

# Data Sheet - cctvX16100

*PC based 16 channel DVR  
reading ANPR (Automatic Licence  
Number Plate Recognition)  
and POS (Point of Sale)  
Till Monitoring data*



the home of  
Kodicom in  
the UK



## Main features

- Real time PC based DVR
- MPEG-4 recording
- Alarm inputs and outputs
- Audio recording
- ANPR
- POS recording system data
- Multi user operation
- Event log
- Intelligent search function
- CMS function
- POS interface
- IP Camera inputs

The **cctvX16100** represents the very latest in PC based DVR technology providing rock solid high quality stability and image quality as well as a host of other features including recording ANPR data (Automatic Licence Number Plate Recognition) via special ANPR cameras (not supplied with unit) and POS (Point of Sale) till monitoring as standard.

This feature rich platform gives access to function previously unheard of as this price point and could be seen as the engine at the heart of any professional CCTV surveillance system.

Data from the ANPR System is recorded as video data via BNC connectors and data is stored via serial RS232 interface. POS data is also stored this way.

## Ideal Applications

- Parking management
- Petrol station forecourt surveillance
- Toll collection
- Vehicle access control
- Law enforcement
- Supermarket check-outs

The architecture of the system is made more flexible by recording IP cameras via the ethernet connector.

The whole system is then further enhanced by the use of remote CMS monitoring software, that means pictures can be viewed in remote locations using a web browser or a PDA interface.

Please contact us for sales and application details.



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## PC based DVR



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### Specifications (all specs subject to modification)

Model	cctvX16100		
Camera Inputs	4 Channels		
Display (fps) NTSC/PAL	100		
Recording (fps)(320 x 240) PAL	100		
External Monitor	1		
Sensor Input	4		
Alarm Output	4		
Audio Recording	1		
Video Input Signal	PAL		
Compression	MPEG4 / MJPEG Selection (SW Codec)	H/W MPEG4 (CIF)	H/W MPEG4 (D1)
Image Resolution	PAL 704 x 576		
Recording Mode	Continuous, Motion Detection, Sensor, Scheduling Mutiple Recording		
Motion Detection	Above 2000 regions per channel / Adjustable sensitivity		
Image Verify	Water-mark		
Self Diagnostics	Watch-dog		
Remote Access	Full remote control PSTN, ISDN, LAN, Leased line, Internet		
Remote Setup	Supported		
PTZ Interface	RS-485 / RS-232		
Operating System	Windows 98SE, ME, 2000, XP		

www.CctvX-cctv.com

Contact us @

cctvX  
Unit 7 Cygnet Business Centre  
Hanley Swan  
Worc.  
WR8 0EA

Tel: +44 1684 311885  
Fax: +44 1684 311912  
sales@cctvX-cctv.com  
www.cctvX-cctv.com

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cctvX the exclusive home of the World leading Kodicom range of Surveillance products including DVR's and Cameras

## ANPR – LPR – ALPR

### Automatic Number / License Plate Recognition

#### System Data Sheet and Specification

The CCTVX ANPR (Automatic Number Plate Recognition) system is a software recognition engine, capable integrating and fulfilling most requirements where a vehicles number plate is used or recorded as an identifier. Popular uses include toll-collection, vehicle access control, parking management and law-enforcement applications.

#### Proven Technology

The advanced ANPR/LPR (Automatic Number Plate Recognition/License Plate Recognition) technology from CCTVX sets a new benchmark through its combination of best-of-breed neural network software design by offering the highest success in continuous rapid read rate for vehicles either stationary or travelling at speeds in excess of 180 km/h.

#### Neural Network

This world-class product continuously improves both read accuracy and recognition speed during operation through **NeuvNet** Neural networking or software “learning” techniques embedded in its design, applying various **LineDraw** and **Colour Fading** proprietary software techniques.

#### Single Deployment - Multiple Applications

Multiple applications via a single deployment can be achieved through the use of open DLL's, enabling easy integration of legacy and enterprise systems to its open architecture without impacting the remarkable afford ability of this proven technology.

#### Modular Design

This key feature, as well as modular design architecture, allows for rapid deployment in a variety of multi-lane applications and highlights another advantage achieved through the use of a Vista-ready, Windows based product that is easily scalable through normal network protocol standards.

