Security Administrator User Manual

Schneider Electric

Documentation

Table of Contents

Part I Security Administrator User Manual 3

1 Technical Support 3

2 Safety Information 4

3 Preface 6

4 Introduction 8

5 System Requirements 9

6 Security Administrator License 9

7 Starting Security Administrator 10

7.1 Title and Menu Bars 12

7.1.1 File Menu 12

7.1.2 Insert Menu 13

7.1.3 Export Menu 13

7.1.4 Master Key Menu 13

7.1.5 Help Menu 17

7.2 Tree Control 17

8 Project View 17

8.1 Groups View 20

8.1.1 Adding or Editing a Group 21

8.1.2 Deleting a Group 27

8.1.3 Exporting Groups 27

8.2 Users View 29

8.2.1 Adding or Editing a User 30

8.2.2 Deleting a User 31

8.3 Configurators View 32

8.3.1 Adding or Editing a Configurator 33

8.3.2 Deleting a Configurator 34

8.3.3 Exporting Configurators 34

I Security Administrator User Manual

Schneider
Electric

Documentation

Version: 8.05.4

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed. Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

1 Technical Support

Support related to any part of this documentation can be directed to one of the following support centers.

Technical Support: The Americas

Available Monday to Friday 8:00am – 6:30pm Eastern Time

Toll free within North America	1-888-226-6876
Direct Worldwide	+1-613-591-1943
Email	TechnicalSupport@controlmicrosystems.com

Technical Support: Europe

Available Monday to Friday 8:30am – 5:30pm Central European Time

Direct Worldwide	+31 (71) 597-1655
Email	euro-support@controlmicrosystems.com

Technical Support: Asia

Available Monday to Friday 8:00am – 6:30pm Eastern Time (North America)

Direct Worldwide	+1-613-591-1943
Email	TechnicalSupport@controlmicrosystems.com

Technical Support: Australia

Inside Australia	1300 369 233
Email	au.help@schneider-electric.com

2 Safety Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

⚡	The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.

⚠	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result** in death or serious injury.

⚠CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result** in minor or moderate injury.

CAUTION

CAUTION used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, **can result in** equipment damage..

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and the installation, and has received safety training to recognize and avoid the hazards involved.

BEFORE YOU BEGIN

Do not use this product on machinery lacking effective point-of-operation guarding. Lack of effective point-of-operation guarding on a machine can result in serious injury to the operator of that machine.

⚠CAUTION

EQUIPMENT OPERATION HAZARD

- Verify that all installation and set up procedures have been completed.
- Before operational tests are performed, remove all blocks or other temporary holding means used for shipment from all component devices.

- Remove tools, meters, and debris from equipment.

Failure to follow these instructions can result in injury or equipment damage.

Follow all start-up tests recommended in the equipment documentation. Store all equipment documentation for future references.

Software testing must be done in both simulated and real environments.

Verify that the completed system is free from all short circuits and grounds, except those grounds installed according to local regulations (according to the National Electrical Code in the U.S.A, for instance). If high-potential voltage testing is necessary, follow recommendations in equipment documentation to prevent accidental equipment damage.

Before energizing equipment:

- Remove tools, meters, and debris from equipment.
- Close the equipment enclosure door.
- Remove ground from incoming power lines.
- Perform all start-up tests recommended by the manufacturer.

OPERATION AND ADJUSTMENTS

The following precautions are from the NEMA Standards Publication ICS 7.1-1995 (English version prevails):

- Regardless of the care exercised in the design and manufacture of equipment or in the selection and ratings of components, there are hazards that can be encountered if such equipment is improperly operated.
- It is sometimes possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer’s instructions as a guide for functional adjustments. Personnel who have access to these adjustments should be familiar with the equipment manufacturer’s instructions and the machinery used with the electrical equipment.
- Only those operational adjustments actually required by the operator should be accessible to the operator. Access to other controls should be restricted to prevent unauthorized changes in operating characteristics.

3 Preface

Scope

This manual covers the functionality and features included in Schneider Electric Security Administrator software. It is applicable to Security Administrator version 2.11 and later.

The features described in this manual apply to the following controller platforms:

- SCADAPack ES
- SCADAPack ER
- SCADAPack 314E
- SCADAPack 330E
- SCADAPack 334E
- SCADAPack 350E
- SCADAPack 357E

Purpose

This manual can be used in conjunction with Schneider Electric Security Administrator software package for configuring security on SCADAPack E RTUs. The manual describes the use of Security Administrator with SCADAPack E Configurator to deploy security settings.

Assumed Knowledge

It is assumed that the reader is familiar with basic concepts in SCADA (Supervisory Control and Data Acquisition) and DNP3. The reader should also have familiarity with Microsoft Windows® operating system and its basic user interfaces.

Target Audience

- Systems Engineers
- Commissioning Engineers
- Maintenance Technicians

4 Introduction

What Is Security Administrator?

Security Administrator is a Windows® based security tool designed to configure security for SCADAPack E controllers communicating using DNP3 and AGA12-2 standards.

Security Administrator is used to manage the security of SCADAPack E RTUs, and SCADAPack E Configurator (the primary tool for configuring Schneider Electric SCADAPack E RTUs).

Security Administrator uses standard Windows features and styles such as tool bars, menus, and property pages.

Using Security Administrator, you can:

- Select one of three security modes:
  - DNP3 Secure Authentication
  - AGA12-2 Encryption
  - DNP3 Secure Authentication with AGA12-2 Encryption
- Select one of three SCADAPack E Configurator key modes:
  - Default key (low security)
  - Common key (medium security)
  - Unique key (high security)
- Generate secruity files with DNP3 Secure Authenticaton and AGA12-2 encryption security information
- Configure each outstation to use a single, system-wide security key, a key file for sub-groups of RTUs, or a key file for each RTU
- Configure an RTU to use a single key pair for AGA12-2 encryption
- Create, edit, and delete groups of RTUs
- Define security settings for groups of RTUs
- Create, edit, and delete users
- Define security settings for users
- Create, edit, and delete instances of SCADAPack E Configurator
- Define security settings for SCADAPack E Configurator
- Generate and export a license file for SCADAPack E Configurator
- Deploy controller security configuration files for deployment from SCADAPack E Configurator to field controllers

Typical Usage Scenario

Security Administrator is usually used by the person / people tasked with system security within an organization ("security administration personnel").

Typically, Security Administrator does not reside on the same PC with an instance of SCADAPack E Configurator. The security administration personnel use Security Administrator. to create master keys, create users, create security configuration for groups of RTUs, set security modes, and create security file for Configurator PCs. These configurations are Exported to secure configuration files for deployment throughout a system.

Most companies will have more instances of SCADAPack E Configurator than instances of Security Administrator and still more controllers than both of the PC applications.

Also see:

- ***Exporting Groups*** 27
- ***Exporting Configurators*** 34

5 System Requirements

PC System Requirements

Security Administrator operates on a Windows PC or laptop with the following hardware requirements:

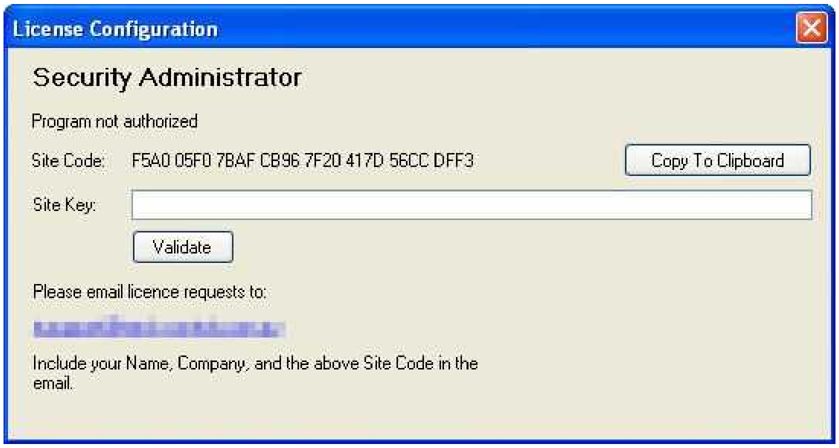
- Microsoft Windows XP, Windows Server 2003, Windows Vista, Windows Server 2008, or Windows 7, on 32-bit or 64-bit Operating System
- Recommended: 2.2 GHz or higher CPU, 1 GB or more RAM, 1280x1024 display, 7200 RPM or higher hard disk
- 100MB free disk space
- Mouse (or other pointing device)
- CD-ROM drive

6 Security Administrator License

Security Administrator requires an individual licence in order to run.

Individual RTU feature licenses are also needed for DNP3 Secure Authentication and AGA12-2 Encryption facilities to be enabled on SCADAPack E controllers.

When you run Security Administrator for the first time, it displays the following dialog:



Security Administrator

Program not authorized

Site Code: F5A0 05F0 7BAF CB96 7F20 417D 56CC DFF3

Site Key:

Please email licence requests to:

[redacted]

Include your Name, Company, and the above Site Code in the email.

