

DSI has partnered with Noldus Information Technology, the leading solution provider for human and animal behavioral research for 25 years, to offer scientists a better video experience. By integrating the Noldus Media Recorder and DSI's Ponemah Physiology Platform, scientists now have an easy method for synchronizing physiologic data with video data.

The Noldus Media Recorder enables synchronous video recordings from **up to eight** different video sources. When integrated with Ponemah, you can command the Media Recorder to save and sync video data with the physiologic data recorded from DSI hardware and manage all your data with one application. This combined solution provides greater insights into the physiologic data to better understand your results.

Note: Synchronization of video data with physiologic signals will be within +/- 1 second.

INSTALLATION

In addition to the Ponemah installation, users are required to install the Noldus Media Recorder software and necessary cameras drivers. For information on installing these items, please refer to the Noldus Media Recorder Reference Manual.

Once installed, launch Noldus Media Recorder. The following registry entry should then be updated:

\HKEY_CURRENT_USER\Software\MainConcept\MainConcept AVC/H.264 Video Decoder\MediaRecorder.exe

- Double-click Hardware Acceleration
- Change the Value data to 0
- Click OK.

Edit DWORD (32-bit) Value	×
Value <u>n</u> ame:	
Hardware acceleration	
<u>V</u> alue data:	Base <u>H</u> exadecimal <u>D</u> ecimal
	OK Cancel

• Close the Registry.



GIGE CAMERA SETUP

GigE cameras are high-performance industrial cameras. They can have a higher frame rate and resolution than the other supported cameras. The images are sent unprocessed to the computer using a standard network cable (UTP). Noldus Media Recorder is compatible with certain Basler GigE Cameras.

For GigE camera setup and support, please see the Noldus Media Recorder Reference Manual.

Note:

- File size of a 24 hours recording is very large (at least 12 Gb).
- When using multiple GigE cameras, it takes a while before they become visible in Media Recorder. GigE cameras take time to initialize.

IP CAMERA SETUP

IP cameras are connected directly to a network. IP cameras are especially useful to film remote locations and receive the video files through an ethernet network on your computer. Noldus Media Recorder is compatible with Axis IP Cameras. In order to configure Axis IP Cameras in Noldus Media Recorder a few camera settings are required to be updated.

To Configure:

- 1. Access the camera's webpage:
 - a. Open Windows Explorer.
 - b. Select the Network folder.



- c. Double-click the camera to launch its webpage.
- d. When prompted for Authentication, enter the following:
 - i. Username: root
 - ii. Password: root

Authentio	cation required
http://10.10 Your conne	0.209.148 ction to this site is not private
Username	root
Password	••••
	Log in Cancel

- e. Note the IP Address of the camera, as it will be needed later when configuring the cameras in Noldus Media Recorder.
- 2. Add an ONVIF Admin User:

ONVIF is a communication standard for network devices. ONVIF Profile S applies video and audio streaming and PTZ control. Most IP cameras nowadays support ONVIF Profile S. For cameras that do so, pan, tilt, and zoom control can be done with Media Recorder and audio from the camera can be recorded. For cameras that do not support ONVIF, pan, tilt, and zoom control must be done with a browser and audio must be recorded with a microphone connected to the sound card of the computer.

a. Select the **Setup** link in the upper right side of the webpage.

Live view - AXIS M1145-U ×			Cuest	-	×
\leftarrow \rightarrow C \triangle (i) 10.10.209.14	8/view/view.shtml?id=156&imagepath=%2Fmjpg%2F1%2Fvide	eo.mjpg&size=1			:
AXIS	AXIS M1145-L Network Camera	Live View	Setup	Help	
View size	a T				

- b. From the menu options on the left side of the webpage, select System Options | ONVIF.
- c. Click the **Add...** button associated with the User List.



System Ontions/ONIVIE			(Buest	-		×
	10.209.148/admin/onvi	f.shtml?id=161					1:
	,						
AXIS	AXIS M1145	5-L Network Ca	mera			Live Vi	ew I
• Basic Setup	ONVIF						
• Video	ONVIF Version: Profile	S					
▶ Live View Config	Users List	User Group			1		
Detectors							
• Applications							- 1
• Events							- 1
• Recordings							- 1
Languages							
 System Options Security 	Add Mo	dify Remove		v	J		
Users							
IP Address Filter							
HTTPS TEEE 802 1X	See also: ONVIE Me	dia Profiles					•
4							•

- d. When prompted, enter the following:
 - i. Username: onvifadmin
 - ii. Password: onvifadmin
 - iii. User Group: Administrator

🔺 System Options/	ONVIF Us — 🗆 🗙
Not secure 1	0.10.209.148/operator/onvif_u
ONVIF Use	r Setup 🕜
User name:	onvifadmin
Password:	•••••
Confirm password:	•••••
User group:	O Media user
	Operator
	Administrator
ок	Cancel

- e. Click OK.
- 3. Update TCP/IP Settings:
 - a. Still within the System Options, select Network | TCP/IP | Advanced.
 - b. Locate the Link-Local IPv4 Address heading.
 - c. Uncheck Auto-Configure Link-Local Address.