#### Real-Time Communication

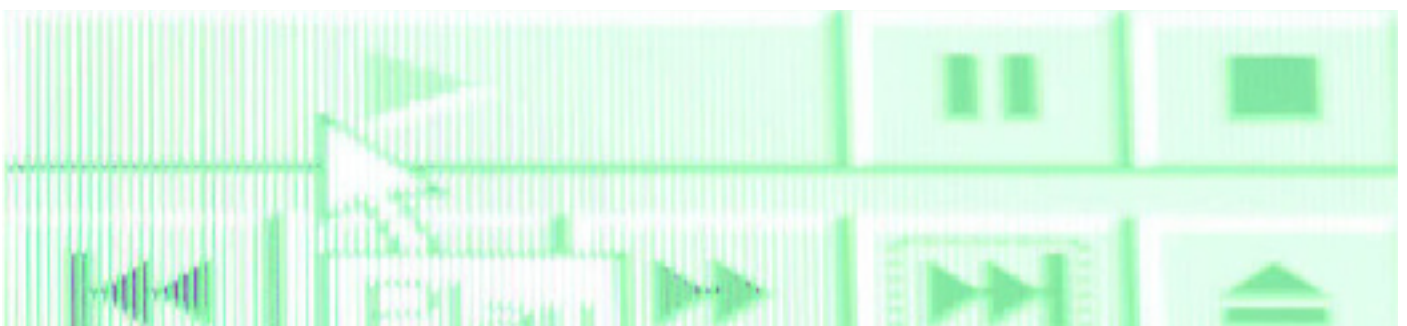
Remote access via telecommunications further enhances the flow of information in critical reaction requirements such as instantaneous **Hot Plate** uploads.

#### Ease of Use

The rugged hardware design is packaged with client-driven software to result in a friendly user interface that can be applied in simplistic user environments.

#### Rapid Recognition Rate

The rapid and effective recognition process and adjunct applications are backed up by a thorough log process, rounding off with an audit trail of the event history for improved information systems and management reporting.



## Overview of the Traditional VS Neural Networking

Traditional methods used for number plate recognition:

- OCR “*Optical Character Recognition*”
- Formula Based Recognition

Although both these methods have some merit, both have inherent problems; OCR makes use of a simple method of placing a numerical or alphabetical historical character image over the captured image and comparing the two for accuracy. While formula based systems make use of complex algorithms to compare the captured numerical or alphabetical character with a similar value in its database. Both systems require a lengthy comparison process the average time to analyze a complete number plate is between 250ms and 500ms

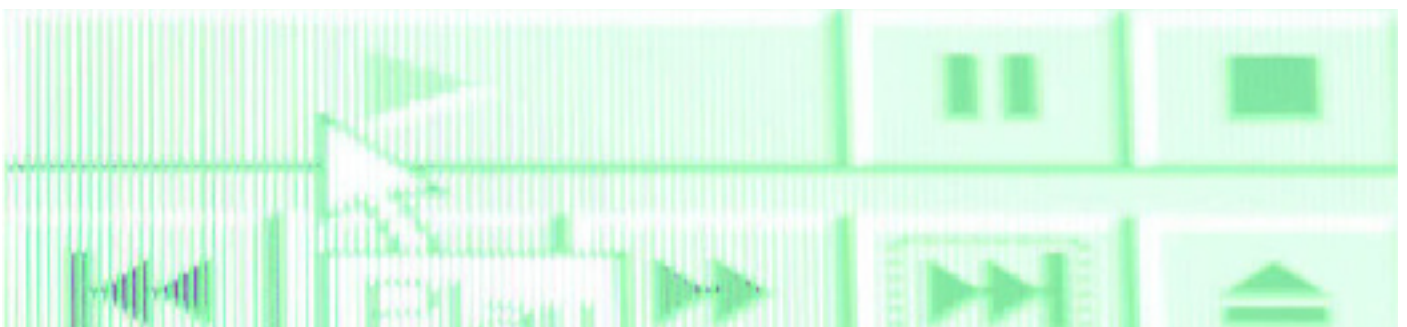
Breakthroughs in computer processing abilities has allowed CCTVX to move away from the traditional OCR “*Optical Character Recognition*” and Formula Based number plate recognition methods to the use of our proprietary **NeuvNet** “*Neural Network*” intelligence engine, ensuring a greater accuracy rate while improving the recognition speed. Average speed to recognize a number plate: between 80ms and 200ms.

The CCTVX ANPR **NeuvNet** system will teach itself the average places in the image where it is likely to find a number plate as well as what the average number size will be, this is done to increase reading speed. With its **inbuilt training system** the user can with minimal computer skills train the system to recognize new characters or symbols such as those found in the Chinese or Arabic alphabet allowing for rapid deployment into new countries and territories. The CCTVX **NeuvNet** software will assign a confidence level to each character in its trained character layers, thus in fact posing a question to the user asking for confirmation on its accuracy. Characters or symbols with a low confidence level can be trained to improve accuracy and read speeds.

## NeuvNet System Advantages

The CCTVX ANPR systems **NeuvNet** apply several proprietary methods to the image in order to obtain a clear recognizable alphanumerical character:

- **Neural filter**
  - Each time a character is recognized correctly the answer is stored separately in a new neural layer.
  - New recognition processes will first question the newest neural layer for an answer thus improving speed by reducing the recognition processes.
  - This ensures increased speed and accuracy for cameras in a stationary position.
- **LineDraw**
  - By redrawing each alphanumerical character horizontally and vertically with parameters, the CCTVX ANPR system removes most imperfections or obstructions from the number plate.
- **Colour Fade**
  - In some countries number plates are not reflective and contain images in the background, the CCTVX Colour fade process will flood the image with multiple colours and remove each individual colour until only the alphanumerical characters of the number plate remain.



