



DSV2+^{Turbo} User's Manual

GSA Approved – NIST FIPS 201/SP 800-76 Compliant

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1. Overview

The DSV2+^{Turbo} is a GSA Approved, NIST FIPS-201 CHUID, mobile hand-held reader with an integrated fingerprint sensor and Smart Card reader with the capability to identify and authenticate a PIV card by accessing and authenticating the CHUID stored on the cards as defined by “SP 800-73, Section 1.8.3.”

The Smart Card reader can read both contact style Smart Cards (ISO 7816 compliant) as well as RF-based contactless Smart Cards (ISO 14443 compliant). The contact and contactless Smart Cards can be programmed to contain biometric information that can be verified against the internal fingerprint sensor using 1-to-1 or 1-to-N fingerprint matching algorithms. The DSV2+^{Turbo} is applicable for programs such as USVISIT, Transportation Worker ID Card (TWIC), Common Access Card (CAC), and many other ID card scenarios.

The basic DSV2+^{Turbo} product comes from the factory with a Windows CE .NET, Version 5.00 Operating System, software utilities, and some demo and sample applications. When the unit is activated, a standard Windows CE desktop is presented that allows users to launch demonstration programs. The primary human interface is the touch screen, stylus, and function keys.

The internal fingerprint sensor is an 8-bit, grayscale, solid-state, capacitive-touch device that can capture fingerprint bitmap images measuring 256 pixels wide by 360 pixels high at 500 dpi. Images from this sensor can be used for a variety of card holder ID validation purposes, including extraction, matching, and storage of fingerprint minutia templates.

Figure 1: DSV2+^{Turbo}-SC



2. Unpacking & Inventory

Depending on the number of terminals ordered, your DSV2+^{Turbo} units and accessories may be shipped in a single pack box, a multi pack box or some number of each type. Carefully open the shipping box(s) and use the following Shipping Box Inventory list to verify the contents.

Shipping Box Inventory:

- DSV2+^{Turbo} Smart Card Reader
- Universal (90-240 VAC input) DC power/charging adapter.
- AC power cord for DC power/charging adapter. (Plug depends on country of destination)
- Documentation, including: User Manual (on CD), End User License Agreement, and Quick-Reference Guide.



Please retain the shipping box in the event you need to return your product for service.

3. Initial Setup

- Each unit is shipped with one Lithium Polymer battery installed, though **disconnected**. To connect the battery, you will need to remove the rear battery access cover and plug the battery connector into the mating connector on the left hand side of the battery compartment.
- It is **recommended** that you fully charge the internal battery before use to maximize operating time before recharging is required. The unit will operate when connected via the AC adapter regardless of the charge state of the internal battery.
- The DSV2+ contains an integrated charging circuit that allows the batteries to be charged inside the unit whenever the unit is properly connected to the AC adapter. No external standalone charger for batteries is required.



Please refer to Section 5.0 “Battery Charging and Replacement”, for additional instructions and safety information.

4. Hardware Features

4.1 Keypad

The DSV2+ comes equipped with a backlit, 5-button keypad, shown at right. The upper four keys are function-keys, and are vertically aligned along the left side of the LCD display, enabling application software to position “virtual buttons” appropriately. These keys are initially programmed as standard “F1” through “F4” keys and are mapped as cursor (arrow) keys.

Below the four function keys is the power switch. The power switch has a bi-color (red/green) backlight indicator, which identifies whether the system is on, charging, or running low on battery power. To turn the unit on, you must depress and hold the power switch until a single beep is heard, then immediately release it for an additional two beeps. Holding the button too long will cause an “error” type beep sound and the system will not be powered up or down, as the case may be. This procedure helps to guard against accidental activation or shutdown of the system.



4.2 Power LED Indications

System State	Power-switch LED	Comments
Off, not charging	Off	
Off, charging	Red	Unit is plugged into external power
User initiates power-on by pressing power button.	Green	Release power button after first beep. If power button is pressed too long it causes an “error” beep tone and system remains locked “off” until button is released.
	Red	Available battery power is too low, causing an “error” beep tone and unit will not start.
System on	Green	System on, not charging.
	Green → Red flash (90% → 10%)	System on, with the unit plugged into external power with the AC adapter and batteries charging.
Suspend mode	Green flash	Unit is in the Suspend state and not charging.
	Red flash	Unit is in the Suspend state and batteries are charging.
System Warning: Batteries very low	Green → Red alternating (50% → 50%)	Batteries are very low and should be charged as soon as possible

4.3 LCD, Touch Screen, Fingerprint Sensor & Indicators

4.3.1 LCD Display & Touch Screen

The LCD is a color-TFT (Thin Film Transistor) active-matrix display, and features white-LED backlighting. There is a resistive touch panel overlay, which should only be operated with the included stylus to help prevent scratching or other damage.

4.3.2 Fingerprint Sensor – UPEK Turbo, NIST FIPS 201/SP 800-76 Compliant

The DSV2+ UPEK TCS1 fingerprint sensor is an 8-bit, grayscale, solid-state, capacitive-touch device that can capture fingerprint bitmap images measuring 256 pixels wide by 360 pixels high at 500 dpi. Images from this sensor can be used for a variety of card holder ID validation purposes, including extraction, matching, and storage of fingerprint minutia templates.

Datastrip supports fingerprint matching algorithms from a variety of the industry leading vendors such as: Cogent, Bioscrypt, Identix, Motorola, and NEC.



4.3.3 UPEK Sensor Calibration

The UPEK sensor is factory calibrated and tested on every DSV2+ terminal, however, if recalibration is required for whatever reason follow these steps:

- Double tap My Computer and Select Storage Card / DSVII.
- Double tap the PPCalFt41utility and press the “Calibrate” button to re-calibrate the fingerprint sensor. This process may take up to a minute and then a “green” window with a number “1” should appear to indicate the sensor was successfully calibrated.
- Double tap the DsVerifyFpCaptureTest application. In the lower right hand corner select “UPEK” and click “OK”.
- Use the “Scan” button to test the fingerprint image quality.

4.3.4 Finger Placement:

It is important to place the finger properly on the sensing area, to enable the DSV2+ to capture more quickly a good fingerprint image:

- Finger placement icons: These two icons pictorially indicate the correct (green) and incorrect (red) way to align the cuticle of your finger with the points of the finger-placement guide arrows.
- Finger placement guide arrows: These arrows should be used as a guide for alignment of the cuticle part of the finger as described above.

4.3.5 Cleaning the LCD Touch Screen and Fingerprint Sensor

The LCD touch screen and fingerprint sensor require periodic cleaning to remove dirt, oils, grease, dust, and foreign matter.

- Ensure that the DSV2+ power is OFF and unplugged from any external power source.
- Using standard alcohol wipes, gently wipe the surface of the LCD screen and fingerprint sensor until it appears clear.
- Allow the cleaning solvent to dry completely before turning the unit on again.

4.4 I/O Port Access

The top rubber end cap on the DSV2+ snaps open to reveal the I/O ports. To open the top rubber end cap pull up from the back edge using the two finger indents. The rubber cap is tethered at two points to prevent it from being lost or misplaced. To reattach the cover, simply press the cover into place.

Shown here is the I/O connector panel located on the top of the unit, which includes a 10/100 base-T LAN port, two USB-2.0 host ports, one mini-USB client port, and one external Compact Flash slot.



4.4.1 External Compact Flash Slot

The DSV2+ has one externally accessible Type-I/II Compact Flash slot. It is compatible with “ATA-Flash” storage cards, NE-2000-compatible network adapters, and various modem and serial interface devices.

4.4.2 USB Ports

The DSV2+ supplies two standard USB ports (Ver-2.0), compatible with either low-speed (1.5 Mbps) or full-speed (12 Mbps) devices. These are “host” type ports, compatible with peripheral devices only (keyboard, mouse, etc.). DO NOT connect this host ports directly to other USB host devices such as a PC, for these type applications use the mini USB client port (Ver-2.0).

4.4.3 10/100 LAN Ethernet Port

The DSV2+ features an Ethernet LAN port, compatible with 10/100baseT networking standards. The mating connector is a standard RJ-45. The LAN connector has two integrated LED indicators: Green for “link activity” and Yellow for “link present”.

4.4.4 Smart Card Slot

The DSV2+ has an integrated Smart Card reader. It is compatible with **Contact-type** Smart Cards (ISO 7816, 8-contact style). Cards need to be inserted with the contacts facing UP (towards the LCD display).

In addition, there is an integrated **Contactless Smart Card** transceiver and antenna. The antenna is positioned in a plane perpendicular to the LCD screen, on the same side of the unit as the Smart Card slot. The typical maximum operating range is 30 mm.



4.5 Serial Port

The DSV2+ contact pins in the bottom endcap provide one external serial port available for interfacing to a host computer or other external equipment via the Datastrip Docking Station.



4.5.1 Serial Port Electrical Specifications

- Signaling type: RS-232 compatible.
- Output signals: TXD, RTS, DTR.
- Input signals: RXD, CTS, DSR, DCD, RI.
- Interface chip: Maxim MAX3243 or equivalent.

If a specific application requires detailed knowledge of the interface drive capability, latch-up immunity, safety, or other signaling level information, please refer to manufacturer datasheets for the interface chips listed above.

4.6 Dual Grip Battery Cover

All models of the DSV2+ can optionally be equipped with a Dual Grip Battery Cover which provides a more robust handgrip for better control under harsh conditions. The Dual Grip Battery Cover is an alternative to the standard battery cover.



4.7 Digital Still Camera

The Digital Still Camera (DSC) is an optional module that is available for use with any of the DSV2+ models. It is a 3.2 Megapixel camera packaged in a mechanical module that replaces the standard battery cover of the DSV2+. The DSC is designed for use in a variety of applications and markets such as facial recognition, law enforcement, mobile enrollment, and other scenarios.

The Digital Still Camera subsystem is comprised of following 5 major components:

1. Camera Hardware
2. Camera Firmware
3. Camera Device Driver
4. Camera API/SDK
5. Camera Test/Demo Application (DsVerifyStillCameraTest)

The version of each of the DSC subsystem components can be displayed on the DSV2+ screen.



- To display the Camera Hardware, Firmware, Device Driver, and SDK versions, select:
“*Help->Versions*”
- To display the version of the camera test application, select:
“*Help->About DsVerifyStillCameraTest*”

4.7.1 Digital Still Camera Installation Instructions

Step 1 - Remove the DSV2+ battery door cover. Step 2 – Plug the camera cable into the battery compartment camera connector. Step 3 – Attach the camera housing to the DSV2+ using the two captive screws.



Step #1



Step #2



Step #3

5. Battery Charging and Replacement

The standard configuration for the DSV2+ uses one 3000 mAh Lithium Polymer battery pack. There is also an internal, rechargeable coin cell battery that powers the Real Time Clock for more than 6 months while the unit is off.

NOTES:

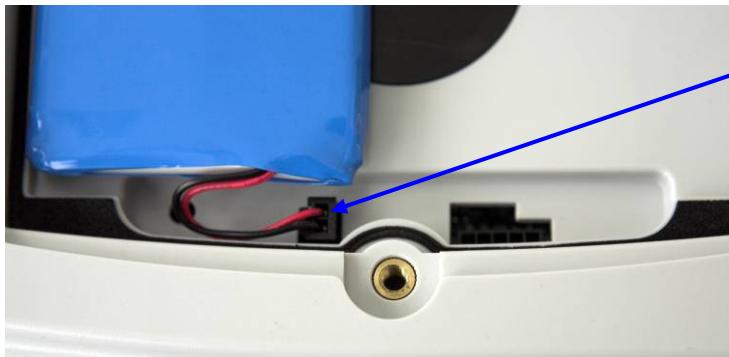
1. Scanners should never be operated on AC power alone. A battery should always be plugged in for reliable operation.
2. The capacity estimates in the following table are worse case results that reflect continuous use with all power saving options turned off. The scanner is running 1 scan per minute continuously. Actual capacity numbers should be much better.
3. The battery capacity (hours of use) can be extended by 50% or more by using the power savings options such as: System Idle or Suspend. These power settings are user programmable and details can be found in Section 6.6 Power Management.
4. The charge time is the same whether the battery is charged with the unit “On” or “Off”
5. When a DSV2+ terminal is left on the shelf in the “Off” state the battery will maintain its charge for over 6 months.

