SOFFA™

SOFFA Installation Guidelines

October 2020

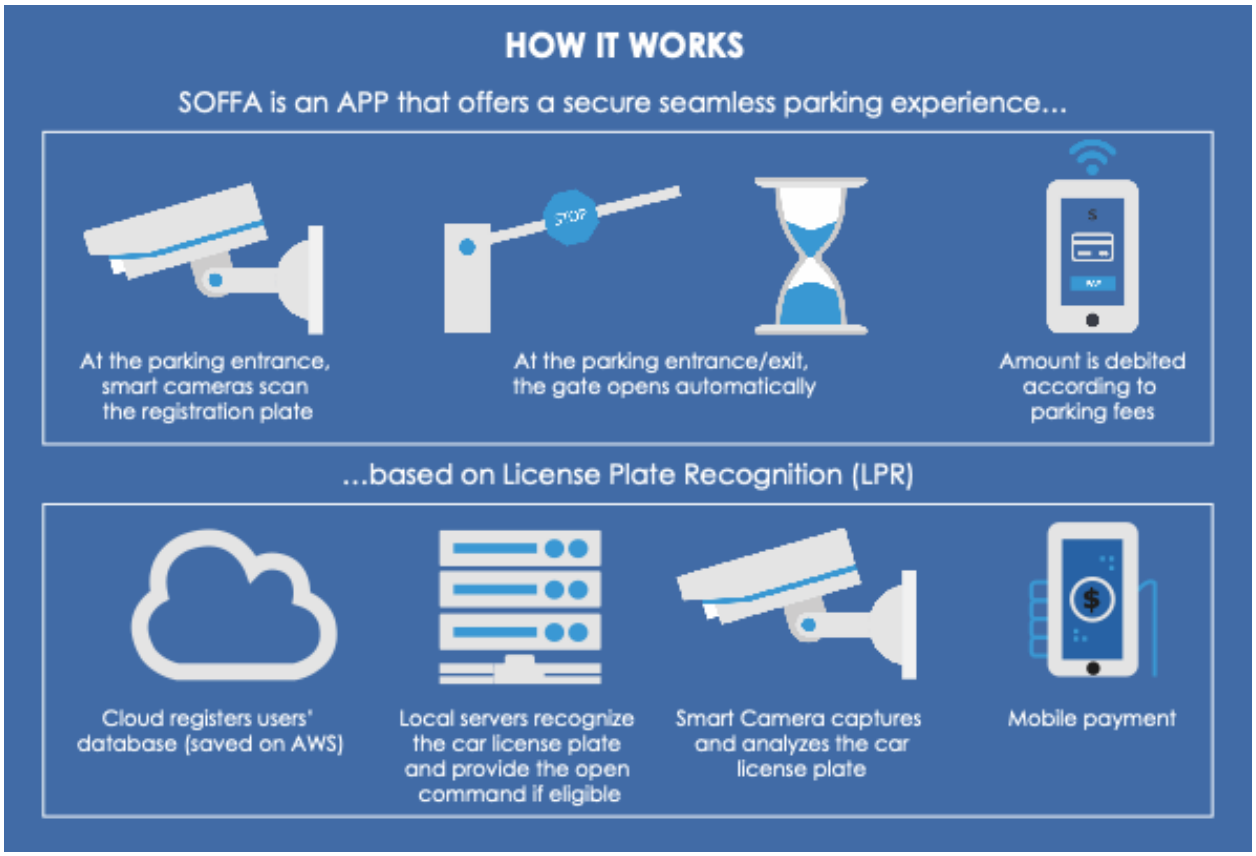
DOCUMENT HISTORY CHANGE

This section provides a summary of the various document versions

Version	Change Log
1.0	Final

1. SOFFA Description

SOFFA is a parking service platform offering critical benefits to the whole parking ecosystem. It offers an automated, hassle & hands free digital access/exit and payment solution to parking users based on License Plate Recognition (LPR) technology and/or QR Code reading using an application available on Apple Store and Google Play.



