JVC®



Streamcorder Application Note 4

Subject: Wireless Peer-to-Peer Connections from Streamcorder to Computer



This application note applies to the GY-DV300, GY-DV5000 and BR-DV6000 Streamcorders equipped with optional network packs KA-DV300/350, KA-DV5000 or SA-DV6000

Objective

Successfully connecting your Streamcorder to a computer using wireless network interface cards (WLANs) involves installation and configuration of a KA-DV300/350, KA-DV5000 or SA-DV6000 Network Pack, including a WLAN card, and (installing and) configuring your computers' WLAN network interface.

This Application Note describes connecting a single Streamcorder connected directly to a single computer in an AD HOC configuration, with no switch, hub, or access point present. Other connection strategies are described in other Application notes.

System Components

There are five components, or 'blocks' required when connecting a Streamcorder to a computer as shown here.

| GY-DV300/GY-DV5000/BR-DV6000 | | | Computer | |
|------------------------------|------|---|----------|--|
| Network Pack | WLAN | - | WLAN | |

Other than the obvious components, i.e., a computer and a Streamcorder, you need a network pack with a wireless network interface (WLAN) card, and another WLAN card for the computer.

Only the following WLAN cards are supported by the Streamcorder network pack. Any WLAN card can be used in the computer:

| Manufacturer | Model | KA-DV300 | KA-DV350 KA-DV5000 SA-DV6000 |
|--------------------------|--|------------------------|------------------------------------|
| Linksys | WCF11 (requires Type II CF to PCMCIA adapter) | \checkmark | \checkmark |
| Socket Communications | WL6000-320 (requires CF to PCMCIA adapter)* | (Rev. 2.0 or later) | \checkmark |
| TRENDnet | TEW-201PC TEW-202CF (requires Type II CF to PCMCIA adapter) | \checkmark | \checkmark |
| Symbol Technologies | Wireless Networker Compact Flash (requires Type II CF to PCMCIA adapter) | (Rev. 2.0 or later) | ✓ |
| Cisco | Aironet 350 model AIR-PCM35x | | \checkmark |

* Socket Communications WL6000-320 does not support AD HOC mode of operation

Peer-to-Peer Wireless Network Basics



Unless the computer is a server providing IP addresses to all connected devices, IP addresses and Netmask settings must be configured manually.

In peer-to-peer networks, both devices MUST have unique IP addresses in the same network group. The network group is defined by the first three numbers of the four number IP address. Connecting camera to computer, only the fourth group of number must be different. In the example above, the network group is 192.168.100. The camera's IP address is 192.168.100.101 (the default address) and the IP address of the computer will be set to 192.168.100.102, unique addresses in the same network group.

Although IP addresses of all devices on a network must be unique, the Netmask must be the same. In the example above, both devices use 255.255.255.0 as a Netmask.

In addition to the IP address and Netmask, wireless networks also require the following parameters be set identically on the Streamcorder and computer. Please refer to the manual that came with the WLAN card installed in the computer for these settings.

- ESS ID This may be called ESSID or SSID on by the computers WLAN software. This *must* be the same for the Streamcorder and the computer. Some revisions support multiple ID's.
- CH (channel) Both the Streamcorder and computer must be set to use the same channel. Streamcorder does not auto-scan for channels.

- AD HOC MODE The ad-hoc mode must be used when connecting peer-to-peer with no intermediate infrastructure (wireless access point).
- Encryption If used, the encryption key *must* be the same on both Streamcorder and computer. We recommend disabling encryption until you feel comfortable with the other settings.

What You Need

- GY-DV300 camera with a KA-DV300/350 Network Pack, GY-DV5000 camera with a KA-DV5000 Network Pack, or a BR-DV6000 VTR with an SA-DV6000 Network Pack.
- A wireless network card (with adapter, if applicable) for the Streamcorder. Only those shown on the list above are supported by the Streamcorder
- A computer with a wireless LAN interface.

Configuring the KA-DV300/350, KA-DV5000, or SA-DV6000 Network Pack

Before you can use Streamcorder with a wireless LAN interface, you must configure it properly. You only need to configure the network pack when using it for the first time or when connecting to a different computer.

The menus illustrated in the following discussion are from a KA-DV300 revision 2.00. Other revisions of the KA-DV300/350, the KA-DV5000 and the SA-DV6000 may have slightly different menu structures. Please consult your owners' manual for more information.

