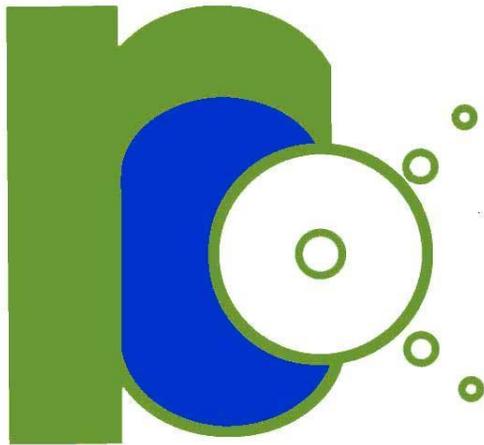# User's Guide

**Radiant**
**Communications**
**Corporation**

# VL4119
# ASI/IP VIDEO

## June 12, 2007
## Version 1.0.9

Radiant Communications Corp.

These products are not intended for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Radiant Communications Corp. (Radiant) customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Radiant for any damages resulting from such improper use or sale.

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# 1.0    Introduction

## 1.1 The Scope of this User's Manual

This User's Manual describes how to access and use Radiant's VL4119 ASI / IP product. The VL4119 is designated as both an encoder (Part Number VL4119-E) or decoder (Part Number VL4119-D), so some descriptions in the manual, apply particularly to one for each configuration.

Section 3.2 of the Manual includes instructions for a Quick-Start Set-Up.

# 2.0 Overview

## 2.1 Product Summary

RADIANT'S VL4119 ETHERCAST ASI/IP Video Engine is a small, low-power device that reliably transports SD-SDI, SDTI, or DVB-ASI (MPEG2-TS) video in real time over standard Gigabit Ethernet (GigE) (1000 Mb/s) or Fast Ethernet (100 Mb/s) IP networks, depending on the bandwidth requirement of the video stream. All ancillary data, including digital audio and timing, is transported across the link with the video stream.

The engine auto-detects the incoming SDI or DVB video signal, converts it quickly and efficiently to IP packets, and pumps it live over a GigE or Fast Ethernet network. At the other end of the connection, the video is returned to its original format by a second VL4119 engine.

RADIANT'S VL4119 ETHERCAST ASI/IP Video Engine does not compress or decompress the signal, and there are no video quality compromises. Jitter control is exceptional, transfer is lossless, and end-to-end latency (or delay) is low and predictable.

With the VL4119 engine, video distribution systems can leverage GigE's inherent long reach, networking flexibility, and scalability. Switched or fiber-based GigE video networks, for example, deliver virtually unlimited transmission distances, while point-to-point GigE links over Cat-5 copper extend up to 100 meters.

On the networking front, the engine supports multicasting, which means the same video signal can be sent through a switch to more than one destination simultaneously.

The VL4119 engine includes the ETHERCAST Configuration Utility, which allows users to quickly discover ETHERCAST engines and configure video networks.

## 2.2 Bandwidth Requirements & Network Quality

For the VL4119 engine to operate successfully there must be enough network bandwidth to transport the video stream and the network must be of good quality.

SD-SDI requires 270 Mb/s and therefore requires a GigE network. DVB-ASI (MPEG2-TS) has a variable data rate, but can use up to 270 Mb/s. Most DVB streams require much less bandwidth than this, and so may work over a Fast Ethernet (100 Mb/s) network. Unless you have verified that a DVB stream uses less than 100 Mb/s, a GigE network is recommended. You should budget up to 10% for overhead (i.e.: about 300 Mb/s for an SD-SDI stream).

Network quality is also critical in the successful transport of the video stream; key factors include network latency, jitter, and packet loss.

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## 2.3 **Key Features**

Table 1 lists the key features of the VL4119 ETHERCAST Video IP Engine.

| | |
|---|---|
| Complies with SMPTE 259M and 305M | ♦ Supports uncompressed SD-SDI video and compressed SDTI video<br>♦ Transfers SDI data at full 270 Mb/s rate |
| Full SD-SDI data integrity | ♦ All SD-SDI data is transported across the link, including ancillary data such as digital audio and timing information |
| Wide range of DVB-ASI data rates | ♦ Handles rates of from 1.5 kb/s - 270 Mb/s (effectively 200 Mb/s due to 8/10 encoding) |
| DVB-ASI packet size auto-detect | ♦ Configuration-free 188-byte or 204-byte MPEG packet detection |
| WAN support | ♦ Communicates with other VL4119 engines over a managed GigE WAN (dependant on network quality). |
| Low, predictable latency | ♦ Adjustable from 750 microseconds to 233 milliseconds |
| Superior jitter control | ♦ PCR jitter as low as +/- 100 ns, steady state |
| Excellent jitter tolerance | ♦ +/- 0.3 UI |
| Carrier input detect | ♦ Automatically detects and switches between SD-SDI/SDTI and DVB-ASI input streams |
| Hot pluggable | ♦ Fast, automatic recovery from cable disconnects or system faults, with no need for PC reboot |
| Clock recovery | ♦ Clock frequency on receiver locked over GigE link to clock frequency on transmitter |
| Efficient packet ordering | ♦ Packets placed in correct order regardless of the order in which they are received |
| Built-in network traffic shaper | ♦ Steady and consistent packet transmission rate |
| Automatic lost packet detection | ♦ Intelligent, bandwidth-efficient, sub-millisecond data resend scheme |
| Intelligent source absence detection | ♦ Idle insertion in DVB mode, black screen in SDI mode |
| Intelligent idle detection | ♦ Minimizes bandwidth utilization when input signal is not present |
| Internal test pattern | ♦ In SDI mode, the input video can be bypassed, and a color bar test pattern generated.<br>♦ Aids fault isolation |
| Loopback mode | ♦ Loops the SDI/DVB input path back to the SDI/DVB output<br>♦ Simplifies testing and system setup |
| Configuration via either PC or DIP switches | ♦ Network and/or engine configured from PC using ETHERCAST Configuration Utility<br>♦ In absence of network-connected PC, configurable using DIP switches |
| Setting retention | ♦ Retains settings upon power-off with write-to-flash via PC or DIP switches |
| LED status indicators | ♦ Green – engine is transmitting data to IP network<br>♦ Orange – engine is receiving data from IP network |

*Table 1: Key Features of VL4119 ETHERCAST Video IP Engine*

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# 3.0 ETHERCAST Configuration Utility

This section describes how to configure the VL4119 ETHERCAST ASI/IP Video Engine using the ETHERCAST Configuration Utility. The Utility is used to:

- Detect all ETHERCAST engines on the LAN/WAN;
- Show their status and their current configuration;
- Dynamically configure engines;
- Save static configurations into engines;
- Give names to engines; and
- Restart engines.

## 3.1 PC Requirements

The ETHERCAST Configuration Utility runs on almost any commercial PC. The minimum system requirements are:

- Windows 2000 (SP4) or XP (SP2);
- 10 MB of free hard drive space;
- 256 MB of RAM;
- 300 MHz processor or faster;
- Display;
- CD drive; and
- 10/100 network interface card/chip (NIC) with operating LAN access.

