Monek Bridge Specification

Technical Specification for the Monek Bridge Library

For use with the .net MonekBridge.dll

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Introduction

Purpose

This document provides a detailed understanding of the technical architecture of the proposed solution. Its purpose is to scope the development work required for partners in their respective businesses.

Processing Requirements

The solution involves the POS till application collecting transaction information and submitting it to a PED, via the Monek Bridge. The PED will pass the transaction data in APACS 40 format to Monek who will transmit to the acquiring bank for authorisation. Their response will be routed back to the PED in APACS 40. The PED will then relay the response to the POS till application, via the Monek Bridge. The solution will ensure that card data is processed to PCI DSS standards and that PAN data is not stored by the partner or transmitted across the network between the PED and the POS till system.

The POS till application will integrate with the Monek Bridge, which will in turn manage the processing of transaction data with the PED and subsequently Monek.

PCI DSS Compliance Notes

The following notes describe how the design of the solution relate to the requirements of PCI DSS compliance.

1. All processing for each Chip and PIN or Swiped transaction is handled directly on the PED.
2. Cardholder data is never transmitted between the PED, Monek Bridge or POS software.
3. Authorisation messages transmitted to the Payment Gateway Client are encrypted using industry standard SSL/TLS.
4. All handling of the authorisation message is done by Monek PCI DSS level 1 accredited systems.

Confidentiality

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Technology Overview

Monek Bridge

The Monek Bridge component will be supplied by Monek and will provide a high-level interface to the PED. This will remove the complexity involved in the management of the device and transactions.

The Monek Bridge uses .NET Standard 2.0 providing compatibility across .NET Core, .NET Framework, Mono, and more. For more information see: .NET Standard versions

PED

The PEDs supported by this library are:

- Spire SPc50, SPw60
- Kinetic Smart devices supporting the Connect API. e.g. Castles MP200, Vega 3000
- Terminal Simulator for integration testing

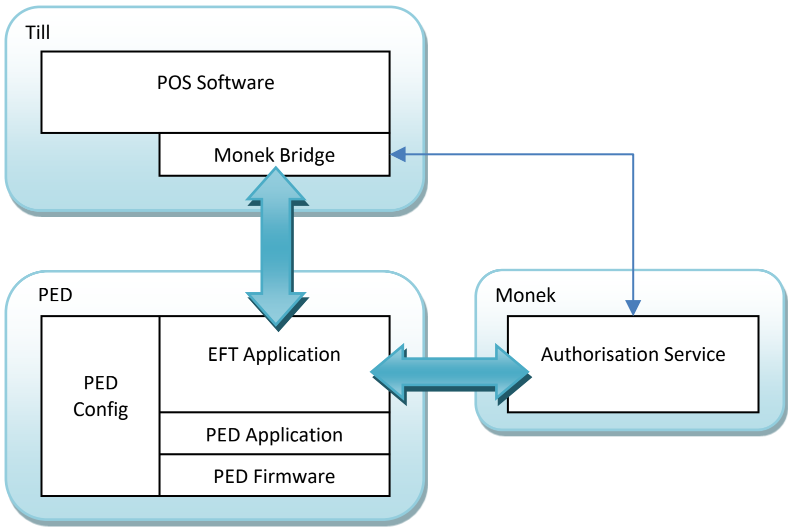
Communication between the PED and the till will be via Ethernet or Wi-Fi connection.

An Ethernet or Wi-Fi connection with routed access to Monek is required so it is suggested that the tills also utilise this link for communications with the POS.

Architecture

Component View

The diagram below shows the components that make up the solution and the main communication paths between them. The remainder of this section describes the most important components that make up the solution.



Till Components

POS Software

The software is the POS package running on the tills and will communicate with the PED via the Monek Bridge.

Monek Bridge

The Monek Bridge will be supplied by Monek and will provide a high-level interface to the PED. This will remove the complexity involved in the management of the device.

The Monek Bridge will still function when the PED is not present or configured. This will permit a call to be made to check if the PED is available and allow for consistent Error responses in scenarios where a PED is not available.

