ASTRO® 25
INTEGRATED VOICE AND DATA

KVL 4000
KEY VARIABLE LOADER
RADIO AUTHENTICATION
USER GUIDE

January 2013

6871018P53-F

© 2013 Motorola Solutions, Inc. All rights reserved

Copyrights

The Motorola products described in this document may include copyrighted Motorola computer programs. Laws in the United States and other countries preserve for Motorola certain exclusive rights for copyrighted computer programs. Accordingly, any copyrighted Motorola computer programs contained in the Motorola products described in this document may not be copied or reproduced in any manner without the express written permission of Motorola.

© 2013 Motorola Solutions, Inc. All Rights Reserved

No part of this document may be reproduced, transmitted, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, without the prior written permission of Motorola Solutions, Inc.

Furthermore, the purchase of Motorola products shall not be deemed to grant either directly or by implication, estoppel or otherwise, any license under the copyrights, patents or patent applications of Motorola, except for the normal nonexclusive, royalty-free license to use that arises by operation of law in the sale of a product.

Disclaimer

Please note that certain features, facilities, and capabilities described in this document may not be applicable to or licensed for use on a particular system, or may be dependent upon the characteristics of a particular mobile subscriber unit or configuration of certain parameters. Please refer to your Motorola contact for further information.

Trademarks

MOTOROLA, MOTO, MOTOROLA SOLUTIONS, and the Stylized M Logo are trademarks or registered trademarks of Motorola Trademark Holdings, LLC and are used under license. All other trademarks are the property of their respective owners.

European Union (EU) Waste of Electrical and Electronic Equipment (WEEE) directive

The European Union's WEEE directive requires that products sold into EU countries must have the crossed out trash bin label on the product (or the package in some cases).

As defined by the WEEE directive, this cross-out trash bin label means that customers and end-users in EU countries should not dispose of electronic and electrical equipment or accessories in household waste.

Customers or end-users in EU countries should contact their local equipment supplier representative or service centre for information about the waste collection system in their country.

Document History

Version	Description	Date
6871018P53-A	Original release of the *KVL 4000 Key Variable Loader Radio Authentication User Guide*	November 2010
6871018P53-B	Updates to the following sections: • “Configuring VPN Settings” • “Establishing the VPN Connection” • “Terminating the VPN Connection”	July 2011
6871018P53-C	Updates to the following sections: • “Configuring VPN Settings – KVL Directly Connected to the Firewall” • “Configuring VPN Settings – KVL Connected to the Firewall Through a Network”	August 2011
6871018P53-D	Updated/added the following sections: • “MOTOROLA SOLUTIONS, INC. END USER LICENSE AGREEMENT” • “PUBLICLY AVAILABLE SOFTWARE LIST – KVL SOFTWARE INSTALLATION WIZARD” • “PUBLICLY AVAILABLE SOFTWARE LIST – PDA” • “Personal Digital Assistant” • “Applying Enhanced Security Settings Through the KVL Software Installation Wizard” • “Applying Transparent Security Settings Through the KVL Software Installation Wizard” • “Launching the KVL Application” • “Setting Up Passwords on the KVL” • “Selecting the Password Masking Mode” • “KVL 4000 Disaster Recovery” • “Troubleshooting KVL Application and/or VPN Software Failure” • “Motorola System Support Center and Radio Support Center” • “North America Parts Organization” • “KVL 4000 – Orderable Parts”	March 2012

Version	Description	Date
	Updated the following figures: • Figure 1-1 KVL 4000 Key Variable Loader • Figure 1-2 Personal Digital Assistant (PDA) • Figure 1-13 Today Screen	
6871018P53-E	Updated the following sections: • “Applying Enhanced Security Settings Through the KVL Software Installation Wizard” • “Applying Transparent Security Settings Through the KVL Software Installation Wizard” • “Launching the KVL Application” • “Exiting the KVL Application” • “Setting the PDA USB Mode” Updated the following figures: • Figure 1-2 Personal Digital Assistant (PDA) • “Figure 1-12 Today Screen”	November 2012
6871018P53-F	Updated the following sections: • “Applying Enhanced Security Settings Through the KVL Software Installation Wizard” • “Applying Transparent Security Settings Through the KVL Software Installation Wizard” • “Connecting the KVL to the Network for AuC Communication” • “Exiting the KVL Application”	January 2013

Contents

List of Figures

List of Tables

List of Procedures

About the KVL 4000 Key Variable Loader Radio Authentication User Guide

This manual provides step-by-step instructions for using the Key Variable Loader (KVL) to create authentication keys, load them into Motorola radios, and upload radio key pairs to the Authentication Center (AuC).

This manual is intended for use by experienced technicians familiar with similar types of equipment. Technicians should understand encryption concepts and be familiar with other types of Motorola encryption equipment.

Depending on the options ordered, the KVL has the capability of being configured to operate in the Advanced SECURENET® (ASN) mode, ASTRO® 25 mode, and/or the Radio Authentication mode. The KVL menu system, functionality, and operating characteristics are different, depending on which operating mode is active.

This manual describes the Radio Authentication operating mode.

What Is Covered In This Manual?

This manual consists of the following chapters:

- Chapter 1 Introduction
- Chapter 2 Performing Initial Programming
- Chapter 3 Setting Up the KVL for Radio Authentication Key Management Operations
- Chapter 4 Provisioning Radios With Authentication Keys
- Chapter 5 Managing Provisioned Radio Information
- Chapter 6 Managing Log Records
- Chapter 7 Troubleshooting

Helpful Background Information

Motorola offers various courses designed to assist in learning about the system. For information, go to http://www.motorolasolutions.com/training to view the current course offerings and technology paths.

Related Information

Refer to the following documents for associated information:

Related Information	Purpose
Standards and Guidelines for Communication Sites	Provides standards and guidelines that should be followed when setting up a Motorola communications site. Also known as *R56* manual. This may be purchased on CD 9880384V83, by calling the North America Parts Organization at 800-422-4210 (or the international number: 302-444-9842).
System Documentation Overview	For an overview of the ASTRO® 25 system documentation, open the graphical user interface for the ASTRO® 25 system documentation set and select the **System Documentation Overview** link. This opens a file that includes: • ASTRO® 25 system release documentation descriptions • ASTRO® 25 system diagrams • ASTRO® 25 system glossary For an additional overview of the system, review the architecture and descriptive information in the manuals that apply to your system configuration.
MC55 Enterprise Digital Assistant User Guide (72E-108859)	Describes how to use the MC55 EDA.
MC55 Quick Start Guide (72-127603)	Describes how to get the MC55 EDA up and running.
KVL 4000 Quick Start Guide	Provides basic information on the KVL 4000.
KVL 4000 Key Variable Loader ASTRO 25 User Guide	Provides step-by-step instructions for using the Key Variable Loader (KVL) to create and store encryption keys, and then load them into other Motorola secure equipment, such as radios, fixed encryption units, digital interface units (DIUs), and others. This manual describes the ASTRO® 25 mode of operation.
KVL 4000 Key Variable Loader Advanced SECURENET User Guide (6871018P35)	Provides step-by-step instructions for using the Key Variable Loader (KVL) to create and store encryption keys, and then load them into other Motorola secure equipment, such as radios, fixed encryption units, digital interface units (DIUs), and others. This manual describes the Advanced SECURENET® operating mode.
KVL 4000 FLASHPort Upgrade User Guide	Provides instructions for upgrading the Key Variable Loader (KVL), radios, and other target devices. It also provides instructions for applying security settings on the KVL, installing and activating VPN software, as well as provides troubleshooting information.

Related Information	Purpose
Firewall	Provides information about the firewall hardware appliances including installation, replacement, and LEDs.
Radio Authentication	Provides information to support customers who purchased radio authentication as part of the ASTRO® 25 system. This manual provides a description of the feature, a description of the hardware and software supporting this feature, as well as installation and configuration processes, operation procedures, troubleshooting, and maintenance information.

MOTOROLA SOLUTIONS, INC. END USER LICENSE AGREEMENT

Motorola Solutions, Inc. ("Motorola") is willing to license the Motorola PDA and Security Adapter Software and the accompanying documentation to you ("Licensee" or "you") for use with a Motorola KVL4000 only on the condition that you accept all the terms in this End User License Agreement ("Agreement").

IMPORTANT: READ THE FOLLOWING TERMS AND CONDITIONS BEFORE USING THE ACCOMPANYING PRODUCT.

IF YOU DO NOT AGREE TO THIS AGREEMENT, DO NOT USE THE SOFTWARE OR COPY THE SOFTWARE, INSTEAD, YOU MAY, FOR A FULL REFUND, RETURN THIS PRODUCT TO THE LOCATION WHERE YOU ACQUIRED IT OR PROVIDE WRITTEN VERIFICATION OF DELETION OF ALL COPIES OF THE SOFTWARE. ANY USE OF THE SOFTWARE, INCLUDING BUT NOT LIMITED TO USE ON A KVL 4000 THAT INCLUDES MOTOROLA PDA AND SECURITY ADAPTER, WILL CONSTITUTE YOUR AGREEMENT TO THIS END USER LICENSE AGREEMENT.

1. Definitions

In this Agreement, the word "Software" refers to the set of instructions for computers, in executable form and in any media, (which may include diskette, CD-ROM, downloadable internet, hardware, or firmware) licensed to you. The word "Documentation" refers to electronic or printed manuals and accompanying instructional aids licensed to you. The word "Product" refers to the specific combination of Software and Documentation that you have licensed and which has been provided to you under this Agreement.

2. Grant of License

Motorola grants you a personal, non-exclusive, non-assignable, nontransferable license to use the Products subject to the Conditions of Use set forth in Section 2 and the terms and conditions of this Agreement. Any terms or conditions appearing on the face or reverse side of any purchase order, purchase order acknowledgment or other order document that are different from, or in addition to, the terms of this Agreement will not be binding on the parties, even if payment is accepted.

3. Conditions of Use

Any use of the Products outside of the conditions set forth in this Agreement is strictly prohibited and will be deemed a breach of this Agreement.

3.1 Only you, your employees or agents may use the Products. You will take all necessary steps to insure that your employees and agents abide by the terms of this Agreement.

3.2 You will use the Products: (i) only for your internal business purposes; (ii) only as described in the Products; and (iii) in strict accordance with this Agreement.

3.3 You may install and use the Products on a single Motorola PDA and KVL 4000 security adapter, provided that the use is in conformance with the terms set forth in this Agreement.

3.4 Portions of the Products are protected by United States copyright laws, international treaty provisions, and other applicable laws. Therefore, you must treat the Products like any other copyrighted material (e.g., a book or musical recording) except that you may either: (i) make 1 copy of the transportable part of the Products (which typically is supplied on diskette, CD-ROM, or downloadable internet), solely for back-up purposes; or (ii) copy the transportable part of the Products to a PC hard disk, provided you keep the original solely for back-up purposes. If the Documentation is in printed form, it may not be copied. If the Documentation is in electronic form, you may print out 1 copy, which then may not be copied. With regard to the copy made for backup or archival purposes, you agree to reproduce any Motorola copyright notice, and other proprietary legends appearing thereon. Such copyright notice(s) may appear in any of several forms, including machine-readable form, and you agree to reproduce such notice in each form in which it appears, to the extent it is physically possible to do so. Unauthorized duplication of the Software or Documentation constitutes copyright infringement, and in the United States is punishable in federal court by fine and imprisonment.

3.5 You will not transfer, directly or indirectly, any product, technical data or software to any country for which the United States Government requires an export license or other governmental approval without first obtaining such license or approval.

4. Title; Restrictions

If you transfer possession of any copy of the Products to another party outside of the terms of this agreement, your license is automatically terminated. Title and copyrights to the Products and any copies made by you remain with Motorola and its licensors. You will not, and will not permit others to: (i) modify, translate, decompile, bootleg, reverse engineer, disassemble, or extract the inner workings of the Software or Documentation, (ii) copy the look-and-feel or functionality of the Software or Documentation; (iii) remove any proprietary notices, marks, labels, or logos from the Software or Documentation; (iv) rent or transfer all or some of the Software or Documentation to any other party without Motorola's prior written consent; or (v) utilize any computer software or hardware which is designed to defeat any copy protection device, should the Products be equipped with such a protection device. If the Products are provided on multiple types of media (such as diskette, CD-ROM, downloadable internet), then you will only use the medium which best meets your specific needs, and will not loan, rent, lease, or transfer the other media contained in the package without Motorola's written consent. Unauthorized copying of the Software or Documentation, or failure to comply with any of the provisions of this Agreement, will result in automatic termination of this license.

5. Confidentiality

You acknowledge that all Products contain valuable proprietary information and trade secrets and that unauthorized or improper use of the Products will result in irreparable harm to Motorola for which monetary damages would be inadequate and for which Motorola will be entitled to immediate injunctive relief. Accordingly, you will limit access to the Products to those of your employees and agents who need to use the Products for your internal business purposes, and you will take appropriate action with those employees and agents to preserve the confidentiality of the Products, using the same degree of care to avoid unauthorized or improper disclosure as you use for the protection of your own proprietary software, but in no event less than reasonable care.

You have no obligation to preserve the confidentiality of any proprietary information that: (i) was in the public domain at the time of disclosure; (ii) entered the public domain through no fault of yours; (iii) was given to you free of any obligation to keep it confidential; (iv) is independently developed by you; or (v) is disclosed as required by law provided that you notify Motorola prior to such disclosure and provide Motorola with a reasonable opportunity to respond.

6. Right to Use Motorola's Name

Except as required in Section 3.4 above, you will not, during the term of this Agreement or thereafter, use any trademark of Motorola, or any word or symbol likely to be confused with any Motorola trademark, either alone or in any combination with another word or words.

7. Payment

The rights granted hereunder are contingent upon payment for the Product. All payments are due next 30 days from the date of the invoice.

8. Transfer

In the case of Software designed to operate on Motorola equipment, you may not transfer the Software to another party except: (i) if you are an end-user, when you are transferring the Software together with the Motorola equipment on which it operates; or (ii) if you are a Motorola licensed distributor, when you are transferring the Software either together with such Motorola equipment or are transferring the Software as a licensed duly paid for upgrade, update, patch, new release, enhancement or replacement of a prior version of the Software. If you are a Motorola licensed distributor, when you are transferring the Software permitted in this Agreement, you agree to transfer the Software with a license agreement having terms and conditions no less restrictive than those contained in this Agreement. All such transfers of Software are strictly subject to the conditions precedent that the other party agrees to accept the terms and conditions of this License, and you destroy and copy of the Software you do not transfer to that party. You may not sublicense or otherwise transfer, rent or lease the Software without Motorola's written consent. You may not transfer the Software in violation of any laws, regulations, export controls or economic sanctions imposed by the U.S. Government.

9. Upgrades and Updates

If the Products are licensed to you as an upgrade or update to a product previously licensed to you, you must destroy the Products previously licensed to you, including any copies, within 30 days of your receipt of the update or upgrade.

10. Maintenance and Support

Motorola is not responsible for maintenance or support of the Software under this Agreement. By accepting the license granted under this Agreement, you agree that Motorola will be under no obligation to provide any support, maintenance or service in connection with the Software. Any maintenance and support of the Software and equipment on which it resides will be provided under the terms of a separate agreement.

11. Limited Warranty

All diskettes or CD-ROMS on which the Products are furnished (“Media”) are warranted to be free from manufacturing and material defects for 90 days after the shipment date of the Products to you. Media that becomes defective during such period will be repaired or, at Motorola's option, replaced. This limited warranty is contingent upon proper use of the Media and does not cover Products which have been tampered with, modified, or subjected to unusual physical or electrical stress. Tampering with or removal of any factory seal or label on any Media voids this warranty and releases Motorola from any and all liability.

12. Disclaimer

EXCEPT FOR THE ABOVE EXPRESS LIMITED WARRANTY, MOTOROLA DISCLAIMS ALL WARRANTIES OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY, OR IN ANY COMMUNICATION WITH YOU. MOTOROLA SPECIFICALLY DISCLAIMS ANY WARRANTY INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILTY, NONINFRINGEMENT, OR FITNESS FOR A PARTICULAR PURPOSE. THE PRODUCTS ARE PROVIDED “AS IS”. MOTOROLA DOES NOT WARRANT THAT THE SOFTWARE WILL MEET YOUR REQUIREMENTS, OR THAT THE OPERATION OF THE SOFTWARE WILL BE UNINTERRUPTED OR ERROR FREE, OR THAT DEFECTS IN THE SOFTWARE WILL BE CORRECTED. MOTOROLA MAKES NO WARRANTY WITH RESPECT TO THE CORRECTNESS, ACCURACY, OR RELIABILITY OF THE SOFTWARE AND DOCUMENTATION. Some jurisdictions do not allow the exclusion of implied warranties, so the above exclusion may not apply to you.

13. Remedies

The entire liability of Motorola, and your exclusive remedy under the warranty provided in this Agreement will be, at Motorola's option, to repair or replace any Media found to be defective within the warranty period, or to refund the purchase price and terminate this Agreement. To seek such a remedy, you must return the entire Product to Motorola, with a copy of the original purchase receipt, within the warranty period.

14. Limitation of Liability

THE TOTAL LIABILITY OF MOTOROLA UNDER THIS AGREEMENT FOR DAMAGES WILL NOT EXCEED THE TOTAL AMOUNT PAID BY YOU FOR THE PRODUCT LICENSED UNDER THIS AGREEMENT. IN NO EVENT WILL MOTOROLA OR ANY OF THE LICENSORS BE LIABLE IN ANY WAY FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES OF ANY NATURE, INCLUDING WITHOUT LIMITATION, LOST BUSINESS PROFITS, OR LIABILITY OR INJURY TO THIRD PERSONS, WHETHER FORESEEABLE OR NOT, REGARDLESS OF WHETHER MOTOROLA HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE LIMITATIONS IN THIS PARAGRAPH WILL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY. Some jurisdictions do not permit limitations of liability for incidental or consequential damages, so the above exclusions may not apply to you.

15. U.S. Government

If you are acquiring the Product on behalf of any unit or agency of the U.S. Government, the following applies. Use, duplication, or disclosure of the Products is subject to the restrictions set forth in subparagraphs (c) (1) and (2) of the Commercial Computer Software Restricted Rights clause at FAR 52.227-19 (JUNE 1987), if applicable, unless being provided to the Department of Defense. If being provided to the Department of Defense, use, duplication, or disclosure of the Products is subject to the restricted rights set forth in subparagraph (c) (1) (ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013 (OCT 1988), if applicable. Software and Documentation may or may not include a Restricted Rights notice, or other notice referring specifically to the terms and conditions of this Agreement. The terms and conditions of this Agreement will each continue to apply, but only to the extent that such terms and conditions are not inconsistent with the rights provided to you under the aforementioned provisions of the FAR and DFARS, as applicable to the particular procuring agency and procurement transaction.

16. Term of License

Your right to use the Products will terminate immediately without notice upon a breach of this Agreement by you. Within 30 days after termination of this Agreement, you will certify to Motorola in writing that through your best efforts, and to the best of your knowledge, the original and all copies, in whole or in part, in any form, of the Software and all related material and Documentation, have been destroyed, except that, with prior written consent from Motorola, you may retain one copy for archival or backup purposes. You may not sublicense, assign or transfer the license or the Product, except as expressly provided in this Agreement. Any attempt to otherwise sublicense, assign or transfer any of the rights, duties or obligations hereunder is null and void.

17. Governing Law

This Agreement is governed by the laws of the United States of America to the extent that they apply and otherwise by the laws of the State of Illinois.

18. Assignment

This Agreement may not be assigned by you without Motorola's prior written consent.

19. Survival of Provisions

The parties agree that where the context of any provision indicates an intent that it survives the term of this Agreement, then it will survive.

20. Entire Agreement

This Agreement contains the parties' entire agreement regarding your use of the Products and may be amended only in writing signed by both parties, except that Motorola may modify this Agreement as necessary to comply with applicable laws.

21. Third-Party Software

The Software may contain one or more items of Third-Party Software supplied by other third-party suppliers. The terms of this Agreement govern your use of any Third-Party Software UNLESS A SEPARATE THIRD-PARTY SOFTWARE LICENSE IS INCLUDED, IN WHICH CASE YOUR USE OF THE THIRD-PARTY SOFTWARE WILL THEN BE GOVERNED BY THE SEPARATE THIRD-PARTY LICENSE.

22. Open Source Software

The Software may contain one or more items of Open Source or other Publicly Available Software. For information regarding licenses, acknowledgements, required copyright notices, and other usage terms, see Open Source Software Legal Notices, page xxiii.

Open Source Software Legal Notices

This media, or Motorola Solutions Product, may include Motorola Solutions Software, Commercial Third-Party Software, and Publicly Available Software.

The Motorola Solutions Software that may be included on this media, or included in the Motorola Solutions Product, is Copyright (c) by Motorola Solutions, Inc., and its use is subject to the licenses, terms and conditions of the agreement in force between the purchaser of the Motorola Solutions Product and Motorola Solutions, Inc.

The Commercial Third-Party Software that may be included on this media, or included in the Motorola Solutions Product, is subject to the licenses, terms and conditions of the agreement in force between the purchaser of the Motorola Solutions Product and Motorola Solutions, Inc., unless a separate Commercial Third-Party Software License is included, in which case, your use of the Commercial Third-Party Software will then be governed by the separate Commercial Third-Party License.

The Publicly Available Software that may be included on this media, or in the Motorola Solutions Product, is listed below. The use of the listed Publicly Available Software is subject to the licenses, terms and conditions of the agreement in force between the purchaser of the Motorola Solutions Product and Motorola Solutions, Inc., as well as the terms and conditions of the license of each Publicly Available Software package. Copies of the licenses for the listed Publicly Available Software, as well as all attributions, acknowledgements, and software information details, are included below. Motorola Solutions is required to reproduce the software licenses, acknowledgments and copyright notices as provided by the Authors and Owners, thus, all such information is provided in its native language form, without modification or translation.

The Publicly Available Software in the list below is limited to the Publicly Available Software included by Motorola Solutions. The Publicly Available Software included by Commercial Third Party Software or Products, that is used in the Motorola Solutions Product, are disclosed in the Commercial Third-Party Licenses, or via the respective Commercial Third-Party Publicly Available Software Legal Notices.

For instructions on how to obtain a copy of any source code being made publicly available by Motorola Solutions related to software used in this Motorola Solutions Product you may send your request in writing to:

MOTOROLA SOLUTIONS, INC.
Government & Public Safety Business
Publicly Available Software Management
1301 E. Algonquin Road
Schaumburg, IL 60196
USA

In your request, please include the Motorola Solutions Product Name and Version, along with the Publicly Available Software specifics, such as the Publicly Available Software Name and Version.

Note that source code for the Publicly Available Software may be resident on the Motorola Solutions Product Installation Media, or on supplemental Motorola Solutions Product Media. Please reference and review the entire Motorola Solutions Publicly Available Software Legal Notices and End User License Agreement for the details on location and methods of obtaining the source code.

Note that dependent on the license terms of the Publicly Available Software, source code may not be provided. Please reference and review the entire Motorola Solutions Publicly Available Software Legal Notices and End User License Agreement for identifying which Publicly Available Software Packages will have source code provided.

To view additional information regarding licenses, acknowledgments and required copyright notices for Publicly Available Software used in this Motorola Solutions Product, please select “Legal Notices” display from the GUI (if applicable), or review the Legal Notices and End User License Agreement File/README, on the Motorola Solutions Product Install Media, or resident in the Motorola Solutions Product.

PUBLICLY AVAILABLE SOFTWARE LIST – KVL SOFTWARE INSTALLATION WIZARD

Name: RAPI2

Version: 1.2

Description: A managed wrapper to access the features exposed by the COM interfaces for the Remote API 2. These classes allow the developer to access information, files, and the registry on a device connected through ActiveSync from desktop applications.

Software Site: http://rapi2.codeplex.com

Source Code: No Source Code Distribution Obligations. The Source Code may be obtained from the original Software Site.

License: MIT Type of License

Copyright (c) 2008 David Hall

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the “Software”), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED “AS IS“, WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Credits: See License

==

Name: NLOG

Version: 2.0

Description: NLog is a logging platform for .NET with rich log routing and management capabilities. It makes it easy to produce and manage high-quality logs for application.

Software Site: http://nlog.codeplex.com

http://nlog-project.org

Source Code: No Source Code Distribution Obligations. The Source Code may be obtained from the original Software Site.

