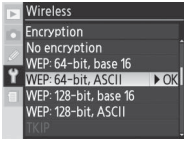
Encryption

1



Highlight encryption method.

2

Return to wireless menu (2/2).

3

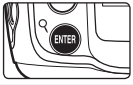
Highlight encryption key. Skip Steps 3–5 if **No encryption** was selected in Steps 1–2.

4

Edit encryption key:

- Base 16: press multi selector left or right to select character, up or down to change. 64-bit keys require 10 digits, 128-bit keys 26 digits, TKIP and AES keys 64 digits.
- ASCII: enter key as described on page 26. 64-bit keys are 5 characters long, 128-bit keys 13 characters long, TKIP and AES keys 8 to 63 characters long.

5



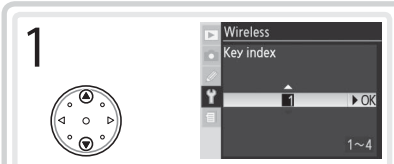
Return to wireless menu (2/2).

Encryption

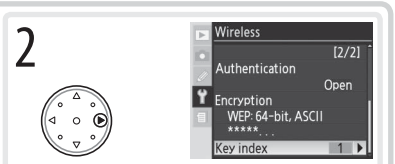
The type of encryption available depends on the option selected for **Authentication** (14, 36):

- **Open**: none, Wep: 64-bit,base 16, Wep: 64-bit,ASCII, Wep: 128-bit,base 16, Wep: 128-bit,ASCII
- **Shared**: Wep: 64-bit,base 16, Wep: 64-bit,ASCII, Wep: 128-bit,base 16, Wep: 128-bit,ASCII
- **WPA-PSK**: TKIP, AES
- **WPA2-PSK**: AES

Key index: In infrastructure networks that use WEP encryption, choose the key index used by the host or access point.



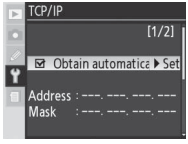
Choose index.



Return to wireless menu (1/2).

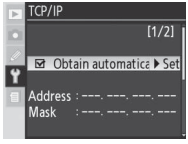
TCP/IP

Adjust TCP/IP settings as described on the following pages. The TCP/IP menu has two pages of options; to scroll between pages, press the multi selector up or down.

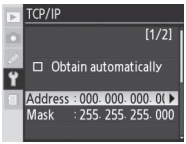


TCP/IP Menu, Page 1/2

Obtain automatically: Highlight this option and press the multi selector right to toggle it on (✔) or off. Turn this option on if the wireless network is configured to supply an IP address automatically by DHCP server or Auto IP (52). Otherwise turn it off and enter the address and subnet mask supplied by the network administrator as described on the following page.

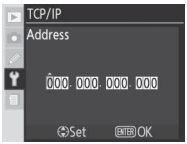


1



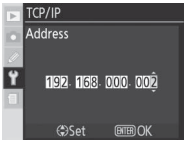
Highlight **Address**.

2



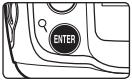
Enter edit mode.

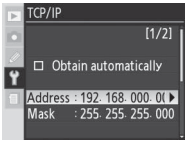
3



Press multi selector left or right to select, up or down to change.

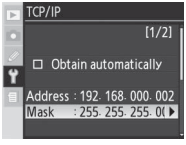
4





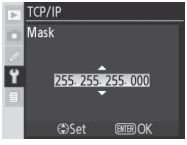
Exit to TCP/IP menu (1/2). If subnet mask is required, proceed to Step 5.

5



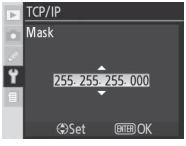
Highlight **Mask**.

6



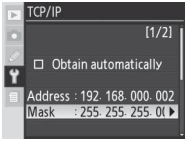
Enter edit mode.

7



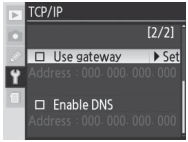
Choose subnet mask.

8

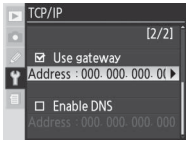


Exit to TCP/IP menu (1/2).

Use gateway: Highlight this option and press the multi selector right to toggle it on (✔) or off. If the network requires a gateway address, turn this option on and enter the address supplied by the network administrator as described below.

