# exacq\/ision<sup>.</sup>

### Purpose

The purpose of this document is to provide guidance for configuring and understanding the exacqVision serial interface. This guide provides step-by-step instructions and also explains more complex topics in-depth.



Serial data refers to unencrypted, clear text, or ASCII characters received by exacqVision. It is referred to as serial data because it is sent as a series of characters over a UART (RS-232 or RS-485) interface or in a TCP/IP packet over Ethernet.

exacqVision processes serial data in many ways. For example, the data can simply be stored as human-readable text and overlaid on live views; or it can be used to trigger actions such as calling a PTZ preset on a camera, recording video, triggering an alarm output, changing a view, sending an email, and more.

### The Physical Layer

You must first determine through which interface the serial data will be received by exacqVision. There are two possibilities, both of which are handled and processed the same by exacqVision software:

- UART (RS-232/RS-485). In this case, an RS-232 port is not installed in the exacqVision recorder; thus, a USBto-RS-232 adapter is used.
- TCP/IP (Ethernet). Either Ethernet port can be used for serial data. For simple configurations, serial data can be received through the same port as the video streams, requiring only one Ethernet port to be used.



### USB-to-RS-232 Adapter

A USB-to-RS-232 can be used if an RS-232 port is not available on the exacqVision system. Most adapters require the installation of device drivers per the manufacturer's instructions. After driver installation, verify the COM port has been detected by the Windows operating system, as described in the following section.



### Verifying Windows COM Port Drivers



To verify that Windows recognizes any new hardware, look in the Windows Device Manager. In this example, COM6 is the USB-to-RS-232 converter.

Double click on that entry in Device Manager and note the following settings in the Port Settings tab. These settings must match the device that is connected to the exacqVision system.

	Bits per second:	9600	
	<u>D</u> ata bits:	8	•
	Parity:	None	•
	<u>S</u> top bits:	[1	•
	Elow control:	None	÷

### Configuring a Serial Port

### UART

UART is the typical physical implementation of the serial data transmitted over RS-232 or RS-485.



- 1. Click on Serial Ports in the navigation tree of the exacqVision Client software.
- 2. Enter a unique name, if desired.
- 3. Select an option from the Use drop down menu:

Unused	+
Unused	1
PTZ	
POS	
ATM	
Access Ctrl	

**Unused.** Default setting used for disabling the port.

PTZ. Used for connecting to an analog PTZ camera for control (UART option ONLY).
POS. Used for receiving point-of-sale serial data.
ATM. Used for receiving ATM serial data.
Access Ctrl. Used for receiving access control serial data.

- 4. The port is automatically assigned by the operating system.
- 5. The Profile/Protocol varies based on the Use selection.

to create a Serial Profile after the serial port

a. If POS, ATM, or Access Ctrl is selected for Use, existing serial profiles are available. Select New

configuration is complete

S None None New... New Profile 1 New Profile 2

b. If PTZ is selected for Use, a PTZ protocol list is available.



- 6. Select a rate of data transmission for the Baud Rate. This must match the rate configured in the serial device.
- 7. Data Bits defaults to 8. This must match the rate configured in the serial device.
- 8. Stop Bits defaults to 1. This must match the rate configured in the serial device.
- 9. Parity defaults to None. This must match the rate configured in the serial device.
- 10. Flow Control defaults to None. This must match the rate configured in the serial device.
- 11. Max Line Length defaults to 80. This is the maximum number of characters before assuming an END OF LINE.
- 12. Line Ending is a character or set of characters that defines the END OF LINE.

- 13. Timeout is the interval in seconds at which END OF LINE is inserted.
- 14. Status displays the status of the port. Open means that the port is ready to send or receive data; unused means that the port is disabled or unconfigured.
- 15. Click Apply when finished.

#### IP

An IP-based serial port is the same as UART, except that the serial data is received over TCP/IP or an Ethernet network.



- 1. Click on Serial Ports in the navigation tree of the exacqVision Client software.
- 2. Click New.
- 3. Enter a unique name, if desired.
- 4. Select an option from the Use drop down menu:

Unused	-
Unused	
POS	
ATM	
Access Ctrl	

Unused. Default setting used for disabling the port.POS. Used for receiving point-of-sale serial data.ATM. Used for receiving ATM serial data.Access Ctrl. Used for receiving access control serial data.

5. Select a serial profile to process the data received by this serial port:



None. Default selection.
New. Prompts the user to create a serial profile after configuring this serial port.
New Profile 1. An example existing serial profile.
New Profile 2. An example existing serial profile.

6. Select a Type:



TCP. Acts as a TCP client (default).HTTP. For connecting via HTTP protocol.TCP Listener. Acts as a TCP server.

- 7. Enter an IP address of the remote source.
- 8. Enter the TCP port of the remote source.
- 9. Max Line Length defaults to 80. This is the maximum number of characters before assuming an END OF LINE.
- 10. Line Ending is a character or set of characters that defines the END OF LINE.
- 11. Timeout is the interval in seconds at which END OF LINE is inserted.
- 12. Status displays the status of the port: Not Available, Connecting, or Connected.
- 13. Click Apply when finished.

### Use and Profile/Protocol Fields

#### UART

Selecting PTZ in the Use field results in

PTZ protocols in Profile/Protocol field.



### **UART and IP**

Selecting POS, ATM, or Access Ctrl in the Use field results in Serial Profiles in Profile/Protocol field.



