# Dual Channel Video Processors

Models C2-7110, C2-7100

**C2-7110 2-Channel 9-Input Video Processor** provides two independent video processing and scaling engines and two video mixers for maximum flexibility in handling Composite, YC (S-Video), YUV Component, YPbPr HD Component, DVI, and RGB. At home in both broadcast and display environments, it is multiple products in one.

Three operating modes simplify control:

**Switcher Mode** - Equally powerful Program and Preview channels allow any function (Next Image, PIP, Keying, Logo, etc.) to be set up and previewed, totally independent of the Program output. Transition from Preview to Program is by Cut, Dissolve or Special Effect.

**Independent Mode** - Provides all the power of two completely independent scalers in one box, each with a full range of features, including PIP, Keying, etc. Each output can deliver different formats and resolutions simultaneously. For example, a presentation being fed to a high resolution display on Output 1 via DVI can be fed to a VCR for recording on Output 2 via Composite Video.

**Dual PIP Mode** - Any video input can be squeezed and placed into either of two windows of any size and positioned anywhere on the screen, even overlapping each other with user defined layer priority control. The windows can be placed over any other video input or a static image from memory as the background. The image in the window can then be seamlessly switched, faded or even zoomed. Keying can be applied to each window independently.

**Powerful Features** - 4:4:4 sampling provides full bandwidth color which allows precise keying, including Transparent (Soft) Keys. The 9 video inputs can accommodate signals (either analog or digital, video or computer) in a variety of formats and resolutions. It handles all known HDTV formats plus any analog RGB resolution up to 2048x2048 - and new resolutions can be easily added. Each of the two independent outputs delivers a wide range of digital and analog video signals.

In addition to SD and HD television formats, the C2-7110 output signal format flexibility assures that the native resolution of virtually any Digital Display can be matched. Using the software based resolution calculator, new or unusual resolutions can be instantly added to the menu. Signal parameter adjustments can be made for each video input and are stored in individual non-volatile memories. Integral Test Signals are user defined. A fast Logo memory is provided, so the unit can easily be used as a Logo Inserter. Advanced motion compensation (NTSC and PAL) is employed to smooth out fast moving images and its automatic 3:2 Pull-down detection efficiently de-interlaces video from 24 fps film (NTSC).

**Setup and Control** is extremely flexible. Local control is provided by the 48-button CORIO EXP Front Panel designed expressly for handling live events. These buttons plus the multi-way navigation control and integrated LCD bring all the control needed for quick and easy access right to the front panel. Remote control via RS-232 or Ethernet (IP) is standard. Macros are provided to facilitate complex command sequences. The Windows Control Panel affords complete control of the unit. The CC-300 CORIOconsole option takes control to the next level by providing the C2-7000 series with the operational feel of a traditional Video Production Switcher. Two rows of 14 buttons, a fader bar, joystick and an integrated LCD touch screen provides access to the powerful C2-7000 series functions with a minimum of keystrokes. Event control directly from the CC-300 is available by the integral interface to Calypso control systems. Virtually any third party device is controllable.

C2-7110 Front

C2-7100 Front

C2-7100-7110 Rear

**Multiple Products in One**

- 9-Input Multi-format Seamless Switcher
- 2x Universal Scalers
- 2x Single Window PIP
- 2x Down Converters
- 2x Frame Synchronizers
- 2x Standards Converters
- 2x Chromakeyers
- 2x Aspect Ratio Converters
- 2xLogo Inserters
- 1x Dual Window PIP
- 2x Up Converters
- 2x TBC's
- 2xVideo Transcoders
- 2xLumakeyers
- And more

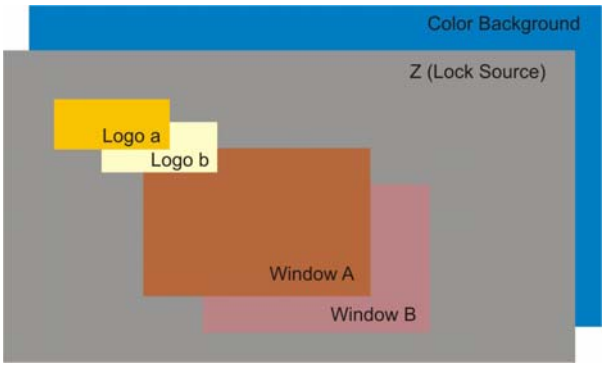
**CC-300 CORIOconsole**

**C2-7100** provides all the functions of the C2-7110 with a different front panel. This version has 10 programmable buttons and a shift key with removable key caps for flexible labeling. It is intended for applications where custom or restricted access to functions is desirable. The programmability of the buttons provides the ability to setup the unit to allow only specific functions to be accessed directly from the front panel buttons. This is particularly important in situations where public access to the unit is available.