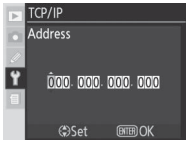


1



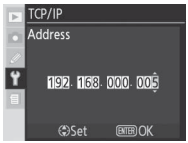
Highlight **Address**.

2



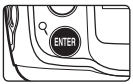
Enter edit mode.

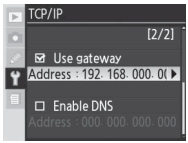
3



Press multi selector left or right to select, up or down to change.

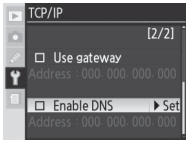
4



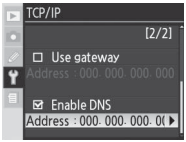


Return to TCP/IP menu (2/2).

Enable DNS: Highlight this option and press the multi selector right to toggle it on (✔) or off. If a **D**omain **N**ame **S**erver (DNS) exists on the network, turn this option on and enter the address supplied by the network administrator as described below.

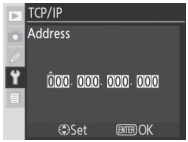


1



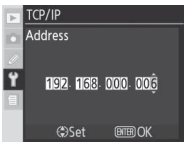
Highlight **Address**.

2



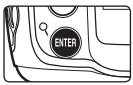
Enter edit mode.

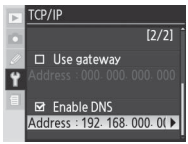
3



Press multi selector left or right to select, up or down to change.

4

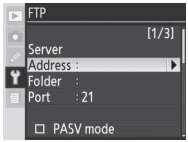




Return to TCP/IP menu (2/2).

FTP

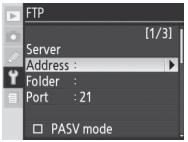
Adjust ftp settings as described on the following pages. The ftp menu has three pages of options; to scroll between pages, press the multi selector up or down.



FTP Menu, Page 1/3

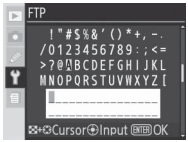
Server

1



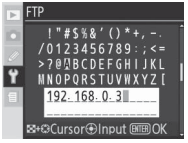
Highlight **Address**.

2



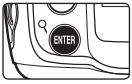
Display text entry dialog.

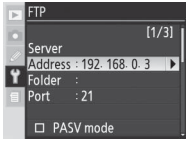
3



Enter server address (required; 35).

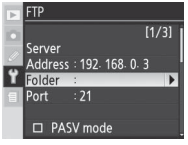
4





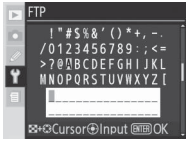
Return to ftp menu (1/3).

5



Highlight **Folder**.

6

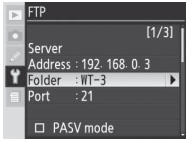


Display text entry dialog.

7

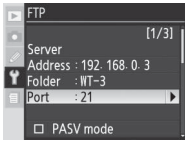
Enter destination folder name (35).

8



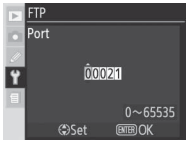
Return to ftp menu (1/3).

9



Highlight **Port**.

10

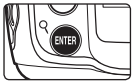


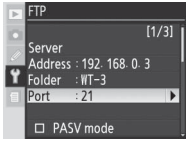
Enter edit mode.

11

Press multi selector left or right to select, up or down to change.

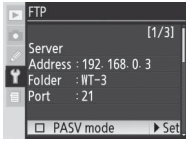
12





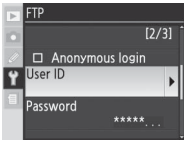
Return to ftp menu (1/3).

PASV mode: Highlight this option and press the multi selector right to toggle PASV mode on (✔) or off. Turn this option off to use normal (PORT) mode. Be sure the server supports PASV mode before turning this option on.



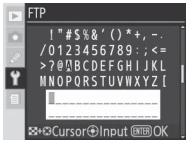
Anonymous login: Highlight this option and press the multi selector right to toggle it on (✔) or off. Turn this option on for anonymous login, off to enter a user name and password as described below.