License: BSD Type of License

Copyright (c) 2004-2009, Jaroslaw Kowalski
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of Jaroslaw Kowalski nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Credits: See License

PUBLICLY AVAILABLE SOFTWARE LIST – PDA

Name:	NLOG
Version:	2.0
Description:	NLog is a logging platform for .NET with rich log routing and management capabilities. It makes it easy to produce and manage high-quality logs for application.
Software Site:	http://nlog.codeplex.com http://nlog-project.org
Source Code:	No Source Code Distribution Obligations. The Source Code may be obtained from the original Software Site.
License:	BSD Type of License

Copyright (c) 2004-2009, Jaroslaw Kowalski
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of Jaroslaw Kowalski nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS “AS IS” AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Credits:	See License

==

Name:	Smart Device Framework - Community Edition
Version:	2.3.0.39
Description:	Extentions, to the NET Compact Framework core libraries, which enables calls to OS services.
Software Site:	http://www.opennetcf.com/Products/SmartDeviceFramework.aspx
Source Code:	No Source Code Distribution Obligations. The Community Edition of the Smart Device Framework is only provided in Binary form from the Software Authors. Source Code can be obtained via commercially licensing the Software.
License:	OpenNETCF Shared Source License

NOTICE

This license governs use of the accompanying software (“Software”), and your use of the Software constitutes acceptance of this license.

Subject to the restrictions below, you may use the Software for any commercial or noncommercial purpose, including distributing derivative works.

SECTION 1: DEFINITIONS

A. “OpenNETCF” refers to OpenNETCF Consulting, LLC, a limited liability corporation organized and operating under the laws of the state of Maryland.

B. “SDF” refers to the OpenNETCF Smart Device Framework, which is an OpenNETCF software product.

C. “SOFTWARE” refers to the source code, compiled binaries, installation files documentation and any other materials provided by OpenNETCF.

SECTION 2: LICENSE

You agree that:

A. You are NOT allowed to combine or distribute the SOFTWARE with other software that is licensed under terms that seek to require that the SOFTWARE (or any intellectual property in it) be provided in source code form, licensed to others to allow the creation or distribution of derivative works, or distributed without charge.

B. You may NOT distribute the SOFTWARE in source code form to any other person, company, government, group or entity.

C. You may NOT decompile, disassemble, reverse engineer or otherwise attempt to extract, generate or retrieve source code from any compiled binary provided in the SOFTWARE.

D. You will (a) NOT use OpenNETCF's name, logo, or trademarks in association with distribution of the SOFTWARE or derivative works unless otherwise permitted in writing; and (b) you WILL indemnify, hold harmless, and defend OpenNETCF from and against any claims or lawsuits, including attorneys fees, that arise or result from the use or distribution of your modifications to the SOFTWARE and any additional software you distribute along with the SOFTWARE.

E. The SOFTWARE comes “as is”, with no warranties. None whatsoever. This means no express, implied or statutory warranty, including without limitation, warranties of merchantability or fitness for a particular purpose or any warranty of title or non-infringement.

F. Neither OpenNETCF nor its suppliers will be liable for any of those types of damages known as indirect, special, consequential, or incidental related to the SOFTWARE or this license, to the maximum extent the law permits, no matter what legal theory its based on. Also, you must pass this limitation of liability on whenever you distribute the SOFTWARE or derivative works.

G. If you sue anyone over patents that you think may apply to the SOFTWARE for a person's use of the SOFTWARE, your license to the SOFTWARE ends automatically.

H. The patent rights, if any, granted in this license only apply to the SOFTWARE, not to any derivative works you make.

I. The SOFTWARE is subject to U.S. export jurisdiction at the time it is licensed to you, and it may be subject to additional export or import laws in other places. You agree to comply with all such laws and regulations that may apply to the SOFTWARE after delivery of the SOFTWARE to you.

J. If you are an agency of the U.S. Government, (i) the SOFTWARE is provided pursuant to a solicitation issued on or after December 1, 1995, is provided with the commercial license rights set forth in this license, and (ii) the SOFTWARE is provided pursuant to a solicitation issued prior to December 1, 1995, is provided with Restricted Rights as set forth in FAR, 48 C.F.R. 52.227-14 (June 1987) or DFAR, 48 C.F.R. 252.227-7013 (Oct 1988), as applicable.

K. Your rights under this license end automatically if you breach it in any way.

L. This license contains the only rights associated with the SOFTWARE and OpenNETCF reserves all rights not expressly granted to you in this license. © 2006 OpenNETCF Consulting, LLC. All rights reserved.

Credits: See License Above

PUBLICLY AVAILABLE SOFTWARE LIST – SECURITY ADAPTER

Name: Buffer Management Source Code from OpenBSD Operating System, as well as, OpenSSH Project.

Version: N/A

Description: This Package was included by Commercial Third Party Software Development Kit, from WindRiver-Interpeak, within the Motorola Product.

Copyright 2000-2005 Interpeak AB (http://www.interpeak.se).
All rights reserved.

Software Site: http://www.openbsd.org

License: The utilized Code is under BSD Type of License

Author: Tatu Ylonen <ylo@cs.hut.fi>
Copyright (c) 1995 Tatu Ylonen <ylo@cs.hut.fi>, Espoo, Finland
All rights reserved.
Functions for manipulating fifo buffers (that can grow if needed).

As far as I am concerned, the code I have written for this software can be used freely for any purpose. Any derived versions of this software must be clearly marked as such, and if the derived work is incompatible with the protocol description in the RFC file, it must be called by a name other than "ssh" or "Secure Shell".

Copyright (c) 1983, 1990, 1992, 1993, 1995
The Regents of the University of California.
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS AS IS AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Credits: OpenBSD Project, http://www.openbsd.org
Tatu Ylonen <ylo@cs.hut.fi>, Espoo, Finland

===

Name: C Support Libraries and Headers

Version: N/A

Description: The Packages were included by Commercial Third Party Software Development Kit, from Blunk MicroSystems, within the Motorola Product.

Copyright 2009, Blunk Microsystems, ALL RIGHTS RESERVED

Software Site: http://www.blunkmicro.com

Source Code:	No Source Code Distribution Obligations
License:	The utilized Code is under BSD and MIT Type of Licenses

sccl.c, vscanf.c

Copyright (c) 1990 The Regents of the University of California.
All rights reserved.

Redistribution and use in source and binary forms are permitted provided that the above copyright notice and this paragraph are duplicated in all such forms, and that any documentation related to such distribution and use acknowledge that the software was developed by the University of California, Berkeley. The name of the University may not be used to endorse or promote products derived from this software without specific prior written permission. THIS SOFTWARE IS PROVIDED "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

xscanf.c

Copyright (c) 1990, 2006 The Regents of the University of California.
All rights reserved.

This code is derived from software contributed to Berkeley by Chris Torek.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

stdint.h

Copyright (c) 2004, 2005 by Ralf Corsepius, Ulm/Germany.
All rights reserved.

Permission to use, copy, modify, and distribute this software is freely granted, provided that this notice is preserved.

Credits:	N/A

PUBLICLY AVAILABLE SOFTWARE COMMON LICENSES

No Common Licenses included.

Commercial Warranty and Service Limited Warranty

MOTOROLA COMMUNICATION PRODUCTS

I. WHAT THIS WARRANTY COVERS AND FOR HOW LONG:

MOTOROLA SOLUTIONS, INC. (“MOTOROLA”) warrants the MOTOROLA manufactured Communication Products listed below (“Product”) against defects in material and workmanship under normal use and service for a period of time from the date of purchase as scheduled below:

KVL 4000 Key Variable Loader	One (1) Year
Product Accessories	One (1) Year

MOTOROLA, at its option, will at no charge either repair the Product (with new or reconditioned parts), replace it (with a new or reconditioned Product), or refund the purchase price of the Product during the warranty period provided it is returned in accordance with the terms of this warranty. Replaced parts or boards are warranted for the balance of the original applicable warranty period. All replaced parts of Product shall become the property of MOTOROLA.

This express limited warranty is extended by MOTOROLA to the original end user purchaser only and is not assignable or transferable to any other party. This is the complete warranty for the Product manufactured by MOTOROLA. MOTOROLA assumes no obligations or liability for additions or modifications to this warranty unless made in writing and signed by an officer of MOTOROLA. Unless made in a separate agreement between MOTOROLA and the original end user purchaser, MOTOROLA does not warrant the installation, maintenance or service of the Product.

MOTOROLA cannot be responsible in any way for any ancillary equipment not furnished by MOTOROLA which is attached to or used in connection with the Product, or for operation of the Product with any ancillary equipment, and all such equipment is expressly excluded from this warranty. Because each system which may use the Product is unique, MOTOROLA disclaims liability for range, coverage, or operation of the system as a whole under this warranty.

II. GENERAL PROVISIONS:

This warranty sets forth the full extent of MOTOROLA's responsibilities regarding the Product. Repair, replacement or refund of the purchase price, at MOTOROLA's option, is the exclusive remedy.

THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER EXPRESS WARRANTIES. IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY. IN NO EVENT SHALL MOTOROLA BE LIABLE FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT, FOR ANY LOSS OF USE, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, LOST PROFITS OR SAVINGS OR OTHER INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE ORINABILITY TO USE SUCH PRODUCT, TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW.

III. STATE LAW RIGHTS:

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION OR EXCLUSIONS MAY NOT APPLY.

This warranty gives specific legal rights, and there may be other rights which may vary from state to state.

IV. HOW TO GET WARRANTY SERVICE:

You must provide proof of purchase (bearing the date of purchase and Product item serial number) in order to receive warranty service and, also, deliver or send the Product item, transportation and insurance prepaid, to an authorized warranty service location. Warranty service will be provided by MOTOROLA through one of its authorized warranty service locations. If you first contact the company which sold you the Product (e.g., dealer or communication service provider), it can facilitate your obtaining warranty service. You can also call MOTOROLA at 1-800-927-2744 in the US/Canada.

V. WHAT THIS WARRANTY DOES NOT COVER:

1. Defects or damage resulting from use of the Product in other than its normal, customary or authorized manner.
2. Defects or damage from misuse, accident, water, neglect or act of God.
3. Defects or damage from improper testing, operation, maintenance, installation, alteration, modification, or adjustment not provided or authorized in writing by MOTOROLA.
4. Breakage or damage to antennas unless caused directly by defects in material workmanship.
5. A Product subjected to unauthorized Product modifications, disassembles or repairs (including, without limitation, the addition to the Product of non-MOTOROLA supplied equipment) which adversely affect performance of the Product or interfere with MOTOROLA's normal warranty inspection and testing of the Product to verify any warranty claim.
6. Product which has had the serial number removed or made illegible.
7. Rechargeable batteries if:
   - any of the seals on the battery enclosure of cells are broken or show evidence of tampering.
   - the damage or defect is caused by charging or using the battery in equipment or service other than the Product for which it is specified.
8. Freight costs to the repair depot.
9. A Product which, due to illegal or unauthorized alteration of the software/firmware in the Product, does not function in accordance with MOTOROLA's published specifications or the FCC type acceptance labeling in effect for the Product at the time the Product was initially distributed from MOTOROLA.
10. Scratches or other cosmetic damage to Product surfaces that does not affect the operation of the Product.
11. Normal and customary wear and tear.

VI. PATENT AND SOFTWARE PROVISIONS:

MOTOROLA will defend, at its own expense, any suit brought against the end user purchaser to the extent that it is based on a claim that the Product or parts infringe a United States patent, and MOTOROLA will pay those costs and damages finally awarded against the end user purchaser in any such suit which are attributable to any such claim, but such defense and payments are conditioned on the following:

1. that MOTOROLA will be notified promptly in writing by such purchaser of any notice of such claim;
2. that MOTOROLA will have sole control of the defense of such suit and all negotiations for its settlement or compromise; and
3. should the Product or parts become, or in MOTOROLA's opinion be likely to become, the subject of a claim of infringement of a United States patent, that such purchaser will permit MOTOROLA, at its option and expense, either to procure for such purchaser the right to continue using the Product or parts or to replace or modify the same so that it becomes non-infringing or to grant such purchaser a credit for the Product or parts as depreciated and accept its return. The depreciation will be an equal amount per year over the lifetime of the Product or parts as established by MOTOROLA.

MOTOROLA will have no liability with respect to any claim of patent infringement which is based upon the combination of the Product or parts furnished hereunder with software, apparatus or devices not furnished by MOTOROLA, nor will MOTOROLA have any liability for the use of ancillary equipment or software not furnished by MOTOROLA which is attached to or used in connection with the Product. The foregoing states the entire liability of MOTOROLA with respect to infringement of patents by the Product or any parts thereof.
Laws in the United States and other countries preserve for MOTOROLA certain exclusive rights for copyrighted MOTOROLA software such as the exclusive rights to reproduce in copies and distribute copies of such MOTOROLA software. MOTOROLA software may be used in only the Product in which the software was originally embodied and such software in such Product may not be replaced, copied, distributed, modified in any way, or used to produce any derivative thereof. No other use including, without limitation, alteration, modification, reproduction, distribution, or reverse engineering of such MOTOROLA software or exercise of rights in such MOTOROLA software is permitted. No license is granted by implication, estoppel or otherwise under MOTOROLA patent rights or copyrights.

VII. GOVERNING LAW:

This Warranty is governed by the laws of the State of Illinois, U.S.A.

SERVICE

Proper repair and maintenance procedures will assure efficient operation and long life for this product. A Motorola maintenance agreement will provide expert service to keep this and all other communication equipment in perfect operating condition. A nationwide service organization is provided by Motorola to support maintenance services. Through its maintenance and installation program, Motorola makes available the finest service to those desiring reliable, continuous communications on a contract basis. For a contract service agreement, please contact your nearest Motorola service or sales representative, or an authorized Motorola dealer.

Repair Service Advantage (RSA) Service Agreements is a post-warranty service offering that provides for the repair of this product. The service agreement is renewable annually for as long as Motorola supports the equipment. For more information about RSA Service Agreements, contact the Motorola Radio Support Center at 800-247-2346 or your Customer Support Manager.

1 Introduction

1.1 MC55A0 PDA Reference

See the *MC55 Enterprise Digital Assistant User Guide* (72E-108859) (available at http://www.motorola.com/enterprisemobility/manuals) for the following information:

- Inserting/replacing the battery
- Charging the battery (Security Adapter disconnected)
- Changing the power settings (setting the timeout for turning off the display to conserve battery power)

SUGGESTION

Set up the PDA so that it turns itself off when it is not in use to preserve the KVL 4000 battery life.

- Changing the backlight settings:
  - Setting the display backlight time-out
  - Adjusting brightness
- Setting date and time for timestamping logs
- Turning KVL sounds on/off
- Troubleshooting the MC55
- MC55 performance specifications

1.2 Overview of the KVL 4000 for Radio Authentication

The KVL 4000 Key Variable Loader is a portable, handheld, rugged device whose function in the Radio Authentication mode is to provision mobile and portable radios with authentication keys. These keys can be entered manually by the KVL user, or auto-generated by the KVL. They are then transferred to the radios, which return their individual IDs (Unit IDs) to the KVL.

For the auto-generated authentication keys, the radio – key pairs (a Unit ID and a corresponding authentication key) are then stored in the KVL and forwarded to the Authentication Center (AuC) through an Ethernet connection, allowing the AuC to authenticate the radios provisioned by the KVL to the communications system.

For the manually entered authentication keys, the radio – key pairs are not stored in the KVL. Therefore, they need to be given to the AuC operator so that they can enter them manually into the AuC.

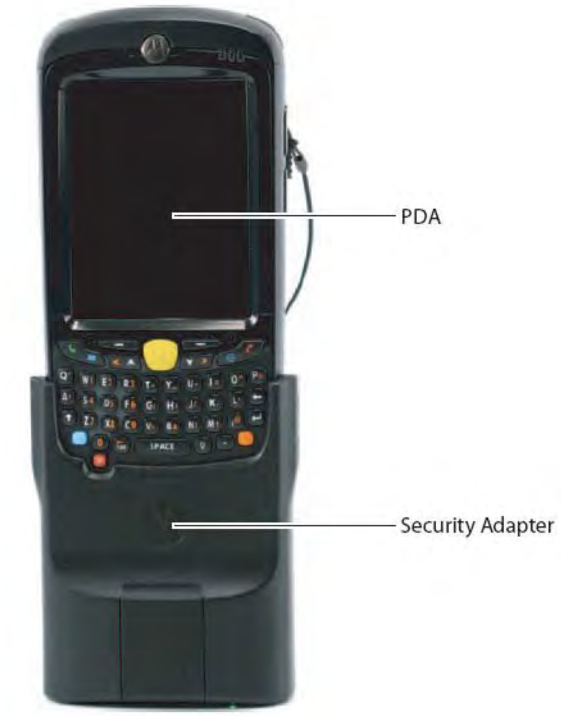
The KVL 4000 provides a User Interface for entering authentication keys, and transferring them to target radios. It also provides internal processing and memory for secure data storage, as well as an interface for data communication with the AuC.

1.2.1 KVL 4000 Components

The KVL 4000 consists of the two main components:

- **Personal Digital Assistant (PDA)**
- **Security Adapter**

Figure 1-1 KVL 4000 Key Variable Loader



1.2.1.1 Personal Digital Assistant

The Personal Digital Assistant (PDA) is the host component of the KVL 4000, responsible for controlling all operations of the device. It is a Motorola rugged handheld computer operating Windows Mobile 6.5. The PDA model used as part of the KVL 4000 is MC55A0.

Figure 1-2 Personal Digital Assistant (PDA)

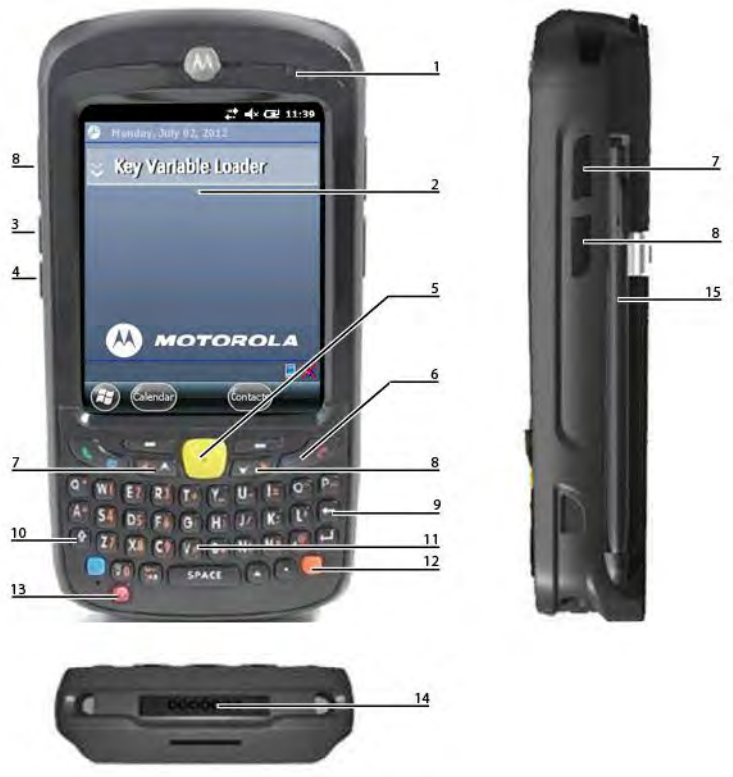


Table 1-1 PDA Controls and Ports Used in the KVL Operation

Callout Number	Item	Description
1	Charging/Battery Status LED	Blinks when the battery is charging; solid when the battery is charged.
2	Touch screen	Navigate through the UI by tapping or dragging items on the screen.
3	Volume Up Key	Press to turn the volume of the KVL sounds up.
4	Volume Down Key	Press to turn the volume of the KVL sounds down.
5	Action Button	You can use it instead of your finger to initiate an action.
6	End Key	Press to return to the KVL main screen.
7	Side Up Navigation Key	You can use it instead of your finger to scroll up a list.
8	Side Down Navigation Key	You can use it instead of your finger to scroll down a list.
9	Backspace Key	Press to delete digits entered with the PDA keypad.

Table 1-1 PDA Controls and Ports Used in the KVL Operation (cont'd.)

Callout Number	Item	Description
10	Shift Key	Press twice to access and lock capital letters.
11	PDA Keypad	Use it for all cases when alphanumeric text entry is required.
12	Orange Key	Press twice to access and lock the secondary layer of characters.
13	Power Button	Press to power on or suspend the KVL; press and hold for 5 seconds to reboot.
14	I/O Connector	Use to connect the PDA to the Security Adapter or to a PC through the USB Programming Cable.
15	Stylus	You can use it instead of your finger to tap and drag items on the screen.

NOTE

For more information on the PDA, see the *MC55 Enterprise Digital Assistant User Guide* (72E-108859) (available at http://www.motorola.com/enterprisemobility/manuals).

1.2.1.2 Security Adapter

The Security Adapter is an integral component of the KVL 4000, providing secure storage of data, cryptographic operations, and port access for the KVL 4000.

CAUTION

Always make sure that you exit the KVL application on the PDA before disconnecting the Security Adapter. Otherwise, you may lose any unsaved work or cause data corruption.

Figure 1-3 Security Adapter – Ports and Interfaces

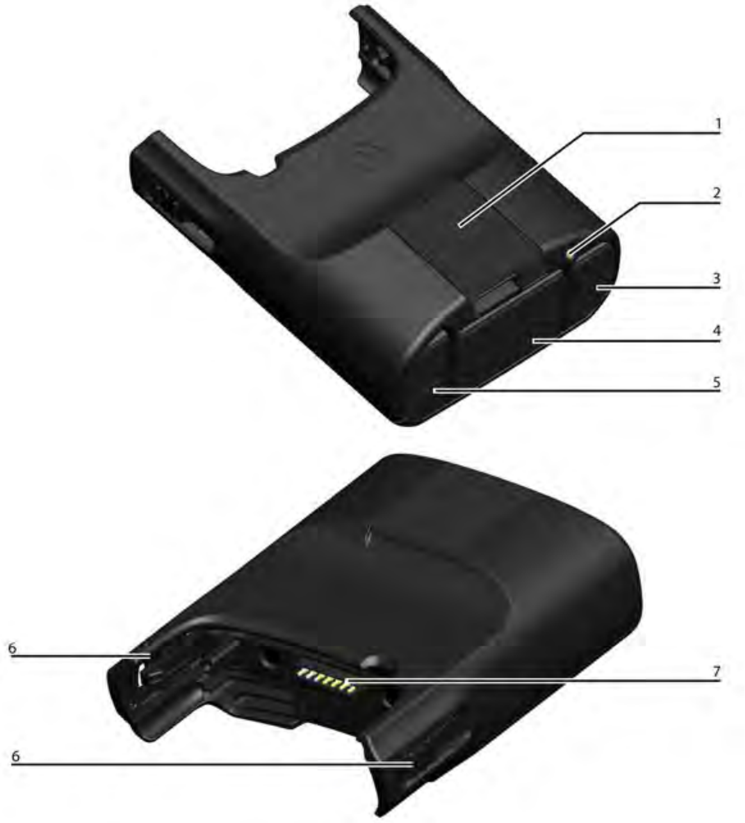


Table 1-2 Security Adapter – Ports and Interfaces

Number	Item	Description
1	Key load Port	Not used in the Radio Authentication mode
2	Tricolored LED	Serves as the diagnostic status indicator for the KVL. The available states are: • Momentary Red – before security adapter self tests • Fast Flashing Amber – during security adapter self tests (power-on) • Momentary Green – after successful security adapter self tests • Solid Red – fatal error / hardware failure
3	Charging Port	Connect the charger to charge the PDA battery.

Table 1-2 Security Adapter – Ports and Interfaces (cont'd.)

Number	Item	Description
4	DB9 Port (RS-232)	Serves as the interface to: • target radios for provisioning authentication keys • a PC/Printer for transferring/printing log records
5	USB Port	Serves as the interface to the USB to Ethernet Adapter for the AuC communication.
6	Locking Tabs	Attach the Security Adapter to the PDA and slide the two locking tabs up until they both lock into position.
7	PDA Interface Port	Serves as the interface to any attached host (the primary host for the Security Adapter is the PDA).

