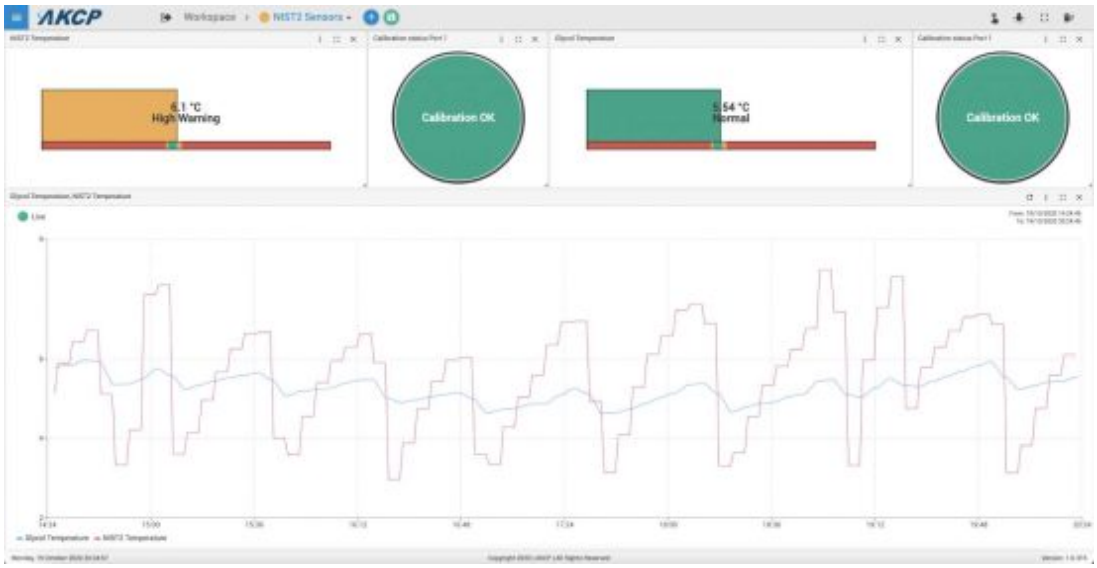
AKCP NIST Single Port Temperature and Humidity Sensor User Guide

NIST Sensors QuickStart Guide

NIST Sensors on sensorProbe+



The NIST2 sensors feature 2x NIST traceable, calibrated temperature sensors and an internal calibration integrity check.
With this technology, the sensors operate in pairs, with the values compared once a second.
If a difference greater than the stated tolerance of the sensor is detected, an alarm is raised to warn that the sensor is out of calibration.
For a higher level of accuracy, an average of the sensor pairs is calculated.

The NIST3 sensors feature 3x NIST traceable, calibrated sensors with internal calibration integrity check and failover.
The NIST3 is suited to critical infrastructure monitoring where failover systems are required.
The average of each sensor is calculated. This results in a higher accuracy but also multiple failovers. When a sensor is detected as being out of calibration, its values are ignored and an alarm is raised. In the event of a failure, you have a continuous operation, graphing, and monitoring of the environmental conditions.

WTS-NIST type sensors have the same features as the wired sensors, but can be used wirelessly with our WTG units.

The wired NIST2 and NIST3 sensors are compatible with the SPX+ series units.
Wired NIST2 sensors are compatible with the securityProbe (SEC5) base units.
The wireless WTS-NIST2 and WTS-NIST3 sensors are compatible with the WTG units.

Sensor features:

- Multiple traceable, calibrated temperature sensors
- Value averaging between temperature sensors for more accuracy
- Internal calibration integrity checking
- Failover function (NIST3 only)
- 2 additional supports per sensor:

