Card Transaction System (CTS) Guide

Version: 1.7

11 February 2025

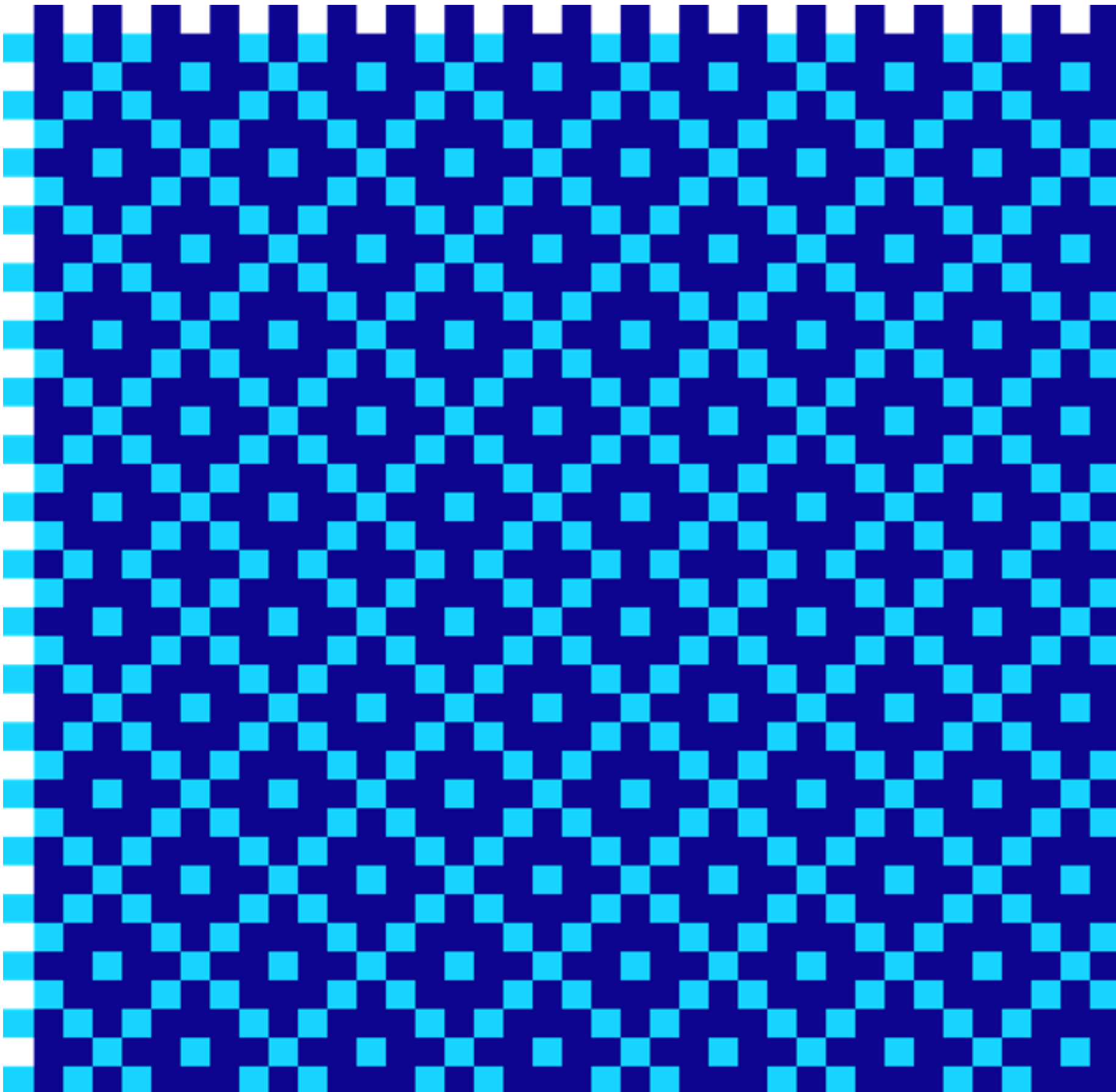
Publication number: CTS-1.7-2/11/2025

For the latest technical documentation, see the Documentation Portal.

Thredd 6th Floor, Victoria House, Bloomsbury Square, London, WC1B 4DA

Support Email: occ@thredd.com

Support Phone: +44 (0) 203 740 9682



Copyright

About this Document

This guide describes the Card Transaction System (CTS) and explains how to use it to integrate and test your systems with the Thredd Apex payment processing platform. It describes the CTS user interface and shows how to run the built-in standard test cases.

Target Audience

This guide is aimed at Program Managers and developers who want to test the integration of their systems and validate the setup of the External Host Interface (EHI) before going live in a production environment.

What's Changed?

To find out what's changed since the previous release, see the Document History section.

Related Documents

Refer to the table below for other documents which should be used in conjunction with this guide.

Document	Description
Smart Client Guide	How to use Smart Client, which is an administration application that can be used to view and manage cards and transactions in your programme.
EHI Guide	Describes the Thredd External Host Interface (EHI) and provides specifications on how to process and respond to messages received from EHI.
Web Services Guide	Describes how to use the Thredd SOAP API to send requests to Thredd and provides specifications on the available web service calls.
Thredd Portal	Describes how to use Thredd's new user interface for managing cards and transactions on the Thredd platform.

Tip: See the Thredd Documentation Portal for a full suite of documentation.

1 Introduction

The Card Transaction System (CTS) enables you to test the integration of your card processing systems and validate the setup of your External Host Interface (EHI) before you go live in a production environment. A simple dashboard provides built-in standard test cases and a transaction history screen.

The service is written as a SOAP and REST service which enables you to submit card test transactions in the Thredd UAT environment in line with your programme setup. All input parameters are strings or numerics, making integration and testing simple and fast.

Using CTS, you can:

- Run standard built-in tests to simulate typical POS, ATM, mail-order/telephone-order (MOTO), AFD and e-commerce transactions
- Test authorisation messages for Chip & PIN, Contactless, Magstripe, ATM cash withdrawal, e-commerce, MOTO, and Scheme Stand-in Processing (STIP)
- Simulate clearing for all successful authorisations created on CTS, including clearing of partial refunds. The Clearing screen displays a list of all eligible transactions that can be cleared to simulate the presentment/financial record
- Execute refunds (full or partial) for all cleared transactions
- Test recurrence by specifying if a transaction is recurring (for e-commerce or MOTO)
- Execute reversals for successful authorisations that have not been cleared
- Simulate foreign exchange (FX) transactions by specifying the country where the transaction occurs to simulate cross-border transactions
- View a history of all CTS transactions which you can filter and refine
- Simulate a scheme STIP message for POS and e-commerce transactions

1.1 How does CTS work?

The figure below illustrates how you can simulate and test the payment authorisation flow using CTS.

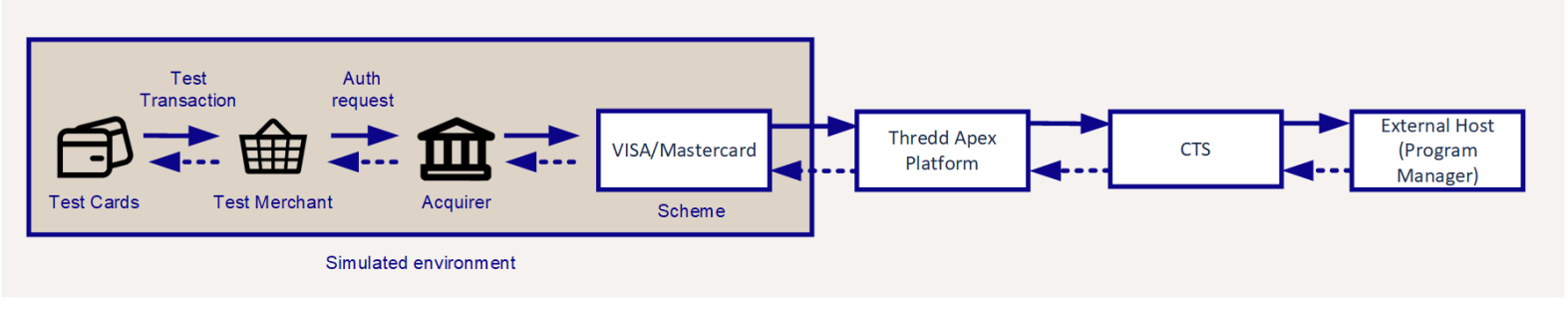


Figure 1: Testing authorisations using the Card Transaction System

2 Accessing CTS

This topic explains what you require to set up Thredd and how you access the system.

2.1 Pre-requisites

To access CTS, you need the following:

- Your public IP address(es) added to the Thredd 'allowed' list if different to Web Services IP address(es)
- Your programme set up in UAT
- A unique username and password for each user (you can use the same credentials which you use to access Smart Client UAT with CTS enabled)
- EHI set up at product level (refer to your Product Setup Form)

To submit test transactions, you will use Thredd Web Services to create and activate test cards. If you are using EHI Mode 2 or 3, you will also need to load funds onto the test cards. You will need the 9-digit token, CVV2, and Expiry Date (provided in the Ws_CreateCard Web Service response). For the PIN, Thredd recommends setting this in the Ws_CreateCard request, otherwise you will need to use Ws_PINControl to retrieve the generated PIN.

For more information about deploying CTS in your environment, contact your Account Manager.

2.2 Logging into CTS

You access CTS using a web browser. Thredd recommends Google Chrome or Microsoft Edge.

To log into CTS:

1. Go to: https://cts-uat.globalprocessing.net:54340/. The Sign in screen appears:

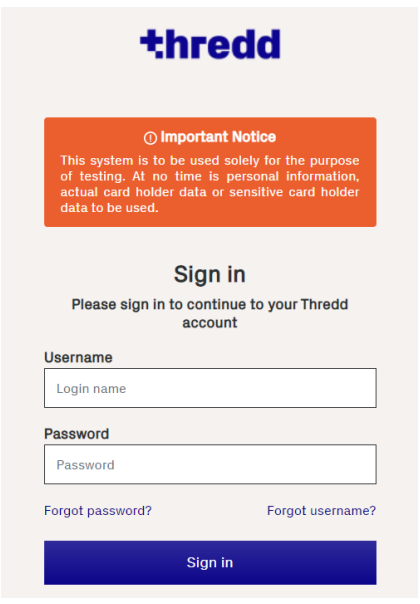


Figure 2: Thredd Login Screen

2. Enter your username and password and click **Sign in**. The CTS Dashboard appears (described in the following section).

