Lexmark™

Embedded Web Server — Security

Administrator's Guide

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Model(s):

MS911de, MX910de, MX911, MX912, XM9145, XM9155, XM9165, CS310, CS317dn, CS410, CS417dn, CS510, CS517de, CX310, CX317dn, CX410, CX417de, CX510, CX517de, M1140, M1145, M3150, M3150dn, M5155, M5163, M5170, XM1140, XM1145, XM3150, XM5163, XM5170, XM7155, XM7163, XM7170, XC2132, MS310, MS317dn, MS410, MS417dn, MS510, MS517dn, MS61x, MS617dn, MS81x, MS817dn, MS817n, MS818dn, MX310, MX317dn, MX410, MX417de, MX51x, MX517de, MX61x, MX617de, MX71x, MX717de, MX718de, MX81x

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Devices covered in this guide

There are two levels of security supported based on the product definition. For a complete list of available functions, see “Authentication and authorization” on page 5.

Simple-security devices

CS310n/dn, CS317dn, CS410n/dn, CS410dtn, CS417dn, CX310n/dn, CX317dn, M1140, M1145, M3150dn, M5163dn, MS310d/dn, MS317dn, MS410d/dn, MS417dn, MS510dn, MS517dn, MS610dn, MS610dtn, MS617dn, MS810n/dn, MS810dtn, MS811n/dn, MS811dtn, MS812dn, MS812dtn, MS817dn, MS817n, MS818dn, MX310dn, MX317dn

Advanced-security devices

MS911de, MX910de, MX911, MX912, CS510de, CS510dte, CS517de, CX410de, CX410e/dte, CX417de, CX510de, CX510dhe/dthe, CX517de, M3150, M5155, M5163, M5170, XM1140, XM1145, XM3150, XM5163, XM5170, XM7155, XM7163, XM7170, XC2132, MS610de, MS610dte, MS810de, MS812de, MX410de, MX417de, MX510de, MX511de, MX511dhe, MX511dte, MX517de, MX610de, MX611de, MX611dhe, MX611dte, MX617de, MX710de, MX710dhe, MX711de, MX711dhe/dthe, MX717de, MX718de, MX810de, MX810dfe, MX810dme, MX810dte, MX810dtfe, MX810dtme, MX810dxe, MX810dxfe, MX810dxme, MX811de, MX811dfe, MX811dme, MX811dte, MX811dtfe, MX811dtme, MX811dxe, MX811dxfe, MX811dxme, MX812de, MX812dfe, MX812dme, MX812dte, MX812dtfe, MX812dtme, MX812dxe, MX812dxfe, MX812dxme

Managing authentication and authorization methods

Understanding the basics

Secure a printer through the Embedded Web Server by defining the users who can use the printer and the functions that they can access. This process involves the components called Authentication, Authorization, and Groups.

Create a plan that identifies who the users are and what they need to do before configuring printer security. Items to consider might include the following:

- The location of the printer and whether authorized persons have access to that area
- Sensitive documents that are sent to or stored on the printer
- Information security policies of your organization

Authentication and authorization

Authentication is the method by which a system securely identifies a user.

Authorization specifies which functions are available to a user who has been authenticated by the system. This set of authorized functions is also referred to as “permissions.”

There are two levels of security that are supported based on the product definition. Simple security only supports internal device authentication and authorization methods. More advanced security permits internal and external authentication and authorization as well as additional restriction capability for management, function, and solution access. Advanced security is supported for those devices that permit the installation of additional solutions to the device.

Simple security uses Panel PIN Protect to restrict user access to the printer control panel and Web Page Password Protect to restrict administrator access to the device. For more information, see “Creating a PIN and applying access control restrictions” on page 9 and “Creating a Web page password and applying access control restrictions” on page 8.

Advanced‑security devices support the following:

- PIN and password restrictions in addition to the other authentication and authorization specified
- Multiple local authentication functions that support PIN, password, and user name–password combinations
- Standard network authentication through LDAP, LDAP+GSSAPI, Kerberos, and Active Directory®

Authorization can be specified individually or by groups (either local or network). Devices that support advanced‑level security are capable of running installed solutions, which permit usage of card readers to provide advanced two‑factor authentication.

Function	Simple-security devices	Advanced-security devices
Panel PIN Protect	✓	X
PIN Protection	X	✓
Web Page Password Protect	✓	X
Password Protection	X	✓
Internal Accounts (Username and Username/Password)	X	✓
Groups (internal)	X	✓
LDAP	X	✓
LDAP+GSSAPI	X	✓
Kerberos 5	X	✓
Active Directory*	X	✓
Limited access controls	✓	X
Access controls (complete)	X	✓
Security Templates	X	✓
Basic Security Setup	X	✓
✓ = Supported X = Not supported * Available only in some printer models		

The device handles authentication and authorization using one or more of the following, also referred to as *building blocks*:

- PIN or Panel PIN Protect
- Password or Web Page Password Protect
- Internal Accounts
- LDAP
- LDAP+GSSAPI
- Kerberos 5 (used only with LDAP+GSSAPI and the Smart Card Authentication application)
- Active Directory (available only in some printer models)

To provide simple security, use either PIN and Password, or Panel PIN Protect and Web Page Password Protect. This type of security might be appropriate if a printer is located in a lobby or other public area of a business, so that only employees who know the password and PIN are able to use the printer. Passwords and PINs are considered less secure than other building blocks because they do not require a user to be identified or authorized.

Note: The device default settings do not contain any authentication or authorization building blocks, so everyone has unrestricted access to the device.

Groups

Administrators can designate up to 32 groups to be used in association with either the Internal Accounts or LDAP and LDAP+GSSAPI building blocks. To ensure device security, groups are used to identify sets of users needing access to similar functions. For example, in Company A, employees in the warehouse do not need to print in color, but employees in sales and marketing use color every day. In this scenario, you can create a “Warehouse” group and a “Sales and Marketing” group.

Access Controls

By default, all device menus, settings, and functions come with no security enabled. Access controls (also referred to in some devices as “Function Access Controls”) are used to manage access to specific menus and functions or to disable them entirely. Access controls can be set using a password, PIN, or security template. The number of functions that can be controlled varies depending on the type of device, but in some multifunction printers, over 40 individual menus and functions can be protected.

Note: For a list of individual access controls and what they do, see “Appendix D: Access controls” on page 68.

Security Templates

Some scenarios call for only limited security, such as PIN-protected access to common device functions, while others require tighter security and role-based restrictions. Individually, building blocks, groups, and access controls may not meet the needs of a complex security environment. In order to accommodate users in different groups needing access to a common set of functions such as printing, copying, and faxing, administrators must be able to combine these components in ways that give all users the functions they need, while restricting other functions to only authorized users.

A *security template* is a profile constructed using a building block, or certain building blocks paired with one or more groups. How they are combined determines the type of security created:

Building block	Type of security
Internal Accounts	Authentication only
Internal Accounts with Groups	Authentication and authorization
Kerberos 5	Authentication only
LDAP	Authentication only
LDAP with Groups	Authentication and authorization
LDAP+GSSAPI	Authentication only
LDAP+GSSAPI with Groups	Authentication and authorization
Password	Authorization only
PIN	Authorization only

Each device can support up to 140 security templates, allowing administrators to create very specific profiles for each access control.

Accessing the Embedded Web Server

Open a Web browser, and then type the printer IP address.

To obtain the printer IP address, print a network setup page, and then locate the TCP/IP section. For more information on printing a network setup page, see the printer *User's Guide*.

We recommend using HTTPS when connecting to the Embedded Web Server to prevent network viewing of the data being entered. For example, type **`HTTPS://`*`ip_address`***.

Note: When you access the Embedded Web Server, a warning message may appear. Proceed by continuing to connect to the device IP address.

Simple-security device access controls

Creating a Web page password and applying access control restrictions

For simple-security devices, Web page access control is limited to creating a password and applying access restrictions through "Web Page Password Protect" on the device Embedded Web Server.

Note: This feature is available only in simple-security devices.

1. From the Embedded Web Server, click **Settings** > **Security** > **Web Page Password Protect**.
2. Create a user and administrator password.
   - Under "Basic Security Setup: Create User Password," type a password in the appropriate box, then retype the password to confirm it, and then click **Modify**.
   - Under "Basic Security Setup: Create Admin Password," type a password in the appropriate box, then retype the password to confirm it, and then click **Modify**.

   Notes:

   - Functions or settings protected by a user-level password can be accessed using any administrator-level password.
   - To delete the password, click **Delete Entry**.
3. From the function drop-down menu, select one of the following security template settings:
   - Admin Password Protected
   - Admin and User Password Protected
   - No Security
   - Disable

     Note: This setting is only usable by some functions.
4. Click **Submit**.

Creating a PIN and applying access control restrictions

For simple-security devices, control panel access control is limited to creating a PIN and applying access restrictions through the Panel PIN Protect security control.

Typically, *personal identification numbers* (PINs) are used to control access to a device or specific device menus. PINs can also be required when retrieving a held print, copy, or fax job.

Note: This feature is available only in simple-security devices.

1. From the Embedded Web Server, click **Settings** > **Security** > **Panel PIN Protect**.
2. Under “Basic Security Setup: Create User PIN,” enter a PIN in the appropriate field, and then reenter the PIN to confirm it.
3. Under “Basic Security Setup: Create Admin PIN,” enter a PIN in the appropriate field, and then reenter the PIN to confirm it.

   Note: Functions or settings protected by a user PIN can be accessed using any administrator PIN.

4. Click **Modify**, and then for each function to protect, select one of the following security template settings:
   - Admin Password Protected
   - Admin and User Password Protected
   - No Security
   - Disable

     Note: This setting is available only in some functions.

5. Click **Submit**.

Limiting access using Basic Security Setup

Use Basic Security Setup to limit access to the Embedded Web Server settings and the configuration menus on the printer control panel. This selection allows the definition of simple internal device security authentication methods.

Notes:

- This feature is available only in advanced-security printer models as a simple-security access restriction method.
- The device default settings do not contain any authentication or authorization building blocks, so everyone has unrestricted access to the Embedded Web Server.

Applying Basic Security Setup

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.
2. Under Basic Security Setup, from the Authentication Type menu, select one of the following:
   - **PIN**—Enter a PIN number. Each PIN must be 4–16 digits in length.
   - **Password**—Type the password. Each password must have a unique name containing up to 128 UTF-8 characters.
   - **User ID and Password**—Type a unique user ID, and then type the password. Each password must have a unique name containing up to 128 UTF-8 characters.

3. Click **Apply Basic Security Setup**.

   Note: Applying this setup may overwrite a previous configuration.

The new settings are submitted. The next time you access Security Setup, you are required to enter your authentication credentials.

Modifying or removing Basic Security Setup

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.
2. Enter your authentication credentials to access Security Setup.
3. Under Modify or Remove Basic Security Setup, enter your new authentication credentials.
4. Click **Modify Basic Security Setup** to enter your new authentication credentials to access Security Setup, or click **Remove Basic Security Setup** to remove all authentication requirements.

Advanced-security building blocks

To define the authentication required when accessing device functions and menus, create and configure a login method (building block).

Advanced-security building blocks used in security templates are found under “Configure a Building Block.”

Configuring advanced building blocks from the control panel

We recommend configuring security setup using the device Embedded Web Server. These steps in configuring security setup are the same for all advanced-security devices.

When configuring from the control panel, the steps may vary depending on your printer model. For example, for devices with a large touch screen, you can access the security setup by doing the following:

1. Navigate to the menu screen.
2. Touch **Security** > **Edit Security Setups**.

Creating a password building block for advanced security setup

Note: This feature is available only in advanced-security devices.

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.
2. Under Advanced Security Setup, click **Password**.
3. Under Manage Passwords, select **Add a Password**.
4. In the Setup Name field, type a name for the password.

   Note: Each password must have a unique name containing up to 128 UTF-8 characters. For example, “Copy Lockout Password.”
5. Type a password in the appropriate field, and then retype the password to confirm it.

6 If the password is used as the administrator password, then select **Admin Password**.

   Note: Functions or settings protected by a user-level password can be accessed using any administrator-level password.

7 Click **Submit**.

Notes:

- To edit a password, select a password from the list, and then modify the settings.
- To delete a password, select a password from the list, and then click **Delete Entry**.
- To delete all passwords in the list, click **Delete List**.

Creating a PIN building block for advanced security setup

Note: This feature is available only in advanced-security devices.

PINs are used to control access to specific device menus or to a device itself. PINs can also be required when retrieving a held print, copy, or fax job.

1 From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.

2 Under Advanced Security Setup, click **PIN** > **Add a PIN**.

3 In the Setup Name field, type the name of the PIN configuration.

   Note: Each PIN must have a unique name containing up to 128 UTF-8 characters. For example, “Copy Lockout PIN.”

4 Type a PIN in the appropriate field, and then retype the PIN to confirm it.

5 If the PIN is used as the Administrator PIN, then click **Admin PIN**.

6 Click **Submit**.

Changing the PIN length

1 Click **Settings** > **Security** > **Miscellaneous Security Settings**.

2 Enter a number in the Minimum PIN Length field.

3 Click **Submit**.

Setting up internal accounts

Note: This feature is available only in advanced-security devices.

Administrators can configure one internal account building block per supported device. Each internal account building block can include a maximum of 750 user accounts and 32 user groups.

You can use this building block by itself in a security template to provide authentication-level security, or with other groups to provide both authentication and authorization.

Defining user groups

Before you begin, do the following:

- Create a list of all the users in the group.
- Identify the device functions needed for all users and for specific users.

Note: When a security template is assigned to a group, a role is created. Users can be assigned to more than one group or role.

Using the Embedded Web Server

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.
2. Under Advanced Security Setup, click **Internal Accounts** > **Setup groups for use with internal accounts**.
3. Type the group name.

   Note: Group names can contain up to 128 UTF-8 characters.

4. Click **Add**.

Using the control panel

Note: These instructions apply only in printer models with a touch-screen display.

1. Navigate to the menu screen.
2. Touch **Security** > **Edit Security Setups** > **Edit Building Blocks** > **Internal Accounts** > **General Settings** > **Groups for Internal Accounts** > **Add Entry**.
3. In the Name field, type a group name.
4. Touch **Done**.

Creating user accounts

Note: We recommend creating groups before creating a user account.

Using the Embedded Web Server

1. Click **Settings** > **Security** > **Security Setup**.
2. Under Advanced Security Setup, click **Internal Accounts** > **Add an Internal Account**.
3. Provide the information needed for each account:
   - **Account Name**—Type the account name of the user. For example, “Jack Smith.” You can use up to 164 UTF-8 characters.
   - **User ID**—Type an ID for the account. For example, “jsmith.” You can use up to 128 UTF-8 characters.
   - **Password**—Type a password of between 8 and 128 characters.
   - **Re-enter Password**—Type the password entered in the preceding field.
   - **E-mail**—Type the e-mail address of the user. For eample, “jsmith@company.com.”
   - **Groups**—Select the groups to which the account belongs. Hold down the **Ctrl** key to select multiple groups for the account.
4. Click **Submit**.

Using the control panel

Note: These instructions apply only in printer models with a touch-screen display.

1. Navigate to the menu screen.
2. Touch **Security** > **Edit Security Setups** > **Edit Building Blocks** > **Internal Accounts** > **General Settings**.
3. Set Required User Credentials to **User ID and password**, and then touch **Submit**.
4. Select **Manage Internal Accounts** > **Add Entry**.
5. Type the user account name, and then touch **Done**.
6. Type a user ID for the account, and then touch **Done**.
7. Type a password for the account, and then touch **Done**.
8. Retype the password, and then touch **Done**.
9. Type the user e-mail address, and then touch **Done**.
10. From the Set Groups screen, select the groups to which the account belongs.
11. Touch **Done**.

Specifying settings for internal accounts

Internal account settings determine the information an administrator submits when creating a new internal account and the information a user submits when authenticating.

- **Custom Building Block Name**—Type a unique name for this building block.
- **Require E-mail Address**—Select this box to make the e-mail address a required field when creating new internal accounts.
- **Required User Credentials**—Select either **User ID** or **User ID and password** to specify the information a user must submit when authenticating.

Connecting your printer to an Active Directory domain

Using Active Directory simplifies network authentication and authorization setup, automatically creating and configuring LDAP+GSSAPI and Kerberos authentication building blocks. It also simplifies certificate chain download.

Notes:

- This feature is available only in advanced-security devices.
- Use HTTPS to protect the credentials that are used to join the printer to the domain.

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup** > **Active Directory** > **Join an Active Directory Domain**.
2. Provide the information needed for each account:
    - **Domain Name**—Type the name of the domain that you want to join in uppercase.
    - **User ID**—Type the user name of the network administrator or any individual who has rights to add computers to a network.

- **Password**—Type the password of the network administrator or the individual who has rights to join the domain.

  Note: Passwords are case sensitive and are not cached by the device.

- **Organizational Unit**—Type the name of your organizational unit, if necessary.

3 Select one or more of the following domain services:

- **LDAP Address Book**—Configure LDAP server address book information using Active Directory data.
- **Standard Admin Groups and Security Templates**—Create a group named “admin,” and a security template named “Active Directory.”
- **CA Certificate Monitoring**—Enable the CA certificate monitor feature with the following default settings:
  - “Enable CA Monitor” is selected.
  - “Schedule run time” is set to `0:00` (midnight).
  - Monitoring is repeated every day.

4 Click **Submit**.

Notes:

- The screen flashes, and you may hear a clicking noise.
- If the configuration is unsuccessful, then a big red **X** mark appears. A message appears if the configuration is not successful.

5 Click **Manage Security Templates** to use the Active Directory information to complete your security setup.

If you want to review or make some small modifications to the LDAP+GSSAPI building block, then click **Return to Security Setup** and do the following:

a Under Advanced Security Setup, click **Kerberos 5**.

b Click **View File** to open the Kerberos Config file that was created using the Active Directory setup.

c Review the file, and then click the back button of the browser.