1



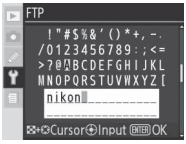
Highlight **User ID**.

2



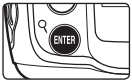
Display text entry dialog.

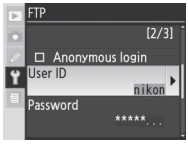
3



Enter user name (35).

4



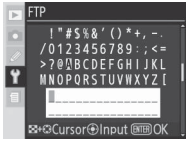


Return to ftp menu (2/3).

5

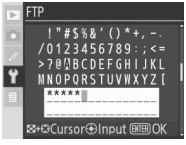
Highlight **Password**.

6



Display text entry dialog.

7

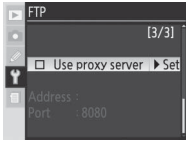


Enter password (35).

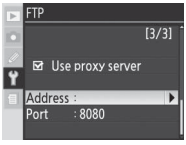
8

Return to ftp menu (2/3). Password is disguised as a row of dots.

Use proxy server: Highlight this option and press the multi selector right to toggle it on (✔) or off. If a proxy server is required for ftp, turn this option on and enter an address and port number as described below.

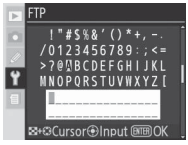


1



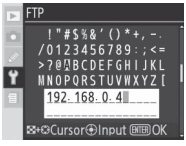
Highlight **Address**.

2



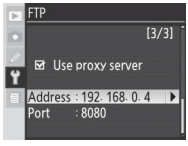
Display text entry dialog.

3



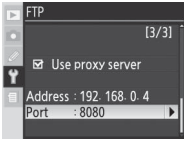
Enter proxy server address (35).

4



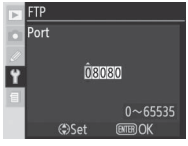
Return to ftp menu (3/3).

5



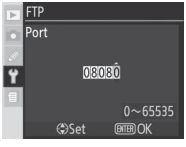
Highlight **Port**.

6



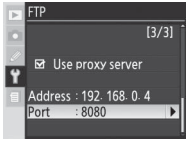
Enter edit mode.

7



Press multi selector left or right to select, up or down to change.

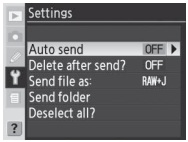
8



Return to ftp menu (3/3).

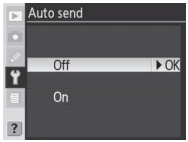
Settings (Transfer Mode Only)

The following settings are available in transfer mode:



Auto Send

Choose whether to upload photographs to the server as they are taken.



Option	Description
Off (default)	Photos are not automatically uploaded as they are taken. Photos can be selected for transmission when camera is in playback mode.
On	Photos are uploaded immediately after being recorded to camera memory card.* Be sure memory card is inserted in camera before shooting.

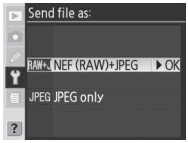
*Pictures will not be uploaded to the server if **Off** is selected in the **Wireless transmitter** > **Wireless LAN system** menu. Pictures will instead be marked with a "send" indicator as they are recorded to the memory card.

Delete After Send?

Select **Yes** to delete photographs from the camera memory card automatically once upload is complete (the default option is **No**). Files uploaded before this option was selected are not affected. Photographs will not be deleted while displayed in slide shows or in the delete, print set, and preset white balance menus. Sequential file numbering is used while this option is in effect, regardless of the option selected for Custom Setting d6 (**File No. Sequence**).

Send File As

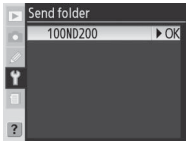
When uploading NEF+JPEG images to an ftp server, choose whether to send both NEF (RAW) and JPEG files or only the JPEG files.



Option	Description
NEF (RAW) + JPEG (default)	Upload both NEF (RAW) and JPEG files. JPEG files are sent first.
JPEG only	Upload JPEG files only.

Send Folder

All files in the selected folder (including those already marked as "sent") will be uploaded in ascending order by file number, beginning when the folder is selected. The folder itself will not be uploaded. This option is not available when the memory card contains no folders.

