



# **BR CODE MANUAL**

## **Version 2.0.0**

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The Brazilian main financial regulation can be access at the *BCB's website*.

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## Review history

| Date           | Version | Description of modifications  |
|----------------|---------|---|
| March 13, 2020 | 1.0.0   | First version   |
| May 25, 2020   | 2.0.0   | The restriction that established that only alphanumeric characters could be used has been removed |

## Introduction

This manual details the automated initiation of payments through quick response codes (or QR Codes) within the scope of the schemes that comprise the **Brazilian Payments System** (SPB).

The **BR Code** is the name of the QR Code standard, adopted in Brazil for the purposes of initiating payments, under the terms of BCB Circular Nr. **3,682, of November 4, 2013**.

A QR Code is a two-dimensional graphic standard for encoding data that can be captured by electronic devices, such as mobile device cameras or readers at points of sale, allowing automated data entry into applications or processing systems. The QR Code is an international standard according to the document ISO/IEC 18004.

Within the scope of the **SPB**, structured payment data (payee and payer information, in addition to details of the payment transaction, which are graphically encoded in a QR Code) proposed in the EMV<sup>®1</sup> standard of QR Codes for Payment Systems (QR Code Specification for Payment Systems) is adopted. It is an open and free, extensible standard, implemented in ecosystems in other countries, which complies with the requirements of the Brazilian system with the potential for integrating existing schemes, favoring the adoption, reutilization and optimization of resources.

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<sup>1</sup> EMV<sup>®</sup> is a registered trademark in the USA and other countries and an unregistered trademark elsewhere. The EMV<sup>®</sup> trademark is owned by the company EMVCo, LLC



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## **Terms of Use**

This specification regulates the use of QR Codes for the initiation of payments within the scope of the SPB, in accordance with BCB Circular Nr. 3,682, of November 4, 2013.



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## References

These specifications are based on, refer to and complement, where applicable, the following document:

| # | Reference   | Purpose  | Origin  |
|---|---|--|---|
| 1 | EMV QRCPS–MPM <i>QR Codes for Payment Systems – Merchant Presented Mode</i> | EMV Standard for the use of QR-Codes in Payment Systems – Merchant Presented Mode <sup>2</sup> | <a href="https://www.emvco.com/terms-of-use/?u=/wp-content/uploads/documents/EMVCo-Merchant-Presented-QR-Specification-v1-1.pdf">https://www.emvco.com/terms-of-use/?u=/wp-content/uploads/documents/EMVCo-Merchant-Presented-QR-Specification-v1-1.pdf</a> |

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<sup>2</sup> Payee or Recipient; credited.



**BANCO CENTRAL DO BRASIL**

## **BR Code Manual: QR Codes for the initiation of payments within the SPB**



## **1. Introduction**

In payment initiation flows, the payee provides payment data in a QR Code in the EMV® standard to be captured by the payer as an image. The Central Bank of Brazil, within the scope of the SPB, has adopted the EMV® standard due to the capability of storing multiple payment schemes in a single QR Code. The objective is to converge on a solution that discourages the proliferation of QR Codes at the point of sale.

A QR Code with this standard can simultaneously identify different schemes, leaving the payer to decide which one to use. The paying device then uses the data of the chosen scheme<sup>3</sup> and ignores the others<sup>4</sup>.

Each payment scheme that uses the BR Code to initiate payments is responsible for defining and documenting its data structure and specific semantics within the restrictions and layout set out in this document.

The following sections present the structure of the BR Code within the EMV – QRCP standard and detail restrictions and specificities within this payment context for cases of QR Codes generated by the payee.

This document deals specifically with the case of the MPM: Merchant Presented Mode, defined in reference # 1.

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<sup>3</sup> In addition to the fields in common use to the various arrangements, such as the amount of the transaction, among others.

<sup>4</sup> It is also possible to use the native data of the EMV standard, common to the arrangements.



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## **2. EMV<sup>®</sup>-QRCPS**

The QR Code EMV<sup>®</sup> MPM contains the information of the payee and the context of the transaction, such as:

- payee account information (identifies a payment scheme);
- additional payee information (such as name, country, language);
- information about the transaction (amount, currency, purpose); and
- additional data (invoice number or other scheme-specific data)

At least one payment scheme with the respective ID account must be present in each QR Code. As already mentioned in previous sections, multiple schemes can coexist in the same QR Code.

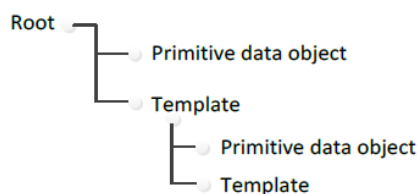
In this manner, the consumer captures the data of the payee and of the transaction and, if in agreement, activates his authorization for payment.