1.2.2 KVL 4000 Key Features

The KVL 4000 offers the following features:

- Manual and automatic generation of authentication keys
- Password protection (Administrator and Operator security levels)
- Secure storage of radio – key pairs
- Configuration of system- and user-specific settings
- Support of the KVL and Crypto Module upgrades
- Support of the AES-128 encryption algorithm
- Support of the following encryption standards:
  - FIPS 140-2
  - FIPS 197
- USB and DB9 (RS-232) Ports
- Maintenance of log records of KVL activities
- Uploading of Authentication Key Provisioning Information to the Authentication Center (AuC)

1.2.3 KVL 4000 Sounds

Table 1-3 Sounds Played by the KVL 4000

Sound name	Description
attention	Played for any case when your attention is needed.
bad bonk	Played when you enter an invalid digit when entering a value.

Table 1-3 Sounds Played by the KVL 4000 (cont'd.)

Sound name	Description
completed	Played when an action or a process (such as loading keys) is completed.
connected	Played when you connect an external device (such as a radio) to the KVL.

NOTE

For information on how to turn the sounds on or off, see the *MC55 Enterprise Digital Assistant User Guide* (72E-108859) (available at http://www.motorola.com/enterprisemobility/manuals).

1.2.4 Using the KVL 4000 for Radio Authentication

Radio communications systems support the exchange of voice and data traffic between a number of devices. As part of the system's security, only devices intended to operate on the system should be given access. ASTRO® 25 Radio Authentication provides a mechanism that allows a radio to prove that it is genuine and therefore can use the trunking system.

The KVL is used to provision each radio that is to be authorized to use the system. Once the radio is properly provisioned, it is able to communicate on the system. All other devices are denied access to the system's communication resources.

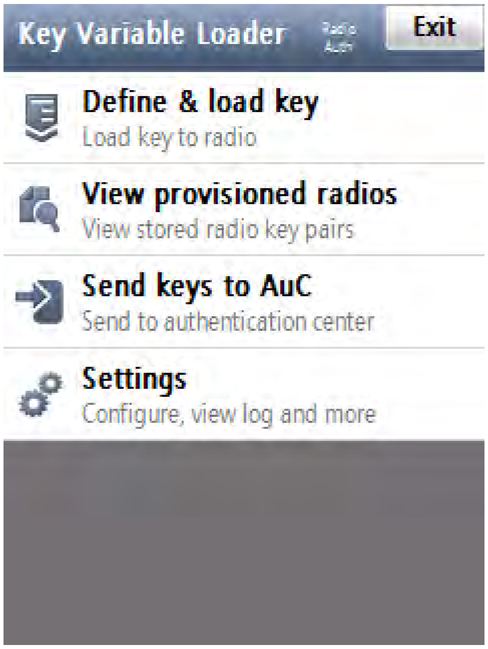
1.3 KVL User Interface

You navigate through the KVL UI and perform operations by:

- Selecting list items, buttons, and tabs
- Entering data
- Dragging sliders
- Scrolling through lists

You can navigate through the KVL UI using your finger. Alternatively, you can use the stylus attached to the side of the PDA, or press hard controls on the PDA.

Figure 1-4 KVL Main Screen



1.4 Getting Started

This section covers the following topics:

1.4.1 Applying Enhanced Security Settings Through the KVL Software Installation Wizard

Prerequisites:

- Ensure that you have the USB Programming Cable.
- For Windows XP, ensure that Microsoft ActiveSync is installed on your PC.
- For Windows Vista and Windows 7, ensure that Microsoft Windows Mobile Device Center is installed on your PC.

When and where to use:
By default, the KVL uses Transparent Security Settings. If required by your organization's policies, follow this procedure to apply Enhanced Security Settings.

NOTE

Applying Enhanced Security Settings causes the KVL to:

- prevent installation and launching of any unsigned applications
- disable the use of wireless modem (Bluetooth and WiFi are disabled)
- require you to set a password on the Operating System

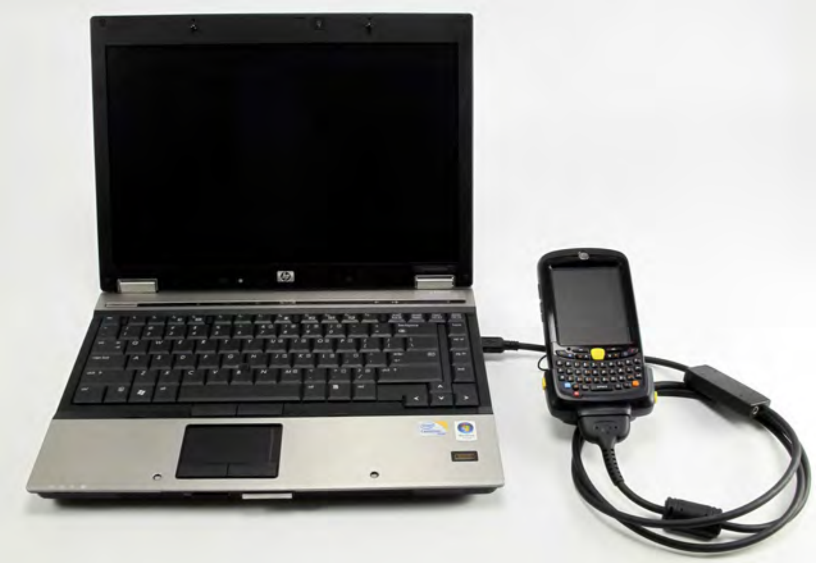
Procedure Steps

1 If the KVL Application software is running, exit or log out of the KVL.

2 Disconnect the Security Adapter from the PDA.

3 Connect the PDA to a PC using the USB Programming Cable.

Figure 1-5 PDA and PC – Connected



Step result: For Windows XP, the ActiveSync application starts. For Windows Vista and Windows 7, the Windows Mobile Device Center starts.

NOTE

If ActiveSync or Windows Mobile Device Center do not start automatically, perform 7.4 Setting the PDA USB Mode, page 7-4 to put the PDA into the **USB Client** or **USB OTG** mode.

4 Insert the CD provided by Motorola and run the Setup.exe file to start the KVL Software Installation Wizard.

Step result: The End User License Agreement screen appears.

5 Click **Accept**.

6 In the window that appears, select the check box next to **Your device is using Transparent Security Settings (default)**, and click **Next**. The Enhanced Security Settings will be applied after the KVL application reinstallation/upgrade.

NOTE

During the process, the PDA may restart several times.

Step result: When the process is completed, a message appears, asking you to configure your device according to the security policy.

7 Check your PDA screen and follow the instructions to renew your password settings.

8 When you have entered and confirmed the password on your PDA, click **OK** on the message on your PC.

Step result: The Enhanced Security Settings are applied successfully.

9 Click **Next** → **Exit** to close the KVL Software Installation Wizard.

10 Disconnect the USB Programming Cable from the PDA.

11 Connect the Security Adapter to the PDA.

NOTE

If the Security Adapter is not detected automatically, perform 7.4 Setting the PDA USB Mode, page 7-4 to put the PDA into the **USB Host** or **USB OTG** mode.

1.4.2 Applying Transparent Security Settings Through the KVL Software Installation Wizard

Prerequisites:

- Ensure that you have the USB Programming Cable.
- For Windows XP, ensure that Microsoft ActiveSync is installed on your PC.
- For Windows Vista and Windows 7, ensure that Microsoft Windows Mobile Device Center is installed on your PC.

Procedure Steps

1 If the KVL Application software is running, exit or log out of the KVL.

2 Disconnect the Security Adapter from the PDA.

3 Connect the PDA to a PC using the USB Programming Cable.

Step result: For Windows XP, the ActiveSync application starts. For Windows Vista and Windows 7, the Windows Mobile Device Center starts.

NOTE

If ActiveSync or Windows Mobile Device Center do not start automatically, perform 7.4 Setting the PDA USB Mode, page 7-4 to put the PDA into the **USB Client** or **USB OTG** mode.

4 Insert the CD provided by Motorola and run the Setup.exe file to start the KVL Software Installation Wizard.

Step result: The End User License Agreement screen appears.

5 Click **Accept**.

6 In the window that appears, clear the check box next to **Your device is using Enhanced Security Settings**, and click **Next**. The Transparent Security Settings will be applied after the KVL application reinstallation/upgrade.

NOTE

During the installation process, the PDA may restart several times.

7 When the process is completed, click **Next** → **Exit** to close the KVL Software Installation Wizard.

Step result: The Transparent Security Settings are applied successfully.

8 Disconnect the USB Programming Cable from the PDA.

9 Connect the Security Adapter to the PDA.

NOTE

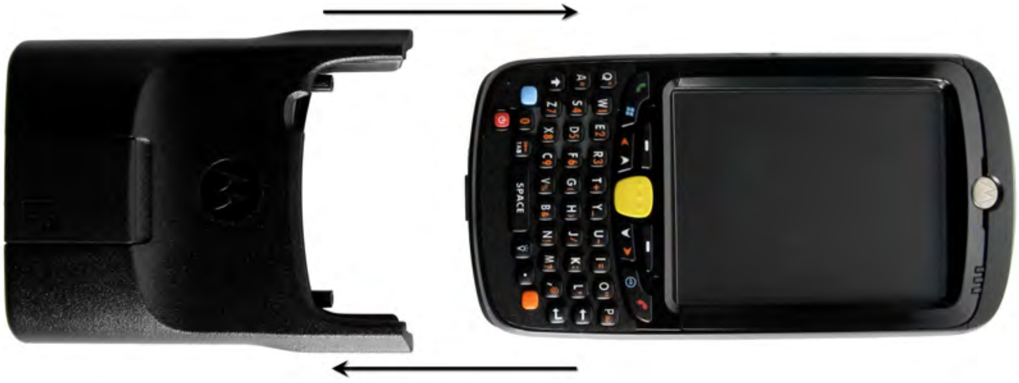
If the Security Adapter is not detected automatically, perform 7.4 Setting the PDA USB Mode, page 7-4 to put the PDA into the **USB Host** or **USB OTG** mode.

1.4.3 Connecting the PDA and the Security Adapter

Procedure Steps

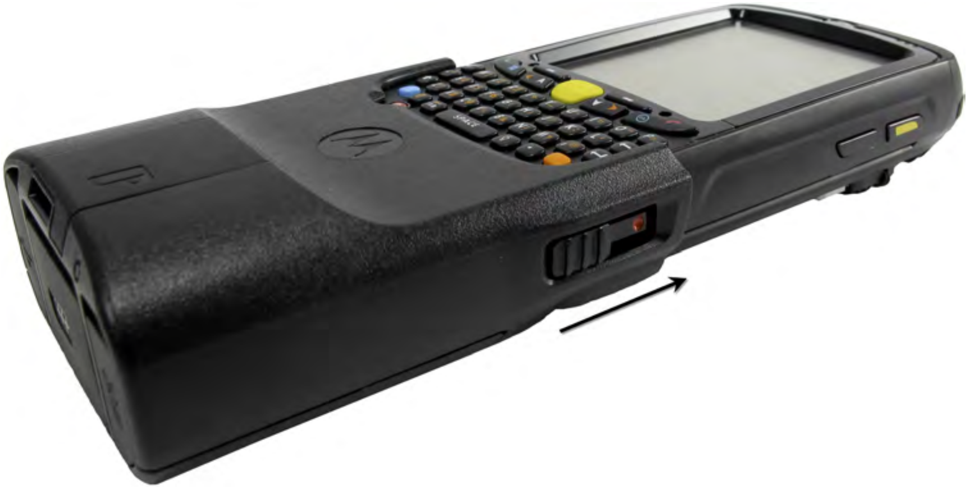
1 Connect the PDA and the Security Adapter.

Figure 1-6 PDA and Security Adapter – Connecting



2 To secure the Adapter, slide the locking tabs up fully until a click is felt indicating they are in the locked position. If either slide is not in the locked position, an orange dot is visible.

Figure 1-7 PDA and Security Adapter – Connected



3 If the Security Adapter is not detected automatically after powering on the PDA, perform 7.4 Setting the PDA USB Mode, page 7-4 to put the PDA into the **USB Host** or **USB OTG** mode.

1.4.4 Connecting the KVL to a Target Device for Radio Authentication

For the Radio Authentication key management operations, the KVL can communicate with the following devices:

- ASTRO® 25 Target Radios (see 1.4.4.1 Connecting the KVL to a Target Radio, page 1-13.)
- Authentication Center (AuC) (see 1.4.4.2 Connecting the KVL to the Network for AuC Communication, page 1-15.)

1.4.4.1 Connecting the KVL to a Target Radio

Prerequisites:
Ensure you have:

- Data cable
- DB9 Gender Changer

Procedure Steps

1 For information on what cables to use with specific target radios, see Table B-5 Interface Cables.

2 Connect the KVL and the target radio using the DB9 Port on the Security Adapter, an appropriate data cable, and a DB9 Gender Changer.

Figure 1-8 KVL and a Portable Radio – Connected (Example)

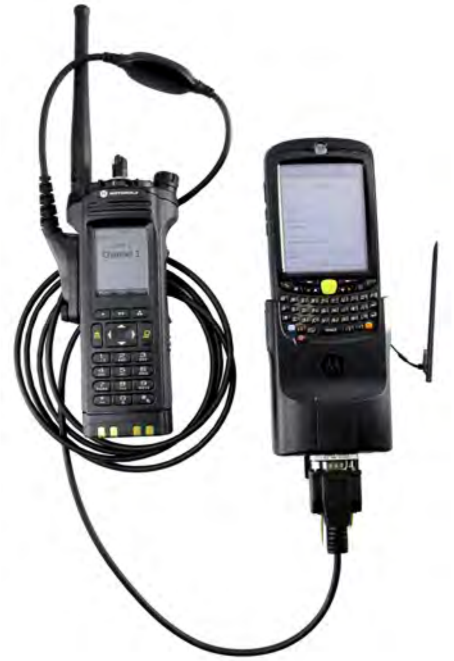
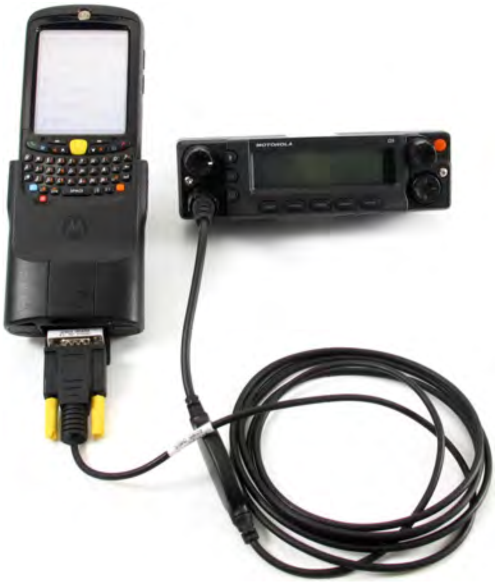


Figure 1-9 KVL and a Mobile Radio – Connected (Example)



1.4.4.2 Connecting the KVL to the Network for AuC Communication

Prerequisites:
Ensure that you have:

- USB to Ethernet Adapter
- MINI-B to Type-A USB Cable
- Ethernet cable

Procedure Steps

1 Connect the KVL to the power supply.

IMPORTANT

It is recommended that you keep the power supply connected to the KVL during the operation.

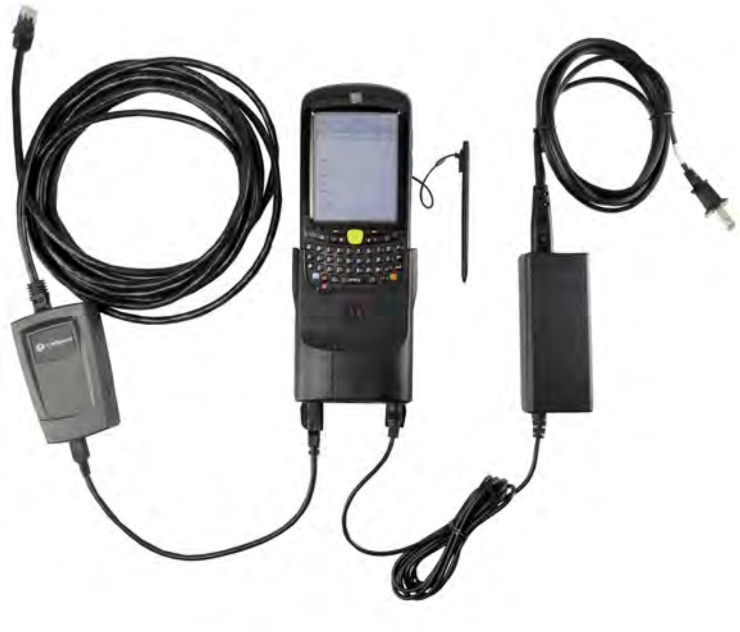
2 Connect the USB to Ethernet Adapter to the USB Port on the KVL using the MINI-B to Type-A USB Cable.

NOTE

Use the CradlePoint Technology® Ethernet adapter.

3 Connect the USB to Ethernet Adapter to the network, using the Ethernet cable.

Figure 1-10 KVL and USB to Ethernet Adapter - Connected



1.4.5 Charging the KVL 4000

Prerequisites:
Ensure that you have:

- Power Supply
- AC Line Cord (See B KVL 4000 – Orderable Parts, page B-1 for the list of compatible AC Line Cords.)

Procedure Steps

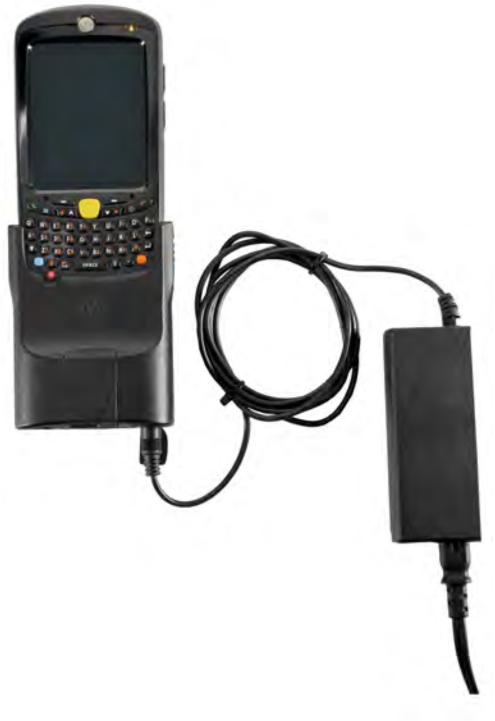
1 Connect one end of the AC Line Cord to the power source.

2 Connect the other end of the AC Line Cord to the power supply.

3 Connect the power supply to the KVL through the Charging Port on the Security Adapter.

Step result: The KVL starts charging. The middle LED on the PDA is blinking to indicate the KVL is being charged. Once the device is fully charged, the LED becomes solid.

Figure 1-11 KVL 4000 - Charging



1.4.6 Launching the KVL Application

Procedure Steps

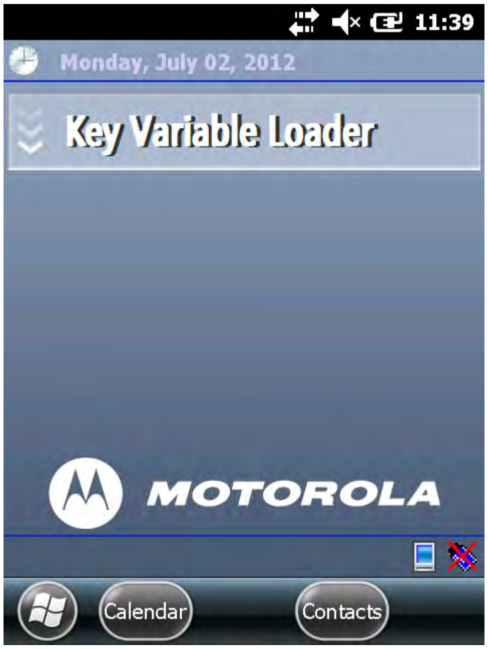
1 If the device is not already powered on, press the **Power** button on the PDA.

NOTE

If you reboot the device, the KVL application launches automatically.

Step result: The KVL powers on and the **Today** screen appears.

Figure 1-12 Today Screen



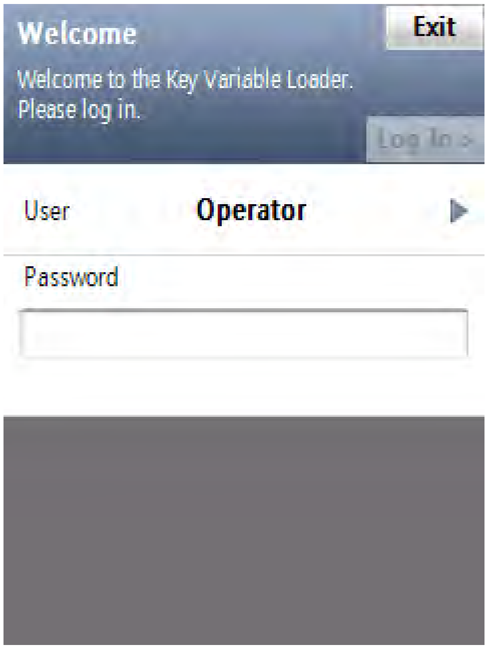
2 Tap the **Key Variable Loader** button.

NOTE

If the PDA and the Security Adapter are not compatible, a notification appears.

Step result: If there are no passwords defined for your KVL, the KVL application launches and the KVL main screen appears. Otherwise, the **Welcome** screen appears.

Figure 1-13 Welcome Screen



Welcome

Welcome to the Key Variable Loader.
Please log in.

User Operator

Password

NOTE

- To change the user level, tap **User** (the current user level is presented). The available values are **Operator** and **Administrator**.
- To exit the KVL application, tap **Exit**.

NOTE

If you launch the KVL first time after reinstalling/upgrading the KVL application, upgrading Security Adapter software, or applying Security Settings on the KVL, the End User License Agreement screen appears. To continue, select **Accept >**.

3 In the **Password** field, type your password using the keypad and tap **Log In** >.

Step result: The KVL main screen appears.

NOTE

If you log on as an Administrator and there are upgrades available for the Security Adapter or a target device, the **Upgrades available** screen appears. For more information on upgrades, see the *KVL 4000 FLASHPort Upgrade User Guide*.

NOTE

If you log on as an Operator and enter an incorrect password 3 times, your account is locked. Wait 15 minutes to try again, or contact an Administrator to unlock your account (see 7.3 Unlocking the Operator Account, page 7-4).

1.4.7 Exiting the KVL Application

When and where to use:
Use these steps to exit the KVL application.

IMPORTANT

To avoid unnecessary drain on the battery, always exit the KVL application before turning off the unit with the **Power** button.

Procedure Steps

1 Navigate to the KVL main screen.

NOTE

You can do it by pressing the End Key on the PDA (see 1.2.1.1 Personal Digital Assistant, page 1-2).

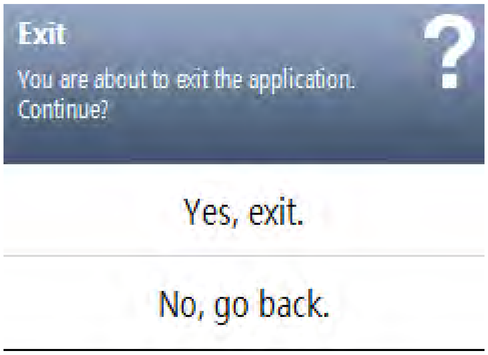
2 Tap **Exit**.

NOTE

If you have passwords defined for your KVL, the button says **Log Off** instead.

Step result: Depending on whether you have passwords defined or not, the **Exit** or the **Log off** screen appears.

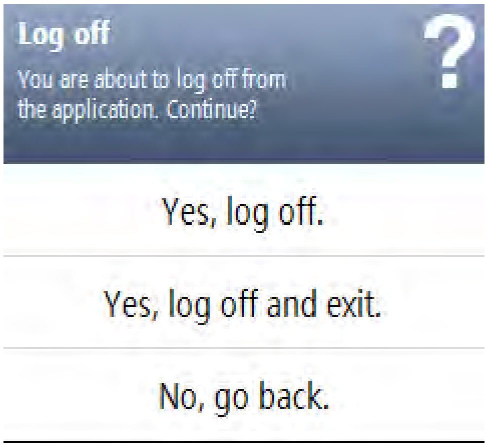
Figure 1-14 Exit Screen



Exit

You are about to exit the application. Continue?