Description	SC Capacity (hours of use)	Scanner Capacity (hours of use)	Charge Time for fully depleted battery	Comments
One 3000 mAh battery	5.5 hours	N/A	3 hours	

Under normal operating conditions, the battery does not need to be removed. The DSV2+ has an internal charging circuit that will charge the battery whenever the unit is connected to the external AC power adapter. The battery may be replaced by opening the battery-access cover on the rear of the DSV2+. Before changing the battery turn the DSV2+ power off and remove the AC adapter. A slotted screwdriver can be used to operate the fasteners holding the battery compartment cover in place.



Once the cover is removed, unplug the battery by squeezing the locking tab and pulling up on the connector at the end of the battery cable. This will unlock the connector, allowing it to be withdrawn. When replacing the battery, ensure that the battery wiring is tucked in, out of the way of the mating surfaces for the rear-cover. Replace the battery cover and tighten the fasteners (do not over-tighten).



Depress locking tab and pull up to release the battery cable.



CAUTION! Use ONLY approved replacement batteries and power adapters as provided by Datastrip.



CAUTION! Battery has a risk of FIRE, EXPLOSION, or BURNS. DO NOT: short-circuit the battery terminals; crush, puncture, disassemble or otherwise damage the battery's case; operate or charge at temperatures above 40°C or store the battery at temperatures above 100°C; incinerate or immerse in water.



DISPOSAL: Always consult and obey all international, federal, provincial/state, and local hazardous waste disposal laws. Certain jurisdictions require recycling of this spent product.

6. Basic Operation

The following sections describe some of the features and functions that are available on the DSV2+ family of products.

6.1 System Startup Sequence

- To begin operation, press the **Power** button (located under the Function Keys) and hold down until one beep is heard. Release the button (two more beeps are heard).
- The unit takes approximately 30 seconds to boot as diagnostic testing is performed. The display will indicate that the system is booting.
- When the unit powers up, the Windows CE.NET desktop will appear on the display.

6.2 Stylus

The DSV2+ provides a stylus to use with the touch screen for selecting items and entering information (the unit may also be operated with a standard USB mouse). The DSV2+ stylus is stored in the bottom end cap of standard units and in the Dual Grip Battery Cover for units that have that option installed. The following actions are available with the stylus:

- **Tap** – Lightly touch the screen once with the stylus to open items and select options. Tapping is equivalent to clicking an item with the mouse on your personnel computer.
- **Double-Tap** – Lightly touch the screen twice with the stylus to open folders and applications. Double-Tapping is equivalent to Double-clicking an item with the mouse on your personnel computer.
- **Drag** - Hold the stylus on the screen and drag it across the screen to select text and images. Drag within a list to select multiple items.
- **Tap-and-hold** - Tap and hold the stylus on an item for a short period until a menu displays a list of actions available for that item. Tapping and holding is equivalent to right-clicking your personnel computer mouse button. When you tap and hold, a circle of red dots appears around the stylus to indicate that the menu will soon pop up. Tap the action you want to perform on the pop-up menu that appears.

6.3 Touch Screen Adjustments

The touch screen on DSV2+ terminals is calibrated during factory acceptance tests. If you wish to recalibrate these setting to suit your personnel preferences the following options are available:

- **Calibration** – If your device isn't responding properly to your screen taps, you may need to recalibrate your screen. Go to the Control Panel, select Stylus Properties and under the “Calibration” tab, click the “Recalibrate” button and follow the on screen instructions. When you are told to “press enter” to accept the setting, just tap the screen anywhere, then click the “OK” button.
- **Double-Click Sensitivity** – Go to the Control Panel and select Stylus Properties. Double-tap the checkerboard grid to set the double-tap sensitivity for both speed and physical distance between the taps. Then double tap the icon below the checkerboard to verify your settings. Click the “OK” button when done.
- **Brightness and Contrast** – The display brightness and contrast can be adjusted for different operating environment lighting conditions. Go to the Control Panel, select Display and under the “Backlight” tab adjust the slider control then click the “OK” button.

6.4 Input Panel / Keyboard

The input panel (Keyboard) is used to enter alpha-numeric information in any program on your DSV2+. Tap the **Input Panel** icon in the bottom right hand corner of the screen to show the Keyboard or Hide the Input Panel.



6.5 Creating Desktop Shortcuts

Find the application for which you want to create a shortcut. Tap and hold the stylus on the application until the options menu pops up. Select copy and go to the directory where you want to put the shortcut. Tap and hold the stylus until the options menu pops up and select “Paste Shortcut”.

6.6 Power Management

The DSV2+ Power Properties can be configured and monitored by double clicking the Power icon in the windows Control Panel. The Battery Tab displays the Main battery gauge and the Schemes Tab allows the user to configure the timeout for each of the Power States defined in the section below.

6.6.1 Power States

Clicking the power schemes tab allows you to maximize battery life by programming the idle time for each of the following conditions:

1. Fully On
 - Every sub-system is on and operational
2. User Idle
 - Touch screen or Function keys haven't been used for some amount of time (user configurable).
 - Backlight is dimmed to save power, tap the screen and the backlight comes back on.
 - All other internal subsystems are on
3. System Idle
 - No major background software tasks are running
 - Backlight remains dimmed in this state
 - All other internal subsystems are on
4. Suspend

Suspend is indicated by flashing power button (flashed red if charging, green if charged or on AC)

 - USB subsystem is turned off
 - Display and backlight are turned off
 - CF cards are turned off
 - Processor is put to sleep
 - Tap the screen or give the power button a quick tap to wake up the unit to a fully on condition
5. Fully Off
 - Everything is off
 - Push the power button to start the unit and return to a Fully On state

Note: The times configured by the user for each state are cumulative! For example, the time required for the system to suspend is the sum of the time configured to go to User Idle + the time to go to System Idle + the time to go to Suspend.

6.6.2 Battery Gauge

The DSV2+ battery gauge will help you monitor the battery state and the charge held in the batteries. The battery gauges can be found in the Control Panel under Power Properties. Clicking the battery tab displays the DSV2+ battery gauge. The gauge displays three battery states and three battery charging levels.

Battery States – There are three battery states that are displayed above the Main Battery gauge (left side). The battery states are as follows:

1. **Main Battery** – Unit is operating on battery power and no external AC adapter is connected. The Power LED is Green.
2. **External** - External AC adapter is connected and the battery is fully charged. The Power LED is Green.
3. **Charging** – External AC adapter is connected and the battery is charging. The unit operates normally while simultaneously charging the battery. The power LED is Green → Red flash

Battery Levels - The three battery levels that are color coded on the battery gauge:

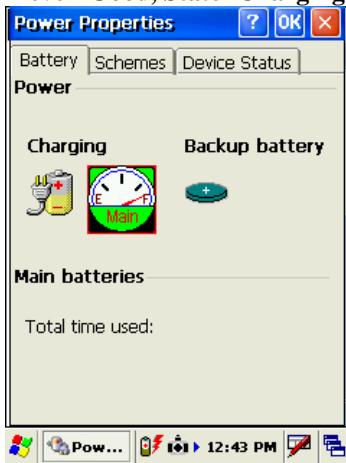
1. **Green** – Battery charge is Good
2. **Yellow** – Battery charge is Low
3. **Red** – Battery charge is Very Low (“Critical”).

As seen in the color coded pie chart below, the three battery levels are not linear. If this were the gas tank on your car, then “Yellow” would be a quarter of a tank and “Red” would be when the refuel gas light comes on. When the battery gauge turns “Red”, you should immediately charge the batteries by connecting the unit to an AC adapter or the unit will automatically shut down when the voltage level drops below the minimum threshold.

There are four user warnings that occur when the battery level is “Very Low”:

1. The battery gauge turns “Red”
2. The power LED alternately flashes “Red” and “Green”
3. A “Warning” message pops up “Main Batteries Very Low”. This warning will repeat itself periodically until the condition clears or the unit automatically shuts down.
4. An error beep sounds each time the warning message pops up.

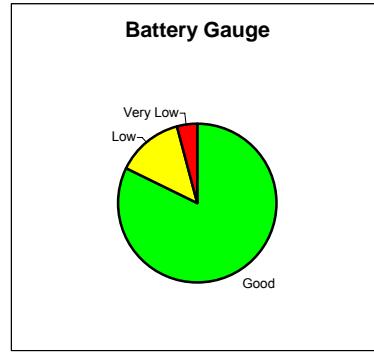
Main & Backup Batteries
Level=Good, State=Charging



Main Battery=No external power
Level=Very Low



Battery Gauge



6.7 Safe Boot Mode

The DSV2+ provides a mechanism that permits the recovery of lost or damaged Operating System files via a “Safe Boot” mode. This mechanism is similar to Microsoft Windows Safe Mode that is available on PCs. If one or more Operating System files are damaged or inadvertently deleted, when the unit is turned on it will automatically boot-up into a smaller, limited function version of Windows CE that will permit the recovery of the files or allow them to be replaced or overwritten. This permits the unit to be repaired and then subsequently rebooted using the full version of Windows CE. Safe Boot mode can also be accessed on demand by holding down the F1 key while turning on the power to the unit. A special bitmap will appear indicating that the unit is booting-up in Safe Boot mode.



7. Demo Applications and Utilities

All of the applications listed below except “DsVerify2About” are located in the “\Storage Card\DSVII” directory. The “DsVerify2About” is a hidden file in the Windows directory. There are additional demonstration programs available as source code for custom software development in the Datastrip DSVII SDK (sold separately).

7.1 Software Version Utility (DsVerify2About.exe)

This utility reports the OS Version, the versions of all Datastrip specific drivers and components, software license settings, the unit serial number, and the HW Configuration. To run this utility:

- Click Start \ Run
- Click Browse then Double tap the Windows folder
- Scroll over and double tap the application: DatastripDsVerify2About.exe
- Click “OK”

This version information can be saved to a file by clicking on the “Send to File” button.



7.2 Smart Card Reader & Scanner Demo (SuperViewer.exe)

This application demonstrates the primary features of the DSV2+ products – reading optical or smart card media and performing one-to-one fingerprint matching. The types of documents supported include the following document types or symbology that contains Datastrip-formatted information:

- ISO 7816 Contact Smart Cards
- ISO 14443 Contactless Smart Cards

The following symbologies are supported on DSV2+ scanner products

- Datastrip2D and 2DSuperscript Two-Dimensional Barcodes
- PDF417
- OCRB
- Linear Barcodes

When this application is launched, the *Main Screen* is displayed and the unit is ready to scan a document or read a smart card. The application automatically reads and decodes a submitted

document and the result is displayed in the Photo, Text, and Fingerprint windows. If the default icon or text is displayed, the document did not contain that type of data.

If a fingerprint was stored on the document, the application will also perform a one-to-one match of a fingerprint stored on the document to the fingerprint captured by the on-board fingerprint sensor. This demonstrates a typical scenario of verifying that a card holder is the same person whose fingerprint is stored on the document.

