

payShield® 10K

Release Note - Base Software Version v1.7a

007-001511-007 Rev A



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1 Introduction

1.1 Summary

This version of the Release Note has been updated to include the following:

- > New feature release v1.7a.

The following general information is included:

- > Summary of software version numbers
- > Information on PCI HSM v3 Compliance
- > How to download and install the software
- > The details provided for each release are:
 - > Version Details
 - > PCI HSM Compliance
 - > Manuals to be used
 - > payShield Manager compatibility Information
 - > New functions provided
 - > Known Issues
 - > Bugs and errors corrected
- > The update to the Release Note on October 1st confirms the Hosted HSM End User Guide is now available via the account manager instead of the support portal - see page 8.

1.2 Latest Software Numbers

- | | | |
|----------------------------------|-------------------|----------------------------|
| > Version 1.7 Development Stream | 1500-0033 (v1.7a) | Deployment Version: 1.11.0 |
| > Version 1.6 Development Stream | 1500-0032 (v1.6a) | Deployment Version: 1.10.1 |
| > Version 1.5 Development Stream | 1500-0031 (v1.5a) | Deployment Version: 1.9.2 |
| > Version 1.4 Development Stream | 1500-0030 (v1.4a) | Deployment Version: 1.8.3 |
| > Version 1.3 Development Stream | 1500-0029 (v1.3d) | Deployment Version: 1.7.1 |
| > Version 1.2 Development Stream | 1500-0024 (v1.2a) | Deployment Version: 1.5.3 |
| > Version 1.1 Development Stream | 1500-0023 (v1.1a) | Deployment Version: 1.4.2 |
| > Version 1.0 Development Stream | 1500-0022 (v1.0f) | Deployment Version: 1.3.2 |

1.3 PCI HSM Compliance

Selected versions of payShield 10K from v1.0c onwards will be certified to the PCI HSM v3 requirements. Please note the following:

1. Information is included for each release later in this document to indicate which versions of payShield 10K software are certified to PCI HSM v3.
2. Please note that in order to allow backwards compatibility, some settings are not compliant with PCI HSM. The certified software becomes PCI HSM compliant only when these settings are set as required by PCI HSM.

As an indicator that all the settings are compliant, the software revision number (accessible using, for example, the payShield Manager Summary Dashboard or the VR Console command) is in the format nnnn-10nn.

If the software revision is shown in the format nnnn-00nn, then some settings are not compliant with PCI HSM.

3. Further information about PCI HSM is included in the payShield 10K Manuals.

1.4 Upgrading Software

Customers with appropriate Thales support contracts can download new software releases from the support portal. Please contact support for further information.

Instructions on upgrading the software are provided in the payShield 10K Installation and User Guide, which is also available from Thales support.

2 1500-0033 (v1.7a) – Released November 2022

2.1 Summary

This is a general release for all customers.

2.2 Version Details

Base Release: 1.7a

Revision: 1500-0033

Deployment Version: 1.11.0 Released November 2022 ... Feature Release

2.3 PCI HSM Compliance

This software release is planned to be submitted for approval to PCI HSM V3. Assuming this completes successfully, the software will be listed on the PCI web site at the following location:

https://www.pcisecuritystandards.org/assessors_and_solutions/pin_transaction_devices?agree=true

2.4 Manuals

The following payShield 10K manuals should be used with this release:

- > 007-001512-007 payShield 10K Installation and User Guide
- > 007-001518-007 payShield 10K Host Programmers Manual
- > 007-001515-007 payShield 10K Core Host Commands
- > 007-001516-007 payShield 10K Legacy Host Commands
- > 007-001513-007 payShield 10K Security Operations Manual
- > 007-001517-007 payShield 10K Applications Manual
- > 007-000997-007 payShield 10K Console Guide
- > 007-001443-007 payShield 10K Host Command Examples

2.5 payShield Manager

This table indicates the combinations of operating system and browser supported by payShield Manager in this release.

It is possible that other combinations will work, either completely or partially, but this should not be relied upon.

Please note that payShield Manager no longer supports Internet Explorer as this is no longer supported by Microsoft.

Operating System	Windows 10 64-bit			Linux Ubuntu 18 64-bit		macOS Big Sur
Browser	Chrome 64-bit	Firefox 64-bit	Edge 64-bit	Chrome 64-bit	Firefox 64-bit	Chrome 64-bit
payShield 10K v1.7a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

2.6 New Functions

Deployment Version	Reference	Description
1.11.0	PA-10475 PA-1569 PA-11544	<p>The support provided for the TR-31 Optional Blocks has been enhanced in this release. Now supported are:</p> <ul style="list-style-type: none"> TR-31 Optional Key Block IDs: <ul style="list-style-type: none"> IK - Initial Key Identifier for the Initial DUKPT Key KC - Key Check Value of wrapped key KP - Key Check Value of the wrapping key TS - Time Stamp TR-31 Numeric Optional Block IDs TR-31 Extended Numeric Optional Blocks (for host command A8 only) <p>For further information, please refer to:</p> <ul style="list-style-type: none"> Host Programmer's Manual, Section 11.3 Core Host Commands Manual, Host Commands, A0, A8, K8 Console Guide, Console Commands KG, KE
	PA-12463 PA-12613	<p>The host command that exports symmetric keys according to the TR-34 standard (B8) has been enhanced as follows:</p> <ul style="list-style-type: none"> An AES ephemeral key is now supported (128 bit) An option to use a Time Stamp to protect against replay attack has been added which can be used instead of using a Random Nonce. <p>Please note that currently the maximum RSA key length supported for the KRD Public Key with Host Command B8 is 2048 bits. This key is used to wrap the AES ephemeral key and therefore the security setting 'Enforce PCI HSMv3 Key Equivalence for Key Wrapping' must be set to No to export an AES Key.</p>
	PA-6725	<p>This release also supports the 10,000 cps performance licence. This gives an approximate number of calls per second for the host commands listed below:</p> <ul style="list-style-type: none"> CA - Translate a PIN from TPK to ZPK/BDK (3DES DUKPT) Encryption CC - Translate a PIN from One ZPK to Another <p>The performance of the other host commands (excluding those listed below) are between 2,500 cps and 10,000 cps.</p> <p>The performance achieved in practice will depend on environment in which the payShield 10K is operating, including network configuration, network traffic, the Host Application and the Host Platform. In particular, the following aspects should be considered to achieve maximum performance:</p> <ul style="list-style-type: none"> Sufficient multiple threads should be used The host interface should have no other traffic Command/response processing at the host should not introduce any delays The gathering of Utilization Statistics should be tuned OFF to achieve maximum performance.

Deployment Version	Reference	Description
1.11.0		<p>The following Host Commands are excluded from the performance ratings:</p> <ul style="list-style-type: none"> • Host Commands generating RSA Keys • Host Commands processing a large amount of data, e.g. commands performing Message Authentication, Message Encryption, Message Hashing <p>Note that 10,000 cps is only available for the Premium package and that payShield 10K FICON Hardware Platform does not support 10,000 cps.</p>
	PA-7363	<p>Support is now provided for connection to the German Payment Network using AES. For AES only, this functionality is provided for customers operating as either a “Network Operator” (NSP) or an “Acquirer” in the GBIC scheme. The Host Commands supporting the scheme are as follows:</p> <ul style="list-style-type: none"> • ‘A0’ (Derive Key) – to derive the AES PIN Encryption, Message Authentication and Data Encryption keys from the AES Master Key • ‘A0’ (Generate Key) – to generate a random AES ZKA Key • ‘A6’ (Import Key) – to import the AES Master Key in TR-31 format • ‘A8’ (Export Key) – to export the AES Master Key in TR-31 format • ‘BW’ (Translate Keys) – to translate the AES Master Key when the LMK is changed • ‘BU’ – (Generate Key Check Value) – to generate a KCV for the AES ZKA Master Key <p>For further information, please refer to:</p> <ul style="list-style-type: none"> • Host Programmer’s Manual, Section 4.4 • Core Host Commands Manual, for the above Host Commands
	PA-12552	<p>Host Command A8 (Export Key) has been enhanced to support the export of AES keys in CBC Format. This requires Authorisation and also the security setting “Key export and import in trusted format only” to be set to No.</p>

2.7 Known Issues

Deployment Version	Reference	Description
1.11.0	PA-236	When using payShield Manager to view the Error Log and selecting the “Get More” button in the Status Tab all the information is displayed, but no message is displayed when you have reached the end of the Error Log.

2.8 Bugs and Errors Corrected

Deployment Version	Reference	Description
1.11.0	PA-12620 PA-12853	<p>The following Host Commands have been updated to address an issue with the functionality to encrypt a PIN Block encrypted under an AES Key Block LMK.</p> <p>The commands now support the input and output of a PIN Block encrypted under a 3DES ZPK/TPK/BDK as follows:</p> <p>PIN Verification:</p> <ul style="list-style-type: none"> BE - Verify an Interchange PIN Using the Comparison Method GU - Verify a PIN using the Encrypted PIN method. <p>PIN Translation:</p> <ul style="list-style-type: none"> JC - Translate a PIN from TPK to LMK Encryption JE - Translate a PIN from ZPK to LMK Encryption JG - Translate a PIN from LMK to ZPK Encryption
	PA-10415 PA-12446	<p>For customers using the Australian Standard functions (AS2805), Host Command ‘RK’ (Generate Transaction Response, with Auth Para Generated by Acquirer) has been updated as follows:</p> <ul style="list-style-type: none"> This command now supports an option to generate the MAC to the AS2805 standard. The standard specifies the amount(AT) field is right justified and left zero-filled. In previous releases it was only possible to left-justify and right zero-fill this field. The command now also supports an option not to force odd parity on the ‘TK’ key as required by the AS2805 standard. In previous releases it was only possible to force odd parity.
	PA-11191	An issue found with Host Command ‘G0’ (Translate a PIN from BDK to BDK or ZPK Encryption (3DES & AES DUKPT)) has been fixed when using a Destination KSN of ‘000’ with BDK 2.
	PA-11656	Host Command ‘EM’ (Translate a Private Key) now supports translation of an RSA Private Key from a Variant LMK to a Key Block LMK in the following situation:

Deployment Version	Reference	Description
1.11.0		<ul style="list-style-type: none"> Variant LMK: RSA Private Key with Key Type Indicator '4' (Data encryption/decryption (e.g. TLS/SSL premaster secret)) Key Block LMK: RSA Private Key with Key Usage '06' (Data encryption/decryption (e.g. TLS/SSL premaster secret))
	PA-12433	Host Command 'GI' (Import Key or data under an RSA Public Key) returned error code 'A5' when using stored private key and enabling the security setting "Enforce minimum key strength of 2048-bits for RSA". This has been fixed in this release.
	PA-12860 PA-12865 PA-12937	<p>A number of Host Commands were not operating correctly in EBCDIC mode when using an AES Key Block LMK. These have been fixed in this release:</p> <ul style="list-style-type: none"> BA, BG, CE, DE, DG, EE, GA, JA, NG, PE, PG and QK
	PA-3232 PA-12972 PA-12591	<p>payShield 10K Manuals have been updated for this release to include information on the new features as well as updates as required for the bug fixes listed above. They have also been updated to include a number of corrections as follows::</p> <ul style="list-style-type: none"> Core Host Commands Manual: <ul style="list-style-type: none"> Host Command 'PM' (Verify a Dynamic CVV/CVC) to clarify the format of the 'Unpredictable Number' Field. For Host Commands 'M6', 'M8' and 'MY' an update is included to confirm that if Padding Method = '3', then Mode Flag must be set to '0' The notes provided with Host Command 'BU' (Generate Key Check Value) have been updated to provide further information on how the key check values are calculated. Host Command 'KU' (Generate Secure Message (EMV 3.1.1)) has been updated to clarify when the Plain Text Message Data is required. <p>In addition, the Installation and User Guide now includes information on the new 'Power Supply Type 2'.</p>

3 1500-0032 (v1.6a) – Released July 2022

3.1 Summary

This is a general release for all customers.