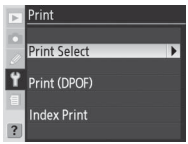


Deselect All?

Select **Yes** to remove "send," "sending," and "sent" marking from all images on the memory card. Upload of any images marked with a "sending" icon will immediately be terminated.

Print (Print Mode Only)

Choose a printer from the profile list. Once a connection has been established, photographs can be printed as described in "Printing Via Direct USB Connection: Printing Multiple Photographs" in the camera manual. This option is only available when **On** is selected for **Wireless transmitter** > **Wireless LAN system** in the camera setup menu. Note that index printing is only available with the optional PD-10 wireless printer adapter.

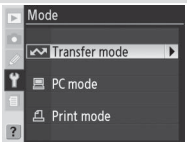


Creating ftp Profiles Using the Camera Menus

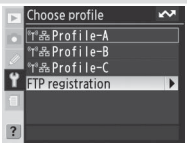
In transfer mode, the camera menus can be used to create ftp profiles in place of the WT-3 Setup Utility. Before creating an ftp profile with the camera menus, set the camera **USB** option to **PTP** and connect the WT-3. To prevent unexpected loss of power, be sure the battery is fully charged or use an optional EH-6 AC adapter. The drain on the battery can be reduced by selecting **Off** for the **Wireless transmitter** > **Wireless LAN system** option in the camera setup menu before adjusting ftp settings.

1 Turn the camera on.

2 Select **Transfer mode** for **Wireless transmitter** > **Mode** (34).



3 A profile list will be displayed showing the connections available in transfer mode. Highlight **FTP registration** and press the multi selector to the right. Note a new ftp profile can not be created if the camera already contains nine profiles; if necessary, delete a profile using the button.



Firewalls

The WT-3 uses TCP ports 20 and 21 for ftp. It may be necessary to adjust firewall settings before connecting to a server behind a firewall (16).

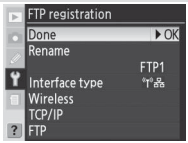
Using the Menus

If the shutter-release button on the camera or WT-3 is pressed while menus are displayed, the monitor will turn off and any changes to the current profile will be lost. Do not press the shutter-release button while editing profiles.

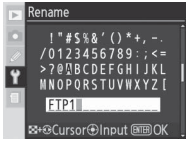
Editing Existing ftp Profiles

See the Menu Guide for information on using the camera menus to edit existing ftp profiles (35).

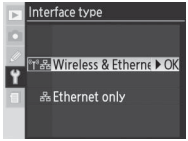
4 The registration dialog shown at right will be displayed. Press the multi selector up or down to highlight an option, then press to the right to select. Select **Done** to proceed to Step 5 when settings are complete.



Rename: The dialog shown at right will be displayed. Enter a profile name of up to 16 characters as described in "Text Entry" (35) and press the ENTER button to return to the registration dialog.

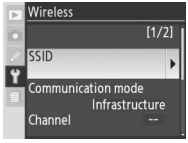


Interface type: The dialog shown at right will be displayed. Highlight one of the following options and press the multi selector to the right to return to the registration dialog.

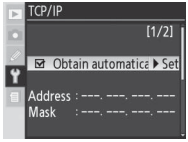


Option	Description
Wireless & Ethernet (default)	Connect via wireless and/or Ethernet.
Ethernet only	Connect via Ethernet only.

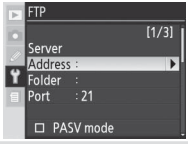
Wireless: If **Wireless & Ethernet** is selected for **Interface type**, select this option to adjust wireless settings as described in the Menu Guide (35–38). Press the multi selector to the left to return to the registration dialog when settings are complete.



TCP/IP: Adjust TCP/IP settings as described in the Menu Guide (38–41). Press the multi selector to the left to return to the registration dialog when settings are complete.



FTP: Adjust ftp settings as described in the Menu Guide (42–45). Press the multi selector to the left to return to the registration dialog when settings are complete.



5 If **On** is selected for **Wireless transmitter** > **Wireless LAN system**, a confirmation dialog will be displayed. Choose from the following options:

- **Yes**: Open a connection to the new server and return to the top level of the wireless transmitter menu.
- **No**: Return to Step 3 without connecting to the server.

