Transformer IV

Pure passive I/V stage board

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A. Introduction

Transformer I/V works in pure passive mode without any feedback and active component. It even doesn't need any power supply. With it, people can build a really nice sound quality DAC at low over all cost.

Different from traditional active I/V solutions, the Transformer I/V plays music in very natural and analog way and the sound signature is enjoyed by many audiophiles.

B. Features and Specifications

- Audiophile grade sound quality but still at low cost.

- Has both single end (RCA) and balanced (XLR) outputs. All output connectors are at the same edge of the PCB.

- Customized high performance audio transformers included/assembled 15Hz-30kHz +/-0.3dB.

- 0dB Output levels. XLR: 4V RMS; RCA 2V RMS

- Pure passive mode with zero feedback and no active component.

- No need power supply. Simplify the system configuration.

- Fully finished. Plug and play. No need any soldering job.

- Directly works with both ES9038Q2M Dual Mono and ES9028Q2M DAC HATs. Compatible and swappable with other I/V such as the OPA861. Easy to install.

- Vishay/Dale CMF55 series high precision low noise metal film I/V resistors.

- Power LED to indicate DAC working status.

- Grounding jumpers.

- Great built quality.

C. Getting started

1. Install the Transformer I/V on top of a ES9038Q2M Dual Mono DAC or ES9028Q2M DAC. Ensure the connector J1 is installed at correct position. Please be very careful never shift the pins. Please use 13mm standoffs to mount them together.

2. Turn on the power. Power LED D1 should be lit up to indicate I/V and DAC are connected.

3. Connect the I/V output to your pre-amplifier. XLR outputs would be preferred. RCA outputs are also great.

4. Enjoy the music.

D. Typical projects

1. Audiophile grade high quality ESS DAC at low cost (PCM/DSD)

    (1). Transformer I/V (#7B)

    (2). ES9039Q2M Dual Mono II DAC (#4B or #5A)

    (3). ESS controller (#3A)

    (4). ShieldPiPro (#23B)

    (5). RaspberryPi

    (6). PurePi power supply (#48B)

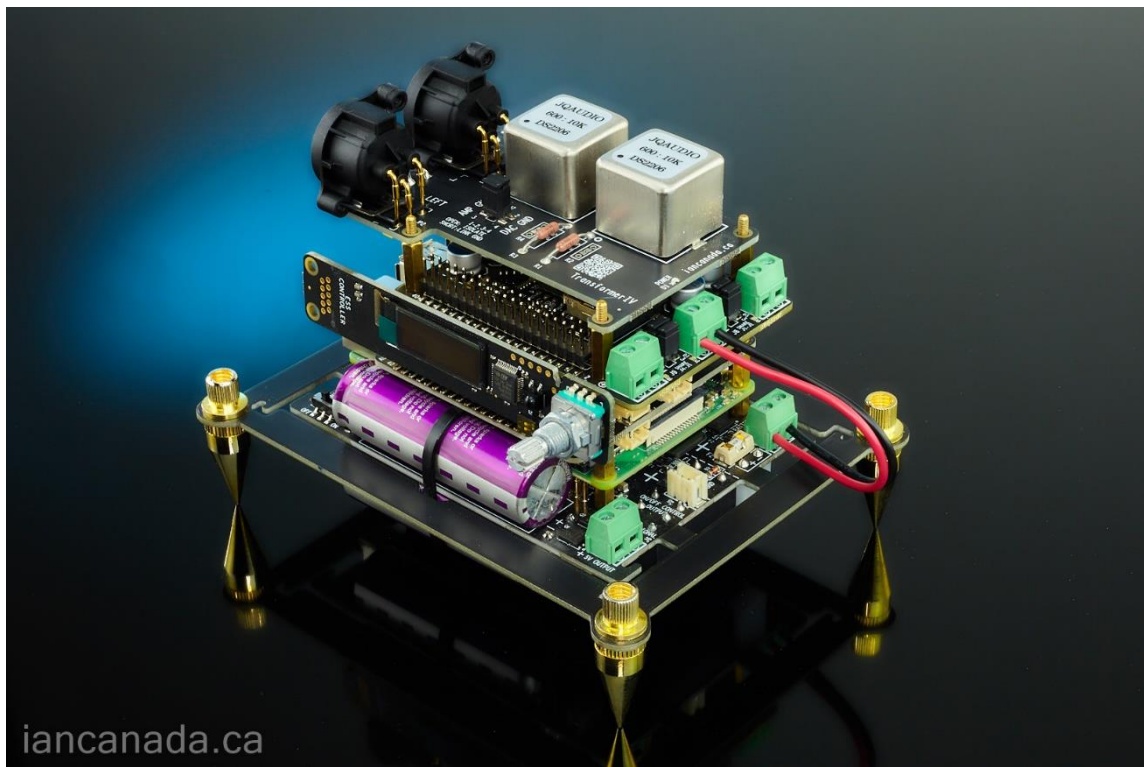Linux driver selection: General I2S or Hifiberry DAC+ or Audiophonics ESS DAC

