mLink Library Reference Guide for

mLink 1,2 & 4 Channel Relay Module (HCMODU0182, HCMODU0183, & HCMODU0184)

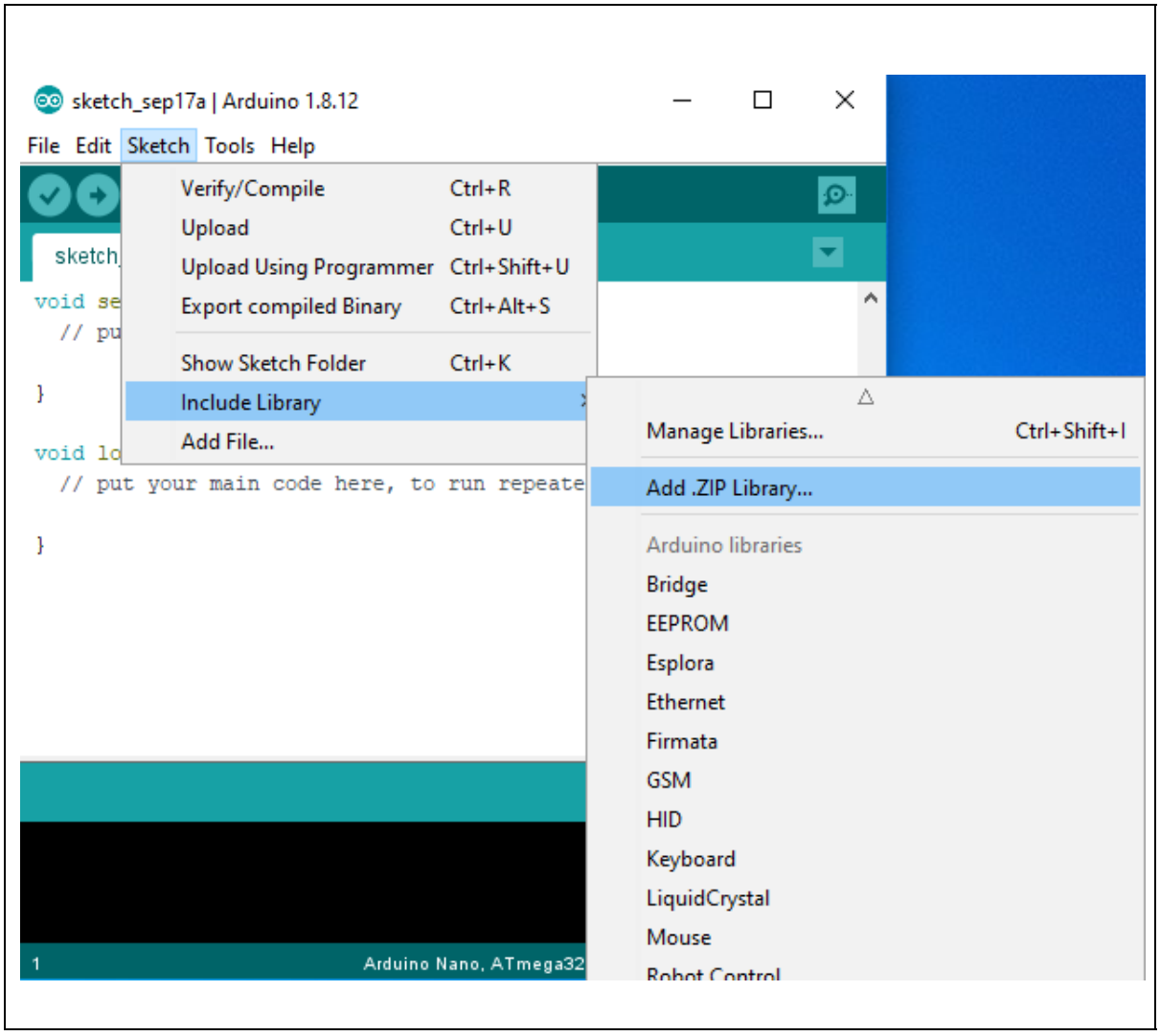
Installing the mLink library

Adding the mLink library to your Arduino IDE can be done in the same way as any other Arduino library:

