

Appendix Q Taxi Camera Technical Specification and System Requirements

In order to be considered suitable for installation in a Rotherham Council Licensed vehicle, a taxi camera system must meet the following requirements:

1.0 Operational Technical Specifications

Reference	Specification	Details
1.1	100% solid state design or a proven vibration and shock resistant system	The system should not have any fan and the recording should be vibration and shock proof, i.e.: <ul style="list-style-type: none"> - Flash-based SSD (100% industrial grade), - Hard disk with both mechanical anti-vibration and anti-shock mechanism and self-recovery and self-check file writing system.
1.2	8 to 15 Volts DC	Operational between 8 and 15 volts DC
1.3	Reverse polarity protected	System to be protected against reverse voltage.
1.4	Short circuit prevention	System to be protected against short circuits
1.5	Over voltage protection	System to be protected against high voltage transients likely to be encountered in the vehicle electrical system.
1.6	Automotive Electromagnetic Compatibility Requirements	The in-vehicle taxi camera system must be compliant with the Council Directives: <ul style="list-style-type: none"> - 2004/108/EC on Electromagnetic Compatibility (CISPR 22/EN55022), - 2004/104/EC on Radio Interference (sections 6.5, 6.6, 6.8 and 6.9) <p>The taxi camera equipment should therefore be e-marked or CE-marked with confirmation by the equipment manufacturer as being non-immunity related and suitable for use in motor vehicles.</p>
1.7	System activation (on / off) switch to be located in a position where it is not accessible from inside the vehicle (i.e. in the boot / engine compartment).	The system is required to be active at all times that the vehicle is being used as a licensed vehicle. This will allow the facility for the system to be deactivated during times when the vehicle is being used for private purposes (e.g. domestic use). The switch that deactivates the system must be located within the vehicles boot or engine compartment (i.e. it must only be possible to deactivate the system from outside of the vehicle).
1.8	First-in/first-out buffer recording principle	
1.9	Built-in, automatic logging of all access actions, including date and personnel names	
1.10	Security, duration and auto-clearing of log files	
1.11	Image export formats and media	Images must be exported in commercially available formats.

1.12	Image protection during power disruption	Images must be preserved in the event of loss of power. Battery back-up will not be permitted
1.13	Unit must operate without the ignition being turned on.	The Unit must have the ability to operate for at least 2 hours without power from the ignition.
1.14	Image and audio data shall be recorded and stored in a unit separate from the camera head.	
1.15	GPS capability	System must be compatible to allow for GPS capability.
1.17	The system shall not to record audio except when audio recording is activated by means of an approved trigger.	<p>The system should have the ability to start recording audio data by means of at least two trigger buttons (see also 1.26 below).</p> <p>One trigger button must be capable of being activated by the driver. Once the trigger is activated the system must begin to record audio data. The system will continue to record audio until the same trigger is activated again. The second activation of the trigger must result in the cessation of audio recording (e.g. a button could be pressed to begin audio recording, if the (i.e. the trigger, which could for example be a button, would be pressed to begin audio recording, pressing the button again would stop audio recording).</p> <p>The second trigger button must be capable of being activated by the passengers in the vehicle independently of the driver. Once the trigger is activated the system must begin to record audio data. The system will continue to record audio until the same trigger is activated again. The second activation of the trigger must result in the cessation of audio recording (i.e. the trigger, which could for example be a button, would be pressed to begin audio recording, pressing the button again would stop audio recording).</p> <p>Both audio activation triggers must be independent of each other – this means that audio recording can only be deactivated by means of the same trigger (driver or passenger) that was used to activate the audio recording.</p>
1.16	The system must be capable of recording audio time synchronized to the recorded images.	
1.18	The audio playback, when triggered, shall be in 'real time' and synchronised with the images that are captured.	

1.19	Digital sampling of the audio signal must exceed 8KHz	
1.20	Digital resolution of the audio samples must exceed 10 bits.	
1.21	The audio microphone shall be integrated within the camera head.	
1.22	Audio data and image data must be stored together, not in separate files, and must be protected against unauthorized access or tampering.	
1.23	The system must support testing of the audio function for installation set-up and inspection purposes.	
1.24	The system must 'go to sleep' to reduce battery drain during prolonged idle time. It must be capable of immediate reactivation	
1.25	Images recorded by the system shall not be displayed within the vehicle.	
1.26	The system must have at least two emergency activation triggers (panic buttons).	<p>One of the triggers / panic buttons must be capable of being operated by the driver – this must be independent of the audio recording activation switch.</p> <p>At least one other trigger / panic button must be capable of being operated by a passenger from any passenger seat in the vehicle. Once activated, this switch must trigger the recording of video and audio in accordance with section 6.1 below.</p>
1.27	The system must include a visual indicator that will clearly show when audio recording is taking place. This indicator must be visible to all passengers within the vehicle.	This may take the form of an indicator LED built into the audio activation switch, or a remote LED that can clearly be seen by passengers.

