# datavideo

SDI AUDIO EMBEDDER

# DAC-91
## Instruction Manual

www.datavideo.com

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**Disclaimer of Product and Services**

The information offered in this instruction manual is intended as a guide only. At all times, Datavideo Technologies will try to give correct, complete and suitable information. However, Datavideo Technologies cannot exclude that some information in this manual, from time to time, may not be correct or may be incomplete. This manual may contain typing errors, omissions or incorrect information. Datavideo Technologies always recommend that you double check the information in this document for accuracy before making any purchase decision or using the product. Datavideo Technologies is not responsible for any omissions or errors, or for any subsequent loss or damage caused by using the information contained within this manual. Further advice on the content of this manual or on the product can be obtained by contacting your local Datavideo Office or dealer.

# FCC Compliance Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

(1)  This device may not cause harmful interference, and
(2)  This device must accept any interference received, including interference that may cause undesired operation.

# Warnings and Precautions

1.  Read all of these warnings and save them for later reference.
2.  Follow all warnings and instructions marked on this unit.
3.  Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4.  Do not use this unit in or near water.
5.  Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
6.  Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7.  This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your Datavideo dealer or your local power company.
8.  Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9.  If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord's rating.
10.  Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11.  Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in risk of fire or electric shock. Never spill liquid of any kind onto

or into this unit.

12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.

13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:
    a. When the power cord is damaged or frayed;
    b. When liquid has spilled into the unit;
    c. When the product has been exposed to rain or water;
    d. When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;
    e. When the product has been dropped or the cabinet has been damaged;
    f. When the product exhibits a distinct change in performance, indicating a need for service.

# Warranty

## *Standard Warranty*

- Datavideo equipment are guaranteed against any manufacturing defects for one year from the date of purchase.
- The original purchase invoice or other documentary evidence should be supplied at the time of any request for repair under warranty.
- The product warranty period begins on the purchase date. If the purchase date is unknown, the product warranty period begins on the thirtieth day after shipment from a Datavideo office.
- All non-Datavideo manufactured products (product without Datavideo logo) have only one year warranty from the date of purchase.
- Damage caused by accident, misuse, unauthorized repairs, sand, grit or water is not covered under warranty.
- Viruses and malware infections on the computer systems are not covered under warranty.
- Any errors that are caused by unauthorized third-party software installations, which are not required by our computer systems, are not covered under warranty.

- All mail or transportation costs including insurance are at the expense of the owner.
- All other claims of any nature are not covered.
- All accessories including headphones, cables, and batteries are not covered under warranty.
- Warranty only valid in the country or region of purchase.
- Your statutory rights are not affected.

## *Three Year Warranty*

- All Datavideo products purchased after July 1st, 2017 are qualified for a free two years extension to the standard warranty, providing the product is registered with Datavideo within 30 days of purchase.
- Certain parts with limited lifetime expectancy such as LCD panels, DVD drives, Hard Drive, Solid State Drive, SD Card, USB Thumb Drive, Lighting, Camera module, PCIe Card are covered for 1 year.
- The three-year warranty must be registered on Datavideo's official website or with your local Datavideo office or one of its authorized distributors within 30 days of purchase.

## Disposal

**For EU Customers only - WEEE Marking**

This symbol on the product indicates that it should not be treated as household waste. It must be handed over to the applicable take-back scheme for the recycling of Waste Electrical and Electronic Equipment. For more detailed information about the recycling of this product, please contact your local Datavideo office.

**CE Marking** is the symbol as shown on the left of this page. The letters "CE" are the abbreviation of French phrase "Conformité Européene" which literally means "European Conformity". The term initially used was "EC Mark" and it was officially replaced by "CE Marking" in the Directive 93/68/EEC in 1993. "CE Marking" is now used in all EU official documents.

## Introduction

DAC-91 is an SDI Audio Embedder that allows the user to embed 2 channels of mixed analog audio signals into the SDI video signal.

