



Dry Contact Sensor DCS15 User Manual



Help Version updated till firmware 404i / SP456
Copyright © 2012, AKCess Pro Co., Ltd..

Introduction / What is a Dry Contact Sensor

The Dry Contact sensor or DCS15 is a simple connection to burglar alarms, fire alarms or any application that requires monitoring by the unit. Dry contact sensors are user definable and can be used to detect many different inputs such as UPS status, security systems, air conditioning status.

These general purpose switches can be either input or output. When used as an output it can sink up to 20 mAs. You can select the output voltage by setting the Output Level to a Low or a High. When set to Low, the pin will output 0 volts. When set as a High, the pin will output 5 volts.

When used as an input a switch will retain any error condition until it is read via SNMP. Therefore, if a switch encounters a critical condition at any time, it must report that condition before it can return to a normal state.

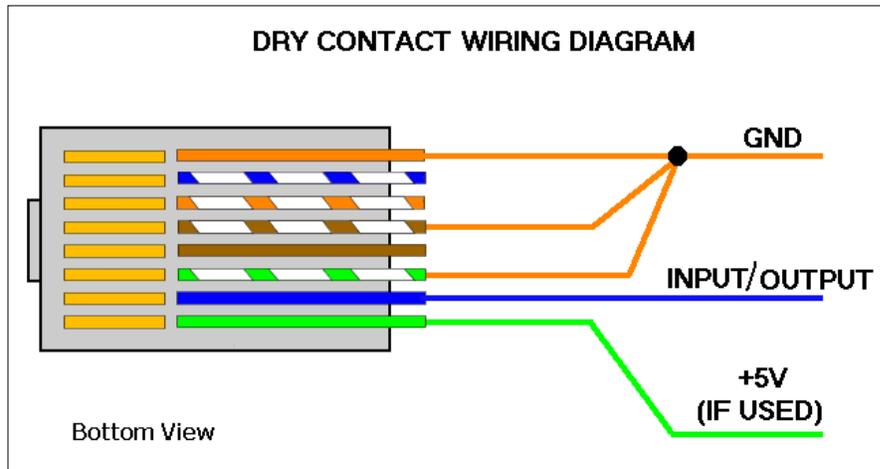
Input pins can be used to detect whether or not an input switch is open or closed. In combination with external sensors, input pins can detect whether a door or window is open or closed, if there is a water incursion and many other conditions.

The input pins work by sensing the presence of a voltage level on an input pin. When the switch is open, the voltage is different than when the switch is closed.

To test a dry contact input, wire ground to one side of the switch. Ground is always pin 8 on the connector. Wire the other side of the switch to the switch sensor. Set the Normal State field to Open. Set the Direction field to Input. When the switch closes, the input pin will be shorted to ground and the switch will change state from normal to critical

Specifications & Features:

- Measurement Indication - Alarm or Normal
- Communications cable - RJ-45 jack to sensor using UTP Cat 5 wire.
- Sensor type - open/closed contact switch
- Power source: powered by the unit. No additional power needed.
- The unit auto detects the presence of the Voltage Sensor
- Measurement rate - multiple readings every second
- Full Autosense including disconnect alarm
- Dry contact sensor OID is: 1.3.6.1.4.1.3854.1.2.2.1.18.1.3.X
- Maximum CAT5/6 Cable Extension Run Length: 300 meters or 1000 feet.



DCS15 Pin Assignments – RJ-45 End

Pin 1 -- color = Green -- function = Is +5 Volts and is the power source pin (does not have a pull up resistor)

Pin 2 -- color = Blue -- Function = Is the Input/Output pin to the base unit. Maximum voltage is 5Volts, maximum sink current is 20mA. Has internal pull up resistor of 4.7k ohms

Pin3 -- color = White/Green -- Function = This is an input pin and used for checking the sensor type.

Pin4 -- color = Brown -- Function = This is an input pin and used for checking the sensor type.

Pin5 -- color = White/Brown -- Function = This is an input pin and used for checking the sensor type.

Pin6 -- color = White Orange -- Function = This is an input pin and used for checking the sensor type.

Pin7 -- color = White/Blue -- Function = This pins is used for the digital input and output of our analog sensors (Airflow, Digital Voltmeter and 4-20mA Converter sensors).

Pin8 -- color = Orange -- Function = Ground

Note: The Dry Contact Sensor can be extended up to 300 Meters.

DCS15 Pin Assignments – RJ-45 & Two Wire Terminal End

The RJ-45 the combination is:

green, blue, white/green, brown, white/brown, white/orange, white/blue, orange.

On the terminal end the black wire = white/green, white/brown and orange.
 On the terminal end the red wire = only blue, the rest are cut off.

Dry Contact connection FAQ

Question #1: Why do you connect the Gnd to the +5 on the "black wire" for the RJ45 cable?