Figure 1-15 Log Off Screen



Log off

You are about to log off from the application. Continue?

3 Select **Yes, exit** or **Yes, log off and exit**.

Step result: You exit the application and the **Today** screen appears.

1.4.8 Configuring VPN Settings

For the Radio Authentication key management operations where the Key Variable Loader (KVL) communicates with an Authentication Center (AuC), the VPN must be configured on the PDA for the KVL to communicate with the AuC remotely. The KVL uses an Ethernet connection to communicate with its managing AuC. To enable this communication, the KVL must be configured with an IP address for itself.

There are configuration profiles for two scenarios:

- When the KVL is directly connected to the Firewall (see 1.4.8.1 Configuring VPN Settings - KVL Directly Connected to the Firewall, page 1-21).
- When the KVL is connected to the Firewall through a network (see 1.4.8.2 Configuring VPN Settings - KVL Connected to the Firewall Through a Network, page 1-29).

NOTE

It is recommended that you create both profiles.

1.4.8.1 Configuring VPN Settings - KVL Directly Connected to the Firewall

Prerequisites:

- Obtain the VPN gateway IP address from the system administrator.
- For Windows XP, ensure that Microsoft ActiveSync is installed on your PC.
- For Windows Vista and Windows 7, ensure that Microsoft Windows Mobile Device Center is installed on your PC.
- Ensure that NCP Entry Configuration Manager WM is installed on your PC. NCP Entry Configuration Manager WM is available at http://www.ncp-e.com/en/downloads/software.html.
- Ensure that you have the USB Programming Cable.

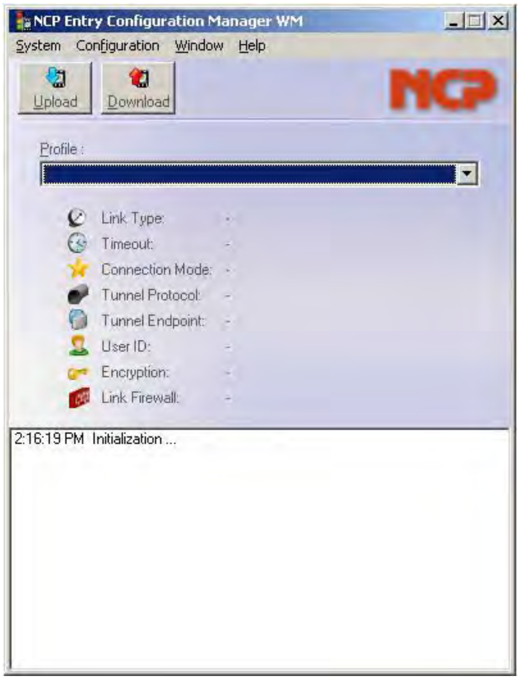
When and where to use:
Use these steps to create a configuration profile for a scenario when the KVL is going to be directly connected to the Firewall.

Procedure Steps

1 On the desktop, select **Start** → **Programs** → **NCP Secure Client** → **NCP Entry Configuration Manager WM**.

Step result: The NCP Entry Configuration Manager WM launches.

Figure 1-16 NCP Entry Configuration Manager WM Window



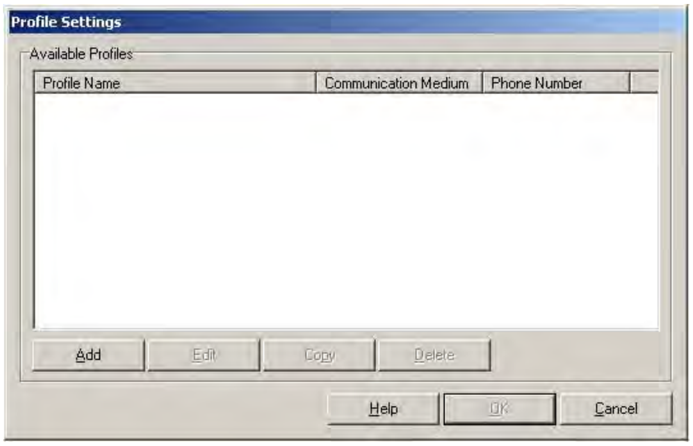
Link Type: -
Timeout: -
Connection Mode: -
Tunnel Protocol: -
Tunnel Endpoint: -
User ID: -
Encryption: -
Link Firewall: -

```
2:16:19 PM  Initialization ...
```

2 On the NCP Entry Configuration Manager WM window, select **Configuration** → **Profile Settings**.

Step result: The Profile Settings window appears.

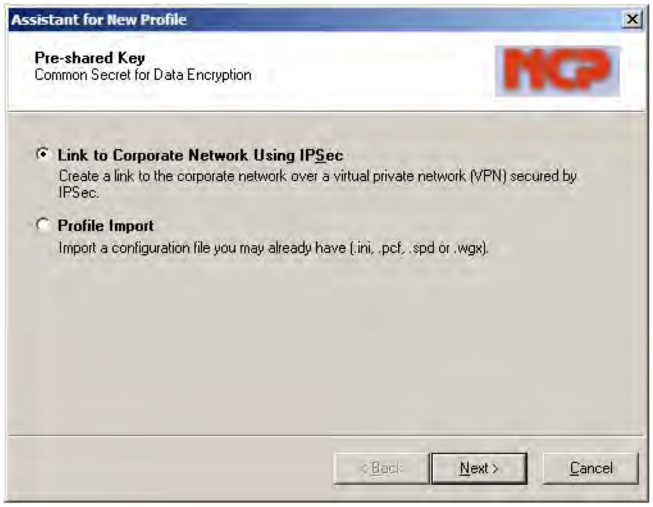
Figure 1-17 Profile Settings Window



3 On the Profile Settings window, click **Add**.

Step result: The Assistant for New Profile – Pre-shared Key window appears.

Figure 1-18 Assistant for New Profile – Pre-shared Key Window



Assistant for New Profile

Pre-shared Key
Common Secret for Data Encryption

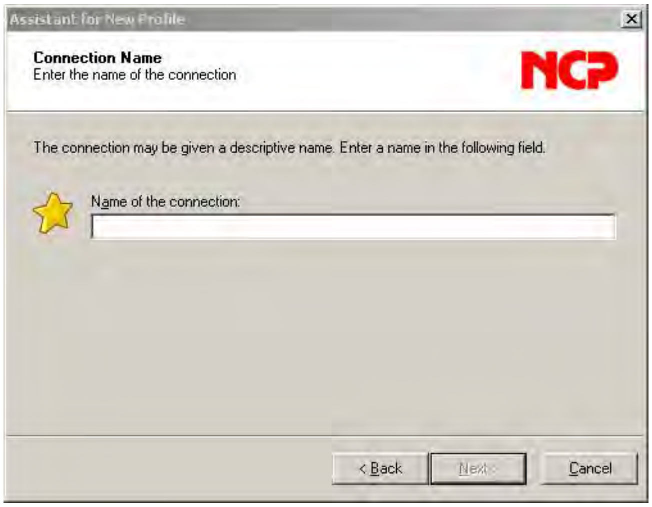
● **Link to Corporate Network Using IPSec**
Create a link to the corporate network over a virtual private network (VPN) secured by IPSec.

○ **Profile Import**
Import a configuration file you may already have (.ini, .pcf, .spd or .wgx).

4 Select **Link to Corporate Network Using IPSec**, and click **Next**.

Step result: The Assistant for New Profile – Connection Name window appears.

Figure 1-19 Assistant for New Profile – Connection Name Window



Assistant for New Profile

Connection Name
Enter the name of the connection

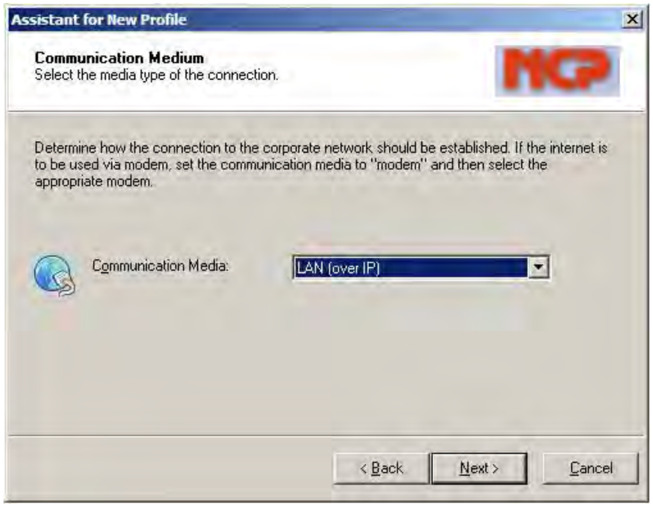
The connection may be given a descriptive name. Enter a name in the following field.

Name of the connection:

5 In the Name of the connection field, type **`KVL4000 at Firewall`**, and click **Next**.

Step result: The Assistant for New Profile – Communication Medium window appears.

Figure 1-20 Assistant for New Profile – Communication Medium Window



Assistant for New Profile

Communication Medium
Select the media type of the connection.

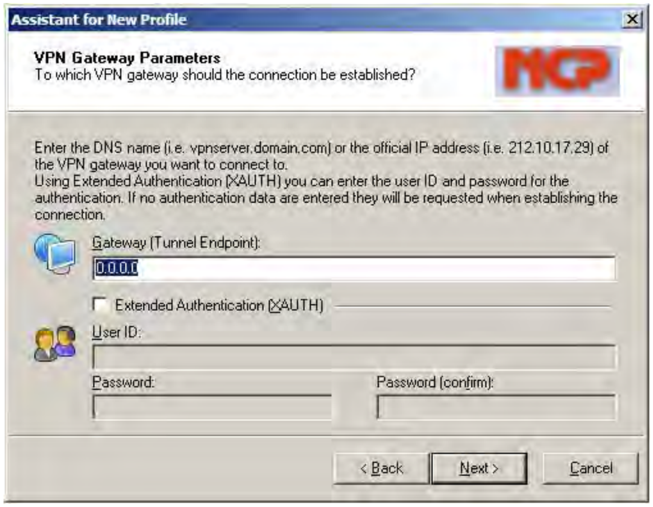
Determine how the connection to the corporate network should be established. If the internet is to be used via modem, set the communication media to "modem" and then select the appropriate modem.

Communication Media: LAN (over IP)

6 From the Communication Media drop-down list, select **LAN (over IP)**, and then click **Next**.

Step result: The Assistant for New Profile – VPN Gateway Parameters window appears.

Figure 1-21 Assistant for New Profile – VPN Gateway Parameters Window



Assistant for New Profile

VPN Gateway Parameters
To which VPN gateway should the connection be established?

Enter the DNS name (i.e. vpnserver.domain.com) or the official IP address (i.e. 212.10.17.29) of the VPN gateway you want to connect to.
Using Extended Authentication (XAUTH) you can enter the user ID and password for the authentication. If no authentication data are entered they will be requested when establishing the connection.

Gateway (Tunnel Endpoint): 0.0.0.0

□ Extended Authentication (XAUTH)

User ID:

Password:

Password (confirm):

7 On the VPN Gateway Parameters window, perform the following actions:

a. In the Gateway (Tunnel Endpoint) field, enter the IP address you obtained from the system administrator.

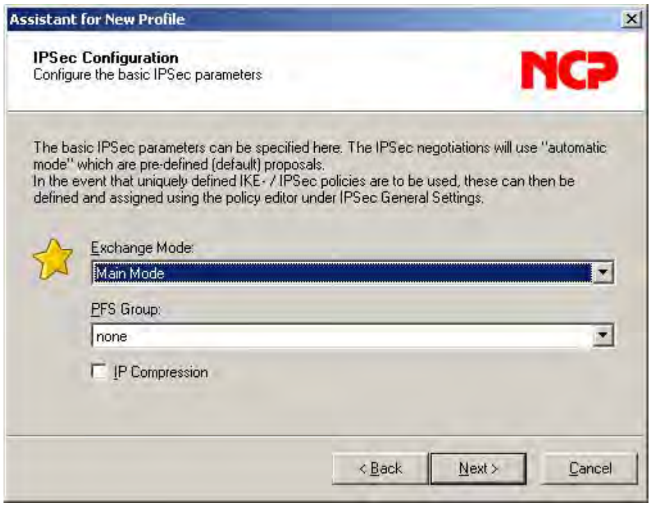
NOTE

For systems with the Dynamic System Resilience (DSR) feature, in case of a switchover, you will need to change the IP address to be able to contact the backup Gateway.

b. Click **Next**.

Step result: The Assistant for New Profile – IPSec Configuration window appears.

Figure 1-22 Assistant for New Profile – IPSec Configuration Window



Assistant for New Profile

IPSec Configuration
Configure the basic IPSec parameters

The basic IPSec parameters can be specified here. The IPSec negotiations will use "automatic mode" which are pre-defined (default) proposals.
In the event that uniquely defined IKE- / IPSec policies are to be used, these can then be defined and assigned using the policy editor under IPSec General Settings.

Exchange Mode: Main Mode

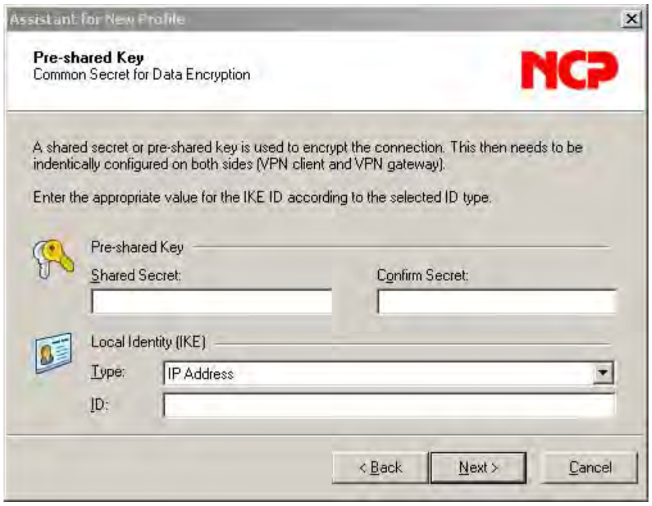
PFS Group: none

□ IP Compression

8 On the IPSec Configuration window, click **Next**.

Step result: The Assistant for New Profile – Pre-shared Key window appears.

Figure 1-23 Assistant for New Profile – Pre-shared Key



Assistant for New Profile

Pre-shared Key
Common Secret for Data Encryption

A shared secret or pre-shared key is used to encrypt the connection. This then needs to be indentically configured on both sides (VPN client and VPN gateway).

Enter the appropriate value for the IKE ID according to the selected ID type.

Pre-shared Key

Shared Secret:

Confirm Secret:

Local Identity (IKE)

Type: IP Address

ID:

9 In the Pre-shared Key window, perform the following actions:

a. In the appropriate fields, enter and reenter the Shared Secret.

NOTE

The Pre-shared key that you enter here must match the Pre-shared key on the Firewall. For more information, see the *Firewall* manual.

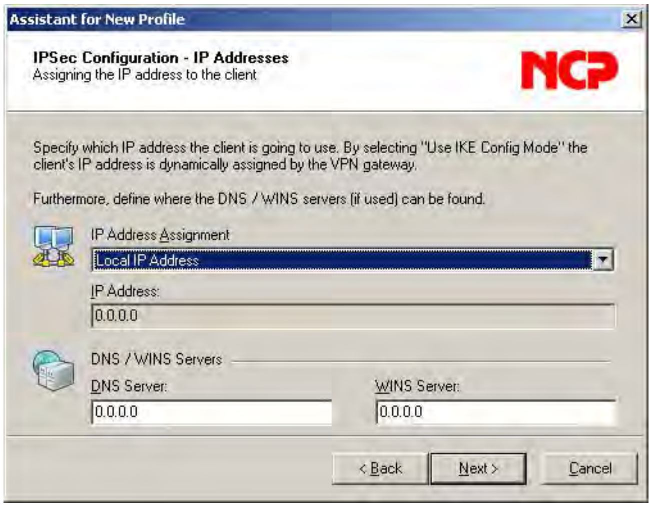
b. From the Type drop-down list, select **Fully Qualified Domain Name**.

c. In the ID field, enter the ID.

d. Click **Next**.

Step result: The Assistant for New Profile – IPSec Configuration – IP Addresses window appears.

Figure 1-24 Assistant for New Profile – IPSec Configuration – IP Addresses Window



Assistant for New Profile

IPSec Configuration - IP Addresses
Assigning the IP address to the client

Specify which IP address the client is going to use. By selecting "Use IKE Config Mode" the client's IP address is dynamically assigned by the VPN gateway.

Furthermore, define where the DNS / WINS servers (if used) can be found.

IP Address Assignment: Local IP Address

IP Address: 0.0.0.0

DNS / WINS Servers

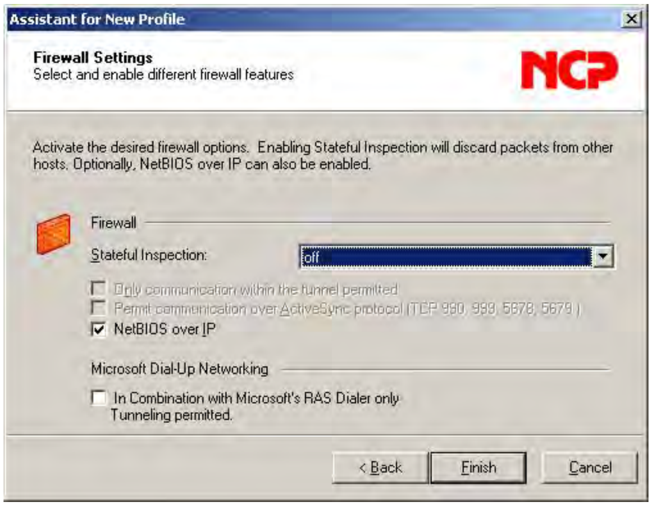
DNS Server: 0.0.0.0

WINS Server: 0.0.0.0

10 From the IP Address Assignment drop-down list, select **Local IP Address**, and then click **Next**.

Step result: The Assistant for New Profile – Firewall Settings window appears.

Figure 1-25 Assistant for New Profile – Firewall Settings Window



Assistant for New Profile

Firewall Settings
Select and enable different firewall features

Activate the desired firewall options. Enabling Stateful Inspection will discard packets from other hosts. Optionally, NetBIOS over IP can also be enabled.

Firewall

Stateful Inspection: off

□ Only communication within the tunnel permitted
□ Permit communication over ActiveSync protocol (TCP 990, 999, 5678, 5679)
☑ NetBIOS over IP

Microsoft Dial-Up Networking

□ In Combination with Microsoft's RAS Dialer only Tunneling permitted.

---

11 On the Firewall Settings window, click **Finish**.

Step result: The window closes.

---

12 On the Profile Settings window, click **OK**.

Step result: The window closes.

---

13 Connect the PDA to the PC using the USB Programming Cable.

Step result: For Windows XP, the ActiveSync application starts. For Windows Vista and Windows 7, the Windows Mobile Device Center starts.

NOTE

If ActiveSync or Windows Mobile Device Center do not start, perform 7.4 Setting the PDA USB Mode, page 7-4 to put the PDA into the **USB Client** or **USB OTG** mode.

---

14 Click **Upload** on the NCP Entry Configuration Manager WM window.

Step result: The upload process starts, followed by a confirmation message.

1.4.8.2 Configuring VPN Settings - KVL Connected to the Firewall Through a Network

Prerequisites:

- Obtain the VPN gateway IP address from the system administrator.
- For Windows XP, ensure that Microsoft ActiveSync is installed on your PC.
- For Windows Vista and Windows 7, ensure that Microsoft Windows Mobile Device Center is installed on your PC.
- Ensure that NCP Entry Configuration Manager WM is installed on your PC. NCP Entry Configuration Manager WM is available at http://www.ncp-e.com/en/downloads/software.html.
- Ensure that you have the USB Programming Cable.

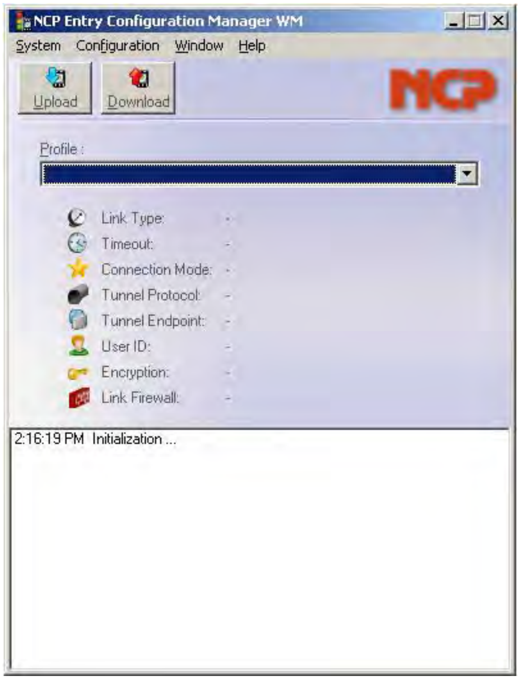
When and where to use:
Use these steps to create a configuration profile for a scenario when the KVL is going to be connected to the Firewall through a network.

Procedure Steps

1 On the desktop, select **Start** → **Programs** → **NCP Secure Client** → **NCP Entry Configuration Manager WM**.

Step result: The NCP Entry Configuration Manager WM launches.

Figure 1-26 NCP Entry Configuration Manager WM Window



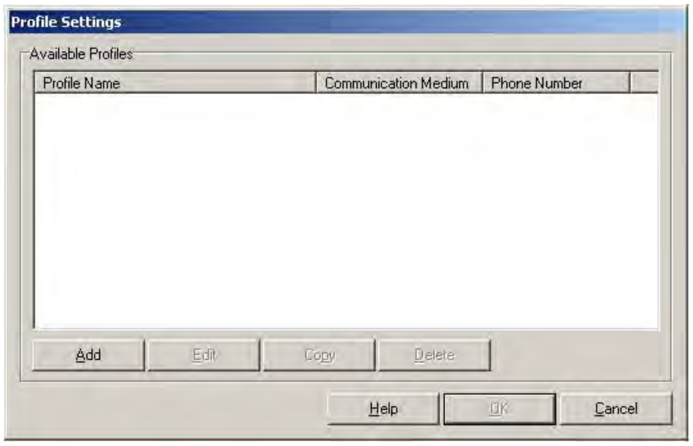
Link Type: -
Timeout: -
Connection Mode: -
Tunnel Protocol: -
Tunnel Endpoint: -
User ID: -
Encryption: -
Link Firewall: -

2:16:19 PM Initialization ...

2 On the NCP Entry Configuration Manager WM window, select **Configuration** → **Profile Settings**.

Step result: The Profile Settings window appears.

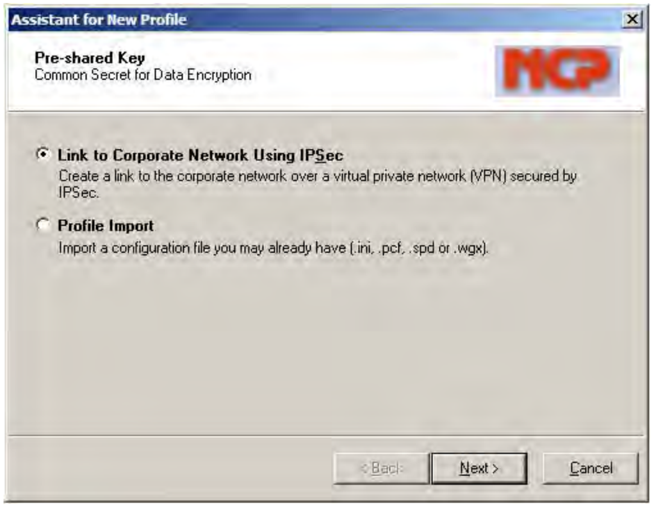
Figure 1-27 Profile Settings Window



3 On the Profile Settings window, click **Add**.

Step result: The Assistant for New Profile – Pre-shared Key window appears.