ESS controller settings: All default

Software setting: DoP

Optional accessory: Acrylic cover (#51A) with 25mm standoffs

Possible upgrade: UcConditioner/Pro 3.3V (#26C or #26B)

Standoffs: All 13mm except 11mm between ShieldPiPro and RPi

2. Flagship RaspberryPi SYNC mode ESS DAC with FIFO Re-Clocker (PCM/DSD)

    (1). Transformer I/V (#7B)

    (2). ES9039Q2M Dual Mono II DAC (#4B) with local 100MHz XO removed

    (3). GPIO spacer (#50B)

    (4). MonitorPiPro(#49B) or ESS controller (#3A)

    (5). FifoPiQ7 (#1D)

    (6). RaspberryPi

    (7). PurePi power supply (#48B)

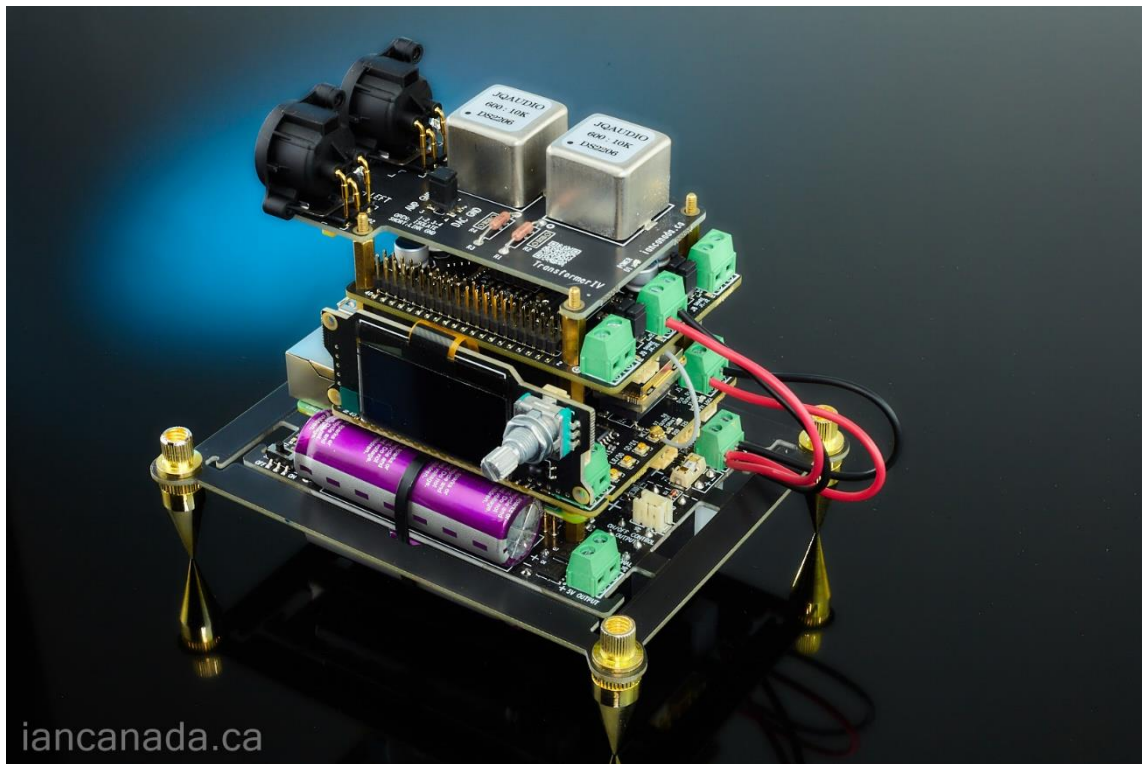Linux driver selection: Audiophonics ESS DAC or General I2S

MonitorPiPro/ESS controller settings: Both PCM and DSC bandwidth 1

Software setting: DoP

Optional accessory: Acrylic cover (#51A) with 25mm standoffs

Possible upgrade: UcConditioner/Pro 3.3V (#26C or #26B), SC-Pure clocks (#80A and #80B)

Standoffs: All 13mm except 11mm between FifoPiQ7 and RPi

3. **Flagship RaspberryPi free SYNC mode ESS DAC with FIFO Re-Clocker (PCM/DSD)**
   (Inputs: USB, Coaxial, OPT, I2S/DSD over HDMI)

Configurations:

(1). Transformer I/V (#7B)

(2). ES9039Q2M Dual Mono II DAC (#4B) with local 100MHz XO removed

(3). GPIO spacer (#50B)

(4). MonitorPiPro(#49B)

(5). FifoPiQ7 (#1D)

(6). ReceiverPi DDC (#19D)

(7). Amanero or compatible USB interface (optional)