Answer: The +5V is the input pin to the sensorProbe unit and is used for checking the sensor type, we have pull up resistor inside sensorProbe units.

Question #2: How do you use the above diagram to determine how I connect the dry contact sensor to a simple switch?

Answer: We use pin 1 (green wire) and pin 8 (orange wire) for connecting to the power source and GND of the switch. Pin 2 and 7 are for connecting the input/outputs. The other pins are used for checking the sensor type.

Question #3: Do I connect one side of my switch to the "Gnd" and the other to the "Input/Output"?

Answer: Yes. Just like the diagram above.

Question #4: What is the function of the green wire (+5V)?

Answer: The Green wire is +5V source connection and this is used when the sensor requires a power source.

Question #5. Can I control the Dry Contact Sensor via SNMP?

Answer: Yes, you can use the following SNMP commands:

```
SNMPset -m all -v1 -c <community> <IPAddress> .1.3.6.1.4.1.3854.1.2.2.1.18.1.25.<port> i  
<mode>
```

When <community> is admin password <IPAddress> is IP address of the unit <port> is the Port of power relay (default start with 0)

<mode> is mode to control
allow-sensor-control(1),
cycle-On-Off-On(8),
cycle-Off-On-Off(7),
turn-on(3),
turn-off(4)

Differences between Dry Contacts

List of Dry Contacts;

1. DCS15 (Dry Contact RJ-45 Sensor covered in this manual)
2. IO-Digital8 (8 Dry Contact Inputs or Outputs on a single port – (securityProbe base unit only)
3. sensorProbe and securityProbe family X20 & X60 Dry Contact Inputs.
4. E-opto16 Dry Contact Inputs.

This list includes the DCS15 (RJ-45 dry contact sensor), IO-Digital8, the X20 and X60 extra dry contact inputs (on the SP8-X20/X60 & SEC-X20/X60 SEC-5E-X20/X60, SEC-5ES-X20/X60, SEC-5ESV-X20/X60 units), and the E-opto16 expansion units. See each separate product manual for more details.

The extra dry contact inputs on the X20 and X60 units can be switched from opto-isolated mode to non-opto isolated mode (jumper setting on the boards), where the E-opto16 inputs are all shipped as opto isolated and cannot be configured as non-opto isolated. Because of this, the E-opto16 inputs do require an input voltage as the module will not supply this voltage.

See the E-opto16 product manual for connecting simple switches to the modules inputs.

The DCS15 and extra dry contact inputs on the X20/X60 units do not require any input voltage if left in their default configuration of non-opto isolated (see the sensorProbe8-X20/X60 manual for these jumper settings).

The E-opto16 (16 opto isolated dry contact inputs) expansion unit is used when the customer requires inputs of more than 5 Volts DC up to 24 volts DC, hence the use of the term opto-isolated.

The following are the differences between the E-opto16 and the IO-digital8 (8 inputs or outputs on a single sensor port) and DCS15 (single input or output on a single sensor port).

Compared to the E-opto16, the DCS15 and the IO-digital8 is for 5 Volts or less and they have the added advantage of supplying 5 Volts output and can sync 20 milliamps. This would be used if the inputs require 5 Volts or less or the requirements are a 5 Volt output. The IO-Digital8 has 8 separate inputs or outputs where the DCS15 is the same only using a single input or output on a single RJ-45 port.

Configuring the Dry Contact Sensor

- a) Plug the sensor into one of the RJ45 ports on the rear panel of the unit.
- b) Now point your browser to the IP address of the unit (default, 192.168.0.100). Next you need to login as the administrator using your administrator password (default is "public"). You will then be taken to the summary page.
- c) From the summary page you need to select the sensors tab. The layout of the next page will vary depending on your unit so please refer to your units manual.
- d) You should now be able to setup the settings for your sensor. The specific steps for setting up the sensor in the units web interface will be covered below and in within the next couple of pages.

Now we will cover the settings that are specific to your sensor.

Direction: The Switch Direction can be either **Input** or **Output**. When set as an Input, the sensor will report its status as either **Normal** or **Critical**. The status is Normal if the Normal State field matches the current value applied to the sensor. For example, if the Normal State field is High and the input to the sensor is high then the status is Normal. The input voltage should be limited to 0 to 5 volts in order to protect the sensor.

If the Direction of the sensor is Output, the sensor can be used to drive external equipment.

Description of Status When Normal: This field is the custom description, which will be displayed in the Status field when the dry contact sensor is Normal. Examples for this field are: Door Open, Pump Turned On, Light Turned On, etc

Description of Status When Critical: This field is the custom description, which will be displayed in the Status field when the dry contact sensor is Critical. Examples for this field are: Door Closed, Pump Turned Off, Light Turned Off, etc

Output Level: The Switch Output Level field can be either **High/+5 Volts** or **Low/GND**. When set to a High, the output value of 5 volts will be applied to the switch. When set to a Low, the Output Level field will depend upon the value of Direction. If Direction is set to Output and the Output Level field is set to low, the Switch will source current in order to maintain 0 Volts. If Direction is set to Input and the Output Level field is set to low, the Switch will become tri-state.