Note: If the message "*This site can't be reached*" appears, this means that your IP address is not on the 'allowed list' on our system. Contact Thredd by raising a Thredd JIRA to request that your IP address is added to the allowed list.

3 Thredd Portal UAT Validation

You can use Thredd Portal in the UAT environment to see the transactions that have taken place on the card, by searching on either the 9-digit token or transaction ID provided in the CTS response. For details, see the Thredd Portal User Guide.

Search Results

Export Columns

TRANSACTION ID	DATE & TIME	MERCHANT	TRANSACTION TYPE	TRANSACTION STATUS	PROCESS
6161067888	15 Apr, 2024 14:34	London	Authorisation	Accepted	Debits (goods and service
6161163722	16 Feb, 2024 14:54	Thredd.com LONDON Greater London	Authorisation	Accepted	Debits (goods and service
6161067999	16 Feb, 2024 14:54	Thredd.com LONDON Greater London	Authorisation	Accepted	Debits (goods and service
6161062231	01 Feb, 2024 08:54	Clintons Cards LONDON Greater London	Authorisation	Disputed	Debits (goods and service

Figure 3: Thredd Portal Transactions Page

Alternatively, you can use Smart Client in the UAT environment to see the transactions that have taken place on the card, by searching on either the 9-digit token or transaction ID provided in the CTS response. For details, see the Smart Client User Guide.

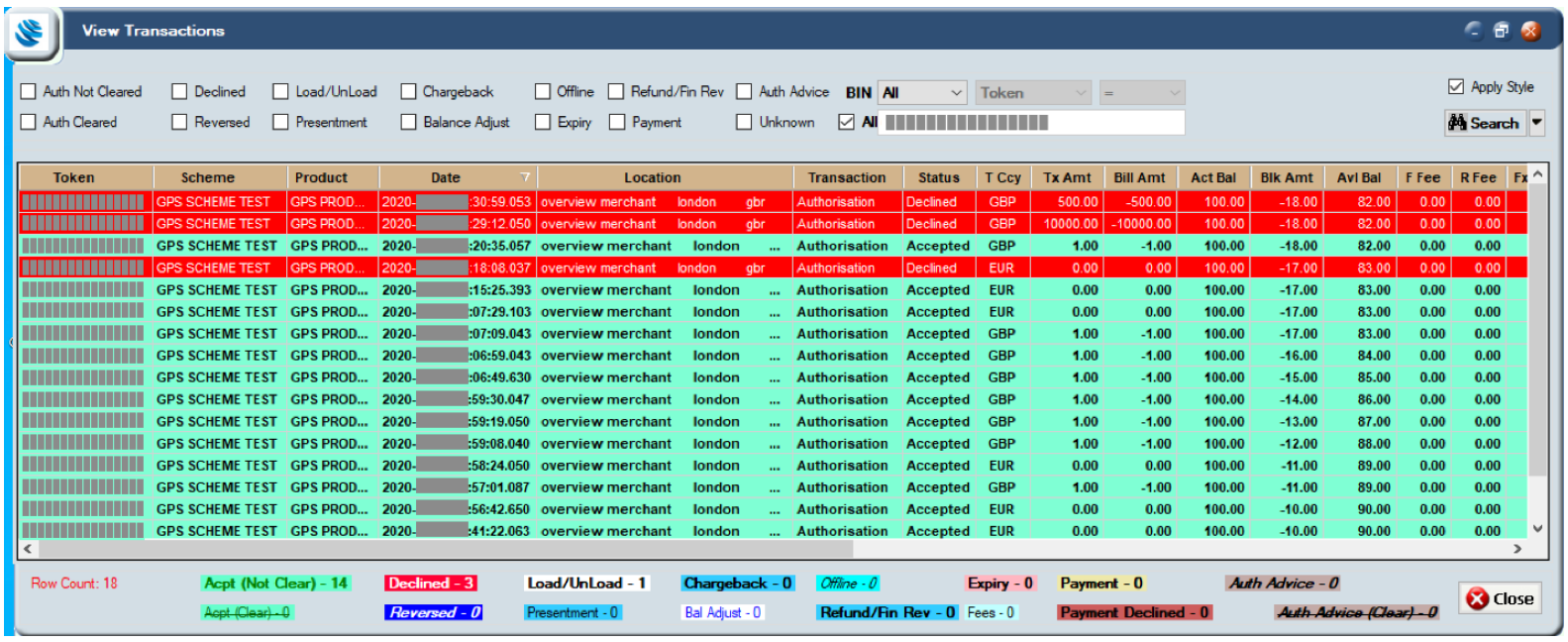


Figure 4: Smart Client Transactions Screen

4 Resetting your Password

The **Reset Password** option enables you to reset your password for CTS.

Note: Resetting your password will impact other Thredd-related systems that use these credentials.

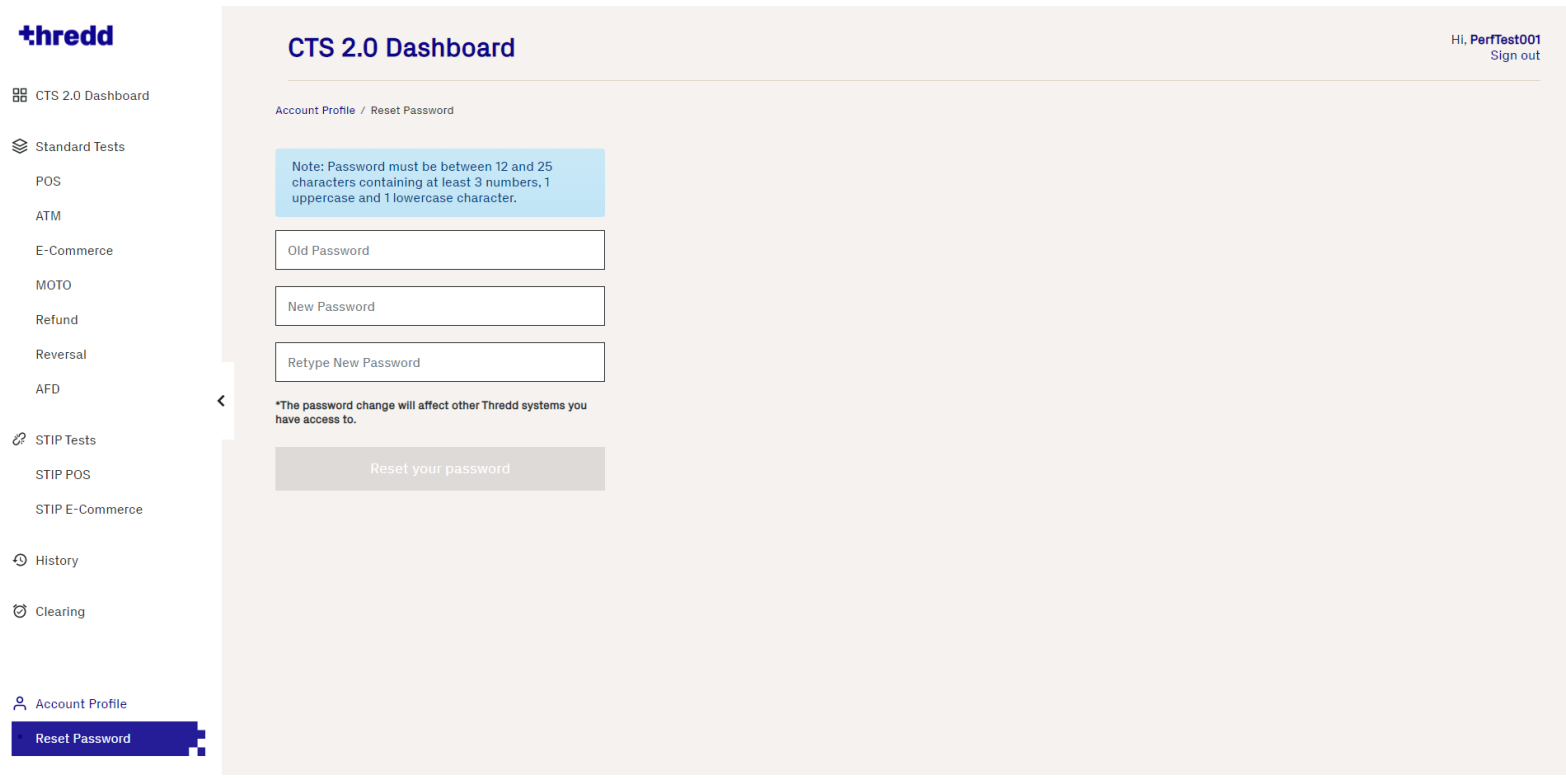


Figure 5: Reset Password Screen

5 Using the CTS Dashboard

This topic describes the main CTS screen and explains how to run the built-in tests available.