a) Operable sensors count
b) Calibration status

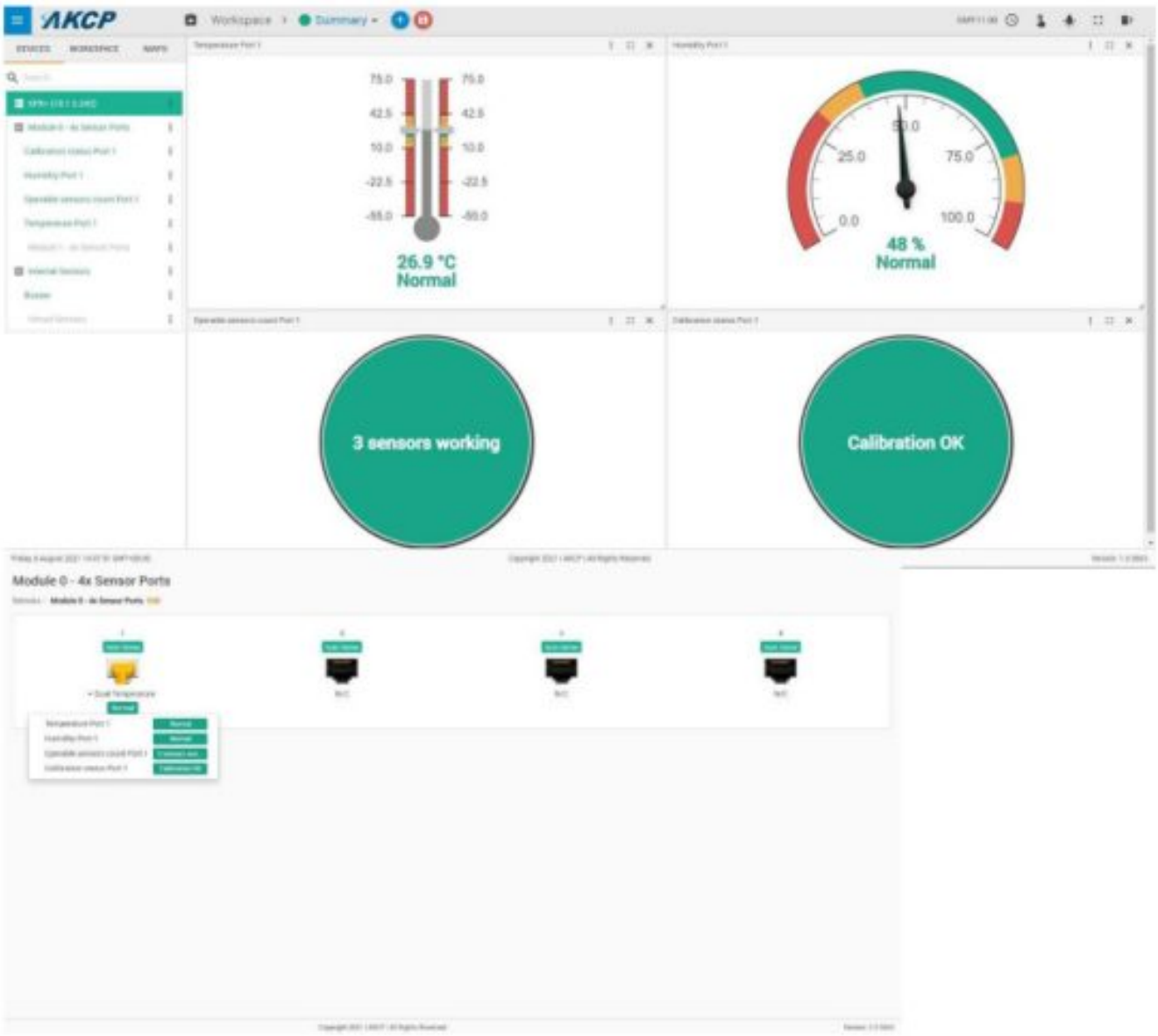
Important notes:

We do not recommend using NIST3 on the SPX+ Sensor4 module's port (including BEB units), it may not work properly due to hardware limitations on the Sensor4 module.

Only the wired NIST2 sensors are compatible with the securityProbe (SEC5) base units.
The NIST2 sensor on SEC5 works a little differently than on the SP+ platform: it doesn't have the additional "Calibration Status" and "Operable Sensors Count" sensors.

Contents

Sensor description



After plugging the NIST sensor into the main sensor port or Sensor4 module, the following sensors will be shown on the unit.

