



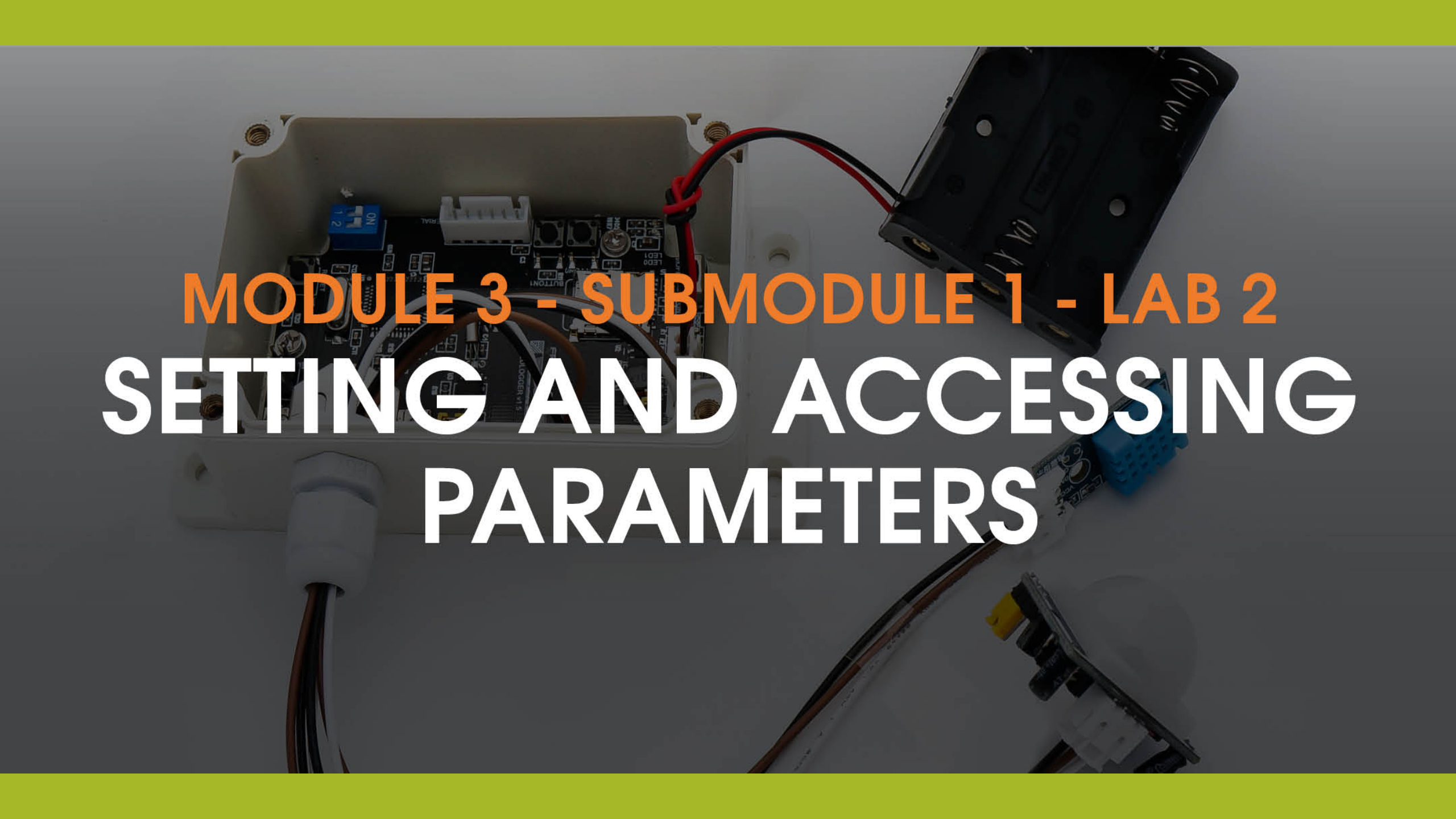
VIRTUAL COURSE
**BUILD YOUR OWN
DATA LOGGER**



WILDLABS.NET

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FREAKLABS



MODULE 3 - SUBMODULE 1 - LAB 2
**SETTING AND ACCESSING
PARAMETERS**

Command Line - Lab 1 Recap

We:

- Installed cmdArduino library
- Went through the library functions including `cmd.begin()`, `cmd.add()`, `cmd.poll()`, `cmdFunctionName()`
- Wrote our first command: Hello Command Line

Command Line - Lab 2

Goal:

- Understand how the cmdFunctionName() takes in and handles arguments
- Write a command that lists its own arguments
- Understand how to change parameters by passing in arguments through the serial monitor
- Set the date on a pretend real time clock, and print it out, all via the serial console

Recap

- *Parameters (similar to variable) = refers to an unknown data value capable of being set by the user, eg. Through the command line.*
- *Arguments = a value that is passed into a command, function, or routine*

Programming Refresh – Data Types

Data types (in C++)

- Character (char) is a data type used to store a single character which might be a letter, a space, a number or a symbol. Eg. "a" "1" "!"
- String (str) = a series of characters. Can contain letters, spaces, numbers and symbols. eg. "Hello World!", "I'm number 1".
- Integer (int) is a number with no decimal point. Can be positive, negative or zero. eg. 1, 34, -1024, 0
- Floating point number (float) is a number with decimal point that can move. eg 34.4, 1.15, 234.02567,

Programming Refresh – Arrays

Arrays

- An array is a group of related data values called elements.
- The array elements (or values) must be the same data type
- When declaring an array we specify the data type, arrayName and arrayLength.

Eg. `type arrayName[arrayLength] = [..., ..., ...]`

- Access elements (or values) in the array via the element's index (or position in the array).
- Index count starts from 0

Eg. `arrayName[index]`

Programming Refresh –Arrays

Array

If we type *list hello command line* in the serial monitor:

```
char args[4] = ["list", "hello", "command", "line"]
```

0	1	2	3
"list"	"hello"	"command"	"line"

```
args[0] = "list"
```

```
args [1] = "hello"
```

```
args [2] = "command"
```

```
args [3] = "line"
```

Programming Refresh – “for” Loop

“for” Loop

- A “for” Loop is used to repeat a specific block of code a certain number of times.
- Often used to loop through an array, and do something to all the elements.

Eg.

```
int i;  
for (i=0; i<arrayLength; i++)  
{  
    Serial.println(arrayName[i]);  
}
```


cmdArduino - Program Structure

void cmdFunctionName(int argCnt, char **args)

int argCnt

- The number of arguments we're passing to our function through our the serial monitor
- Gives us the array length for args
- Defaults to 1 which is the command keyword (or first word we type)

char **args

- an array of strings called args.
- Takes each word we've typed as an element of the args array

eg. If we type *list hello command line* into the serial console it creates:

```
string args["list", "hello", "command", "line"]
```

cmdArduino – cmd.conv(arg1)

What we type into the serial console is a string (ASCII text).

Therefore we need to convert any numbers from a string into an integer using the `cmd.conv(args[index])` function

cmd.conv(args[index])

If we type `list 5` into the serial console, and want to convert "5" into a number 5, we write :

```
int variableName = cmd.conv(args[1])
```

Where `args[1] = "5"` in our string array `args`.

Now let's get into the code!