Note: Do not edit or copy the Kerberos Config file to use with older devices, to avoid issues with KDC Server Affinity Service. Older devices do not recognize the special mappings associated with the KDC Server Affinity Service.

d Click **Return to Security Setup**, and then click **LDAP+GSSAPI**.

e Under LDAP+GSSAPI Setups, click the building block that was created by the Active Directory Setup process.

Note: By default, the building block name is the realm name, and the server address field is the domain controller name.

f If necessary, change some of the building block settings depending on your environment, including the following:

- **Server Port**—The standard port for LDAP is 389. Another common port is 3268, but this port is used only for Global Catalog servers in Active Directory. If applicable, change the port to 3268 to speed up the querying process.
- **Search Base**—This setting indicates the location in the directory tree where the device starts searching. At the most basic, we recommend specifying the root of the directory (such as “dc=company,dc=com”).

- **Use Kerberos Service Ticket**—This advanced setup, otherwise known as SPNEGO, is the session ticket that a user uses to log in to a computer. We recommend leaving this setting unchanged.
- **Use Active Directory Device Credentials**—This option lets you use the service account that is created in Active Directory. If you want to use an existing service account or user credentials (advanced setup), then clear this check box.

g If necessary, adjust the following settings:

- **Group Search Base**—This setting indicates the location in the directory tree where the device starts searching for a particular group. If the environment does not require user- or group-based authorization, then leave this field blank.
- **Short name for group**—This setting is a name that a user can use to associate to a group identifier.
- **Group Identifier**—This setting is a container or organizational unit that a device searches to validate whether an authenticated user is a member of an authorized group.

h Click **Modify**.

Using LDAP

Note: This feature is available only in advanced-security devices.

Lightweight Directory Access Protocol (LDAP) is a standards-based, cross-platform, extensible protocol that runs directly on top of the TCP/IP layer. It is used to access information stored in a specially organized information directory. It can interact with many different kinds of databases without special integration, making it more flexible than other authentication methods.

Notes:

- Supported devices can store a maximum of five unique LDAP configurations. Each configuration must have a unique name.
- Administrators can create up to 32 user-defined groups that apply to each unique LDAP configuration.
- LDAP relies on an external server for authentication. If an outage prevents the printer from communicating with the server, then users are not able to access protected device functions.
- To help prevent unauthorized access, log out from the printer after each session.

Adding an LDAP setup

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.
2. Under Advanced Security Setup, click **LDAP**.
3. Click **Add an LDAP Setup**.

   The LDAP Server Setup dialog is divided into four parts:

   General Information

   - **Setup Name**—This name is used to identify each particular LDAP Server Setup when creating security templates.
   - **Server Address**—Type the IP address or the host name of the LDAP server where the authentication is performed.
   - **Server Port**—The Embedded Web Server communicates with the LDAP server using this port. The default LDAP port is 389.
   - **Use SSL/TLS**—From the drop-down menu, select **None**, **SSL/TLS**, or **TLS**.
   - **Userid Attribute**—Type either **`cn`**, **`uid`**, **`userid`**, or **`user-defined`**.

- **Mail Attribute**—Type a maximum of 48 characters to identify e‑mail addresses. The default value is “mail.”
- **Full Name Attribute**—Type a maximum of 48 characters. The default value is “cn.”
- **Search Base**—The node in the LDAP server where user accounts reside. You can enter multiple search bases, separated by commas.

  Note: A search base consists of multiple attributes separated by commas, such as cn (common name), ou (organizational unit), o (organization), c (country), and dc (domain).
- **Search Timeout**—Enter a value from 5 to 30 seconds or 5 to 300 seconds, depending on your printer model.
- **Required User Input**—Select either **User ID and password** or **User ID** to specify which credentials a user must provide when attempting to access a function protected by the LDAP building block. **User ID and password** is the default setting.

Device Credentials

- **Use Active Directory Device Credentials**—Allow user credentials and group designations to be pulled from the existing network comparable to other network services.
- **Anonymous LDAP Bind**—Bind the Embedded Web Server with the LDAP server anonymously, and make the Distinguished Name and MFP Password fields unavailable.
- **Distinguished Name**—Type the distinguished name of the print server.
- **MFP’s Password**—Type the password for the print server.

Search specific object classes

- **Person**—Allow the “person” object class to be searched.
- **Custom Object Class**—Allow the custom search object class to be searched. You can define up to three custom search object classes.

LDAP Group Names

- Administrators can associate as many as 32 named groups stored on the LDAP server by entering identifiers for those groups under the Group Search Base list. Both the **Short name for group** and **Group Identifier** must be provided.
- When creating security templates, you can pick groups from this setup for controlling access to device functions.

4 Click **Submit** to save the changes, or **Cancel** to return to previous values.

Editing an LDAP setup

1 From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.

2 Under Advanced Security Setup, click **LDAP**.

3 Click a setup from the list.

4 Make any needed changes in the LDAP Configuration dialog.

5 Click **Modify** to save the changes, or click **Cancel** to return to previous values.

Deleting an LDAP setup

1 From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.

2 Under Advanced Security Setup, click **LDAP**.

3 Select a setup from the list.

4 Click **Delete Entry** to remove the profile, or **Cancel** to return to previous values.

Notes:

- Click **Delete List** to delete all LDAP setups in the list.
- An LDAP building block cannot be deleted if it is being used as part of a security template.

Validating an LDAP setup

1 From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.

2 Under Advanced Security Setup, click **LDAP**.

3 Click **Test LDAP Authentication Setup** next to the setup you want to test.

Using LDAP+GSSAPI

Note: This feature is available only in advanced-security devices.

Some administrators prefer authenticating to an LDAP server using the more secure *Generic Security Services Application Programming Interface* (GSSAPI) instead of simple LDAP authentication. Instead of authenticating directly with the LDAP server, the user first authenticates with a Kerberos server to obtain a Kerberos “ticket.” This ticket is then presented to the LDAP server using the GSSAPI protocol for access. LDAP+GSSAPI is typically used for networks running Active Directory.

Notes:

- LDAP+GSSAPI requires Kerberos 5 to be configured.
- Supported devices can store a maximum of five unique LDAP+GSSAPI configurations. Each configuration must have a unique name.
- LDAP relies on an external server for authentication. If an outage prevents the printer from communicating with the server, then users are not able to access protected device functions.
- To help prevent unauthorized access, log out from the printer after each session.

Adding an LDAP+GSSAPI setup

1 From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.

2 Under Advanced Security Setup, click **LDAP+GSSAPI**.

3 Click **Add an LDAP+GSSAPI Setup**. The setup dialog is divided into four parts:

General Information

- **Setup Name**—This name is used to identify each particular LDAP+GSSAPI Server Setup when creating security templates.
- **Server Address**—Type the IP address or the host name of the LDAP server where the authentication is performed.
- **Server Port**—The port used by the Embedded Web Server to communicate with the LDAP server. The default LDAP port is 389.
- **Use SSL/TLS**—From the drop-down menu, select **None**, **SSL/TLS**, or **TLS**.
- **Userid Attribute**—Type either `cn`, `uid`, `userid`, or `user-defined`.

- **Mail Attribute**—Type a maximum of 48 characters to uniquely identify e‑mail addresses. The default value is "mail."
- **Full Name Attribute**—Type a maximum of 48 characters.
- **Search Base**—The node in the LDAP server where user accounts reside. You can enter multiple search bases, separated by commas.

  Note: A search base consists of multiple attributes separated by commas, such as cn (common name), ou (organizational unit), o (organization), c (country), and dc (domain).
- **Search Timeout**—Enter a value from 5 to 30 seconds or 5 to 300 seconds depending on your printer model.
- **Use Kerberos Service Ticket**—If selected, then a Kerberos ticket is presented to the LDAP server using the GSSAPI protocol to obtain access.

Device Credentials

- **Use Active Directory Device Credentials**—Allow user credentials and group designations to be pulled from the existing network comparable to other network services.
- **MFP Kerberos Username**—Type the distinguished name of the print server.
- **MFP's Password**—Type the Kerberos password for the print server.

Search specific object classes

- **Person**—Allow the "person" object class to be searched.
- **Custom Object Class**—Allow the custom search object class to be searched. You can define up to three custom search object classes.

LDAP Group Names

- You can associate up to 32 named groups stored on the LDAP server by entering identifiers for those groups under the Group Search Base list. Both the **Short name for group** and **Group Identifier** must be provided.
- When creating security templates, you can pick groups from this setup for controlling access to device functions.

4 Click **Submit** to save the changes, or **Cancel** to return to previous values.

Editing an LDAP+GSSAPI setup

1 From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.

2 Under Advanced Security Setup, click **LDAP+GSSAPI**.

3 Select a setup from the list.

4 Make any needed changes in the LDAP Configuration dialog.

5 Click **Modify** to save the changes, or **Cancel** to return to previous values.

Deleting an LDAP+GSSAPI setup

1 From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.

2 Under Advanced Security Setup, click **LDAP+GSSAPI**.

3 Select a setup from the list.

4 Click **Delete Entry** to remove the profile, or **Cancel** to return to previous values.

Notes:

- Click **Delete List** to delete all LDAP+GSSAPI setups in the list.
- An LDAP+GSSAPI building block cannot be deleted if it is being used as part of a security template.

Configuring Kerberos 5 for use with LDAP+GSSAPI

Note: This feature is available only in advanced-security devices.

Kerberos 5 can be used by itself for user authentication, but it is most often used with the LDAP+GSSAPI building block. While only one Kerberos configuration file (krb5.conf) can be stored on a supported device, that file can apply to multiple realms and Kerberos Domain Controllers (KDCs). An administrator must anticipate the different types of authentication requests that the Kerberos server might receive, and configure the krb5.conf file to handle these requests.

Notes:

- Because only one krb5.conf file is used, uploading or resubmitting a simple Kerberos file overwrites the configuration file.
- The krb5.conf file can specify a default realm. But if a realm is not specified in the configuration file, then the first realm specified is used as the default realm for authentication.
- Some types of authentication relies on an external server. If an outage prevents the printer from communicating with the server, then users are able to access protected device functions.
- To help prevent unauthorized access, log out from the printer after each session.

Creating a simple Kerberos configuration file

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.
2. Under Advanced Security Setup, click **Kerberos 5**.
3. Type the KDC (Key Distribution Center) address or host name in the KDC Address field.
4. Enter the number of the port (between 1 and 65535) used by the Kerberos server in the KDC Port field. The default port number is 88.
5. Type the realm (or domain) used by the Kerberos server in the Realm field.
6. Click **Submit** to save the information as a krb5.conf file on the selected device, or **Reset Form** to reset the fields and start again.

Uploading a Kerberos configuration file

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.
2. Under Advanced Security Setup, click **Kerberos 5**.
3. Click **Browse**, and then select the krb5.conf file.
4. Click **Submit** to upload the krb5.conf file to the selected device.

   The Embedded Web Server automatically tests the krb5.conf file to verify that it is functional.

   Notes:

   - To reset the field and search for a new configuration file, click **Reset Form**.
   - To remove the Kerberos configuration file from the selected device, click **Delete File**.

- To view the Kerberos configuration file for the selected device, click **View File**.
- To verify that the Kerberos configuration file for the selected device is functional, click **Test Setup**.

Setting date and time

Kerberos servers require key requests to have a recent time stamp (usually within 300 seconds). Therefore, the printer clock must be in sync or closely aligned with the KDC system clock. You can update the printer clock settings manually. You can also set it to use Network Time Protocol (NTP) to sync automatically with a clock that is also used by the Kerberos server.

Note: We recommend using an NTP server.

1. Access the date and time settings.

   Do either of the following:

   - From the Embedded Web Server, click **Settings** > **Security** > **Set Date and Time**.
   - From the home screen, navigate to the menu screen, and then click **Security** > **Set Date and Time**.

     Note: When accessing the menu screen, log in as an administrator.

2. To manage the settings manually, enter the correct date and time in **`YYYY-MM-DD HH:MM`** format, and then select a time zone from the drop-down menu.

   Notes:

   - Entering manual settings automatically disables the use of NTP.
   - If you select **(UTC+user) Custom** from the Time Zone list, then you need to configure more settings under Custom Time Zone Setup.

3. If daylight saving time (DST) is observed in your area, then select **Automatically Observe DST**.
4. If you are located in a nonstandard time zone or an area that observes an alternate DST calendar, then adjust the Custom Time Zone Setup settings.
5. If you want to sync to an NTP server rather than update the clock settings manually, then select **Enable NTP**. Then type the IP address or host name of the NTP server.
6. If the NTP server requires authentication, then select the preferred method from the Authentication menu. Then click **Install MD5 key** or **Install Autokey IFF params** to browse to the file containing the matching NTP authentication.
7. Click **Submit** to save the changes, or click **Reset Form** to restore the default settings.

Using a security template to control function access

Note: This feature is available only in advanced-security devices.

Each access control can be set to require no security (default) or to use any of the building blocks in the drop-down menu for that function. Only one method of security can be assigned to each access control.

Step 1: Create a building block

A building block is required to specify authentication and authorization for device menus and functions. Use the building blocks to define security templates, and then select a template for each access control.

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.
2. Under Advanced Security Setup, click the appropriate building block, and then configure it.

   Note: For more information on configuring a specific type of building block, see "Advanced-security building blocks" on page 10.

Step 2: Create a security template

Using the Embedded Web Server

One or two building blocks can be combined with a unique name of up to 128 characters to create a security template. Each device can support up to 140 security templates. Though the names of security templates must be different from one another, building blocks and security templates can share a name.

1. Click **Settings** > **Security** > **Security Setup**.
2. Under Advanced Security Setup, click **Security Template**.
3. Under Manage Security Templates, click **Add a Security Template**.
4. In the Security Template Name field, type a unique name containing up to 128 characters. It can be helpful to use a descriptive name, such as "dministrator_Only" or "Common_Functions_Template."
5. From the Authentication Setup list, select a building block method for authenticating users.

   Note: The Authentication Setup list is populated with the authentication building blocks that have been configured on the device. Certain building blocks such as passwords and PINs, do not support separate authorization.
6. To use authorization, click **Add authorization**, and then from the Authorization Setup menu, select a building block.

   Note: The Authorization Setup list is populated with the authorization building blocks available on the device.
7. To use group authorization, click **Modify Groups**, and then select one or more groups to include in the security template.

   Note: Hold down the **Ctrl** key to select multiple groups.
8. Click **Save Template**.

Note: For simple authorization-level security, which uses no individual authentication, administrators can control access to functions by assigning only a password or PIN to a security template. Users are required to enter the correct code to access any function controlled by the password or PIN.

Using the control panel

Note: These instructions apply only in printer models with a touch-screen display.

1. Navigate to the menu screen.
2. Touch **Security** > **Edit Security Setups** > **Edit Security Templates** > **Add Entry**.

3 Type a unique name to identify the template. Use a descriptive name, such as ”Administrator_Only” or “Authenticated_Users,” and then touch **Done**.

4 On the Authentication Setup screen, select the appropriate building block, and then touch **Done**.

5 On the Authorization Setup screen, select the appropriate building block, and then touch **Done**.

6 Select one or more groups to be included in the template, and then touch **Done**.

Step 3: Assign security templates to access controls

After assigning a security template, users are required to provide the appropriate credentials to access any functions assigned with a security template.

Using the Embedded Web Server

1 Click **Settings** > **Security** > **Security Setup** > **Access Controls**.

Note: If necessary, click **Expand All** to view all access controls, or select a folder to view specific access controls for the selected access control group.

2 For each function you want to protect, select a security template from the drop-down menu next to the name of that function.

3 Click **Submit** to save the changes, or **Reset Form** to cancel all changes.

Notes:

- To help prevent unauthorized access, log out from the printer after each session.
- For a list of individual access controls, see “Appendix D: Access controls” on page 68.

Using the control panel

Note: These instructions apply only in printer models with a touch-screen display.

1 Navigate to the menu screen.

2 Touch **Security** > **Edit Security Setups** > **Edit Access Controls**.

3 For each function you want to protect or update, select a security template for that function.

Note: Scroll down to see all available access controls.

4 Touch **Submit**.

Editing or deleting a security template from the Embedded Web Server

1 Click **Settings** > **Security** > **Security Setup**.

2 Under Advanced Security Setup, click **Security Template**.

3 Select a security template from the list.

4 Edit the fields if necessary.

5 Click **Modify** to save the changes.

Notes:

- To retain previously configured values, click **Cancel**.
- To delete the selected security template, click **Delete Entry**.

- To delete all security templates on the device, from Manage Security Templates screen, click **Delete List**.
- You can delete a security template only if it is not in use, but you can edit a security template that is in use.

Editing or deleting a security template from the control panel

Note: These instructions apply only in printer models with a touch-screen display.

1. Navigate to the menu screen.
2. Touch **Security** > **Edit Security Setups** > **Edit Security Templates**.
3. Do one of the following:
    - To remove all security templates, touch **Delete List**.
    - To remove an individual security template, select it from the list, and then touch **Delete Entry**.
    - To modify an individual security template, select it from the list, and then touch **Open Entry**.

Managing certificates and other settings

The Certificate Management menu is used for configuring printers to utilize certificates for establishing SSL, IPSec, and 802.1x connections. Additionally, devices utilize certificates for LDAP over SSL authentication and address book look ups.

Certificates are used by network devices to securely identify other devices. Certificate Authorities (CA) are trusted locations established on the network that are required in secure environments. Otherwise, the default device certificate is used to identify devices on the network.

The process for creating a CA-signed certificate on a device consists of the following activities:

1. Loading of the CA certificate for a certificate authority into the device
2. Creating a Certificate Signing Request (CSR) to obtain a CA-signed device certificate
3. Generating a CA-signed certificate using the CSR by the CA administrator
4. Loading of the CA-signed certificate into the device

Note: You can simplify the process by using the Automatic Certificate Enrollment Application, which is available when an Active Directory environment is used. For more information, see “Appendix C: Automatic Certificate Enrollment Application” on page 66.

