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# HomeControl

Mar 26, 2020



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## 1.1 Action Engine

ActionEngine for HomeControl

```
class homecontrol.dependencies.action_engine.ActionEngine (item: homecontrol.dependencies.entity_types.Item,  
                                                         core)
```

Bases: object

Holds available actions for an item

```
coroutine execute (name: str, *args, **kwargs) → bool  
    Executes an action, optionally with parameters
```

```
homecontrol.dependencies.action_engine.action (arg: Union[Callable, str]) → Callable  
    Decorator to mark a coroutine as an action
```

```
>>> @action  
>>> async def foo(): ...
```

```
>>> @action(name)  
>>> async def foo(): ...
```

## 1.2 Configuration Manager

config\_manager module

```
class homecontrol.dependencies.config_manager.ConfigManager (cfg: dict, cfg_path: str)
```

Bases: object

Manages the configuration with configuration domains

**coroutine approve\_domain\_config** (*domain: str, config: dict, initial: bool = True*) → dict  
Returns an approved and validated version of config for a domain

**get** (*key, default=None*)  
getter for self.cfg

**coroutine register\_domain** (*domain: str, handler: object = None, schema: voluptuous.schema\_builder.Schema = None, allow\_reload: bool = False, default: dict = None*) → object  
Registers a configuration domain

Objects can register themselves to their own configuration domain and subscribe to changes in the configuration

### Parameters

- **domain** (*str*) – The configuration domain (A top-level key in config.yaml)
- **handler** (*object*) – The object subscribing to this domain. Methods it can implement are: - `approve_configuration(domain, config) -> bool`: - `apply_new_configuration(domain, config) -> None`: If not specified then your configuration domain will not be reloadable

**allow\_reload (bool)**: Allow reloading this configuration domain

**schema (voluptuous.Schema)**: Schema to validate the configuration and to fill in defaults

**default (dict)**: A default configuration

**Returns** A validated and approved version of the configuration

**coroutine reload\_config** () → None  
Reloads the configuration and updates where it can

## 1.3 Data Types

data types for HomeControl that can be translated to JSON for API usage

**class** homecontrol.dependencies.data\_types.**Color** (*h: int, s: int, l: int*)

Bases: object

Representation for a color

**dump** () -> (<class 'int'>, <class 'int'>, <class 'int'>)

Dumps the Color into a JSON serialisable format

**staticmethod from\_data** (*hsl: tuple*)

Constructor from the data received through the API or configuration

**staticmethod from\_hsl** (*hsl: tuple*)

HSL constructor

**staticmethod from\_rgb** (*rgb: tuple*)

RGB constructor

**h**

Hue

**l**

Lightness

```

rgb
    RGB

s
    Saturation

```

```

class homecontrol.dependencies.data_types.DateTime
    Bases: datetime.datetime

    date time format

    dump ()
        Dump to JSON serialisable data

    staticmethod from_data (data)
        Construct from JSON serialisable data

```

## 1.4 Entity Types

Module containing the entity types Every new Item or Module will get one of these classes as a base class

```

class homecontrol.dependencies.entity_types.Item
    Bases: object

    A dummy Item

    config_schema = <Schema(<class 'object'>, extra=PREVENT_EXTRA, required=False) object>

    coroutine constructor (identifier: str, name: str, cfg: dict, state_defaults: dict, core: homecontrol.core.Core) → Item
        Constructs an item

    coroutine init () → None
        Default init method

    status = 'offline'

    coroutine stop () → None
        Default stop method

class homecontrol.dependencies.entity_types.Module
    Bases: object

    A dummy Module

    folder_location = None

    coroutine init () → None
        Default init method

    coroutine stop () → None
        Default stop method

homecontrol.dependencies.entity_types.ModuleDef
    alias of homecontrol.dependencies.entity_types.Module