## 3.2 Quick Start Set-Up

This section is a step-by-step guide of how to get two VL4119 engines up and running in a point-to-point LAN configuration.

There are three main steps, which are laid out in Section 3.2.1 to Section 3.2.3 below:

1) Install the ETHERCAST Configuration Utility on your PC;
2) Set up an IP network transmitter (the engine that will send video over the IP network), and;
3) Set up an IP network receiver (the engine that will receive video from the IP network).

**NOTE:** Keep in mind that the VL4119 engine also supports configurations other than point-to-point. For example, one camera can transmit simultaneously to multiple destinations.

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## 3.2.1      Installing the ETHERCAST Configuration Utility

1) From the CD, run the "EtherCast_setup" executable and follow the directions.

    The ETHERCAST Configuration Utility will be placed in a folder on your PC hard drive, and a shortcut will be placed on your desktop. You may wish to drag the icon to your start menu for easy access.

2) You are now ready to start configuring VL4119 engines and determining which engines send or receive from other engines.

    **IMPORTANT**: All engines are shipped with a default IP address. For the Encoder (VL4119-E) the Default IP address is 10.5.4.101, For the Decoder (VL4119-D) the Default IP address is 10.5.4.201. To change IP address, users must manually assign IP addresses to engines using the Set IP Address Drop-Down menu. Refer to Section 3.3.5 for instructions on how to use this menu.

3) Power up one of the VL4119 engines. Observe the green power LED light up.

4) Connect a Cat-5 cable from the LAN connector on the VL4119 engine to your LAN. Observe the green LAN LED (on the right side) light up.

**NOTE**: The ETHERCAST Configuration Utility can be removed from your PC via the Add or Remove Programs in the Control Panel.

## 3.2.2      Setting Up an IP Network Transmitter

1) Double-click on the ETHERCAST Configuration Utility application. If you have a security application running, such as Norton Internet Security, it may suggest blocking access of EtherCast.exe to the Internet. Permit 'EtherCast.exe' to access the Internet.

2) The Main Dialog Controls panel (Figure 1) of the ETHERCAST Configuration Utility will come up on your screen. Note that there are no default values and no available engines.

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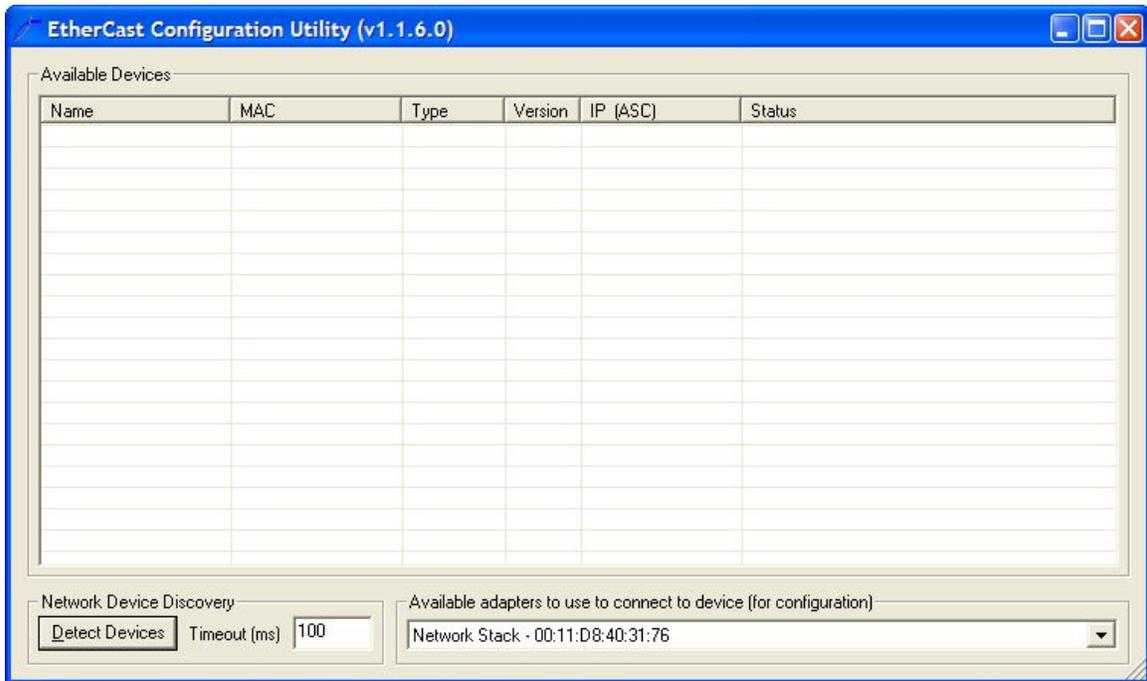


*Figure 1: Main Dialog Controls Panel with No Engines or Default Values*

3) Click on 'Detect Devices' in the bottom left-hand corner of the panel. The Utility will find the engine you connected earlier and add some first-stage configuration information to the Available Devices list, as shown in Figure 2. Observe that the engine is not yet named, that its MAC address is the same as the address printed on the bottom of the engine, that its type and version are displayed, that the DHCP server has assigned it an IP address, and that its operational status is Idle.
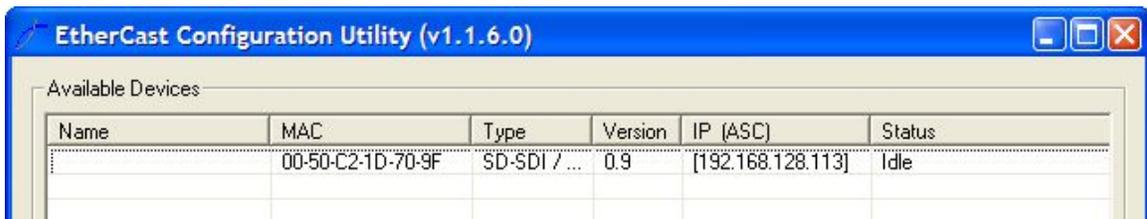


*Figure 2: Main Dialog Controls Panel with First-Stage Engine Detected Information*

4) Right-click on the entry for the engine, and select 'Device Name…' from the drop-down menu.

5) Type a name for this engine in the box (in this example, the engine is assigned the name 'Transmit 1,' but the name can be anything that suits user needs). Select OK.