3.2 Version Details

Base Release:	1.6a	
Revision:	1500-0032	
Deployment Version:	1.10.1 Released September 2022 ...	This is 1.10.0 with the addition of 1 fix only
	1.10.0 Released July 2022 ...	Feature Release

3.3 PCI HSM Compliance

This software release is planned to be submitted for approval to PCI HSM V3. Assuming this completes successfully, the software will be listed on the PCI web site at the following location:

https://www.pcisecuritystandards.org/assessors_and_solutions/pin_transaction_devices?agree=true

Note that deployment version 1.10.1 listed above includes specific bug fixes only and so will be covered by the PCI HSM Certification for v1.6a when this completes.

3.4 Manuals

The following payShield 10K manuals should be used with this release:

- > 007-001512-006 payShield 10K Installation and User Guide
- > 007-001518-006 payShield 10K Host Programmers Manual
- > 007-001515-006 payShield 10K Core Host Commands
- > 007-001516-006 payShield 10K Legacy Host Commands
- > 007-001513-006 payShield 10K Security Operations Manual
- > 007-001517-006 payShield 10K Applications Manual
- > 007-000997-006 payShield 10K Console Guide
- > 007-001443-006 payShield 10K Host Command Examples

3.5 payShield Manager

This table indicates the combinations of operating system and browser supported by payShield Manager in this release.

It is possible that other combinations will work, either completely or partially, but this should not be relied upon.

Please note that payShield Manager no longer supports Internet Explorer as this is no longer supported by Microsoft.

Operating System	Windows 10 64-bit			Linux Ubuntu 18 64-bit		macOS Big Sur
Browser	Chrome 64-bit	Firefox 64-bit	Edge 64-bit	Chrome 64-bit	Firefox 64-bit	Chrome 64-bit
payShield 10K v1.6a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Please note PA-12519 regarding a temporary issue with the availability of the smart card bridge from the Chrome Store has been fixed.

3.6 New Functions

Deployment Version	Reference	Description
1.10.0	PA-7362	<p>For Issuers, support for the encryption of PIN Blocks under an AES Key Block LMK is provided in this release. Please note:</p> <ul style="list-style-type: none"> PIN Blocks are encrypted under an AES Key Block LMK in ISO PIN Block Format 4 (Thales PIN Block Format 48) The tag 'M' is used to indicate the PIN Block is encrypted under an AES Key Block LMK. <p>The following Host Commands are updated:</p> <ul style="list-style-type: none"> PIN & Offset Generation: EE, GA, JA, DE, CE, DG PIN Mailer Printing: PE, PG Clear PIN: BA, NG PIN Verification: BC, BE, GU PIN Translation: JE, JC, JG, QK LMK Translation: BG <p>Note that the following Host Commands for PIN Solicitation do NOT support an AES Key Block LMK as we understand these are no longer used:</p> <ul style="list-style-type: none"> PIN Solicitation: OA, RC, QA, QC
	PA-9788	<p>For Issuers, support is provided for the encryption of PIN Blocks under an AES TPK, ZPK or when using a BDK.</p> <p>The following Host Commands are updated:</p> <ul style="list-style-type: none"> PIN Generation Host Commands: BK FW PIN Change Host commands: DU, CU PIN Verification Host Commands (Standard): BC, BE, DA, EA, CG, EG, DC, EC PIN Verification Host Commands (DUKPT): GO, GQ, GS, GU PIN Translation: JE, JC, JG Host Commands Used For Updating PIN on EMV Card: KU, KY Host Command Used For Generation of Digitized Single Use Keys (SUKs) for Cloud Based Payments: IY
	PA-11740	<p>payShield Manager now supports Microsoft Edge. Please note:</p> <ul style="list-style-type: none"> The latest version of Microsoft Edge based on Chromium only is supported Support is provided when using Edge on Windows 10 only The Thales Bridge extension is installed from the Chrome store and not the Microsoft store Please note there is a temporary issue with the Bridge in the Chrome Store – see Known Issues.

Deployment Version	Reference	Description
1.10.0	PA-10596	<p>SNMP Enhancements for payShield Monitor. Enhancement in payShield 10K MIB to allow customers to obtain the following additional information:</p> <ol style="list-style-type: none"> 1. MIB for maximum limit of error and audit logs. 2. MIB for monitoring host machines and their respective load. 3. MIB for hash for following configurations of HSM. <ul style="list-style-type: none"> • Security Settings • General Settings • Configure Commands • Audit Settings • LMK
	PA-10517	Secure Host Communications using TLS. The SHA-1 cipher suites have been removed and so can no longer be used.
	PA-9938	<p>Two new Security Settings have been added in this release order to comply with the GBIC requirements in Germany. These are:</p> <p>Return PIN Length in PIN Translation Response: Yes or No</p> <p>This setting should be set to YES for backward compatibility. If set to YES, the PIN length will be returned in the Host Commands AQ, CC, CA and G0.</p> <p>This setting should be set to NO if the PIN Length returned in the Host Commands below is not required, or to comply with the requirements of the German Banking Industry (GBIC).</p> <p>Enable PIN Translation to BDK Encryption: Yes or No</p> <p>This setting should be set to YES for backward compatibility. If set to YES, translation to BDK encryption is enabled for Host Commands CA and G0.</p> <p>This setting should be set to NO if translation to BDK encryption is not required, or to comply with the requirements of the German Banking Industry (GBIC).</p> <p>Please note that in addition meet the requirements of the German Certification Scheme (GBIC), Host Command 'A0' has been updated to restrict the mode of use that can be specified for the keys that are derived from the ZKA Master Key. This update is also included in v1.5a deployment version 1.9.0.</p> <p>The change ensures:</p> <ul style="list-style-type: none"> • The sender must use ZKA Option 1 to generate a random RNDI and can only use the derived keys for encryption and MAC generation operations as appropriate for the key type specified. • The receiver must use ZKA Option 0 with the RNDI supplied by the sender and can only use the derived keys for decryption and MAC verification operations as appropriate for the key type specified. <p>The restrictions imposed for ZKA Option '1' and '0' are given below and are detailed in the payShield 10K Core Host Commands Manual for Host</p>

Deployment Version	Reference	Description
1.10.0		<p>Command 'A0'. Please also see below for a temporary removal of some of these restrictions in deployment version 1.9.2.</p> <p>'0': Derive one of the following "receive" keys using supplied RNDI:</p> <ul style="list-style-type: none"> • PIN Decryption Key (Key Usage="72", Mode Of Use="D") • Data Decryption Key (Key Usage="22", Mode Of Use="D") • MAC Verification Key (Key Usage="M3", Mode Of Use="V") <p>'1': Derive one of the following "send" keys using new RNDI:</p> <ul style="list-style-type: none"> • PIN Encryption Key (Key Usage="72", Mode Of Use="E") • Data Encryption Key (Key Usage="22", Mode Of Use="E") • MAC Generation Key (Key Usage="M3", Mode Of Use="G")
	PA-1377	<p>Derivation of data encryption keys from the Master Key to the Italian Standard.</p> <p>Host Command A0 now support the derivation of a Terminal Encryption Key (TEK) from the Master MKPOS/MKSER to the Italian Standard.</p> <p>Please note that generation, import and export of the Master MKPOS/MKSER (key usage 57) is only supported in the following host commands:</p> <ul style="list-style-type: none"> • A0 (Generate Key) • GK (Export Key under an RSA Public Key) • A6 (Import Key) • A8 (Export Key) • BW (Translate Key from Old LMK to New LMK). <p>Note that for host command BW, only translation from Key Block LMK to Key Block LMK is supported for this key – as this key is not supported in base when using a variant LMK, translation using a Variant LMK is not supported.</p>
	PA-8358	<p>Canadian Interac Debit Card</p> <p>ARQC verification and ARPC generation is supported in this version, as specified for the Canadian domestic Interac debit card. This is implemented in the KW Host Command (ARQC Verification and/or ARPC Generation).</p>

3.7 Known Issues

Deployment Version	Reference	Description
1.10.1 1.10.0	PA-236	When using payShield Manager to view the Error Log and selecting the “Get More” button in the Status Tab all the information is displayed, but no message is displayed when you have reached the end of the Error Log.

3.8 Bugs and Errors Corrected

Deployment Version	Reference	Description
1.10.1	PA-12858	When using a printer with the “Delay” parameter configured using payShield Manager or the Console to a time longer than 100 ms, an error was given in earlier releases. This has been fixed in this release.
1.10.0	PA-7699	An issue with the removal of SNMP users when upgrading software using DHCP has been resolved.
	PA-11553	Host Command ‘GW’ (Generate / Verify a MAC) has been updated to correct the key derivation algorithm used for AES DUKPT when using bi-directional keys (i.e. BDK-2 and BDK-4).
	PA-8102	Host Command ‘KU’ (Generate a Secure Message) now correctly changes the PIN when using ISO PIN Block Format 4 (Thales PIN Block Format 48) with Mode 4 and Scheme 1.
	PA-10626	Host Command ‘KY’ (Generate Secure Message) now supports the correct key derivation algorithm when using Scheme ID 9 (Visa VIS CVN 22)
	PA-10358	The ‘IE’ Host Command (Prepare Secure Message for Chip Card) now supports DGI length of 3 bytes as required by VISA v2.8.1.
	PA-9891	Host Command ‘QE’ (Generate Certificate Signing Request) now correctly sets the CSR version to 1 instead of 2.
	PA-10440	Host Command ‘B8’ (TR-34 Key Export) now correctly now supports EBCDIC.
	PA-10513	Host Command ‘B8’ (TR-34 Export) now supports Key Block Version ID ‘D’ (Key block protected using the AES Key Derivation Binding Method) as documented in the Host Command Reference Manual.
	PA-9925	Host Command ‘IG’ (Key Derivation using Elliptic Curve Key Agreement) now corrects DES keys for odd parity.

Deployment Version	Reference	Description
1.10.0	PA-8485	For customers using the Australian Standard functions (AS2805), an update is included to support the Alternate Variant 'Hb' with Host Command 'PI' (Generate a Set of Terminal Keys) – see the Core Host Commands Manual for further details.
	PA-8786	For customers using the Australian Standard functions (AS2805), Console Command 'EA' (Convert (KEK) ZMK into a KEKr or KWK) is now available.
	PA-10439	Host Command 'A0' now gives Error 17 when attempting to export a ZMK in Key Block Format when the Security setting 'Enable export of a ZMK' is set to NO.
	PA-8080	The following key block keys can now be authorized individually: <ul style="list-style-type: none"> • K0 (KEK Generic) • 53 (ZKA Master Key) • E7 (EMV/Master Personalization Key) • K1 (KEK Generic)
	PA-8823	For a customer with custom software, key type 604 can now be authorized individually when using the Console or Host Commands.
	PA-12261	When using the Hosted HSM functionality, when calling the OOB performance endpoint with LMK=1, a combination of 1 Key Block LMK and 1 Variant LMK is now allowed instead of 1 x Key block or 1 x Variant LMK.
	PA-9002 PA-10394 PA-11422 PA-11010 PA-11132 PA-11500 PA-11609 PA-4754 PA-11397	payShield 10K Manuals have been updated for this release as follows: <ul style="list-style-type: none"> • Security Operations: <ul style="list-style-type: none"> ○ Further information on the Audit Trail has been added. ○ Error Log information has been moved to the Installation and User Guide. ○ The certification section has been updated. ○ Two new Security Settings have been added that are required for GBIC in Germany. • Host Command Examples: <ul style="list-style-type: none"> ○ This is now added to the manual set, using the same examples as provided with payShield 9000 <p>All other manuals include a number of updates, corrections and clarifications.</p>

4 1500-0031 (v1.5a) – Released March 2022

4.1 Summary

This is a general release for all customers.