5.1 About the Main CTS Screen

After logging into the CTS platform, the main CTS screen appears:

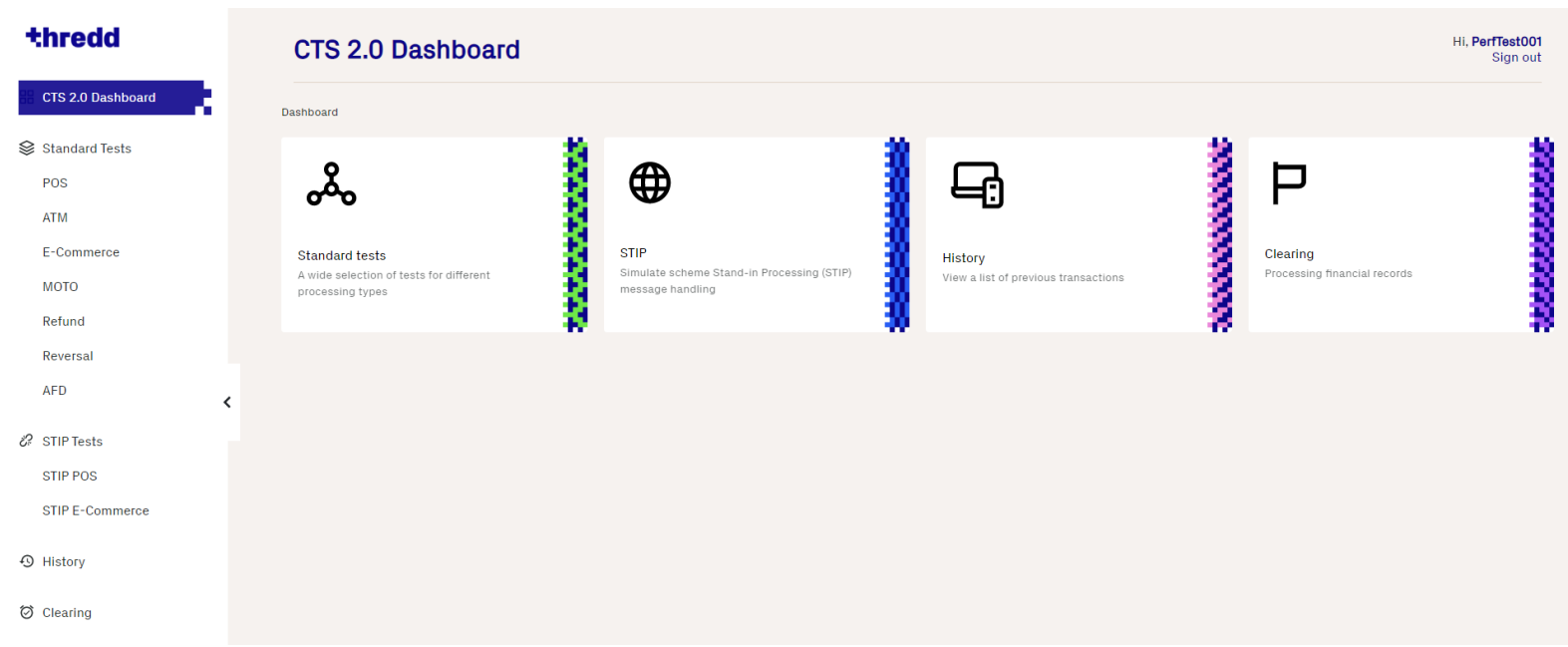


Figure 6: CTS Dashboard

The interface is divided into three main sections:

- **Toolbar** – Use the toolbar along the top of the screen to see your username and sign out.
- **Menus** – Use the menu on the left-hand side to select an option such as a standard test, display your account profile, and reset your password. See Running Standard Tests for more information.
- **Dashboard** – View the dashboard to access standard tests, simulations, and transaction history details. See Using the CTS Dashboard for more information.

5.1.1 CTS and Mastercard Network Exchange

For customers using Mastercard Network Exchange (MNE), it is possible to process tests for tokens that originate from an MNE sub-network by selecting the **Process Transaction via MNE** option during the setup of the test.

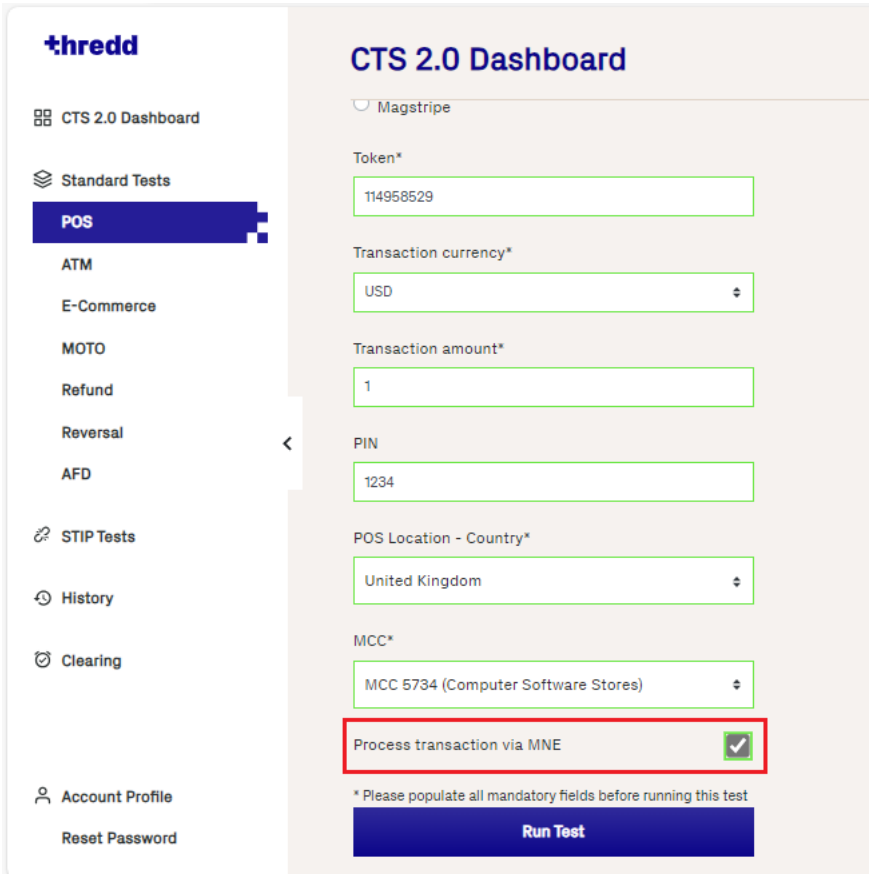


Figure 7: Process transaction via MNE allows for tokens to be processed by MNE networks.

The token entered in the *Token* field must be associated with a sub-network for the *Process transaction via MNE* check box to be enabled. If the token is not associated with a sub-network then the check box will be disabled.

Note: The PIN change option in ATM, and the Recurring option in MOTO, do not currently support processing transactions in MNE.

5.2 Running Standard Tests

CTS provides the following standard simulation tests:

- **POS** – simulates a Point-of-Sale transaction completed through a card terminal
- **ATM** – simulates a balance enquiry or cash withdrawal transaction made on an Automated Teller Machine (ATM)
- **E-Commerce** – simulates an online, e-commerce transaction
- **MOTO** – simulates a Mail Order/Telephone Order (MOTO) transaction
- **Refund** – simulates a refund transaction initiated by a cardholder or merchant
- **Reversal** – simulates an acquirer reversing a previous authorisation
- **AFD** – simulates an Automated Fuel Dispenser (AFD) transaction

To run a test:

1. Click **Standard tests** on the dashboard and select a test (or choose a test from the menu). A screen appears showing the standard tests available:

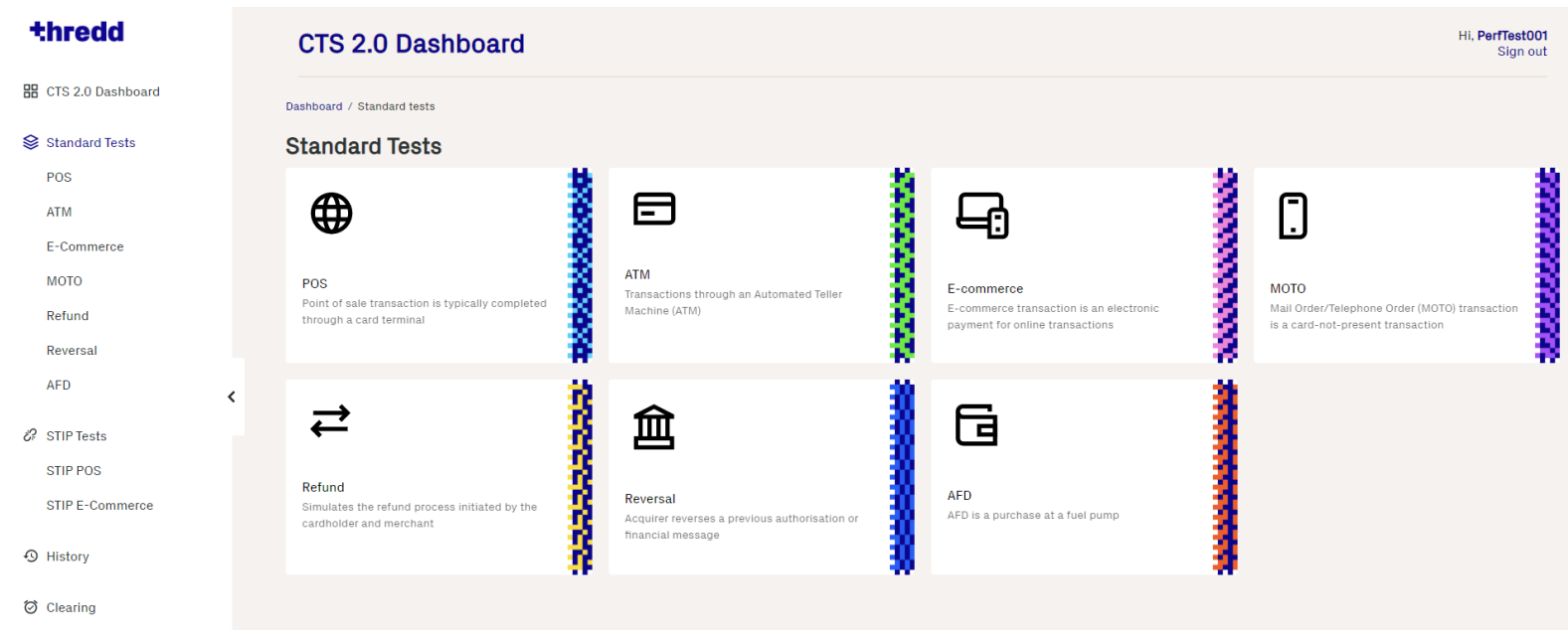


Figure 8: Standard Tests Screen

See the following sections for more information about the various tests.

5.2.1 POS Transaction Test

Use this test to simulate a Point-of-Sale (POS) transaction on a card terminal.