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6) The Start-Up Device Configuration dialog will appear. Observe that this dialog opens at the Override DIP Switches dialog. UNCHECK the checkbox for 'Use DIP switch settings,' as shown in Figure 3. Click on 'Save settings to flash memory.'
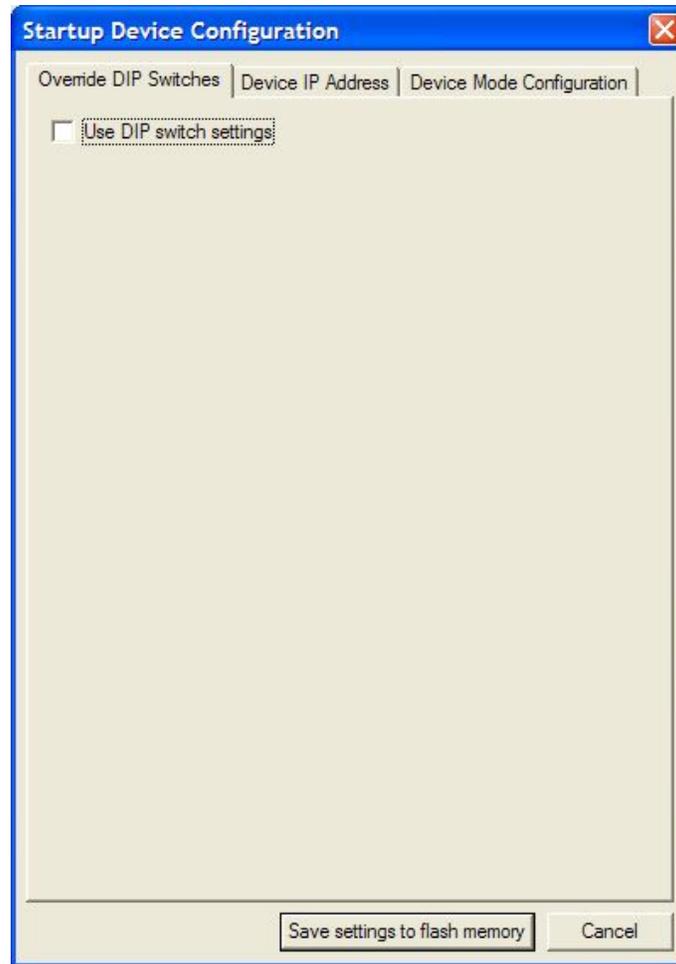
*Figure 3: Override DIP Switches Dialog with Use DIP Switch Settings Unchecked*

7) Right-click again on the engine in the Available Devices List and select 'Current Settings…' from the drop-down menu.

8) The Start-Up Configuration dialog will open. Click on the check box beside 'IP Network Transmitter (Video Input).'

9) At this point, pause and perform Step 1 in the instructions for Setting Up an IP Network Receiver (Section 3.2.3 below). You will then have the IP address of the IP network receiver to which this engine will send video data.

10) In the Device Mode Configuration dialog, select the Destination IP (address) and input the IP address of the IP network receiver. Click on 'Apply settings on device'.

11) Check to see if the changes have been captured on the engine by selecting 'Detect Devices' once again. If your changes have been captured, the Main Dialog Controls Panel will look like the screen in Figure 4. The engine will be labelled with the name you assigned, such as 'Transmit 1', the MAC and IP addresses will be shown, and the engine will be configured to transmit to a second engine with a different IP address. If this information is not as shown, review the instructions. You may not have correctly applied the settings to the engine.
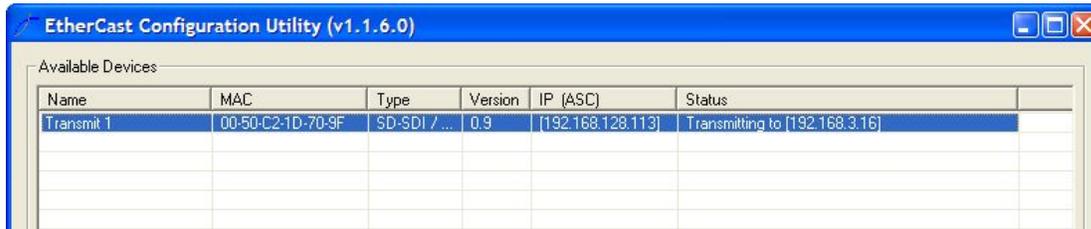


*Figure 4: Main Dialog Controls Panel with Engine Name, MAC and IP Addresses, and Status*

## 3.2.3      Setting Up an IP Network Receiver

1) Start by repeating some of the initial steps used to set up the IP network transmitter. Plug a Cat-5 cable into the LAN connector of the second VL4119 engine and plug the other end of the cable into your LAN. Next, click on 'Detect Devices' in the bottom left-hand corner of the Main Dialog Controls Panel.

2) Observe the IP address assigned to the second VL4119 engine. At this point, pause and return to Step 10 in the directions for Setting up an IP Network Transmitter.

3) Right-click on the second VL4119 engine in the Available Devices list and select 'Device Name…' from the drop-down menu. Type a name for this engine in the box (in this example, the engine is assigned the name 'Receive 1,' but the name can be anything that suits user needs). Select OK.

4) Right-click on the engine in the Available Devices list and select 'Startup Settings…' from the drop-down menu. The Startup Device Configuration dialog will open at the Override DIP Switches. UNCHECK the checkbox for 'Use DIP switch settings'. Click 'Save the settings to flash memory.'

5) Right-click on the engine entry and select 'Current Settings…' from the drop-down menu. This will open the Current Device Configuration dialog, as shown in Figure 5.

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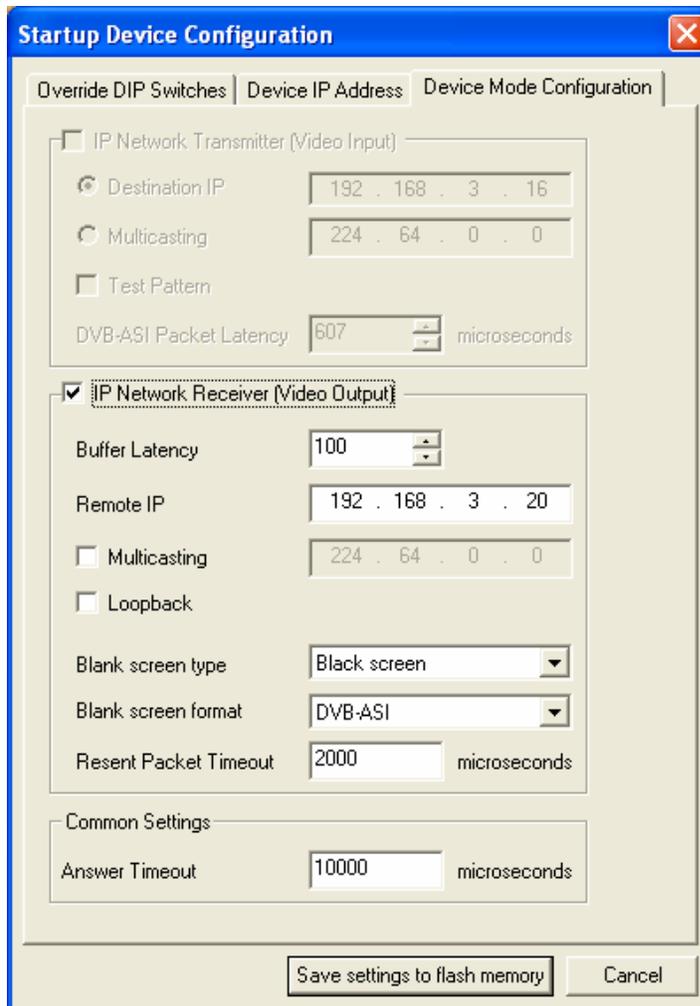


*Figure 5: Current Device Configuration Dialog with IP Network Receiver Selected*

6) Click on the box beside 'IP Network Receiver (Video Output)' to select it. In the 'Remote IP' box, enter the address of the IP network transmitter from which this engine will receive data. Click on 'Apply settings to this device'.

