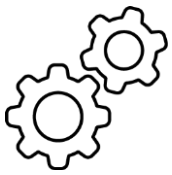
New Payments Platform

NPP QR Code Standard



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Documents Referenced

Document number	Short name	Long name	Version location
1	EMV QRCPS	EMVCo QR Code Specification for Payment Systems (EMV QRCPS) Merchant Presented Mode	https://www.emvco.com/terms-of-use/?u=/wp-content/uploads/documents/EMVCo-Merchant-Presented-QR-Specification-v1-1.pdf

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1 Introduction

A standardised QR Code specification for NPP payments is provided to help promote NPP payments for different use cases and to provide a consistent user experience for merchants and consumers. It will also enable interoperability in the payments industry.

The QR Code standard provides a single common QR Code that can encompass QR Code payment solutions from multiple payment service operators. It facilitates payments among different payment schemes, e-wallets and banks and encourages merchants to adopt QR Code as a payment method.

NPPA has developed a common QR Code specification for NPP payments using the EMV® Merchant-Presented QR Code Specification for Payment Systems (EMV QRCPS) published by EMVCo as a basis, as it offers an effective solution to ensure interoperability. The notational conventions used in this specification are the same as those used in EMV QRCPS.

NPPA does not mandate support of this QR Code specification for NPP Payments by participating financial institutions or third parties. Parties including NPP Participants may observe and use these Guidelines as they see fit, subject to any conditions set out in this document or in the EMV QRCPS.

2 Overview of EMV® QR Code Specification for Payment Systems

According to the design of the EMV® QRCPS, the data within a QR Code are organized in a tree-like structure of data objects. A data object may be a primitive data object or a template. A template may include other primitive data objects and templates. Each data object is made up of three individual fields. The first field is an identifier (ID) by which the data object can be referenced. The second field is a length field that explicitly indicates the number of characters included in the third field, i.e. the value field. A data object therefore comprises the following:

- ID field, which is coded as a two-digit numeric value, with a value ranging from "00" to "99";
- Length field, which is coded as a two-digit numeric value, with a value ranging from "01" to "99"; and
- Value field, which has a minimum length of one character and maximum length of 99 characters.

A common QR Code may support multiple payment operators, where individual payment operators may define their own structures of merchant account information and make use of the common data fields, such as transaction currency and amount, contained in the common QR Code.

Specifically, the EMV Merchant-Presented QR Code supports EMVCo and non-EMVCo payment operators using IDs “02” to “25” for the EMVCo payment operators and IDs “26” to “51” for any other payment operators. For the purposes of EMV QRCPS, NPP will use ID from 26 as a template, with overlay services identified within the template.

2.1 Assumptions and general principles

The following assumptions and general principles have been considered in developing the NPP QR Codes specification in this document:

- QR Codes used across the NPP platform will be merchant presented QR Codes.
- Merchants may create the QR Code for use on the NPP platform.
- NPP Participants may provide QR Code generation for merchants.
- Third-party providers may provide QR Code generation for merchants.
- The QR Code may be consumed by an NPP Participant on behalf of customer (payer) and mapped into a payment initiation or clearing message. Note the acceptance of the payment initiation will be subject each individual financial institution supporting the acceptance of this message.
- Use of an “End To End ID” will be mandatory in the QR Code-to-pacs.008 message flow. This will be managed by a mandatory Data Object in the QR Code specification being mapped to the End to End ID element in relevant NPP pain and pacs messages.

2.2 Common business case

A Merchant-presented QR Code enables a merchant (payee) to present encoded payment details to a customer (payer), who can then verify the decoded payment details and make the payment if the satisfied that the payment information is correct.

