

AmigaTemp

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	<i>TITLE :</i> AmigaTemp		
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REVISION HISTORY

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- 1) ARexx support.
- 2) Alarm.
- 3) Supports the SMT-sensor which gives a more accurate temperature than the NTC-resistors.
- 4) More display types.
- 5) Temperature in Celsius or Fahrenheit.

If you have built the old type of sensor with only NTC-resistors you can still use it with the new version.

1.4 Hardware

Component list :

NTC (Max 2)

- 1 NTC-resistor
- Cable (2 conductor)

SMT (Max 5)

- 1 SMT-sensor
 - * 1 120 Ohm resistor
- **1 20nF capacitor
- Cable (3 conductor)

1 9-pin D-Sub Female + Cap

- *) Not necessary but it protects your computer from short circuits.
- ***) Not necessary but if you have a long cable and the measured temperature is to high you should connect it.

What should I choose (NTC or SMT) ?

NTC-resistors are cheap.
SMT are quite expensive.
SMT have high accuracy over a large temperature range.
NTC-resistors have low accuracy (The built-in A/D has only 8 bits).

What you have to think about when you selects NTC-resistors:

- 1) Max resistance 528kohm.
- 2) The A/D converters have an accuracy of $528k/256 = 2.1kohm$, a difference in resistance less than 2.1kohm gives no temperature difference!

Suggestion : NTC #1 Outdoors R25 = 10kohm (R25=resistans at 25 degrees Celsius) ↔

NTC #2 Indoors R25 = 100kohm

If you place any of the sensors inside the cap the computer will

```

|   |   |       |   |   |
|   |   |       |   |   |
1   2   3       1   3   2

```

Mount the cap.

If you are going to measure the outdoor temperature you must protect the sensor from moisture.

1.5 Software

You can start AmigaTemp from WB or CLI.

From WB

Double-click on the AmigaTemp icon.

You can also drag the AmigaTemp icon to the WBStartup drawer.

See also Tool Types .

From CLI

Enter AmigaTemp on the command line and press return.

See also Tool Types .

Intro

Menu choices

Calibrate NTC

Calibrate SMT

Window

1.6 Tool Types

AmigaTemp supports the following Tool Types:

DONOTWAIT Needed if program is started from the WBStartup drawer.

TOOLPRI 'Exec Task' priority.

STARTPRI Start priority for programs in the WBStartup drawer.

PUBSCREEN Screen name for AmigaTemp.

CX_POPKEY Key combination to show the AmigaTemp window.

Ex 'CX_POPKEY = lalt a' (Press left Alt + a).

CX_POPUP If 'CX_POPUP = YES' use window settings from AmigaTemp.config.

If 'CX_POPUP = NO' don't open a window at start-up.

CX_PRIORITY Commodities priority.

You can also use Tool Types from CLI.

Ex: HD0:>AmigaTemp CX_POPUP=NO

1.7 Intro

When you run the program for the first time you will see a requester. Press OK until it's disappears.

One little window will pop up.

Choose the Config menu and select the sensors you have connected (You see the type and pin number for every sensor in the menu). Click in the Connected gadget in the window that pops up. Click on Use.

Choose the View menu and select View Big. In the window that pops up you choose the order in which the sensors will be viewed. If you have two sensors you click one time on the uppermost gadget and two times on the second gadget. Click on Use. Repeat for all windows.

Select Save Config from the Project menu.

The SMT-sensors shows the correct temperature, but the NTC-sensors must be calibrated .

1.8 Menu

Project menu :

- Hide : Closes the AmigaTemp window, but the program continues to read the temperature. View the window again with the key combination in CX_POPKEY (Tool Types), or use Exchange (System:Tools/Commodities/Exchange)
- Small Window : Switch to Small window
- Big Window : Switch to Big window
- Compact Window : Switch to Compact window
- Analog Window : Switch to Analog window

- Auto Save : When selected all settings are saved every 30 minutes.

- Save Config : Saves all settings in S:AmigaTemp.config.

- About : About the program.

- Quit : Quit the program.

Config menu :

- Common : Settings common for all sensors:
 - Samples NTC :
Number of samples for the NTC-resistors.
Normally 3.
 - Samples SMT :
Number of samples for the SMT-sensors.
Normally 1000.
 - Time :
Time between measurements in seconds.
Normally 3 sec.
 - Feedback :

Determine how much of the old measurements that should be used in the new temperature.
Max 0.999999.

NumDec :
Number of decimals in the temperature (0 - 4).

C/F :
View temperature in Celsius or Fahrenheit.

Config for each sensor :

Connected :
Select this if the sensor is connected.

Name :
Name of sensor. This name is viewed in all windows.

Max/Min :
Alarm if temperature is higher/lower.

Text :
Text viewed at alarm.

Alert :
View an Alert if alarm.

Req :
View a requester if alarm.

Sound :
Uses WB sound setting (Flash screen or play a sound) if alarm.

ARexx :
The ARexx command 'Alarm' returns 'Max' or 'Min' if alarm. See also ARexx

Repeat :
If repeat is selected the alarm is repeated every X second (X = Value in Time gadget).