7) Check to see if the changes have been captured on the engine by selecting 'Detect Devices' once again from the Main Dialog Controls panel. The panel should look like the example in Figure 6. The engine should have a name (Receive 1, in this example), a MAC address, an IP address, and should be configured to receive from a second engine (the IP network transmitter) with a different IP address. If your changes have not been implemented, review the instructions. You may not have correctly applied the settings to the engine or saved the settings to flash.

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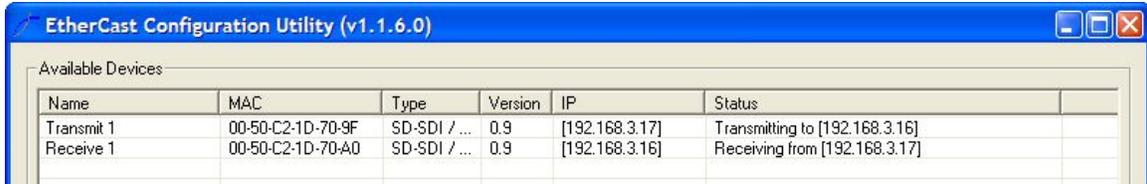


*Figure 6: Main Dialog Controls Panel with Added Configuration for IP Network Receiver*

12) Before installing the VL4119 engines in a network, and especially if this is your first time configuring engines, you may wish to perform a final check by connecting the IP network transmitter to a video source and the IP network receiver to a monitor.

13) You may choose to close the ETHERCAST Configuration Utility at this point. You will be prompted to reply to the question: 'Do you want to save the list of ETHERCAST devices for the next session?

You can sort the engines by a field in ascending or descending alphabetical order. Selecting a field toggles its sort order from ascending [ASC] to descending [DESC] order. Boolean sorting is not enabled (i.e. sort by type and then by name). Figure 7 shows the two engines sorted by ascending '[ASC]' order of IP address.
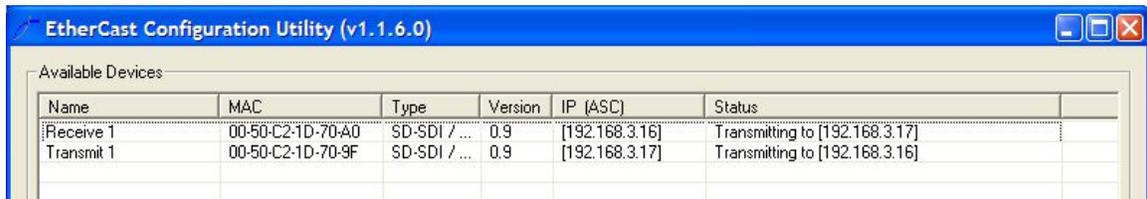


*Figure 7: Main Dialog Controls Panel with Receiver and Transmitter Sorted by IP Address*

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## 3.3 **Main Dialog Controls**

Figure 8 shows the Main Dialog Controls panel of the ETHERCAST Configuration Utility.
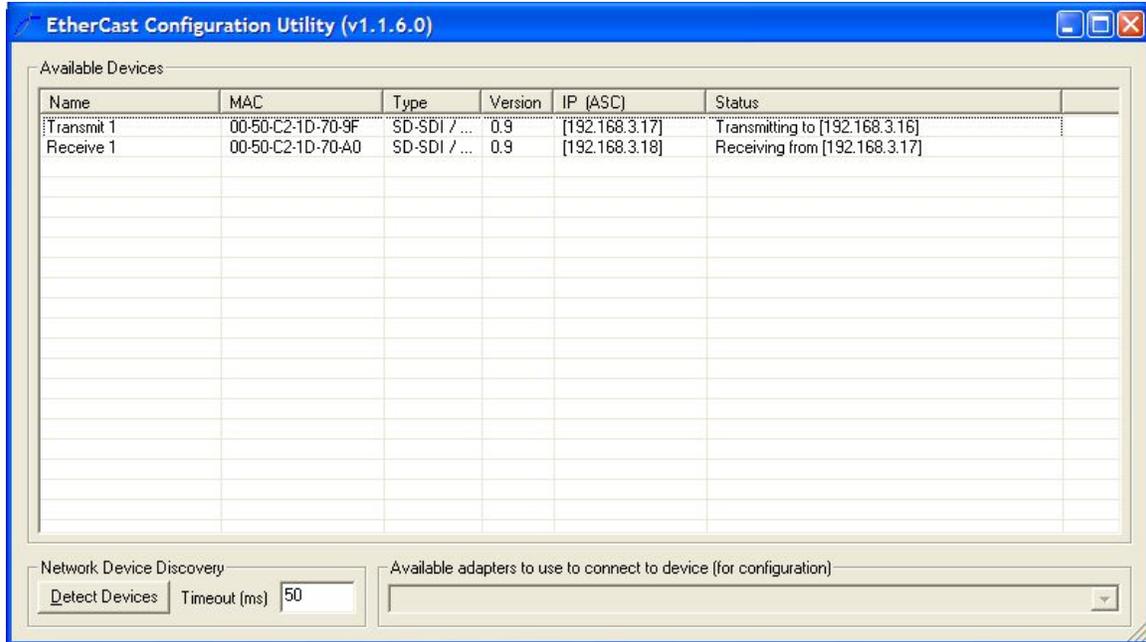


*Figure 8: Main Dialog Controls Panel*

The dialog provides the following controls:

- **Detect Devices**: Used to detect all operational VL4119 engines on the LAN and to list them in the Available Devices table. The detection of engines is not dynamic; the Detect Devices control must be used to determine whether or not devices are connected and available for use. While detecting engines, the ETHERCAST Configuration Utility 'freezes' and awaits information. The Detect Devices command is related to the Timeout control (see below).

- **Available Devices list**: After a network engine discovery, this table lists all VL4119 engines detected in the LAN. It also lists WAN-connected devices, which must be added manually (Section 3.3.3 describes how to do this). Each entry in the list displays the name of the VL4119 engine, its MAC Address, its ETHERCAST product category (i.e. whether the engine is for SD-SDI/DVB-ASI or another video format), its firmware version, its IP address, and its current status.

- **Timeout (ms) Edit Box**: Used to set the timeout, in milliseconds, for network engine discovery. This setting is saved in the Windows registry for the next time the application is started. There is no upper limit to the timeout that can be set.

    **NOTE**: The timeout applies **only** to the detection of VL4119 engines, and is unrelated to the buffer latency. Use the 'buffer latency' setting in the Device

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> Mode Configuration dialog to modify the transmit latency to accommodate network topologies with many hops.

- **Available adapters to use to connect to device Combo box**: When more than one network adapter (or NIC – network interface card/chip) is present in the system, this combo box lists the available adapters that can be used. Users can select which adapter will communicate with the VL4119 engine.