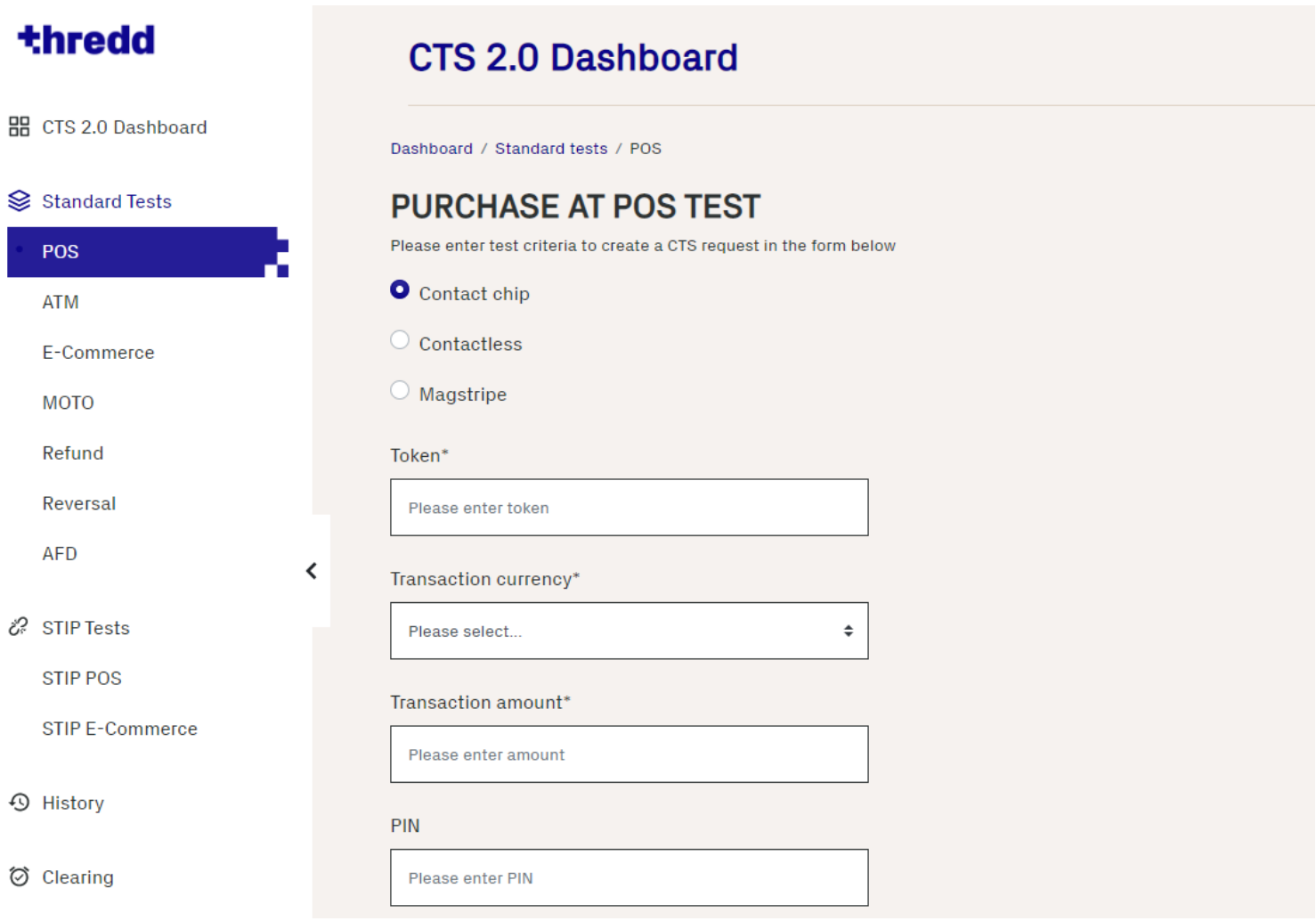


Figure 9: POS Transaction Test Screen

1. Select the card element being tested:
    - Contact chip
    - Contactless
    - Magstripe
2. Enter the 9-digit **Token**, **Transaction currency**, **Transaction amount**, card **PIN** and **POS Location - Country**.

    Note: If the transaction currency is different to the billing currency of the card, Thredd provides an FX transaction based on static values pulled from a database. These rates may not represent the market value.
3. Select a Merchant Category Code (**MCC**) from the drop-down list. If you do not select one, the default MCC is used.
4. If you're using a token that is associated with a sub-network, click the *Process transaction via MNE* checkbox. For more information on MNE, see CTS and Mastercard Network Exchange.
5. Click **Run Test**.

5.2.2 ATM Transaction Test

Use this test to simulate an ATM balance enquiry or cash withdrawal at an ATM location.

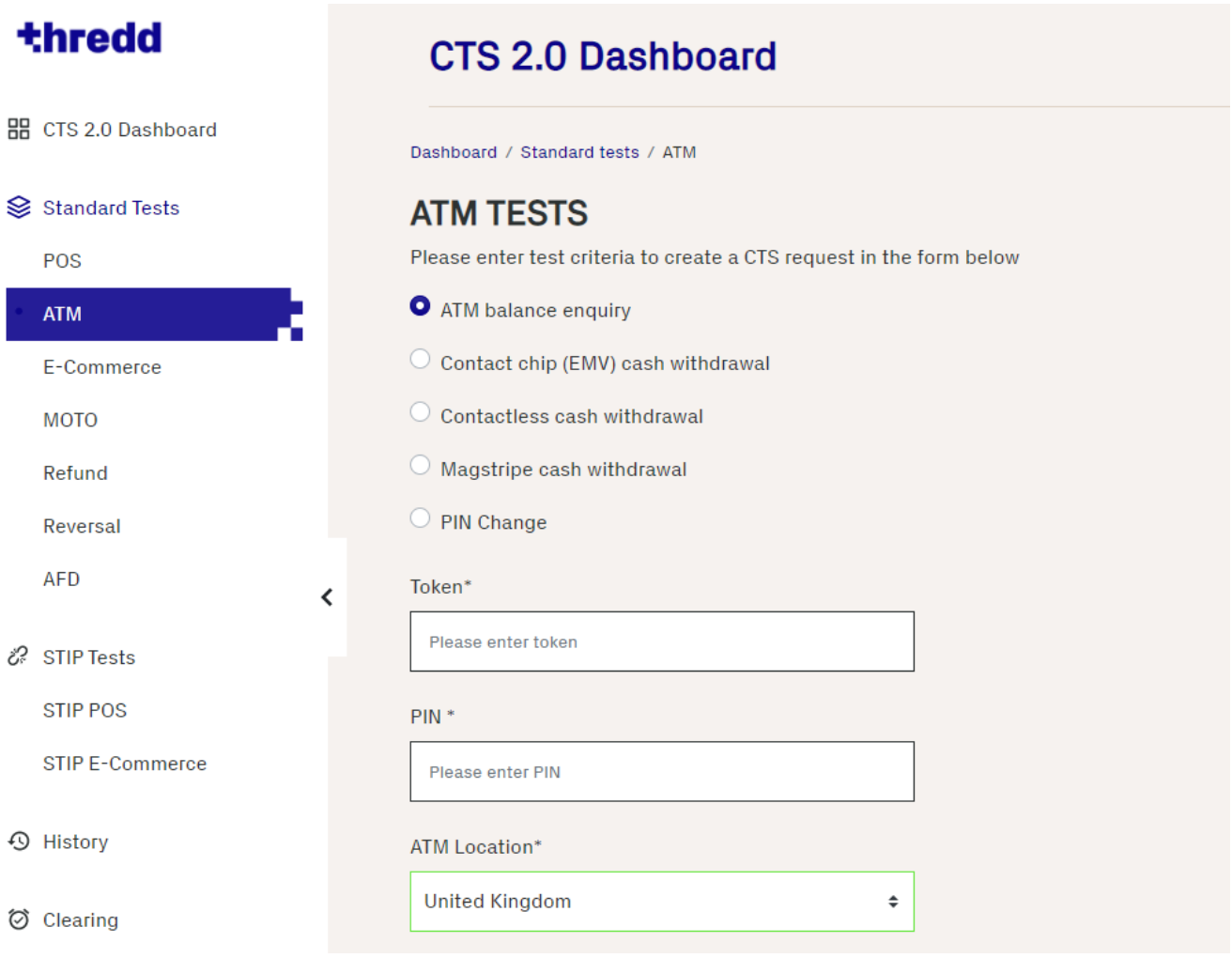


Figure 10: ATM Transaction Test Screen

1. Select the ATM element being tested:
    - ATM balance enquiry
    - Contact chip (EMV) cash withdrawal
    - Contactless cash withdrawal
    - Magstripe cash withdrawal
    - PIN Change
2. Enter the 9-digit **Token**, **Transaction currency**, **Transaction amount**, card **PIN** and **ATM Location** (country).

    Note: If the transaction currency is different to the billing currency of the card, Thredd provides an FX transaction based on static values pulled from a database. These rates may not represent the market value.
3. If you're using a token that is associated with a sub-network, click the *Process transaction via MNE* checkbox. For more information on MNE, see CTS and Mastercard Network Exchange.

    Note: The Process transaction via MNE check box cannot be used with the Change PIN option currently.
4. Click **Run Test**.

5.2.3 E-commerce Transaction Test

Use this test to simulate an e-commerce transaction made through an online website.