PED Components

PED Configuration

The PED Configuration Files are a set of merchant specific files that contain the encryption keys and configuration settings to determine how a transaction is processed. Many of these settings are merchant specific and relates to floor limits and rules for risk management.

PED Application

The PED Application is a software layer in the PED that manages transactions.

PED Firmware

The PED Firmware is a software layer in the PED that provides low level services to communicate with the PED hardware.

Monek Components

Authorisation Service

The Authorisation Service is the service provided by Monek for the authorisation of credit card transactions. Responsibility for communication with this service will be with the Monek Bridge which will be supplied by Monek.

Process Overview

Transaction Types

When looking at the different types of transaction that can be processed, they fall into two general categories. The categories are:

- Initiated Transactions: Transactions that are initiated by the POS.
- Automatic Transactions: Transactions that are initiated automatically in response to a previous transaction.

Of the transaction types identified each fall into one of the categories as follows:

Transaction Type	Description	Initiated	Automatic
Sale	A standard POS sale transaction, this could be Chip and PIN, Chip and Signature or swipe and Signature.	✓	
Refund	A standard POS refund transaction, this could be Chip and PIN, Chip and Signature or swipe and Signature.	✓	
Referral	This is a transaction type that is processed automatically and is the resubmission of a transaction as the result of a referral. It uses information from the parent transaction in addition to the bank provided authorisation code.		✓
Sale Reversal	This is a transaction type that is processed automatically and is usually the result of a signature problem. It uses information from the parent transaction that is being reversed.		✓
Refund Reversal	This is a transaction type that is processed automatically and is usually the result of a signature problem. It uses information from the parent transaction that is being reversed.		✓

Transaction Processes

Overview

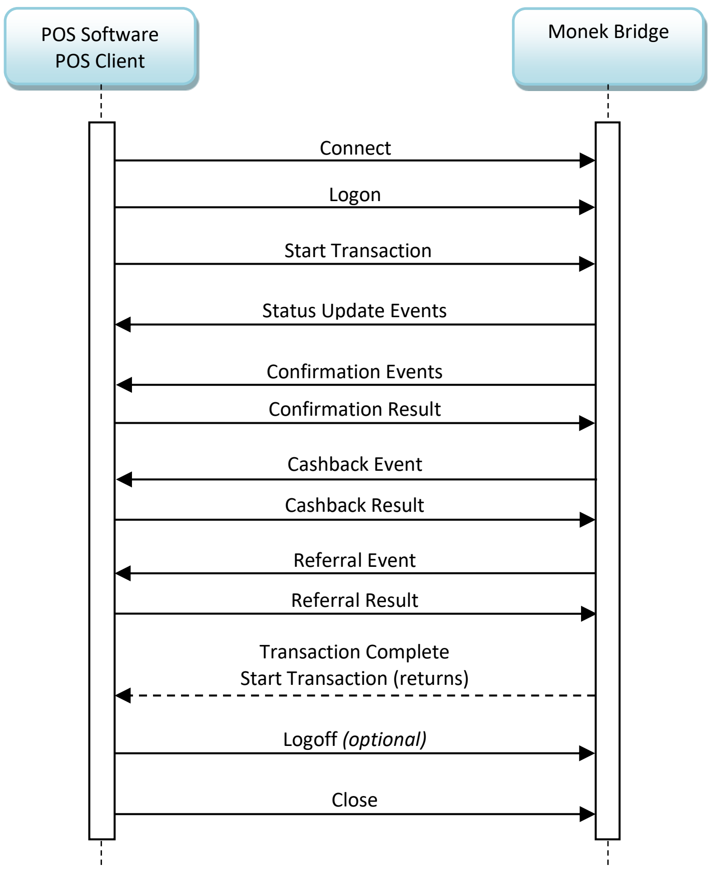
Transactions require the PED to be attached to the till via the network and are for cardholder present transactions, this covers:

1. Chip and PIN Transactions
2. Chip and Signature Transactions
3. Swipe and Signature Transactions

Once the transaction has been initiated the process is managed by the Monek Bridge with events being raised at various stages to allow the POS software to update the status of the transaction.

