I2C Bus Monitor 1.2 User's Guide

(Palm Edition)

Twincom

www.twincom.net

I²C Bus Monitor 1.21 User's Guide (Palm Edition)
June, 2004

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Revision: 5

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Contents

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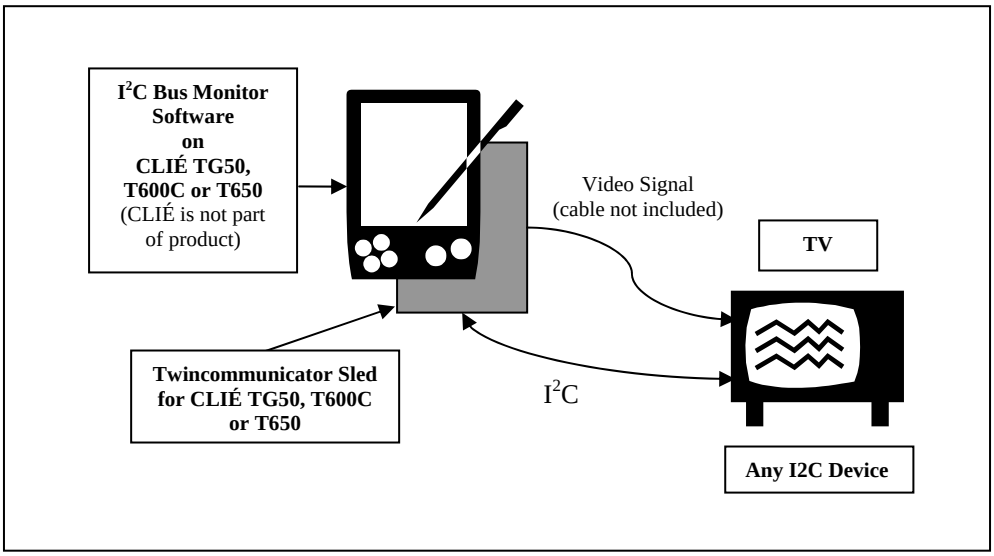
Introduction to I²C Bus Monitor and Twincommunicator

I²C Bus Monitor application is software that is a part of Twincommunicator product. Twincommunicator allows you to monitor and interact with activities on I²C bus. You can also use this product to generate standard color bar pattern video signal.

Twincommunicator Product Overview

Figure 1 – Twincommunicator Product Overview



Parts List

Twincommunicator product from TCA includes the following:

- Twincommunicator Sled for CLIÉ TG50, T650C, or T600
- I²C bus cable (2 meters)
- AC power supply for the sled (100~240V 50/60Hz)
- 4 AA battery pack (4.8~6V alternate power source for the sled)
- CD which contains:
  - I²C Bus Monitor Software for PalmOS (I2CBusMon.prc)
  - I2C Bus Monitor 1.2 User's Guide (this document in PDF format)

NOTE: Video cable is not included in the product package

System Requirements

- Sony CLIÉ Models: TG50, T600C, and T650

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- Windows or Macintosh system for installing software of CLIÉ devices
- 20 MB of available hard disk space (For Palm Desktop and I^2C Bus Monitor software)
- Palm Desktop Software (with HotSync) for Windows or Macintosh for installing software on CLIÉ devices. You can get this software from Palm web site (www.palm.com or http://www.palmone.com/us/software/desktop/). For more information on HotSync setup, consult your CLIÉ manual

Installing I^2C Bus Monitor Software

1. If you already have data in your CLIÉ, you should perform a HotSync before installing I^2C Bus Monitor Software.
2. Use Palm Install Tool to install I2CBusMon.prc to the corresponding profile on your CLIÉ.
3. Turn on your CLIÉ and place it in its cradle.
4. Press the HotSync button on the cradle. The I^2C Bus Monitor software will be installed on your CLIÉ device.

I^2C Bus Monitor software is now installed.