2.0 Storage Capacity Technical Specification

Reference	Specification	Details
2.1	Minimum of twenty-one days of recording capacity	The camera system must be capable of recording and storing a minimum of twenty-one days of images of HD1 (720/288) size or better.
2.2	Images must be clear in all lighting conditions	System to provide clear images in bright sunshine, shade, dark and total darkness. Also, when strong back light is present.

3.0 Camera Head Technical Specification

Reference	Specification	Details
3.1	Camera installation non-obstructive	The camera and all system components shall be installed in a manner that does not interfere with the driver's vision or view of mirrors or otherwise normal operation of the vehicle.
3.2	Protected camera disconnect	The camera head shall be designed to disconnect for ease of removal and replacement by maintenance personnel.
3.3	Special tools for adjustment/removal	To prevent inappropriate interference only tools supplied to authorised fitters should be capable of carrying out adjustments or removal.
3.4	Field of view to capture all passengers in the vehicle	The lens of the camera must be of a type that captures the driver and all passengers of the vehicle on the recorded image. The lens must be of a style not to create a "fishbowl" effect.
3.5	Images must be clear	System to provide clear images in all lighting conditions and allow different skin tones to be detected
3.6	Compatible for use in vehicles with a partition (shield)	The camera system must be adaptable to provide clear images when a vehicle is equipped with a shield. This may be accomplished with the use of multiple camera heads.
3.7	Multiple cameras	The unit shall be capable of supporting up to four (4) cameras. Four cameras may be required to provide adequate coverage in larger vehicles and/or certain purpose built vehicles.

4.0 Storage Device (Recorder) Technical Specification

Reference	Specification	Details
4.1	Impact and shock resistance	The recorder shall be impact resistant, sufficient to withstand a typical car accident, or striking with a large, heavy object such as a suitcase.
4.2	Controller in concealed location	The storage unit shall be concealed from view and effectively inaccessible except by authorised personnel.
4.3	Download port provision	The recorder shall be equipped with a communication port for downloading by authorised personnel.
4.4	Download port shall be located in an easily accessible location such as a glove compartment.	The recorder download port shall be located in the glove box if practicable, if not then in a location that does not require the removal of panels and is accessible.
4.5	Download port cable length (1 foot minimum)	Download port shall be at least one foot in length for ease of download.
4.6	Recorder to be securely affixed to the vehicle	
4.7	Log to register each user access	
4.8	Log to register camera system parameter modifications	
4.9	Log to register each image download session	
4.10	Log to register modification/ manipulation of downloaded images	
4.11	Log to register exporting of downloaded images	
4.12	Log to register exporting of downloaded clips	
4.13	Log file protected against un-authorised access	
4.14	Time/date stamp	All stored images must be time and date stamped.
4.15	Vehicle ID number stamp	All stored images must have two fields for vehicle identification (VIN & number plate).
4.16	Controller non-modifiable ID code stamp	Each recorded image shall be automatically stamped with a unique and non-modifiable code that identifies the controller that was used to record the image.
4.17	Controller (Storage Recorder)	Manufacturer to supply Rotherham MBC with a supply of specialised tools to allow for removal of the controller and download of data when required.

5.0 Specifications for video and audio recording rate

Reference	Specification	Details
5.1	Video image recording on system activation (when audio is not activated).	The system shall record images at the rate of four images per second.
5.2	Video image recording when audio is activated.	The system shall record images at the rate of twenty five images per second during periods when audio recording is activated (either due to time requirement, or through activation by the driver trigger switch or passenger panic button).
5.3	When activated, audio recording must be in real time and synchronised with the video recording.	
5.4	System to continue to record images (and audio when applicable) when engine is off.	System must continue to record images (and audio when applicable) for 30 minutes after engine / ignition is switched off.

