Procedure for Test, Evaluation and Certification of QR Code Scanner

(STQC/BDCS/P11)

Issue: 01

Biometric Device Certification Scheme (BDCS)
STQC Directorate,
Ministry of Electronics & Information Technology (MeitY)
Government of India

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0.1 Approval and Issue

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Reviewed by : Management Representative

Approved by : Head, BDCS

Note:

- Management Representative (MR) is responsible for issue and distribution of this document including amendments.
- Holder of this copy is responsible for incorporation of all the amendments and currency of the document.

0.2 Amendment Record

Sl. No.	Date	Issue	Rev.	Reason of Change /Change Details
1.	04-01-2020	1	0	Scheme revised

1. Background

Biometric Device Certification Scheme (BDCS) is operated by STQC Directorate, Ministry of Electronics and Information Technology (MeitY), Govt. of India. Under supervision of CB, the Testing Laboratories or Biometric Device Test laboratory (henceforth will be referred as BDTL) perform Testing of Biometric Device products against the requirements of UIDAI.

QR code is an image of a matrix barcode that stores data in two dimensions. Data is presented as square dots with specific pattern in both horizontal and vertical dimensions. Specific imaging devices (QR scanners) can read this image and retrieve the stored data based on the pattern of square dots. Smart phone devices can also be used as QR code scanners. The embedded camera in the smart phone captures an image of the QR code, then an application analyses the pattern of square dots to retrieve the encoded data and displaying the extracted information.

UIDAI has developed a secure QR code for e-Aadhaar / Aadhaar letter which carries demographic information & photograph digitally signed by UIDAI. Users can read the information in Secure QR code to verify the details of person presenting the e-Aadhaar / Aadhaar letter thus, facilitating off-line identity verification.

A Windows based client application has been developed by UIDAI and is available on UIDAI website. The secure QR code can be read using commercially available bar code scanners**.**

2. Purpose

The purpose of this document is to define procedure and criteria for certification of QR Code Scanner to be used in various GoI programs which require Aadhaar Based Recognition.
QR Code Scanner Certificationis required to

- Maintain quality of QR Code Scanner across the eco-system to read the information in Secure QR code for verifying the details of person presenting the e-Aadhaar / Aadhaar letter thus, facilitating off-line identity verification
- Have the consolidated benchmarking of QR Code Scanner vis-à-vis available industry standards

3. Reference Documents

STQC/BDCS/D01	:	Rules and Procedures
STQC/BDCS/D08	:	Specifications
STQC/BDCS/F01	:	Application
ISO/IEC 18004	:	Information technology -- Automatic identification and data capture techniques -- QR Code bar code symbology specification
ISO/IEC 15424	:	Information technology -- Automatic identification and data capture techniques -- Data Carrier Identifiers (including Symbology Identifiers)

*(Please refer **Master List of Documents** for latest version of the documents)*

4. Target Audience

The Supplier of authentication devices, Biometric Device Test Laboratory (BDTL) and the Certification body shall follow this procedure for certification.

5. Certification Context

Biometric holds out the promise of increased confidence in personal authentication processes compared with traditional password and tokens. This is because of the direct link between the biometric characteristic and the individual. Measuring the quality of biometric sample is a crucial step in the collection process. Quality of sample features (data quality) that can be extracted from digitized sample depend on the image quality. Poor quality biometric image diminishes the matching performance of biometric recognition system result in false matches, false non-matches and increase search time.

To meet the objective of UIDAI, it is required that sufficient degree of assurance is provided that good qualities of authentication devices are available to the user agencies. Testing and Certification are means to provide this confidence. This procedure facilitates the execution of Certification Process.