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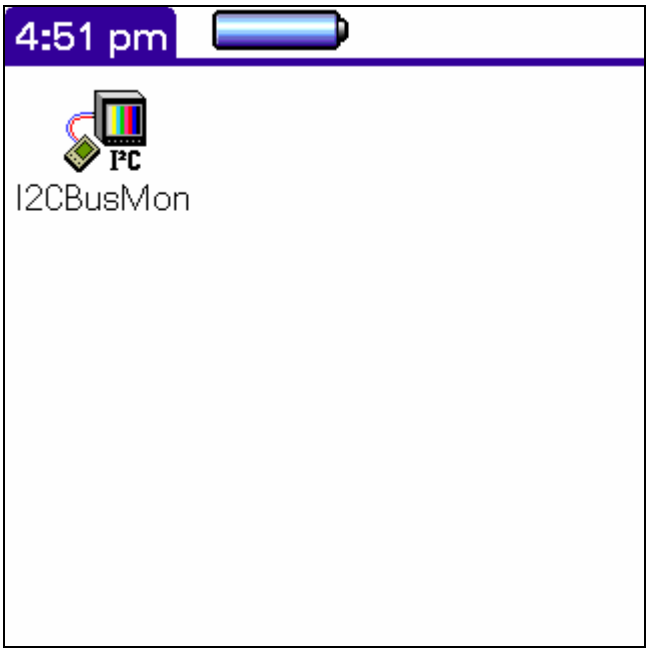
Using I²C Bus Monitor

Launching I²C Bus Monitor

After I²C Bus Monitor software is installed, its icon will show up on your CLIÉ as shown in Figure 2.

Figure 2 - I²C Bus Monitor Application



Tap the I2CBusMon icon to start the application.

Demonstration Mode

When I2CBusMon is launched and it does not detect the proper Twincommunicator hardware connection, it will prompt the user if s/he wants to continue running the software in demonstration mode. The following screen will be shown (Figure 3):

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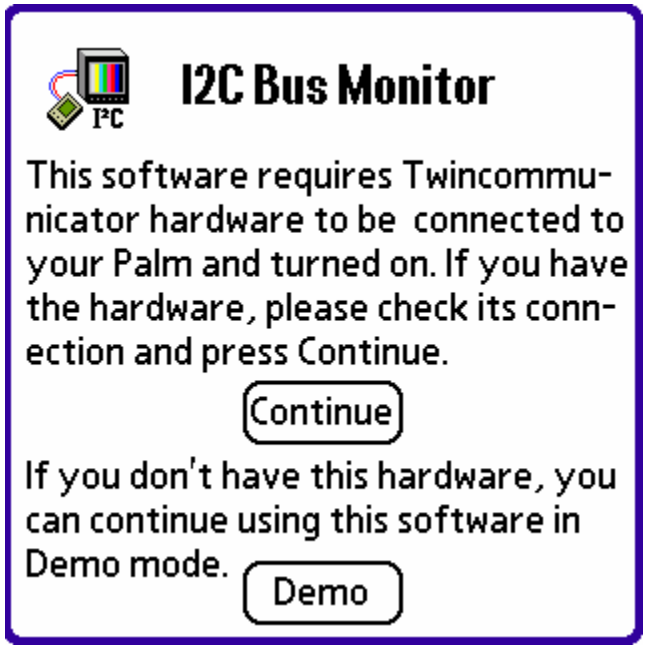
Figure 3 - Demo Dialog



To use the software in demonstration mode, press “Demo” button.

NOTE: This dialog will come up only *once* in the following condition:

1. Twincommunicator hardware is not connected
2. Twincommunicator hardware is not turned on

Demo mode will terminate when you exit the software.

In demonstration mode, I2CBusMon software uses simulated data to demonstrate all its features.

