

HERNIS Flex



HERNIS Flex

- System overview
- System components
- Network

HERNIS Software

- HWIN
- HAM
- HSM
- HLSA
- HAKI

Introduction

HERNIS FLEX



➤ Digital video system

➤ The system consist of:

- A HERNIS System Server
(PC with HERNIS server software installed)
- One or more HERNIS Video Servers
- Normally min one HVR and/or HVS
- One or more HERNIS System Nodes (Where analogue cameras are applicable)
- Various HERNIS Cameras
- One or more Workstations with HERNIS Client Software
(HWIN/HAM/HSM/...)
- Various Head End components
(Power distribution, network equipment, various other transmission equipment, UPS...)

➤ **IP Camera stations**

- EX Camera stations, PTZ and Fixed
- Safe area Camera stations, PTZ and Fixed

➤ **HVR, Video Recorder**

➤ **HVS = upgraded NVR**

Camera stations / JB EXD170 & S14

- Enable for IP connectivity on current camera stations.
- Ex286, Ex285, and PT9 are mounted directly on JB.
- **Configurations:**
 - IP 30VAC
 - IP 115/230 VAC
 - FO 30VAC
 - FO 115/230VAC
 - FO & IP 30VAC
 - FO & IP 115/230VAC
- **EX170 certified to -50 + 60C for use with compound gland only.**
- **Cable gland and flying lead not included**
- **Product combination will not be DNV Type approved.**



HERNIS Video Recorder (HVR)

