FOMO Pay

Integration Guide

Mobile Payment Integration (POS)

v1.3.1

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1. Change Log

V1.3.0

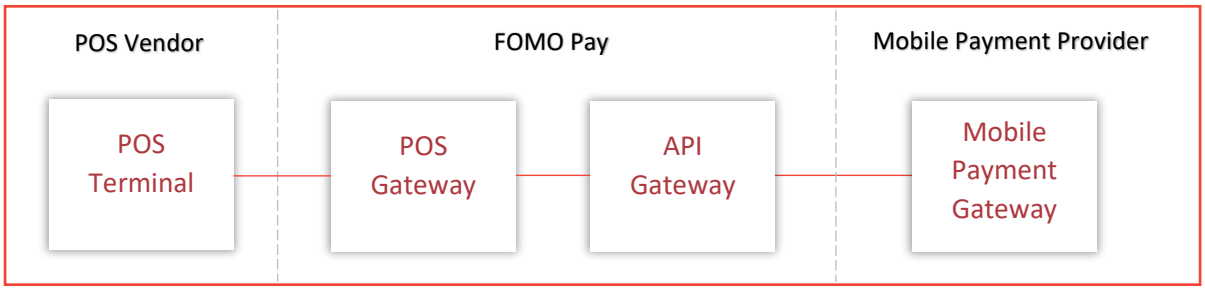
Page	Comments
1	Add change log
14	Add new Message API for batch pre-submit
15	Add new field 114 in batch submit response
16	Add new Message API to retrieve supported SOF of a terminal
19	Add new Resource API for SOF query
23	Add Table 12 - Table 16 in Appendix
24-25	Add Response 1, Response 2 in Appendix
all	Update footer

V1.3.1

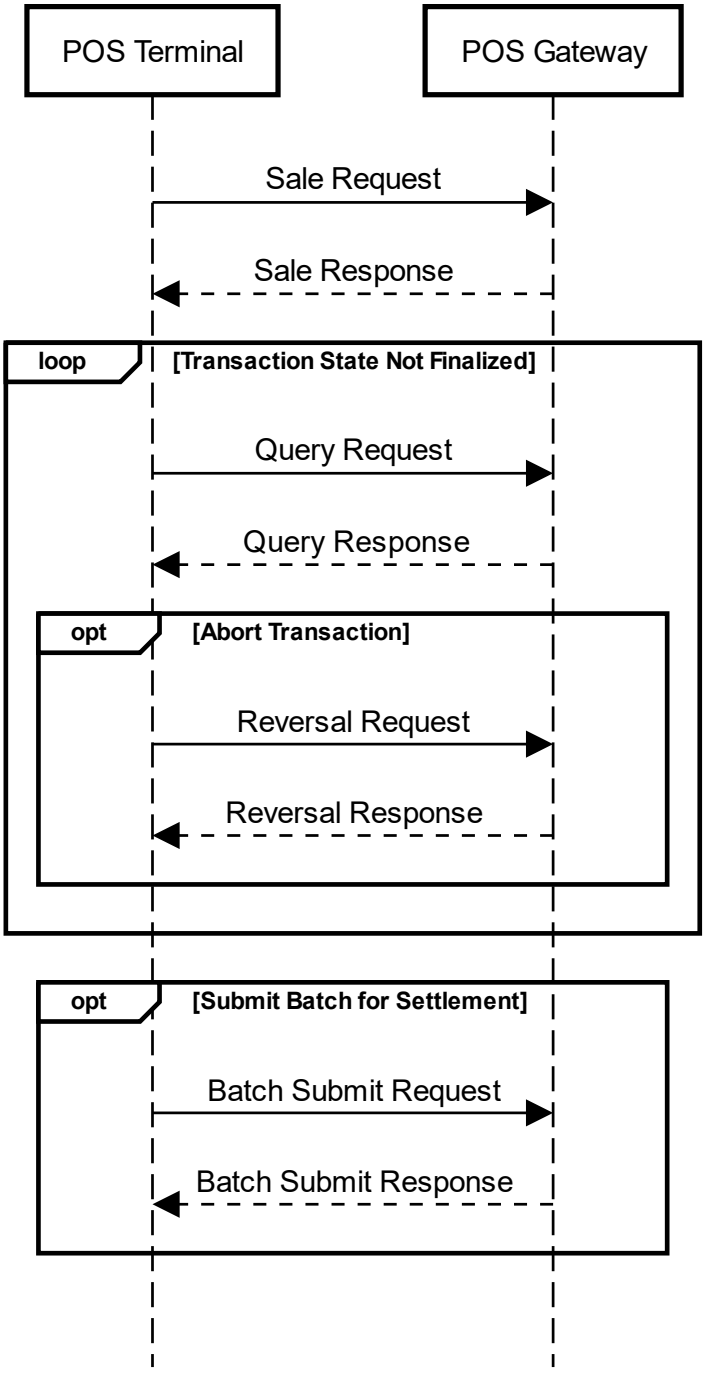
Page	Comments
11	Reversal Request is deprecated
9-10,12-19	Add new field 113 in API responses