If the wireless transmitter is off, the dialog shown in Step 3 will be displayed and the WT-3 will not open a connection to the new server.

Errors

An error will be displayed if the new profile does not match server settings. Edit wireless, TCP/IP, and ftp settings as described in the Menu Guide (35).

Troubleshooting

Problem	Solution	
"POWER" LED does not light.	• Confirm that battery is inserted in WT-3 and is fully charged.	20
	• Reattach WT-3.	18
	• Insert memory card (transfer and print modes only).	21, 30
	• Turn camera on.	—
	• Press shutter-release button halfway to activate exposure meters.	—
	• Select **On** for **Wireless transmitter** > **Wireless LAN system** option in camera setup menu.	34
	• Open connection to printer (print mode only).	31
All LEDs blink at once.	WT-3 hardware error. Contact a Nikon-authorized service representative.	25, 29, 31
Wireless transmitter option not available.	• Reattach WT-3.	18
	• Select **PTP** for **USB** option in camera setup menu.	11
Excessive radio interference.	Change orientation of camera or antenna.	4
Camera displays "Ethernet cable is not connected."	Connect Ethernet cable or change interface setting to **Wireless & Ethernet**.	4, 13, 49
Camera displays wireless error.	• Confirm that host and wireless LAN adapter are on.	—
	• Ensure that there are no obstacles between WT-3 and wireless LAN adapter.	—
	• Check settings for host and/or wireless LAN adapter and adjust camera settings appropriately.	14, 35
Camera displays TCP/IP or FTP error.	• Check settings for host and/or wireless LAN adapter and adjust camera settings appropriately.	14, 35
	• Check firewall settings.	16, 48
Memory card error displayed.	Confirm that memory card is properly inserted.	21, 30
Photos can not be transferred to computer to which PictureProject has been installed.	• PictureProject version is incorrect. Update to latest version or install version supplied with D200.	—
	• **Macintosh**: If PictureProject was installed after WT-3 Setup Utility, reinstall WT-3 Setup Utility.	
Transfer interrupted before all photographs are sent.	Transfer will resume if camera is turned off and then on again, exposure meters are reactivated, or **On** for **Wireless transmitter** > **Wireless LAN system**.	34
Error displayed stating that no images are available for printing.	Only JPEG images can be printed from the camera. Transfer RAW (NEF) images to computer and print them from PictureProject or Nikon Capture version 4.4 or later.	—

Glossary

Ad-hoc: Devices in an ad-hoc wireless network communicate directly ("peer to peer"), without a wireless access point.

AES (Advanced Encryption Standard): An encryption standard developed for use by the American government. AES has been praised for combining strong encryption with rapid processing.

Auto IP (APIPA—Automatic Private IP Addressing): Allows devices in a network to automatically assign themselves unique IP addresses if no DHCP server is found on the network. Auto IP uses addresses from 169.254.1.0 to 169.254.254.255 and a subnet mask of 255.255.0.0. These addresses are neither global nor private but are reserved for Auto IP.

BSS-ID (Basic Service Set ID): All wireless devices on an ad-hoc wireless network share the same BSS-ID. The BSS-ID may be up to thirty-two characters long and is case sensitive. *See also* Ad-hoc.

Channel: When multiple wireless LANs with different ESS-IDs are operating on a single frequency within a given area, transmission speeds will drop. Specifying a separate channel (frequency) for each network can prevent interference and increase transmission speeds (note that all devices in the same network must be set to the same channel). In the IEEE 802.11b/g standard, the 2.4 GHz band is divided into 14 channels, each separated by 4 MHz.

DHCP (Dynamic Host Configuration Protocol) Server: Each device in a TCP/IP network requires an IP address. If a DHCP server is present on the network, IP addresses will be assigned automatically.

DNS (Domain Name Server): A server that contains a database of IP addresses and host names for the machines it administers and that converts host names to IP addresses in response to queries from clients. Each DNS can also query other Domain Name Servers for addresses not listed in its database.

