QS/1 PaySentry®

Card Transaction Tool

Payment Application Data Security Standard (PA-DSS)

PaySentry Implementation Guide

Version 20.1.x

History of Revisions

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1 Introduction to Security

1.1 Payment Card Industry Data Security Standard (PCI-DSS)

The PCI-DSS program is a mandated set of security standards that were created by the major credit card companies to offer a complete, unified approach to safeguarding cardholder data for all payment card brands.

A group of five leading payment card brands including American Express, Discover Financial Services, JCB, MasterCard Worldwide and Visa International jointly announced formation of the PCI Security Standards Council, an independent counsel established to manage ongoing evolution of the PCI standard. Concurrent with the announcement, the council released version 3.2 of the PCI standard.

The PCI Data Security Standard requirements apply to all payment card network members, merchants and service providers that store, process or transmit cardholder data. The requirements apply to all methods of cardholder processing, from manual to computerized; the most comprehensive and demanding of which apply to e-commerce websites, and retail point-of-sale systems that process cardholder data over the Internet.

The following high-level 12 requirements comprise the core of the PCI-DSS:

Build and Maintain a Secure Network

1. Install and maintain a firewall configuration to protect data
2. Do not use vendor-supplied defaults for system passwords and other security parameters

Protect Cardholder data

3. Protect Stored Data
4. Encrypt transmission of cardholder data and sensitive information across public networks

Maintain a Vulnerability Management Program

5. Use and regularly update anti-virus software
6. Develop and maintain secure systems and applications

Implement Strong Access Control Measures

7. Restrict access to data by business need-to-know
8. Assign a unique ID to each person with computer access
9. Restrict physical access to cardholder data

Regularly Monitor and Test Networks

10. Track and monitor all access to network resources and cardholder data
11. Regularly test security systems and processes

Maintain an Information Security Policy

12. Maintain a policy that addresses information security

1.2 Payment Application Data Security Standard (PA-DSS)

The PA-DSS applies to software vendors and others who develop payment applications that store, process or transmit cardholder data as part of authorization or settlement, where these payments applications are sold, distributed or licensed to third parties.

Traditional PCI-DSS compliance may not apply directly to payment application vendors since most vendors do not store, process or transmit cardholder data. However, vendor's payment applications are used by customers to store, process and transmit cardholder data. Therefore, the requirements for the PA-DSS are derived from the PCI-DSS and detail the mandates for payment applications to facilitate customer's PCI-DSS compliance.

2 Glossary of Terms

Term	Definition
Application	Includes all purchased and custom software programs or groups of programs designed for end users, including both internal and external (web) applications
ASP	Application service provider. Subscription service in which companies can rent some or all of their resources in lieu of purchasing software, servers, computers and hiring IT staff
Authentication	Process of verifying identity of a subject or process
Cardholder	Customer to whom a card is issued or individual authorized to use the card
Cardholder data	Full Magnetic stripe or the PAN plus any of the following: ▪ Cardholder name ▪ Expiration date ▪ Service Code
Card Validation Value or Code	Data element on a card's magnetic stripe that uses secure cryptographic process to protect data integrity on the stripe, and reveals any alteration or counterfeiting. Referred to as CAV, CVC, CVV or CSC depending on payment card brand. The following list provides the terms for each brand: ▪ **CAV –** Card Authentication Value (JCB payment cards) ▪ **CVC –** Card Validation Code (MasterCard payment cards) ▪ **CVV –** Card Verification Value (Visa and Discover payment cards) ▪ **CSC –** Card Security Code (American Express) *Note: The second type of card validation value or code is the three-digit value printed to the right of the credit card number in the signature panel area on the back of the card. For American Express cards, the code is a four-digit unembossed number printed above the card number on the face of all payment cards. The code is uniquely associated with each individual piece of plastic and ties the card account number to the plastic. The following provides an overview:* ▪ **CID –** Card Identification Number (American Express and Discover payment cards) ▪ **CAV2 –** Card Authentication Value 2 (JCB payment cards) ▪ **CVC2 –** Card Validation Code 2 (MasterCard payment cards) ▪ **CVV2 –** Card Verification Value 2 (Visa payment cards)
CCC	Central Credit Card processing
Console	Screen and keyboard which permits access and control of the server or mainframe computer in a networked environment
Default accounts	System login account pre-defined in a manufactured system to permit initial access when system is first put into service
Default password	Password on system administration or service accounts when system is shipped from the manufacturer; usually associated with default account. Default accounts and passwords are published and well known
DSS	Data Security Standard

Encryption	Process of converting information into an unintelligible form except to holders of a specific cryptographic key. Use of encryption protects information between the encryption process and the decryption process (the inverse of encryption) against unauthorized disclosure
Enterprise	Software system configuration which allows multiple retail pharmacy, HME or closed-shop pharmacy locations to reside on a single server for more efficient and cost-effective central management within a shared environment (allowing drug and physician information or transfer of prescriptions between stores) or non-shared environment (no data is shared between stores)
EULA	End-user license agreement
Firewall	Hardware, software or both that protect resources of one network from intruders from other networks. Typically, enterprises with an intranet that permits workers access to the wider internet must have a firewall to prevent outsiders from accessing internal private data resources
FTP	File transfer protocol
Host	Main computer hardware on which computer software is resident
HTTP	Hypertext transfer protocol. Open-internet protocol to transfer or convey information on the World Wide Web
ID	Identity
Information Security	Protection of information to ensure confidentiality, integrity and availability
IP	Internet protocol. Network-layer protocol containing address information and some control information that enables packets to be routed. IP is the primary network-layer protocol in the internet protocol suite
IP address	Numeric code that uniquely identifies a particular computer on the internet
IPSEC	Internet Protocol Security. Standard for securing IP communications by encrypting and/or authenticating all IP packets. IPSEC provides security at the network layer
Key	In cryptography, a key is an algorithmic value applied to unencrypted text to produce encrypted text. The length of the key generally determines how difficult it will be to decrypt the text in a given message
LAN	Local area network. Computer network covering a small area, often a building or group of buildings
MAC	Message authentication code
Magnetic Stripe Data (Track Data)	Data encoded in the magnetic stripe used for authorization during transactions when the card is presented. Entities must not retain full magnetic stripe data subsequent to transaction authorization. Specifically, subsequent to authorization, service codes, discretionary data/Card Validation Codes/Values and proprietary reserved values must be purged; however, account number, expiration date, name and service code may be extracted and retained, if needed for business
Monitoring	Use of system that constantly oversees a computer network including for slow or failing systems and that notifies the user in case of outages or other alarms

Network	Two or more computers connected together to share resources
Offline	Refers to processing credit card transactions either when the server is down, the internet is down or when standalone credit card processing is not switching through QS/1
PAN	Primary Account Number is the payment card number (credit or debit) that identifies the issuer and the particular cardholder account. Also called Account Number
PA	Payment Application
PABP	Payment Applications Best Practices
Password	A string of characters that serve as an authenticator of the user
PCI	Payment Card Industry
PIN	Personal identification number
Policy	Organization-wide rules governing acceptable use of computing resources, security practices and guiding development of operational procedures
POS	Point-of-sale
Public Network	Network established and operated by a telecommunications provider or recognized private company, for the specific purpose of providing data transmission services for the public. Data must be encrypted during transmission over public networks as hackers easily and commonly intercept, modify and/or divert data while in transit. Examples of public networks in scope of PCI DSS include the Internet, GPRS and GSM
Recurring Billing	Process of running credit card transactions without needing the customer's credit card present. Customer's card numbers are stored the first time they swipe their card. For subsequent transactions, neither the customer nor the card need be present
Router	Hardware or software that connects two or more networks. Functions as sorter and interpreter by looking at addresses and passing bits of information to proper destinations. Software routers are sometimes referred to as gateways
SAD	Sensitive authentication data. Security-related information (card validation codes/values, complete track data, PINs and PIN Blocks) used to authenticate cardholders, appearing in plain text or otherwise unprotected form. Disclosure, modification or destruction of this information could compromise the security of a cryptographic device, information system or cardholder data or could be used in a fraudulent transaction
Security Policy	Set of laws, rules and practices that regulate how an organization manages, protects and distributes sensitive information
Service Code	Three- or four-digit number on the magnetic-stripe that specifies acceptance requirements and limitations for a magnetic-stripe read transaction
SQL	Structured (English) Query Language. Computer language used to create, modify and retrieve data from relational database management systems
SSH	Secure shell. Protocol suite providing encryption for network services like remote login or remote file transfer

SSL	Secure sockets layer. Established industry standard that encrypts the channel between a web browser and web server to ensure the privacy and reliability of data transmitted over this channel
Token	A token is the result of a technology process that converts a card number to a totally random number suitable for risk-free storage
Tokenized data	Token plus any of the following: cardholder name, expiration date
Transaction data	Data related to electronic payment
TLS	Transport Layer Security. Protocol that ensures privacy between communicating applications and their users on the internet. When a server and client communicate, TLS ensures that no third party may eavesdrop or tamper with any message
Two-factor authentication	Authentication that requires users to produce two credentials to access a system. Credentials consist of something the user has in their possession (for example, smart cards or hardware tokens) and something they know (for example, a password). To access a system, the user must produce both factors
User ID	A character string used to uniquely identify each user of a system
VPN	Virtual private network. Private network established over a public network
WPA	Wi-Fi Protected Access (WPA and WPA2). Security protocol for wireless (Wi-Fi) networks

3 Compliance

PaySentry is a software utility designed for integration into existing QS/1 Point-of-Sale systems. PaySentry is the actual program that handles cardholder data transactions. PaySentry was developed with all the necessary tools to allow customers to be PCI DSS compliant. This does not mean that merely owning the system ensures compliance.