POS, ATM, and Access Ctrl are the same functionally; they simply change the look of the icon that appears in Live view in exacqVision:



When POS, ATM, or Access Ctrl is selected, you must make a Profile selection. If no profiles exist, New is the only option. Selecting New displays the Serial Profile page immediately following the completion of the Serial Port configuration. (Serial Profiles do not apply to UART ports if PTZ is selected in Use field.)

For UART ports, selecting PTZ allows you to configure PTZ control, typically for analog PTZ-capable cameras. For this reason, the Profile/Protocol field displays a list of supported PTZ protocols instead of Serial Profiles. Generally, the COM port associated with the RS-485 network should be selected.

### Max Line Length, Line Ending, and Timeout Fields

exacqVision processes serial data on a line-by-line basis. Therefore, it is necessary to define what a line is. Lines are defined by an END OF LINE (EOL). This is done using the three following fields; if any one of these fields is received, an EOL is identified and the line segment can be processed:

- 1. Max Line Length determine the EOL when this character count is reached.
- 2. Line Ending determines the EOL when a specific character string is matched.
- 3. Timeout determines the EOL after a certain time interval, in seconds, has elapsed (0 = disabled).

**NOTE:** It might appear that no data is being received if the criteria for one of these three methods is not met. Or, data might be received but it is not in the expected format.

Let's use the following stream of serial data to perform each of the three EOL methods. There are 50 printable characters here, and two control characters that are invisible and non-printable. These control characters are represented by \x0D and \x0A. (More on control characters later.)

welcome t	o this example string of	unencry	pted data\x0D\x0A	
Full Line of Tout		Serial Preview		
Full Line of Text		Port Name:	Exacq_Serial_Data	
		Port Status:	Connecting.	
Full l	ine of text.	Show Ray	w Data	
_	<b></b>	welcome	to this example string of unencrypted data	
Max Line Length = 27	would result in:	Serial Preview		
		Port Name:	Exacq_Serial_Data	
First	EOL is after 27th character.	Port Status:	Connecting.	
Rema	aining characters on second line.	Show Raw	Data	
_	>	welcome t ing of une	to this example str ncrypted data	R.
<i>Line Ending</i> = x (NOTE: We've set Max Li	ine Length to 80.)	Serial Preview	(	1
		Port Name:	Exacq_Serial_Data 🔹	
		Port Status:	Connecting.	
First	EOL is after the first x.	Show Rav	v Data	
Rema	aining characters on second line.	welcome ample str	to this ex	
Timeout = 1		Serial Previev	N .	
(NOTE: We've set Line Er	nding to blank.)	Port Name:	Exacq_Serial_Data 👻	
		Port Status:	Connecting.	
		Show Ra	w Data	
Every	y one second we get a line.	welcome welcome welcome welcome	e to this example string of unencrypted data to this example string of unencrypted data	

#### **Max Line Length**

In the example, we inserted an EOL after the 27th character. This separated the line into two parts, assuring the receipt of the first 27 characters (exacqVision identifies the 28<sup>th</sup> character location as an EOL). We also received the rest of the characters on the next line because of the built-in carriage return (\x0D) and line feed (\x0A) control characters at the end of the line.

	EOL HERE		Built-in EOL
welcome to th	s example string	of unencrypted	data\x0D\x0A

### **Line Ending**

Line ending assumes that there will be a particular character or string of characters at the end of a line. Windows and Linux use different strategies for appending their EOL characters:

- Windows terminates the EOL with a carriage return and line feed (\x0D\x0A).
- Linux terminates the EOL with just a line feed (\x0A).

Leaving the Line Ending field blank causes exacqVision to try to match a carriage return and line feed (\x0D\x0A) automatically for Windows operating systems or just a line feed (\x0A) for Linux operating systems. Therefore, the user does not have to enter anything in this field for this matching to occur. However, if the user wants to match something other than the standard control characters, any character or string of characters can be entered into this field. It is important to understand that once a character is typed into this field, the automatic matching of carriage returns and line feeds is disabled, and exacqVision will attempt to match the entry in this field instead.

In the previous example, we entered an "x" into the Line Ending field. This told exacqVision to match an x in the data string instead of trying to match a carriage return and line feed (xOAxOD). This separated the line into two parts, between the x and the next character. The rest of the characters appeared on the next line.



### Timeout

Timeout pulls a segment of data from the serial data stream at a regular interval, specified in seconds. If neither Line Length nor Line Ending result in the capture of data, setting Timeout to 1 second could reveal the data. This method is useful for troubleshooting. **NOTE:** A setting of zero means timeout is disabled.

In this example, let's assume that there are no carriage returns or line feeds, and the data size is less than the Max Line Length value. Therefore, there is nothing to tell exacqVision that an EOL has occurred. Let's also assume that the data source is continuously producing the same line of data. If we set the Timeout field to 1, we might see something like the following



### **Configuring a Serial Profile**

Serial Profiles are intended for processing inbound serial data from POS, ATM, or access control systems. After the Serial Port has been configured correctly to identify individual segments or lines of serial data, the Serial Profile allows the user to process these data segments into more meaningful textual structures and set up actions such as keyword matching, line masks, string replacements, and rules.

