

TVP9900EVM

1 Introduction

The TVP9900EVM refers to the TVP9900 board, which includes an RF tuner. The TVP9900EVM is a printed circuit board designed for evaluation of the TVP9900 VSB/QAM receiver. This quick start guide outlines the necessary hardware and software setup required to provide full evaluation of the TVP9900.

2 Overview

The TVP9900EVM allows the user to have one RF input through a standard RF connector. The evaluation module (EVM) provides, as an output, a digital parallel or serial MPEG-2 transport stream that is compliant to DVB-SPI. This output stream can be easily connected to a BER tester or to an MPEG-2 decoder, such as the TVP9000. The TVP9900EVM uses the PC parallel port to emulate the I²C bus, which provides communication with the TVP9900 Receiver and the RF tuner. The WinVCC application software that communicates with the devices via I²C is included on the EVM CD-ROM.

3 Required Hardware and Equipment

The required hardware and equipment necessary to use the TVP9900EVM are:

- TVP9900EVM (provided)
- Universal 5-V power supply (provided)
- Parallel cable (provided)
- Windows®-based PC with Win95™ or later
- RF cable for input
- Parallel cable for output
- RF video sources (terrestrial antenna, DTV cable, 8VSB/QAM test transmitter, etc.)
- MPEG-2 decoder or BER tester

4 Hardware Setup

All connectors are labeled according to their function. To prepare the EVM for evaluation, connect the following:

1. There are two parallel interfaces on the EVM. The one labeled J3 is for the I²C interface to the PC. Connect a parallel port cable from this connector on the EVM to the PC.
2. The other connector, labeled J2, provides a digital MPEG-2 transport stream that is compliant to DVB-SPI. Connect this to a BER tester or to a MPEG-2 decoder.
3. Connect an RF video source to the TVP9900EVM tuner board RF input.
4. Connect the 5-V power supply to the dc jack on the TVP9900 board. A green LED on the board should now be lit.

The TVP9900 I²C slave address can be selected with jumper JP2. There are two possible addresses: 0xB8 and 0xBA. The default setting for this jumper is for the shunt to be in place, which selects 0xB8. This is connected to TVP9900 pin 38, which is read at power up. If the shunt is removed and the EVM is reset, the TVP9900 now responds to I²C slave address 0xBA.

Note: If the I²C address is changed on the TVP9900 or tuner board while the TVP9900EVM is powered up, then the device will not recognize the new I²C address. The reset button on the TVP9900EVM must be pressed, and WinVCC must be exited, restarted, and configured for the new I²C address.

5 Software Installation

WinVCC is a Windows application that uses the PC parallel port to emulate I²C, providing access to each device on the I²C bus. WinVCC makes use of CMD files, which are text editable files that allow preset receiver setups to be programmed easily.

This feature allows the user to easily set multiple I²C registers with the press of a button. WinVCC also has property sheets for the TVP9900, which allow the user to control the I²C registers with a GUI. A tuner control page is provided to set up and control the included RF tuner.

All the necessary software for the TVP9900EVM is provided on the enclosed CD. Perform the following steps to install WinVCC:

1. Explore the provided TVP9900EVM software CD.
2. Install Port95NT.exe. This is the parallel port driver used by WinVCC. This driver must be installed, and the PC must be rebooted before WinVCC can operate correctly. This does not affect normal parallel port operation.
3. Install Setup.exe. Click Next at all prompts and click Finish to complete the installation process. This installs WinVCC onto the PC. No reboot is required.
4. Run WinVCC.exe.

6 WinVCC Quick Start

Perform the following steps in order to get an MPEG-2 transport stream out of the TVP9900EVM.

1. Once the EVM software is executed, the WinVCC Configuration screen appears, as shown in [Figure 1](#). This dialog box configures the I²C bus. Next to TVP9900, select the TVP9900 and ensure the I²C address is set to 0xB8. This must match the I²C ADDR jumper on the TVP9900 board.
2. The tuner I²C address is set by default in WinVCC to 0xC2. This is also the default setting on the tuner EVM board; verify the correct I²C ADDR jumper setting on the tuner board.