This certification is primarily focused on combination on sensor and the extractor. However, the context on the device is not lost during the certification activity covering its reliability, portability and other relevant characteristics. The applicant shall provide the details of both the components (sensor and extractor/Kin7Generator) in their application

Biometric Authentication device Certification is required to

- Maintain quality of Authentication devices across the UIDAI eco-system for uniform resident experience
- Ensure Maximum compatibility and interoperability of devices across the application/ vendors
- Ensure Reusability of various authentication applications available across UIDAI ecosystem
- have the consolidated benchmarking of Authentication devices vis-à-vis available industry standards
- Ensure service levels and support availability
- Ensure secure and transparent authentication

6. Objectives of Testing and Certification

The objective of Certification of QR Code Scanner is to facilitate the availability of Quality Assessed Devices to user agencies. This certification scheme ensures that certified devices are reliable, safe, and secure and meet the requirements of UIDAI.

This objective is attained by ensuring device suppliers are certified based on their capability to supply QR Code Scanner which meets the technical specification of UIDAI and suppliers have adequate support systems to ensure availability of device functionalities/services in its life cycle.

Testing:

a) To verify the degree of compliance of device characteristics and specification conforming to the UIDAI specification requirements. Refer STQC/BDCS/D08.
b) Provide opportunity to Vendors in understanding the defects/Non-conformance and rectify the same for further improvement in the quality.

Certification:

a) To make purchase decision fast and easy from buyer perspective as certified Devices are technical compliant with UIDAI specification.
b) Reducing overall cost of demonstrating compliance, as certification is a Continuous process compared to repeatedly demonstrating compliance, tender wise, to different buyers
c) Enhancing Quality benchmarks systematically in a well-structured way through consultative process with stakeholders.
d) To provide a platform for stakeholders in regard to "Quality" of the device.

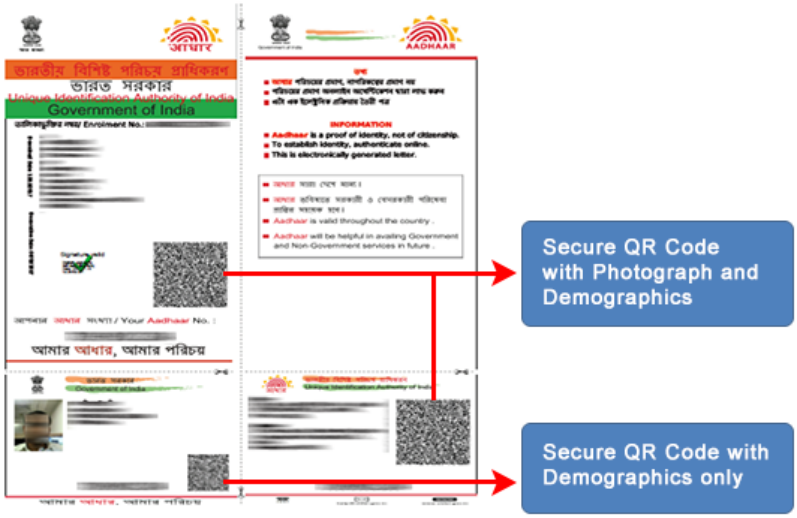
7. Scope of Certification

The scope of certification covers a various types (Form factor) of QR Code Scanner which are compliant with UIDAI specification