In the context of QR Codes generated by the payee in the SPB, each payment scheme will define the semantics, usage variations, security and other payment initiation strategies within the restrictions established in this document. In the sections below, the definitions common to all the SPB schemes are detailed.

## 2.1. Usual definitions

The payload (sequence of bytes read) of a QR Code in the EMV-QRCPS – MPM standard - generated by the payee - consists of a sequence of objects (data-objects) in the form ‘ID, size, value” (or TLV - type, length, value). The value of a given object, in turn, can be a nested sequence of objects (TLV), creating a tree structure, as exemplified in Figure 3.1 of the standard (reference # 1):

**Figure 3.1: Data Object Organization in the QR Code**



Some IDs (object types) are pre-defined (primitive) and are mandatory at the root (root) of the structure. Others are reserved for extensions (templates). Objects under these templates will have specific interpretations, according to the template.

The BR Code will use, within the EMV® specification (reference # 1), in section 4.7.11, IDs “26” to “51” for arbitrary payment schemes other than card payment schemes. Specific IDs, in the range **02-25**, with regulation in accordance with reference # 1, are reserved for card payment schemes.

It is important to note that at least one “Merchant Account Information” object in the range 02-51 must be present<sup>5</sup> in the QR Code.

<sup>5</sup> This requirement is contained in section 4.7.9.1 of reference # 1.





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The nested objects ID 00 (**26-51 <size> 00**) within templates 26-51, where *size* specifies how many characters in the sequence make up the value of fields 26-51 (including ID 00 itself), correspond to the primitive object *GUI - Globally Unique Identifier*, which must be present.

The value of the GUI object sets the context for the remainder of the template. As already mentioned, the semantics of the objects that are within the template in question are specific to the context of each scheme and are outside the scope of this document.

The value of object 00 of IDs 26-51, a value that will be unique within the scope of the SPB, characterizes the specific payment scheme in question. The possible values for the GUI are established in accordance with the EMV-MPM®.

For a scheme within a **BR Code** to be identified, the presence of the GUI object is enough, as long as it is correctly allocated to an ID in the range 26-51. The ID itself has no significant meaning. It is possible to dynamically allocate, according to what is allowed by the ranges available in the specific QR Code, the GUIs objects in IDs 26-51. Thus, the rule that there are no duplicate IDs in the document's *root*, according to reference # 1, is respected.

| Field EMV® QRCPS-MPM ([26-51]-00)       | Value                           | Size      |
|---|---------------------------------|-----------|
| GUI – <i>Globally Unique Identifier</i> | <b>com.example</b> <sup>6</sup> | <b>11</b> |

Table 1 presents the primitive objects under the root of the data structure of EMV® QR Codes generated by the payee that make up the BR Code. The 'O' Usage fields are optional, according to reference # 1.

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<sup>6</sup> This is just an example. The actual reverse domain will be different for each specific arrangement.