Note: If WinVCC is running and the TVP9900 or tuner board I²C address is changed, then power must be cycled on the EVM.

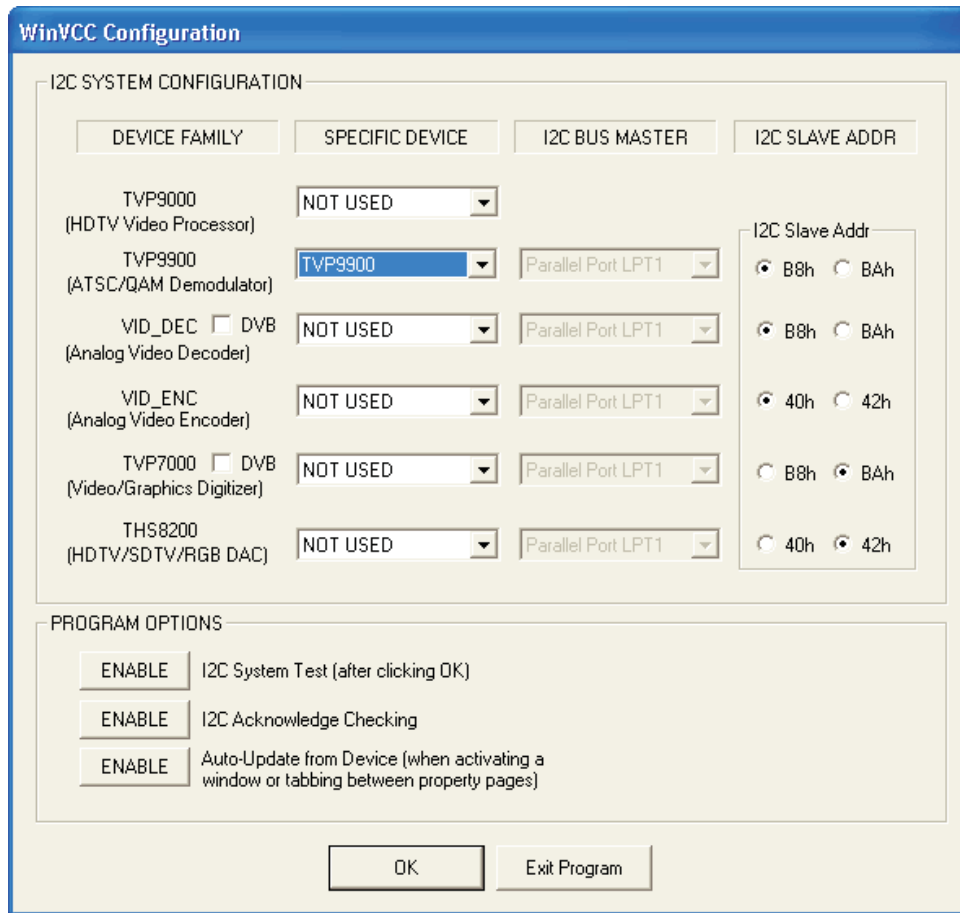


Figure 1. WinVCC – I²C Configuration Screen

3. Ensure that all other boxes are set to “Not Used” and that all program options buttons are set to ENABLE. Click OK.
4. If there are no I²C communication issues, the WinVCC Main Screen dialog window displays next, as shown in Figure 2. If there are I²C issues, an I²C Test Report dialog box displays. Completely exit out of WinVCC, double-check the parallel port cable connections, cycle power on the TVP9900EVM, and run WinVCC again.



Figure 2. WinVCC – Main Screen

5. Load the provided initialization command (CMD) file into WinVCC by clicking on Tools → System Initialization and clicking the *Browse* button. The default directory is C:\Program Files\Texas Instruments\WinVCC\TVP9900\Initialization.
6. In the System Initialization Window, shown in Figure 3, click the “Program TVP9900 - 8-VSB mode - outputs enabled” dataset in the window and then click the PROGRAM Device(s) Using Selected Dataset button to initialize the TVP9900EVM for 8-VSB mode. The 64QAM mode and 256QAM mode can be set up by using the other datasets in this command file.