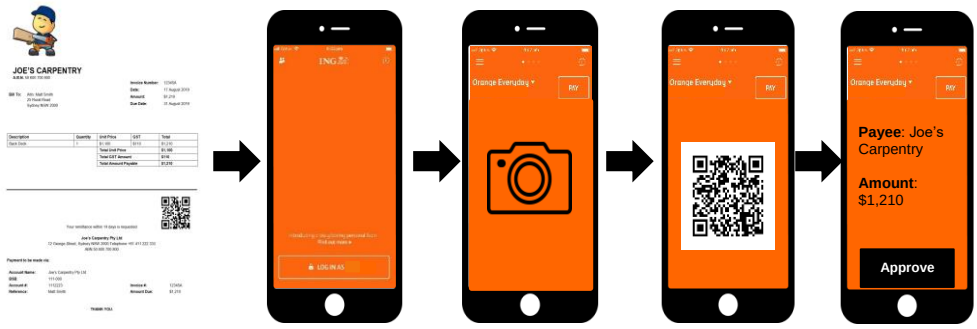
QR Codes can support various payment types, including bill payments, online payments and point-of-sale payments and are classified as static or dynamic QR Codes depending on the use case. The information encoded in static QR Codes is fixed and used for multiple transactions, while a dynamic QR Code contains additional transaction details and is used for specific transactions.

The following outlines a typical QR Code sequence:

1. Merchant displays QR Code with merchant/transaction details.
2. Customer scans QR Code using a mobile application/banking channel and inputs the amount to initiate the transaction, if required (see Transaction Value Rules on page 11).
3. Mobile application/banking channel resolves PayID (if applicable).
4. Customer is asked to verify the payment details.
5. Mobile application/channel sends a payment to the merchant's Financial Institution or payment initiation to the customer's Financial Institution.
6. The receiving Financial Institution processes the payment or payment initiation according to NPP rules.[1]
7. Mobile application/channel provides notification of the transaction details to the customer.
8. Merchant receives notification of successful transaction from their Financial Institution.

Figure 1 QR Code Invoice

1. Invoice includes a unique QR code
2. Customer scans the QR Code using their banking app - payment details are filled in automatically
3. Customer approves the payment and invoice gets paid



2.3 QR Code Payload Data Objects

The NPP QR specification follows the EMV QRCPS, organising the content of the QR Code into the following 5 groups of data objects:

- QR Code Conventions (*Table 1*)
- Merchant Account Information (*Table 2*)
- Additional Merchant Information (*Table 5*)
- Transaction Value (*Table 6*)
- Additional Data Template (*Table 7*)

The Globally Unique Identifier data object is further described in 2.4.2 below and the Merchant Account Information template to be used for NPP Payments is described in 2.4.3 below.

2.4 QR Code Conventions

The QR Code Conventions (*Table **1***) specify conventions used for the QR Code content, such as Payload Format Indicator, which defines the version of the QR Code template and hence the conventions on the identifiers, lengths and values.

ID	Name	Length	Presence for NPP	Remarks
"00"	Payload Format Indicator	02	M	A fixed value of "01"

[1] Please note third parties are required to confirm with their financial institution on the ability to support payment initiation messages.

ID	Name	Length	Presence for NPP	Remarks
“01”	Point of initiation Method	02	O	“11” for static QR Codes: “12” for dynamic QR Codes
“63”	Cyclic Redundancy Check (CRC)	04	M	Checksum calculated over all the data objects included in the QR Code.

Table 1 QR Code Conventions

General Rules

- The Payload Format Indicator (ID “00”) shall contain a value of "01"
- The Point of Initiation Method (ID “01”) shall contain a value of "11" or "12".
- The CRC (ID “63”) shall be calculated according to [ISO/IEC 13239] using the polynomial '1021' (hex) and initial value 'FFFF' (hex). The data over which the checksum is calculated shall cover all data objects, including their ID, Length and Value, to be included in the QR Code, in their respective order, as well as the ID and Length of the CRC itself (but excluding its Value). Following the calculation of the checksum, the resulting 2-byte hexadecimal value shall be encoded as a 4-character Alphanumeric Special value by converting each nibble to an Alphanumeric Special character. For example, a CRC with a two-byte hexadecimal value of '007B' is included in the QR Code as "6304007B".[2]

2.4.1 Merchant Account Information

The Merchant Account Information specifies the identity of a merchant. Each payment operator may define its own format of the Merchant Account Information IDs. *Table **2*** shows the allocation of Merchant Account Information IDs among various payment operators.

ID	Name	Length	Presence for NPP	Comments
“02”- “03”	Reserved for Visa	Variable up to 99	M	
“04”- “05”	Reserved for Mastercard			
“06”- “08”	Reserved for EMVCo			
“09” – “10”	Reserved for Discover			
“11” – “12”	Reserved for Amex			
“13”- “14”	Reserved for JCB			
“15” – “16”	Reserved for UnionPay			
“17” – “25”	Reserved for EMVCo			
One of “26” to “51”	26 designate for NPP			ID 26 has been nominated for NPP.