ESS-ID (Extended Service Set ID): Multiple BSSs can be configured to form an ESS, allowing users to roam between wireless access points. Only devices with the same ESS-ID as a given access point can communicate with that access point. The ESS-ID may be up to thirty-two characters long and is case sensitive.

Ethernet: The name given to the IEEE 802.3 LAN standard. Devices in an Ethernet network are connected via UTP cables for transmission speeds of up to 10 Mbps (10 base-T) or 100 Mbps (100 base-TX).

Gateway: A network node that acts as an entrance to another network, for example between a company network and the Internet.

IIS (Internet Information Services): Microsoft's name for its Web server software. Notable for its close connection to Windows-based systems through Active Server Pages (ASPs). When installed as part of the operating system, IIS makes it relatively easy to build web a server.

Infrastructure: Devices in an infrastructure network communicate via wireless access points that may be connected to an Ethernet network, allowing wireless and Ethernet devices to coexist on a single network.

IP address: The address given to each node in a TCP/IP network. All nodes in a TCP/IP network must have a unique IP address. Private IP addresses are recommended for nodes that are part of a local network.

Key index: A number identifying which WEP key is to be used for encryption when communicating via an access point with more than one WEP key. All devices on the network must use the same key index.

LAN (Local Area Network): A network of computers located in relatively close proximity to one another. LANs generally support data transfer speeds of 10–100 Mbps.

MAC (Media Access Control) Address: A unique hardware address for each device on a network, required when sending and receiving packets.

Open system: The name given to a wireless network using no authentication (open authentication). Open systems are relatively insecure, as a password is not required to gain access to the server.

PASV mode: PASV mode is used by clients behind firewalls, when it allows the ftp server to supply the port number.

Private IP address: An IP address that is only visible within a local network. Because packets using a private IP address can not be transmitted to another network, they are usually sent between networks via a proxy server or NAT. Private IP addresses in the range 10.0.0.0–10.255.255.255 are termed "class A." Class B addresses are in the range 172.16.0.0–172.31.255.255, class C addresses in the range 192.168.0.0–192.168.255.255. The class of address used depends on the size of the network. Class C addresses are often used for small networks.

Protocol: A set of rules for passing information back and forth between devices in a network. By defining such elements of communication as how links are established, how receipt of a signal is acknowledged, how data are encoded, and how to handle errors, a protocol ensures that data are transmitted without loss of information.

Proxy: A server that stands between large networks and local networks or computers, typically to ensure security. One element of a firewall.

PTP-IP (Picture Transfer Protocol over Internet Protocol): A commonly used name for the CIPA DC-005-2005 image transfer protocol for transmitting images over LANs. It represents an extension to the Picture Transfer Protocol (PTP) used to transfer images between cameras and computers connected via USB cable. The WT-3 uses PTP-IP to communicate with host computers.

Shared key: An authentication system in which WEP keys are used to establish whether a client has access to the network. Communication is restricted to devices with the same WEP key.

SS-ID (Service Set ID): An SS-ID prevents interference between devices in different networks by allowing communication only between devices that share an SS-ID. *See* BSS-ID, ESS-ID.

Subnet mask: A mask that divides a network into subnets.

TCP/IP (Transmission Control Protocol/Internet Protocol): A dual protocol consisting of a transport-layer protocol (TCP) that divides data into packets which it later reassembles, and a network protocol (IP) that handles transmission of the packets between points in the network. It can be implemented on different platforms, allowing data to be transmitted between machines with different operating systems.

TKIP (Temporal Key Integrity Protocol): An encryption standard using dynamic WPA-PSK keys that change periodically or after a specified amount of data have been transmitted, making it more secure that WEP, which uses fixed keys.

UDP (User Datagram Protocol): A fast but unreliable transport layer transmission protocol using the OSI model.

USB (Universal Serial Bus): A standard for connecting peripheral devices. USB supports data transfer rates of up to 480 Mbps (USB 2.0). Devices connected via USB can be connected and disconnected with the power on ("hot plug") and do not require separate IRQ (interrupt request) numbers, preventing conflicts with other devices.

WAN (Wide Area Network): A network connecting computers or LANs in widely separated locations. The Internet is an example of a WAN.

WEP (Wired Equivalent Privacy): A type of encryption in which the data transmitted between devices is encoded using a shared encryption key (WEP key).