Basic Process

The following diagram shows the basic process followed during a PED Transaction.



For simplicity the above diagram does not include details of the user interaction with the PED.

If you receive a Confirmation, Cashback, or Referral event, you will need to pass information back to the Monek Bridge. For example, if you receive a message asking for a signature confirmation, you will need to send a response that is Boolean (these are all listed in the ConfirmationTypes enumerator).

Monek Bridge Interface

Terminal class

The Terminal classes provide properties, methods, and events to support transaction processing. The terminal class group is comprised of a TerminalBase base class defining common properties, methods and core functionality and derived classes that implement the specific requirements for your target terminal.

Terminal Classes

The following terminal specific classes are available in the Monek Bridge.

Class Name	Description
KineticSmart	For Kinetic Smart Connect API enabled devices.
PaxWebLink	For PAX terminals utilising the PAX WebLink application. (Preview)
Simulator	For integration/testing without access to a physical device.
SpireSPx	For Spire SPx series terminals.

Properties

Name	Type	Description
AllErrors	List<Exception>	A collection of all errors that occurred during the current activity.
IsConnected	bool	Indicates if the terminal is currently connected.
IsLoggedIn	bool	Indicates if the terminal is currently logged in.
LastError	Exception	The most recent error that occurred.
TerminalCapabilities	TerminalCapabilities	Provides information about the capabilities of the current terminal.
TerminalConfiguration	TerminalConfiguration	Allows configuration of terminal connectivity and configuration details.
TerminalState	TerminalState	Indicates the current state of the terminal.
TransactionDetail	TransactionDetail	Provides information about the active or recently completed transaction.
TerminalVersion	string	Provides the terminal version as reported by the device.

Methods

Cancel

Attempts to cancel the current terminal command.

Syntax

void Cancel()

Usage

This method should be called when a previous command is still in progress which will attempt to cancel that command.

Clear

Clears all transaction details.

Syntax

void Clear()

Usage

This method should be called once a transaction is fully completed. All transaction data will be automatically cleared when calling the StartTransaction method.

Close

Closes the connection to the terminal.

Syntax

void Close()

Usage

This method can be called once a transaction is fully completed.

Note: It is not necessary to log off the terminal prior to closing the connection.

Connect

Open a connection to the terminal using communication settings specified in the TerminalConfiguration object.

Syntax

void Connect()

Usage

This method must be called prior to any other communication. Once connected the device will remain connected until the Close method is called.

DiscoverTerminals

Discovers terminals on the local network where discovery is supported by the device type.

Note: This call does not require connectivity to a terminal, it can be used to detect terminals on the local network where DHCP may result in variable IP addresses.

Syntax

List<DiscoveredTerminal> DiscoverTerminals(*timeout*)

Parameters

Name	Type	Description
timeout	int	Indicates the maximum amount of time in milliseconds to spend looking for devices.

Returns

List<DiscoveredTerminal>. Returns a list of devices detected.

Additional details about each device will be available in the *DiscoveredTerminal* object.

Name	Type	Description
Name	string	The reported device name for the terminal, if available and configured on the device.
Hostname	string	The host name or IP address of the discovered terminal. *Note: This can be used as returned on the TerminalConfiguration.*
Port	int	The port number of the discovered terminal *Note: This can be used as returned on the TerminalConfiguration.*
SerialNumber	string	The serial number of the discovered terminal, if available.

Exceptions

NotSupportedException. This method is not supported for this terminal. Support can be checked using the TerminalCapabilities.SupportsDeviceDiscovery property.

Usage

Where terminals are configured to use DHCP this method can be used to locate available devices and their network configuration. It can also be used where devices use complex or unpredictable hostnames as the values returned can be used when configuring the TerminalConfiguration.

This can be performed at any time, but it is recommended to cache discovered device details in the client to minimise unnecessary delays when processing individual transactions.