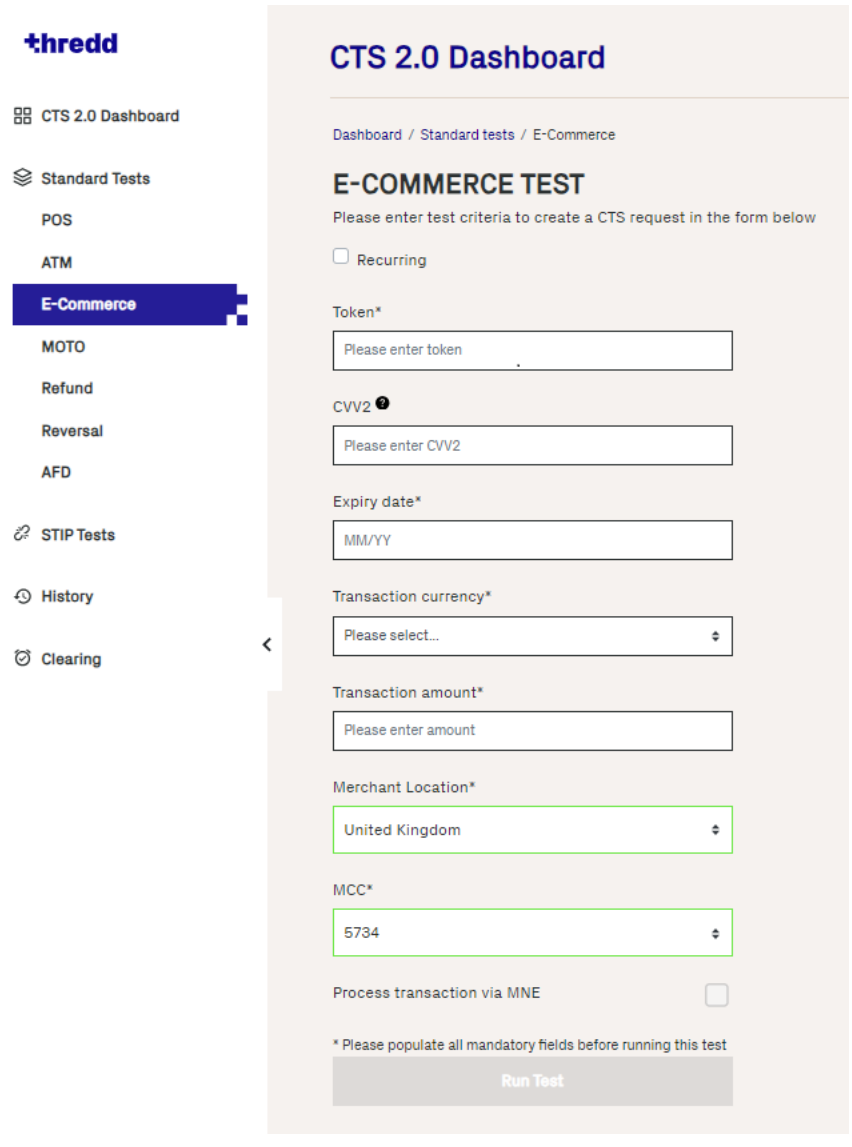


Figure 11: E-Commerce Transaction Test Screen

1. Enter the 9-digit **Token**, the cards' **CVV2** (if required) and the card **Expiry date**.
2. Enter the **Transaction currency**, **Transaction amount**, and **Merchant Location** (country).

   Note: If the transaction currency is different to the billing currency of the card, Thredd provides an FX transaction based on static values pulled from a database. These rates may not represent the market value.
3. In **Merchant Location**, specify a location for the merchant.
4. Select a Merchant Category Code (**MCC**) from the drop-down list. If you do not select one, the default MCC is used.
5. If you're using a token that is associated with a sub-network, click the *Process transaction via MNE* checkbox. For more information on MNE, see CTS and Mastercard Network Exchange.
6. Click **Run Test**.

   Note: To simulate a recurring transaction, select **Recurring**.

5.2.4 MOTO Test

Use this test to simulate a Mail and Telephone Order (MOTO) transaction, which is a payment made over the telephone (for example, via a call centre) or via a mail order catalogue.

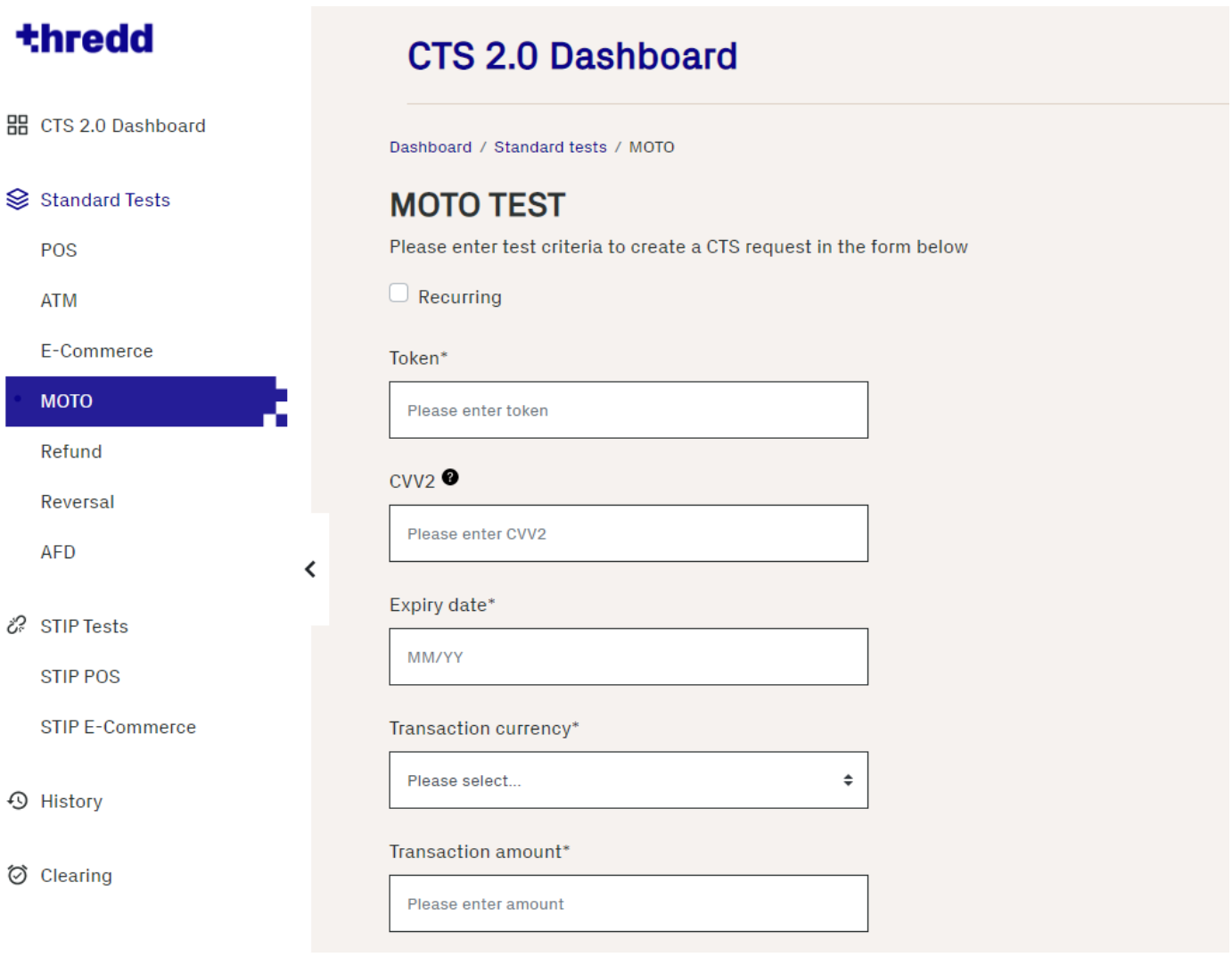


Figure 12: MOTO Transaction Test Screen

Note: The Process transaction via MNE check box cannot be used for MOTO tests currently.

1. To simulate a recurring transaction, select **Recurring**.
2. Enter the 9-digit **Token**, the card's **CVV2** (if required) and the card **Expiry date**.
3. Enter the **Transaction currency**, **Transaction amount**, and **Merchant Location** (country).

   Note: If the transaction currency is different to the billing currency of the card, Thredd provides an FX transaction based on static values pulled from a database. These rates may not represent the market value.
4. Select a Merchant Category Code (**MCC**) from the drop-down list. If you do not select one, the default MCC is used.
5. Click **Run Test**.

5.2.5 Refund

Use this test to simulate a refund process initiated by the cardholder and merchant.

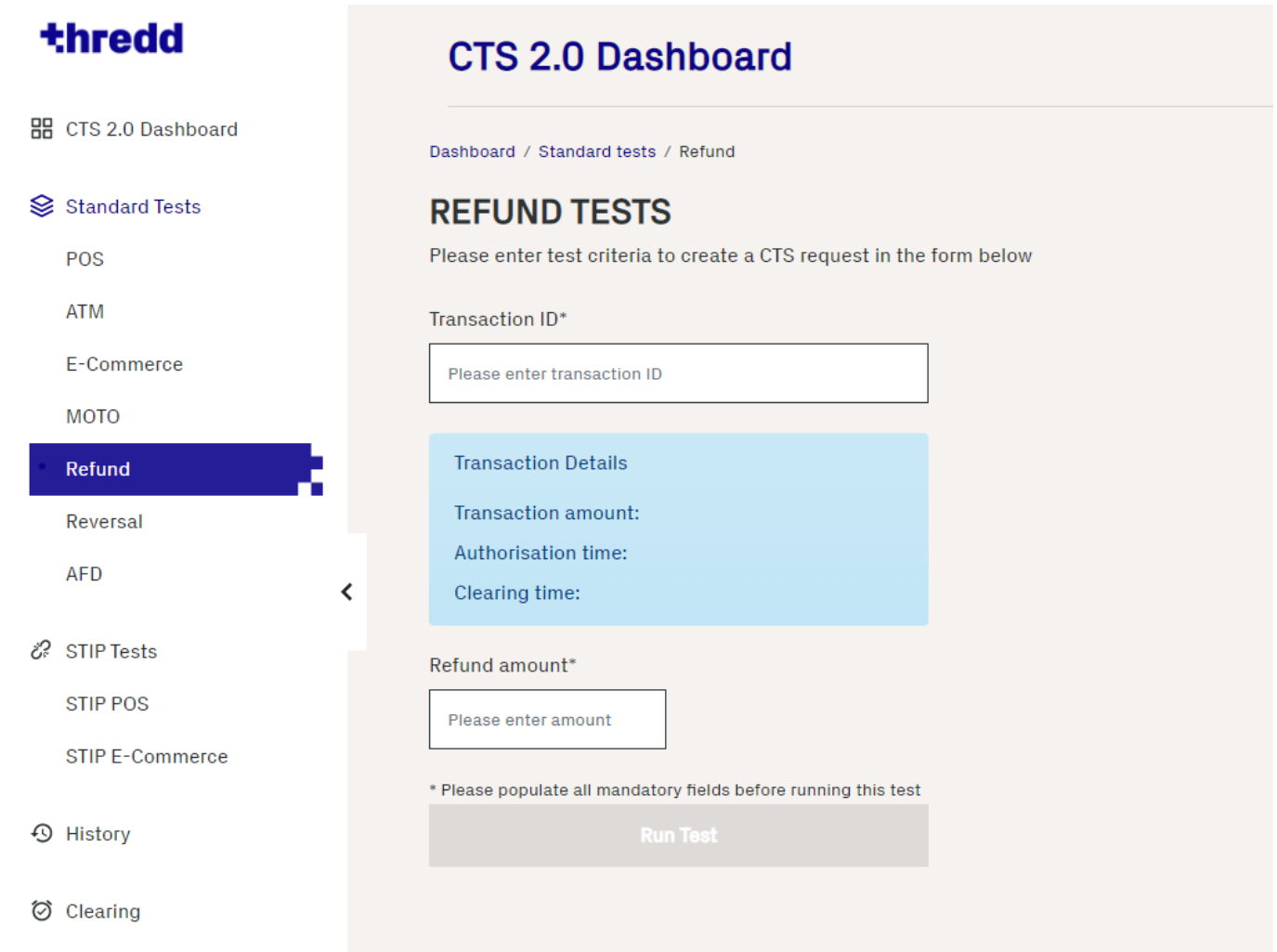


Figure 13: Refund Screen

1. Enter the 10-digit **Transaction ID** that corresponds to a transaction that has been successfully cleared.
2. Enter the **Refund amount** (this can be a partial amount, or full amount which cannot exceed the total amount of the transaction).
3. If you're using a token that is associated with a sub-network, click the *Process transaction via MNE* checkbox. For more information on MNE, see CTS and Mastercard Network Exchange.
4. Click **Run Test**.

