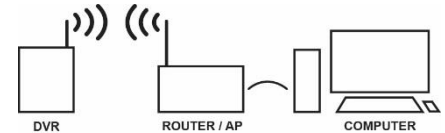The Enhanced Connectivity Bundle (ECB) integrates the features of PV Transfer software into the PV Player; this combination allows the user to request videos from vehicles to be transferred wirelessly as well as review transferred videos without ever leaving the playback software.

The PV Transfer software requires an application to be installed on a server to handle the device authentication and file storage processes. The server running the software must be accessible to the DVR units and have either a large internal storage disk or access to a network storage device to store the video files that are transferred.

Once the software is setup and DVR units are configured, each time the DVR unit establishes network connectivity through Wi-Fi or 4G, it will connect to the server and uploaded files. The software utilizes a web based (HTTP/HTTPS) transfer protocol to handle the file transfer process and can be done over a local network or over an internet connection.

Each client PC that will be reviewing and requesting video will need the PV Player software installed and the server URL set within the settings. The client PC will also need permissions configured to the file storage location on the server.

Preparing for the Hardware Installation

Prior to the installation of the hardware in the vehicles, this document should be provided to the IT professional that will handle the software installation and network configuration. Assistance from an IT professional or equivalent is required for the installation and configuration of the transfer software as advanced technical knowledge of the existing computer hardware, software, and network configuration is required. It is recommended to prepare and have the PV Transfer server software installed and network access confirmed prior to hardware installation, as this will allow the installer to register the devices to the server during the installation process.

Setup Process:

The customer's IT professional will need to complete some steps in preparation for the product installer:

1. IT will open the provided USB disk to read and understand the guide.
2. IT will install the PV Transfer software on the computer/server per the instruction guide:
    a. Configure the storage location and check permissions.
    b. Start the PV Transfer service.
    c. Enable Device Auto Registration
3. IT will determine which SSID the DVR units will connect to and ensure its location is adequate for performance and its configuration meets the DVR unit's Wi-Fi AP requirements (next page).
4. Installer will install the DVR unit(s), including the mounting of the Wi-Fi or 4G antenna(s) required for connectivity.
5. Installer will configure the DVR's Wi-Fi Client to connect to the customer's Wi-Fi Access Point
6. Installer will program the server URL and register the device
7. IT will verify system operation after vehicles exit and return to network coverage by checking the status and connection history in the PV Transfer software.

Note: If the network/server is not configured before installation, the IT professional must complete steps 5 and 6.

System Operation:

When the DVR establishes network connectivity (upon arrival to the yard or parking area for most Wi-Fi applications), it contacts the server and it begins transferring all event video files (oldest first). The server will automatically store the transferred files in the configured storage location in an easy to understand folder and naming structure. The transfer software has an API that allows user of the PV Player software to request videos from time periods that were not triggered as events, these requests will also be sent to the DVR unit upon connection and queued for transfer along with the event video files.

Computer/Server:

The PV Transfer software is a lightweight software package that runs as a service on a Microsoft Windows operating system. The services host a web interface on a port of the server, the port number is configurable and can be made accessible through the firewall for remote uploads over the internet. The service must be configured with user permissions to have read/write permissions to the desired storage location. The software must be installed on a computer running either Windows 10 or newer or a server running Server 2012 or newer with a minimum 2GB RAM, 3Ghz processor, 200MB disk space available for software and database, and a large storage device connected to the computer directly or through the network for video file storage (see below for storage requirements).

Client/User Computer:

Client computers will review transferred video using the PV Player software, they can also make video requests for videos that were not marked as events. To access the transferred files, the client computers must have permissions to the storage destination for the transferred file used by the transfer server software. They must also have access to the same web service/port that is required for DVR connection. The PV Player software requires a computer running Windows 7, 8, or 10 with a minimum of 4GB RAM. It is recommended that the client computer have a 1080p display and speakers.

Wi-Fi Access Point (AP):

DR-200/DVR-808 Systems: These units contain a 2.4GHz radio that can connect to an 802.11n Wi-Fi Access Point. It is recommended to use an AP with 802.11n 2x2 MIMO (Dual Antenna) to achieve the fastest transfer speed (up to 300Mbps).

DVR-906 Systems: This unit contains a 2.4GHz/5GHz radio that can connect to an 802.11n or 802.11ac Wi-Fi Access Point. It is recommended to use an AP with 802.11ac 2x2 MIMO (Dual Antenna) to achieve the fastest transfer speed (up to 867Mbps).

IMPORTANT! Only WPA/WPA2 security using AES or TKIP are supported. WPA2 Enterprise and unsecured networks are not supported.

The SSID name must contain only letters, numbers, underscores, or dashes. The password must contain only letters, numbers, and special characters except for semi-colon.

Network Requirements:

The DVR unit can connect to a Wi-Fi network using a static IP or one configured through DHCP. It is important that the server and port running the PV Transfer software web service is accessible from whatever location the DVR will be connecting. It is recommended to first connect a computer to the network and check access to the server before connecting a DVR. The system uses HTTPS for encrypted file transfer by default, but can be configured to use HTTP transfer for a significant improvement in transfer speed, this is recommended for local network transfer only.

Storage:

The following factors are need to calculate required storage space:
- Recording quality (Bitrate) in GB/hour/camera/vehicle
- Expected number of hours of video to be saved per day that will be transferred
- Number of cameras per vehicle
- Number of vehicles
- Number of days each week vehicle operates
- Number of weeks to retain transferred video.

All models of PRO-VISION DVR units are capable of recording up to 30fps with a video resolution up to 1920x1080 per channel. On average, the storage rate is approximately 0.32GB/hour/camera/vehicle filming at a low quality setting (1Mbps). At a high quality setting (4Mbps) video can use as much as 1.2GB/hour/camera/vehicle.

Example: 4 vehicles each with 2-camera systems, storing 2hrs of video per day, 5 days a week, for 52 weeks would equal about 1332GB (1.3TB) at a low quality setting (1Mbps) or about 4992GB (4.9TB) for a high quality setting (4Mbps).
Formula: **1.2GB/hr/cam/vehicle** x **2hrs** x **2cams** x **4vehicles** x **5days** x **52weeks** = **4992GB**