This guide is intended for customers who wish to create and maintain an environment within the PaySentry card transaction tool that adheres to the guidelines mandated by the Payment Card Industry (PCI) within the Payment Card Industry Data Security Standard (PCI DSS) and the Payment Application Data Security Standard (PA-DSS).

The PaySentry Implementation Guide is available on the QS/1 Customer Support Web page under Product Documents. It is also available in Point-of-Sale Web Help>Getting Started>QS/1 PaySentry.

4 PaySentry Setup

PaySentry must be installed on a computer that is not connected to the internet and must be installed on SQL Server 2014 Express SP 2. Refer to *Appendix A – SQL Server 2014 Express SP 2* for system requirements.

To install PaySentry, follow the steps below:

1. Install PaySentry on a SQL station. **Important:** If downloading the PaySentry self-extractable, you must be authorized to receive the PaySentry Quick Service Update (QSU). Contact QS/1 Customer Support at 800.845.7558 to request this update or a copy of the PaySentry CD.
   a. Download the PaySentry self-extractable from the QS/1 website. Make a note as to where the file downloads.

      Note: It may be possible that you received the PaySentry self-extractable on CD from QS/1. If this is the case, insert the medium into the appropriate drive on the station where SQL is to be installed, open the contents of the medium and start this process at e.

   b. Transfer the file to the SQL station. Refer to *Appendix B – Transferring Files* for more information.

      Note: If transferring files from a CD, the files MUST be copied to the SQL station before the installation is attempted.

   c. Right click on the PaySentry full install executable. Then left click on Run as Administrator. A list of files are extracted and copied into the current file path.
   d. Double click the setup batch file (.bat). New files and folders display and temporary ones are deleted. **DO NOT RUN AS ADMINISTRATOR.**
   e. Right click on the client install executable then left click on Run as Administrator to install the Windows Client program (if using the QS/1 CD, this file is located in the WindowsClient folder).
   f. Right click the system dependency executable and then left click on Run as Administrator to install the systems dependency program (if using the QS/1 CD, this file is located in the SysDepends folder).
      Note: In order for the Winclient to run properly, a local, generic/text only printer must be installed. Refer to *Appendix C – Generic/Text Only Printer Setup* for more information.
   g. Right click on the QIA Install executable and then left click on Run as Administrator. Follow the system prompts.
   h. Double click Windows Client icon and connect to the QS/1 Server. System prompts to run updates; click **OK**. Then close the Windows Client.
   i. Right click the setup executable and then left click on Run as Administrator to install the PaySentry program (if using the QS/1 CD, this file is located in the PaySentry folder). Click **Install**.
      - Accept EULA license for .NET framework 4.6.2 if prompted
      - Accept EULA license for SQL Server 2014 Express SP 2 if prompted
        Note: .NET framework 4.6.2 and SQL Server 2014 Express SP 2 run an unattended installation. It will take several minutes to complete.
      - The PaySentry Welcome screen displays. Click **Next**.
      - Adjust the installation path so that the QS1 folder is the root of the PaySentry folder (for example: **C:\QS1\PaySentry**). Click **Next**.
      - The confirmation screen displays. Click **Next**.
      - The Update Settings screen displays. Enter the Hostname and Port number of your system for downloading updates from the QS/1 Server. Click **Save**.

        Note: Hostname and Port number can be entered at a later time by opening PaySentry Manager, clicking on the Settings tab and entering the information.

      - Click **Finish**.
   j. Verify the installation.
      - Right click **My Computer** icon on the desktop and select **Manage**.
      - Click **+** beside Services and Applications to expand the selections.
      - Click **Services**.
      - Scroll through the list and verify that Services, Name, QS/1 PaySentry Gateway and SQL Server (PAYSENTRY) exist and have Status of **Started**.
   k. Set PSUser2 password and configure PaySentry Manager to run under that account.
      - Right click **My Computer** icon on the desktop and select **Manage**.
      - Click **+** beside Local Users and Groups to expand the selections.
      - Click **Users**.
      - Right click **PSUser2** and click **Set Password**.
      - Click **Proceed**.
      - Enter a strong password that, at the least, consists of numeric and alpha-characters, is a minimum length of twelve (12) characters and includes at least one capital letter, one lower case letter, one number and one special character (@ # $ % ^ & * + =).

- Click **OK**. If the password meets system requirements, click **OK**. If not, enter a new password.
- Navigate to the **PaySentry**, **PaySentryMgr** folder on your system (this may be different for each system).
- Right click PaySentryMgr.exe and click **Run as…**.
- Click **The following user:** check box.
- If on a domain, type **XXX\PSUser2** where XXX is the name of the computer. If not on a domain, type **PSUser2** only.
- Enter the strong password you created in the previous step.
- Click **OK**. An instance of PaySentry Manager opens, but may take several minutes before it displays.

l. Backup Service Master Key and Database Master Key using PaySentry Manager.
- After the PaySentry Manger displays from the previous step, select **Backup**.
- Click **SMK and DMK Backup**. A default path for the backup file is pre-populated. Change this path as desired.
- For the Service Master Key Backup, enter a password and confirm the password. Click **Backup SMK**.
- For the Database Master Key Backup, enter a password and confirm the password. Click **Backup DMK**.
- Click **Close**.
- Move SMK/DMK backup files to a secure off-site location.

m. Enable and configure centralized logging.
- Refer to Appendix E - Set Up Syslog Server to enable and configure centralized logging.

2. Manually go into Central Credit Card config (CCC) and check the SQL box to enable communication with the PaySentry SQL database. Also, check the Log All Transactions box depending on your preference to log all transactions (highly recommended) and type in the IP address of the SQL server in the Gateway Host field.

   Note: CCC should not be installed on the QS/1 Server. Refer to *Appendix F – Install CCC on a Separate Server* to move the CCC service.

   Note: This procedure should be performed after regular business hours as it may interfere with credit card processing.

   a. Click the Windows **Start** icon.
   b. Select **All Programs**, **QS1**, **Utilities**, **CCC Config**.
   c. Click **Action**.
   d. Click **Configure**.
   e. A prompt displays asking if you want to review/change the CentralCreditCard.ini. Click **Yes**.
   f. Check the SQL and Log All Transactions (highly recommended) fields.
   g. Type the IP address of the SQL server in the Gateway Host field. Click **OK**.
   h. A prompt displays asking if all changes have been made. Click **Yes**.
   i. A prompt displays asking if you wish to perform activation. Click **Yes**.
   j. A prompt displays asking if the service started without errors. Click **Yes**.
   k. A prompt displays asking if you want to terminate the CCC configuration program. Click **Yes**.
   l. A prompt displays asking if you want to keep the CentralCreditCardCfg.log. Click **Yes**.

3. Verify that the IP Address of the Windows Client options of all workstations and registers is set to the IP Address of the server on which Central Credit Card is installed.
   a. Click the Windows **Start** icon located on the server on which Central Credit Card is installed.
   b. Click **Run…**.
   c. Type **cmd** and click **OK**. The Command Prompt displays.
   d. Type **ipconfig** and press **Enter**.
   e. Make note of the IP Address.
   f. On all workstations and registers, double click **QS1 Windows Client**.
   g. On the Connect screen, click **Options…**.
   h. Click the Central Credit Card tab.
   i. Enter the IP Address from step e. Click **OK**.

4. Disable hibernation on the SQL station.
   a. Click the Windows **Start** icon located on the SQL station.
   b. Click **Control Panel**.
   c. Double click **Power Options**.
   d. Select the **Hibernate** tab.
   e. If the Enable hibernation field is checked, uncheck it.
   f. Click **OK**.

5 Security Validation

*5.1 Do not retain full magnetic stripe, card validation code or value (CAV2, CID, CVC2, CVV2) or PIN block data**

*** Includes EMV Track Equivalent Data**

PA-DSS - 1.1.4a

PCI-DSS - 3.2

PaySentry has been developed to never store sensitive authentication data (SAD). Full magnetic stripe, card validation code or value, PIN block data, and EMV track equivalent data are not stored.