4.2 Version Details

Base Release:	1.5a		
Revision:	1500-0031		
Deployment Version:	1.9.2 Released May 2022	...	This is 1.9.0 with the addition of 9 fixes only (5 customer related fixes and 4 internal fixes)
	1.9.0 Released March 2022	...	Feature Release

4.3 PCI HSM Compliance

This software release has completed certification to the PCI HSM Version 3 standard.

The software is listed on the PCI web site at the following location:

https://www.pcisecuritystandards.org/assessors_and_solutions/pin_transaction_devices?agree=true

Note that deployment version 1.9.2 listed above includes specific bug fixes only and so will be covered by the PCI HSM Certification for v1.5a.

4.4 Manuals

The following payShield 10K manuals should be used with this release:

- > 007-001512-005 payShield 10K Installation and User Guide
- > 007-001518-005 payShield 10K Host Programmers Manual
- > 007-001515-005 payShield 10K Core Host Commands
- > 007-001516-005 payShield 10K Legacy Host Commands
- > 007-001513-005 payShield 10K Security Operations Manual
- > 007-001517-005 payShield 10K Applications Manual
- > 007-000997-005 payShield 10K Console Guide

4.5 payShield Manager

This table indicates the combinations of operating system and browser supported by payShield Manager in this release.


It is possible that other combinations will work, either completely or partially, but this should not be relied upon.

Please note that payShield Manager no longer supports Internet Explorer as this is no longer supported by Microsoft.

Operating System	Windows 10 64-bit		Linux Ubuntu 18 64-bit		macOS Big Sur
Browser	Chrome 64-bit	Firefox 64-bit	Chrome 64-bit	Firefox 64-bit	Chrome 64-bit
payShield 10K v1.5a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

4.6 New Functions

Deployment Version	Reference	Description
1.9.0	PA-1633	<p>Remote configuration of the Trusted Management Device (TMD) using payShield Manager.</p> <p>The Trusted Management Device (TMD) is a separate product provided by Thales for use together with payShield 10K. The TMD is used to securely manage key components to meet the latest requirements from PCI.</p> <p>In this release of payShield 10K Software, a new method of setting up the initial key (MZMK) is provided in payShield Manager. This is provided to share the MZMK between payShield 10K and the TMD.</p> <p>This allows the TMD to be used entirely remotely from payShield 10K. In previous releases, a visit to the datacentre was required to store the MZMK in components on smart card using payShield 10K to share with the TMD.</p> <p>The new method to exchange the MZMK uses the Elliptic Curve Key Agreement Algorithm (ECKA) and is carried out as follows:</p> <ul style="list-style-type: none"> • Use the TMD to generate an ECC key pair and export the Public Key • Use payShield Manager to import the TMD Public Key, to generate the MZMK and to export the MZMK derivation data • Use the TMD to import the MZMK derivation data and derive the MZMK <p>The new feature is provided in the “Manage MZMK” option in the “Configuration Tab” in payShield Manager. Further information is given in the Install and User Guide Sections 1.11 and 9.10.11. Some background information on ECKA is also provided together with the ‘IG’ Host Command in the Core Host Commands manual.</p> <p>Please note that to use this feature also requires the next release of the TMD software which will be available soon.</p>

Deployment Version	Reference	Description
1.9.0	PA-9811 PA-7950	<p>Support for a new payShield Manager smart card is included in this release.</p> <p>The smart card will be available later in 2022 and provides the same functionality as the existing payShield Manager smart cards except that it can only be used with payShield 10K software v1.5a and above.</p> <p>The smart card can be identified easily as new graphics are used as follows:</p>  <p>The new smart card will be available later using the following part numbers:</p> <ul style="list-style-type: none"> 971-000176-001 - PS10-RMGT-PM6 - payShield Manager Smart Cards x 6 for Software v1.5a and above 971-000177-001 - PS10-RMGT-PM30 – payShield Manager Smart Cards x 30 for Software v1.5a and above
1.9.0	PA-9303	<p>To meet the requirements of the German Certification Scheme (GBIC), Host Command 'A0' has been updated to restrict the mode of use that can be specified for the keys that are derived from the ZKA Master Key.</p> <p>The change ensures:</p> <ul style="list-style-type: none"> The sender must use ZKA Option 1 to generate a random RNDI and can only use the derived keys for encryption and MAC generation operations as appropriate for the key type specified. The receiver must use ZKA Option 0 with the RNDI supplied by the sender and can only use the derived keys for decryption and MAC verification operations as appropriate for the key type specified. <p>The restrictions imposed for ZKA Option '1' and '0' are given below and are detailed in the payShield 10K Core Host Commands Manual for Host Command 'A0'. Please also see below for a temporary removal of some of these restrictions in deployment version 1.9.2.</p> <p>'0': Derive one of the following "receive" keys using supplied RNDI:</p> <ul style="list-style-type: none"> PIN Decryption Key (Key Usage="72", Mode Of Use="D") Data Decryption Key (Key Usage="22", Mode Of Use="D") MAC Verification Key (Key Usage="M3", Mode Of Use="V") <p>'1': Derive one of the following "send" keys using new RNDI:</p> <ul style="list-style-type: none"> PIN Encryption Key (Key Usage="72", Mode Of Use="E") Data Encryption Key (Key Usage="22", Mode Of Use="E") MAC Generation Key (Key Usage="M3", Mode Of Use="G")
1.9.2	PA-11686	<p>Following customer feedback, to allow customers further time to update their applications to meet the restrictions noted above, some restrictions have been removed in deployment version 1.9.2. This is a temporary measure and the restrictions imposed in PA-9303 above will be reinstated in v1.6a.</p> <p>'0': Derive one of the following "receive" keys using supplied RNDI:</p> <ul style="list-style-type: none"> PIN Decryption Key (Key Usage="72", Mode Of Use="D" or "N") Data Decryption Key (Key Usage="22", Mode Of Use="D" or "N") MAC Verification Key (Key Usage="M3", Mode Of Use="V", "G" or "N") <p>'1': Derive one of the following "send" keys using new RNDI:</p>

Deployment Version	Reference	Description
		<ul style="list-style-type: none"> PIN Encryption Key (Key Usage="72", Mode Of Use="E" or "N") Data Encryption Key (Key Usage="22", Mode Of Use="E" or "N") MAC Generation Key (Key Usage="M3", Mode Of Use="G" or "N")
1.9.0	PA-8174	<p>The two cipher suites below are available for use with TLS when using the Ethernet Host Port:</p> <ul style="list-style-type: none"> TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256
1.9.0	PA-536	The version of AngularJS used with payShield Manager has been updated to the latest version - v1.8.2.

4.7 Known Issues

Deployment Version	Reference	Description
1.9.0 & 1.9.2	PA-236	<p>When using payShield Manager and selecting the "Get More" button in the Status Tab in the drop down list for the error log, no additional information is displayed.</p> <p>The work around is to use the "ERRLOG" Console Command in the payShield Manager Virtual Console.</p>
1.9.0 & 1.9.2	PA-11609	The manual for Host Command 'M6' (Generate MAC) does not specify the message length should be a multiple of 16 when using Input Format Flag '1' (Hex-encoded binary), MAC Algorithm '3' (ISO 9797 MAC Algorithm 3) and Padding Method '0' (No padding).

4.8 Bugs and Errors Corrected

Deployment Version	Reference	Description
1.9.2	PA-10999	<p>After a significant number of SNMP requests are made to payShield 10K, a payShield 10K reboot occurs. Typically an SNMP request every 5 minutes causes a reboot after approximately 5 months. The reboot takes approximately 1 minute and normal service resumes after this completes.</p> <p>This issue is apparent in versions from v1.2a to v1.5a deployment version 1.9.0 inclusive. To reduce the occurrence of this issue, the number of SNMP requests should be reduced.</p> <p>This issue has been fixed in this release (i.e. v1.5a deployment version 1.9.2).</p>

Deployment Version	Reference	Description
	PA-7583	Host Command 'M6' (Generate MAC) occasionally failed with an error when using Input Format Flag '1' (Hex-encoded binary), MAC Algorithm '3' (ISO 9797 MAC Algorithm 3) and Padding Method '0' (No padding) when the message length is not a multiple of 16 as required. This has been fixed in this release.
	PA-8224	When using Custom Software, the SNMP GET request "payShieldEnabledHostCommandsList.0" is now correctly showing custom commands which were missing in earlier releases.
	PA-10505	With Host Command 'A8', when exporting in TR-31 format with optional header block ID's KS and KV, an error was given when exporting in EBCDIC format. This is corrected in this release.
	PA-11686	See entry in the 'New Functions' section above. This specifies the temporary changes to the restrictions imposed to the mode of use that can be specified for the keys that are derived from the ZKA Master Key in Host Command 'A0'.
1.9.0	PA-10458	<p>A significant issue is addressed when using Host Command 'QY' (Generate a Dynamic CVV) with a Key Block LMK. Customers using this command are advised to use v1.5a or a later release when using a Key Block LMK.</p> <p>In previous releases, multiple uses of this Host command causes all host commands using a Key Block LMK to respond with Error Code 'AC'. For payShield Manager users, the 'Reboot' option in the 'Status' Tab in the 'Device Information' option can be used to resolve the issue for a short while. For Console Users, a power cycle can be used instead.</p> <p>Customers using a Variant LMK are unaffected by this issue.</p>
	PA-8896	<p>Host Command 'A0' (Generate Key) has been updated to correct an issue when used as follows:</p> <ul style="list-style-type: none"> Exporting the key generated in TR-31 format Using EBCDIC format (instead of ASCII) Using Optional Header Block IDs 'KS' (Key Set Identifier) and/or 'KV' (Key Block Values) <p>In previous releases, the 'KS' and 'KV' Optional Header Blocks were in ASCII format instead of EBCDIC format.</p>
	PA-10413 PA-8323	Host Command 'B8' (TR-34 Key Export) now correctly supports the Optional Key Usage 'K0' or 'K1'.
	PA-10703	For Host Command 'B8' (TR-34 Export), a new Scheme has been added. This supports the update included in the ASC X9 TR 34-2019 Draft Errata (ASC X9 TR 34-2019 Corrigendum).

Deployment Version	Reference	Description
1.9.0		When Scheme = '2', this is identical to Scheme 1 but in the Response Message, the ASN.1 encoded <code>EncryptedContent</code> element is a sibling of the <code>ContentEncryptionAlgorithm</code> element instead of a child of the element.
	PA-4369	An update is included with Host Command 'BA' (Generate an IBM PIN Offset (of a customer selected PIN)) to correct the mode of use supported from 'V' to 'G'. This command now supports mode of use 'C', 'G', and 'N' instead of 'C', 'V' and 'N'
	PA-8834	Host Command 'BU' (Generate a Key Check Value) now correctly returns a key check value for an HMAC when using a key block LMK. In previous releases, error A7 was given.
	PA-8924	Host Command 'BW' (Translate Keys from Old LMK to New LMK and Migrate to New Key Type) now prevents translation of a key from encryption under a Variant LMK to encryption under a Key Block LMK with an Optional Header Block Key Status of 'T' (Test).
	PA-8635	For Host Command 'EI' (Generate RSA Key Pair, the activities 'generate.05.host' and 'generate.06.host' can now be authorized in the same way as 'generate.03.host' when using a key block LMK.
	PA-9674 PA-9784	Host Command 'EK' now correctly loads the following RSA Private Keys into key change storage. In previous releases Error Code '03' was given: <ul style="list-style-type: none"> RSA Key pair generated using host command 'EI' with Key Type Indicator '1' (key pair used for key management only) RSA key pair generated with Key Type Indicator '5' (key pair used for PIN encryption/decryption).
	PA-5048	When using Host Command 'IC' (Establish Secure Session with Chip Card), with an AES Key Block LMK and Secure Channel Method 1, Error 26 was returned. This is now fixed in this release.
	PA-1566	An issue when using a Key Block LMK has been fixed with Host Command 'K2' (Verify Truncated Application Cryptogram (Mastercard CAP))
	PA-10396	An issue with Host Command 'KO' (Generate Card RSA Key Set and Public Key Certificate) has been resolved where very infrequently an erroneous response is given.
	PA-10309 PA-10312	An issue with the key derivation method used when using BDK-2 and BDK-4 has been fixed with Host Command 'M0' (Encrypt Data Block), 'M2' (Decrypt Data Block), 'M4' (Translate Data Block), 'MY' (Verify and Translate a MAC) and 'GW' (Generate/Verify a MAC).

