



1T-C2-511 and 1T-C2-520

User Guide V3.00

In this guide

Welcome	1
Features	1
About your 1T-C2-511	1
1T-C2-511 front panel	1
1T-C2-511 rear panel	1
Video/Audio inputs and outputs	1
1T-C2-520	2
1T-C2-520 front panel	2
1T-C2-520 rear panel	2
Video inputs and outputs	3
Front panel controls	4
Button controls	4
Default settings	4
Control	4
The menu	4
Troubleshooting and FAQs	6
The unit does not power up	6
There is no picture on the output of your unit	6
There is no audio on the output of your 1T-C2-511	6
The controls are not responding	7
The ERROR LED remains illuminated on the 1T-C2-520	7
The picture on the video display is green	7
The output image is distorted	7
Changing the input resolution causes the output video to be unstable	7
There is no output from the 1T-C2-511	7
The PC is set to output 720P but there is no output from the 1T-C2-520	7
General troubleshooting checklist	7
Returning a product for repair	8
Connector pinouts	8
DVI-I connector	8
RS232 / D9 socket	9
Specifications	10
1T-C2-511 SD/HD-SDI to DVI-I converter and audio de-embedder	10
Video input	10
Video output	10
Audio input	10
1T-C2-520 DVI-I to SD/HD-SDI Converter	11
Video input	11

Video output	11
Regulatory compliance	11
Environmental	11
Power requirement	11
Control methods.....	11
Accessories in box	11
Mechanical.....	12
Optional accessories	12
Contact us.....	12

Welcome

The 1T-C2-511 and 1T-C2-520 are compact (half-rack) standard and high definition video format converters capable of converting resolutions from 525i to 1080p without scaling.

The 1T-C2-511 is a SD/HD-SDI to DVI-I format converter and Audio De-Embedder capable of converting from standard and high definition serial digital video simultaneously to DVI digital and analog. Audio can be extracted from any stereo pair selected from any of 8 embedded within the SDI. The extracted stereo audio signal is then output as a single AES-3id output and a stereo analog audio pair. The input SDI signal is equalized and provided as a re-clocked output.

The 1T-C2-520 is a DVI-I and YUV to SD/HD-SDI format converter capable of converting analog and digital DVI signals to standard and high definition serial digital video signals. Input analog formats include RGBHV, RGBS, RGsB, YUV and YPbPr.

These two units have been designed to a high standard with ease of use and reliability in mind, utilizing intuitive simple to use controls and interfaces, as well as rugged metal cases for robustness in tough environments. Up to two units can also be rack mounted using the optional RM-220 single/dual rack-mount kit.

Features

Simple control

In many instances both units need no set up or control, but can be used straight from the box. However, both are provided with buttons and LEDs on the front panel and an on-screen display (OSD) to allow control of the unit and show status.

Upgradeability

Both units benefit from firmware upgradeability, thus reducing product obsolescence by allowing the installation of the latest version of firmware. This only applies to the software used to control the unit, and not its actual functionality. See tvone.com/support for more detail.

About your 1T-C2-511

The 1T-C2-511 is an HD/SD-SDI to DVI-I format converter with reclocked SDI loop thru and audio extraction. Video processing is achieved using proprietary video processing.

Audio de-embedding may alter control and user data within the AES output, but will not normally change the video or audio signals.

SD-SDI inputs will be line doubled to be compatible with the DVI standard.

1T-C2-511 front panel



1T-C2-511 rear panel



Video/Audio inputs and outputs

MNL-1T-C2-5xx-SERIES-V3.00

Visible in the images, the units have:

- 1 SD/HD-SDI input
- 1 SD/HD-SDI re-clocked output
- 1 DVI-I output
- 1 AES-3id output
- 1 Stereo audio output on two RCA jack sockets

Input formats:

- SD-SDI SMPTE 259M-C (270Mbps) with or without embedded audio
- HD-SDI SMPTE 292M (1.485/1.4835Gbps) with or without embedded audio

Output formats:

- SDI Loop thru matches the input format.
- DVI-I
- RGBHV, RGBS, RGsB, YUV, YPbPr
- AES-3id on BNC
- Stereo audio on 2 off RCA

Input-output conversion table:

Input Signal	Video Output Signal	
525-line SD-SDI @ 29.97Hz	Analog	525-line progressive RGBHV @ 29.97
	Digital	525-line progressive DVI-D @ 29.97Hz
625-line SD-SDI @ 25Hz	Analog	625-line progressive RGBHV @ 25Hz
	Digital	625-line progressive DVI-D @ 25Hz
720p HD-SDI @ 23.98, 24 Hz, 25Hz, 29.97Hz, 30Hz, 50Hz, 59.94Hz, 60Hz	Analog	720-line progressive RGBHV @ same frame rate as input
	Digital	720-line progressive DVI-D @ same frame rate as input
1080p HD-SDI @ 23.98Hz, 24Hz, 25Hz, 29.97Hz, 30Hz	Analog	1080-line progressive RGBHV @ same frame rate as input
	Digital	1080-line progressive DVI-D @ same frame rate as input
1035i HD-SDI @ 29.97 Hz, 30Hz	Analog	1035-line interlaced RGBHV @ same frame rate as input
	Digital	1035-line interlaced DVI-D @ same frame rate as input
1080i HD-SDI @ 25Hz, 29.97Hz, 30Hz	Analog	1080-line interlaced RGBHV @ same frame rate as input
	Digital	1080-line interlaced DVI-D @ same frame rate as input

1T-C2-520

This is a DVI-I to HD/SD-SDI format converter without scaling.

1T-C2-520 front panel



1T-C2-520 rear panel



Video inputs and outputs

Visible in the images, the units have:

- 1 YPbPr input on 3 BNC connectors
- 1 DVI-I input
- 1 SD/HD-SDI output

Input formats:

- DVI
- RGBHV, RGBS, RGsB, YUV, YPbPr on DVI-I connector.

Output formats:

- SD-SDI SMPTE 259M-C (270Mbps)
- HD-SDI SMPTE 292M (1.485/1.4835Gbps)

Input-output conversion table:

Video Input Signal		Output Signal
Analog	NTSC	525-line SD-SDI @ 29.97Hz
Digital	N/A	
Analog	PAL	625-line SD-SDI @ 25Hz
Digital	N/A	
Analog	720-line progressive RGBHV @ 23.98, 24 Hz, 25Hz, 29.97Hz, 30Hz, 50Hz, 59.94Hz, 60Hz	720p HD-SDI @ 23.98, 24 Hz, 25Hz, 29.97Hz, 30Hz, 50Hz, 59.94Hz, 60Hz
Digital	720-line progressive DVI-D @ 23.98, 24 Hz, 25Hz, 29.97Hz, 30Hz, 50Hz, 59.94Hz, 60Hz	
Analog	1080-line progressive RGBHV @ @ 23.98Hz, 24Hz, 25Hz, 29.97Hz, 30Hz	1080p HD-SDI @ 23.98Hz, 24Hz, 25Hz, 29.97Hz, 30Hz
Digital	1080-line progressive DVI-D @ @ 23.98Hz, 24Hz, 25Hz, 29.97Hz, 30Hz	
Analog	1035-line interlaced RGBHV @ 29.97 Hz, 30Hz	1035i HD-SDI @ 29.97 Hz, 30Hz
Digital	1035-line interlaced DVI-D @ 29.97 Hz, 30Hz	
Analog	1080-line interlaced RGBHV @ 25Hz, 29.97Hz, 30Hz	1080i HD-SDI @ 25Hz, 29.97Hz, 30Hz
Digital	1080-line interlaced DVI-D @ 25Hz, 29.97Hz, 30Hz	

Front panel controls

Button controls

The following buttons are available on the front of the unit include all or some of the following:

Button	Button Function
Menu	Activates the on screen display and allows for menu control
↓	This displays the previous menu item
↑	This displays the next menu item
Input	Input select (1T-C2-520 only). Press to cycle thru the input sources.
Standby	Hold in to put the unit into Standby (power-save) mode. Hold in briefly to come out of Standby mode.

Default settings

When your unit powers up for the first time, the LED next to the Menu button will illuminate showing that the unit is operational. If there is no valid input, the 1T-C2-5111 will output the OSD in 720p, and on 1T-C2-520 will output the OSD in 525i resolution. If there is a valid input then the output signal will be present on all outputs simultaneously. In the same way if the SDI video input has audio present on channels 1 and 2, then these will be output on both AES and analog stereo outputs, else they will be muted.

Control

The on-screen display (OSD) is controlled from the front panel using the MENU, ↓ and ↑ buttons on the front panel. Pressing the MENU button once will activate the OSD. Holding the MENU button in for a short while will then close the OSD.

While the OSD is active, use the ↓ and ↑ arrowed keys to change where you are in the menu.

You can edit values in square brackets '[]' by pressing the MENU button once (you will note that the brackets surrounding a particular parameter's value will begin to flash). Change the value by using the ↓ and ↑ buttons to decrease and increase the value respectively. Then finalize your adjustment by pressing the MENU button once more.