Figure 1-28 Assistant for New Profile – Pre-shared Key Window



Pre-shared Key
Common Secret for Data Encryption

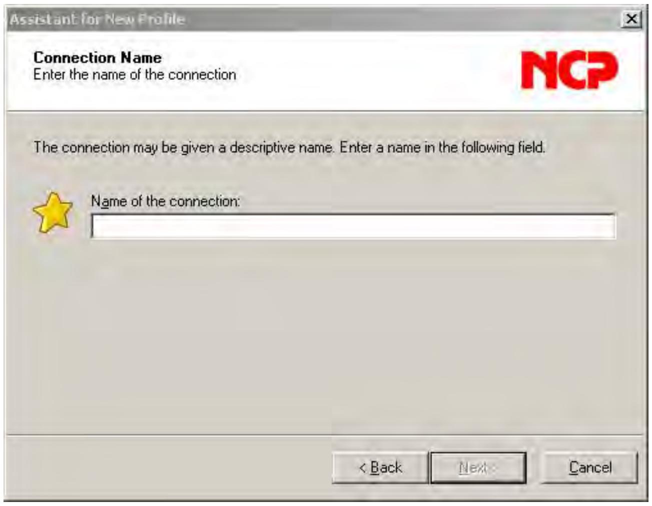
● **Link to Corporate Network Using IPSec**
Create a link to the corporate network over a virtual private network (VPN) secured by IPSec.

○ **Profile Import**
Import a configuration file you may already have (.ini, .pcf, .spd or .wgx).

4 Select **Link to Corporate Network Using IPSec**, and click **Next**.

Step result: The Assistant for New Profile – Connection Name window appears.

Figure 1-29 Assistant for New Profile – Connection Name Window



Connection Name
Enter the name of the connection

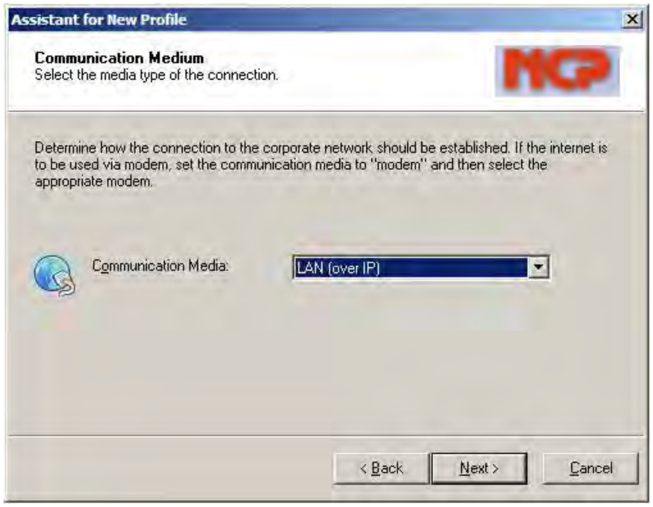
The connection may be given a descriptive name. Enter a name in the following field.

Name of the connection:

5 In the Name of the connection field, type `KVL4000 through Network`, and click **Next**.

Step result: The Assistant for New Profile – Communication Medium window appears.

Figure 1-30 Assistant for New Profile – Communication Medium Window



Communication Medium
Select the media type of the connection.

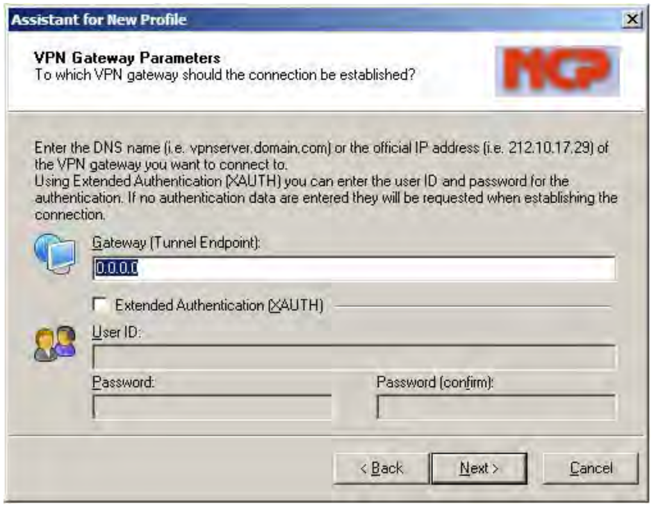
Determine how the connection to the corporate network should be established. If the internet is to be used via modem, set the communication media to "modem" and then select the appropriate modem.

Communication Media: LAN (over IP)

6 From the Communication Media drop-down list, select **LAN (over IP)**, and then click **Next**.

Step result: The Assistant for New Profile – VPN Gateway Parameters window appears.

Figure 1-31 Assistant for New Profile – VPN Gateway Parameters Window


Assistant for New Profile
VPN Gateway Parameters
To which VPN gateway should the connection be established?
NCP

Enter the DNS name (i.e. vpnserver.domain.com) or the official IP address (i.e. 212.10.17.29) of the VPN gateway you want to connect to.
Using Extended Authentication (XAUTH) you can enter the user ID and password for the authentication. If no authentication data are entered they will be requested when establishing the connection.

Gateway (Tunnel Endpoint): 0.0.0.0

□ Extended Authentication (XAUTH)

User ID:

Password:

Password (confirm):

7 On the VPN Gateway Parameters window, perform the following actions:

a. In the Gateway (Tunnel Endpoint) field, enter the IP address you obtained from the system administrator.

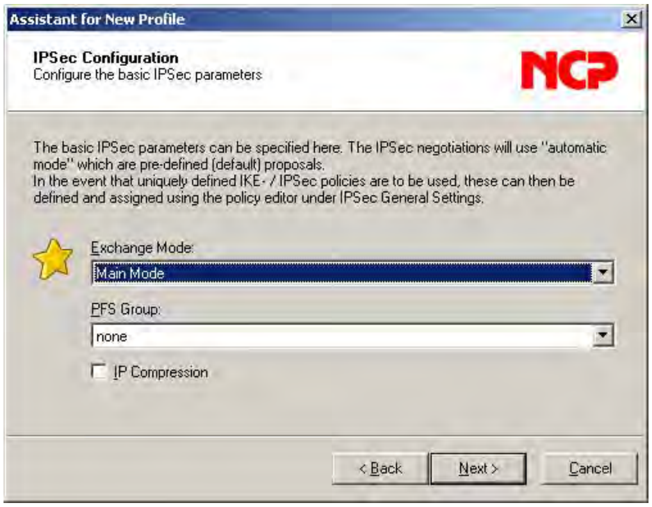
NOTE

For systems with the Dynamic System Resilience (DSR) feature, in case of a switchover, you will need to change the IP address to be able to contact the backup Gateway.

b. Click **Next**.

Step result: The Assistant for New Profile – IPSec Configuration window appears.

Figure 1-32 Assistant for New Profile – IPSec Configuration Window



Assistant for New Profile

IPSec Configuration
Configure the basic IPSec parameters

The basic IPSec parameters can be specified here. The IPSec negotiations will use "automatic mode" which are pre-defined (default) proposals.
In the event that uniquely defined IKE- / IPSec policies are to be used, these can then be defined and assigned using the policy editor under IPSec General Settings.

Exchange Mode: Main Mode

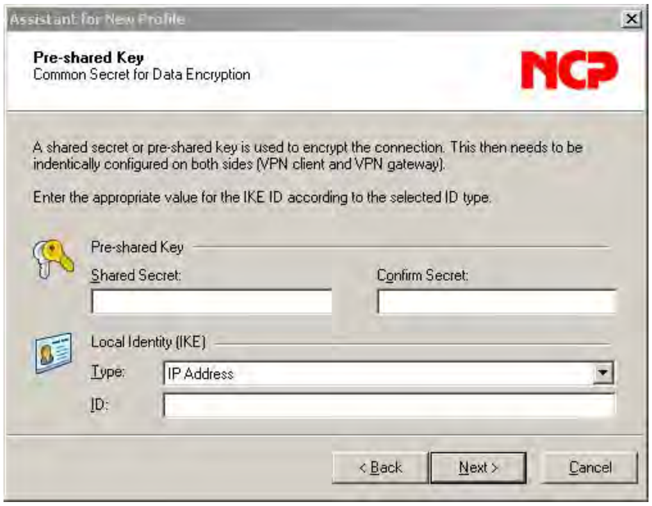
PFS Group: none

☐ IP Compression

8 On the IPSec Configuration window, click **Next**.

Step result: The Assistant for New Profile – Pre-shared Key window appears.

Figure 1-33 Assistant for New Profile – Pre-shared Key



Assistant for New Profile

Pre-shared Key
Common Secret for Data Encryption

A shared secret or pre-shared key is used to encrypt the connection. This then needs to be indentically configured on both sides (VPN client and VPN gateway).

Enter the appropriate value for the IKE ID according to the selected ID type.

Pre-shared Key

Shared Secret:

Confirm Secret:

Local Identity (IKE)

Type: IP Address

ID:

9 In the Pre-shared Key window, perform the following actions:

a. In the appropriate fields, enter and reenter the Shared Secret.

NOTE

The Pre-shared key that you enter here must match the Pre-shared key on the Firewall. For more information, see the *Firewall* manual.

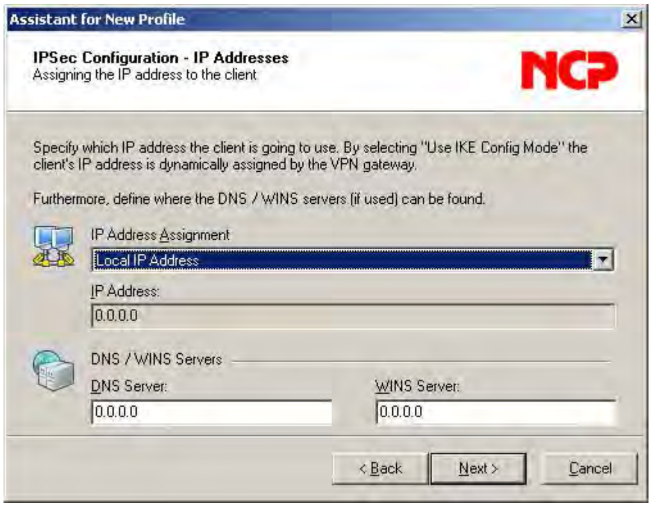
b. From the Type drop-down list, select **Fully Qualified Domain Name**.

c. In the ID field, enter the ID.

d. Click **Next**.

Step result: The Assistant for New Profile – IPSec Configuration – IP Addresses window appears.

Figure 1-34 Assistant for New Profile – IPSec Configuration – IP Addresses Window



Assistant for New Profile

IPSec Configuration - IP Addresses
Assigning the IP address to the client

Specify which IP address the client is going to use. By selecting "Use IKE Config Mode" the client's IP address is dynamically assigned by the VPN gateway.

Furthermore, define where the DNS / WINS servers (if used) can be found.

IP Address Assignment: Local IP Address

IP Address: 0.0.0.0

DNS / WINS Servers

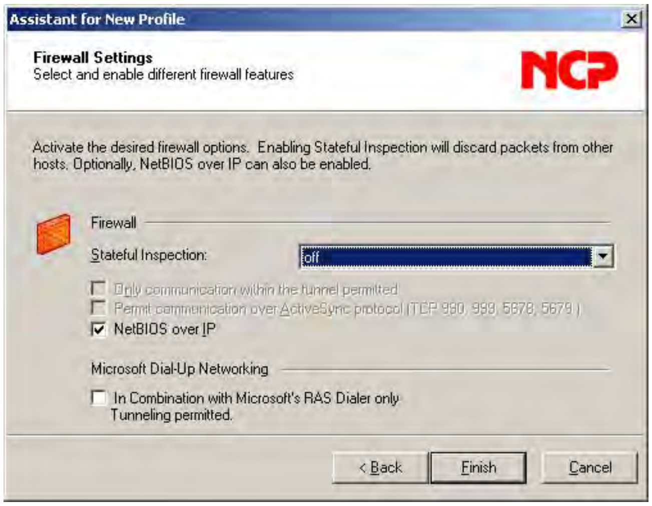
DNS Server: 0.0.0.0

WINS Server: 0.0.0.0

10 From the IP Address Assignment drop-down list, select **Local IP Address**, and then click **Next**.

Step result: The Assistant for New Profile – Firewall Settings window appears.

Figure 1-35 Assistant for New Profile – Firewall Settings Window



Firewall Settings
Select and enable different firewall features

Activate the desired firewall options. Enabling Stateful Inspection will discard packets from other hosts. Optionally, NetBIOS over IP can also be enabled.

Firewall

Stateful Inspection: off

□ Only communication within the tunnel permitted
□ Permit communication over ActiveSync protocol (TCP 990, 999, 5678, 5679)
☑ NetBIOS over IP

Microsoft Dial-Up Networking

□ In Combination with Microsoft's RAS Dialer only
Tunneling permitted.

11 On the Profile Settings window, click **OK**.

Step result: The window closes.

12 On the Profile Settings window, click **OK**.

Step result: The window closes.

13 Connect the PDA to the PC using the USB Programming Cable.

Step result: For Windows XP, the ActiveSync application starts. For Windows Vista and Windows 7, the Windows Mobile Device Center starts.

NOTE

If ActiveSync or Windows Mobile Device Center do not start, perform 7.4 Setting the PDA USB Mode, page 7-4 to put the PDA into the **USB Client** or **USB OTG** mode.

14 Click **Upload** on the NCP Entry Configuration Manager WM window.

Step result: The upload process starts, followed by a confirmation message.

1.4.9 Establishing the VPN Connection

Prerequisites:

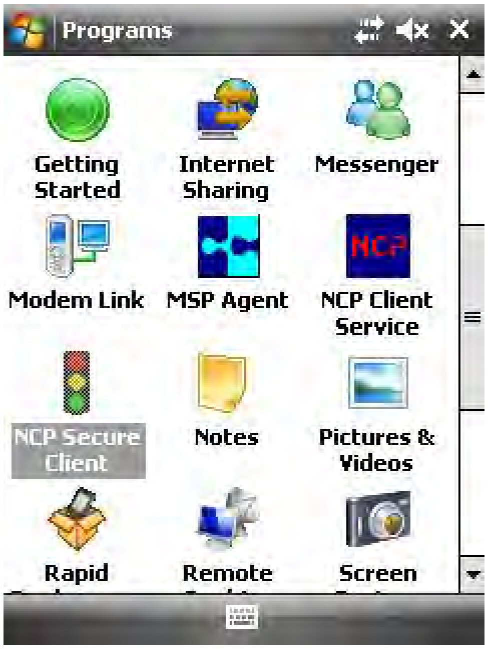
- For the VPN connection to work, the NCP Client Service must be running. On the PDA screen, select **Start** → **Programs** → **NCP Client Service**, and run the service if it is not already running.
- Obtain the VPN Username and VPN Password from your system administrator.

Procedure Steps

1 In the upper left corner of the PDA screen, select **Start** → **Programs**.

Step result: The Programs screen appears.

Figure 1-36 Programs Screen



2 Select the **NCP Secure Client** icon.

Step result: The NCP Secure Client screen appears.

Figure 1-37 NCP Secure Client Screen – KVL 4000 at Firewall

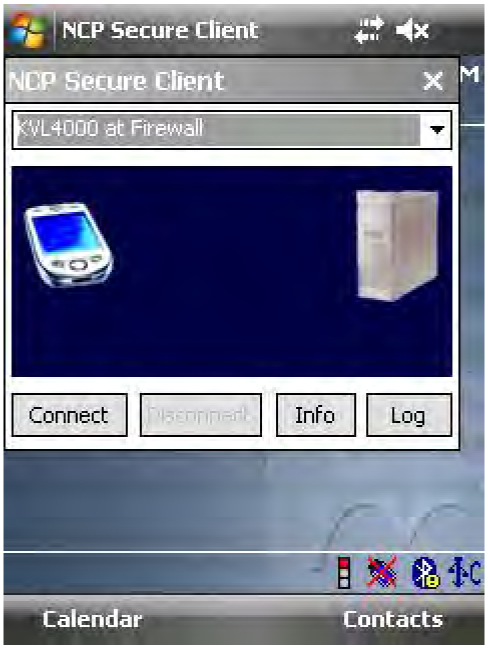
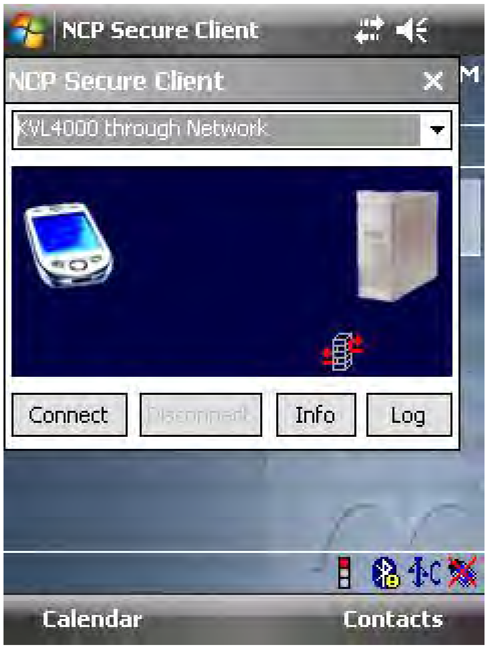


Figure 1-38 NCP Secure Client Screen – KVL 4000 Through Network



3 From the drop-down list, select one of the following options:

If...	Then...
Your KVL is connected directly to the Firewall...	Select **KVL4000 at Firewall**.
Your KVL is connected to the Firewall through a network...	Select **KVL4000 through Network**.

4 Select **Connect**.

Step result: You are prompted to enter your VPN Username.

5 Type in your VPN Username and select **OK**.

Step result: You are prompted to enter your VPN Password.

6 Type in your VPN Password and select **OK**.

Step result: The **Connecting** animation appears, followed by the Connected screen. The VPN connection is established.

Figure 1-39 NCP Secure Client Screen – KVL 4000 at Firewall – Connected

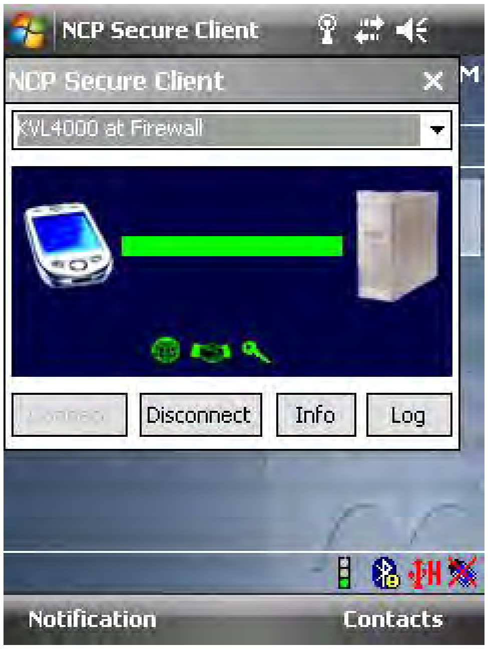
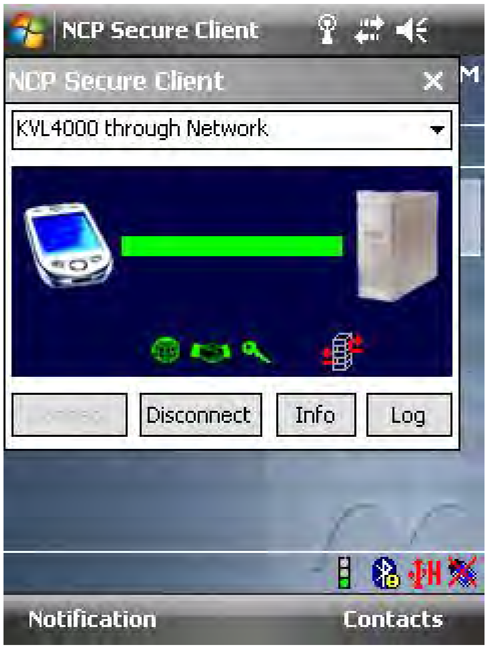


Figure 1-40 NCP Secure Client Screen – KVL 4000 Through Network – Connected



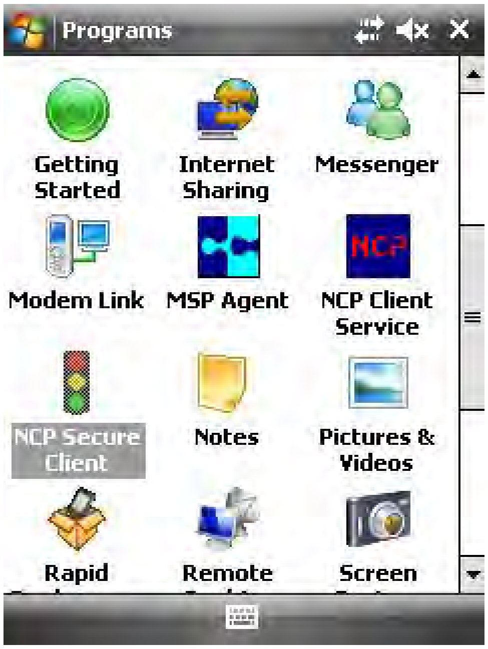
1.4.10 Terminating the VPN Connection

Procedure Steps

1 In the upper left corner of the PDA screen, select **Start** → **Programs**.

Step result: The Programs screen appears.

Figure 1-41 Programs Screen



2 Select the **NCP Secure Client** icon.

Step result: The NCP Secure Client screen appears.

3 Select **Disconnect**.

Step result: The **Disconnecting** animation appears, and then the NCP Secure Client screen comes back. The VPN connection is terminated.

Postrequisites:
Before provisioning radios with authentication keys, ensure the NCP Client Service is stopped. On the PDA screen, select **Start** → **Programs** → **NCP Client Service**, and stop the service.

2 Performing Initial Programming

Before using your KVL to enter and load authentication keys, set several parameters that determine how the KVL operates.

2.1 KVL 4000 User Preference Parameters

The user preference parameters and settings are not required for operation of the KVL, but instead provide a way of customizing certain functions to suit your individual needs.

2.1.1 Setting the KVL Log Off Time

For security reasons, you can set the period of inactivity after which you are logged off from the KVL.

Prerequisites:
This option is only available if you have set passwords on your KVL. Only an Administrator can set or change the KVL log off time.

Procedure Steps

1 Log on to the KVL application as an Administrator.

2 On the KVL main screen, select **Settings** → **Security** → **Inactivity**.

Step result: The list of available duration appears, with the currently set duration highlighted.

NOTE

To return to the previous screen without changing the current duration, tap **Cancel**.

3 Tap the desired duration.

Step result: The duration is changed.

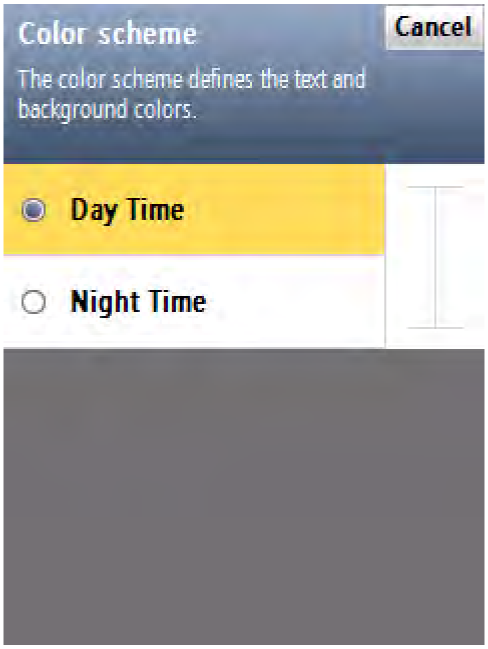
4 Tap **Done** on the consecutive screens to return to the KVL main screen.

2.1.2 Setting the KVL Screen Color Scheme

You can set the KVL screen to one of the two color schemes: Day Time, or Night Time. These schemes define the text and background colors of the KVL screen. By default, the KVL screen is set to the Day Time scheme.

When and where to use:
Use these steps to set the KVL screen color scheme.

