Noldus

Viso 12

Technical specifications

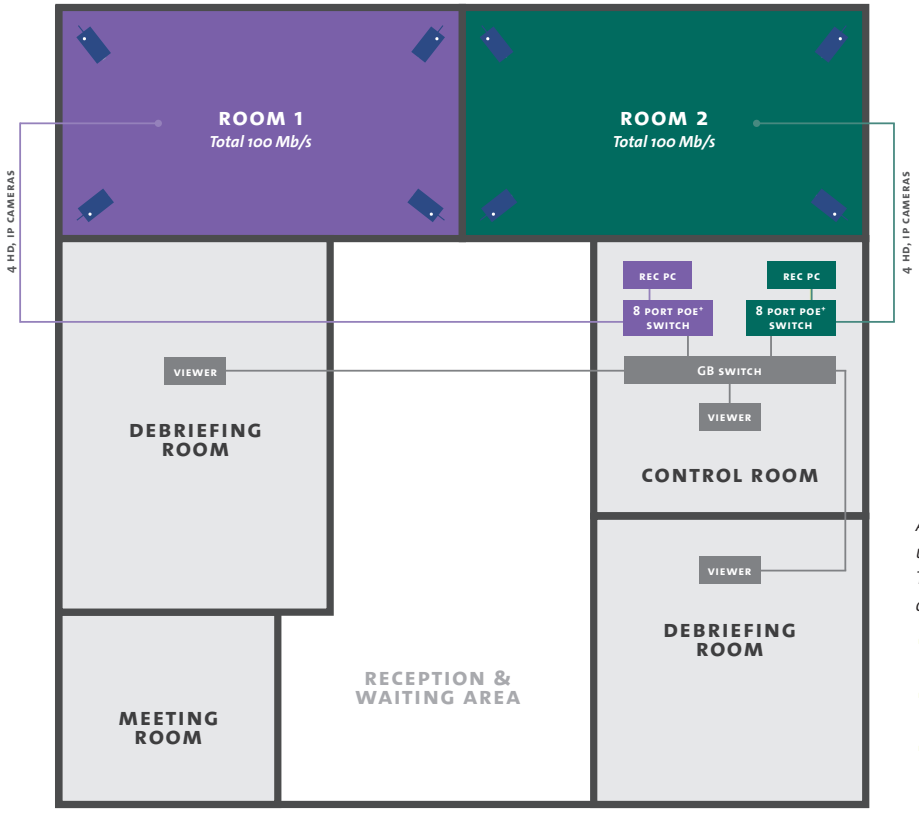
Viso® is the software suite for high quality recording of audio/video in multiple locations (rooms), qualitative annotation, and debriefing. Recordings may be started independently from one another in multiple rooms at once, and each video can be viewed as it is recorded.

After recording, the videos are immediately accessible for analysis and debriefing while the system is available for the next recording. The annotation module allows insertion of subjects and markers during recording as well as debriefing. Sessions may be exported to The Observer® XT for later in-depth quantitative analysis. Recordings can be operated from a single location (the central room), or started from any location within the network.

PROGRAM COMPONENTS

Viso consists of multiple components that operate together:

- *Viso Viewer* – this component is the user interface of Viso. It allows the user to select a room to start/stop recording, view during recording (live view), and play back the videos after recording. Furthermore, it allows the user to create multiple marker (code) lists. Each list must contain markers (events of interest), and may optionally also include subjects. Additional viewers may be used to view the same video/room from different computers by different users.
- *Viso Recorder* – this is the software where the actual recordings from the cameras takes place. Each Viso Recorder can be used for synchronized recording



An installation of Viso may differ from user to user, there is no typical setup. The following plan shows an example consisting of:

- *2 recording rooms (2 recorders)*
- *2 debriefing rooms (2 viewers)*
- *1 control room (1 viewer)*

of 1-4 cameras, and up to 20 Viso Recorders can be placed on a single computer.

- *Viso Services* – this is the software for management of the recorded streams from multiple locations to multiple viewers. Viso services also manages users and their access level.
- *Viso Web App* – this is the web-based application for remote viewing and controlling recordings from any device.

SYSTEM CONFIGURATION

With the development of IP cameras, it is no longer necessary to control cameras on location; camera control can now occur remotely within the software. With Viso you can record video and audio in multiple locations simultaneously, each equipped with a maximum of four cameras. Furthermore, you can record and review sessions at the same time on separate computers.

Computers

Cameras should be connected to computers via POE or POE+ switch (for instance Netgear GS728TP, Netgear GS310TP or its successors). The computers with Viso, Viso Recorder, and Viso Services should be connected in a workgroup. All computers and devices must have a fixed IP address.