2. Hardware Requirements and Specifications

a. CAMERA SPECIFICATION

Although many cameras are promoted as ANPR cameras, only a relatively small proportion has all the technical features necessary to ensure optimal plate reading capability. An ANPR camera will require infra-red (IR) illumination, and a very fast shutter speed (1/10,000 to 1/20,000 second). The IR lamp should be shuttered in synchronization with the camera to provide a maximum burst of light to illuminate the number plate. The camera should have a zoom lens so that the angle of view can be adjusted precisely to obtain the best possible angle of view (preferably via motorized control to save having to open up the camera case each time you want to tweak the lens angle).

We recommend AXIS Cameras, however SOFFA can work with any other camera that has similar specifications to the AXIS camera as detailed below:

AXIS P1435-LE Network Camera

Compact and fully-featured HDTV for any light condition

With Lightfinder and WDR – Forensic Capture, the AXIS P1435-LE bullet camera provides excellent image quality in HDTV 1080p resolution. At low light, Axis' OptimizedIR automatically adapts the exposure of the camera resulting in high-quality and low-noise video. The camera features corridor format, pixel counter, remote zoom and focus, as well as P-Iris control – ensuring optimal depth of field, resolution, image contrast and clarity. The I/O port can be used for notification to an alarm panel or control of a relay. Axis Zipstream technology reduces bandwidth and storage requirements. The outdoor-ready camera comes with either a wide or a tele lens.