Figure 2-1 KVL Screen in Day Time Color Scheme (Example)



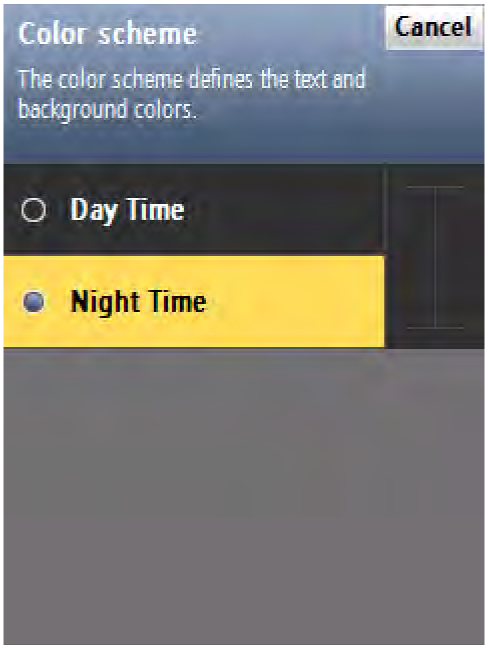
Color scheme

The color scheme defines the text and background colors.

● Day Time

○ Night Time

Figure 2-2 KVL Screen in Night Time Color Scheme (Example)



Color scheme

The color scheme defines the text and background colors.

○ Day Time

● Night Time

Procedure Steps

1. On the KVL main screen, select **Settings** → **General** → **Color scheme**.

   Step result: The list of color scheme options appears, with the one currently used highlighted.

   NOTE

   Tap **Cancel** to return to the previous screen without changing the current mode.

2. Tap the desired color scheme.

   Step result: The color scheme is changed.

3. Tap **Done** on the consecutive screens to return to the KVL main screen.

2.1.3 Managing Passwords

The KVL provides two levels of security access:

- **Administrator**
- **Operator**

The Administrator has access to all functions and features. The Operator does **NOT** have access to the following functions and features:

- performing KVL and radio's Crypto Module upgrades
- changing the KVL inactivity timeout
- changing Administrator password
- changing KVL ID
- changing AuC ID
- changing System ID
- changing WACN ID
- changing AuC Destination Port
- changing Radio Destination Port
- changing active AuC
- changing UKEK for AuC operation
- changing KVL network configurations
- clearing the list of provisioned radios
- clearing passwords
- clearing log records

Without password protection, all users have access to all of the KVL functions.

2.1.3.1 Setting Up Passwords on the KVL

This section covers the following topics:

- 2.1.3.1.1 Setting Up the Operator Password, page 2-4
- 2.1.3.1.2 Setting Up the Administrator Password, page 2-5

2.1.3.1.1 Setting Up the Operator Password

When and where to use:
Use these steps to set up the Operator password.

NOTE

You cannot set just Administrator or Operator passwords, but must set both, if the password feature is desired.

Procedure Steps

1 On the KVL main screen, select **Settings** → **Security** → **Passwords** → **Define passwords** → **Operator**.

Step result: The **New password** and **Repeat password** entry fields appear.

2 In the **New password** entry field, type the password of your choice using the PDA keypad.

NOTE

The password must contain between 15 and 30 characters, including at least 1 special character, 1 numeric character, and 1 uppercase character. The following special characters are acceptable: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | } ~

NOTE

As you type the password, dynamic hints about password rules appear.

3 In the **Repeat password** entry field, type the password again.

Step result: If the passwords match, the **Done** button is enabled.

NOTE

To abort the operation at any time, tap **Cancel**.

4 Tap **Done**.

Step result: The password has been set up.

5 Tap **Done** on the consecutive screens to return to the KVL main screen.

IMPORTANT

If the Operator password is forgotten, the Administrator can assign a new Operator password.

2.1.3.1.2 Setting Up the Administrator Password

When and where to use:
Use these steps to set up the Administrator password.

NOTE

You cannot set just Administrator or Operator passwords, but must set both, if the password feature is desired.

Procedure Steps

1 On the KVL main screen, select **Settings** → **Security** → **Passwords** → **Define passwords** → **Administrator**.

Step result: The **New password** and **Repeat password** entry fields appear.

2 In the **New password** entry field, type the password of your choice using the PDA keypad.

NOTE

The password must contain between 15 and 30 characters, including at least 1 special character, 1 numeric character, and 1 uppercase character. The following special characters are acceptable: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | } ~

NOTE

As you type the password, dynamic hints about password rules appear.

3 In the **Repeat password** entry field, type the password again.

Step result: If the passwords match, the **Done** button is enabled.

NOTE

To abort the operation at any time, tap **Cancel**.

4 Tap **Done**.

Step result: The password has been set up.

5 Tap **Done** on the consecutive screens to return to the KVL main screen.

2.1.3.2 Changing Passwords on the KVL

This section covers the following topics:

2.1.3.2.1 Changing the Operator Password (Operator Access Level)

When and where to use:
Use this procedure if you have the Operator level of access.

Procedure Steps

1 Log on as an Operator.

Step result: The KVL main screen appears.

2 Select **Settings** → **Security** → **Password**.

Step result: The **Operator** screen appears, with the **Current password**, **New password**, and **Repeat password** entry fields.

3 In the **Current password** entry field, type the current password using the PDA keypad.

4 In the **New password** entry field, type the password of your choice using the PDA keypad.

NOTE

The password must contain between 15 and 30 characters, including at least 1 special character, 1 numeric character, and 1 uppercase character. The following special characters are acceptable: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | } ~

NOTE

As you type the password, dynamic hints about password rules appear.

5 In the **Repeat password** entry field, type the password again.

Step result: If the passwords match, the **Done** button is enabled.

NOTE

To abort the operation at any time, tap **Cancel**.

6 Tap **Done**.

Step result: The password has been changed.

7 Tap **Done** on the consecutive screens to return to the KVL main screen.

2.1.3.2.2 Changing the Operator Password (Administrator Access Level)

When and where to use:
Use this procedure if you have the Administrator level of access.

Procedure Steps

1 Log on as an Administrator.

NOTE

If you are prompted for upgrades, select **No, not now**.

Step result: The KVL main screen appears.

2 Select **Settings** → **Security** → **Passwords** → **Update passwords** → **Operator**.

Step result: The **Current password**, **New password**, and **Repeat password** entry fields appear.

3 In the **Current password** entry field, type the current password using the PDA keypad.

4 In the **New password** entry field, type the password of your choice using the PDA keypad.

NOTE

The password must contain between 15 and 30 characters, including at least 1 special character, 1 numeric character, and 1 uppercase character. The following special characters are acceptable: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | } ~

NOTE

As you type the password, dynamic hints about password rules appear.

5 In the **Repeat password** entry field, type the password again.

Step result: If the passwords match, the **Done** button is enabled.

NOTE

To abort the operation at any time, tap **Cancel**.

6 Tap **Done**.

Step result: The password has been changed.

7 Tap **Done** on the consecutive screens to return to the KVL main screen.

2.1.3.2.3 Changing the Administrator Password

Prerequisites:
Only an Administrator can change the Administrator password.

Procedure Steps

1 Log on as an Administrator.

NOTE

If you are prompted for upgrades, select **No, not now**.

Step result: The KVL main screen appears.

2 Select **Settings** → **Security** → **Passwords** → **Update passwordsAdministrator**.

Step result: The **Current password**, **New password**, and **Repeat password** entry fields.

3 In the **Current password** entry field, type the current password using the PDA keypad.

4 In the **New password** entry field, type the new password.

NOTE

The password must contain between 15 and 30 characters, including at least 1 special character, 1 numeric character, and 1 uppercase character. The following special characters are acceptable: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | } ~

NOTE

As you type the password, dynamic hints about password rules appear.

5 In the **Repeat password** entry field, type the new password again.

Step result: If the passwords match, the **Done** button is enabled.

NOTE

To abort the operation at any time, tap **Cancel**.

6 Tap **Done**.

Step result: The password has been changed.

7 Tap **Done** on the consecutive screens to return to the KVL main screen.

IMPORTANT

If you forget the Administrator password, you must perform a system reset before the KVL can be used again. Since a system reset erases all stored keys and returns the KVL settings to the factory defaults, you must enter all keys again.

2.1.3.3 Clearing KVL Passwords

Prerequisites:
Only an Administrator can clear passwords.

Procedure Steps

1 Log on as an Administrator.

NOTE

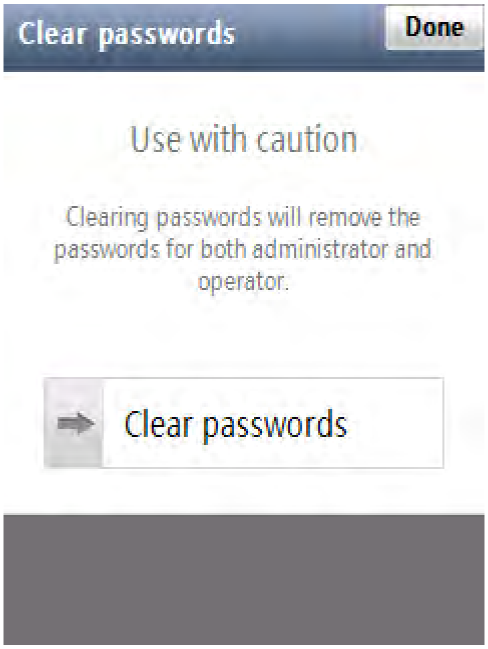
If you are prompted for upgrades, select **No, not now**.

Step result: The KVL main screen appears.

2 Select **Settings** → **Security** → **Passwords** → **Clear passwords**.

Step result: A screen with the **Clear passwords** slider appears.

Figure 2-3 Clear Passwords Screen



Clear passwords

Use with caution

Clearing passwords will remove the passwords for both administrator and operator.

3 Touch the slider and drag it from left to right. Alternatively, highlight the slider, and use the navigation key on the PDA to move it.

CAUTION

Clearing passwords removes the passwords for both administrator and operator.

Step result: The passwords have been cleared.

4 Tap **Done** on the consecutive screens to return to the KVL main screen.

2.1.3.4 Selecting the Password Masking Mode

There are two masking modes available for the KVL passwords: all characters masked, or the last character non masked.

Procedure Steps

1 On the KVL main screen, select **Settings** → **Security** → **Masking mode**.

Step result: A screen with the list of available options appears.

2 Select the masking mode of your choice.

Step result: The masking mode is selected and you return to the previous screen.

3 Tap **Done** on the consecutive screens to return to the KVL main screen.

2.2 KVL 4000 System-Dependent Parameters

Set the parameters in this section depending on the particular system (ASN, ASTRO® 25, or Radio Authentication) in which the KVL is operating.

2.2.1 KVL 4000 – Switching Between the Modes of Operation

The KVL provides three modes of operation: ASN (Advanced SECURENET®), ASTRO® 25, and Radio Authentication. The KVL is shipped from the factory to power on in the ASTRO® 25 mode. Then, the KVL powers on in the mode it was operating in when it was last powered off.

Prerequisites:
This procedure is applicable if your KVL is configured to operate in more than one mode of operation.

When and where to use:
Use these steps to switch between the modes of operation.

IMPORTANT

In the Radio Authentication mode, the KVL operates in FIPS Level 2 only. Before changing the mode of operation to Radio Authentication, ensure FIPS Level 2 is set for the mode the KVL is currently operating in.

Procedure Steps

1 On the KVL main screen, select **Settings** → **System**.

Step result: A list of available modes appears (ASN, ASTRO® 25, and Radio Authentication), with the currently used mode highlighted.

NOTE

To return to the previous screen without changing the mode, tap **Cancel**.

2 Tap the desired mode of operation.

Step result: The mode is changed.

3 Tap **Done** to return to the KVL main screen.

2.2.2 Setting the Baud Rate for RS-232 Communication

When using the KVL DB9 Port (RS-232) to communicate with external equipment (such as a KMF, or a modem), select the proper baud rate.

Procedure Steps

1 On the KVL main screen, select **Settings** → **General** → **Baud Rate**.

Step result: A list of available values appears, with the currently set value highlighted. You can choose from the following values:

- 9600
- 19200
- 57600
- 115200

NOTE

To return to the previous screen without changing the current value, tap **Cancel**.

2 Tap the desired value.

3 Tap **Done** on the consecutive screens to return to the KVL main screen.

2.2.3 Changing the FIPS Mode

The KVL can operate in a mode that is compliant with the U.S. Federal Information Processing Standard (FIPS) guidelines. To be FIPS-compliant, set passwords on your KVL.

IMPORTANT

In the Radio Authentication mode, the KVL operates in FIPS Level 2 only. Before changing the mode of operation to Radio Authentication, ensure FIPS Level 2 is set for the mode the KVL is currently operating in. For details, see “Changing the FIPS Mode” in the *KVL 4000 Key Variable Loader Advanced SECURENET User Guide* (6871018P35) or the *KVL 4000 Key Variable Loader ASTRO 25 User Guide* manual.

3 Setting Up the KVL for Radio Authentication Key Management Operations

Before using your KVL for the Radio Authentication key management operations, program the following parameters:

- **UKEK**
- **AuC ID**
- **KVL ID**
- **System ID**
- **WACN ID**

Also, perform the following actions:

- Select Main or Backup AuC.
- Configure the AuC network parameters (IP Address and Destination Port).
- Configure the KVL with the destination port of the radio it is going to communicate with.

3.1 Entering the UKEK for Radio Authentication

For the Radio Authentication key management operations, program a Unique Key Encryption Key (UKEK) into the KVL for the AES-128 algorithm. The UKEK is a 16-character key used to communicate with an AuC.

Prerequisites:
Only an Administrator can enter the UKEK. The KVL must support AES-128.

When and where to use:
Use these steps to enter the UKEK.

IMPORTANT

You enter the UKEK only once, after which it is permanently stored in the KVL memory. The UKEK is destroyed if the FIPS mode is enabled.

Procedure Steps

1 On the KVL main screen, select **Settings** → **Radio authentication** → **Authentication center** → **UKEKs** → **AES-128**.

Step result: A Hex keypad appears.

2 Enter the UKEK using the Hex keypad.

NOTE

As you enter the digits, they appear in the info field and the green background indicates the progress. If you enter an incorrect digit, a **bad bonk** tone is played. To delete a digit you have entered, tap the **< Del** key, or hold it to delete all entered digits. To abort the operation, tap **Cancel**.

Step result: When you have entered a valid string of digits, a check mark appears next to it.

3 Tap **Done** on the consecutive screens until you return to the KVL main screen.

3.2 Entering the AuC ID

For the Radio Authentication key management operations, the KVL must be supplied with the identifier (ID) of an AuC it is to communicate with (AuC ID).

Prerequisites:
Only an Administrator can enter the AuC ID.

Procedure Steps

1 On the KVL main screen, select **Settings** → **Radio authentication** → **Authentication center** → **AuC ID**.

Step result: A decimal keypad appears.

2 Enter the AuC ID using the decimal keypad.

NOTE

- The available values range from 1 through 9999999. The default value is 9999999.
- As you enter the digits, they appear in the info field. When you have entered a 7-digit value, the keypad becomes disabled.
- To delete a digit you have entered, tap the **< Del** key, or hold it to delete all entered digits. To abort the operation, tap **Cancel**.

3 When you have entered the AuC ID, tap **Done** on the consecutive screens to return to the KVL main screen.

3.3 Entering the KVL ID

For the Radio Authentication key management operations, the KVL must be supplied with an identifier (KVL ID) for itself to be able to communicate with the AuC and the target radio. The KVL ID is used to uniquely identify the KVL within the AuC as the AuC may communicate with more than one KVL.

Prerequisites:
Only an Administrator can enter the KVL ID.

Procedure Steps

1 On the KVL main screen, select **Settings** → **KVL ID**.

Step result: A decimal keypad appears.

2 Enter the KVL ID using the decimal keypad.

NOTE

- The available values range from 1 through 9999999. The default value is 9999998.
- As you enter the digits, they appear in the info field. When you have entered a 7-digit value, the keypad becomes disabled.
- To delete a digit you have entered, tap the **< Del** key, or hold it to delete all entered digits. To abort the operation, tap **Cancel**.

3 When you have entered the KVL ID, tap **Done** on the consecutive screens to return to the KVL main screen.

3.4 Entering the System ID

For the Radio Authentication key management operations, the KVL must be supplied with a System ID for itself to be able to communicate with the AuC and the target radio for automatic authentication key management. The System ID ensures the KVL only provisions target radios with an authentication key for the system the AuC and KVL are configured to manage.

Prerequisites:
Only an Administrator can enter the System ID.

When and where to use:
Use these steps to enter the System ID.

CAUTION

Changing the System ID erases all stored radio – key pairs.

Procedure Steps

1 On the KVL main screen, select **Settings** → **Radio authentication** → **System ID**.

Step result: A Hex keypad appears.

2 Enter the System ID using the Hex keypad.

NOTE

- The available values range from 000 through FFF. The default value is 000.
- As you enter the digits, they appear in the info field. When you have entered a 3-digit value, the keypad becomes disabled.
- To delete a digit you have entered, tap the **< Del** key, or hold it to delete all entered digits. To abort the operation, tap **Cancel**.

3 When you have entered the System ID, tap **Done** on the consecutive screens to return to the KVL main screen.

3.5 Entering the WACN ID

For the Radio Authentication key management operations, the KVL must be supplied with a WACN ID for itself to be able to communicate with the AuC and the target radio for automatic authentication key management. The WACN ID ensures the KVL only provisions target radios with an authentication key for the system the AuC and KVL are configured to manage.

Prerequisites:
Only an Administrator can enter the WACN ID.

When and where to use:
Use these steps to enter the WACN ID.

CAUTION

Changing the WACN ID erases all stored radio – key pairs.

Procedure Steps

1 On the KVL main screen, select **Settings** → **Radio authentication** → **WACN ID**.

Step result: A Hex keypad appears.

2 Enter the WACN ID using the Hex keypad.

NOTE

- The available values range from 00000 through FFFFF. The default value is 00000.
- As you enter the digits, they appear in the info field. When you have entered a 5-digit value, the keypad becomes disabled.
- To delete a digit you have entered, tap the **< Del** key, or hold it to delete all entered digits. To abort the operation, tap **Cancel**.

3 When you have entered the WACN ID, tap **Done** on the consecutive screens to return to the KVL main screen.

3.6 Selecting Main or Backup AuC

For the Radio Authentication key management operations, the KVL can communicate to a Main or a Backup AuC. Only one AuC can be considered active at a time.

Prerequisites:
Only an Administrator can change the active AuC.

Procedure Steps

1 On the KVL main screen, select **Settings** → **Radio authentication** → **Authentication center** → **Active AuC**.

NOTE

To return to the previous screen without changing the currently selected AuC, tap **Cancel**.

Step result: A list of available options (Main or Backup AuC) appears, with the currently selected AuC highlighted.

2 Select the desired AuC.

3 Tap **Done** on the consecutive screens to return to the KVL main screen.

3.7 Configuring the AuC Network Parameters

For the Radio Authentication Key Management operations, the KVL must be configured with the communication parameters necessary to communicate with the AuC remotely. The KVL uses an Ethernet connection to communicate with its managing AuC. To enable this communication, the KVL must be configured with an IP address and destination port of the AuC.

3.7.1 Entering the AuC IP Address

Prerequisites:
Only an Administrator can enter the AuC IP address.

When and where to use:
Use these steps to enter the AuC IP address.

NOTE

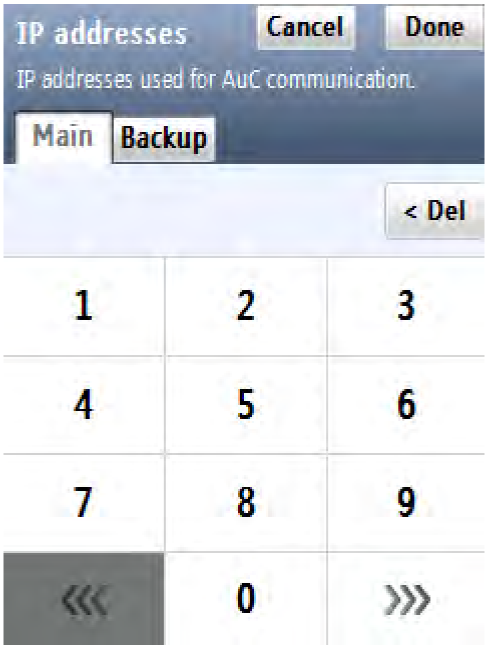
The IP address must be IPv4.

Procedure Steps

1 On the KVL main screen, select **Settings** → **Radio authentication** → **Authentication center** → **IP addresses**.

Step result: A decimal keypad appears.

Figure 3-1 IP Addresses Entry Screen



IP addresses

IP addresses used for AuC communication

2 Select the tab associated with the AuC you want to enter the IP address for (**Main** or **Backup**) and enter the IP address using the decimal keypad.

NOTE

For the IP address, contact your radio network administrator.

NOTE

Tap **< Del** to delete a digit, or hold it to delete all entered digits. To abort the operation, tap **Cancel**.

3 Tap **Done**.

Step result: The IP address is stored in the KVL memory.

4 Tap **Done** on the consecutive screens to return to the KVL main screen.

3.7.2 Entering the AuC Destination Port

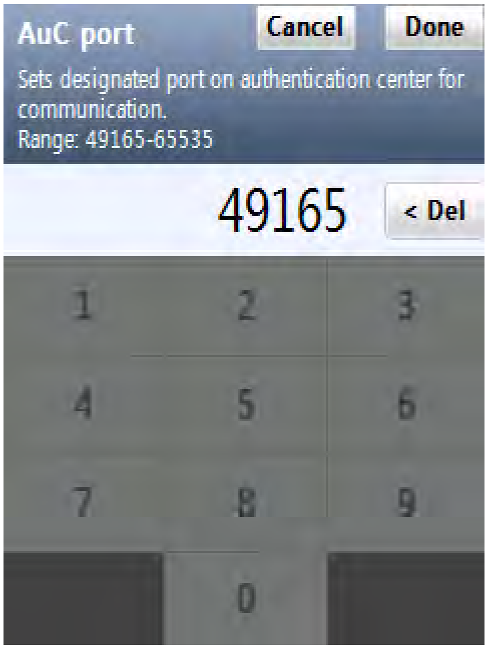
Prerequisites:
Only an Administrator can enter the AuC destination port.

Procedure Steps

1 On the KVL main screen, select**Settings** → **Radio authentication** → **Authentication center** → **AuC port**.

Step result: A decimal keypad appears.

Figure 3-2 AuC Port Entry Screen



AuC port

Sets designated port on authentication center for communication.
Range: 49165-65535

49165

2 Enter the AuC destination port value using the decimal keypad.

NOTE

The available values range from 49165 through 65535. Tap < **Del** to delete a digit, or hold it to delete all entered digits. To abort the operation, tap **Cancel**.

IMPORTANT

Even though the security adapter can store a different destination port for Main and Backup AuC, this setting sets both Main and Backup destination ports to the same value when changed.

3 Tap **Done**.

Step result: The AuC destination port value is stored in the KVL memory.

4 Tap **Done** on the consecutive screens to return to the KVL main screen.

3.8 Entering the Radio Destination Port

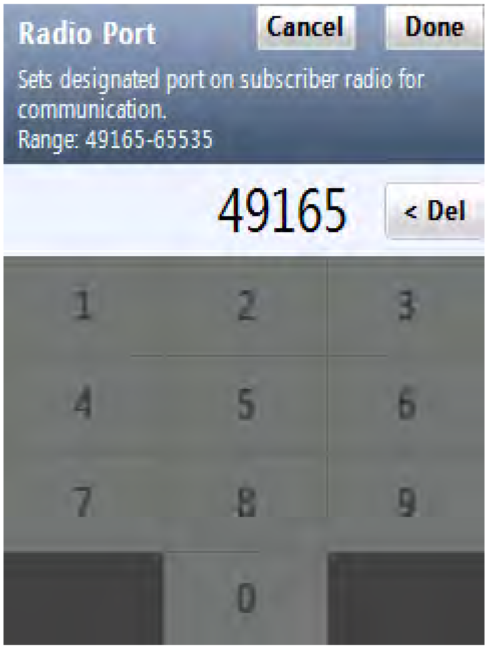
For the Radio Authentication Key Management operations, the KVL must be configured with the destination port of the radio it is going to communicate with.

Procedure Steps

1 On the KVL main screen, select **Settings** → **Radio authentication** → **Radio port**.

Step result: A decimal keypad appears.

Figure 3-3 Radio Port Entry Screen



Radio Port

Sets designated port on subscriber radio for communication.

Range: 49165-65535

49165

2 Enter the Radio port value using the decimal keypad.

NOTE

The available values range from 49165 through 65535. Tap **< Del** to delete a digit, or hold it to delete all entered digits. To abort the operation, tap **Cancel**.

3 Tap **Done**.

Step result: The Radio port value is stored in the KVL memory.