The dialog displays a unique ‘Site Code’. You need to send this to Schneider Electric to receive your site key. The easiest way to do this is to do the following:

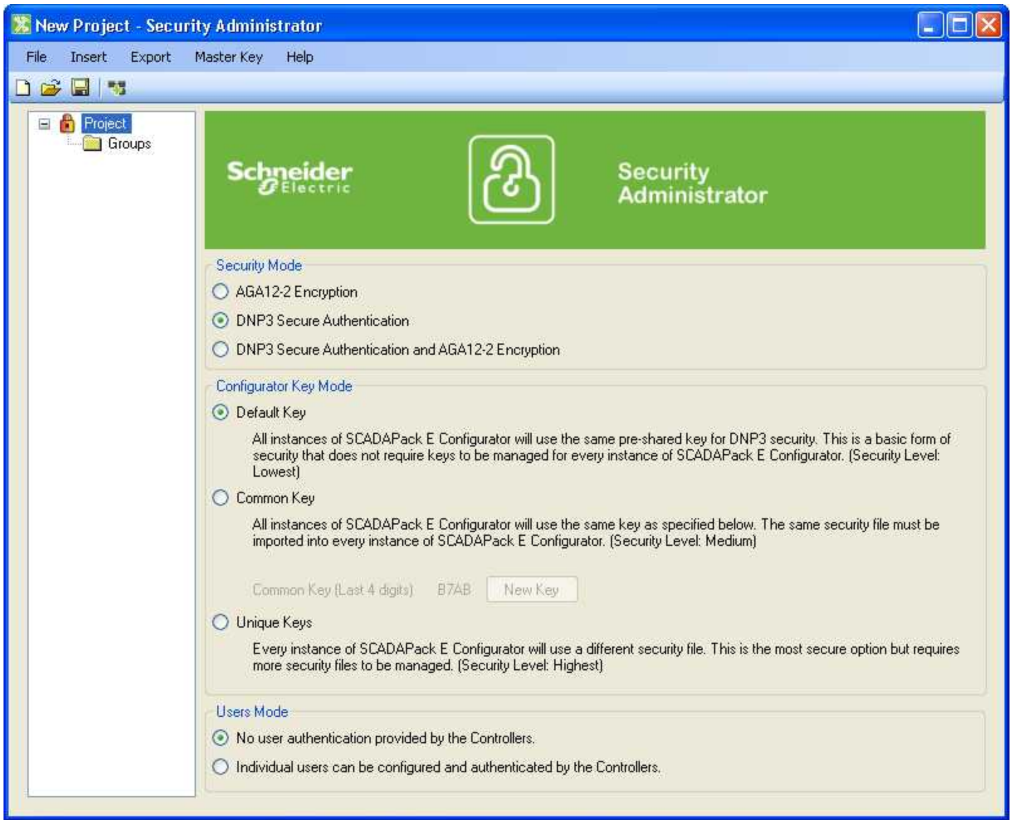
1. Press the *Copy To Clipboard* button and paste into the body of an email message
2. Send the email to the email address specified on the **License Configuration** dialog.
3. Once you receive the site key, copy and paste it into the *Site Key* field.
4. Click **Validate** to activate your Security Administrator.

7 Starting Security Administrator

You can start Security Administrator using the Windows Start button.

Start>> All Programs >> Schneider Electric SCADAPack E >> Security Administrator

When Security Administrator opens, the **Main** dialog displays the **Project View:**



Security Mode

○ AGA12-2 Encryption

● DNP3 Secure Authentication

○ DNP3 Secure Authentication and AGA12-2 Encryption

Configurator Key Mode

● Default Key

All instances of SCADAPack E Configurator will use the same pre-shared key for DNP3 security. This is a basic form of security that does not require keys to be managed for every instance of SCADAPack E Configurator. (Security Level: Lowest)

○ Common Key

All instances of SCADAPack E Configurator will use the same key as specified below. The same security file must be imported into every instance of SCADAPack E Configurator. (Security Level: Medium)

Common Key (Last 4 digits) B7AB New Key

○ Unique Keys

Every instance of SCADAPack E Configurator will use a different security file. This is the most secure option but requires more security files to be managed. (Security Level: Highest)

Users Mode

● No user authentication provided by the Controllers.

○ Individual users can be configured and authenticated by the Controllers.

On the left, the tree displays the parent-level node known as the **Project** node. By default, when you open Security Administrator, the **Group** sub-node displays.

You can only select one sub-node at a time.

The Security Administrator main window shows the main SCADAPack E Configurator window, consisting of (in order from top of window) the title bar, menu bar, tree control (left-hand pane), property page, splitter window, and status bar.

On the right, the modes you can configure for each sub-node selected on the left display. By default, the **Security Mode** selected is **DNP3 Secure Authentication**. To change the any of the modes on this dialog, click the appropriate radio button.

- **AGA12-2 Encryption:** A system using AGA12-2 is secured using SCM (SCADA Crytopgraphic module) devices. In the case of SCADAPack E RTUs, a virtual SCM is integrated with the RTU.
- **DNP3 Secure Authentication:** A system using DNP3 Secure Authentication is secured through groups where a security key (Group Common Key) is shared between the outstations and the DNP3 host.
- **DNP3 Secure Authentication with AGA-12-2 Encryption:** A system using DNP3 Secure Authentication with AGA12-2 Encryption is secured through groups where a security key (Group Common Key) is shared between the outstations and the DNP3 host.

The **Configuration Key Mode** displays the security keys available. SCADAPack E Configurator Key modes are available only if you select either DNP3 Secure Authentication or DNP3 Secure Authentication with AGA12-2 Encryption. The three key modes are:

— **Default key**: This option is the easiest one to use and maintain. However, there is a cost to such simplicity: it offers the weakest level of security of the three key types. This key is the factory default. The same factory default key is used for every controller Schneider Electric sells. Schneider Electric recommends selecting one of the other key modes for a enhanced security level. If left unchanged, this option does require user-based authentication from SCADAPack E Configurator and the controller.

— **Common key**: This option requires you deploy the same configurator security configuration file to every instance of SCADAPack E Configurator. This means that you only need to maintain one key for all your configurators. This offers a stronger level of security than using the default key. A disadvantage of using common keys is that if the security on a laptop with SCADAPack E Configurator is breached, the security configuration files need to be updated on instances of SCADAPack E Configurator that you have deployed, as well as on every controller that is set to request authentication. This option also requires user-based authentication from SCADAPack E Configurator and the controller. If you select the radio button to change the default key to a common key, you confirmation dialog displays indicating that changing the key requires you to re-deploy keys to every security point in your network. To do so, click **<OK>**, to cancel this request, click **<Cancel>**.

— **Unique key:** This option is the most secure of the three key modes. Each instance of SCADAPack E Configurator uses a specific SCADAPack E Configurator security configuration file that is linked to the Machine ID on which SCADAPack E Configurator is installed and licensed. From the Security Administrator, you can add, edit, and remove instances of SCADAPack E Configurator from your system.

The **Users Mode** section displays the user-based authentication options. If a security file is not loaded into SCADAPack E Configurator, this mode allows you to enable or disable that the user is authenticated to communicate with the controllers. The two modes are:

— No user authentication provided by the Controller (**default setting**)

— Individual users can be configured and authenticated by the Controllers

After you select the security settings for the Security Administrator,, do the following:

- select **File** >> **Save** from the main menu**.** The **Save >> File** dialog opens. By default, the location the where the file is saved is your **My Documents** folder on your local hard drive.
- Make necessary changes to the folder name and enter a filename to the file.

- To complete the action, click **<Save>.**

If you change your security mode to AGA12-2 Encryption after you have configured either users or SCADAPack E Configurator instances, a message is displayed telling you that changing you security mode removes all security configuration for users and SCADAPack E Configurator instances you have created.

For more information on using the **Project View** dialog, see:

- ***Groups View*** 20
- ***Users View*** 29
- ***Configurators View*** 32

7.1 Title and Menu Bars

Title Bar

The title bar is a standard Windows® title bar. It consists of (from left to right):

- Access button (Security Administrator Logo)
- Current Project name
- Application name (Security Administrator)
- Minimize, maximize, and close application buttons on the right

Menu Bar

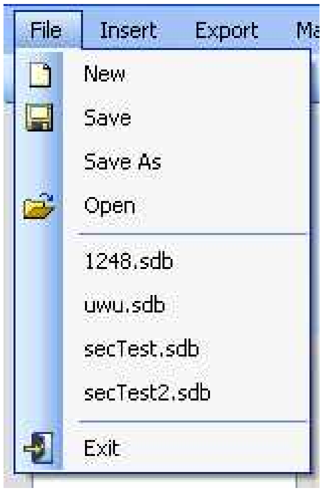
The Security Administrator menu bar consists of the following menus. From left to right, these menus are:

Menu: ***File*** 12 ***Insert*** 13 ***Export*** 13 ***Master Key*** 13 ***Help*** 17

7.1.1 File Menu

The **File** menu contains commands to create, open, and save Security Administrator security configuration files.

The **Quick File** list displays the recently used files (maximum number displayed is four).



For more information on the menus, see:

- ***Title and Menu Bars*** 12
- ***Insert Menu*** 13
- ***Export Menu*** 13
- ***Master Key Menu*** 13
- ***Help Menu*** 17

7.1.2 Insert Menu

From this menu, you can do the following:

- Add a **Group** 21
- Add a **User** 30
- Add an SCADAPack E Configurator ***Configurator*** 33 instance

7.1.3 Export Menu

From this menu, you can do the following:

- ***Export Groups*** 27
- ***Export Configurators*** 34

7.1.4 Master Key Menu

From this menu, you can manage master keys. The intention of the master key is to provide the security boundary for RTUs and security administration to one organization or part of an organization.

The master key customizes the controller security configuration file generated by the Security Administrator and read by the RTU.