The Output level of High will pull-up the switch even if the Direction is set to Input. However, when the Switch Direction is set to Input and Output level is set to high the Switch will output a weak pull-up current. This output can be overridden by shorting the pin to ground. In this way, an external switch can be determined to be open or closed.

Normal State: The Switch Normal State field can be either **Open/+5 Volts** or **Closed/GND**. When set to a +5 Volts, the input value of 5 volts will cause the Status to be reported as normal. When set to +5 Volts, the input value of 0 volts will cause the Status to be reported as Critical Low. When the Switch Normal State is set to a Low, the input value of 5 volts will cause the Status to be reported as Critical High, and the input value of 0 volts will cause the Status to be reported as normal.

OID: The dry contact is a switch-type sensor such as water sensor, motion sensor, AC Voltage Detector, relay, and siren & strobe light. The OID is sensorProbeSwitchStatus = 1.3.6.1.4.1.3854.1.2.2.1.18.1.3.X



Information on Dry contact cables: The extension length of the dry contact twisted pairs is limited only by the amount of electromagnetic noise in the area. So the lengths can be quite long, but long cable lengths may create occasional false positives. These false positives can be eliminated with the advanced filtering of the dry contact sensor on the system. You can define how long a sensor must be in the error condition before changing state from Normal to Critical. You can also define how long the sensor must remain in the Normal state before changing from Critical to Normal.

Dry Contact Sensor Setup (input on sensorProbe)

It is normal for the dry contacts to be detected as the security sensor, as it is the same type of sensor when they are first connected to your sensorProbe unit.

What you have to do on the sensorProbe is click on the "Dry Contacts & Drivers" and enable the dry contact port as shown below:



Port	Type	Description	Reading	Status	Action
1	-	-	-	-	-
2	Dry contact	Dry Contact Switch2 Description	-	Normal	-

Sys Log (95 messages)	
1	26/02/10 11:40:04 Dry contact sensor on RJ45#2 status is now Normal
2	26/02/10 11:40:01 Dry contact sensor on RJ45#2 status is now Critical
3	26/02/10 11:39:48 Dry contact sensor on RJ45#2 status is now Normal
4	26/02/10 11:39:47 Dry contact sensor on RJ45#2 status is now Critical
5	26/02/10 11:37:52 Dry contact sensor on RJ45#2 status is now Critical

Dry Contact Sensor Relay Setup (output on securityProbe)

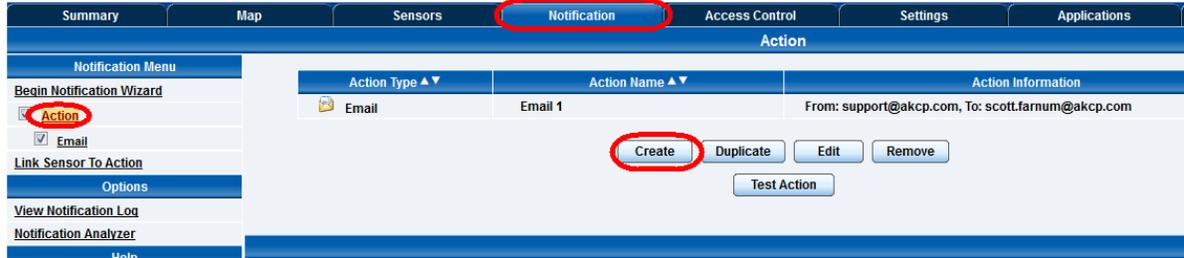
First you need to connect the dry contact sensor and the temperature sensor to the RJ-45 sensor port on your main base unit or your E-sensor8 expansion module.

The screenshot shows the 'Sensor Settings' page for port 6. The 'Auto Sense' checkbox is checked. The sensor type is 'Dry contact I/O'. The 'Normal Settings' tab is active. The 'Sensor Name' is 'Dry contact I/O Port 6'. The 'Status' is 'Low'. The 'Sensor Currently' is 'Online'. The 'Direction' is set to 'Output' (indicated by a red arrow). The 'Description of status When Output High' is 'High' with a green indicator. The 'Description of status When Output Low' is 'Low' with a red indicator. The 'Description of Status When Sensor Error' is 'Sensor Error' with a red indicator. The 'Save' button is circled in red.