To configure the network pack and LAN card:

- 1. Turn the camera or VTR power ON and wait for the Network Pack initialization sequence to finish. With the KA-DV5000, you must also turn the network pack power ON as well. You will know when the sequence finished when the icon, shown to the right, appears in the viewfinder.
- From the camera, press and hold the MENU button until the main menu appears. With the BR-DV6000 VTR, you just have to press, but not hold, the MENU button. Please refer to your User's Guide for instructions on menu navigation if necessary.
- From the top menu, shown here for the GY-DV300, select 'NETWORK PACK CONFIGURAION'. From the NETWORK PACK CONFIG window, not shown, select 'NETWORK MAIN SET'.
- 4. From the 'NETWORK MAIN SETUP' window, select 'NETWORK SETUP'.
- 5. From the first of the two NETWORK SET windows, shown below, the following parameters are set:
 - HOST NAME This is an arbitrary name, up to 64 characters, that will be used by the host computer for saving files.
 - DHCP When set to 'ON', this allows a host device or IP service provider to dynamically assign an IP address. For direct connections as outlined here, this must be set to 'OFF'

| MODE MENU MANUAL | |
|----------------------------------|--|
| EARHONE LEVEL 10 SYSTEM SET | |
| DISPLAY SET CAMERA SET[CAM-A] | |
| OPERATION[CAM-A] CLOCK/TC | |
| NETWORK PACK CONFIG | |
| EATT | |

HOST NAME.. DHCP OFF IP ADDRESS.. SUBNET MASK.. GATEWAY.. NEXT PAGE PAGE BACK

- IP ADDRESS Since Dynamic IP addressing is turned OFF, a specific address must be assigned. Since, in this application, there is no direct connection to the outside world and thus there can be no conflicts, any address following the standard addressing format can be used. The factory default is 192.168.100.101.
- NETMASK The netmask is used to establish how many simultaneous users can connect to the network. The factory default is 255.255.255.0, and this is acceptable for this application.

| Parameter | Factory Default |
|------------|-----------------|
| Host Name | 'none' |
| DHCP | OFF |
| IP Address | 192.168.100.101 |
| Netmask | 255.255.255.0 |
| Gateway | 192.168.100.254 |

- GATEWAY This setting is not applicable for this configuration, and does not have to be changed.
- Select 'PAGE BACK' to return to the 'NETWORK MAIN SETUP' page, and select 'WIRELESS LAN 6. SETUP'. From this page, the following parameters are set:
 - AD HOC MODE There are two 'on' modes: IBSS and AHDM. Use IBSS if the PC's WLAN card supports 802.11 AD HOC. Use AHDM if the PC's card supports ADHOC.
 - ESS ID These must be the same for the Streamcorder and computer. This field cannot be left blank. Some firmware revisions support multiple ESSID's. Also, do not assume that the universal ESSID 'ANY' works with all wireless cards.
 - COUNTRY Selecting the proper country enables only thos • channels legally allowed to be used in the selected country.
 - CH Channels 1 through 11 are for use in North America. Sele trial-and-error. We suggest starting with the default channel 10, then trying channels 11, 6, and 1 before trying other channels.
 - WEP KEY This key is used for data encryption, and must match the encryption key set in the PC. We suggest not using encryption until a wireless connection has been tested.
 - LEAP Cisco's LEAP user authentication is not supported in the AD HOC mode. Leave this set to 'OFF'.
- 7. Press the 'MENU' button to exit the configuration menu.

This completes the configuration of the Network Pack and network interface card. The next step is to configure the NIC in the computer.

Configuring the PC's WLAN connection:

To wirelessly connect to the Streamcorder it is necessary to have a wireless LAN card in the computer. The installation of the WLAN card and any associated drivers required in the PC is covered by each specific card manufacturer, and as such is beyond the scope of this Application Note. Please refer to the documentation supplied with your computer and/or network interface

The exact WLAN configuration procedures depend on the PCs operating system. The examples shown here are for Windows XP Professional and may not correspond exactly to your system.

1. From the Windows Task Bar, click 'Start' then 'Control Panel (Windows XP) or 'Start', 'Settings', 'Control Panel' (Windows 2000).

| meter | | Fact | ory Default | |
|-------|---------------------|-------------|---------------|------|
| ectin | g the op | timum cha | annel us usua | ally |
| se | | | | |
| bai | WEP LEAP PAGE | KEY BACK | OFF | |

-- WIRELESS LAN SETUP --

IBSS

USA

10CH

► AD HOC MODE

Country

CH

PRIMARY ESS ID..

SECONDARY ESS ID..

| Parameter | Factory Default |
|-------------|-----------------|
| AD HOC MODE | OFF |
| ESS ID | NONE |
| Country | USA |
| CH | 10 CH |
| WEP KEY | — |
| LEAP | OFF |
| | |

- 2. From the Control Panel, select 'Network Connections' and then select the NIC that will be connecting to the Streamcorder (shown at right).
- 3. From the Status window that opens when the NIC is selected (not shown here), click on 'Properties'.
- From the Connection Properties window shown below, double click on 'Internet Protocol (TCP/IP)'.

| 🚣 Local Area Connection 2 Properties 🄶 🤶 🗙 | | | |
|--|--|--|--|
| General Authentication Advanced | | | |
| Connect using: | | | |
| FE575C-3Com 10/100 LAN CardBus-Fast Ethernet | | | |
| This connection uses the following items: | | | |
| Client for Microsoft Networks Comparison of the Staring for Microsoft Networks Comparison of | | | |
| Install Uninstall Properties | | | |
| Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks. | | | |
| Shom icon in notification area when connected | | | |
| OK Cancel | | | |

- 5. From the 'Internet Protocol (TCP/IP) Properties' window (shown at right), select 'Use the following IP address' and enter an IP address. NOTE: you must select a unique IP address using the same Network Group (using the first three sets of numbers) as the cameras NIC. In our example, the IP address is 192.168.100.102 as shown here.
- 6. Use the same Subnet mask as the camera, in our case, 255.255.255.0.
- Click 'OK'. Then 'OK' again. This saves the IP address and NET MASK settings.