GetPostTransactionDetail

Additional transaction detail may be available post authorisation.

Syntax

bool GetPostTransactionDetail()

Returns

bool. Indicates if additional data was retrieved from Monek.

Usage

This is retrieved automatically prior to a referral event and before the *StartTransaction* method returns. If the information is not immediately available, then the *GetPostTransactionDetail* call may be used to request the data again.

GetTransactionDetail

Retrieves additional transaction detail for a previously completed transaction.

Note: This call does not require connectivity to a terminal and can be called independently to allow processing from back-office systems. It does require a correctly configured API Key for the target Merchant ID.

Syntax

bool GetTransactionDetail(*merchantId, terminalId, receiptNumber, amount*)

Parameters

Name	Type	Description
merchantId	string	The Monek Merchant ID used to perform the required transaction.
terminalId	String	The Terminal ID used to perform the required transaction.
receiptNumber	Int	The Receipt Number from the required transaction.
amount	Int	The amount, in minor currency, of the required transaction.

Returns

bool. Indicates if original transaction data was retrieved from Monek.

Additional transaction details retrieved will be available on the *TransactionDetail* object.

Usage

Additional transaction information is typically available during the transaction, however there are some use cases where it may not be. As an example, an offline authorised contactless transaction will not be allocated a Monek Cross Reference until it is sent online.

The *GetTransactionDetail* method can be used to request these transaction details at a later point in time.

One approach would be to use this during end-of-day processing. The standard *ReconcileTotals* call will ensure all offline transactions have been processed and the *GetTransactionDetail* method can then be used to request the additional details.

Login

Logs the POS into the terminal on the active connection.

Syntax

bool Login()
bool Login(*password*)

Parameters

Name	Type	Description
password	string	[optional] If not specified then password set in TerminalConfiguration is used.

Returns

bool. Indicates if logon was successful.

Usage

This method must be called prior to commencing a transaction. Once logged in the device will remain logged in until the *Logout* method is called. Calling the *Close* method will not log the client out, subsequent connections will resume the active session.

The *Login* method can be called on a device that is already logged in and will behave in the same way.

Logout

Logs out of the terminal on the active connection.

Syntax

bool Logout()

Returns

bool. Indicates if logout was successful or if the device was already logged out.

Note: It is not typically necessary to log off the terminal in between transactions.

Pair

Performs device pairing with a compatible terminal.

Syntax

bool Pair(*pairingDeviceId*, *pairingCode*)

Returns

bool. Indicates if pairing was successful. If successful, the device will update the Username and Password properties on the TerminalConfiguration as required for subsequent connectivity.

Exceptions

NotSupportedException. This method is not supported for this terminal. Support can be checked using the TerminalCapabilities.RequiresPairing property.

ReconcileTotals

Reconciles the internal transaction totals on the terminal.

Syntax

bool ReconcileTotals()

Returns

bool. Indicates if cleardown of reconciliation was successful.

Exceptions

NotSupportedException. This method is not supported for this terminal. Support can be checked using the TerminalCapabilities.SupportsReconciliation property.

Usage

This method can be used at any time to clear down the totals on the terminals.

This must be run at the end of each day after trading has completed. This function can be run at any point between the last transaction of the day and midnight.

Additionally, this can be configured to run automatically on the PED. When run directly from the PED, a nightly report is printed from the internal paper roll.

SharedLogin

Logs the POS into a shared terminal on the active connection. If the terminal is in use logon attempts will continue until the terminal becomes available or the configured SharedLoginTimeout is reached.

Syntax

bool SharedLogin()
bool SharedLogin(*password*)

Parameters

Name	Type	Description
Password	string	[optional] If not specified then password set in TerminalConfiguration is used.

Returns

bool. Indicates if logon was successful.

Usage

This method must be called prior to commencing a transaction. Once logged in the device will remain logged in until the *Logout* method is called. Calling the *Close* method will not log the client out, subsequent connections will resume the active session.