PA-DSS - 1.1.5c

PCI-DSS - 3.2

To ensure PCI compliancy, PaySentry will never store sensitive authentication data (SAD). QS/1 provides troubleshooting via log files. There is no debug mode for PaySentry. No sensitive authentication data is collected or stored.

5.2 Protect stored cardholder data

PA-DSS - 2.1, 2.2a

PCI-DSS - 3.1

PaySentry does not store PAN post authorization. Instead, when cardholder data is sent by PaySentry to the QS/1 payment gateway (i.e.; QS/1's PCI DSS-certified Data Center), a token is generated by the QS/1 payment gateway using HP's Voltage Secure Stateless Tokenization technology. The token consists of truncated PAN (first 6 and last 4) separated by unrelated alphanumeric characters, which is returned for storage in the PaySentry database.

Refer to Appendix G - Tokenization for more information on how tokens are generated.

There are no configuration options for truncating (first 6 and last 4) PAN. The process is automated and cannot be turned off. Since PaySentry does not store PAN, customers will not have access to see the full PAN.

The truncated PAN (first 6 and last 4) is displayed for view in the following areas of the system:

- ⇨ Scan Credit Card File
- ⇨ Transaction Journal
- ⇨ Customer Record.

The truncated PAN (last 4 only) is displayed for print out on the signature pad when electronically signing for the credit card payment.

The truncated PAN (last 4 only) is stored for print out on the following areas:

- ⇨ Payment Detail Audit Report
- ⇨ Credit Card Analysis Report
- ⇨ IIAS Audit Report
- ⇨ Cardholder and Merchant Receipts

Customers should establish a retention period for tokenized data. Tokenized data exceeding the retention period must be purged from all locations where the data is stored.

This data may be purged by doing the following:

1. Double click **PaySentry Manager** icon located on your desktop.
2. Click **SQL** tab.
3. In the Purge section, you have three options for deletion: Transaction, Customers and Audit Log. Click the down arrow next to the Purge Records Older Than field for the type of records you wish to purge and choose a date from which to begin the purge. QS/1 recommends that you check with your credit card processor for the recommended period of time to retain records.
4. Click the button of the type of records you wish to purge.
5. A confirmation message displays. Click **OK**.
6. The status section displays the system activity. If necessary, choose another record type and repeat the process.

To prevent the inadvertent capture or retention of tokenized data, *Refer to Appendix J - Microsoft Disable System Restore*. This feature prevents the system from being rolled back, or restored, to a point before certain events took place.

5.3 Provide secure authentication features

PA-DSS - 3.1.1-3.1.11

PCI-DSS - 8.1, 8.2, and 8.5.8-8.5.15

PaySentry does not handle authentication features that would lead to administrative access or access to cardholder data.

The following should be used on the underlying systems:

- ⇨ You must assign secure authentication to default accounts (even if they won't be used), and then disable or do not use the accounts.
- ⇨ You must assign secure authentication for payment applications and systems whenever possible.
- ⇨ Do not use group, shared or generic accounts/passwords.
- ⇨ Change user passwords at least every 90 days.
- ⇨ Require a minimum password length of at least seven characters.
- ⇨ Use passwords containing both numeric and alphabetic characters.
- ⇨ Do not allow individuals to submit a new password that is the same as any of the last four passwords they have used.
- ⇨ Limit repeated access attempts by locking out user ID after not more than six attempts.
- ⇨ Set the lockout duration to 30 minutes or until administrator enables the user ID.
- ⇨ If a session has been idle for more than 15 minutes, require the user to re-enter password to re-activate terminal.

Refer to *Appendix I–PaySentry PCI Security Settings.*

WARNING: Security Settings for passwords default with PCI-compliant settings. While these settings may be changed by an administrator with proper access clearance, it is recommended to keep them at the default settings. If for any reason these settings must be changed, consult PCI DSS requirements 8.5.8-8.5.15. Customers are advised that changing "out of the box" installation settings may result in non-compliance with PCI DSS.

PA-DSS - 3.2

PCI-DSS - 8.1 and 8.2

Customers are strongly advised to require a unique username and complex password to access any computer, server or database with payment applications installed or that store cardholder data.

5.4 Log payment application activity

PA-DSS - 4.1, 4.2, 4.3,

PCI-DSS - 10.1, 10.2, 10.3

PaySentry has been designed to provide extensive event logging for security audits. The types of events logged by PaySentry are as follows:

- ⇨ Initialization of the assessment logs
- ⇨ Creation and deletion of system-level objects

In these circumstances, the following data is recorded:

- ⇨ Type of event (from the aforementioned list)
- ⇨ Date and time
- ⇨ Success or failure indication

- Origination of event
- Identity or name of affected data, system component or resource

Note: Logging is automatically enabled by default at the end of the PaySentry installation process. Logs are not configurable, and it is not possible for the user to disable the logs. Any attempt to disable the logs will result in non-compliance with PCI-DSS.

5.5 Payment application must facilitate centralized logging

PA-DSS - 4.4b

PCI-DSS - 10.5.3

To incorporate the payment application logs into a centralized logging environment, Syslog functionality has been added to the implementation of PaySentry. To utilize this functionality, the Syslog feature must be enabled and Syslog Configuration Settings must be modified according to the environment using PaySentry Manager. Refer to *Appendix E – Set Up Syslog Server* for instructions on configuring this server.

5.6 Versioning methodology

PA-DSS – 5.4.4

The version format for the QS/1 PaySentry application is the following: MM.mm.ww, where MM is the major attribute, mm is the minor attribute and ww is the wildcard attribute. Attributes are designated as numbers. Preceding zeros will not display. Major, Minor, and Wildcard attributes are separated by periods. For example: 20.1.x reflects the Major.Minor.Wildcard.

- **Major -** The major attribute is an indicator of high-impact changes made to the payment application where any of the following apply: four or more PA-DSS Requirements affected, not including Requirements 13 and 14; half or more of all PA-DSS Requirements/sub-Requirements are affected, not including Requirements 13 and 14; half or more of PaySentry functionality is affected or half or more of its code-base is changed; or addition of a tested platform/operating system to include on the List of Validated Payment Applications.

  Changes of this magnitude could reflect major rewrites to the user interface in PaySentry and/or to the PaySentry architecture of the system. Therefore, these types of changes will require a full PA-DSS assessment. Since PaySentry is a middle-ware application, the major attribute changes will be infrequent. The only exception to changing the major attribute without significant changes would be if the the major attribute changed in the QS/1 integrated software applications and PaySentry's major attribute is changed to reflect the release of those QS/1 integrated software applications. Currently, all of our integrated application versions begin with 19.

- **Minor** - The minor attribute is an indicator of low-impact changes made to the payment application and/or for security-impacting changes where all of the following conditions are met: three or fewer PA-DSS Requirements are affected, not including Requirements 13 and 14; less than half of all PA-DSS Requirements/sub-Requirements are affected, not including Requirements 13 and 14; and less than half of PaySentry functionality is affected and less than half of its code-base is changed.

  Minor changes can be rolled into a major if an upcoming major release is already scheduled. Minor changes include enhancements that provide additional features such as EMV and tokenization. These changes may be eligible for a partial assessment.

- **Wildcard** - The wildcard attribute is an indicator of changes to the application functionality or administrative changes that have no impact on security or PA-DSS. It reflects non-security related changes to the payment application that have no impact on PA-DSS related functions, tested platforms, operating systems, or dependencies and no impact on any of the PA-DSS Requirements.

  These changes could include updates to reporting and to other user interface features, updates to add/remove payment processors, and non-security patches. These changes can never impact security or PA-DSS.

  Version elements reflecting a security impacting change must appear to the left of the first wildcard attribute.

5.7 Protect wireless transmissions

PA-DSS - 6.1

PCI-DSS - 1.2.3 and 2.1.1

Customers using a wireless configuration must install perimeter firewalls between any wireless networks and the cardholder data environment, and configure these firewalls to deny any traffic from the wireless environment or from controlling any traffic. Refer to *Appendix D – Security Specifications.*

PA-DSS - 6.2, 6.3

PCI-DSS - 4.1.1

For customers with wireless environments, certain guidelines and settings are appropriate, such as:

- ⇨ System defaults (encryption keys, passwords and SNMP community strings, etc.) must be changed upon installation so that the known defaults are not used and must also be changed when anyone with knowledge of the settings changes positions or leaves the company.
- ⇨ Wireless networks should be segregated by a firewall that denies (or if necessary, controls access to) the cardholder data environment. Industry best practices should be used to provide strong encryption for authentication and transmission for any data on that network (e.g., IEEE 802.11i).
- ⇨ Enable Wi-Fi protected access (WPA and WPA2) technology for encryption and authentication when WPA-capable
- ⇨ Encrypt wireless transmissions by using Wi-Fi Protected Access (WPA or WPA2) technology, Internet Protocol Security (IPSEC) VPN or Transport Layer Security version 1.2 or higher 'Live' (TLS).