2. Introduction

This document describes the interface specifications required for POS integration with FOMO Pay.



3. Sequence Diagram



4. POS Gateway Interface

1. URL

SIT/UAT	https://uat.pos.fomopay.net/rpc
Production	https://pos.fomopay.net/rpc

2. Request Content Type

application/json; charset=utf-8
OR
application/json

3. Request Method

HTTP POST

4. Response Content Type

application/json; charset=utf-8
OR
application/json

5. Request and Response Body (Sample)


```
{"0":"0200","1":"a238408000c080000000010001000000","3":"000000","7":"1231235959","11":"0
00135","12":"235959","13":"1231","18":"0005","25":"20","41":"22222222","42":"11111111111
1111","49":"SGD","88":"000000001000","104":"Payment Description"}
```

5. Security and Encryption

1. Transport Security

Transport Layer Security (TLS) 1.2.

2. Message Authentication

Following algorithm is used to authenticate both client (POS terminal) and server (POS gateway) in addition to TLS.

Prerequisite

The following keys are required:

1. RSA key pair (key pair 1) generated by POS vendor (See Appendix – Generating an RSA Key Pair).
2. RSA key pair (key pair 2) generated by FOMO Pay.

POS vendor shall share public key of key pair 1 with FOMO Pay. FOMO Pay will register the two key pairs in POS gateway system and share public key of key pair 2 with POS vendor. A key id representing the two key pairs will also be shared with POS vendor.

POS vendor shall have the following after key exchange.

- Private key of key pair 1
- Public key of key pair 2
- Key id representing the two key pairs.

Algorithm

Before sending a message to POS gateway, the message shall be signed. Any message not properly signed or not properly formatted will be rejected by POS gateway.

The signing algorithm is as follows:

1. POS terminal serialize JSON to an UTF-8 encoded string buffer `[payload]`.
2. POS terminal generates UNIX timestamp `[timestamp]` and a nonce `[nonce]` on device. `[timestamp]` should be in 10 digits and `[nonce]` should have a length of 16 – 256.
3. POS terminal concatenate the payload, timestamp and nonce and get byte array to be digested.
4. POS terminal calculate the signature of the byte array using SHA256WithRSA with private key of key pair 1 and get the raw sign.
5. POS terminal then convert the raw sign to lowercase hexadecimal `[sign]`.
6. POS terminal prepare HTTP request in following format.

7. POST the message to POS gateway URL.

Headers	
X-Authentication-Version	1.1
X-Authentication-Method	SHA256WithRSA
X-Authentication-KeyId	[keyid]
X-Authentication-Nonce	[nonce]
X-Authentication-Timestamp	[timestamp]
X-Authentication-Sign	[sign]
Content-Type	application/json
Body	
[payload]	

Upon receiving message from POS gateway, the POS terminal shall verify the signature in the response HTTP header.

The verification algorithm is as follows:

1. POS terminal extracts the following HTTP headers from HTTP response.

X-Authentication-Version	[version]
X-Authentication-Method	[method]
X-Authentication-Nonce	[nonce]
X-Authentication-Timestamp	[timestamp]
X-Authentication-Sign	[sign]
Content-Type	[content-type]

2. If one or more condition of the following does not satisfy, reject the response.
    - version is 1.1
    - method is SHA256WithRSA
    - nonce exists and was not used by POS gateway within 300 seconds
    - timestamp within ± 300 seconds of current time
3. POS terminal reads response body [payload] from HTTP response.
4. POS terminal concatenate the payload, timestamp and nonce and get byte array to be digested.
5. POS terminal verifies the digest against received signature sign using SHA256WithRSA with public key of key 2.
6. If the signature cannot be verified, reject the response.