analyticat Clark		
	🔛 📓 🔘 exact	Wision
Configuration 1a	Serial Profiles	
P Add Systems	Date Bateritor	
Ligs Client     Light Event Monitoring	Davis to Action Datas (60 🖄 🖉 🖉 Konne 🗍	
Ti Mara	Santa Preview Configuration	_
Views New Methods	For failer + Name: New Partie (	
Layouts 1	the Data-Networks Strukter	
B Enterprise     B B execution Association	Brev fair Table 3 Marker Type: Standard+	
# System	807 market	
- D Seriel Ports	Case Services 🗵	
- Secial Profiles - Sell Net/Fications	Portion Fort Sample	
Auto Export	Event Nervierds Lake Marka   String Replacements   Rules	
(III Schedule	E tana M	
- Archeing - Doms	Bing Brid	le .
P exception Hybrid Server		
T. D. and Land, with miles		
14		
10	4	
	Close Service	
	4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-
En New Juli	Deep III Full Seatthe Alty C	iton
	0.11 kB/s - Feider, October 00, 2014 - 11	12913 PM

- 1. Click on Serial Profiles in the navigation tree.
  - a. If New was selected in the Profile field while configuring the serial port, exacqVision automatically creates a blank profile named New Profile 1. Select this profile and continue to step 3.
  - b. If the profile list is empty, click New. exacqVision initially names the first new profile New Profile
     1. However after completing the next two steps, go back to the Serial Ports page and select your newly created profile in the Profile field of the serial port.
- 2. Change the name of the profile to something meaningful.
- 3. Leave SOT Marker (start of transaction) and EOT Marker (end of transaction) blank and Marker Type as Standard.
- 4. Click Apply.

A blank profile has been created and associated with a serial port. A conduit now exists for routing serial data from the wire into exacqVision. From here, it is important to have an understanding of the nature of the data you will be formatting.

# exacqVision<sup>.</sup>

### Using Serial Preview

The Serial Preview window displays the data segments or lines that have been defined by the Serial Ports page. With an open Serial Profile we should start to see data.

- 1. Select the serial port name. This is the is the value assigned in the Name field on the Serial Ports configuration page.
- 2. Port Status shows the current connection status.
- 3. Show Raw Data displays the non-printable control characters such as carriage returns and line feeds (\x0D\x0A) along with the standard characters.
- 4. The Run button starts and stops the display. Clicking inside the display pauses the update.
- 5. The Flush button allows you to display the next line of data in the buffer, if there is any.
- Send To... provides a quick way of assigning SOT, EOT, keywords, and more. First, highlight serial a string of data from the window, and then click "Send To..."





Font... Font Sample

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## **SOT** and EOT

Start of Transaction (SOT) and End of Transaction (EOT) identify the beginning and the end of a transaction. This requires that the markers you are attempting to match are present in the data segments coming from the serial port. This can be verified by using the Serial Preview window.

exacqVision trims data to the left of the SOT and to the right of the EOT, and then aggregates all lines between into an individual transaction with timestamps for SOT and EOT. This results in a single database entry containing all data from an individual transaction.

The two examples to the right are from the Search page in exacqVision. They illustrate the difference between using SOT and EOT to construct a point of sale transaction and leaving those fields blank. Leaving SOT and EOT fields blank is equivalent to having each line be a unique transaction.

Using SOT and EOT	Not using SOT and EOT
	-
NAME 441 9764 & Sette Straty Frantises, is Access Frantises, is Access intel (156-4404	CANNEL #11     PORE #, 1019 ETERT     TENERE, 20 4007     ILITERE LAW
AND THE TOTAL ADDRESS ADDRESS	THE R PLATE NAME OF A
NALAS (FRANKARAS) 311 1164 - NAUN DYARDY TYURING, 18 Actus?	High Life memory selected
ETT CARE RECEASE DE 10.10.10 UN-12 TITLE TRANSPORTE A ANIME A UN	
Apr: 444274	MALER ATTEMPTOR EST
10         0.04.0         0.01.0         0.0           1000000         00         0.0         0.0           100040         0.0         0.0         0.0           100040         1.0         0.0         0.0	FURNIE, 28 16097
THEFT OF THE ACCTOR AT ARASE	APT CARE PERMANE DALLETTE (B.10
1001 CAREED HAL SHE	TTTL TWARTIN ARTICLUS
Contradio america un el ecte major Lat una press esta clave ettade pene mor es ane tetat.	3127.3A127A
NE VALUE NAVI CREAK DR ANT: many lower march and	VE (100 1000 00.00

## 12 Marker Type

The marker type allows the user to select between two methods for identifying the structure of the data: standard and XML.

#### Standard

Standard tells exacqVision to expect plain text characters without any special formatting or structure in mind. Following is a piece of XML data that will be processed as Standard, clear text input. The text is a character match as it exists in the file. No special processing has taken place.

	Serial Preview			Profile Configuration
New Text Document.txt - Notepad	PortName:	Exacq_Serial_Data	•	Name: Printer_Port_Profile
<u>File E</u> dit F <u>o</u> rmat <u>V</u> iew <u>H</u> elp	Port Status: C	onnecting.		SOT marker:
<transaction> <foods <name>Belgian waffles</name> <price>\$5.95</price> <description> two of our famous Belgian waffles with plenty of real maple syrup </description> <calories>650</calories>  </foods </transaction>	<pre>Show Raw D </pre> <pre> &lt;</pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>	eta ACTION> Belgian Waffles 5.95 tion> ur famous Belgian Waffles ity of real maple syrup otion> i=>650 BACTION>		Marker Type: Standard  EOT marker: Case Sensitive:  Font Sample Event Keywords Line Masks: String Repl String String

#### XML

XML tells exacqVision to identify XML formatting syntax, including angle brackets and a hierarchical structure. exacqVision assumes an opening and closing element for all pieces of data. exacqVision also disables user input to the EOT field, because it will generate the proper closing EOT based on what has been entered in the SOT field. For now, in this example, the SOT and EOT have been left blank.

exacqVision processes the XML data as follows:

- 1. Remove all angle bracket characters from the XML elements.
- 2. Remove the closing element from each element pair.
- 3. Indent as appropriate.
- 4. Insert equal signs between data and values, making it easy to set up Rules.