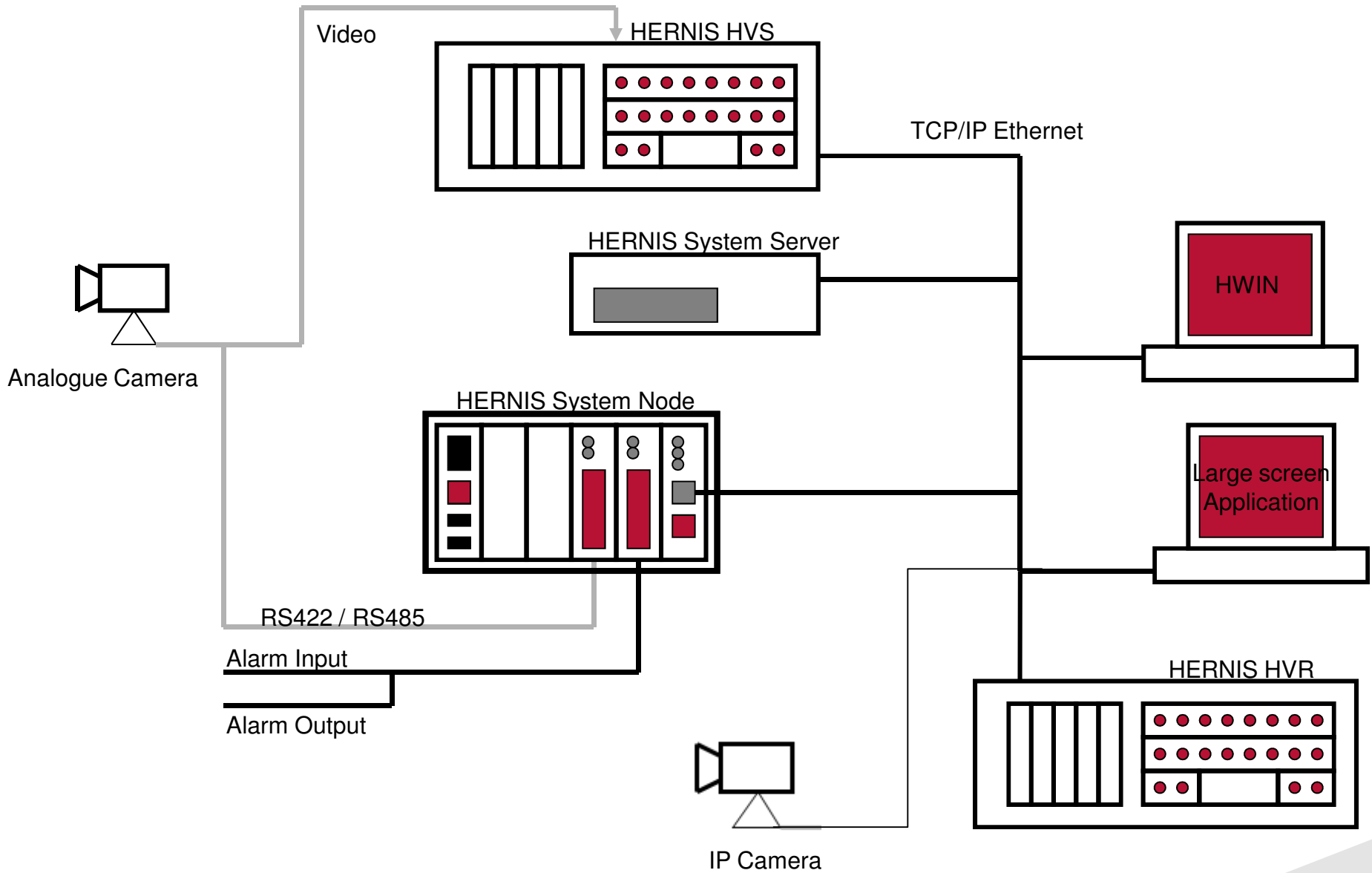


Technical Data Sheet – D 505xxxx

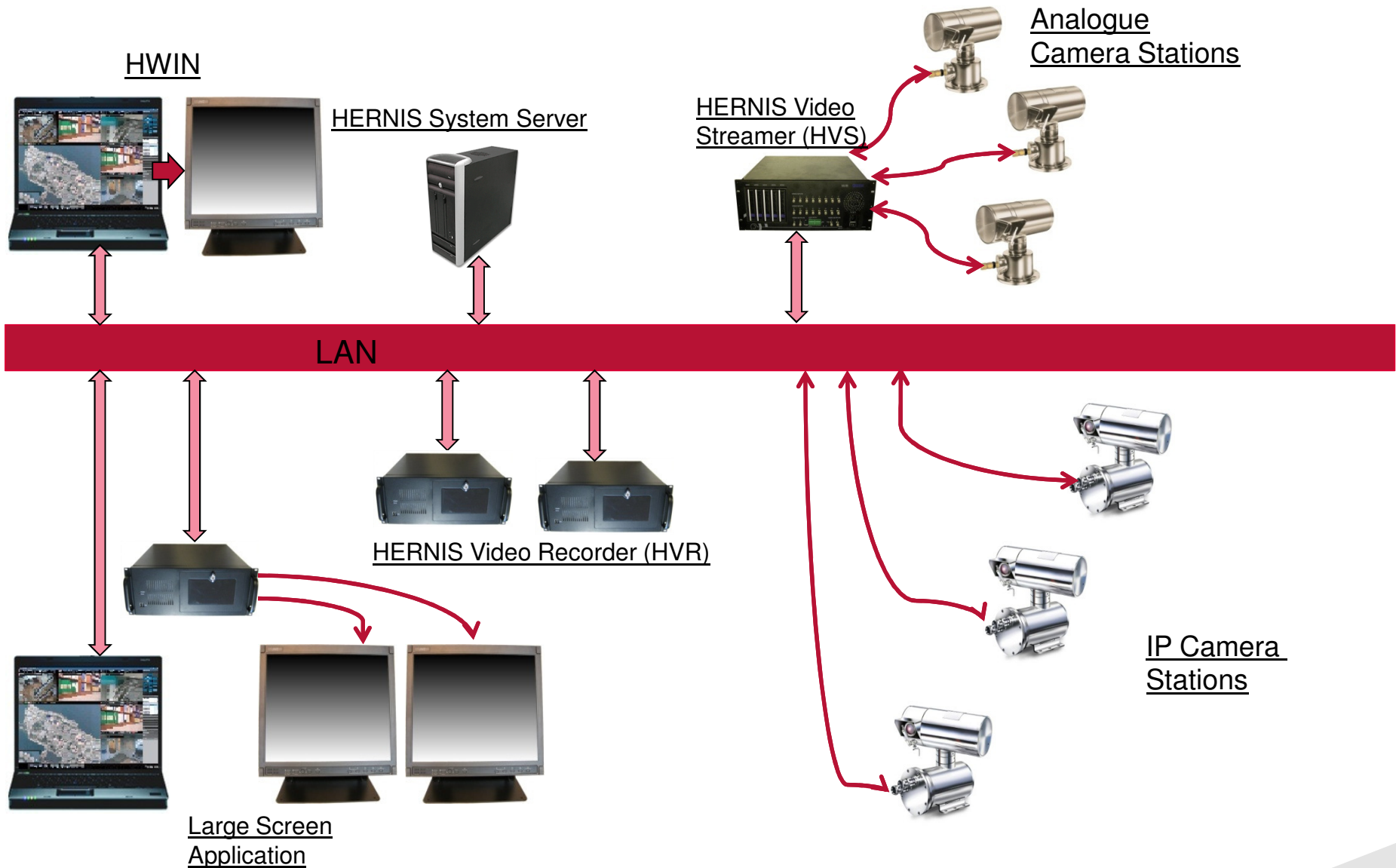
HERNIS 500 HVR Network Video Recorder



Order Info	
HERNIS Part No:	D505000-Y*
*Number of Internal HDDs, 1-10	
Features	
Input:	Video and Audio over TCP/IP Network Simultaneous recording of up to 32 TCP/IP streams
Supported formats:	H.264/MPEG
Recording:	Full frame rate recording Alarm triggered recording
Identification:	Digital watermarking, time and date are embedded in video Parameters like CameraID and alarm events are stored along with the video stream
Storage:	Up to 10 Internal drives for recording (2TB drives) RAID-0, Hot-Swap
Storage expandability:	Several HVRs can be connected on the same network allowing for larger disk capacity. External third party storage solutions can also be added (Consult Hervis for compatibility)
Output to network:	Dual 1000 Mbps output (only one available if dedicated storage port is enabled)
Retrieval of data	All recordings are made easily retrievable via dedicated download page in HWIN software.
Other:	Drives can be hot-swapped during operation
Attributes	
Power Supply:	110-220VAC, 50/60Hz, Optional, Redundant power
Power Consumption:	Max. 500W, Typ. 200W
Operating Conditions	
Operating Temperature Range:	45°C – 40°C
Humidity:	Less than 80% (non-condensing)
Physical Dimensions	
Weight:	15kg (depending on disk configuration)
Dimensions (W x H x D):	452 x 177 x 425mm
Accessories	
Optional:	Spare Hard Disks
<p>Note: All data in the data sheet are subject to change without further notice.</p>	
<p>Head Office: Cooper Hervis Tel: +47 27 32 27 00 web:hervis@cooperhervis.no</p>	
<p>Subsidiary: Houston Tel: +1 281 333 8322 web:hervis@cooperhervis.us</p>	
<p>Subsidiary: Singapore Tel: +65 63 42 2222 web:hervis@cooperhervis.sg</p>	
<p>Subsidiary: Seoul Tel: +82 21 5715 2122 web:hervis@cooperhervis.kr</p>	



HERNIS Flex System



- **Windows XP Professional for Embedded systems**
Same as standard Windows XP, available until 2016
- **HVS up to 16 video + audio inputs per unit.**
Configurations available for 8/16 channels
- **HVR up to 32 video + audio per unit**
- **H264 video with configurable resolution**
QCIF, CIF, DCIF, 2CIF or 4CIF (CIF=352x288/240 PAL/NTSC)
- **Dual channel streaming**
High + Low quality stream stored and available for streaming.
- **Configurable Pre Recording**
Memory + Bit rate limits amount
- **“Post recording” using alarm minimum time**
- **Hot swappable Internal storage medium (RAID 6)**

- **Possible to use Redundant Power**
Dual input power option is now possible.
- **Configurable manual or loop recording per camera**
FIFO storage on disk.
- **Configurable settings on each camera**
Bit rate, VBR/FBR, PAL/NTSC, resolution, frame rate, sub channel...
- **Recording searchable**
Time+Date, Graphically visualized, logs, alarms, user defined events
- **Time/Date embedded in video**
This makes it harder to tamper with the video
- **Watermarked video**
Each frame within the video contains CRC based watermark to ensure that no bit within the stream has been altered.

➤ H.264

H.264/MPEG-4 Part 10 or AVC (Advanced Video Coding) is a standard for video compression, and is currently one of the most commonly used formats for the recording, compression, and distribution of high definition video.

➤ Bit rate

The amount of data that is transmitted per second. Normally in megabit per second. (Mb/s)

➤ Variable vs. Constant

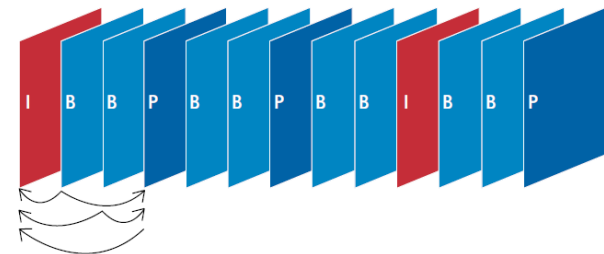
Controls if the encoder is allowed to lower the bit rate if possible.

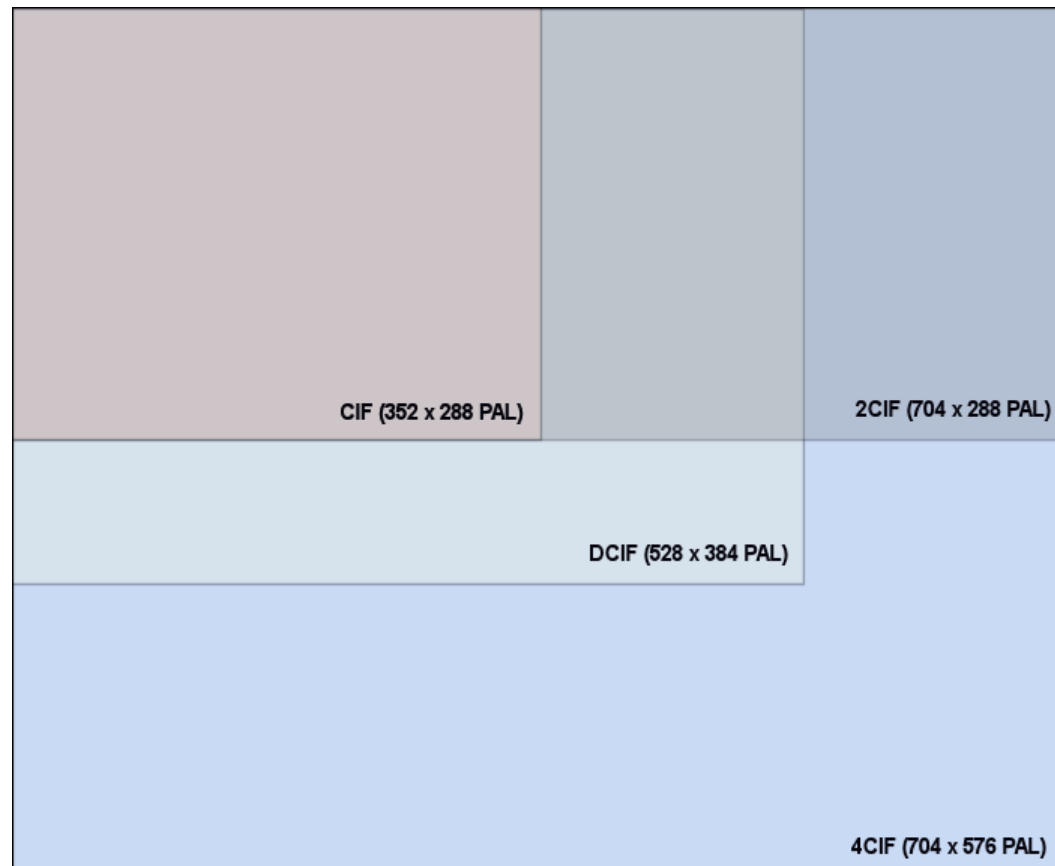
➤ Frame rate

The number of frames each second, impacts both storage and live viewing. Range (1-25/1-30)



- An I-frame, or intra frame, is a self-contained frame that can be independently decoded without any reference to other images.
- A P-frame, which stands for predictive inter frame, makes references to parts of earlier I and/or P frame(s) to code the frame
- A B-frame, or bi-predictive inter frame, is a frame that makes references to both an earlier reference frame and a future frame.