A few menu items have multiple parameters within an individual menu selection. In those cases, you can adjust one item, and then move to the next etc.

Holding the MENU button in for a few seconds stores all changes in memory. Unless you intentionally change it again later, the adjustment will remain even after power is removed from the unit.

On the 1T-C2-520 repeatedly pressing the INPUT button cycles through the three possible inputs, DVI-D, DVI-A and YPbPr. If the selected input has no connection or the resolution is not one of those supported by the unit, then the error LED will illuminate and the output resolution will revert to 525i with the OSD permanently on.

The menu

Menus are arranged so that a particular general function has a menu name on the top line and beneath that either a sub-menu or one or more related individual settings are displayed.

In some cases the functionality is global – meaning it has an effect on the unit as a whole (such as changing the output format). In the majority of cases, the function is related to a specific operational area of the unit, detailed by the text in the top line.

There are two screens that appear before the Group Menus (sub-menus) are accessed.

TV One CORIO2 1T-C2-5xx

The first is the 'welcome' display shown above indicating the model of the unit.

www.tvone.com SW: 154. PT: 70, BT: 65
--

Moving to the next menu item displays the firmware information screen (the numbers on your unit will be different to those shown). The SW number refers to the version of firmware loaded into the unit, this can be upgraded from the support website.

The PT and BT numbers refer to Hardware version information and are of interest to the Technical Support Group should you ever need assistance.

The source display screen allows the input source for the currently selected window to be changed. The top

1280x720 60Hz
CORIO2 1T-C2-511
Audio L&R extract [1&2]

line of the display shows the detected characteristics of the signal. Valid input sources match those available on the front of the unit.

This menu item allows you to select different pairs of audio channels from the SDI signal and route them to both the AES-3id and the stereo analog outputs. The odd channels will be routed to the left output, whilst the even channel will be routed to the right output.

This menu item allows you to select the type of signal output your unit will provide. Types of output vary depending on the resolution selected and include various types of component signals YUV with tri level sync. (tYUV) and RGB signals RGBHV, RGBS, RGsB (sync on green).

This positions the selected Window horizontally and vertically on the monitor. This should only be used for

CORIO2 1T-C2-511
Output type [RGBHV]
CORIO2 1T-C2-5xx
H/V shift [0] [0]
Push to store

'fine tuning' and should not normally require adjustment.

This screen provides a quick and easy way to store all current operating parameters. The unit will remember the set up you are currently using at the time of data storage and also when you next apply power. To store the current settings, press and release the menu button.

CORIO2 1T-C2-5xx	
OSD on power up	[On]

This parameter controls whether the 'welcome' screen is displayed or not on power up – it can be disabled as required. This is useful when a unit is installed as part of an overall system.

This menu item allows the adjustment of the serial baud rate used for RS-232 communications. The rate can

CORIO2 1T-C2-5xx	
RS232 baud rate	[57600]

be adjusted to 9600, 19200, 28800, 33600, 38800, 57600 and 115200. (This adjustment is provided for those instances where you wish to use the RS-232 control system for your own purposes.) The default baud rate is 57600.

Power Cycles refers to how many times the unit has been powered since it left the factory. This is an

CORIO2 1T-C2-5xx	
Power cycles	4

informational screen. No action is taken regardless of the value shown here, however some users have an equipment cleaning or specification audit procedure and this information may be useful to those users.

Indicates the total number of times the firmware has been changed over the life of the unit. It is quite possible for this to be more than 1, as a unit undergoes numerous tests during production.

CORIO2 1T-C2-5xx	
Hours in Use	4

This is another informational display for usage audit purposes.

Troubleshooting and FAQs

The unit does not power up

When powered, you should see one or more LEDs illuminated on the front panel. If this is not the case, check that the power supply is plugged in and is the correct voltage and polarity.

There is no picture on the output of your unit

If no LEDs are on, then ensure that the AC power adaptor is connected properly and the power switch is on at the AC outlet.

Check that video is being input to the unit by connecting your video source directly to the receiving equipment.

Check that the display video equipment is set to the correct line input and format/standard as appropriate.

Check that the device connected to the output is on and can support the resolution of the input device.

There is no audio on the output of your 1T-C2-511

If no LEDs are on, then ensure that the AC power adaptor is connected properly and the power switch is on at the AC outlet.

Check that there is audio embedded in the SDI source, and that you have selected audio channels with audio present.

The controls are not responding

Check that the unit is powered and that the LEDs are illuminated.