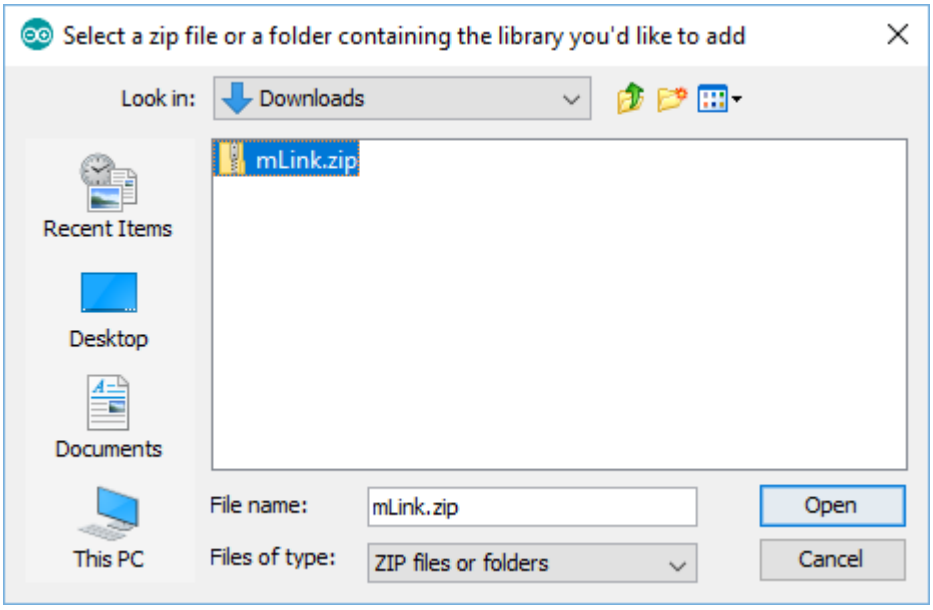
First download the mLink.zip file from the software section of our support forum here:

https://hobbycomponents.com/mLink

Once downloaded, open up your Arduino IDE and go to Sketch->Include Library->Add .ZIP Library.



In the file selection dialogue window that opens, navigate to wherever you downloaded the mLink .zip file and select it, then click the ‘Open’ button.



Including the mLink library in your sketch

Adding the mLink library to your sketch consists of 3 steps; Firstly include the mLink header file (mLink.h) at the top of your sketch, create an instance of the library, then finally initialise the library inside the startup() function:

```
// Step 1: Include the mLink library
#include "mLink.h"


//Step 2: Create an instance of the library
mLink mLink;


void setup()
{
  // Step 3: Initialise the library
  mLink.init();
}


void loop()
{
}
```

Quick library reference table

COMMAND		PARAMETERS	RETURNS
init()	Initialises the mLink library	None	n/a
readBit(*add*, *reg*, *bit*)	Reads the state of a bit from one of the mLink registers	*add* = *byte* value containing I2C address of mLink module *reg* = *byte* value containing register index *bit* = byte value containing the bit number to read (0 to 7)	*boolean* value containing the state of the bit
read(*add*, *reg*)	Reads the contents of one of the mLink registers	*add* = *byte* value containing I2C address of mLink module *reg* = *byte* value containing register index	*byte* value containing the state of the register
writeBit(*add*, *reg*, *bit*, *state*)	Writes to a bit in one of the mLink registers	*add* = *byte* value containing I2C address of mLink module *reg* = *byte* value containing register index *bit* = *byte* value containing the bit number to write to (0 to 7) *state* = boolean value to set the bit to	n/a
write(*add*, *reg*, *data*)	Writes data to one of the mLink registers	*add* = *byte* value containing I2C address of mLink module *reg* = *byte* value containing register index *data* = *byte* value containing the data to write to the register	n/a
SET_RLY0(*add*, *state*);	Library macro that sets the state of relay 0	*add* = *byte* value containing I2C address of mLink module *state* = boolean value containing the required state of the relay	n/a
SET_RLY1(*add*, *state*);	Library macro that sets the state of relay 1	*add* = *byte* value containing I2C address of mLink module *state* = *boolean* value containing the required state of the relay	n/a
SET_RLY2(*add*, *state*);	Library macro that sets the state of relay 2	*add* = *byte* value containing I2C address of mLink module *state* = boolean value containing the required state of the relay	n/a
SET_RLY3(*add*, *state*);	Library macro that sets the state of relay 3	*add* = *byte* value containing I2C address of mLink module *state* = *boolean* value containing the required state of the relay	n/a