5.2.6 Reversal

Use this test to simulate an acquirer reversing a previous authorisation.

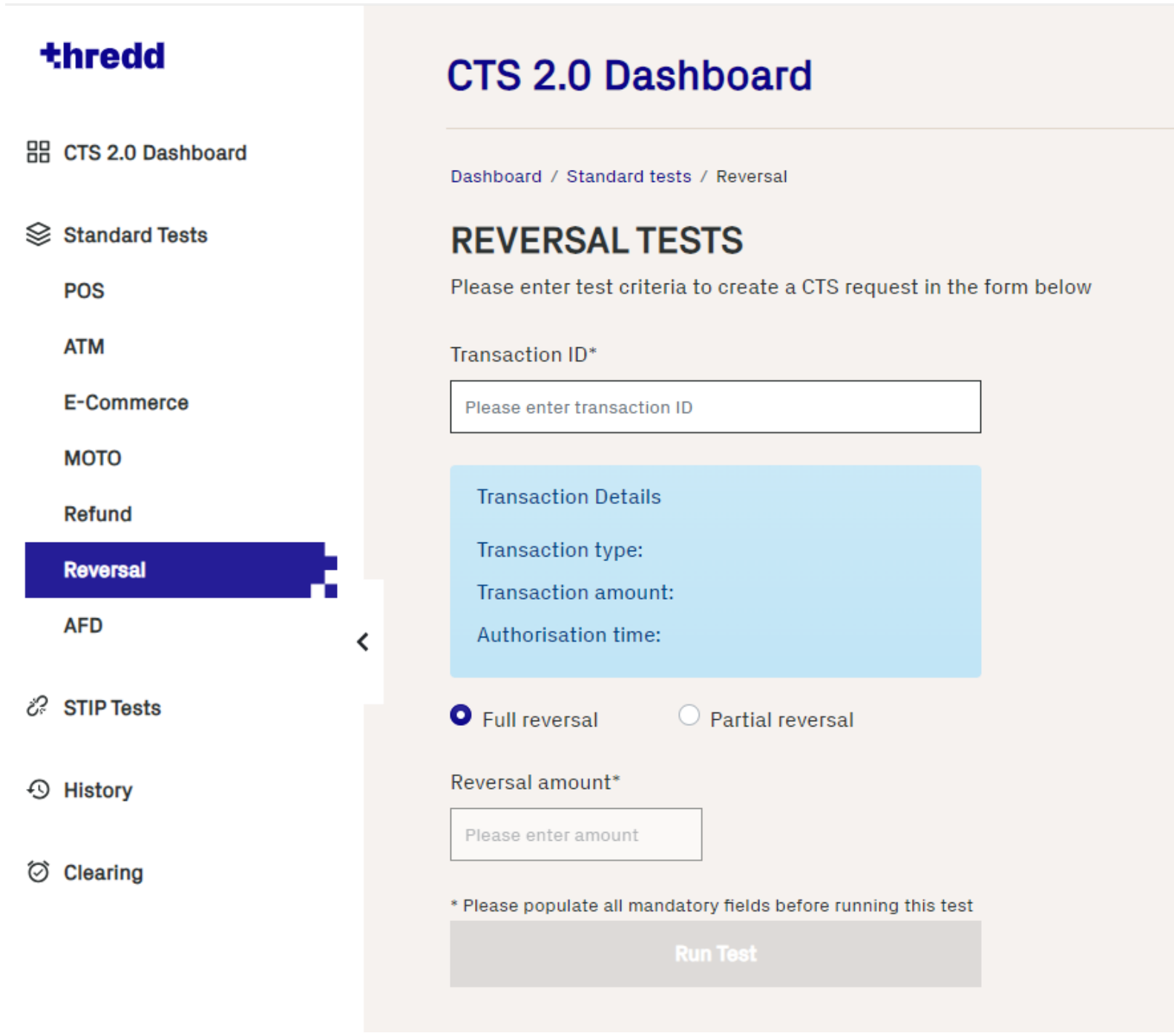


Figure 14: Reversals Screen

1. Enter the 10-digit **Transaction ID** that corresponds to an authorisation.
2. Select either **Full Reversal** or **Partial Reversal** and specify the **Reversal amount**.
3. If you're using a token that is associated with a sub-network, click the *Process transaction via MNE* checkbox. For more information on MNE, see CTS and Mastercard Network Exchange.
4. Click **Run Test**.

Note: Unlike full reversals, partially reversed transactions must be sent for clearing. In a partial reversal, there are two transactions: one with the original transaction amount and another partial reversal transaction with a lower amount. Both transactions must be sent for clearing so that the Merchant's Processor can calculate the Settlement amount (the new transaction amount to be used for Settlement and Account Billing). For information, see Clearing.

5.2.7 AFD Test

Use this test to simulate an Automated Fuel Dispenser (AFD) transaction.

Automatic Fuel Dispensers are machines that can be used to deliver fuel to vehicles, normally at a petrol station. These are identified with a specific Merchant Category Code of 5542. The cardholder pays at the machine, normally by inserting their card (or swiping or contactless), and the fuel pump machine will then either:

- authorise a maximum amount (e.g., £100), then pump up to this, and send an advice to say how much fuel was actually delivered (common outside USA).

-or-

- authorise a nominal amount (e.g., 1 USD), then pump up to the permitted maximum it is allowed to clear according to the chargeback rules, then it will send an advice to say how much fuel was actually delivered (common in USA).

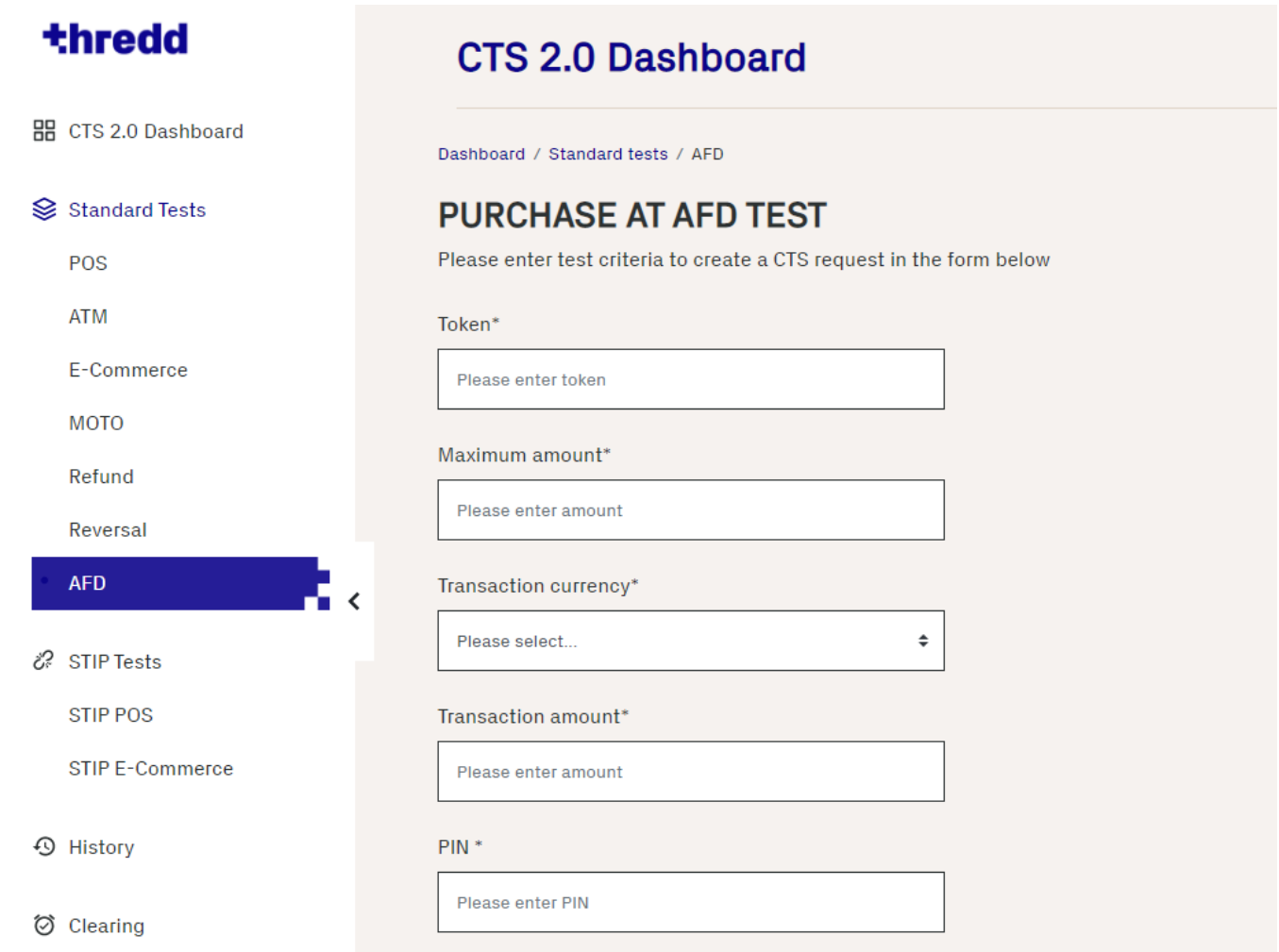


Figure 15: AFD Test Screen

1. Enter the 9-digit **Token**
2. Enter the **Maximum amount**.
3. Enter the **Transaction currency** and **Transaction amount**.

