black/fade to program/cut to black/cut to program (default)

Fade frames: Range 1 (cut) to 2047 frames 'fade time' reported is in seconds

Test pattern: Off/color bars

Auxiliary out 1&2: Preview (default)/program/program pre-fade/background 1/background 2/fill/key/processed key/black/color bars

Note: If the standard of selected source differs from the operating standard the output will be black

Key enable object:

DSK: Keyer/mixer

Object assignment to layer 1-6 of program/preview output

**DSK Controls**

Key enable: Program/preview outputs

DSK operation: Keyer/mixer

BGD proc amp controls: Proc amp enable

BGD luma gain range: -6 dB to +6 dB in 0.2 dB steps

BGD black level range: -100 mV to +100 mV in 0.8 mV steps

BGD chroma gain range: -6 dB to +6 dB in 0.2 dB steps

Fill proc amp controls: Proc amp enable

Fill luma gain range: -6 dB to +6 dB in 0.2 dB steps

Fill black level range: -100 mV to +100 mV in 0.8 mV steps

Fill chroma gain range: -6 dB to +6 dB in 0.2 dB steps

Key proc amp controls: Proc amp enable/key invert/key range video

Key gain range: 0 (off) to 13.7 applied after key lift

Key lift range: -10% to 110% in 0.1% steps

Key invert range: -6 dB to +6 dB in 0.2 dB steps

**Keyer Controls**

Fill source: Fill

Key source: Key/fill

Key mode: Luma/linear (pre-shaped)

Key control: Key on/key off/transition on/transition off

Transition frames:

Range 1 (cut) to 2047 fields/frames

Transition time reported is in seconds

Only active for linear key mode

Opacity: Range 100% to 50% in 1% steps

**Mixer Controls**

Control: Cut to background/cut to fill/transition to background/transition to fill/manual mix

Transition type: Mix/fade-fade/fade-cut/cut-fade

Transition frames:

Range 1 (cut) to 2047 fields/frames

Transition time reported is in seconds

Mixer transition time is doubled for fade/fade

Manual mix: Range 0% (selected background) to 100% (fill) in 1% steps

**Layer 1-6 Control – Logo Control**

Layer [n] – key enable: Program/preview output

Active object: Logo name and file

Key action: Cut to on/cut to off/transition to on/transition to off

Transition frames:

Range 1 (cut) to 2047 fields/frames

Transition time reported is in seconds

Animation: Start/stop/pause

Logo opacity: Range 100% to 50% in 1% steps

Logo top position: Range 0% (top of logo aligned with top video line) to 100% (bottom of logo aligned with last video line) in 1% steps

Logo left position: Range 0% (aligned left) to 100% (aligned right) in 1% steps

Logo list: Logo file selected/none

Key mode: Auto/luma/linear (pre-shaped)

**Logo Download**

Note: The logo download software supports the following files: PNG (with embedded key)

Logo limits: Maximum logo file storage capacity of 64 GB on microSD card

**RollCall Controls**

**Genlock:** Operating standard

Genlock status: Free run/force input lock/genlock

Lock source: Frame ref A/frame ref B/external/background (input)

Input timing status: Background/fill/key (OK, warning, error)

Ref. phase: H phase/V phase

H phase range: -2640 to +2640 output standard pixels in steps of 1 pixel (3G-B, 2 pixels)

V phase range: 563 to +562 output standard lines in steps of 1 line (3G-B, 2 lines)

**Memory**

Display memory: Save/clear/recall/name locations 1-32/last recalled

Config memory: Save/clear/recall/name locations 1-32/last recalled

**GPIO**

GPIO 1-8 configuration: Unused/input/output

GPIO 1-8 trigger: State change event

GPIO 1-8 input: Unused, black/fade to black/fade to program/DSK PGM key enable/DSK PGM key disable/layer 1-6 PGM transition to on/layer 1-6 PGM transition to off/display memory 1-32/config memory 1-32 (internal pull-up resistors, 5V open voltage)