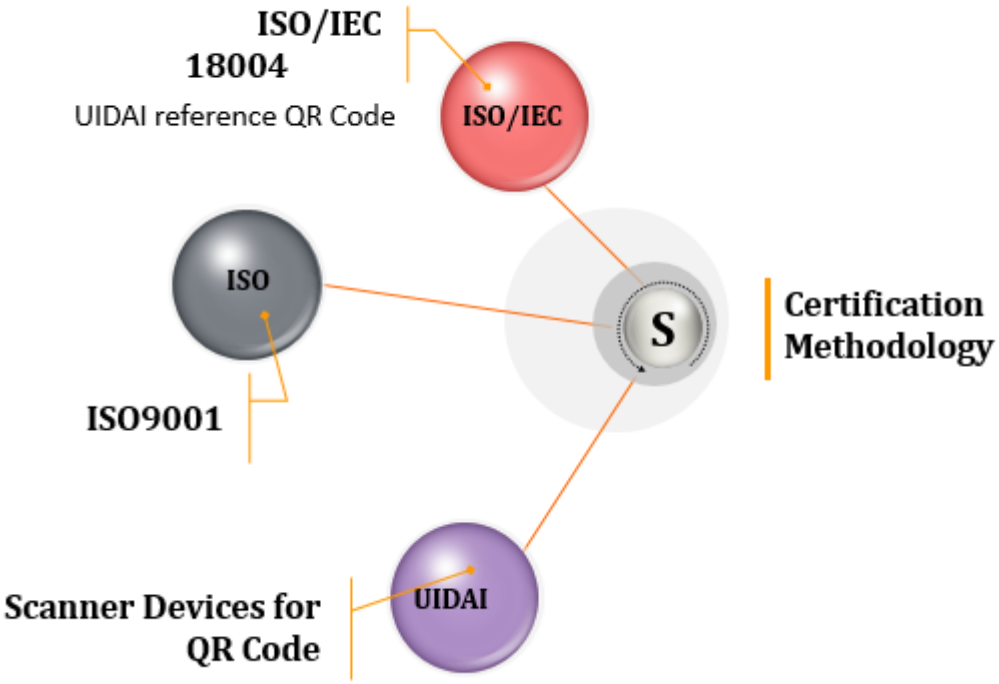
8. Quality Model and Certification Methodology

The Quality of QR Code Scanner is defined by the following characteristic:

a) Design to Specification
b) Security Assurance
c) Safety of the Device
d) Reliability and Durability of the Device
e) Environment, Health and Safety
f) Electro-magnetic compliance
g) Compatibility / functionality of software application (Provided by UIDAI)



Certification Methodology



9. Certification Procedure

Approaching STQC

Any interested supplier of QR Code Scanner can approach STQC for certification and can also obtain details from www.stqc.gov.in. Before applying for certification supplier shall understand the complete specification and certification procedure as listed below

Pre-requisite of Certification

Supplier shall understand the Certification and Surveillance requirements, applicable charges etc. before applying to Certification Body (STQC). Since specification consist of design and performance parameters of QR Code Scanner, a comprehensive approach has been followed for certification purposes. This means that supplier with the help of a manufacturer has to provide an assurance that critical components, as required by specification are quality assessed. The quality assessment of these critical components as per UIDAI specification is done by manufacturer, records are maintained and shared with authorized supplier. There could be variety of methods of assessing the quality of these components such as vendor appraisal or quality reports of vendors/vendor selection methods or performing quality control at incoming inspection or using supply chain principle and maintaining traceability, etc. For each critical component the assurance method selected by manufacturer shall be documented in technical construction file.

Supplier shall establish a relationship with the manufacturer and a level of trust that this information will be used to get a confidence that devices meet the specification and can be certified. The critical components shall include but are not limited to the following:

a) Engine
b) Image Sensor
c) Light Source
d) Decoder (If separate, must be specified and required document to be provided.

There could be two situations

a) Supplier represents a manufacturer (OEM - anywhere located in the world) in India and is responsible for device management in India.
b) Supplier is a manufacturer in India based on indigenous or imported technology

Supplier shall prepare a Technical Construction File (TCF). The clarity in TCF provides confidence to the Certification Body regarding Quality of QR Code Scanner. The requirements of TCF are given in Annexure –I of the document.

Assurance through design and internal Quality Control

Since it's a requirement that manufacturer (OEM) shall have an established quality management system and certified to the requirements of ISO 9001 indicates that he has adequate control mechanism to meet customer and user requirement. Since the QMS of OEM is certified by an Agency which has got international accreditation, STQC is relying on internal controls for demonstrating compliance.

Supplier is responsible for ensuring that device is a compliant (with UIDAI specification) device, he shall provide these declarations based on test report as part of their technical construction file and shall maintain a record of release notes from OEM for each lot (consignment) which will be checked during surveillance.

The supplier shall place the details and configuration of the device (candidate for certification) in the public domain (on their website).

