mLink Library Reference Guide for

mLink 12bit Digital Port Expander Module (HCMODU0180)

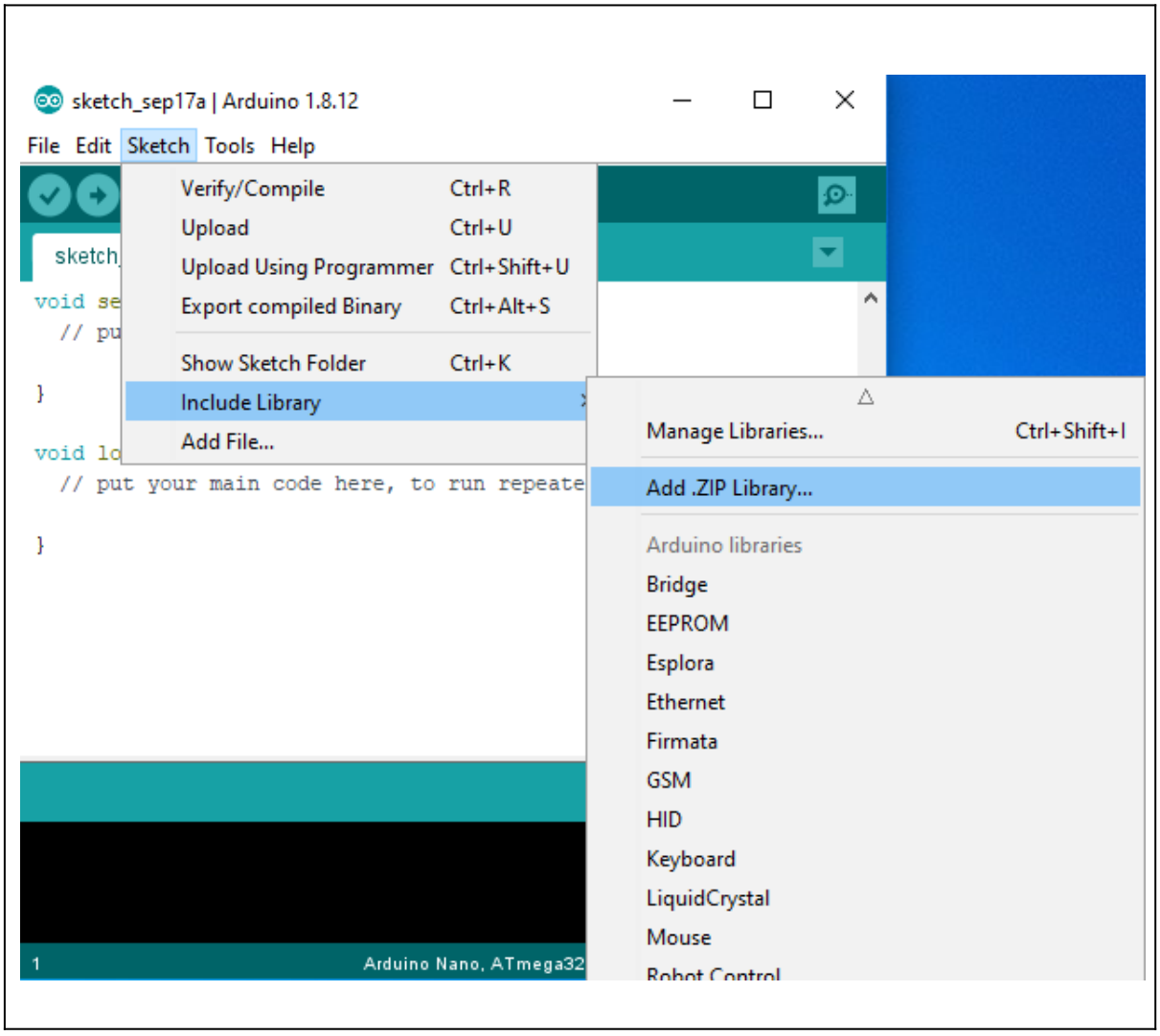
Installing the mLink library

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

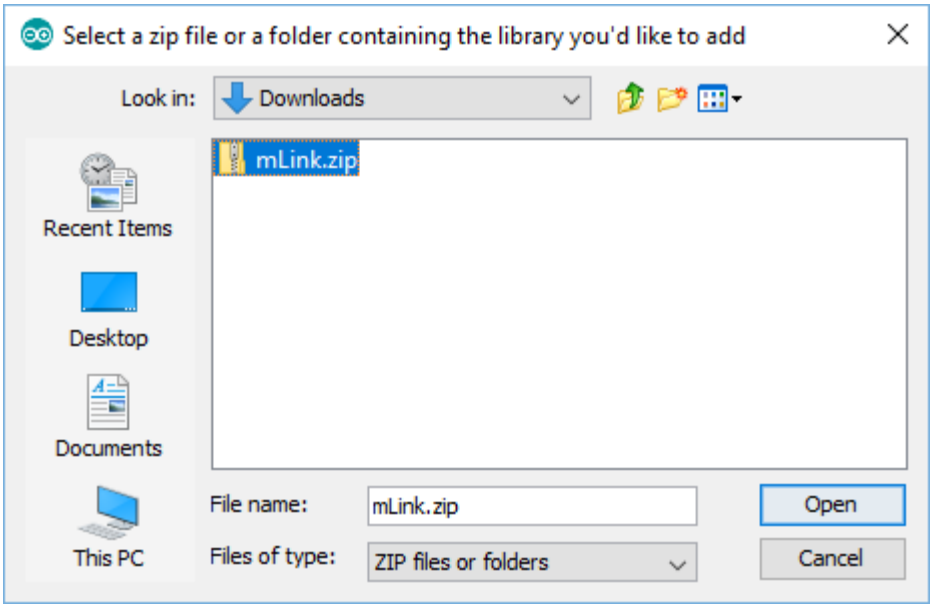
First download the mLink.zip file from the software section of our support forum here:

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
readInt(*add*, *reg*)	Reads the contents of 2 consecutive registers and returns the result as an unsigned integer	*add* = byte value containing I2C address of mLink module *reg* = byte value containing register index of the first register	*unsigned integer* containing the values of the two registers
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
writeInt(*add*, *reg*, *data*);	Writes an unsigned integer to two consecutive registers	*add* = *byte* value containing I2C address of mLink module *reg* = *byte* value containing register index *data* = *unsigned int* value containing the data to write to the register	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 (0x50) you can use the predefined value:

DIO12_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_DIO12_DIR0_REG
MLINK_DIO12_DIR1_REG
MLINK_DIO12_DATA0_REG
MLINK_DIO12_DATA1_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(DIO12_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 (0x50) you can use the predefined value:

DIO12_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_DIO12_DIR0_REG
MLINK_DIO12_DIR1_REG
MLINK_DIO12_DATA0_REG
MLINK_DIO12_DATA1_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(DIO12_I2C_ADD, MLINK_SW_VER_REG);
```

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

Description

Reads the state of two consecutive 8 bit registers and returns the result as an unsigned int.

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:

DIO12_I2C_ADD

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