This menu offers you two options:

- Set Master Key
- Generate Master Key for all Controllers
- Generate Blank Master Key for all Controllers

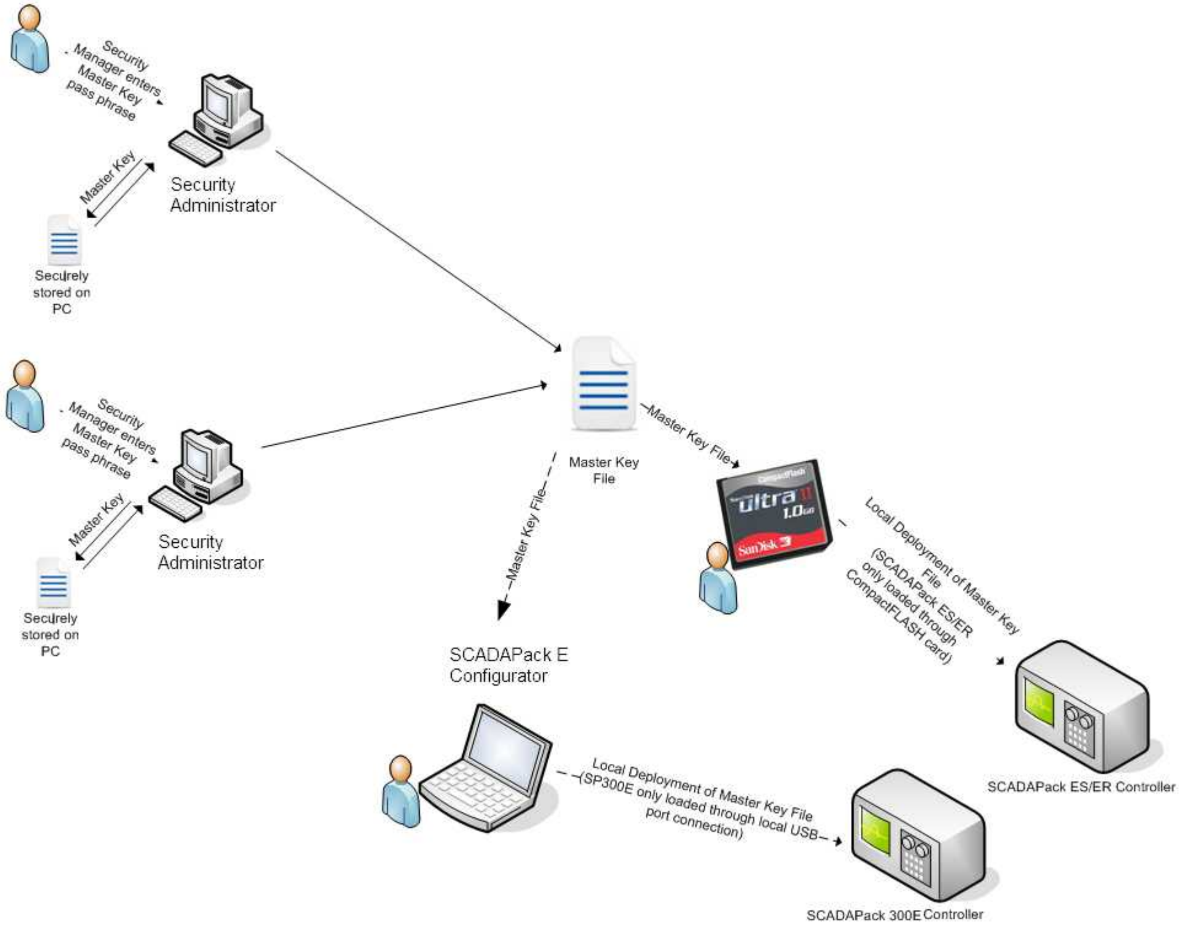
To set a new master key, you need to enter a new pass phrase. When you create a new master key, it needs to be updated locally in every RTU. In addition, the pass phrase needs to be entered on every Security Administrator instance your organization uses.

Similar guidelines apply to selecting a new pass phrase that apply when setting passwords. Select a phrase that you can easily remember but is not one someone else could guess by knowing a few facts about you. For example, your wedding anniversary, date of birth, child's name or other information that could be easily guessed. Use a combination of alpha-numeric characters and/or a combination of upper- and lower-case characters.

Be certain to limit the knowledge of the pass phrase!

Make sure the master key files and its deployment to RTU devices is kept secure. Delete any copies of the Master Key File from removable media and PC disks after the master key is deployed in RTU devices.

The master key pass phrase is stored securely on the security administrator PC independent of Security Administrator **Project** files.


Security Manager enters Master Key pass phrase
Master Key
Security Administrator
Securely stored on PC
Security Manager enters Master Key pass phrase
Master Key
Security Administrator
Securely stored on PC
Master Key File
Master Key File
Master Key File
Local Deployment of Master Key File
(SCADAPack ES/ER only loaded through CompactFLASH card)
SCADAPack ES/ER Controller
SCADAPack E Configurator
Local Deployment of Master Key File (SP300E only loaded through local USB port connection)
SCADAPack 300E Controller

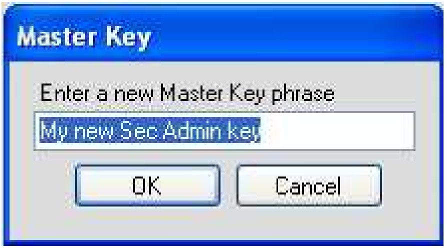
Creating a new Master Key

To set a new Master key, do the following:

1. From the **Master Key** menu, select **Set Master Key.** The Master key dialog opens.

2. Enter a new Master Key phrase.

3. Click **OK**

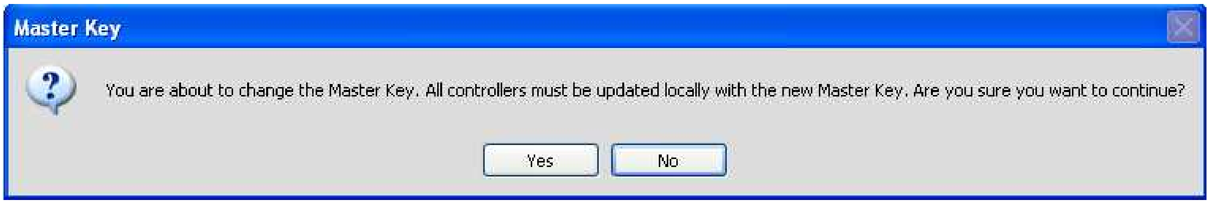


Master Key

Enter a new Master Key phrase

My new Sec Admin key

4. Click **Yes** to acknowledge you are aware all controllers will need to be updated locally with the new master key you are creating; click **No** to terminate the action.



Master Key

You are about to change the Master Key. All controllers must be updated locally with the new Master Key. Are you sure you want to continue?

Generating a Master Key for All Controllers

1. From the **Master Key** menu, select **Generate a Master Key for All Controllers.** The **Browse for Folder** dialog opens. Select the folder where you want to store the Master Key file (***system.key***).

2. Click **OK**

Generating a Blank Master Key for All Controllers

In the event that a user has misplaced the master key file it may be necessary to disable security temporarily. A blank master key is used to disable security for the RTU or Configurator.

1. From the **Master Key** menu, select **Generate a Blank Master Key for All Controllers.** The **Browse for Folder** dialog opens. Select the folder where you want to store the Master Key file (***system.key***).

2. Click **OK**

7.1.5 Help Menu

Security Administrator Help

To display the online version of this document, select **Help >> Security Administrator Help.**

About Security Administrator

This selection displays information about the version of Security Administrator running on your PC and copyright information.

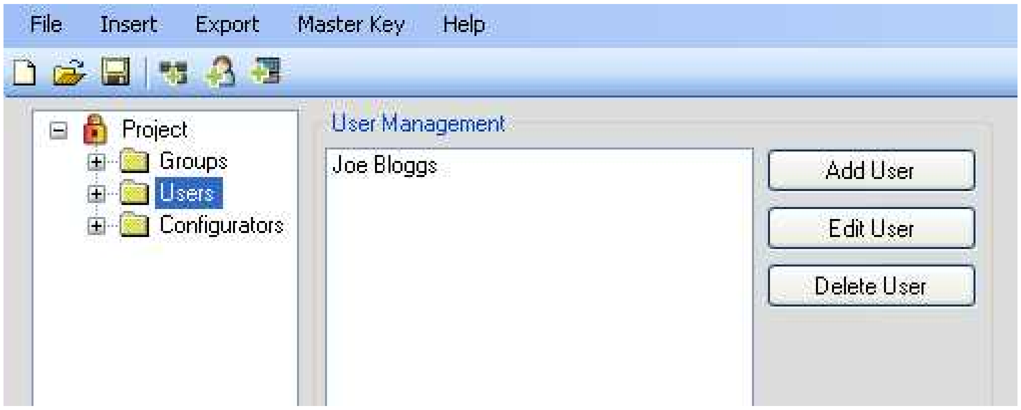
7.2 Tree Control

Tree Control

A Tree Control is displayed on the left-hand side of the Security Administrator **Project** view. Its purpose is to group the sub-nodes together by function.

To select a sub-node, click the sub-node and click the '+' symbol to expand the desired folder.

Click on the desired name of the group, user, or configurator you want to rename, edit, or delete. The selected page displays on the right-hand side of the Security Administrator **Project** view window.



More information on each option, see the following:

- ***Groups View*** 20
- ***Users View*** 29
- ***Configurators View*** 32

8 Project View

This view displays when you create new projects (**File >> New**) or when you click on the parent node, **Project** from the Tree Control 17.

If you change your security mode to *AGA12-2 Encryption* after you have configured either users or SCADAPack E Configurator instances, a message is displayed telling you that changing you security mode removes all security configuration for users and SCADAPack E Configurator instances you have created.

Security Mode

Choose the main security operating mode for the system defined by this Security Administrator database.

AGA12-2 Encryption is used on licensed RTU devices to provide encryption services for DNP3 communication. It requires the use of a AGA12-2 Gateway for conversion of clear text DNP3 to cipher text AGA12-2 (typically a SCADAPack ES RTU is used for this). AGA12-2 Encryption can be used with a Master Station host supporting standard DNP3 communication.

DNP3 Secure Authentication is used on licensed RTU devices to provide DNP3 security authentication services (so that critical operations such as controls and configuration changes are performed by authorized devices or users). It can provide SCADAPack E Configurator security and User level security. It requires that the Master Station host or a DNP3 Data Concentrator natively supports DNP3 and DNP3 Secure Authentication. (For example ClearSCADA and SCADAPack E RTUs).

DNP3 Secure Authentication and AGA12-2 Encryption provides DNP3 security services including SCADAPack E Configurator security and User level security, along with AGA12-2 encryption services on the same RTU device.

Configurator Key Mode

The selection of this mode affects how SCADAPack E configuration software is activated and secured when using DNP3 security to SCADAPack E RTUs.

Default Key mode is the basic security mode used between SCADAPack E Configurator and SCADAPack E security-enabled RTU devices. It does not require special configuration and operates "out-of-the-box", providing a basic security level.

Common Key mode is a configuration mode using a system specific code SCADAPack E Configurator and SCADAPack E security-enabled RTU devices. The key is included in the security configuration for all secured RTU devices and is applied to all SCADAPack E Configurator installations using a common configurator security file. It provides a medium security level.