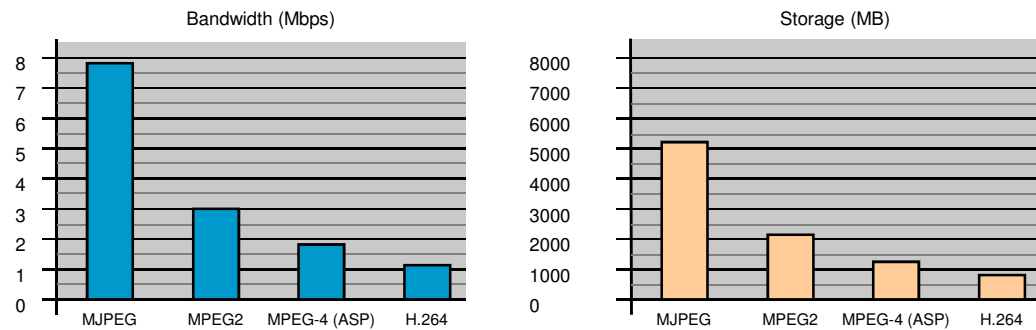




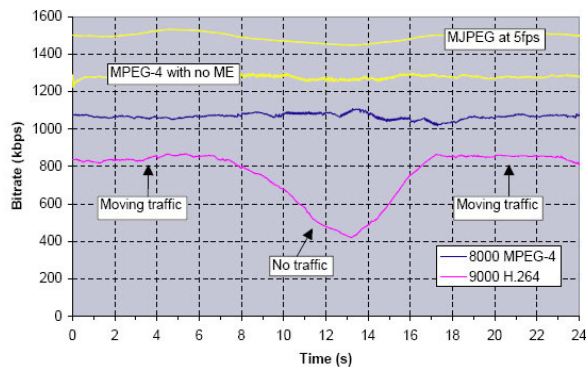
Typical max bitrates

- QCIF 128Kbit
- CIF 512Kbit
- 2CIF 1Mbit
- DCIF 1Mbit
- 4CIF 2Mbit

- Comparisons between different coding technologies for 90 min of DVD quality video:



- Traffic monitoring example, compression comparison between codec's



Storage Fixed Bitrate HERNIS Flex

$$C_{TB} = \frac{\left(\frac{N * (BR_{main} + BR_{sub}) \text{ Mbit/s}}{8 \text{ b/B}} \right) \text{ MB/s} * D_{s/day} * L_{days}}{T_{MB/TB}} * A$$

- **C = Total capacity required for a recorder**
- **N = Number of channels on recorder**
- **D = 86400 (Seconds/day)**
- **T = 1048576 (MB/TB)**
- **A = 1,01 (Administrative space requirement)**
- **BR = Bitrate**
 - 4CIF : 2MBit/s
 - 2CIF/DCIF : 1MBit/s
 - CIF : 0.5MBit/s
 - QCIF : 0.25MBit/s
 - Not Configured 0MBit/s

$$C_{TB} = \frac{\left(\frac{16 * (2 + 0) \text{ Mbit/s}}{8 \text{ b/B}} \right) \text{ MB/s} * 86400 \text{ s/day} * 20 \text{ days}}{1048576 \text{ MB/TB}} * 1,01$$

$$C_{TB} = \frac{4 \text{ MB/s} * 1728000 \text{ s}}{1048576 \text{ MB/TB}} * 1,01$$

$$C_{TB} = \frac{6912000 \text{ MB}}{1048576 \text{ MB/TB}} * 1,01$$

$$C_{TB} = 6,66 \text{ TB}$$

Storage Variable Bitrate HERNIS Flex

$$C_{TB} = \frac{\left(\frac{X * (BR_{main} + BR_{sub}) \text{ Mbit/s}}{8 \text{ b/B}} \right) \text{ MB/s} * D_{s/day} * L_{days}}{T_{TB/MB}} * A$$


- **C = Capacity required for single channel**
- **X = Complexity factor**
 - 0,5 : Simple scene static lighting little movement.
 - 0,7 : Moderately complex scene
 - 0,9 : Complex scene with variable lighting
- **D = 86400 (Seconds/day)**
- **T = 1048576 (MB/TB)**
- **L = Number of days to record**
- **A = 1,01 (Administrative space requirement)**
- **BR = Bitrate**
 - 4CIF : 2MBit/s
 - 2CIF/DCIF : 1MBit/s
 - CIF : 0.5MBit/s
 - QCIF : 0.25MBit/s
 - Not Configured 0MBit/s


Use caution when estimating requirements with variable bitrate

- Disk vendors define 1 Gigabyte as 1000 Megabyte
- 1 Gigabyte is actually 1024 Megabyte
- Example 2TB disk is actually 1,86TB

$$C_{TB} = \frac{V_{TB} * A}{B}$$

- $A = 1000 * 1000 * 1000 = 1000000000$ (Vendor bytes per TB)
- $B = 1024 * 1024 * 1024 = 1073741824$ (Actual bytes per TB)
- $C =$ Disk capacity
- $V =$ Vendor specified capacity

- **Systems should have an NTP server. Either through a NTP server that is shared within the entire Customer Installation or for example using a Standalone GPS based NTP unit.**
 - **All servers and clients should synchronize.**
 - **Ensures timestamp in video is correct on all recorders.**
 - **Ensures that time search will work as intended**
 - **Ensures alarm logs are correct.**
 - **Ensures that system logs are correct.**
- 
- A light gray triangle pointing upwards, located in the bottom right corner of the slide.