Installing a Certificate Authority certificate on the device

Note: This feature is available only in network printers or in printers connected to print servers.

The Certificate Authority (CA) certificate is needed so that the printer can trust and validate the credentials of another system on the network. Without a CA certificate, the printer cannot determine whether to trust the certificate that is presented by the system trying to create the secure connection.

Start with the certificate file (.pem format) for the CA that you want to utilize. An example of how to create this file is provided in “Appendix A: CA file creation” on page 66.

1. Open a Web browser, and then type the IP address or host name of the printer.
2. From the Embedded Web Server, click **Settings** > **Security** > **Certificate Management** > **Certificate Authority Management**.

   Notes:

   - This window lets the device administrator load a new CA certificate, delete all CA certificates, and view previously installed CA certificates. To view more details of an installed CA certificate or delete a certificate, click common name link under Certificate Authority Common Name.
   - There are no installed CA certificates to view on this page in new devices.
3. Click **New** to display the Certificate Authority Installation screen.
4. Click **Browse** to select the .pem format certificate authority file.
5. Click **Submit**.

Configuring the device for certificate information

The printer has a self-generated certificate. For some operations (such as 802.1X and IPSec), the printer certificate needs to be upgraded to a certificate that has been signed by a certificate authority.

The printer includes a process of generating a certificate signing request that can be viewed or downloaded, which facilitates the process of obtaining the signed certificate for the printer.

1. From the Embedded Web Server, click **Settings** > **Security** > **Certificate Management** > **Set Certificate Defaults**.
2. Update the information on the device to fit your organization, and then click **Submit**. For more information, see “Setting certificate defaults” on page 27.
3. From the Certificate Management page, click **Device Certificate Management**.

   Notes:

   - This window lets the device administrator load a new device certificate, delete all device certificates, and view previously installed device certificates. To view more details of an installed device certificate or delete a device certificate, click on the certificate common name link under Friendly Name.
   - If you are configuring a new device, then a default self-signed certificate can be viewed on this page.
4. Select the link for the preferred device certificate to obtain the certificate signing request information.

   Notes:

   - You may use the link to the default certificate created in step 2 or another named certificate. The certificate information is displayed.
   - To create other certificates, select **New** to open a Certificate Generation Parameters page. For more information, see “Creating a new device certificate” on page 26.
5. Click **Download Signing Request**, and then save and open the .csr file with a text editor.

   Note: The file data is displayed in a standard format that includes the base-64 representation in the application window. Copy and save that information for later use.

Sample certificate request data

```
-----BEGIN CERTIFICATE REQUEST-----
MIIC+TCCAeECAQAwaDEQMA4GA1UEChMHTGV4bWFyazEOMAwGA1UECxQFUFMmU0Qx
EjAQBgNVBAcTCUxleGluZ3RvbjELMAkGA1UECBMCS1kxCzAJBgNVBAYTAlVTMRYw
FAYDVQQDEw1MZXhtYXJrIE1YODEyMIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIB
CgKCAQEAtqZYnFpgp9CfvK9cp4WY+jcerPHZkqTdCmyo8TcVArItFXPZk0XwzirZ
UvdA6lgnEc2lA9QG4M9ldm2Kg48qnUvTq8qGbs09FtoS3ayYfY6HxF5NXiQdkJTh
8coS3E3k8ZdM5kP4UFBL3dTf1POTbn1FEQf5YwVCmjxFjDv48xXobzSfu/cqC42e
KZsH4EK6thVOy0KoScPbO5DfI5m0xm6ZRlPjaA6NXu/4pZQYtcuur2hhI/7mrkTb
flX6P9aa2rYL+WDypaNyKJxfygfk090bI+L1rRWHKEKu+GOGfO1+NjFvlm6Kr82C
nOIpV/x8fU6WRFbG7z2gVHisTW1tCwIDAQABoEwwSgYJKoZIhvcNAQkOMT0wOzAP
BgNVHREECDAGhwT/////MAkGA1UdEwQCMAAwHQYDVR0OBBYEFLOZMlQBnxiCfLx3
6VDLpC88HgSzMA0GCSqGSIb3DQEBBQUAA4IBAQBwTHx62ROkOh8IbUv5tTWyYeUc
ayiPW+8ekGyHXajFybXTzKxu2KMUCeQen6CIeGq6MJWiQ1BvpVrIlPsCH8H2mbxD
1dWutSMtDJR6W9Cgk/TLXzKbdhVwd7yY8XhGkigj6c4k2C6dxRNaxvNWU06JCrVp
nfFQvyQq88M7tZuhHbvD8+AkCOsub1hceGSQPhtdo8Ctlu1uDKe99u5uCFabiHs0
sbQJFUkEkA9AJBGLEUjRWl8B+bauYn2eSCgF8+tppgMSKFRays5M3Kt7UPiT5WiE
afQqHR4K/E0mzx+++1S+4yriryt7gNw6ofoJwV4i7YVBOJWHDN5S9e/TIxdX
-----END CERTIFICATE REQUEST-----
```

6. Open another Web browser, and go to the CA Web site.

7 Follow the CA certificate request process as defined for the CA. A sample request is shown in "Appendix B: CA-Signed Device Certificate creation" on page 66.

Note: The result is a CA-signed device certificate file (in .pem format). Save this file on your computer for use in the next steps.

8 From the Embedded Web Server, return to the "default" Device Certificate Management page, and then click **Install Signed Certificate**.

9 Click **Browse**, and then select the CA-signed device certificate file that was created in step 8.

10 Click **Submit**.

Note: This completes the process of creating and installing a signed printer certificate. The printer can now present a valid CA-signed certificate to systems to which it attempts to negotiate an SSL or IPSec connection.

Creating a new device certificate

1 From the Embedded Web Server, click **Settings** > **Security** > **Certificate Management**.

2 Click **Device Certificate Management** > **New**.

3 Enter values in the appropriate fields:

- **Friendly Name**—Type a name for the certificate (64-character maximum).
- **Common Name**—Type a name for the device (128-character maximum).

  Note: Leave this field blank if you want to use the host name for the device.
- **Organization Name**—Type the name of the company or organization issuing the certificate (128-character maximum).
- **Unit Name**—Type the name of the unit within the company or organization issuing the certificate (128-character maximum).
- **Country/Region**—Type the country or region where the company or organization issuing the certificate is located (2-character maximum).
- **Province Name**—Type the name of the province or state where the company or organization issuing the certificate is located (128-character maximum).
- **City Name**—Type the name of the city where the company or organization issuing the certificate is located (128-character maximum).
- **Subject Alternate Name**—Type the alternate name and prefix that conforms to RFC 2459. For example, type an IP address using the format **`IP:1.2.3.4`**, or a DNS address using the format **`DNS:ldap.company.com`**. Leave this field blank if you want to use the IPv4 address (128-character maximum).

4 Click **Generate New Certificate**.

Viewing, downloading, and deleting a certificate

1 From the Embedded Web Server, click **Settings** > **Security** > **Certificate Management** > **Device Certificate Management**.

2 Select a certificate from the list.

The details of the certificate appear in the Device Certificate Management window.

3 Click any of the following:

- **Delete**—Remove a previously stored certificate.
- **Download To File**—Download or save the certificate as a .pem file.
- **Download Signing Request**—Download or save the signing request as a .csr file.
- **Install Signed Certificate**—Upload a previously signed certificate.

Setting certificate defaults

Administrators can set default values for certificates generated for a supported device. The values entered here will be present in all new certificates generated in the Certificate Management task, even though those fields will remain blank on the screen.

1 From the Embedded Web Server, click **Settings** > **Security** > **Certificate Management** > **Set Certificate Defaults**.

2 Enter values in the appropriate fields:

- **Common Name**—Type a name for the device (128‑character maximum).

  Note: Leave this field blank to use the domain name for the device.
- **Organization Name**—Type the name of the company or organization issuing the certificate.
- **Unit Name**—Type the name of the unit within the company or organization issuing the certificate.
- **Country/Region**—Type the country or region where the company or organization issuing the certificate is located (2‑character maximum).
- **Province Name**—Type the name of the province or state where the company or organization issuing the certificate is located.
- **City Name**—Type the name of the city where the company or organization issuing the certificate is located.
- **Subject Alternate Name**—Type the alternate name and prefix that conforms to RFC 2459. For example, type an IP address using the format **`IP:1.2.3.4`**, or a DNS address using the format **`DNS:ldap.company.com`**. Leave this field blank to use the IPv4 address.

  Note: All fields accept a maximum of 128 characters, except where noted.

3 Click **Submit**.

Setting up a Certificate Authority certificate monitor

Note: This setting is available only in printer models that support Active Directory.

When the device is joined to an Active Directory environment, automatic updates of CA certificates are necessary. The certificate monitor performs this function.

1 From the Embedded Web Server, click **Settings** > **Security** > **Certificate Management** > **CA Cert Monitor Setup**.

2 Enable the CA monitor.

3 Select when and how often the device checks for new CA certificates.

4 Click **Submit**.

Downloading the Certificate Authority certificates

Note: This setting is available only in some printer models.

We recommend retrieving the certificate immediately. The default setting for the automatic download of the CA certificates is 12:00 AM in the device-designated time zone.

1. From the Embedded Web Server, click **Settings** > **Security** > **Certificate Management** > **CA Cert Monitor Setup**.
2. Select **Enable CA Monitor** > **Fetch immediately**.
3. Click **Submit**.
4. Click **Certificate Authority Management**, then review the downloaded CA certificate chain by selecting on the name from the CA Common Name section.

Managing devices remotely

Using HTTPS for device management

Turn off the HTTP port, leaving the HTTPS port (443) active, to restrict the access of the device Embedded Web Server to HTTPS only. This action ensures that all communication with the device using Embedded Web Server is encrypted.

1. From the Embedded Web Server, click **Settings** > **Security** > **TCP/IP Port Access**.
2. Clear **TCP 8000 (HTTP)** and **TCP 80 (HTTP)**.
3. Click **Submit**.

Setting a backup password

Note: This setting is available only in advanced‑security devices.

A backup password lets the Embedded Web Server administrator access security menus regardless of the type of security assigned. It can also be helpful if other security measures become unavailable, such as when there is a network communication problem or an authentication server fails.

Notes:

- In some organizations, security policies prohibit the use of a backup password. Consult your organization's policies before deploying any security method that might compromise those policies.
- The backup password is not associated with any accounts in the corporate directory. It is a password stored only on the device. Share only with users who are authorized to modify the device security settings.
- Make sure that the backup password contains a minimum of eight alphanumeric characters and that it is not a dictionary word or a variation of the user ID.

Using the Embedded Web Server

1. Click **Settings** > **Security** > **Security Setup**.
2. Under Additional Security Setup, click **Backup Password**.
3. Select **Use Backup Password**, and then type and retype the password to confirm it.
4. Click **Submit**.

Using the control panel

1. Navigate to the menu screen.
2. Touch **Security** > **Edit Security Setups** > **Edit Backup Password** > **Password**.
3. Type and then retype the password to confirm it.
4. From the Edit Backup Password screen, set User Backup Password to **On**.
5. Apply the changes.

Setting up SNMP

Simple Network Management Protocol (SNMP) is used in network management systems to monitor network-connected devices for conditions that warrant administrative attention. The Embedded Web Server allows administrators to configure settings for SNMP versions 1 through 3.

Note: We recommend selecting only SNMPv3, setting Minimum Authentication Level to **Authentication, Privacy**, and setting the strongest privacy algorithm.

SNMP Version 1,2c

1. From the Embedded Web Server, click **Settings** > **Security** > **SNMP**.
2. Under SNMP Version 1,2c, select **Enabled**.
3. To allow administrators to set SNMP variables, select **Allow SNMP Set**.
4. Type a name to be used for the SNMP Community identifier. The default community name is “public.”
5. To facilitate the automatic installation of device drivers and other printing applications, select **Enable PPM Mib** (Printer Port Monitor MIB).
6. Click **Submit** to save the changes, or click **Reset Form** to restore the default values.

SNMP Version 3

1. From the Embedded Web Server, click **Settings** > **Security** > **SNMP**.
2. Under SNMP Version 3, select **Enabled**.

   Note: Under SNMP Version 1,2c, clear **Enabled**.
3. To allow remote installation and configuration changes, and device monitoring, type login information in the SNMPv3 Read/Write User and SNMPv3 Read/Write Password fields.
4. To allow device monitoring only, type login information in the SNMPv3 Read Only User and SNMPv3 Read Only Password fields.
5. From the SNMPv3 Minimum Authentication Level list, select **Authentication, Privacy**.
6. From the SNMPv3 Authentication Hash list, select **MD5** or **SHA1**.
7. From the SNMPv3 Privacy Algorithm list, select the strongest setting supported by your network environment.
8. Click **Submit** to save the changes, or click **Reset Form** to restore the default values.

Setting SNMP Traps

After configuring SNMP Version 1,2c or SNMP Version 3, you can further customize which alerts are sent to the network management system by designating SNMP “traps,” or events that trigger an alert message.

1. From the Embedded Web Server, click **Settings** > **Security** > **SNMP**.
2. Click **Set SNMP Traps**.
3. From the IP Address list, click one of the blank IP address entries (shown as `0.0.0.0`).

4 Under Trap Destination, enter the IP address of the network management server or monitoring station, and then select the conditions for which you want to generate an alert.

5 Click **Submit** to save the changes, or click **Reset Form** to clear all fields.

Configuring security audit log settings

Note: This setting is available only in advanced-security devices and in simple-security devices with color LCD control panels.

The security audit log lets administrators monitor security-related events on a device, including failed user authorization, successful administrator authentication, and Kerberos file uploads to a device. By default, security logs are stored on the device, but may also be transmitted to a network syslog server for further processing or storage.

We recommend enabling audit in secure environments.

1 From the Embedded Web Server, click **Settings** > **Security** > **Security Audit Log**.

2 Select **Enable Audit** to activate security audit logging.

3 To use both remote syslog server and internal logging, type the IP address or host name of the Remote Syslog Server. Then select **Enable Remote Syslog** to transmit log events to a network syslog server.

   Note: Enable Remote Syslog is available only after an IP address or host name is entered.

4 Enter the Remote Syslog Port number used on the destination server. The default value is 514.

5 From the Remote Syslog Method menu, select one of the following:

   - **Normal UDP**—Send log messages and events using a lower-priority transmission protocol.
   - **Stunnel**—If implemented on the destination server.

6 From the Remote Syslog Facility menu, select a facility code for events to be logged to on the destination server. All events sent from the device are tagged with the same facility code to aid in sorting and filtering by network monitoring or intrusion detection software.

   Note: step 3 on page 31 through step 6 and step 8 are valid only if Remote Syslog is enabled.

7 From the “Severity of events to log” menu, select the priority level cutoff (0–7) for logging messages and events.

   Note: The highest severity is 0, and the lowest is 7. The selected severity level and anything higher is logged. For example, if you select **4 - Warning**, then severity levels 0–4 are logged.

8 Select **Remote Syslog non-logged events** to send all events regardless of severity to the remote server.

9 In the “Admin's e-mail address” field, type one or more e-mail addresses (separated by commas) to automatically notify administrators of certain log events. Then select from the following options:

   - **E-mail log cleared alert**—Indicates when the Delete Log button is clicked.
   - **E-mail log wrapped alert**—Indicates when the log becomes full and begins to overwrite the oldest entries.
   - **Log full behavior**—Provides a drop-down list with two options:
     - Wrap over oldest entries
     - E-mail log then delete all entries
   - **E-mail % full alert**—Indicates when log storage space reaches a certain percentage of capacity.

- **% full alert level (1–99%)**—Sets how full the log must be before an alert is triggered.
- **E-mail log exported alert**—Indicates when the log file is exported.
- **E-mail log settings changed alert**—Indicates when the log settings are changed.
- **Log line endings**—Sets how the log file terminates the end of each line. Select a line ending option from the drop-down menu.
- **Digitally sign exports**—Adds a digital signature to each exported log file.

Note: To use e-mail alerts, click **Submit** to save the changes, and then click **Setup E-mail Server** to configure SMTP settings.

10 Click **Submit** to save the changes, or **Reset Form** to restore the default settings.

E-mail server setup

To use the e-mail notification of logged events, set up the e-mail server.

1. From the Security Audit Log main screen, click **Setup E-mail Server**.
2. Under SMTP Setup, type the IP address or host name of the Primary SMTP Gateway the device uses for sending e-mail.
3. Enter the Primary SMTP Gateway Port number of the destination server. The default value is 25.
4. If you are using a secondary or backup SMTP server, then type the IP address/host name and SMTP port for that server.
5. For SMTP Timeout, enter the number of seconds (5–30) the device waits for a response from the SMTP server before timing out. The default value is 30 seconds.
6. To receive responses to messages sent from the printer (in case of failed or bounced messages), type the reply address.
7. From the Use SSL/TLS list, select **Disabled**, **Negotiate**, or **Required** to specify whether e-mail is to be sent using an encrypted link.
8. If your SMTP server requires user credentials, then select an authentication method from the SMTP Server Authentication list. The default setting is “No authentication required.”
9. From the Device-Initiated E-mail list, select **None** for no authentication, or **Use Device SMTP Credentials** if authentication is required.
10. From the User-Initiated E-mail list, select **None** for no authentication, or **Use Device SMTP Credentials** if authentication is required.
11. If the device must provide credentials in order to send e-mail, then enter the information appropriate for your network under Device Credentials.
12. Click **Submit** to save the changes, or **Reset Form** to restore the default settings.

Managing the security audit log

- To view or save a text file of the current syslog, click **Export Log**.
- To delete the current syslog, click **Delete Log**.