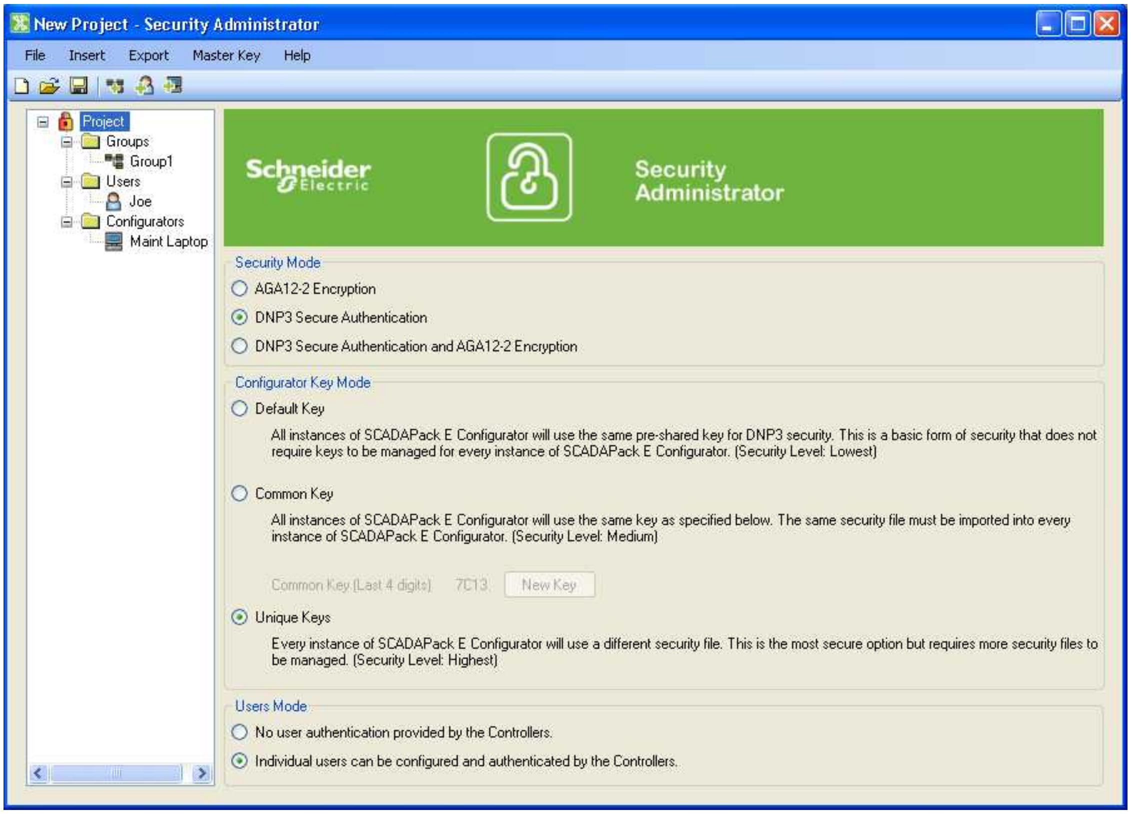
Unique Keys mode is a configuration mode using specific codes for individual SCADAPack E Configurator installations. Keys for all configurator installations are included in the security configuration for all secured RTU devices. Authorization is provided to all SCADAPack E Configurators using a unique configurator security file for each SCADAPack E Configurator installed. It provides the highest security level.

Users Mode

The selection of this mode affects whether SCADAPack E RTUs require individual users to be authenticated in order to perform critical operations when using DNP3 communication.

No user authentication provided by the Controllers indicates to all SCADAPack E Configurator and SCADAPack E security-enabled RTU devices that individual user logon is not required in order to perform critical operations.

Individual users can be configured and authenticated by the Controllers indicates to all SCADAPack E Configurator and SCADAPack E security-enabled RTU devices that individual users must be authenticated by SCADAPack E RTUs in order to perform critical operations.



Security Mode

○ AGA12-2 Encryption

● DNP3 Secure Authentication

○ DNP3 Secure Authentication and AGA12-2 Encryption

Configurator Key Mode

○ Default Key

All instances of SCADAPack E Configurator will use the same pre-shared key for DNP3 security. This is a basic form of security that does not require keys to be managed for every instance of SCADAPack E Configurator. (Security Level: Lowest)

○ Common Key

All instances of SCADAPack E Configurator will use the same key as specified below. The same security file must be imported into every instance of SCADAPack E Configurator. (Security Level: Medium)

Common Key (Last 4 digits) 7C13 New Key

● Unique Keys

Every instance of SCADAPack E Configurator will use a different security file. This is the most secure option but requires more security files to be managed. (Security Level: Highest)

Users Mode

○ No user authentication provided by the Controllers.

● Individual users can be configured and authenticated by the Controllers.

By right-clicking the mouse of the tree control Project entry, you can do the following:

- ***Insert Group*** 21
- ***Insert User*** 30
- ***Insert Configurator*** 33
- ***Export All Group Security Files*** 28
- ***Export All Configurator Security Files*** 35

For more information on project settings, see:

- ***Starting Security Administrator*** 10
- ***Groups View*** 20
- ***Users View*** 29
- ***Configurators View*** 32

8.1 Groups View

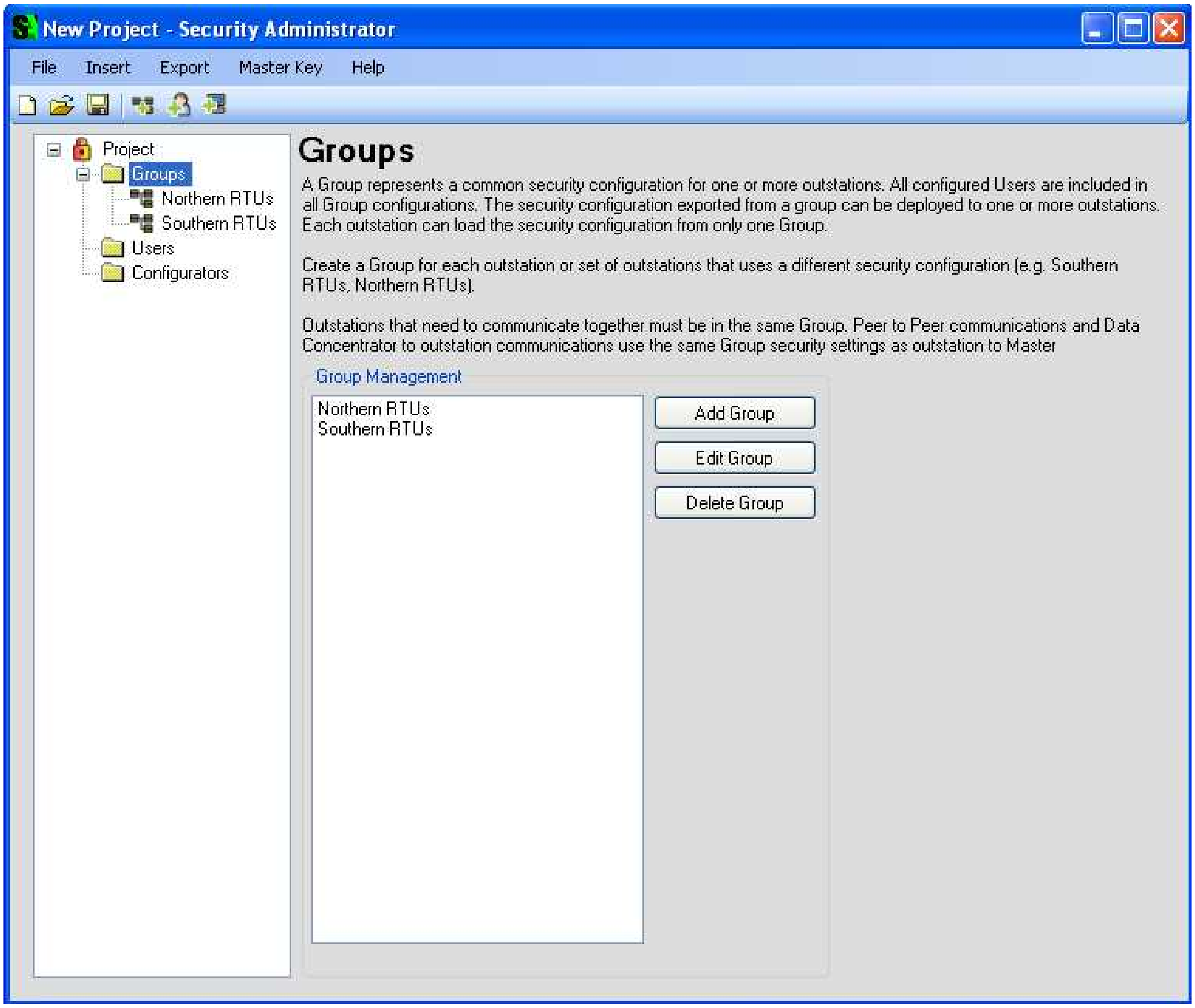
A Group represents common security configuration for one or more controllers (outstations).

Group configurations automatically include configured Users 29 and Configurators 32. You can export the Group security configuration so that you can deploy it to one or more outstations. Outstations can only have security configuration from one Group.

Outstations that need to communicate with one another need to be in the same Group. Peer-to-peer communications and communication between outstations and Data Concentrators need to use the same group security settings.

The **Groups** view is shown when you select the **Groups** node in the tree view. The first time you access the **Groups** view, there are no group names displayed on the Group Management list.

From this view, you can add a group, edit the currently selected group, or delete a group.



Groups

A Group represents a common security configuration for one or more outstations. All configured Users are included in all Group configurations. The security configuration exported from a group can be deployed to one or more outstations. Each outstation can load the security configuration from only one Group.

Create a Group for each outstation or set of outstations that uses a different security configuration (e.g. Southern RTUs, Northern RTUs).

Outstations that need to communicate together must be in the same Group. Peer to Peer communications and Data Concentrator to outstation communications use the same Group security settings as outstation to Master

Group Management

Northern RTUs
Southern RTUs

- ***Adding or Editing a Group*** 21
- ***Deleting a Group*** 27

- ***Exporting Groups*** 27

8.1.1 Adding or Editing a Group

The **Add/Edit Group** selection lets you view or configure the specific details for a group.