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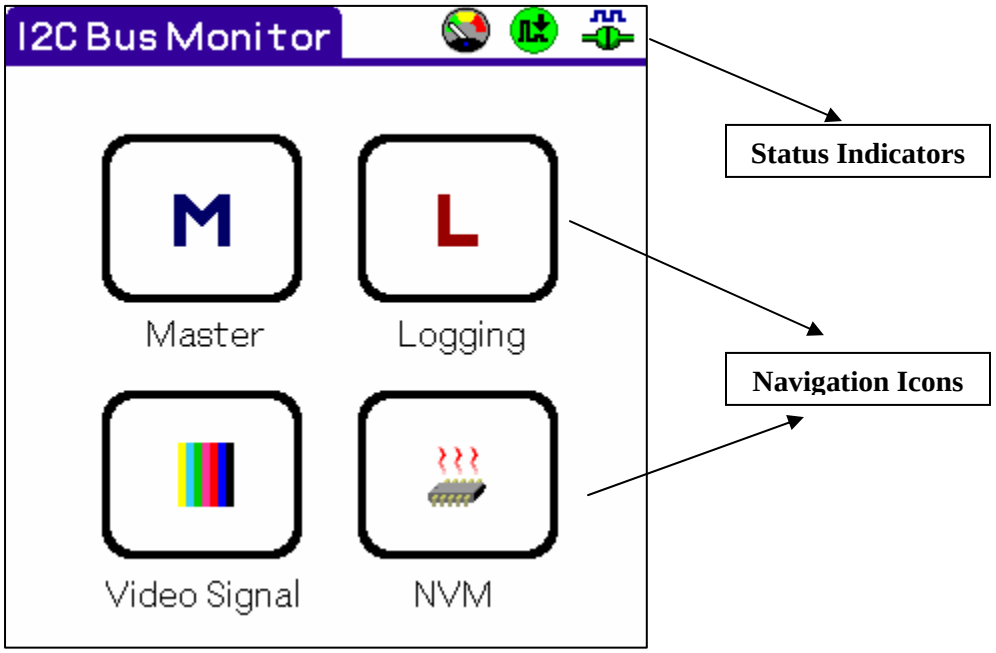
Main Screen

Figure 4 - Main Screen



Main Screen (Figure 4) is the first screen displayed when you launch I2CBusMon application. From this screen, you can navigate to other screens. This is the home position of I2CBusMon application.

Navigation Icons

	Use this button to switch to Master Mode Screen
	Use this button to switch to Slave / Logging Screen

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	Use this button to switch to Signal Generator Screen
	Use this button to switch to Non-Volatile Memory Screen

Status Indicators

At the top of most screens in this application, there are 4 different kinds of icons that signify various application states. These states are explained below.

Activity Status

 OK

 Waiting

 Timeout

 Error

Bus Speed Status

 High Speed Bus Mode (400 kHz)

 Low Speed Bus Mode (100 kHz)

ACK Status

 Twincommunicator received an ACK signal from I2C slave device

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Twincommunicator did not receive an ACK signal from I2C slave device

Connection Status

I2CBusMon detected proper connection to sled

I2CBusMon did not detect proper connection to sled

I2CBusMon is operating in demonstration mode

Configuring I²C Bus Monitor

To configure I2CBusMon to your need, open the Settings Screen using the Settings menu as shown in Figure 5.