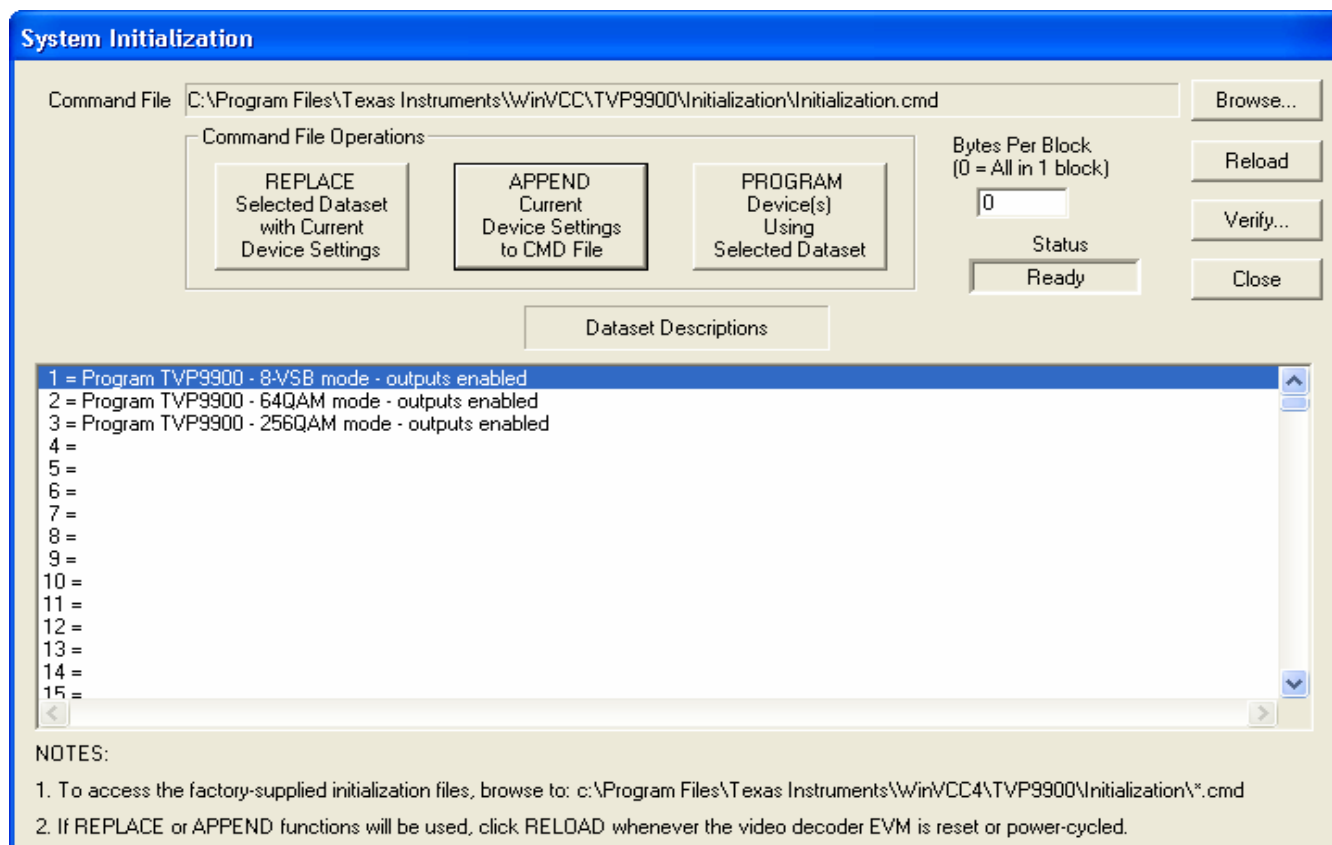


Figure 3. WinVCC – System Initialization

- Click Close.
- Program the tuner by clicking Tools → TV Tuner Control → ATSC. The ATSC Tuner Type window (see Figure 4) allows the user to select tuner and source settings. Click the Standard Digital ATSC Tuner button and click OK to use the default tuner shipped with the TVP9900EVM.