4 Tap **Done** on the consecutive screen to return to the KVL main screen.

4 Provisioning Radios With Authentication Keys

Using the KVL, you can define authentication keys and load them into ASTRO® 25 radios.

4.1 Provisioning Authentication Keys Manually

Prerequisites:

- Obtain a Data cable and a DB9 Gender Changer.
- Ensure the NCP Client Service is stopped. On the PDA screen, select **Start** → **Programs** → **NCP Client Service**, and stop the service if it is running.

When and where to use:
Use these steps to manually provision a target radio with an authentication key.

Procedure Steps

1 Connect the KVL and the target radio. (See 1.4.4.1 Connecting the KVL to a Target Radio, page 1-13.)

NOTE

You can also connect the target radio anytime before step 4.

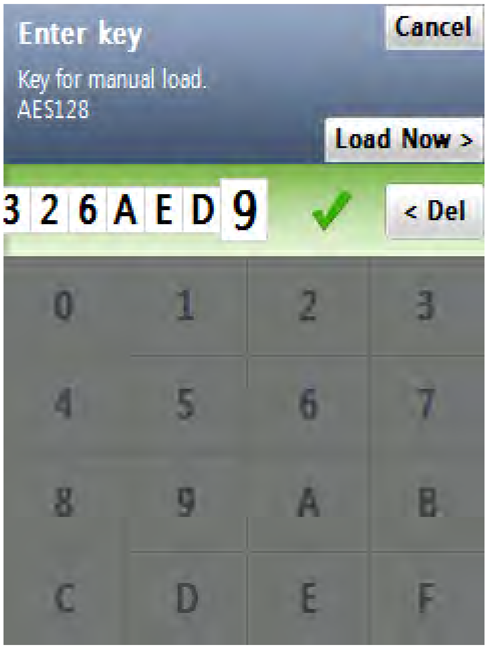
2 On the KVL screen, select **Define & load key** → **Manually entered**.

Step result: A Hex keypad appears.

3 Tap **Auto** to quickly generate the authentication key, or enter the key using the Hex keypad.

Step result: Once the key is validated, a check mark appears next to it.

Figure 4-1 Enter Key Screen Key Validated



Enter key

Key for manual load.
AES128

3 2 6 A E D 9 ✓

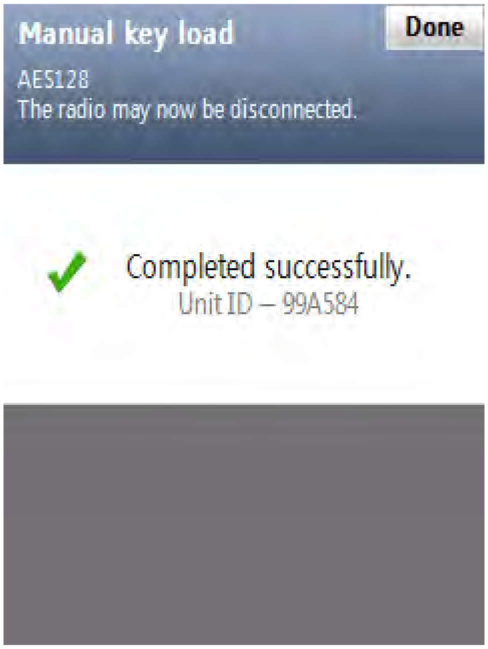
SUGGESTION

Since manually generated keys are erased from the KVL after loading to radios, you may want to write down the key.

4 Tap **Load Now** >.

Step result: The KVL validates if the target radio has a valid and active Unit ID. Then, a progress screen appears, indicating that the key is being loaded into the active Unit ID. When the key is loaded successfully, a confirmation screen appears, displaying the Unit ID to which the key has been assigned.

Figure 4-2 Manual Key Load Successful – Confirmation Screen



Manual key load

AES128

The radio may now be disconnected.

Completed successfully.

Unit ID – 99A584

SUGGESTION

Since the radio – key pairs are not stored in the KVL for the manually generated keys, you may want to write down the Unit ID.

5 Disconnect the radio.

6 Tap **Done** to return to the KVL main screen.

4.2 Provisioning Authentication Keys Automatically

Prerequisites:

- Obtain a Data cable and a DB9 Gender Changer.
- Ensure the NCP Client Service is stopped. On the PDA screen, select **Start** → **Programs** → **NCP Client Service**, and stop the service if it is running.

When and where to use:
Use these steps to automatically provision a target radio with an authentication key.

Procedure Steps

1 Connect the KVL and the target radio. (See 1.4.4.1 Connecting the KVL to a Target Radio, page 1-13.)

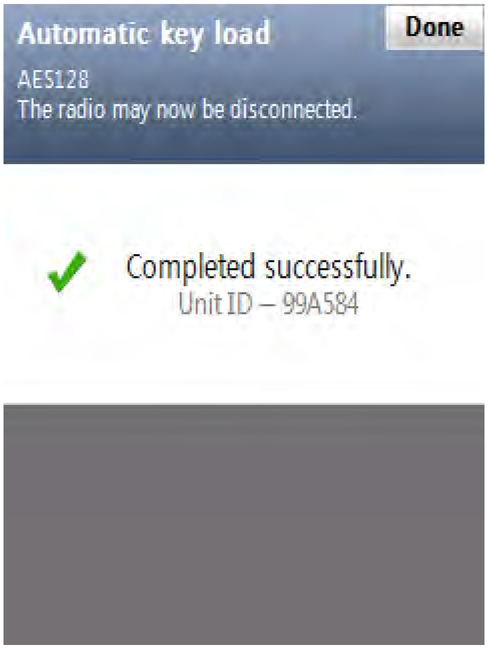
NOTE

You can also connect the target radio anytime before step 2.

2 On the KVL main screen, select **Define & load key** → **Auto generated**.

Step result: The KVL validates if the target radio has a valid and active Unit ID, and generates the authentication key automatically. Then, a progress screen appears, indicating that the key is being loaded into the active Unit ID. When the key is loaded successfully, a confirmation screen appears, displaying the Unit ID to which the key has been assigned.

Figure 4-3 Automatic Key Load Successful – Confirmation Screen



Automatic key load

AES128
The radio may now be disconnected.

✓ Completed successfully.
Unit ID – 99A584

NOTE

The KVL stores the radio – key pair in its memory.

3 Disconnect the radio.

4 Tap **Done** to return to the KVL main screen.

5 Managing Provisioned Radio Information

5.1 Uploading Provisioning Information to the AuC

In a Radio Authentication system, the KVL acts as a provisioning tool for the authentication key in the target radio and radio - key pairs into an Authentication Center. The KVL generates and downloads an authentication key to a target radio and stores a radio - key pair that is intended to be loaded into the AuC.

Prerequisites:
Ensure you have:

- USB to Ethernet Adapter
- MINI-B to Type-A USB Cable
- Ethernet cable

When and where to use:
Use these steps to upload radio - key pairs stored in the KVL to the AuC.

NOTE

This section is applicable to the auto-generated authentication keys. For the manually generated keys, give the radio - key pairs to the AuC operator, so that they can manually enter them into the AuC.

NOTE

The KVL can store a maximum of 475 radio - key pairs. When the number of the stored radio - key pairs reaches 200, you are notified to upload them to the AuC.

Procedure Steps

1 Ensure that you have performed 1.4.8.1 Configuring VPN Settings - KVL Directly Connected to the Firewall, page 1-21.

2 Connect the KVL to the network. (See 1.4.8 Configuring VPN Settings, page 1-20.)

3 Establish the VPN connection. (See 1.4.9 Establishing the VPN Connection, page 1-37.)

4 Launch the KVL application.

5 Select **Send keys to AuC** on the KVL main screen.

NOTE

To abort the operation and terminate the connection to the AuC, tap **Cancel** → **Cancel now**.

Step result: The following takes place:

1. The connection between the KVL and the AuC is established.
2. The KVL validates the AuC.
3. The KVL uploads all the radio - key pairs to the AuC.
4. The KVL provides operation status information.

6 When all the radio - key pairs have been loaded to the AuC, tap **Done**.

NOTE

After successful upload to the AuC, the radio - key pairs are erased from the KVL memory.

Step result: You return to the KVL main screen.

7 Terminate the VPN connection. (See 1.4.10 Terminating the VPN Connection, page 1-40.)

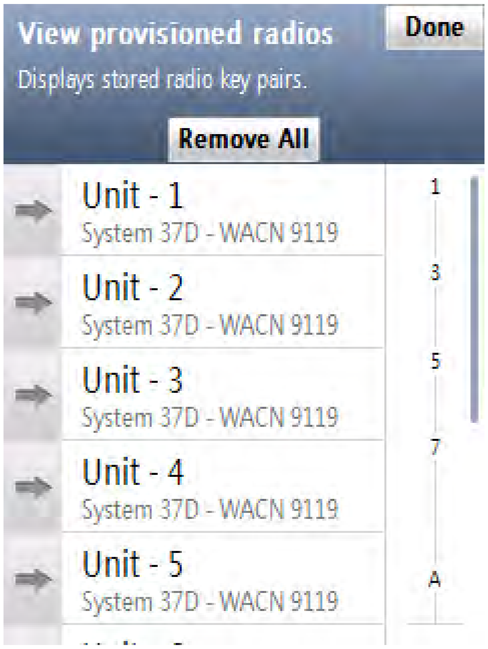
5.2 Viewing the List of Provisioned Radios

Procedure Steps

1 Select **View provisioned radios** on the KVL main screen.

Step result: A list of provisioned radios appears.

Figure 5-1 View Provisioned Radios Screen



NOTE

You can scroll through the list or quickly jump to a selected area using the smart bar on the right side of the screen. If the list fits completely on the screen, the smart bar is disabled.

2

If...	Then...
you want to remove an individual radio – key pair...	continue to 5.3 Removing Individual Radio – Key Pairs, page 5-3.
you want to clear the list of provisioned radios...	continue to 5.4 Removing Provisioning Information for All Radios, page 5-4.

5.3 Removing Individual Radio – Key Pairs

As part of the general management activities of authentication keys, radio – key pairs may need to be removed from the KVL on an individual basis from time to time.

Prerequisites:
Only an Administrator can remove individual radio – key pairs.

Procedure Steps

1 Navigate to the list of provisioned radios (see 5.2 Viewing the List of Provisioned Radios, page 5-2).

2 On the list, locate the radio – key pair you want to remove.

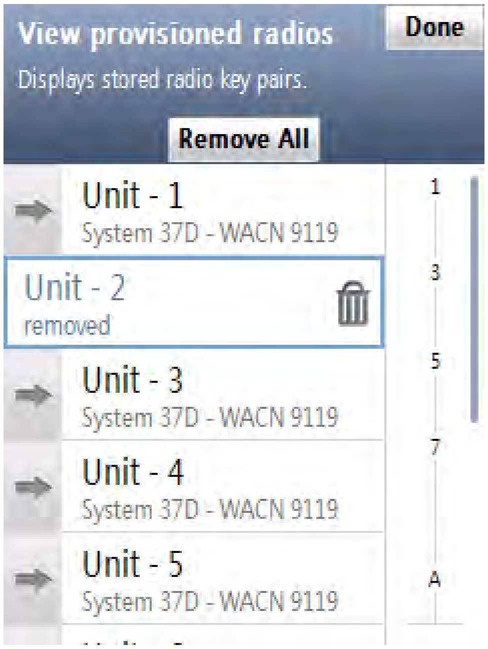
NOTE

You can scroll through the list or quickly jump to a selected area using the smart bar on the right side of the screen. If the list fits completely on the screen, the smart bar is disabled.

3 To remove the selected radio – key pair, drag the slider associated with it to the left.

Step result: The radio – key pair is removed.

Figure 5-2 Unit ID Removed - Example



View provisioned radios

Displays stored radio key pairs.

Unit - 1
System 37D - WACN 9119

Unit - 2
removed

Unit - 3
System 37D - WACN 9119

Unit - 4
System 37D - WACN 9119

Unit - 5
System 37D - WACN 9119

4 Tap **Done** to return to the KVL main screen.

5.4 Removing Provisioning Information for All Radios

If the radio – key pairs are no longer valid or their security has been compromised, they must be immediately destroyed.

Prerequisites:
Only an Administrator can clear the list of provisioned radios.

Procedure Steps

1 Navigate to the list of provisioned radios (see 5.2 Viewing the List of Provisioned Radios, page 5-2).

2 Tap **Remove All**.

NOTE

To restore the list, tap **Undo**.

Step result: A confirmation screen appears.

3 Tap **Accept**.

Step result: The list of provisioned radios has been cleared and you return to the KVL main screen.

6 Managing Log Records

The KVL maintains a running record of the most recent 500 successful key load operations.

The format of each log record entry on the list is as follows:

- First line: Date / Time
- Second line: Role / Action Performed
- Third line: Unit ID / System ID / WACN ID

Log records can be:

- Viewed and scrolled on the KVL screen.
- Exported to a PC for printing or saving to a file.
- Cleared (erased) from the KVL memory.

6.1 Organization of Log Records

The log records are stored chronologically in a 500-location continuous buffer, with the most recent log record displayed first each time you access the log records.

Each new log record created is appended to the beginning of the buffer, with each existing log record moving down one position.

When the buffer is full (500 entries maximum), the next new log record is appended to the beginning, the existing log records move down one position, and the oldest log record is overwritten.

6.2 Accessing Log Records

Prerequisites:
There are log records in the KVL memory.

Procedure Steps

1 On the KVL main screen, select **Settings** → **Operations log**.

Step result: The list of log records appears.

NOTE

You can scroll through the list or quickly jump to a selected area using the smart bar on the right side of the screen.

2 When you have finished viewing log records, tap **Done** on the consecutive screens to return to the KVL main screen.

6.3 Clearing Log Records

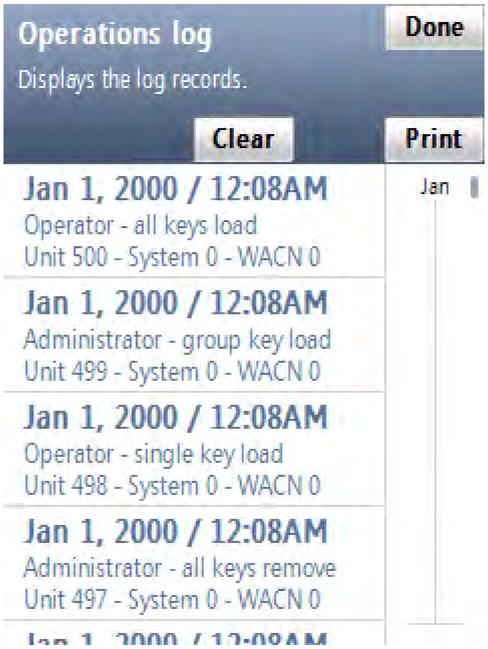
Prerequisites:
Only an Administrator can clear log records.

Procedure Steps

1 On the KVL main screen, select **Settings** → **Operations log**.

Step result: The list of log records appears.

Figure 6-1 Operations Log – Example



Operations log

Displays the log records.

Jan 1, 2000 / 12:08AM
Operator - all keys load
Unit 500 - System 0 - WACN 0

Jan 1, 2000 / 12:08AM
Administrator - group key load
Unit 499 - System 0 - WACN 0

Jan 1, 2000 / 12:08AM
Operator - single key load
Unit 498 - System 0 - WACN 0

Jan 1, 2000 / 12:08AM
Administrator - all keys remove
Unit 497 - System 0 - WACN 0

2 Select **Clear**.

Step result: A confirmation screen appears.

NOTE

To restore the log, tap **Undo**.

3 Tap **Accept** to confirm.

IMPORTANT

If your KVL is configured to operate in more than one mode of operation, only the logs for the current mode of operation are cleared.

Step result: The log records have been cleared.

4 Tap **Done** to return to the KVL main screen.

6.4 Exporting Log Records to a PC

You can connect the KVL to a COM port on a PC (typically a laptop) and export log records to the PC. You can then print log records from the PC or save them on the PC as a file.

Prerequisites:
A communications program, such as Microsoft HyperTerminal, must be running on the PC in order to export log records.

Procedure Steps

1 Connect an appropriate cable between the KVL DB9 Port (RS-232) and a COM port on the PC. Depending on the cable type, you may need to use a gender changer.

NOTE

Ensure that the baud rate set up in the KVL matches the baud rate in the communications program.

2 Launch a communications program on the PC (such as Microsoft HyperTerminal or equivalent). Set up the program as follows:

- No parity
- 8 bits
- 1 stop bit
- Translate line feeds <LF> to Carriage Return and Line Feed <CR><LF>
- 80 character width

3 On the KVL main screen, select **Settings** → **Operations log** → **Print** → **Print Now>**.

Step result: A progress animation appears, indicating that the log records are being exported to the PC. When the log records have been exported successfully, you return to the list of log records.

4 Tap **Done** on the consecutive screens to return to the KVL main screen.

7 Troubleshooting

7.1 KVL Error Messages

This section lists all possible KVL error messages, along with their probable causes and remedies.

For most of the operational errors, the cause is a faulty cable connection between the KVL and the target device. Ensure that the connection is good and try the operation again. If it still fails, contact Motorola (see 7.9 Contacting Motorola, page 7-13).

Table 7-1 KVL Error Messages

Error/Status Message	Probable Cause	Remedy
`Out of memory.`	The KVL internal database is full and cannot store any more data.	Delete any items stored in the KVL to make room for new data. This includes items such as keys, logs, and provisioned radio lists.
`FIPS level is currently level 3. Radio Authentication mode only operates in FIPS level 2, please change the FIPS level to continue.`	You are attempting to transition to the KVL Radio Authentication mode and the KVL is currently in FIPS level 3 mode.	The KVL must be in FIPS level 2 mode before the Radio Authentication mode can be used. Transition to FIPS level 2 mode before attempting to transition to the KVL radio authentication mode of operation
`Changing the System ID will delete all the stored K-Unit ID pairs.`	If the System ID is changed, the stored K-Unit ID pairs are no longer valid in the context of the KVL and must be erased.	Select **Continue, delete pairs** or **Cancel**.
`Changing the WACN ID will delete all the stored K-Unit ID pairs.`	If the WACN ID is changed, the stored K-Unit ID pairs are no longer valid in the context of the KVL and must be erased.	Select **Continue, delete pairs** or **Cancel**.
`A valid AuC IP Address must be entered in order to send keys to the AuC.`	The entered IP address may be all zeros (0).	Enter a valid IP address before trying to send keys to the AuC.
`A valid UKEK must be entered in order to send keys to the AuC.`	A UKEK has not been entered.	Enter a valid UKEK before attempting to send keys to the AuC.

Table 7-1 KVL Error Messages (cont'd.)

Error/Status Message	Probable Cause	Remedy
`There aren't any radio key pairs to send to the AuC.`	Attempt has been made to send keys to an AuC and there have been no radios provisioned / K-Unit ID pairs stored.	Provision some radios before you attempt to send keys to an AuC.
`Radio does not have an active Unit ID.`	The connected radio has not been configured with an active Unit ID. The KVL can only provision radios that have an active Unit ID.	Configure the connected radio to have an active Unit ID and select **Try Again**. Otherwise, select **Cancel** to cancel the operation.
`The active Unit ID - [] already has a key.`	The active Unit ID for the connected radio has already been provisioned with a Key.	Either select **Continue and overwrite the existing key**, or select **Cancel and do not change the key**.
`A communications error has occurred.`	Either the connected radio has not been turned on, there is a problem with the cable connecting the radio and the KVL, or the VPN client was left in the connected state after sending keys to the AuC.	Check the power on the radio, the cable connection, and the VPN connection status before trying again. The VPN must be in the disconnected state for proper key provisioning operation.
`The Radio and KVL's WACN IDs do not match.`	A KVL cannot be used to load a radio that has a different WACN ID. The WACN ID of both the Radio and the KVL must match before a key can be loaded.	Update either the Radio's or the KVL's WACN ID so there is a match before trying the key load again.
`Maximum number of radio key pairs stored.`	The KVL can store a maximum of 475 K-Unit ID pairs.	Send stored key pairs to the AuC or remove all stored key pairs before attempting to provisioned more radios.
`There are currently 200 radio key pairs stored, please consider uploading to the AuC soon.`	The KVL has many K-Unit ID pairs stored. It is advised that you upload these key pairs to an AuC.	Upload the stored key pairs to an AuC or continue storing more key pairs.
`A connection with the AuC could not be established, please check your communications settings and try again.`	Either the VPN has not been connected or the Ethernet connection to the network is not set up properly.	Make sure that the VPN client has been connected (see 1.4.9 Establishing the VPN Connection, page 1-37). Also, make sure that the USB-to-Ethernet adapter is connected to the USB Port on the KVL Security Adapter. Make sure that the Ethernet cable is connected to the USB-to-Ethernet adapter and the attached network.

Table 7-1 KVL Error Messages (cont'd.)

Error/Status Message	Probable Cause	Remedy
`A communications error has occurred, please check the connection and try again.`	Either the USB-to-Ethernet adapter, or the Ethernet cable is not connected properly.	Make sure that the USB-to-Ethernet adapter and the Ethernet cables are all connected and try again.
`System ID and WACN ID mismatch with the AuC.`	The KVL cannot be used to send keys to an AuC that has a different System ID and WACN ID. The System ID and WACN ID of both the AuC and the KVL must match before keys can be exchanged.	Update either the AuC's or the KVL's System ID and WACN ID so there is a match before trying to send keys again.
`System ID mismatch with the AuC.`	The KVL cannot be used to send keys to an AuC that has a different System ID. The System ID of both the AuC and the KVL must match before keys can be exchanged.	Update either the AuC's or the KVL's System ID so there is a match before trying to send keys again.
`WACN ID mismatch with the AuC.`	The KVL cannot be used to send keys to an AuC that has a different WACN ID. The WACN ID of both the AuC and the KVL must match before keys can be exchanged.	Update either the AuC's or the KVL's WACN ID so there is a match before trying to send keys again.
`Error trying to send key with Unit ID: [x].`	Either there was a communications error or the entered UKEK is not the same as the one entered into the AuC.	Make sure that the UKEK entered in the AuC and the KVL is the same and try again.
`Error The key entered is weak. Enter a strong key.`	Displayed when you have entered key that has been determined to be cryptographically weak and unworthy for use in the system.	Try entering another key.
`Error Security adapter not connected.  Check connection.`	The Security Adapter got disconnected.	Reattach the Security Adapter and select **Retry connection**.

7.2 Performing a System Reset

Resetting causes the KVL to erase the UKEKs, all stored keys, key groups, log records, and passwords, and reset the configuration settings to the factory defaults. For KVLs equipped for triple mode operation (ASN, ASTRO® 25, and Radio Authentication), resetting erases UKEKs, ASN keys, ASTRO® 25 keys, all stored radio – key pairs, macros, key groups, log records, and passwords.

Procedure Steps

1 On the KVL main screen, select **Settings** → **System reset**. Alternatively, if user authentication is set on your KVL, press the Windows key on the PDA and hold it for 5 seconds to go to the System Reset screen.

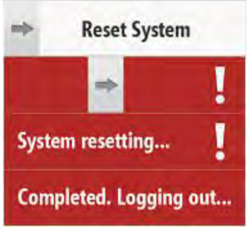
CAUTION

Use this option with caution as a system reset resets the KVL to its original state. All settings are reset and all data is deleted.

2 Drag the Reset System slider from left to right. Alternatively, highlight the slider and use the navigation key on the PDA to move it.

Step result: The system is being reset. When the action is completed, you are logged out of the KVL application and the Welcome screen appears.

Figure 7-1 KVL System Reset Slider – Subsequent States



Reset System

System resetting...

Completed. Logging out...

7.3 Unlocking the Operator Account

Prerequisites:
Only an Administrator can unlock the Operator account.

Procedure Steps

1 Select **Settings** → **Security** → **Unlock operator account** → **Yes, unlock now**.

Step result: The Operator account is unlocked.

2 Tap **Done** on the consecutive screens to return to the KVL main screen.

7.4 Setting the PDA USB Mode

When and where to use:
Sometimes, the PDA may not automatically detect whether it should work in a Host mode (when connected to the Security Adapter), or in a Client mode (when connected to a PC). In such a case, use these steps to set the PDA USB mode manually.