Updating firmware

Automated firmware updates can be done simultaneously over a network of devices. For security, the ability to perform this update can be restricted to authorized administrators by using access control.

Devices inspect all downloaded firmware packages for a number of required attributes before adopting and executing the packages. The firmware must be packaged in a proprietary format and encrypted with a symmetric encryption algorithm through an embedded key that is known only to Lexmark. However, the strongest security measure comes from requiring all firmware packages to include multiple digital 2048-bit RSA signatures from Lexmark. If these signatures are not valid, or if the message logs indicate a change in firmware after the signatures were applied, then the firmware is discarded.

1. From the Embedded Web Server, click **Settings** > **Update Firmware**.
2. Browse to the flash file.
3. Click **Submit**.

Managing other access functions

Configuring confidential printing

Note: This feature is available only in printer models that allow PIN selection from the control panel.

Users printing confidential or sensitive information may use the confidential print option. This option allows print jobs to remain in the print queue until the user enters a PIN on the printer control panel.

1. From the Embedded Web Server, click **Settings** > **Security** > **Confidential Print Setup**.
2. Enter an option for the following:

Use	To
Max Invalid PIN Off 2–10	Set a limit on the number of times an invalid PIN can be entered. **Notes:** • This menu item appears only when a formatted, working printer hard disk is installed. • Enter **0** to allow users to enter an incorrect PIN as many times as they choose. • Enter a value between 2 and 10 to specify the number of times users can enter an incorrect PIN before being locked out. • When the limit is reached, the print jobs for that user name and PIN is deleted.
Confidential Job Expiration Off 1 hour 4 hours 24 hours 1 week	Set a limit on how long the printer stores confidential print jobs. **Notes:** • Changes in this setting do not affect the expiration time for confidential print jobs that are already in the printer memory or hard disk. • If the printer is turned off, then all confidential jobs held in the printer memory are deleted.
Repeat Job Expiration Off 1 hour 4 hours 24 hours 1 week	Set a limit on how long the printer stores print jobs.
Verify Job Expiration Off 1 hour 4 hours 24 hours 1 week	Set a limit on how long the printer stores print jobs needing verification.
Note: Off is the factory default setting.	

Use	To
Reserve Job Expiration Off 1 hour 4 hours 24 hours 1 week	Set a limit on how long the printer stores print jobs for printing at a later time.
Note: Off is the factory default setting.	

3 Click **Submit**.

Setting login restrictions

Note: This setting is available only in advanced-security devices.

To prevent malicious access to a device, restrict the number of invalid login attempts and require a lockout time before letting users retry logging in.

Many organizations establish login restrictions for information assets such as workstations and servers. Make sure that device login restrictions also comply with organizational security policies.

1 From the Embedded Web Server, click **Settings** > **Security** > **Miscellaneous Security Settings** > **Login Restrictions**.

2 Enter the appropriate login restrictions:

- **Login failures**—Specify the number of times a user can attempt login before being locked out.
- **Failure time frame**—Specify how long before lockout takes place.
- **Lockout time**—Specify how long the lockout lasts.
- **Panel Login Timeout**—Specify how long a user may be logged in before being automatically logged out.
- **Remote Login Timeout**—Specify how long a user may be logged in remotely before being automatically logged out.

3 Click **Submit**.

Enabling and disabling USB host ports

Note: This setting is available only in some printer models.

USB host ports on devices do the following:

- Detect and display the files that are stored in the inserted USB mass storage devices, such as a flash drive.
- Print a supported file from the flash drive or initiate a firmware update.
- Scan data directly into the flash drive.
- Access can be restricted or permitted depending on the schedule.

In secure environments, devices can be configured to limit these operations, or to not allow them at all.

Device administrators can disable the front USB port during setup using access control restrictions. Devices have a rear USB host port designed for card readers and HID devices, such as a keyboard.

To restrict access to the front USB port, apply a security template to the appropriate access control. For more information, see “Using a security template to control function access” on page 20.

To set the schedule that restricts access at a specified time, do the following:

1. From the Embedded Web Server, click **Settings** > **Security** > **Schedule USB Devices**.
2. From the Disable Devices menu, select to disable printing from any USB device or from flash drives only.

   Note: All scheduled Disable actions are affected by this setting.
3. Click **Submit**.
4. Enable or disable the use of USB devices on certain days or during certain hours. To create a schedule:
   - **a** Select a device action, and then set the time and day for the device to perform the action.
   - **b** Add the entry.

   Notes:

   - Use of USB devices is enabled by default.
   - For each Disable schedule entry, create an Enable schedule entry to reactivate use of the USB devices.

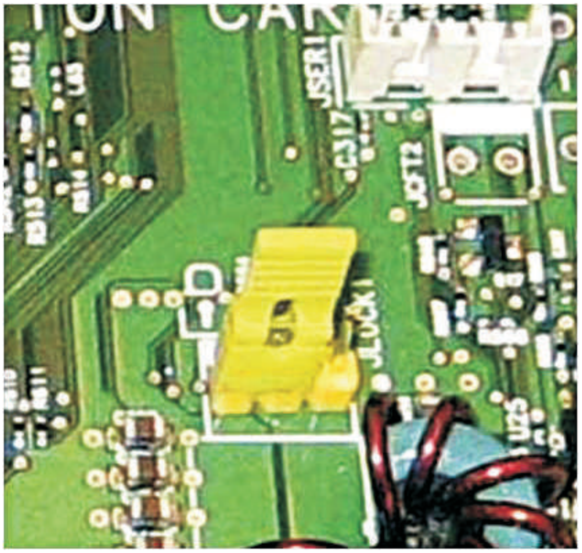
Enabling the security reset jumper

Note: This feature is available only in some printer models.

If the device is locked down due to a forgotten administrator password or lost network connectivity, then you can recover the device by resetting it. Access the controller board and move the reset jumper to cover the middle and unexposed prongs.

Using a cable lock to secure access to the controller board ensures that the device is not maliciously reset.

Warning—Potential Damage: Resetting the device deletes all customer data.



The secure reset feature requires specifying in the Embedded Web Server the effect of using the *security reset jumper*, which is located on the controller board.

1 From the Embedded Web Server, click **Settings** > **Security** > **Miscellaneous Security Settings**.

2 From the Security Reset Jumper list, select one of the following:
   - **No Effect**—Remove access to *all* security menus. This option should be used with caution.
   - **Access controls = “No security”**—Remove security only from the function access controls.
   - **Reset factory security defaults**—Restore all security settings to the default values.

3 Click **Submit** to save the changes, or **Reset Form** to restore the default settings.

Warning—Potential Damage: If you selected **No Effect** and the device is locked down, then you cannot access the security menus. To replace the device controller board and regain access to the security menus, a service call is required.

Enabling holding faxes

Use the Incoming Fax Holding feature to configure MFPs to receive faxes and temporarily store them in the printer hard disk. The held faxes are secured in the hard disk until the designated release time or when valid user credentials are provided.

1 From the Embedded Web Server, click **Settings** > **Fax Settings** > **Analog Fax Setup** > **Holding Faxes**.

2 Select the appropriate help fax mode.
   - **Always On**—Always holds the fax jobs.
   - **Manual**—Lets users select if they want to continue storing the fax jobs or not.
   - **Scheduled**—Prints faxes depending on the set fax holding schedule.

3 Click **Submit**.

Setting the fax holding schedule

1 From the Embedded Web Server, click **Settings** > **Fax Settings** > **Analog Fax Setup** > **Holding Faxes** > **Fax Holding Schedule**.

2 Select a device action, and then set the time and day for the device to perform the action.

3 Add the entry.

Notes:

- Fax printing is enabled by default.
- For each Disable schedule entry, create an Enable schedule entry to reactive fax printing.

Enabling Operator Panel Lock

Use the Operator Panel Lock feature to lock a device so that the control panel cannot be used for any user operations or configurations. If the device has a hard disk, then incoming print and fax jobs are temporarily stored instead of being printed. The device can be unlocked by entering a valid user credential.

Configure this feature by creating an authentication building block, then applying it against the control panel lock function access control using the Embedded Web Server. To access the device control panel, provide your credentials.

Notes:

- This feature requires a hard disk.
- When the device is locked, incoming print and fax jobs are stored in the printer hard disk. If the hard disk is encrypted, then the jobs stored are encrypted.
- When the device is unlocked, jobs received during the locked period are printed. Confidential print jobs received during the lock state are not printed, but are available through the confidential print job menu on the control panel.

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.
2. Under Advanced Security Setup, click **Access Controls**.
3. Select a template for control panel lock .
4. Click **Submit**.

Securing network connections

Configuring 802.1X authentication

Though normally associated with wireless devices and connectivity, 802.1X authentication supports both wired and wireless environments. 802.1X is located within the wireless menu when wireless is enabled on the device.

The following network authentication mechanisms can be included in the 802.1X protocol negotiation:

- EAP-MD5
- EAP-TLS
- EAP-TTLS with the following methods:
  - CHAP
  - MSCHAP
  - MSCHAPv2
  - PAP
- EAP_MSCHAPV2
- PEAP
- LEAP

Use	To
EAP-MD5	Require a device login name and password.
EAP-TLS	Require a device login name and password, CA certificate, and signed device certificate.
EAP-TTLS	Require a device login name and password, and CA certificate.
PEAP (TLS)	Require a device login name and password, CA certificate, and signed device certificate.
LEAP	Require a device login name and password.

Note: Make sure that all of the devices participating in the 802.1X process support the same EAP authentication type.

1. From the Embedded Web Server, click **Settings** > **Security** > **802.1x**.
2. Under 802.1x Authentication, do the following:
   a. Select **Active** to enable 802.1X authentication.
   b. Type the login name and password the printer uses to log in to the authentication server.
   c. Select the **Validate Server Certificate** check box to require verification of the security certificate on the authenticating server.

      Notes:

      - If using digital certificates to establish a secure connection to the authentication server, configure the certificates on the printer before changing 802.1X authentication settings. For more information, see “Managing certificates and other settings” on page 24.
      - Server certificate validation is integral to TLS (Transport Layer Security), PEAP (Protected Extensible Authentication Protocol), and TTLS (Tunneled Transport Security Layer).

d Select **Enable Event Logging** to log activities related to 802.1X authentication.

Warning—Potential Damage: To reduce flash part wear, use this feature only when necessary.

e From the 802.1x Device Certificate list, select the digital certificate that you want to use. If only one certificate is installed, then **default** is the only option that appears.

3 Under Allowable Authentication Mechanisms, select the authentication protocols that the printer recognizes by clicking the check box next to each applicable protocol.

4 From the TTLS Authentication Method list, select the authentication method to accept through the secure tunnel created between the authentication server and the printer.

5 Apply the changes.

Note: The print server resets when changes are made to settings marked with an asterisk (*) on the Embedded Web Server.

Configuring IP security settings

Apply IPSec between the device and the workstation or server to secure traffic between the systems with a strong encryption. The devices support IPSec with preshared keys and certificates. Both modes can be used simultaneously.

In preshared key mode, devices are configured to establish a secure IPSec connection with up to five other systems. Devices and the systems are configured with a pass phrase that is used to authenticate the systems and to encrypt the data.

In certificate mode, devices are configured to establish a secure IPSec connection with up to five systems or subnets. Devices exchange data securely with a large number of systems, and the process is integrated with a PKI or CA infrastructure. Certificates provide a robust and scalable solution, without configuring or managing keys and pass phrases.

1 From the Embedded Web Server, click **Settings** > **Network/Ports** > **IPSec**.

2 Configure the following settings:

Setting	Description
IPSec Enable On* Off	Enable or disable the IP security settings of your printer.
* This is the factory default setting.	

Setting	Description
Connections Pre-Shared Key Authenticated Connections Host 1 Host 2 Host 3 Host 4 Host 5 Host 6 Host 7 Host 8 Host 9 Host 10 Certificate Authenticated Connections Host 1 Host 2 Host 3 Host 4 Host 5	Configure the authenticated connections of your printer. • For Hosts 1–10, the following settings can be configured: – **Address**—You can type a maximum of 45 bytes of characters. – **Key**—You can type a maximum of 256 bytes of characters. • For Hosts 1–5, the following setting can be configured: – **Address[/subnet]**—You can type a maximum of 59 bytes of characters.
Settings DH Group Encryption Authentication Certificate Validation Validate Peer Certificate On* Off Select Device Certificate	Specify the encryption and authentication methods of your printer. Select an option for each setting.
* This is the factory default setting.	

3 Click **Submit**.

Connecting to a wireless network

Before you begin, make sure that:

- Your printer is connected temporarily to an Ethernet network.
- A wireless network adapter is installed in your printer and working properly. For more information, see the instruction sheet that came with your wireless network adapter.

1 From the Embedded Web Server, click **Settings** > **Network/Ports** > **Wireless**.

2 Modify the settings to match the settings of your access point (wireless router).

Note: Make sure to enter the correct SSID.

3 Click **Submit**.

4. Turn off the printer, and then disconnect the Ethernet cable. Wait for at least five seconds, and then turn the printer back on.
5. Check if your printer is connected to the network. Print a network setup page, and then in the Network Card [x] section, see if the status is "Connected."

   For more information, see the "Verifying printer setup" section of the printer *User's Guide*.

Configuring the TCP/IP port access setting

You can control your network device activities by configuring your device to filter out traffic on specific network ports. Protocols (such as FTP, HTTP, and Telnet) can be disabled.

Port filtering on devices disables network ports individually. When a port is closed, a device does not respond to traffic on the specified port whether or not the corresponding network application is enabled. We recommend closing any ports that you do not plan to use under standard operation by clearing them.

This feature lets you set access settings on the different TCP/IP ports of the device.

1. From the Embedded Web Server, click **Settings** > **Security** > **TCP/IP Port Access**.
2. Click the check box of the TCP/IP port to change its access setting.
3. Click **Submit**.

Setting the restricted server list

Devices can be configured to allow connection only from a list of specified TCP/IP addresses. This action blocks all TCP connections from other addresses, protecting the device against unauthorized printing and configuring.

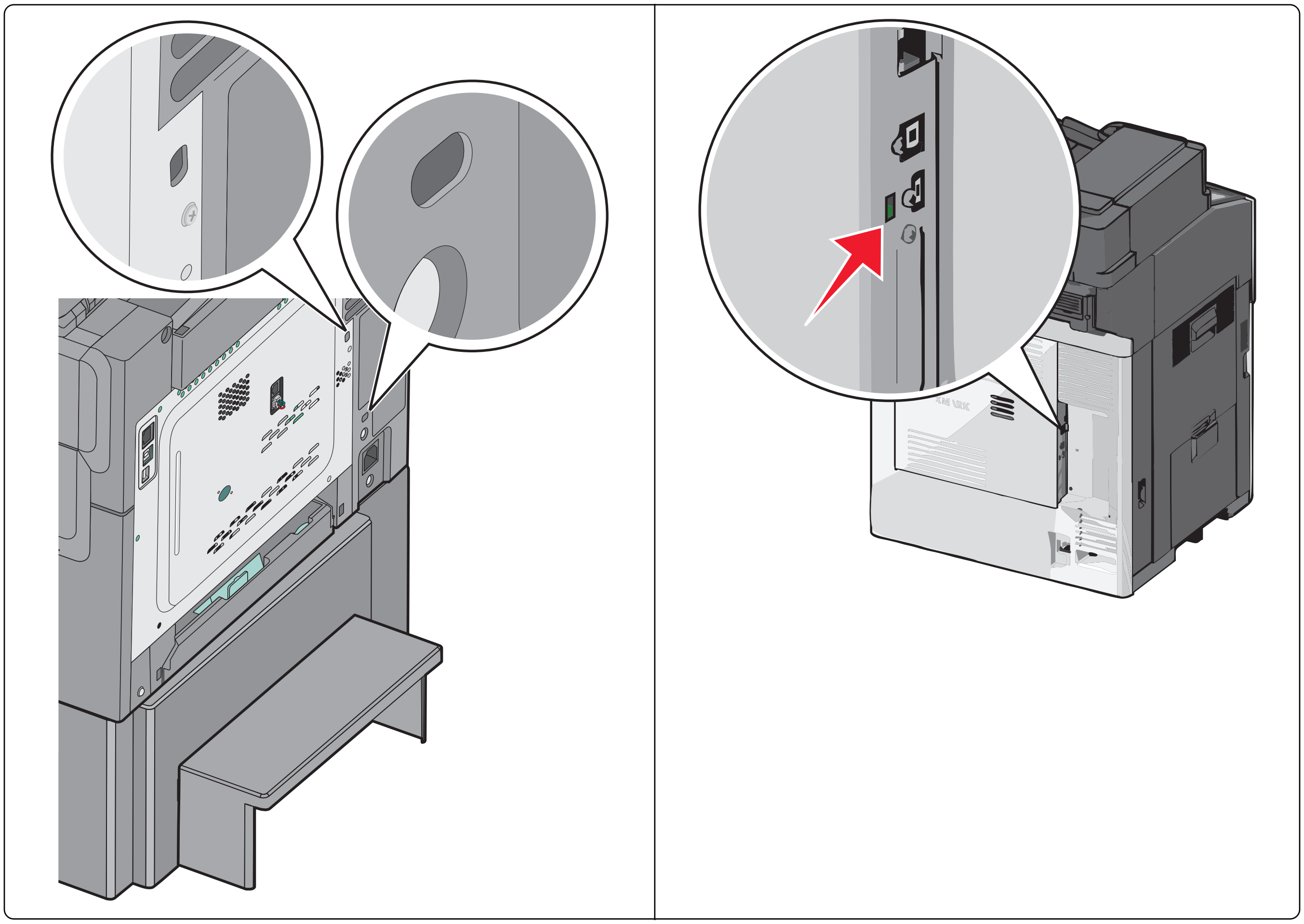
1. From the Embedded Web Server, click **Settings** > **Network/Ports** > **TCP/IP**.
2. In the Restricted Server List field, type up to 50 IP addresses, separated by commas, that are allowed to make TCP connections.
3. From the Restricted Server List Options menu, set the blocking option.
4. Click **Submit**.