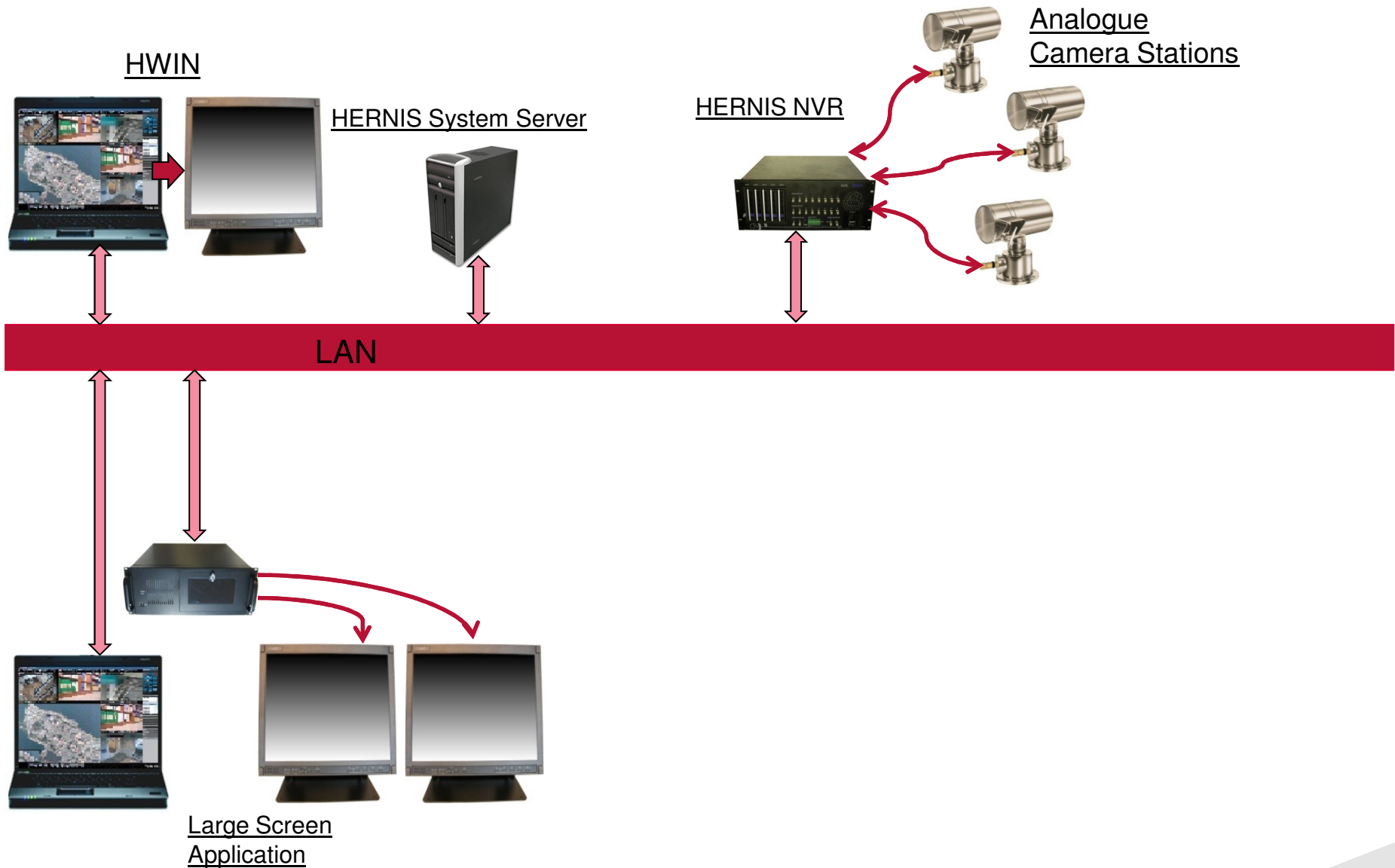
- System is best suited to work within a single subnet.
 - Query/Answer latency should never exceed 200ms
 - A link capacity study should be made on the network to determine if required capacity is not exceeded. If the video network is part of the customer network then this is even more important.
 - There should never be any link between a client and HERNIS Flex that is less than that of the connected speed of the HERNIS Flex. (Not following this will increase the amount of packet loss significantly)
- 

- Has to be calculated using Fixed Bitrate parameters for the highest resolution camera since there may be conditions when all videos are at max bitrate.

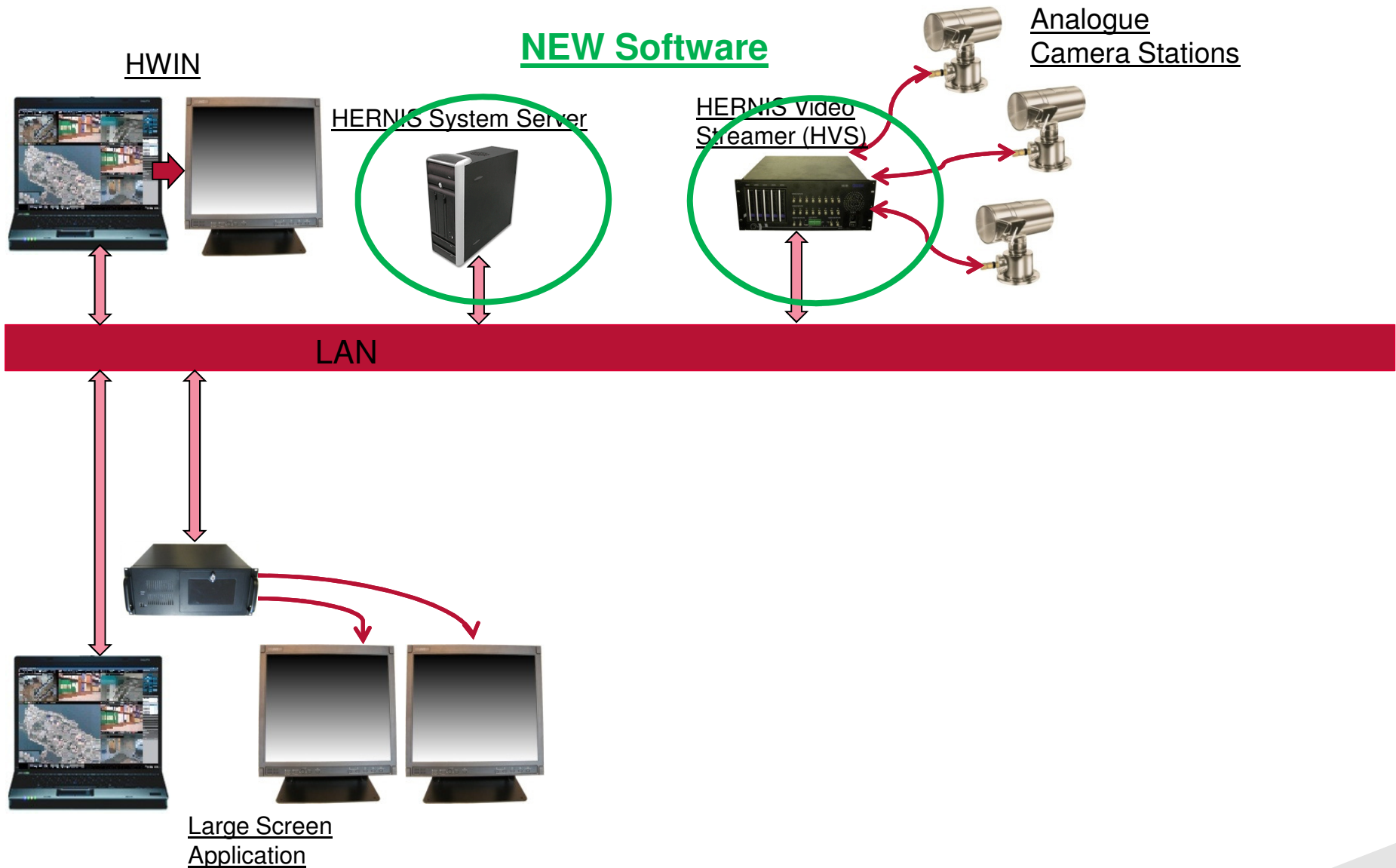
$$T_{\text{Mbit/s}} = (T_1 + T_2 + T_3 \dots T_n) * B_{\text{Mbit/s}}$$

- T = Number videos on client
- B = Max bitrate of camera with highest resolution