Viso has been tested with Dell Precision™ 3660 work-station PCs on Windows 10 and Windows 11. The computer requirements for workstations are:

- *Processor* – Intel Core i5 8500 (six core) 3.0GHz or better
- *Internal memory* – 8 GB or more
- *Hard disk* – 1 TB (minimal, for recording we advise at least 2 TB)
- *Graphics card* – SSD is recommended, 2 GB NVIDA Quadro P400, or better

Viso has been tested with Dell Precision 3581 Notebook for a standalone, portable setup:

- *Processor* – Intel Core i7 (6 Core), 2,2 GHz or better
- *Internal memory* – 8 GB or more
- *Hard disk* – 500 GB (minimal)
- *Graphics card* – 4 GB NVIDA Quadro P600, or better

Cameras and screen capture devices

Requirements:

- Support RTSP (Real Time Streaming Protocol) communication, a protocol to stream video and audio data over a network
- Produce H.264 video streams

Optionally:

Support ONVIF (Open Network Video Interface Forum) technology a communication standard for network devices. In Viso, ONVIF enables:

- Pan, Tilt, and Zoom (PTZ) control, if the camera has PTZ
- Recording audio, if the camera has a microphone, or a microphone can be connected to it

Viso has been extensively tested with the following cameras at 1080p (resolution of 1920x1080 (2.1 megapixel), marketed as Full HD) at 30 fps with:

- Axis M1075 IP camera
- Axis P5525-E PTZ IP camera
- Epiphan Nano (to record a screen)

Network and Bandwidth

Viso requires an internal network of cameras and computers to work. The network must be local and dedicated in order to minimize interference. All cameras on the network should operate via Internet Protocol (IP). Network bandwidth requirements are important conside-rations when designing a video recording solution. It is important that the solution has enough bandwidth available so that the recorded videos are of high quality without suffering from any transmission problems. Various factors influence the network performance and thus the performance of Viso. These factors include:

- the number of cameras per location
- the resolution used (HD vs full HD)
- frame rates (any frame rate, but most often used are 15, 25 or 30 fps)
- the amount of motion of the recorded subjects
- The networking hardware has an effect on the system's behavior.

  Note that different brands use different configuration settings and options. Viso is optimized for use with Netgear switches.

Any local area network (LAN) will have a limited amount of bandwidth available. If there is not enough bandwidth, then the video breaks up and is of a much lower quality than normal. If more bandwidth is needed, then higher speed switches and hubs are needed. Upgrading to higher quality cabling can also assist with creating more bandwidth. Using Fiber Optic networking, for example, will provide a lot of extra bandwidth between the switch and computer; cameras are limited to 1 Gb/s.

Cameras	Number of cameras	Viso data transferred (streaming + viewing) (Mb/s)	One additional viewer (viewing live or recorded sessions) (Mb/s)	Total data transferred
1280x720 @ 25 fps	1	10	5	15
	4	40	20	60
	8	80	20	100
	12	120	20	140
	16	160	20	180
1920x1080 @ 25 fps	1	50	25	75
	4	200	100	300
	8	400	100	500
	12	600	100	700
	16	800	100	900

The table above shows the bandwidth demand of Axis IP cameras at 1280x720 and at full HD (resolution 1920x1080).

For most applications a dedicated local network of at least 1 GB suffices. As a rule of thumb 35% of this capacity can be used for video transfer. The network will run into its limitations when 8 full HD cameras or more are used simultaneously. In this case additional measures must be taken to optimize the bandwidth and thus the quality of video recordings.

Although each Viso Recorder can be used for recording of 1-4 cameras, and up to 16 Viso Recorders can be placed on a single computer, Noldus Information Technology advises to use additional computers and switches when using full HD cameras.

Light conditions

The more light available in the scene, the better the recorded image will be. To prevent the recorded video from being too noisy or too dark, the amount of light should be sufficient. At the setup, the bandwidth used by the camera can be limited, but this will result in poorer image quality or lower frame rate.

To produce a good-quality image a certain type of camera with enough light sensitivity is needed. When light drops low, the camera must be able to amplify the weak signal from the sensor. In strengthening the signal, an unwanted side effect is that image noise could also be amplified. Apart from impairing overall image quality, noise also increases demands on bandwidth.

Camera settings that influence the image quality are Brightness, Sharpness, Contrast and various settings for Exposure, which can be adjusted in the setup menu of the camera. Noldus uses default settings as changing this may influence the amount of data produced by the camera. Default settings provides consistently good image quality at the expense of increased bandwidth in low light conditions.

Audio

Viso offers two recording methods:

1 *Through the camera* – up to four Axis cameras with audio may be recorded at the same time. The camera needs to support RTSP and ONVIF and supports AAC audio and has a microphone, or a microphone can be connected to it. Audio will be recorded directly synchronous with the video of that camera. In Viso the user may select or deselect the audio source to be heard when viewing. The tested cameras have an RTSP audio sample rate of 16 KHz.