> Slim, bullet camera

> Built-in IR LEDs with OptimizedIR

> Two lens alternatives

> HDTV 1080p at up to 50/60 fps

> Axis Zipstream

SOFFA

Camera	
Image sensor	Progressive scan CMOS 1/2.8"
Lens	**3–10.5 mm, F1.4:** Horizontal field of view: 95°–35° Vertical field of view: 51°–20° **10–22 mm, F1.85:** Horizontal field of view: 34.5°–18° Vertical field of view: 20°–11° Varifocal, Remote focus and zoom, P-Iris control, IR corrected
Day and night	Automatically removable infrared-cut filter
Minimum illumination	**3–10.5 mm, at 50 IRE F1.4:** **Color:** 0.12 lux at 30 fps **Color:** 0.24 lux at 60 fps **B/W:** 0.01 lux at 30 fps **B/W:** 0.02 lux at 60 fps **10–22 mm, at 50 IRE F1.85:** **Color:** 0.16 lux at 30 fps **Color:** 0.32 lux at 60 fps **B/W:** 0.02 lux at 30 fps **B/W:** 0.03 lux at 60 fps 0 lux with IR illumination on
Shutter speed	1/66500 to 2 s
Video	
Video compression	H.264 High, Main and Baseline profiles (MPEG-4 Part 10/AVC) Motion JPEG
Resolution	HDTV 1080p 25/30 fps (WDR): 1920x1080 to 160x90 HDTV 1080p 50/60 fps (no WDR): 1920x1080 to 160x90 Meets relevant parts of SMPTE 274M (HDTV 1080p)
Frame rate	Up to 50/60 fps (50/60 Hz, no WDR) in all resolutions
Video streaming	Multiple, individually configurable streams in H.264 and Motion JPEG Axis Zipstream technology in H.264 Controllable frame rate and bandwidth VBR/ABR/MBR H.264
Multi-view streaming	Up to 8 individually cropped out view areas
Image settings	Manual shutter time, Compression, Color, Brightness, Sharpness, White balance, Exposure control, Exposure zones, Fine tuning of behavior at low light, Text and image overlay, Privacy masks, IR illumination Wide Dynamic Range - Forensic Capture: Up to 120 dB depending on scene, Mirroring of images Rotation: 0°, 90°, 180°, 270°, including Corridor Format
Pan/Tilt/Zoom	Digital PTZ
Network	
Security	Password protection, IP address filtering, HTTPS[a] encryption, IEEE 802.1X (EAP-TLS)[a] network access control, digest authentication, user access log, brute force delay protection, signed firmware
Supported protocols	IPv4, IPv6 USGv6, HTTP, HTTPS[a], SSL/TLS[a], QoS Layer 3 DiffServ, FTP, CIFS/SMB, SMTP, Bonjour, UPnP™, SNMP v1/v2c/v3 (MIB-II), DNS, DynDNS, NTP, RTSP, RTP, SRTP, SFTP, TCP, UDP, IGMPv1/v2/v3, RTCP, ICMP, DHCP, ARP, SOCKS, SSH, LLDP
System integration	
Application Programming Interface	Open API for software integration, including VAPIX® and AXIS Camera Application Platform; specifications at *axis.com* AXIS Video Hosting System (AVHS) with One-Click Connection ONVIF® Profile G, ONVIF® Profile S and ONVIF® Profile T, specification at *onvif.org*
Event triggers	Analytics Detectors: Day/Night Mode, Live Stream Accessed, Tampering Hardware: Network, Temperature Input Signal: Manual Trigger, Virtual Inputs Storage: Disruption, Recording System: System Ready Time: Use Schedule, Recurrences
Event actions	File upload: FTP, SFTP, HTTP, HTTPS network share and email Notification: email, HTTP, HTTPS and TCP and SNMP trap External output activation Video recording to edge storage Pre- and post-alarm video buffering WDR mode PTZ control, Overlay text IR illumination
Built-in installation aids	Pixel counter, Remote zoom (**3–10.5 mm** 3.5x optical, **10–22 mm** 2x optical), Remote focus
Data streaming	Event data
Analytics	
Applications	**Included** AXIS Motion Guard, AXIS Fence Guard, AXIS Loitering Guard AXIS Video Motion Detection **Supported** AXIS Digital Autotracking, AXIS Perimeter Defender, AXIS Cross Line Detection Support for AXIS Camera Application Platform enabling installation of third-party applications, see *axis.com/acap*
General	
Casing	IP66, IP67- and NEMA 4X-rated casing (polyester polycarbonate blend)
Sustainability	PVC free
Memory	512 MB RAM, 256 MB Flash
Power	Power over Ethernet IEEE 802.3af/802.3at Type 1 Class 3 Typical: 4.6 W, max 11 W
Connectors	Shielded RJ45 10BASE-T/100BASE-TX PoE I/O: 4-pin terminal block for 1 alarm input and 1 output
IR illumination	OptimizedIR, highly efficient LEDs with adjustable intensity and angle of illumination. **3–10.5 mm:** Range up to 30 m (98 ft) **10–22 mm:** Range up to 50 m (164 ft)
Storage	Support for microSD/microSDHC/microSDXC card Support for SD card encryption Support for recording to network-attached storage (NAS) For SD card and NAS recommendations see *axis.com*
Operating conditions	-30 °C to 55 °C (-22 °F to 131 °F) -30 °C to 60 °C (-22 °F to 140 °F) when IR LEDs are off Humidity 10–100% RH (condensing)
Storage conditions	-40 °C to 65 °C (-40 °F to 149 °F) Humidity 5-95% RH (non-condensing)
Approvals	EN 55022 Class B, EN 61000-6-1, EN 61000-6-2, EN 50121-4, IEC 62236-4, EN 55024, FCC Part 15 Subpart B Class B, ICES-003 Class B, VCCI Class B, RCM AS/NZS CISPR 22 Class B, KCC KN22 Class B, KN24, IEC/EN/UL 60950-1, IEC/EN/UL 60950-22, EN 62471, IEC/EN 60529 IP66/IP67, IEC/EN 62262 IK08, NEMA 250 type 4X, IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-27 **Network** NIST SP500-267 **Safety** IEC/EN/UL 60950-1, IEC/EN/UL 60950-22, IEC/EN 62471, IS 13252 **Environment** IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-14, IEC 60068-2-27, IEC 60068-2-30, IEC 60068-2-78, IEC/EN 60529 IP66/IP67, IEC/EN 62262 IK08, NEMA 250 Type 4X, IEC 60825-1 **Network** NIST SP500-267
Weight	With weather shield: 800 g (1.75 lb)
Dimensions	Ø132 x 260 mm (Ø5 3/16 x 10 1/4 in)
Included accessories	Mounting bracket, Drill template, Installation Guide, Windows decoder 1-user license AXIS Weather Shield L
Optional accessories	AXIS T94F01M J-Box/Gang Box Plate AXIS T91A47 Pole Mount AXIS T94P01B Corner Bracket AXIS T94F01P Conduit Back Box AXIS Weather Shield K Axis PoE Midspans

