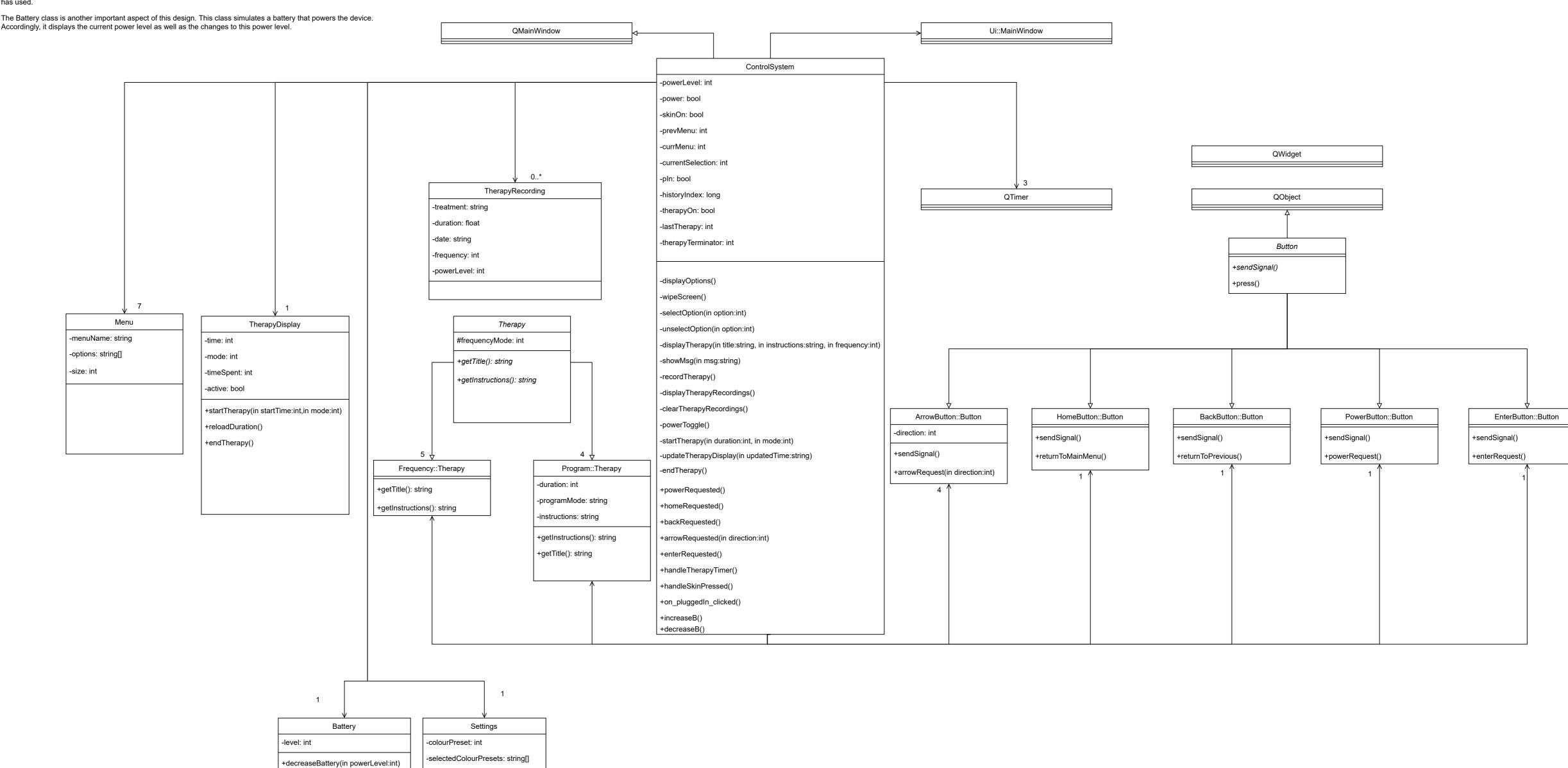# UML Diagram - MCT Device Simulator

This design follows the mediator pattern, in that the ControlSystem controls all aspects of the MCT Device. So all signals from sensors/buttons go to the ControlSystem where it then reviews signals from the other classes, makes the appropriate decisions, and sends back instructions. The observer pattern is also present as the QT framework is used. The simulation follows the model, control and view design, where the models are the classes that the ControlSystem controls, the view is the Ui object, and the control is from ControlSystem class.