6. Symbols and Abbreviated Terms

1. Field Types

Abbreviation	Description	Comment
a	Alpha and space	a-zA-ZSPACE
n	Numeric values only	0-9
s	Special characters only	!"#$%&'()*+,-./:;<=>?@[\]^_`{|}~
.x	Variable length field up to x bytes	
..xx	Variable length field up to xx bytes	
...xxx	Variable length field up to xxx bytes	

2. Required Flag

Abbreviation	Description
M	Mandatory
O	Optional
C	Conditional
X	Not supported

7. Message Types and Specification

1. Sale Request

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0200
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	000000
7	Transmission date & time (MMDDHHmmss)	n10	M	
11	System trace audit number (STAN)	n6	M	
12	Local transaction time (HHmmss)	n6	M	
13	Local transaction date (MMDD)	n4	M	
18	Merchant type, or merchant category code	n4	M	ISO 18245
25	Point of service condition code	n2	M	See Appendix - Table 1
41	Card acceptor terminal identification	ans8	M	Terminal ID assigned by FOMO Pay
42	Card acceptor identification code	ans15	M	Merchant ID assigned by FOMO Pay
48	Additional data (private)	an...999	C	See Appendix - Table 1
49	Currency code, transaction	a3	M	ISO 4217 currency code
54	Additional amounts	an...120	O	See Appendix – Table 9
62	Order number	ans...999	O	Order number assigned by merchant
88	Total amount of debits	n12	M	The amount of payment is accurate to the smallest unit of currency
104	Transaction description	ans...100	M	Description of the transaction to be shown on user e-wallet or e-receipt(length is required to be greater or equal than 1)

2. Sale Response

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0210
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	Return Unchanged
7	Transmission date & time (MMDDHHmmss)	n10	M	Return Unchanged
11	System trace audit number (STAN)	n6	M	Return Unchanged
12	Local transaction time (HHmmss)	n6	M	Return Unchanged
13	Local transaction date (MMDD)	n4	M	Return Unchanged
18	Merchant type, or merchant category code	n4	M	Return Unchanged
25	Point of service condition code	n2	M	Return Unchanged
37	Retrieval reference number	an...24	C	Unique reference number assigned by FOMO Pay Applicable when request success
39	Response code	n2	M	See Appendix – Table 2
41	Card acceptor terminal identification	ans8	M	Return Unchanged
42	Card acceptor identification code	ans15	M	Return Unchanged
49	Currency code, transaction	a3	M	Return Unchanged
54	Additional amounts	an...120	O	Return Unchanged
62	Order number	ans...999	O	Return Unchanged
63	Payment QR code	ans...999	C	
88	Total amount of debits	n12	M	Return Unchanged
104	Transaction description	ans...100	M	Return Unchanged
113	Message	ans...999	C	Error Message in hexadecimal encoding when Response Code is not 00

3. Query Request

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0100
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	300000
7	Transmission date & time (MMDDHHmmss)	n10	M	
11	System trace audit number (STAN)	n6	M	Same as STAN in Sale Request
41	Card acceptor terminal identification	ans8	M	Terminal ID assigned by FOMO Pay
42	Card acceptor identification code	ans15	M	Merchant ID assigned by FOMO Pay

4. Query Response

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0110
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	Return Unchanged
7	Transmission date & time (MMDDHHmmss)	n10	M	Return Unchanged
11	System trace audit number (STAN)	n6	M	Return Unchanged
39	Response code	n2	M	See Appendix – Table 3
41	Card acceptor terminal identification	ans8	M	Return Unchanged
42	Card acceptor identification code	ans15	M	Return Unchanged
113	Message	ans...999	C	Error Message in hexadecimal encoding when Response Code is not indicating a status (00, 05, 06, 09, 21, 22, 23 are indicating transaction status)

5. Reversal Request

Reversal can be initiated only when the original transaction is successful, and the transaction batch is not yet submitted.

Note: Reversal is currently supported for WeChat Pay, Alipay and Singtel Dash transactions. Others will be supported in the future.

Note: Reversal is deprecated and not updated from V1.3.0. Please use Void and Refund instead.