Temperature sensor
The Temperature port of the NIST sensors uses value averaging from the NIST calibrated temperature sensors to be the displayed value.

If any temperature sensor value pair gets a value difference of more than 1°C, it will be excluded from averaging.

Humidity sensor (THS NIST sensors only)
The Humidity sensor port of the NIST sensors displays the humidity reading from the NIST calibrated sensor.

Operable sensors count
This sensor status shows the number of sensors that are working (sensors that have successful communications with the base unit).

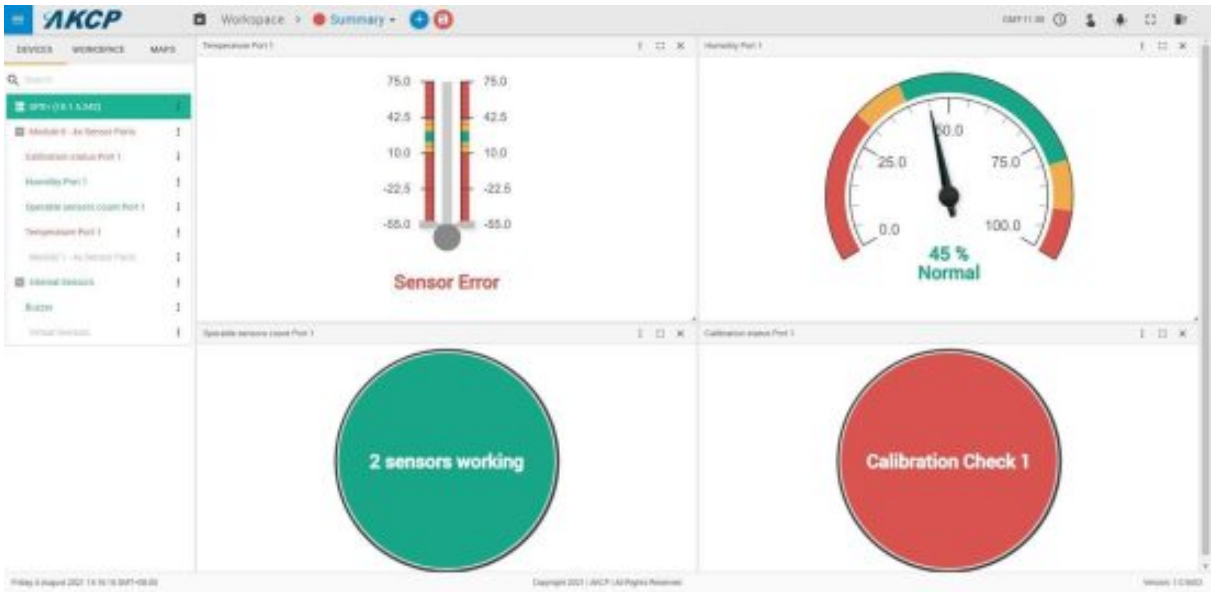
Calibration status
This sensor status shows the calibration status of the temperature sensors.
In case when all of the differences in value pairs are within 1°C, the status will be “Calibration OK”.

In case when there are value pairs with differences of more than 1°C, the status will be “Calibration Check x”
Where x is the number of invalid value pairs.