Port Name: Exacq_Serial_Data   Name: Printer_Purt_Profile  Port Status: Connecting.  Storm Raw Data	
Port Status Connecting, SCIT markers	
Show Raw Data	
Marker Tune: XM. •	
TRANSACTION	
food EOT markers 4/>	
name = Belgian Waffles	
price = \$5.95	
description = two of our famous Belgi	płe
calories calories = 650	

**NOTE:** When entering an SOT for XML data, you must prepend the opening angle bracket (<). For example, you would enter the SOT as "<TRANSACTION." exacqVision then generates the EOT when you click Apply.

Profile Configura	don
Name:	Printer_Port_Profile
SOT marker:	<transaction< th=""></transaction<>
Marker Type:	XML +
EOT marker:	
Case Sensitive:	19
Font	Font Sample

# exacqVision<sup>.</sup>

### 13 Event Keywords

Event keywords trigger exacqVision to react when it detects a certain combination of characters. Actions can be defined using Event Linking or Event Monitoring in exacqVision.

- 1. Click the Event Keywords tab.
- 2. Click New.
- 3. Enter the keyword.
- 4. Click Apply.

This keyword will be available for selecting in the Event Source list in both the Event Linking page and the Event Monitoring page of exacqVision.

Event Keywords Une Masks String Replacements Ru	les
Select All	
sting	Enable
3	
2	
2 Case Se stive	4 Deter

### Using a Keyword in Event Linking

Event Linking allows you to set up event-based actions that can trigger functions such as recording video, PTZ control, sending an email, and more. For more information on Event Linking, see the exacqVision User Manual. A simple example is shown here for verification of how keywords in the Serial Profile are shown in Event Linking.



- 1. Select Event Linking in the navigation tree.
- 2. Click New.
- 3. Select Serial Profile in the Event Type list.
- 4. Select the serial profile name with " Door1" appended to it. This affirms that exacqVision recognizes "Door1" as a keyword from the Serial Profile for use as an Event Source.

**NOTE**: Selecting only the serial profile name "New Profile 1" without the " - Door 1" appended to it will cause ALL keywords defined in the serial profile to be matched.

- 5. Select an Action Type.
- 6. Select a camera from the Action Target list.
- 7. Click Apply.

An Event Linking action has now been configured so that when exacqVision receives the serial string "Door1," the camera selected will move to a PTZ preset position. The options available in Action Type and Action Target vary based on other features of the exacqVision system, along with available cameras and components.

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It is also possible to match keywords on a specific serial port, as opposed to all serial ports. In this example, Serial Port is chosen as the Event Type. The Event Source box contains the names of the configured serial ports. You can select the serial port name, without any appended keywords (to match all keywords configured), or you can select the serial port name with individual keywords appended.

exactly/inten Clevit								
IQ 💁								exacqVisio
Configuration	Server Actions		Event Li	nking				
	Log Event Type Event	Source Action Type PTZ Preset	Action Target N/A	Pre Trigger B	Pest Trigger g	Status N/A		
	Even Type Holes Holes + Hout Trope Serie Horde Haadh IP Carera Canecton +	Event Source deta - Dor 1	Action Type Record W Record W Record A Cutput IN Auto Expe	den udio rigger ort	Action Target			Pre Trigger T Seconds Peet Trigger 0 3 Seconds
			Log Settings Meximum Dens to Finto Logger	dEvents 30	(† Cercel			
				- metserrist		0.06 ki	E/a Thursday	April 16, 2015, 512-58 Pt

### **Using Keywords in Event Monitoring**

Event Monitoring allows you to set up event-based actions that change the way the client displays cameras, views, and video. For a full discussion of Event Monitoring, see the exacqVision User Manual. A simple example is shown here for verification of how keywords in the Serial Profile are shown in Event Monitoring.

and the second se		exacq
iguration ens edd Systems	hulles	Event Monitoring 3
Client Event Monikoring Groups Maps Jorouts Layouts Layouts Conceptions Hybrid Server Storage Social Ports Social Ports Social Ports Social Ports Social Ports Motifications Auto Export Event Uniting Schedule Archiving Uters	Name - Type Profile Video Panel 2 2 Cleme	Action Target Confirm Timonat Message Canon VB-C68 Nin 0
_	Event Source	7 8 Action Type Action Target

- 1. Select Event Monitoring.
- 2. Click New.
- 3. Name the Event Monitoring profile. This a profile specifically for the Event Monitoring page, which should not be confused with the profile for Serial Profiles. There is no correlation between these two profiles.
- 4. Click New.
- 5. Select Serial Profile.
- 6. Select the serial profile name with "- Door1" appended to it. This affirms that exacqVision has recognized "Door1" as a keyword for use as an Event Source.
- 7. Select an Action Type.
- 8. Select an Action Target.

