

CCTV CAMERA BUYING & INSTALLATION GUIDE

A practical guide to choosing cameras, lenses, night vision, storage, networking, monitoring and privacy-conscious CCTV systems for homes and businesses.

THE CALLSAVE RULE

Do not sell cameras by megapixels alone. A professional CCTV proposal should start with what must be seen, from how far away, in what lighting, for how long, and what the footage needs to prove. Then choose the camera, lens, network, recorder and storage around that objective.

1. What a CCTV system actually contains

- Camera: captures the image. Resolution, sensor size, lens, dynamic range, IR and low-light performance all matter.
- Lens: determines the field of view and how large a person/vehicle appears in the image. A wide lens covers more area but gives less detail at distance.
- PoE switch/injector: can carry network data and power over Ethernet to compatible cameras.
- NVR: records and manages IP cameras. Storage capacity, camera channels, recording settings and bandwidth must match the system.
- Hard drives: use surveillance-rated drives intended for continuous recording; size them from the required retention period.
- Network/router: enables local connectivity and, where configured securely, remote access.
- UPS: can keep the recorder, switch, router and selected cameras operating through short power interruptions.
- Mounting/protection: brackets, poles, weather sealing, junction boxes and anti-tamper measures are part of the system.

2. The camera specification that matters

SPEC	WHAT TO ASK
Resolution	2 MP, 4 MP, 5 MP, 8 MP/4K etc. Higher resolution can provide more detail, but sensor quality, lens choice, compression and lighting still determine useful evidence.
Lens	2.8 mm is typically wide; 4 mm is narrower; 6 mm+ gives progressively narrower views and can be better for distance. Exact field of view varies by sensor.
Low light	Look for sensor performance, colour-at-night capability where appropriate, and realistic night examples — not just a large IR distance number.
WDR	Wide Dynamic Range helps when bright backgrounds and darker foregrounds occur together, such as entrances and vehicle gates.
IR	Infrared illumination supports black-and-white night imaging. Check real-world coverage and avoid relying on headline IR distance alone.
IP/IK	IP rating addresses dust/water ingress; IK relates to impact protection. Select according to the environment and vandalism risk.

SPEC	WHAT TO ASK
Compression	H.265/H.265+ can reduce storage/bandwidth compared with older codecs, subject to device compatibility and configuration.

CAMERA TYPES & WHERE TO USE THEM

The best system often uses several camera types rather than one camera model everywhere.

TYPE	BEST FOR	CALLSAVE CHECK
Turret	Homes, entrances, offices, retail, general outdoor areas	Excellent general-purpose option; usually less vulnerable to spider-web glare than some exposed dome designs.
Dome	Indoor areas, ceilings, discreet commercial installations	Consider vandal-resistant housing where the camera is reachable.
Bullet	Perimeters, driveways, long views, gates	Visible deterrent and easy directional aiming; verify weather and mounting conditions.
PTZ	Large sites, yards, compounds, active monitoring	Useful for operator-controlled coverage but does not replace fixed cameras; a PTZ cannot watch every direction at once.
ANPR/LPR	Vehicle entrances, parking and access control	Requires purpose-specific positioning, shutter/IR considerations and privacy/legal review.
Thermal	Specialised perimeter/detection applications	Designed for heat signatures/detection rather than ordinary identification; higher-cost specialist solution.

3. Lens selection — the mistake that ruins many installations

- Wide lens: excellent for seeing a room or driveway, but faces and number plates become smaller in the image.
- Narrower lens: reduces field of view but places more pixels on a distant subject.
- Varifocal: lets the installer adjust the viewing angle after installation and is valuable where the exact framing is uncertain.
- Do not point a wide camera at a distant gate and expect plate/face detail. If identification matters, design the camera position and lens specifically for that target.

4. Resolution guide for sales conversations

LEVEL	TYPICAL USE	IMPORTANT NOTE
2 MP / 1080p	Basic monitoring, small rooms, general overview	Can be adequate for overview but offers less crop/detail than higher-resolution options.
4 MP / 5 MP	Strong general-purpose residential and business CCTV	Often a useful balance between image detail, storage and bandwidth.
8 MP / 4K	Higher-detail entrances, yards, retail and larger scenes	Requires sensible storage/bandwidth planning; 4K does not guarantee useful night identification.

CALLSAVE RECOMMENDATION: standardise a few proven camera packages rather than offering customers dozens of confusing models. For example: Essential 4 MP, Professional 4/5 MP, Premium 8 MP, plus specialist ANPR/PTZ options.

NIGHT VISION, PLACEMENT & IMAGE QUALITY

Most CCTV complaints happen after dark: faces are too dark, headlights wash out the scene, IR reflects off walls, or the camera is simply aimed at the wrong place.