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| ID                             | EMV Name                              | Size   | Usage <sup>7</sup> | Description  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
|--------------------------------|---------------------------------------|--------|--------------------|--|------------|-----------------|-------|--------------------|-------------|----|------------------------|-----------------|---|-----------------------|-------|--------------------------------|--|--|--|
| 00                             | <i>Payload Format Indicator</i>       | 02     | M                  | version of <i>payload</i> QRCPs-MPM, fixed as "01"   |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 01                             | <i>Point of information Method</i>    | 02     | O                  | If the value 12 is present, this means that the BR Code can only be used once.   |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| [26-51]                        | <i>Merchant Account Information</i>   | 05..99 | M                  | "26" – indicates a specific scheme; "00" (GUI) mandatory:  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
|                                |                                       |        |                    | <table border="1"> <thead> <tr> <th>ID</th> <th>Name</th> <th>Size</th> <th>Usage</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>00</td> <td><i>GUI</i></td> <td>11</td> <td>M</td> <td><b>COM.EXAMPLE</b></td> </tr> <tr> <td>01.99</td> <td colspan="4" style="text-align: center;"><b>according to the scheme</b></td> </tr> </tbody> </table>             | ID         | Name            | Size  | Usage              | Description | 00 | <i>GUI</i>             | 11              | M | <b>COM.EXAMPLE</b>    | 01.99 | <b>according to the scheme</b> |  |  |  |
|                                |                                       |        |                    | ID   | Name       | Size            | Usage | Description        |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 00                             | <i>GUI</i>                            | 11     | M                  | <b>COM.EXAMPLE</b>   |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 01.99                          | <b>according to the scheme</b>        |        |                    |  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| <b>according to the scheme</b> |                                       |        |                    |  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 52                             | <i>Merchant Category Code</i>         | 04     | M                  | "0000" or <b>MCC ISO18245</b>  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 53                             | <i>Transaction Currency</i>           | 03     | M                  | "986" – BRL; Brazilian real – <b>ISO4217</b>   |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 54                             | <i>Transaction Amount</i>             | 01..13 | O                  | value of the transaction. i.e.: "0", "1.00", "123.99"  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 58                             | <i>Country Code</i>                   | 02     | M                  | "BR" – Country code ISO3166-1 alpha 2  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 59                             | <i>Merchant Name</i>                  | 01..25 | M                  | name of beneficiary/payee  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 60                             | <i>Merchant City</i>                  | 01..15 | M                  | city where the transaction is carried out <sup>8</sup>   |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 61                             | <i>Postal Code</i>                    | 01..99 | O                  | CEP (zip code) of the locality where the transaction is carried out  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 62                             | <i>Additional Data Field Template</i> | 05.29  | M                  | <table border="1"> <thead> <tr> <th>ID</th> <th>EMV Name</th> <th>Size</th> <th>Usage</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>05</td> <td><i>Reference Label</i></td> <td>01..25</td> <td>M</td> <td><b>Transaction ID</b></td> </tr> </tbody> </table>  | ID         | EMV Name        | Size  | Usage              | Description | 05 | <i>Reference Label</i> | 01..25          | M | <b>Transaction ID</b> |       |                                |  |  |  |
|                                |                                       |        |                    | ID   | EMV Name   | Size            | Usage | Description        |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 05                             | <i>Reference Label</i>                | 01..25 | M                  | <b>Transaction ID</b>  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| <b>according to the scheme</b> |                                       |        |                    |  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 80<br>..<br>99                 | <i>Unreserved Templates</i>           | 01.99  | O                  | <table border="1"> <thead> <tr> <th>ID</th> <th>Name</th> <th>Size</th> <th>Usage</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>00</td> <td><i>GUI</i></td> <td>11<sup>9</sup></td> <td>M</td> <td><b>COM.EXAMPLE</b></td> </tr> <tr> <td>01.99</td> <td colspan="4" style="text-align: center;"><b>according to the scheme</b></td> </tr> </tbody> </table> | ID         | Name            | Size  | Usage              | Description | 00 | <i>GUI</i>             | 11 <sup>9</sup> | M | <b>COM.EXAMPLE</b>    | 01.99 | <b>according to the scheme</b> |  |  |  |
|                                |                                       |        |                    | ID   | Name       | Size            | Usage | Description        |             |    |                        |                 |   |                       |       |                                |  |  |  |
|                                |                                       |        |                    | 00   | <i>GUI</i> | 11 <sup>9</sup> | M     | <b>COM.EXAMPLE</b> |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 01.99                          | <b>according to the scheme</b>        |        |                    |  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| <b>according to the scheme</b> |                                       |        |                    |  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |
| 63                             | <i>CRC16<sup>10</sup></i>             | 04     | M                  | 4 nibbles of the result. i.e.: 0xAC05 => "AC05"  |            |                 |       |                    |             |    |                        |                 |   |                       |       |                                |  |  |  |

**Table 1 – Usual structure for BR Codes**

In the table above, ID 05 within the EMV<sup>®</sup> 62 template houses the transaction identifier dealt with in the QR Code. This transaction, in principle, serves to identify the payment in the payee's conciliation flow and is common to all schemes<sup>11</sup>.

For each scheme that is present throughout fields 26 to 51, a non-reserved template for extension is destined, if applicable. For instance, the `BR.COM.SCHEME` scheme might opt to use an unreserved template [80-99] and just one.

<sup>7</sup> M – Mandatory; O - Optional

<sup>8</sup> Definition of the EMV-QRCPs-MPM standard. In other cases (for example in online transactions) the city of the payee's branch or the city of the headquarter of the payee may be used.

<sup>9</sup> Just an example. The size of the GUI may vary.

<sup>10</sup> According to section 4.7.3 CRC (ID "63") of reference # 1, the polynomial '1021' (hex) and the initial value 'FFFF' (hex) are used to calculate the CRC, which corresponds to the CRC "CRC -16-CCITT-FFFF".

<sup>11</sup> In specific cases in the context of an arrangement, it is possible that the transaction id is different from the id shown in field **05** of template **62**. The specific semantics and functioning that occur in this type of situation are outside the scope of this document.



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It is **recommended** that a scheme uses only an unreserved template in the range 26-51, and, if not sufficient, another template in the range 80-99. The motivation is to try to obtain the greatest possible optimization of space in view of the coexistence of multiple schemes in the same BR Code.