The three DNP3 group configuration boxes are only visible when the project's security mode is either DNP3 Secure Authentication or DNP3 Secure Authentication with AGA12-2 Encryption (shown below).

The two AGA12-2 group configuration boxes are only displayed when the security mode for the project is AGA12-2 Encryption or DNP3 Secure Authentication with AGA12-2 Encryption.

To **Add** a group, do the following:

1. Select **Insert** from the menu bar or right-click on the **Group** sub-node.

2. Select **Add** group.

3. Rename the group, if required.

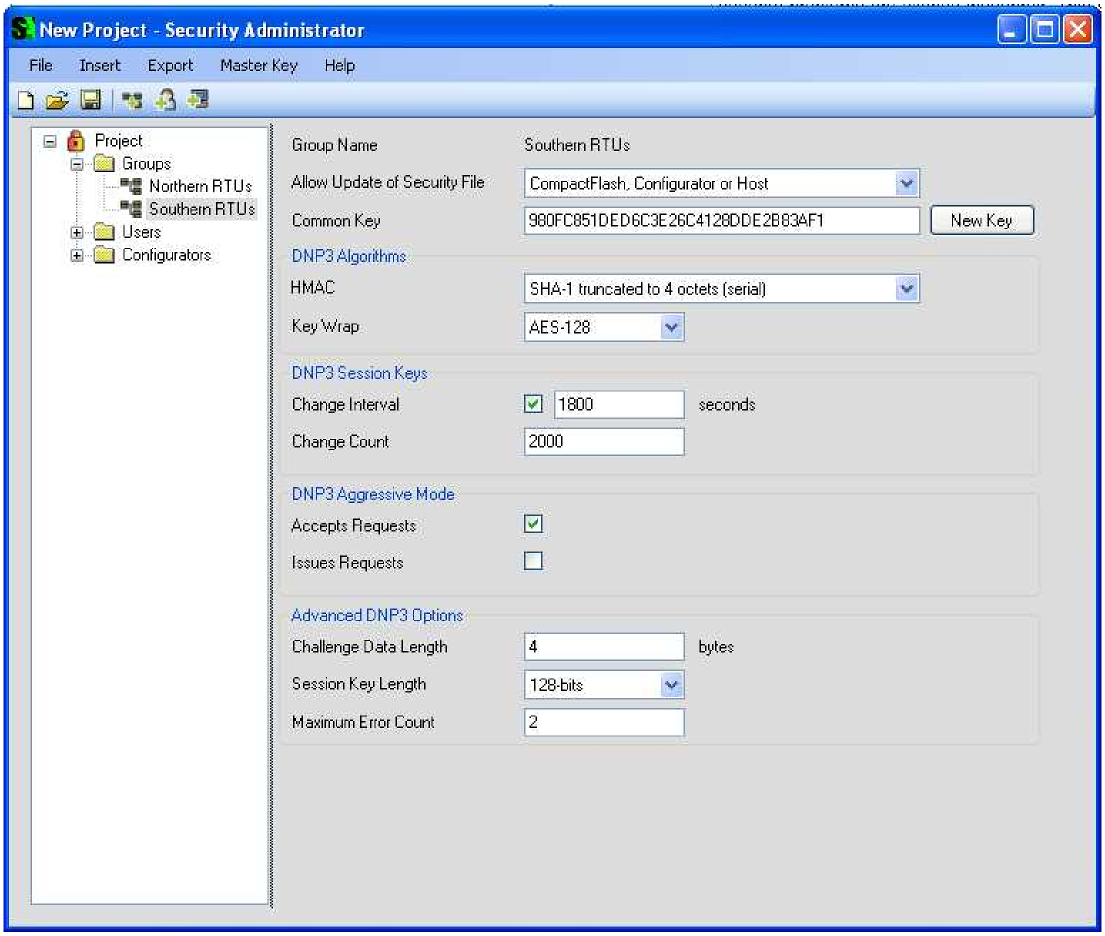
4. Change the default values as required.

To **Rename** a group, do the following:

1. Select the user account to rename in the Tree Control 17.

2. Right-click and select Rename, or press **F2**.

3. Enter the new username.



Group Name: Southern RTUs

Allow Update of Security File: CompactFlash, Configurator or Host

Common Key: 980FC851DED6C3E26C4128DDE2B83AF1

DNP3 Algorithms

HMAC: SHA-1 truncated to 4 octets (serial)

Key Wrap: AES-128

DNP3 Session Keys

Change Interval: ☑ 1800 seconds

Change Count: 2000

DNP3 Aggressive Mode

Accepts Requests: ☑

Issues Requests: □

Advanced DNP3 Options

Challenge Data Length: 4 bytes

Session Key Length: 128-bits

Maximum Error Count: 2

To **Edit** group selections, do the following:

1. Right-click on the **Group** sub-node.
2. Select the group you want to edit.
3. Click **Edit Group.**

You cannot edit the group name from this view.

You can configure the following fields when DNP3 Secure Authentication is the security mode.

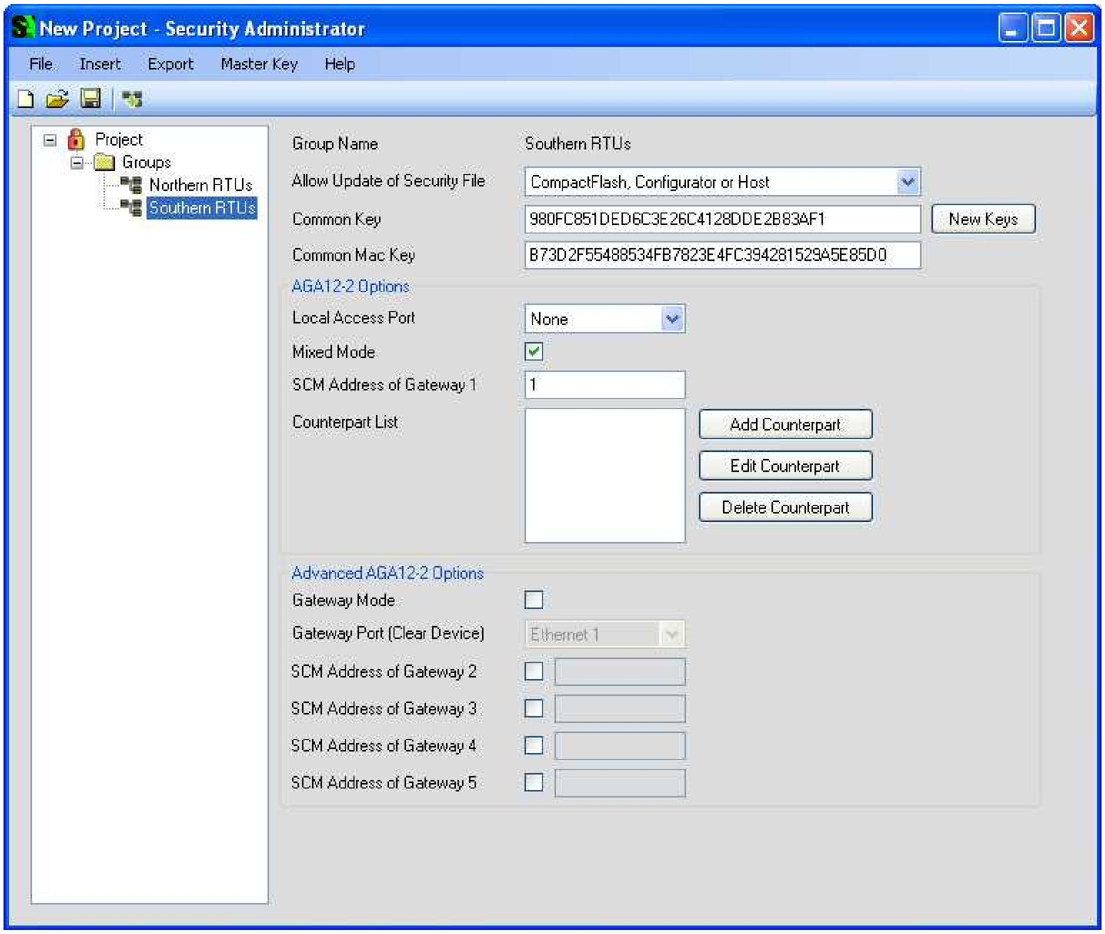
Field	**Range or Selection**	**Default Setting**	**Explanation**
Allow Update of Security File	CompactFLASH, Configurator via USB CompactFLASH, Configurator, Remote Host	Compact FLASH, Configurator, Remote Host	Select the method to update security file on controllers.

Field	Range or Selection	Default Setting	Explanation
Common Key	32 characters (0-9,A-F)	Valid key displays	This is the security key (static DNP3 Update Key) common to all devices in this security Group. It can be generated by the Security Administrator application or generated externally and entered in this field on the Security Administrator.
New Key Button	N/A	N/A	Click to automatically generate a new key value for the Common Key field. If you generate a new key, you need to re-deploy keys to each security point in your network that are part of this security Group.
HMAC Algorithm	SHA-1 trunc to 4 octets (serial) SHA-1 trunc to 10 octets(networked) SHA-256 trunc to 8 octets (serial) SHA-256 trunc to 16 octets (networked)	SHA1 truncated to 4 octets	This algorithm is used to protect usernames, passwords, DNP3 session keys, etc. This is a system wide parameter and needs to match the parameter setting in Master Station Hosts, remote devices, Peer nodes, etc.
Key Wrap AES Key Wrap algorithm protects cryptographic keys within applications where the key is either transmitted over insecure communication channels or stored within untrusted environments.	AES-128	AES-128	Currently, this is the only cryptographic key type supported
Change Interval	1 - 50,000 (seconds)	1800 seconds	Select the period for session key changes between devices. E.g. between the RTU and Master Station Host

Field	Range or Selection	Default Setting	Explanation
Change Count	10 - 60000	2000	Select the message count between session key changes
Aggressive Mode - Accept Requests	N/A	Checked	To reduce the overhead of a challenge/response in DNP3 Secure Authentication,when this field is checked, the RTU accepts the master station adding an authentication response to the protocol request for critical function codes (rather than forcing a challenge to every critical message).
Aggressive Mode - Issue Requests	N/A	Unchecked	Disables the outstation from issuing Aggressive Mode requests when sending critical function codes in Data Concentrator or Peer messages.
Challenge Data Length (bytes)	4-40	4	The number of bytes of challenge data used in session key negotiation and authentication challenge messages. This is a system wide parameter and needs to match the parameter setting in Master Station Hosts, remote devices, Peer nodes, etc.
Session Key Length (bits)	128, 192, 256, 384, 512, 1024	128	Indicates the length of session keys. This is a system wide parameter and needs to match the parameter setting in Master Station Hosts, remote devices, Peer nodes, etc.
Maximum Error Count	0 – 10	2	The number of consecutive security conditions for which the RTU will return errors. After this number of errors, security conditions are silently discarded. This setting affects only the RTU on which the configuration is deployed.