Figure 5 - Settings Menu

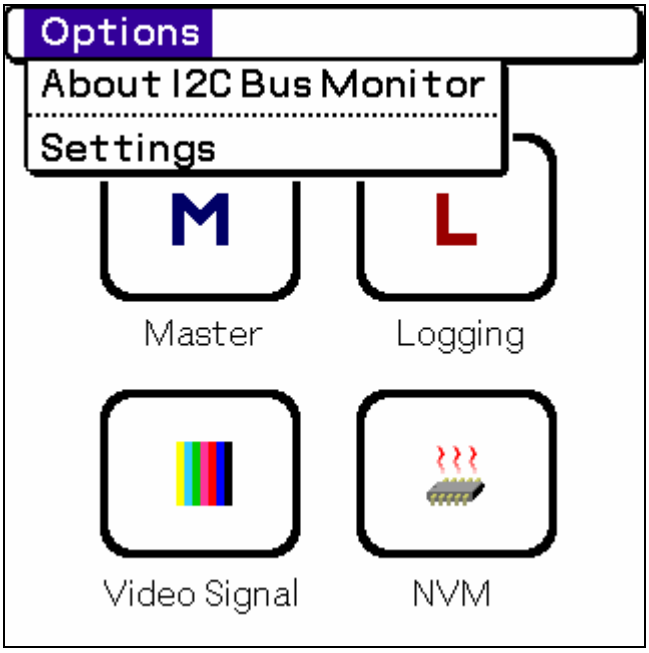

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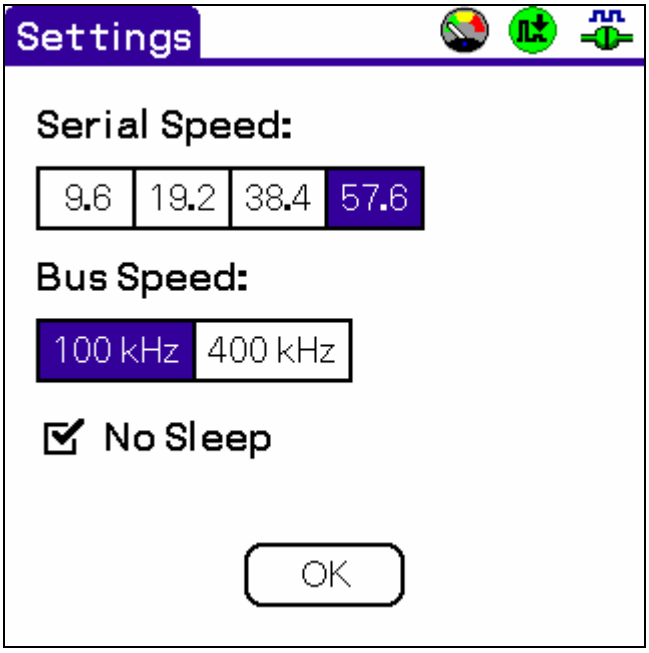
Figure 6 - Settings Screen



On the Settings Screen, you can specify connection speed, bus speed and whether to allow the device to auto-sleep or not.

Serial Speed

Serial Speed controls the serial connection speed between CLIÉ and I^2C Bus Monitor Sled. This application supports 4 serial speeds: 9600 baud, 19200 baud, 38400 baud and 57600 baud. Factory default is 9600 baud.

Bus Speed

I2CBusMon supports 2 standard I^2C bus speeds: 100 kHz and 400 kHz. Factory default is 100 kHz.

No Sleep

Use the checkbox to indicate whether the device is allowed to auto sleep or not. By default, this application does not allow CLIÉ to sleep. Uncheck this checkbox if you would like to allow CLIÉ to sleep after a period of inactivity. The inactivity interval is specified in the standard CLIÉ's preferences control panel. This application preserves CLIÉ's preferences, i.e. when you exit I2CBusMon application, the device sleep behavior resumes according to the settings on CLIÉ's control panel.

Master Mode Screen

On this screen, I2CBusMon application turns the Twincommunicator into an I^2C master device. This means Twincommunicator is the device which initiates a transfer, generates clock signals and terminates a transfer.

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Master device can be set to either Read or Write mode. In the Write mode (Figure 7), users can write data into slave devices on the I^2C bus. In the Read mode (Figure 8), users can inspect data from slave devices on the I^2C bus.