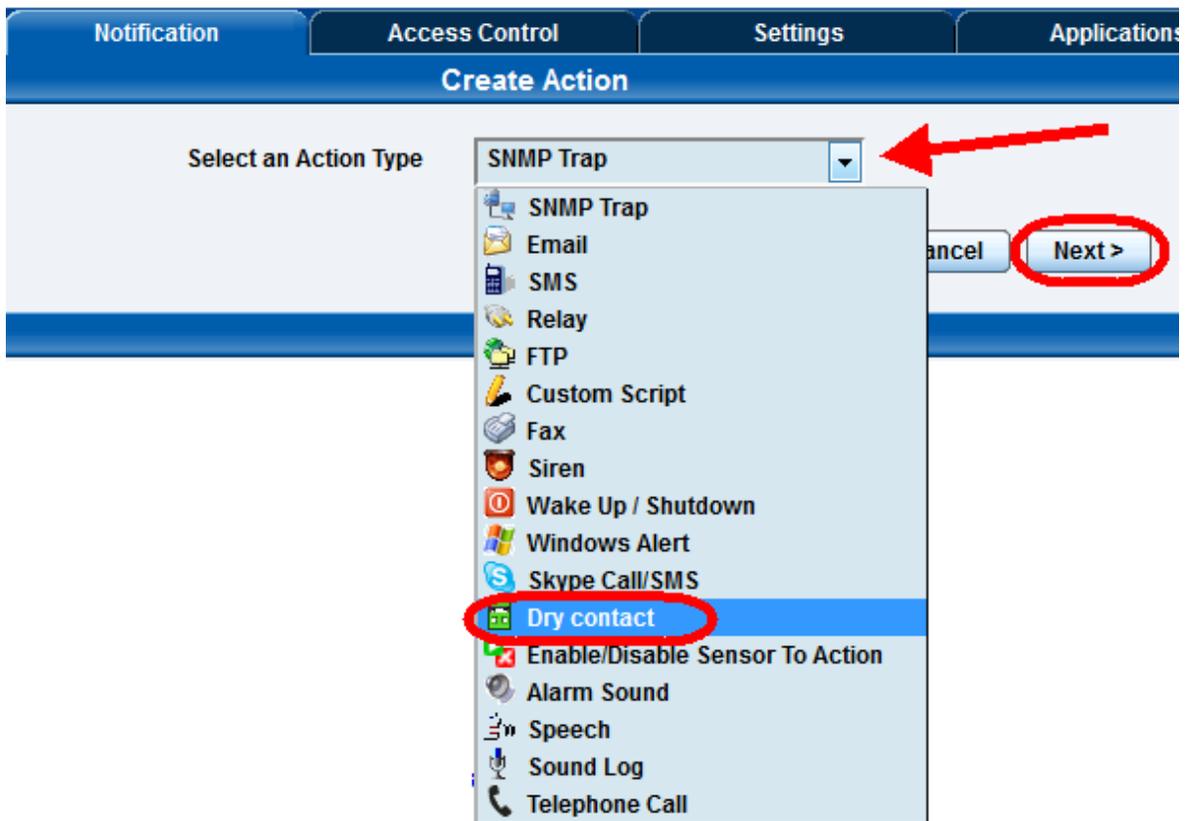
Next you need to be logged in as an Administrator, then navigate to the Sensors page then click on the Dry Contact I/O sensor port. In the Normal Settings tab as shown above you can now rename your sensor, you need to change the Direction to Output and you can also rename your Status descriptions or even change the color of the descriptions, then click the Save button.

The screenshot shows the 'Sensor Settings' page for a 'Dry contact I/O' device. The 'Advanced Settings' tab is selected. The 'Control Mode' is set to 'Notification Control', and the 'Normal State' is set to 'Open/+5 Volts'. A red arrow points to the 'Open/+5 Volts' radio button.

Since you are going to have our temperature sensor control your dry contact sensor relay you need to change the “Control Mode” to Notification Control as shown above. You also need to set the normal state of the sensor, whether it will be normally Closed (on) or normally Open (off). These settings need to then be saved by clicking on the “Save” button.



Now that the dry contact sensor is setup we now need to setup our Dry Contact Action so you need to first navigate to the Notification page, then go to the Action page and click on the “Create” button as shown in the screen shot above.