5.8 Facilitate secure network implementation

PA-DSS – 8.2.c
PCI-DSS - 1.2.3 and 2.1.1

PaySentry must be installed on a computer with SQL Server 2014 Express SP 2 that is not connected to the internet. Refer to *Appendix D – Security Specifications* for a review of hardware and software firewalls, the payment card processing configuration and the components comprising the configuration.

5.9 Facilitate secure remote access to payment application

PA-DSS - 10.1, 10.2 and 10.3

PCI-DSS - 8.3

Remote access to customers originating from outside of the customer environment is not permitted.

All remote access must originate from inside the customer environment. Unique credentials (username and password) per customer must be used to access customer systems/payment applications.

In the event it becomes necessary for remote access to customers originating from outside the customer environment, the use of a multi-factor authentication mechanism provided by the customer is mandatory.

Remote access software must be securely implemented, such as:

- ⇨ Change the default settings in the remote access software
- ⇨ Allow connections only from specific (known) IP/MAC addresses via IPSEC
- ⇨ Use strong authentication and complex passwords for logins (refer to PCI DSS requirements 8.1, 8.3 and 8.5.8-8.5.15)
- ⇨ Enable encrypted data transmission (refer to PCI DSS requirement 4.1)
- ⇨ Enable account lockout after a certain number of failed login attempts
- ⇨ Establish a Virtual Private Network ("VPN") connection via a firewall before access is allowed
- ⇨ Enable the logging function

5.10 Facilitate secure remote software updates

PA-DSS - 10.2.1

PCI-DSS - 1 and 12.3.9

PaySentry utilizes an update feature in which customers download new releases/service packs from a secure server through the internet. These updates never require QS/1 to access a customer's system. Once the release/service pack is downloaded, an installer program completes the process.

If customers utilize VPN, or other high-speed connection such as cable modem, the use of a firewall product is necessary. Secure modem use requirements are listed in PCI DSS requirement 12.3. Refer to 5.6 and *Appendix D - Security Specifications* for firewall details.

5.11 Encrypt sensitive traffic over public networks

PA-DSS - 11.1

PCI-DSS - 4.1

PaySentry implements TLS 1.2 or above by default with only trusted TLS keys/certificates. This protects cardholder data by encrypting with a strong key strength of a minimum 128-bit using AES. There are no user configurations to make changes.

Enable Encryption on Console and Non-Console Ports:

1. Close the QS/1 Server.
2. Click **Start**. Select **All Programs**, **QS1**, **Utilities**, **Setports**, **Set Logical Ports**.
3. Select the system.
4. Double click the line item for the console port.
5. The Edit Port Entry window displays. Check the Encryption box.
6. Click **OK**.
7. Repeat these steps for the non-console port.

PA-DSS - 11.2

PCI-DSS - 4.2

PANs are never sent unencrypted by PaySentry via email. PANs will never be requested explicitly by QS/1 by email.

5.12 Secure all non-console administrative access

PA-DSS - 12.1, 12.1.1, 12.2

PCI-DSS - 2.3

PaySentry does not support non-console administrative access.

However, any time non-console administrative access is used, customers must ensure strong cryptography is used and all personnel with non-console administrative access, for example, administrators who have non-console access to the servers via Windows remote desktop, must utilize multi-factor authentication to access the Cardholder Data Environment (CDE).

5.13 Patches and Updates

PA-DSS - 7.2.3

Customers are notified of patches and/or updates via a messaging service with the QS/1 Automatic Updates (QAU) application, not PaySentry. A notification icon displays for the customer to click to download the patch and/or update. When the customer selects this action, QAU initiates a Microsoft Background Intelligent Transfer Service (BITS) session to connect to the QS/1 PCI-DSS certified Data Center and downloads patches and/or updates. The patches and/or updates contain digitally signed binaries to guarantee a known chain of trust. After patches and/or updates are downloaded to the QS/1 server application, automated programs in PaySentry retrieve patches and/or updates from the QS/1 server application and apply patches and/or updates to PaySentry. SHA-256 is computed on the delivered updates.

In addition to the notification from the messaging service, customers should also login to the Customer Support Site to view available patches and/or updates on a weekly basis.

To view available patches and/or updates from the Customer Support Site:

1. Visit www.qs1.com.
2. Sign into the Customer Support Site with your Username and Password; click **Login**.
3. Under Software Service Pack Details & Downloads, click **PaySentry**. The patches and/or updates for PaySentry display.

Note: If you are not on the latest patches and/or updates, click the QS/1 notification icon in the system tray to download the patch and/or update.

6 Appendices

Appendix A – SQL Server 2014 Express SP 2

You must have SQL Server 2014 Express SP 2 installed on a station/computer that is not connected to the internet and that is separate from the server where the QS/1 application is currently stored.

- ⇨ SQL Server 2014 Express SP 2 allows a maximum of 10GB of data to be stored.
- ⇨ Minimum system requirements for tokenized data storage on a SQL server include:

  - Windows 8.1 Pro
  - Windows 10 Enterprise 2016 LTSB (version 1607)
  - Windows Server 2008 R2
  - Windows Server 2012
  - Windows Server 2012 R2
  - 1.0 GHz CPU Pentium III-compatible or better
  - 512 MB RAM or more (recommended)
  - 4.2 GB available hard disk space

If you are unsure of your current system's technical specifications, contact QS/1 Customer Support at 800.845.7558 to assess your system.

The SQL station does not need to be purchased through QS/1, although, it is highly recommended. If using an existing station, it is necessary to reformat the current hard drive and re-install the operating system.

Disable Hibernation on the SQL Station

1. Click the Windows **Start** icon located on the SQL station.
2. Click **Control Panel**.
3. Double click **Power Options**.
4. Click the **Hibernate** tab.
5. If the Enable hibernation box is checked, uncheck it.
6. Click **OK**.

Appendix B – Transferring Files

CD ROM

In order to do this procedure, your system must have a CD burner and data burning software installed. If not, use one of the other forms of transfer mentioned. If you are unsure, ask your IT department or call QS/1 Customer Support at 800.845.7558.

Flash Drives

1. Insert your flash drive into a USB port on the server where the .txt files are stored.
2. Locate the path where the .txt files are stored.
3. Copy the .txt files by highlighting them, then press **CTRL**+**C** (after highlighting, you may also right click on one of the files and click **Copy**).
4. Navigate to **My Computer** and locate the flash drive you inserted.
5. Double click the flash drive, and paste the copied files by pressing **CTRL+V** (you may also right click inside the flash drive folder and click **Paste**).
6. Once the files have been copied to the flash drive, remove the drive from the server and insert it into a USB port located on the SQL server.
7. Navigate to **My Computer** and locate the flash drive you inserted.
8. Double click the flash drive, and copy the .txt files by highlighting them, then press **CTRL+C** or right click and click **Copy**.
9. Navigate to a location on your SQL server, preferably the C drive, and paste the files by pressing **CTRL+V** or right click and click **Paste**.

Appendix C – Generic/Text Only Printer Setup

1. Click the Windows **Start** icon and choose **Control Panel**.
2. Double click **Printers and Faxes**.
3. Under Printer Tasks, select **Add a printer**.
4. Click **Next**.
5. Select the **Local printer attached to this computer** option. Be sure the **Automatically detect and install my Plug and Play printer** option is unchecked. Click **Next**.
6. Click **Next**.
7. Choose the **Generic** manufacturer and **Generic/Text Only** printer. Click **Next**.
8. Name the printer **QS1LPT1** and set as the default printer. Click **Next**.
9. Be sure the **Do not share this printer** option is checked. Click **Next**.
10. On the Print Test Page screen, choose **No**. Click **Next**.
11. Click **Finish**.

Appendix D – Security Specifications

When setting up an internal software firewall or external hardware firewall, certain security specifications must be designated. Follow the tables below.

PaySentry Server						
Program	**Direction**	**Protocol**	**Remote Address**	**Local Port**	**Remote Port**	**Comment**
PAYSENTRY.EXE	Inbound	TCP	Central Credit Card Server	1173	Any	Connection from Central Credit Card
QS1COM.EXE	Outbound	TCP	QS/1 Server	Any	1150	Connection for getting updates
PAYSENTRY.EXE	Outbound	TCP	Webservices.cornerdrugstore.com	Any	80	Log Updates
PAYSENTRY.EXE	Outbound	UDP	Any	Any	514	Syslog Server messages
Notes: • Installed programs and their ports may vary depending on system configuration. • The PaySentry Server is considered a specialized QS/1 Workstation. Also refer to the Firewall settings for a QS/1 Workstation.						