Main Screen

Clicking the Datastrip logo will return the user to the Main Screen and will reset the scanner subsystem (if the unit is a DSV2+ scanner model). On the *Main Screen*, a user can perform the following operations:

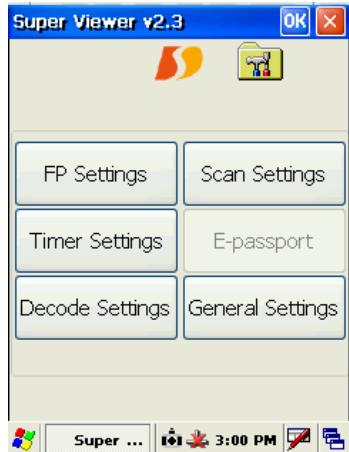
- Clicking on the ‘toolbox’ button will open the *Configuration Screen*.
- Clicking on the ‘OK’ or ‘X’ will exit the application.
- Clicking on the **Photo**, **Text**, or **Fingerprint** windows expands that window



Configuration Screen

On the *Configuration* screen, the following operations are available:

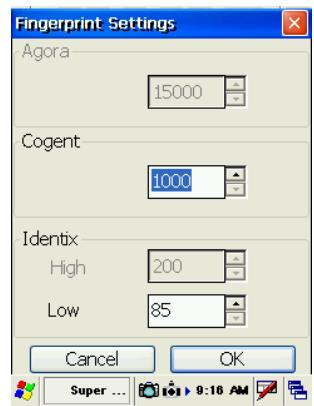
- Clicking on the ‘FP Settings’ button will open the fingerprint threshold setting screen. Refer to the **Fingerprint Settings Screen** section below for details.
- Clicking on the ‘Scan Settings’ button will open the scanner settings screen. Refer to the **Scanner Settings Screen** section below for details.
- Clicking on the ‘Timer Settings’ button opens the “Display Timer Diagnostics” screen. To use this feature you must first “Auto hide” the windows task bar by clicking “Run” settings/taskbar. Now check the “Display Timer Diagnostics” box and return to the main screen. The next document scanned will be timed and recorded on the bottom line of the display as (Scan: Find: Decode: Total). e.g. S:5.3 F:0.1 D:0.6 T:6.0.
- Clicking on the ‘Decode Settings’ button will open the Find Decode Settings screen. Refer to the **Find Decode Settings Screen** below for details.
- Clicking on the ‘General Settings’ button will open the General Settings screen. To use the feature check the “Use GUI Buttons” box and return to the Main Screen. The GUI buttons **“Photo”**, **“Text, and “Fingerprint”** will be displayed above the windows.
- Clicking on the “Datastrip” logo button will bring the application back to the Main Screen.
- Clicking on the ‘Toolbox’ has no effect.
- Clicking on the ‘OK’ or ‘X’ will exit the application.



Fingerprint Settings Screen

On the *Fingerprint Settings* screen, a user can configure the thresholds used by the fingerprint matching algorithms. A higher number tells the system to require a better match of the fingerprints. Agora, Cogent, and Identix are different fingerprint algorithms that can be licensed for use on the DSV2+.

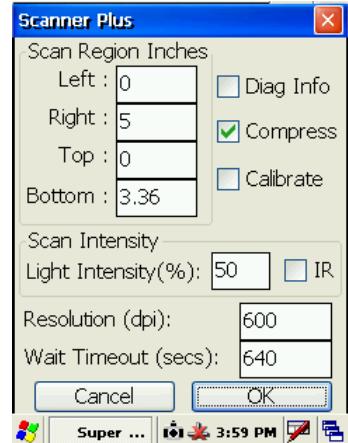
- Clicking on the ‘OK’ will save the settings and return the application to the Configuration Screen.
- Clicking on the ‘Cancel’ or the ‘X’ will abort any changes to the settings and return the application to the Configuration Screen.



Scanner Settings Screen

On the *Scanner Settings* screen, a user can configure the Scan Region (Window size, Scan Intensity for both IR and RGB, resolution and timeout. The example shown to the right shows the default settings for a DSV2+-PA.

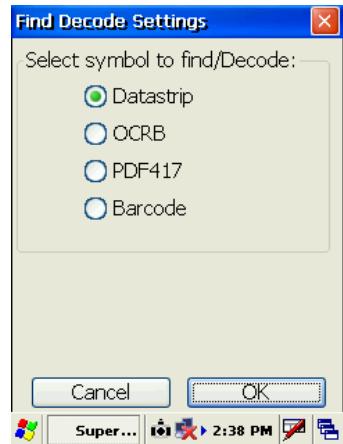
- The scanner parameters can be changed from this screen. For details on the scanner settings please refer to Appendix B – Section 17.1 Scanner Settings.
- Clicking on the ‘OK’ will save the settings and return the application to the Configuration Screen.
- Clicking on the ‘Cancel’ or the ‘X’ will abort any changes to the settings and return the application to the Configuration Screen.



Find Decode Settings Screen

On the *Find Decode Settings* screen, a user configures the type of optical symbology the system will look for to decode. Only one symbology at a time can be selected.

- Select the type of ‘symbol’ that the DSV2+ will Find and Decode from this screen. The choices are Datastrip, OCRB, PDF417 or Barcode.
 - **Datastrip:** Datastrip2D and 2DSuperscript two-dimensional barcodes
 - **OCRB:** OCRB text
 - **PDF417:** PDF417 two-dimensional barcode
 - **Barcode:** a variety of linear (1 dimensional) barcodes
- Clicking on ‘OK’ will save the settings and return the application to the Configuration Screen.
- Clicking on the ‘Cancel’ or the ‘X’ will abort any changes to the settings and return the application to the Configuration Screen.



7.3 PIV Card and CHUID Verifier (DatastripPIVCard_CHUIDVerifier.exe)

The DSV2+ CHUID software allows an operator to read and authenticate PIV cards as defined by “SP 800-73, Section 1.8.3”. The application is located in the “\Storage Card\DSVII” directory in the folder PIVCardApps. Double tap on DatastripPIVCard_CHUIDVerifier and the Main Menu will open:

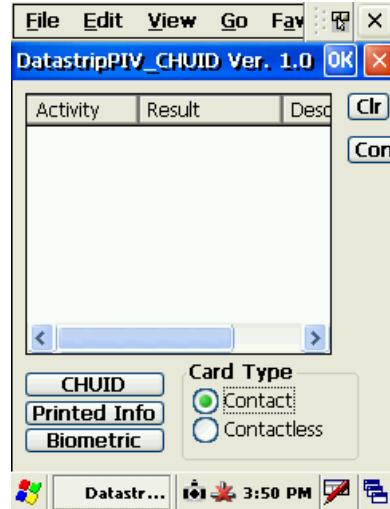
The Main Menu:

The main menu is divided into sections: The first section is the Activity Log window. In this window data sent and retrieved from the cards is captured for Auditing and diagnostic purposes.

There are 5 Buttons in the Main Menu, as well as 2 radio buttons, and the OK/Exit controls as seen below

The usage of each button is as follows:

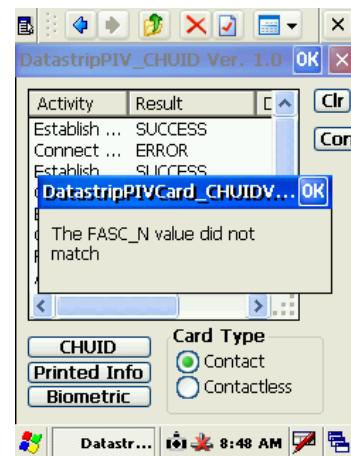
The OK or X buttons - These buttons located in the upper right corner of the application are used to close or terminate the application. Clicking either of these buttons will shut down the application.



The CHUID Button - The CHUID button will perform a number of tests on the card and extract the CHUID details. Additionally it will check the configuration settings of the program and determine if the information stored in the card is to be accepted at this particular station or not. It will also ensure that the card has not expired.

The process to read/verify the PIV card is as follows:

1. Insert the CHUID card into the unit as shown (Contact facing up.)
2. Click the CHUID Button.
3. The reader will attempt to parse the data from the PIV Card and look for the following error conditions.
 - a. Expired or Abnormal Expiration Data.
 - b. Non Authorized or incorrect data in the following fields
 - i. FASC-N
 - ii. Agency Code
 - iii. Organization Code



PIV Card Rejected - Error Conditions:

If either error condition is met the application will display an error message on top of the Activity Log Window and notify the operator of a non acceptable PIV card.

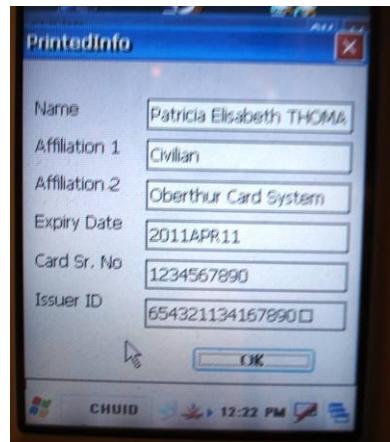
PIV Card Accepted - No Error Conditions:

If there are no errors the display will change to the CHUID details screen which displays some of the data elements on the card and no errors will be reported. This would mean the presented PIV card is acceptable in this situation.

4. Clicking OK at this point will return you to the Activity Log Window and the Main Menu
5. Clicking the Clr Button at this point will clear out all of the data from Activity Log Window.
6. At this point the application is ready to process the Next PIV Card or move to the Printed info or Biometric Steps on the existing card.



The Printed Info Button- The Printed Info button will, after PIN authentication display the stored printed personalization information on the card. This data can be used as necessary for auditing, logging, or advanced determination of qualifications. Tapping the Printed info button will initiate the PIN procedure and after authentication provide the Printed info Display in the application

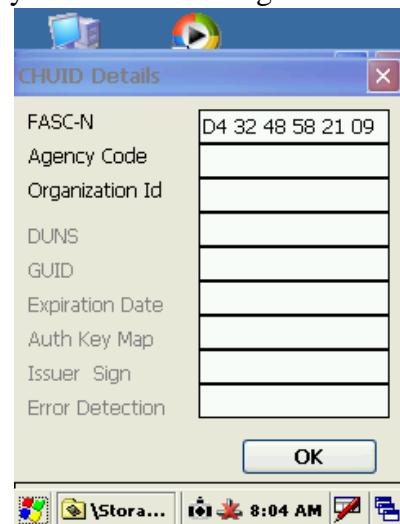


The Biometric Button - This button is used (after pin authentication) to extract the biometric template from the card. This is for future expansion on the system and allows for custom integration into a biometric access control system if required by an individual organization. Tapping the Biometric button will initiate the PIN procedure and after authentication provide the Biometric Data Display in the application. This additional functionality is included for systems integrators to add biometric capabilities at some future point using the DSVII CHUID SDK.

The Clr Button- Pressing the Clr Button will clear the data from the Activity Log Window.

The Con Button- The Con or Configure button is used to setup the configuration for acceptance of a PIV card based on the following fields:

- FASC-N
- Agency Code
- Organization Code



The default is that all values are accepted in any of these fields. If the value in any field is blank the CHUID application accepts any correctly formatted value read from the PIV card as acceptable. The system integrator or operator can set restrictions on the acceptance by placing values in these fields. If there is a Value in any of these fields it will be compared against the data read from the PIV card and if it does not match the card will be rejected. Pressing the Con button brings up the CHUID Detailed Configuration screen.

To set the configuration an operator does the following actions:

1. Press the Con button
2. Enter the filter data into the appropriate field.
3. Click the OK button.

Card Type Radio Buttons- These buttons are used to select Contact or Contactless Cards to be read. The contactless setting is there to allow system integrators to add contactless functionality if required at some point in the future using the CHUID SDK, as well as for diagnostic testing purposes. The default setting for this application is Contact and a user would have to change this setting manually to move into contactless mode.

7.4 Digital Still Camera Demo (DsVerifyStillCameraTest.exe)

This application is used in conjunction with the optional Digital Still Camera (DSC) module to demonstrate the capabilities of the camera subsystem.

After starting the application, the LCD displays preview images which are used to align the subject in preparation of taking a snapshot. After aligning the subject in the display, pressing F1 will turn on the preview illumination (if selected in the settings), and then pressing F1 a second time will capture and save the target image. If the preview illumination is not configured, pressing F1 once will capture and save the target image.

Digital zoom can be controlled via the “Settings” menu or by using the F2 and F3 buttons:

- F3 = X2 digital zoom
- F2 = X1 digital zoom

Snapshots taken and stored by the camera may be viewed on the display via the menu selection “FILE->Display latest Snapshot”. This will display the last snapshot acquired by the camera. The user can then navigate to previous and next snapshots via the “FILE->Previous Snapshot” and “FILE->Next Snapshot” menu selections. Once the user is done reviewing snapshots, selecting “FILE->Exit snapshot display mode” will return the camera to the previewing state.

It is recommended that an external Compact Flash Storage Card be used for storing snapshots since there is a limited amount of memory available on the internal Storage Card. All captured images are stored in 24-bit color depth (full color) BMP files and are stored in the folder \Storage Card2\DSVII\My Documents if an external Compact Flash card is inserted, or \Storage Card\DSVII\My Documents if no card is inserted.

