

Lisa 2. Tehniline kirjeldus / Annex 2 Technical Specifications

Hankija nimi / Contracting authority: SMIT

Riigihanke nimetus / Procurement title: EES näohõive lahenduse tellimine/Entry/Exit System face image capture solution in Estonian Border Control Points

Riigihanke viitenumber / Procurement reference number: 222866

ISFB-33 „EES ja ETIAS rakendamine“. The project is co-financed by the European Union via the Internal Security Fund and Estonian Ministry of Interior

CONTENTS

1	INTRODUCTION	4
1.1	Scope Of Tender	4
1.2	Terminology	5
1.3	Definitions And Abbreviations.....	5
1.3.1	Definitions	5
1.3.2	Abbreviations	5
1.4	References And Standards.....	6
1.5	First order	6
2	GENERAL DESCRIPTIONS.....	6
2.1	Background Information.....	6
2.1.1	Hardware set.....	7
2.2	Safety	7
2.3	Overview of the Camera Parameters	8
2.3.1	File Parameters and Integration Interface	8
2.3.2	Solution Operating Conditions.....	9
2.4	Stand Configuration.....	9
2.5	Network Cabling and Connections.....	12
2.6	Human Interface	13
2.6.1	Display	13
2.6.2	Travellers' Screen Interface	13
2.7	Requirements to Camera Functionality	13
2.8	Power Supply.....	14
2.9	Lighting	14
3	REQUIREMENTS TO THE CAPTURE PROCESS.....	14
4	DATA/INFORMATION EXCHANGE	16
4.1	Data exchange with BCW	16
5	REQUIREMENTS TO RELIABILITY	17
6	ADDITIONAL INFORMATION.....	17
6.1	List of messages to BCW	17
6.2	List of Messages to a Traveller.....	17
7	REQUIREMENTS DEFINITION AND TENDER EVALUATION.....	17
7.1	Requirements Definition.....	17
7.1.1	Minimum requirements	17

TABLES

Table 1. Scope of Tender

Table 2: Interpretation of keywords

Table 3: Definitions

Table 4: Abbreviations

Table 5: References and standards

FIGURES

Figure 1. Overall possible design of the stand

Figure 2. Fastening of the camera set to the wall of the BCB

Figure 3. Design of the U-clamps

Figure 4. Yaw angle

Figure 5. Positioning of the camera sets

1 INTRODUCTION

Herewith the Contracting Authority has decided to initiate a project to introduce solution for facial image capture to the entry/exit system on the Schengen Border in Estonian Republic.

For accomplishing of the goals set the Contracting Authority intends to acquire facial image capture solution to facilitate border crossing without lowering the security level of border checks. The requirements in this Technical Specification are provided to explain the details of technical and procedural parameters to achieve the service level required.

The workflow of the solution consists of following operations:

- Facial biometric image capture;
- Giving instructions to the travellers for facial image capture;
- Forwarding of facial images from the facial image capture solution to border control officer workstation;
- Giving feedback to the border guard officer about facial image capture failure with detailed information about deviation from [ISO 19794-5] and [ISO 29794-5] requirements

No captured images SHALL be stored in the cameras.

Unless otherwise stated, the requirements in this document apply to all software and hardware components offered by the Vendor in the framework of this Tender. All requirements SHALL be considered mandatory if not clearly specified otherwise.

All components supplied by the Vendor SHALL make it possible to completely implement and meet all relevant requirements of standards, regulations, guidelines and recommendations provided in Table 5 hereunder.

This document includes drawings of a design of a camera set. This design is OPTIONAL, being one of many possible and not mandatory to be followed. It has been provided only to describe the situation. For example, see 'Figure.1 Overall possible design of the stand'.

There are some mandatory requirements though that MUST be followed while developing the final design of the stand. These requirements are provided in pp. 2.4 and 2.5.

1.1 SCOPE OF TENDER

Table 1 describes the scope of the components of the tender. Refer to Chapter 2 for further description of each component.

Solution component	Scope
Facial image capture solution	The Vendor SHALL deliver hardware sets provided in p. 2.1.1 ready to be connected to Contracting Authority's border control booths to PBGB information system.
Facial image capture solution management software	Software used for configuration and work procedures of the solution.
Integration software	Solution SDK for integration with Contracting Authority's border control software
Licenses	The Vendor SHALL submit proof that he has all the licenses required to operate the facial image capture solution, contingent hard- and software. Licenses MUST cover all the components purchased in course of this Tender.