2 *Through line-in on the PC* – only one microphone can be connected per PC. For a multiple room setup to have audio in each room, each room has to have its own PC for Viso Recorder with its own line-in for the microphone. Through line-in an audio sample rate of 44 kHz can be achieved.

Recording

Viso offers three recording methods:

- *Single session* – for a single recording of 1 location
- *Separate session* – multiple locations can be selected. For each selected location, a separate session is recorded.
- *Composite session* – multiple locations can be selected. A single session is created for all selected locations.

When opening a location to start video recording, the user sees the selected cameras for that location in the middle of the screen. Above this screen, on the toolbar, the names of the selected locations are shown.
By using the navigation button, the user can move from one room to another, for instance to check if all students are ready.

On the left hand side three tabs are shown: Codes, Events, and Participants. In the Codes tab a predefined marker list can be selected. When subjects and markers are scored, these are shown in the Event tab on the left and on the timeline at the bottom of the screen. Each marker has its own color and symbol combination and is shown per subject. Besides subjects and markers, Viso also allows the insert of comments by pressing the Add Remark button on the right upper corner of the Codes and Events tab or by pressing the shortcut key CTRL+R.

The third tab is to add participants to view this recording. Participants are allowed to view the recording and the session after recording, but are not allowed to rescore or edit the session.

Hovering over any of the camera images may show three icons. The first shows a cross to enable the Pan, Tilt and Zoom features of a camera; two preset positions may be created. The second icon shows a microphone to use the software Push-to-talk functionality. Alternatively, when audio is used, this icon is replaced by a mute audio button and audio bar. The third icon is the maximize screen icon, pressing this icon immediately maximizes the camera view. A double click on the image does the same. In the upper right corner a button opens the View Settings dialog in which a choice of preferred camera layout can be made and to set the audio volume/add a microphone.

In the middle of the screen, at the bottom, a large red recording button is shown to start and stop the recording. When recording is started a timer shows the length of recording.

Start/stop Viso recordings from outside Viso software

Using HTPP commands, Viso recording locations can be started and stopped from another source. For example, a physical button placed next to the door of a simulation room.

Alternatively, these commands can be used by The Observer XT to start and stop a recording in combination with, for example, an eye tracker and FaceReader facial expression analysis software to achieve a multimodal measurement.

VIEW AND RECORD SESSIONS FROM OUTSIDE THE VISO NETWORK

By using the Viso Web App, you can view and control recordings for locations and sessions from outside the local Viso network, on the commonly used operating systems and browsers. It has been fully tested and approved on the following operating systems and browsers:

- Windows 11 (2621.3155): Chrome 115 (115.0.5790.138 and up)
- macOS Mojave 10.14: Safari (12.0.2), Chrome 115 (115.0.5790.138 and up)
- Android 8 and up: Chrome

Limited compatibility tests have been done on the following operating systems and browsers, this means that the Viso Web App works, but no extensive synchronicity test has been done:

- Android (7.1.1): Chrome (71.0.3578.99)
- IOS 12, IOS 12.3.1, and up

SCHEDULE RECORDINGS

The Scheduling functionality allows you to plan and set up recordings in advance and automatically start and stop these recordings at the scheduled time. Different periods and rooms can easily be selected for single, separate, or composite sessions. It is simple because there is no manual intervention needed; participants enter the recording room and perform their tasks while their session is recorded automatically.

ANNOTATION

Viso allows the user to mark interesting events with a code. Codes can be predefined in the Codes tab. The codes can be subjects, markers or free text (remark). These codes can be set during session recording, or afterwards while playing the recorded session back by clicking the subjects (optional) and markers in the Codes window or by pressing the associated keys on the keyboard. When debriefing the session, you can easily jump to an episode using the scored markers and remarks. In these cases it is handy to set a pre-roll interval of, for instance, 3 seconds. When you click on a scored marker in the Event log, the play back will start 3 seconds prior to the event.

Video highlights

From each recorded session you can summarize one or more fragments from the session into short videos. The default highlight video length is 6 seconds; 3 seconds before and 3 seconds after the selected point. Maximum duration before and after the selected point is 30 seconds, allowing for a 1-minute highlight video.

DEPARTMENTS AND GROUPS LEVELS

To offer maximum flexibility, Viso can be setup to be used by different departments and groups within the same company, organization, or institution. For example, at a university of applied sciences both the Nursing and Communication faculty can use the same Viso system, with their own locations and without having access to each other's video sessions.

Department level

Per department, you can assign one or more locations, for example a simulation room, where recordings take place.