To ensure that an adequate amount of internal memory (RAM) is allocated for the camera when capturing the highest quality images, it is recommended that a minimum amount of internal memory be used by other applications, and the proper amount of program memory is allocated in the DSV2+. To set the internal DSV2+ memory allocation for camera use, select “Start”->“Settings”->“Control Panel” -> “System”, select the “Memory” tab, then slide the memory allocation bar to the left until approx. 3456 KB is allocated to storage memory.

Changes to the camera settings can be made via the “Settings” menu selection, and the settings are stored in the registry and restored the next time the application is run. The Digital Still Camera settings include:

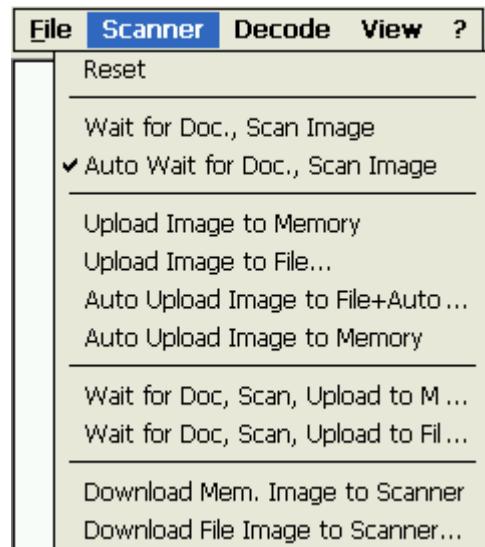
Setting	Selections Available	Description of Setting
Brightness	-2.0 F-stops to +2.0 F-stops	Controls the amounts of light during exposure. The larger the F-stop, the more bright the image will appear.
Capture Size	2048 x 1536 (3.2M pixels) 1632 x 1232 (2.0M pixels) 1280 x 1024 (1.3M pixels) 800 x 600 (480K pixels) 640 x 480 (307K pixels)	Used to select the size of the snapshot image to acquire. Values indicate the height and width of the image in pixels.
Contrast	Automatic, OFF, 10% - 100% in increments of 10%	This setting is used to adjust the visual properties of an image that makes an object in an image distinguishable from other objects and the background.
Flash Mode	Automatic, OFF, Always ON	Used to specify the flash (illumination) operation when taking snapshot images.
Flash Intensity Still Mode	25% to 100% in increments of 25%	Controls the intensity of the flash when taking snapshots.
Flash Intensity Preview Mode	25% to 100% in increments of 25%	Controls the intensity of the flash when previewing a scene prior to taking a snapshot.
Flicker Cancellation	OFF, 50 Hz, 60 Hz	Improves image quality when the camera is used in an environment containing fluorescent lighting. Flickering of fluorescent lighting is caused by alternating current reversals occurring 50 to 60 times a second.
Preview Illumination Mode	ON, OFF	Specifies whether or not to use flash illumination during preview mode.
Preview Size	320 x 240, 160 x 120	Used to select the size of the preview image displayed on the DSV2+ screen. Values indicate the height and width of the preview image.
Sharpness	Normal, Less Sharp, More Sharp	This setting softens or sharpens areas in the image where an edge changes from one brightness level to another.
White Balance	Automatic, Sunlight, Outdoor shadow, Fluorescent, Tungsten, LED	Controls the process of removing unrealistic color casts, so objects which appear white in the scene being captured are rendered white in the photograph. Specify the setting closest to the environment in which the snapshot is being taken.
Zoom	x1, x2	Used to provide the equivalent of two lenses with different focal lengths. X1 is normal operation, X2 is the “zoomed” mode.

7.5 Scanner (PA & SW) Test Demo (DsVerifyScanTestAsync.exe)

This application can be used to optically scan and save documents and also allows the decoding technology to be invoked by the use of a menu. To close the application click File/Exit.

Scanner Screen

- **Reset** – Resets the scanner subsystem. The message on the bottom of the display should say “Scanner Idle”.
- **Auto Wait for Doc., Scan Image** – This is the default setting.
 - After starting the application, the message on the bottom of the display should say “Waiting for Scan”
 - After scanning a document the message should read “Scanner Idle w/Image”. You must now specify to the scanner what type of document you want to decode and where you want to decode it. See Decoder Screen options below.



- When decoding is complete, the scanner will be ready to scan another document and will again display “Waiting for Scan”.
- **Wait for Doc., Scan Image** – To operate in this mode, the “Auto Wait for Doc., Scan Image” option must be unchecked.
 - In this non-persistent mode the scanner will scan one document and display “Scanner Idle w/Image”. The scanner will remain in this state until “Wait for Doc., Scan Image” is clicked again and then the message “Waiting for Scan” will be displayed.
- **Upload Image to Memory**
This non-persistent option takes the scanned image, uploads it to the Host processor memory, and shows the image on the display.
- **Upload Image to File...**
This non-persistent option takes the scanned image and uploads it to a user defined file name and location.
- **Auto Upload Image to File+Auto...**
When checked, this option takes the scanned image, uploads it to a user defined file name and location, and then shows the image on the display.
- **Auto Upload Image to Memory**
When checked, this option takes the scanned image, uploads it to the Host Processor memory and shows the image on the display.
- **Wait for Doc, Scan, Upload to M...**
When doing repetitive operations, this non-persistent option makes things easier by combining “Wait for Doc., Scan Image” and “Upload Image to Memory”.
- **Wait for Doc, Scan, Upload to File...**
When doing repetitive operations this non-persistent option makes things easier by combining “Wait for Doc., Scan Image” and “Upload Image to File”.
- **Download Mem. Image to Scanner**
This non-persistent option takes an image from the Host Processor memory and downloads it to the scanner (DSP).
- **Download File Image to Scanner...**
This non-persistent option takes an image from a file and downloads it to the scanner (DSP).

Decode Screen

- **Host Find, Decode ...**
The Host Processor (SH4) Find and Decode operations are legacy operations (except for Datastrips).
- **Scnr Find, Upload Image to Mem**
The image found by the scanner is uploaded to SH4 memory.
- **Scnr Find, Decode...**
The Scanner (DSP) Find and Decode of the symbology specified.
- **Upload Found Image to Mem**
The image found by the Host Processor (SH4) is uploaded to memory.

File	Scanner	Decode	View	?
		Host Find, Decode Datastrip		
		Host Find, Decode PDF417		
		Host Find, Decode Passport OCR ...		
		Host Find, Decode ID Card (3 lin ...		
		Host Find, Decode ID Card (2 lin ...		
		Scnr Find, Upload Image to Mem		
		Scnr Find, Decode, Get DStrip		
		Scnr Find, Decode, Get PDF417		
		Scnr Find, Decode, Get OCRB Text		
		Scnr Find, Decode, Get Linear		
		Upload Found Image to Mem		

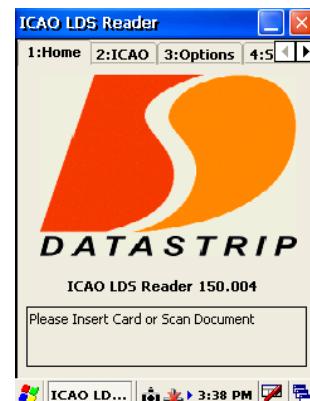
7.6 EPassport ICAO Viewer (ICAO Viewer.exe)

EPassports and other Machine Readable Travel Documents (MRTD) contain, in a standard format, the holders identification details, including a photograph or digital image, with mandatory identity elements in a two-line Machine Readable Zone (MRZ) printed in Optical Character Recognition-B (OCR-B) format at the bottom of the ePassport.

ICAO (International Civil Aviation Organization) has issued a set of guidelines on MRTD which specifies that these documents should use an RFID chip that can be used to read the individual's identification details using contactless media. The transmission of data is encrypted by "Basic Access Control" (BAC) where the key is comprised of data contained on the document itself.

ICAO Viewer Application

The Datastrip ICAO Viewer application is a dialog-based application created to demonstrate ePassport scanning and decoding. The ePassport is first scanned to read the Machine Readable Zone (MRZ) at the bottom of the ePassport. This information contains a key that can then be used to open the contact-less Smart Card, when presented to the DSV2+ smartcard reader, and to extract the biometric information for verification purposes. The ICAO Viewer application supports JPEG2000 images and is able to read Passports that utilize passive authentication. The application is located in the “\Storage Card\DSVII” directory in the folder “EPassport_ICAOViewer.”

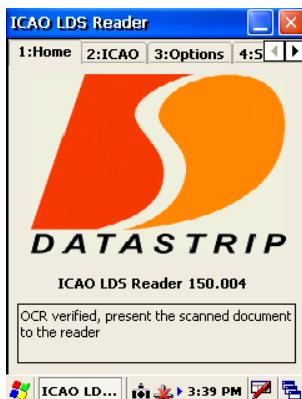


ICAO Figure #1

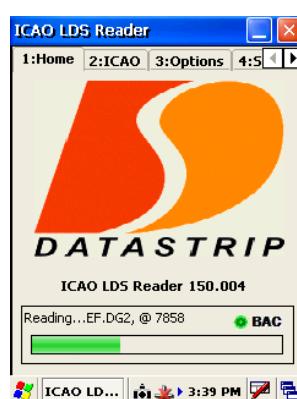
ICAO Viewer Operation

After opening the application follow the instructions in the dialog box and wait for the Scanner and ICAO engine to activate. The initialization is complete when the dialog box reads, “Please Insert Card or Scan Document”. See ICAO Figure#1

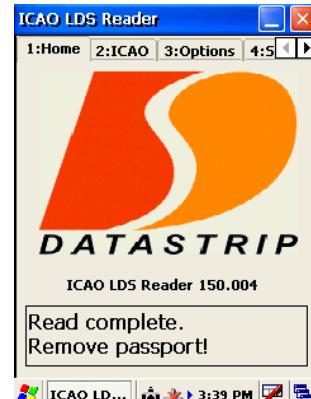
After scanning the ePassport the dialog box should indicate “OCR found...”, “Decoding...”. If the OCR is successfully decoded, the dialog box should now read “OCR verified, present the scanned document to the reader.” See ICAO Figure #2.



ICAO Figure #2



ICAO Figure #3



ICAO Figure #4

Once the ePassport is presented to the reader, and the green progress bar indicates data is being read, see ICAO Figure #3. The Passport must continue to be held against the reader until all the data has been completely read and the dialog box indicates “Read complete. Remove passport!”, see ICAO Figure #4. If the dialog box does not indicate “Done” but displays “Please Insert Card or Scan Document” the key did not verify (could be a bad scan or invalid key). Rescan the document.

Results

The Document Security Object (SOD), which is a digital signature of the contents of the MRTD generated by the issuance agency, is stored within the MRTD. It is very important that the Document Security Object (SOD) is authenticated to prove that the Logical Data Structure (LDS) is authentic and unaltered.

Passive Authentication (m)

– Proves that the contents of SOD and DGs are authentic and not changed. It cannot, however, protect against perfect duplications of the chip or chip substitution.

Active Authentication (o)

– Prevents copying SOD, authenticates chip and proves that chip and physical passport belong together. It can ensure that the chip is legitimate and issued by the country claimed

Basic Access Control (o)

– Prevents skimming, eavesdropping, and misuse. The e-Passport cannot be read by an electronic reader until the machine-readable zone is read first



Results of AA and PA security features are displayed as follows:

AA green :	AA successful
AA red :	AA failed *
AA orange:	AA not required
PA green :	PA successful
PA red :	PA failed *
PA orange :	PA not required

* For AA and/or PA failure pressing F4 displays the errors encountered or relevant messages indicating the reason of failure. F4 is used to toggle between displaying errors and displaying geographic details of DG1. However, F4 can be used to view errors only when one of these features fails. In all other cases, F4 will navigate you to the Scanner tab. The errors you come across would be due to unsupported signature algorithms and/or hash algorithms.

7.7 Data Capture Enrollment Application (DataCapture.exe)

The Data Capture enrollment application is used to collect data records that can be stored on a memory card and transferred to a PC. **You Must Have a Digital Still Camera installed for this application.**

New Record: Enter the User Data; Name, Doc #, Date, Location, Type.

Record Composer:

PHOTO – Clicking on the Photo will open the camera application in preview mode. Press the F4 key to “Capture” the image. You can then accept the photo or cancel and recapture a new image.