Wireless LAN access point: A wireless transceiver that acts as the connection between wireless devices and a wireless network.

WPA-PSK (WiFi Protected Access with Pre-Shared Key): A type of authentication for wireless networks using previously-established (pre-shared) TKIP or AES keys. Wireless devices using this form of authentication can only communicate with devices with the same pre-shared key.

Specifications

Wireless	
Standards	IEEE 802.11b/g (standard wireless LAN protocol), ARIB STD-T66 (standard for low power data communications systems)
Communications protocols	IEEE 802.11g: OFDM IEEE 802.11b: DBPSK, DQPSK, CCK
Operating frequency	WT-3: 2412–2472 MHz (13 channels) WT-3A: 2412–2462 MHz (11 channels)
Range (line of sight)	Approximately 80 m (262 ft.) with built-in antenna Approximately 280 m (919 ft.) with WA-E1 extended range antenna and large antenna at wireless LAN access point
Data rates*	IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps IEEE 802.11b: 1, 2, 5.5, and 11 Mbps
Security	TKIP, AES, 128/64-bit (104/40-bit) WEP
Access protocols	Infrastructure/ad-hoc
Ethernet	
Standards	IEEE 802.3u (100 base-TX)/IEEE 802.3 (10 base-T)
Data rates	10/100 Mbps with auto detect
Port	100 base-TX/10 base-T (AUTO-MDIX)
Data transfer protocols	PTP-IP, ftp
Power consumption	3.5 W maximum
Power source	Rechargeable EN-EL3e Li-ion battery × 1 (supplied with D200), EH-6 AC adapter (available separately)
Operating environment	Temperature: 0–40 °C (32–131 °F) Humidity: less than 85% (no condensation)
Weight	WT-3: 295 g/10.4 oz (body only) WT-3A: 295 g/10.4 oz (body only)
Dimensions (W × H × D)	152 mm × 110 mm × 72.5 mm (6.0 in. × 4.3 in. × 2.9 in.)

* Maximum logical data rates according to IEEE standard. Actual rates may differ.

Battery Life

The number of shots that can be taken with a fully-charged EN-EL3e battery (1500 mAh) varies with the condition of the batteries, temperature, and how the camera and WT-3 are used. The following measurements were performed at a temperature of 20 °C (68 °F) both with the WT-3 off and while uploading photographs to a Windows XP Professional SP2 computer using **Auto send**.

Example 1

Network	None (WT-3 off)	Wireless (802.11g, infrastructure mode)	Ethernet (100 base-TX)
No. of shots	1600	1000	1100
Camera settings	Zoom Nikkor AF-S VR 70–200 mm f/2.8G IF ED lens (VR off); continuous high-speed shooting mode; continuous-servo autofocus; image quality set to JPEG Basic; image size set to **M**; shutter speed 1/250 s; shutter-release pressed halfway for three seconds and focus cycled from infinity to minimum range three times with each shot; after six shots, monitor turned on for five seconds and then turned off; cycle repeated after eight seconds.		

Example 2

Network	None (WT-3 off)	Wireless (802.11g, infrastructure mode)	Ethernet (100 base-TX)
No. of shots	300	200	210
Camera settings	Zoom Nikkor AF-S VR 24–120 mm f/3.5–5.6G IF ED lens (VR off); single-frame shooting mode; single-servo autofocus; image quality set to JPEG Normal; image size set to **L**; shutter speed 1/250 s; shutter-release pressed halfway for five seconds and focus cycled from infinity to minimum range once with each shot; built-in Speedlight fired at full power with every other shot; AF-assist illuminator lights when Speedlight is used; cycle repeated after eight seconds; camera turned off for one minute after ten photographs have been transferred.		

The following can reduce battery life:

- Using the monitor
- Keeping the shutter-release button pressed halfway
- Repeated autofocus operations
- Taking NEF (RAW) photographs
- Slow shutter speeds

To ensure maximum battery performance:

- Keep the battery contacts clean. Soiled contacts can reduce battery performance.
- Use EN-EL3e batteries immediately after charging. Batteries will lose their charge if left unused.

The battery level displayed by the camera may vary with changes in temperature.

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