Central Credit Card Server						
Program	**Direction**	**Protocol**	**Remote Address**	**Local Port**	**Remote Port**	**Comment**
CENTRALCREDITCARD.EXE	Inbound	TCP	Any	1171	Any	Connection from QS/1 Windows Client
CENTRALCREDITCARD.EXE	Outbound	TCP	Pwlccssl.qs1.com and/or pwlccss12.qs1.com	Any	443 and/or 5845	QS/1 Payment Gateway
CENTRALCREDITCARD.EXE	Outbound	TCP	PaySentry Sever	Any	1173	PaySentry
CENTRALCREDITCARD.EXE	Outbound	TCP, HTTP, Microsoft BITS Service	downloads.qs1.com and errors.qs1.com	Any	80 or 12345	Central Credit Card Updates and MSM Error Uploads

POS Register						
Program	**Direction**	**Protocol**	**Remote Address**	**Local Port**	**Remote Port**	**Comment**
QS1COM.EXE	Outbound	TCP (SSL, TLS)	Any SMTP Server	Any	Any SMTP Server	Connection for sending SMTP Email
QS1COM.EXE	Outbound	TCP	QS/1 Server	Any	1150	Connection to QS/1 Server network secondary task.
QS1COM.EXE	Outbound	TCP	QS/1 Server	Any	1151	Connection to QS/1 Server network secondary task.

QS1COM.EXE	Outbound	TCP	Central Credit Card Server	Any	1171	Connection to Central Credit Card.
QIA.EXE	Outbound	TCP	QS/1 Server	Any	17777	Connection to QS/1 Automatic Updates for picking up Message Center notifications.

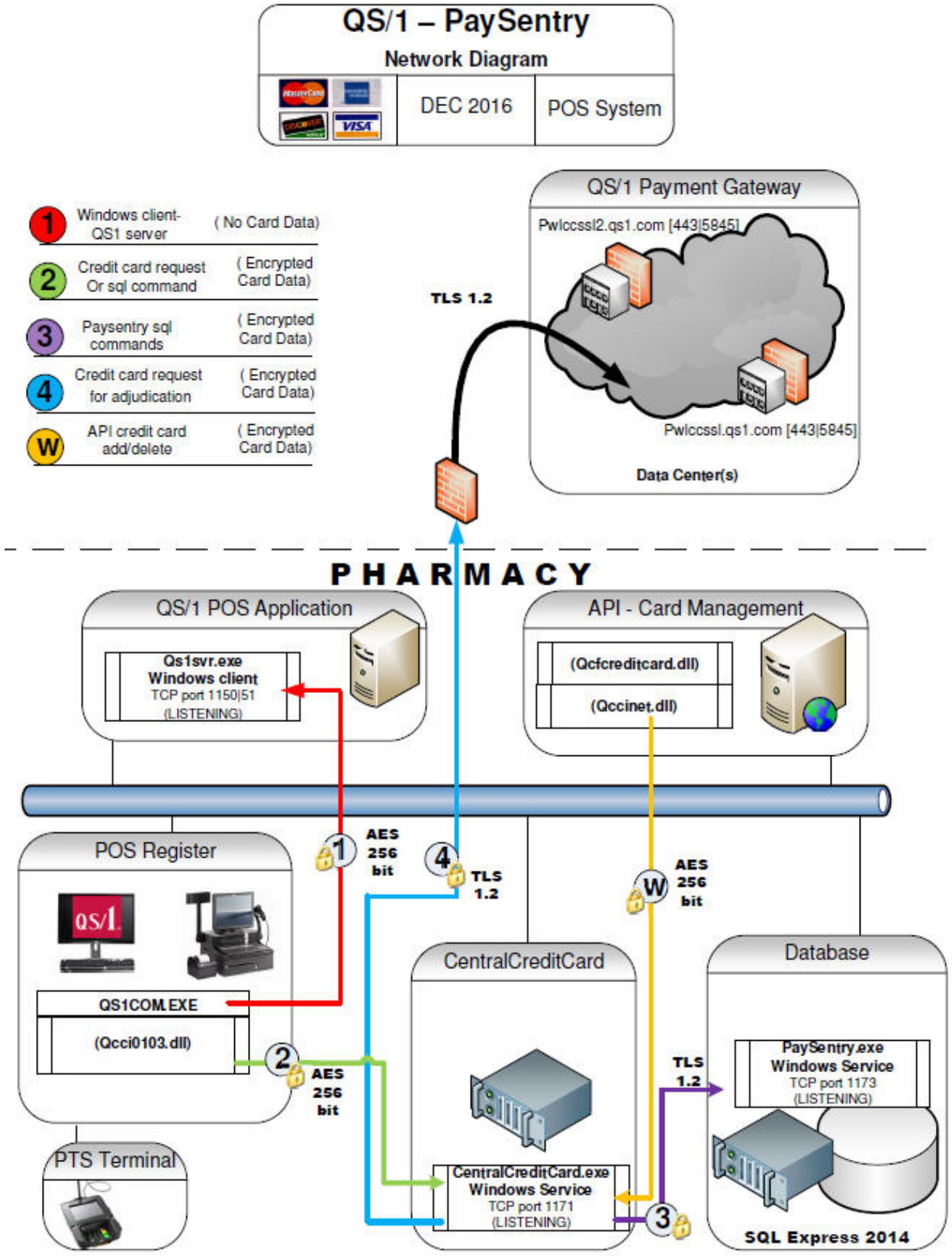
The PaySentry payment card processing configuration includes the follow components:

Qcci0103.dll: QCCI0103.DLL provides the client with support for communicating with CentralCreditCard for the purpose of interacting with the PaySentry SQL DB.

CentralCreditCard.exe: CentralCreditCard.exe is a multi-threaded application that runs as a Windows service. Its purpose is to process incoming PaySentry database queries and payment requests from multiple clients. It routes PaySentry Queries to PaySentry.exe and payment requests to the QS/1 payment gateway (i.e.; QS/1's PCI DSS-certified Data Center).

PaySentry.exe: PaySentry.exe is a Windows service running on the server where the PaySentry SQL database resides. PaySentry.exe processes requests relayed by CentralCreditCard.exe using stored procedures to read from and write to the PaySentry database tables. The service also manages the automatic database backup process on a daily basis.

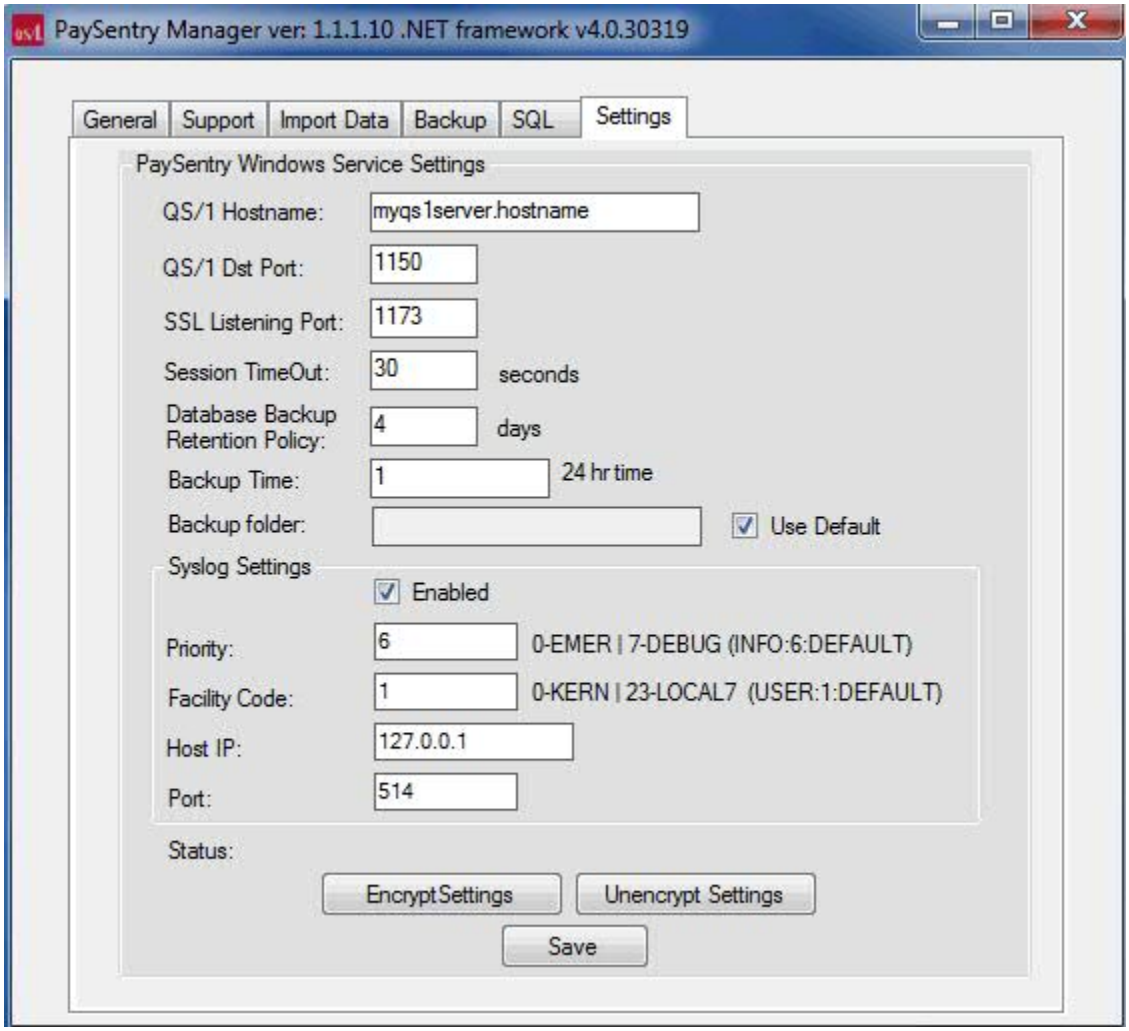
Qcfcreditcard.dll, Qccinet.dll: These components allow third party web developers to add and delete tokens from the PaySentry database server. Qcfcreditcard.dll invokes Qccinet.dll to communicate with CentralCreditCard.exe.