The *Login* method can be called on a device that is already logged in and will behave in the same way.

StartTransaction

Begins a new transaction.

Syntax

TransactionResult StartTransaction(*transactionType*, *amount*)
TransactionResult StartTransaction(*transactionType*, *amount, password*)
TransactionResult StartTransaction(*transactionType*, *amount, currencyCode*)
TransactionResult StartTransaction(*transactionType*, *amount, currencyCode, password*)

Parameters

Name	Type	Description
transactionType	TransactionType	The transaction type to start
amount	int	The amount for the transaction
currencyCode	short	[optional] Currency code for transaction. If not specified the default terminal currency set in TerminalConfiguration is used.
password	string	[optional] Password, if required for transaction type. If required but not specified then default password set in TerminalConfiguration is used.

Returns

TransactionResult. Indicates the result of the transaction.

Comments

If any errors occur this method will return TransactionResult.Error. All error details, either handled or terminal are available from the LastError and AllErrors properties.

UpdateFirmware

Instructs the device to call the terminal management system and perform any required software or configuration updates.

Syntax

bool UpdateFirmware()

Returns

bool. Indicates if the update process was successfully initiated.

Exceptions

NotSupportedException. This method is not supported for this terminal. Support can be checked using the TerminalCapabilities. SupportsFirmwareUpdate property.

Usage

This method can be used at any time to check for software or configuration changes on the terminal management hosts. It is not typically required as standard terminal configuration automatically performs this check on a weekly basis.

Note: Calling this method will disconnect the Bridge and will typically reboot the terminal. To reconnect after the check, call the Connect and Login methods.

Events

Cashback

Indicates that the cashback is available for the card used in this transaction. To add cashback to the active transaction set the requested value in the Amount field using minor currency notation. e.g. for £20 cashback set Amount to 2000.

Where cashback is not required the amount should be set to 0.

Syntax

Cashback(object sender, CashbackEventArgs e)

CashbackEventArgs Properties

Name	Type	Description
Amount	int	Return field indicating the cashback amount requested; or 0 where no cashback is required.

ConfirmationRequest

Indicates that the transaction requires merchant confirmation for a particular stage of the transaction. Receipt data may be available at this point to allow the POS to print the merchant or customer receipts and request a signature as appropriate. The transaction will be suspended until the event returns and will continue based on the contents of the "continue" property.

The transaction will be completed or reversed automatically.

Syntax

ConfirmationRequest(object sender, ConfirmationRequestEventArgs e)

ConfirmationRequestEventArgs Properties

Name	Type	Description
ConfirmationType	ConfirmationType	Indicates the transaction event that requires confirmation.
Continue	bool	Return field indicating if the event is successful and the transaction should continue.

ProcessReferral

Indicates that the transaction has been referred and provides information to process the referral. The transaction will be suspended until the event returns and will continue based on the contents of the "AuthorisationCode" property. If an authorisation code is supplied the transaction will continue, if none is supplied the transaction will be cancelled.

The referral response request or reversal will be carried out automatically.

Syntax

ProcessReferral(object sender, ProcessReferralEventArgs e)

ProcessReferralEventArgs Properties

Name	Type	Description
Message	string	Message associated with referral
PhoneNumber	string	Referral phone number
AuthorisationCode	string	Return field indicating authorisation code provided during referral processing

StatusUpdate

Provides feedback of transaction status changes

Syntax

StatusUpdate(object sender, StatusUpdateEventArgs e)

StatusUpdateEventArgs Properties

Name	Type	Description
Message	string	Message indicating current device status
Status	TransactionStatus	Indicates the current transaction status

Timeout

Indicates that a communication timeout has occurred during the current activity. The event arguments indicate the activity in progress, the number of timeouts experienced, and the total duration of the affected communication attempt. Set the continue property to true to retry the current activity.