In this example, Event Monitoring has been configured so that when exacqVision receives the serial string "Door1," exacqVision Client switches the video currently being displayed to the camera selected in the Action Target. The options available in Action Type and Action Target vary based on other features of the exacqVision system, along with the cameras and components connected to the system.

## 4 Line Masks

Line masks are used for masking out entire line segments. Line Masks work by matching a character string entered by the user to a character string embedded in the serial data segment. When a match is found, the entire segment is removed from the transaction. The Live and Search checkboxes provide control of where and how you want the line segment removed.

- Live removes line segment from Live View, but still writes the data to database for searching.
- Search prevents line from being written to database, and therefore it cannot be searched.

**NOTE:** Selecting Search but not Live results in seeing the line segment in live view, but not saving it to the database.

In this example, a Line Mask of "GOLDFISH" prevents the entire line containing the word GOLDFISH from being displayed.

First, configure the Line Mask

- 1. Select Line Masks.
- 2. Click New.
- 3. Enter the character string to match.
- 4. Click Apply.



Here are the before and after results of this Line Mask in the Serial Preview Window. The entire line containing GOLDFISH has been removed from Serial Preview.

Before	After
MARSH #01 8766 E. 96TH STREET FISHERS, IN 46037 (317)576-5200 7050 GAL PLAS 2% MILK 2.69 F 53 NEW CASTLE 12LNR NP 13.59 T 7802 GOURMET MILD SAL SA 3.99 F	<ul> <li>MARSH #01</li> <li>8766 E. 96TH STREET</li> <li>FISHERS, IN 46037</li> <li>(317)576-5200</li> <li>7050 GAL PLAS 2% MILK 2.69 F</li> <li>53 NEW CASTLE 12LNR NP 13.59 T</li> <li>7802 GOURMET MILD SALSA 3.99 F</li> </ul>
7867 PF GOLDFISH CHEDDR.99 F5117 OB AD CGRP 35SFT2.79 T4786 HOT TMLS CINNAMON1.49 B4790 MIKE&IKE FRUIT FLV1.49 B3478 CEREAL APPLE JACKS2.99 T3478 VOID APPLE JACKS-2.99 V***** TAX1.16 BAL28.19FRESH IDEA CUSTOMER40002628583	5117 OB AD CGRP 35SFT       2.79 T         4786 HOT TMLS CINNAMON       1.49 B         4790 MIKE&IKE FRUIT FLV       1.49 B         5295 LIQUOR JIM BEAM       17.25 T         4763 VOID JIM BEAM       -17.25 V         ***** TAX       1.16 BAL       28.19         FRESH IDEA CUSTOMER       42302628583
MARSH SUPERMARKET #01 8766 E. 96TH STREET FISHERS, IN 46037	MARSH SUPERMARKET #01 8766 E. 96TH STREET FISHERS, IN 46037 (317)576-5200

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Here are the results in the Search Page of exacqVision. Notice that, with the Search box checked when we created the line mask, the line segment does not appear in search results because it was not written to the database. This means the data has not been saved. Use caution when creating line masks and configuring the Search and Live checkboxes.





	Marsh Feed	
	RARSH FUI RARSH FUI RARSH FUI	
	FISHERS IN 46037	
	(317)576-5200	
	7050 GAL PLAS 2% MILK 2.69 F	
	53 NEW CASTLE 12LNR NP 13.59 T	
	7802 GOURMET MILD SALSA 3.99 F	
	5117 OB AD CGRP 35SFT 2.79 T	
	4786 HOT TMLS CINNAMON 1.49 B	
	4790 MIKE&IKE FRUIT FLV 1.49 B	
	3478 CEREAL APPLE JACKS 2.99 T	
	3478 VOID APPLE JACKS -2.99 V	
	**** TAX 1.16 BAL 28.19	
	FRESH IDEA CUSTOMER 40002628583	
	MARSH SUPERMARKET #01	
	8766 E. 96TH STREET	
		_
	Paused	
111		G
3:26	03:27 03:28 03:29 03:30 03	L

### .5 String Replacements

String replacements are used to replace an anticipated character string in the serial data with a character string defined by the user. String Replacements can be visible in the exacqVision Live and Search views:

- Live performs replacement in Live View but still writes the original data to database.
- Search replaces of data written to the database but leaves data displayed in Live View unchanged.

In this example, GOLDFISH is replaced by BUBBLE GUM.

- 1. Select the String Replacements tab.
- 2. Click New.
- 3. Enter the string to replace.
- 4. Enter the replacement string.
- 5. Click Apply

The Live and Search checkboxes enable or disable the masking effects in exacqVision for the Live or Search pages. Remember, the original data is not deleted, and it is saved in the database.

Select All	 11.0	Cainch	Danihara	_
Sering Concernent	 Live	Search	Repace BLRR F CI M	
2			Δ	
<b>3</b>				
2	1103-			
2	m			
2	 m	_		ł

Here are the before and after results of this String Replacement.

#### Before

MARSH #01 8766 E. 96TH STREET FISHERS, IN 46037	*
(317)576-5200	
7050 GAL PLAS 2% MILK 2.69 F	
7802 GOUPMET MILD SALSA 3.99 F	
7867 PF GOLDFISH CHEDDR .99 F	
5117 OB AD CGRP 355F1 2.79 T	
4786 HOT TMLS CINNAMON 1.49 B	
4790 MIKE&IKE FRUIT FLV 1.49 B	
3478 CEREAL APPLE JACKS 2.99 T	
3478 VOID APPLE JACKS -2.99 V **** TAX 1.16 BAL 28.19	
FRESH IDEA CUSTOMER 40002628583	
MARSH SUPERMARKET #01	
8766 E. 96TH STREET	1.13
FISHERS, IN 46037	-
*	F.