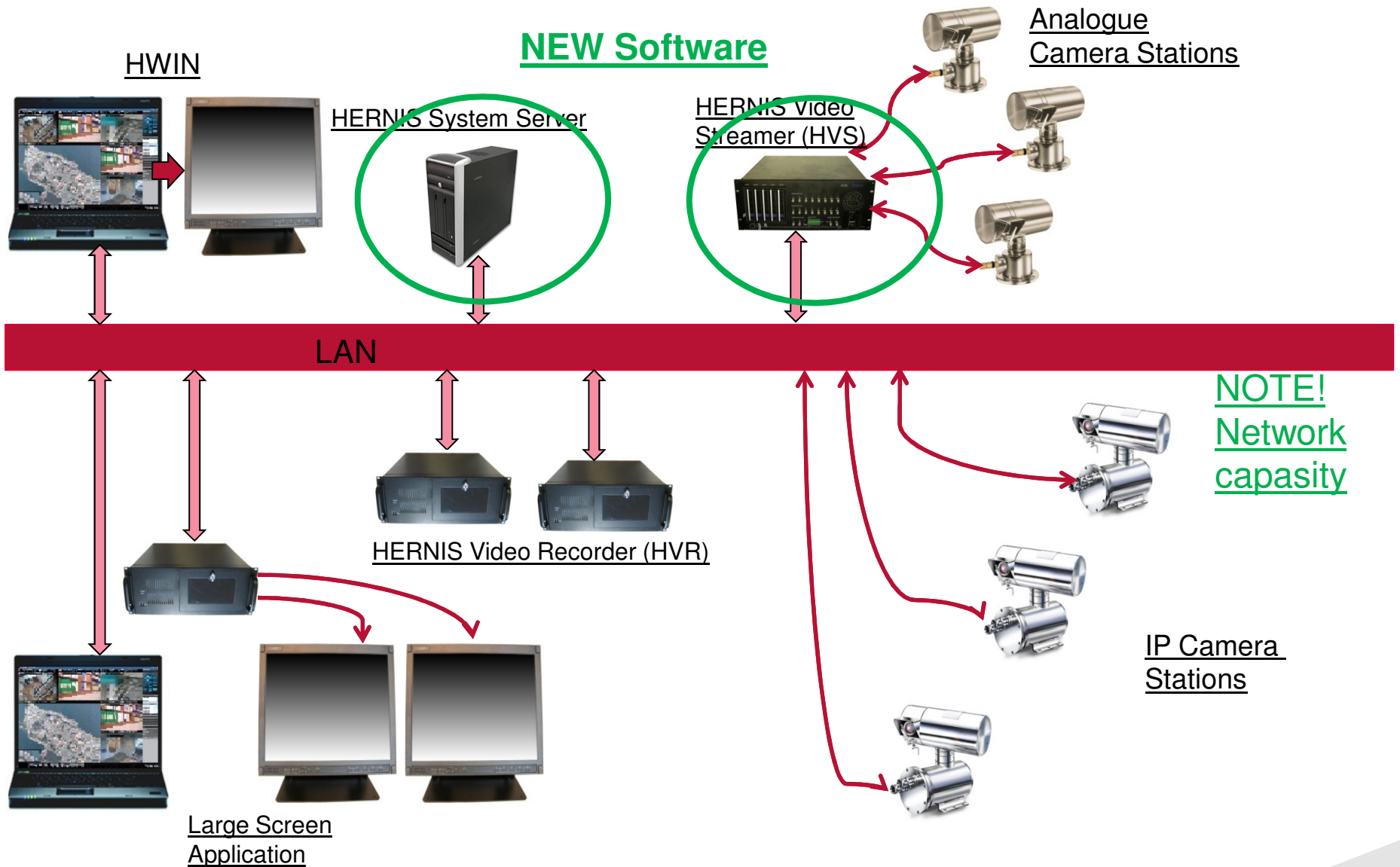
HERNIS 500 >> Flex System



HERNIS 500 >> Flex System



HERNIS 500 >> Flex System



General introduction

HERNIS CLIENT SOFTWARE



Application	Type	Description
HWIN	Application	General control application for all HERNIS Systems
HAM	Application	Alarm control application for HERNIS 400 and 500 systems.
HLSA	Application	Video split application for Large Screen displays
HSM	Application	System health monitoring application.
HAS	Application	System configuration and administration application.
Sea Touch	Touch Application	Touch application with map functionality for HERNIS 400 and 500 systems.
Masterview Basic	Touch Application	Basic touch application for all HERNIS systems.
HAKI	Software Development Kit (SDK)	

➤ **New .NET Application:**

- **HWIN 5.x** – HERNIS application for Camera control.
- **HAM 5.x** – HERNIS application for Alarm management
- **HSM 5.x** – HERNIS application for System health monitoring.
- **HLSA 5.x** – HERNIS application for large screens.

➤ **Legacy Applications, faced out/going to be faced out. (Various programming languages)**

- **HAS 4.x**– HERNIS application for system configuration. (In progress)
- **HELP 4.x** – HERNIS application for system logging. (Will be integrated into HSM 5.x)
- **Sea Touch** – HERNIS application for touch screens. (Will be replaced by HWIN 5.x)
- **Masterview Basic** – HERNIS application for touch screens. (Will be replaced by HWIN 5.x)
- **HWIN 4.x** – Mostly replaced by HWIN 5.x
- **HWIN 3.x** – Replaced by HWIN 5.x
- **HFD 4.x** – Replaced by HSM 5.x
- **HFD 3.x** – Replaced by HSM 5.x
- **HERNIS Large Screen Application** – Replaced by HLSA 5.x

- **Microsoft .NET 3.5 SP1**
- **Microsoft Windows XP/Vista/Windows 7**

- **Hardware**
 - **Intel Core 2Quad CPU or better.**
NOTE: Accurate requirements depends on video type and number of displayed videos.
 - **2 Gigabyte Memory**
NOTE: May vary depending on OS.
 - **Mid range GPU (graphics adapter)**
NOTE: If you have a low end GPU the CPU might not be able to decode the video fast enough.

HERNIS Control Application

HWIN



Version 5.x General application structure

Main control area.
(Video, Maps,
Configuration etc)



Menu bar

Connection status

Application Mode selector

Split selector

- **Control cameras**
- **Configure user specific settings**
- **Multiple videos.**
- **Playback Camera Video**
- **Remote systems**
- **Use maps (HWIN Advanced).**
- **Control HLSA applications (HWIN Advanced).**
- **Control External systems (HWIN Advanced).**

- **Primary control applications for HERNIS systems.**
- **Currently 3 variants**
 1. HWIN Standard
 2. HWIN Advanced
 3. HWIN Web
 4. *A touch variant will be released.*
- **Systems:**
 - **HERNIS 400 Compact** – Supported
 - **HERNIS 8x8** - Supported
 - **HERNIS 400 Version 2.x** – Not supported (Serial connection may work)
 - **HERNIS 400 Version 3.x** – Not supported (Serial connection may work)
 - **HERNIS 400 Version 4.x** – Supported from version 4.4.8.0, fully supported from 4.5.0.0
 - **HERINS 500 Version 4.x** – Supported from version 4.4.8.0, fully supported from 4.5.0.0

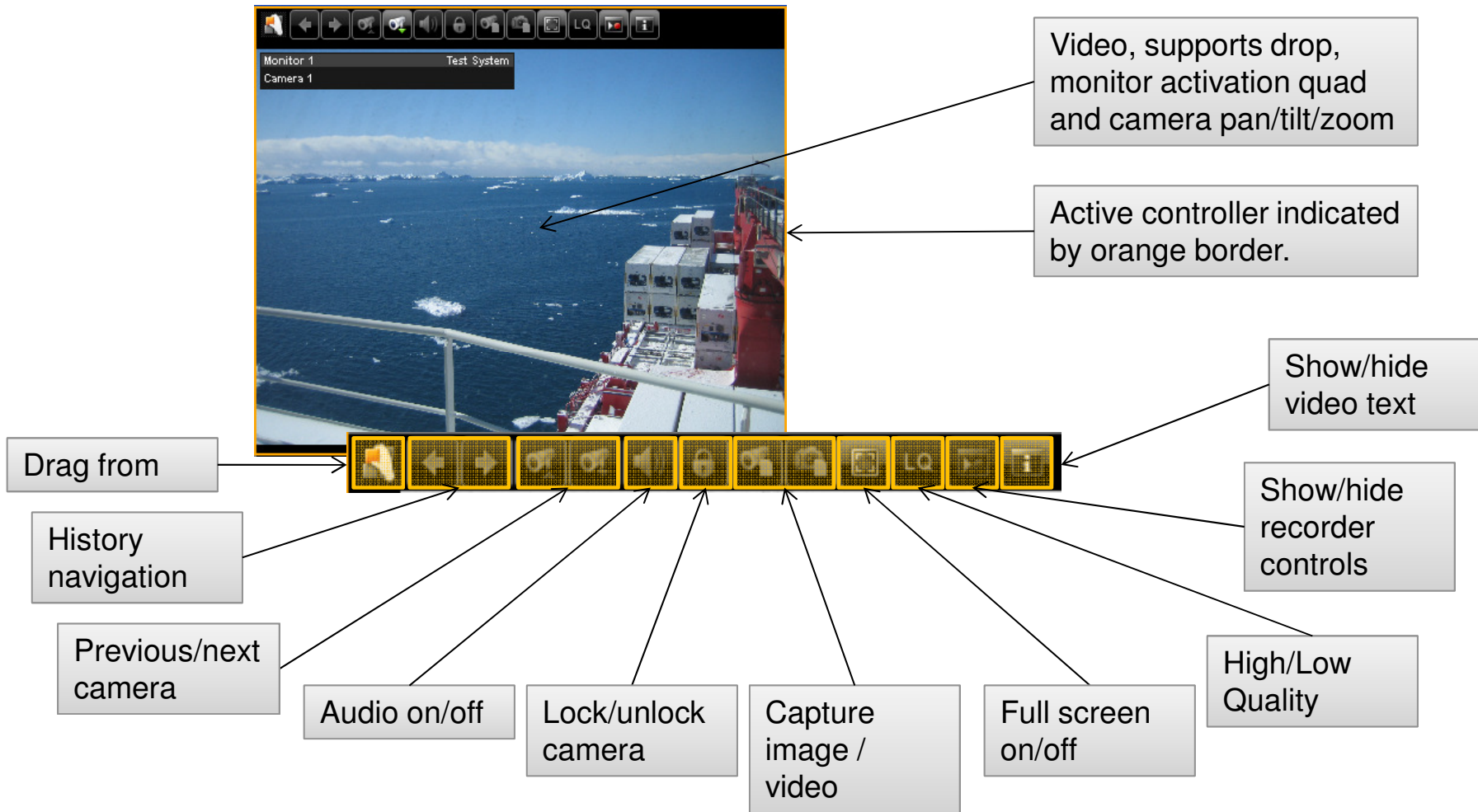
	HWIN Standard	HWIN Advanced	HWIN Web
Camera selection	Yes	Yes	Yes
Basic camera control	Yes	Yes	Limited
Preset control and configuration	Yes	Yes	Control only
Sequence control and configuration	Yes	Yes	No
Multi Switch control and configuration	Yes	Yes	No
Basic Alarm control and configuration	Yes	Yes	Limited
External systems	No	Yes	Yes
Map control	No	Yes	Yes
Large Screen control	No	Yes	No
Video Playback	Yes	Yes	Yes
Video Download	Yes	Yes	No