Listed engines can be sorted by field (i.e. Name, MAC address) in ascending or descending alphabetical order. Selecting a field toggles its sort order from ascending [ASC] to descending [DESC]. Boolean sorting is not enabled (i.e. sort by type and then by name).

## 3.3.1    Status Drop-Down Menu

In some cases, for example, if network settings change, the ETHERCAST Configuration Utility may be able to find a VL4119 engine, but not connect to it.

In these situations, the Status column of the Available Devices list will display the text 'Connection could not be established.' Right-clicking on this text will open the 'Connect using the currently selected adapter' prompt shown in Figure 9. Releasing it will cause the engine to attempt connection with the adapter shown in 'Available adapters to use to connect to device' combo box (see Section 3.3 for more information).



*Figure 9: Status Drop-Down Menu*

## 3.3.2    Device Menu

Each VL4119 engine in the Available Devices list of the Main Dialog Controls panel has an associated drop-down menu. The menu can be opened by right-clicking with the mouse when the cursor is above the VL4119 engine in the list, as shown in Figure 10. Note that some functions are reserved for future use.

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*Figure 10: Device Drop-Down Menu*

The menu offers the following choices:

- **Startup Settings**: Opens the Startup Device Configuration dialog. This dialog allows users to set and save a static configuration into the selected VL4119 engine.
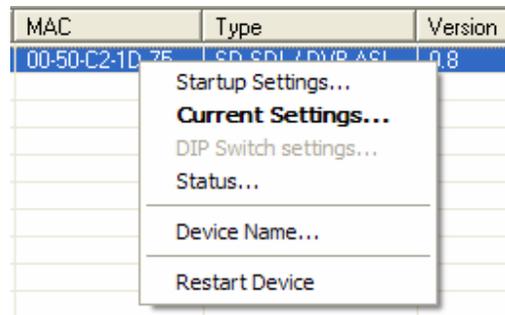
- **Current Settings**: Opens the Current Device Configuration dialog. This dialog allows users to set and dynamically apply a configuration to the selected VL4119 engine.

- **DIP Switch Settings**: (For future use.) Opens the DIP Switch Settings dialog. This dialog shows the current settings of the engine's DIP switches.

- **Status**: Opens the Device Status dialog. This dialog displays status information about the selected VL4119 engine. The information is refreshed every 500 milliseconds.

- **Device Name**: Opens the Device Name dialog. This dialog allows users to give a name to the selected VL4119 engine and save it into the engine's flash memory.

- **Restart Device**: Restarts the selected VL4119 engine.

## 3.3.3   Add a Device Menu (for WAN-connected engines)

This menu allows users to add WAN-connected engines with known IP addresses to the Available Devices list in the Main Dialog Controls panel. WAN-connected engines are not automatically detected by the 'Detect Devices' button on the panel, because detection requests do not pass routers and gateways. Thus, WAN-connected engines must be added manually using the Add a Device Menu.

IMPORTANT: The VL4119 ETHERCAST Video IP Engine only works over a managed (GigE or Fast Ethernet depending on bandwidth requirements) WAN with a path dedicated to the ETHERCAST connection. This path must be set up in advance by the network administrator, and must have the following characteristics:

1) The range of IP addresses outside of the Local Area Network must not conflict with the addresses inside of it, based on the subnet mask.

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2) The gateway or router (as configured in the VL4119 engine) must have a route set-up to reach the network of the WAN-connected engine. At the very least, the gateway should have a route that reaches a network close to the network of the ETHERCAST engine.

3) If there is a firewall between networks, the following ports should be opened: 20200 and 20202. For added security, network administrators should make sure that only the ETHERCAST engines have access to these ports (identified by either their IP or MAC addresses). This is dependent on the firewall in use. Users should refer to documentation and support from the firewall's manufacturer.

4) The network latency must be low enough to accommodate the buffer latency (refer to 3.3.4 and the settings for the Buffer Latency Edit Box).

To enable the Add a Device Menu, right-click on empty space in the Available Devices list, as shown in Figure 11. The menu itself is shown in Figure 12.
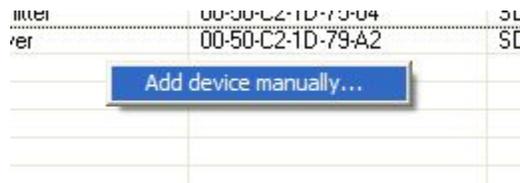


*Figure 11: Enabling the Add a Device Menu*



*Figure 12: Add a Device Menu*

This menu offers the following options:

- **IP Address**: The IP address of the WAN-connected engine you want to add.

- **Ping ETHERCAST Device… Button:** Pings the device at the designated IP address to determine if it exists, and if it is a VL4119 engine.

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Depending on the result of the ping, either the prompt shown in Figure 13 or Figure 14 will show up on your screen.



*Figure 13: No Device Found Prompt*



*Figure 14: ETHERCAST Device Has Responded Prompt*

Clicking on 'OK' in the prompt in Figure 14 adds the entry for the WAN-connected engine to the Available Devices list.

It is possible to save an Available Devices list, including the manually added WAN-connected engines. When closing the ETHERCAST Configuration Utility, the prompt shown in Figure 15 will appear. Click on 'Yes' to save the information in the registry.



*Figure 15: Save the Device List Prompt*



*Figure 16: Reload ETHERCAST Devices from Last Session Prompt*

When you next open the ETHERCAST Configuration Utility, the prompt shown in Figure 16 will appear. If you click on 'Yes,' all the previously available engines that were

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saved earlier will appear, after a short wait, on the Available Devices list in the Main Controls Dialog.

# 3.3.4 Start-Up Device Configuration Dialog

The Startup Device Configuration Dialog allows users to set and save a static configuration into the selected VL4119 engine. If no static configuration is saved, the address will attempt to retrieve its address from a DHCP server. See Section 3.3.5 for information on how to connect to and configure an engine with no static configuration and no access to a DHCP server.

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The common controls of the Start-Up Device Configuration dialog are:

- **Dialog Control**: Three dialogs are available: Override DIP Switches (Figure 17), Device IP Address (Figure 18), and Device Mode Configuration (Figure 19).

- **Save settings to flash memory Button**: Clicking on this button saves the static configuration into the flash memory of the VL4119 engine.

- **Cancel**: Clicking on this button cancels any changes done by the user and closes the dialog.