🔺 System Options/Advan		Grast — 🗆 🗙
\leftrightarrow \rightarrow C \triangle \bigcirc 10.	10.209.148/admin/advanced_tcpip.shtml?id	d=164
AXIS A	XIS M1145-L Network Ca	mera Live View Setup
Basic Setup	Advanced TCP/IP Setti	ngs
· busic occup	DNS Configuration	
Video	Obtain DNS server address via DHCP	View
Live View Config	Use the following DNS server address:	
Detectors	Domain name: Primary DNS server:	transomamedical.com (use ; to separate nar
Applications	Secondary DNS server:	
• Events	NTP Configuration	
Recordings	Obtain NTP server address via DHCP	View
Languages	Network address:	(host name or IP addr
Custom Ostions	Host Name Configuration	
 Security 	Obtain host name via IPv4 DHCP	View
Date & Time	Use the host name:	axis-accc8e5bcb80
-TCP/IP	Enable dynamic DNS updates	
Basic	Register DNS name:	(Axisproduct.examp
SOCKS	TTL:	30
QoS	Link-Local IPv4 Address	
SNMP UPnP™	Auto-Configure Link-Local Address	View
RTP	НТТР	
< <u> </u>	k.	

- 4. Update WebService Settings:
 - a. Still within the System Options, select Advanced | Plain Config | Advanced.
 - b. Select WebService from the dropdown menu, then click Select Group.
 - c. **Uncheck** the *Enable replay attach protection* setting.
 - d. Click Save.

🛦 System Options/Plain cor 🗙	Guast	_		×
← → C û 10.10.209.148/admin/config.shtml?group=WebService				:
AXIS M1145-L Network Camera	lp			
The plain config page allows direct access to all the configurable parameters supp Camera. This page uses no extra scripts (Javascript or otherwise) and should func Select the parameter group to modify and configure the settings directly.	ported by tion corre	the All ectly in	XIS M1 any br	145-L owser o
For help on parameters, please refer to the relevant help page available from the s Select a group of parameters to modify:	standard s	setup to	ools.	
WebService Select group				
WebService UsernameToken: Enable replay attack protection: Save page changes Save Reset				

5. Repeat steps 1-4 above for any additional Axis IP Cameras.

CONFIGURING CAMERAS IN MEDIA RECORDER

To configure cameras within Noldus Media Recorder:

- 1. Launch Ponemah.
- 2. Open the appropriate Protocol.



- 📴 Ponemah Sync-System-Test_8-Implant.PRO (User: DSI-NHQ2\DSI) File Setup Study SEND Hardware Acquisition Replay Options Tools Help APR Configuration... LR1 LR2 LR3 LR4 a b c 乡 🖪 🛤 🔍 😣 🔛 Edit Configuration... Select Implants... Diagnostics... Channel Configuration... Video Configuration... Save ET: DT: 60D 17h DS: 143.26 GE Data Set: **ON**
- 3. Select the Hardware menu | Video Configuration to launch Noldus Media Recorder.

4. Click the Settings button or choose the File menu | Settings.

Me	edia R	ecorder 4.0						×
ile	Help	p						
					No Please	signal	from Video 1. ure a device first.	
R	ecordi	ing properties						
R	ecordi Use	ing properties Video name	Audio name	Mute	Volume	^	File location:	C:\Users\Public\Documents\Noldus\Medii
Ri Nr 1	ecordi Use	ing properties Video name Video 1 <u>A</u>	Audio name Audio 1	Mute	Volume		File location: File base name:	C:\Users\Public\Documents\Noldus\Medii @
R/ Nr 1 2	ecordi Use	ing properties Video name Video 1 A Video 2	Audio name Audio 1 Audio 2	Mute	Volume		File location: File base name:	C:\Users\Public\Documents\Noldus\Medii 6
R/ Nr 1 2 3	ecordi Use	Video name Video 1 🛕 Video 2 Video 3	Audio name Audio 1 Audio 2 Audio 3	Mute	Volume		File location: File base name: Output mode:	C:\Users\Public\Documents\Noldus\Medi; 🖆 Video
R/ Nr 1 2 3 4	Use	Video name Video 1 Video 2 Video 3 Video 4	Audio name Audio 1 Audio 2 Audio 3 Audio 4	Mute	Volume	<	File location: File base name: Output mode:	C:\Users\Public\Documents\Noldus\Medii @
R/ Nr 1 2 3 4 4	Use	Video name Video 1 Video 2 Video 3 Video 4	Audio name Audio 1 Audio 2 Audio 3 Audio 4	Mute Setting	Volume gs	sh	File location: File base name: Output mode:	C:\Users\Public\Documents\Noldus\Medii 2

(Optional) Update the name of video camera.
 The name specified here will be displayed within Ponemah during the camera assignment process.