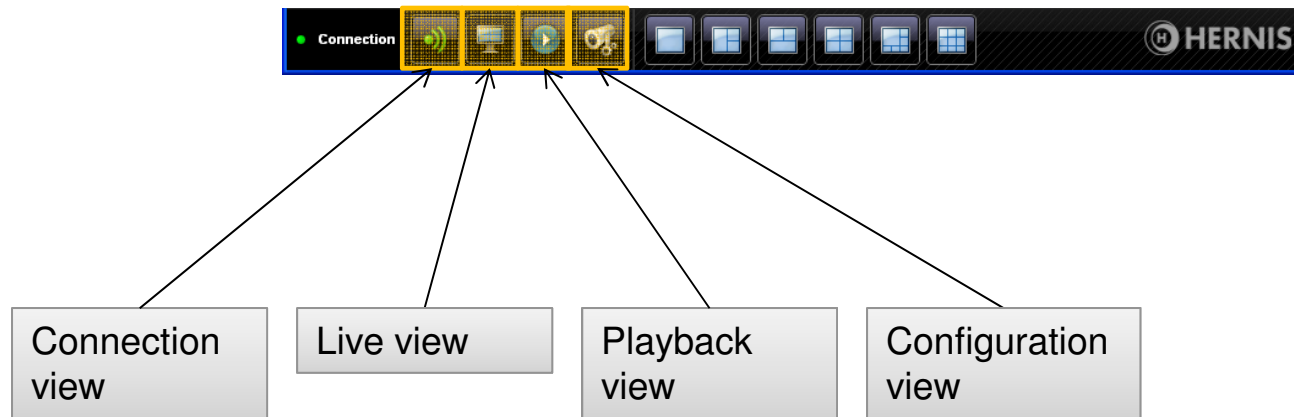
- **Map navigation and control**
- **External system support**
- **Customizable user interface**
- **Drag and drop**
- **Context menus for fast access to functions.**
- **Multi video support and split selection**
- **Quick access toolbars**
- **Large Screen control**
- **Joystick support and customizable joystick functions**
- **Remote control of HLSA application**

- Camera control
- Camera menu
- Sequence menu
- Multi Switch menu
- Alarm menu
- Relay Output menu
- Quad menu
- Recorder menu
- Map menu
- User Override menu



Video and Video Toolbar





HERNIS Alarm Monitoring Application

HAM



- **Control and handle alarms**
- **Modify alarm settings**
- **Multiple videos.**
- **View alarm logs.**
- **Alarm Video Playback.**
- **Use maps (Advanced).**
- **Control HLSA applications (Advanced).**

	HAM Standard	HAM Advanced	HWIN Web
Camera selection	Yes	Yes	Yes
Basic camera control	Yes	Yes	Limited
Preset control and configuration	Yes	Yes	Control only
Sequence control and configuration	Yes	Yes	No
Multi Switch control and configuration	Yes	Yes	No
Basic Alarm control and configuration	Yes	Yes	Limited
Extended Alarm control, log and configuration	Yes	Yes	No
External systems	No	Yes	Yes
Map control	No	Yes	Yes
Large Screen control	No	Yes	No
Video Playback	Yes	Yes	Yes
Video Download	Yes	Yes	No

HAM Alarm Maintenance View

- View active and acknowledged alarms.
- Alarms arranged by priority, the highest priority alarms are always at the top.
- View associated cameras and presets.
- Support multiple systems

Active Alarms

Alarm name	Priority	Status	Actions
Alarm 1	0	HardwareTriggered	2
Alarm 4	0	HardwareTriggered, UserAcknowledged	1
Alarm 34	0	HardwareTriggered	1
Action			
Select P1 Alarm 1 on Camera 1 to Monitor 1			
Select P1 Alarm 1 on Camera 1 to Monitor 5			

Active Alarms

Alarm name	Priority	Status	Actions
Test System			
Alarm 1	0	HardwareTriggered	2
Alarm 4	0	HardwareTriggered	1
Test System 2			
Gas High H Alarm	255	HardwareTriggered	1
Action			
Select P1 Alarm 1 on Camera 1 to Monitor 1			
Select P1 Alarm 1 on Camera 1 to Monitor 5			

Active alarms.
Used to review
the alarms

Alarm actions.
Used to view the
related cameras

The screenshot displays the HAM Live view interface. On the left, the 'Active Alarms' table shows one active alarm: 'S1 - Alarm 11' with priority 0 and status 'User triggered'. Below the table, the 'Action' list includes various camera and system controls. The main area shows two camera feeds: 'Monitor 11' (nighttime outdoor scene) and 'Monitor 12' (indoor hallway scene). On the right, the 'Camera Control' panel shows 'Selected Alarm' as 'S1 - Alarm 11' with 'Acknowledge' and 'Actions' buttons. Below it, the 'Alarm' list shows 'S1 - Alarm 11' selected. The 'Relay Output' panel shows 'General' selected. At the bottom, there is a 'Connection' status bar and a 'HERNIS' logo.

Alarm name	Priority	Status	Actions
S1 - Alarm 11	0	User triggered	9

Alarm
handling

Alarm inputs

Output control

Filters the log by date.

List of alarms in the specified time span.

Events that can be used for playback.

The screenshot shows the 'HAM (Test system en)' interface. At the top, it says 'Playback from Alarm Log' and 'Download and view the HERNIS system alarm log.' Below this are two date selection fields: 'Select start date' with '5. oktober 2011' and 'Select end date' with '1. desember 2011'. An 'Update Alarm Log' button is below these fields. A large video player area is in the center, currently showing a black screen with a playback control bar at the bottom. To the right is a 'Playback menu' with options: Camera Video, Alarm Video, DVR Video, Captured Data, Download Video, and Alarm Log. Below the video player are two tables: 'Alarms' and 'Action list'.