It features 3G/HD/SD-SDI to support up to 1080p/60 video format, and automatically detects and switches between different formats. In addition, mini XLR and RCA audio connectors are provided as inputs for analog audio with left mini XLR and RCA mixed to CH1 and right mini XLR and RCA mixed to CH2.

The Audio Box also allows the user to adjust audio gain using the built-in DIP switches.

## *Features*

- SDI audio embedder supporting 3G-SDI Level A/B at 1080p/1080i/720p
- Single or dual audio channel mixing with channels 3/4 bypass
- Automatic detection of  3G, HD, and SD videos
- 4 analog audio inputs (Mini XLR x 2 / RCA x 2)
- Audio level indicator display
- SMPTE/EBU audio levels
- 5 audio gain settings
- Control via DIP Switches
- Rack mounted using RMK-2

## Connections & Controls

### *Front Panel*
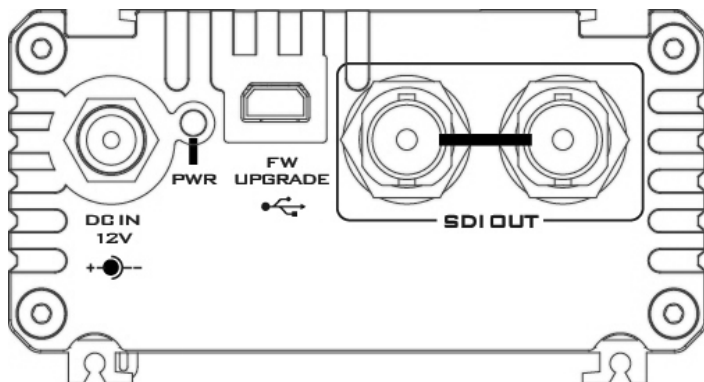


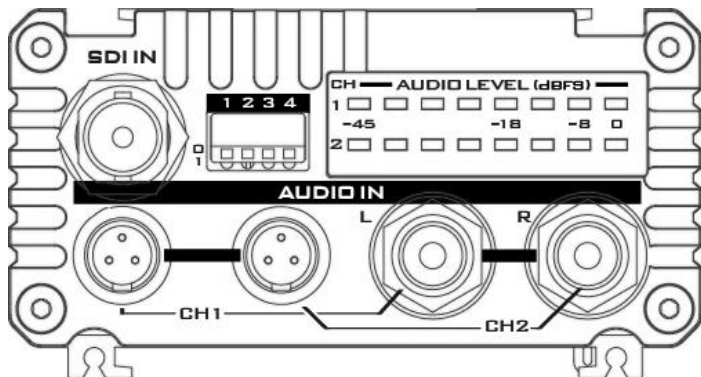| | |
|---|---|
|  | **DC In Socket**<br>Connects the supplied 12V PSU to this socket. The connection can be secured by screwing the outer fastening ring of the DC In plug to the socket. |
|  | **Power Indicator**<br>Indicates the power status |
|  | **SDI OUT**<br>SDI Video and Audio output |
|  | **Mini-USB**<br>For firmware Upgrade, see *__Firmware Update__* for details. |

## *Rear Panel*



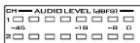| | |
|---|---|
|  | **SDI IN**<br>SDI input for video and audio |
|  | **Mini-XLR**<br>Balanced XLR audio input channel x 2 |
|  | **RCA**<br>Unbalanced RCA audio input channel x 2 |
|  | **Audio Level Indicator**<br>LED colors and the corresponding audio levels |
|  | **4 PIN DIP Switch**<br>Audio level adjustment; see the table below for details. |

**Audio Level Indicator**

| Green | | | | | Yellow | | Red |
|---|---|---|---|---|---|---|---|
| -45~-40 | -39~-35 | -34~-29 | -28~-24 | -23~-18 | -17~-13 | -12~-8 | -7~0 |

(Unit : dBFS)

| 4 PIN DIP SWITCH CONFIGURATION | | | | | | |
|---|---|---|---|---|---|---|
| DIP SW 1 | | DIP SW 2-4 | | | | |
| Audio Level | | Audio Gain Setting & Firmware Upgrade | | | | |
| 0<br>1 | SMPTE<br>EBU | 000 | 0dB | 011 | +12dB | 110 | Firmware Upgrade 1 |
| | | 001 | +6dB | 100 | -12dB | 111 | Firmware Upgrade 2 |
| | | 010 | -6dB | | | | |

## Firmware Update

From time to time, Datavideo may release new firmware to either add new features or to fix reported bugs in the current DAC-91 firmware. Customers can update the firmware themselves if they wish or they can contact their local dealer or reseller for assistance should they prefer this method.

