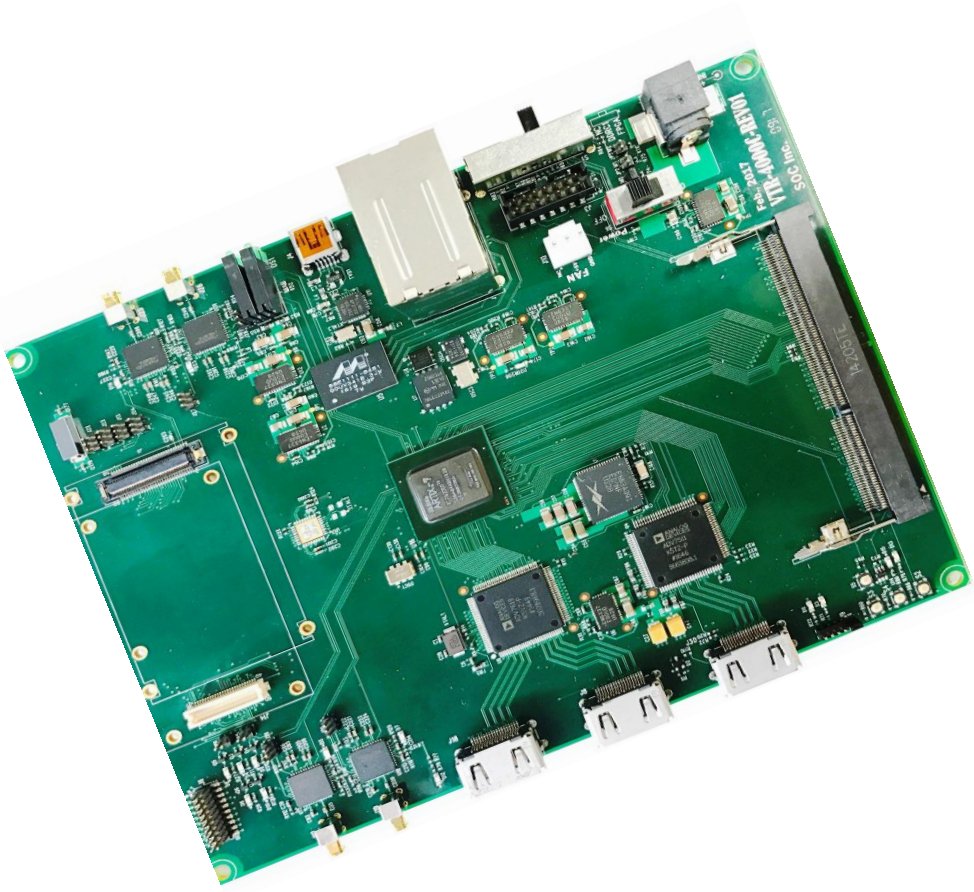
VTR-4000C

Evaluation and Product Development Platform

Quick-Start Guide

- Encoder Kit

Revision 1.0



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Quick-Start Guide

V1.0, 2017

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Revision History

Date (MM/DD/YYYY)	Version	Notes	Author
05/25/2017	1.0	Initial Version	Mulong Li

This document is intended to be a quick-start guide for getting familiar with the evaluation kit environment. For a thorough evaluation of SOC CODEC's capabilities, please refer to the User Guide and various API Manuals after reading this guide.

1. Kit Contents

1. VTR-4000C Encoder Carrier-Board
2. Encoder Module
3. Cables
    - 5V Power Adapter
    - USB Mini-B Cable
    - HDMI and/or SDI cable(s)
    - Ethernet Cable

2. Prerequisites

To avoid issues, please use the latest versions of software.

1. Latest version of VLC Media Player - **http://www.videolan.org**
2. FFmpeg: Recommended for H.265 playback - **https://ffmpeg.org**
3. Serial terminal. (Recommended: Tera Term - **https://ttssh2.osdn.jp)**
4. (Optional) SOC API CLI Toolkit – **http://soctechnologies.com/tools**

3. Connecting the System

CODEC Module	Video Cable	Source	Board Ports
HD Codec Modules	HDMI / SDI	up to 1080p60	HDMI_IN (J18) / SDI_CH4 (J26)
4K Codec Modules	SDI x 4	up to 2160p60 (4 x 3G-SDI)	Quadrants: SDI_CH1 (J12), upper-left SDI_CH2 (J25), upper-right SDI_CH3 (J19), lower-left SDI_CH4 (J26), lower-right
Multi-Channel Codec Modules	SDI x N	N number of channels	SDI_CH1(J12), SDI_CH2(J25), SDI_CH3(J19), SDI_CH4(J26), (SDI_CH4 must be connected)