SP+ and WTG Configuration

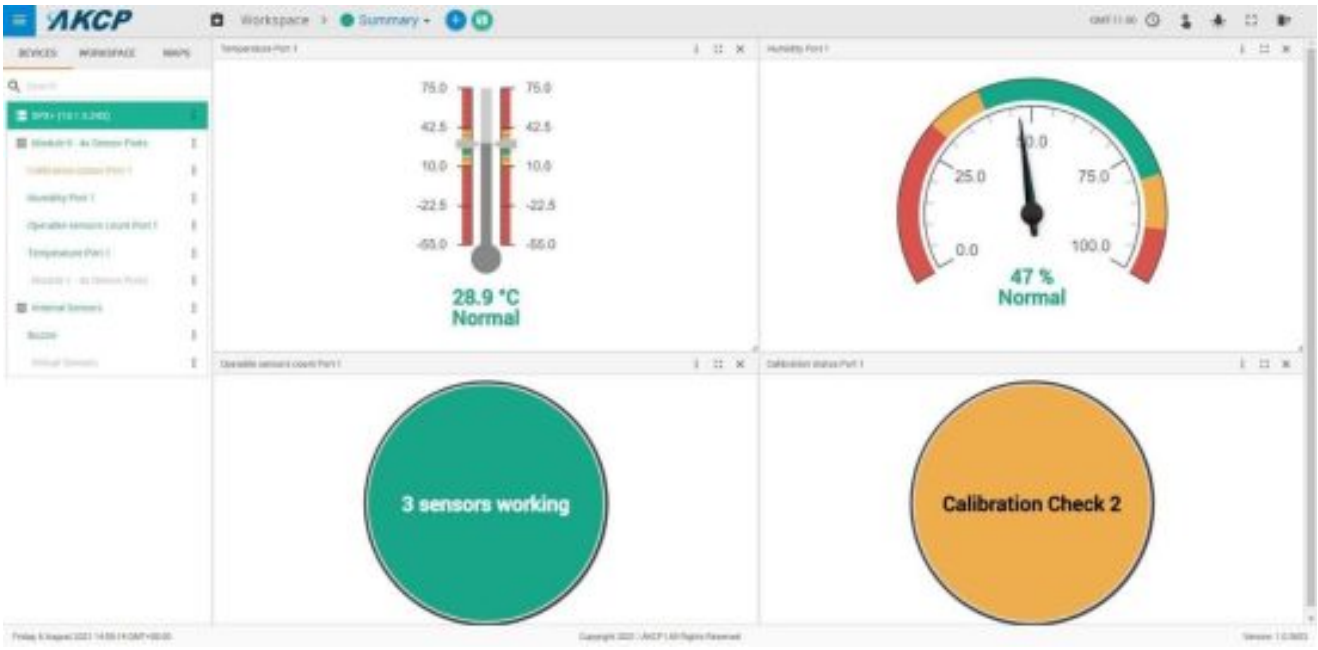
To configure temperature and humidity sensors, please refer to our existing “Specifications Features and Configuration” section of our “Temperature & Dual Temp + Humidity Sensors” manual.
You may customize the status texts of the “Operable sensors count” and “Calibration status” sensors.

Examples of the NIST sensor status alerts



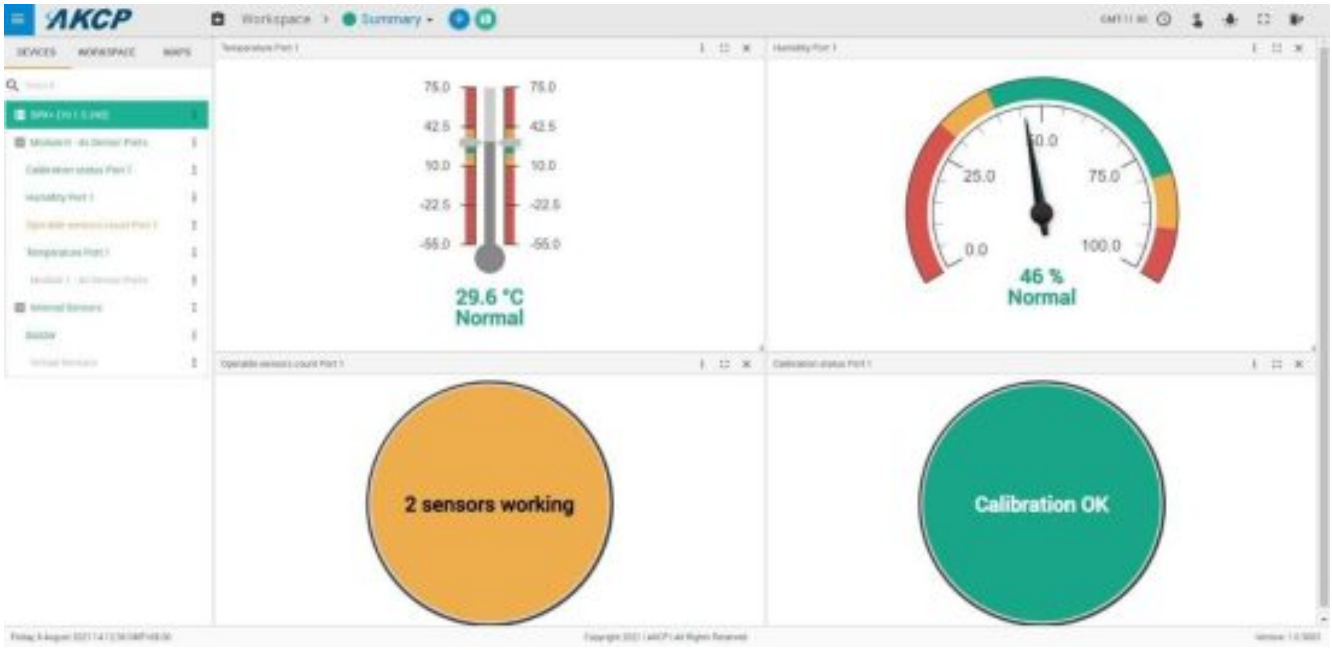
NIST2: Temperature sensors value difference is more than 1°C