[2]EMVCo QR Code Specification for Payment Systems (EMV QRCPS) Merchant Presented Mode Viewed 30 April 2019: https://www.emvco.com/terms-of-use/?u=/wp-content/uploads/documents/EMVCo-Merchant-Presented-QR-Specification-v1-1.pdf

ID	Name	Length	Presence for NPP	Comments
“26”to “51”	Reserved for additional payment operators			

Table 2 Merchant Account Information

Merchant Account Information Rules

The ID “26” is designated for NPP for use in Australia. Merchants creating NPP QR Codes will complete the Merchant Account Information template for the root ID 26.

2.4.2 Globally Unique Identifier

A Merchant Account Information template shall contain a primitive Globally Unique Identifier data object, with a data object ID "00", identifying NPP as the payment operator. The identifier will be au.com.nppa and the template will contain corresponding merchant account information (*Table **3*** below).

ID	Sub-ID	Name	Format	Length	Presence for NPP	Remarks
26	“00”	Globally Unique Identifier	Ans	Var. up to “32”	M	Identifies the payment operator who uses an ID or template to define Merchant Account information. The value for NPP is the reverse domain name au.com.nppa.
	“01” – “99”	Payment network specific	S		M	Additional components required by the payment operator to define the merchant. This is purely related to the merchant (see *Table **4*** below).

Table 3 Globally Unique Identifier

Globally Unique Identifier Rules

The value of the Globally Unique Identifier field shall contain one of the following:

- An Application Identifier (AID) consisting of a RID registered with ISO and, optionally, a PIX, as defined by [ISO 7816-4]. For example, "D840000000".
- A [UUID] without the hyphen (-) separators. For example, “581b314e257f41bfbbdc6384daa31d16”.
- A reverse domain name. For example, “com.merchant.name”.

2.4.3 Merchant Account Information template for NPP

The Merchant Account Information template for NPP is described in *Table **4*** below. This is a user defined template defined for NPP use.

ID	Sub ID	Name	Format	Length	Presence for NPP	Comments
26	“00”	Globally Unique Identifier	Ans	11	M	For NPP this is au.com.nppa. (See *Table **3***)

ID	Sub ID	Name	Format	Length	Presence for NPP	Comments
	“01”	Creditor account name	ANS	Var up to 25	M	Name of the account where the merchant generating the QR Code wants funds to be deposited.
	“02”	BBAN		Var up to 25	M	BBAN for the account where the merchant generating the QR Code wants funds to be deposited.
	“03”	PayID	Ans	Var up to 33	M	This is the PayID of the Merchant sending the QR Code. A merchant may need to create a new PayID due to the 33-character limit for this Data Object.
	“04”	PayID Type	N	1	M	Where the value represents the PayID type used: 1 - Phone Number 2 - Email 3 - ABN 4 - Organisation Identifier
	“05”	Overlay Service identifier	N	Var up to 2	O	The Overlay Service identifier will be numeric made up of two numbers and will be published by NPPA as an Appendix to this specification.

Table 4 Merchant Account Information template for NPP

2.4.4 Additional Merchant Information

The Additional Merchant Information (*Table **5***) specifies the information about a merchant such as merchant name and business location. IDs 52, 58 and 59 are mandatory (M) in the EMV Co standard and have been provided with default values in the NPP implementation of the QR Code Standard.

ID	Name	Format	Length	Presence	Remarks
“52”	Merchant Category Code	N	04	M	As defined in ISO 18245 and assigned by the Acquirer. May be displayed to the customer. Where not available populate with “0000”.
“58”	Country Code	Ans	02	M	Country of the merchant acceptance device as defined by ISO 3166-1

ID	Name	Format	Length	Presence	Remarks
					Default to AU.
“59”	Merchant Name	Ans	Var up to 25	M	The name that the Merchant is known by. May be displayed to the customer.
“60”	Merchant City	Ans	Var up to 15	M	City of operation of the merchant. May be displayed to the customer.
“61”	Postal Code	Ans	Var up to 10	O	Post code. May be displayed to the customer.
“64”	Merchant information – Language Template	S	Var up to 99	O	A template with other language. This is not currently used for NPP.