QS/1 – PaySentry
Network Diagram
DEC 2016
POS System
1 Windows client- QS1 server (No Card Data)
2 Credit card request Or sql command (Encrypted Card Data)
3 Paysentry sql commands (Encrypted Card Data)
4 Credit card request for adjudication (Encrypted Card Data)
W API credit card add/delete (Encrypted Card Data)
QS/1 Payment Gateway
Pwlccssl2.qs1.com [443|5845]
TLS 1.2
Pwlccssl.qs1.com [443|5845]
Data Center(s)
PHARMACY
QS/1 POS Application
Qs1svr.exe
Windows client
TCP port 1150|51
(LISTENING)
API - Card Management
(Qcfcreditcard.dll)
(Qccinet.dll)
POS Register
QS1COM.EXE
(Qcci0103.dll)
AES 256 bit
TLS 1.2
AES 256 bit
CentralCreditCard
CentralCreditCard.exe
Windows Service
TCP port 1171
(LISTENING)
Database
PaySentry.exe
Windows Service
TCP port 1173
(LISTENING)
TLS 1.2
SQL Express 2014
PTS Terminal

Appendix E – Set Up Syslog Server

To incorporate the payment application logs into a centralized logging environment, PaySentry supports a Syslog-compliant centralized logging system. To utilize this functionality, the Syslog feature must be enabled and Syslog Configuration Settings must be modified according to the customer environment using the PaySentry Manager. Any attempt to disable centralized logging after it is set up will result in non-compliance with PCI DSS.

The configuration settings that correspond to the application log shipment are located under Syslog Settings in the Settings tab of PaySentry Manager.



Syslog Settings fields:

Priority: Defines the severity/priority of the message. The acceptable values are integers in the range from 0 to 7 as follows:

- 0 = Emergency
- 1 = Alert
- 2 = Critical
- 3 = Error
- 4 = Warning
- 5 = Notice
- 6 = Informational
- 7 = Debug

The default = 6 Notice. Therefore, if the Syslog feature is enabled, it sends all messages generated by PaySentry with a priority of 6 or higher (5, 4, 3, 2, 1, 0) to the Syslog server. The higher the priority value, the more messages are captured and sent to the Syslog server.

Facility Code: Corresponds to the type of program that is logging the message. Values range from 0 - 23 as follows:

- Kernel = 0 – Kernel messages
- User = 1 – User-level messages
- Mail = 2 – Mail system
- System = 3 – System daemons
- Security = 4 – Security/authorization messages
- Syslog = 5 – Messages generated internally by Syslog
- Printer = 6 – Line printer subsystem
- Network = 7 – Network news subsystem
- UUCP = 8 – UUCP subsystem
- Clock = 9 – Clock daemon
- AuthMsg = 10 – Security/Authorization messages
- FTPDaemon = 11 – FTP daemon
- NTP = 12 – NTP subsystem
- LogAudit = 13 – Log audit
- LogAlert = 14 – Log alert
- ClockDaemon = 15 – Clock daemon
- Local0 = 16 – Local use 0
- Local1 = 17 – Local use 1
- Local2 = 18 – Local use 2
- Local3 = 19 – Local use 3
- Local4 = 20 – Local use 4
- Local5 = 21 – Local use 5
- Local6 = 22 – Local use 6
- Local7 = 23 – Local use 7

Host: IP or host of the machine where Syslog listener is located.

Port: UDP port of the machine where Syslog listener is located.

Click **Save** when fields are populated.

Additional Log

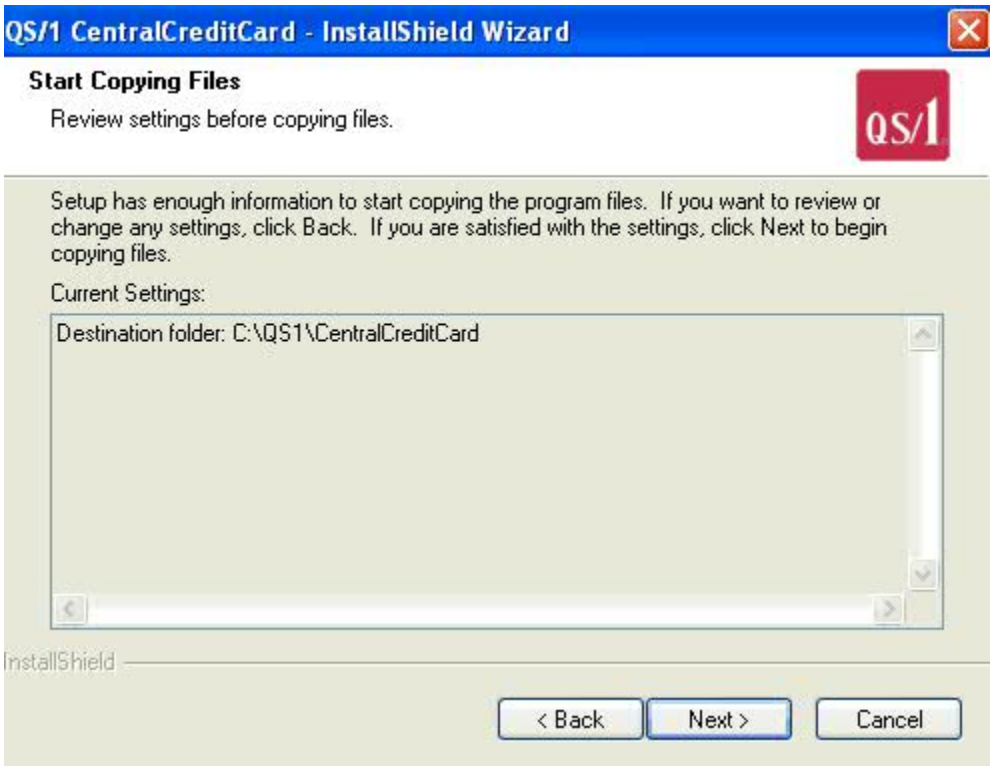
The CentralCreditCard.log file is located at the following path on the Central Credit Card server: C:\QS1\CentralCreditCard.

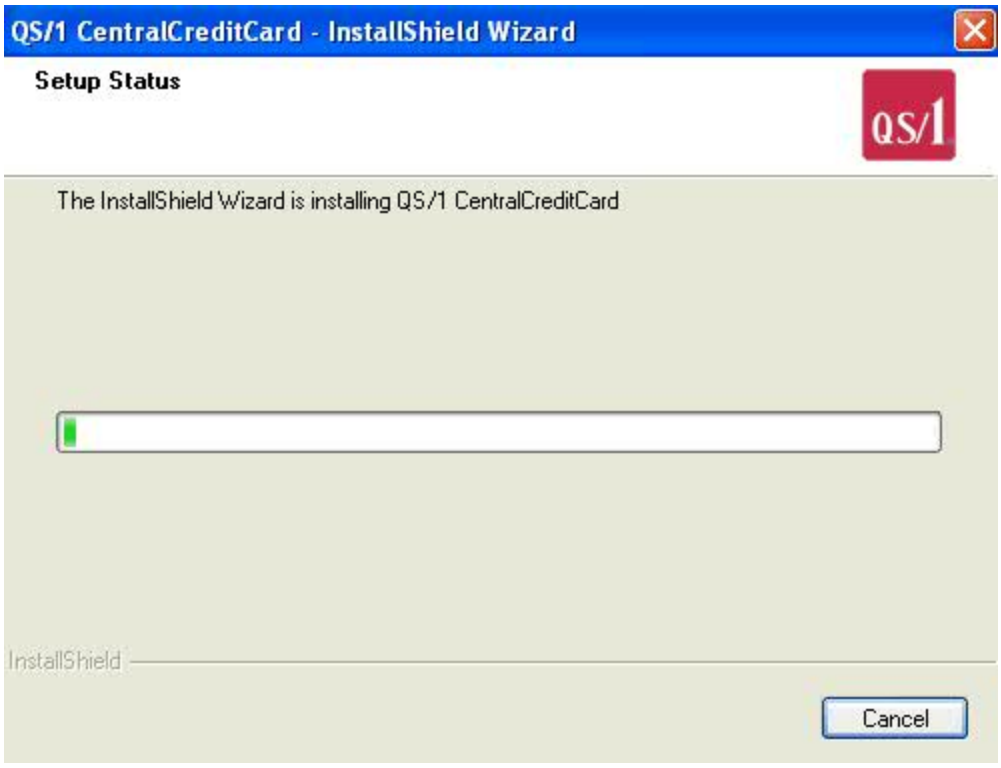
Appendix F – Install CCC on a Separate Server

CCC should not be installed on the QS/1 Server. To install CCC on a server, follow the instructions noted here.

