



## 9.16.1 CAMTRACE DATASHEET

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### Software

- Server software, named CT-Server : video engine, full-web interface for administration. Based on Linux 64 bit Xubuntu '22.04.1 LTS' operating system. Kernel version : '5.15.0-53-generic'. 14.5 PostgreSQL Database version. 2.4.52 Apache Web Server version.
- Client software (thick client), named CT-Client : used by the operator to see cameras and recordings (and much more). Available for Windows®, macOS® or Linux.
- Monitoring software (thick client), named CT-Monitor : available for Windows®, macOS® or Linux.
- Smartphone app, named CT-Mobile : available for iOS, Android.

### USB key install

- Quick installation (estimated time : 15 minuts) using the CT-Server USB key.
- ISO image available for virtual machine installation (VMware®, VirtualBox®, Hyper-V®...).
- 'Live CD' mode which runs on RAM without installation. 'Live CD' mode offers several system tools.

### Software licence

CamTrace is sold in the form of unit licences. It is possible to deploy a pack of 50, 100, 500 or 1000 cameras or more on one or more servers for the same end customer. In this case, the licences are not tied to the hardware and can be freely distributed over the server park.

CamTrace licences are valid for life. Upgrades can be done within the framework of a maintenance contract or, punctually, by resumption of the maintenance contract.

## Software licence options

- Cluster interface licences.
- Licences for external sources (connectors) : cash machines, access control, LPR, metadata, LAPI...
- Passive screen licences – video wall.
- Hierarchical architecture licences in which a central CamTrace collects its flows from several remote CamTrace.

## Programming languages used

- CT-Server :  
C, C++, PHP, HTML5, JavaScript, Shell, SQL.

## Supported cameras

- All ONVIF compatible cameras.
- ONVIF PTZ with WSSE authentication.
- Possibility of discovering new ONVIF models.
- Integration of the ISAPI protocol (HIKVISION cameras).
- Integration of the VAPIX protocol (AXIS cameras).

## Formats supported in stream acquisition

All acquisition protocols described below are adjustable per camera.

- Push HTTP protocol. Motion jpeg (mjpeg).
- RTSP protocol. Formats H265+ H265, H264+, H264, Mpeg4 et mjpeg.
- RTSP encapsulation on TCP and RTSP (for HTTP). These operating modes depend on the capabilities of the cameras.
- Audio recording.
- Unicast or Multicast.
- Image formats : 1/2 D1, D1, 4CIF, HD, Full HD, 3 Mega Pixels, 4 Mega pixels, 5 Mega pixels, 8 Mega pixels (4K), 12 Mega pixels.
- ASP mode for remote cameras. Automatic stream shutdown between CT-Server and cameras and automatic reactivation when an alarm is triggered.
- Possibility to record two video streams (e.g. two video streams with different resolutions) continuously.

## Network

- 1 to 10 Ethernet TCP/IP interfaces.
- Aggregation of network links.
- SSH access.
- HTTPS Support - management of self-signed and certified certificates.
- Management of the maximum bandwidth allowed on each network interface and to the router.
- Operating system routing disabled by default with complete isolation from corporate network and camera or surveillance networks.
- Remote access via the Internet: Video streams are rebroadcast by the server (video streaming). All cameras can retain their original ports.
- Full support of TLS tunnels between CT-Server and CT-Client.
- Port forwarding function (without routing enabled) for transparent access to all designated devices in a network from another address range.
- Transparent proxy function (without routing enabled) for access to camera administration functions via HTTP from another address range (cameras using identical ports).
- NTP client for permanent or scheduled synchronisation.
- NTP server for cameras and other devices.
- Automatic detection of cameras on connected networks.

## Client machine

- 64-bit CT-Client software available for Windows, macOS and Linux.
- CT-Client is not subject to licence : CT-Client can be installed on an unlimited number of client computers.
- Multi-site and multi-server client software.
- For fixed workstations: full HD screen or more recommended.
- Minimum hardware requirements: - RAM: 4 GB. CPU following GPU decoding with Nvidia video card and CUDA support.
- Normal use as a master station with keyboard and mouse, or possible configuration of stations as a slave display, without keyboard or mouse (subject to optional licence).
- Video wall.
- Application for smartphones: Android or iOS.