	Use	Video n	name	Video device		Frame rate	Resolution	Audio name	Audio device	
	\checkmark	Video 1		RTSP IP Camera (Noldus RT	<u> </u>	30.00	640 x 480	Audio 1	No Audio	
		Video 2		Select video device				Audio 2	No Audio	
		Video 3		Select video device	a			Audio 3	No Audio	1
ł		Video 4		Select video device	-			Audio 4	No Audio	ļ
5		Video 5		Select video device				Audio 5	No Audio	[
5		Video 6		Select video device				Audio 6	No Audio	ļ
7		Video 7		Select video device				Audio 7	No Audio	ļ
3		Video 8		Select video device	8			Audio 8	No Audio	(
C P P)utput iP Posi iP Size iP Mar	mode: ition: : gin:	Separate Top - Left 20% 5%	videos V	1		Time format: [Decimals: [Example: [HH:mm:ss v 0 v 16:43:52 um recording time:	01:00:00	
	Use	audio d	evice 1 for	all videos					,	

6. Select RTSP IP Cameras from the dropdown list under Video Device.

7. Click the **Camera Icon**

to access the advanced settings.

COMPLETE THE CAMERA SETTINGS DIALOG WITH THE CAMERA'S IP ADDRESS (GIGE CAMERA SETUP

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IP CAMERA SETUP SECTION STEP 1) AND ONVIF USERNAME AND PASSWORD (GIGE CAMERA SETUP

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For GigE camera setup and support, please see the Noldus Media Recorder Reference Manual.

Note:

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- When using multiple GigE cameras, it takes a while before they become visible in Media Recorder. GigE cameras take time to initialize.
- 8. IP Camera Setup section step 2.d.), then click **Get device properties**.

RTSP IP Camera	a Settings X
IP address:	10.10.209.159
Port:	554
User name:	onvifadmin
Password:	•••••
	Get device properties
Encoding:	H264
Quality:	640 x 480 @ 30fps Edit
	Flip pan axis
	Flip tilt axis
	OK Cancel

9. Click **OK**.

10. Select the desired Frame Rate and Resolution.

The available options will depend on the camera model. By default, the optimal combination of frame rate and resolution for the camera is selected. If you increase the frame rate, the maximum resolution available goes down and vice versa. If you select an impossible combination of frame rate and resolution and format, Media Recorder gives a warning.

- 11. Add subsequent cameras by enabling the checkbox under the Use header.
- 12. Repeat steps 5-10 for additional cameras.
- 13. Click **OK** to close the *Medial Recorder Settings* dialog.
- 14. Once camera setup is complete, choose **File | Exit** to close Noldus Medial Recorder and return to Ponemah to associate the cameras to the desired subjects.

Note: Please keep the default settings for Output Settings, Timer Settings, File Location, and File Base Name.

ASSOCIATING CAMERAS TO PONEMAH SUBJECTS

To assign cameras to the appropriate subject for synchronized physiologic data and video data acquisitions:

1. Select the Ponemah Setup menu | P3 Setup.

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File	Setu	p St	udy	SEND	Hard	ware	Acquis	tion	Rep	lay	Optio	ons	Тоо	ls I	lelp		
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- 2. Select the **Groups** on the left.
- 3. Select the camera from dropdown menu in the *Camera* column to pair with the desired Group.

- PPP3 Setup - Groups	- Groups						
Channel Input Setup Template Setup Groups	Group Informa	tion Use S	Study Subjects 🔲	Use Study Doses			
Events Digital Display Satur	Group	Name	Trigger	Camera	Species	Dose	_
Alarm Setup	Group A	Rat1_C50	1 - (CHN1)	Video 1 💌	Dog		
Experimental Protocol Head	Group B	Rat2_C50			Dog		
Print RAW Data Setup	Group C	Rat3_C50		Video 1 Video 2	Dog		
Data Reduction Setup Variability Analysis	Group D	Group D		Video 3	Dog		
/ariability Analysis Graph Setup Sinary Data Convert	Group E	Group E		Video 4 Video 5	Dog		
	Group F	Group F		Video 6	Dog		
Settings	Group G	Group G		Video 7 Video 8	Dog		
SEND	Group H	Group H			Dog		
Data Parser Setup	Group I	Group I			Dog		
	Group J	Group J			Dog		
	Group K	Group K			Dog		
	Group L	Group L			Dog		
	Group M	Group M			Dog		
	Group N	Group N			Dog		
	Group O	Group O			Dog		
		Group P			Dea		•
					ок	Cancel	Apply

- 4. Repeat for any additional subjects.
- 5. Select OK.