6.0 Specification for activation via driver or passenger trigger / panic buttons

Reference	Specification	Detail
6.1	The activation of a trigger button must provide for overwrite-protected image storage when activated by driver or passenger.	The system must be fitted with at least two trigger buttons that once activated will trigger the protected recording of audio and video (see also 1.17 and 1.26 above).
6.2	Emergency image overwrite protection capability	Image sequences resulting from emergency activation shall be recorded in an area of memory which is protected from being overwritten
6.3	Overwrite protection capacity for at least 3 activations	
6.4	Overwrite protection self-clear on 96 hr timer	

7.0 Downloading Technical Specification

Reference	Specification	Details
7.1	Time to download complete memory not to exceed 30 minutes	Time to download to be accomplished in 30 minutes or less.
7.2	Provision of necessary software, cables, security keys to the Council's Licensing Team.	
7.3	Windows 10 compatible.	
7.4	Downloaded images stored in non-volatile media	
7.5	Downloaded images stored in secure format	

7.6	Verifiable image authenticity	Each image shall be stamped with controller ID and vehicle ID and be tamperproof.
7.7	Provision of technical support to Rotherham MBC Licensing team when necessary.	To assist in accessing system in case of damage to the vehicle or to the system in case of accident within 1 hour during normal working hours and within 8 hours otherwise.
7.8	Wireless Download Prohibited	Unit must not allow for wireless downloads. Wireless diagnostic may be used. All wireless hardware to be disabled.
7.9	Filter the specific images for events and times for the approximate time of the crime committed.	

8.0 Requirements in relation to System Information

Reference	Requirement	Details
8.1	Provision of service log sheet with each unit shipped	The unit manufacturer shall have a service log shipped with the unit. The manufacturer shall also enclose detailed instructions for the drivers with each unit shipped. An installation manual shall also be furnished to authorised installers and fleet operators.
8.2	Serial number indication on service log	The unit will be marked with a serial number
8.3	Installation date indication on service log	The provision for the installer to indicate the installation date
8.4	Provision of driver instruction card with each unit shipped	
8.5	Provision of installation manual to installers and fleet operators	
8.6	Clarity of operating instructions	The system shall be provided with clear and concise operation instructions which are written with due consideration to varying levels of literacy.
8.7	Installation by authorised agents	The unit shall be installed by manufacturer's authorised agents, or other installers approved by the council (subject to agreement with the manufacturer).
8.8	Provision of authorised agents list to Rotherham MBC Licensing Team	The manufacturer shall provide a list of all authorised agents to Rotherham MBC Licensing Team.
8.9	Documentation	The manufacturer must provide clear and concise operating instructions which are written in layman's terms. (Details on how the system records the images)
8.10	Image Protection	All captured images must be protected using encryption software that meets or exceeds the current FIPS 140-2 (level 2) standard or equivalent.

9.0 System requirements in relation to Vehicle Inspection Facility – Inspections

Reference	Requirement	Details
9.1	Provision of system status/health indicator	The driver shall have an indicator showing when the system is operational and when there is a malfunction.
9.2	Mounting location of system status/health indicator to be seen by driver only	The indicators shall be mounted/installed for the driver's vision only. The indication system must be in accordance with section 9.3 and 9.4 below.
9.3	Additional indicator requirement	Where a system is fitted with an indicator to show that the system is on, this indicator shall be separate to those listed above or of a different colour to avoid any possible confusion on the part of the drivers using the system.
9.4	Designed / installed to be testable by Rotherham MBC Licensing Team (or persons acting on behalf of the council – such as vehicle inspectors)	The system shall be designed and installed such that the system may be easily tested by Rotherham MBC Licensing Team staff to ensure that all features are operating and that images are being recorded as prescribed.

10.0 General System Requirements

Reference	Requirement	Details
10.1	Vandal and tamper resistance	
10.2	Provision of statement of compliance	In addition to a formal test of all aspects of this requirement specification, a statement of compliance shall be provided and signed by an officer of the company.
10.3	Reliability in operational and environmental conditions	The system shall provide reliable and full functionality in all operational and environmental conditions encountered in the operation of taxis.
10.4	Programmability of image timing parameters	It shall be possible to change timing and parameters without the requirement to change components.
10.5	Training and Technical Support and Equipment	Manufacturer must provide Rotherham MBC Licensing Team with a Training and Technical Manual. Supply a working unit to Rotherham MBC Licensing for testing purposes.
10.6	Software and Hardware	Manufacturer to supply Rotherham MBC Licensing Team with a supply of cables and software to be installed under the supervision of the council's authorised staff.
10.7	Agreement between the Camera Manufacturer and Rotherham MBC	Agreement to allow Rotherham MBC access to the relevant software from the manufacturer so that in the event the manufacturer goes out of business, council will be able to support the system.