Figure 7 - Master Mode (Write) Screen

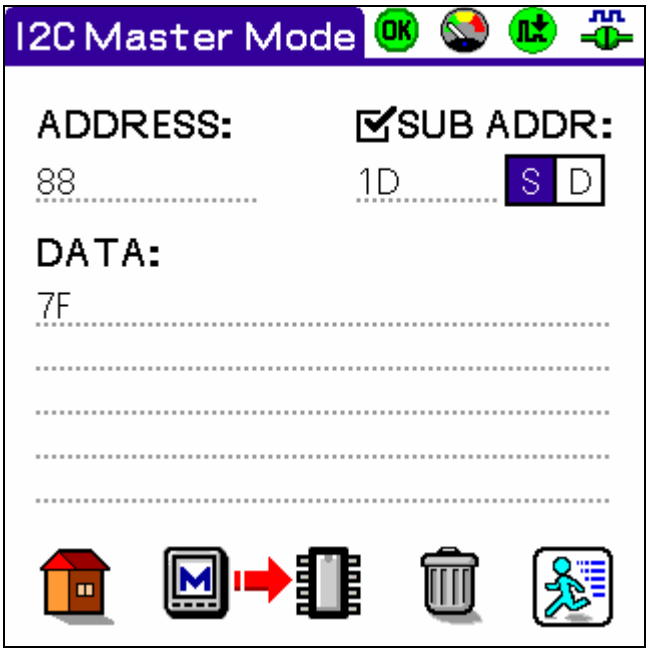
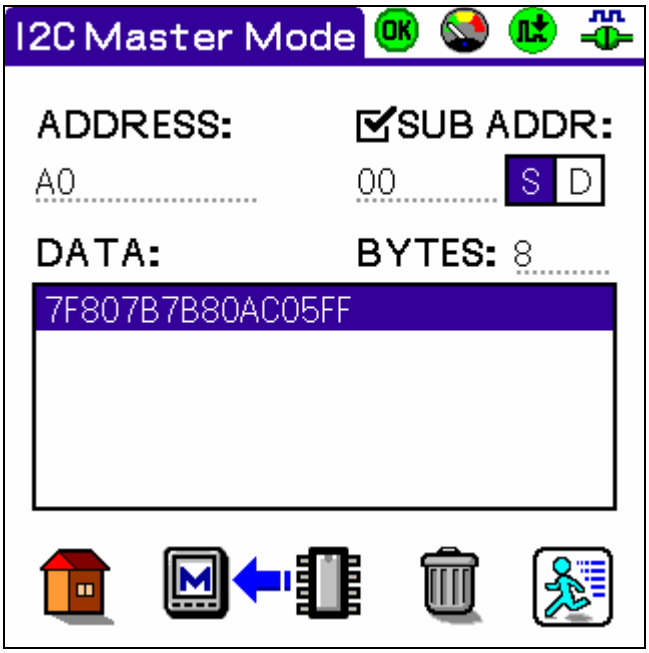


Figure 8 - Master Mode (Read) Screen



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Address Text Field
The current slave address is specified here. User can change this address to write or read from a specific slave device. Users must specify a hexadecimal number within 0x00 to 0xFF. For example, the screenshot (Figure 8 above) shows that we are reading 8 bytes from a slave device at address 0xA0 with a single-byte sub-address 0x00.

Sub-Address Checkbox
Select this checkbox to specify that sub-address will be used when issuing Master mode commands.

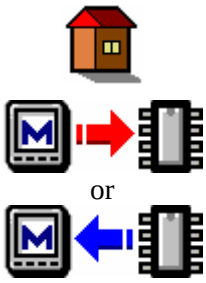
Sub-Address Field
If Sub-Address checkbox is checked, the hexadecimal number in this field will be used as the sub-address. Users must specify a hexadecimal number in this field. This field only applies if the Sub-Address checkbox is checked.

Sub-Address Choice Buttons (S / D)
Users can specify whether the sub-address is a Single Byte (S) or a Double Byte (D) number. This button toggles between Single (S) and Double (D). This button only applies if the Sub-Address checkbox is checked.

Length Field
The number specifies in this field determines the number of bytes to read from the bus. This field only applies in master read mode.

Data Area
When operating in master read mode, the data area is set to read-only. Data that was read from the bus will be displayed in this area as a string of hexadecimal numbers. When operating in master write mode, this area is writeable. Users can specify a set of hexadecimal numbers to write to the specified address on the I^2C bus.