FINGERPRINT – Clicking on the fingerprint window will open the fingerprint screen. Click the “Capture” button and place your right index finger on the fingerprint scanner. You can then accept the fingerprint image or cancel and recapture a new image.

STORE OR CANCEL – Review the record data and “Store” the record or “Cancel” the record. Stored records will be saved in the DSV2+ folder named “Enrollment_Data”. The file name structure will be: month:day:year:hour:minute:lastname:doc#.

View Records: From this screen you can scroll through the stored records using the; First, Previous, Next, and Last buttons. When a record has been selected you can then “Edit” or “Discard” that record.

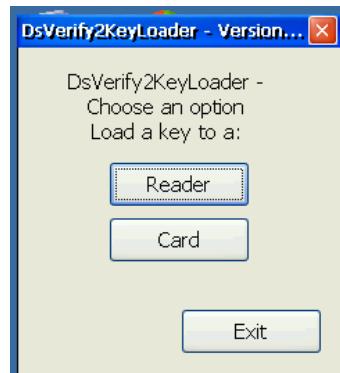
Store: Memory Card: The memory card must have a folder named “Enrollment_Data”. When you click Store: Memory Card, the data from the StorageCard/Enrollment_Data folder will be copied to the StorageCard2/Enrollment_Data folder.

7.8 iClass Card Demo (IClassReadWriteSample.exe)

The IClassReadWriteSample application is used to enroll and later verify user information on HID IClass Smart Cards. This sample uses a PC/SC driver developed by Datastrip to operate with an HID OEM-150 Smart Card reader when it is present in a system. It captures both fingerprints and photos (using the internal fingerprint imager and Digital Still Camera), collects some sample demographic information and encodes this data onto 2K IClass Smart Cards for later verification.

1. Double tap the application called IClassReadWriteSample.exe
 - a. Two options will be on the screen:
 - F3 – IClass Reader
 - F4 – IClass Writer
 - b. The two buttons allow the writing to and reading from an iClass card.
2. F4 - IClass Writer
 - a. Select camera type: F3 – FlyCam or F4 – TetraCam
 - b. F2-FP – press F2 and Place your finger on the fingerprint scanner.
 - c. F3-Text – press F3 and type Last Name, First Name using the keyboard, then enter.
 - d. F4-Cam – press F4 to activate the camera preview mode. Press F4 again to capture photograph.
 - e. F1-Write – Place iClass card against reader and press F1. Continue to hold card in position until the message “Transmit Write Success” is displayed.
3. F3 - IClass Reader.
 - a. Hold the iClass card up to the reader as in previous smartcard tests.
 - b. While holding the card to the reader press the F3 – Read IClass button.
 - c. The message Transmit Read success should appear along with the message “Place your finger on the scanner.”
4. To close the application tap on the “X” in the upper right corner.

7.9 IClass Key Loader Utility (DsVerify2KeyLoader.exe)

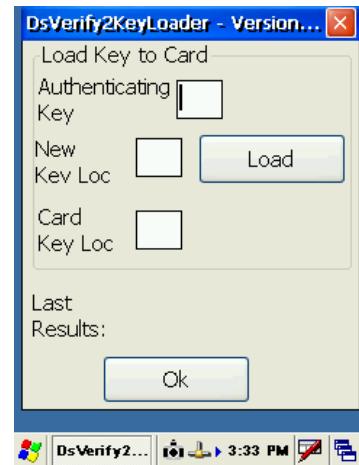


Note: Datastrip loads a default key on new units that allows iClass cards with a default key to be used. Secure keys can only be obtained through HID or the iClass card distributor can load the key when you buy iClass cards. After you have obtained a secure key this application allows you to write the key on iClass cards.

1. Double tap the application DsVerify2KeyLoader.exe.
 - a. A dialog box will appear with three buttons, Reader, Card and Exit.
2. Loading a key to the Reader.
 - a. Tap the button labeled “Reader”.
 - b. A new dialog box will appear.
 - c. Fill in the edit box labeled Key with the Key that is to be loaded into the reader. The size of every key is 16 alpha numeric characters. The letters can be lowercase or uppercase.
 - d. Fill in the edit box labeled Exchg Key. This is the Exchange Key distributed by HID.
 - e. Next if you need to change the location that the key is being placed in the reader, edit the box labeled Rdr Key Loc. This is the location that the key will be loaded to on the reader.
 - i. **Note:** The default value is 3. This is the location that the DsVerifyIClassDemo looks for its authentication key when reading and writing to an IClass card.
 - f. When all the boxes are filled. Tap the button labeled “Load”. This will attempt to load the key to the reader. Any errors received or if the loading was successful will be displayed next to the label “Last Result”.
 - g. To close this dialog tap the “X” in the upper right corner or tap the “Ok” button.
3. Loading a key to a Card.

Note: Loading a key to a card requires two keys to be loaded onto the reader. One needs to be the authenticating key for the area that the key is being loaded to and the second is the key that is to be loaded to the card.

- a. Tap the button labeled “Card” from the main dialog.
- b. A new dialog will appear.
- c. Fill in the edit box labeled Authenticating Key Loc with the location where that key was loaded.
- d. Fill in the edit box labeled New Key Loc with the location of the key to be written to the card, on the reader.
- e. Fill in the edit box labeled Card Key Loc with the location on the card that the key is supposed to be written to.
- f. Once the edit boxes are filled with the proper data, tap the “Load” button. This will attempt to load the key to the location given on the card. Any error or success will be shown next to the label “Last Results”.
- g. To close the dialog tap the little “X” in the upper right corner or tap the “Exit” button.
4. To close the application click on the “Exit” button or the “X” in the upper right corner.



7.10 Fingerprint Capture Utility (DsVerifyFpCaptureTest.exe)

This application demonstrates the capabilities of the fingerprint image sensor on the DSV2+ and it provides a means of exercising the fingerprint imaging system. The application has several buttons that allow a user to Scan to the display or Scan to File. Since this application is provided as source code in the SDK, it is often used as an example for developers to observe how typical application software can interface to the fingerprint subsystem. *The source code for this application is provided in the SDK for developer use.*

7.11 DsVerify Registry Install Utility (DsVerifyRegInst.exe)

This application registers all of the Datastrip specific components of the DSV2+ that are needed to read/write Smart Cards, scan documents, operate the Fingerprint sensor, and so forth. It is typically run after a software update to registers the components in sequence and reports any errors if it doesn't succeed. If it finishes successfully, it pops up a message box indicating "Finished Registration". It can take up to a minute or two to complete this process.

Internally, this program calls regsvrce.exe to register each ActiveX control so that the interface presented by the ActiveX control will be available for application use. This is usually followed by RegistrySaver.exe (or Suspend) to make sure that the altered registry is written to flash memory for future use. When this application is invoked, it queries the user for the specific DSV2+ platform type (DSV2+-SC, DSV2+-SW, or DSV2+-PA) and writes the appropriate platform type information into the registry along with the other registration information.

7.12 DsVerify Registry Saver Utility (RegistrySaver.exe)

This application is used to save the current registry settings to flash memory. This is very useful after adding applications (or applications components such as ActiveX controls) to DSV2+ products that require some aspect of the behavior to be registered. When any DSV2+ is powered-on, the saved registry is read and used as part of WinCE startup. Datastrip ActiveX components are registered (see DsVerifyRegInst application that follows) and then the registry settings are saved using this application. The registry can also be saved by hitting "Suspend" function that is located under the Start menu button, but this application is provided to save the registry to the Storage Card without having to warm-start the unit.

8. Loading Software and Firmware

8.1 Loading DSV2+ Software Updates

The DsVerify2SoftwareUpdate application permits the user to download software updates from several source locations as listed below:

- CAB files located on \Storage Card 2, \Storage Card, and USB thumb drives
- CAB files loaded directly from the Datastrip corporate FTP server, (requires a Datastrip supplied) username and password that accesses a pre-determined account.
- CAB files loaded from user/developer designated FTP servers, given a username and password to a valid account.

8.1.1 DSV2+ Software Update Procedure - Using CF card in external slot

NOTE: It is recommended that upgrades are done with the unit operating on the AC adapter.

This upgrade process should take approximately 3.5 minutes to complete.

- Power up unit.
- Insert the provided CF Card containing the new OS cab file into the external CF slot.
- When the device is finished booting, double tap My Computer and Select Storage Card / DSVII.
- Double tap the DsVerify2SoftwareUpdate utility.
- Select Server: Storage Card2 (you must scroll down to make selection)
- Username and Password are not necessary for this procedure
- Select most recent appropriate source file (Ex. Src File: \DSVII_0195_sh4.CAB)
- Click Update (This step will take approximately 2.5 minutes.
- Click Reboot (The registry will be cleared prior to shutdown).
- Power Up unit
- The DSV2+ registration program will automatically open. Select the button for the device that you are registering (DSVII-SC, DSVII-PA, or DSVII-SW). Select [OK] and wait. (This process will take from a few seconds).
- Click [Ok] in the “Hurray!” Box when it appears, then close the application window.
- Double tap the RegistrySaver program.
- Double tap My Computer and Select Storage Card / DSVII.
- Double tap the PPCalFt41utility and press the “Calibrate” button to initialize the fingerprint sensor. This process may take up to a minute and then a “green” window with a number “1” should appear to indicate the sensor was successfully calibrated.
- Double tap the DsVerifyFpCaptureTest application. In the lower right hand corner select “UPEK” and click “OK”. DO NOT use the calibrate button on this screen for UPEK, however you can use the Scan function to test the fingerprint image.
- If you are upgrading a scanner go to Section 8.2

8.1.2 DSV2+ Software Update Procedure – Using Datastrip FTP site

NOTE: It is recommended that upgrades are done with the unit operating on the AC adapter.

This upgrade process should take approximately 13 minutes to complete.

- Power up unit.
- When the device is finished booting double tap My Computer and Select Storage Card / DSVII.
- Double tap the DsVerify2SoftwareUpdate utility
- Select Server: datastrip.serveftp.net
- Click Connect

- Select most recent appropriate source file (Ex. Src File: \DSVII_0195_sh4.CAB)
- Click Download and wait for message “Download complete”
- Click Update
- Click Reboot
- Power up unit
- The DSV2+ registration program will automatically open. Select the button for the device that you are registering (DSVII-SC, DSVII-PA, or DSVII-SW). Select [OK] and wait. (This process can take from a few seconds to up to 45 seconds).
- Click [Ok] in the “Hurray!” Box when it appears, then close the application window.
- Double tap My Computer and Select Storage Card / DSVII.
- Double tap the RegistrySaver program.
- Double tap the PPCalFt41utility and press the “Calibrate” button to initialize the fingerprint sensor. This process may take up to a minute and then a “green” window with a number “1” should appear to indicate the sensor was successfully calibrated.
- Double tap the DsVerifyFpCaptureTest application. In the lower right hand corner select “UPEK” and click “OK”. DO NOT use the calibrate button on this screen for UPEK, however you can use the Scan function to test the fingerprint image.
- If you are upgrading a scanner go to Section 8.2

8.2 Loading Scanner Firmware Updates

The DsVerify2ScannerUpdate utility is used to update the DSP firmware in the scanner-based versions of DSV2+ by installing runtime files of the proper form (.hex extension) which have been generated by Datastrip.

- Check that the Scanner Firmware provided is compatible for use with the unit by looking at the DSVII Software Release Notes for the Run-Time software. The version of the scanner firmware can be checked in the DatastripDsVerify2About application under the name “ScanVer”.
- In the directory Storage Card/DSVII run the utility DsVerify2ScannerUpdate.exe.
- Using the button marked [...]; select by, double clicking, the appropriate scanner runtime DSP binary file (.hex) that is to be loaded into the scanner sub-system. The latest copy is usually found in the Storage Card -> DSVII -> DSVII_Scanner_DSP directory. (Ex. Src File: \DSVII_Scanner_Runtime_Ver_152.Hex)
- Once the appropriate file has been chosen, click the Verify button to validate the format and checksums for the file.
- Click the Update button to download the file to the scanner DSP engine.
- When the status message indicates “Scanner Update Complete”, Exit the application.
- To confirm the new version has been loaded use the DatastripDsVerify2About.exe application to check the “ScanVER” entry, which should match the release number of the (.hex) file that was just loaded.
- Reboot the unit by pressing Power Off button.