Securing data

Physical lock

Most Lexmark printers support cabled computer locks used to secure the critical and sensitive components of the device, such as the controller board and hard disk. These locks let you identify whether the physical components containing sensitive data on the devices have been tampered with.

The following shows the most common security slot locations:



Disk encryption

Enable hard disk encryption to prevent loss of sensitive data if the printer or its hard disk is stolen. When hard disk encryption is activated, the encryption key to be used (256-bit AES symmetric encryption) is pseudo-randomly generated. This encryption key is stored in a proprietary way in the NV memory of the device. The hard disk is then reformatted with the encryption key. Any data on the disk is lost. The key, which is unique to the device, is not stored on the hard disk itself. So if the hard disk is removed from the device, then the contents of the hard disk are indecipherable.

When an encrypted hard disk is moved to another supported device, the hard disk attempts to verify its encryption key with the device encryption key. Because the encryption key on the hard disk is different than the device encryption key, the verification fails. The device prompts to reformat the hard disk with a new encryption key, replacing the existing encrypted data on the hard disk.

Note: Some printer models may not have a printer hard disk installed.

Using the Embedded Web Server

1. Click **Settings** > **Security** > **Disk Encryption**.

   Note: Disk Encryption appears in the Security menu only when a formatted, working hard disk is installed.

2. From the Disk Encryption menu, select either of the following:
   - **Disable**—Disable disk encryption.
   - **Enable**—Enable disk encryption.

     Notes:

     - Disable is the factory default setting.
     - Changing this setting causes the printer to undergo a power-on reset.

     Warning—Potential Damage: Changing the setting for disk encryption erases the contents of the hard disk.

3. Click **Submit** to proceed with disk encryption.

   Note: Encryption takes approximately two minutes. A status bar appears on the control panel indicating the progress of the disk encryption task.

   Warning—Potential Damage: Do not turn off the printer during the encryption process.

4. From the Web browser, refresh the page to return to the Embedded Web Server.

Using the control panel

1. Turn off the printer.

2. While turning the printer on, press and hold down **2** and **6** simultaneously on the keypad until a progress bar appears.

   Note: Some printer models require you to press and hold down the check mark and the right arrow buttons.

   The printer performs a power-on reset, and then the Configuration menu appears. When the printer is fully turned on, a list of functions appears on the printer display.

3. Touch **Disk Encryption** > **Enable** > **Yes**.

Notes:

- Encryption takes approximately two minutes. A status bar appears on the control panel indicating the progress of the disk encryption task.
- After the disk has been encrypted, the printer returns to the Enable/Disable screen.

Warning—Potential Damage: Do not turn off the printer during the encryption process. Doing so may result in loss of data.

4 Touch **Exit Config Menu** or **Exit Config**.

The printer performs a power-on reset, and then returns to normal operating mode.

Checking disk encryption status

1 From the Embedded Web Server, click **Select Reports** > **Select Device Settings**.

2 In the Other Settings section, check the value for Disk Encryption.

Note: You can also check the disk encryption status using Markvision^{TM} Enterprise. Markvision provides an advanced search feature to view the disk encryption status on a fleet of devices.

Erasing settings (non-volatile memory)

Most devices use two forms of non-volatile memory—EEPROM and NAND. These components store the device settings, network information, embedded solution applications, various scanner settings, and bookmark settings. No user-related print, copy, or scan data is stored in non-volatile memory.

The user may erase selected groups of data or all data. There is one “restore defaults” setting defined in the standard administrator menu to restore the basic operator settings. This setting is easily accessible but only restores basic settings. From the configuration menu or the device Embedded Web Server, you can add more options for erasing groups of settings (printer, settings, or application settings).

The Erase Printer Memory option (also called Wipe All Settings on some devices) erases all contents stored on non-volatile memory. Using Wipe All Settings completely clears all device settings, including network and security settings. Installed applications and their settings are also removed.

Restoring default settings from the control panel

1 Navigate to the menu screen, and then touch **Settings** > **General Settings** > **Factory Defaults**.

2 Select **Restore Now** > **Submit**.

Note: This feature does not remove the following settings:

- Network settings or connections
- Paper source settings
- Country selections
- Display language
- Applications settings
- CA certificate data
- Security settings

Clearing selected settings

Using the Embedded Web Server

Note: This menu is available only in some printer models.

1. Click **Settings** > **Security** > **Restore Factory Defaults** > **Restore Settings**.
2. Select one of the following settings:
   - **Printer Settings**—Restore all non-critical base device settings to the factory default. It does not affect network settings or connections, and display language.
   - **Network Settings**—Reset all network and port settings.
   - **Apps**—Restore the factory default configuration of applications. All non-factory installed applications are removed, all application settings are reset, and SE logs are cleared.
3. Click **Restore**.

Using the control panel

1. Turn off the printer.
2. While the printer is turning on, press and hold **2** and **6** on the keypad simultaneously until a progress bar appears.

   Note: Some printer models require you to press and hold the check mark and the right arrow buttons.

   The printer performs a power-on sequence, and then the Configuration menu appears.
3. From the list, select **Restore Factory Settings** > **Restore Settings**.
4. Select one of the following settings:
   - **Restore Printer Settings**—Restore all non-critical base device settings to the factory default. It does not affect network settings or connections, and display language.
   - **Restore Network Settings**—Reset all network and port settings.
   - **Restore Solutions**—Restore the factory default configuration of applications. All non-factory installed applications are removed, all application settings are reset, and SE logs are cleared.

Clearing all settings

Note: After all settings are cleared or reset, network connectivity cannot be retained because the device is in the out-of-box shipping state. You are prompted to restart the device for transport. There is no network connectivity until the device is restarted to ensure that the original ship configuration is maintained.

Using the Embedded Web Server

Note: This menu is available only in some printer models.

1. Click **Settings** > **Security** > **Restore Factory Defaults** > **Erase Printer Memory**.
2. Select the check box to confirm, and then click **Erase**.

Using the control panel

1. Turn off the printer.
2. While the printer is turning on, press and hold **2** and **6** on the keypad simultaneously until a progress bar appears.

   Note: Some printer models require you to press and hold the check mark and the right arrow buttons.

   The printer performs a power-on sequence, and then the Configuration menu appears.
3. From the list, select **Restore Factory Defaults** > **Erase Printer Memory**.

While clearing the settings, the "Restoring Factory Defaults" message appears on the display, and then the device reboots to the initial setup wizard screen. Turn off the device to restore factory settings completely.

This feature erases all device settings stored in NVRAM, including network, security, and application settings, and all pending jobs. Installed applications and settings are also removed. If there is no hard disk installed, then pending fax data are also removed.

Disk file wiping

The file-based disk wipe sanitizes the portion of the hard disk where data was stored after a job has been processed to remove any residual data.

Some devices uses hard disks to temporarily buffer scan, fax, print, and copy data that exceed the amount of RAM installed on the device. Buffered data can be deleted from the hard disk immediately after an original scan, fax, print or copy job is complete. Additionally, devices can temporarily hold print jobs on a hard disk if you use the Confidential Print and Print and Hold features or when held fax jobs are received and sent. This data remains on the hard disk until you print or delete the job, or until the document expires through the job expiration feature.

When a data file is deleted from a hard disk, the data that is associated with that file is not actually deleted. This data remains on the hard disk and can be recovered with substantial effort. All printer models with a hard disk support an additional mechanism for protecting residual data, which is hard disk file wiping.

Hard disk file wiping actively overwrites any job data files that are deleted. You have a choice of single or multiple passes to overwrite data, which removes all data residue from the deleted file.

All permanent data on the hard disk is preserved, such as downloaded fonts, macros and held jobs. The multiple pass wiping process adheres to NIST and DoD (DoD 5220.22-M) guidelines for overwriting confidential data.

Erasing temporary data files from the hard disk

On devices that contain a hard disk, use the Erase Temporary Data Files option to remove residual confidential material and free up memory space. This setting securely uses random data patterns to overwrite files stored on the hard drive that have been marked for deletion. Overwriting can be accomplished with a single pass for a quick wipe, or with multiple passes for greater security.

Note: If there is no hard disk installed on your device, then Erase Temporary Data Files is not available in the main Security menu.

Using the Embedded Web Server

1. Click **Settings** > **Security** > **Erase Temporary Data Files**.

   Note: Wiping Mode can only be set to **Auto**. This setting automatically wipes the files that are no longer required for printing.

2. Modify the following settings:
   - **Single Pass**—Overwrite the printer hard disk in a single pass with a repeating bit pattern. This setting is the factory default.
   - **Multi-pass**—Overwrite the printer hard disk with random bit patterns several times, followed by a verification pass. A secure overwrite is compliant with the DoD 5220.22M standard for securely erasing data from a hard disk. Use this method to wipe highly confidential information.

3. Click **Submit**.

Using the control panel

1. Navigate to the menu screen, and then touch **Security** > **Disk Wiping**.
2. Select **Single Pass** or **Multi-pass**.
3. Apply the changes.

Erasing hard disk data

Completely erase the hard disk data to wipe it clean when doing any of the following:

- Decommissioning the device
- Replacing the hard disk
- Moving the device to a different department or location
- Preparing the device to be serviced by someone outside the organization
- Removing the device from the premises of service

Warning—Potential Damage: This action deletes all the contents of a hard disk, including font data, forms data, macros, and any buffered fax, Confidential Print, or Print and Hold data.

Access the Erase Hard Disk option from the Configuration menu or from the Embedded Web Server.

Using the Embedded Web Server

1. Click **Settings** > **Security** > **Restore Factory Defaults** > **Erase Hard Disk**.
2. Select the check box to confirm.
3. Select either of the following:
    - **Single Pass Erase**—Overwrite the hard disk in a single pass.
    - **Multiple Pass Erase**—Overwrite the hard disk with random bit patterns several times, followed by a verification pass. A secure overwrite is compliant with the DoD 5220.22-M standard for securely erasing data from a hard disk. Use this method when wiping highly confidential information.
4. Click **Submit**.

Using the control panel

1. Turn off the printer.
2. While turning on the printer, press and hold the **2** and **6** on the keypad simultaneously until a progress bar appears. It takes approximately a minute before the Configuration menu appears.

    Note: Some printer models require you to press and hold the check mark and the right arrow buttons.
3. From the list, select **Reset Factory Defaults** > **Erase Hard Disk** or **Erase All Information on Disk** depending on your printer model.
4. Select **Single Pass Erase** or **Multiple Pass Erase**.

Note: Do not turn off the printer while erasing hard disk data. This process may take several hours to complete.

Out-of-service wiping

This menu lets you clear all settings, applications, and pending job or fax data stored in the device, erase all contents on the hard disk, or both. Doing both restores the device to the original factory default settings, which includes network settings.

Out-of-service wiping allows users to erase the printer memory and completely wipe the hard disk in one process. When removing a device from a secure environment, we recommend performing this to make sure that no customer data remains.

Using the Embedded Web Server

1. Click **Settings** > **Security**.

   Note: Depending on your printer model, click **Restore Factory Defaults**.

2. Depending on your printer firmware version, click **Out of Service Erase** or **Out of Service Wiping**, and then select one or more of the following:

   - **Erase Printer Memory**—Erase all settings, applications, and job data.
   - **Erase Hard Disk**—Erase all the contents of the hard disk.
   - **Perform Disk Wipe**—Clear all job data.
   - **Clear Settings and Solutions**—Clear all settings and applications.

   Note: In some printer models, the Out of Service Wiping setting is visible only if security is enabled. Make sure that the access control for the security menus are set to use any security template other than No Security.

3. If you selected either Erase Hard Disk or Perform Disk Wipe, select either of the following:

   - **Single Pass Erase**—Erase the content on the printer hard disk in a single pass with a repeating bit pattern.
   - **Multiple Pass Erase**—Erase the content on the printer hard disk with random bit patterns several times, followed by a verification pass. A secure erase is compliant with the DoD 5220.22-M standard for securely erasing data from a hard disk. Highly confidential information should be erased using this method.

4. Confirm your selection.

5. Apply the changes.

Warning—Potential Damage: Do not turn off the printer while erasing data. This process may take several hours to complete.

Using the control panel

This menu is available only in some firmware versions.

1. Turn off the printer.

2. While turning on the printer, press and hold **2** and **6** on the keypad simultaneously until a progress bar appears.

   Note: Some printer models require you to press and hold the check mark and the right arrow buttons.

   The printer performs a power-on reset, and then the Configuration menu appears.

3. From the list, select **Reset Factory Defaults** > **Out of Service Erase**.

4 Select one of the following:

- **Erase Memory**—Erase all settings, applications, and job data.
- **Erase Memory and Hard Disk (Single Pass)**—Erase all settings, applications, and job data (including all the contents of the hard disk) in a single pass with a repeating bit pattern.
- **Erase Memory and Hard Disk (Multiple Pass)**—Erase all settings, applications, and job data (including all contents of the hard disk) with random bit patterns several times, followed by a verification pass. A secure erase is compliant with the DoD 5220.22-M standard for securely erasing data from a hard disk. Highly confidential information should be erased using this method.

5 Follow the instructions on the printer display.

Warning—Potential Damage: Do not turn off the printer while erasing data. This process may take several hours to complete.

Statement of volatility

Your printer contains various types of memory that are capable of storing device and network settings, information from embedded solutions, and user data. The types of memory—along with the types of data stored by each—are described as follows:

- **Volatile memory**—Your device utilizes standard random access memory (RAM) to temporarily buffer user data during simple print and copy jobs.
- **Non-volatile memory**—Your device may utilize two forms of non-volatile memory: EEPROM and NAND (flash memory). Both types are used to store the operating system, device settings, network information, scanner and bookmark settings, and embedded solutions.
- **Hard disk memory**—Some devices have a hard disk drive installed. The printer hard disk is designed for device-specific functionality and cannot be used for long term storage for data that is not print-related. The hard disk does not provide the capability for users to extract information, create folders, create disk or network file shares, or FTP information directly from a client device. The hard disk can retain buffered user data from complex scan, print, copy, and fax jobs, as well as form data, and font data.

You may want to erase the contents of the memory devices installed in your printer when:

- The printer is being decommissioned.
- The printer hard drive is being replaced.
- The printer is being moved to a different department or location.
- The printer is being serviced by someone from outside your organization.
- The printer is being removed from your premises for service.

Disposing of a hard disk

Note: Some printer models may not have a hard disk installed.

High-security environments may require additional steps to ensure that confidential data on the printer or hard disk cannot be accessed when either is removed from premises.

- **Degaussing**—Flushes the hard drive with a magnetic field that erases stored data
- **Crushing**—Physically compresses the hard disk to break component parts and render them unreadable
- **Milling**—Physically shreds the hard disk into small metal bits

Note: Most data can be erased electronically, but to guarantee that all data is completely erased, physically destroy each hard disk where data is stored.

Erasing volatile memory

The volatile memory (RAM) installed on your printer requires a power source to retain information. To erase the buffered data, simply turn off the device.

Erasing non-volatile memory

There are several methods for erasing data stored in non-volatile memory, depending on the type of memory device installed and the type of data stored.

- **Individual settings**—Erase individual printer settings using the control panel or the Embedded Web Server. For more information, see the printer *User's Guide*.
- **Device and network settings**—Erase device and network settings, and restore factory defaults by resetting the NVRAM from the configuration menu. You can also use the Restore Factory Defaults setting from the Embedded Web Server.
- **Security settings**—Restore factory defaults or erase security settings by selecting an action for the Security Reset Jumper setting in the Embedded Web Server. Then move the hardware jumper on the controller board.
- **Fax data**—If no hard disk is installed, or fax storage uses NAND, then erase fax settings and data by resetting the NVRAM from the configuration menu. You can also use the Restore Factory Defaults setting from the Embedded Web Server.

  Note: If your printer has a hard disk that has been partitioned for fax storage, then reformat that partition to erase fax data and settings.
- **Embedded solutions**—Erase information and settings associated with embedded solutions by uninstalling the solution, or by restoring factory defaults from the configuration menu. You can also use the Restore Factory Defaults setting from the Embedded Web Server.

Security solutions

Lexmark products support installable solutions that are developed to utilize the Embedded Solutions Framework (eSF) and Cloud Solutions Framework (cSF) platforms in the device. These solutions extend the basic capabilities of the device, often enhancing the security of the device or the customer environment. Some device models come with selected solutions pre-installed such as Common Criteria configured models.

Print Release

This solution consists of an externally hosted document management application and a device-resident application providing the local user interface for selecting and releasing print jobs. All documents are held in a print queue until their owners release them. The queue can be hosted on-premise or in the cloud, which offers more features and benefits. To release your documents, enter your credentials at the device, and then select the documents you want to print.

For more information on how to configure and use the application, see the documentation that came with the Lexmark^{TM} Print Management application.

Secure Held Print Jobs

This application prevents accidental exposure of sensitive or confidential business information by holding jobs at the printer until an authorized user releases the job for printing. You can send and store jobs on printers with hard disks and release them using a card or a PIN.

To clear all DRAM used to store job data after a job is completed, from Advanced Settings, enable **Clear Print Data**.

For more information on configuring and using the application, see *Secure Held Print Jobs Administrator’s Guide*.

Card Authentication

Lexmark devices support a number of different contactless card solutions (applications) for basic badge authentication where your identity is linked to your ID badge. The application verifies the badge ID and retrieves your user information so that it can be used for accessing held print jobs. It can also be used for identifying the source of scanned documents or identifying you for other identification purposes.

The application is designed to work with a card reader driver application. The card reader driver provides card ID data to other solutions that manage workflows, or access to device functions. The background and idle screen control application is also included to restrict control of the operator panel primary menus.