- **Individual Numerical & Alphabetic Character Training**

- This world first, built-in program feature will allow the operator access to train the system to recognize new characters. Additional characters or symbols such as those used in the Chinese or Arabic alphabet can then simply be added to the system within days without the help of CCTVX system developers.

- **Character Segmentation**

- In some cases, a character may be partially obstructed, by an insect smear or tow hitch. Character segmentation will then make use of a partial numerical or alphabetical character to reconstruct the character.
- Even with perfect alphanumerical characters present, recognizing a segment of a character, the **NeuvNet** system will instantaneously revert to its most likely comparisons in the neural layers thus increasing accuracy and speed.

- **Plate Filters**

- By providing the CCTVX ANPR systems **NeuvNet** with a basic filter containing the likely alphanumerical sequence of the number plate greatly improves recognition accuracy and speed.
- Several filters can be applied but in cases such as a personalized number plate, the **NeuvNet** will ignore the filter and apply a Brute Force method for recognition.

- **Automatic Number Scaling**

- The CCTVX system builds its own Auto Number Scaling providing the **NeuvNet** with a likely character size. This greatly reduces internal processes and increases accuracy and speed.

- **Dual Layer character Matching**

- By quick matching a possible character with potential matches in the neural layers, essentially short-listing the alphanumerical characters and then comparing the shortlist with the reduced possibilities, our system reduces system processes as well as increasing accuracy and speed. (Double-Check)

- **Multiple Read Method**

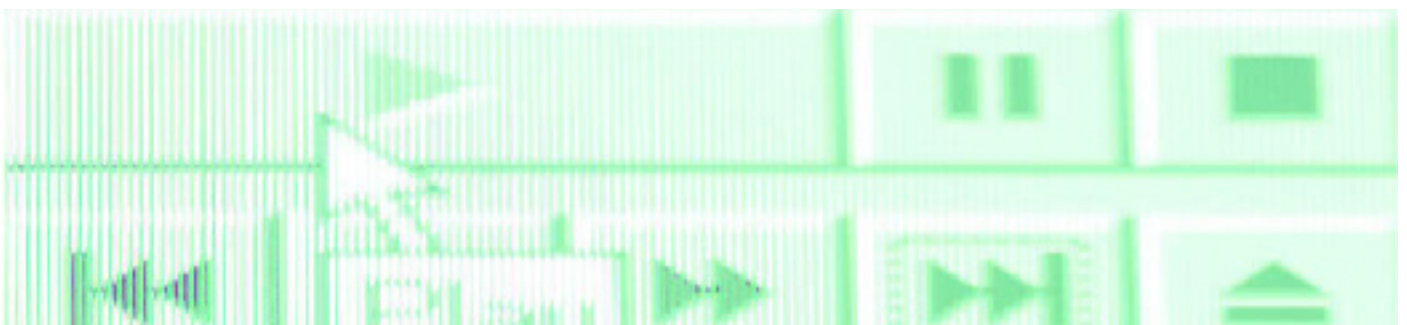
- The CCTVX ANPR system is capable of processing 25 images per second, per channel. It reads each passing number plate more than once. By comparing its first read with the second and third it obtains a higher level of confidence in its accuracy and will display the most likely number plate sequence.
- Depending on the placement of the system and the average speed of the vehicle, the multiple reads function can be set from two reads to ten reads.

- **Free Flow Method**

- In a case such as the law enforcement application, where the number plate is compared with a database, the Free Flow method will pass all the number plates that are processed to a database. The database will be questioned several times per the passing vehicle. This increases the number of successful database hits.

- **ODD Line Only Method**

- In cases where vehicles are moving at high speeds the CCTVX ANPR system will only acquire the ODD lines from the image and compress the ODD lines into a single image, removing all potential image smear from the image. (2CIF)



- **ODD and EVEN Line Method**

- For increased accuracy the system can individually extract the ODD and EVEN fields from the image compressing them into two new images then compare each new image individually to display a singular result. (2CIF x 2)

- **Motion detection**

- CCTVX ANPR makes use of pure image motion detection. The need of external triggers and lines being cut into the road is eliminated.

## **Event Recording**

CCTVX makes use of a proprietary event-recording log; each individual number plate recognized is stored in a managed log file with the image used and time-date stamp.

The log file features include:

- Search by number Plate
- Search by date
- Search by time
- Search by camera
- Individual recognition printing (Time, date, transaction data and image)
- Log printing
- Individual image saving (Time, date, transaction data and image)

### **Audit Log**

The inbuilt auto-logging system will ensure a complete audit trail of all user events as well as attempts by unauthorized users to execute administrative functions. The information is provided in a “*User, Time, Date, Operation*” format and can be printed or saved as a user system audit trail.

### **System Security**

ANPR system contains sensitive information and need to be protected with adequate security features, for this reason CCTVX makes use of our security group system, allowing various groups of user’s access to levels of information equivalent to the clearance awarded by the administrator. Traditional user groups include the