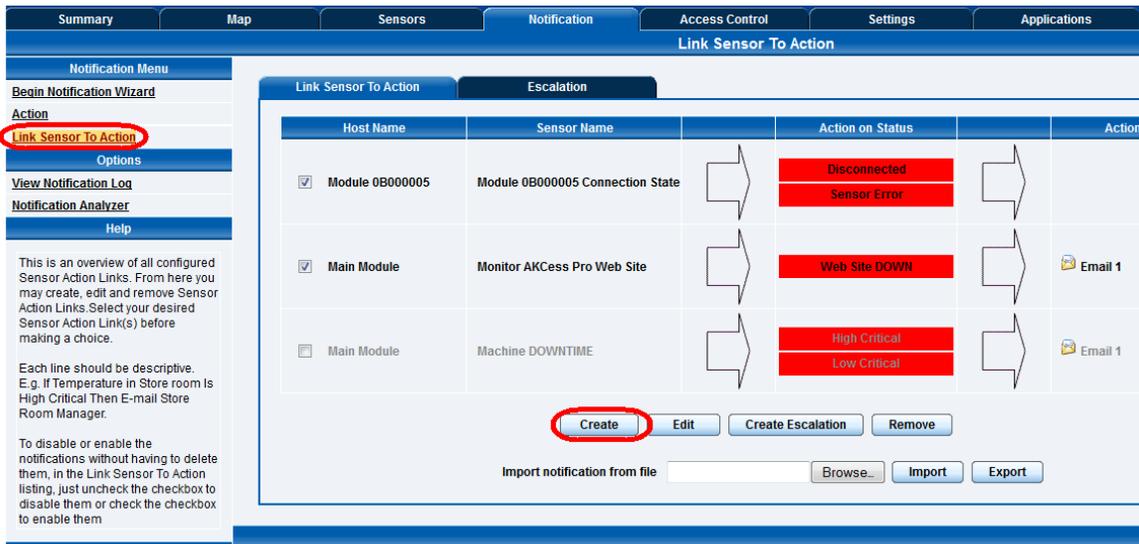


This will launch the Create Action Wizard. You will then click on the down arrow and choose the “Dry Contact” action from the drop down menu displayed, then clicking on the “Next” button as shown in the screen shot above.

In the next screen of the wizard you can name your action as you wish, you need to select the sensor that was previously setup from the Port drop down menu and then choose what action the output relay will take when triggered by the temperature sensor. You will then click on the “Finish” button to complete the action wizard.

Action Type ▲▼	Action Name ▲▼	Action Information
Email	Email 1	From: support@akcp.com, To: scott.farnum@akcp.com
Dry contact	Dry contact 1	Dry contact I/O Port 6: Turn High Till Sensor Normal

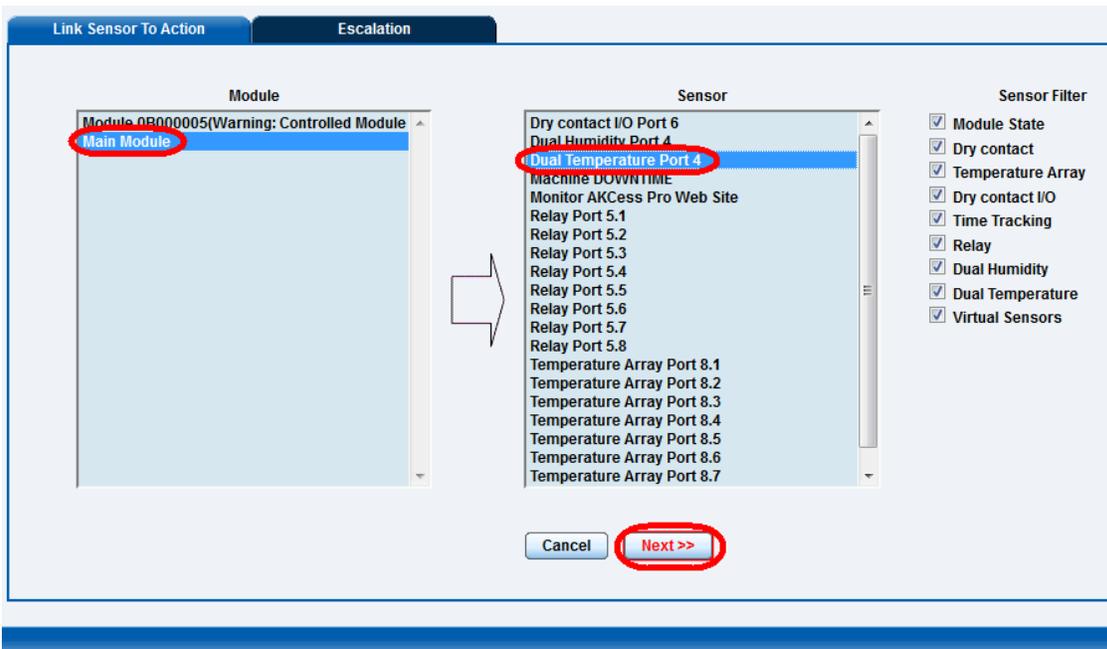
Now we see in the screen shot above that our new Dry Contact Action has been created and is displayed in our Action listing.