   Note: If the transaction currency is different to the billing currency of the card, Thredd provides an FX transaction based on static values pulled from a database. These rates may not represent the market value.
4. Enter a card **PIN**.
5. Select the **AFD Location - Country** from the drop-down list.
6. Select the **MCC 5542** Merchant Category Code from the drop-down list.
7. If you're using a token that is associated with a sub-network, click the *Process transaction via MNE* checkbox. For more information on MNE, see CTS and Mastercard Network Exchange.
8. Click **Run Test**.

5.3 Running a STIP test

Use this test to simulate scheme Stand-in Processing (STIP) messages for POS and e-commerce transactions.

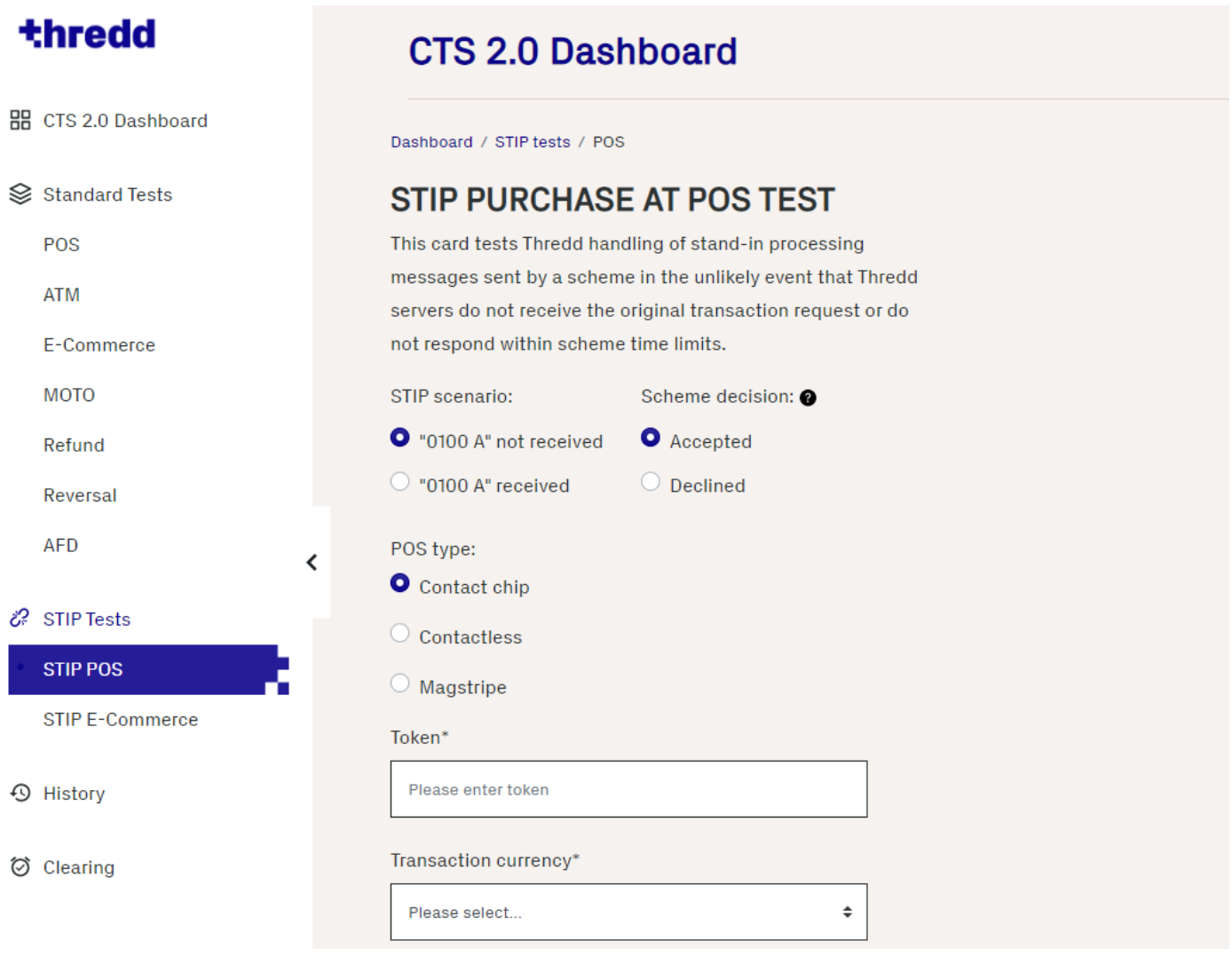


Figure 16: STIP Tests Screen

1. Select the STIP scenario and decision that you would like to simulate.
2. Choose the POS type from the list.
3. Enter the 9-digit **Transaction ID** that corresponds to an authorisation.
4. Enter the **Transaction currency** and **Transaction amount**.

   Note: If the transaction currency is different to the billing currency of the card, Thredd provides an FX transaction based on static values pulled from a database. These rates may not represent the market value.

5. For the STIP E-Commerce test, select a **Merchant Location**.
6. If you're using a token that is associated with a sub-network, click the *Process transaction via MNE* checkbox. For more information on MNE, see CTS and Mastercard Network Exchange.
7. Click **Run Test**.

5.4 Transaction History

The History screen displays a list of all the transactions made using CTS.

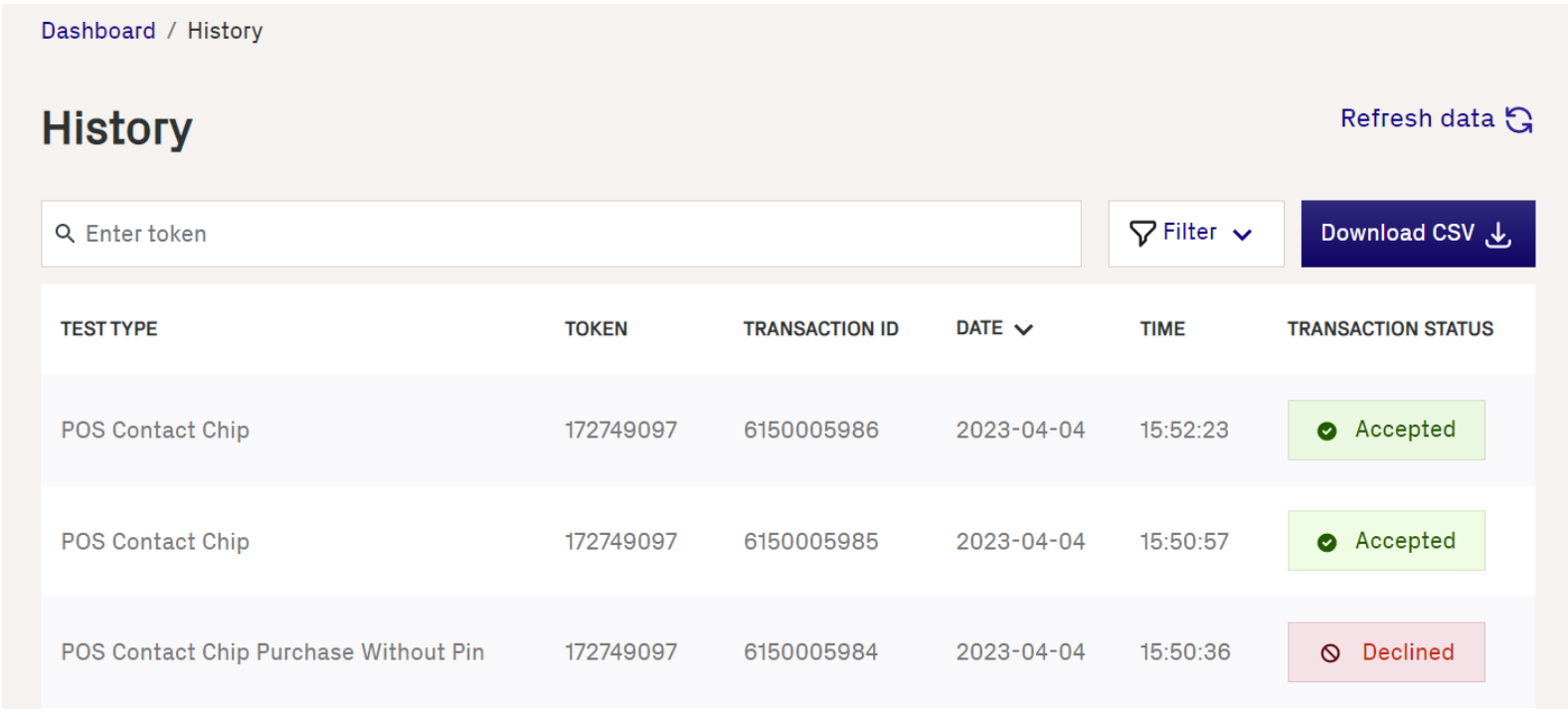


Figure 17: History Screen

5.4.1 Filtering transactions

To filter transactions, click **Filters**. The filter pane appears where you can refine the list of transactions:

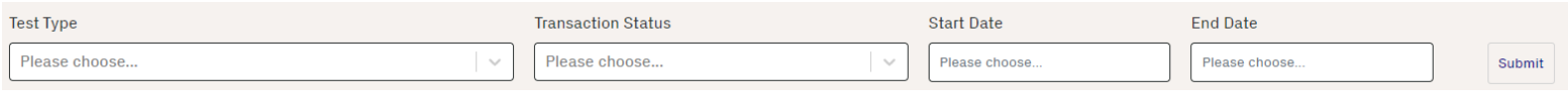


Figure 18: Filter pane

Click **Submit** to apply a filter.

5.4.2 Exporting data to CSV

To export data to a CSV file, click **CSV**. If you have applied a filter, only filtered data will be included in the CSV file. If no filter is applied, all data will be included.

5.5 Clearing

The Clearing screen displays a list of all eligible transactions made using CTS that can be cleared to simulate the presentment/financial record.