Syntax

Timeout(object sender, TimeoutEventArgs e)

TimeoutEventArgs Properties

Name	Type	Description
Continue	bool	Return field indicating if the current request should be retried and the activity should continue.
Count	int	Indicates the number of timeouts that have occurred for the current request.
Source	TimeoutEventSource	Indicates the activity in progress.
TotalDuration	TimeSpan	Indicates the total amount of time the current request has been in progress.

TransactionDetail class

The TransactionDetail class provides information used to print the customer and merchant receipts.

Properties

Name	Type	A[*1]	R[*2]	Description
Amount	Int	r	m	Transaction amount
ApplicationCryptogram	string	r	m[*3]	Application cryptogram
ApplicationId	string	r	m[*3]	ICC application number
AuthorisationCode	string	r	m[*3]	Transaction authorisation code
AuthorisationMessage	string	r		Transaction authorisation message
CardDescription	string	r	m[*3]	Card type description
CardNumber	string	r	m	Obscured card number
CardInputMethod	CardInputMethod	r	m	Indicates the card input method
CardTrackingToken	Guid?	r		Tracking token that uniquely identifies the card used.
CardType	CardType	r		Enumerated card type
CashbackAmount	int	r		Cashback amount
CrossReference	string	r		Transaction cross reference
CurrencyCode	string	r	o	Transaction currency code
ExpiryDate	string	r	o	Card expiry date
FollowOnTransactionUuids	List<Guid>	r	o	A list of unique IDs for any SCA follow on transactions.
IsComplete	bool	r		Indicates if the active transaction is complete
IsPinOk	bool	r	o[*4]	Indicates if the PIN was successfully checked
IsReferred	bool	r		Indicates if this transaction was referred
IsSignatureOk	bool	r		Indicates if a valid signature was obtained
MerchantId	string	r	M	Monek merchant number
Message	string	r		General transaction message

PanSequenceNumber	string	r	o	The PAN sequence number from a Chip card
ReceiptNumber	int	r	m	Transaction receipt number
ReferralPhoneNumber	string	r		The phone number for a referred transaction
StartDate	string	r	o	Card start date
TerminalId	string	r	m	Terminal identifier
TransactionResult	*TransactionResult*	r		Indicates the transaction result
TransactionTime	String	r	m	Transaction date and time
TransactionType	*TransactionType*	r	m	Indicates the type of transaction
TransactionUuid	Guid	r	o	A unique ID for the transaction

*1 Field access level. r = Read, w = Write, r/w = Read/Write
*2 Receipt detail indicator.
*3 Mandatory if available/applicable.
*4 Receipt should display "Verified by PIN" if PIN was successfully validated.

TerminalCapabilities class

The TerminalCapabilities class is used to provide feature and functionality details for the connected terminal.

Properties

Name	Type	A*1	Description
ConnectionType	ConnectionType	r	Indicates the network connection type for this terminal.
HasReceiptPrinter	TriState	r	Indicates if the current device has its own receipt printer.
RequiresPairing	bool	r	Indicates if the current device requires pairing to establish connection credentials.
SupportsCurrencySelection	bool	r	Indicates if the current device supports currency selection.
SupportsDeviceDiscovery	bool	r	Indicates if the current device supports the DiscoverTerminals method.
SupportsPosOnlyMode	bool	r	Indicates if the current device supports POS Only mode.
SupportsReconciliation	bool	r	Indicates if the current device supports the ReconcileTotals method.

SupportsFirmwareUpdate	bool	r	Indicates if the current device supports the UpdateFirmware method.

TerminalConfiguration class

The TerminalConfiguration class is used to provide configuration details for the connected terminal.

The TerminalConfiguration class is primarily used to configure communication settings between the POS and the Terminal. Low level terminal details such as acquirers, merchant details and processing rules are all maintained centrally by Monek.