## 2.2. Example of a BR Code

For strictly illustrative purposes, the information structure within the BR Code standard is presented, which will compose the QR Code for the initiation of a card scheme transaction (field 4), a PIX (field 26) and some other scheme that is accepted by a particular payee (field 27).

| ID        | EMV Name                                    | Size      | Value                      |                                     |           |   |
|-----------|---|-----------|----------------------------|-------------------------------------|-----------|---|
| <b>00</b> | <i>Payload Format Indicator</i>             | <b>02</b> | <b>01</b>                  |                                     |           |   |
| <b>04</b> | <i>Merchant Account Information - Cards</i> | <b>14</b> | <b>12345678901234</b>      |                                     |           |   |
| <b>26</b> | <i>Merchant Account Information – PIX</i>   | <b>58</b> | ID                         | Name                                | Size      | Value                                       |
|           |   |           | <b>00</b>                  | <i>GUI</i>                          | <b>14</b> | <b>BR.GOV.BCB.PIX<sup>12</sup></b>          |
|           |   |           | <b>01</b>                  | PIX Key                             | <b>36</b> | <b>123e4567-e12b-12d1-a456-426655440000</b> |
| <b>27</b> | <i>Merchant Account Information – Other</i> | <b>30</b> | <b>00</b>                  | <i>GUI</i>                          | <b>12</b> | <b>BR.COM.OTHER<sup>13</sup></b>            |
|           |   |           | <b>01</b>                  | IdAcc.                              | <b>10</b> | <b>0123456789</b>                           |
| <b>52</b> | <i>Merchant Category Code</i>               | <b>04</b> | <b>0000</b> (not informed) |                                     |           |   |
| <b>53</b> | <i>Transaction Currency</i>                 | <b>03</b> | <b>986</b> (R\$)           |                                     |           |   |
| <b>54</b> | <i>Transaction Amount</i>                   | <b>06</b> | <b>123.45</b>              |                                     |           |   |
| <b>58</b> | <i>Country Code</i>                         | <b>02</b> | <b>BR</b>                  |                                     |           |   |
| <b>59</b> | <i>Merchant Name</i>                        | <b>17</b> | <b>NAME OF PAYEE</b>       |                                     |           |   |
| <b>60</b> | <i>Merchant City</i>                        | <b>08</b> | <b>BRASILIA</b>            |                                     |           |   |
| <b>61</b> | <i>Postal Code</i>                          | <b>08</b> | <b>70074900</b>            |                                     |           |   |
| <b>62</b> | <i>Additional Data Field</i>                | <b>19</b> | ID                         | Name                                | Size      | Value                                       |
|           |   |           | <b>05</b>                  | <i>Reference Label</i>              | <b>15</b> | <b>RP12345678-2019</b>                      |
| <b>80</b> | <i>Unreserved Templates</i>                 | <b>39</b> | <b>00</b>                  | <i>GUI</i>                          | <b>12</b> | <b>BR.COM.OTHER</b>                         |
|           |   |           | <b>01</b>                  | Arbitrary information of the scheme | <b>19</b> | <b>0123.ABCD.3456.WXYZ</b>                  |
| <b>63</b> | <i>CRC16-CCITT (0xffff)</i>                 | <b>04</b> | <b>0xAD38</b>              |                                     |           |   |

<sup>12</sup> The GUI is case insensitive. If it had been typed here in small letters, the effect would have been the same.

<sup>13</sup> The GUI is case insensitive.



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The sequence of characters corresponding to the dynamic QR Code payload in the EMV-QRCPS-MPM standard generated by the payee, highlighted in the table, is demonstrated below (extra spaces and line breaks):

**0002 01**  
**0414 12345678901234**  
**2658**  
**0014 BR.GOV.BCB.PIX**  
**0136 123e4567-e12b-12d1-a456-426655440000**  
**2730**  
**0012 BR.COM.OTHER**  
**0110 0123456789**  
**5204 0000**  
**5303 986**  
**5406 123.45**  
**5802 BR**  
**5917 NAME OF PAYEE**  
**6008 BRASILIA**  
**6108 70074900**  
**6219**  
**0515 RP12345678-2019**  
**8039**  
**0012 BR.COM.OTHER**  
**0119 0123.ABCD.3456.WXYZ**  
**6304 AD38**

This structure, with a total of 270 characters, is encoded in the QR Code below.



**BANCO CENTRAL DO BRASIL**



00020104141234567890123426580014BR.GOV.BCB.PIX0136123e4567-e12b-12d1-a456-42665544000027300012BR.COM.OUTRO011001234567895204000053039865406123.455802BR5917NOME DO RECEBEDOR6008BRASILIA61087007490062190515RP12345678-201980390012BR.COM.OUTRO01190123.ABCD.3456.WXYZ6304AD38