Temperature: Sensor Error
Operable sensors count: 2 sensors working
Calibration status: Calibration Check 1 (1 value pair difference is more than 1°C)



NIST3: Temperature sensors value difference is more than 1°C

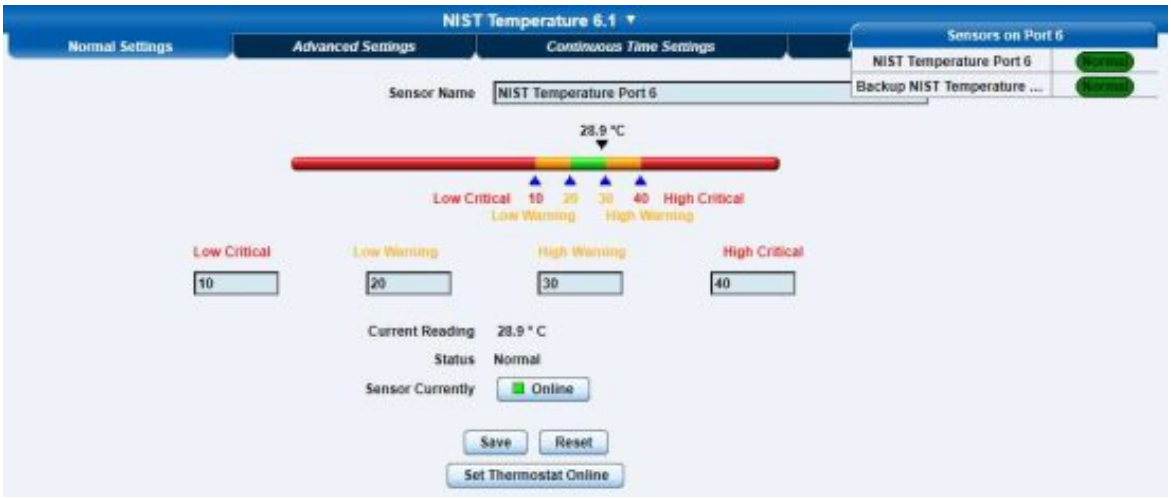
Temperature: has valid reading
Operable sensors count: 3 sensors working
Calibration status: Calibration Check 2 (2 value pairs have a difference of more than 1°C)



NIST3: 1 temperature sensor stopped working (communication failure)

Temperature: has valid reading
Operable sensors count: 2 sensors working
Calibration status: Calibration OK

NIST2 Sensors on securityProbe



The NIST2 sensors feature 2x NIST traceable, calibrated temperature sensors.
With our provided Virtual Sensor script, users can set customizable thresholds to raise an alarm to warn that the sensor is out of calibration.

