LM75 Device Driver

1.0

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Here are the classes, structs, unions and interfaces with brief descriptions:

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2.1 File List

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Class Documentation

3.1 LM75 Class Reference

Public Types

- enum tempUnit_t { LM75_TK, LM75_TC, LM75_TF }
- enum setPointType { SPT_OVERTEMP, SPT_HYSTERESIS }
- enum outputPolarity { POL_LOW, POL_HIGH }
- enum outputMode { MODE_COMP, MODE_INT }
- enum opMode { OPM_NORMAL, OPM_SHDN }
- enum faultQueue { FQ_1 = 1, FQ_2 = 2, FQ_4 = 4, FQ_6 = 6 }

Public Member Functions

- LM75 (uint8_t addr=LM75_I2CDEFAULTADDR)

  LM75 Device class constructor.
- boolean begin ()

  Initialize the device and the i2c interface.
- double readTemp (tempUnit_t tunit)

  Return the measured temperature in specified units.
- double readSetPoint (tempUnit_t tunit, setPointType spt)

  Return the specified setpoint in specified units.
- void writeSetPoint (double val, tempUnit_t tunit, setPointType spt)

  Write the specified setpoint supplied in the specified units.
- void setOutputPolarity (outputPolarity pol)

  Set the OS polarity.
- void setOutputMode (outputMode mode)

  Set the OS operation mode.
- void setOperationMode (opMode mode)

  Set the device operation mode.
- void setFaultQueue (faultQueue fqueue)

  Set the value of the OS fault queue.
- double convCtoK (double degC)

  Convert temperature in degrees C to degrees K.
- double convCtoF (double degC)

  Convert temperature in degrees C to degrees F.
- double convKtoC (double degK)

Convert temperature in degrees K to degrees C.

- double convFtoC (double degF)

  Convert temperature in degrees F to degrees C.

Public Attributes

- Property< uint8_t, LM75 > busAddr

Private Member Functions

- uint8_t getAddr (void)

  Return the device I2C Bus address.
- uint8_t read8 (uint8_t reg)

  Return an 8 bit register value from the device.
- uint16_t read16 (uint8_t reg)

  Return a 16 bit register value from the device.
- void write8 (uint8_t reg, uint8_t data)

  Write a value to an 8 bit register in the device.
- void write16 (uint8_t reg, uint16_t data)

  Write a value to a 16 bit register in the device.

Private Attributes

- uint8_t _addr

3.1.1 Detailed Description

Definition at line 80 of file LM75.h.

3.1.2 Member Enumeration Documentation

3.1.2.1 enum LM75::faultQueue

Enumerations for fault queue length.

Enumerator

FQ_1 fault queue value = 1

FQ_2 fault queue value = 2

FQ_4 fault queue value = 4

FQ_6 fault queue value = 6

Definition at line 110 of file LM75.h.

3.1.2.2 enum LM75::opMode

Enumerations for operating mode.

Enumerator

OPM_NORMAL normal operation mode

OPM_SHDN shutdown mode

Definition at line 106 of file LM75.h.

3.1.2.3 enum LM75::outputMode

Enumerations for output mode.

Enumerator

MODE_COMP OS comparator mode

MODE_INT OS interrupt mode

Definition at line 102 of file LM75.h.

3.1.2.4 enum LM75::outputPolarity

Enumerations for output polarity.

Enumerator

POL_LOW OS output active low

POL_HIGH OS output active high

Definition at line 98 of file LM75.h.

3.1.2.5 enum LM75::setPointType

Enumerations for setpoint registers.

Enumerator

SPT_OVERTEMP overtemp shutdown register

SPT_HYSTERESIS hysteresis register

Definition at line 94 of file LM75.h.

3.1.2.6 enum LM75::tempUnit_t

Enumerations for temperature units.

Enumerator

LM75_TK degrees Kelvin

LM75_TC degrees Centigrade

LM75_TF degrees Fahrenheit

Definition at line 89 of file LM75.h.

3.1.3 Constructor & Destructor Documentation

3.1.3.1 LM75::LM75 (uint8_t *i2caddr* = LM75_I2CDEFAULTADDR)

LM75 Device class constructor.

constructor

Parameters

in	*i2caddr*	Device address (default: published value).

Definition at line 49 of file LM75.cpp.

3.1.4 Member Function Documentation

3.1.4.1 double LM75::convCtoF (double *degC*)

Convert temperature in degrees C to degrees F.

Parameters

in	*degC*	Temperature in degrees Centigrade.

Returns

Temperature in degrees Fahrenheit.

Definition at line 258 of file LM75.cpp.

3.1.4.2 double LM75::convCtoK (double *degC*)

Convert temperature in degrees C to degrees K.