The ERROR LED remains illuminated on the 1T-C2-520

Check that video is being input to the unit by connecting your video source directly to the receiving equipment.

Check that the display video equipment is set to the correct line input and format/standard as appropriate.

Check that the device connected to the output is on and can support the resolution of the input device by comparing it with the resolutions in the specifications at the end of this manual.

The picture on the video display is green

The Output type is probably incorrectly set to YUV mode, whereas you are connected to an RGB monitor – see Adjust outputs menu.

The output image is distorted

This may occur where some of the areas of the image are dark and others are very bright. The solution is to adjust the contrast and brightness settings on your Output device to rectify the problem.

Changing the input resolution causes the output video to be unstable

This may occur when changing between two similar resolutions (such as 720p 59.94Hz and 720p 60Hz). Because the unit is able to compensate for poor input resolutions changing between similar resolutions may be seen by the unit as the input frequency 'drifting.' In order to lock to the new resolution a power cycle or re-connecting the input may be necessary.

There is no output from the 1T-C2-511

Check that the input resolution is supported by the unit. The unit is designed to conform to SDI specifications, for a full list of available resolutions look at the 1T-C2-511 Input-output conversion table.

The PC is set to output 720P but there is no output from the 1T-C2-520

Some PC graphic cards do not output 1280 x 720p correctly. There appear to be two variants of this resolution, one with the correct number of lines per frame (750), and one with the incorrect number (746). It would seem that this is due to some graphic cards being unable to generate the correct pixel clock frequency (74.25MHz for 60Hz and 74.1758MHz for 59.94Hz).

This makes it impossible for the 1T-C2-520 DVI-I to SDI convertor to correctly convert this to HD-SDI. The only solution for this issue is to consult the graphics card manufacture or try another graphics card.

General troubleshooting checklist

If specific troubleshooting advice isn't helping, or your product has stopped working, go through the points below. If your product still doesn't work, you might need to return it for repair.

1. Make sure your product is set up correctly, as shown in this guide.
2. Check that your cables and equipment are all connected firmly.
3. Check that your product is connected to an electrical outlet that is switched on.

Can you see LED lights on the front of your product?

4. Test your sources by connecting them directly to a display.

5. Test your display by connecting it directly to a source.
6. Test each cable.
7. Try restoring your product to factory default settings.

Note: during factory reset your custom settings are deleted.

8. Try updating your firmware.

Note: during a firmware update your custom settings are deleted.

Returning a product for repair

You can request to return your product to tvONE™ for repair. When you contact tvONE support, have the following information ready.

- Product type
- Serial number of the faulty unit (this is on the underside of the unit)
- Full details of the issue
- Invoice number (if available)

Contact tvONE support for your area.

- Customers in North, Central, and South America (NCSA), email tech.usa@tvone.com.
- Customers in Europe, the Middle East, and Africa (EMEA), email tech.europe@tvone.com.
- Customers in Asia, email tech.asia@tvone.com.

EMEA and Asia

Customers in EMEA and Asia receive an RMA Request form from tvONE support. Complete the form and return it to tvONE support for your area.

All customers

tvONE support decides if your product needs to return for repair, and, if needed, provide a return authorization number.

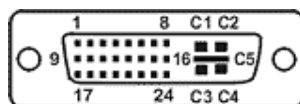
Send your product to tvONE by insured carrier or registered mail. Write your return authorization number on the outside of the packaging, and on any documents you send with your product.

You must arrange and pay for shipping and insurance. Products in transit are your responsibility. tvONE does not accept responsibility for products lost in transit.

Do not return a product for warranty repair without a return authorization number. tvONE will not repair your product.