READ_RLY0(*add*)	Library macro that gets the current state of relay 0	*add* = *byte* value containing I2C address of mLink module	*boolean* value containing the state of relay 0
READ_RLY1(*add*)	Library macro that gets the current state of relay 1	*add* = *byte* value containing I2C address of mLink module	*boolean* value containing the state of relay1
READ_RLY2(*add*)	Library macro that gets the current state of relay 2	*add* = *byte* value containing I2C address of mLink module	*boolean* value containing the state of relay 2
READ_RLY3(*add*)	Library macro that gets the current state of relay 3	*add* = *byte* value containing I2C address of mLink module	*boolean* value containing the state of relay 3
RLY0_SetOnTime(*add*, *time*)	Library macro that sets the on time for relay 0 in seconds	*add* = *byte* value containing I2C address of mLink module *time* = unsigned int value containing the on time in seconds	n/a
RLY1_SetOnTime(*add*, *time*)	Library macro that sets the on time for relay 1 in seconds	*add* = *byte* value containing I2C address of mLink module *time* = unsigned int value containing the on time in seconds	n/a
RLY2_SetOnTime(*add*, *time*)	Library macro that sets the on time for relay 2 in seconds	*add* = *byte* value containing I2C address of mLink module *time* = unsigned int value containing the on time in seconds	n/a
RLY3_SetOnTime(*add*, *time*)	Library macro that sets the on time for relay 3 in seconds	*add* = *byte* value containing I2C address of mLink module *time* = unsigned int value containing the on time in seconds	n/a

mLink 12bit Port Expander Library Commands

mLink.init()

Description

Initialises the mLink library
Add to the setup() section of your sketch to initialise the mLink library

Syntax

mLink.init()

Parameters

None

Returns

Nothing

Example Code

```
void setup()
{
  mLink.init();
}

void loop()
{
}
```

mLink.readBit(add, reg, bit)

Description

Reads the state of a bit from one of the mLink modules 8 bit registers and returns the result as a boolean value.

Parameters

add: byte value containing I2C address of mLink module. Alternatively, if the mLink module is set to its default I2C address (0x52) you can use the predefined value:

RLY_I2C_ADD

reg: byte value containing the register number to read. You can either specify the register number (see register table) or you can use one of the following predefined values:

MLINK_STATUS_REG
MLINK_RELAY_STATE_REG

bit: byte value containing the bit number within the specified register to read. Valid values are 0 to 7.

Returns

A boolean value representing the state of the bit.

Example Code

Reads the state of bit 0 (COM error bit) from the status register

```
boolean result = mLink.readBit(RLY_I2C_ADD, MLINK_STATUS_REG, 0);
```

mLink.read(*add*, *reg*)

Description

Reads the state of one of the mLink modules 8 bit registers and returns the result as a byte.

Parameters

add: byte value containing I2C address of mLink module. Alternatively, if the mLink module is set to its default I2C address (0x52) you can use the predefined value:

RLY_I2C_ADD

reg: byte value containing the register number to read. You can either specify the register number (see register table) or you can use one of the following predefined values:

MLINK_STATUS_REG
MLINK_ADD_REG
MLINK_MOD_TYPE_REG
MLINK_MOD_SUBTYPE_REG
MLINK_SW_VER_REG
MLINK_RELAY_STATE_REG

Returns

A byte value representing the state of the register.

Example Code

Reads the contents of the software version register (register 4)

```
byte result = mLink.read(RLY_I2C_ADD, MLINK_SW_VER_REG);
```

mLink.writeBit(*add*, *reg*, *bit*, *state*)

Description

Writes to a bit in one of the mLink modules 8 bit registers.

Parameters

add: byte value containing I2C address of mLink module. Alternatively if the mLink module is set to its default I2C address (0x50) you can use the predefined value:

RLY_I2C_ADD

reg: byte value containing the register number to write to. You can either specify the register number (see register table) or you can use one of the following predefined values:

MLINK_STATUS_REG
MLINK_RELAY_STATE_REG

bit: byte value containing the bit number within the specified register to write to. Valid values are 0 to 7.

state: boolean value containing the state to set the specified bit to.