Timestamp	Length	Status	Name
03.11.2011 12:32:04	0h 1m 19s	Hardware Trigge...	S1 - Alarm 3
03.11.2011 11:52:34	0h 42m 4s	Hardware Trigge...	S1 - Alarm 2
03.11.2011 11:51:33	0h 43m 51s	Hardware Trigge...	S1 - Alarm 11

Type	Name
Camera to monitor	Select S1 - Camera 1 en to Monitor 28
Camera to monitor	Select S1 - Camera 1 en to Monitor 1
Camera Recording	Save S1 - Camera 3 to NVR alarm archive

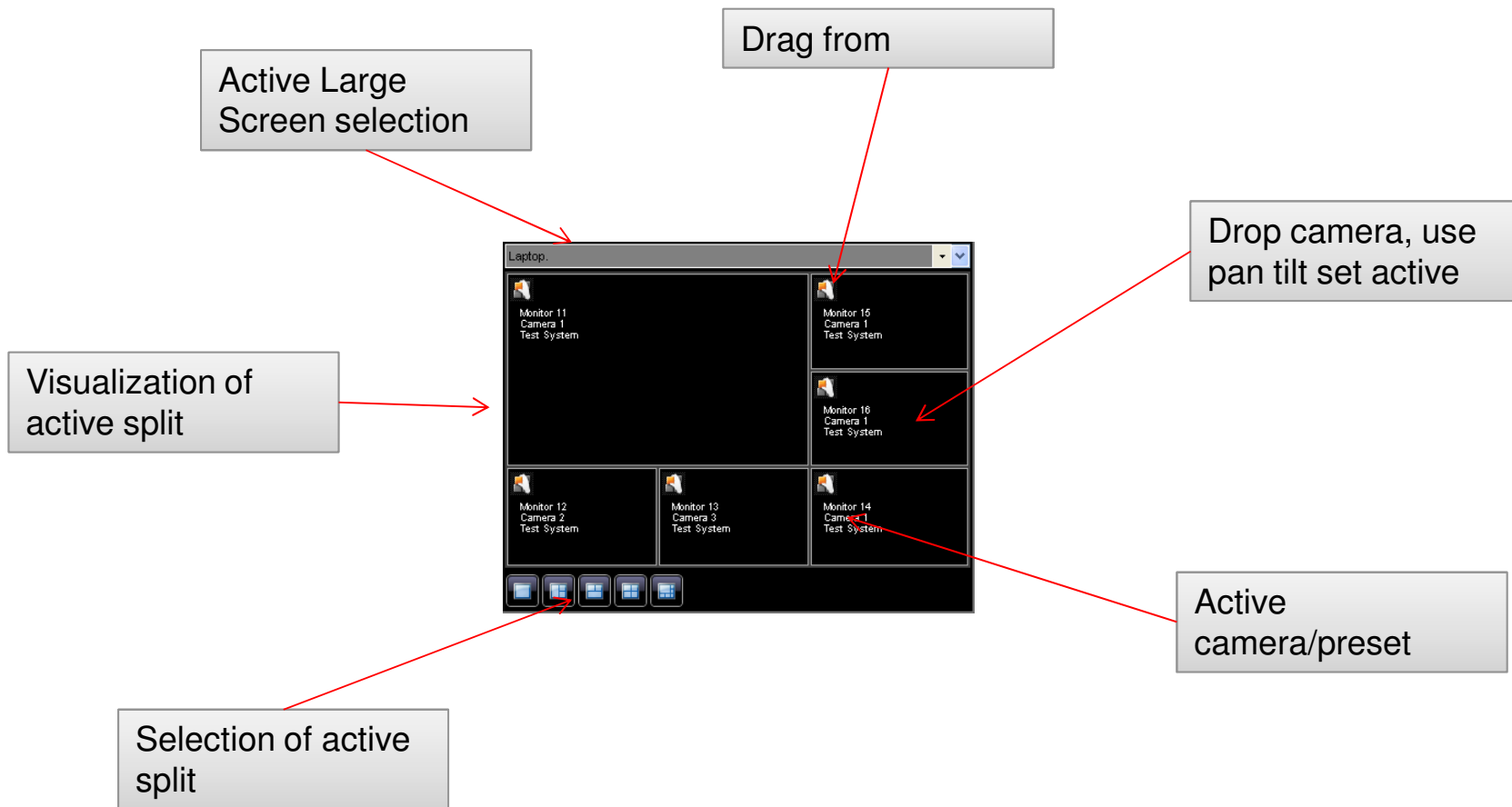
HERNIS Large Screen Application

HLSA

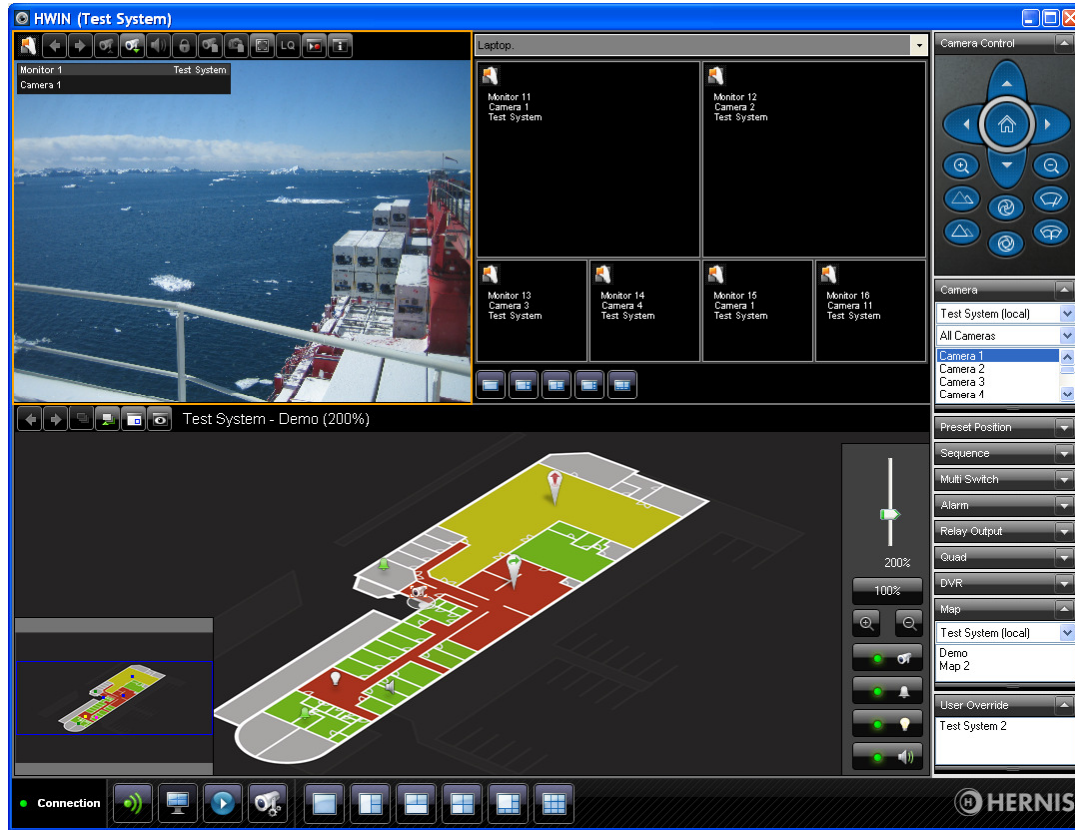


- Display multiple videos in various splits on a large LCD/Plasma or projector.
- Standalone application controlled from HWIN/HAM Advanced.
- Supports splits with up to 9 videos.
- No local controls all done remotely from HWIN/HAM

HLSA Large screen controller



HLSA – Control from HWIN/HAM



HERNIS System Management Application

HSM



- System management application.
- System module monitoring.
- Node monitoring and firmware updating.
- Camera monitoring and firmware updating.
- External system monitoring.

HSM Systems overview

Overview covering all configured systems

System selection

Main menu (page selection)

The screenshot displays the 'System Overview' page of the HSM management interface. The main content area features a table with the following data:

Name	Connected	Cameras	Control Stations	DVRs	Nodes	Servers
Test system 3	🟢	🔴	⚪	⚪	⚪	🟢
Test system 1	🟢	🔴	🔴	⚪	🔴	🟢
Test system 2	🟢	🔴	⚪	⚪	⚪	🔴
Test system 4	🟢	⚪	⚪	⚪	⚪	🟢
Test system 400	🟢	🔴	🔴	🔴	⚪	🟢

On the right side, a vertical main menu contains the following items: System Overview, Camera Status, Control Station Status, DVR Status, Recorder Status, Node Status, Client Status, Server Status, and System Log. The 'System Overview' item is currently selected. At the bottom of the interface, there is a status bar with a 'Connection' indicator and the HERNIS logo.