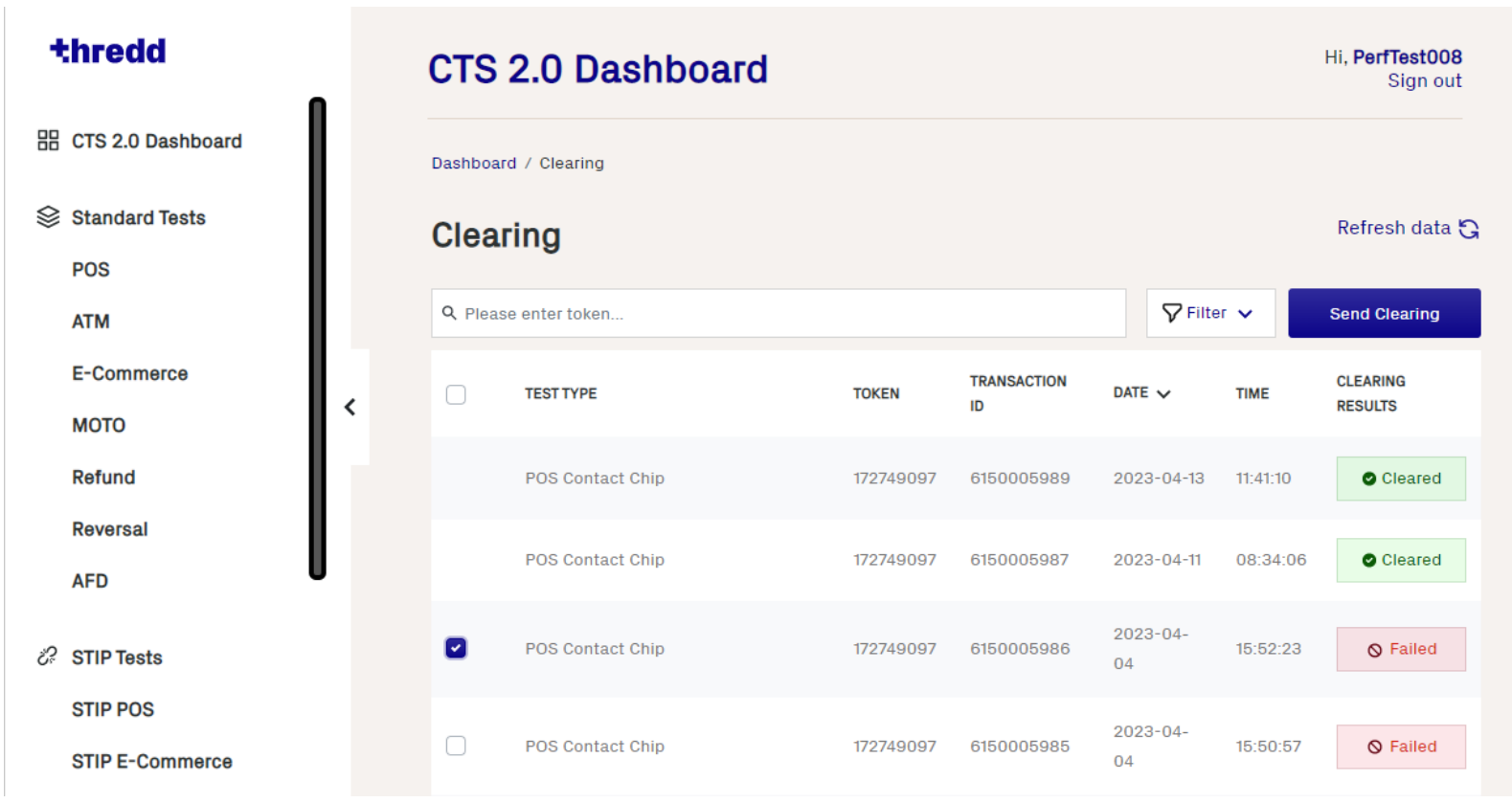


Figure 19: Clearing Screen

Select the authorisations you want to send to clearing, and then click **Send Clearing**.

Tip: To filter transactions, click **Filters**. The filter pane appears where you can refine the list of transactions.

5.5.1 Clearing Partial Reversals

Unlike full reversals, partially reversed transactions must be sent for clearing. In a partial reversal, there are two transactions: one with the original transaction amount and another partial reversal transaction with a lower amount. Both transactions must be sent for clearing so that the Merchant's Processor can calculate the Settlement amount (the new transaction amount to be used for Settlement and Account Billing).

To simulate a partial reversal:

- Run the **Reversal** standard test, and select the **Partial Reversal** option. See Reversal for more information.
- In the Clearing screen, select the transaction ID and click **Send Clearing**.

The transaction appears in the list with a status of **Clearing** or **Cleared**. Cleared transactions are also visible in the **History** screen.

FAQs

This section provides answers to frequently asked questions about CTS.

Q. What MCC codes are used?

The following Merchant Category Codes (MCC) are used:

- E-commerce: 5734 – Computer Software Stores
- MOTO: 5311 – Department Stores
- POS: 5734 – Computer Software Stores
- ATM: 6011 – Automated Cash Disburse

Q. What merchant name is displayed on the transactions?

The following Merchant names are displayed:

- E-commerce: e-commerce merchant
- MOTO: moto merchant
- POS: Shop with Chip POS
- ATM: offsite ATM

Q. Are PSD2 counter limits validated in CTS?

Currently the CTS system does not validate against any PSD2 counters that may be setup in the system as there are several different hosts that manage these limits.

Q. Are contactless limits validated in the CTS tests?

Due to the contactless limits varying by country, currency and merchant, CTS is unable to validate this.

Q. What FX Rate does CTS provide?

If the transaction currency is different to the billing currency of the card, Thredd provides an FX transaction based on static values pulled from a database. These rates may not represent the market value.

Q. What is Mastercard Network Exchange?

This is a processing network for US issuers, where messages are processed based on Single Message standards. This network enables one stop integration for the US Local Debit Networks such as STAR, PULSE, NYCE.

Glossary

This page provides a list of glossary terms used in this guide.

A

Acquirer

: The merchant acquirer or bank that offers the merchant a trading account, to enable the merchant to take payments in store or online from cardholders.

ATM

: Automated Teller (Cash) Machine.

Authorisation

: Stage where a merchant requests approval for a card payment by sending a request to the card issuer to check that the card is valid, and that the requested authorisation amount is available on the card. At this stage the funds are not deducted from the card.

C

Contact chip

: Card transaction where the POS terminal reads and validates the card's chip.

Contactless

: Secure payment method using a debit or credit card or another payment device by using RFID technology and near-field communication. To use the system, a cardholder taps the payment card near a POS terminal equipped with the technology.

CVV2

: The Card Verification Value (CVV) on a credit card or debit card is a 3 digit number on VISA, MasterCard and Discover branded credit and debit cards. Cardholder's are typically required to enter the CVV during any online or cardholder not present transactions. CVV numbers are also known as CSC numbers (Card Security Code), as well as CVV2 numbers, which are the same as CVV numbers, except that they have been generated by a 2nd generation process that makes them harder to guess.

E

EHI

: The External Host Interface (EHI) is a Thredd system that enables Thredd customers to receive and respond to real-time transaction data as well as financial messages.

EMV

: EMV is a payment standard for smart payment cards, payment terminals and automated teller machines (ATMs). EMV is an acronym for "Europay, Mastercard, and Visa", the three companies which created the standard.

External Host

: The external system to which Thredd sends real-time transaction-related data. The URL to this system is configured within Thredd per programme or product. The Program Manager uses their external host system to hold details of the balance on the cards in their programme and perform transaction-related services, such as payment authorisation, transaction matching and reconciliation.

I

Issuer

: Financial organisation and scheme member, licensed by the scheme to issue cards and process transactions using the scheme's network.

M

Magstripe

: The magnetic stripe on the back of the card. Can be used for a card point of sale (POS) transaction using a merchant POS terminal.

Mastercard Networks Exchange

: Enables smaller networks to use Mastercard as a routing platform for payments. Can also be referred to as MNEX or MNGS.

Merchant

The shop or store providing a product or service that the cardholder is purchasing. A merchant must have a merchant account, provided by their acquirer, in order to trade. Physical stores use a terminal or card reader to request authorisation for transactions. Online sites provide an online shopping basket and use a payment service provider to process their payments.

Merchant Category Code (MCC)

A unique identifier of the merchant, to identity the type of account provided to them by their acquirer.

MOTO

Mail and Telephone Order (MOTO) transaction, which is a payment made over the telephone (e.g., via a Call centre) or via a mail order catalogue.

P

POS

Point of Sale transaction.

S

Single Message System

A transaction processing message standard which combines authorisation and presentment into a single message.

Smart Client

Smart Client is Thredd's legacy desktop application for managing your account on the Thredd Platform.

Stand In Processing (STIP)

The card network (Visa and Mastercard) may perform approve or decline a transaction authorisation request on behalf of the card issuer. Depending on your Thredd mode, Thredd may also provide STIP on your behalf, where your systems are unavailable.

T

Thredd Portal

Thredd Portal is Thredd's new web application for managing your cards and transactions on the Thredd Platform.

Thredd Web Services

Thredd’s SOAP based Application Program Interface (API) which enables integration of your systems with Thredd.

V

Validation

Checks to confirm the card is valid, such as CHIP cryptograms, mag-stripe data (if available) and expiry date

Document History

Version	Date	Description	Author
1.7	11/02/2025	Added references to Thredd Portal, our new web application for managing your cards and transactions.	JB
	29/02/2024	Mastercard Network Exchange functionality added to Standard and STIP tests. See Using the CTS Dashboard.	JB
	31/05/2023	Updated Operations email address to be occ@thredd.com	MW
	27/04/2022	Guide rebrand to new company name and brand identity.	JB
1.6	21/12/2022	Updated the numbering in the Table of Contents	MW
1.6	01/12/2022	Updated the Copyright Statement	MW
1.5	16/11/2022	Addition of AFD test, CVS History Export, Partial Reversals, POS without PIN, PSD2 Contactless transactions, Magstripe and contactless cash withdrawals, PIN Change, and MCC capabilities	AL
1.4	12/08/2022	New guide layout and HTML version now available	PC
1.3	07/06/2022	Documentation improvements	AL
1.2	06/04/2021 06/04/2022	Additional POS tests added STIP added Reversals added Minor text amendments	AW WS
1.1	13/04/2021	Clearing added	AW
1.0	09/02/2021	First version	AW

Contact Us

Please contact us if you have queries relating to this document. Our contact details are provided below.

Thredd Ltd.

Support Email: occ@thredd.com

Support Phone: +44 (0) 203 740 9682

Our Head Office

6th Floor,

Victoria House,

Bloomsbury Square,

London,

WC1B 4DA

Telephone: +44 (0)330 088 8761

Technical Publications

If you want to contact our technical publications team directly, for queries or feedback related to this guide, you can email us at: docs@thredd.com.