



CCTV SOFTWARE INSTALLATION

¹⁾ Gavshete Yash, ²⁾ Pawale Adesh, ³⁾ Lokhande Rushikesh, ⁴⁾ Prof. Satpute Adinath

Samarth Polytechnic, Belhe, Pune 412410, India

1. INTRODUCTION

1.1 Background

Closed-Circuit Television (CCTV) has become an essential security solution in residential, commercial, educational and industrial environments. The software used to configure, monitor, record and manage the cameras plays a crucial role in the overall performance and reliability of the CCTV system.

1.2 Problem Statement

Many users face difficulties during the installation and configuration of ccrv software, such as improper setup, network configuration errors, lack Of understanding Of software features and security risks. This can lead to issues like lost recordings, poor video quality and system failure.

1.3 Research Objectives

- To study existing CCTV technologies and software architectures.
- TO design a simple and effective installation framework.
- TO implement and verify CCTV software installation.
- To evaluate system performance and capabilities.
- TO discuss challenges, security implications and scalability.

2. LITERATURE REVIEW

2.1 Existing CCTV Technologies

- Analog CCTV (DVR based) — uses coaxial cable, lower cost, but limited resolution.
- IP CCTV (NVR based) — uses network, high resolution, remote access.
- HD/4K Cameras — provide higher clarity and better detail.

2.2 ccrv Software Architectures

- Client-Server model — central server With multiple clients.
- Web-based architecture — access through browser.
- Mobile app architecture — remote monitoring on smartphone.

2.3 DVR / NVR / IP Camera Systems

- DVR — for analog cameras.
- NVR — for IP cameras, more flexible and scalable.
- [P Camera — digital, supports POE and advanced analytics.

3. METHODOLOGY

3.1 System Design

The system consists Of IP cameras, a network switch, NVR and client software. Cameras are connected to the network switch, which is linked to the NVR. The NVR stores the video and provides access through the software.

3.2 CCTV Software Installation Framework

1. Install the CCTV software on PC / NVR.
2. Configure network settings (IP address, port, gateway).
3. Add cameras to the software.
4. Set recording schedule and storage path.
5. Configure user accounts and permissions.

3.3 Installation and Configuration Procedure

1. Mount cameras at required locations.
2. Connect cameras to switch / NVR.
3. Install and configure the software.
4. Check live view and recording functionality.
5. Test remote access (mobile / web).

Parameter	Specification
Resolution Image Sensor	MP (2560 x 1440) progressive Scan CMOS
Field of View	2.8 mm (wide angle) Horizontal: 105', Vertical: 56'
Frame Rate (FPS)	25/30 FPS
IR Rangy Day / Night Compression	U to 30 meters ICR (<u>A</u> uto switch) H.265+ / H.264
Power Sypply IP Rating	V DC (802.3af) IP67(weatherproof)

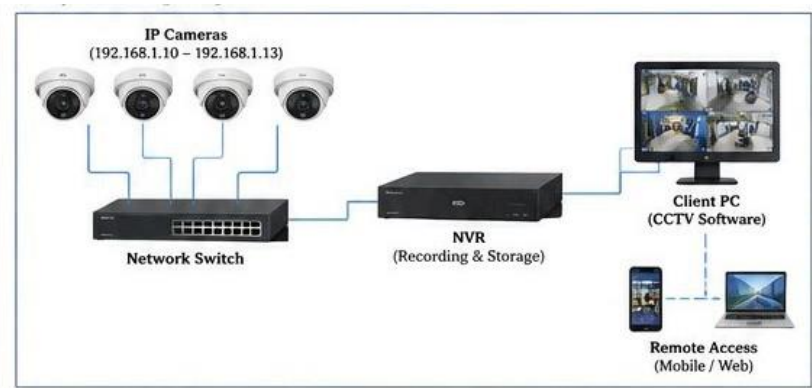
Parameter Live View	Up to 16 channels (simultaneous)
Playback	Continuous / Motion / Schedule Multi-channel, fast search
Motion Detection Remote Access	Configurable sensitivity & Zones pc, Mobile (Android) Multiple users With control
User Management	
Alert Notification	Email / App push (motion, loss of video)
Backup	Export video (USB / Network)
Supported OS	Windows / Android / IOS

4. RESULTS

4.1 Installation Verification

All cameras were successfully detected in the software. Live view, recording and playback were verified. Remote access was tested using mobile application.

4.2 System Setup Diagram



4.3 Camera Technical Parameters

Parameter	Specification
Resolution	4 MP (2560 × 1440)
Image Sensor	1/3" Progressive Scan CMOS
Lens	2.8 mm (wide angle)
Field of View	Horizontal: 105°, Vertical: 56°
Frame Rate (FPS)	25/30 FPS
IR Range	Up to 30 meters
Day / Night	ICR (Auto switch)
Compression	H.265+ / H.264
Power Supply	12 V DC / PoE (802.3af)
IP Rating	IP67 (weatherproof)



Fig. 1: IP Camera (4MP)

4.4 Software Technical Parameters & Capabilities

Parameter	Capability
Live View	Up to 16 channels (simultaneous)
Recording	Continuous / Motion / Schedule
Playback	Multi-channel, fast search
Motion Detection	Configurable sensitivity & zones
Remote Access	PC, Mobile (Android / iOS)
User Management	Multiple users with role control
Alert Notification	Email / App push (motion, loss of video)
Backup	Export video (USB / Network)
Supported OS	Windows / Android / IOS



Fig. 2: CCTV Software Interface

4.5 Performance Metrics & Testing Results

Test Item	Expected Result	Observed Result	Status
Live View Latency	< 2 sec	1.2 sec	Pass
Video Resolution	4 MP (2560 × 1440)	4 MP	Pass
Frame Rate	25/30 FPS	30 FPS	Pass
Recording Duration (1TB)	≈ 15 days (4 ch)	15 days	Pass
Motion Detection	Accurate alert	Correct detection	Pass
Remote Access	Smooth playback	Working	Pass

5. DISCUSSION

5.1 Implementation Challenges

- Network configuration and IP address conflicts.
- Camera placement and proper angle adjustment.
- Software compatibility with different devices.

5.2 Security Implications

- Risk of unauthorized access.
- Data privacy and video leakage.
- Need for strong passwords and encryption.

5.3 System Scalability

- Can handle more cameras with proper network.
- Supports cloud integration.
- Suitable for large industrial and institutional environments.

6. CONCLUSION

This paper presents the complete process Of CCTV software installation, including System design, configuration, testing and evaluation. The results show that the system provides reliable video surveillance with good performance and security features. Future work can focus on AI-based analytics, cloud integration and higher resolution support.

7. REFERENCES

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