Table 5 Additional Merchant Information

Rules for Additional Merchant Information

- The Merchant Category Code (MCC) (ID “52”) shall contain an MCC as defined by ISO 18245. The MCC should indicate the Merchant Category Code of the merchant. Where this is not available to the merchant, a default code of “0000” in the MCC field may be used.
- The Country Code (ID “58”) shall contain a value as defined by ISO 3166-1 alpha 2. The Country Code should indicate the country in which the merchant transacts. For NPP this will always be “AU”.
- The Merchant Name (ID “59”) shall be present. The Merchant Name should indicate the “trading” name for the merchant.
- The Merchant City shall be present (ID “60”). The Merchant City should indicate the city of the merchant's physical location.
- The Merchant Information – Language Template (ID “64”) is a template, which contains other data fields, which may be used by a mobile application to present the merchant information in an alternate language.

2.4.5 Transaction Value

The Transaction Value data objects (*Table **6***) specify the currency and amount of a transaction. They also include a tip, which allows merchants or customers to specify the tip in fixed value or percentage.

ID	Name	Format	Length	Presence for NPP	Comments
“53”	Transaction Currency	N	03	M	Defined by ISO 4217: AUD = 036
“54”	Transaction Amount	Ans	Var. up to 13	O	May be included by the merchant or mobile app may prompt the customer to input the amount to be paid.

ID	Name	Format	Length	Presence for NPP	Comments
“55”	Tip	N	02	O	Currently not included for NPP
“56”	Value of Tip Fixed	Ans	Var. up to 13	C	Conditional on 55. Currently not included for NPP
“57”	Value of Tip Percentage	Ans	Var. up to 5	C	Conditional on 55. Currently not included for NPP

Table 6 Transaction Value

Transaction Value Rules

- The Transaction Currency (ID “53”) shall conform to ISO 4217 and shall contain the 3-digit numeric representation of the currency. For NPP, AUD is represented by the value "036".
- The value should indicate the transaction currency in which the merchant transacts. The Transaction Amount (ID “54”), if present, shall be different from zero, shall only include (numeric) digits "0" to "9" and may contain a single "." character as the decimal mark. When the amount includes decimals, the "." character shall be used to separate the decimals from the integer value and the "." character may be present even if there are no decimals. The Transaction Amount shall not be included if the mobile application prompts the consumer to enter the amount to be paid to the Merchant or is presented to the consumer.

2.4.6 Additional Data Template

ID “62” is a template which includes common additional data objects such as invoice number and reference information. Values for these Data Objects can be provided by the merchant or the mobile app may prompt the customer for these values. It is also where specific information is defined for NPP transactions.

The Data Objects in the template at ID 62 are optional (O) in the EMV Co QR Code. However, 62-05, 62-06 and 62-08 are Mandatory (M) for NPP implementation.

ID	Sub- ID	Name	Format	Length	Presence for NPP	Comments
62	01	Invoice Number	Ans	Var. up to 25	O	Mapped to RmtInf/Strd/RfrdDocInf/Nb
	02	Mobile Number	Ans	Var. up to 25	O	Not used for NPP
	03	Store Label	Ans	Var. up to 25	O	Not used for NPP
	04	Loyalty Number	Ans	Var. up to 25	O	Not used for NPP
	05	Reference Label	Ans	Var. up to 10	M	Unique reference for the QR Code provided by the merchant to allow for point-to-point reconciliation between QR Code and pacs.008. Mapped to

ID	Sub- ID	Name	Format	Length	Presence for NPP	Comments
						<PmtId>/<InstrId>
	06	Customer/Consumer Label	Ans	Var. up to 25	M	Mapped to End to End ID. Must be populated by the merchant with a reference number or "NOTPROVIDED". If a category purpose code is included at 08 it must be populated according to rules to be defined. Must be carried into the associated pain or pacs message and provided to end customer as per current core clearing and settlement rules. Mapped to <EndtoEndID>
	07	Terminal Label	Ans	Var. up to 25	O	Not used for NPP
	08	Purpose of Transaction	Ans	Var. up to 5	M	Category Purpose Code. Mapped to CdtTrfTxInf/PmtTpInf/CtgyPurp
	09	Additional Consumer Data Request	Ans	Var. up to 25	O	Not used for NPP
	10-49	Reserved for EMVCo	S		O	Not used for NPP
	50-99	Payment system specific	S	1	O	Not used for NPP

Table 7 Additional Data Template

Additional Data Template Rules

- As the maximum data size of this Additional Data Field Template (ID "62") is 99 characters, merchants may specify up to 29 characters of information in optional Data Objects.