Deployment Version	Reference	Description
	PA-7444	When using the Console Command 'VR' (View Revision), the Elliptic Curve Algorithm (ECC) is now listed.
	PA-4347	When using a printer connected to payShield 10K, the printer settings now do not need to be re-entered when the printer is rebooted.
	Various	<p>payShield 10K Manuals have been updated for this release as follows:</p> <ul style="list-style-type: none">• The Core Host Commands Manual includes a number of updates, corrections and clarifications in particular:<ul style="list-style-type: none">○ An update for Host Command A0 regarding the ZKA Option○ An update to Host Command B8 which now includes Scheme 2 and improved descriptions of Scheme 0 and 1.○ An AES DUKPT Key Usage Indicator table added in Section 5.6• All other manuals include a number of updates, corrections and clarifications.

5 1500-0030 (v1.4a) – Released Sept 2021

5.1 Summary

This is a general release for all customers.

5.2 Version Details

Base Release:	1.4a	
Revision:	1500-0030	
Deployment Version:	1.8.3 Released December 2021	This is 1.8.2 with the addition of 3 fixes only
	1.8.2 Released November 2021	This is 1.8.1 with the addition of 2 fixes only
	1.8.1 Released October 2021	This is 1.8.0 with the addition of 2 fixes only
	1.8.0 Released September 2021 ...	Feature Release

5.3 PCI HSM Compliance

This software release has completed certification to the PCI HSM Version 3 standard.

The software is listed on the PCI web site at the following location:

https://www.pcisecuritystandards.org/assessors_and_solutions/pin_transaction_devices?agree=true

Note that all deployment versions listed above include specific bug fixes only and so will be covered by the PCI HSM Certification for v1.4a.

5.4 Manuals

The following payShield 10K manuals should be used with this release:

- > PUGD0535-010 Installation User Guide
- > PUGD0541-005 Host Programmers Manual
- > PUGD0537-007 Core Host Commands
- > PUGD0538-005 Legacy Host Commands
- > PUGD0536-005 Security Operations Manual
- > PUGD0539-003 Applications Manual
- > 007-000997-003 payShield 10K Console Guide

5.5 payShield Manager

This table indicates the combinations of operating system and browser supported by payShield Manager in this release.

It is possible that other combinations will work, either completely or partially, but this should not be relied upon.

Operating System	Windows 10 64-bit			Linux Ubuntu 18 64-bit		macOS Big Sur
Browser	Chrome 64-bit	Firefox 64-bit	Internet Explorer 64-bit	Chrome 64-bit	Firefox 64-bit	Chrome 64-bit
payShield 10K v1.4a	☑	☑	☑	☑	☑	☑

5.6 New Functions

Deployment Version	Reference	Description
1.8.0	PA-885	<p>Hosted HSM introduces a new capability to payShield to support the deployment of HSMs into Service Provider environments.</p> <p>This feature is license enabled and provides a new REST API – Out of Band (OOB) Management – to allow a service provider to allocate HSMs, and perform limited device management. With the Hosted HSM license enabled, the HSM can transition from Data Centre to Allocated, and finally End User state, enforcing role separation between the Service Provider and End User.</p> <p>Once allocated, a customer is able to fully manage the device through payShield Manager in the same way as their on-premises HSMs.</p> <p>Some of the key differences between a hosted payShield and an on-prem (or non-hosted) payShield include:</p> <ul style="list-style-type: none"> • Service provider has no access to customer or end user data (key material, logs, settings, etc.) • Physical keylocks are completely decoupled from Online/Offline/Secure states • Position of the physical keylocks do not impact payShield Manager and payment services • End user can only use the payShield Manager to switch application states between Online/Offline/Secure • Very limited set of commands are allowed at the local console (see later section for allowed command list) • Aux interface is not available to the end user • Service provider has a separate audit log and is completely independent of the end user audit log • Service provider has no access to error log while the device is in use by end user • In case of a medium tamper, unlike on-prem payShield, customer will not be able to use HRK recovery mechanism to

Deployment Version	Reference	Description
		<p>recover a payShield that was previously tampered. Encrypted logs can be retrieved via the service provider.</p> <p>Please see the Hosted HSM End User Guide (available via your account manager) for more information.</p>

5.7 Known Issues

Deployment Version	Reference	Description
1.8.0, 1.8.1 & 1.8.2	PA-236	<p>When using payShield Manager and selecting the “Get More” button in the Status Tab in the drop down list for the error log, no additional information is displayed.</p> <p>The work around is to use the “ERRLOG” Console Command in the payShield Manager Virtual Console.</p>
	PA-7446	<p>When using Payshield Manager with Internet Explorer, the error "Incompatible smart card terminal" is displayed. Selecting RUN CONTROL allows connection.</p>

5.8 Bugs and Errors Corrected

Deployment Version	Reference	Description
1.8.3	PA-6865 PA-8400 PA-10487	<p>An issue has been fixed in payShield Manager when using the Thales (Gemalto) IDBridge CT700 Smartcard Reader with PIN Pad.</p> <p>This smart card reader will soon be available in the payShield Manager Starter Pack and also be available to be purchased separately and will replace the existing reader. For further information on this smart card reader please see: https://cpl.thalesgroup.com/resources/access-management/idbridge-ct700-product-brief</p> <p>The driver for the IDBridge CT700 Smartcard Reader for Windows is available using the following link: https://supportportal.gemalto.com/csm?sys_kb_id=68db1c5edb9bbe40d298728dae9619e9&id=kb_article_view&sysparm_rank=1&sysparm_tsqueryId=794215c6db544110f0e32208059619cd&sysparm_article=KB0015847</p> <p>The driver for Linux and MacOS are included with the operating systems.</p>

Deployment Version	Reference	Description
1.8.2	PA-8956	<p>Digital signatures were occasionally generated and verified incorrectly when using the Elliptic Curve Cryptographic (ECC) algorithm. This has been fixed in this release.</p> <p><i>Customers using ECC should upgrade to this or a later release.</i></p> <p>This issue impacts the following functionality:</p> <ul style="list-style-type: none"> Host Commands supporting the ECC algorithm. TLS connections when using an ECC cipher suite. The impact seen here is that the payShield 10K response is occasionally rejected by the TLS client and vice versa in v1.2a and above.
	PA-10257	<p>The following problem has been fixed in this release. This only occurs on the PS10-D payShield 10K 10Gb Ethernet Hardware Platform:</p> <ul style="list-style-type: none"> Occasionally the payShield 10K 10Gb Ethernet link goes down and requires the unit to be rebooted to recover. This has been seen occasionally when the 10Gb Transceivers have been swapped and also when the network switch has been powered off and then on.
1.8.1	PA-10064	Hosted HSM Out of Band (OOB) REST API returning 'Undefined' for the provisioning state. This has been fixed in this release.
	PA-9876	Hosted HSM Out of Band (OOB) REST API now supports an LMK override of 1 in addition to 2, 5, 10 and 20.
1.8.0	PA-8384	<p>The following security vulnerabilities in OpenSSL have been addressed by upgrading to OpenSSL 1.1.1k:</p> <ul style="list-style-type: none"> CVE-2021-3449
	PA-5157 PA-3170	<p>The Security Setting "Enforce minimum key strength of 2048-bits for RSA?" when set to "Yes" prevented a number of valid operations that can be undertaken with an RSA key length less than 2048-bits. This has now been fixed.</p> <p>If enabled, the HSM will not permit RSA operations (signing, generation, encryption, decryption) using a key smaller than 2048 bits. Enforcement is now only provided for PCI payment brand relevant transactions and so does not apply to host commands used for Card and Mobile Issuance, Multos and OBKM as well as the Australian Commands and WebPIN Commands.</p> <p>Only the following host commands are now impacted by this security setting:</p> <ul style="list-style-type: none"> ES Validate a Certificate and Import the Public Key – only the CA RSA Public Key must be 2048 bits or greater. GI Import Key or data under an RSA Public Key GK Export Key under an RSA Public Key – only the RSA Public Key in the request in the command must be 2048 bits or greater.

Deployment Version	Reference	Description
		<ul style="list-style-type: none"> QE Generate a Certificate Request EW Generate an RSA Signature JW Build a JSON Web Token. JY Decode a JSON Web Token. EY Validate an RSA Signature AQ Translate an RSA-encrypted PIN to a ZPK/TPK-encrypted PIN B8 TR-34 Key Export
1.8.0	PA-8518 PA-8519 PA-8529 PA-8530 PA-8531	<p>Host commands 'CA' (Translate a PIN from TPK to ZPK/BDK Encryption), 'CC' (Translate a PIN from One ZPK to Another) and 'G0' (Translate a PIN from BDK to BDK or ZPK Encryption) have been updated to address a number of issues reported with the translation operations when using PIN Block ISO Format 4. Included in the updates are the following:</p> <ul style="list-style-type: none"> Host Commands CA, CC and G0 now give error 23 in all cases if the following conditions are not met: <ul style="list-style-type: none"> AES PIN encryption keys can only be used with PIN Block ISO Format 4. 3DES PIN encryption keys cannot be used with PIN Block ISO Format 4.
	PA-2463	<p>The following issue has been addressed with Host Command 'A4' (Form a Key from Encrypted Components):</p> <ul style="list-style-type: none"> payShield 10K closed the connection when processing the command when using an AES KeyBlock LMK
	PA-6568	<p>The following update has been made for Host Command 'GK' (Export Key under an RSA Public Key):</p> <ul style="list-style-type: none"> Authorized mode is now correctly required to export the TMK, as specified in the Key Type Table
	PA-7231	<p>The following issue has been addressed with Host Commands 'A6' (Import a Key) and 'A8' (Export a Key)</p> <ul style="list-style-type: none"> Authorized mode is now correctly required to export the TMK, as specified in the Key Type Table
	PA-8205	<p>A fix is included for Host Commands 'P6' (Load OPINPad to HSM Memory) and 'P8' (Decode OPIN and translate to ZPK) to address an issue with access to the PADid stored in memory.</p>
	PA-5368	<p>payShield Manager now allows text to be copied and pasted when using the Virtual Console</p>
	PA-6139	<p>payshield Manager now allows Key Usage code 22 (ZEK) to be authorized for import or export when using an AES Key Block LMK.</p>

Deployment Version	Reference	Description
	PA-8250	Continued use of Console Commands using the Virtual Console on payShield Manager caused the Virtual Console response to slow down when using v1.2a or above software. This is fixed in this release.
1.8.0	Various	<p>payShield 10K Manuals have been updated for this release as follows:</p> <ul style="list-style-type: none">• The Installation and User Guide has new sections on Fraud Detection, Secure Host Comms, Utilization Data, Health Check Data and the Audit Log.• The Core Host Commands Manual includes a number of updates, corrections and clarifications, including updates to host commands 'CA', 'CC' and 'G0'.• The Host Programmer's Manual includes a number of updates and corrections including updates to the PIN Block information provided in Chapters 16 and 18.• The Security Operations Manual also includes a small number of corrections to the descriptions of the Security Settings.

6 1500-0029 (v1.3d) – Released August 2021

6.1 Summary

This is a general release for all customers.

6.2 Version Details

Base Release: 1.3d
 Revision: 1500-0029
 Deployment Version: 1.7.1 Released August 2021 Maintenance Release

6.3 PCI HSM Compliance

Note this release is **not** planned to undergo certification to PCI HSM V3.