If supplier is confident regarding meeting the Certification requirement then he can apply to Certification Body (STQC). The contact details are given in the application form.

The Application

Requirements for Application

The Certification Body requires that supplier:

a) Always complies with the relevant provisions of this certification scheme
b) Provide all necessary inputs for testing and pay the applicable fee in advance as listed in schedule of charges.
c) Shall sign "Certification Agreement" indicating agreeing with the rules, procedures, Terms and Conditions of the Certification Body

Inputs required by STQC

Access to the followings information & facilities/ systems to undertake testing of QR Code Scanner devices will be required by STQC:

- Duly filled Application form along with following documents:
  - Test and certification charges
  - Technical construction file
  - GeM Registration Number
  - Certification Agreement
  - Three Nos. of QR Code Scanner Device to be tested.
  - Test environment for functional testing
  - Compliance statements and Test reports

- Arrangement to witness the specialized testing (if applicable) at manufacturer facility, in case the in-house facility for the same is not available with STQC

Supplier would need to be directly providing the documentation to STQC and as per the certification needs provide additional information/Test results if required.

Application processing

On receipt of application, Certification Body evaluates the completeness of the application along with necessary documentation submitted in TCF and informs the supplier to supply the QR Code Scanner (3-Number) to the designated test laboratories. At the same time CB informs the test laboratory for commencement of the test and also supplies the copy of application and test specifications to the laboratory.

Conduct of Test

The Certification Body (STQC) approaches any of the following test laboratories:

- ERTL (East) Kolkata
- ERTL (North) Delhi
- ERTL (West) Mumbai
- ETDC (Bengaluru)
- ETDC Mohali

Applicant shall deposit the certification and test charges to the test Laboratory based on their invoice as per Schedule of charges (Refer Scheme document **STQC/BDCS/D02**)

Testing

Testing activity consist of the following task

a) Study & Understanding of the device design and configuration
b) Test Planning & Preparation (as per Annexure-I)
c) Test Execution
d) Test Report Preparation

STQC test lab will execute the testing as per Test Plan. In case of any non-compliance/failure STQC test lab shall inform to the supplier and stop the testing. The supplier should analyse the results and take corrective action, both at device level and at System Level. If corrections are required at Manufacture level (device level) supplier shall co-ordinate the same and inform to CB. The testing can be re-started if CB is satisfied with the analysis and corrective actions are satisfactory. CB and STQC test lab will decide whether to start test from zero level or partial testing is adequate depending on the situation and engineering analysis of the test data. This should be recorded and presented to Certification Committee at the time of Certification.

The supplier shall maintain analysis and corrective actions records which will be audited during surveillance visit.

The designated laboratory (STQC test lab) carries out the test as per supplied test specifications and following the prescribed test methods:

- Tests are conducted by testers as per defined test methodologies.
- Test results are logged and whenever a defect is found during test, the same recorded with details of observations.
- A Test Report is prepared that summarizes the test results including defects and anomalies according to their degree of severity as per defined criteria.
- The test report is submitted to the Certification Body, after the completion of tests.

After completion of the tests STQC test lab shall prepare the Test report in approved format and forward the detail test report to Certification Body

Policy of certification body in the event of the failure of the device

In the event of the failure of the device the test lab should inform the certification body. If failure is due to the software the supplier shall immediately take corrective/ preventive actions and inform to the CB

(a) Failure analysis and root cause analysis
(b) Corrective and preventive actions
(c) Action on change control/configuration control/version control

If failure is due to the hardware testing should be stopped, supplier should be informed and a fresh testing with double the number of samples should be taken up after (a) and (b) stated above are implemented.

Additional test charges shall be calculated and levied for testing. Tests to be re-conducted and test charges will depend upon the stage of device failure

If any of the two samples fails the testing activity should be concluded as fail.