3 Mapping to NPP Payment Initiation and Clearing Messages

The following table outlines the key information to be mapped to the NPP pain.001 and pacs.008 messages from the payload of the QR Code.

EMVCo ID	EMVCo Template/ Sub-ID	Data Object name	Pacs.008 element	pain.001 element	Comments
00	N/A	Payload Format Indicator	N/A	N/A	Not used by NPP
01	N/A	Point of Initiation Method	N/A	N/A	Optional and not used by NPP
02-25	N/A	N/	N/A	N/A	N/A
26	00 Merchant Account Information	Globally Unique Identifier	N/A	N/A	Not used by NPP
26	01	Creditor account name	<CdtrAcct>	<CdtrAcct>	
26	02	BBAN	<CdtrAcct>/<Id>	<CdtrAcct>/<Id>	
26	03	PayID	<EmailAdr>	<EmailAdr>	This is the Merchant's PayID
26	04	PayID type	N/A	N/A	Type of PayID provided for Alias Resolution
26	05	Overly Service identifier	N/A	N/A	This element is not mapped but is used to determine the Service code in the payment message.
27-51	N/A	N/A	N/A	N/A	N/A
52		Merchant Category	N/A	N/A	This element is not mapped but may be used by

EMVCo ID	EMVCo Template/ Sub-ID	Data Object name	Pacs.008 element	pain.001 element	Comments
		Code			Participants.
53		Transaction Currency	<Amt>/<InstdAmt>/<Ccy>	<Amt>/<InstdAmt>/<Ccy>	
54		Transaction amount	<Amt>/<InstdAmt>	<Amt>/<InstdAmt>	
55		Tip or Convenience Indicator	N/A	N/A	Optional in QR Code Not used by NPP
56		Value of Convenience Fee Fixed	N/A	N/A	Conditional on 55 Not used by NPP
57		Value of Convenience Fee Percentage	N/A	N/A	Conditional on 55 Not used by NPP
58		Country Code	N/A	N/A	Mandatory in the EMV spec but not used by NPP
59 M		Merchant Name	N/A	N/A	Mandatory in the EMV spec but not used by NPP
60 M		Merchant City	N/A	N/A	Mandatory in the EMV spec and not used by NPP
61 O		Postal Code	N/A	N/A	Optional and not used by NPP
62	Additional Data Field	01			
62	01	Invoice Number	RmtInf/Strd/RfrdDocInf/Nb	RmtInf/Strd/RfrdDocInf/Nb	
62	02	Mobile Number	N/A	N/A	Not used by NPP
62	03	Store Label	N/A	N/A	Not used by NPP

EMVCo ID	EMVCo Template/ Sub-ID	Data Object name	Pacs.008 element	pain.001 element	Comments
62	04	Loyalty Number	RmtInf/Strd/Invcee/Id/PrvtId/Othr	RmtInf/Strd/Invcee/Id/PrvtId/Othr	
62	05	Reference Label	<PmtId>/<InstrId>	<PmtId>/<InstrId>	Unique reference for the QR Code provided by the merchant to allow for point-to-point reconciliation between QR Code and pacs.008. Must be carried into the pacs.008 if provided in the QR Code by the Merchant.
62	06	Consumer Label	<EndtoEndID>	<EndtoEndID>	An end-to-end customer reference. Must be carried into the pacs.008 if provided in the QR Code by the Merchant.
62	07	Terminal Label	N/A	N/A	Not used by NPP
62	08	Purpose of Transaction	CdtTrfTxInf/PmtTpInf/CtgyPurp	CdtTrfTxInf/PmtTpInf/CtgyPurp	Optional Category Purpose
62	09	Additional Customer Data	N/A	N/A	Optional and not used by NPP
62	10-49	RFU EMVCo	N/A	N/A	Not used by NPP
62	50-99	Payment System specific templates	N/A	N/A	Not used by NPP

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