	For more accessories, see *axis.com*
Video management software	AXIS Companion, AXIS Camera Station, Video management software from Axis' Application Development Partners available at *axis.com/vms*
Languages	English, German, French, Spanish, Italian, Russian, Simplified Chinese, Japanese, Korean, Portuguese, Traditional Chinese
Warranty	Axis 3-year warranty and AXIS Extended Warranty option, see *axis.com/warranty*

a. *This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (openssl.org/), and cryptographic software written by Eric Young (eay@cryptsoft.com).*

Environmental responsibility:

axis.com/environmental-responsibility

b. SERVER SPECIFICATION

Server specs up to 4 Cameras

1 x Xeon CPU 4110
1 x 32GB RAM
2 x 480GB SSD HDD Raid 1 for OS
3 x 2 TB SATA Raid 5 for Images Storage Up to 5Million
1 x Single core Free Flow Dongle
1 x Nvidia Quadro P1000

Server specs up to 10 Cameras

2 x Xeon CPU 4110
2 x 16GB RAM
2 x 480GB SSD HDD Raid 1 for OS
2 x 2 TB SATA Raid 5 for Images Storage Up to 5Million
1 x Dual core Free Flow Dongle
1 x Nvidia Quadro P4000

c. DONGLE SPECIFICATION (To be provided by SOFFA)

A Neural Network Controller is a hardware protection key, either in a form of USB dongle or a special controller card that connects to the PC or server where the ANPR is performed. This NNC contains a special code that tightly cooperates with the ANPR engine during the automatic number plate recognition process. The main parts of the license plate recognition run on the CPU of the PC, but some functions of the code are outsourced to the microcontroller – that is why the presence of the Neural Network Controller is required during the image processing.

- The FXMC USB Neural Network Controller (NNC) is a non-transparent neural network controller that connects to the USB port of a computer. When using this device, there is no need for free PCI slots or PC104+ layers, only the USB support by the operating system.

- This NNC is an internal device that directly connects to the motherboard through the 4-pin vertical USB connector (Samtec SSM-102). Since installed internally, it is ideal for system integrators, as the hardware key is protected from theft or physical damage.

- The CARMEN® FXMC PCIe Neural Network Controller has a PCIe x1 interface to be inserted into a free PCIe slot of a PC. The high speed PCIe interface provides exceptionally fast response time.

In functionality, the mini-PCIe NNC is on par with the USB version. The only difference is the connecting interface. This NNC connects to the mini PCI Express slot, using its USB pins. Also the above dongles come in 3 different sizes:

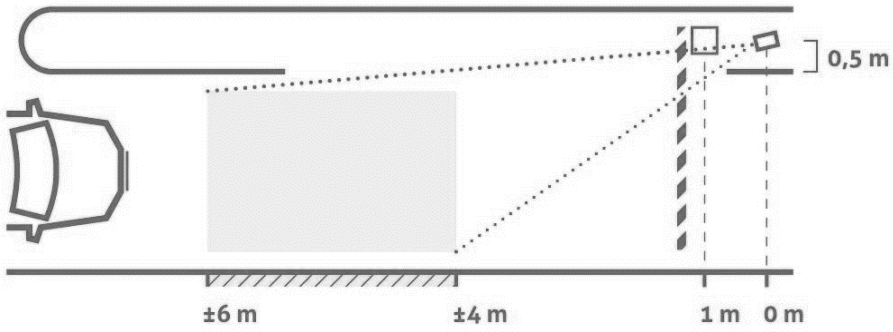
1. Single core, which can host up to 8 cameras.
2. Dual core, which can host up to 16 cameras.
3. Quad core, which can host up to 32 cameras.

