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Virtual Sensors

Introduction:

Virtual sensors can be a very powerful tool in your monitoring system. On the securityProbe you can have up to 80 of these virtual sensors and they allow for a multitude of applications.

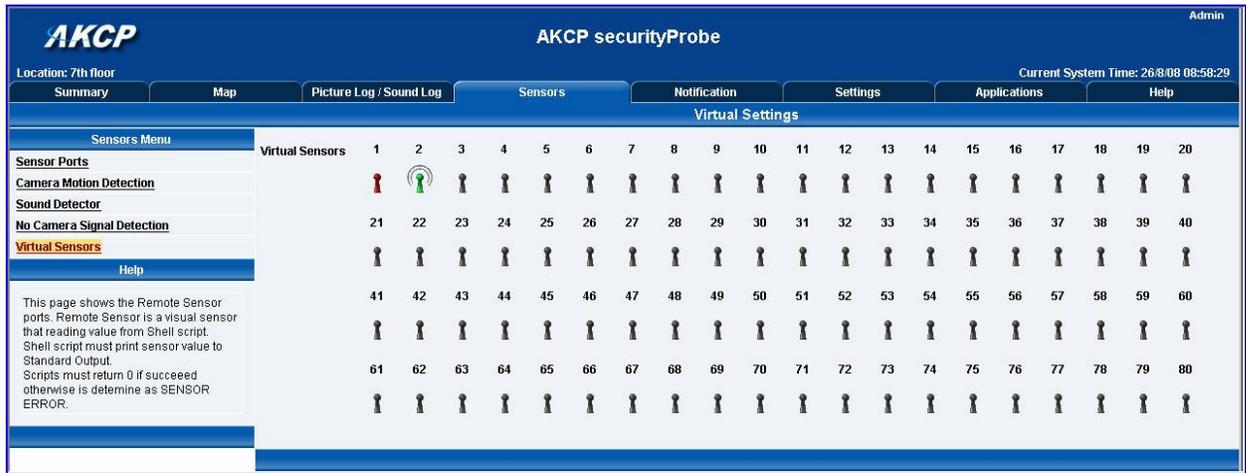
Integration with MODBUS networks with the securityProbe as a MODBUS master/slave, SNMPget and ping commands and others are all possible from the virtual sensors. An example use of this could be to use the securityProbe as a probe manager. If you had a securityProbe and multiple sensorProbe devices they could all be monitored, mapped and alerted via the securityProbe. You can perform SNMPget commands on a server to monitor memory or CPU load, or you can ping network enabled devices and be alerted if they go offline.

Configuring Virtual Sensors

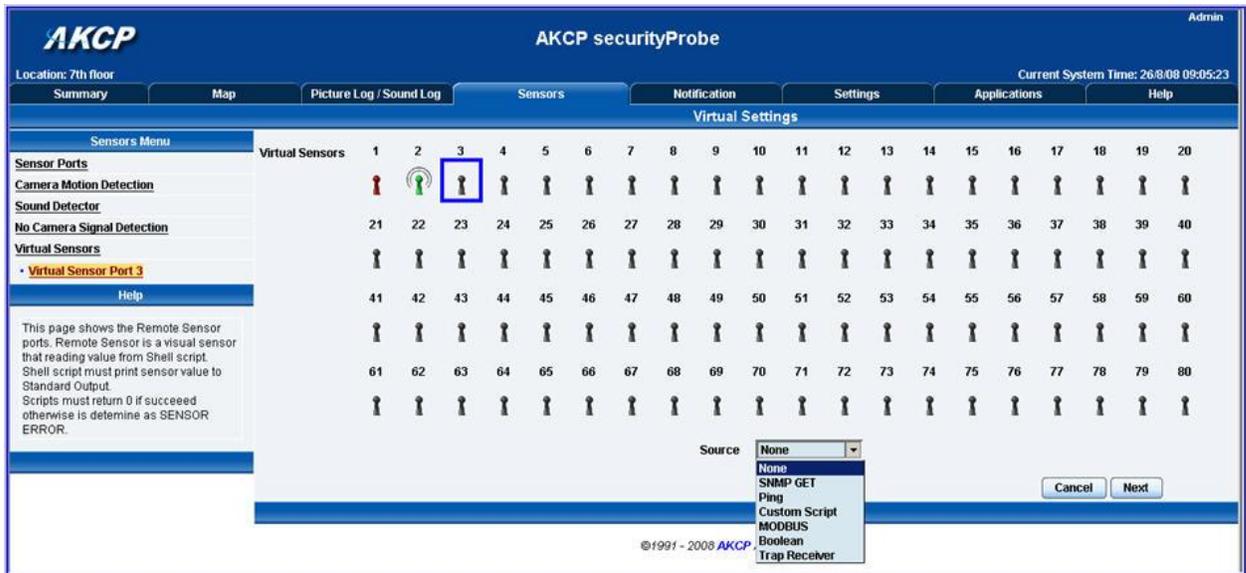
The virtual sensors are found in the sensors tab and "virtual sensors" from the left hand menu.