Parameters

in	*degC*	Temperature in degrees Centigrade.

Returns

Temperature in degrees Kelvin.

Definition at line 251 of file LM75.cpp.

3.1.4.3 double LM75::convFtoC (double *degF*)

Convert temperature in degrees F to degrees C.

Parameters

in	*degF*	Temperature in degrees Fahrenheit.

Returns

Temperature in degrees Centigrade.

Definition at line 272 of file LM75.cpp.

3.1.4.4 double LM75::convKtoC (double *degK*)

Convert temperature in degrees K to degrees C.

Parameters

in	*degK*	Temperature in degrees Kelvin.

Returns

Temperature in degrees Centigrade.

Definition at line 265 of file LM75.cpp.

3.1.4.5 uint8_t LM75::getAddr (void) [private]

Return the device I2C Bus address.

Returns

Device address.

Definition at line 173 of file LM75.cpp.

3.1.4.6 uint16_t LM75::read16 (uint8_t *reg*) [private]

Return a 16 bit register value from the device.

Parameters

in	*reg*	16b Register to read from.

Returns

Value read from register.

Definition at line 198 of file LM75.cpp.

3.1.4.7 uint8_t LM75::read8 (uint8_t *reg*) [private]

Return an 8 bit register value from the device.

Parameters

in	*reg*	8b Register to read from.

Returns

Value read from register.

Definition at line 180 of file LM75.cpp.

3.1.4.8 double LM75::readSetPoint (tempUnit_t *tunit,* setPointType *spt*)

Return the specified setpoint in specified units.

Setpoint is returned as a 2's complement value in the most significant 9 bits of a 16 bit field expressed in degrees C to a resolution of 0.125C.

Parameters

in	*tunit*	Temperature units to convert raw data to.
in	*spt*	Setpoint type (overtemp or hysteresis)

Returns

Temperature.

Definition at line 93 of file LM75.cpp.

3.1.4.9 double LM75::readTemp (tempUnit_t *tunit*)

Return the measured temperature in specified units.

Temperature is returned as a 2's complement value in the most significant 11 bits of a 16 bit field expressed in degrees C to a resolution of 0.125C.

Parameters

in	*tunit*	Temperature units to convert raw data to.

Returns

Temperature.

Definition at line 73 of file LM75.cpp.

3.1.4.10 void LM75::setFaultQueue (faultQueue *fqueue*)

Set the value of the OS fault queue.

Parameters

in	*fqueue*	Enumerated OS fault queue programming value.

Definition at line 157 of file LM75.cpp.

3.1.4.11 void LM75::setOperationMode (opMode *mode*)

Set the device operation mode.

Parameters

in	*mode*	Enumerated operation mode.

Definition at line 147 of file LM75.cpp.

3.1.4.12 void LM75::setOutputMode (outputMode *mode*)

Set the OS operation mode.

Parameters

in	*mode*	Enumerated OS operation mode.

Definition at line 137 of file LM75.cpp.

3.1.4.13 void LM75::setOutputPolarity (outputPolarity *pol*)

Set the OS polarity.

Parameters

in	*pol*	Enumerated OS polarity selection.

Definition at line 127 of file LM75.cpp.

3.1.4.14 void LM75::write16 (uint8_t *reg,* uint16_t *data*) [private]

Write a value to a 16 bit register in the device.

Parameters

in	*reg*	Register to write to.
in	*data*	Value to write.

Definition at line 235 of file LM75.cpp.

3.1.4.15 void LM75::write8 (uint8_t *reg,* uint8_t *data*) [private]

Write a value to an 8 bit register in the device.

Parameters

in	*reg*	Register to write to.
in	*data*	Value to write.

Definition at line 220 of file LM75.cpp.

3.1.4.16 void LM75::writeSetPoint (double *val,* tempUnit_t *tunit,* setPointType *spt*)

Write the specified setpoint supplied in the specified units.

Setpoint is written as a 2's complement value in the most significant 9 bits of a 16 bit field expressed in degrees C to a resolution of 0.125C.

Parameters

in	*val*	Setpoint temperature.
in	*tunit*	Temperature units of the setpoint.
in	*spt*	Setpoint type (overtemp or hysteresis)

Definition at line 112 of file LM75.cpp.

3.1.5 Member Data Documentation

3.1.5.1 uint8_t LM75::_addr [private]

Slave address

Definition at line 130 of file LM75.h.

3.1.5.2 Property<uint8_t, LM75> LM75::busAddr

I2C Bus address property

Definition at line 86 of file LM75.h.

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

- LM75.h
- LM75.cpp

Chapter 4

File Documentation

4.1 LM75.cpp File Reference

LM75 Family Device Driver Library - CPP Source file.

```
#include "LM75.h"
```

4.1.1 Detailed Description

LM75 Family Device Driver Library - CPP Source file. Based on the Melexis LM75 Family Data Sheet 3901090614 Rev 004 09jun2008.