Menu



Return to Main Screen

Switch to Write Mode
or
Switch to Read Mode

Clear the Data area

Execute command

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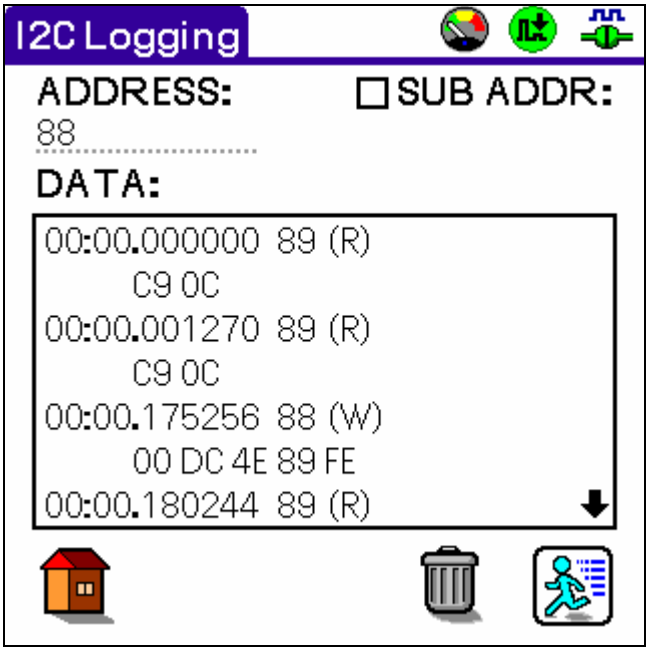
Slave / Logging Screen

On this screen, I2CBusMon application turns the Twincommunicator into an I^2C slave device. This means Twincommunicator is the device that can be addressed by an I^2C master device.

NOTE: I2CBusMon logging buffer is 4 kilobytes. I2CBusMon will only record logs up to the size of this buffer or until timestamp indicates 35 minutes. Logging buffer is cleared automatically every time log is started.

Figure 9 - Slave / Logging Screen



Address Text Field

The current address of the slave device being monitored is shown here. Users can change this address to monitor a specific I^2C slave device. Users must specify a hexadecimal number within 0x00 to 0xFF. For example, the screenshot (Figure 9 above) shows that we have just monitored the slave device at address 0x88.

Sub-Address Checkbox

Select this checkbox to specify that sub-address will be used to specify the slave device.

Sub-Address Field

If Sub-Address checkbox is checked, the hexadecimal number in this field will be used as the sub-address. Users must specify a hexadecimal number in this field. This field only applies if the Sub-Address checkbox is checked.

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Sub-Address Choice Buttons (S / D)

Users can specify whether the sub-address is a Single Byte (S) or a Double Byte (D) number. This button toggles between Single (S) and Double (D). This button only applies if the Sub-Address checkbox is checked.

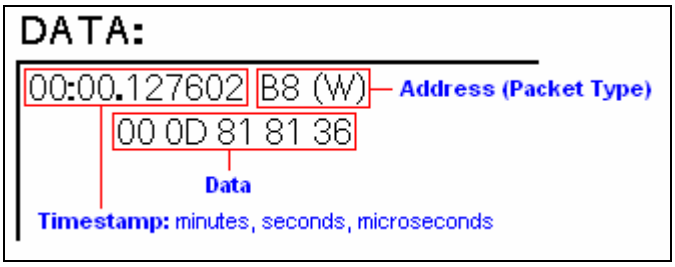
Data Area

This area is read-only. Data that was read from the bus will be displayed in this area.

Data Display Format

Data printed on this area use the format shown below:

Figure 10 - Logging Data Display Format



Packet types can be (R) for read packet, (W) for write packet and (R, GeneralCall) for general call packet.

Menu

Return to Main Screen

Clear the Data area

or

Start or stop logging

Signal Generator Screen

For version 1.2 or above only: I2CBusMon will try to launch an external application called TVG.prc if it exists. This application is an advanced signal generator for the Twincommunicator sled. If this application does not exist, the built-in signal generator screen will be shown instead (see below). For information on how to use TVG.prc, see the **TVG User's Guide** that comes with the application.