**Edge Blending** is a standard feature of the C2-7000 series. Because of the ability to 'feather' any or all of the edges, multiple images can be aligned vertically, horizontally, or both to create unusual displays. Since it is dual channel, only one unit is required to blend two edges. Using multiple units, there is no limit to the number of blended images. Edge Blending is not limited to high resolution RGB computer images, but can be applied to any input. Gamma correction is employed to compensate for many of the problems faced when blending between projectors. Special preparation of the video in advance is not necessary, since all processing is done within the unit.

**Image Layer Processing** within the C2-7000 series utilizes a multiple layer video display system whose stacking order can be altered as desired by the user. Using the dual PIP as an example, the layers consist of:

- 1 or 2 image windows (A & B) that can be resized and positioned as desired
- a lock source (the Z layer) which can be an active video or still image background
- 1 or 2 logo images (a & b)
- a color background




Should the user wish, the layers can be re-ordered (example: B in front of A) and the individual layers can also be made opaque, semi-opaque or transparent. Windows A & B can be positioned anywhere on the screen and used as either key sources or key background images. Logos a & b can also be positioned anywhere on the screen and have their appearance set to opaque normal keying or to semi-transparent for channel branding. When keying, the Z Layer may be moved from the background to the foreground.

## Other products in the C2-7000 family

**C2-7200** provides all the functions of the C2-7100, plus two SD/HD-SDI Inputs and two SD/HD-SDI Outputs.
**C2-7210** provides all the functions of the C2-7110 plus two SD/HD-SDI Inputs and two SD/HD-SDI Outputs.
**C2-7260** provides all the functions of the C2-7210 but with 6 additional HD-SDI Inputs for a total of 17 inputs.
**C2-7310** provides all the features and functions of the C2-7210, plus 48 channels of integral stereo processing. This allows for simultaneous extraction of 8 stereo channels from each of the two SD/HD-SDI inputs and embedding of 8 stereo channels into each of the two SD/HD-SDI outputs. Due to the highly flexible internal audio routing, 32 stereo channels (16 in, 16 out) are not restricted for SDI use, but can be assigned to any of the other Composite, Component, S-Video, analog RGB or DVI inputs and outputs.

## Key Features of the C2-7100, C2-7110

- 9 Multi-format Inputs:
  - 3x Composite Video, 3x YC (S-Video),
  - 3x DVI-I (also handles RGB, YUV & YPbPr)
- 2 Independent Output Channels, each with one:
  - Composite Video, YC (S-Video)
  - DVI-I (also handles RGB, YUV & YPbPr)
- Dual Independent Scaling Engines
- 4:4:4 Sampling for full bandwidth color
- Multiple Conversion & Scaling products in one
- Multi-format Inputs – Digital and Analog
- Analog RGBHV to 2048x2048
- All HDTV Resolutions to 1080p
- Genlock any Video Input to any other
- Seamless Switching with Cuts, Fades or Effects
- Unrestricted Dual PIP - Any Input over any other
- Multiple Layering and Windowing Capability
- Flexible Key Layering - Background Lock Source can be moved to the Foreground
- RS-232 & IP Interface Remote Control
- External Control by Windows Control Panel
- External Control by Third Party Control Systems
- Choice of Front Panels to suit the application:
  - 48 Button CORIO EXP Panel – C2-7110
  - 10 Programmable Buttons + Shift – C2-7100
- External Hardware Control by Optional CC-300
- CORIO2® Technology Conversion Engines
- Zoom up to 1000% with full Positioning
- Image Shrink to 10% with full Positioning

## CORIO2 Technology

This symbol on a product indicates that it is powered by CORIO2™ technology, the most flexible video processing engine now available.

Unlike most manufacturers, who use third party chipsets to provide video conversion, TV One has developed its own proprietary technology known as CORIO2™. This frees TV One products from the constraints imposed by third parties and results in an unsurpassed degree of flexibility. Products based on third party chipsets have a feature set frozen at the introduction of the product. Since the CORIO2™ video processing engine is entirely firmware based, it can be upgraded at any time by downloading the latest firmware version form the support website and flash upgrading the unit in the field. This enables new features to be added to units many years after the initial purchase. This "obsolescence insurance" means that a CORIO2™ based product can always be upgraded to the latest version of that model.