- The current implementation does not manage PWM (only digital data by I2C).
- Sleep mode is not implemented yet.

Note

THIS IS ONLY A PARTIAL RELEASE. THIS DEVICE CLASS IS CURRENTLY UNDERGOING ACTIVE DEVELOPMENT AND IS STILL MISSING SOME IMPORTANT FEATURES. PLEASE KEEP THIS IN MIND IF YOU DECIDE TO USE THIS PARTICULAR CODE FOR ANYTHING.

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Definition in file LM75.cpp.

4.2 LM75.h File Reference

LM75 Family Device Driver Library - CPP Header file.

```
#include "WProgram.h"
#include <Wire.h>
#include "Property.h"
```

Classes

- class LM75

Macros

- #define LM75_I2CDEFAULTADDR 0x48
- #define LM75_BROADCASTADDR 0
- #define LM75_CONF 0x01
- #define LM75_TEMP 0x00
- #define LM75_TOS 0x03
- #define LM75_THYST 0x02
- #define LM75_CONF_RES 0x00
- #define LM75_CONF_OSFQUE_1 0x00
- #define LM75_CONF_OSFQUE_2 0x08
- #define LM75_CONF_OSFQUE_4 0x10
- #define LM75_CONF_OSFQUE_6 0x18
- #define LM75_CONF_OSPOL_AL 0x00
- #define LM75_CONF_OSPOL_AH 0x04
- #define LM75_CONF_OSOM_COMP 0x00
- #define LM75_CONF_OSOM_INT 0x02
- #define LM75_CONF_DOM_NORMAL 0x00
- #define LM75_CONF_DOM_SHUTDOWN 0x01

4.2.1 Detailed Description

LM75 Family Device Driver Library - CPP Header file. Based on the Melexis LM75 Family Data Sheet 3901090614 Rev 004 09jun2008.

- The current implementation does not manage PWM (only digital data by I2C).
- Sleep mode is not implemented yet.

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Definition in file LM75.h.

4.2.2 Macro Definition Documentation

4.2.2.1 #define LM75_BROADCASTADDR 0

Device broadcast slave address

Definition at line 55 of file LM75.h.

4.2.2.2 #define LM75_CONF 0x01

REGISTER addresses. RAM reg - Configuration

Definition at line 58 of file LM75.h.

4.2.2.3 #define LM75_CONF_DOM_NORMAL 0x00

Device operation mode - normal

Definition at line 73 of file LM75.h.

4.2.2.4 #define LM75_CONF_DOM_SHUTDOWN 0x01

Device operation mode - shutdown

Definition at line 74 of file LM75.h.

4.2.2.5 #define LM75_CONF_OSFQUE_1 0x00

OS fault queue programming value = 1

Definition at line 65 of file LM75.h.

4.2.2.6 #define LM75_CONF_OSFQUE_2 0x08

OS fault queue programming value = 2

Definition at line 66 of file LM75.h.

4.2.2.7 #define LM75_CONF_OSFQUE_4 0x10

OS fault queue programming value = 4

Definition at line 67 of file LM75.h.

4.2.2.8 #define LM75_CONF_OSFQUE_6 0x18

OS fault queue programming value = 6

Definition at line 68 of file LM75.h.

4.2.2.9 #define LM75_CONF_OSOM_COMP 0x00

OS operation mode - comparator

Definition at line 71 of file LM75.h.

4.2.2.10 #define LM75_CONF_OSOM_INT 0x02

OS operation mode - interrupt

Definition at line 72 of file LM75.h.

4.2.2.11 #define LM75_CONF_OSPOL_AH 0x04

OS polarity selection active HIGH

Definition at line 70 of file LM75.h.

4.2.2.12 #define LM75_CONF_OSPOL_AL 0x00

OS polarity selection active LOW

Definition at line 69 of file LM75.h.

4.2.2.13 #define LM75_CONF_RES 0x00

CONFIGURATION bits masks. Manufacturer reserved bits

Definition at line 64 of file LM75.h.

4.2.2.14 #define LM75_I2CDEFAULTADDR 0x48

Device default slave address

Definition at line 54 of file LM75.h.

4.2.2.15 #define LM75_TEMP 0x00

RAM reg - Temperature

Definition at line 59 of file LM75.h.

4.2.2.16 #define LM75_THYST 0x02

RAM reg - Hysteresis

Definition at line 61 of file LM75.h.

4.2.2.17 #define LM75_TOS 0x03

RAM reg - Overtemperature shutdown threshold

Definition at line 60 of file LM75.h.