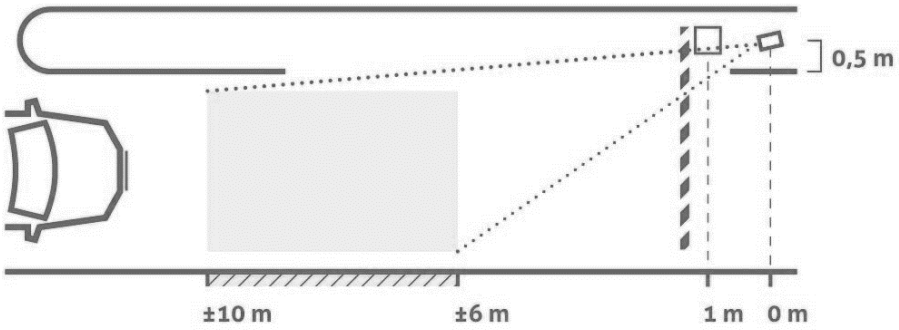
3. Guideline of Installation

Automatic Number Plate Recognition (ANPR) cameras detect passing vehicles and captures their license plates. To obtain the maximum license plate recognition accuracy, the ANPR camera should be installed in a proper way to get a clear image.

a. CAMERA POSITIONING

The ANPR camera is positioned behind the barrier at bumper height. If there is some space behind the barrier and the sight is not blocked, then the best place for the ANPR camera is at bumper height (0.5m height) about 1 to 2 meters max behind the barrier. A vehicle just in front of the barrier is still recognized in that case.





- ✓ Make sure vehicles captured on camera are not sheltered by any object (tree, road sign…)
- ✓ Make sure the license plate captured on camera are not skewed
    - Example of license plates:

b. LENS SELECTION

- ✓ If using a camera with a CS-mount lens, fixed lens is recommended since they perform better for license plate recognition with greater depth of focus. Or you can use a motorized lens with autofocus that helps in setting the right focus automatically, with less errors.
- ✓ Lens with auto iris mode is recommended if the cars are facing direct sunlight (direct sunlight beams can distort a picture)

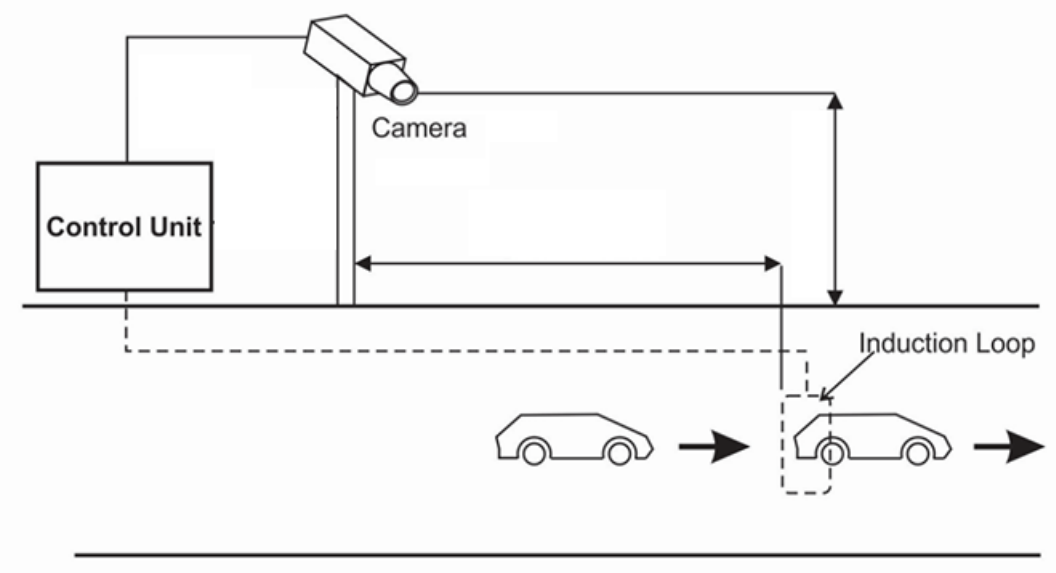
- ✓ To get enough pixels in the frame, a proper lens (example shown in the table below) should be selected

Example for lens selection

Camera	Lens (mm)	Minimum Recognition Distance (m)	Maximum Recognition distance (m)	Surveillance
ANPR Camera	2.8-12	2	6	Entrance

c. LOOP DETECTOR

Vehicle detection loops, called inductive-loops traffic detectors, can detect vehicles passing or arriving at a certain point.