8.3 Loading Smartcard Firmware Updates

Smartcard firmware version 5.12 cannot be erased and therefore does not support the update procedure. Only ScardFw versions 6.32 or later can be updated. Verify the version of your ScardFw by running the DsVerify2About Utility. The procedure for updating the smartcard firmware is as follows:

- In the directory Storage Card/DSVII run the utility “DsVerifyCleanUp” and select the option “Clear SCM Firmware”. Answer “OK” to the question “Are you REALLY sure”
- Reboot or Suspend as required
- When the device is finished booting double tap My Computer and select Storage Card / DSVII.
- Open the folder “DSVII_SCM_Firmware”. Verify the new firmware is in the folder: “SCR331-DI_HW_140_FW_632”
- Double tap the utility “FlashIt”
- Tap the button “Open bin file” and navigate to: StorageCard/DSVII/DSVII_SCM_Firmware
- Select “SCR331-DI_HW_140_FW_632” and click OK
- Status should read “Binary file is valid.”
- Tap the button “Download”
- Reboot to complete update.

8.4 Loading Digital Still Camera Firmware Updates

The **DSC Firmware Update Utility** is a “stand-alone” program which can be used to update the camera module’s firmware. The procedure for updating the Digital Still Camera firmware is as follows:

- In the directory “Storage Card/DSVII” run the utility DSC_Firmware_update.exe.
- The application displays the current version number of the camera firmware and asks the question “Do you want to update the camera firmware? “
- If you answer “Yes” then browse to the directory “Storage Card/DSVII/DSVII_DSC_Firmware”, select the latest firmware version and double-click on it, or select it and hit “OK”.
- Wait for the camera to update its firmware (approx 15 seconds). Note: After the firmware is updated, the camera illumination LED will blink 10 times.
- Turn the DSV2+ off and then back on to activate the new firmware.

8.5 Loading PIC Firmware Updates

The procedure for updating the PIC firmware is as follows:

- In the directory “Storage Card/DSVII” run the utility DatastripDsVerify2PICUpdate.exe.
- When the dialog box opens that reads “Select valid PIC HEX File” click the small box and navigate to the directory /Storage Card/DSVII/DSVII_PIC_Firmware
- Double tap the latest release e.g. “PIC_FW_V401.hex” to select it.
- Click the button “Update PIC Firmware”.
- Reboot to complete update.

9. DSV2+^{Turbo}-SC Product Specifications - GSA FIPS-201 Compliant

Physical Characteristics		Power Management	
Dimensions	185 x 185 x 50 mm (7.3 x 7.3 x 2.0 in)	External Power	11.4 -19 VDC
Weight	962 g (2.1 lbs) with 3000 mAh Battery	Battery	Rechargeable Li Ion Polymer 7.4 V 3000 mAh Standard Capacity Integral Protection Circuitry
Display	3.5" Color Reflective TFT LCD 240 (H) x 320 (V) QVGA LED Backlight Indoor/Outdoor Viewable	AC Adapter/Charger	100-240 VAC 50-60 Hz 30 Watts
Touch Screen	Integrated Resistive Touch Panel	Optional Auto Adapter	
Keypad	5-Button Backlit Rubber Keypad Power Button + 4 Function Keys		
Stylus	Integrated Stylus Holder		
I/O Panels	Easy Access to I/O Connectors and Battery Compartment		
Handheld	Non-Slip Hand Grips Adjustable Hand Strap		
Hardware/Software		Fingerprint Sensor – UPEK TURBO	
Processor	Renesas SH4 7760 200 MHz Floating-Point RISC Processor	Hardware	Capacitive Solid-State Sensor 256 x 360 pixels
System Memory	64 MB RAM, 16 MB ROM Built-In	Resolution	500 DPI, , 8-bit grayscale
Expandable Memory	256 MB Internal Compact FLASH	Sensor Area	12.8 x 18.0 mm
Operating System	Microsoft® Windows® CE .Net V5.0	ESD	15 KV
Interfaces	2x USB Host 1x Mini USB Client 1x Serial via Docking Station 1x Ethernet (RJ45) 1x External CF Type I/II 1x Internal CF Type I/II 1x Internal CF Type I/II (System Boot)	Contact Smart Card Interface	
Audio	0.5 to 4 kHz, 8 Ω, 750 mW	Specification	ISO 7816
Environmental Characteristics		Connector	8X Landing Style Contacts 100K Min Insertion Cycles
Operating Temperature	0° to +40° C (32° to 104° F) 50° C (120° F) or higher at low RH	Contactless Smart Card Interface	
Storage Temperature	-20° to +60° C (-4° to 158° F)	Specification	ISO 14443 A/B
Relative Humidity	< 90% at +40° C Non-condensing	Operating Frequency	13.56 MHz
Drop Resistance	Exceeds MIL-STD 810F	Operating Range	30 mm
Regulatory Compliance (Core System)		Security Access Modules	0 or 2
Safety: CE Low Voltage Directive (72/73/EEC) EN 60950:2000		Docking Station	
EMC: CE EMC Directive (89/336/EEC) / (93/68/EEC) EN 55022:1998 & EN 55024:1998		Battery Charging RS232 Serial Communication	
R&TTE: Compliance under EN 300330 & EN 301489-03		Reliability	
NRTL: TÜV Rheinland of North America, Inc.		Mean Time Between Failure (MTBF)	
Regulatory Markings: CE, TÜV NRTL (Canada & US).		39,887 Hours	

10. Regulatory Compliance Statement

The DSV2 product is in conformity with the requirements of the Low Voltage Directive (72/73/EEC) and the EMC directive (89/336/EEC) as amended by (93/68/EEC).

FCC Declaration:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING: Changes or modification to Datastrip DSV2 not expressly approved by the party responsible for assuring compliance could void the user's authority to operate the equipment in a safe or otherwise regulatory compliant manner.



11. Fingerprint Algorithms and Support

Fingerprint Matching Vendor	Algorithm	Matching Mode	Support Type	Standard Supported / Notes
Identix	BioEngine 5.0 or 3.0	1:1 locally 1:N on host	Fully Integrated	Proprietary ANSI 378/ANSI 381 - Q3 06
Cogent	Ver 2.0.0.1	1:1 locally 1:N on host	Fully Integrated	Proprietary
Bioscrypt	BioSDK Ver 8.1	1:1 locally 1:N on host	3 rd Party Integrated	Proprietary, "User Record Format" ANSI INCITS 377-2004 Finger Pattern Data Interchange
Agora	Ver 1.5	1:1 locally 1:N on host	Fully Integrated	Proprietary
Motorola		1:1 locally 1:n locally 1:N on host	3 rd Party Integrated	Proprietary ANSI 378/ANSI 381 - Q3 06 Printrak 1:2000 locally in less than 15 secs
NEC		1:1 locally 1:n locally 1:N on host	3 rd Party Integrated	Proprietary NEC 1:5000 locally in less than 1 second

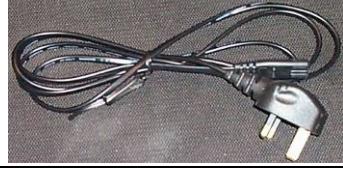
12. Troubleshooting

PROBLEM	POSSIBLE REASON AND REMEDY
Unit does not power up	The battery may be not connected, or may be completely discharged. ➤Open the battery access cover and verify that the battery is properly installed. ➤Use the external AC power adapter to operate the unit and simultaneously charge the battery. <i>Please refer to Section 0 "Battery Charging and Replacement"</i>
Unit generates a single "error" beep tone, and the power LED flashes RED once	➤This is an indication that the internal battery is very low, and does not have sufficient charge to run the unit at all. ➤Plug in the AC power adapter to charge the battery AS SOON AS POSSIBLE

13. Available Parts, Supplies, and Accessories

The following replacement parts and supplies are available through the technical-support contacts, or through your authorized Datastrip reseller. Please contact Datastrip or an authorized reseller for a complete list of options, accessories, pricing, and availability information.

ACCESSORIES / SPARE PARTS	Datastrip P/N
Stylus	DSVOSTY
D-Ring and Shoulder Strap For applications that require over-shoulder carrying of DSV2+ devices. Works with all Models. Sturdy metal snap-swivels. Ergonomically curved and padded shoulder area, featuring non-slip material on one side. Wide length adjustment range.	DSVDRING – D-Ring DSVXXSS – Shoulder Strap
Dual Grip Battery Cover with Tethered Stylus More robust handgrip for better control under harsh conditions. Works with all models.	DSVODGBC
Digital Still Camera (DSC) Module 3.2M Pixel Color Camera. Quick point and shoot use. Seamlessly integrated into dual grip back cover. Built in flash illumination. Built in preview illumination. Auto Exposure. User configurable operation. Demo application software included. Full SDK support.	DSVODSC
Docking Stations Works with all models. Operates and charges batteries simultaneously while units are docked. Serial Cable included for Active Sync connections Convenient upright position using a two position backrest.	DSVOACS3 – Power + Serial DSVOACS1 – Power only
DSV2+ USB 2.0 Active Sync Cable Provides ActiveSync connection via the USB 2.0 Client Port	DSVOSCAUSB
DSVII SDK (Software Development Kit) Provides the software components, samples, and information necessary to develop and deploy large scale, real world applications.	DSVIISDK
Datastrip 2D Superscript PC (Software Development Kit) This kit contains the software that is required in order to generate and decode Datastrips on PC's using Win32 based operating systems.	DSSSDK

ACCESSORIES / SPARE PARTS	Datastrip P/N
Dual-SAM Smart Card Module ISO 14443 Contactless card support. ISO 7816 Contact card support. 2 internal security slots for SAM (Security Access Modules).	DSVODSAM
Internal Memory Upgrade: 512 Meg CF card	DSVOMEM512
Internal Memory Upgrade: 1 Gigabyte CF card	DSVOMEM1G
Internal Memory Upgrade: 2 Gigabyte CF card	DSVOMEM2G
.NET Wrapper License (Oddysey Wrapper): Used for .NET software development and deployment, such as for Visual Basic and C#.	DSVSOW
External Power Supply & Line Cord: (Universal 90-240 VAC 50/60 Hz input)	 DSVOACC P/N 3090-01225-02
External Power Supply Cord: (Universal 90-240 VAC 50/60 Hz input)	 P/N 3008-60163-01
External power supply AC-mains cord: (European): These cables allow equipment fitted with a figure of 8 power connector to be plugged into a 2 or 3 pin European mains power socket (NOT suitable for use in the UK).	 3008-90001-01
External power supply AC-mains cord: (UK, Ireland, Middle East): These cables allow equipment fitted with a figure of 8 power connector to be plugged into a UK mains power socket. They have moulded plugs and are 3 amp fused.	 3008-90002-000
Vehicle Power Charger:	 DSTPVDC
Proximity Card Reader (PROX) Multi Format ready Programmable output Supports HID standard Prox cards Indala and Motorola also available	DSTPPR

ACCESSORIES / SPARE PARTS	Datastrip P/N
<p>Carry Bag</p> <ul style="list-style-type: none"> Outer covering is made from black ballistic nylon weave, laminated with padding material on the inside. Zipper access to insert/remove DSV2+ device. Shoulder-strap attachment D-rings. Cover-flap to protect the front of the device when not in use. Can be “self-stored” when not needed, or removed when not needed for long periods (scanner models only). Stylus pocket. Serial & DC power connectors remain accessible for user convenience. 	DSVSCCB – DSV2+-SC DSVPACB - DSV2+-PA

14. Service & Support

Technical support is available through the following contacts:

Home page and Tech Support: www.datastrip.com

For customers located in North and South America:

Address: Datastrip, Inc.
 211 Welsh Pool Road, Suite 100
 Exton, PA 19341
 E-mail: support@datastrip-inc.com
 Phone: (610) 594-6130
 Fax: (610) 594-6065
 Office Hours: 8:30 AM to 5:30 PM EST/EDT

For Customers outside North and South America:

Address: Datastrip Ltd.
 Unit 7, Thame Park Business Centre
 Wenman Road
 Thame, Oxon
 OX9 3XA
 E-mail: uksupport@datastrip.com
 Phone: +44 (0) 1844 215668
 Fax: +44 (0) 1844 215669
 Licensing: +44 (0) 1844 215668
 Office Hours: 0900 to 1730 GMT/BST.