Sensor features:

- Multiple traceable, calibrated temperature sensors

  Main and Backup Temperature sensor supports
- Value averaging between temperature sensors for more accuracy (via Custom Script VS)
- Failover function (via Custom Script VS)

SEC5 Configuration
Temperature Sensor Supports
To configure temperature sensors, please refer to our existing “Specifications Features and Configuration” section of our securityProbe user manual.
Virtual Sensor Custom Script We provide 2 scripts to be used with the NIST2 sensor.

1. Value averaging (For more accurate value representation)
2. Value difference (For sensor accuracy check)

   Click here to download both scripts in a ZIP file.

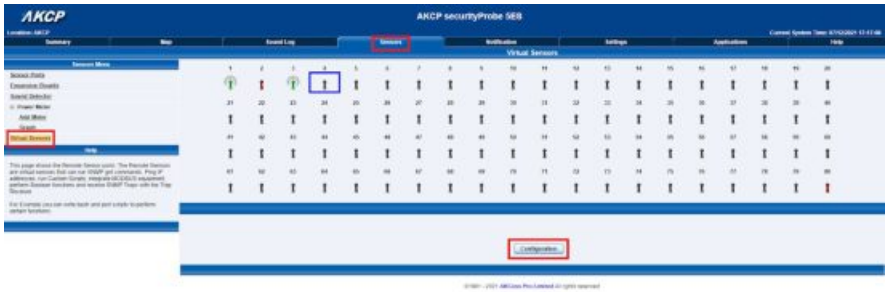
   These script files are also included at the end of this manual.

   In order to create a Custom Script Virtual Sensor, please follow the following steps.

These are example steps on how to create a Virtual Sensor for the Value averaging script.

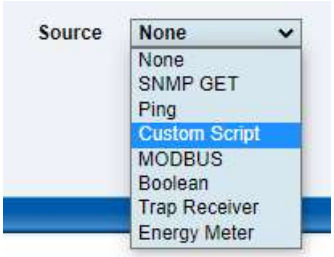
1. Access the Virtual Sensor setting page via Sensor => Virtual Sensors.

   Select a desired free Virtual Sensor port.