- ➢ An insulated, electrically conducting loop should be installed in the pavement preferably.
- ➢ The electronics unit transmits energy into the wire loops at frequencies between 10 kHz to 200 kHz, depending on the model.

- The inductive-loop system behaves as a tuned electrical circuit in which the loop wire and lead-in cable are the inductive elements.
- When a vehicle passes over the loop or is stopped within the loop, the vehicle induces eddy currents in the wire loops, which decreases their inductance. The decreased inductance actuates the electronics unit output relay or solid-state optically isolated output, which sends a pulse to the traffic signal controller signifying the passage or presence of a vehicle

PS: In the above loop, only metal masses above a certain size are capable of triggering the relay. This is good in that the loop does not thus produce very many "false positive" triggers (say, for example, by a pedestrian crossing the loop with a pocket full of loose metal change) but it sometimes also means that Bicycles, scooters, and motorcycles stopped at such intersections may never be detected by them (and therefore risk being ignored by the switch/signal). Most loops can be manually adjusted (sensitivity) to consistently detect the presence of scooters and motorcycles at the least.

4. Safety Instructions

Safety Instructions are divided into “Warnings” and “Cautions”

⚠ Follow the Warnings to avoid injury or death

⚠ Follow the Cautions to avoid Injury or equipment damage

a. Warnings

⚠ In the use of the product, you must be in strict compliance with the electrical safety regulations of the country in which the ANPR camera is being setup. Please refer to an electrical safety specialist or technician for detailed information about electrical safety regulations.

⚠ Consult electrical safety specialist or technician for detailed information about power supply voltage

⚠ Do not connect several devices to one power adapter as adapter overload may cause over-heating or a fire hazard

⚠ Please make sure that the plug is firmly connected to the power socket. When the product is mounted on wall or ceiling, the device shall be firmly fixed.

⚠ If smoke, odor or noise rise from the device, turn off the power at once and unplug the power cable, and then please contact the service center.

b. Cautions

- ⚠ Make sure the power supply voltage is correct before using the camera.
- ⚠ Do not drop the camera or subject it to physical shock.
- ⚠ Do not touch sensor modules with fingers. If cleaning is necessary, use clean cloth with a bit of ethanol and wipe it gently. If the camera will not be used for an extended period, please replace the lens cap to protect the sensor from dirt.
- ⚠ Do not aim the camera at the sun or extra bright places.
- ⚠ The sensor may be burned out by a laser beam, so when any laser equipment is in using, make sure that the surface of sensor will not be exposed to the laser beam.
- ⚠ To avoid heat accumulation, good ventilation is required for the operating environment.
- ⚠ Keep the camera away from liquid while in use.
- ⚠ While in delivery, the camera shall be packed in its original packing, or packing of the same texture.
- ⚠ Camera parts shall be replaced regularly according to their average enduring time. The average time varies because of differences between operating environment and using history, so regular checking is recommended for all the users. Please contact your camera dealer for more details.
- ⚠ Improper use or replacement of the battery may result in hazard of explosion. Replace with the same or equivalent type only. Dispose of used batteries according to the instructions provided by the battery manufacturer.
- ⚠ If the product does not work properly, please contact your dealer or the nearest service center. Never attempt to disassemble the camera yourself. (We shall not assume any responsibility for problems caused by unauthorized repair or maintenance.)

5. Disclaimer

This Document might contains one or many technical/printing errors.

The Content of this document is subject to change without prior notice.

The updates will be added automatically to the new version of this document.

Different models may differ in functions and specifications.