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0420
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	000000
7	Transmission date & time (MMDDHHmmss)	n10	M	
11	System trace audit number (STAN)	n6	M	Same as STAN in Sale Request
41	Card acceptor terminal identification	ans8	M	Terminal ID assigned by FOMO Pay
42	Card acceptor identification code	ans15	M	Merchant ID assigned by FOMO Pay

6. Reversal Response

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0430
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	Return Unchanged
7	Transmission date & time (MMDDHHmmss)	n10	M	Return Unchanged
11	System trace audit number (STAN)	n6	M	Return Unchanged
39	Response code	n2	M	See Appendix – Table 4
41	Card acceptor terminal identification	ans8	M	Return Unchanged
42	Card acceptor identification code	ans15	M	Return Unchanged

7. Void Request

Void can be initiated for any transaction, but the transaction batch must have not been submitted.

Note: Void can be called for any transaction when the payment status is not SUCCESS. Or Void can be called for WeChat Pay, Alipay Singtel Dash and GrabPay transaction when payment status is SUCCESS. Others will be supported in the future.

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0440
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	000000
7	Transmission date & time (MMDDHHmmss)	n10	M	
11	System trace audit number (STAN)	n6	M	Same as STAN in Sale Request
41	Card acceptor terminal identification	ans8	M	Terminal ID assigned by FOMO Pay
42	Card acceptor identification code	ans15	M	Merchant ID assigned by FOMO Pay

8. Void Response

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0450
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	Return Unchanged
7	Transmission date & time (MMDDHHmmss)	n10	M	Return Unchanged
11	System trace audit number (STAN)	n6	M	Return Unchanged
39	Response code	n2	M	See Appendix – Table 5
41	Card acceptor terminal identification	ans8	M	Return Unchanged
42	Card acceptor identification code	ans15	M	Return Unchanged
113	Message	ans...999	C	Error Message in hexadecimal encoding when Response Code is not 00

9. Cancel Request

Cancel can be initiated only when the original transaction is not finished, and transaction batch is not yet submitted. E.g. The QR code has been generated but payment is not yet made.

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0460
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	000000
7	Transmission date & time (MMDDHHmmss)	n10	M	
11	System trace audit number (STAN)	n6	M	Same as STAN in Sale Request
41	Card acceptor terminal identification	ans8	M	Terminal ID assigned by FOMO Pay
42	Card acceptor identification code	ans15	M	Merchant ID assigned by FOMO Pay

10. Cancel Response

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0470
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	Return Unchanged
7	Transmission date & time (MMDDHHmmss)	n10	M	Return Unchanged
11	System trace audit number (STAN)	n6	M	Return Unchanged
39	Response code	n2	M	See Appendix – Table 6
41	Card acceptor terminal identification	ans8	M	Return Unchanged
42	Card acceptor identification code	ans15	M	Return Unchanged
113	Message	ans...999	C	Error Message in hexadecimal encoding when Response Code is not 00

11. Refund Request

Refund can be initiated only when original transaction is successful regardless of the status of the transaction batch. E.g. Transaction can be refunded after settlement.

Note: Refund is currently only supported at merchant portal. Refund through direct API call will be supported in the future.

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0400
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	000000
7	Transmission date & time (MMDDHHmmss)	n10	M	
11	System trace audit number (STAN)	n6	M	
12	Local transaction time (HHmmss)	n6	M	
13	Local transaction date (MMDD)	n4	M	
37	Retrieval reference number	an...24	M	Same as retrieval reference number in Sale Response
41	Card acceptor terminal identification	ans8	M	Terminal ID assigned by FOMO Pay
42	Card acceptor identification code	ans15	M	Merchant ID assigned by FOMO Pay
89	Reversal amount	n12	M	Must use the same currency as in sale request
104	Transaction description	ans...100	M	Description of the transaction (refund) to be shown on user e-wallet or e-receipt

12. Refund Response

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0410
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	Return Unchanged
7	Transmission date & time (MMDDHHmmss)	n10	M	Return Unchanged
11	System trace audit number (STAN)	n6	M	Return Unchanged
12	Local transaction time (HHmmss)	n6	M	Return Unchanged
13	Local transaction date (MMDD)	n4	M	Return Unchanged
37	Retrieval reference number	an...24	M	Return Unchanged
39	Response code	n2	M	See Appendix – Table 7
41	Card acceptor terminal identification	ans8	M	Return Unchanged
42	Card acceptor identification code	ans15	M	Return Unchanged
89	Reversal amount	n12	M	Return Unchanged
104	Transaction description	ans...100	M	Return Unchanged
113	Message	ans...999	C	Error Message in hexadecimal encoding when Response Code is not 00

13. Batch Pre-submit Request

Batch submit is to group a set of transactions into a batch. **Only batch submitted transactions** will be settled to merchant.