6.4 Manuals

The following payShield 10K manuals should be used with this release:

- > PUGD0535-007 Installation User Guide
- > PUGD0541-005 Host Programmer's
- > PUGD0537-005 Core Host Commands
- > PUGD0538-005 Legacy Host Commands
- > PUGD0536-004 Security Manual
- > PUGD0539-003 Applications Manual
- > 007-000997-002 payShield 10K Console Guide

6.5 payShield Manager

This table indicates the combinations of operating system and browser supported by payShield Manager in this release.

It is possible that other combinations will work, either completely or partially, but this should not be relied upon.

Operating System	Windows 10 64-bit			Linux Ubuntu 18 64-bit		macOS Big Sur
Browser	Chrome 64-bit	Firefox 64-bit	Internet Explorer 64-bit	Chrome 64-bit	Firefox 64-bit	Chrome 64-bit
payShield 10K v1.3d	☑	☑	☑	☑	☑	☑

6.6 New Functions

Deployment Version	Reference	Description
1.8.0	NA	<p>PS10-S - payShield 10K Special Edition Hardware Platform is a new variant of the standard payShield 10K hardware platform supporting the following performance levels only:</p> <ul style="list-style-type: none"> 25, 60 and 250 cps <p>For further information, please contact your account manager.</p>

6.7 Known Issues

Deployment Version	Reference	Description
1.7.1	PA-5157	The Security Setting “Enforce minimum key strength of 2048-bits for RSA?” when set to “Yes” prevents a number of valid operations that can be undertaken with an RSA key length less than 2048-bits.
	PA-236	<p>When using payShield Manager and selecting the “Get More” button in the Status Tab in the drop down list for the error log, no additional information is displayed.</p> <p>The work around is to use the “ERRLOG” Console Command in the payShield Manager Virtual Console.</p>
	PA-7446	When using Payshield Manager with Internet Explorer, the error "Incompatible smart card terminal" is displayed. Selecting RUN CONTROL allows connection.

6.8 Bugs and Errors Corrected

Deployment Version	Reference	Description
1.7.1	PA-8995 PA-9025 PA-9596	Improved error handling and increased entropy redundancy for the random number generator.
	PA-4037	<p>For all customers using “UTILSTATS” to monitor the command utilisation statistics, the following issue has been resolved in this release:</p> <ul style="list-style-type: none"> Once the total transaction value reaches the maximum value of 4,294,967,295 you may experience performance problems with the HSM. <p>The following workaround must be used for previous releases:</p>

Deployment Version	Reference	Description
		<ul style="list-style-type: none">It is recommended to clear the UTILSTATS before the above value is reached. This can be achieved by using the UTILSTATS console command to view the values and then selecting Y to the "RESET ALL STATS" option. This can be done while the HSM is online. Please also see the UTILSTATS command in the payShield 10K Console Manual.
	PA-7444	When using the 'VR' Console Command to view the software revision number and other details, the ECC algorithm is now shown.

7 1500-0026 (v1.3b) – Released June 2021

7.1 Summary

This is a general release for all customers.

7.2 PCI HSM Compliance

Please note this release is now **not** planned to undergo certification to PCI HSM V3.

7.3 Version Details

Base Release:	1.3b		
Revision:	1500-0026		
Deployment Versions:	1.6.2 Released July 2021	....	This is 1.6.1 with the addition of 3 fixes only
	1.6.1 Released June 2021	....	Feature Release

7.4 Manuals

The following payShield 10K manuals should be used with this release:

- > PUGD0535-007 Installation User Guide
- > PUGD0541-004 Host Programmer's
- > PUGD0537-005 Core Host Commands
- > PUGD0538-005 Legacy Host Commands
- > PUGD0536-004 Security Manual
- > PUGD0539-003 Applications Manual
- > 007-000997-001 payShield 10K Console Guide

7.5 payShield Manager

This table indicates the combinations of operating system and browser supported by payShield Manager in this release.

It is possible that other combinations will work, either completely or partially, but this should not be relied upon.

Operating System	Windows 10 64-bit			Linux Ubuntu 18 64-bit		macOS Big Sur
Browser	Chrome 64-bit	Firefox 64-bit	Internet Explorer 64-bit	Chrome 64-bit	Firefox 64-bit	Chrome 64-bit
payShield 10K v1.3b	☑	☑	☑	☑	☑	☑

7.6 New Functions

Deployment Version	Reference	Description
1.6.1	PA-71	<p>PS10-F payShield 10K FICON is a new variant of the standard payShield 10K hardware platform supporting the FICON host interface. This is supported in base software version v1.3a and above.</p> <p>The product provides a port for connection to an IBM mainframe host computer to allow host commands and responses to be transmitted using a FICON fiber optic interface.</p> <p>Note:</p> <ul style="list-style-type: none"> Two physical FICON ports are provided, but only one port is supported by software. The FICON transceiver provided by Thales must be ordered for compatibility reasons – options are provided for short wave and long wave transceivers. PS10-PRM-X Premium package is the only package and performance licence available for payShield 10K FICON and must be ordered with the product. payShield 10K FICON can be configured to use either the FICON host port or the standard Ethernet host ports – simultaneous use of the FICON and Ethernet host ports is not supported. The Ethernet Management and Auxiliary ports can be used when the host port is configured to use either the FICON host port or the Ethernet host ports. The FICON interface is integrated into the HSM's application software, and the Utilization and Health Check reporting facilities will report on the FICON interface. <p>Further information is provided in the latest payShield 10K Installation & User Guide.</p> <p>Note this functionality is also included in v1.3a which is for restricted distribution.</p>

7.7 Known Issues

Deployment Version	Reference	Description
1.6.1 & 1.6.2	PA-5157	The Security Setting "Enforce minimum key strength of 2048-bits for RSA?" when set to "Yes" prevents a number of valid operations that can be undertaken with an RSA key length less than 2048-bits.
	PA-236	When using payShield Manager and selecting the "Get More" button in the Status Tab in the drop down list for the error log, no additional information is displayed. The work around is to use the "ERRLOG" Console Command in the payShield Manager Virtual Console.
	PA-7444	When using the 'VR' Console Command to view the software revision number and other details, the ECC algorithm is not shown.
	PA-7446	When using Payshield Manager with Internet Explorer, the error "Incompatible smart card terminal" is displayed. Selecting RUN CONTROL allows connection.

7.8 Bugs and Errors Corrected

Deployment Version	Reference	Description
1.6.2	PA-9063	The following issue is found only in v1.3b deployment version 1.6.1 - this has been fixed in this release: <ul style="list-style-type: none"> after installing v1.3b deployment version 1.6.1, using the erase button on the rear of payShield 10K to erase keys, the unit freezes after rebooting. the workaround is to install v1.3b deployment version 1.6.2 or v1.2a – please contact support for assistance.
	PA-9018 PA-9080	The following issues in earlier releases have been fixed to improve the error handling for the Solid State Drive (SSD): <ul style="list-style-type: none"> A check and recovery mechanism has been added to ensure the health of the SSD partitions before they are mounted. Failure of factory reset if a severe error is found in the format of the Solid State Drive (SSD) when using v1.2a Deployment Version 1.5.3. <p>If file operation errors are shown in the Error Log, it is strongly recommended to upgrade to this or a later release that includes this fix.</p>

Deployment Version	Reference	Description
1.6.1	PA-8363	<p>The following issue found only in v1.3a has been fixed in v1.3b:</p> <ul style="list-style-type: none">When v1.3a has been installed on payShield payShield 10K and has subsequently been downgraded from v1.3a to an earlier release, a Factory Reset should not be used with the earlier release.This issue will not occur if v1.3a has not been installed.If v1.3a has been installed, upgrade to v1.3b to solve this issue. Once this is done, a downgrade to all earlier releases except v1.3a can be performed.
	PA-8274	<p>The following security vulnerabilities in OpenSSL have been addressed in an OpenSSL patch:</p> <ul style="list-style-type: none">OpenSSL CVE-3449 and CVE-3450

8 1500-0025 (v1.3a) – Released for Restricted Distribution April 2021

8.1 Summary

Please note this software release is intended for specific customers that require the fixes included only – it is not for general release. All other customers should continue with v1.2a or use a later release.

Note also this release is not planned to undergo certification to PCI HSM V3.

8.2 Version Details

Base Release: 1.3a
 Revision: 1500-0025
 Deployment Version: 1.6.0 Released April 2021 Maintenance Release - Restricted

8.3 Manuals

The following payShield 10K manuals should be used with this release:

- > PUGD0535-007 Installation User Guide
- > PUGD0541-004 Host Programmer's
- > PUGD0537-005 Core Host Commands
- > PUGD0538-005 Legacy Host Commands
- > PUGD0536-003 Security Manual
- > PUGD0539-003 Applications Manual
- > 007-000997-001 Rev A payShield 10K Console Guide

8.4 payShield Manager

This table indicates the combinations of operating system and browser supported by payShield Manager in this release.

It is possible that other combinations will work, either completely or partially, but this should not be relied upon.

Operating System	Windows 10 64-bit			Linux Ubuntu 18 64-bit		macOS Big Sur
Browser	Chrome 64-bit	Firefox 64-bit	Internet Explorer 64-bit	Chrome 64-bit	Firefox 64-bit	Chrome 64-bit
payShield 10K v1.3a	☑	☑	☑	☑	☑	☑

8.5 Known Issues

Deployment Version	Reference	Description
1.6.0	PA-8363	<p>The following issue has been found when downgrading from v1.3a to an earlier release.</p> <ul style="list-style-type: none"> When payShield 10K has been downgraded from v1.3a to an earlier release, a Factory Reset should not be used with the earlier release. After downgrading, if a Factory Reset is required: <ul style="list-style-type: none"> payShield 10K should first be upgraded to v1.3a using payShield Manager or the Console in the usual way. a Factory Reset should then be undertaken with v1.3a loaded. payShield 10K should then be downgraded using payShield Manager or the Console in the usual way. If payShield 10K is downgraded from v1.3a to an earlier release and a Factory Reset is undertaken with the earlier release, an error is given and payShield Manager can no longer be used. To recover from this error: <ul style="list-style-type: none"> The software must be upgraded to v1.3a using the Console with the software provided on USB stick. This requires local access to payShield 10K as payShield Manager cannot be used in this case. a Factory Reset should then be undertaken with v1.3a loaded. payShield 10K should then be downgraded using payShield Manager or the Console in the usual way. If v1.3a has been installed, upgrade to v1.3b to solve this issue. Once this is done, a downgrade to all earlier releases except v1.3a can be performed without problem.
	PA-5157	The Security Setting “Enforce minimum key strength of 2048-bits for RSA?” when set to “Yes” prevents a number of valid operations that can be undertaken with an RSA key length less than 2048-bits.
	PA-236	<p>When using payShield Manager and selecting the “Get More” button in the Status Tab in the drop down list for the error log, no additional information is displayed.</p> <p>The work around is to use the “ERRLOG” Console Command in the payShield Manager Virtual Console.</p>
	PA-7444	When using the ‘VR’ Console Command to view the software revision number and other details, the ECC algorithm is not shown.
	PA-7446	When using Payshield Manager with Internet Explorer, the error "Incompatible smart card terminal" is displayed. Selecting RUN CONTROL allows connection.