Device	External	Board Port	Notes
Mini-B USB	PC	USB-UART (J4)	For API access
Module		SODIMM Slot (J2)	Power-off carrier board before inserting/removing modules
Ethernet Cable	PC Ethernet port, SOC decoder board, network switch, router, or third-party receiver	Primary Ethernet port (J5, bottom)	To send encoded stream data
5V Power	5V Adapter	5V DC IN (J7)	Power switch: S6

4. Sending Streams

Encoder Kit to PC

Checklist:

1. Cables connected (See *3. Connecting the System*)**.**
   - Ethernet cable connected from board to PC
2. Serial terminal with serial port (COM port) open on PC.
   - Carrier-board > Destination IP matches PC's IP address. (See *SOC VTR-4000C Carrier Board API Specification*)
3. On PC, VLC listening on "udp://@:1234" (1234 is default port, can be changed in Carrier-Board API)

Note: H.265 Decoding is a resource-intensive operation. We advise that customers use high-performance desktop workstations rather than laptops/netbooks to decode H.265 streams. Playback will be smoother, and it would be easier to judge the quality and performance. Recommended playback tool: FFmpeg (https://ffmpeg.org). For smoother playback when PC performance is limited, lower the bitrate or frame rate through the API (See Encoder Module API Manual).

Recommended PC configuration for H.265 playback:

- CPU: Intel Xeon E5-2637v3, 3.5GHz
- Graphics card: NVIDIA Quadro K620, 2Gb DDR3

Encoder Kit to Decoder Kit

Checklist:

1. Cables connected (See *3. Connecting the System*)
   - Ethernet cable connected from Encoder board to Decoder board.

2. Encoder TX IP matches Decoder IP.

5. On-board User Interface

	Label	Notes
System Reset	S3 (Push-button)	Reset the carrier board system
API Mode Cycle	S2 (Push-button)	Toggles API Mode (See *6. API Interface*)
API Mode LED	D11 (LED)	**Off** – Carrier Board API **On** – Module API
SDI LED	D5 D14 D7 D23 (LEDs)	**Off** – SDI TX/RX signal detected **On** – No SDI TX/RX signal
Network Speed Select*	J9 0/1 (Jumper)	**On/Present** – 1Gbps **Off/Not Present** – 100Mbps

*: Network Speed can be pre-configured before power-on through Jumper J9, and can be re-configured after power-on using API interface. (See *SOC VTR-4000C Carrier Board API Specification*)

6. API Interface

When the USB-UART Cable is connected from board to PC, the PC will expose a serial (COM) port. You can find this port in Windows in **Device Manager > COM Ports.** Use the following settings for the serial port:

- Baud rate: 115200
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

The serial link is shared by the carrier board and the module endpoints, one at a time. The API endpoint can be selected by pressing the API Mode Cycle button S2. API Mode LED D11 indicates the endpoint that is currently linked.

Endpoint	API Functions Available	Documentation
Carrier Board API	• Network Configuration (send/receive IP/port) • Flash Update	• VTR-4000C API Manual

Endpoint	API Functions Available	Documentation
Module API	• CODEC Core API • CODEC System API • Video Input API • Flash Update	• H.264 Encoder API Manual • H.265 Encoder API Manual • Encoder System API Manual • Video Input API Manual • Multiboot Module API Manual

The API serial format is available in two formats. You may press ESC (or ENTER without entering a value) to cycle the prompt. **Important: Backspace is not supported.** If you make a mistake, use **ESC** to cycle back and restart the input.

New API 2.0 format

Format: (optional arguments: [optional])

C AA [DDDD]

- C = Command (R/r/W/w)
- AA = 2 Byte Hex Address
- DDDD = 4 Byte Hex Data Value

Read a register value:

> R <address hex>

Change a register value:

> W <address hex> <value hex>

Legacy API 1.0 format

Legacy API prompt looks like this: **"Enter an address(HEX):"**

The API will expose an address-value prompt-loop. To change values, enter the register address at the address prompt (in hex), and then the decimal value at the value prompt, followed by enter. Hex values are also accepted when given an "h" prefix/suffix, (ex. 4ABCh or h4ABC represent 0x4ABC)

You can safely press **ESC** at any time to cycle the prompt without changing current values.

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