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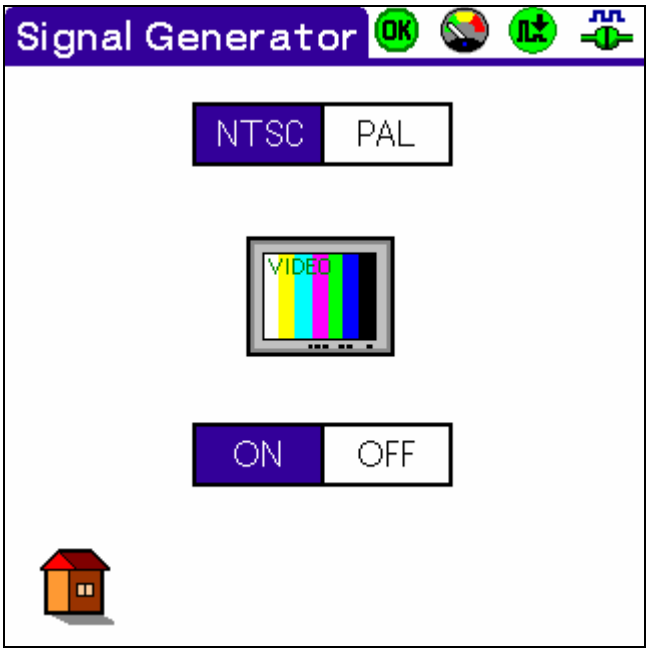
Built-in signal generator: On this screen, users can generate a standard color bar pattern to a television set attached to the Twincommunicator. This application support both NTSC and PAL video signals.

Figure 11 - Signal Generator Screen (Built-in)



Signal Type Choice Button
Use this button to choose between NTSC and PAL video signal.

On / Off Choice Button
Use this button to turn on or off video signal generated by Twincommunicator.

Menu

Return to Main Screen

Non Volatile Memory Read / Write (NVM R/W) Screen

On this screen, users can interact with a Non Volatile Memory attached to the I^2C bus. Users can write data to the attached NVM device and users can read data from the attached NVM device.

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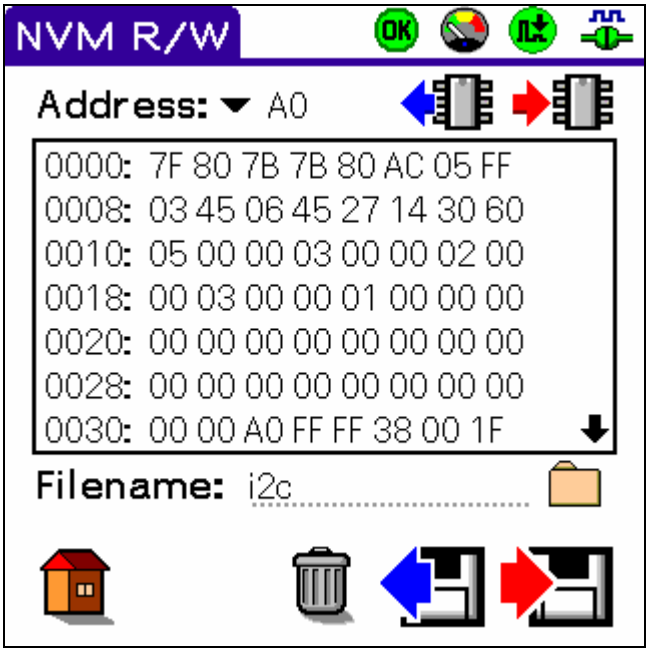
Figure 12 - NVM R/W Screen



Address Popup Menu

This popup menu is used to select the address of the NVM device.

Data Area

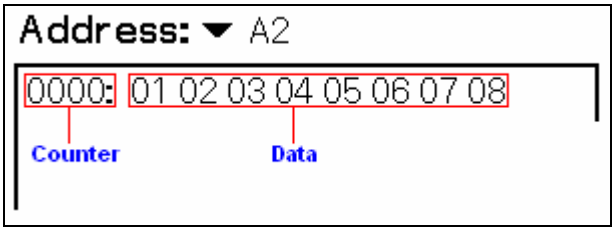
When data is read from an NVM device, the data will be displayed in this area. Data contained in this area can also be written back to the attached NVM device.

Data in this area can be stored into a CSV (comma separated value) file in a Memory Stick. Users can also fill this data area by loading the data from a CSV file in a Memory Stick.