DIO12_DIR
DIO12_DATA

Returns

An unsigned int containing both registers where the low byte is the first register and the high byte is the second register.

Example Code

Reads the contents of the two digital input registers (register 12 & 13).

```
unsigned int result = mLink.readInt(DIO12_I2C_ADD, DIO12_DATA);
```

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:

DIO12_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_DIO12_DIR0_REG
MLINK_DIO12_DIR1_REG
MLINK_DIO12_DATA0_REG
MLINK_DIO12_DATA1_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

Sets bit 0 in register DIR0 high, which results in digital pin 0 being set to an output.

```
mLink.writeBit(DIO12_I2C_ADD, MLINK_DIO12_DIR0_REG, 0, HIGH);
```

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 (0x50) you can use the predefined value:

DIO12_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_DIO12_DIR0_REG
MLINK_DIO12_DIR1_REG
MLINK_DIO12_DATA0_REG
MLINK_DIO12_DATA1_REG

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

Returns

None

Example Code

Changes the I2C address to 0x52 by writing to the address register.

```
byte data = 0x52;
 mLink.write(DIO12_I2C_ADD, MLINK_ADD_REG, data);
```

mLink.writeInt(add, reg, data);

Description

Writes an unsigned integer to two consecutive 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:

DIO12_I2C_ADD

reg: byte value containing the first 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:

DIO12_DIR
DIO12_DATA

Data: unsigned int containing the data to write to the two registers where the low byte is the first register and the high byte is the second register.

Returns

None

Example Code

Sets all 12 digital outputs high.

```
unsigned int data = 0b0000111111111111;
 mLink.writeInt(DIO12_I2C_ADD, DIO12_DATA, data);
```

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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