Alternatively, the option 'No department' can be used to access all locations from all places. For example, when the Viso system does not need to be used by different departments, or when the different departments share a certain location, a so-called 'joined room'.

The persons with the user role of technician or administrator are the only ones who can manage departments. Whereby the technician can manage all departments of the organization and the administrator only his assigned department.

Group level

A faculty may have more than one class during an academic year, or a medical institution may have more than one team. To bring the members of one class or team together in Viso, a group can be created.

People with the user role of trainer are authorized to add multiple members to a group in a quick way (using selection-boxes).

USER MANAGEMENT

Another powerful option in Viso is to manage its users. Add Local users whose Username and Password are known only in Viso or use the LDAP to add Domain users, so a user's own familiar Username and Password can be used.

There are 4 basic levels of user access;

- *Trainee* – can only view a video recording when invited.
- *Trainer* – can create videos, export their own files, delete their own files, rename own video files, start/stop their own recordings, make codes lists.
- *Administrator* – has similar options as the Technician for the assigned department. The administrator cannot setup the cameras, and cannot stop someone else's recording or upgrade the software.
- *Technician* – can setup the camera locations, has full access to user management, can assign roles to users and upgrade the software. May export any file, delete any file, rename any file, start/stop recordings, make codes lists.

Invite participants

All users, except Trainees, can invite other users to join a session or view a recorded video afterwards. An invitation will pop up on the right of the screen in a small message. Each user has a Dashboard showing the latest invites and previously recorded sessions.

Annotation rights

Any user, except trainees, can give another user rights to annotate their session.

Terminology

Users can be changed in Settings during Setup of the system to customize Viso to the terminology of your organization.

MEDIA

The recorded video files can be played back in Viso. To play back a recorded session, open the Session tab to view all sessions. Select a session and double-click it to open the Playback Control window and click the Play button in the lower left corner to play it back.

The quick review button allows the recording to jump minimal 5 seconds back. This can be used multiple times. The interval of quick review can be enlarged in the Viso Settings. Trainees and other trainers can simultaneously view the same recorded video; a trainer can modify and edit scored subjects and markers and show these by pressing CTRL+S.

Another option is to use the presenter view to show the session without any events; this is ideal to present an unbiased video during debriefing. This option can be selected in the View Settings dialog which can be accessed by pressing the icon when hovering over any camera image.

Using the recorded file in other software

Recorded video files can be copied to other software by a Technician, Administrator, and/or Trainer. To copy the videos from a session, right-click the session and select Copy videos. Recorded videos have the extension H.264 video, AAC audio in an MP4 container (resulting in extension MP4). The session (video including events) can also be exported as an observation (ODX file) for use

in The Observer XT for instance for research purposes and reliability analysis.

IMPORT & EXPORT

Pre-recorded videos can be imported into Viso for example for central storage, to annotate the recordings, or to debrief the recorded sessions. Up to four videos that belong to each other can be imported into a single session. Files that can be imported must have H.264 video, AAC audio in an MP4 container (resulting in extension MP4) or can be MOV files (used in Apple tools such as iPad and iPhone).

All recordings of up to four videos that belong to each other can be exported as a single file. You don't have to search through the whole database to find these four videos. This single file provides you with an overview of information of all four videos in one glance.

Recorded sessions can be exported to The Observer XT as ODX file, this includes scored subjects and markers for quantitative analysis. Alternatively, the videos, without annotation, can be copied to a directory of choice. Scored annotations, without video, can be exported as CSV file to a directory of choice.

CTRL and/or SHIFT key may be used for selection of multiple sessions for export.

MISCELLANEOUS

In MyNoldus (my.noldus.com) you can find:

- Information about your *software license(s)* for Viso
- *Viso Setup files* available for download
- *Documentation* – the Quick Start Guide, Setup Manual, and Viso Help (all PDF)
- *Upgrade notes* – What's new in the latest Viso version

In MyNoldus you can also:

- *Get Support* – feel free to contact our customer support center to ask your questions online or submit a new support case.
- *View resources* – find a quick answer in our Frequently Asked Questions (FAQ) and expand your knowledge with our free 'How To's in blog posts and webinars.

NoldusCare

As a registered user of Viso, you are entitled to at least one full year of NoldusCare, which includes fast, reliable, and worldwide available services. Our highly qualified and experienced support staff is ready to help you. We have helpdesk locations in five different time zones, spanning the entire globe. You can be sure to receive a personal and useful answer to your questions.

You can choose how to communicate with our support engineers: via phone, email, Teams, Zoom, or a TeamViewer meeting. Technical support questions can be submitted via MyNoldus, by e-mail, telephone, or fax.

Moreover, a NoldusCare subscription of a Noldus software product entitles you to the latest release, and Quick repair or replacement on hardware, free of charge.

MORE INFORMATION

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www.noldus.com/viso