8.6 Bugs and Errors Corrected

Deployment Version	Reference	Description
1.6.0	PA-6579 PA-7651 PA-7567	The following issue has been addressed with Host Command 'CA' (Translate a PIN from TPK to ZPK/BDK (3DES DUKPT) Encryption): <ul style="list-style-type: none"> Issue when translating from Thales PIN Block Format 01 to 48 and from PIN Block Format 48 to 01.
	PA-7562 PA-7563 PA-7566	The following 3 issues have been addressed with Host Command 'CC' (Translate a PIN from One ZPK to Another): <ul style="list-style-type: none"> Error given when translating PIN Block from encryption under a 3DES ZPK to encryption under an AES ZPK PIN Block Translation to Encryption Under a ZPK now gives error 23 if the ZPK is not an AES key. Issue when translating a PIN Block from 48 to ISO Format 01.
	PA-6831 PA-8064	The following 2 issues have been addressed with Host Command 'G0' (Translate a PIN from BDK to BDK or ZPK Encryption): <ul style="list-style-type: none"> PIN Block Translation to Encryption Under a ZPK now gives error 23 if the ZPK is not an AES key. Issue when translating a PIN Block from 48 to ISO Format 01.
	PA-7186	Import of EMV Keys with key usages E0 to E6 will now accept a Mode of Use of 'X' (the key may only be used to derive other keys) as well as 'N' (no special restrictions apply) when using the following commands: <ul style="list-style-type: none"> Host Command 'A6' (Import a Key) Console Command 'IK' (Import Key)
	PA-7869	Entries are now made to the Error Log to inform the user that the log has reached 90%, 95% and 99% of capacity. The entries advise the user to download and clear the Error Log before the capacity is reached in each case. The capacity of the Error Log is now 10,000 entries and another entry is added when the Error Log is full and then no further entries are added.
	PA-8172	payShield 10K Manuals have been updated for this release as follows: <ul style="list-style-type: none"> The Console Commands are now covered in a separate manual instead of in an Appendix in the Installation and User Guide. The description of the 'GK' (Generate LMK Component) Console Command has been corrected to remove the references to the entry of secret values which are not supported in payShield 10K.

9 1500-0024 (v1.2a) – Released Feb 2021

9.1 PCI HSM Compliance

This software release has completed certification to the PCI HSM Version 3 standard.

The software is listed on the PCI web site at the following location:

https://www.pcisecuritystandards.org/assessors_and_solutions/pin_transaction_devices?agree=true

9.2 Version Details

Base Release:	1.2a		
Revision:	1500-0024		
Deployment Versions:	1.5.3 Released June 2021	....	This is 1.5.2 with the addition of 1 fix only
	1.5.2 Released April 2021	....	This is 1.5.1 with the addition of 1 fix only (For restricted distribution)
	1.5.1 Released Feb 2021	....	This is 1.5.0 with the addition of 1 fix only (For custom software only)
	1.5.0 Released Feb 2021	....	Feature Release

9.3 Manuals

The following payShield 10K manuals should be used with this release:

- > PUGD0535-006 Installation User Guide
- > PUGD0541-004 Host Programmer's
- > PUGD0537-005 Core Host Commands
- > PUGD0538-005 Legacy Host Commands
- > PUGD0536-003 Security Manual
- > PUGD0539-003 Applications Manual

9.4 payShield Manager

This table indicates which combinations of operating system and browser are supported by payShield Manager in this release.

It is possible that other combinations will work, either completely or partially, but this should not be relied upon.

Operating System	Windows 10 64-bit			Linux Ubuntu 18 64-bit		macOS Big Sur
Browser	Chrome 64-bit	Firefox 64-bit	Internet Explorer 64-bit	Chrome 64-bit	Firefox 64-bit	Chrome 64-bit
payShield 10K v1.2a	☑	☑	☑	☑	☑	☑

9.5 New Functions

Deployment Version	Reference	Description
1.5.0	PA-70	<p>Support for Elliptic Curve Cryptography (ECC) is introduced in this release.</p> <p>Elliptic Curve Cryptography (ECC) is an asymmetric algorithm that supports Public Key cryptography. It is based on a branch of mathematics called elliptic curve and is an alternative technique to RSA.</p> <p>Functions are provided for:</p> <ul style="list-style-type: none"> > ECC Key Management: <ul style="list-style-type: none"> • Key pair generation • Generation of a certificate signing request • Load a private key into User Storage • Import a public key • Translate private and public keys when LMK changed > ECC Signature Functions: <ul style="list-style-type: none"> • Generate and validate signatures on a message using ECDSA > ECC Key Derivation Functions: <ul style="list-style-type: none"> • Key Derivation Using Key Agreement: Derives keys using an Elliptic Curve Key Agreement Algorithm (ECKA) providing a secure method of symmetric key exchange between parties. Methods supported are: <ul style="list-style-type: none"> ▪ either ECKA-EG (El-Gamal) using ephemeral/static keys ▪ or ECKA-DH (Diffie-Hellman) using ephemeral keys only <p>The ECC Prime Curves currently supported for payments are defined in FIPS 186-3 and are as follows:</p> <ul style="list-style-type: none"> • '00' – P-256 • '01' – P-384 • '02' – P-521 <p>The following host commands now support ECC functionality:</p> <ul style="list-style-type: none"> • 'FY' – Generate ECC Key Pair (new host command for v1.2a) • 'QE' – Generate Certificate Request • 'EO' – Import Public Key • 'EK' – Load Private Key • 'EM' – Translate a Private Key • 'EU' – Translate a Public Key • 'EW' – Generate Signature

Deployment Version	Reference	Description
		<ul style="list-style-type: none"> 'EY' – Validate Signature 'IG' – Key Derivation Using Key Agreement (new host command for v1.2a). <p>Please note:</p> <ul style="list-style-type: none"> Further Information on the support for ECC provided is given in the payShield 10K Host Programmer's Manual and the Core Host Commands Manual. Performance for the 'FY' and 'IG' host commands in this release are lower than the cps performance rating for the payShield 10K – performance improvements may be provided in a later release The ECC algorithm is scheduled to be NIST approved later.

9.6 Known Issues

Deployment Version	Reference	Description
1.5.3	PA-9080	<p>The following issue is found only in v1.2a deployment version 1.5.3.:</p> <p>The solution to this issue is to upgrade to a release that includes the fix (for example v1.3b deployment version 1.6.3). Please contact support for assistance.</p>
1.5.0	PA-3265	There is a problem when using the payShield 10K Console to ping localhost (127.0.01). The following is returned: 0 packets received and 100% packet loss.
1.5.0	PA-5157	The Security Setting “Enforce minimum key strength of 2048-bits for RSA?” when set to “Yes” prevents a number of valid operations that can be undertaken with an RSA key length less than 2048-bits.
1.5.0	PA-236	<p>When using payShield Manager and selecting the “Get More” button in the Status Tab in the drop down list for the error log, no additional information is displayed.</p> <p>The work around is to use the “ERRLOG” Console Command in the payShield Manager Virtual Console.</p>

Deployment Version	Reference	Description
1.5.0	PA-7444	When using the 'VR' Console Command to view the software revision number and other details, the ECC algorithm is not shown.
1.5.0	PA-7446	When using Payshield Manager with Internet Explorer, the error "Incompatible smart card terminal" is displayed. Selecting RUN CONTROL allows connection.

9.7 Bugs and Errors Corrected

Deployment Version	Reference	Description
1.5.3	PA-9018	<p>The following issues in earlier releases have been fixed to improve the error handling for the Solid State Drive (SSD):</p> <ul style="list-style-type: none"> A check and recovery mechanism has been added to ensure the health of the SSD partitions before they are mounted. <p>If file operation errors are shown in the Error Log, it is strongly recommended to upgrade to this or a later release that includes this fix.</p>
1.5.2	PA-4863	payShield 10K was not issuing zero length keep-alive TCP segments. This has been fixed.
1.5.1	PA-7461	Internal problem with custom software builds resolved.
1.5.0	PA-3960	Host Command 'A0' (Generate Keys) is now able to generate an AES key with key usage 'E2' (EMV/Chip card Master Key: Secure Messaging for Integrity - MK-SMI).
	PA-3272	Intermittent failures were occurring when using host command PM which verifies a dynamic CVV/CVC. This has been fixed.
	PA-3405	Fixed issue with the host command to translate encrypted PIN to encrypted alphanumeric PIN (ZK) for WEBPIN which returned error 14.
	PA-3538	Fixed issue with Host Command 'M6' (Generate MAC) which was returning the incorrect CMAC when supplied with an empty message.
	PA-4582	Fixed issue with host command 'IY' (Generate Digitized Card Single Use Keys) which was not operating correctly in EBCDIC mode.

Deployment Version	Reference	Description
	PA-4586	Host command 'CC' (Translating PIN from One ZPK to Another) was failing to translate a PIN Block encrypted using an AES Key to encryption under a TDES ZPK with a PAN length of 15. This has been fixed.
	PA-5164	Fixed issue with generation of an IPEK and export in TR-31 format encrypted under a TMK in host command 'A0'.
	PA-5168	The Korean SEED related host and console commands have been updated to correct an issue found in the implementation of the algorithm.
	PA-5218	Problem with Host Command 'QY' (Generate a Dynamic CVV) fixed when using Key Derivation Method 'B' (EMV 4.1 Book 2 Option B method).
1.5.0	PA-5219	Fixed problem with Host Command 'IC' (Establish Secure Session with Chip Card) when using Secure Channel Method 5 and key scheme 'U' and 'S' and also when using Secure Channel Method 4 and key scheme 'U'.
	PA-6109	Host Command 'GW' (Generate/Verify a MAC (3DES & AES DUKPT) was giving an error when generating a MAC using BDK-2 and the AS2805 MAC Method and verifying using BDK-4. This has been fixed.
	PA-5952	Host Command 'EI' (Generate a Public / Private Key Pair) now correctly allows the key usage of 'N' when using Key Usage '06' and Key Type Indicator '4' (for data encryption/decryption (e.g. TLS/SSL pre master secret)). Host Command 'GI' (Import Key or data under an RSA Public Key) now supports an RSA key with key usage '06' and mode of use 'N'.
	PA-6507	Host Command 'NO' (HSM Status) was responding with '0' instead of '2' when some of the security settings relevant to PCI HSM compliance have non-compliant values but the "Enforce key type 002 separation for PCI HSM compliance" setting is not one of these. This has been fixed.
	PA-6542	An update to Host Command 'QE' (Generate a Certificate Request) has been implemented to place the blank attributes tag in the CSR. Further details are provided in the Core Host Commands Manual.
	PA-5654	Fixed issue with 'AQ' host command (Translate an RSA-encrypted PIN to a ZPK or TPK-encrypted PIN) when being used in a Multiple LMK configuration and the LMK was configured to select the LMK using the port number. In this case, payShield 10K was always using LMK 00 when another LMK was requested.
	PA-4851	The performance ratings for the payShield 10K are expressed in terms of "calls per second" (cps) instead of "transactions per second" (tps) as used with the payShield 9000.

Deployment Version	Reference	Description
		<p>The payShield 10K Console, payShield Manager and Utilstats now correctly use the new term cps in place of tps.</p> <p>This is a change to the way the performance rating is displayed only – this update does not affect the actual performance of payShield 10K in any way.</p> <p>Please note the performance ratings for the payShield 10K in cps are comparable to the payShield 9000 tps rating noting the performance of RSA signature generation and verification is greatly enhanced in the payShield 10K when compared to the payShield 9000.</p>
	PA-6466	Fixed issue when trying to authorize an installed LMK with "Enable multiple authorized activities" setting disabled on payShield Manager - an error was displayed and remote authorization failed for the LMK.
1.5.0	PA-3969	payShield Manager is now prevented from loading settings from smart card when payShield 10K is in PCI compliant mode.
	PA-2192	The virtual console in payShield Manager, did not clear all the contents when the 'Clear' button is selected. This has been fixed.
	PA-4694	Update to the internal Console driver is included to improve stability.
	PA-1424	Console Command 'FK' (Form Key from Components) is now able to import an AES key with key usage 'E2' (EMV/Chip card Master Key: Secure Messaging for Integrity - MK-SMI).
	PA-6476	The JQuery library has been updated to a later version.
	PA-2417 PA-5808	Intermittent failure in reporting information relating to the fans and the power supplies. This has been fixed in this release.
	PA-6298	Information on using payShield Manager with MacOS Catalina has been added to the Installation User Guide.
	Various	<p>payShield 10K Manuals have been updated for this release as follows:</p> <ul style="list-style-type: none"> PUGD0537 Core Host Commands V1: Includes information on the new ECC functionality. Support for storage of PINs encrypted under an AES Key Block LMK has been removed. A small number of corrections and updates are also included. PUGD0541 Host Programmer's: The new information on ECC has been incorporated. The section on User Storage has been updated. A small number of corrections and updates are also included.