Writing a command that lists its own arguments

cmdList

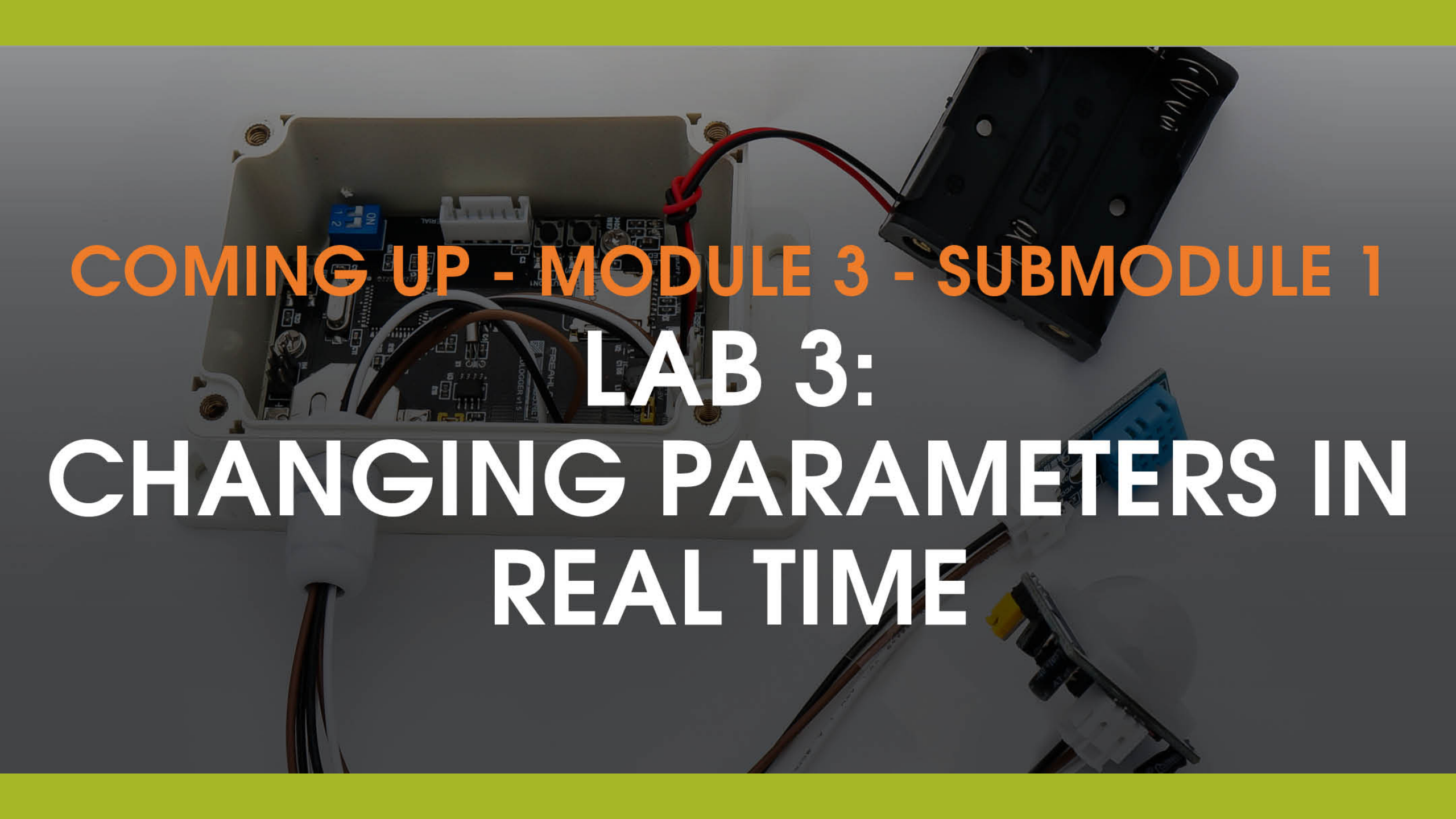
Setting a date on our pretend realtime clock (changing the date through the serial console)

cmdSetDate

Troubleshooting!

If your code doesn't verify check:

- The correct board is selected
- The correct port is selected
- There's no typos in your code
- Function and variables names are consistent (case sensitive)
- Each opening bracket has a closing bracket
- Each statement has a semi-colon at the end

A photograph of an open electronic device, possibly a microcontroller board, with a circuit board visible inside. A black battery is connected to the board via red and black wires. Several other cables and connectors are visible, including a blue ribbon cable and a white connector. The background is a light gray surface.

COMING UP - MODULE 3 - SUBMODULE 1

LAB 3:

**CHANGING PARAMETERS IN
REAL TIME**