HSM (Test system 3)

Overview | Test system 3 | Test system 1 | Test system 2 | Test system 4 | Test system 400

Node Status - Test system 1

Displays the current status.

Name	ID	Communication	Firmware	Programmed Date
AlarmNode	1	●	Not available	Not available
AlarmNode	2	●	5.42	11.01.2011 15:20:41
CameraNode	1	●	5.50	02.06.2010 14:41:41
CameraSwitchNode	1	●	5.41	08.09.2009 12:15:40
CameraSwitchNode	2	●	5.41	07.02.2008 15:15:12
MonitorTextNode	1	●	5.42	11.02.2009 14:40:38
NetworkNode	1	●	5.50	02.06.2010 15:42:14
Ok450Node	1	●	1.10	14.06.2011 11:36:56
Not configured nodes:				
NetworkNode	3	●	Not available	Not available
Ok400Node	1	●	Not available	Not available
Ok400Node	2	●	Not available	Not available

Manage Firmware

System Overview
 Camera Status
 Control Station Status
 DVR Status
 Recorder Status
 Node Status
 Client Status
 Server Status
 System Log

● Connection

HERNIS

HERNIS Software Development Kit

HERNIS SDK



➤ Alarm System

- Automatic triggering of alarms in the CCTV based on alarms in the Alarm System.
- Manual selection and control of cameras from the Alarm System GUI.

➤ Drilling System

- Automatic selection of cameras and or preset positions during drilling operation based on feedback from the drilling system.
- Manual selection and control of cameras from the Drilling System GUI.

➤ Allows integration of HERNIS CCTV Systems

- Camera selection and control
- Preset positions
- Sequences
- Multi Switch
- Quads
- Alarms
- ...

➤ **The SDK contains the following items**

- HAKI communication component
- DVR Client control (Video from HERNIS 500 System)
- Examples in various languages (C++, C#, Java, VB, Javascript)
- Documentation
- Dongle, Server Installation and various other software for testing purposes.

➤ **HAKI version 3.x**

- ActiveX component
- Maintenance and bug fixing only.

➤ **HAKI version 4.x**

- Java component
- Maintenance and bug fixing only.

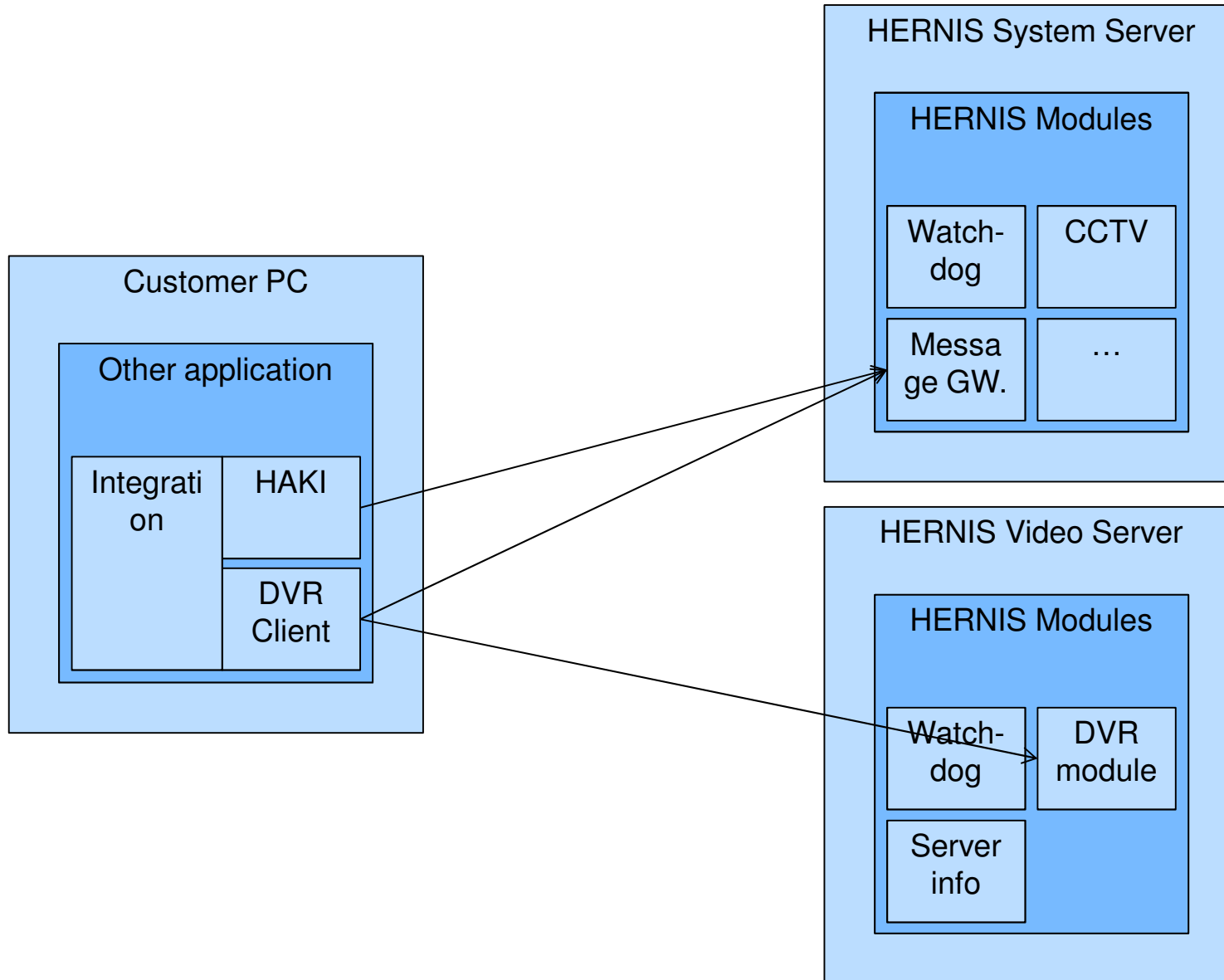
➤ **HAKI version 5.x**

- .NET assembly with control binding support.
- Under continuous development.
- Recommended for new integrations.

➤ **DVR Client**

- ActiveX control
 - Video from HERNIS 500 systems
- 
- A light gray right-angled triangle pointing downwards, located in the bottom right corner of the slide.

SDK Overview



The screenshot displays the HERNIS 400 Control Centre software interface. The interface is divided into several sections:

- Standby (Left):** Features a vertical panel with directional arrow keys (up, down, left, right) and a 'Standby' label.
- Messages and Alarms (Top Center):** Contains a 'Messages' header and an 'Alarms' section with a red alarm indicator. Below these are several gauges: 'Dead Line' (0.0 ton), 'Torque' (0.0 kNm), 'Acc. Level' (50.0 %), and 'Air Load' (0.0 MT).
- Hernis 400 Control Centre (Center):** A central window titled 'Hernis 400 Control Centre' showing a log of recent messages from the CCTV Centre. The log includes connection status updates and camera change notifications.
- Camera 2 (Right):** A large video feed labeled 'Camera 2' showing a harbor scene with a crane and buildings. Below the video are 'Camera controls' including 'Pan/Tilt' buttons and a 'Camera Group' dropdown.
- Control Panel (Bottom):** Contains mode selection buttons: 'Spin Mode', 'Torque Mode', 'Elevator Closed', 'Slips Set', 'Slips Released', 'Tripping Mode', and 'Drilling Mode'. It also displays 'Hook Load' (37 ton) and 'WOB' (0.0 ton).
- Taskbar (Bottom):** Shows the Windows XP taskbar with several open applications, including 'Hernis 400 Control Ce...'.