Data Display Format

Data printed on this area is shown below:

Figure 13 - NVM Data Display Format



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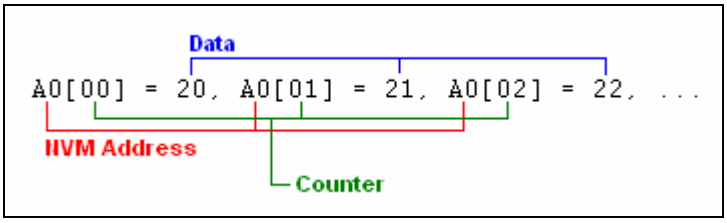
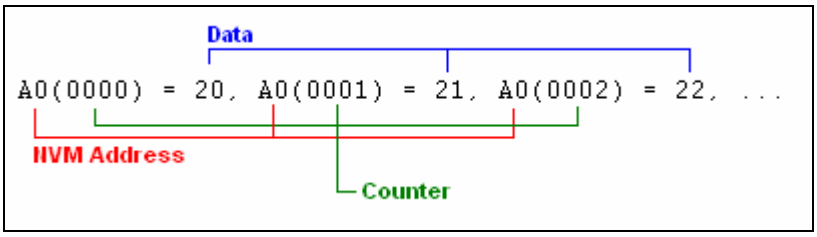
CSV File Format (Single Byte)

Figure 14 - CSV File Format (Single Byte)



CSV File Format (Double Byte)

Figure 15 - CSV File Format (Double Byte)



Filename Field

This field is used to specify the CSV filename to use for loading or saving in the Memory Stick. Files will always be saved or loaded from a standard directory on the Memory Stick: **/PALM/Programs/I2C/**.

Menu


Read data from NVM device


Write data to NVM device


Choose a filename in the Memory Stick for subsequent loading or saving


Return to Main Screen


Clear the data area


Load data from a CSV file in a Memory Stick


Save data into a CSV file in a Memory Stick

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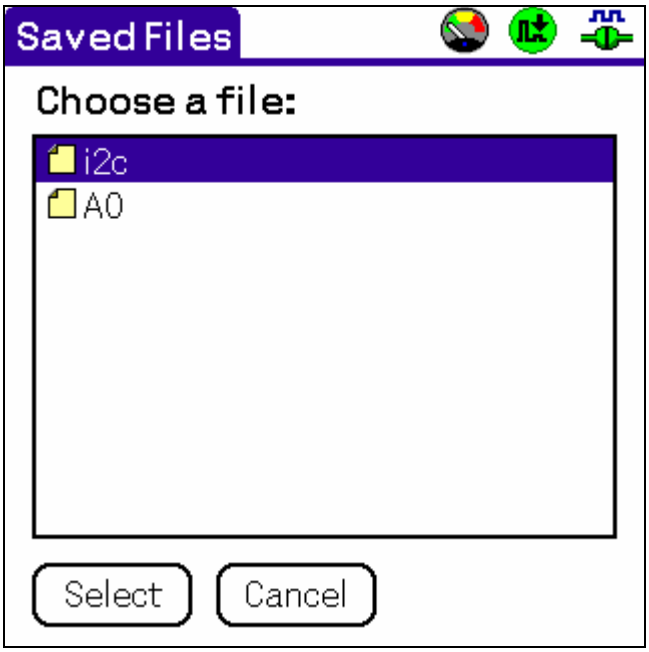
Saved Files Screen

This screen allows users to specify an existing file in Memory Stick. This chosen filename will be subsequently used for loading or saving CSV file containing NVM data.

Figure 16 - Saved Files Screen



File List

This list contains all the files that can be found on **/PALM/Programs/I2C/** directory in the Memory Stick. Users can choose from this list.

Select Button

Use this button to choose the selected file in the file list and go back to the previous screen.

Cancel Button

Use this button to cancel the current selected file and go back to the previous screen.

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Frequently Asked Questions

1. How to exit Demo mode?

To exit demo mode, simply exit I2CBusMon application.

2. Why does I2CBusMon ask if I want to use Demo mode?

This software requires the proper Twincommunicator hardware to be properly connected and powered. The first time the software detects no connection to this hardware, it will prompt users to make sure Twincommunicator hardware is attached and turned on.

3. Where can I get additional information about I2C bus technology?

You can find specifications and other information about this technology on Philips website: http://www.semiconductors.philips.com/buses/i2c/

4. Where can I get additional information about Twincommunicator?

Please visit our website www.twincom.net or send us an email at info@twincom.net.

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