This section describes the firmware update process and it should take *approximately few minutes to complete*. Once started, *the update process should not be interrupted in any way* as this could result in a non-responsive unit.

### *Requirements*

1. Latest firmware files
   - Firmware 1: MCU
   - Firmware 2: FPGA
2. A Male USB A to Male mini-USB cable not longer than 2 meters
3. A Windows PC with USB 2.0 ports

### *Firmware 1 Update Procedure*

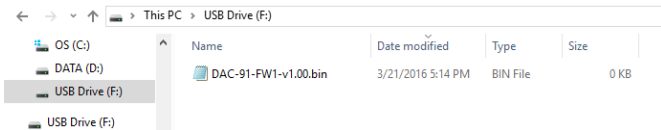1. When power is not connected, set DIP SW 2-4 to 110 as shown in the diagram below:
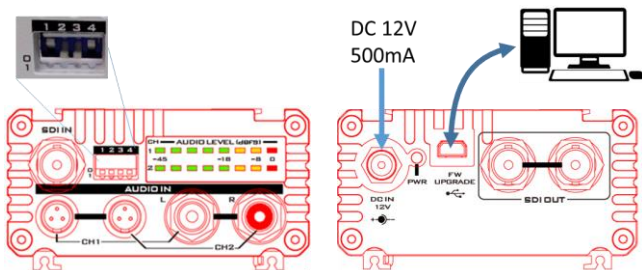


2. Connect the DC 12V Power:
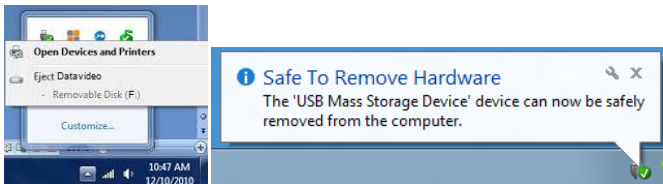   PWR LED will be turned ON and the device will enter the Firmware 1 update mode.

3. Connect the PC via mini-USB port and the "**Removable Disk**" dialogue box will appear on the PC (if the device is connected to the PC for the first time, you will then see a "**DAC-91 Datavideo FW1 USB Drive**" prompt appearing at the bottom right corner of the screen). You will see an empty drive after it is opened.
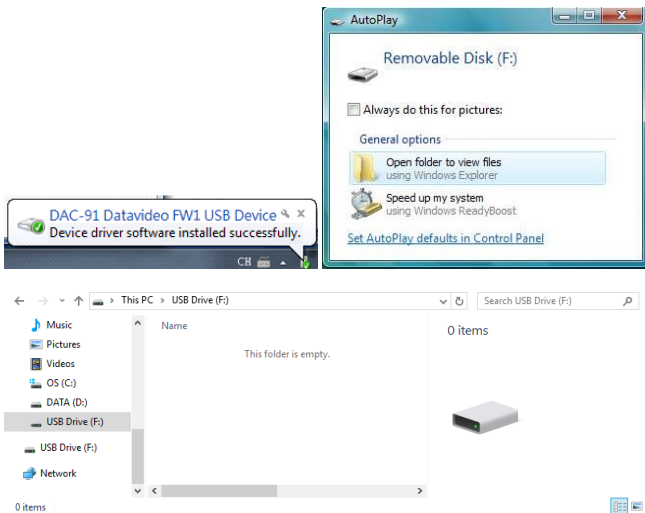


4. Copy the MCU Firmware 1 file (DAC-91-FW1-V1.xxBIN) to the removable disk and after about five seconds, the user should be able to see the file:



5. Click on the "Safely Remove Hardware and Eject Media" icon to eject the Datavideo Removable Disk. After the "Safe to Remove Hardware" prompt appears, disconnect the mini-USB cable and unplug the DC 12V power.