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## Specifications

| | |
|---|---|
| **Video Inputs** | |
| Composite Video | 3x via BNC Connector |
| S-Video (Y/C) | 3x via 4-PIN Mini-DIN Connector |
| DVI-I (Note 1) | 3x via DVI-I Connector |
| **Genlock Input** | |
| Reference Signal | Any of the Video Inputs |
| **Independent Output 1** | |
| Composite Video | 1x via BNC Connector |
| S-Video (Y/C) | 1x via 4-PIN Mini-DIN Connector |
| DVI-I (Note 1) | 1x via DVI Connector |
| **Independent Output 2** | |
| Composite Video | 1x via BNC Connector |
| S-Video (Y/C) | 1x via 4-PIN Mini-DIN Connector |
| DVI-I (Note 1) | 1x via DVI Connector |
| **Input/Output Range** | |
| Computer Resolutions | Analog: Up to 2048x2048<br>DVI: Up to 1280x1024 |
| Max Vert Refresh Rate | 250Hz |
| Max Horiz Frequency | 150KHz |
| HDTV Resolutions | All thru 1080p |
| Interlace Support | Progressive and Interlaced |
| Television Standards | NTSC 3.58, 4.43, PAL-B,G,I ,D, H, PAL-M, PAL-N & SECAM (In Only) |
| **Input RGB Sync** | |
| Type | RGBHV, RGBS, RGsB |
| Level / Impedance | TTL, 10KΩ |
| Polarity | Positive or Negative |
| Maximum Level | 5Vp-p |
| **Output RGB Sync** | |
| Type | RGBHV, RGBS,RGsB |
| Level / Impedance | 5Vp-p, 220Ω |
| Polarity | Positive or Negative |
| **Audio Switching** (Optional A2-2000) Note 2 | |
| Stereo Inputs | 10x Balanced and Unbalanced |
| Program Output | 1x Balanced and Unbalanced |
| Preview Output | 1x Balanced and Unbalanced |
| Connectors per I/O | 2x RCA for Unbalanced |
| **Control Methods** | |
| Local Front Panel | 10x2 Programmable Buttons +LED, Rotary Selector, and LCD |
| RS-232 Interface | DB-9 Male Connector |
| IP Interface | RJ45 Connector |
| **Mechanical** | |
| Desktop Case (HWD) | 1.75”x17”x7.9” (44x420x200mm) |
| With Rack Ears (HWD) | 1.75”x19”x7.9” (44x482x200mm) |
| Weight (Net) | 8.4 lbs (3.8 kg) |
| **Environmental** | |
| Operating Temperature | +40° to +113° F (4° to +45° C) |
| Operating Humidity | 10% to 85%, Non-condensing |
| Storage Temperature | 32° to +140° F (0° to +60° C) |
| Storage Humidity | 10% to 85%, Non-condensing |
| **Regulatory Approvals** | |
| Video Scaler Unit | FCC, CE, RoHS |
| Power Supplies | UL, CE, CSA, RoHS |
| **Warranty** | |
| Limited Warranty | 2 Years Parts and Labor |

| | |
|---|---|
| **General** | |
| Image Size & Position | AutoSet or Manual |
| Image Zoom Range | Continuous to 1000% |
| Image Shrink Range | Continuous to 10% |
| Image Mirroring | Horizontal and/or Vertical |
| Image Freeze | Full Frame |
| Video Sampling Rate | 108MHz |
| Resolution Memory | Approximately 1,000 Definable |
| Firmware Memory | Flash, Upgradeable via RS-232 |
| Flicker Filter | 4-Level Vertical |
| Picture-in-Picture | 2 Windows + Background from any 3 Video Inputs |
| Number PIP Windows | 2 in Dual PIP Mode<br>1 in Switcher & Ind. Modes |
| Video I/O Impedance | 75Ω |
| Video Decoder | 9-bit Digital |
| Comb Filter Decoding | Adaptive |
| De-Interlacing (PAL-NTSC) | Pixel-level Motion Adaptive |
| Film Mode (NTSC) | 3:2 Pull Down Detection |
| Video Encoder | 10-bit Digital |
| Digital Sampling | 24-bit, 8-bits per R, G and B |
| Colors | 16.7 Million |
| Video Scaling Engine | Proprietary CORIO2® |
| Internal Format | 4:4:4 YUV |
| Internal Test Patterns | User Defined |
| LCD Panel | 24x2 Character |
| Logo Inserter | Flash Programmable |
| Proc Amp Adjustments | Brightness, Contrast, Saturation, & Hue for CV & SV Inputs, plus Video Level for RGB Input |
| Proc Amp Memory | Settings for each Video Input |
| **Power Requirement** | |
| Internal Power Supply | 100-240VAC, 47-63Hz, 50W |
| **Accessories Included** | |
| 1x C-Video I/O Cable | 6’ (2m) BNC to BNC |
| 1x S-Video I/O Cable | 6’ (2m) 4-Pin S-V to 4-Pin S-V |
| 1x DVI I/O Cable | 6’ (2m) DVI-I to DVI-I |
| 5x RGBHV I/O Adapters | DVI to HD-15 Adapters |
| 1x AC Power Cord | 6’ (2m) US, UK or Euro Type |
| 1x RS-232 Cable | 6’ (2m) D9F to DB9F |
| 1 DVI-A to 5 BNC | 6’ (2m) DVI-A to 5 BNC |
| 1x Operations Manual | |
| 1x Rackmount Kit | 2 Ears and 4 Screws |
| 1x Control Software | Downloadable from website |
| **Product Item Number** | |
| C2-7110 | Version w/CORIO EXP Front Panel |
| C2-7100 | Version w/Programmable Panel |
| **Optional Accessories** | |
| CC-300 | CORIOconsole |
| A2-2000 | Audio Switcher |