Deployment Version	Reference	Description
		<ul style="list-style-type: none">PUGD0535 Installation User Guide: Information on the Trusted Management Device (TMD) has been added. The chapters on payShield Manager have been reorganized.

10 1500-0023 (v1.1a) – Released August 2020

10.1 PCI HSM Compliance

This software release has completed certification to the PCI HSM Version 3 standard.

In addition for this release, payShield Manager has completed certification as a PCI HSM v3 Remote Access Platform (RAP).

https://www.pcisecuritystandards.org/assessors_and_solutions/pin_transaction_devices?agree=true

10.2 Version Details

Base Release:	1.1a		
Revision:	1500-0023		
Deployment Versions:	1.4.2 Released June 2021	....	Maintenance Release
	1.4.0 Released August 2020	....	Feature Release

10.3 Manuals

Issue 004 of the payShield 10K manuals should be used with this release.

10.4 New Functions

Deployment Version	Reference	Description
1.4.2	PA-5862	New Console Command QMAC added to show MAC addresses of all network interfaces.
1.4.0	PA-3112	<p>A variant of the standard payShield 10K hardware platform is now available supporting 10G Ethernet. This is supported in base software version v1.1a and above.</p> <p>The new variant is the PS10-D payShield 10K 10G Ethernet Hardware Platform. This can be ordered in place of the standard PS10-S payShield 10K Ethernet Hardware Platform.</p> <p>10G Ethernet is provided on all four Ethernet ports - Host Port 1, Host Port 2, the Management Port and the Auxiliary Port. Transceivers for connection to either copper or optical networks must also be ordered for each port.</p> <p>As with the standard PS10-S model, a Software Package with Performance must be included in the order together with the Hardware Platform as well as any optional licenses and hardware accessories as required.</p>

Deployment Version	Reference	Description
		Further information is provided in the latest payShield 10K Installation User Guide.
1.4.0	PA-2711	<p>Bancontact manage the standards for the Bancontact debit card used widely in Belgium. To allow import and export of AES session keys in accordance with their specifications, two host new commands (N6 and N8) are provided.</p> <p>These allow import and export of AES session keys and are used for encryption of PINs, cardholder data and to generate and to verify a MAC to protect the integrity of the messages.</p> <p>These host commands require use of an AES Key Block LMK.</p> <p>A Premium Licence is also required to use these commands.</p>
	PA-2716	<p>Updates to the standard DUKPT commands to support an option for the Italian Standard Key Derivation Method are included.</p> <p>The following DUKPT host commands now support the Italian Standard Key Derivation Method when using a key block LMK:</p> <ul style="list-style-type: none"> GO, GO, GQ, GS, GU. <p>The following new key type is used with the above commands to specify that the Italian Standard Key Derivation Method is to be used:</p> <ul style="list-style-type: none"> BDK-5 with key usage 44. <p>The following host commands used for key management have been updated to support the new key BDK-5:</p> <ul style="list-style-type: none"> A0, A6, A8, GK, BW.
	PA-2575 PA-4665	<p>Host Command KY 'Generate Secure Message (EMV 4.x)' has been enhanced to support Visa VIS CVN '18'.</p> <p>Also a correction to this command for Visa VIS CVN '22' is included and this also now correctly supports ISO PIN Format 1.</p>
	PA-3939	payShield Manager now also supports Chrome 80. This required the Thales smart card bridge to support the Chrome 'SameSite' feature.
	PA-2573	<p>The import/export of a ZMK encrypted under another ZMK is now supported in host commands A6 and A8 as well as host command BY.</p> <p>Two Configure Security Settings control the capability (default is OFF):</p> <p>"Enable import of a ZMK under a ZMK? [Y/N]" with a default value of "N".</p> <ul style="list-style-type: none"> When set to "Y", the host command A6 and console command IK allow the import of a ZMK under a ZMK. <p>"Enable export of a ZMK under a ZMK? [Y/N]" with a default value of "N".</p> <ul style="list-style-type: none"> When set to "Y", the host command A8 and console command KE allow the export of a ZMK under a ZMK.

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10.5 Significant Corrections to Functionality

Deployment Version	Reference	Description
1.4.0	PA-4010 PA-4425	<p>A number of host commands have been updated to correct an issue with the support provided for ISO PIN Block Format 4 (Thales PIN Block Format 48). This is the format used to encrypt a PIN Block using the AES cryptographic algorithm.</p> <p>The Host Commands that have been changed in this releases are as follows:</p> <ul style="list-style-type: none"> • CA - Translate a PIN from TPK to ZPK/BDK (3DES DUKPT) Encryption • CC - Translate a PIN from One ZPK to Another • G0 - Translate a PIN from BDK to BDK or ZPK Encryption (3DES & AES DUKPT) <p>The Host Commands that only required a documentation update in the new manuals for this release are as follows:</p> <ul style="list-style-type: none"> • BK - Generate an IBM PIN Offset (of a customer selected PIN) • FW - Generate an ABA PVV (of a customer selected PIN) • DU - Verify a PIN & Generate an IBM PIN Offset (of customer selected new PIN) • CU - Verify a PIN & Generate an ABA PVV (of a customer selected PIN) • JE - Translate a PIN from ZPK to LMK Encryption • JC - Translate a PIN from TPK to LMK Encryption • JG - Translate a PIN from LMK to ZPK Encryption • DA - Verify a Terminal PIN Using the IBM Offset Method • EA - Verify an Interchange PIN Using the IBM Offset Method • CG - Verify a Terminal PIN Using the Diebold Method • EG - Verify an Interchange PIN Using the Diebold Method • DC - Verify a Terminal PIN Using the ABA PVV Method • EC - Verify an Interchange PIN Using the ABA PVV Method • BC - Verify a Terminal PIN Using the Comparison Method • BE - Verify an Interchange PIN Using the Comparison Method • KU - Generate Secure Message (EMV 3.1.1) • KY - Generate Secure Message (EMV 4.x) • IY - Generate Digitized Card Single Use Keys <p>Note that all the above host commands are backward compatible with v3.4c for all PIN Block Formats except ISO PIN Block Format 4 (Thales PIN Block Format 48).</p> <p>Changes will only be required to applications using ISO PIN Block Format 4 in order to include the check digit in the PAN/Token as documented in the Host Command Manual for v3.5a.</p>

10.6 Bugs and Errors Corrected

Deployment Version	Reference	Description
1.4.2	PA-9018 PA-9080	<p>The following issues in earlier releases have been fixed to improve the error handling for the Solid State Drive (SSD):</p> <ul style="list-style-type: none"> A check and recovery mechanism has been added to ensure the health of the SSD partitions before they are mounted. Failure of factory reset if a severe error is found in the format of the Solid State Drive (SSD) when using v1.2a Deployment Version 1.5.3. <p>If file operation errors are shown in the Error Log, it is strongly recommended to upgrade to this or a later release that includes this fix.</p>
1.4.0	PA-1002 PA-4046	Fixed issue with Host Command M4 when translating data from encryption using a 3DES key to an AES key if the data is not 16-byte blocks in size.
	PA-1106	SNMP log type of "Failed to get IP address" log has been changed from an error to a warning. This is because it could mislead customers to believe that the interface did not obtain the DHCP IP address even though the interface may have obtained the IP address at a later time.
	PA-1577	The error has been corrected which is displayed when attempting to install a Null LMK.
	PA-4549	The text displayed when using the VR Console Command has been updated to show the PCI information given on the payShield 10K label.
	PA-4583 PA-2526	<p>Two problems have been fixed when generating and installing a Key Transport Key (KTK) for the legacy Key Management Device (KMD):</p> <ul style="list-style-type: none"> A problem with the check value (KCV) has been corrected. When creating a KTK with the KM Console Command with the security setting "RESTRICT KCV to 6 CHARACTERS" set to YES, the individual components are now 6 in length and the KCV is now also 6 in length (previously 16). A problem when using the Console Command KN to load the KTK components which caused a crash.
	PA-4585 PA-4588 PA-4589 PA-4590	<p>A number of issues have been corrected with host command B8 which is used to export keys in TR-34 format:</p> <ul style="list-style-type: none"> The LMK ID was included in the TR-34 key block header in error. This has been corrected. A problem with the ASN1 encoding was corrected. The sequence tag length was not included in the digest calculation The key block parameters at the end of the command were read incorrectly
	PA-4783 PA-4741 PA-4561	<p>When using payShield Manager with Internet Explorer 11 the following three problems have been fixed:</p> <ul style="list-style-type: none"> A Web Socket error would pop-up and the session was terminated intermittently.

Deployment Version	Reference	Description
		<ul style="list-style-type: none"> When downloading the audit log, the session terminated expectantly. The 'Configure Commands' option (>Configuration->Configure Command) was not being displayed correctly.
	PA-5188	payShield 10K Core Host Commands Manual: The description of host command to export a key under an RSA public key (GK) has been corrected to include the correct position of the delimiters.
	PA-4256	The audit log printed an incorrect version when the payShield 10K software version is downgraded. This is now fixed.
1.4.0	PA-4462	A fix is included to address a problem whereby the host command to generate keys (A0) gave error 17 when generating an MK key with key usage 90.
	PA-1767	The error message when an attempt to use the CA Console Command to configure the auxiliary port in Online State has been corrected.
	PA-4580	A fix is included to host command G0 which translates a PIN using the DUKPT standard. The problem occurred when the same key is used.
	PA-1422	Host Command KG which is used to validate an Issuer Public Key Certificate gave an incorrect error when using an AES LMK and with the exportability of the key set to sensitive. This has been fixed.
	PA-2835	A number of ports on the host interface have been enabled.
	PA-4150	Fixed a problem with host command GW that generates or verifies a MAC when using DUKPT. The problem occurred if the data provided was not a multiple of 16 bytes.
	PA-4185	When using payShield Manager with Chrome or Internet Explorer and the security setting "Display general information on payShield Manager landing page = YES", the payShield Manager landing page takes a long time to display the Summary, Health and Software & License details. The login with the RACC cards also fail. This has been fixed.
	PA-4983	A fix is included for the problem whereby Authorization is not maintained after a reboot.
	PA-5186	A problem with Console Command GS (Generate Key & Write Components to Smartcard) is fixed and the components are now correctly written to smart card.
	PA-3259	When disabling healthstats data collection using payShield Manager the endtime did not update automatically in the displayed report. This was fixed in v1.1a.

11 1500-0022 (v1.0f) – Released April 2020

11.1 PCI HSM Compliance

This software release has completed certification to the PCI HSM Version 3 standard. The software is listed on the PCI web site at the following location:

https://www.pcisecuritystandards.org/assessors_and_solutions/pin_transaction_devices?agree=true

11.2 Version Details

Base Release: 1.0f

Revision: 1500-0022

Deployment Version: 1.3.2 Released April 2020 This is 1.3.0 with the addition of 1 fix only

11.3 Manuals

Installation User Guide will use Issue 004 and all other payShield 10K manuals should use Issue 003 with this release.

11.4 Bugs and Errors Corrected

Reference	Description
PA-4357	Tested and modified RSA Host Commands for 10K (AQ, EI, EK, EM, ES, GI, GK, QE, JW, J0, KO, L8 and L6) so that they work with the Security Setting for RSA key length of 2048 when the setting is as follows: "Enforce minimum key strength of 2048-bits for RSA: YES".

12 1500-0021 (v1.0e) – Released March 2020

12.1 PCI HSM Compliance

This software is not planned to undergo certification to the PCI HSM Version 3 standard.

12.2 Version Details

Base Release: 1.0e
Revision: 1500-0021
Deployment Versions: 1.3.0 Released March 2020 Maintenance Release

12.3 Manuals

Installation User Guide will use Issue 004 and all other payShield 10K manuals should use Issue 003 with this release.