The screenshot displays the AKCP web interface. At the top, there are navigation tabs: Summary, Map, Picture Log, and Sensors (which is circled in red). Below the tabs is a 'Sensors Menu' on the left, containing links for Sensor Ports, Camera Motion Detection, Sound Detector, No Camera Signal Detection, Virtual Sensors (circled in red), and Help. The main content area shows three sensor ports labeled 1, 2, and 3. Each port has an 'Auto Sense' button with a green square icon, a 'Status' indicator (a red dot), and an 'Online' indicator (a green dot). Below the indicators are icons representing the sensor types: 'Dual Sensors' (port 1), and 'N/C' (ports 2 and 3). A small text box at the bottom right of the interface says 'Please s'.

You will then be presented with the following screen showing your 80 virtual sensors :-

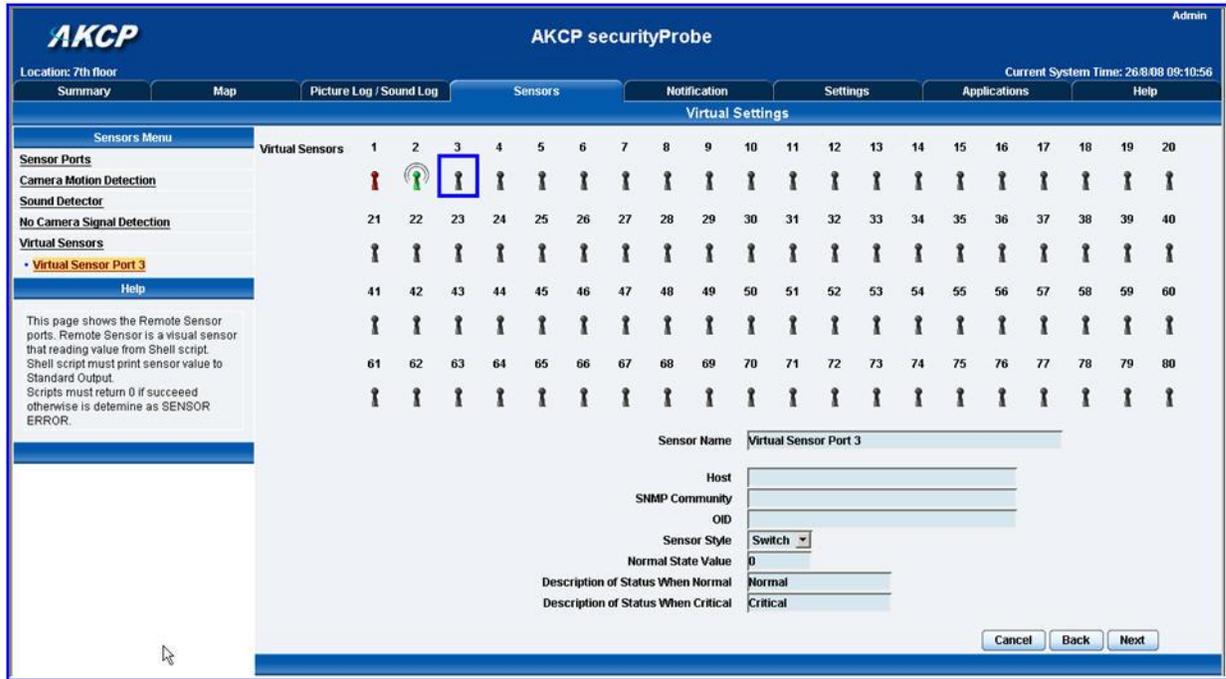


Click on the first available virtual sensor (in this case 3) you can then choose what type of sensor to setup from the next screen. First click on “Configuration” button you will then have a choice of SNMP Get, Ping, Custom Script, MODBUS, Boolean, or Trap Receiver.



SNMP GET:

If you select SNMP get from the menu and click next you will get the following page:



Sensor Name: - Input the name you wish to use to identify your virtual sensor

Host :- The IP address of the unit on which you wish to perform an SNMPget command. For example this could be the IP address of a sensorProbe2 device.

SNMP community :- The NSMP password, default is usually public.

OID :- The OID for what you wish to monitor. If for example you want to poll temperature data from a sensorProbe 2 device with a temp sensor on port 1 then you would use the following OID

1.3.6.1.4.1.3854.1.2.2.1.16.1.3.0

Where the last digit (0) is port 1. Port 2 the last digit would be 1. If you are monitoring some other device you will need the relevant OID for what you wish to measure.

Sensor Style :- Choose either switch or analogue. A switch sensor would be for example a water sensor, on or off, an analogue sensor would be a temperature sensor or humidity sensor or some other sensor that gives a data value.