**Notes**

(1) DVI-I Input/Output connectors also accommodate RGBHV, RGBS, RGsB, YUV & YPbPr signal formats.

(2) A2-2000 is controlled from the C2-7100 and provides Audio Follow Video or Audio Breakaway.

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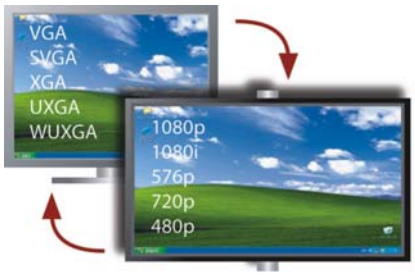
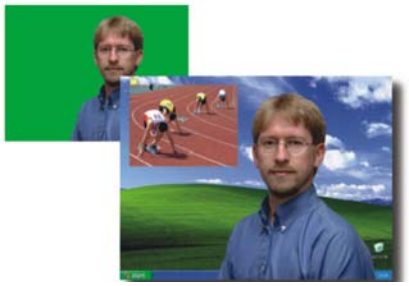
## Sample Capabilities



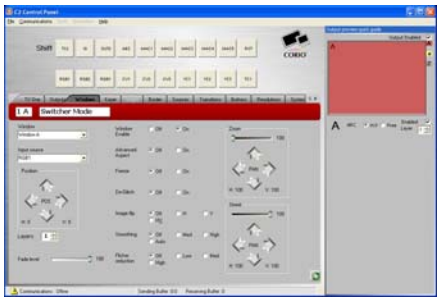

Dual Channel Universal Signal Conversion – Up, Down, Cross



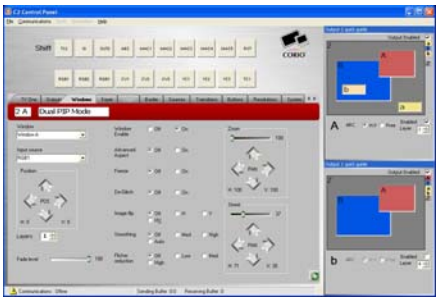
Dual Channel Chromakey with simultaneous PIP Insertion

Multi-Format, Dual PIP over an Active Video Background

## Sample Windows Control Panel Screens



Window Setup Menu



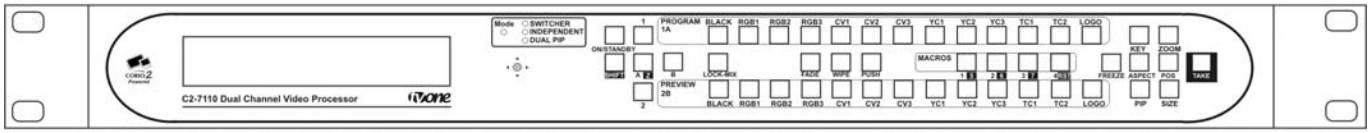
Switcher Dual PIP Menu

Outputs Menu

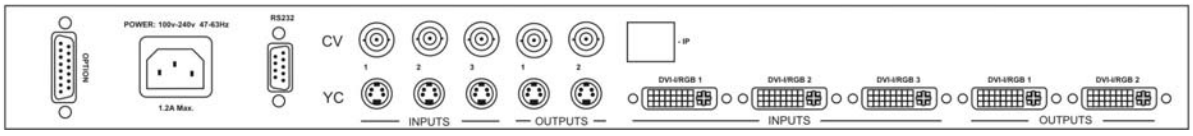
Resolution Editor Menu

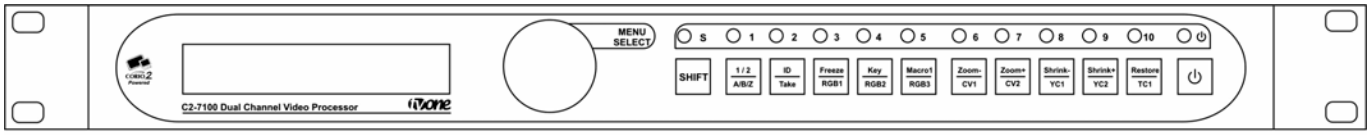
Keyer Menu

## Panel Drawings




C2-7110




C2-7100