For more information on how to configure and use the application, see *Card Authentication Administrator’s Guide*.

Smart Card authentication

The Common Access Card (CAC) and Personal Identity Verification (PIV) authentication solution extends the card authentication applications to provide safe workflow processes throughout federal government operations. The solution provides more control over the security of networked Lexmark MFPs. The same solution also supports SIPR token cards (using a different card interface application) to provide access over the Secret Internet Protocol Router Network.

For more information on how to configure and use this application, see *Smart Card Authentication Administrator’s Guide*.

Security scenarios

Scenario: Printer in a public place

To provide simple protection for a printer located in a public space, such as a lobby, use a password and PIN. Administrators can assign a single password or PIN for all authorized users of the device, or separate codes to protect individual functions. Anyone who knows a password or PIN can access any functions protected by that code.

Setting up simple-security devices

1. From the Embedded Web Server, click **Settings** > **Security** > **Panel PIN Protect**.
2. Enter a user PIN, and then reenter the PIN to confirm it.
3. Enter an administrator PIN, and then reenter the PIN to confirm it.
4. Click **Modify**.
5. Select the appropriate security template setting for each function you want to protect.
6. Click **Submit**.

Notes:

- When an access control is set to user PIN, any administrator PIN set for your printer is valid for that access control. For more information, see “Simple-security device access controls” on page 8.
- You can also create a Web Page password for the administrator to restrict access to the security settings. For more information, see “Creating a Web page password and applying access control restrictions” on page 8.

Setting up advanced-security devices

1. Create a building block password or PIN.
   a. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.
   b. Under Advanced Security Setup, click either **PIN** or **Password**, and then configure it.
   c. Click **Submit**.

Note: For more information, see “Creating a password building block for advanced security setup” on page 10 and “Creating a PIN building block for advanced security setup” on page 11.

2. Create a security template.
   a. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup** > **Security Template** > **Add a Security Template**.
   b. Type a security template name containing up to 128 characters. It can be helpful to use a descriptive name, such as ”Administrator_Only” or “Common_Functions_Template.”
   c. From the Authentication Setup menu list, select the PIN or password created in step 1.
   d. Save the template.

3. Assign security templates to access controls.
   1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup** > **Access Controls**.
   2. If necessary, expand or click a specific folder to view a list of available functions.
   3. From the drop-down menu next to the name of each function you want to protect, select the security template created in step 2.
   4. Click **Submit**.

Note: To gain access to any function controlled by this security template, users are required to enter the appropriate PIN or password.

Scenario: Standalone or small office

Note: This feature is available only in advanced-security devices.

Create and store internal accounts within the Embedded Web Server for authentication or authorization in the following conditions

- Your printer is not connected to a network.
- You do not use an authentication server to grant users access to devices.

For small office usage, an internal account building block should be defined. Each user is added as an entry in the internal account. You can set up multiple groups (for example, admin, managers, function1, function2) with each user associated with one or more groups. You can define one or more templates. Within a template definition, specify the authorization as the internal account building block name and then the groups that have that authorization. Then specify the access controls for each template.

Step 1: Set up individual user accounts

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup**.
2. Under Advanced Security Setup, click **Internal Accounts**, and then configure it.

   For more information on configuring individual user accounts, see “Setting up internal accounts” on page 11.

Step 2: Create a security template

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup** > **Security Template** > **Add a Security Template**.
2. Type a security template name containing up to 128 characters. It can be helpful to use a descriptive name, such as ”Administrator_Only” or “Common_Functions_Template.”
3. From the Authentication Setup menu, select a building block method for authenticating users. This list is populated with the authentication building blocks that have been configured on the device.

   Note: Certain building blocks (such as PINs and passwords) do not support separate authorization.
4. To use authorization, click **Add authorization**, and then select a building block from the Authorization Setup menu. This list is populated with the authorization building blocks available on the device.

   Note: Certain building blocks (such as PINs and passwords) do not support separate authorization.

5. To use authorization groups, click **Modify Groups**, and then select one or more groups to include in the security template.
6. Save the template.

Step 3: Assign security templates to access controls

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup** > **Access Controls**.
2. If necessary, click **Expand All** or click a specific folder to view a list of available functions.
3. Select a security template for each function you want to protect.
4. Click **Submit**.

Note: Users are now required to enter the appropriate credentials to access any function controlled by a security template.

Scenario: Network running Active Directory

Note: This feature is available only in advanced-security devices.

On networks running Active Directory, administrators can use the LDAP+GSSAPI capabilities of the device to use the authentication and authorization services deployed on the network. User credentials and group designations can be pulled from the existing network, making access to the printer as seamless as other network services. The device automatically downloads the domain controller CA certificate chain.

Before configuring the Embedded Web Server to integrate with Active Directory, check the following:

- Domain name
- User ID (for the domain)
- Password (for the User ID)

For more information, see “Connecting your printer to an Active Directory domain” on page 13.

Create a security template

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup** > **Security Template** > **Add a Security Template**.
2. Type a security template name containing up to 128 characters. It can be helpful to use a descriptive name, such as ”Administrator_Only” or “Common_Functions_Template.”
3. From the Authentication Setup list, select the name given to your authentication client application or building block setup.
4. Click **Add authorization**, and then select the name given to your authentication client application or building block setup.
5. To use groups, click **Modify Groups**, and then select one or more of the groups listed in your Active Directory Group Names list.
6. Save the template.

Assign security templates to access controls

1. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup** > **Access Controls**.
2. Select the newly created security template for each function you want to protect.
3. Click **Submit**.

Note: Users are required to enter the appropriate credentials in order to gain access to any function controlled by the security template.

Scenario: More security-aware environment (802.1X) and SNMPv3

In this scenario, the network uses 802.1X communication to restrict network access, and secure LDAP to enforce authentication and authorization for access of device functions. Also, device access is logged and the device is remotely managed using SNMPv3.

1. Load a CA certificate for the authority you want into the device. For more information, see "Installing a Certificate Authority certificate on the device" on page 24.
2. Create the CA-signed device certificate and load it into the device. For more information, see "Configuring the device for certificate information" on page 25.
3. Set up a secure a connection using the 802.1X authentication. Make sure that the usage of 802.1X is specified in the CA-signed certificate. For more information, see "Configuring 802.1X authentication" on page 39.
4. To allow remote management of SNMPv3, enable SNMPv3, and then disable SNMPv1,2. For more information, see "Setting up SNMP" on page 30.

   Note: Specify the user credentials for Read/Write and optionally Read/Only users. We recommend setting the authentication level to **Authentication, Privacy**.
5. Configure audit logging. For more information, see "Configuring security audit log settings" on page 31. Remote system log for events can be specified by identifying the syslog server and selecting the appropriate settings. We recommend specifying an e-mail address for the administrator and selectingn the events to be e-mailed.
6. Set up secure LDAP authentication and authorization. For more information, see "Using LDAP" on page 15.

   Note: Specify the LDAP setup name, server address, port, and other appropriate settings. To enhance security, use a TLS or SSL/TLS connection.
7. Create one or more security templates using the LDAP building block, and then assign them to the appropriate access controls. For more information, see "Using a security template to control function access" on page 20.

Scenario: Network-based usage restrictions using access card

Note: Before your begin, make sure that the Smart Card Authentication bundle is installed.

In this scenario, the network uses an Active Directory environment. A SIPR access card and a password are used for device authentication and authorization. Device access is audited and the device is remotely managed using SNMPv3. All ports except the HTTPS (443) port and the SNMPv3 port are blocked.

1. Configure the Active Directory domain. For more information, see "Connecting your printer to an Active Directory domain" on page 13.

   Make sure to specify the following:

   - Domain name
   - User ID
   - Password

   Note: Make sure to enable **CA Certificate Monitoring**.

2. Specify an LDAP building block and security template, and then configure CA certificate monitoring. For more information, see "Setting up a Certificate Authority certificate monitor" on page 27.

3. Configure the Smart Card Authentication bundle. For more information, see *Smart Card Authentication Administrator's Guide*.

   Note: To secure access to all applications and printer functions on the home screen, configure Background and Idle Screen. For more information, see *Background and Idle Screen Administrator's Guide*.

4. To secure a network, restrict all network connections that are not used. For more information, see "Configuring the TCP/IP port access setting" on page 42.

5. To allow remote management of SNMPv3, enable SNMPv3, and then disable SNMPv1,2. For more information, see "Setting up SNMP" on page 30.

   Note: Specify the user credentials for Read/Write and optionally Read/Only users. It is recommended that authentication level is set to **Authentication, Privacy**.

6. Configure the audit logging. For more information, see "Configuring security audit log settings" on page 31. You can specify a remote system log for events by identifying the syslog server and selecting the appropriate settings. We recommend specifying an e-mail address for the administrator and selecting the events to be e-mailed.

7. Create one or more security templates using the LDAP building block, and then assign them to the appropriate access controls. For more information, see "Using a security template to control function access" on page 20.

Troubleshooting

Login troubleshooting

USB device is not supported

Make sure that a supported smart card reader is attached

Remove the unsupported reader and attach a valid reader. For information on the supported readers, contact your Lexmark representative.

Printer home screen fails to return to a locked state when not in use

Try one or more of the following:

Make sure that the authentication token is installed and running

1. From the Embedded Web Server, click **Settings** > **Apps** > **Apps Management**.
2. Make sure that the authentication token appears in the list of installed solutions and that it is in a “Running” state.
   - If the authentication token is installed but is not running, then select the check box next to the application name, and then click **Start**.
   - If the authentication token does not appear in the list of installed solutions, then contact the Solutions Help Desk for assistance.

Make sure that Smart Card Authentication is installed and running

1. From the Embedded Web Server, click **Settings** > **Apps** > **Apps Management**.
2. Make sure that the Smart Card Authentication solution appears in the list of installed solutions and that it is in a

   "Running" state
   - If Smart Card Authentication is installed but is not running, then select the application name, and then click **Start**.
   - If the authentication token does not appear in the list of installed solutions, then contact the Solutions Help Desk for assistance.

Login screen does not appear when a smart card is inserted

Make sure that the smart card is recognized by the reader

Contact the Solutions Help Desk for assistance.

KDC and MFP clocks are out of sync

This error indicates that the printer clock is more than five minutes out of sync with the domain controller clock.

Make sure that the date and time settings on the printer are correct

1. From the Embedded Web Server, click **Settings** > **Security** > **Set Date and Time**.
2. If you have manually configured date and time settings, then adjust the settings if necessary. Make sure that the time zone and daylight saving time settings are correct.

   Note: If your network uses DHCP, then make sure that NTP settings are not automatically provided by the DHCP server before manually configuring NTP settings.
3. If the printer uses an NTP server, then make sure that those settings are correct and that the NTP server is functioning correctly.
4. Apply the changes.

Kerberos configuration file is not uploaded

This error occurs when Smart Card Authentication is configured to use the Device Kerberos Setup, but no Kerberos file has been uploaded.

Make sure that the Kerberos file has been uploaded

1. From the Embedded Web Server, click **Settings** > **Apps** > **Apps Management** > **Smart Card Authentication** > **Configure**.
2. If you are using Simple Kerberos Setup, then clear the **Use Device Kerberos Setup** check box, and then apply the changes.
3. If you are using a Kerberos configuration file, then do the following:
   - a From the Embedded Web Server, click **Settings** > **Security** > **Security Setup** > **Kerberos 5**.
   - b Under Import Kerberos File, browse to the krb5.conf file, and then click **Submit**.

Unable to authenticate users

Make sure that the Realm specified in the Kerberos settings is in uppercase

1. From the Embedded Web Server, click **Settings** > **Apps** > **Apps Management** > **Smart Card Authentication** > **Configure**.
2. For Simple Kerberos Setup, make sure that the Realm is correct and typed in uppercase.
3. If you are using krb5.conf file, then make sure that the Realm entries in the configuration file are in uppercase.

Domain controller certificate is not installed

Make sure that the correct certificate is installed on the printer

For more information, see “Managing certificates and other settings” on page 24.

KDC did not respond within the required time

Try one or more of the following:

Make sure that the IP address or host name of the KDC is correct

1. From the Embedded Web Server, click **Settings** > **Apps** > **Apps Management** > **Smart Card Authentication** > **Configure**.
2. For Simple Kerberos Setup, make sure that the IP address or host name specified for the Domain Controller is correct, and then apply the changes.
3. If you are using a krb5.conf file, then make sure that the IP address or host name specified for the Domain Controller is correct.

Make sure that the KDC is available

You can specify multiple KDCs in the Smart Card Authentication settings or in the krb5.conf file.

Make sure that Port 88 is not blocked by a firewall

Port 88 must be opened between the printer and the KDC for authentication to work.

User realm not found in the Kerberos configuration file

Make sure that the Windows Domain is specified in the Kerberos settings

1. From the Embedded Web Server, click **Settings** > **Apps** > **Apps Management** > **Smart Card Authentication** > **Configure**.
2. Under Simple Kerberos Setup, add the Windows® domain in lowercase to the Domain setting.

   For example, if the Domain setting is **`mil,.mil`** and the Windows domain is **`x.y.z`**, then change the Domain setting to **`mil,.mil,x.y.z`**.
3. If you are using a krb5.conf file, then add an entry to the domain_realm section. Map the lowercase Windows Domain to the uppercase realm (similar to the existing mapping for the “mil” domain).

Cannot find realm on card in the Kerberos configuration file

This error occurs during smart card login.

Upload a Kerberos configuration file and make sure that the realm has been added to the file

The Smart Card Authentication settings do not support multiple Kerberos Realm entries. If multiple realms are needed, then create and upload a krbf5.conf file containing the needed realms. If you are already using a Kerberos configuration file, then make sure that the missing realm is added to the file correctly.

Client is unknown

This error indicates that the KDC being used to authenticate the user does not recognize the User Principal Name specified in the error message.

Make sure that the Domain Controller information is correct

1. From the Embedded Web Server, click **Settings** > **Apps** > **Apps Management** > **Smart Card Authentication** > **Configure**.
2. For Simple Kerberos Setup, make sure that the IP address or host name of the Domain Controller is correct.
3. If you are using a Kerberos configuration file, then make sure that the Domain Controller entry is correct.

Login does not respond at “Getting User Info”

For information on LDAP-related issues, see“LDAP troubleshooting” on page 63.

User is logged out automatically

Increase the Panel Login Timeout interval

1. From the Embedded Web Server, click **Settings** > **Security** > **Miscellaneous Security Settings** > **Login Restrictions**.
2. Increase the time (in seconds) of the Panel Login Timeout setting.
3. Apply the changes.

LDAP troubleshooting

LDAP lookups take a long time and then fail

This issue can occur during login (at “Getting User Info”) or during address book searches. Try one or more of the following:

Make sure that Port 389 (non-SSL) and Port 636 (SSL) are not blocked by a firewall

The printer uses these ports to communicate with the LDAP server. The ports must be open for LDAP lookups to work.

Make sure that the LDAP search base is not too broad in scope

Narrow the LDAP search base to the lowest possible scope that includes all necessary users.

LDAP lookups fail almost immediately

Try one or more of the following:

Make sure that the Address Book Setup contains the host name for the LDAP server

1. From the Embedded Web Server, click **Settings** > **Network/Ports** > **Address Book Setup**.
2. Make sure that the host name (not the IP address) of the LDAP server specified in the Server Address field is correct.
3. Apply the changes.

Make sure that the Address Book Setup settings are correct

1. From the Embedded Web Server, click **Settings** > **Network/Ports** > **Address Book Setup**.
2. If necessary, modify the following settings:
   - **Server Port**—Set this port to 636.
   - **Use SSL/TLS**—Select **SSL/TLS**.
   - **LDAP Certificate Verification**—Select **Never**.
3. Apply the changes.

Narrow the LDAP search base to the lowest possible scope that includes all necessary users

Make sure that the LDAP attributes for the user e-mail address and home directory are correct

Held Jobs / Print Release Lite troubleshooting

Cannot use the Held Jobs / Print Release feature

Add the user to the appropriate Active Directory group

If user authorization is enabled for Held Jobs, then add the user to an Active Directory group that is included in the authorization list for the Secure Held Print Jobs function.

Cannot determine Windows user ID

Make sure that Smart Card Authentication sets the user ID for the session

1. From the Embedded Web Server, click **Settings** > **Apps** > **Apps Management** > **Smart Card Authentication** > **Configure**.
2. From the User Session and Access Control section, for the Session Userid setting, specify how to obtain the Windows user ID when logging in:
   - **None**—The user ID is not set. Select this option if the user ID is not needed by other applications.
   - **User Principal Name**—The smart card principal name or the credential provided by manual login is used to set the user ID (userid@domain).

- **EDI-PI**—The user ID portion of the smart card principal name or the credential provided by manual login is used to set the user ID.
- **LDAP Lookup**—The user ID is retrieved from Active Directory.

3 Apply the changes.

No jobs available for user

Try one or more of the following:

Make sure that the Smart Card Authentication sets the correct user ID

1 From the Embedded Web Server, click **Settings** > **Apps** > **Apps Management** > **Smart Card Authentication** > **Configure**.

2 From the User Session and Access Control section, select **LDAP Lookup** for the Session UserID setting.

3 Apply the changes.

Make sure that the jobs were sent to the correct printer and were printed

The jobs may have been sent to a different printer, or automatically deleted because they were not printed quickly enough.

Jobs are printing immediately

Try one or more of the following:

Make sure that Secure Held Print Jobs is installed and running

1 From the Embedded Web Server, click **Settings** > **Apps** > **Apps Management**.

2 Verify that the Secure Held Print Jobs solution appears in the list of installed solutions and that it is in a “Running” state.

- If Secure Held Print Jobs is installed but is not running, then select the check box next to the application name, and then click **Start**.
- If Secure Held Print Jobs does not appear in the list of installed solutions, then contact the Solutions Help Desk for assistance.