#### After

MARSH #01	*
8766 E. 96TH STREET	
FISHERS, IN 46037	
(317)576-5200	
7050 GAL PLAS 2% MILK 2.69 F	
53 NEW CASTLE 12LNR NP 13.59 T	
7802 GOURMET MILD SAL SA 3.99 F	
7867 PF BUBBLE GUM CHEDDR .99 F	
5117 OB AD CGRP 355FT 2.79 T	
4786 HOT TMLS CINNAMON 1.49 B	
4790 MIKE&IKE FRUIT FLV 1.49 B	
3478 CEREAL APPLE JACKS 2.99 T	
3478 VOID APPLE JACKS -2.99 V	
**** TAX 1.16 BAL 28.19	
FRESH IDEA CUSTOMER 40002628583	
MARSH SUPERMARKET #01	11
8766 F. 96TH STREET	1.00
FISHERS, IN 46037	
	-
8	<u>b</u>

## exacqVision<sup>-</sup>

Here are the result on the Search age. Notice that, with the Search box checked when we created the string replacement, the data written to the database was the substituted data of "BUBBLE GUM," not the original data of "GOLDFISH." Use caution when selecting the Search and Live checkboxes.

#### Before

### Marsh Feed 12 MARSH #01 8766 E. 96TH STREET FISHERS, IN 46037 (317) 576-5200 7050 GAL PLAS 2% MILK 2.69 F 53 NEW CASTLE 12LNR NP 13.59 T 7802 COURNET MILE CALSA 3.99 F 4867 PF GOLDFISH CHEDDR .99 F 5117 OB AD CORF 355FI 2.79 T 4786 HOT TMLS CINNAMON 1.49 B 4790 MIKE&IKE FRUIT FLV 1.49 B 3478 CEREAL APPLE JACKS 2.99 T 3478 VOID APPLE JACKS -2.99 V \*\*\*\* TAX 1.16 BAL 28.19 FRESH IDEA CUSTOMER 40002628583 III -------MARSH SUPERMARKET #01 8766 E. 96TH STREET FISHERS, IN 46037 (317) 576-5200 11 11 🗙 🖫 🕼 Paused 04:32 04:31 4:29 04:30 04:29:05 04:28

#### After

	-
MARSH #01	
8766 E. 96TH STREET	
FISHERS, IN 46037	
(317)576-5200	
7050 GAL PLAS 2% MILK 2.69 F	
53 NEW CASTLE 12LNR NP 13.59 T	
7802 COUPMET MILD CALSA 3.99 F	
7867 PF BUBBLE GUM CHEDDR .99 F	
5117 OB AD CGRF 355F1 2.79 T	
4786 HOT TMLS CINNAMON 1.49 B	
4790 MIKE&IKE FRUIT FLV 1.49 B	
5295 LIQUOR JIM BEAM 17.25 T	
4763 VOID JIM BEAM -17.25 V	
**** TAX 1.16 BAL 28.19	
FRESH IDEA CUSTOMER 42302628583	
MARSH SUPERMARKET ‡01 8766 E. 96TH STREET FISHERS, IN 46037 (317)576-5200	1
MARSH SUPERMARKET #01 8766 E. 96TH STREET FISHERS, IN 46037 (317)576-5200 Paused 04:28 04:29 04:30 04:31 04:32	
MARSH SUPERMARKET #01 8766 E. 96TH STREET FISHERS, IN 46037 (317) 576-5200 Paused 04:28 04:29 04:30 04:31 04:32 04:29 04:29:40	
MARSH SUPERMARKET #01 8766 E. 96TH STREET FISHERS, IN 46037 (317)576-5200 Paused 04:28 04:29 04:30 04:31 04:32 04:29 04:29 04:31 04:32	
MARSH SUPERMARKET #01 8766 E. 96TH STREET FISHERS, IN 46037 (317) 576-5200 Paused 04:28 04:29 04:30 04:31 04:32 04:29 04:29 04:30 04:31 04:32	
MARSH SUPERMARKET #01 8766 E. 96TH STREET FISHERS, IN 46037 (317)576-5200 Paused 04:28 04:29 04:30 04:31 04:32 04:29 04:29 04:31 04:32	

# 16 Serial Rules

exacq\/ision

Serial Rules provide a way to perform simple logic algorithms on serial data.

- 1. Select the Rules tab.
- 2. Click New. A dialog box for configuring the first rule is opened.



- 3. Field Position tells exacqVision where the field is positioned relative to its associated value in the serial data segment:
- 4. Field is the variable. This can be a previously defined Event Keyword, or it can be declared in the text box:
- 5. Operator is a typical mathematical comparison functions:
- 6. Value is the value for which the comparison will be made (+ and signs are respected).
- Add Sub-Rule
   Subtract Sub-Rule

If more than one Sub-Rule is defined for any given Serial Rule, the Sub-Rules are ANDED together. This means that all Sub-Rules must be satisfied for the Serial Rule to be true.

Serial Rules are made available in:

- Event Linking
- Event Monitoring
- Serial Search

The Serial Rule Name field is how the Serial Rule is identified in these other features of exacqVision.