5. Night-time checklist

- ☐ Identify the actual night lighting conditions before choosing the camera.
- ☐ Check whether headlights will point toward the camera.
- ☐ Use WDR where entrances/driveways have bright and dark areas.
- ☐ Avoid placing IR cameras too close to reflective walls, signs or glass.
- ☐ Confirm the IR/low-light performance at the required distance.
- ☐ Where colour identification at night matters, consider suitable white-light/colour-night technology and site lighting.
- ☐ Test the camera at night before final handover.
- ☐ Record a real sample clip rather than relying only on specification sheets.

6. Camera placement checklist

- ☐ Main entrance / reception
- ☐ Vehicle entrance and exit
- ☐ Driveway / parking area
- ☐ Perimeter and vulnerable boundary points
- ☐ Cash desk / point-of-sale area where lawful and appropriate
- ☐ Stockroom / loading area
- ☐ Server/network room
- ☐ Blind spots identified during the site walk-through
- ☐ Camera cannot be easily reached or tampered with
- ☐ Camera view avoids unnecessary neighbouring/private areas
- ☐ Important areas have overlapping coverage where justified

7. Aiming for the right objective

OBJECTIVE	DESIGN APPROACH
Detection	Know that something/someone is present. Wider coverage can be appropriate.
Observation	See characteristics and behaviour with more useful detail.
Recognition	Obtain enough detail to recognise a known person/vehicle under suitable conditions.
Identification	Design specifically for evidence-quality identification. This usually requires tighter framing, correct lighting, suitable shutter/exposure and sufficient pixel density.

A camera that looks beautiful on a phone screen is not necessarily an identification camera. Callsave should quote the intended outcome — overview, detection, recognition or identification — for each critical camera.

NETWORK, POWER, STORAGE & CYBERSECURITY

IP CCTV is an IT system as well as a security system. Poor networking can create dropped cameras, unstable recordings and remote-access vulnerabilities.

8. PoE & network checklist

- ☐ Confirm camera PoE standard and power requirement.
- ☐ Confirm switch PoE budget is greater than the combined camera requirement with sensible reserve.
- ☐ Calculate Ethernet cable distances; copper Ethernet runs are commonly limited to around 100 m per segment, so longer runs need appropriate network design.
- ☐ Use suitable outdoor-rated cable/conduit for exposed routes.
- ☐ Protect network equipment against power surges and environmental risks.
- ☐ Separate CCTV traffic appropriately where the site network warrants VLANs or other segmentation.
- ☐ Label cameras, ports, cables and recorder channels.
- ☐ Record IP addresses and device details securely — not on a public-facing document.

9. Storage: calculate it — don't guess

Storage depends on number of cameras × bitrate × hours/day × retention days, plus recording mode, codec, resolution and motion activity. A rough planning relationship is: $GB \approx \text{bitrate(Mbps)} \times 10.8 \times \text{hours}$ for one camera, before practical overheads. For a final quote, use the actual camera bitrate and NVR/storage calculator.

QUESTION	CALLSAVE CHECK
How many cameras?	Total channels required now + reasonable future expansion.
How many days?	Define retention by business/security need. Do not promise a fixed retention period without calculating it.
24/7 or motion?	Continuous recording uses more storage; event recording can reduce storage but may miss context around events.
Resolution/bitrate?	Use actual settings. Two 4 MP cameras can have different storage requirements depending on bitrate.
Redundancy?	For critical sites, consider storage health monitoring and appropriate backup/export procedures.

10. Cybersecurity checklist

- ☐ Change all default passwords before commissioning.
- ☐ Use unique, strong credentials and role-based access.
- ☐ Keep camera/NVR firmware updated according to a controlled maintenance process.
- ☐ Disable unnecessary services and unused accounts.
- ☐ Avoid exposing the NVR directly to the public internet where a safer vendor-supported remote-access architecture is available.
- ☐ Use secure remote access and MFA where supported.
- ☐ Secure Wi-Fi and router credentials.
- ☐ Document who can view/export footage.
- ☐ Have a process for lost/stolen phones or staff access changes.

STORAGE, REMOTE VIEWING & POPIA

CCTV footage can contain information about identifiable people. In South Africa, that means CCTV is not just a technical installation — it can create personal-information responsibilities under POPIA.

11. POPIA-conscious CCTV checklist

- ☐ Define the legitimate security purpose for the CCTV.
- ☐ Document what areas are monitored and why.
- ☐ Avoid unnecessary capture of private areas or neighbouring property.
- ☐ Put appropriate signage/notice in place so people know CCTV is operating.
- ☐ Define who may access footage.
- ☐ Define how footage may be exported/shared and with whom.
- ☐ Set a documented retention period appropriate to the purpose and risk; do not retain footage indefinitely without justification.
- ☐ Protect stored footage from unauthorised access, loss and destruction.
- ☐ Secure cloud accounts and remote viewing.
- ☐ Have a process for responding to access requests, incidents and security compromises.
- ☐ If a third-party monitoring/storage provider processes footage, use an appropriate written operator/processing arrangement and security controls.