Table 1. Scope of Tender

1.2 TERMINOLOGY

Requirements as defined in this Specification can be mandatory, recommended or optional. All the requirements in this document are mandatory if not otherwise clearly specified.

MUST, SHALL, REQUIRED, NORMATIVE	The implementation is an absolute requirement of the specification and must be used/included.
RECOMMENDED, NOT RECOMMENDED, SHOULD, SHOULD NOT	The requirements are recommendations, this means that there may exist valid reasons in particular circumstances to ignore a particular item or requirement, but the full implications must be understood and carefully weighed before choosing a different course.
MAY, OPTIONAL	The requirements are not binding. One vendor may choose to include it, another may omit it.
MUST NOT, SHALL NOT	A so-called requirement is an absolute prohibition of the specification.

Table 2: Interpretation of keywords

1.3 DEFINITIONS AND ABBREVIATIONS

1.3.1 DEFINITIONS

Term	Definition
Contracting Authority	The term Contracting Authority is used to refer to (SMIT) as responsible for the tender process and as responsible Commissioning Party.
Camera module	Self-standing set of 1 (one) camera without a wall- or floor-anchored stand.
Camera set	Camera module together with a wall- or floor-anchored stand.
Vendor	The term is used throughout this specification to refer to the vendor, tenderer/bidder or contractor in all phases of the procurement and delivery of the requested solution.

Table 3: Definitions

1.3.2 ABBREVIATIONS

BCB	Border Control Booth
BCP	Border Control Point
BCW	Border Control Officer Workstation
CA	Certification Authority
FtAR	Failure to Acquire Rate
GDPR	The EU General Data Protection Regulation
ICAO	International Civil Aviation Organisation

IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
JPG	Joint Photographic Experts Group
LCD	Liquid Crystal Display
mTIR	Maryland Test Facility True Identification Rate
PBGB	Estonian Police and Border Guard Board
PoE	Power over Ethernet
SMIT	IT and Development Centre, Ministry of the Interior

Table 4: Abbreviations

1.4 REFERENCES AND STANDARDS

#	Standard	Publisher	Date
[EN 62368-1:2014]	IEC/EN 62368-1:2014: Audio/video, information and communication technology equipment. Safety requirements.	IEC/EN	October 4 th , 2018
[IEC 62471]	IEC 62471:2006: Photobiological safety of lamps and lamp systems	IEC	July 26 th , 2006
[ISO10918-1]	ISO/IEC 10918-1: Information technology - Digital compression and coding of continuous-tone still images: Requirements and guidelines	ISO	February 1994
[ISO 19794-5]	ISO 19794-5: Information Technology – Biometrics – Biometric Data Interchange Formats – Part 5: Face Image Data	ISO	November 2011
[ISO 29794-5]	ISO/IEC TR 29794-5: Information technology — Biometric sample quality — Part 5: Face image data	ISO	April 2010
[RFC5246]	The Transport Layer Security (TLS) Protocol Version 1.2	IETF	August 2008

Table 5: References and standards

1.5 FIRST ORDER

The approximate quantity of the first order is 134 cameras with licenses and 3-years technical support.

2 GENERAL DESCRIPTIONS

2.1 BACKGROUND INFORMATION

Facial image capture solution will be installed in all Estonian border control points for both entry and exit. The solution will be installed indoors, anchored to border control booths. The solution is protected from outside weather.

The Contracting Authority is interested in purchasing fully automatic facial image capture solution.

More detailed requirements to functional components are provided in the following sub-chapters.

2.1.1 HARDWARE SET

One set consists of following items:

1. Camera;
2. Camera metal stand;
3. Connecting cables; and
4. 230V power supply module in case of PoE or DC power supply.

2.2 SAFETY

All equipment and fittings **MUST** comply with EU safety requirements and applicable standards.