## Internationalisation and time zones

- Web interface available in English, French, Spanish, Dutch, German and Italian.
- Choice of international keyboards. Time zone settings for all countries.
- Summer and winter time management.
- Use of different languages simultaneously on the same CT-Server.
- Management of connections from another time zone.

## Video relay

- Duplication of video streams by the server in H265, H264, mpeg4, and mjpeg.

## Camera visualization

- Visualisation through the client software.
- Live audio supported in the client. Support for PCMa, PCMu, G726, AAC formats.
- Resizable windows with functions: full screen, always on-screen, and keep proportions.
- Change the camera displayed in the window with the mouse or with the numeric keypad.
- Sending the view to a display screen.
- Management of PTZ (PTZ cameras) in the view.
- Access to the presets of each PTZ camera. Control of cameras in instantaneous or progressive mode.
- Digital magnifier to access details of a megapixel image in a small window. Adjustment of the zoom factor and movement of the observed area with the mouse.
- Selectable display modes from : Video, Alarm, Replay, Reference.
  - Video: normal display of the real time stream.
  - ALR: Video stream only in case of alarm.
  - REPLAY: looped playback of the last alarm sequence.
- Ability to write comments in the snapshot tool.
- Automatic adaptation of the video streams retransmitted by CamTrace to each client station according to the available bandwidth (mjpeg only).
- Management of streams of different sizes and compressions (H265, H264, Mpeg4, Mjpeg)
- Setting the maximum number of frames per second sent by the server (mjpeg).
- Launching a forced recording of the viewed camera.
- Instant capture of a view on the client station (screenshot).
- Mode Player (replay of recordings) to view the recorded scene.
- Possibility of displaying external overlay sources (cash registers, access control, LPR or other devices) next to the camera view. Identification information (item, name, vehicle, etc.) is visible in real time on the views. This function is an option.

Example with number plate reading: recovery of the make, colour, direction, lane number, clipping of the image of the vehicle plate (if the LPR camera sends this metadata). The operator then uses specific search criteria: search by colour, vehicle make, etc.

- Display of mosaic : several cameras are displayed in either Live or Player mode.

## Mosaic display

- Mosaics of  $n$  cameras views, with adjustable Cells size.
- Possibility to merge the cells of a mosaic horizontally and vertically.
- Resizable mosaic windows with functions: full screen, always on, and keep proportions.
- Possibility to mix cameras with different proportions.
- Ability to open each mosaic view in a single new window or in separate windows on the desktop.
- Ability to send each view of the mosaic, or the whole mosaic, to a display screen.
- Change the cameras displayed in each cell of the mosaic with the mouse or with the numeric keypad.
- PTZ management (PTZ cameras) directly in each group view. Control by mouse or joystick.
- Access to the presets of each PTZ camera.
- Digital magnifier to access the details of a megapixel image in each mosaic view.
- Adjustment of the zoom factor and movement of the observed area with the mouse.
- Selectable display modes for the whole mosaic or for each view individually from :
  - Video, Alarm, Replay.
- - Video: normal display of the real time stream.
  - ALR: Video stream only in case of alarm.
  - REPLAY: looped playback of the last alarm sequence,
- Mosaic viewing cycles with adjustable time delay. Possibility to stop/replay the cycle.
- Entering comments in the snapshot section.
- Automatic adaptation of the video streams retransmitted by the CT-Server to each client station according to the available bandwidth (mjpeg only).
- Management of streams of different sizes and compressions.
- Setting of the maximum number of images per second sent by the CT-Server for all cameras in the mosaic (mjpeg).
- Instant capture of one of the views on the client station.
- Forced recording of all cameras in the mosaic.
- Forced recording of each camera in the mosaic.
- Direct links with the Player (replay of recordings) in each view.
- Possibility to switch a cell to web browser mode for controlling a network device with a web interface (contact box, door opener, etc.). The cell can be set in web browser mode by default when the mosaic is launched with automatic loading of a URL.
- Possibility of displaying a map in a cell of a mosaic. Possibility, from the plan, to change the views to be displayed in the other cells of the mosaic.