GPIO 1-8 output: Black/pattern/in background 1 OK/in background 2 OK/input OK/DSK PGM key enabled/layer 1 key enabled/layer 2 key enabled/layer 3 key enabled/layer 3 key enabled/layer 5 key enabled/layer 6 key enabled (30 mA max. sink current, 5V max. voltage)

**Other Controls****RollCall Logging**

Video input logging: Input name/status/std & errors

Output logging: Standard

Layer object logging: Layer object 1-6 state/name

Misc. logging: Serial no./version

**RollTrack**

RollTrack controls: Source/address/command/status/sending

RollTrack sources: (Internal or detected device states that trigger the sending of RollTracks)

Unused/BG1 loss/BG1 OK/BG2 Loss/BG2 OK/input loss/input OK/fill loss/fill OK/key loss/Key OK/PGM fade/PGM unfade/layer 1-6 key ON/OFF

Timing state: Input error/input no error/fill error/fill no error/key error/key no error

Utility: Product/software version/serial no./rear ID/microSD card available space, video memory free

Clear display data: Clear all logos/clear all text/factory reset/default all

**Ethernet**

Selection: Fixed address, DHCP

Entry fields for: IP address, IP gateway, IP netmask

Current IP config display fields: Current IP address, current IP gateway, current IP netmask

**Module Power Consumption**

IQLDK3000-1B3: 7.5 PR (B frames)

IQLDK3003-2B3: 7.5 PR (B frames)

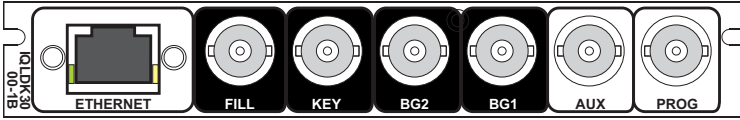
**Relay Bypass Version**

IQLDK3002-2B3: 7.5 PR (B frames)

**ORDERING**

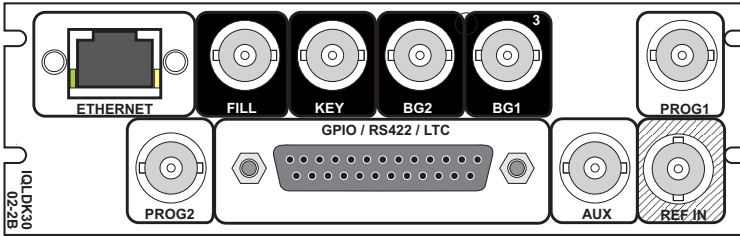
**IQLDK3000-1B3**

3G/HD/SD-SDI Logo inserter and keyer. 2 Background, 1 Fill and 1 Key input, 1 Program and 1 Auxiliary output and Ethernet to card.



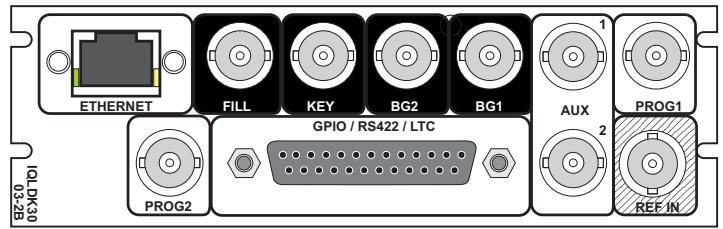
**IQLDK3002-2B3**

3G/HD/SD-SDI Logo inserter and keyer. 2 Background, 1 Fill and 1 Key input, 2 Program and 1 Auxiliary outputs, relay bypass for Background 1 input to Program output 1, 8 GPIO and Ethernet to card.



**IQLDK3003-2B3**

3G/HD/SD-SDI Logo inserter and keyer. 2 Background, 1 Fill and 1 Key input, 2 Program and 2 Auxiliary outputs, 8 GPIO and Ethernet to card.



**Software Options**

**IQOPTL-CLK** – Digital Clock support on IQLDK30

**IQOPTL-CWL1** – Text crawl inserter on IQLDK30

**IQOPTL-CWL2** – Second text crawl inserter on IQLDK30

For more details on enclosure types please refer to the IQ Modular Enclosures datasheet.



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