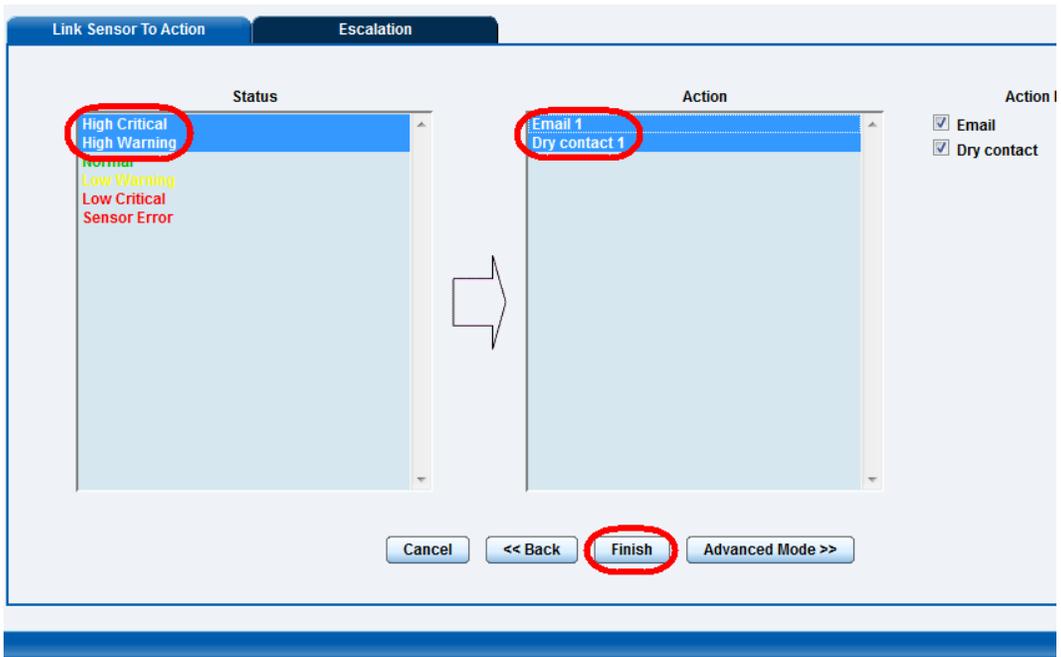
Now that our dry contact sensor has been setup and our dry contact action has also been setup we will now link our temperature sensor to our output relay (dry contact sensor).

Note: Keep in mind you can substitute the temperature sensor with any other AKCP sensor for example a water sensor, smoke sensor, AC or DC voltage sensor to control the dry contact relay output.

We first will click on the Link Sensor To Action then click on the “Create” button which will launch the Link Sensor To Action Wizard as shown in the screen shot above.

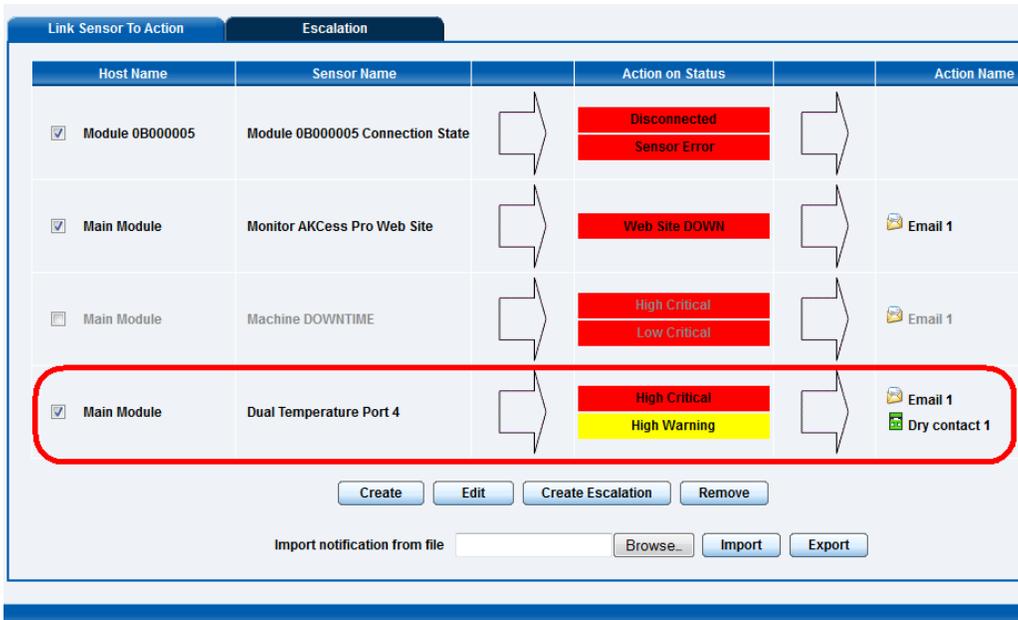


In the first screen of the wizard we will first highlight where our temperature sensor is connected in the Module field then highlight our temperature sensor in the Sensor field and click on the “Next” button as shown in the screen shot above.



The next screen in the wizard we will highlight the status or threshold that we want the relay to turn on or off in the “Status” field shown above. In the Action field we will highlight the action or actions we want the sensor to trigger. You can choose multiple actions by holding down the Ctrl key. In our example above we also have highlighted an email alert that was previously setup on the unit. (see the email notification manual for setting up an email alert on the unit).