Batch pre-submit is an optional step for merchant to check current batch summary before making batch submit request.

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0500
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	300000
7	Transmission date & time (MMDDHHmmss)	n10	M	
41	Card acceptor terminal identification	ans8	M	Terminal ID assigned by FOMO Pay
42	Card acceptor identification code	ans15	M	Merchant ID assigned by FOMO Pay

14. Batch Pre-submit Response

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0510
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	Return Unchanged
7	Transmission date & time (MMDDHHmmss)	n10	M	Return Unchanged
39	Response code	n2	M	See Appendix – Table 8
41	Card acceptor terminal identification	ans8	M	Return Unchanged
42	Card acceptor identification code	ans15	M	Return Unchanged
113	Message	ans...999	C	Error Message in hexadecimal encoding when Response Code is not 00
114	Batch summary	ans...999	M	Serialized JSON Object See Appendix – Response 1

15. Batch Submit Request

Batch submit is to group a set of transactions into a batch. **Only batch submitted transactions** will be settled to merchant.

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0500
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	000000
7	Transmission date & time (MMDDHHmmss)	n10	M	
41	Card acceptor terminal identification	ans8	M	Terminal ID assigned by FOMO Pay
42	Card acceptor identification code	ans15	M	Merchant ID assigned by FOMO Pay

16. Batch Submit Response

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0510
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	Return Unchanged
7	Transmission date & time (MMDDHHmmss)	n10	M	Return Unchanged
39	Response code	n2	M	See Appendix – Table 8
41	Card acceptor terminal identification	ans8	M	Return Unchanged
42	Card acceptor identification code	ans15	M	Return Unchanged
113	Message	ans...999	C	Error Message in hexadecimal encoding when Response Code is not 00
114	Batch summary	ans...999	M	Serialized JSON Object See Appendix – Response 1

17. Retrieve Supported Sources of Fund Request

Retrieve supported sources of fund is an optional step for merchant to get the list of supported sources of fund (presented as condition codes in Appendix - Table 1) for a terminal.

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0800
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	600000
7	Transmission date & time (MMDDHHmmss)	n10	M	
41	Card acceptor terminal identification	ans8	M	Terminal ID assigned by FOMO Pay
42	Card acceptor identification code	ans15	M	Merchant ID assigned by FOMO Pay

18. Retrieve Source of Fund Response

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0810
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	Return Unchanged
7	Transmission date & time (MMDDHHmmss)	n10	M	Return Unchanged
39	Response code	n2	M	See Appendix – Table 12
41	Card acceptor terminal identification	ans8	M	Return Unchanged
42	Card acceptor identification code	ans15	M	Return Unchanged
113	Message	ans...999	C	Error Message in hexadecimal encoding when Response Code is not 00
116	Supported sources of fund	ans...999	M	Serialized JSON String Array of condition codes See Appendix – Response 2

19. Static QR Notification Request

Note: See Appendix – Static QR Notification

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0120
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	300000
7	Transmission date & time (MMDDHHmmss)	n10	M	
11	System trace audit number (STAN)	n6	C	See Appendix – Table 10
41	Card acceptor terminal identification	ans8	M	Terminal ID assigned by FOMO Pay
42	Card acceptor identification code	ans15	M	Merchant ID assigned by FOMO Pay

20. Static QR Notification Response

Note: See Appendix – Static QR Notification

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0130
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	Return Unchanged
7	Transmission date & time (MMDDHHmmss)	n10	M	Return Unchanged
11	System trace audit number (STAN)	n6	C	See Appendix – Table 10
39	Response code	n2	M	See Appendix – Table 11
41	Card acceptor terminal identification	ans8	M	Return Unchanged
42	Card acceptor identification code	ans15	M	Return Unchanged
113	Message	ans...999	C	Error Message in hexadecimal encoding when Response Code is not 00

21. Static Query Request

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0140
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	300000
7	Transmission date & time (MMDDHHmmss)	n10	M	
11	System trace audit number (STAN)	n6	M	Same as STAN in Static QR Notification Request
41	Card acceptor terminal identification	ans8	M	Terminal ID assigned by FOMO Pay
42	Card acceptor identification code	ans15	M	Merchant ID assigned by FOMO Pay