Decision on Certification

Certification body will internally check the compliance with respect to Rules and Procedures STQC/BDCS/D01 of the scheme and put up to Certification Committee after

a) Analyzing the test results
b) Verifying compliance to evaluation Criteria

Certification Committee will review the reports and other information holistically, and give the recommendation for Certification. Certification Committee can use a reference Checklist.

Certification Body will issue the certificate after getting satisfied with the recommendation of certification committee. The certificate of approval covers:

a) The name and address of the manufacturer and supplier
b) The scope of the certification granted including brand and model no., standards and/or other normative documents to which QR Code Scanner are certified
c) The effective date of certification and the term for which the certification is valid

Simultaneously, arrangements will be made to update the list of certified suppliers available at www.stqc.gov.in

The performance of QR Code Scanner depends on the nature of the components used in the devices and also the configuration of the device. Therefore, the certificate will be valid for a particular nature of components used in the device and its configuration. Any change in the nature of the components used in the device and its configuration will require a fresh evaluation.

Deliverables

On satisfactory completing all above activities and fulfilment of certification & Evaluation Criteria and after receipt of payment, the certificate will be issued along with the test report.

To ensure Certification remains valid, the supplier shall meets the maintenance of Certification Requirements

Test and Certification Schedule

- It will take about 6-8 weeks to complete the testing and certification after required inputs have been provided by the client to STQC.
- The charges for testing and certification will be as per the schedule of charges and Test report/Certificate will be issued only after receipt of test certification fees.
- The GST shall be extra as applicable.

Mode of Payment

Applicable charges are required to be paid in advance through BharatKosh (bharatkosh.gov.in) only in favour of concerned laboratory.

Terms and Conditions

- The payments to STQC Directorate (being Government of India organization) are exempted from TDS under section 196 of Income Tax Act.
- The vendor shall arrange for DUT and support environment at STQC test lab where testing will be undertaken.

- In order to complete the testing, as per schedule, vendor shall ensure readiness of test related documentation and timely availability of the required information.
- STQC shall ensure timely completion of test activities as per plan and submit the deliverables.

10. ABBREVIATIONS

BDCS	- Biometric Device Certification Scheme
CB	- Certification Body
CC	- Certification Committee
DUT	-Device under test
STQC	- Standardization Testing Quality and Certification Directorate
UIDAI	- Unique Identification Authority of India
QR Code	- Quick Response Code

Annexure-I Guidelines to the Vendors for QR Code Scanner

Requirements of Technical Construction File (TCF)

To create confidence in the Device Quality and to demonstrate compliance, Supplier shall maintain a technical construction file. This will require close collaborations of supplier with the manufacturer. The confidential part of this file may not be revealed to the Certification Body, only summary/principles used of confidential part of the file may be informed to the Certification Body on need base. The general content of the TCF are

General

- General description of the product and reference to Website (Website should clearly display the device image and technical specifications)
- QR Code Scanner Specification (may be in the form of brochure) of the Supplier
- Summary of Quality Control System in reference to supplier activities of distribution (of QR Code Scanner), maintenance and support system
- Risk Assessment and/or recommended practice for the use of device in the Indian conditions and Mitigation Plan
- Incoming quality control mechanism (***Optional***)
- User Manual and 3 devices to be provided for testing to the Test Laboratory

Certificates

- Certificate for ISO 9001 (Certification for QR Code Scanner, Design and Development, Manufacturing and Service) by the Manufacturer/OEM
- Certificate for ISO 9001 (Certification for QR Code Scanner Supply and Distribution, Training, Maintenance, and Service (Supplier)(***Optional***)
- Certificate of Incorporation in India (Supplier)
- Manufacturer's authorization to supplier to place devices in Indian market
- Service Center – List of authorized Service centers and Contact details
- BIS Registration Letter(CRS) indicating compliance with IS 13252 (Part 1): 2010

Data sheets and Catalogues

- Image sensors
- Light Source
- Engine
- Decoder (If separate, must be specified and required document to be provided.