The first step is to contact QS/1 Customer Support and request to download the latest CCC installation wizard. After downloading the CCC installation wizard, follow the screen prompts as follows:


QS/1 CentralCreditCard - InstallShield Wizard
Choose Destination Location
Select folder where setup will install files.
QS/1
Setup will install QS/1 CentralCreditCard in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
C:\QS1\CentralCreditCard
Browse...
InstallShield
< Back
Next >
Cancel


QS/1 CentralCreditCard - InstallShield Wizard
Start Copying Files
Review settings before copying files.
QS/1
Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files.
Current Settings:
Destination folder: C:\QS1\CentralCreditCard
InstallShield
< Back
Next >
Cancel



When setting up an internal software firewall or external hardware firewall, certain specifications must be designated. Follow the table below.

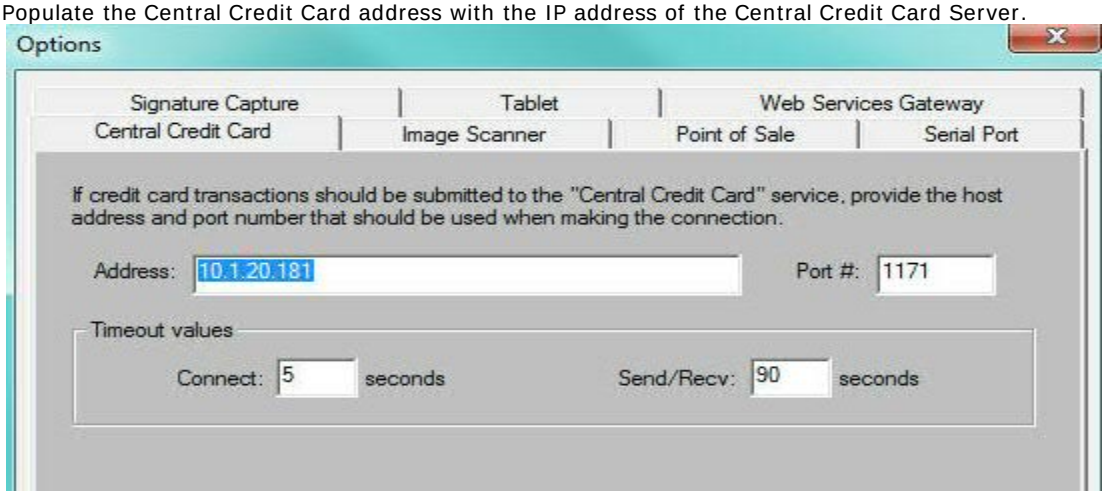
Central Credit Card Server

Program	Direction	Protocol	Remote Address	Local Port	Remote Port	Comment
CENTRALCREDITCARD.EXE	Inbound	TCP	Any	1171	Any	Connection from QS/1 Windows Client.
CENTRALCREDITCARD.EXE	Outbound	TCP	pwlccssl.qs1.com and/or pwlccssl2.qs1.com	Any	443 and/or 5845	QS/1 Payment Gateway
CENTRALCREDITCARD.EXE	Outbound	TCP	*PaySentry Server*	Any	1173	PaySentry
CENTRALCREDITCARD.EXE	Outbound	TCP, HTTP, Microsoft BITS service	downloads.qs1.com and errors.qs1.com	Any	80 or 12345	Central Credit Card Updates and MSM Error Uploads

Notes:

- *Installed programs and their ports may vary depending on system configuration.*
- *Typically QS/1 Central Credit Card will be installed on a QS/1 Server or QS/1 Enterprise Server machine.*

Populate the Central Credit Card address with the IP address of the Central Credit Card Server.



Appendix G –Tokenization

Tokenization is a technology process that converts a card number to a totally random number (i.e.; token) suitable for risk-free storage.

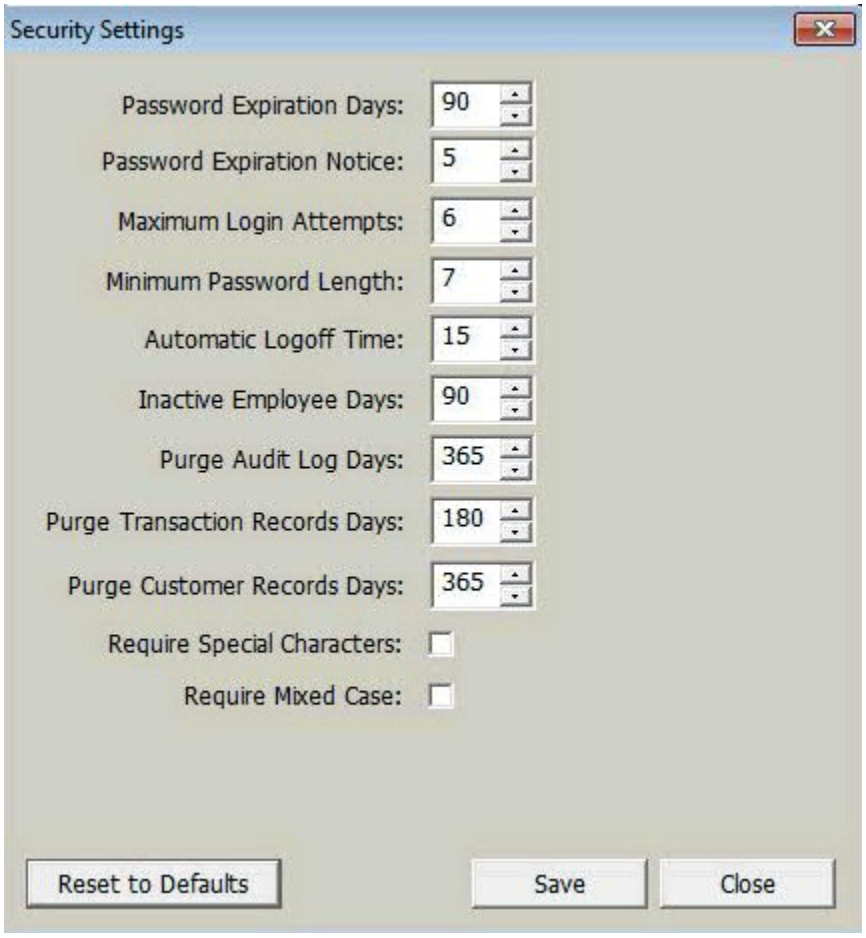
When cardholder data is sent by PaySentry to the QS/1 payment gateway (i.e.; QS/1's PCI DSS-certified Data Center), a token is generated by the QS/1 payment gateway using HP's Voltage Secure Stateless Tokenization technology. The token consists of truncated PAN (first 6 and last 4) separated by unrelated alphanumeric characters, which is returned for storage in the PaySentry database.

Tokenization is required so that PAN is never stored in PaySentry.

Refer to HP's documents concerning HP's Voltage Secure Stateless Tokenization technology:
https://www.voltage.com/technology/tokenization-and-key-management/hpe-secure-stateless-tokenization/

Appendix H –PaySentry PCI Security Settings

Security settings are accessed by an administrator going to Store Control, Security Access, PCI Security Options.