Conditions Earlid Reaction	Field	Constal		Nation 1	
Before *	1100	Equals	•	TIDAC.	0
Sefuns 🔹		Equals	•		0
Sefore +	3	Equale	•		0

Event Keywords Line Masks String Replacements Rules

Void >= \$10.00         Edit           Void <= \$5.00         Edit           Cash Given >= \$100.00         Edit           Cashier = Kamerra         Edit           Cashier = Bob         Edit	Name	Configure
Void <= \$5.00         Edit           Cash Given >= \$100.00         Edit           Cashier = Kamerra         Edit           Cashier = Bob         Edit	Void >= \$10.00	Edit
Cash Given >= \$100.00         Edit           Cashier = Kamerra         Edit           Cashier = Bob         Edit	Void <= \$5.00	Edit
Cashier = Kamerra     Edit       Cashier = Bob     Edit	Cash Given >= \$100.00	Edit
Cashier = Bob	Cashier = Kamerra	Edit
li Zara	Cashier = Bob	Edit
		li di
Case Sensitive	Case Sensitive	

# exacq\/ision

### **Example Serial Rule**

You might set up a rule for encountering the word "void" this way.

- 1. The word "void" occurs before, or to the left of, the actual value (-10.00). Therefore, choose Before for Field Position.
- 2. Enter the word that you want exacqVision to address as the variable. In this case, it is "void."
- 3. Enter the operator type.
- 4. Enter the value you want to compare.

This rule will become TRUE when a void occurs on an item less than or equal to \$-10.00.

MARSH #01 8766 E. 96TH STREET FISHERS, IN 46037 (317)576-5200	*
7050 GAL PLAS 2% MILK 2.69 F 53 NEW CASTLE 12LNR NP 13.59 T 7802 GOURMET MILD SALSA 3.99 F 5117 OB AD CGRP 35SFT 2.79 T 4786 HOT TMLS CINNAMON 1.49 B 4790 MIKE&IKE FRUIT FLV 1.49 B 5295 LIQUOR JIM BEAM 17.25 T 4763 VOID JIM BEAM 17.25 V	
FRESH IDEA CUSTOMER 42302628583	
MARSH SUPERMARKET #01 8766 E. 96TH STREET FISHERS, IN 46037 (317)576-5200	



### **Event Monitoring with Serial Rules**

exacq\/ision

In Event Monitoring, Serial Rules become Event Sources. When the Serial Rule becomes true, the Action Type and Action Target mechanisms are executed.

MIXA:			Profile Config	uration		
ame Type	Paral		Name:	Profile		
74			Description:			
				E Show Ev	ent Honitor List	
New		Detetar	Type:	Video Pa	nel	
lent Actions						
Event To: A Event Co	Satis Time	1	1	100		
Serial Profile Unknow	n Digital Preset	Action Sarget Analog - Disco Ball - New Preset, I	Confirm No	0	message	
Serial Profile Unknow	nince Action Type in Digital Preset	Action 5 arget Analog - Disco Ball - New Preset_1	Confirm No	0	Message	Delete
Serial Profile Unknow New Event Type	nin Digital Preset	Action 5 arget Analog - Disco Ball - New Preset_1	Confirm No Action Type	0	Action Target	Delete
New Video Loss A	Event Source	Action 5 arget Analog - Disco Ball - New Preset_1	Action Type	e	Action Target	Delete
New Event Type Video Loss A Deput Type	Event Source exactivities Hybrid Server PMarth Port - rold PMarth Port - rold = 100	Action Sarget Analog - Disco Ball - New Preset_1	Action Type  Action Type  Log Play Sound Switch Value		Action Target exactly/son Hybrid Server Analog - Y-New Preset, 1 Analog - Exact Cafe - Candy	Delete
New Event Type Velocity Event Type Velocity Velo	Event Source exacquision Hybrid Server P March Part - sold P March Part - sold P March Part - sold P March Part - Cash Siven P March Part - Cash Siven P March Part - Casher = 10	Action Sarget Analog - Disco Ball - New Preset_1 Analog - Disco Ball - New Preset_1	Action Type  Action Type  Log  Bay Sound  Switch Vide  *	timeout 0	Action Target exactlySion Hybrid Server Analog - The Preset, 1 Analog - Staco Cafe - Candy Analog - Staco Cafe - Candy Analog - Stocke Door - New Preset, 1 Analog - Stocke Door - New Preset, 1 Analog - Stocke Door - New Preset, 1 Analog - West Windows - New Preset, 1	Delate

#### **Event Linking with Serial Rules**

In Event Linking, Serial Rules become Event Sources. When the Serial Rule becomes true, the Action Type and Action Target mechanisms are executed.

						Even	t Linking			
erver A	ctions									
Log	Event Type	Event So	surce A	ction Type	Action Targ	et	Pre Trigger	Post Trigger	Status	
(P)	Serial Profile	IP Marsh	Port G	utput Trigger	Output 2 - I	Disce ball	0	0	N/A	
Event	Гуре		Event Source			Act	ton Type	Action Targ	et	Pre Trigger
Evenit Video	Type Motion	2	Event Source IP Mandt Part - goldfild IP Mandt Part - goldfild	1	7	Act	ton Type	Action Targe	et Jam Dutpurt 1	 Pre Trigger * 0 Seconds
Evenit Vides Vides	Type Motion Loss Trigger Past	.W	Event Source IP Hards Port - goldfilte IP Mards Port - void IP Mards Port - void	- \$10.00	7	Act Act	ten Type me cord Video eord Audio	Action Targo 103-040 - A - Output 1 DDK-1500	et Jerm Output 3 - Alem Output 1	Pre Trigger
Evenit Video Video Seria	Type Moban Loss Trigger Port	-W	Event Source IP Harsh Port - goldRef IP Marsh Port - vold IP Marsh Port - Vad, > IP Marsh Port - Cash G IP Marsh Port - Cash G	1 = \$10.00 = \$5.00 Wen > = \$100.00		Act Marka	ton Type scord Video ecord Audo reput France	Action Targe 103-140 - A - Output 1 DIX-1500 SIX-O119 SIX-O119	et Jerm Dutput 3 - Alerm Output 1 - Alerm Output 1 - Alerm Output 2	 Pre Trigger