2.3 OVERVIEW OF THE CAMERA PARAMETERS

NO.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 1.	Optical system with autofocus range 50 – 80 cm is REQUIRED.		
REQ 2.	Optical autofocus is REQUIRED. Hyper focal focusing is not accepted. Focusing based on moving intra-lens component(s) or sensor are both accepted.		
REQ 3.	Image synthesis based on images from different cameras is not accepted, captured images MUST be originating from 1 (one) camera device.		
REQ 4.	Additional cameras and sensors may be used for other purposes e.g. liveness detection etc.		
REQ 5.	The camera system SHALL cover at least a range of 120cm to 210cm of a person's body height (if standing in marked position in front of the camera system).		
REQ 6.	The camera system SHALL guarantee sharpness of the captured facial image if the traveller is positioned within the designated capture area.		
REQ 7.	The camera system SHALL minimise distortion of the captured facial image within the whole capture area.		
REQ 8.	Each camera SHOULD be uniquely identifiable.		
REQ 9.	All cameras must be given unique identifiers and the camera unique identifiers MUST be linked to the captured images.		
REQ 10.	Camera unique identifiers' syntax prescribed by the Contracting Authority MUST be supported.		
REQ 11.	Camera case colour SHALL be agreed with the Contracting Authority during the execution of the Contract.		

2.3.1 FILE PARAMETERS AND INTEGRATION INTERFACE

NO.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 12.	Resolution of the captured facial image at the output of a camera MUST be 1600 (height) to 1200 (width) pixels.		
REQ 13.	The facial images provided by the capture unit MUST have at least 250 pixels between the centres of the eyes.		
REQ 14.	The face SHALL be fully visible in the foreground of the captured image.		

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 15.	Image format of the captured facial image at the output of a camera MUST be jpg.		
REQ 16.	Colour depth of facial image processed MUST be 24-bit RGB.		
REQ 17.	Colour space sRGB is REQUIRED.		
REQ 18.	The captured facial image MUST be fully compatible to [ISO 19794-5] and [ISO 29794-5] and suitable for later biometric comparison.		
REQ 19.	Integration interface details will be agreed during course of the Contract. Captured facial image file plus XML coded metadata will be forwarded to the border control officer workstation.		

2.3.2 SOLUTION OPERATING CONDITIONS

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 20.	The camera modules MUST be operative at ambient temperatures 5 – 40 degrees Centigrade.		
REQ 21.	The camera modules MUST be operative at ambient humidity 30 – 70 per cent.		

2.4 STAND CONFIGURATION

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 22.	The primary method of anchoring of the stand SHALL be to the border control booth frontal or side wall by means of U-clamps. See Figure 2.		
REQ 23.	The configuration including length of the threaded part of U-clamps SHALL be agreed with the Contracting authority as it is dependent on the design of the BCBs and on the profile of the vertical shaft of the stand. See Figure 3.		
REQ 24.	Fastening of the stand to the floor (e.g. by means of glue or screws/bolts) MUST be supported as an option.		
REQ 25.	No. of floor mounted stands SHALL be agreed with the Contracting Authority during execution of the Contract.		
REQ 26.	Positioning of the camera module (yaw, pitch, roll) MUST be fixed. No operative adjustment of the camera SHALL be performed.		

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 27.	Stand design MUST enable vertical positioning of the camera module so that captured facial images of the persons of minimal and maximal height will be compliant to [ISO 19794-5] and [ISO 29794-5] requirements.		
REQ 28.	Stand design MUST enable horizontal positioning (yaw) of the camera module depending on the local needs in concrete border control point.		
REQ 29.	Distance of the camera module from the stand or booth MUST allow yaw angle ± 45 degrees on horizontal plane. See Figure 4.		
REQ 30.	Distance between the front wall surface of the border control booth and the camera module SHALL be agreed with the Contracting Authority during execution of the Contract.		
REQ 31.	Positioning of the camera module either on the left or right side from the traveller MUST be supported. See Figure 5.		
REQ 32.	The physical design of the solution MUST enable to fasten fingerprint reader to the stand in vicinity of the camera module at height and in a way that enables ergonomical usage of the fingerprint reader.		
REQ 33.	All fastenings MUST be covered and/or special tools MUST be used to operate.		
REQ 34.	Footprint images indicating the standoff distance in front of the camera SHALL be applied on the floor by the Contracting Authority.		