Description when Normal :- eg, Normal, Critical, Online etc.

Description when Critical :- eg, Critical, Offline, Low etc

Normal State value :- 0 or 1 (for switch type sensor only).

If you choose an analogue sensor you will get a slightly different menu

The screenshot shows a configuration window for a virtual sensor. The fields are as follows:

- Sensor Name:** Virtual Sensor Port
- Host:** (empty text box)
- SNMP Community:** (empty text box)
- OID:** (empty text box)
- Sensor Style:** Analog (dropdown menu)
- Value Factor:** x1 (dropdown menu)
- Unit Text:** Unit (text box with a yellow lightning bolt icon)
- Value Range for Slider Bar:** 0 To 100

Buttons at the bottom right: Cancel, Back, Next.

Value Factor gives you the chooses from the drop down menu as x1, x 0.1, x 0.01 or x0.001

Unit text :- example, if measuring temperature “degrees centigrade” or if measuring humidity “percentage humidity” etc.

Value range for slider bar :- The range that you wish to measure. For temperature you could put the max at 100 for 100 degrees, or humidity, 100 for 100%.

When finished, click on next, you can then configure the time interval between data polling.

PING

If you select a Ping virtual sensor and click next you will get the following screen:-

The screenshot shows the AKCP securityProbe interface. The top navigation bar includes: Location: 7th floor, Map, Picture Log / Sound Log, Sensors, Notification, Settings, Applications, Help. The current system time is 26/8/08 09:10:56.

The **Sensors** menu is open, showing a grid of 80 virtual sensors. Sensor 3 is selected and highlighted with a blue box. The configuration form for **Virtual Sensor Port 3** is displayed below the grid:

- Sensor Name:** Virtual Sensor Port 3
- Host:** (empty text box)
- SNMP Community:** (empty text box)
- OID:** (empty text box)
- Sensor Style:** Switch (dropdown menu)
- Normal State Value:** 0
- Description of Status When Normal:** Normal
- Description of Status When Critical:** Critical

Buttons at the bottom right: Cancel, Back, Next.