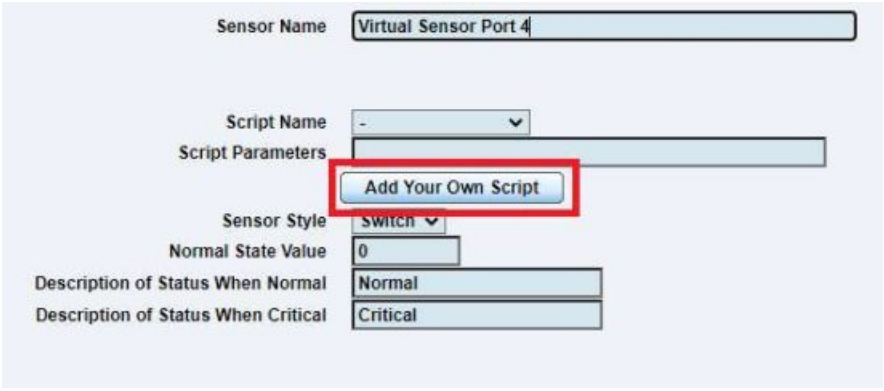


2. Click “Configuration” to start configuring the sensor.

3. Choose Source: Custom Script, and click “Next”



4. Click on “Add Your Own Script”



5. In the popup window click Choose File => Browse to the script => Add File => Close

6. Next, you will need to configure the sensor.

   Sensor Name: Configure the sensor name as desired

   Script Name: Select the desired script

   Script Parameters: Set the sensor port where you plugged in the NIST2 sensor

   Sensor Style: Analog

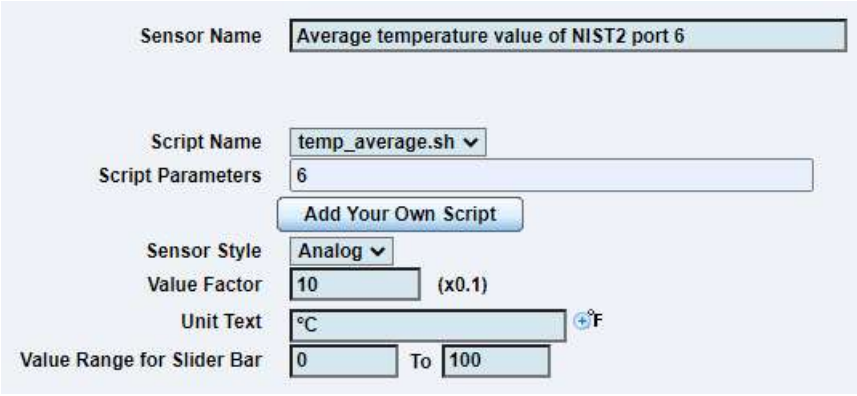
   Value Factor: 10

   Unit Text: Configure according to the sensor unit of the NIST2 sensors (°C / °F)

   Value Range for Slider Bar: Configure as desired

   Note: For the Value difference script, we recommend -5 to 5

When you are done, click “Next”



7. Configure sensor thresholds as desired.

   Note: For the Value difference script, we recommend -5, -1, 1, 5

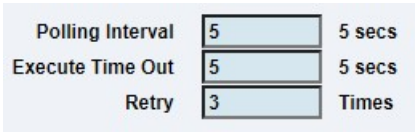
   Click “Next”

8. Configure the Virtual Sensor execution settings as follows.

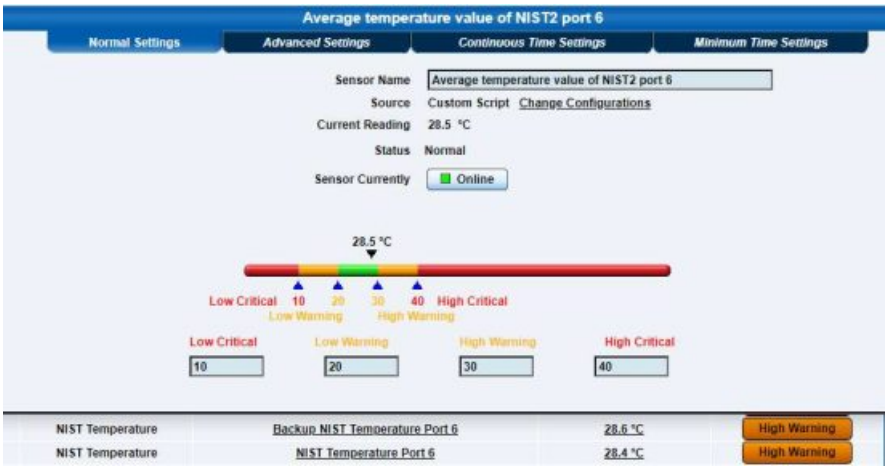
   Note: The Minimum Polling Interval of the Virtual Sensor is 5 seconds.

   This means that the value averaging and value difference scripts can update the Virtual Sensors value at a maximum rate of 5 s.

   Click on “Finish” to create the virtual sensor.



Example of a configured Averaging Custom Script



This is an example of the configured value averaging virtual sensor for the NIST2 sensor that is plugged on sensor port 6.

Note: In case of “sensor error” reading, we have the following error message format from our NIST2 scripts:
Error Message: NIST2 sensors on RJ45 port {Port} have invalid status ({MainSensorStatus}, {BackupSensorStatus})
For example: “NIST2 sensors on RJ45 port 6 have invalid status (7, 7)” will be shown if the NIST2 port 2 is unplugged.

Quick reference for Sensor Status values:
2 => Normal, 3 => High Warning, 4 => High Critical, 5 => Low Warning, 6 => Low Critical, 7 => Sensor Error

SEC5 custom scripts for reference
Click here to download both scripts in a ZIP file.