Make sure that all jobs are required to be held

1 From the Embedded Web Server, click **Settings** > **Apps** > **Apps Management** > **Secure Held Print Jobs** > **Configure**.

2 From the Advanced Settings section, enable **Require All Jobs to be Held** and **Clear Print Data** .

3 Apply the changes.

Appendix

Appendix A: CA file creation

Note: This example of generation of a CA file for the Certificate Authority assumes usage of a Windows Certificate Authority server.

1. Point the browser window to the CA. Make sure to use the URL, http//<CA's address>/CertSrv, where **CA's address** is the IP address or host name of the CA server.

   Note: Before the CA Web page opens, a Windows login window may pop up and request user credentials to verify that you have access to the CA Web page.

2. Click **Download a CA certificate, certificate chain, or CRL**.
3. Click **Base 64 encoded**, and then click **Download CA Certificate**.

   Note: DER encoding is not supported.

4. Save the certificate that is offered in a file. The file name is arbitrary, but the extension should be ".pem".

Appendix B: CA-Signed Device Certificate creation

Note: This example of generation of a CA file for the Certificate Authority assumes usage of a Windows Certificate Authority server.

1. Point the browser window to the CA. Make sure to use the URL, http//<CA's address>/CertSrv, where **CA's address** is the IP address or host name of the CA server.
2. Click **Request a certificate**.
3. Click **advanced certificate request**.
4. Click **Submit a certificate request by using a base-64-encoded**.
5. Paste the (.csr prompted) information copied from the device into the Saved Request field, and then select a Web Server-type certificate template.
6. Click **Submit**.

   Note: The server takes a moment or two to process the request, and then presents a dialog window.

7. Select **Base 64 encoded**, and then click **Download Certificate**.

   Note: DER encoding is not supported.

8. Save the certificate that is offered in a file. The file name is arbitrary, but the extension should be ".pem".

Appendix C: Automatic Certificate Enrollment Application

This application, after installation, will automatically create a device certificate signing request and pass the signing request on to the Certificate authority (CA) for approval. It will then retrieve the CA signed device certificate, and then install the certificate. The previous manual process is replaced by a simple process with only limited initial setup required.

For this application to function, the device must be joined to an Active Directory environment and a Certificate Enrollment Web Services (Server Role) application needs to be installed on the customer's network.

Note: The example usage instructions given below assume the Certificate Enrollment Web Services is installed on a Windows 2008 R2 server.

1. Open a Web browser, and then type the IP address or host name of the printer in the address field.
2. From the Embedded Web Server, click **Settings** > **Security** > **Certificate Management** > **Device Certificate Management**.
3. Click **Advanced Management** to use the Automatic Certificate Enrollment application, and then click **Request new Certificate**.

   Note: The screen may refresh for 10 to 15 seconds. At this time, the device is contacting the Certificate Enrollment Web Service on the server and capturing the certificate templates that are available to the device.
4. From the "Device Certificate Management > Advanced > Templates" page, select any of the following displayed template options to use when requesting a certificate:
   - **IPSec**—If you want to install a device certificate that is used for IPSec negotiations.
   - **Web Server**—If you want to secure any SSL/TLS connections such as the EWS or LDAP over SSL.
   - **RAS and IAS Server**—If you want to install a device certificate that is used for 802.1X negotiations.
5. Click **Request Certificate**. From this screen, you will customize the certificate for this device.

   Note: If you want to view the template details first, then click **View** instead of **Request Certificate**.
6. Modify the settings from the Request Certificate Web page, but only when necessary.

   Notes:

   - The fields that are filled in with the data and the selected check boxes are the template defaults that were pulled from the CA. You can change them if you choose, but remember that the default templates are generally configured with the appropriate settings by the CA administrator and changing some settings may cause the request to be denied.
   - The "Collapse/Expand Subject Name" fields link is used to change any of the device information that is used to create or generate a certificate. This includes the same information as the Set Certificate Defaults link under Certificate Management.
7. Click Submit to send the Certificate Signing Request (CSR) to the CA.

   Note: The screen may refresh for 10 to 15 seconds. At this time, the device is contacting the Certificate Enrollment Web Service requesting the CA signed certificate be generated.
8. If successful, you will return to the "Device Certificate Management > Advanced" Web page and the new CA-signed device certificate with the specified name will be included in the list of certificates. If not, an error message is displayed.

   Note: If a template is specified at the server to require CA administrator approval, then a separate table of pending certificates is displayed and a message indicating that a request is pending admin approval will be displayed on the Device Certificate Management screen where the certificate is listed. The certificate is not valid until approved. Once approval is granted, the message will disappear and the certificate(s) will be displayed in the installed certificates table.

The link with the certificate name can be selected if you would like to see the information associated with the new certificate. The "Renew" link is used to renew the certificate when the current CA certificate is about to expire (default of 2 years).

To specify that certificates that are about to expire are automatically renewed, in the Configure tab on the “Settings > Apps > App Management” Web page for the Automatic Enrollment application, select the check box for Automatically Update Certificates, specify the number of days before expiration for the Auto Renewal Threshold setting, and then click **Apply**.

Appendix D: Access controls

Note: Depending on the device type and installed options, some access controls (referred to on some devices as Function Access Controls) may not be available for your printer.

Administrative Menus

Function access control	What it does
Configuration Menu	This protects access to the Configuration Menu.
Manage Shortcuts at the Device	This protects access to the Manage Shortcuts section of the Settings menu from the printer control panel.
Manage Shortcuts Remotely	This protects access to the Manage Shortcuts section of the Settings menu from the Embedded Web Server.
Network/Ports Menu at the Device	This protects access to the Network/Ports section of the Settings menu from the printer control panel.
Network/Ports Menu Remotely	This protects access to the Network/Ports section of the Settings menu from the Embedded Web Server.
Option Card Configuration at the Device	This controls access to the Option Card Configuration section of the Settings menu from the printer control panel. This applies only when an Option Card with configuration options is installed on the device.
Option Card Configuration Remotely	This controls access to the Option Card Configuration section of the Settings menu from the Embedded Web Server. This applies only when an Option Card with configuration options is installed on the device.
Paper Menu at the Device	This protects access to the Paper menu from the printer control panel.
Paper Menu Remotely	This protects access to the Paper menu from the Embedded Web Server.
Reports Menu at the Device	This protects access to the Reports menu from the printer control panel.
Reports Menu Remotely	This protects access to the Reports menu from the Embedded Web Server.
Security Menu at the Device	This protects access to the Security menu from the printer control panel.
Security Menu Remotely	This protects access to the Security menu from the Embedded Web Server.
Service Engineer Menus at the Device	This protects access to the Service Engineer menu from the printer control panel.
Service Engineer Menus Remotely	This protects access to the Service Engineer menu from the Embedded Web Server.
Settings Menu at the Device	This protects access to the General and Print Settings sections of the Settings menu from the printer control panel.
Settings Menu Remotely	This protects access to the General and Print Settings sections of the Settings menu from the Embedded Web Server.

Management

Function access control	What it does
Firmware Updates	This controls the ability to update firmware from any source other than a flash drive. Firmware files that are received through FTP, the Embedded Web Server, etc., will be ignored (flushed) when this function is protected.
Operator Panel Lock	This protects access to the locking function of the printer control panel. If this is enabled, then users with appropriate credentials can lock and unlock the printer touch screen. In a locked state, the touch screen displays only the "Unlock Device" icon, and no further operations can be performed at the device until appropriate credentials are entered. Once unlocked, the touch screen will remain in an unlocked state even if the user logs out of the device. To enable the control panel lock, the user must select the "Lock Device" icon, and then enter the appropriate credentials.
PJL Device Setting Changes	When disabled, all device settings changes requested by incoming print jobs are ignored.
Remote Management	This controls access to printer settings and functions by remote management tools such as MarkVision^{TM}. When protected, no printer configuration settings can be altered except through a secured communication channel (such as that provided by a properly configured installation of MarkVision).
Apps Configuration	This controls access to the configuration of any installed applications.
Web Import/Export Settings	This controls the ability to import and export printer settings files (UCF files) from the Embedded Web Server.
Configuration Files Import/Export	This controls the ability to import and export settings and security configuration files.
Internet Printing Protocol (IPP)	This controls the ability to use the IPP.

Function Access

Function access control	What it does
Address Book	This controls the ability to perform address book searches in the Scan to Fax and Scan to E-mail functions.
Cancel Jobs at the Device	This controls the ability to cancel jobs from the printer control panel.
Change Language from Home Screen	This controls access to the Change Language feature from the printer control panel.
Color Dropout	This controls the ability to use the Color Dropout feature for scan and copy functions.
Copy Color Printing	This controls the ability to perform color copy functions. Users who are denied will have their copy jobs printed in black and white.
Copy Function	This controls the ability to use the Copy function.
Create Bookmarks at the Device	This controls the ability to create new bookmarks from the printer control panel.
Create Bookmarks Remotely	This controls the ability to create new bookmarks from the Bookmark Setup section of the Settings menu on the Embedded Web Server.
Create Profiles	This controls the ability to create new profiles.
E-mail Function	This controls access to the Scan to E-mail function.

Function access control	What it does
Fax Function	This controls access to the Scan to Fax function.
Flash Drive Color Printing	This controls the ability to print color from a flash drive. Users who are denied will have their print jobs printed in black and white.
Allow Flash Drive Access	This controls the ability to access the flash drive.
Flash Drive Print	This controls the ability to print from a flash drive.
Flash Drive Scan	This controls the ability to scan documents to a flash drive.
FTP Function	This controls access to the Scan to FTP function.
Held Jobs Access	This protects access to the Held Jobs function.
PictBridge Printing	This controls the ability for some devices to print from an attached PictBridge-enabled digital camera. **Note:** Selected devices only.
Release Held Faxes	This controls the ability to release (print) held faxes.
Use Profiles	This controls access to profiles, such as scanning shortcuts, workflows, and eSF applications.

Device Applications

Function access control	What it does
New Apps	This controls the initial security profile of each application-specific access control installed on the printer.
App 1–10	The App 1 through App 10 access controls can be assigned to installed eSF applications and profiles created by LDSS. The access control for each application is assigned in the creation or configuration of the application or profile.

Notes:

- Depending on the applications you have installed, additional application-specific access controls may be listed below apps 1–10. Use these additional access controls if they are available for your installed applications. If no additional solution-specific access controls are available, then assign one of the ten numbered access controls to each application you want to protect.
- Some applications may be included with printers as default configurations and appear as function access control selections.

Appendix E: Common Criteria configuration

Overview

This guide describes how to configure a supported Lexmark printer to reach Common Criteria Target of Evaluation. Carefully follow the instructions in this guide to make sure that the device meets the requirements of the evaluation.

Supported printers

MFPs with a hard disk

- Lexmark CX510h
- Lexmark MX511h
- Lexmark MX611h
- Lexmark MX710h
- Lexmark MX711h
- Lexmark MX810
- Lexmark MX811
- Lexmark MX812
- Lexmark MX910
- Lexmark MX911
- Lexmark MX912
- Lexmark XM7155
- Lexmark XM7163
- Lexmark XM7170
- Lexmark XM9145
- Lexmark XM9155
- Lexmark XM9165
- Lexmark XC2132

MFPs without a hard disk

- Lexmark CX410
- Lexmark CX510
- Lexmark MX410
- Lexmark MX510
- Lexmark MX511
- Lexmark MX610
- Lexmark MX611
- Lexmark MX710
- Lexmark MX711
- Lexmark XM1145
- Lexmark XM3150
- Lexmark XM5163
- Lexmark XM5170

SFPs

- Lexmark CS510
- Lexmark M3150
- Lexmark M5155
- Lexmark M5163
- Lexmark M5170

- Lexmark MS610E
- Lexmark MS810E
- Lexmark MS812E

Note: MFPs support copy, e-mail, fax, and printing features. SFPs support printing features only. Printers with a hard disk support hard disk features. This guide describes the configuration of features that are not available on all printers.

Before configuring the printer (required)

Checking physical interfaces and installed firmware

1. Inspect the printer to make sure that only one network interface is installed. There should be no optional network, parallel, or serial interfaces.

   Note: USB ports that perform document processing functions are disabled at the factory.

2. Turn on the printer.
3. Navigate to the menu screen, and then touch **Reports** > **Menu Settings Page**.

   Note: A device information page is printed.

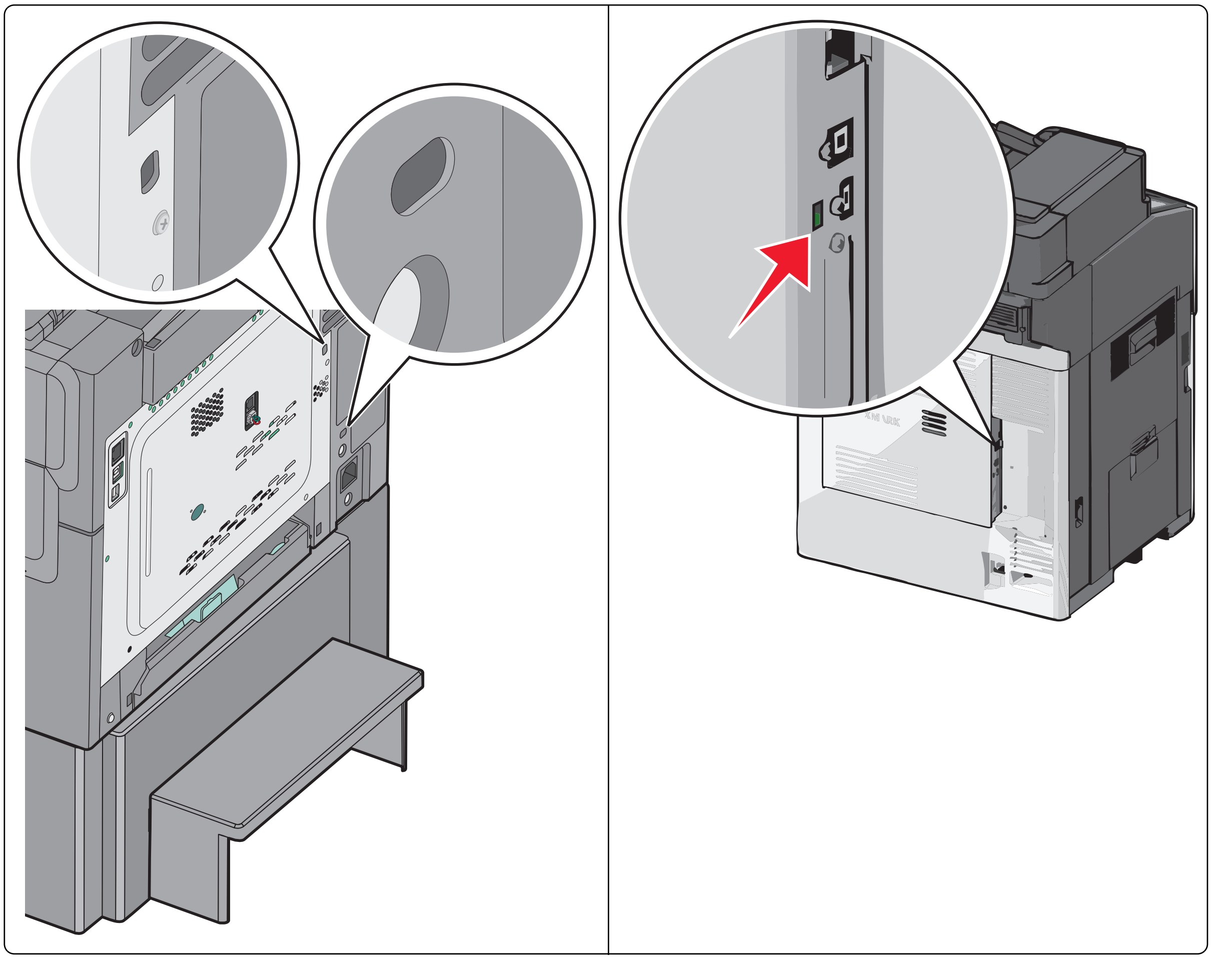
4. In the Installed Features section, make sure that there are no Download Emulator (DLE) option cards installed.
5. If you find more interfaces, or if a DLE card is installed, then contact your Lexmark representative before proceeding.
6. To check the firmware version, from the Device Information section, locate **`Base =`** and **`Network =`**.
7. To check if the Base and Network values are correct and up-to-date, contact your Lexmark representative.

Attaching a lock

Once a lock is attached, the metal plate and controller board cannot be removed, and the security jumper cannot be accessed without causing visible damage to the device.

1. Make sure that the printer case is closed.
2. Locate the security slot, and then attach a lock. It is the same type of security slot found on most laptop computers and can normally be found on the back of the printer near an outside edge.

   The following illustrations show the most common security slot locations:



Encrypting the hard disk

If a hard disk is present, then it must be encrypted. For more information, see “Disk encryption” on page 44.

Disabling the USB buffer

This feature disables the USB client port on the back of the device.

1. Navigate to the menu screen, and then touch **Network/Ports** > **Standard USB**.
2. In the USB Buffer field, enter **0** or select **Disabled**.
3. Apply the changes.

Installing the minimum Common Criteria configuration

Configuring disk wiping

Disk wiping removes residual confidential material from the printer. It uses random data patterns to securely overwrite files stored on the hard disk that have been marked for deletion. Multiple-pass wiping is compliant with the DoD 5220.22-M standard for securely erasing data from a hard disk.

1. Navigate to the screen menu, and then touch **Security** > **Disk Wiping**.
2. Make sure that Wiping Mode to **Auto**.
3. Set Automatic Method to **Multi-pass**.
4. Touch **Submit**.

Enabling the backup password (optional)

Note: Using a backup password is strongly discouraged because it can degrade the overall security of your printer.

For more information on how to configure a backup password security, see “Setting a backup password” on page 29.