```

## 1.5 Event Engine

EventEngine for HomeControl

```
class homecontrol.dependencies.event_engine.Event (event_type: str, data: dict = None,  
timestamp: int = None, kwargs: dict  
= None)  
  
Bases: object  
Representation for an Event  
  
class homecontrol.dependencies.event_engine.EventEngine (core)  
Bases: object  
Dispatcher for events  
  
broadcast (event_type: str, data: dict = None, **kwargs) → List[_asyncio.Future]  
Broadcast an event and return the futures  
  
Every listener is a coroutine that will simply receive event and kwargs  
  
Example: >>> async def on_event(event: Event, ...): >>> return  
  
broadcast_threaded (event_type: str, data: dict = None, **kwargs) → List[_asyncio.Task]  
Same as broadcast BUT - It returns Futures and not Tasks - It uses threads  
  
staticmethod create_event (event_type: str, data: dict = None, **kwargs) → homecon-  
trol.dependencies.event_engine.Event  
Creates an Event to be broadcasted  
  
coroutine gather (event_type: str, data: dict = None, timeout: Union[float, int, None] = None,  
**kwargs) → List[Any]  
Broadcast an event and return the results  
  
get_event_handlers (event: homecontrol.dependencies.event_engine.Event) → List[T]  
Returns a list of handlers for an Event  
  
register (event: str) → Callable  
Decorator to register event handlers  
  
remove_handler (event: str, handler: Callable) → None  
Removes an event handler
```

## 1.6 Item Manager

ItemManager for HomeControl

```
class homecontrol.dependencies.item_manager.ItemManager (core)  
Bases: object  
ItemManager manages all your stateful items  
  
coroutine add_from_module (mod_obj: homecontrol.dependencies.entity_types.Module) →  
None  
Adds the item specifications of a module to the dict of available ones  
  
mod_obj: homecontrol.entity_types.Module  
  
coroutine create_from_storage_entry (storage_entry: dict) → homecon-  
trol.dependencies.entity_types.Item  
Creates an Item from a storage entry  
  
coroutine create_item (identifier: str, item_type: str, cfg: dict = None,  
state_defaults: dict = None, name: str = None) → homecon-  
trol.dependencies.entity_types.Item  
Creates a HomeControl item
```

**coroutine init** () → None  
Initialise the items from configuration

**coroutine init\_item** (*item: homecontrol.dependencies.entity\_types.Item*) → None  
Initialises an item

**for ... in iter\_items\_by\_id** (*iterable*) → [*<class homecontrol.dependencies.entity\_types.Item>*]  
Translates item identifiers into item instances

**load\_yaml\_config** () → None  
Loads the YAML configuration

**register\_item** (*item: homecontrol.dependencies.entity\_types.Item*) → None  
Registers an item

**coroutine remove\_item** (*identifier: str*) → None  
Removes a HomeControl item

**identifier: str** The item's identifier

**coroutine stop\_item** (*item: homecontrol.dependencies.entity\_types.Item, status: homecontrol.const.ItemStatus = <ItemStatus.STOPPED: 'stopped'>*) → None  
Stops an item

**update\_storage\_entry** (*entry: dict*) → None  
Updates a config storage entry

`homecontrol.dependencies.item_manager.yaml_entry_to_json` (*yaml\_entry: dict*) → dict  
Converts a yaml entry to a JSON entry

## 1.7 JSON Response

JSONResponse module

**class** `homecontrol.dependencies.json_response.JSONResponse` (*data: Any = None, error: str = None, status\_code: int = 200, core=None, headers: dict = None*)

Bases: `aiohttp.web_response.Response`

A HTTP response for JSON data

## 1.8 JSON

JSON Encoder and Decoder

**class** `homecontrol.dependencies.json.JSONEncoder` (*core: Core, \*args, \*\*kwargs*)

Bases: `json.encoder.JSONEncoder`

Custom JSONEncoder that also parses HomeControl types

**default** (*o*)

Encode custom types

`homecontrol.dependencies.json.dump` (*obj*, *fp*, \*, *skipkeys=False*, *ensure\_ascii=True*, *check\_circular=True*, *allow\_nan=True*, *indent=None*, *separators=None*, *sort\_keys=False*, *core: Core = None*, \*\**kw*)

Dumps an object into a Writer with support for HomeControl's data types

`homecontrol.dependencies.json.dumps` (*obj*, \*, *skipkeys=False*, *ensure\_ascii=True*, *check\_circular=True*, *allow\_nan=True*, *indent=None*, *separators=None*, *sort\_keys=False*, *core: Core = None*, \*\**kw*)

Dumps an object into a JSON string with support for HomeControl's data types

## 1.9 Module Manager

ModuleManager module

**class** `homecontrol.dependencies.module_manager.ModuleFolder` (*name: str*)  
Bases: object

module folder representation to create a dummy package in `sys.modules`

**class** `homecontrol.dependencies.module_manager.ModuleManager` (*core*)  
Bases: object

Manages your modules

**coroutine** `init` () → None  
Initialise the modules

**coroutine** `load_file_module` (*mod\_path: str*, *name: str*) -> (<class 'homecontrol.dependencies.entity\_types.Module'>, <class 'Exception'>)  
Loads a module from a file and initialises it  
Returns a Module object