Procedure Steps

1 On the Today screen, select ⊞.

2 Select **Settings** → **System** → **USBConfig**.

3 Perform one of the following actions:

- If there are two options available (**USB Host** and **USB Client**), then select **USB Host** if you need to connect the PDA to the Security Adapter, or select **USB Client** if you need to connect the PDA to a PC.
- If there are three options available (**USB Host**, **USB Client**, and **USB OTG**), then select **USB OTG** to allow the KVL to auto detect whether it is connected to the Security Adapter or a PC.

7.5 KVL 4000 Disaster Recovery

Table 7-2 KVL 4000 Disaster Recovery

Event	Remedy
Hardware failure	Replace the device and reenter all the lost data. Refer to this manual to configure your KVL with all the necessary parameters. SUGGESTION Keep non-sensitive data in a secure location so that you can restore it quickly when needed.
KVL application failure	Reinstall the KVL application. See “Running the KVL Software Installation Wizard” in the *KVL 4000 FLASHPort Upgrade User Guide*.

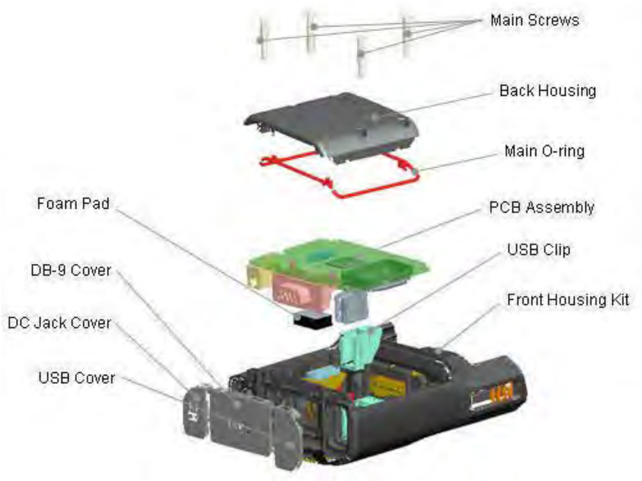
7.6 Troubleshooting KVL Application and/or VPN Software Failure

If you are experiencing problems with the KVL and/or NCP applications, follow “Running the KVL Software Installation Wizard” in the *KVL 4000 FLASHPort Upgrade User Guide* to reinstall the applications.

7.7 Disassembling the Security Adapter

When and where to use:
Use these steps to disassemble the Security Adapter.

Figure 7-2 Security Adapter – Exploded View



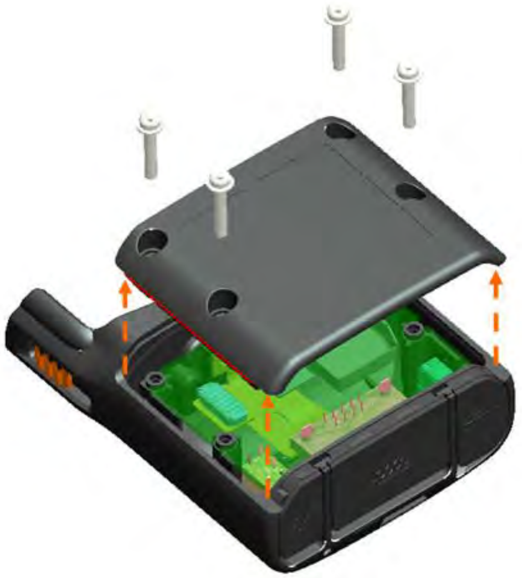
CAUTION

Make sure to exit the KVL application on the PDA before disconnecting the Security Adapter. Otherwise, you may lose any unsaved work or cause data corruption.

Procedure Steps

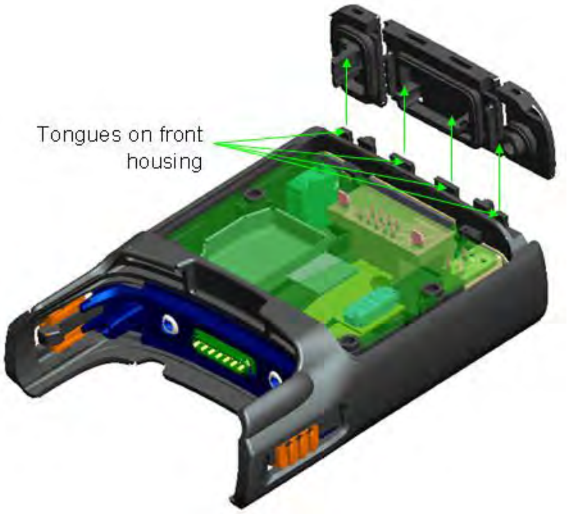
1 Remove the self-tapping screws and then remove the back housing.

Figure 7-3 Removing Back Housing



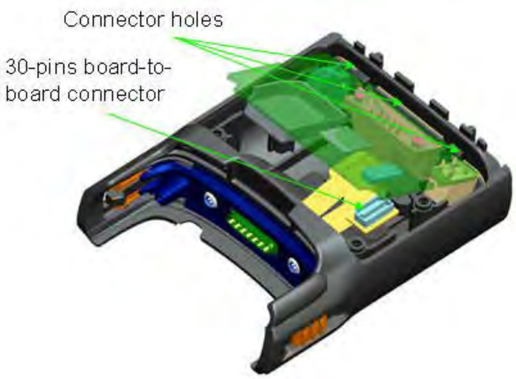
2 Remove the dust covers from the tongue features on the front housing.

Figure 7-4 Removing Dust Covers



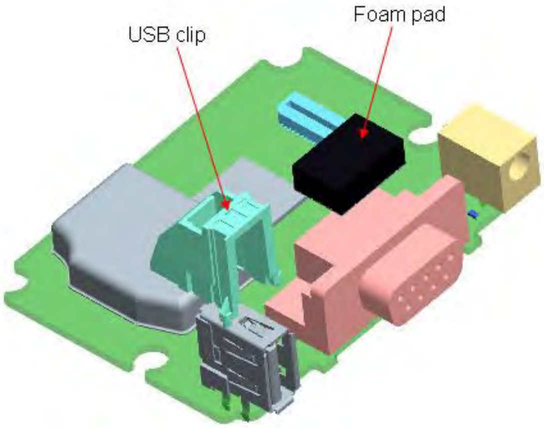
3 Remove the connectors from the front housing connector holes, disconnect the 30-pins board-to-board connector from the flex to the PCB, and remove the PCB assembly from the front housing.

Figure 7-5 Removing PCB Assembly



4 Remove the USB clip from the USB connector and the foam pad from the DB-9 connector on the PCB assembly.

Figure 7-6 Removing USB Clip and Foam Pad

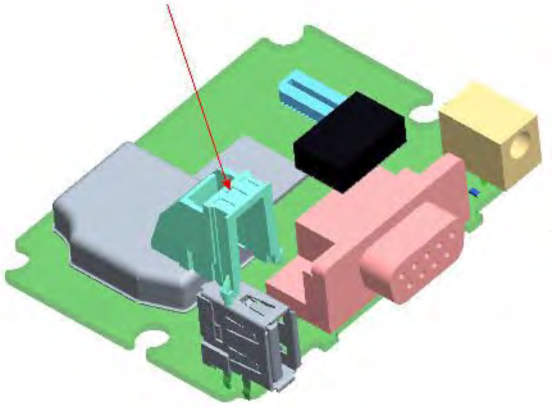


7.8 Assembling the Security Adapter

Procedure Steps

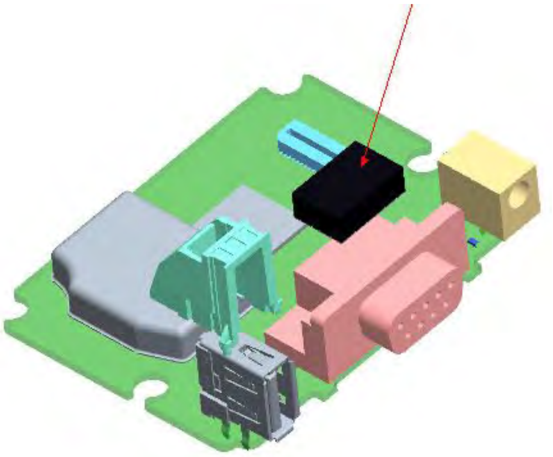
1 Attach the USB clip to the USB connector on the PCB.

Figure 7-7 Assembling USB Clip



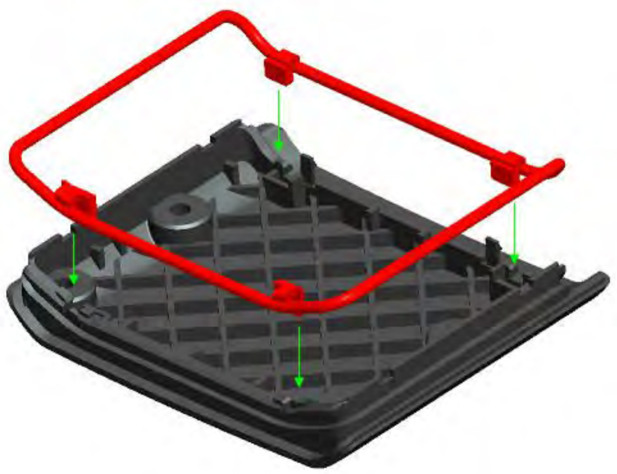
2 Attach the foam pad on top of the DB-9 connector. Ensure that the foam pad is aligned to the middle of the DB-9 face.

Figure 7-8 Assembling Foam Pad



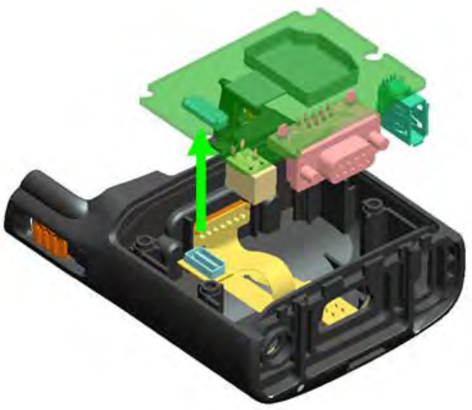
3 Dress the O-ring to the O-ring groove at the back housing. Ensure that the O-ring tabs are slotted to the back housing features. Orient the O-ring so that its tabs' size matches the back housing features' size.

Figure 7-9 Assembling O-Ring



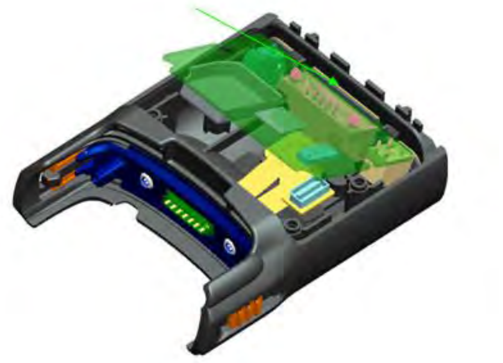
4 Connect the 30-pins board-to-board connector from the flex to the PCB.

Figure 7-10 Assembling Front Housing – PCB



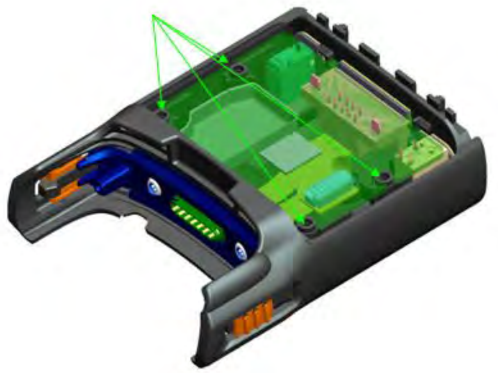
5 Slot the connectors through the front housing connector holes.

Figure 7-11 Assembling Front Housing – Connectors



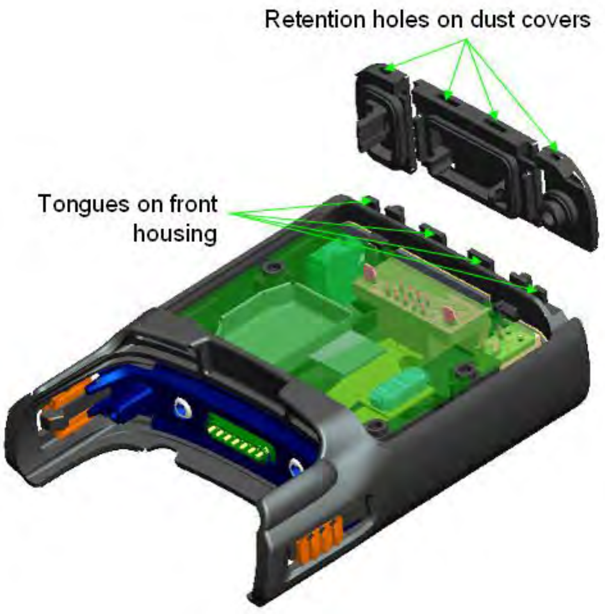
6 Place the PCB assembly to the front housing. Ensure the PCB sits properly on screw bosses.

Figure 7-12 Assembling Front Housing – PCB Placed



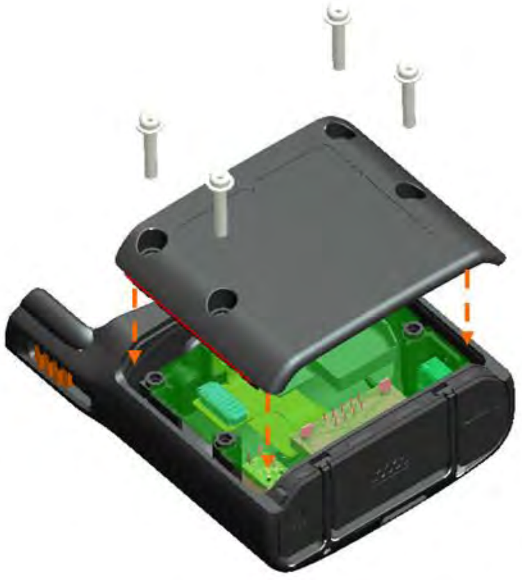
7 Slot in the dust cover retention holes through the tongue features on the front housing.

Figure 7-13 Assembling Dust Covers



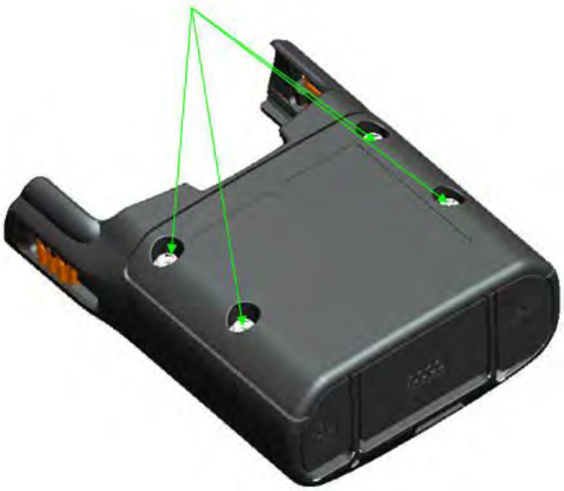
8 Press down the back housing to the front housing vertically. Before closing the back housing, verify that the USB clip is assembled correctly.

Figure 7-14 Assembling Back Housing to Front Housing



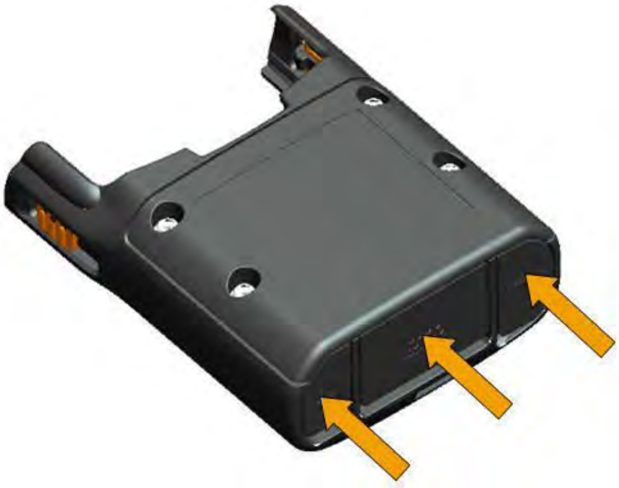
9 Tighten the back housing with the self-tapping screws (tightening torque: 7 lbf.in).

Figure 7-15 Tightening Back Housing



10 Press the dust covers until they are flush with the front housing.

Figure 7-16 Pressing Dust Covers



Result:
The assembly is complete.

7.9 Contacting Motorola

This section contains information about calling Motorola for help.

7.9.1 Motorola System Support Center and Radio Support Center

After collecting the required information and writing a detailed problem report, contact one of the following support centers to help with the problem:

- Motorola System Support Center (SSC):
  - North America: 800-221-7144
  - International: 302-444-9800

NOTE

The Motorola System Support Center (SSC) provides technical support, return material authorization (RMA) numbers, and confirmations for troubleshooting results. Call the System Support Center for information about returning faulty equipment or ordering replacement parts.

- Motorola Radio Support Center:
  - Phone: 800-247-2346
  - Fax: 800-318-0281

NOTE

The Motorola Radio Support Center repairs mobile and portable radios, and related RF equipment.

7.9.2 North America Parts Organization

The North America Parts Organization is your source for manuals, replacement parts, and assemblies.

Table 7-3 North America Parts Organization Telephone Numbers

Purpose	Telephone Number
For ordering	• 800-422-4210 (US and Canada orders) • 302-444-9842 (International orders)
For Fax Orders	800-6226210 (US and Canada orders)
For help identifying an item or part number	800-422-4210; select choice 3 from the menu

Appendix A: Performance Specifications

Table A-1 Physical Characteristics

Item	Description
KVL (PDA + Security Adapter)	Height: 216 mm (8.5 in)
	Width: 84 mm (3.3 in)
	Depth: 39 mm (1.5 in)
	Weight: 473 g

Table A-2 Authentication

Authentication Keys	475 radio – key pairs
Standards	FIPS 140-2
	FIPS 197

Table A-3 Supported Algorithms

Algorithm	ASN	ASTRO 25	KMF (ASTRO 25 Only)	Radio Authentication
DES	✓	✗	✗	✗
DES-XL	✗	✓	✓	✗
DES-OFB	✗	✓	✓	✗
DVI-XL	✓	✓	✓	✗
DVP-XL	✓	✓	✓	✗
AES-128	✗	✗	✗	✓
AES-256	✓	✓	✓	✗
ADP	✗	✓	✗	✗

NOTE

In the ASN mode, the KVL GUI does not distinguish between DES, DES-XL, and DES-OFB, but you can load keys for all DES types by selecting the DES option.

NOTE

ADP does not support the following features related to OTAR:

- Store & Forward
- KEK Key loading
- Tactical OTAR
- Remote Control Head Key loading

Table A-4 Electromagnetic Compatibility

EN 55022 Class A
EN 55024
FCC Part 15 Class A

Table A-5 Regulatory Compliance and Approvals

Safety	EN 609501
	UL 60950-1
	cUL 60950-1

Appendix B: KVL 4000 – Orderable Parts

Table B-1 KVL 4000 Model

Item	Count	Part Number
MC55 Kit (see Table B-2 MC55 Kit)	1	NNTN7864
Security Adapter Super Tanapa (see Table B-3 Security Adapter Super Tanapa)	1	NTN2564
KVL 4000 Documentation CD	1	CLN8627
KVL 4000 Quick Start Guide	1	6871015P34
DB9 Gender Changer	1	2871926H02
Packing Kit	1	HBN5096

Table B-2 MC55 Kit

Item	Count	Part Number
MC55 PDA	1	MC55A0-P30SWQQA79R
Power Supply	1	PWRS-14000-249S
Battery (2400 mAH)	1	BTRY-MC55EAB00
MC55 Quick Start Guide	1	72-127603-02
MC55 Regulatory Guide	1	72-108860-02

Table B-3 Security Adapter Super Tanapa

Item	Count	Part Number
Front Housing Assembly (see Table B-4 Front Housing Assembly – Orderable Parts)	1	01009328004
PCB Assembly Kit	1	NNTN7650
Back Housing	1	15009431001
Main O-ring	1	32009316001
Self tapping screw Dia. 3 x 18 mm	4	03009288001
USB Cover	1	32012053001
DB-9 Cover	1	32012052001
DC Jack Cover	1	32012051001
Foam Pad	1	75009419001
USB Clip	1	42009269001

Table B-4 Front Housing Assembly – Orderable Parts

Item	Count	Part Number
MX Dust Cover	1	32012050001

Table B-5 Interface Cables

Item	Part Number	Used with	Adaptor Required
Key Load Cable	TKN8531	XTL 5000/2500	TRN7414 (W Control Head) HKN6182 (M/O Control Head)
		XTS 5000/3000/2500	NTN8613
		ASTRO Spectra	TRN7414
		APX 7500/6500	HKN6182
		APX 7000/6000/4000	NNTN7869
		RNC, DIU, MGEG, MCC 7500 Console, KMF, PDEG, CDEM, KMF CryptR	n/a
	CKN6886	XTS 4000	n/a
	TDN9390	XTS 5000/3000/2500	n/a
	WPLN6904	APX 7000/6000/4000	n/a
	TKN1039	CRYPTR micro	n/a
OTAR / Radio Authentication Cable	HKN6183	APX 7500/6500, XTL 5000/2500, ASTRO Spectra	n/a
	NKN1027	XTS 4000	n/a
	RKN4106	XTS 5000/3000/2500	n/a
	WPLN6905	APX 7000/6000/4000	n/a
KVL To KVL Cable	TKN8209	KVL 3000/3000 Plus/4000	n/a
USB Programming Cable	25-108022-02R	PDA to PC	n/a
MINI-B to Type-A USB Cable	25-68596-01R	USB to Ethernet Adapter	n/a
Other	CKN6324	Serial Modem	n/a
	TKN8210	Service Monitor	n/a

Table B-6 Optional Accessories

Item	Part Number
AC Line Cord US	50-16000-182R
AC Line Cord cEE7/16 Plug	50-16000-255R
AC Line Cord BS 1363 Plug	50-16000-670R
AC Line Cord GB 2099-1-1996 Plug	50-16000-664R
AC Line Cord AS3112 Plug	50-16000-666R
AC Line Cord Brazil	50-16000-726R

Table B-6 Optional Accessories (cont'd.)

Item	Part Number
MultiMobile™ USB Modem V.92/56K	DSMT9234MUCDCXR
CradlePoint Technology USB to Ethernet Adapter	PS6U1UPE
3600mAH Battery	BTRY-MC55EAB02

Appendix C: Radio Frequency Interference Requirements

C.1 Radio Frequency Interference Requirements – USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user is required to correct the interference at his own expense.

C.2 Radio Frequency Interference Requirements – Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numrique de la classe A est conforme la norme NMB-003 du Canada.

C.3 Radio Frequency Interference Requirements – European Union – EMC Directive 2004/108/EC

This is an EMC Class A product.

This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce magnetic emissions to prevent interference to the reception of radio and television broadcast.

Appendix D: Acronyms

Table D-1 Acronyms

Item	Description
ADP	Advanced Digital Privacy
AES	Advanced Encryption Standard
AME	Assured Mobile Environment
ASN	Advanced SECURENET
CKR	Common Key Reference
CSK	Common Shadow Key
DES	Data Encryption Standard (Cipher)
DES-OFB	Data Encryption Standard-Output Feedback
DES-XL	Data Encryption Standard-Counter Addressing
DIU	Digital Interface Unit
DVI-XL	Digital Voice International-Range Extension
DVP	Digital Voice Protection
DVP-XL	Digital Voice Protection-Range Extension
FIPS	Federal Information Processing Standard
I/O	Input/Output
KID	Key ID
KEK	Key Encryption Key
KMF	Key Management Facility
KMM	Key Management Message
SEK	Signaling Encryption Key
KVL	Key Variable Loader
LED	Light Emitting Diode
LID	Logical ID
MDC	Motorola Data Communications
MGEG	Motorola Gold Elite Gateway
MNP	Message Number Period
OTAR	Over-the-Air Rekeying
PID	Physical ID
RNC	Radio Network Controller
RSI	Radio Set Identifier
TEK	Traffic Encryption Key
UKEK	Unique Key Encryption Key

Table D-1 Acronyms (cont'd.)

Item	Description
USK	Unique Shadow Key
VPN	Virtual Private Network
WACN	Wide Area Communications Network