Properties

Name	Type	A[*1]	Description
CurrencyCode	short	r/w	Default currency code for this terminal
DebugFilename	string	r	Gets the current debug filename. Filenames are automatically generated as daily date stamped files in the form: *MonekBridge_yyyymmdd.log*
DebugLogPath	string	r/w	Sets the path to write debug logs.
EnableDebugLogging	bool	r/w	Indicates if debug logs should be created.
Hostname	string	r/w	Ethernet hostname or IP Address
LoginTimeout	int	r/w	Login timeout in milliseconds
MonekApiKey	string	r/w	API key for post transaction data calls
Password	string	r/w	Terminal password
PollFrequency	int	r/w	Poll frequency in milliseconds for
Port	int	r/w	Ethernet port number
PrintReceiptsOnTerminal	bool	r/w	Indicates if the terminal should print receipts
PrintWidth	byte	r/w	Terminal print width
RequestTimeout	int	r/w	Gets or set the network request timeout
SharedLoginTimeout	int	r/w	Shared Login timeout in milliseconds
TransactionTimeout	int	r/w	Transaction processing timeout
Username	string	r/w	Terminal username

[*1] Field access level. r = Read, w = Write, r/w = Read/Write

Enumerators

CardInputMethod

Indicates the card input method.

Values

Value	Description
Keyed	Card details were keyed
Swiped	Card details were read from the magnetic strip
Chip	Card details were read from the ICC
Contactless	Card details were read using the contactless interface

CardType

Indicates the card type.

Values

Value	Description
Unknown	Unknown card type
Visa	Visa credit card
VisaDebit	Visa debit card
Electron	Visa Electron card
Mastercard	Mastercard credit card
MastercardDebit	Mastercard debit card
Maestro	International Maestro card
MaestroUK	UK domestic Maestro card
Solo	Solo card
Laser	Laser card
JCB	JCB card
AmericanExpress	American Express card
Diners	Diners Club card
Other	Other unidentified card

ConfirmationType

Specifies the type of confirmation requested.

Values

Value	Description
SignatureOkay	Card holder signature confirmation is required. Note: If this event is fired then the cardholder merchant receipt should be printed at this point to capture the signature.
AllowPinBypass	Customer PIN was incorrect or unavailable. The terminal is requesting authorisation to bypass PIN confirmation.
ReceiptPrintedOkay	The terminal is requesting confirmation that the merchant receipt has been printed okay.
RemoveReceiptConfirmation	The terminal is prompting for confirmation that the merchant receipt has been removed.

ConnectionType

Indicates the network connection type for this terminal.

Values

Value	Description
Unknown	Unknown or unspecified.
Persistent	The Bridge maintains a persistent connection to the terminal during communications.
AdHoc	The Bridge connects to the terminal on demand to send requests and retrieve status updates.

TimeoutEventSource

Indicates the activity in progress for a Timeout event.

Values

Value	Description
None	Unknown activity.
Connect	The Terminal.Connect method.
Login	The Terminal.Login method.
Transaction	The Terminal.StartTransaction method.

Cancel	The Terminal.Cancel method.
Reconcile	The Terminal.ReconcileTotals method.

TransactionStatus

Indicates the transaction status reported by the StatusUpdate event.

Values

Value	Description
StatusResponseError	The terminal issued a status update but there was an error decoding the message. Check Terminal.LastError for details.
Diagnostic	Diagnostic messages
DisplayOnly	Terminal display messages
InsertCard	Insert card prompt
SwipeCard	Swipe card prompt
CardAccepted	Card input was accepted
CardRejected	Card input was rejected
ApplicationSelect	Chip application select prompt
AwaitingCustomerInput	Terminal is awaiting customer input
AwaitingPinInput	Terminal is awaiting PIN input
PinAccepted	PIN has been accepted
PinFailed	PIN has failed
Connecting	Terminal is connecting to auth hosts or TMS
Authorising	Terminal is authorising a transaction
Referred	Transaction has been referred
AwaitingSignature	Terminal is awaiting signature confirmation
Reversing	Transaction is being reversed
Cancelling	Transaction is being cancelled
RemoveCard	Remove card prompt

TransactionResult

Indicates the result of a completed transaction.