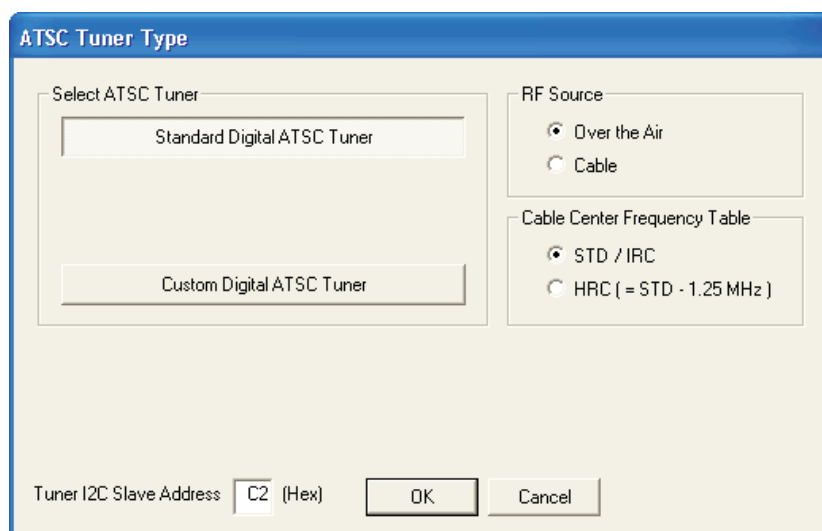


Figure 4. ATSC Tuner Type

- In the TV Tuner Control window, as shown in Figure 5, select a channel from the “Add to Channel List” drop-down box.

10. Click the Add button. After about one second, the tuner is programmed to the selected channel.
11. For direct entry of the RF center frequency, type the center frequency (for example, 189) into the "RF Center Freq (MHz)" box. Click Program to program the tuner.