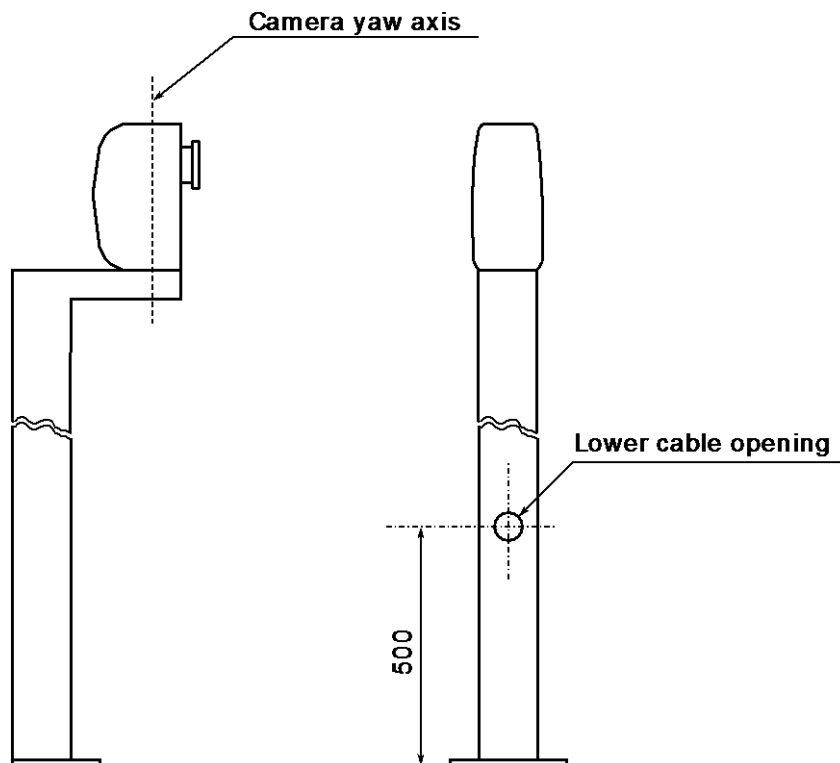


Figure 1. Overall possible design of the stand

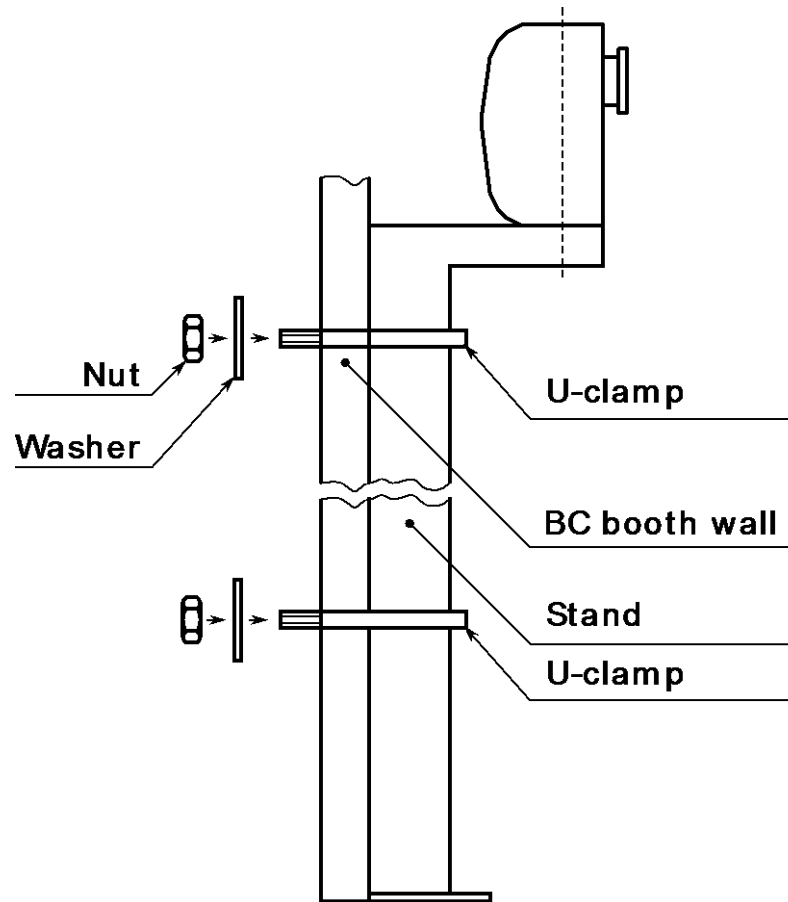


Figure 2. Fastening of the camera set to the wall of the BCB

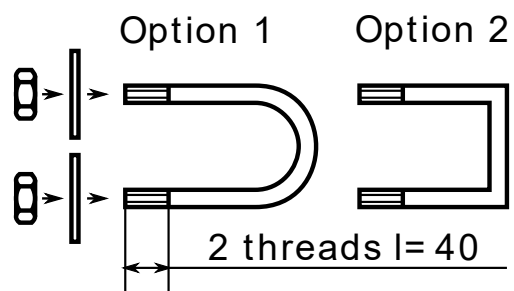


Figure 3. Design of the U-clamps

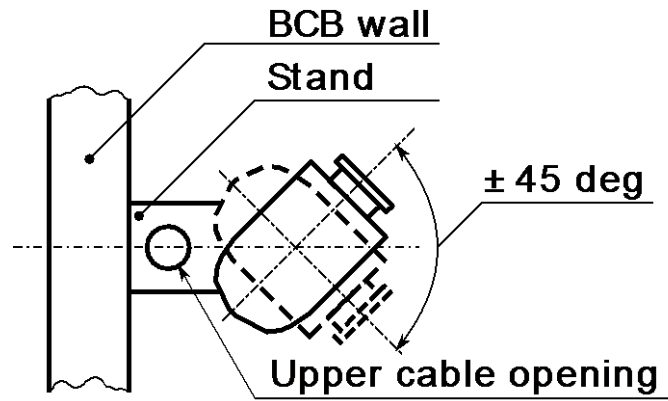


Figure 4. Yaw angle

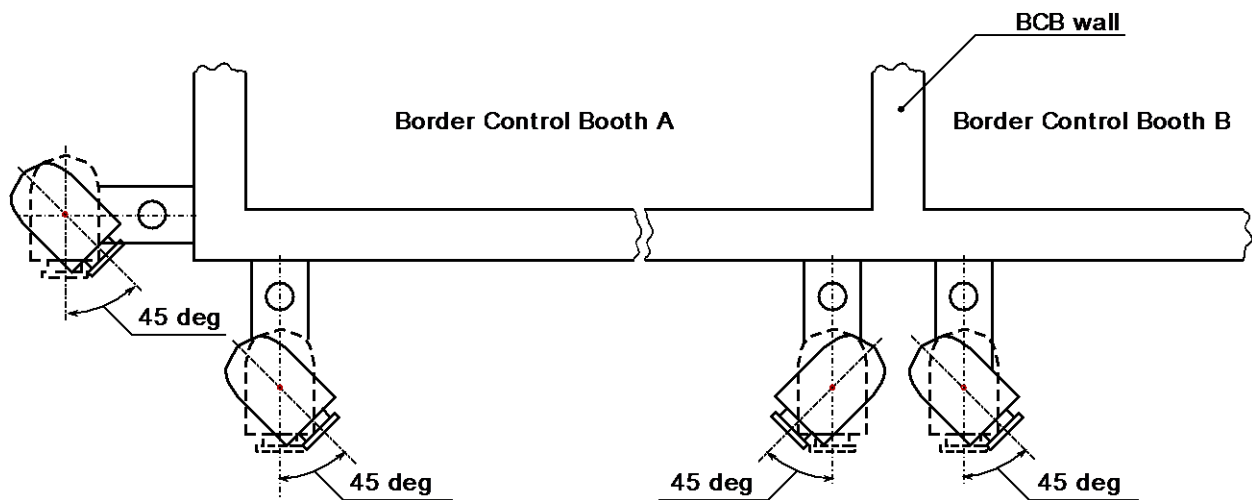


Figure 5. Positioning of the camera sets

2.5 NETWORK CABLING AND CONNECTIONS

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 35.	Cabling between cameras, fingerprint readers and background systems at the same BCP MUST be possible to install in conduits including anchoring unit covering all length of the cables preventing intentional and unintentional damage and intrusion.		
REQ 36.	Anchorage unit design of the stand MUST support covered lead-through of the cables through the wall of the border control booth.		
REQ 37.	Distance of the cable lead-through opening from the floor MUST be 500 mm. See Figure 1.		