Sensor Name :- The name you wish to use to identify the sensor, for example “Ping of server”

Host :- The IP address of the network device you wish to ping

Description when Normal :- eg, online

Description when critical :- eg, offline

Normal state value :- 0 = ping successful, 1 = ping times out.

CUSTOM SCRIPT

If you select a Custom Script and click next you will get the following screen:-

The screenshot shows the AKCP securityProbe interface. At the top, it displays 'AKCP securityProbe' and 'Admin'. Below this, there are tabs for 'Summary', 'Map', 'Picture Log / Sound Log', 'Sensors', 'Notification', 'Settings', 'Applications', and 'Help'. The 'Sensors' tab is active, showing a grid of 80 virtual sensors. Sensor 3 is selected and highlighted with a blue box. Below the grid, there is a configuration form for the selected sensor. The form includes fields for 'Sensor Name' (Virtual Sensor Port 3), 'Script Name' (None), 'Script Parameters', 'Sensor Style' (Switch), 'Normal State Value' (0), 'Description of Status When Normal' (Normal), and 'Description of Status When Critical' (Critical). There are 'Cancel', 'Back', and 'Next' buttons at the bottom right.

Sensor Name: - The name you wish to use to identify the sensor, for example “Custom Script of sensor”

You can add the Script Parameters. Add Your Own Script button allows you to attach your own script file. If you choose Analogue from the Sensor Style option you will get a slightly different menu.

MODBUS

If you select MODBUS and click next you will get the following screen:-

AKCP securityProbe Admin

Location: 7th floor | Current System Time: 26.8.08 09:48:30

Summary | Map | Picture Log / Sound Log | **Sensors** | Notification | Settings | Applications | Help

Virtual Settings

Sensor's Menu		Virtual Sensors																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Sensor Ports																					
Camera Motion Detection																					
Sound Detector																					
No Camera Signal Detection																					
Virtual Sensors																					
Virtual Sensor Port 3																					
Help																					
<p>This page shows the Remote Sensor ports. Remote Sensor is a virtual sensor that reading value from Shell script. Shell script must print sensor value to Standard Output. Scripts must return 0 if succeed otherwise is determine as SENSOR ERROR.</p>																					

Virtual Sensor Port 3 Configuration:

- Sensor Name: Virtual Sensor Port 3
- Modbus Protocol: Modbus RTU
- Serial Port: RS485
- Serial Port Speed: 9600
- Serial Port Parity: None
- Serial Port Stop Bits: 1
- Modbus Slave ID: 0xNAN
- Modbus Command: (0x01) Read Coil Status
- Modbus Register Address: 0xNAN
- Sensor Style: Switch
- Normal State Value: 0
- Description of Status When Normal: Normal
- Description of Status When Critical: Critical

Buttons: Cancel, Back, Next

Sensor Name: - The name you wish to use to identify the sensor, for example “MODBUS”

You can select the Modbus Protocol to either Modbus RTU (serial) or Modbus TCP (Ethernet Network).

MODBUS RTU

If selecting the Modbus RTU protocol you will use the RS485 port to connect the Modbus device. See the following picture of the securityProbe with the RS485 port highlighted.



Still following the screen shot above, you will then select your Serial Port Speed, your Serial Port Parity as None, Odd or Even. Select the Serial Port Stop Bits as 1 or 2, enter the Modbus Slave ID (each slave in a network is assigned a unique unit address from 1 to 247), the Modbus Command, which includes 4 options for the virtual sensor: (0x01) Read Coil Status, (0x02) Read Input Status, (0x03) Read Holding Registers and (0x04) Read Input Registers. You will then enter the Modbus Register Address and the Style of the sensor, the Normal State Value and descriptions of the sensor status

MODBUS TCP

If selecting the Modbus TCP protocol you will get the following screen:

Sensor Name	Virtual Sensor Port 3	
Modbus Protocol	Modbus TCP	
Modbus IP Address		
Modbus TCP Port		
Modbus Command	(0x01) Read Coil Status	
Modbus Register Address		0xNAN
Sensor Style	Switch	
Normal State Value	0	
Description of Status When Normal	Normal	
Description of Status When Critical	Critical	
	Cancel	Next

You will then enter your Modbus IP Address, your Modbus TCP Port and again your Modbus Command, you Modbus Register Address, your Sensor Style, Normal State Value and the Descriptions of the sensor status.