Note: Cameras may be associated with multiple Subjects.

ACQUIRING SYNCHRONIZED VIDEO DATA

To acquire and save synchronized video with the physiologic data:

1. Select the Ponemah Setup menu | P3 Setup.



2. Click on the Settings tab and make sure that the Link Video Saving checkbox is checked, then click OK.

PPP3 Setup - Settings	
PPP3 Setup - Settings - PPP3 Setup Channel Input Setup Template Setup Groups Events Digital Display Setup Alarm Setup Experimental Protocol Head Print RAW Data Setup Data Reduction Setup Variability Analysis Graph Setup Binary Data Convert Settings Remote Connection SEND Data Parser Setup	Acquisition Defaults Logging Method and Rate © Time (hh.mm.ss) 00:00:05 ÷ © Epoch 1 ÷ Epochs ✓ Save RAW Data On ✓ Link Video Saving ✓ Record Video On Data Separator © Space Comma Tab Calescentre Comma Calescentre Calescentre Calescentre Calescentre Calescentre Calescentre Calescentre Calescentre Calescentr
	C 1/1000 Real Group Mode in data parser Use Group Labels Minimum Good Time for Bad Data Mark Merging: 10 Seconds
	OK Cancel Apply

3. Once all cameras are configured, save the changes to the protocol by clicking File | Save.

Once Acquisition is started by clicking **Acquisition | Start Acquisition,** Ponemah will begin data collection, automatically launch Noldus Media Recorder and commence video acquisition. Please note: Do not stop the video recording, if video collection is stopped while data collection is running, it will de-link from the data.

UNDERSTANDING VIDEO FILE GENERATION

When acquiring video data, each subject with have its own video file. This includes an .XML file containing pertinent meta data about the video file Ponemah requires for Subject association and video playback in Ponemah Review and the actual video data files.

New video data files are created at the start of each acquisition session. To stop video and data acquisition simultaneously, select the menu option **Functions – Stop Acquisition**. It will take a few moments for Ponemah to stop the acquisition and close all video and data files.

FILE LOCATIONS

During acquisition, video files are actively saved to the following directory:

C:\Users\Public\Documents\Noldus\Media Recorder\Video Files\

Once acquisition is stopped the video files will be closed and automatically transferred to the appropriate data folder (default location is C:/Ponemah Data). Files will also be renamed at this time based on Ponemah's file naming structure. Please see the Error! Reference source not found. section of this manual for descriptions of the video file types.

VIDEO PLAYBACK WITHIN PONEMAH REVIEW

Video Data can be reviewed within Ponemah Review. To do this, start a review session. Should any video data be associated with the data loaded into Review, it will automatically be available.

The Noldus Media Recorder software MUST be installed on the Analysis computer for playback to occur within Ponemah Review. The Analysis computer does NOT require a separate Noldus Media Recorder license nor does the Noldus security dongle need to be used.

To launch the Video Player:

- 1. Navigate to a Primary or Trend Graph Page.
- 2. Right-click a graph pane and select Show Video from the menu to launch the player.



Once the Video Player is launched, a solid, vertical green line will appear on the graph page to indicate the location of the current frame in relation to the physiologic data. Should this green cursor reach the edge of the graph during video playback, the graph will automatically advance to the next page of data.



Note: If video files are not found for the Subject, the following message will be displayed:

Error	Х
No Video Files associated with this Group	
ОК	;

VIDEO PLAYER CONTROLS





The Video Player will display the date and time of the currently displayed 1/22/2018 9:34:20 AM image. This date and time corresponds to the solid, vertical green line associated with the physiologic data on the graph page. Scroll bar for the video data. Scrolling through with this cursor will also advance the physiologic data graphs to keep synchronized with the image displayed in the Video Player. Rewind button. Used to step through the video file in reverse, two seconds at a time. Play button. Used to step through images at the frame rate acquired; i.e. real-time playback. When video is playing back, this button turns into a Pause button. Reduce playback speed by half. Min: 0.125 Increase playback speed by double. Max: 2 Playback speed indicator. Speed: 0

The Video Player offers several control features to navigate through the video file, as outlined below.

Note: To step forward through the video file frame-by-frame, use the keyboard right arrow key $\langle \rightarrow \rangle$. Reversing through the file with the left arrow $\langle \leftarrow \rangle$ will step back in 0.1 second increments.