For the all Button objects, a UI element will be connected and when it is interacted with (through use of the UI element's signal and Button's slot), pressed() will be called, which will call sendSignal(), which will call the specific Button's signal, and behavior is handled from there when this reaches a slot at ControlSystem.

Another integral part of this design is the main menu of the device. The menu object is responsible for displaying the various menus of the device. Among the menus, three of the options stand out. There are three separate classes to represent each of them. These classes are the Frequency class, Program class and the Settings class. Also, note that the Frequency and Therapy classes both inherit from the Therapy class. Executing the various therapies is the main purpose of this device simulator. In addition to the Therapy class, there is also a TherapyDisplay class to display the various therapies. There is also a TherapyRecording class that handles the recording of all the therapies that the user has used.

The Battery class is another important aspect of this design. This class simulates a battery that powers the device. Accordingly, it displays the current power level as well as the changes to this power level.

QMainWindow

Ui::MainWindow

QWidget

QObject

ControlSystem
- -powerLevel: int
- -power: bool
- -skinOn: bool
- -prevMenu: int
- -currMenu: int
- -currentSelection: int
- -pIn: bool
- -historyIndex: long
- -therapyOn: bool
- -lastTherapy: int
- -therapyTerminator: int

- -displayOptions()
- -wipeScreen()
- -selectOption(in option:int)
- -unselectOption(in option:int)
- -displayTherapy(in title:string, in instructions:string, in frequency:int)
- -showMsg(in msg:string)
- -recordTherapy()
- -displayTherapyRecordings()
- -clearTherapyRecordings()
- -powerToggle()
- -startTherapy(in duration:int, in mode:int)
- -updateTherapyDisplay(in updatedTime:string)
- -endTherapy()
- +powerRequested()
- +homeRequested()
- +backRequested()
- +arrowRequested(in direction:int)
- +enterRequested()
- +handleTherapyTimer()
- +handleSkinPressed()
- +on_pluggedIn_clicked()
- +increaseB()
- +decreaseB()

TherapyRecording
- -treatment: string
- -duration: float
- -date: string
- -frequency: int
- -powerLevel: int

Menu
- -menuName: string
- -options: string[]
- -size: int

TherapyDisplay
- -time: int
- -mode: int
- -timeSpent: int
- -active: bool

- +startTherapy(in startTime:int,in mode:int)
- +reloadDuration()
- +endTherapy()

Therapy
- #frequencyMode: int

- +*getTitle(): string*
- +*getInstructions(): string*

Frequency::Therapy
- +getTitle(): string
- +getInstructions(): string

Program::Therapy
- -duration: int
- -programMode: string
- -instructions: string

- +getInstructions(): string
- +getTitle(): string

QTimer

Button
- +*sendSignal()*
- +press()

ArrowButton::Button
- -direction: int

- +sendSignal()
- +arrowRequest(in direction:int)

HomeButton::Button
- +sendSignal()
- +returnToMainMenu()

BackButton::Button
- +sendSignal()
- +returnToPrevious()

PowerButton::Button
- +sendSignal()
- +powerRequest()

EnterButton::Button
- +sendSignal()
- +enterRequest()

Battery
- -level: int

- +decreaseBattery(in powerLevel:int)
- +increaseBattery()

Settings
- -colourPreset: int
- -selectedColourPresets: string[]
- -unSelectedColourPresets: string[]

Multiplicities: 0..*, 7, 1, 5, 4, 3, 1, 1, 4, 1, 1, 1, 1