When clicking on the “Finish” button the Link Sensor To Action Wizard will be completed.



And finally we can see our temperature sensor and its status is now linked up with both our Email alert and our Dry Contact Sensor setup as a Relay output.

Sensors					
Sensor Information					
Host Name ▲	Type ▼	Sensor Name ▲▼	Reading ▲▼	Status ▲▼	
Main Module	Dry contact I/O	Dry contact I/O Port 6	-	High	
	Dual Humidity	Dual Humidity Port 4	61 %	Normal	
	Dual Temperature	Dual Temperature Port 4	31.5 °C	High Warning	
	Relay	Relay Port 5.1	-	Sensor Error	
	Relay	Relay Port 5.2	-	Sensor Error	
	Relay	Relay Port 5.3	-	Sensor Error	
	Relay	Relay Port 5.4	-	Sensor Error	
	Relay	Relay Port 5.5	-	Sensor Error	
	Relay	Relay Port 5.6	-	Sensor Error	
	Relay	Relay Port 5.7	-	Sensor Error	
	Relay	Relay Port 5.8	-	Sensor Error	
	Temperature Array	Temperature Array Port 8.1	26.0 °C	Normal	
	Temperature Array	Temperature Array Port 8.2	27.0 °C	Normal	
	Temperature Array	Temperature Array Port 8.3	26.0 °C	Normal	
Temperature Array	Temperature Array Port 8.4	27.5 °C	Normal		
Temperature Array	Temperature Array Port 8.5	26.5 °C	Normal		
Temperature Array	Temperature Array Port 8.6	26.5 °C	Normal		
Temperature Array	Temperature Array Port 8.7	26.5 °C	Normal		
Time Tracking	Machine DOWNTIME	0 Hours	Machine ON		
Virtual Sensors	Monitor AKCess Pro Web Site	-	Web Site UP		
Virtual Sensors	Virtual Sensors Port 1	-	Normal		
Module 0B000005	Module	Module 0B000005	-	Disconnected	

Sensors status will be reloaded in 03 secs

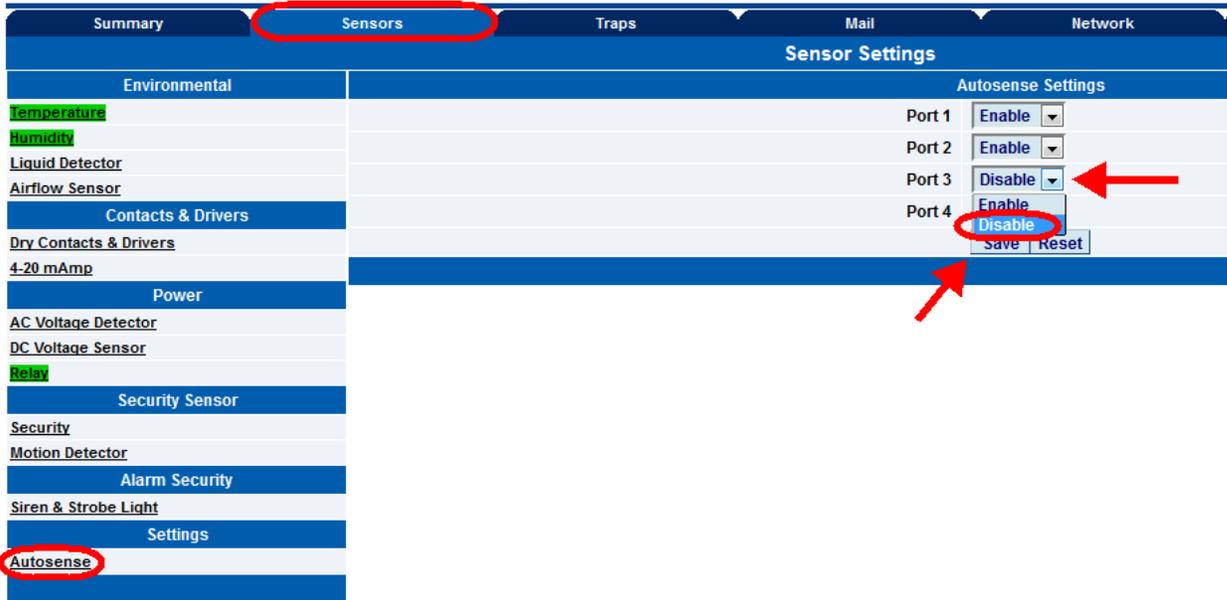
System Log (221 messages)		
1	2012/06/18 21:25:02	Email ok: Good mail sent to scott.farnum@akcp.com
2	2012/06/18 21:24:59	Dry contact I/O Port 6 status is High
3	2012/06/18 21:24:58	Dual Temperature Port 4 is 27.5 °C, status is High Warning

In the screen shot above we can see that when our temperature sensor reaches the High Warning our Dry Contact Sensor Relay is automatically triggered into the High status.