To return your Datastrip for service, upgrade or repairs, please contact the tech-support department by e-mail or telephone. An RMA will be issued, and should be clearly marked on the outside of your shipping carton. Please be certain to provide adequate shipping insurance to safeguard the contents. For international shipments, please include a declaration of value, or other relevant legal documents that are required for shipment of this type of equipment.



Please use the original shipping carton and packing materials whenever possible.



Please ensure you send your package PREPAID or it will not be accepted. Do not ship collect. Datastrip will return all RMA equipment shipping prepaid as well. Failure to follow this requirement will result in delays.



For parts, supplies and accessories, place your order through your authorized Datastrip reseller, or by contacting Datastrip Limited or Datastrip, Inc.

Datastrip thanks you for purchasing our equipment. If you have any comments, suggestions, questions, or concerns, we would like to hear from you.

15. Appendix A: Docking Station

The connector in the bottom endcap of the pins DSV2+^{Turbo} provide external power and one serial port for interfacing to a host computer or other external equipment via the Datastrip Docking Station.



15.1.1 Adjusting the Docking Station Backrest

The docking station backrest has two positions. It is important to adjust the backrest correctly to insure proper operation (i.e. serial connection) between the DSV2+ and the docking cradle.

Forward Position: This position should be used for DSV2+^{Turbo} Scanners or DSV2+^{Turbo}-SC terminals with the standard battery cover. See Figures #1 and #2.

Rear Position: This position should be used for DSV2+^{Turbo} Scanners or DSV2+^{Turbo}-SC terminals with a Dual Grip Battery Cover, or a Dual Grip Camera Assembly. See Figures #3 & #4.



Figure #1–DSV2+ Scanner Figure #2 – DSV2+ SC Figure #3 – Dual Grip Figure #4 – DG Camera

15.1.2 Dual Grip Tethered Stylus

When not in use it is recommended that the Dual Grip tethered stylus cable be stored out of the way by looping it around the dual grip rubber grips as shown in Figures # 5 and #6.



Figure #5



Figure #6

16. Appendix B: Active Sync

The flowing sub-sections describe both wired and wireless methods of establishing ActiveSync communications between the DSV2+ (which runs Win CE) and a PC/Laptop with Windows XP. Some typical operations you can perform via ActiveSync are:

- Synchronize, backup, and restore information on the DSV2+
- Add and remove files from the DSV2+
- Copy data between the DSV2+ and the PC
- Use the connection to debug programs you develop.

16.1 ActiveSync via USB 2.0 Client Port

16.1.1 Hardware/Software Requirements

The following is required to establish an ActiveSync connection via the USB 2.0 Client Port:

- ActiveSync version 3.7.1 or later installed on the host PC (Version 4.5 recommended)
- A DSV2+ terminal with USB 2.0 enabled.
- USB 2.0 to Mini B Cable – Datastrip sales code – DSVOSCAUSB.
- Datastrip DSV2+_Turbo_USB Sync Setup utility found on the DSV2+ User Manual CD.



16.1.2 PC Configuration for USB 2.0 ActiveSync (First Time Only)

- Run the “DSV2+_Turbo_USB Sync Setup” utility found on the DSV2+ User Manual CD
- After running the Sync setup you will be prompted to connect your DSV2+ terminal to the PC. Turn your DSV2+ terminal on and connect it to any one of the host PC USB ports using the USB 2.0 to Mini B cable. After the DSV2+ terminal has been connected, Windows will notify you that it has “Found New Hardware”. You will then be asked “Can Windows Update search for new software?” Answer: NO, not this time.
- The Wizard will then ask how you want to install software. Answer: Install the software automatically (Recommended).

16.1.3 Establishing a Connection

- Each time you connect the DSV2+ terminal to the host PC you will be asked if you would like to set up a Partnership. If you will be using this DSV2+ terminal on this PC regularly then answer “Yes”. If this is a one time use on this PC answer “No”. In either case you will be connected and can transfer files between the PC and the DSV2+ terminal.

16.1.4 Troubleshooting the Connection

If a connection is not automatically established check the following:

- The DSV2+ will not connect while it is in Suspend mode. Wake the DSV2+ from Suspend prior to connecting the USB cable.
- Verify that USB 2.0 is enabled on your terminal and that USB via COM3 is selected. Go to the Control Panel and double click “PC Connection”. On this screen you should see “USB via COM3”. If not then click “Change Connection”. Click the scroll bar arrow. If you see the option for “USB on COM3” then select it and click “OK”. Click “OK” again to close the PC Connection screen. Re-insert your USB cable to get connected. If you did not see the option for “USB on COM3” your terminal is not USB 2.0 enabled.

16.2 ActiveSync via the Docking Station

16.2.1 Software/Hardware Requirements and Setup

- ActiveSync version 3.7.1 or later installed on the host PC.
- Docking station, docking station serial cable and Datastrip power adapter.
- Connect the DB9 end of the Docking station serial cable to the PC COM1.

16.2.2 Establishing the Connection

- Turn on the DSV2+ and when it has finished booting, place it in the docking cradle.
- Each time you connect the DSV2+ terminal to the host PC you will be asked if you would like to set up a Partnership. If you will be using this DSV2+ terminal on this PC regularly then answer “Yes”. If this is a one time use on this PC answer “No”. In either case you will be connected and can transfer files between the PC and the DSV2+ terminal.

16.2.3 Disconnect

- Disconnecting the ActiveSync cable or removing the DSV2+ terminal from the docking cradle will disconnect the session on the PC side, but not on the DSV2+. Manually disconnect the DSV2+ by clicking on the ActiveSync icon in the system tray and clicking “Disconnect” or do nothing and the session will timeout after one minute. Both ends of the connection must be disconnected before you can reconnect the cable and start another ActiveSync session.

16.2.4 Troubleshooting the Connection

If a connection is not automatically established check the following:

- The DSV2+ will not connect while it is in Suspend mode. Wake the DSV2+ from Suspend prior to placing it in the docking station.
- Verify that “Serial via COM1” is selected on your terminal. Go to the Control Panel and double click “PC Connection”. On this screen you should see “Serial via COM1”. If not then click “Change Connection”. Click the scroll bar arrow. Select “Serial via COM1” and click “OK”. Click “OK” again to close the PC Connection screen. Re-insert your DSV2+ into the docking cradle to get connected.
- Place the DSV2+ in the docking cradle. On the PC, open the ActiveSync application and select “File/Connection Settings”. Then select “Connect”. This will initiate a connection with the DSV2+ from the PC side.

16.3 ActiveSync via 802.11 CF Adaptor or Bluetooth USB Adaptor

16.3.1 Hardware/Software Requirements

The following materials are required to establish an ActiveSync connection via 802.11:

- A DSV2+ equipped with an 802.11 CF Adaptor or Bluetooth USB adapter.
- A PC connected (wired or wirelessly) to an 802.11 wireless network.
- ActiveSync version 3.7.1 or later installed on the host PC.
- Docking station, docking station serial cable and Datastrip power adapter.

16.3.2 PC Configuration for 802.11

16.4 If connecting the DSV2+ to the host PC via 802.11 for the first time, start by establishing a wired ActiveSync connection with the

PC using the procedure described in Section 16.2 “ActiveSync via USB 2.0 Client Port

16.4.1 Hardware/Software Requirements

The following is required to establish an ActiveSync connection via the USB 2.0 Client Port:

- ActiveSync version 3.7.1 or later installed on the host PC (Version 4.5 recommended)
- A DSV2+ terminal with USB 2.0 enabled.
- USB 2.0 to Mini B Cable – Datastrip sales code – DSVOSCAUSB.
- Datastrip DSV2+_Turbo_USB Sync Setup utility found on the DSV2+ User Manual CD.

16.4.2 PC Configuration for USB 2.0 ActiveSync (First Time Only)

- Run the “DSV2+_Turbo_USB Sync Setup” utility found on the DSV2+ User Manual CD
- After running the Sync setup you will be prompted to connect your DSV2+ terminal to the PC. Turn your DSV2+ terminal on and connect it to any one of the host PC USB ports using the USB 2.0 to Mini B cable. After the DSV2+ terminal has been connected, Windows will notify you that it has “Found New Hardware”. You will then be asked “Can Windows Update search for new software?” Answer: NO, not this time.
- The Wizard will then ask how you want to install software. Answer: Install the software automatically (Recommended).

16.4.3 Establishing a Connection

- Each time you connect the DSV2+ terminal to the host PC you will be asked if you would like to set up a Partnership. If you will be using this DSV2+ terminal on this PC regularly then answer “Yes”. If this is a one time use on this PC answer “No”. In either case you will be connected and can transfer files between the PC and the DSV2+ terminal.

16.4.4 Troubleshooting the Connection

If a connection is not automatically established check the following:

- The DSV2+ will not connect while it is in Suspend mode. Wake the DSV2+ from Suspend prior to connecting the USB cable.
- Verify that USB 2.0 is enabled on your terminal and that USB via COM3 is selected. Go to the Control Panel and double click “PC Connection”. On this screen you should see “USB via COM3”. If not then click “Change Connection”. Click the scroll bar arrow. If you see the option for “USB on COM3” then select it and click “OK”. Click “OK” again to close the PC Connection screen. Re-insert your USB cable to get connected. If you did not see the option for “USB on COM3” your terminal is not USB 2.0 enabled.

- ActiveSync via the Docking Station”. Then remove the DSV2+ from the docking cradle.
- Connect the PC (wired/wireless) to a network which has a wireless router. Test the connection before proceeding further.
- Configure ActiveSync to support this connection, [FILE] → [CONNECTION SETTINGS...]
- Select the option “Allow network (Ethernet) and RAS server connection with this computer”. Uncheck “Allow serial cable or infrared connection to this COM port”.
- Click OK.

16.4.5 PC Configuration for Bluetooth

16.5 If connecting the DSV2+ to the host PC via 802.11 for the first time, start by establishing a wired ActiveSync connection with the PC using the procedure described in Section 16.2 ActiveSync via USB 2.0 Client Port

16.5.1 Hardware/Software Requirements

The following is required to establish an ActiveSync connection via the USB 2.0 Client Port:

- ActiveSync version 3.7.1 or later installed on the host PC (Version 4.5 recommended)
- A DSV2+ terminal with USB 2.0 enabled.
- USB 2.0 to Mini B Cable – Datastrip sales code – DSVOSCAUSSB.
- Datastrip DSV2+_Turbo_USB Sync Setup utility found on the DSV2+ User Manual CD.

16.5.2 PC Configuration for USB 2.0 ActiveSync (First Time Only)

- Run the “DSV2+_Turbo_USB Sync Setup” utility found on the DSV2+ User Manual CD
- After running the Sync setup you will be prompted to connect your DSV2+ terminal to the PC. Turn your DSV2+ terminal on and connect it to any one of the host PC USB ports using the USB 2.0 to Mini B cable. After the DSV2+ terminal has been connected, Windows will notify you that it has “Found New Hardware”. You will then be asked “Can Windows Update search for new software?” Answer: NO, not this time.
- The Wizard will then ask how you want to install software. Answer: Install the software automatically (Recommended).

16.5.3 Establishing a Connection

- Each time you connect the DSV2+ terminal to the host PC you will be asked if you would like to set up a Partnership. If you will be using this DSV2+ terminal on this PC regularly then answer “Yes”. If this is a one time use on this PC answer “No”. In either case you will be connected and can transfer files between the PC and the DSV2+ terminal.

16.5.4 Troubleshooting the Connection

If a connection is not automatically established check the following:

- The DSV2+ will not connect while it is in Suspend mode. Wake the DSV2+ from Suspend prior to connecting the USB cable.

- Verify that USB 2.0 is enabled on your terminal and that USB via COM3 is selected. Go to the Control Panel and double click “PC Connection”. On this screen you should see “USB via COM3”. If not then click “Change Connection”. Click the scroll bar arrow. If you see the option for “USB on COM3” then select it and click “OK”. Click “OK” again to close the PC Connection screen. Re-insert your USB cable to get connected. If you did not see the option for “USB on COM3” your terminal is not USB 2.0 enabled.