22. Static Query Response

Key	Field Name	Field Type	Required	Comments
0	Message type identifier	n4	M	0150
1	Bitmap	an16/an32	M	See Appendix – Bitmap Calculation
3	Processing code	n6	M	Return Unchanged
7	Transmission date & time (MMDDHHmmss)	n10	M	Return Unchanged
11	System trace audit number (STAN)	n6	M	Return Unchanged
25	Point of service condition code	n2	C	See Appendix - Table 1 Applicable when request success
37	Retrieval reference number	an...24	C	Unique reference number assigned by FOMO Pay Applicable when request success
39	Response code	n2	M	See Appendix – Table 3
41	Card acceptor terminal identification	ans8	M	Return Unchanged
42	Card acceptor identification code	ans15	M	Return Unchanged
49	Currency code, transaction	a3	C	ISO 4217 currency code Applicable when request success
88	Total amount of debits	n12	C	The amount of payment is accurate to the smallest unit of currency Applicable when request success
113	Message	ans...999	C	Error Message in hexadecimal encoding when Response Code is not indicating a status (00, 05, 06, 09, 21, 22, 23 are indicating transaction status)

8. Resource API

1. Query Source of Fund (SOF)

URL

`https://pos.fomopay.net/resource/sof/:conditionCode`

(Replace `:conditionCode` with `conditionCode` in Appendix - Table 1. e.g. `20` for WeChat Pay QR Code)

Method

HTTP GET

Authentication

No authentication

Description

This API allows merchant to obtain details of source of fund.

Response Content-Type

`application/json`

Response

HTTP Status Code	Comments
200	SOF Retrieved
404	SOF Not Found
500	Server Error

When HTTP status code is `2xx`

Key	Field Name	Field Type	Required	Comments
name	SOF Name	string	M	Name of SOF
country	SOF Country	string	M	Country of SOF ISO3166 alpha-2
presentation	SOF Presentation	string	M	See Appendix - Table 13
mode	SOF Mode	string	M	See Appendix - Table 14
type	SOF Type	string	M	See Appendix - Table 15
images	SOF Images	object	M	See Appendix - Table 16

9. Appendix

Table 1 – Condition Code for Sale Request

Condition Code (25)	Field Name	Additional Data (48)
20	WeChat Pay QR Code	X, not supported. Do not include this field with your request.
21	WeChat Pay Quick Pay	M, mandatory. Scanned WeChat barcode (authorization code). WeChat barcodes consist of 18 digits starting with 10, 11, 12, 13, 14 or 15.
28	Singtel Dash QR Code	X, not supported. Do not include this field with your request.
30	Alipay Merchant QR Code	X, not supported. Do not include this field with your request.
31	Alipay Barcode	M, mandatory. Scanned Alipay barcode. Alipay barcodes consist of 16 - 24 digits starting with 25, 26, 27, 28, 29 or 30.
36	NETS QR	X, not supported. Do not include this field with your request.
50	GrabPay	X, not supported. Do not include this field with your request.
52	Razer Pay	X, not supported. Do not include this field with your request.
54	UnionPay	X, not supported. Do not include this field with your request.
82	PayNow	X, not supported. Do not include this field with your request.
46	ShopeePay	X, not supported. Do not include this field with your request.
90	WeChat Pay Static QR	N.A.
92	Singtel Dash Static QR	N.A.
95	Alipay Static QR	N.A.
94	NETS Static QR	N.A.
60	GrabPay Static QR	N.A.
61	Razer Pay Static QR	N.A.
62	UnionPay Static QR	N.A.
98	PayNow Statis QR	N.A.
63	ShopeePay Statis QR	N.A.

Table 2 – Response Code for Sale Response

Response Code	Field Name
00	Request completed successfully
03	Invalid merchant
05	Do not honor
06	Unsupported condition code
09	Request in progress
26	Duplicate record
30	Format error
96	System malfunction

Table 3 – Response Code for Query/Static Query Response

Response Code	Field Name
00	Payment success
03	Invalid merchant
05	Payment error
06	Payment closed
09	Payment in progress
12	Invalid transaction
21	Payment void
22	Payment reversed
23	Payment cancelled
30	Format error
96	System malfunction

Table 4 – Response Code for Reversal Response

Response Code	Field Name
00	Request completed successfully
03	Invalid merchant
05	Do not honor
06	Request not applicable
12	Invalid transaction
30	Format error
96	System malfunction