12.4 New Functions

Reference	Description
PA-162	Added Licensing for FF1 algorithm to payShield 10K

12.5 Bugs and Errors Corrected

Reference	Description
PA-1432	Fixed ACL list so it cannot be disabled in the online mode and only in the secure mode
PA-2491	Notarized macOS Bridge with Apple
PA-2496	Modified SNMP for changes with kernel updates as a result of Ethernet interface name changes
PA-2888	Modified VR console command to display ADK version
PA-3382	Updated payShield Manager to return the semantic version
PA-3386	Corrected Upgrade/Downgrade detection
PA-3505	Fixed the inability to load PTI in payshield, when PTI name contains "+"
PA-3539	Corrected 10K Custom App PTI filename
PA-3875	Changed "Base Version" to "Firmware Version"
PA-3968	Updated SNMP to return semantic version

Reference	Description
PA-4186	Fixed HRK recovery fails between 1.0d and 1.0e
PA-4187	Modified payShield Manager to accept '+' symbol in filename while using "Update Software" in payShield Manager
PA-1124	Corrected MAC calculation in KY Host Command
PA-1143	Fixed EW Host Command when returning Error when using 2048 bit RSA keys
PA-1391	Fixed L6 returning error L726
PA-1408	Corrected inability to execute /sbin/ifconfig command because there was not enough memory
PA-1412	Modified Host Command A0 allowing it to generate a key with Algorithm 1 that can be used in the Host Command M0
PA-1417	Fixed problem with importing AES keys using 05 Optional Header
PA-1436	Fixed CS Host Command to work with AES Keys
PA-1564	Fixed a failure with HMAC keys using the Host Command 'L0', with HMAC Key Usages 01 or 02
PA-1570	Fixed error 50 - Invalid CRT component length byte for Host Command I8
PA-3210	Fixed Mode Flag 4 Scheme ID A in Host Command 'KY'
PA-3468	Fixed the M4 Host Command returning M506
PA-1433	Fixed A0 Host Command failing on AES key generation and export
PA-2954	Fixed BW so that translation can be done with a single length PVK w/ KTC 002 from 2DES LMK to AES LMK
PA-1433	Fixed A0 Host Command so that it does not fail on AES key generation and export

13 1500-0020 (v1.0d) – Released Dec 2019

13.1 PCI HSM Compliance

This software release has completed certification to the PCI HSM Version 3 standard. The software is listed on the PCI web site at the following location:

https://www.pcisecuritystandards.org/assessors_and_solutions/pin_transaction_devices?agree=true

13.2 Version Details

Base Release: 1.0d

Revision: 1500-0026

Deployment Version: 1.2.5 Released December 2019 Feature Release

13.3 Manuals

Issue 002 of the payShield 10K manuals should be used with this release.

13.4 New Functions

Reference	Description
PA-146, 148 and 149	Merge payShield 9K v3.4b and v3.4c into ps10K v1.0d
PA-201	Descriptions of commands for enable and disable configuration were added to payShield Manager.
PA-305	SNMP MIB-2 settings for payShield Manager were updated
PA-801	Messaging for situations where payShield Manager must be commissioned via local console was improved.
PA-918	.CSR from Secure Host communications used SHA1 and now uses SHA-2
PA-2179	Hardware Version now shown in 'VR' command
PA-913	Added verification of audit log integrity after reboot of payShield

13.5 Bugs and Errors Corrected

Reference	Description
PA-2304	Fixed to allow assure that only alphanumeric characters can be used in the console 'CH' network names.
PA-2529	Corrected issue where Host command descriptions in payShield Manager were not shown if command was not enabled.
PA-2544	Fixed "invalid range" for payShield Manager ACL host entry when the IP address of the beginning is greater than the end IP address.
PA-2545	Prevented the entry of duplicate entries for ACL.
PA-750	Fixed rebooting causing under voltage tamper.
PA-836	Corrected issue with DHCP misconfigures on lease renewal.
PA-1011	Corrected issue where security scan produces error.
PA-1207	Corrected memory errors with MyPINpad PIN tables.
PA-1723	Corrected issue where FRU status on payShield Manager health dashboard was delayed in updating.
PA-1725	Corrected issue where boot manager would not attempt to clear tamper during update.
PA-1733	Corrected issue where 'XR' console command could not connect to card.
PA-1734	Added validation on port numbers from payShield Manager.
PA-1739	Corrected issue where Fan controller fails to account for stopped fan.
PA-1741 PA-1757	Corrected issue where UI for payShield Manager does not show FIPS Status
PA-2778	Corrected issue where the 'KY' host command fails with invalid PIN block format codes. Add Support for ISO Pin Format 1 for CVN22
PA-215	Corrected SNMP issue where Fan state shows as OK when the fan is disconnected
PA-243	Corrected issue where payShield Manager does not apply changes to host settings if disabled interface has invalid settings.
PA-638	Corrected issue where 'JL' Host command is missing a flag in the response causing customer to not be able to parse it out.
PA-994	Corrected issue where payShield Manager session was not restoring console access.
PA-1686	Corrected issue where Configuration Host Settings: Enable TLS should be greyed out indicating HSM is not in Secure Mode
PA-1687	Corrected issue where SNMP - agent gets blocked under heavy trap load
PA-1689	Corrected Error "Failed to validate the server's Chain of Trust" while logging into payShield Manager UI

Reference	Description
PA-1690	Corrected issue where payShield Manager login failure keeps console disabled
PA-1694	Corrected issue with payShield Manager and Console mismatch - Secure Host comms vs Host TLS
PA-1695	Corrected issue where payShield Manager negatively impacts host command processing
PA-1696	Corrected issue with 'GI' host command returning A8 error where on the 9000 it returns successful.
PA-1697	Corrected issue where 'IK' console command is not clearing clear data.
PA-1698	Corrected issue in payShield Manager option "User must change PIN on first use" does not work after toggle.
PA-1699	Corrected 'SV' console command requesting invalid user input.
PA-1700	Updated manual for host commands 'CC', 'G0' and 'CI'
PA-1701	Corrected issue where error log entry is added when FAN is inserted due to initial low speed
PA-1703	Corrected issue where setting session timeouts with payShield Manager does not apply to the current session.
PA-1706	Corrected issue with payShield Manager where administrator attempted to log into PSM using an invalid RACC card and it was not recorded in the audit log.
PA-1710	Corrected issue where 'CA' and 'AQ' host commands were not checking appropriate security setting for Tokens in pin operations.
PA-1711	Corrected issue where MIB field payShieldUtilHostCmdVolume description was misleading.
PA-1712	Corrected issue where running Console command 'XR' generates an Audit log entry on HMAC validation.
PA-1714	Corrected issue where payShield Manager fails to refresh properly.
PA-1715	Corrected issue where temperature alarm information needed to be removed from the 'QL' console command.
PA-291	Corrected payShield Manager error message when logging in.
PA-312	Corrected issue where payShield Manager is left in a bad state after changing the IP address on the management port.
PA-334	Corrected issue where payShield Manager does not display any signed certs that are loaded on the payShield.
PA-1168	Corrected issue where MIB2 systems values were cleared after software upgrade.
PA-1369	Corrected issue where payShield Manager hangs and does not complete saving all settings onto the smart card.
PA-1607	Corrected payShield Manager UI on a defect related to showing host command descriptions.

Reference	Description
PA-1755	Corrected a corruption in the error log caused by a console RESET command.
PA-1758	Corrected payShield Manager Information (?) icon for TLS and Secure Host Communications where it did not display relevant information
PA-1762	Corrected to not record an error in the Error Log when modifying security settings are updated successfully.
PA-1763	Corrected to prevent payShield Manager from writing to error logs constantly after cancelled console RESET
PA-1795	Corrected payShield Manager so that it will display signed certs that are loaded.
PA-1143	Corrected receipt of error A5 with 'EW' host command on 10K using 2048 bit RSA keys
PA-1390	Corrected issue where 'EY' host command fails to verify a No Hash Signature created with 'EW' host command
PA-1423	Corrected issue where host command 'A6' returns authorization failure when using sub category method PA-1764] USB to Serial Driver (93183)
PA-2385	Corrected 'I8' host command, sub command 08, version 3 to return an 8 byte MAC.

14 1500-0010 (v1.0c) – Released April 2019

14.1 PCI HSM Compliance

This software release has completed certification to the PCI HSM Version 3 standard. The software is listed on the PCI web site at the following location:

https://www.pcisecuritystandards.org/assessors_and_solutions/pin_transaction_devices?agree=true

14.2 Manuals

Issue 001 of the payShield 10K manuals should be used with this release.

14.3 New Functions

The table below describes the list of major new functions introduced in this release:

Reference	Description
Compared to payShield 9000	New payShield Maintenance Light, activated at units front panel or remotely through payShield Manager
	New Secure Console UPLOAD command
	Faster and more reliable software updates
	New High Tamper Feature
	New Self Configuring USBC port for Console
	New (more secure) defaults for security configuration settings, command and PIN configurations
	Larger and more robust Audit Log
	Higher Performance Level

14.4 Bug Fixes and Errors

Reference	Description
PA-799	Fixed error log entries from factory

15 payShield 9000 vs 10K

Function/Feature	payShield 9000	payShield 10K
Form Factor	2U	1U
Power Sockets	x1 or x2 (factory fit option)	X2 Hot Swappable
Power Consumption	100W	60W
Fans	Stationary	X2 Hot Swappable
Ethernet Host Ports	x2 (10/100/1000 Mbps)	x2 (10/100/1000 Mbps)
Management Port	x1 (10/100/1000 Mbps)	x1 (10/100/1000 Mbps)
Ethernet Printer Port	x1 (10/100/1000 Mbps)	x1 (10/100/1000 Mbps)
Console Port	via USB-to-serial cable	USB-C
Async Host Port	via USB-to-serial cable	No Longer Supported
FICON Host Port	Option	Option.
Serial Printer Port	via USB-to-serial cable	via USB-to-serial cable
Parallel Printer Port	via USB-to- Parallel cable	via USB-to- Parallel cable
Erase Sensitive Data	Recessed Erase button	Recessed Erase button with completion indicator
Reset HSM	Red reset button	Through payShield Manager or power button on rear panel
LMK(s) loaded indicator	LMK LED	None – information in payShield Manager
Host Activity indicator	Host 1 & Host 2 LED	None – information in payShield Manager
Management Activity indicator	Management LED	None
Power supply indicator	Power LED (various colours)	Power LED, rear panel
Unit serial number	Front & rear panel	Front and rear panel
Motion Detector (Sensitivity)	Off/Low/Medium/High	Off/Low/Medium/High
Console Port speed	300...38400 baud	N/A Self Configuring
Async Host Port speed	300...38400 baud	N/A Removed
Serial Printer Port speed	300...38400 baud	300...38400 baud
IP routing	via gateway or static route	via gateway or static route
ROUTE console command	Yes	No
Software Update	via FTP or USB	Secure HTTPS via payShield Manager or Secure 'UPLOAD' console command with USB
Licence Update	via FTP	Secure HTTPS via payShield Manager or Secure 'UPLOAD' console command with USB
Start-up time	~20 seconds	~20 seconds
Maximum performance	1500 tps	2500 cps (calls per second)
PCI HSM certification	Yes PCI HSM Version 1.0 (selected hardware &	Yes PCI HSM Version 3.0

Function/Feature	payShield 9000	payShield 10K
	software versions) Expires end of April 2019	(Selected software versions)
FIPS Certification	FIPS 140-2, Level 3	FIPS 140-2, Level 3

16 Technical Support Contacts

Our team of knowledgeable and friendly support staff are available to help. If your product is under warranty or you hold a support contract with Thales, do not hesitate to contact us using the link below. For more information, consult our standard Terms and Conditions for Warranty and Support.

<https://supportportal.thalesgroup.com/csm>



Contact us

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