(8). PurePi power supply (#48B)

Linux driver selection: Audiophonics ESS DAC or General I2S

MonitorPiPro/ESS controller settings: Both PCM and DSC bandwidth 1, Enable DDC

Software setting: DoP

Optional accessory: Acrylic cover (#51A) with 25mm standoffs

Possible upgrade: UcConditioner/Pro 3.3V (#26C or #26B), SC-Pure clocks (#80A and #80B)

Standoffs: All 13mm except additional 17mm standoffs between ReceiverPiDDC and PurePi

4. **Flagship Full function SYNC mode ESS DAC with FIFO Re-Clocker (PCM/DSD)**

Configurations:

(1). Transformer I/V (#7B)

(2). ES9039Q2M Dual Mono II DAC (#4B) with local 100MHz XO removed

(3). GPIO spacer (#50B)

(4). MonitorPiPro(#49B) with Apple remote (optional)

(5). FifoPiQ7 (#1D)

(6). ReceiverPi DDC (#19D)

(7). Amanero or compatible USB interface (optional)

(8). RaspberryPi (optional)

This DAC will need only 5V and 3.3V power supplies

5V recommendations: LinearPi 5V + UcConditioner Pro 5V(optional)

3.3V recommendations: PurePi 3.3V or LifePO4 Mini 3.3V + UcConditioner Pro 3.3V (optional)

Linux driver selection: Audiophonics ESS DAC or General I2S

MonitorPiPro/ESS controller settings: Both PCM and DSC bandwidth 1, Enable DDC

Software setting: DoP

Optional accessory: Acrylic cover (#51A) with 25mm standoffs

Standoffs: All 13mm except 17mm between ReceiverPiDDC and RPi

Possible upgrade: SC-Pure clocks (#80A and #80B), GPIO extension KIT for MonitorPiPro(#50A)
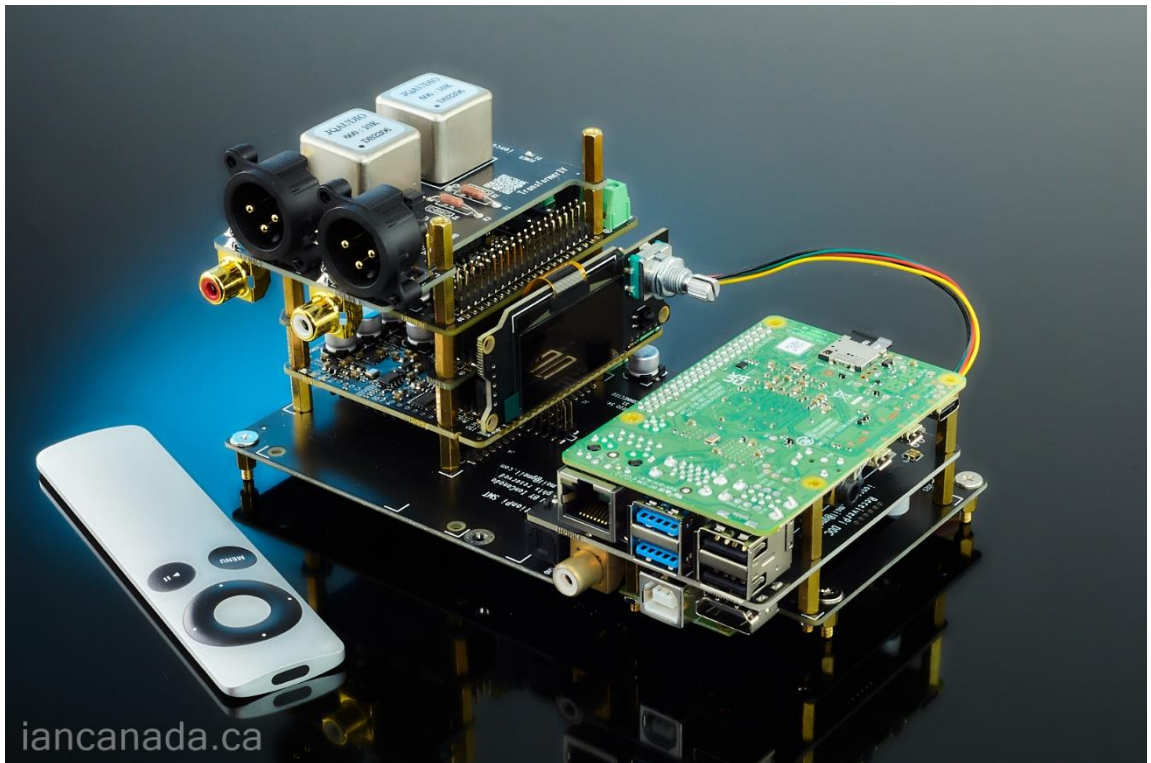
E. History of revising

Feb. 3, 2024 V1.0 released