2.6 HUMAN INTERFACE

2.6.1 DISPLAY

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 38.	Cameras MUST be equipped with colour LCD screens for displaying guidance messages and feedback to persons crossing the border and whose facial images are captured.		
REQ 39.	The size of the display MUST be big enough that information on the screen can be perceived correctly.		
REQ 40.	The screen must offer clear guidance and feedback to the traveller.		
REQ 41.	Screen position MUST be selected based on ergonomics and convenience to the travellers.		

2.6.2 TRAVELLERS' SCREEN INTERFACE

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 42.	Details of the screen interface SHALL be agreed with the Contracting Authority during the execution of the Contract.		
REQ 43.	Upload to the camera modules and display of pictograms and animations prepared by the Contracting Authority MUST be supported.		
REQ 44.	External commands to show uploaded pictograms and animations MUST be supported.		
REQ 45.	Operative guidance messages from border control personnel to the travellers MUST be shown.		

2.7 REQUIREMENTS TO CAMERA FUNCTIONALITY

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 46.	Orientation and framing of the captured facial images MUST be based on cropping principle.		
REQ 47.	The requirements of [ISO 19794-5] p. „Photographic requirements for the Full Frontal Face Image Type“ MUST be followed when positioning the face during cropping procedure.		
REQ 48.	Automatic pre-qualification of compliance of captured live facial images to the [ISO 19794-5] and the [ISO 29794-5] from the acquisition stream MUST be supported.		

NO.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 49.	<p>The camera MUST have functionality for pre-qualification to the following requirements not limited to:</p> <ul style="list-style-type: none"> • Compliance to [ISO 19794-5] p. A.3.2.3 “Summary of best practice photographic recommendations”; • Compliance to [ISO 19794-5] p. A.3.2.4 “Sample images and sample photograph taking guidelines for travel documents”; • Absence of multiplicity of faces in the picture. 		
REQ 50.	No biometric comparison SHALL be performed in the camera.		

2.8 POWER SUPPLY

NO.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 51.	In case of PoE connection to the Contracting Authority's background systems purveyance of PoE units are REQUIRED.		
REQ 52.	In case of USB connection to the Contracting Authority's background systems purveyance of 230V power supply modules are REQUIRED.		

2.9 LIGHTING

NO.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 53.	Active diffuse lighting SHALL be used to ensure uniform illumination of the captured facial image and to be independent of external lighting.		
REQ 54.	The lighting SHALL NOT cause reflections of light sources on glasses or the skin of the face.		
REQ 55.	The lighting MAY be active during the complete capture process and brightness MAY be varied to achieve best contrast and illumination.		

3 REQUIREMENTS TO THE CAPTURE PROCESS

NO.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 56.	Facial image capture process MUST be fully automated.		
REQ 57.	Facial image capture process SHALL be initiated by the border guard official.		

No.	Requirement Description	Vendor's Response	Fulfilled
REQ 58.	The facial image of a person is captured in standing position.		
REQ 59.	If the person is standing in the designated position at the standoff distance and looking straight to the traveller instruction screen the viewing direction of the person SHALL be frontal.		
REQ 60.	In case the person does not need guidance and optimal image is captured at first attempt, regular capture and check time SHALL not exceed 2 seconds. This constraint does not comprise feedback about successful accomplishment of the capture process.		
REQ 61.	Guidance of the travellers will be based on external system messages by showing appropriate uploaded pictograms and animations according to results of biometric comparison in the background system of the Contracting Authority.		
REQ 62.	A correspondence table containing system messages and respective messages to the traveller MUST be present in the camera. The contents of this table SHALL be agreed with the Contracting Authority during execution of the Contract.		
REQ 63.	Max facial image capture time frame duration MUST be configurable. In case satisfactory image is not captured during this time period alert message MUST be forwarded via integration interface.		
REQ 64.	The system MUST be able to show guidance messages to the traveller to obtain optimal captured image based on the internal analysis of non-compliance to the [ISO 19794-5].		
REQ 65.	Full guidance MUST be able to be provided on the camera display screen. The contents of the guidance SHALL be coordinated with Contracting Authority.		
REQ 66.	After facial image capture process end the traveller will be shown a customized message to move on to the border control officer.		
REQ 67.	Every capture SHALL be given unique order No.		
REQ 68.	Unique monotonously increasing identification number MUST be attributed to every individual captured facial image.		
REQ 69.	Any anomaly MUST be considered as an indicator of a possible risk situation resulting in mapping the check to aggregate result 'failed'.		

