Reading the Built-In FraunchPad Thermometer 1.01

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FraunchPad NTC Thermometer

```
Simple sketch for the built-in FraunchPad NTC
Developed with embedXcode
Author
   http://embedxcode.weebly.com
Date
   Oct 08, 2012
Version
   101
Copyright
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See Also
   • Table algorithm by larsie — Tue Apr 03, 2012 1:18 pm
     http://www.43oh.com/forum/viewtopic.php?f=10&p=18608#p18608
   • NTC table generated with TDK / Epcos NTC R/T Calculation 5.0
     http://www.epcos.com/designtools/ntc/index.html
     Select B57560G1104 for NTC 100 k = 25 oC
     with temperature scaling = 5 oC, lower limit = -25 oC and upper limit = + 75 oC
```

| 2 | FraunchPad NTC Thermometer |
|---|----------------------------|
| | |

Class Index

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|---|---|---------|------|----|-----|
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| Here are the classes, structs, unions and interfaces with brief descriptions: | |
|---|---|
| NTC_FR | |
| Temperature NTC on FraunchPad | 7 |

Class Index

File Index

Here is a list of all documented files with brief descriptions:

| FraunchPad_NTC.h | | | | | | | | | | | | | | | | | |
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Class Documentation

4.1 NTC_FR Class Reference

```
Temperature NTC on FraunchPad.
```

```
#include <FraunchPad_NTC.h>
```

Public Member Functions

```
• NTC_FR ()
```

Constructor.

· void begin ()

Initialisation.

• String WhoAmI ()

Who am I?

• void get ()

Acquire temperature.

void celsiusX10 (int32_t &t)

Return temperature in degrees celsius, X10 to avoid float.

• void fahrenheitX10 (int32_t &t)

Return temperature in degrees fahrenheit, X10 to avoid float.

4.1.1 Detailed Description

Temperature NTC on FraunchPad.

4.1.2 Member Function Documentation

```
4.1.2.1 void NTC_FR::celsiusX10 ( int32_t & t )
```

Return temperature in degrees celsius, X10 to avoid float.

```
Serial.print(x/10, DEC);  // integer part
Serial.print(".");  // decimal separator
Serial.print(x%10, DEC);  // decimal part
```

Parameters

8 Class Documentation

```
4.1.2.2 void NTC_FR::fahrenheitX10 ( int32_t & t )
```

Return temperature in degrees fahrenheit, X10 to avoid float.

```
Serial.print(x/10, DEC);  // integer part
Serial.print(".");  // decimal separator
Serial.print(x%10, DEC);  // decimal part
```

Parameters

```
t temperature in degrees celsius
```

```
4.1.2.3 void NTC_FR::get()
```

Acquire temperature.

Note

Call this function prior to degreeX10 or fahrenheitX10

```
4.1.2.4 String NTC_FR::WhoAmI()
```

Who am I?

Returns

Who am I? string

The documentation for this class was generated from the following files:

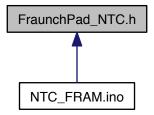
- FraunchPad_NTC.h
- FraunchPad_NTC.cpp

File Documentation

5.1 FraunchPad_NTC.h File Reference

Library header.

This graph shows which files directly or indirectly include this file:



Classes

• class NTC_FR

Temperature NTC on FraunchPad.

5.1.1 Detailed Description

Library header.

Project FRAM_TEMP

Developed with embedXcode

Author

Rei Vilo

http://embedxcode.weebly.com

10 File Documentation

```
Date
```

Oct 08, 2012

Version

101

Copyright

```
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```

See Also

Table algorithm by larsie — Tue Apr 03, 2012 1:18 pm
 http://www.43oh.com/forum/viewtopic.php?f=10&p=18608#p18608

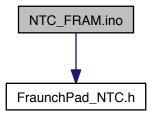
• NTC table generated with TDK / Epcos NTC R/T Calculation 5.0

```
\label{eq:http://www.epcos.com/designtools/ntc/index.html} \\ Select B57560G1104 for NTC 100 k = 25 oC \\ with temperature scaling = 5 oC, lower limit = -25 oC and upper limit = + 75 oC \\ \end{aligned}
```

5.2 NTC_FRAM.ino File Reference

Main sketch.

```
#include "FraunchPad_NTC.h"
Include dependency graph for NTC_FRAM.ino:
```



Functions

- void printX10 (int32_t i)
 - Print for value X10.
- void setup ()

Setup.

• void loop ()

Loop.

Variables

```
• int32_t temperature
```

temperature X10

NTC_FR myNTC

NTC.

5.2.1 Detailed Description

Main sketch.

Developed with embedXcode

Author

Rei Vilo

http://embedxcode.weebly.com

Date

Oct 08, 2012

Version

101

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See Also

ReadMe.txt for references

5.2.2 Function Documentation

5.2.2.1 void printX10 (int32_t *i*)

Print for value X10.

Parameters

i value X10

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```



NTC R/T Calculation 5.0

Type = G1560/100k/+2 Ordering code = B57560G1104G002 R/T characteristic = 8304 B(25/100) = 4092.0 [K] ± 1.0% = $100000 [\Omega] \hat{A} \pm 2.0\%$ R at 25°C = $100000.0 [\Omega]$ R nom at 25°C

| T[°C] | R nom[Ω] | R min[Ω] | R max[Ω] | ΔR/R [+-%] | ΔT [+-°C] | α [%K] |
|-------|----------|----------|----------|------------|-----------|--------|
| -25 | 1344300 | 1279500 | 1409000 | 4.8 | 0.8 | 6.0 |
| -20 | 998530 | 953700 | 1043400 | 4.5 | 0.8 | 5.9 |
| -15 | 748670 | 717400 | 779940 | 4.2 | 0.7 | 5.7 |
| -10 | 566360 | 544420 | 588310 | 3.9 | 0.7 | 5.5 |
| -5 | 432120 | 416630 | 447610 | 3.6 | 0.7 | 5.3 |
| 0 | 332400 | 321410 | 343390 | 3.3 | 0.6 | 5.2 |
| 5 | 257690 | 249860 | 265520 | 3.0 | 0.6 | 5.0 |
| 10 | 201270 | 195680 | 206860 | 2.8 | 0.6 | 4.9 |
| 15 | 158340 | 154340 | 162340 | 2.5 | 0.5 | 4.7 |
| 20 | 125420 | 122550 | 128280 | 2.3 | 0.5 | 4.6 |
| 25 | 100000 | 98000 | 102000 | 2.0 | 0.4 | 4.5 |
| 30 | 80239 | 78413 | 82066 | 2.3 | 0.5 | 4.3 |
| 35 | 64776 | 63159 | 66392 | 2.5 | 0.6 | 4.2 |
| 40 | 52598 | 51174 | 54022 | 2.7 | 0.7 | 4.1 |
| 45 | 42950 | 41699 | 44201 | 2.9 | 0.7 | 4.0 |
| 50 | 35262 | 34164 | 36359 | 3.1 | 0.8 | 3.9 |
| 55 | 29100 | 28138 | 30062 | 3.3 | 0.9 | 3.8 |
| 60 | 24136 | 23293 | 24978 | 3.5 | 0.9 | 3.7 |
| 65 | 20114 | 19376 | 20853 | 3.7 | 1.0 | 3.6 |
| 70 | 16841 | 16193 | 17490 | 3.8 | 1.1 | 3.5 |
| 75 | 14164 | 13594 | 14733 | 4.0 | 1.2 | 3.4 |