Test Reports (References)

	Test – Refer Test Plan	Category identification which is constituent of TCF (to be filled by applicant)
Functional Test	1,2,8,	
Environmental(Durability/Climatic)	21,22	
Safety	25	
Electro Magnetic Compatibility	20	
Ease of use and Ergonomics and Portability	9,10,11	
Health and Safety	26	

Category

a. Internal test report
b. External test report from recognized independent test lab
c. To be conducted by STQC Lab

Declaration of Conformities

1. The applicant (supplier) shall provide a declaration of conformity stating that their candidate product (of certification) meets all the specified requirements of UIDAI and they have established quality management system at their manufacturing site to ensure consistency of the product, quality while complying with the UIDAI specifications.
2. ROHS

Technical Information

TCF shall provide the necessary evidence that the design is in accordance with the relevant requirements.

TCF shall identify the product and its specification consisting of its description in terms of

- Photographs, brochures
- Technical construction drawing and/or
- Schematic diagram

Warranty

Minimum Requirements

Suitable warranty support to be declared and should be available on public domain

Demonstration of Compliance

The supplier shall make a chapter in the technical construction file indicating the mechanism used to demonstrate compliance with UIDAI's specification as specified.

Annexure –II Test Plan (Total number of devices 3)

Sl. No.	Device	Description	Specifications	Compliance Demonstration
01	ALL THREE	Visual Examination		No loosening, breaking and other mechanical damage of parts
02	ALL THREE	Operational Check		Device shall function satisfactorily , Basic operation
03	First	Image Sensor (Pixels)	640 x 400 pixels	
04	NA	Symbologies	QR Code	As per ISO/IEC 18004 As per ISO/IEC 15424 *Declaration - No testing
05	First	Pitch/Skew	+/- 60^{o}, +/- 60^{o}	*Jigs and Fixtures to be provided by applicant
06	First	Scan Angle	Roll 0-360^{o}	*Jigs and Fixtures to be provided by applicant
07	First	Min. Symbol Contrast	<= 25%	
08	First	Interface	USB	
09	First	Dimensions	Ergonomically designed product	
10	First	Weight	<250g	
11	First	Indication	Buzzer, Indicator light LED	
12	First	Operating Power	must be as per USB 2.0/3.0 standard requirement	
13	First	Input Voltage	must be as per USB 2.0/3.0 standard requirement	
14	First	Motion tolerance	Up to 5 in./13 cm per second for 13 mil UPC	*Jigs and Fixtures to be provided by applicant
15		Light Source	LED 350-770nm	
16	First	Operating Temperature	0^{o}C to 50^{o}C	
17	First	Storage Temperature	-20^{o} to 70^{o}C	
18	Second	Functional Test	Black Box Testing	Reference application as provide by UIDAI and along with UIDAI

				approved reference **Secure QR Code**.
19	Second	Humidity	5% to 95% non-condensing	93 ± 3% RH 40° C (Pre and post test condition 1 and 2)
20	Second	ESD	+/- 4 kV contact discharge; +/- 8 kV air discharge	As per IEC 61000-4-2 (Pre and post test condition 1 and 2)
21	Third	DROP	1m, Unpacked Condition	As per IEC 60068-2-31 No of drops: Six drops (one drop on each face) Height of fall: 1m Condition : Unpacked (Pre and post test condition 1 and 2)
22	Third	Environment Sealing	IP42, As per IEC 60529	As per IEC 60529 (Pre and post test condition 1 and 2)
23	First	Decode Range	1” to 10” for 20 mil QR Code	
24	NA	Service Canter	Should Be Available in India	*Declaration and list
25	NA	Safety Standards like LED safety	IEC 62471:2006 IEC 60950-1:2005 + A1 + A2 (optional) IS 13252(PART 1):2010	a. IEC 62471:2006, Photobiological safety of lamps and lamp systems IEC-CB test report – certificate b. IEC 60950-1:2005 + A1 + A2 (optional) c. IS 13252(PART 1):2010 *Demonstration of compliance by national and international certifications*
26	NA	ROHS		IEC 63000 Declaration of conformity