## PTZ cameras

- Control of camera contacts and options in the individual or mosaic view interface.
- Control of PTZ cameras by mouse and joystick.
- Two mouse control modes:
  - In normal mode click to centre in the image, zoom with the wheel, trim an area to move and zoom (for cameras that support it).
  - In continuous PT mode continuous movement. Direction and speed defined by vector (for cameras that support it).
- With joystick continuous PT mode for cameras that support it or keyboard emulation mode.
- Programming of joystick buttons for: activating a contact, changing the active view in an individual view or mosaic, forced recording of a camera or mosaic.

## Alarms

- List of alarms managed by CamTrace: dry contacts of the cameras, HTTP messages coming from all network peripherals (cameras or others), motion detection carried out by the cameras, motion detection carried out by CamTrace, disconnection of a camera, CamIO contact box, network fault, general video fault.
- Network contact management with appropriate module.
- Alarms managed by the cameras (depending on the model): motion detection, sound level, dry contacts, sudden darkening, IR presence detector, etc.
- Management of alarms from cameras in FTP, HTTP, metadata mode.
- Detection of disconnection of each camera.
- Motion detection done by the CT-Server. Adjustment of detection threshold, noise and comparison delay. Definition of a grid to limit the detection to an area of the image.
- Ping failure on internal or external network device (Internet access verification).

## Alarms actions and scenarios

- Indicator light in individual or mosaic views.
- Recording on alarm, on external media.
- Display on a video wall.
- Sending emails.
- Alarm pop-up with activation of personalized audio messages per camera.
- Alarm log entry with thumbnail creation.
- Action on dry contacts on networked boxes.
- Execute one or more commands on a network device.
- Positioning of a dome, triggering of a round or a preset.
- Sending alarm messages to another CT-Server. Hierarchical alarm escalation.
- Advanced scenario module.

## Connectors to third-party applications and metadata retrieval

- ONVIF metadata: HIKVISION license plate reading,
- VAPIX metadata Axis LAPI communications. Axis P8221 contact boxes.
- Axis Access control.
- Foxstream image analysis server, Digital barriers, XXII, Veesion.
- Innova license plate reader server, Alphanumeric Vision.
- Strator cash register, Clio system
- Open API for creating connectors with any third party application capable of sending data over the network.

## Real-time alarm console

- Real time alarm console for operator. Dynamic listing of the last alarms with thumbnails of the alarm time.
- By selecting an alarm in the alarm console, it is possible to view the Live of the camera concerned or to view the precise moment (in Player mode) when the alarm occurred.
- Manual acknowledgement of alarms by the operator, or automatic acknowledgement after a predetermined time.
- Possibility to add comments in the snapshot section.
- Possibility to sort according to alarm types.

## Maps

- Plan mode. Layout of cameras on a map.
- Real time alarm feedback by colour code and direct access to the Live or Player mode of cameras.
- Support for nested plans with dynamic alarm feedback between the different levels.
- Hierarchical classification of objects managed by the plan, i.e. cameras, mobile camera presets, mosaics, screens.
- Management of the visualisation by drag and drop of cameras or presets to individual windows, mosaics or screens.
- Selection of a set of cameras by clipping on a plane to compose and display a mosaic view.

## Alarms popups

- Pop-up display window with customisable sound signal per camera. Spontaneous opening of the screen in case of alarm.
- Activation of pop-ups by camera and on calendar.
- Opening of pop-ups in the same window or in separate windows.
- Possibility for an operator to ignore camera pop-ups for a specific period of time

## User's desktop (CT-Client)

- Memorising the desktop. Possibility for each user to save and recall a window layout on the screen. If the operator uses several monitors: possibility to save the layouts of each window (on each monitor) and to recall these layouts.
- Choice of different appearances (skins) for the interface.

## Video walls with slaves computers

- Full screen display of individual, cycle or group views on dedicated display PCs. Creation of "screen walls" based on PCs running Windows or Linux without keyboard or mouse.
- Automatic launch of a CT-Client in passive mode.
- Possibility to change the display of the screen walls from individual views, groups and plans.