Dry Contact Sensor Relay Setup (output on sensorProbe)

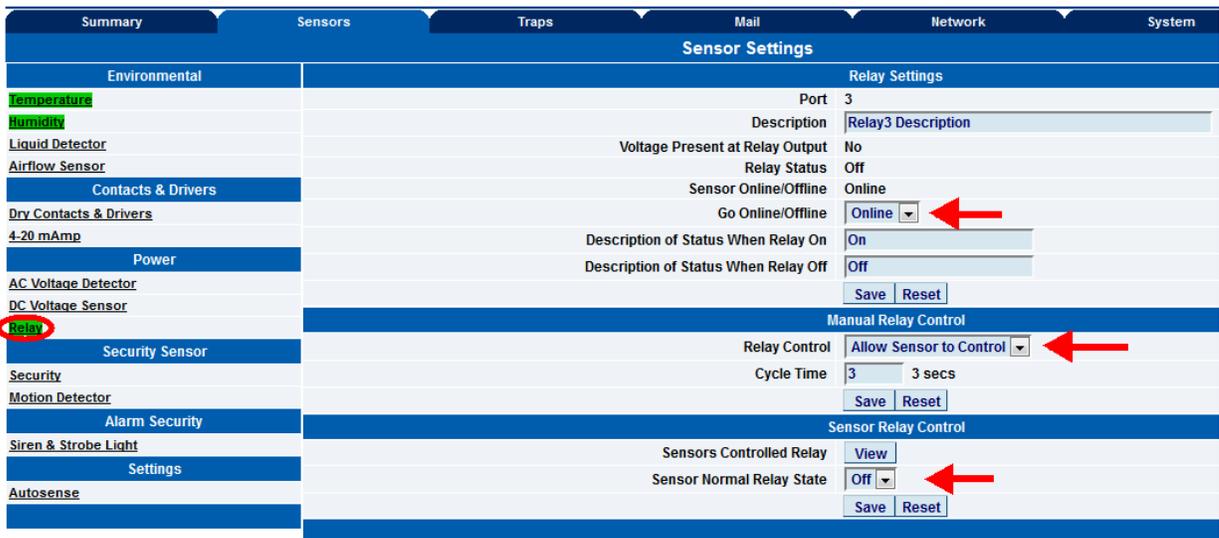
In the sensorProbe's web interface you can set your thresholds, so that if you had a temperature alert then the unit will send an email, an SNMP trap and also control the dry contact (dry contact sensor) setup as an output relay on another port. You can have it turn on the relay, turn it off, or cycle it.

Note: If the screen shots appear too small, just use the view in your pdf reader to zoom in. The following screen shots represent a sensorProbe4 web interface. If your unit is the older SP2 or SP8 with the mega128 memory then your screen may appear differently.



The first thing you need to do is connect your DCS15 (dry contact sensor) and your temperature sensor to your sensorProbe units sensor ports. The DCS15 will be auto sensed as the dry contact sensor along with the temp sensor.

So the next thing you need to do is log in to your sensorProbes web interface as the Administrator then navigate to the Autosense setting for the sensor port that you connected the DCS15 to and Disable the Autosense on this port as shown in the screen shot above.



You then navigate to the Relay settings for the port you have the DCS15 sensor connected to and turn the relay Online. You can also rename your relay, rename your Status Descriptions. You need to make sure the Control is set to Allow Sensor to Control, then you also need to set the Normal condition of the relay either on or off. In other words do you want the temp sensor to turn on something or turn off something? This needs to be saved in the web interface.

After the relay is setup you need to now setup your thresholds on your temp sensor in the sensor settings screen as shown above and Save them.

Next you need to link the temp sensor to your output relay, so you would first click on the Relay Control Tab. Note: As mentioned earlier this may appear different if your using the older unit. If this is the case you would click on the “Sensor Controlled Relay” button. You then choose the Relay that you previously setup from the “This Sensor Controls the Relay on Port” drop down list, choose the threshold for which you want to relay to be activated on and choose the action of the relay as shown in the screen shot above. You then would save this.

Port	Type	Description	Reading	Status	Action
1	Humidity	Humidity1 Description	41 %	Normal	-
1	Temperature	Temperature1 Description	76 °F	Normal	-
2	Humidity	Humidity2 Description	65 %	Warning	-
2	Temperature	Temperature2 Description	88 °F	Warning	-
3	Relay	Relay3 Description	Yes	On	Ack
4	-	-	-	-	-

If we navigate back to the Summary page and force our temp sensor to be in the alert state we can now see that the temp sensor can turn on our output DCS15 dry contact relay.



This concludes the Dry Contact Sensor user manual.

Please contact support@akcp.com if you have any further technical questions or problems setting up your DCS15 or your alerts.

Thanks for Choosing AKCess Pro!