### **Serial Search with Serial Rules**

In the Search feature of exacqVision, Serial Rules are made available as shown below. exacqVision highlights search results in red and displays only instances of those results on the timeline

w exacqVision Client		
	Q. U	🔛 💿 🞯 exacqVision
Search Cameras		
📖 Cameras 🔺		Marsh Feed
ER1314027318     exacqVision Hybrid Server     ACTi KCM5511     Axis M3204     Oncam EVO-05xxD     HikVision HNC303-MB     HikVision HNC303-MB     Ulustra ADCi600F-X002     Disco Ball Camera     IQEye IQ762N     Scallop-Main     ISD JBS-AF-1080P     Sony SNC-CH140     Analog - TV     Analog - Nain Hallway     Analog - Side Door     Analog - DVD     Analog - Side Door     Analog - Storage Entrance     Analog - Storage Entrance     Analog - Storage Entrance     Analog - Storage Entrance     Analog - Front Window     Analog - Front Window     Analog - Back Entrance 2     POS     Marsh Port	No Camera	MARSH #01 8766 E. 96TH STREET FISHERS, IN 46037 (317)576-5200 7050 GAL PLAS 24 MILK 2.69 F 53 NEW CASTLE 12LNR NP 13.59 T 7802 GOURMET MILD SALSA 3.99 F 7867 PF GOLDFISH CHEDDR .99 F 5117 OB AD CGP 355T 2.79 T 4786 HOT TMLS CINNAMON 1.49 B 5295 LENDR JIM BEAM -17.25 V 4766 VOID TIM BEAM -17.25 V 4776 VOID TIM SEAM -17.25
Marsh Feed		UF DEDIT 2010
Search Serial      Rule: Void >= \$10.00      BAGELS CUCUMBER milk 0263 goldfish void Rule: Monitor 1 Rule: Wonitor 2 Rule: System Error - Alarm Count Rule: Void >= \$10.00	Search Range 4/ 2/2015 Start Time: 04:26 PM 4/ 2/2015 End Time: 04:31 PM Search Quick Export	Paused           04:26         04:27         04:28         04:29         04:30         04:39:40         0
Rule: Cashier = Kamerra Rule: Cashier = Bob		1.69 kB/s Friday, April 03, 2015 11:53:37 AM

### **Data Interpretation in Serial Rules**

Because there are no controls over assigning variables directly or declaring data types for the purpose of Serial Rules, there are specific ways in which exacqVision interprets variables and handles data types:

- 1. exacqVision assumes that a numerical value is the value to be operated if any characters 0-9 are found.
- 2. exacqVision interprets the numerical value it finds in one of two ways:
  - a. If a decimal point is not found, exacqVision interprets the numerical value as an integer.
  - b. If a decimal point is found, exacqVision interprets the data as a floating point value.
- 3. Minus and plus signs are respected if they precede a numeric value.
- 4. If neither floating point nor an integer is detected, exacqVision interprets the value as text.
- 5. An equal sign operator also serves as a match operator when matching character strings instead of numeric values.
- 6. Less than "<" and greater than ">" operators apply ONLY to numeric values.



# **17** Data Retention

The Data Retention feature of Serial Profiles allows you to determine how long serial data remains stored in the database before it is automatically deleted. By default, this value is set to 60 days.

Data Retention			
Days to Retain Data:	60	Apply	Cancel

It is recommended that you set the data retention equal to the retention of video on the exacqVision system.

# 18 Known Issue

### NULL Character (0x00)

There is a known issue when NULL characters (0x00) are received and stored by exacqVision. When NULL characters are saved in the database, it can cause searches to return partial data.

As a workaround, add an entry to the String Replacement feature in the Serial Profiles page. In this example, we are replacing the NULL character with a SPACE character. This causes a space to be written permanently into the database in place of NULL characters. This enables searches to work as expected in the future.

**NOTE:** Data already written to the database before enabling a string replacement will NOT be replaced by the string.

- \x00 represents NULL character.
- \x20 represents a SPACE character.

	String	Live	Search	Replace
M	\x00	V	V	\x20
144.5				
٠ [	-	 m		
⊀ [ ] Ca	ase Sensitive	 m	1	

## 19 More Information

The intent of this document was to provide guidance in configuring and using exacqVision's serial integration capabilities. Please see the following resources for more help:

- Context-based Help is available in the exacqVision interface in the upper-right corner.
- <u>https://exacq.com/support/specsheets.php</u> (Quick Start Guides, User Manuals, Integration Guides and more)
- <u>https://exacq.com/kb/#loadCategory~FAQs</u> (exacqVision Knowledge Base)
- <u>https://exacq.com/support/techsupport/</u> (FAQs and technical support)