Default settings per PCI-DSS Requirements:

	Min	Max	Default	
Password Expiration Days	1	90	90	The max is 90 days per PCI DSS requirement 8.5.9.
Password Expiration Notice	0	99	5	
Maximum Login Attempts	1	6	6	The max is 6 per PCI DSS requirement 8.5.13.
Minimum Password Length	7	64	7	The min is 7 per PCI DSS requirement 8.5.10.
Automatic Logoff Time	1	15	15	The max is 15 minutes per PCI DSS requirement 8.5.15.
Inactive Employee Days	1	90	90	The max is 90 days per PCI DSS requirement 8.5.5.
Purge Audit Log Days	365	999	365	The min is 365 days of history that must be kept per PCI DSS 10.7.
Purge Transaction Records Days	0	999	180	
Purge Customer Records Days	0	999	365	
Require Special Characters			N	
Require Mixed Case			N	

**Passwords require at least 1 number and 1 letter. Passwords must contain both numeric and alphabetic characters per PCI DSS requirement 8.5.11.

WARNING: Security Settings for passwords default with PCI-compliant settings. While these settings may be changed by an administrator with proper access clearance, it is recommended to keep them at the default settings. If for any reason these settings must be changed, consult PCI DSS requirements 8.5.8-8.5.15. Customers are advised that changing “out of the box” installation settings may result in non-compliance with PCI DSS.

Appendix I – Disable System Restore

The System Restore feature is enabled by default. To disable System Restore:

1. Right-click **My Computer** and then click **Properties**.
2. On the **Performance** tab, click **File System**, or press ALT+F.
3. On the **Troubleshooting** tab, click to select the **Disable System Restore** check box.
4. Click **OK** twice, and then click **Yes** when you are prompted to restart the computer.
5. To re-enable System Restore, follow steps 1-3, but in step 3, click to clear the **Disable System Restore** check box.

Appendix J – PaySentry Password Overview

QS/1 follows the procedures below for the transmission, encryption and storage of passwords used in conjunction with PaySentry, the QS/1 card transaction tool.

Password Storage

Each password created is stored as a 64 byte one-way hashed value based on a combined random salt value and a SHA256 hash of the salt and password. The random salt value and the SHA256 hash values are computed in PaySentry.exe using Microsoft cryptographic API functions specifically for these purposes.

This hashed and salted password is then stored in the userdata.employees table in the CCCTransactions database in the PaySentry SQL Server instance.

Password Transmission

The password is sent from the Point-of-Sale register to the CentralCreditCard server over a minimum 128-bit AES encrypted transmission. From the CentralCreditCard server, the password is forwarded over a secure TLS 1.2 transmission to PaySentry.exe, where it is salted, hashed and saved in the database.

Appendix K – PaySentry Dependencies

PTS Device Dependencies

- Ingenico, iSC Touch 480 (4-30125)
- Ingenico, iSMP (4-20183)
- Ingenico iSMP4 (4-30220)

Other Dependencies

- OpenSSL version 1.1.0

Appendix L – ScreenConnect

ScreenConnect allows ad-hoc communications between servers or computers for the purpose of training, diagnosing and fixing an issue or installing software by QS/1 support technicians who support PaySentry.

Implement the following allowances in the end user's network:

- TCP/443 needs to be open for outbound communication to the following IP addresses:
  - ⇨ 72.34.192.110
  - ⇨ 72.34.192.114
  - ⇨ 72.34.192.115
  - ⇨ 72.34.192.116
- The IP addresses above need to be excluded from any packet inspection.
- The IP addresses above need to be excluded from any content filtering solutions.

Security Notes

- QS/1's ScreenConnect solution uses AES 256-bit encryption over a TLS 1.2 connection.
- QS/1 technicians who support PaySentry are required to use multifactor authentication when logging into the ScreenConnect application.

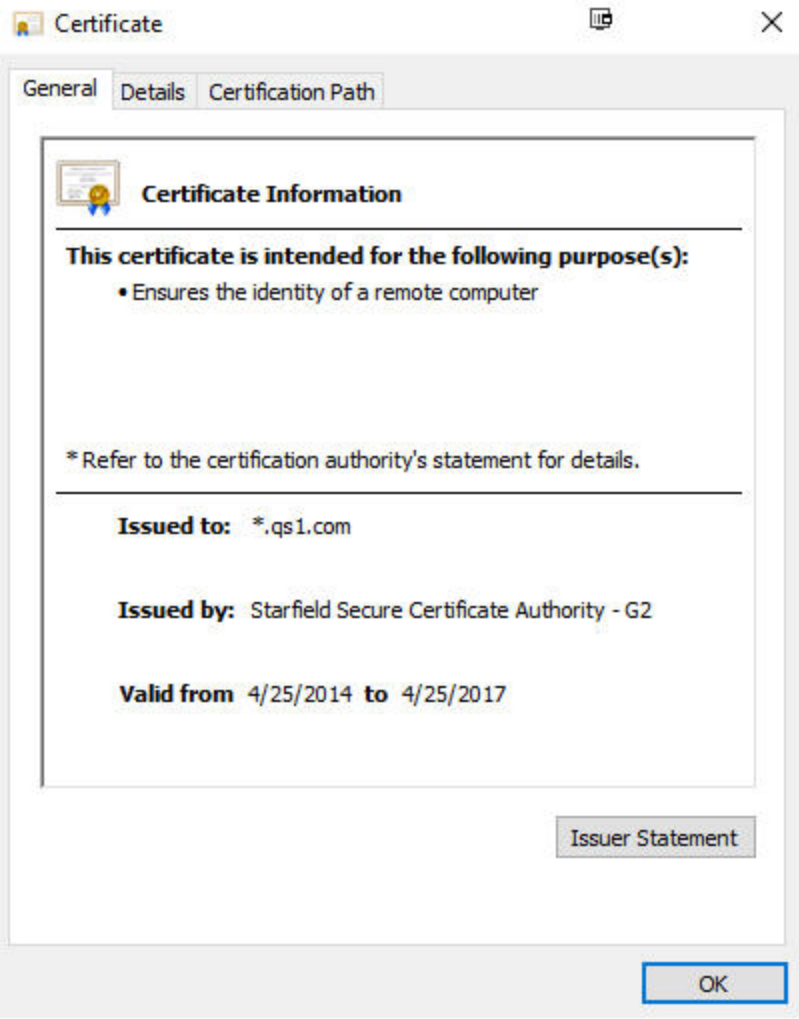
Client Requirements

The following guest requirement must be met: https://help.screenconnect.com/Guest_client_requirements.

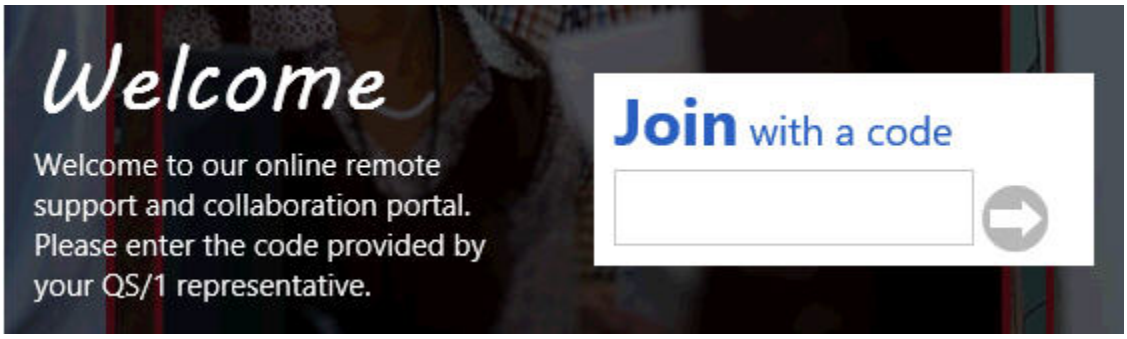
Start the Session

The end user must go to the support site indicated by the QS/1 support technician: https://share.qs1.com or https://share2.qs1.com.

Note: For verification, the user should examine the certificate presented on the website. It must be a wildcard certificate issued to *.qs1.com.



1. The Welcome page displays, and the end user is prompted to enter a code. This code is communicated to the end user by the support technician.
2. Once the code is entered, the end user must click **Join**.



3. Once both the end user and support technician are connected to the session, the end user is prompted to consent or refuse control over the computer. The end user must click **Consent to Control**, to allow the support technician to view the screen and control the mouse and keyboard.

4. After the session is complete, the end user must right click the QS/1 icon in the system tray and click **Exit**. This removes the web app from the cache and disconnects the end user from the ScreenConnect server.

7 Release Notes

The following application/system updates were added to PaySentry Version 20.1.x and correspond to Point-of-Sale 19.1.23 enhancements:

- Made changes to display new QS/1 logo and 2016 copyright
- Changed the mouse cursor to begin in the Expiration field
- Made necessary changes to use SQL Server 2014 Express SP 2 and .NET framework 4.6.2
- Changed verbiage to end-to-end encryption instead of point-to-point encryption
- Changed PAN entry window to timeout.
- Updated so error message for socket timeout displays in QS/1 Point-of-Sale.
- Enhanced format for the CentralCreditCard log to include date, time, event type, success/failure, origination of event, and name of affected data/system/component/resource.
- Updated to include Appendix K – PaySentry Dependencies.