## Recording

- Recording of up to 100 frames/second per camera in Full HD is possible, depending on the performance of the server and the number of cameras
- Recording rate of more than 400 Mbit/sec per disk or per RAID: example on a Core I5 4460 3.2 Ghz, SSD system and double DATA disk possible recording of 100 Full HD cameras configured at 4 Mbps
- Permanent and alarm recordings are independent and can be simultaneous and of different quality. Example: regular recording in 4CIF H264 and simultaneous recording on alarm zone in Full HD.
- Weekly calendars with 1/4 h resolution, applicable to standard or alarm recordings.
- Automatic indexing of image files in the database.
- Adjustable pre-alarm buffer for each camera from 2 to 128 MB allowing several minutes of pre-alarm images to be recorded.
- Recording mode with real-time search and storage of all movements in a sequence.
- Programmable recording time per camera without limitation.
- Resumption of recordings after a stop of the video services or the server.
- Native recording in mkv format. Allowing native replay via a standard player (VLC type)
- Archiving possible on an external system via third party software
- Possibility to record a text data stream coming from a network device such as: cash register, access control, or other. The data is stored in predefined fields in the database and associated with a camera. This function is subject to option (named Connectors).
- Audio recording, support of PCMa, PCMu, AAC formats.



## **Player mode (recordings of cameras)**

- Selectable start and end dates for the sequence.
- Adjustable time scale from several weeks to a few seconds.
- Minute, hour, day and all keys for easy access to the most common time ranges.
- Scroll bar with colour overlay (alarms, standard and activity).
- Cursor movement with the mouse.
- Support for Axis™ T8310 control panel allowing: fast forward, frame by frame, rewind, source change...
- Change of camera in the player.
- Change of quality .
- Very fast access to images through the database.
- Synchronised player, possibility to play several video sources simultaneously.
- Fast forward adjustable from 1 to 20 X (depending on the capacity of the client station).
- Frame by frame forward button.
- Frame by frame backward key.
- Fast forward and rewind by frame jump lframe to lframe from 1 to 256 frames.
- Freeze frame.
- Dichotomous search.
- Search for all movements in an area of the image, which can be activated per camera depending on the system resources.
- Possible protection of recordings against deletion over the selected time range.
- Export of a sequence over the selected time range.
- Image capture and access to a handheld.
- Synchronised audio replay.

## **Full web administration**

- Setting up network interfaces.
- Setting up gateway, network name and DNS.
- Configuration of the time server (NTP).
- Mounting, dismounting and formatting of storage volumes.
- Detection of cameras on the network.
- Create templates based on ONVIF camera detection.
- Stop or restart the server, and each service.
- Modification of the ports of the different services.
- Disable the graphical interface.
- Advanced repair of the database.
- Export logs and statistics for adjustable periods up to one year.
- Reset the server to factory default.
- Change of the system administration password.

## Users management

- Possible use of an LDAP directory.
- Management of an unlimited number of users by the database. Each user belongs to a profile.
- CamTrace administration and record viewing rights per profile. Rights to view, record, pop-up, control, dry contacts and emails, assigned by profile and camera.
- Control of connection times per profile. Control of the number of simultaneous connections per profile.
- Monitoring of the number of connections and the number of viewing streams with indication of IP addresses
- Manual disconnection of unwanted or excess users. Sending messages to users.
- Rights to modify the display on passive screens (slave PCs).
- PTZ rights (for a specific user) linked to a calendar.

## CT-Mobile

- Android and iOS compatible. Download applications via AppStore or PlayStore, or install them manually (APK).
- Choice of real-time streaming to mobile phones.
- Mosaic viewing: dynamic adjustments of the size and compression level of the images sent by the server.
- Control of pan, tilt and zoom mobile cameras.
- Access to alarm thumbnails with link to recorded sequences.
- Player (replay of recordings) with dynamic adjustment of the size and compression level of the images emitted by the server.
- Packages (apk) available for installation without PlayStore/AppStore.
- Digital zoom.