6. To check if the update is successful:
   - Set DIPSW 2-4 to a setting other than 111 or 110, for example, you can set DIPSW 2-4 to 000.
   - Connect the DC 12V power and the PWR LED will be turned ON.
   - After 7 seconds, the Audio LED will be turned ON and then faded out, indicating that the device is functional and the update is successful.

## *Firmware 2 Update Procedure*

1. When power is not connected, set DIP SW 2-4 to 111 as shown in the diagram below:
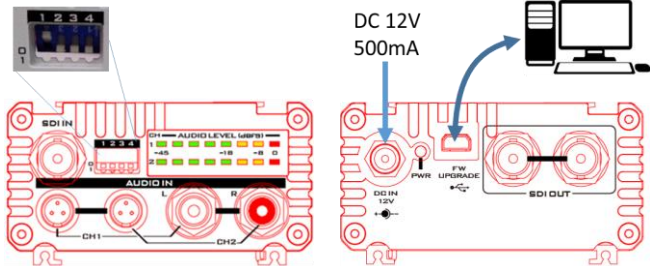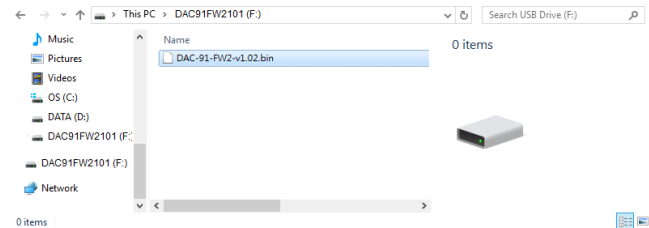


2. Connect the DC 12V Power:
   PWR LED will be turned ON and the device will enter the Firmware 2 update mode.

3. Connect the PC via mini-USB port and the "**Removable Disk**" dialogue box will appear on the PC (if the device is connected to the PC for the first time, you will then see a "**DAC-91 Datavideo FW2 USB Drive**" prompt appearing at the bottom right corner of the screen). The disk name is DAC91FW2XXX

(XXX corresponds to the previous version number X.XX). You will see an empty drive after it is opened.
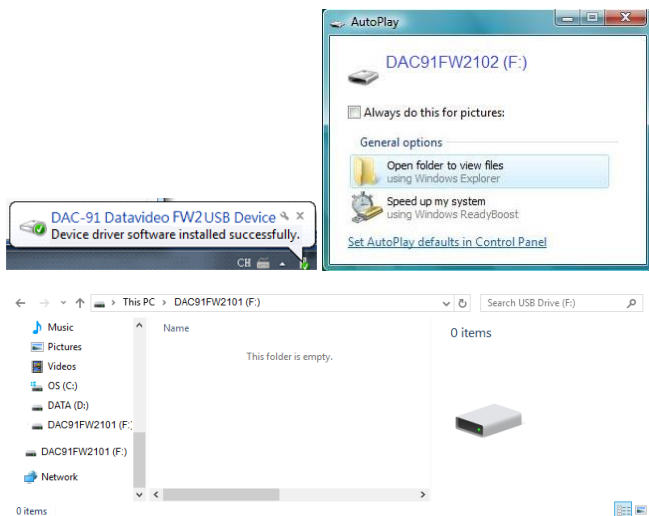


4. Copy the FPGA Firmware 2 file (DAC-91-FW2-Vx.xxBIN) to the removable disk and the update will finish after about 30 seconds:



5. Click on the "Safely Remove Hardware and Eject Media" icon to eject the Datavideo Removable Disk. After the "Safe to Remove Hardware" prompt appears, disconnect the mini-USB cable and unplug the DC 12V power to

complete the update.
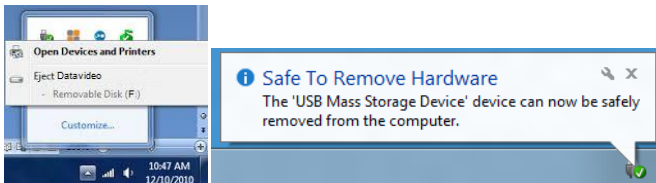


Remark: When DIPSW 2-4 is set to 111, you can check the disk drive label for the updated firmware version if the mini USB connection is not removed and the power is still connected.



6. To check if the update is successful:
   - Set DIPSW 2-4 to a setting other than 111 or 110, for example, you can set DIPSW 2-4 to 000.
   - Connect the DC 12V power and the PWR LED will be turned ON.
   - After 7 seconds, the Audio LED will be turned ON and then faded out, indicating that the device is functional and the update is successful.

# Frequently-Asked Questions

This section describes problems that you may encounter while using DAC-91. If you have questions, please refer to related sections and follow all the suggested solutions. If problem still exists, please contact your distributor or the service center.

| No. | Problems | Solutions |
|---|---|---|
| 1. | Cannot hear the audio and the audio level indicator is off when no video source is connected to SDI-IN. | The DAC-91 requires a compatible SDI video input in order to embed the audio. Please provide a video input. |
| 2. | How long does it take for the DAC-91 to finish booting? | The DAC-91 needs 7 seconds to finish its boot up process before it can be used. The device is ready for use after the audio level LEDs have faded out. |

# Dimensions
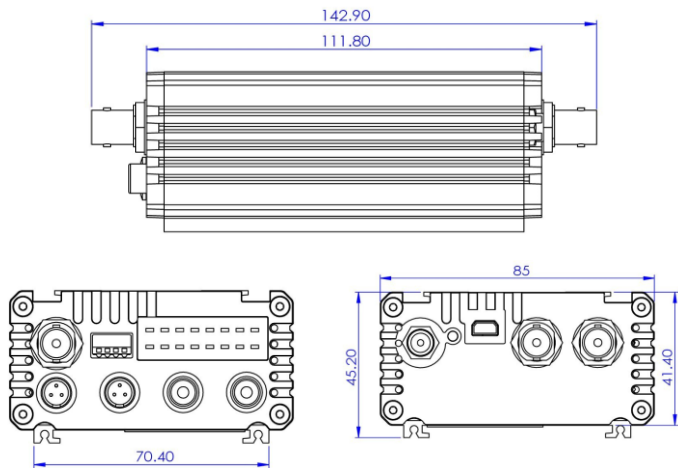


**All measurements in mm**

## Specifications

| Model Name | DAC -91 |
|---|---|
| Product Name | SDI Audio Embedder |
| SDI Video Input | 3G/HD/SD SDI x 1 |
| SDI Video Output | 3G/HD/SD SDI x 2 |
| Analog Audio Input | Mini XLR (balanced) x 2, RCA (unbalanced) x 2 |
| | - Mini XLR1 & RCA1 mixed to CH1 |
| | - Mini XLR2 & RCA2 mixed to CH2 |
| Analog Audio Output | N/A |
| Indicator | Power LED x 1 |
| | Audio LED : 2 rows |
| Updates and Configuration | Mini USB x 1 |
| Audio Format Selection | SMPTE |
| | EBU |
| Gain | Yes |
| Dimensions (LxWxH) | 112 x 85 x 45 mm |
| Weight | 0.4 Kg |
| Operating Temperature | 0 – 40°C |
| Power | DC 12 V / 0.5 A |

**Notes**

## Service & Support

It is our goal to make your products ownership a satisfying experience. Our supporting staff is available to assist you in setting up and operating your system. Please refer to our web site www.datavideo.com for answers to common questions, support requests or contact your local office below.

Please visit our website for latest manual update.
www.datavideo.com/product/DAC-91

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