### 3.3.4.1 Override DIP Switches Dialog:
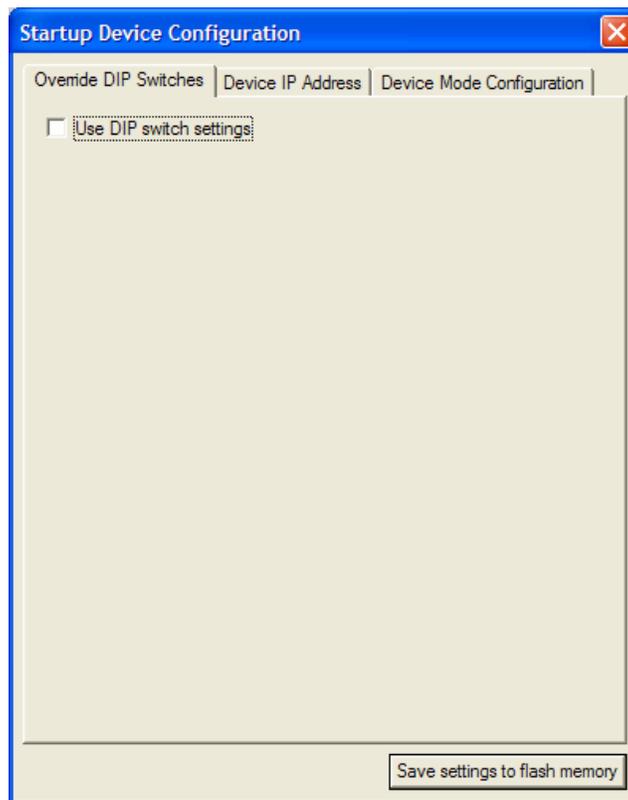


*Figure 17: Override DIP Switches Dialog*

- **Use DIP switch settings Check Box**: When checked, forces the VL4119 engine to use DIP switch settings. This box is UNCHECKED by default when the engine is shipped from the factory. When unchecked, the engine uses a static IP address configured in the ETHERCAST Configuration Utility. When checked, the engine retrieves its IP address from a DHCP server. DIP switch settings are factory configured.

**3.3.4.2   Device IP Address Dialog:**
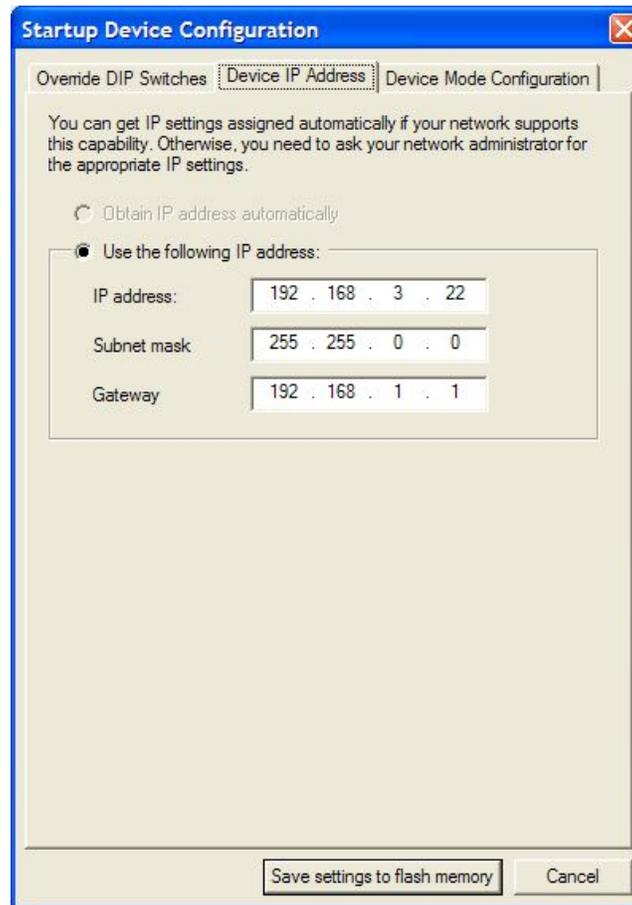


*Figure 18: Device IP Address Dialog*

- **Obtain IP address automatically Radio Button**: (For future use.) When checked, tells the engine to use the DHCP protocol to get its IP Address. The engine does this already through the default (factory) settings of the DIP switches. A future version of the ETHERCAST Configuration Utility will deliver software control of the setting.

- **Use the following IP address Radio Button**: When checked, tells the VL4119 engine to use the IP address, subnet mask, and gateway IP address set by the user.

- **IP address Edit Box**: IP address the VL4119 engine will use when the 'Use the following IP address' radio button is checked.

- **Subnet mask Edit Box**: Subnet mask the engine will use when the 'Use the following IP address' radio button is checked.

- **Gateway Edit Box**: Gateway IP Address the engine will use when the 'Use the following IP address' radio button is checked.

**3.3.4.3** **Device Mode Configuration Dialog (IP Network Transmitter):**



*Figure 19: Device Mode Configuration Dialog for IP Network Transmitter (Video Input)*

- **IP Network Transmitter (Video Input) Check Box**: When checked, the
  VL4119 engine is configured as an IP network transmitter. It will capture video
  from the SDI/DVB input and transmit it over the IP network.

  a. **Destination IP Radio Button**: When checked, the VL4119 engine will be
     set in unicast mode.

  b. **Destination IP Edit Box**: IP address of the destination VL4119 engine to
     which the engine send data in unicast mode.

  c. **Multicasting Radio Button**: When checked, the VL4119 engine will be
     set in multicast mode.

  d. **Multicasting Edit Box**: Multicast group to which the VL4119 engine will
     send data in multicast mode.

  e. **Test Pattern Check Box**: When checked, the VL4119 engine will be set
     to test pattern mode.

f. **DVB-ASI Packet Latency**: This variable, used only when a DVB-ASI signal is present, specifies how long the VL4119 engine accumulates MPEG packets before it transmits its first Ethernet packet. If the specified packet latency time is reached when the engine is receiving an MPEG packet, it waits until the reception of that packet is complete before sending the first Ethernet packet.

Every time an Ethernet packet is sent, the packet latency timer is reset. If no MPEG packet has arrived when the timer reaches the specified packet latency time, the VL4119 engine does <u>not</u> send an empty Ethernet packet. Instead, it remains idle until another MPEG packet is received. If only one MPEG packet is received, an Ethernet packet containing that single MPEG packet is sent. The possible values for the packet latency time are 3 µs to 2424 µs, with a default value of 607 µs.