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 70.	No personal data (e.g. facial images) or border crossing procedure information collected during facial image capture process is stored or logged in the cameras. All data obtained during a facial image capture process SHALL be forwarded to the background system of the Contracting Authority.		

4 DATA/INFORMATION EXCHANGE

4.1 DATA EXCHANGE WITH BCW

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 71.	BCW Interface specification SHALL be agreed with the Contracting Authority during execution of the Contract. Information provided in chapter 8 is preliminary and will be complemented.		
REQ 72.	The information exchange between the camera system solution and BCW SHALL take place only via API.		
REQ 73.	The following data MUST be delivered to BCW: <ul style="list-style-type: none"> • Captured facial image; • Camera unique identifier; • Time stamp. 		
REQ 74.	Alerts deliverable to BCW: <ul style="list-style-type: none"> • Failure of capture ISO compliant image; • Information about the failure reasons for each capture attempt until timeout. 		
REQ 75.	The set of operative guidance messages SHALL be agreed with the Contracting Authority during the execution of the Contract.		
REQ 76.	For every data transfer message sent there MUST be a response in form of response codes. This requirement is applicable to both parties of data transfer. Missing of reply MUST not be considered as a proof of successful data transfer.		
REQ 77.	List of data transfer response codes SHALL be agreed between the Contracting Authority and the Vendor during finalizing the BCW interface.		
REQ 78.	In order to secure the communication channel of the transmission between camera sets and BCW data encryption MUST be used.		
REQ 79.	No other network connection except to the Contracting Authority's network/BCW SHALL be used.		

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 80.	Data exchange SHALL be protected from electronic and mechanical interception.		

5 REQUIREMENTS TO RELIABILITY

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 81.	MTBF during useful life period of one sole camera module not less than 30,000 h is REQUIRED.		

6 ADDITIONAL INFORMATION

6.1 LIST OF MESSAGES TO BCW

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 82.	The messages to BCW SHALL be agreed with Contracting Authority during execution of the Contract.		

6.2 LIST OF MESSAGES TO A TRAVELLER

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 83.	The messages to traveller will be agreed with Contracting Authority during execution of the Contract.		

7 REQUIREMENTS DEFINITION AND TENDER EVALUATION

7.1 REQUIREMENTS DEFINITION

As stated here above in this document all the provided requirements are mandatory if not stated explicitly in another way.

7.1.1 MINIMUM REQUIREMENTS

No.	REQUIREMENT DESCRIPTION	VENDOR'S RESPONSE	FULFILLED
REQ 1	[Requirement title] [Customer's Requirement Description]	<i>[Vendor to include, or refer to, supporting documentation that prove/support fulfilment of the minimum requirement]</i>	Yes/No
REQ 2	[Requirement title] [Customer's Requirement Description]		Yes/No

The requirements will be stated as in the example above.

The first column labelled “No.” provides a unique number for each requirement, using the prefix “REQ”. Requirements are numbered sequentially throughout the document.

The second column labelled “Requirement Description” contains a Requirement Title (bold text) and the Contracting Authority’s Requirement Description. The requirements are not scored, but evaluated as fulfilled/not fulfilled based on the documentation provided by the Vendor. The Contracting Authority reserves the right to decide if the Vendor fulfils the requirements or not based on the documentation provided.

The third column labelled “Vendor’s Response” shall be filled by the Vendor to include, or refer to, supporting documentation to convince the Customer that the requirement is fulfilled. The referenced documentation should be as short and precise as possible.

In the last column labelled “Fulfilled” the Vendor must clearly state whether the Vendor fulfils the requirement (**Yes**) or not (**No**). Should the column “Fulfilled” not be filled in, then the Customer will assume the column to be filled in with “No” and therefore it will constitute a confirmation that the Vendor cannot comply with the requirements.