- ActiveSync via the Docking Station”. Then remove the DSV2+ from the docking station.
- Ensure that the Bluetooth adaptor has been plugged in to the PC. The Bluetooth icon is blue with a white symbol.
- In the [CONTROL PANEL] open [BLUETOOTH DEVICES]. Add an “Incoming” COM port and activate “turn on discovery”. Also ensure that Bluetooth is NOT set for any security or encryption.
- Note which COM port the PC Bluetooth operates on. This will be a virtual port - incoming port, for example COM5.
- In the ActiveSync application, configure the serial port for Bluetooth from [FILE] → [CONNECTION SETTINGS...]
- Check “Allow serial cable or infrared connection to this COM port”. From the drop-down list, select the COM port obtained above.
- Uncheck the other two “Allow...” check boxes.
- Click OK.

16.5.5 DSV2+ Configuration

- Switch on the DSV2+ and configure the internal/external 802.11 CF Adaptor or Bluetooth to connect to the wireless router to which the PC is connected. If the DSV2+ finds an 802.11 adapter or Bluetooth adapter, you will find an icon (screens or pipes) in the notification area with the Ethernet icon.
- Double-click the icon. Configure the 802.11 adaptor on this screen and browse through to the tab [WIRELESS INFORMATION].
- Double-click your wireless network. Configure the adaptor as necessary to connect to the router. Click OK. Note that your network name in the list will display “(preferred)”.
- Select your network from the list again and click Connect. The status will change to “Connected to YourNetworkName” and the icon in the notification area will glow.
- Press “Power Button” momentarily and after the LED extinguishes, press momentarily again. This saves the registry changes. Alternately, [STORAGE CARD] → [DSV2+] → [SAVEREG.EXE]. Click OK to save registry changes.

16.5.6 Establishing the Connection

- Switch on the DSV2+. Once the DSV2+ has booted up, place it in the docking cradle.
- A connection should be established as soon as you place the DSV2 in the docking station.

16.5.7 Troubleshooting the Connection

If a connection is not automatically established check the following:

- See Section 16.2.4 “Disconnect”
- Disconnecting the ActiveSync cable or removing the DSV2+ terminal from the docking cradle will disconnect the session on the PC side, but not on the DSV2+. Manually disconnect the DSV2+ by clicking on the ActiveSync icon in the system tray and clicking “Disconnect” or do nothing and the session will timeout after one minute. Both ends of the connection must be disconnected before you can reconnect the cable and start another ActiveSync session.
- Troubleshooting the Connection”

17. Appendix C: Scanner Information

The DSV2+ optical scanner products (DSV2+^{Turbo}-SW and DSV2+^{Turbo}-PA) contain all of the functionality of the DSV2+^{Turbo}-SC and additionally provide the ability to optically scan and decode a variety of documents including passports, travel visa, drivers licenses, National ID cards, and a wide variety of other ID cards. The optical symbologies processed and decoded by the DSV2+ scanners include:

Two-Dimensional Barcodes	Linear Barcodes	Character Recognition
Datastrip2D	Code39	OCRB
2DSuperscript	UPCA	
PDF417	UPCE	
	EAN13	
	EAN8	
	I2 of 5	
	Code 128	
	Codabar	
	2 and 5 digit supplementals for EAN and UPC codes	

The PA and SW scanners differ only in their ability to scan different document widths as shown in the table below. Aside from this, they are architecturally and functionally the same.

	Scan Window Size
DSV2+ ^{Turbo} -PA	3.36" (81 mm)
DSV2+ ^{Turbo} -SW	1.15" (27 mm)

The SW and PA both scan documents at up to 600 dpi in 8-bit grayscale with a user selectable illumination source of **Near IR** or **RGB / Visible light**. The default configuration of the scanner is to use RGB / Visible light illumination since this setting works for a large percentage of document types. However, many travel documents have a background printed in RGB and OCBR symbology printed with carbon based ink which resonates in near IR wavelength; therefore, it is recommended that the scanner be configured for IR illumination (see below) when processing these document types.

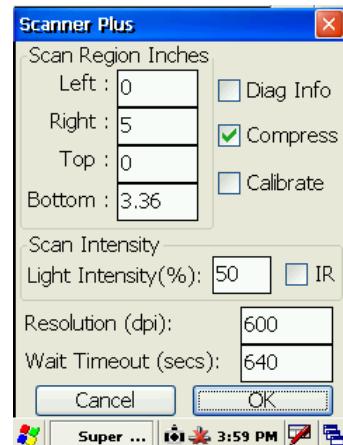
17.1 Scanner Settings

Listed below are the user configurable scanner settings. These configuration options can be adjusted programmatically by calling API functions or by using a Datastrip supplied sample application such as **DsVerifyScanTestAsync.exe** which is located in the **\Storage Card\DSVII** directory.

RGB Scanner Settings:

From the menu select “Scanner” and then select “Scanner settings...”

- Make sure the “IR” box is unchecked
- Set Intensity=50%.
- Leave all the other settings as default



IR Scanner Settings:

From the menu select “Scanner” and then select “Scanner settings...”

- Make sure the “IR” box is checked
- Set Intensity=35%.
- Leave all the other settings as default

Scan Region:

Left and Right: The parameters that define the length of the symbology that will be scanned on a document. Left defines how far from the beginning of a document that the symbology starts.

Right defines how far from the beginning of a document that the symbology ends.

Top and Bottom: The parameters that define the width of symbology that will be scanned on a document. Top defines the outside edge of the card guide and Bottom defines in the inside edge of the card guide.

The default scan regions are set to the maximum length and width as follows:

DSV2+^{Turbo}-PA

Left = 0 inches

Right = 5 inches

Top = 0 inches

Bottom = 3.36 inches

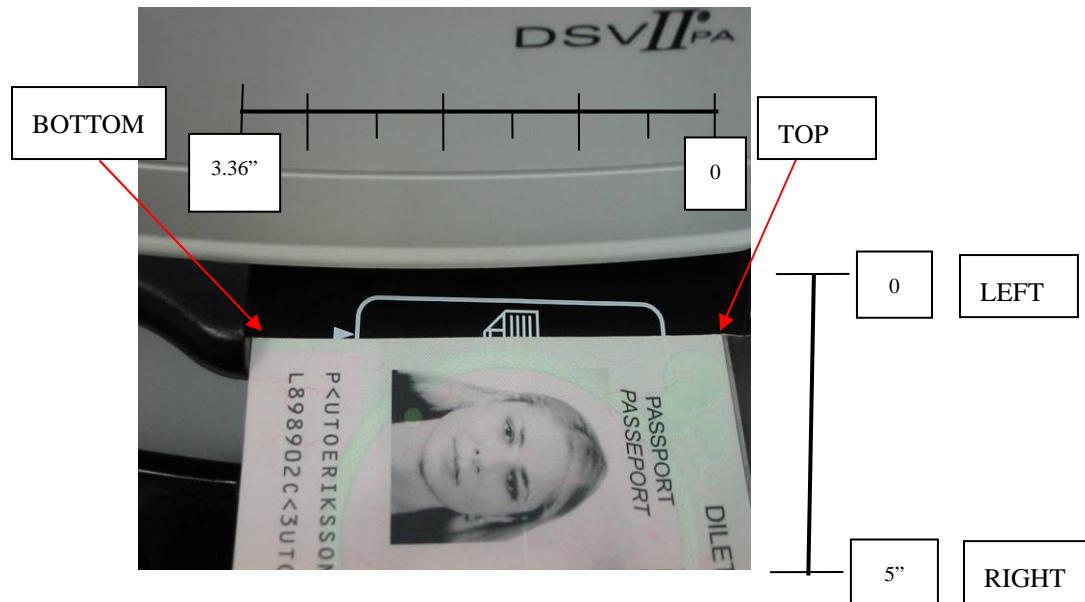
DSV2+^{Turbo}-SW

Left = 0 inches

Right = 5 inches

Top = 0 inches

Bottom = 1.14667 inches

Example:**Resolution:**

When scanning OCRB documents the scanner resolution can be set for 200, 300 or 600 DPI. When scanning Datastrip symbologies the resolution should be set for 600 DPI.

Compress:

The compress option should be used to do decoding on the Host processor or to do document archiving. The option will compress .BMP files to .JPEG making the file size smaller and the internal file transfer faster.

Calibrate:

The default for this option is “Normalize” (calibrate box unchecked).

In Normalize mode the DSP looks for the darkest and lightest spots on the whole image and then balances the image.

In Calibrate mode the DSP looks for the darkest and lightest spots on a row by row basis. This mode is slower but sometimes helpful for problematic (“noisy”) images.

Wait Timeout:

The Wait Timeout is the time, in seconds, that the scanner subsystem will wait for a document to be scanned before restarting the scanner subsystem.

17.2 DSV2+^{Turbo}-PA Product Specifications

Physical Characteristics		Power Management	
Dimensions	185 x 274 x 50 mm (7.3 x 10.8 x 2.0 in)	External Power	11.4 -19 VDC
Weight	1.6 kg (3.5 lbs) with standard battery	Battery	Rechargeable Li Ion Polymer 7.4 V 3000 mAh Standard Capacity Integral Protection Circuitry
Scanning Subsystem	Scan Window: 81mm 600 dpi Contact Image Sensor RGB and IR Illumination DSP (TI) based for high performance	Backup Power	Rechargeable Lithium Internal Cell
Display	3.5" Color Reflective TFT LCD 240 (H) x 320 (V) QVGA LED Backlight Indoor/Outdoor Viewable	AC Adapter/Charger	100-240 VAC 50-60 Hz 30 Watts
Touch Screen	Integrated Resistive Touch Panel	Optional Auto Adapter	
Keypad	5-Button Backlit Rubber Keypad Power Button + 4 Function Keys		
Stylus	Integrated Stylus Holder		
I/O Panels	Easy Access to I/O Connectors and Battery Compartment		
Handheld	Non-Slip Hand Grips Adjustable Hand Strap		
Hardware/Software		Fingerprint Sensor – UPEK TURBO	
Processor	Renesas SH-4 7760 200 MHz Floating-point RISC Processor	Hardware	Capacitive Solid-State Sensor 256 x 360 pixels
System Memory	64 MB RAM, 16 MB ROM Built-In	Resolution	500 DPI, , 8-bit grayscale
Expandable Memory	256 MB Internal Compact FLASH	Sensor Area	12.8 x 18.0 mm
Operating System	Microsoft® Windows® CE .Net V5.0	ESD	15 KV
Interfaces	2x USB Host 1x Mini USB Client 1x Serial via Docking Station 1x Ethernet (RJ45) 1x External CF Type I/II 1x Internal CF Type I/II 1x Internal CF Type I/II (System Boot)		
Audio	0.5 to 4 kHz, 8 Ω, 750 mW		
Environmental Characteristics			
Operating Temperature	0° to +40° C (32° to 104° F) 50° C (120° F) or higher at low RH		
Storage Temperature	-20° to +60° C (-4° to 158° F)		
Relative Humidity	< 90% at +40° C Non-condensing		
Drop Resistance	Exceeds MIL-STD 810F		
Regulatory Compliance (Core System)			
Safety:	CE Low Voltage Directive (72/73/EEC) EN 60950:2000		
EMC:	CE EMC Directive (89/336/EEC) / (93/68/EEC) EN 55022:1998 & EN 55024:1998		
R&TTE:	Compliance under EN 300330 & EN 301489-03		
NRTL:	TÜV Rheinland of North America, Inc.		
FCC Declaration:	This device complies with part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.		
Regulatory Markings:	CE, TÜV NRTL (Canada &US)		
Contact Smart Card Interface		Contactless Smart Card Interface	
Specification	ISO 7816	Specification	ISO 14443 A/B
Connector	8X Landing Style Contacts 100K Min Insertion Cycles	Operating Frequency	13.56 MHz
		Operating Range	30 mm
		Security Access Modules	0 or 2
Docking Station			
Battery Charging			
RS232 Serial Communication			
Reliability			
Mean Time Between Failure (MTBF)	39,887 Hours		