For more information on these parameters see the *SCADAPack E Security Technical Reference.*

When you select AGA12-2 encryption for your project's security mode, the following dialog displays:



Group Name: Southern RTUs
Allow Update of Security File: CompactFlash, Configurator or Host
Common Key: 980FC851DED6C3E26C4128DDE2B83AF1
Common Mac Key: B73D2F55488534FB7823E4FC394281529A5E85D0

Local Access Port: None
Mixed Mode: ☑
SCM Address of Gateway 1: 1
Counterpart List:

Gateway Mode: □
Gateway Port (Clear Device): Ethernet 1
SCM Address of Gateway 2: □
SCM Address of Gateway 3: □
SCM Address of Gateway 4: □
SCM Address of Gateway 5: □

You can configure the following fields when AGA12-2 Encryption is selected as the security mode from the Main 10 dialog.

Field	Range or Selection	Default Setting	Explanation
Allow Update of Security File	CompactFLASH, Configurator via USB CompactFLASH, Configurator, Remote Host	CompactFLASH, Configurator, Remote Host	Select the method to update security file on controllers.
Common Key	32 characters (0-9, A-F)	Valid key displays (default is 32-characters in length)	This is the security key common to all devices in this security Group. It is the DNP3 Secure Authentication static Update Key and the AGA12-2 Encryption Key. It can be generated by the Security Administrator application by pushing the New Keys button, or generated externally and entered in this field.

Field	Range or Selection	Default Setting	Explanation
Common Mac Key	64 characters	Valid key displays	This is the AGA12 MAC (verification signature) key common to all devices in this security Group. It can be generated by the Security Administrator application by pushing the New Keys button, or generated externally and entered in this field.
New Keys Button	N/A	N/A	Click to automatically generate a new key value for the Common & Mac Key fields. If you generate a new key, you need to re-deploy keys to each security point in your network.
Local Access Port	Port 0 to Port 8, Ethernet 1 or 2, and None	None	To allow maintenance of the field controllers, SCADAPack E Configurator communicates using a dedicated Local Access Port on the field controller. Select the port number to use as the local access DNP3 port.
Mixed Mode	N/A	Checked	Mixed mode is enabled by default to allow unprotected cleartext frames to be routed untouched. If you disable (uncheck) this option, cleartext DNP3 frames are not routed.
SCM Address of Gateway 1	1 - 65519	Blank	Enter the SCM address for the Main AGA12 Gateway. The AGA12 messages are directed to this address rather than to the destination DNP3 address where they are converted from AGA12 ciphertext to DNP3 cleartext.Select *AGA12 GW1* in the DNP Network routing table to direct messages to the gateway device on behalf of an upstream DNP address.
Counterpart List	SCM Address 1-65519 Session timeout: 10-86400	Blank 3600	Add or Edit an SCM address, authorizing AGA12 communication to that device Select the SCM session timeout in seconds. An established session will close after the period specified and force re-negotiation. If you delete a counterpart, you will need to confirm the deletion before the action will complete. Delete an SCM entry, removing authorization for AGA12 communication to that device
Gateway Mode	Disable - Enable	Unchecked (disabled)	Enables AGA12 Gateway mode in a device for encoding/decoding AGA12 ciphertext on behalf of a cleartext client (e.g. Master Station Host)
Gateway Port (Clear Device)	Port 0 to Port 8, Ethernet 1 or 2	Ethernet 1	Applies to AGA12 Gateway mode RTU only. This port receives DNP3 data in cleartext (e.g. from a Master Station Host) and encodes it for transmission on a ciphertext port. Select the port to use.

Field	Range or Selection	Default Setting	Explanation
SCM Address of Gateway 2-5	1-65519	Disabled	Enter the SCM address for an additional Gateway. (Up to 4 additional gateway references are provided in addition to the Main AGA12 Gateway 26 configuration this device sends to). This allows AGA12 messages to be directed to other gateway addresses, e.g. in a multi-master configuration, or where an RTU routes received messages from AGA12 nodes and distributes the responses via multiple gateway devices. Conversion from AGA12 ciphertext to DNP3 cleartext is performed by the gateway. Select *AGA12 GW2, AGA12 GW3*, etc in the DNP Network routing table to direct messages to the specific gateway device on behalf of an upstream DNP address.

For more information on these parameters see the *SCADAPack E Security Technical Reference.*

When you select DNP3 Secure Authentication and AGA12-2 Encryption for your project's security mode, a dialog containing the above parameters is displayed.

8.1.2 Deleting a Group

You can delete a group using one of two methods:

1. Right-click on the group name from the Tree Control 17.

2. Select **Yes** to delete the group selected; **No** to cancel.

Or, do the following:

1. Select the sub-node **Groups.**

2. Select the group name you want to delete from the list under **Group Management.**

3. Click **Delete Group.**

4. When the **Confirm group delete** dialog opens, select **Yes** to delete the group selected; **No** to cancel.

8.1.3 Exporting Groups

Group security files are exported by the Security Administrator so that they can be deployed to SCADAPack E RTUs.

An export of a Group includes all User 29 security information, Common Key 11 or Unique Key 11 Configurator 32 security information, as well as the configured Group 30 information.

Exporting a single Group Security File

Exporting a group security file creates a file called **system.rtk** in a sub-folder with security group's name. Using the browser dialog, select a folder in which the group sub-folder will be created.

This file can then be deployed 28 to SCADAPack E field RTUs that are part of this group.

Exporting All Group Security Files

Exporting all group security files creates an individual sub-folder, one for each group (with the security group's name). Using the browser dialog, select a folder in which the group sub-folders will be created. A **system.rtk** file will be save in each folder, one for each group configured in Security Administrator.

The **system.rtk** file in a specific group folder is deployed 28 to SCADAPack E field RTUs that are part of that specific Group. Repeat this for each **system.rtk** group file until every field RTU in every group has been loaded with the appropriate group security file.

Deploying Group configuration to SCADAPack E RTUs

A **system.rtk** file may be loaded to an SCADAPack E RTU in one of several ways. An existing security configuration in an RTU will determine which of the following methods may be used:

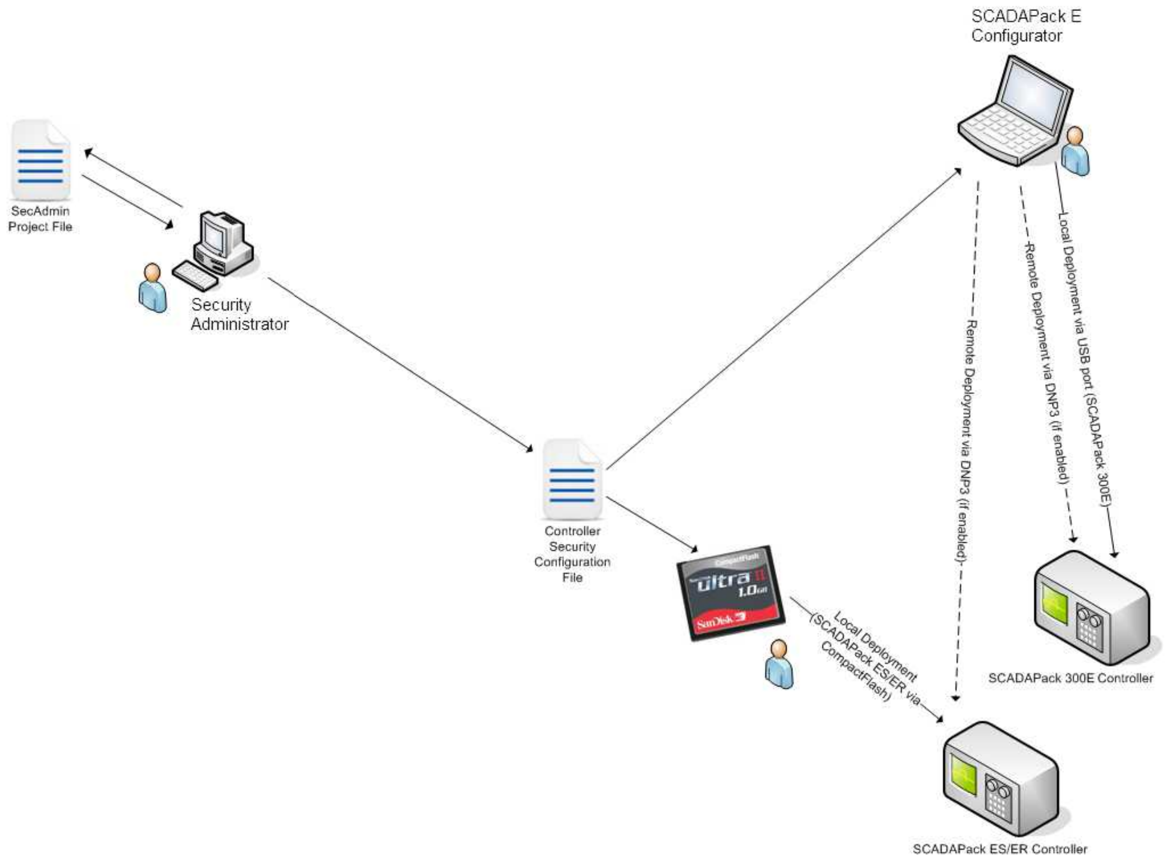
SCADAPack 300E RTUs may be loaded with a security configuration file through the following means:

- SCADAPack E Configurator locally via SCADAPack 300E USB peripheral port (available with authorized configurator) using **Transfer >> Load Security Config File**
- SCADAPack E Configurator via Ethernet or serial ports (available only when the existing controller security setting Allow Update of Security File 22 is "*CompactFlash, Configurator or Host*")
- SCADA master station Host, such as ClearSCADA's SCADAPack E *Security Configuration* object, (available only when the existing controller security setting Allow Update of Security File 22 is *CompactFlash, Configurator or Host*)

SCADAPack ES and SCADAPack ER may be loaded with a security configuration file through the following means:

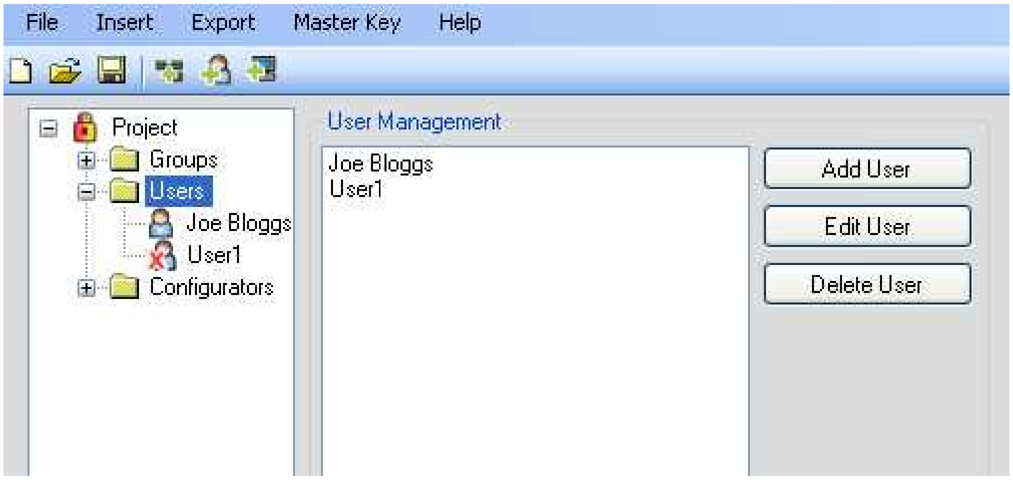
- CompactFLASH card locally, by putting the **system.rtk** file in the root folder of the card
- SCADAPack E Configurator via Ethernet or serial ports (available only when the existing controller security setting Allow Update of Security File 22 is "*CompactFlash, Configurator or Host*")

- SCADA master station Host, such as ClearSCADA's SCADAPack E *Security Configuration* object, (available only when the existing controller security setting Allow Update of Security File 22 is *CompactFlash, Configurator or Host*)


SCADAPack E Configurator
SecAdmin Project File
Security Administrator
Controller Security Configuration File
Remote Deployment via DNP3 (if enabled)
Remote Deployment via DNP3 (if enabled)
Local Deployment via USB port (SCADAPack 300E)
Local Deployment (SCADAPack ES/ER via CompactFlash)
SCADAPack 300E Controller
SCADAPack ES/ER Controller

8.2 Users View

This view displays when you select the **Users** sub-node from the tree view. The **Users** dialog displays a read-only list of every user. You can add, edit the currently selected user, or delete a user. Before you can delete a user, you need to confirm the action.



Joe Bloggs
User1

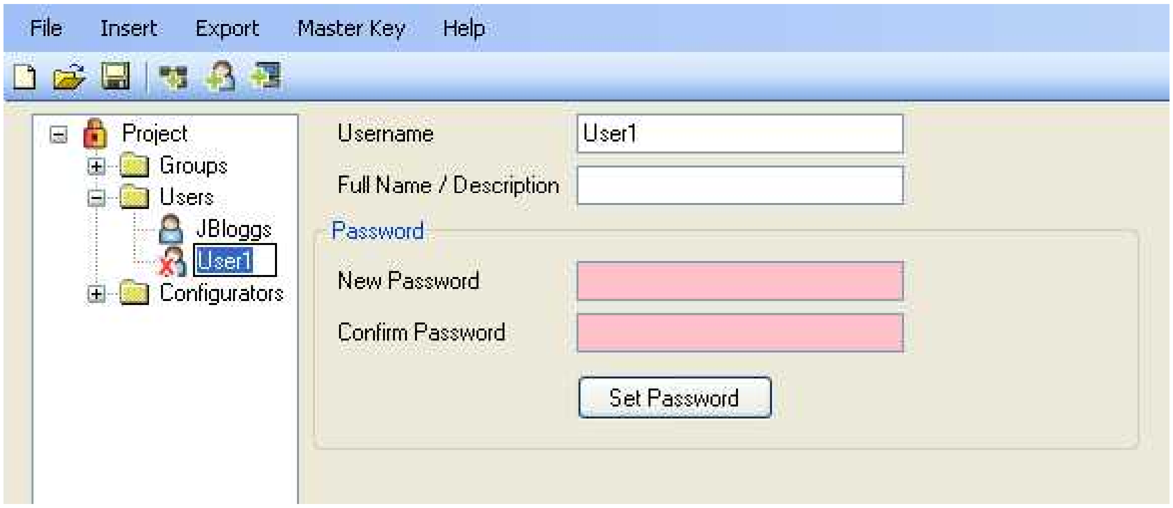
For more information on configuring users, see:

- ***Adding or Editing a User*** 30
- ***Deleting a User*** 31

8.2.1 Adding or Editing a User

The **Users** selection lets you view or configure the specific details for a user.

User configurations are provided to SCADAPack E RTU devices along with Group 20 configurations by exporting groups 34.



Username: User1
Full Name / Description:
New Password:
Confirm Password:

Adding a User

To add a user, do the following:

1. Right-click on the Users node, or
2. Select **Insert** from the menu.
3. Select "Add User."
4. Enter the name of the user.
5. Enter the password assigned to the user.
6. Re-enter the password.

Usernames and passwords are case sensitive.

Editing a User

To edit a user, do the following:

1. Select the user account to edit.
2. Right-click on the User node.
3. Select "Edit User."
4. Enter the name of the user.
5. Enter the password assigned to the user.
6. Re-enter the password.

Usernames and passwords are case sensitive.

Renaming a User

1. Select the user account to rename in the Tree Control 17.
2. Right-click and select Rename, or press **F2**.
3. Enter the new username.

Usernames and passwords are case sensitive.

8.2.2 Deleting a User

You can delete a User by using one of two methods:

1. Right-click on the user's name from the Tree Control 17 and select Delete.

2. Select **Yes** to delete the user selected; **No** to cancel.

Or, do the following:

1. Select the sub-node **Users.**

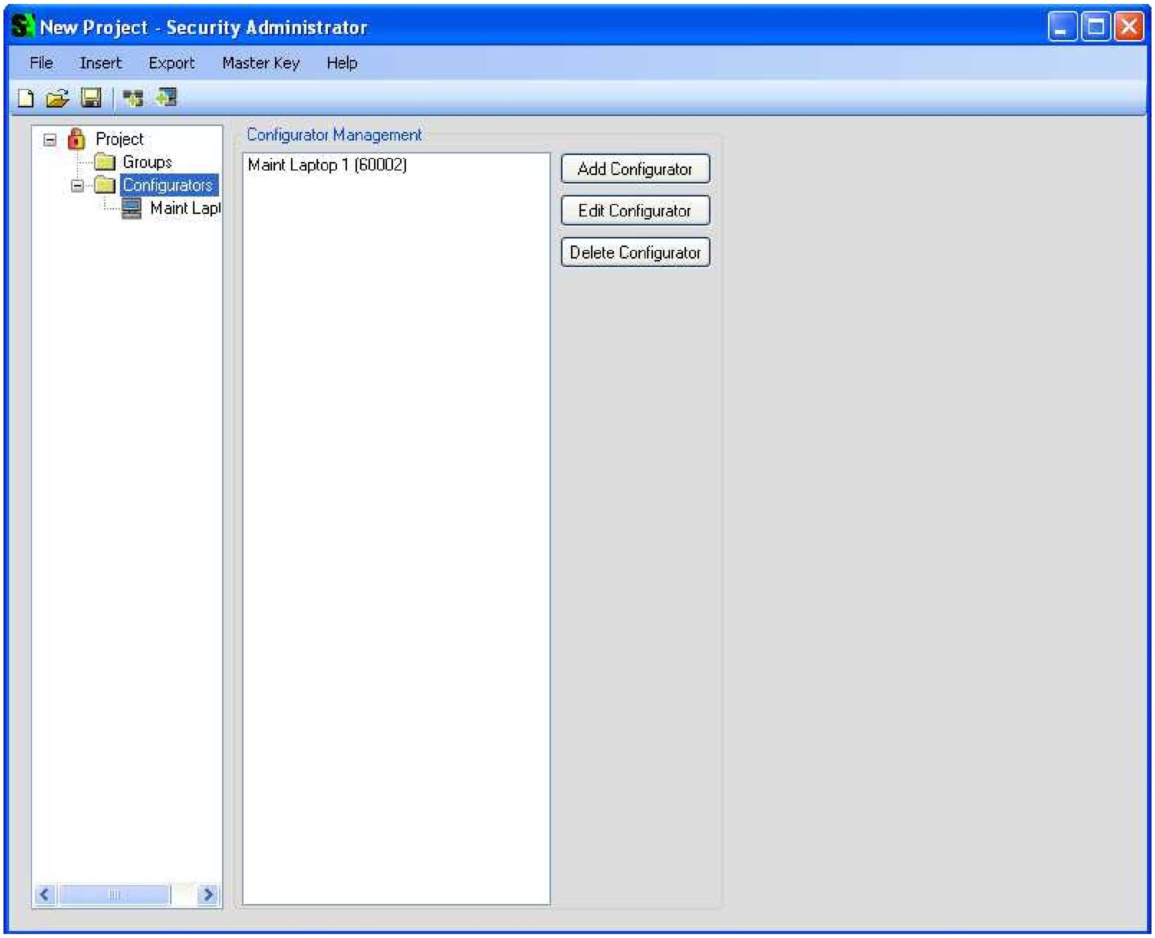
2. Select the group name you want to delete from the list under **User Management.**

3. Click **Delete User.**

4. When the **Confirm user delete** dialog opens, select **Yes** to delete the user selected; **No** to cancel.

8.3 Configurators View

This view only displays when you select **Unique** keys as the **Configurator Key Mode.** Every instance of SCADAPack E Configurator uses a different security file.