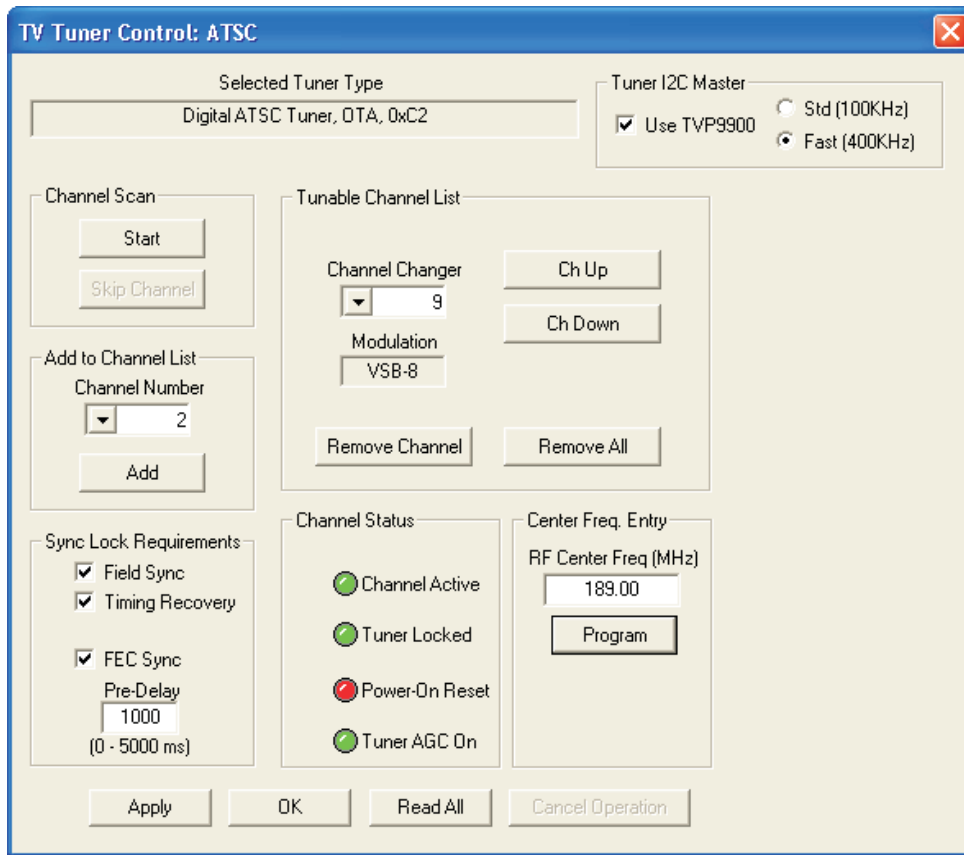


Figure 5. TV Tuner Control for ATSC

12. To perform a channel scan when the input is from an antenna (or cable), click the Start button on the TV Tuner Control page. This selects all channels for which the TVP9900 indicates locked status. The locking criteria are selectable on this page: Field Sync Lock (Default: ON), Timing Recovery (Default: ON), and FEC Sync Lock (Default: ON). The Pre-Delay is not needed.
13. After scanning, switching between channels can be easily done using the channel up/down buttons ("Ch Up" and "Ch Down") or the "Channel Changer" drop-down list.
14. Click OK to close the TV Tuner Control tool.

15. Open the TVP9900 Property Sheets window by clicking on Edit → Property Sheets → TVP9900. Click on the Status tab, as shown in Figure 6. Click the Auto-Update button to enable it, and then click the Soft Reset button. The demodulator and forward error correction status is shown on this page.

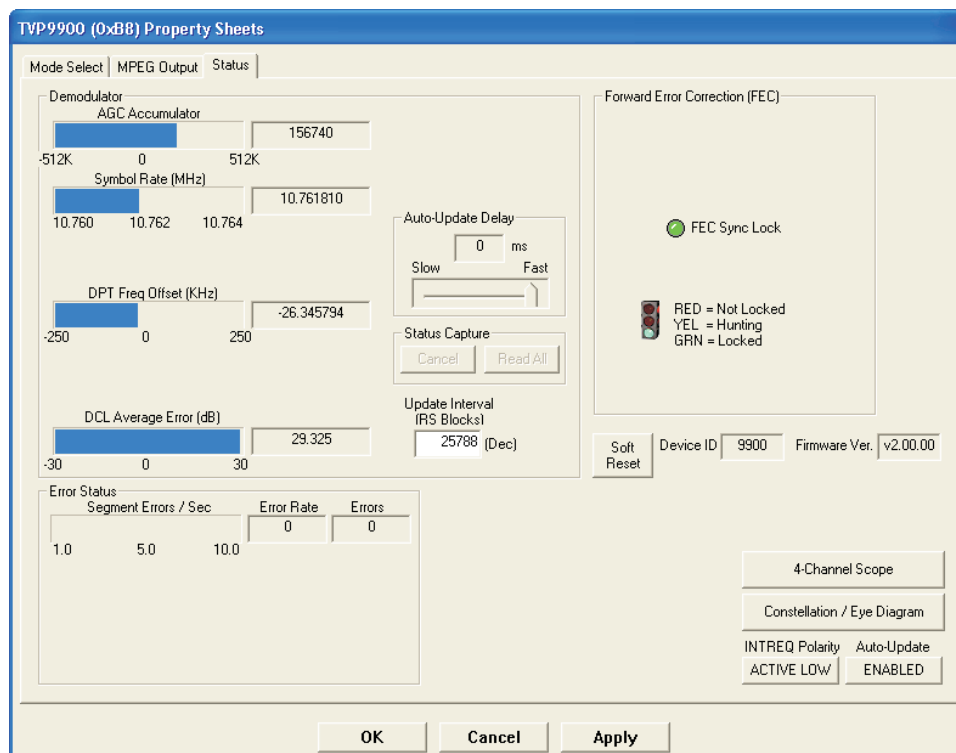


Figure 6. TVP9900 Property Sheets

16. With an RF source provided to the tuner RF connector and the EVM output connected to a BER tester or MPEG-2 decoder, the MPEG-2 transport stream should be available. If the transport stream is not output from the TVP9900EVM, ensure the following is correct:
 - a. The input/output cables are connected correctly to the sources, EVM, and tester/decoder.
 - b. The input source is working properly and providing the expected RF input. Lock can be confirmed with the above Property Sheet.
 - c. The correct dataset is selected and programmed for the correct RF input format.

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