You will get the follow screen when choosing either Modbus RTU, or Modbus TCP:

Polling Interval	<input type="text" value="15"/>	15 secs
Execute Time Out	<input type="text" value="10"/>	10 secs
Retry	<input type="text" value="3"/>	Times

This screen is where you will enter your Polling Interval, your Time Out periods for the sensor and also your Retry amount. You will click on the Finish button to complete the Modbus setup wizard and return to the Virtual Sensor main screen.

Boolean

If selecting Boolean you will get the following screen:

The screenshot shows the 'AKCP securityProbe' interface. The 'Virtual Settings' section is active, displaying a grid of 80 virtual sensors (numbered 1-80). Sensors 2 and 3 are highlighted with a blue box. Below the grid, there are dropdown menus for 'Select Sensor to Boolean Status' and 'Status to Boolean'. The selected options are: 'Motion Detector Port 4' (Critical), 'Dry Contact' (Normal), and 'None' (None). Buttons for 'Cancel', 'Back', and 'Finish' are visible at the bottom right.

Boolean works on the virtual sensor by checking the status of, for example 2 to 3 sensors and if the sensors status matches that of the setting they will return a value of 1, the normal value is 0.

You can set your motion sensor to critical and the dry contact to normal like the image example below and then set your notification page to make the notification.

Select Sensor to Boolean Status		Status to Boolean	
<input type="text" value="Motion Detector Port 4"/>	<input type="text" value="Critical"/>	<input type="text" value="Critical"/>	<input type="text" value="Critical"/>
<input type="text" value="Dry Contact"/>	<input type="text" value="Normal"/>	<input type="text" value="Normal"/>	<input type="text" value="Normal"/>
<input type="text" value="None"/>	<input type="text" value="None"/>	<input type="text" value="None"/>	<input type="text" value="None"/>

Trap Receiver

If selecting the Trap Receiver you will get the following screen:

The screenshot shows the 'Virtual Settings' configuration page for a Trap Receiver. The interface includes a navigation menu on the left with options like 'Sensor Ports', 'Camera Motion Detection', 'Sound Detector', and 'Virtual Sensors'. The main area displays a grid of 80 virtual sensors, with sensor 3 highlighted. The settings panel on the right includes the following fields:

- IP Address: [Empty]
- OID: [Empty]
- Trap sub-Type: [Empty]
- Sensor Style: Switch (dropdown)
- Normal State Value: 0
- Description of Status When Normal: Normal
- Description of Status When Critical: Critical

Buttons for 'Cancel', 'Back', and 'Finish' are located at the bottom right of the settings panel.

The Trap Receiver feature on the Virtual Sensor will check 3 parameters before setting a value. These three parameters are the IP Address, the sensors OID and the Trap sub-type.

In our example below the Trap is sent by the motion sensor on port 5 of our sensorProbe unit. Our device IP is 192.168.0.100. Our sensorProbe Trap Type is set to the specific sub type and will check status of our motion sensor in the following screen.

The screenshot shows the 'Virtual Settings' configuration page with the following values entered:

- IP Address: 192.168.0.100
- OID: 1.3.6.1.4.1.3854.1.7.1.0
- Trap sub-Type: 305
- Sensor Style: Switch (dropdown)
- Normal State Value: 2
- Description of Status When Normal: Normal
- Description of Status When Critical: Critical

Buttons for 'Cancel', 'Back', and 'Finish' are located at the bottom right of the settings panel.