Connector pinouts

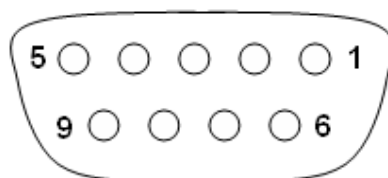
DVI-I connector



PIN#	SIGNAL	PIN#	SIGNAL
1	T.M.D.S DATA 2-	16	HOT PLUG DETECT

PIN#	SIGNAL	PIN#	SIGNAL
2	T.M.D.S DATA 2+	17	T.M.D.S DATA 0-
3	T.M.D.S DATA 2/4 SHIELD	18	T.M.D.S DATA 0+
4	T.M.D.S DATA 4-	19	T.M.D.S DATA 0/5 SHIELD
5	T.M.D.S DATA 4+	20	T.M.D.S DATA 5-
6	DDC CLOCK [SCL]	21	T.M.D.S DATA 5+
7	DDC DATA [SDA]	22	T.M.D.S CLOCK SHIELD
8	Analog Vertical Sync	23	T.M.D.S CLOCK+
9	T.M.D.S DATA 1-	24	T.M.D.S CLOCK-
10	T.M.D.S DATA 1+		
11	T.M.D.S DATA 1/3 SHIELD	C1	Analog Red
12	T.M.D.S DATA 3-	C2	Analog Green
13	T.M.D.S DATA 3+	C3	Analog Blue
14	+5V POWER	C4	Analog Horizontal Sync
15	GND (return for +5V, HSync and VSync)	C5	Analog Ground (analog R, G and B return)

RS232 / D9 socket



1. N/C
2. TX (Transmit data)
3. RX (Receive data)
4. N/C
5. GND (Signal return)
6. N/C
7. CTS (Clear to send)
8. RTS (Request to send)
9. N/C

Specifications

1T-C2-511 SD/HD-SDI to DVI-I converter and audio de-embedder

Video input

SD-SDI:	SMPTE 259M-C 270Mbps
HD-SDI:	SMPTE 292M 1.485/1.4835Gbps

Video output

SD/HD-SDI:	Equalized and re-clocked.
DVI-D:	3+1 TMDS Channels,
DVI-A HV sync:	TTL Level, 56ohm output termination (TTL)
RGB Level Range:	0.5-2.0 V p-p approx.
Formats:	Analog RGB/YPbPr supporting RGBHV, RGBS, RGsB & YPbPr
Resolutions:	525-line @ 29.97 625-line @25Hz 720p @ 23.98Hz, 24Hz, 25Hz, 29.97Hz 30Hz, 50Hz, 59.94Hz, 60Hz 1080p @ 23.98Hz, 24Hz, 25Hz, 29.97Hz 30Hz 1035i @ 29.97Hz 30Hz 1080i @ 25Hz, 29.97Hz 30Hz

Audio input

Selectable in pairs from any 16 embedded channels

Supported Quantization:	24 or 20bit
Supported Sampling:	48 kHz
Stereo Analog output	
Bandwidth:	< 50 Hz to > 20 kHz
THD+N	-72 dB @1 kHz
Crosstalk	< -72 dB @1kHz
AES	3id Output
Level:	1 Vpp
Supported Quantization:	24 or 20bit
Supported Sampling:	48 kHz
Impedance:	75 Ω
THD+N	-115 dB

1T-C2-520 DVI-I to SD/HD-SDI Converter

Video input

YPbPr:	Analog YPbPr
DVI-D:	3+1 TMDS Channels,
DVI-A: HV sync:	TTL Level, 10 kΩ input termination (TTL)
RGB Level Range:	0.5-2.0 V p-p approx.
Formats:	Analog RGB supporting RGBHV, RGBS, RGsB

Video output

SD-SDI:	SMPTE 259M-C 270Mbps
HD-SDI:	SMPTE 292M 1.485/1.4835Gbps
Resolutions:	525-line @ 29.97 625-line @ 25Hz 720p @ 23.98Hz, 24Hz, 25Hz, 29.97Hz 30Hz, 50Hz, 59.94Hz, 60Hz 1080p @ 23.98Hz, 24Hz, 25Hz, 29.97Hz 30Hz 1035i @ 29.97Hz 30Hz 1080i @ 25Hz, 29.97Hz 30Hz

Regulatory compliance

Main unit conforms to FCC, CE, RoHS

Environmental

Operating Temperature:	0° to +45° C (+32° to +113° F)
Operating Humidity:	10% to 85%, Non-condensing
Storage Temperature:	10° to +70° C (+14° to +158° F)
Storage Humidity:	10% to 85%, Non-condensing

Power requirement

External power supply specification: 12v DC regulated 0.5Amp PSU with a 2.5mm locking center-pin positive DC power connector. A non-locking 2.5mm DC power connector will also fit.

Actual current consumption varies between units.

Internal over-voltage & over-current protection.

Control methods

The unit can be controlled locally via the front panel buttons and on-screen display.

Accessories in box

1T-C2-511	DVI to VGA adaptor
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1T-C2-520	None
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Mechanical

Size (H x W x D):	1.2"x7.9"x3.5" (30x200x89mm)
Weight (Net):	1.3 lbs (580g)

Optional accessories

RM-220:	single/dual rack-mount Kit
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Contact us

tvone.com

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Support EMEA: tech.europe@tvone.com

Support Asia: tech.asia@tvone.com

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