Creating user accounts

To create accounts for use with the evaluated configuration, assign user IDs, password, and groups to users. When configuring security templates, select one or more of these groups, and apply a security template to each device.

Step 1: Defining groups

Create either two or four groups depending on whether there is a need to grant access to some administrative functions while restricting others with names and functions. For more information on how to set up user groups, see “Setting up internal accounts” on page 11.

Scenario 1: Using two groups

Select	For
Administrator_Only	Administrators allowed to access all device functions
Authenticated_Users	• Administrators • Non-administrators (all other users)

Scenario 2: Using multiple groups

Select	For
Administrator_Only	Administrators allowed to access all device functions
Administrator_Reports	• Administrators allowed to access all device functions • Administrators allowed to use device functions and access the Reports menu

Select	For
Administrator_Security	• Administrators allowed to access all device functions • Administrators allowed to use device functions and access the Security menu
Authenticated_Users	• Administrators allowed to access all device functions • Administrators allowed to use device functions and access the Reports menu • Administrators allowed to use device functions and access the Security menu • Non-administrators (all other users)

Step 2: Creating accounts

You can add multiple user accounts as needed. For more information, see "Setting up internal accounts" on page 11.

When selecting the groups associated with an account, take note of the following:

- For users with administrative privileges, select the "Authenticated_Users" group and one or more administrator groups, if necessary. For multiple groups with access to specific device functions, select all groups from which the administrator is included.
- For other users, select only the "Authenticated_Users" group.

Creating security templates

Assign a security template to each device function to restrict user access to that function. At a minimum, create two security templates: one for "Administrator_Only" and one for "Authenticated_Users." To allow access to some administrative functions while restricting others, create more security templates, such as "Administrator_Reports" or "Administrator_Security." Each template is populated with groups containing users authorized to access the functions protected by that template.

1. Navigate to the menu screen, and then touch **Security** > **Edit Security Setups** > **Edit Security Templates** > **Add Entry**.
2. Type a unique name to identify the template. Use a descriptive name, such as "Administrator_Only" or "Authenticated_Users," and then touch **Done**.
3. On the Authentication Setup screen, select the internal accounts building block, and then touch **Done**.
4. On the Authorization Setup screen, select the internal accounts building block, and then touch **Done**.
5. Select one or more groups to be included in the template, and then touch **Done**.

Note: You can also configure security templates using the device Embedded Web Server. For more information, see "Using a security template to control function access" on page 20.

Controlling access to device functions

Access to device functions can be restricted by applying security templates to individual functions. For more information, see "Using a security template to control function access" on page 20. For a list of access controls and what they do, see "Appendix D: Access controls" on page 68.

Levels of protection include the following:

- **Administrator access only**—Use an internal account or a security template that provides administrator-only authentication and authorization.
- **Authenticated users only**—Use an internal account or a security template that provides access to authenticated users only. These access controls must not be set to **No Security**.
- **Disabled**—Disable access to a function for all users and administrators.
- **Not applicable**—Another setting disables the function. No change is required, although we recommend setting these access controls to **Administrator access only** or **Disabled**.

Access controls and required levels of protection

Access control	Level of protection
Security Menu at the Device	Administrator access only
Security Menu Remotely	Administrator access only
Service Engineer Menus at the Device	Administrator access only
Service Engineer Menus Remotely	Administrator access only
Configuration Menu	Disabled
Paper Menu at the Device	Authenticated users only
Paper Menu Remotely	Authenticated users only
Reports Menu at the Device	Administrator access only
Reports Menu Remotely	Administrator access only
Settings Menu at the Device	Administrator access only
Settings Menu Remotely	Administrator access only
Network/Ports Menu at the Device	Administrator access only
Network/Ports Menu Remotely	Administrator access only
Manage Shortcuts at the Device	Authenticated users only
Manage Shortcuts Remotely	Authenticated users only
Supplies Menu at the Device	Authenticated users only
Supplies Menu Remotely	Authenticated users only
Option Card Configuration at the Device	Administrator access only
Option Card Configuration Remotely	Administrator access only
Web Import/Export Settings	Disabled
Apps Configuration	Administrator access only
Remote Management	Disabled
Firmware Updates	Disabled or Administrator access only
PJL Device Setting Changes	Disabled
Operator Panel Lock	Authenticated users only
Configuration File Import/Export	Disabled or Administrator access only

Access control	Level of protection
Internet Printing Protocol (IPP)	Disabled
Address Book	Authenticated users only
Create Profiles	Disabled
Create Bookmarks at the Device	Disabled
Create Bookmarks Remotely	Disabled
Flash Drive Print	Disabled
Flash Drive Color Printing	Disabled
Flash Drive Scan	Disabled
Copy Function	Authenticated users only
Copy Color Printing	Authenticated users only
Allow Flash Drive Access	Disabled
Color Dropout	Authenticated users only
E-mail Function	Authenticated users only
Fax Function	Authenticated users only
Release Held Faxes	Administrator access only
FTP Function	Disabled
Held Jobs Access	Disabled
Use Profiles	No Security
Change Language from Home Screen	Authenticated users only
Cancel Jobs at the Device	Authenticated users only
Apps 1	Authenticated users only
Apps 2–10	Administrator access only
New Apps	Administrator access only
Idle screen	Authenticated users only
Secure Held Print Jobs	Authenticated users only

Disabling home screen icons

The final step is to remove unnecessary icons from the printer home screen.

1. Navigate to the menu screen, and then touch **Settings** > **General Settings** > **Home screen customization**.
2. Set the following to **Do not display**.
   - FTP
   - FTP shortcuts
   - Search Held Jobs
   - Held Jobs

- USB Drive
- Jobs by user

Note: If other functions (such as fax) are not available to users, then you can also disable the icons for those functions.

3 Touch **Submit**.

Other settings required for Common Criteria configuration

Disabling the AppleTalk protocol

IP is the only network protocol permitted under this evaluation. The AppleTalk protocol must be disabled.

Using the Embedded Web Server

1 Click **Settings** > **Network/Ports** > **AppleTalk**.

2 Make sure that the **Activate** check box is cleared.

3 Click **Submit**.

Using the control panel

1 Navigate to the menu screen, and then touch **Network/Ports** > **Standard Network** > **STD NET SETUP** > **AppleTalk** > **Activate**.

2 Set Activate to **No**.

3 Apply the changes.

Shutting down port access

Disabling virtual ports helps prevent intruders from accessing the printer using a network connection.

1 From the Embedded Web Server, click **Settings** > **Security** > **TCP/IP Port Access**.

2 Clear the following check boxes:

- TCP 21 (FTP)
- UDP 69 (TFTP)
- TCP 79 (FINGER)
- UDP 161 (SNMP)
- TCP 631 (IPP)
- TCP 5000 (XML)
- TCP 5001 (IPDS)
- TCP 6110/UDP6100/TCP6100
- UDP 9300/UDP 9301/UDP 9302 (NPAP)
- TCP 9500/TCP 9501 (NPAP)
- TCP 9600 (IPDS)
- UDP 9700 (Plug-n-Print)
- ThinPrint

- TCP 65002 (WSD Print Service)
- TCP 65004 (WSD Scan Service)

3 Click **Submit**.

Network Time Protocol

Use *Network Time Protocol* (NTP) to automatically sync printer time settings with a trusted clock so that Kerberos requests and log events are accurately time-stamped.

Note: If your network uses DHCP, then make sure that NTP settings are not automatically provided by the DHCP server before manually configuring NTP settings.

Using the Embedded Web Server

1. From the Embedded Web Server, click **Settings** > **Security** > **Set Date and Time**.
2. In the Network Time Protocol section, select **Enable NTP**, and then type the IP address or host name of the NTP Server.
3. If the NTP server requires authentication, then select **MD5 key** or **Autokey IFF** from the Authentication menu.
   a. Click **Install MD5 key** or **Install Autokey IFF params**, and then browse to the file containing the NTP authentication credentials.
   b. Click **Submit**.
4. Click **Submit**.

Using the control panel

1. Navigate to the menu screen, and then touch **Security** > **Set Date and Time**.
2. Set Enable NTP to **On**.
3. Touch the **NTP Server** field, type the IP address or host name of the NTP server, and then touch **Submit**.
4. If the NTP server requires authentication, then set Enable Authentication to **On**.
5. Apply the changes.

Fax

If your printer includes fax capabilities and is attached to a phone line, then disable fax forwarding and the driver to fax function, and enable held faxes.

Using the Embedded Web Server

1. Click **Settings** > **Fax Settings** > **Analog Fax Setup**.
2. Under Fax Receive Settings, click **Holding Faxes**.
3. Set Held Fax Mode to **Always On**, and then click **Submit**.
4. Under Fax Send Settings, clear **Driver to fax**.
5. Under Fax Receive Settings, select **Print** from the Fax Forwarding list.
6. Click **Submit**.

Using the control panel

1. Navigate to the menu screen, and then touch **Settings** > **Fax Settings** > **Analog Fax Setup** > **Fax Receive Settings** > **Holding Faxes**.
2. Set Held Fax Mode to **Always On**, and then save your changes.
3. Set Fax Forwarding to **Print**, and then touch **Submit**.
4. Touch **Fax Send Settings**, and then set “Driver to fax” to **No**.
5. Apply the changes.

Setting up a fax storage location (optional)

1. Turn off the printer.
2. While turning on back the printer, press and hold **2** and **6** on the keypad simultaneously until a list of printer functions appears.
3. From the list, touch **Fax Storage Location**, and then select **Disk**.
4. Touch **Submit**.
5. Touch **Exit Config Menu** or **Exit Config**.

Note: The printer undergoes a power-on reset and returns to the home screen.

Configuring and securing the application

1. From the Embedded Web Server, click **Settings** > **Apps** > **Apps Management** > **Secure Held Print Jobs** > **Configure**.
2. Specify the text and image that you want to appear on your home screen.

   Note: Some applications require changing the settings from the profile page.
3. From the Release Options section, configure the following settings to specify how users are allowed to release print jobs:
   - **Release Method**—Select either of the following:
     - **User selects job(s) to print**—Let users choose the jobs they want to print.
     - **All jobs print automatically**—Print all pending jobs automatically when the user touches the application icon and authenticates.
   - **Display Print Jobs Sorted By**—Specify the order of jobs listed on the control panel.
4. From the Job Expiration section, set the expiration for Verify jobs and Repeat jobs.

   The Job Expiration settings let you set Verify and Repeat jobs to expire either at the same time as Confidential jobs or at another time. To set the expiration of Confidential jobs, use the printer Confidential Print Setup on the Embedded Web Server. (Click **Settings** or **Configuration**, and then click **Security** > **Confidential Print Setup**.) By default, only Confidential jobs can be set to expire.
5. From the Advanced Settings section, configure the following settings:
   - **Require All Jobs to be Held**—Let all jobs remain on the printer until released by an authorized user or until they expire.
   - **Clear Print Data**—Clear the memory associated with each job when the job is released.
6. Apply the changes.

Securing access to the home screen

Use this method to require users to authenticate to view and use the printer home screen.

Note: The Background and Idle Screen application must be installed and running on the printer before you can secure access to the home screen.

1. From the Embedded Web Server, access the configuration page for Background and Idle Screen.
2. Under the Idle Screen Settings heading, make sure **Enable** is selected.
3. In the Start Time field, enter **0**. This prompts the printer to start the secure idle screen immediately (0 seconds) after a user's login session ends.
4. Under the Home Screen Background heading, clear **Enable**.
5. If you want to add custom idle screen images, then click **Add** under the Idle Screen Images heading.
6. Type an image name, and then upload the file you want to use.

   Note: For information about compatible image file types and recommended file sizes, see the mouse-over help next to the field.
7. Apply the changes.
8. Repeat step 5 through step 7 to add more idle screen images. You can add up to ten images.
9. If you want to add a custom home screen background image, then under the Home Screen Background heading, select one of the default images, or upload a custom image in the Custom Image field.

   Note: For information about compatible image file types and recommended file sizes, see the mouse-over help.
10. If necessary, configure the other application settings. For more information about configuring the application, see the *Background and Idle Screen Administrator's Guide*.
11. Apply the changes.
12. Secure access to the idle screen using Smart Card Authentication Client.
    a. Create a security template for Smart Card Authentication Client to obtain user credentials. For more information, see "Creating security templates" on page 75.
    b. From the Embedded Web Server, click **Settings** > **Security** > **Security Setup** > **Access Controls**.
    c. If necessary, expand the **Device Solutions** folder.
    d. From the Idle Screen drop-down menu, select your security template.
    e. Click **Submit**.

Configuring user access for Common Criteria

Administrators and users are required to log in to the printer using a method that provides both authentication and authorization. Under the evaluated configuration, access to network-connected devices can be granted through internal accounts, LDAP+GSSAPI (which is used in Active Directory), or Smart Card Authentication.

Creating internal accounts for use with the evaluated configuration involves assigning a user ID and password to each user and then segmenting users into groups. When configuring security templates, select one or more of these groups, and then apply a security template to each device function to control access to that function.

Internal accounts

1. Create groups, and then add users to the internal accounts. For more information, see “Setting up internal accounts” on page 11.
2. Create security templates, and then assign each function access controls to the appropriate security templates. For more information, see “Using a security template to control function access” on page 20.

LDAP+GSSAPI

On networks running Active Directory, you can use LDAP+GSSAPI to take advantage of authentication and authorization services already deployed on the network. User credentials and group designations can be pulled from your existing system, making access to the printer as seamless as other network services. Supported devices can store a maximum of five LDAP+GSSAPI configurations. Each configuration must have a unique name. For more information, see “Using LDAP+GSSAPI” on page 17.

Note: Make sure to configure Kerberos before setting up LDAP+GSSAPI. For more information, see “Configuring Kerberos 5 for use with LDAP+GSSAPI” on page 19.

Smart Card Authentication

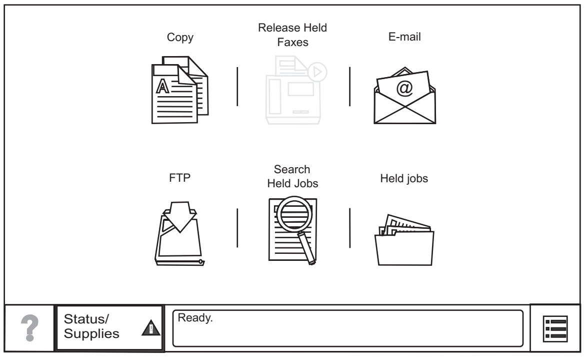
You can use the login screen settings to choose how users can log in to the printer. Users may be prompted for a PIN or a password after inserting a smart card.

1. From the Embedded Web Server, access the configuration page for the Smart Card Authentication Client application.
2. Under Login Screen, in the Login Type menu, select **Smart Card Only**.
3. Set User Validation Mode to **Active Directory**.
4. Click **Apply**.

Note: For more information, see *Smart Card Authentication Administrator’s Guide*.

Understanding the home screen

The screen located on the front of the printer is touch-sensitive and can be used to access device functions and navigate settings and configuration menus. The home screen looks similar to this (yours may contain additional icons):

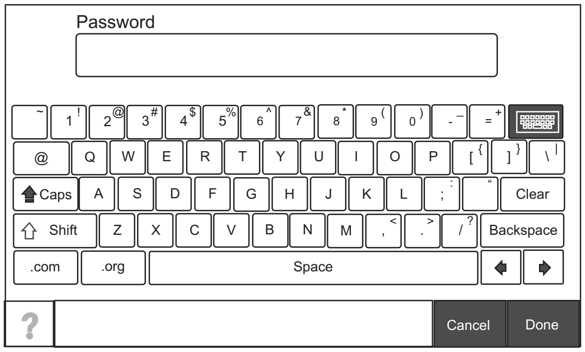


Touch ☰ on the lower right to access settings and configuration menus for the device.

Note: Access to device menus may be restricted to administrators only.

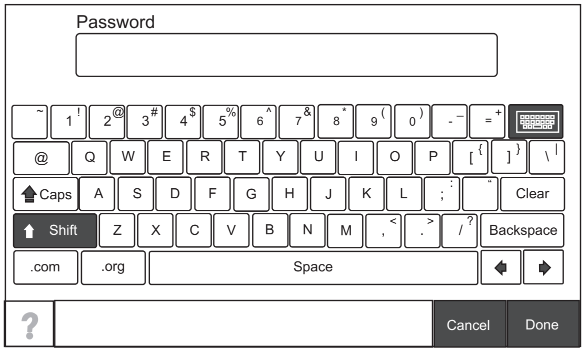
Using the on-screen keyboard

Some device settings require one or more alphanumeric entries, such as server addresses, user names, and passwords. When an alphanumeric entry is needed, a keyboard appears:



As you touch the letters and numbers, your selections appear in a corresponding field at the top of the screen. The keyboard display may also contain other icons, such as Next, Submit, Cancel, and the home icon.

To type a single uppercase or shift character, touch **Shift**, and then touch the letter or number you need to uppercase. To turn on Caps Lock, touch **Caps**, and then continue typing. Caps Lock will remain engaged until you touch **Caps** again.



Touch **Backspace** to delete a single character or **Clear** to delete everything you have typed.

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GifEncoder

ZXing 1.7

This project consists of contributions from several people, recognized here for convenience, in alphabetical order.

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Glossary of Security Terms

Access Controls Settings that control whether individual device menus, functions, and settings are available, and to whom. Also referred to as Function Access Controls on some devices.

Authentication A method for securely identifying a user.

Authorization A method for specifying which functions are available to a user.

Building Block Authentication and Authorization tools used in the Embedded Web Server. They include: password, PIN, Internal accounts, LDAP, LDAP+GSSAPI, Kerberos 5.

Group A collection of users sharing common characteristics.

Security Template A profile created and stored in the Embedded Web Server, used with Access Controls to manage device functions.

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