Value averaging
This script is used for the NIST2 sensor to provide a more accurate value representation #!/bin/sh

```
IP_ADDRESS="127.0.0.1"
PORT=$1

OID_BASE=".1.3.6.1.4.1.3854.2.5.2.1"
T1_OID_STATUS=${OID_BASE}".6.0.0."${PORT}".1"
T2_OID_STATUS=${OID_BASE}".6.0.0."${PORT}".2"
T1_OID_VALUE=${OID_BASE}".20.0.0."${PORT}".1"
T2_OID_VALUE=${OID_BASE}".20.0.0."${PORT}".2"

T1_STATUS=`snmpget -v1 -Oqv -c public ${IP_ADDRESS} ${T1_OID_STATUS}`
T2_STATUS=`snmpget -v1 -Oqv -c public ${IP_ADDRESS} ${T2_OID_STATUS}`
T1_VALUE=`snmpget -v1 -Oqv -c public ${IP_ADDRESS} ${T1_OID_VALUE}`
T2_VALUE=`snmpget -v1 -Oqv -c public ${IP_ADDRESS} ${T2_OID_VALUE}`

# Output the value averaging if both NIST2 sensors are in good sensor
status (Normal/HighWarning/HighCritical/LowWarning/LowCritical).
if [ ${T1_STATUS} -ge 2 -a ${T1_STATUS} -le 6 -a ${T2_STATUS} -ge 2 -a
${T2_STATUS} -le 6 ];
then
awk "BEGIN {printf \"%.2f\",(${T1_VALUE}+${T2_VALUE})/2}";
exit 0;
elif [ ${T1_STATUS} -ge 2 -a ${T1_STATUS} -le 6 ]; # Output main sensor
value if the backup failed. then
echo ${T1_VALUE};
exit 0;
elif [ ${T2_STATUS} -ge 2 -a ${T2_STATUS} -le 6 ]; # Output backup sensor
value if the main failed.
then
echo ${T2_VALUE};
exit 0;
else
echo "NIST2 sensors on RJ45 port $PORT have invalid status
($T1_STATUS, $T2_STATUS)"; # Output error message to "Error Message"
section on the Virtual Sensor setting page.
exit 1;
fi
```

Value difference
This script is used for the NIST2 sensor's accuracy check
#!/bin/sh

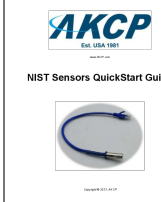
```
# Value preparation
IP_ADDRESS="127.0.0.1"
PORT=$1

OID_BASE=".1.3.6.1.4.1.3854.2.5.2.1"
T1_OID_STATUS=${OID_BASE}".6.0.0."${PORT}".1"
T2_OID_STATUS=${OID_BASE}".6.0.0."${PORT}".2"
```

```
T1_OID_VALUE=${OID_BASE}".20.0.0."${PORT}".1″
T2_OID_VALUE=${OID_BASE}".20.0.0."${PORT}".2″


T1_STATUS=`snmpget -v1 -Oqv -c public ${IP_ADDRESS} ${T1_OID_STATUS}`
T2_STATUS=`snmpget -v1 -Oqv -c public ${IP_ADDRESS} ${T2_OID_STATUS}`
T1_VALUE=`snmpget -v1 -Oqv -c public ${IP_ADDRESS} ${T1_OID_VALUE}`
T2_VALUE=`snmpget -v1 -Oqv -c public ${IP_ADDRESS} ${T2_OID_VALUE}`


# Only output the difference if both NIST2 sensors are in good sensor
status (Normal/HighWarning/HighCritical/LowWarning/LowCritical).
if [ ${T1_STATUS} -ge 2 -a ${T1_STATUS} -le 6 -a ${T2_STATUS} -ge 2 -a
${T2_STATUS} -le 6 ];
then
expr ${T1_VALUE} – ${T2_VALUE}
exit 0
else
echo "NIST2 sensor(s) on RJ45 port $PORT have invalid status
($T1_STATUS, $T2_STATUS)"; # Output error message to "Error Message"
section on the Virtual Sensor setting page.
exit 1
fi
```

Please contact **support@akcp.com** if you have any further technical questions or problems.

Thanks for Choosing AKCP!

Documents / Resources

	**AKCP NIST Single Port Temperature and Humidity Sensor** [pdf] User Guide NIST, Single Port Temperature and Humidity Sensor, NIST Single Port Temperature and Humidity Sensor

References

- **AKCP - AKCP Remote Sensor Monitoring | Data Center Monitoring**