Calibrate :
For NTC-resistors see Calibrate NTC
For SMT-sensors see Calibrate SMT

View menu:
Select in with order the temperatures are going to be shown.
You can only choose sensors which are connected.
See Config/Config for each sensor/Connected.

1.9 Window

Small Window

Opens a window with only a window title which shows sensor name and temperature.

Big Window

Opens a window which shows the temperature, tendency (+/-) and sensor name. The window also shows max/min temperature and date. Reset resets max/min temperatures and dates.

Compact Window

Opens a window which shows sensor name, tendency (+/-) and temperature.

Analog Window

Opens a window and shows the temperature in an analog format.

1.10 Calibrate SMT

You don't need to calibrate the
SMT sensors
, but you
can tune the temperature with C1 and C2.

1.11 Calibrate NTC

Before the NTC-resistors shows right temperature they need to be calibrated. The program must know the resistance at to different temperatures not to close to each other. For example indoor and outdoor temperatures.

- 1) Select one of the NTC-resistors from the Config menu and click on the Calibrate gadget.
- 2) Place the NTC-resistor for instance outdoors.
- 3) Enter the outdoor temperature in the Temp1 gadget.
(Measured with another thermometer.)
- 4) Wait until the value in 'Res' have been stabilized.
'Res' is the NTC-resistor resistance in ohm.
- 5) Click on the OK gadget. (On the same line as Temp1)
- 6) Place the NTC-resistor for instance indoors.
- 7) Enter the indoor temperature in the Temp2 gadget.
(Measured with another thermometer.)
- 7) Wait until the value in 'Res' have been stabilized.
- 8) Click on the OK gadget. (On the same line as Temp2.)

Temp = Actual temperature.
Res = The NTC resistance.
Max = Maximal temperature that can be measured.
Min = Minimal temperature that can be measured.
A = Material constant for the NTC-resistor.
B = Material constant for the NTC-resistor.

- 9) Click on Save.

1.12 ARexx

AmigaTemp V1.1 supports ARexx.

Info:

Port name : 'AmigaTemp'
<sensor> : Sensor number between 1 and 7.
result : Result of last command.
rc : = 0 If OK.
 = 1 If sensor not connected ->
 Connected gadget not selected in Config menu for the sensor.
 = 2 If sensor not found ->
 <sensor> < 1 or <sensor> > 7.

For more info see the example programs in the ARexx drawer!

AmigaTemp ARexx commands:

Version

result = Version of the program.

DegreeType

result = 'CELSIUS' if the temperature is in Celsius.
result = 'FAHRENHEIT' if the temperature is in Fahrenheit.

NumDecimal

result = Number of decimals in temperature.

NumSensor

result = Number of sensors. In this version 7.

Temp <sensor>

result = Actual temperature.

Name <sensor>

result = Name of sensor.

Tendency <sensor>

result = '+' if temperature is rising, '-' if temperature is falling and ' ' if temperature is stable.

Reset <sensor>

Resets max/min temperature and date.

Quit

Quits the program.

Max <sensor>

result = Highest temperature since last reset.
See also DateMax.

Min <sensor>

result = Lowest temperature since last reset.
See also DateMin.

DateMax <sensor>

result = Date when the temperature were highest.

DateMin <sensor>

result = Date when the temperature were lowest.

Alarm <sensor>

result = 'Max' if temperature is too high and ARexx is selected
in the Config menu for the sensor.

result = 'Min' if temperature is too low and ARexx is selected
in the Config menu for the sensor.

else result = 'No'

AlarmMax <sensor>

result = Alarm if temperature is higher than this temperature.

AlarmMin <sensor>

result = Alarm if temperature is lower than this temperature.

AlarmTextMax <sensor>

result = Text shown when temperature is too high.

AlarmTextMin <sensor>

result = Text shown when temperature is too low.

Save

Save all settings. Same as Save Config in the Project menu.

Load

Loads saved setting. Avoid this command because the result is hard
to predict.

1.13 SmartTemp

SMT160-30

The SMT-sensor sends the temperature in digital form to the computer
(Duty-cycle modulated). This eliminates the problems with calibration

There are three different versions of the SMT-sensor. TO92 is the cheapest.

Data for SMT160-30 (TO92):

Total accuracy	: +/- 1.2 degree Celsius (-30 - +100 degree Celsius)
Non-linearity	: 0.2 degree Celsius
Temperature range	: -45 - +130 degree Celsius
Supply voltage	: 5V
Supply current	: <200uA
Frequency	: 1-4kHz
Impedance	: 2000hm

1.14 NTC-Resistors

NTC-resistors have a very temperature dependent resistance.

NTC = Negative Temperature Coefficient = lower resistance at higher temperatures.

NTC-resistors consists of chrome, manganese, iron, cobalt and nickel.

$R = A * e^{(B / T)}$ there

R = Resistance in ohm

T = Temperature in Kelvin = Degree Celsius + 273.15

A = Material constant

B = Material constant

R25 = Resistance at 25 degree Centigrade.

1.15 D-Sub

Same type of contact as for a joystick (9-pin female).