Table 5 – Response Code for Void Response

Response Code	Field Name
00	Request completed successfully
03	Invalid merchant
05	Do not honor
06	Request not applicable
12	Invalid transaction
30	Format error
96	System malfunction

Table 6 – Response Code for Cancel Response

Response Code	Field Name
00	Request completed successfully
03	Invalid merchant
05	Do not honor
06	Request not applicable
12	Invalid transaction
30	Format error
96	System malfunction

Table 7 – Response Code for Refund Response

Response Code	Field Name
00	Request completed successfully
03	Invalid merchant
05	Do not honor
06	Request not applicable
12	Invalid transaction
30	Format error
96	System malfunction

Table 8 – Response Code for Batch Submit/Pre-submit Response

Response Code	Field Name
00	Request completed successfully
03	Invalid merchant
30	Format error
96	System malfunction

Table 9 – Additional Amounts (54) for Sale Request

Flag	Name	Format
B	Base amount (Same unit as Total amount of debits)	B000000000000
T	Tip amount (Same unit as Total amount of debits)	T000000000000

Example:

For base amount 1000 cents and tip amount 200 cents, use
B000000001000T000000000200

Table 10 – STAN for Static QR Notification Request/Response

Phase	STAN (11)
Polling phase	X, not supported. Do not include this field with your request.
Fetching phase	M, mandatory.

Table 11 – Response Code for Static QR Notification Response

Response Code	Field Name
00	Long polling phase: pending transaction exists Fetching phase: STAN accepted
03	Invalid merchant
12	No pending transaction
26	Duplicate record
30	Format error
96	System malfunction

Table 12 – Response Code for Retrieve Supported SOF Response

Response Code	Field Name
00	Request completed successfully
03	Invalid merchant
30	Format error
96	System malfunction

Table 13 – List of SOF Presentation

Presentation	Description
QR	QR Code

Table 14 – List of SOF Mode

Mode	Description
MPM	Merchant presented mode
CPM	Consumer presented mode

Table 15 – List of SOF Type

Type	Description
STATIC	Static QR code when presentation is QR
DYNAMIC	Dynamic QR code when presentation is QR

Table 16 – List of SOF Images

The images object contains the following:

Key	Value
128_128	URL to 128px-by-128px (width by height) PNG image
384_128	URL to 384px-by-128px (width by height) PNG image

Response 1 – Batch Summary

Batch Summary is a serialized JSON object which has the following content:

```
{
    "batch": string,
    "sale": TStats,
    "refund": TStats
}
```

<batch>: Current batch number.

<sale>: Summary for sale transactions.

<refund>: Summary for refund transactions.

TStats is defined as:

```
{
    "success": TAmountAndCount,
    "fail": TAmountAndCount,
    "void": TAmountAndCount,
    "cancelled": TAmountAndCount,
    "closed": TAmountAndCount
}
```

<success>: Summary for sale or refund transactions which are completed successfully.

<fail>: Summary for sale or refund transactions which are failed.

<void>: Summary for sale transactions which are voided, not applicable to refund transactions.

<cancelled>: Summary for sale transactions which are cancelled, not applicable to refund transactions.

<closed>: Summary for sale transactions which are closed *(sale transactions will be closed if payment not completed after timeout)*, not applicable to refund transactions.

TAmountAndCount is defined as:

```
{
    "amount": string,
    "count": number
}
```

<amount>: total amount of sale or refund transactions in current status category.

<count>: total number of sale or refund transactions in current status category.

Response 2 – Supported Sources of Fund

Supported sources of fund is a serialized JSON string array. Each element of the serialized array corresponds to a condition code listed in Appendix – Table 1.

When there is no source of fund supported for a terminal, the response is an empty array:

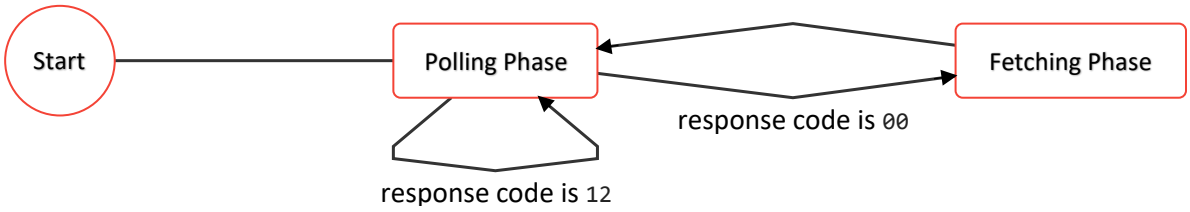
```
[]
```

When there is source of fund supported for a terminal, the response includes a list of condition codes supported by the terminal:

```
["20","30"]
```

Static QR Notification

Push notification is achieved via long polling. There are two states involved in the polling.