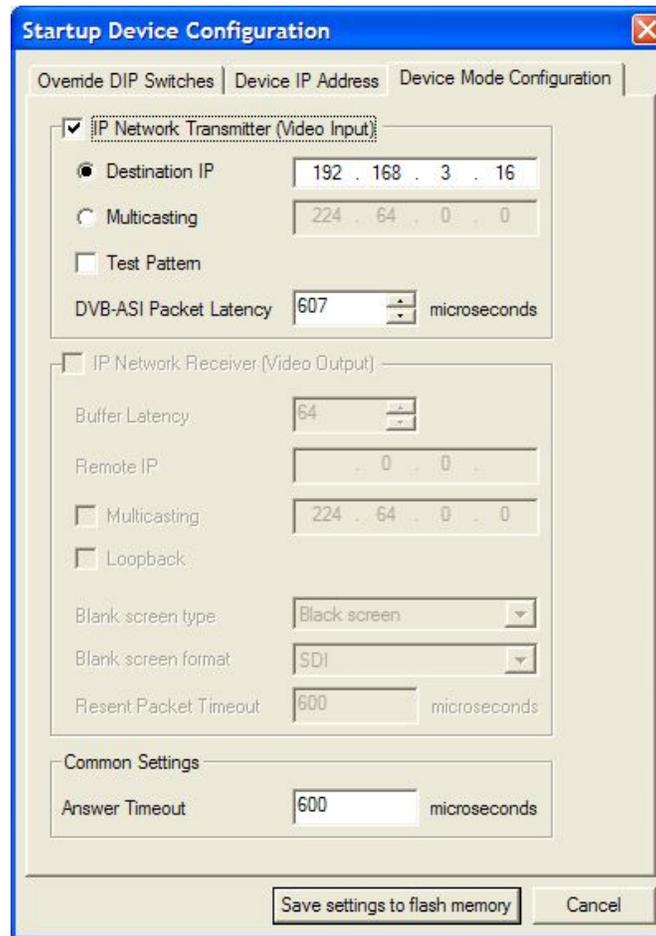### 3.3.4.4 Device Mode Configuration Dialog (IP Network Receiver):
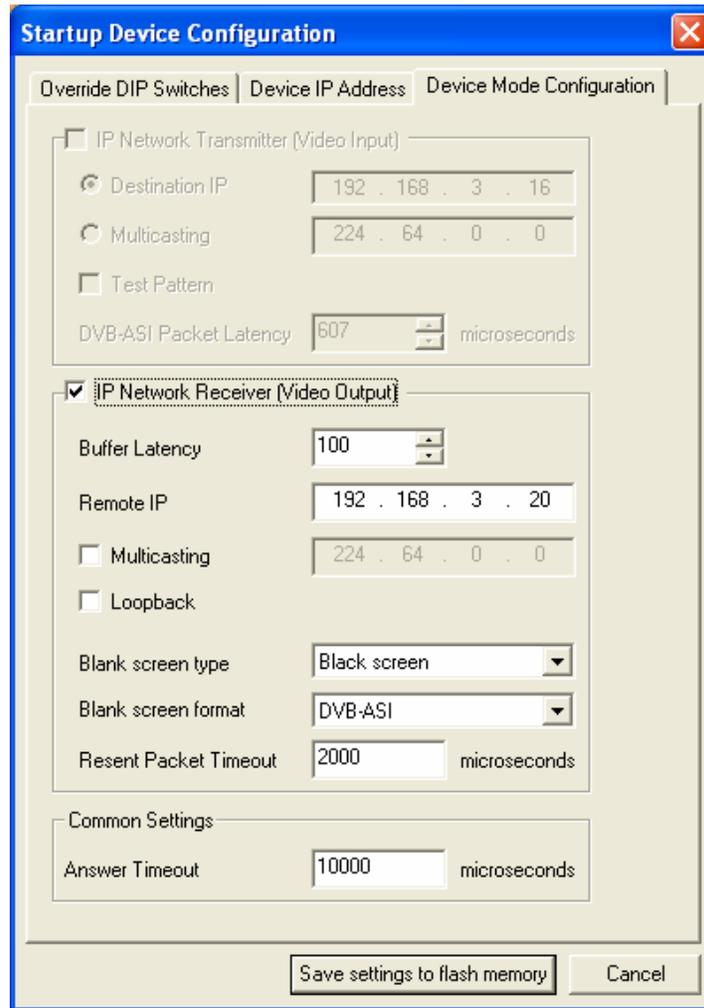


*Figure 20: Device Mode Configuration Dialog for IP Network Receiver (Video Output)*

- **IP Network Receiver (Video Output) Check Box**: When checked, the VL4119 engine begins to receive data from the IP network and transmit it over the SDI/DVB output.

  a. **Buffer Latency Edit Box**: Defines the number of packets to buffer before sending the video over the SDI/DVB output. This is continuously adjustable from 16 to 4800, with 64 packets as the default value.

  This value should be at least greater than (10 x Maximum Network Latency in seconds x Ethernet packets per second).

  Ethernet packets per second:

  - SD-SDI = 25000 pkt/s

  - DVB-ASI (188) = (Input Bandwidth (Mb/s)) / ( 8 x 7 x 188) pkt/s

  - DVB-ASI (204) = (Input Bandwidth (Mb/s)) / ( 8 x 6 x 204) pkt/s

Example:

For DVB-ASI (188 Bytes) at an input bandwidth of 25 Mb/s:

Ethernet packets per second = 25 000 000 / (8 x 7 x 188) = 2 375 pkt/s

If the Maximum Network Latency = 25 ms, then the Buffer Latency = 10 x 0.025s x 2375 pkt/s = 594 packets

b. **Remote IP Edit Box**: The IP address of the VL4119 engine from which the engine will receive data.

c. **Multicasting Check Box**: When checked, VL4119 engine will be set in multicast mode.

d. **Multicasting Edit Box**: Address of the multicast group to which the VL4119 engine will belong and receive data from.

e. **Loopback Check Box**: When checked, the VL4119 engine will be set in loopback mode and will display the content of the video source.

f. **Blank screen type**: Allows the user to choose the type of blank screen to display when no valid video source is streaming into the VL4119 engine and the Blank screen format is set to SDI. Users may choose a black screen or a color bar screen.

g. **Blank screen format**: After the engine has been power-cycled, it will send either DVB idles or SDI blank screens as selected by this combo box. If the engine has started to receive IP network data, it will automatically switch to the received format and continue, even if the source is disconnected.

h. **Resent Packet Timeout**: Time, in microseconds, for the IP Network Receiver to request again for the remote IP Network Transmitter to resend a previously missed packet if a specific packet has not yet been received. This value should be at least greater than 2.5 times the maximum network latency. Granularity is 200 microseconds. This is adjustable from 600 to 13107000 microseconds [i.e.: $(2^{16} – 1)$ x 200 µs], with 2000 µs (i.e. 2 ms) as the default value.

i. **Answer Timeout:** Time, in microseconds, for the Video IP Engine to send again (retry) a command if the answer has not been received. This value should be at least greater than five (5) times the maximum network latency. Granularity is 200 microseconds. This is adjustable from 600 to 13107000 microseconds [i.e.: $(2^{16} – 1)$ x 200 µs], with 10000 µs (i.e. 10 ms) as the default value.

## 3.3.5 Set IP Address Drop-Down Menu

The ETHERCAST VL4119 engine is shipped from the factory with its DIP switches set to enable DHCP, and with the Use DIP Switch Settings checkbox in the Override DIP Switches Dialog checked.

On initial start-up, the engine will have no saved static configuration, and will by default attempt to obtain an address from a DHCP server on the LAN. If no DHCP server is available, then users must assign an address to the engine using the Set IP Address Drop-Down Menu.

To access the Set IP Address drop-down menu, position the mouse over and right-click on the engine entry in the Available Devices list of the Main Dialog Controls panel, as in Figure 21. The Set IP Address drop-down menu will open, as shown in Figure 22.