Values

Value	Description
NotStarted	The transaction has not started and is the default value
InProgress	The transaction is in progress
Authorised	The transaction was authorised
Declined	The transaction was declined
KeepCard	The transaction was declined, and the card should be retained if possible.
Void	The transaction was cancelled
Error	An error occurred attempting to process the transaction
ResponseSequenceError	Internal Error, the transaction has FAILED.
InvalidTransactionType	The transaction passed to the bridge is not supported.

TransactionType

Indicates the type of transaction being processed.

Values

Value	Description
None	No transaction type specified or no active transaction
Refund	Refund transaction
Sale	Sale transaction

TriState

Enumerator used when a Boolean is insufficient due to the presence of an unknown state.

Values

Value	Description
Unknown	Property value or state is unknown.
True	Same as Boolean True
False	Same as Boolean False

Appendix A: Messages

The following list details the typical transaction message responses where the transaction result is *TransactionResult.Error*.

This is the current exhaustive list of expected error codes. This list may be subject to change as and when the terminal is updated. This should be dealt with on a case-by-case basis.

Values

Descriptions	
internal procedure error	ECR abort
unsupported command	zero amount not allowed
invalid amount	cash not allowed
command not supported	Date/time invalid
connecting error	transaction not allowed
printer error	Cashback not permitted
card expired	Start Date Missing
fallback not allowed	Cash Ceiling Limit Exceeded
unsupported card	Transaction Ceiling Limit Exceeded
no transactions present	Bad MAC – Call Help Desk
card invalid	Expiry Date Missing
card unknown	Offline Store Full – Call Help Desk
general error	

Appendix B: Glossary

Business Partner	A generic term used to describe Business to Business clients to whom we provide payment solutions and services.
Card Issuer	An organisation which issues payment cards (prepaid, credit and debit) to enable their cardholders to purchase goods and services from merchants.
Card Schemes	Organisations which process payments between merchant acquirers and the banks of purchasers that use their scheme. Principle schemes are Visa and Mastercard, but other schemes may be accepted by the Business Partner.
Merchant	A business or organisation which accepts payment for goods and services by card.
Merchant Acquirer	An organisation (normally a bank) which works for a merchant to provide a single interface to the principal card schemes to authorise transactions, complete settlement and reconciliation with the issuing bank and manage the payment of all principal card scheme and issuer fees. They also act as an intermediary in the event of card claims, returns, and refunds.
PCI DSS	Payment Card Industry Data Security Standards
PED	PIN Entry Device. The terminal used by a cardholder to identify themselves at Point of Sales and confirm their transaction details are correct.
POS	Point of sale. The merchant location or software where a transaction originates.

This is a generic glossary, not all terms may be directly relevant to this project.

Appendix C: Terminal Simulator

To facilitate integration and testing in lieu of a physical terminal the Monek Bridge contains a Simulator terminal class. The simulator will mimic typical terminal behaviour without need for a physical terminal or Monek merchant accounts to allow early integration and testing.

Login

The terminal simulator needs no specific Host, Port, or Username.

It does however require the password **123456.**

Transaction Response

The transaction response from the simulator can be influenced based on the transaction amount requested as follows:

#MCRR

Where:

# allow any preceding digits for higher values

The M digit indicates the card input method

The C digit indicates the card type to simulate

The RR digits indicate the response

Card Input Method

Value	Description
0	Contactless
1	Keyed
2	Swipe with Signature
3	Chip with Signature
4-9	Chip with PIN

Card Type

Value	Description
0	Visa Credit
1	Visa Debit
2	Electron
3	Mastercard
4	Mastercard Debit

5	Maestro
6	American Express
7	Diners Club
8	Discover
9	JCB

Transaction Result

Value	Description
Any other value	Authorised
02	Referral. Actual result dependent on Referral event.
04	Keep Card Decline
05	Decline
12	Void
30	Transaction error

Examples

Value	Description
55	Authorised, Contactless, Visa Credit
5399	Authorised, Chip & PIN, Mastercard
2105	Decline, Swipe & Sig, Visa Debit
10030	Error, Contactless, Visa Debit
1212	Void, Keyed, Electron