The Information Regulator states that personal information includes multimedia such as security camera footage and that responsible parties must implement appropriate technical and organisational measures to protect it. The Regulator also identifies continuous CCTV surveillance as a form of systematic monitoring that should be considered in privacy-risk assessments. [\[cite\turn0search24\turn0search25\]](#)

The Regulator provides POPIA self-assessment, Information Officer registration and security-compromise services through its eServices portal. Callsave should build privacy and cybersecurity into the CCTV proposal rather than treating them as an afterthought. [\[cite\turn0search12\turn0search5\]](#)

12. Remote viewing

- ☐ Customer can view live cameras.
- ☐ Customer can search recorded footage.
- ☐ Customer can export clips.
- ☐ Time/date on the recorder is correct and synchronised.
- ☐ Mobile app is secured with a strong account.
- ☐ User permissions are separated where multiple staff need access.
- ☐ Internet outage does not automatically destroy local recording.
- ☐ Remote access is tested before handover.

13. CCTV package examples

PACKAGE	TYPICAL BUILD	BEST FOR
ESSENTIAL	4 MP fixed cameras + PoE NVR + surveillance HDD + mobile viewing	Homes, small offices, basic perimeter/entrance monitoring
PROFESSIONAL	4/5 MP cameras + better low-light/WDR + PoE NVR + larger storage + UPS + remote monitoring	SMEs, retail, offices, workshops and larger homes
PREMIUM	8 MP/4K + selected varifocal/AI/ANPR cameras + higher-capacity NVR + UPS + network/security hardening	Large sites, high-value assets, complex entrances and commercial environments

CALLSAVE CCTV SITE ASSESSMENT & HANDOVER CHECKLIST

Use this during every site visit so the sales proposal is based on the customer's actual security objectives.

CUSTOMER / SITE	_____
	☐ Home ☐ Office ☐ Retail ☐ Garage ☐ Warehouse ☐ Farm ☐ Other
NUMBER OF CAMERAS	Now: _____ Future: _____
	☐ Entrance ☐ Gate ☐ Parking ☐ Perimeter ☐ POS ☐ Stock ☐ Other
REQUIRED OUTCOME	☐ Detection ☐ Observation ☐ Recognition ☐ Identification
	☐ Basic IR ☐ Low-light colour ☐ White light ☐ Specialist
CAMERA TYPE	☐ Turret ☐ Dome ☐ Bullet ☐ PTZ ☐ ANPR ☐ Thermal
	☐ 2 MP ☐ 4 MP ☐ 5 MP ☐ 8 MP/4K ☐ Specialist
LENS	☐ 2.8 mm ☐ 4 mm ☐ 6 mm+ ☐ Varifocal
	Channels: _____ NVR: _____
RETENTION	Required: _____ days
	☐ PoE ☐ Ethernet ☐ Wi-Fi where appropriate ☐ 4G/5G
BACKUP POWER	☐ None ☐ UPS ☐ Solar/battery integration
	☐ Yes ☐ No
PRIVACY	☐ Signage ☐ Access controls ☐ Retention policy ☐ Privacy review

CALLSAVE INSTALLATION STANDARD

- Survey first. Photograph the proposed camera positions and identify blind spots.
- Design the view. Do not choose the lens after the camera is already mounted.
- Protect the infrastructure. Use appropriate conduits, glands, mounting hardware and impact protection.
- Commission at day and night. A camera is not finished until the required scene has been tested in realistic conditions.
- Secure the system. Change default credentials, control user access, update devices and secure remote viewing.
- Document everything. Camera map, channel list, IP/network details, storage calculation, passwords handover process, warranties and maintenance schedule.
- Protect privacy. Capture only what is necessary for the stated security purpose and establish a clear footage-access/retention process.

FINAL CALLSAVE SALES QUESTIONS

- What are you trying to protect?
- What incident are you most worried about?
- Which areas must never be missed?
- Do you need identification or simply general monitoring?
- What happens at night?
- How long must footage be kept?
- Who needs remote access?
- What happens if the power goes off?
- What happens if the internet goes down?
- Do you want future expansion, AI analytics, access control or ANPR?

CALLSAVE SOLAR & EV CHARGING SOLUTIONS

Security designed around the property, the people and the risk — with clear specifications, professional installation and ongoing support.

Technical/privacy disclaimer: This guide is a sales and pre-assessment document, not legal advice or a substitute for a site-specific security, electrical, network or privacy assessment. Final camera selection, mounting, electrical/network design, retention and processing practices must be confirmed for the site, the equipment and the current South African legal/standards environment.

Reference: South African Information Regulator resources on POPIA, privacy, security safeguards and compliance services.

[\[cite\]](#)[\[turn0search0\]](#)[\[turn0search12\]](#)[\[turn0search24\]](#) SABS is South Africa's national standards body and publishes/sells applicable SANS and

related standards. [cite[turn0search2[turn0search13[