Polling phase

Terminal sends `0120` message without field `11` (STAN) to initialize polling. Server may hold the HTTP connection up to 30 seconds. Server will respond with `0130` message with field `39` (response code) set to `00`, `12` or other values (see Table 11 – Response code for Static QR Query Response).

Response code `12` means there is no new transaction found and terminal shall immediately perform polling again.

Response code `00` means there is a new transaction found and state machine of terminal shall immediately turn into fetching phase.

If other response code found or connection timeout/disconnected unexpectedly, server shall perform polling again after 5 seconds.

Fetching phase

Terminal sends `0120` message with field `11` (STAN) to initialize fetching. Server will respond with `0130` message with field `39` (response code) set to `00`, `12` or other values (see Table 11 – Response code for Static QR Query Response). Terminal can optionally send field 104 which is the description of the current transaction.

Response code `00` means the transaction is accepted by the server with the STAN provided by the terminal. Terminal shall immediately initiate `0140` message (static query) to query the final status of the transaction. Use the response code of static query response (see Table 3 – Response Code for Query/Static Query Response) for status and other information of the transaction. After determining the status of the transaction, state machine of terminal shall turn into polling phase.

Response code `12` means the previous transaction was aborted or cancelled. Server may hold the HTTP connection up to 30 seconds. State machine of terminal shall turn into polling phase.

If other response code found or connection timeout/disconnected unexpectedly, state machine of terminal shall turn into polling phase and perform polling after 5 seconds.

Calculating Bitmap

Bitmap is used to indicate whether data fields are present in the message.

Bitmap consists of a primary bitmap and a secondary bitmap. Secondary bitmap is optional when all keys are smaller than or equal to 64.

Field 0 and field 1 are ignored while calculating bitmap. If a secondary bitmap is used, first bit of primary bitmap must be set to 1.

Example 1:

Given fields 0, 1, 3, 7, 11, 41 and 42 present in a message. As no key larger than 64, only primary bitmap is required.

bit	0								10								20								30								40								50								60			
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
Bin	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
hex	2		2		2		0		0		0		0		0		0		c		0		0		0		0																											

Final bitmap is `2220000000c00000`.

Example 2:

Given fields 0, 1, 3, 7, 11, 12, 13, 18, 25, 41, 42, 49, 88 and 104 present in a message. As key 88 and 104 will not fit in primary bitmap, both primary and secondary bitmap must be used.

		0								10								20								30								40								50								60			
Primary	bit	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
	Bin	1	0	1	0	0	0	1	0	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	hex	a		2		3		8		4		0		8		0		0		0		c		0		8		0		0		0																											
Secondary	bit	6	0		7	0			8	0			9	0			1	0	0			1	1	0			1	2	0																												
		5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8										
	Bin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0										
	hex	0		0		0		0		0		1		0		0		0		1		0		0		0		0		0																											

Final bitmap is `a238408000c080000000010001000000`.

Generating an RSA Key Pair

Use the follow commands (in bold) to generate an RSA key pair. You will need to have `openssl` installed prior to running the commands.

Please share the file containing only public key (`posvendor.pub.pem`) with FOMO Pay for configuration. The file containing secret key (`posvendor.key.pem`) shall always be kept secure.

```
[user@host secure]~ openssl genrsa -out posvendor.key.pem 2048
Generating RSA private key, 2048 bit long modulus
..............................+++
........................+++
e is 65537 (0x10001)
[user@host secure]~ openssl rsa -in posvendor.key.pem -pubout -out posvendor.pub.pem
writing RSA key
[user@host secure]~ ls
posvendor.key.pem
posvendor.pub.pem
```

Example

`posvendor.pub.pem`

```
-----BEGIN PUBLIC KEY-----
[content omitted]
-----END PUBLIC KEY-----
```

`posvendor.key.pem`

```
-----BEGIN RSA PRIVATE KEY-----
[content omitted]
-----END RSA PRIVATE KEY-----
```