Please note: We recommend that the 'Show icon in notification area...' option be selected as shown here. This places a network condition icon in the Windows notification area as shown here, enabling you to tell the status at a glance.

12:12 PM

| Internet Protocol (TCP/IP) Properties | <u>?</u> × | | |
|---|-----------------------|--|--|
| General | | | |
| You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings. | | | |
| O Obtain an IP address automatically | | | |
| • Use the following IP address: | | | |
| IP address: | 192 . 168 . 100 . 102 | | |
| S <u>u</u> bnet mask: | 255 . 255 . 255 . 0 | | |
| Default gateway: | | | |
| C Obtain DNS server address automatically | | | |
| Use the following DNS server address | sses: | | |
| Preferred DNS server: | | | |
| Alternate DNS server: | | | |
| | Ad <u>v</u> anced | | |
| | OK Cancel | | |

- 8. Open the Connection Properties window again. From this window, click 'Configure'. From the window that opens, click on the 'Advanced' tab. This opens the window shown on the next page (the example shown here is for the TRENDNet wireless interface, but this may vary with WLAN card and operating system).
- 9. From this window, the following parameters must be set (the names and descriptions of these parameters will vary with different WLAN cards):
 - Network Type = 802.11 Ad Hoc (with this designation, the Streamcorder WLAN card gets set to 'IBSS'. If your card only says 'Ad Hoc' for this parameter, set the Streamcorder AD HOC MODE to AHDM.

- ESS ID (with this card it's listed as SSID). Set to match the setting of the camera's WLAN card.
- Encryption mode = Open System (with this card it's listed as Disabled).
- All other default settings should be OK.
- 10. Click 'OK' to save these settings.
- 11. Close all open network configuration windows by clicking 'OK'.

You need to perform the following steps only if you have more than one NIC in your computer and are connected to an Intranet or Internet through a proxy server using another NIC.

> Open Internet Explorer and from the Toolbar, select 'Tools', 'Internet Options' as shown below. From the Internet Options window that opens (not shown here) click the 'Connections' tab. Near the bottom of the Connections window, click 'LAN Settings'. This opens the window shown at left.



- If your LAN connection is functioning properly, the current settings in this window should not be changed. Click on the 'Advanced' button to open the Proxy Settings window shown below.
- 3. When two NICs are used and one is used for communicating with the outside world through a proxy server, your computer must be told not to go out to the Intra/Internet when connecting to the Streamcorder, addresses beginning with 192.168 (or whatever you changed the camera to if you are not using the factory default IP address). In the 'Exceptions' window, enter the camera's address as 192.168.*.*. This tells the computer that any address beginning with 192.168 should be treated as a locally connected machine and should not go through the Internet.
- 4. Click 'OK' on all open settings windows to save changes.



 Use a proxy server for your LAN (These settings will not apply to dial-up or VPN connections).

 Address:
 172.25.17.4

 Port:
 80

 Bypass proxy server for local addresses

OK

Cancel



This completes connecting the configuration of the wireless network interfaces that allow a direct connection between the Streamcorder and a computer.

You should now test the connection by 'Pinging' the Streamcorder from your computer

- 1. Make sure the Streamcorder is ON.
- 2. From your Windows desktop, click 'Start', 'Programs', Accessories', 'Command Prompt to open a DOS command prompt window.
- 3. Type the command 'ping address', where address is the IP address of the Streamcorder Network Interface.

Command Prompt
 Microsoft Windows XP [Uersion 5.1.2600]
 (C) Copyright 1985-2001 Microsoft Corp.
 C:\Documents and Settings\Sam A>ping 192.168.100.101
 Pinging 192.168.100.101 with 32 bytes of data:
 Reply from 192.168.100.101: bytes=32 time<fms TTL=255
 Ping statistics for 192.168.100.101:
 Packets: Sent = 4, Received = 4, Lost = 0 (0½ loss),
 Approximate round trip times in milli-seconds:
 Minimum = 0ms, Maximum = 5ms, Average = 1ms
 C:\Documents and Settings\Sam A>_

If everything is connected and configured correctly, you should get a response similar to that shown above. You are now ready to shoot and stream!

JVC wants you to get the most from your GY-DV300/KA-DV300 or GY-DV5000/KA-DV5000 Camcorder and Network Pack. If you have any comments, concerns or questions, please feel free to contact us at *netinfo@jvc.com*.