## Multi-server management

- Cluster mode provides a single operating interface for multiple CT-Server. The user interface on a client station allows access to all cameras on all servers and to organise them logically. This feature is optional.
- Hierarchical mode allows multiple CT-Server to be chained together. Outgoing feeds from one CT-Server are captured and recorded by another CT-Server. This mode allows for duplication of certain critical recordings and also provides a unified interface.
- CamTrace's management of multiple network interfaces makes it easy to create redundant architectures. Simultaneous recording on two CT-Server of the same cameras.

## Disk management

- Manual deletion of standard or alarm recordings, per camera, or before a specified date.
- Automatic deletion after the specified recording time has elapsed, independently for each camera.
- Automatic deletion of the oldest images if the disk occupancy reaches an adjustable limit. The deletion is done in the proportion of the durations assigned to each camera.
- Compression and automatic deletion of all logs and text files created by CamTrace.
- Dashboard of the total disk filling and per camera. Detail of the filling occupied by the system, image storage space, protected space not available for recordings.
- Visual alert if the occupancy rate exceeds a certain percentage (adjustable).

## Video protection and video exports

- Protection of videos per camera between two specified dates. The protection prevents the sequence from being erased by the automatic deletion procedures.
- Export of videos in .mkv format to a client computer (via the network) or to an export media (key or USB disk connected to the server).
- Very fast export of recordings, e.g. a full HD video of one hour will be exported to a local media in less than 10 minutes.
- Export of .mkv files directly readable with VLC or media player.
- The mkv files can be grouped in a .zip file.
- Automatic splitting of the exported sequence into several sequences of fixed duration or size.
- Audio format supported PCMa, PCMu, AAC.

## Event logs

- Logs can be consulted in web mode with search by character string.
- Possibility to export logs in .csv format to a spreadsheet.
- Compression and automatic cyclic cleaning of logs.
- System log with sorting by character strings.
- Camera disconnection log with sorting by character string.
- Action log with sorting by action type, user, IP address, time range.
- Alarm log with thumbnails and links to records. Sorting by string.
- Log of external logs such as cash register or access control. Search for a video sequence using multiple criteria such as: ticket number, item title, salesperson, cashier number, amount or access door, building, name of a person. This function is optional.

## CT-Monitor

- Control of the correct operation of several CT-Server from a Windows, Mac or Linux station.
- Control of the connection of a server.
- Control of the video service.
- Control of the web service.
- Control of the database service.
- Connection control of each camera.
- Control of the state of the disks (smartd).
- RAID system control (depending on the manufacturer).
- SNMP notifications for supervision software.
- Possibility to create Windows scripts on alarm.

## SNMP and statistics

- Publication of real time graphs detailing all system activity over selectable periods, hour, day, week, month, etc.
- Database and web server.
- Cameras: frequency, image size, GOP (packet loss), disconnections.
- Disks: input/output, bandwidth, latency, usage.
- Video engine: usage.
- CPU: load.
- OID list specific to the CamTrace environment.
- Possible interfacing with third party monitoring software via an HTTP API.
- All statistics can be exported in zip format.

## Automatic recovery and fault tolerance

- Resume all services in case of system reboot.
- Software watchdog on the video engine.
- Resume on power failure.
- Recovery from camera disconnection.
- Recovery of client workstations in the event of a network outage.
- Automatic database replication from the system disk to all data disks.
- In the event of a system disk failure, reinstallation is carried out without loss of records on the data disks.
- Support for RAID controllers.
- Network link aggregation for fault tolerance.
- Possibility of recording cameras on several independent disks.
- Operation in a virtualised environment for high availability infrastructure.

## Programming interfaces

- CamTrace has a library of functions that allow access to individual video streams, groups and recordings from other applications in various domains, e.g. building management systems, supervisors, payment applications, etc.
- The CT-Server APIs are free and can be accessed online directly from [www.camtrace.com](http://www.camtrace.com). This allows to operate in the partner's software.

## Interface to third party software

CamTrace is an open software with "Connectors" to third-party applications. It is thus possible to associate external events with a live view or a record search, to generate scenarios, etc. The programming of the connectors is open with source examples provided.