Once you have selected the **Unique Configurator Key Mode,** right-click on the **Configurators** sub-node to open the **Configurators** view. The first time you access this view, there are no configurators displayed on the read-only list of Configurators. From this view, you can add an SCADAPack E Configurator instance, edit the currently selected SCADAPack E Configurator, or delete an SCADAPack E Configurator.

The SCADAPack E Configurator security information (Common Key or Unique Keys per SCADAPack E Configurator instance) that configured in the Security Administrator, are included in the controller security configuration files generated for the outstations to authorize communication with specific SCADAPack E Configurator installations. The SCADAPack E Configurator security information (Common Key or Unique Keys) is deployed to each authorized instance of SCADAPack E Configurator software.

For more information on configuring SCADAPack E Configurator, see:

- ***Adding or Editing a Configurator*** 33

- ***Deleting a Configurator*** 34

8.3.1 Adding or Editing a Configurator

The **Add/Edit Configurator** selection lets you view or configure the specific details for a SCADAPack E Configurator instance.

The **Machine Id** field is required when using unique key mode 33. Its value is entered from the number provided by SCADAPack E Configurator's *Security >> DNP3 Security Settings* dialog. This Id is used to generate a unique security configuration file authorizing a specific SCADAPack E Configurator installation for operation with a group of controllers.

Using Common Key Mode

Where Common Key mode is used for Configurators, Security Administrator generates the common key for SCADAPack E Configurator and outstation devices.

The "New Key" button should be used to generate a new key prior to configuring the system's devices for the first time. The addition of a new configurator should not generally require a new key to be generated unless every SCADAPack E Configurator key is to be changed at the same time.

To authorized SCADAPack E Configurator installations in the field, do the following:

1. Click **New Key** on the Security Administrator Project page to generate a new key (only if necessary). Confirm that you want to generate a new key. Doing so will require update of security information to all devices in a network.

2. Right-click on **Configurators**

3. Select **Export Configurator Security File**

4. Save the security file (common.csf) and send to the person using the SCADAPack E Configurator

5. Person using SCADAPack E Configurator deploys the security file he receives to the PC where the SCADAPack E Configurator instance resides, using the SCADAPack E Configurator "DNP3 Security Settings" **Change** button.

6. Security configuration files for controller (outstation) groups configured in this Project need to be exported and deployed to each field controller in order for the controller to authorize connection from the newly secured SCADAPack E Configurator.

Using Unique Key Mode

Where Unique Key mode is used for Configurators, the Machine ID for a remote instance of SCADAPack E Configurator could be sent in an email, from the person using the SCADAPack E Configurator, to the security administration personnel.

To add or edit SCADAPack E Configurator instances, do the following:

1. Person using SCADAPack E Configurator obtains the **Machine Id** (for the PC on which the SCADAPack E Configurator instance resides) by using the SCADAPack E Configurator "DNP3 Security Settings" menu item.

2. Highlight the Machine Id field and copy and paste the code from the dialog into an email

3. The security administration personnel creates a configuration on Security Administrator PC by right-clicking on **Configurators** in the Tree Control 17

4. Select **Add Configurator**

5. Open the email from the containing the Machine Id

6. Copy and paste the Machine Id from the email into the Security Administrator Machine Id field

7. Click **New Key** to generate a new key. Confirm that you want to generate a new key

8. Right-click on **Configurators**

9. Select **Export Configurator Security File**

10. Save the security file (*.csf) and attach to a reply email to the person using the SCADAPack E Configurator

11. Person using SCADAPack E Configurator deploys the security file he receives via email to the PC where the SCADAPack E Configurator instance resides, using the SCADAPack E Configurator "DNP3 Security Settings" **Change** button.

12. Security configuration files for controller (outstation) groups configured in this Project need to be exported and deployed to each field controller in order for the controller to authorize connection from the newly secured SCADAPack E Configurator.

8.3.2 Deleting a Configurator

You can delete an SCADAPack E Configuratorinstance of a user using one of two methods:

1. Right-click on the SCADAPack E Configurator's name from the Tree Control 17. Select **Delete**

2. Select **Yes** to delete the group selected; **No** to cancel.

Or, do the following:

1. Select the sub-node **Configurators**

2. Select the **Configurator's** name you want to delete from the list under **Configurator Management.**

3. Click **Delete Configurator**

4. When the **Confirm Configurator delete** dialog opens, select **Yes** to delete the Configurator selected; **No** to cancel.

8.3.3 Exporting Configurators

Configurator security files are exported by the Security Administrator so that they can be deployed to authorized SCADAPack E Configurator installations.

Configurator security files can be exported when using Configurator Common Key 11 and Unique Key 11 modes (not to Configurator Default Key mode).

Information in the Common Key mode or Unique Key mode settings (for Configurators), is also included in the Group configurations when Exporting Groups 27 to field RTU devices.

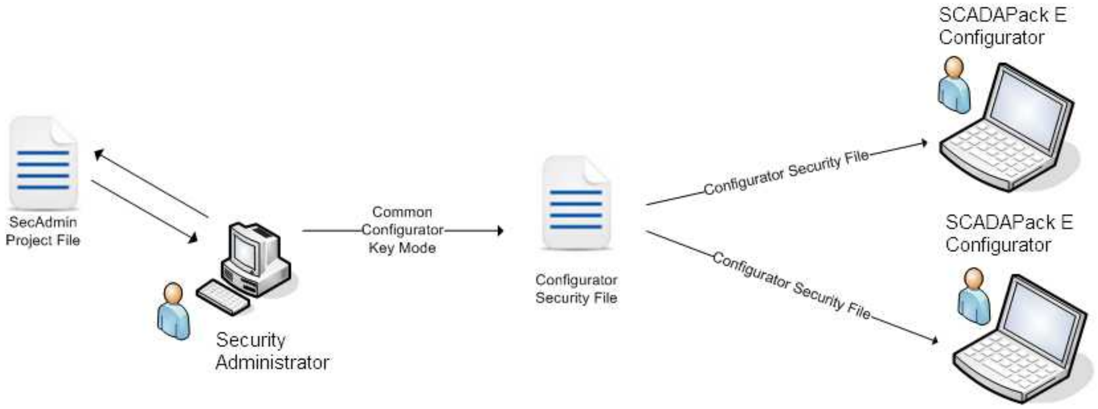
Exporting a common Configurator Security File

A Configurator security file can be exported when using Configurator Common Key 11 mode.

Using the Security Administrator Export menu, choose **Export >> All Group Security Files** to export files for all groups or **Export >> Specific Group Security File** to export the security file for a single group. Likewise, right-clicking on the **Project** node and selecting **Export All Group Security Files** will export the security files for all groups.

A file called **common.csf** is exported. Using the browser dialog, choose a folder location to store the security file.

Take care to keep the configurator security file secure! It is used to authorize SCADAPack E Configurator installations that will operate with your system.


SCADAPack E Configurator
SecAdmin Project File
Configurator Security File
Common Configurator Key Mode
Configurator Security File
SCADAPack E Configurator
Configurator Security File
Security Administrator

Exporting unique Configurator Security Files

When Configurator Unique Key 11 mode is configured using Security Administrator, a configurator security file can be exported for each defined Configurator.

As part of the configuration activities for a configurator, the Machine-ID needs to be retrieved from SCADAPack E Configurator's **Security >> DNP3 Security Settings** dialog. See Adding or Editing Configurators 33 for more information.

Using the Security Administrator Export menu choose one of the following:

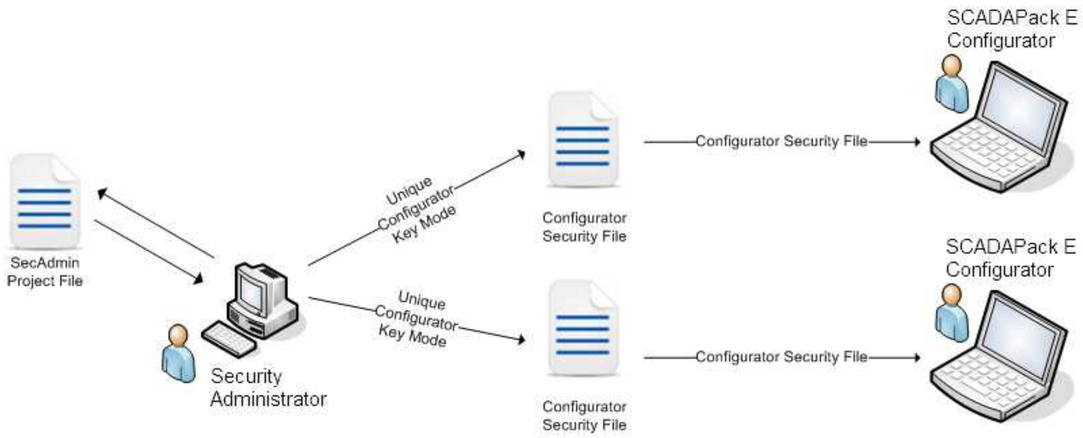
- **Export All Configurator Security Files**

  Using the browser dialog, choose a folder to store the security files. A .csf file is created in the folder for each defined configurator, using the name of the configurator with the csf extension. e.g. **Laptop1.csf**

- **Export Specific Configurator Security File**

  Choose the specific configurator from the drop-down list and using the browser dialog, choose a folder to store the security file. A .csf file is created in the folder for the selected configurator, using the name of the configurator with the csf extension. e.g. **Laptop2.csf**

Unique key mode configurator security deployments are more secure than default or common mode deployments, as a specific configurator security file operates for installation of SCADAPack E Configurator is valid for a single PC (laptop, etc) only.



Deploying SCADAPack E Configurator Security Configuration

Once a configurator security file is exported from Security Administrator, the file is sent to an end user to load in to SCADAPack E Configurator. This authorizes SCADAPack E Configurator for use with the RTU system.

See Adding or Editing a Configurator 33 for more information.