*Figure 21: Accessing the Set IP Address Menu*



*Figure 22: Set IP Address Menu*
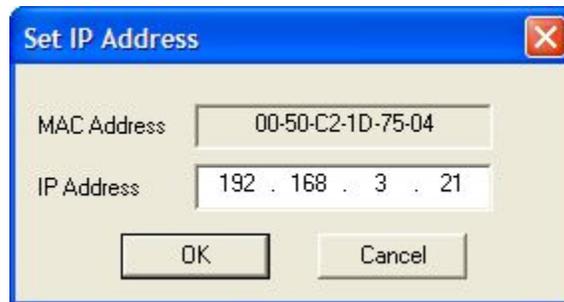
In the Set IP Address menu, the MAC address of the engine you want to add will appear automatically. In the IP address box, assign an address to the engine.

> **NOTE**: Please make sure that the specified address is valid. If you are unsure, consult your network administrator

When you click OK, then the IP address is applied to the device and you can now connect to and configure it.

## 3.3.6 Current Device Configuration Dialog

The Current Device Configuration dialog allows users to set and dynamically apply a configuration to the VL4119 engine. The common controls of this dialog are:

- **Dialog Control**: Two dialogs are available: Device Mode Configuration (Figure 19 and Figure 20) and Device Status (Figure 23).

- **Apply settings on device**: Clicking this button applies the current configuration to the VL4119 engine.

- **Cancel**: Clicking this button cancels any changes done by the user and closes the dialog.

### 3.3.6.1 Device Mode Configuration Dialog:

See the documentation in Section 3.3.4 for the Device Mode Configuration dialog.
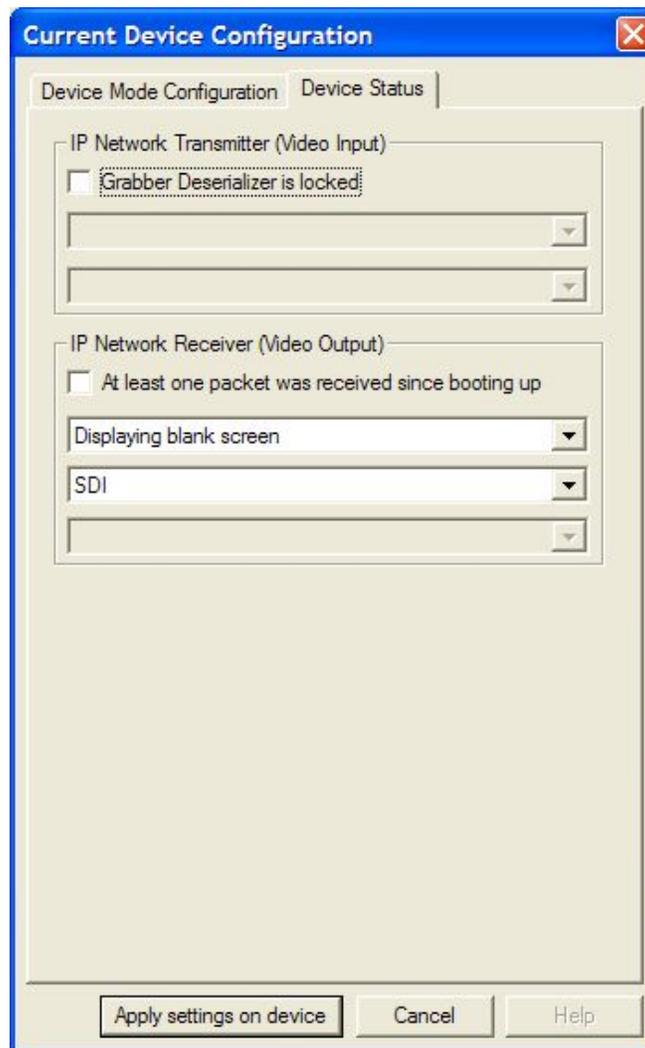
### 3.3.6.2 Device Status Dialog:



*Figure 23: Device Status Dialog*

**IP Network Transmitter (Video Input) Section**: Indicates the video acquisition status of the VL4119 engine.

a) **Grabber Deserializer is locked Check Box**: When checked, indicates that the VL4119 engine has detected a valid video input and is locked on. When unchecked, no valid video input is detected by the engine.

b) **Format Combo Box**: The combo box displays which video format is currently being detected from the video source. The possible values are:

    a. SDI; and

    b. DVB-ASI.

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    c) **Sub-Format Combo Box**: If the detected format is DVB-ASI, this combo box indicates the current size of the MPEG packets being received. The possible values are:

        a. Packets of 204 bytes; and

        b. Packets of 188 bytes.

**IP Network Receiver (Video Output) Section**: Indicates the video output status of the VL4119 engine.

    a) **At least one packet was received since booting up**: Indicates that at least one video packet has been received and sent by the VL4119 engine.

    b) **Blank Screen Status Combo Box**: Indicates the type of image the VL4119 engine is sending over its video output. The possible values are:

        a. Displaying blank screen: Indicates the VL4119 engine is sending out a test pattern, regardless of the presence of incoming IP-formatted video.

        b. Displaying incoming stream of data: Indicates that the VL4119 engine is sending out video that is being received on its IP network side.

    c) **Format Combo Box**: The combo box displays which type of IP-formatted video is being received on the network link. The possible values are:

        a. SDI; and

        b. DVB-ASI.

    d) **Sub-Format Combo Box**: If the video being received is IP-formatted DVB-ASI, this combo box indicates the current size of the MPEG packets. The possible values are:

        a. Packets of 204 bytes; and

        b. Packets of 188 bytes.

# 4.0  Video Connectors

The VL4119 ETHERCAST Video IP Engine has one 75-ohm BNC connectors. The BNC is either the SDI/DVB video input, or the SDI/DVB output depending on the units is an Encoder (VL4119-E) or Decoder (VL4119-D).

If the engine is configured as an IP network Encoder, then it receives SDI/DVB video on its video-in BNC connector, and transmits IP-formatted video over the GigE link via the RJ-45 connector. In this configuration, the video-out connector displays a test pattern if the engine is in SDI mode, and displays idles if the engine is in DVB-ASI mode.

If the engine is configured as an IP network Decoder, then it receives IP-formatted video from the RJ-45 connector and sends SDI/DVB video over the video-out BNC connector. In this configuration, the video-in connector is unused.

# 5.0    Power and Mechanical

Power: 15W @ 90 to 240V AC

Operating Temp: -20° to 50° C

Storage Temp: -40 to 85° C

Size: 16.0" W x 12.0" D x 1.75" H

# 6.0　Known Issues

**1. System does not always recover when the video input cable is disconnected and then reconnected.**

**Description**: When the video input is disconnected from a device, the system does not always recover and restart the video streaming.

**Workaround**: Power-cycle the device by disconnecting and reconnecting the power or do a 'Restart' of the device using the ETHERCAST Configuration Utility.

**Plan**: Radiant  plans to fix this issue in a future firmware release.

# 7.0    Additional Support

Additional support can be obtained by contacting Radiant Communications Toll Free Tech Support 1-800-969-3427.

Radiant strives for clarity and thoroughness in its documentation. If there are areas that you feel are unclear, or would make the installation and operation simpler or easier, please send us your suggestions at support@rccfiber.com.