Returns

None

Example Code

Energises relay 0 by setting the appropriate bit (bit 0) in the relay state register high..

```
mLink.writeBit(RLY_I2C_ADD, MLINK_RELAY_STATE_REG, 0, HIGH);
```

Alternatively in the above example of energising relay 0you can use the RLY4CH_RLY0_ON definition to simplify the above command:

```
mLink.writeBit(RLY_I2C_ADD, RLY4CH_RLY0_ON);
```

mLink.write(*add*, *reg*, *data*)

Description

Writes to one of the mLink modules 8 bit registers.

Parameters

add: byte value containing I2C address of mLink module. Alternatively if the mLink module is set to its default I2C address (0x52) you can use the predefined value:

RLY_I2C_ADD

reg: byte value containing the register number to write to. You can either specify the register number (see register table) or you can use one of the following predefined values:

MLINK_STATUS_REG
MLINK_ADD_REG
MLINK_RELAY_STATE_REG

data: byte value containing the data to write to the register

Returns

None

Example Code

Energises relays 0 and 3 (on a 4 channel relay module) by writing to the MLINK_RELAY_STATE_REG register.

```
byte relayState = 0b1001;
mLink.write(RLY_I2C_ADD, MLINK_RELAY_STATE_REG, relayState);
```

mLink.SET_RLYx(*add*, *state*);

Description

Library macros that set the state of one of the relays where:

mLink.SET_RLY0(*add*, *state*);	Sets the state of relay 0
mLink.SET_RLY1(*add*, *state*);	Sets the state of relay 1
mLink.SET_RLY2(*add*, *state*);	Sets the state of relay 2
mLink.SET_RLY3(*add*, *state*);	Sets the state of relay 3

Parameters

add: byte value containing I2C address of mLink module. Alternatively if the mLink module is set to its default I2C address (0x52) you can use the predefined value:

RLY_I2C_ADD

state: boolean value containing the required state of the relay where

0 = de-energized (off)
1 = energised (on)

Returns

None

Example Code

Energises relay 0

```
mLink.SET_RLY0(I2C_ADD, HIGH);
```

mLink.READ_RLYx(*add*);

Description

Library macro that reads the state of one of the relays where:

mLink.READ_RLY0(*add*);	Sets the state of relay 0
mLink.READ_RLY1(*add*);	Sets the state of relay 1
mLink.READ_RLY2(*add*);	Sets the state of relay 2
mLink.READ_RLY3(*add*);	Sets the state of relay 3

Parameters

add: byte value containing I2C address of mLink module. Alternatively if the mLink module is set to its default I2C address (0x52) you can use the predefined value:

RLY_I2C_ADD

Returns

boolean value containing the state of relay specified relay where

0 = relay de-energised (off)
1 = relay energised (on)

Example Code

Reads the current state of relay 0

```
boolean relayState = mLink.READ_RLY0(RLY_I2C_ADD);
```

mLink.RLYx_SetOnTime(*add*, *time*)

Description

Library macro that sets the on time of one of the relays where:

mLink.RLY0_SetOnTime(*add*, *time*); Sets the on time of relay 0
mLink.RLY1_SetOnTime(*add*, *time*); Sets the on time of relay 1
mLink.RLY2_SetOnTime(*add*, *time*); Sets the on time of relay 2
mLink.RLY3_SetOnTime(*add*, *time*); Sets the on time of relay 3

Parameters

add: byte value containing I2C address of mLink module. Alternatively if the mLink module is set to its default I2C address (0x52) you can use the predefined value:

RLY_I2C_ADD

time: unsigned integer value containing the required on time in seconds. Setting this value to 0 will disable the on timer mode. Maximum on time = 65535 seconds.

Returns

None

Example Code

Sets the on time for relay 0 to 10 seconds

```
boolean relayState = mLink.RLY0_SetOnTime(RLY_I2C_ADD, 10);
```

DISCLAIMER

The mLink range is a series of modules intended for the hobbyist and educational markets. Where every care has been taken to ensure the reliability and durability of this product it should not be used in safety or reliability critical applications.

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