**coroutine** `load_folder` (*path: str*) → [<class 'object'>]  
Load every module in a folder

**coroutine** `load_folder_module` (*path: str*, *name: str*) -> (<class 'homecontrol.dependencies.entity\_types.Module'>, <class 'Exception'>)  
Loads a module from a folder and initialises it  
It also takes care of pip requirements  
Returns a Module object

**resource\_path** (*module: homecontrol.dependencies.entity\_types.Module*, *path: str = ""*) → str  
Returns the path for a module's resource folder Note that only folder modules can have a resource path

**coroutine** `stop` () → None  
Unloads all modules to prepare for a shutdown

## 1.10 State Engine

StateEngine module

---

```

class homecontrol.dependencies.state_engine.State (state_engine:      homecon-
                                                    trol.dependencies.state_engine.StateEngine,
                                                    default, getter: Callable = None,
                                                    setter: Callable = None, name: str
                                                    = None, state_type: type = None,
                                                    schema: dict = None, poll_interval:
                                                    float = None)

Bases: object

Holds one state of an item

check_value (value) → voluptuous.error.Error
    Checks if a value is valid for a state

coroutine get ()
    Gets a state

coroutine poll_value () → None
    Polls the current state and updates it

coroutine set (value) → dict
    Sets a state

coroutine update (value)
    Updates a state

class homecontrol.dependencies.state_engine.StateDef (poll_interval: Optional[float]
                                                    = None, default: Any = None,
                                                    default_factory: Callable =
                                                    None)

Bases: object

getter () → Callable
    Decorator to register a getter

register_state (state_engine: StateEngine, name: str, item: homecon-
                                                    trol.dependencies.entity_types.Item) → State
    Generates a State instance and registers it to a StateEngine

setter (schema: Optional[voluptuous.schema_builder.Schema] = None) → Callable
    Decorator to register a setter

class homecontrol.dependencies.state_engine.StateEngine (item:      homecon-
                                                    trol.dependencies.entity_types.Item,
                                                    core:      homecon-
                                                    trol.core.Core,
                                                    state_defaults: dict =
                                                    None)

Bases: object

Holds the states of an item

coroutine bulk_update (**kwargs)
    Called from an item to update multiple states

check_value (state: str, value) → voluptuous.error.Error
    Checks if a value is valid for a state

coroutine dump () → dict
    Return a JSON serialisable object

coroutine get (state: str)
    Gets an item's state

```

**register\_state** (*state: homecontrol.dependencies.state\_engine.State*) → None

Registers a State instance to the StateEngine

**coroutine set** (*state: str, value*) → dict

Sets an item's state

**coroutine update** (*state: str, value*)

Called from an item to update its state

## 1.11 Throttle Function

throttle\_function

**class** homecontrol.dependencies.throttle\_function.**throttle** (*s: float = 1*)

Bases: object

Throttles a function so it only gets called at a fixed frequency

## 1.12 Tick Engine

TickEngine

**class** homecontrol.dependencies.tick\_engine.**TickEngine** (*core*)

Bases: object

The TickEngine is there to handle every kind of recurring task. Using the decorator TickEngine.tick(interval) you can add a task.

**remove\_tick** (*interval: float, coro*) → None

Removes a tick handler for an interval

**coroutine stop** ()

Called on HomeControl shutdown

**tick** (*interval: float*) → Callable

Register a tick

**interval: int** Interval in seconds

## 1.13 Validators

## 1.14 YAML Loader

Provides a YAML loader

**class** homecontrol.dependencies.yaml\_loader.**Constructor**

Bases: yaml.constructor.SafeConstructor

Constructor for yaml

**env\_var\_constructor** (*node: yaml.nodes.Node*) → str

Embeds an environment variable !env\_var <name> [default]

**format\_string\_constructor** (*node: yaml.nodes.Node = None*) → str

Renders a format string .. rubric:: Example

```
!format { template: "Hello {who}", who: You }
```

**include\_dir\_file\_mapped\_constructor** (*node: yaml.nodes.Node = None*) → dict

```
!include_dir_file_mapped <folder>
```

Loads multiple files from a folder and maps their contents to their filenames

**include\_file\_constructor** (*node: yaml.nodes.Node = None*) → object

!include <path> ~/ for paths relative to your home directory / for absolute paths anything else for paths relative to your config folder

**include\_merge\_constructor** (*node: yaml.nodes.Node = None*) -> (<class 'list'>, <class 'dict'>)

```
!include <file|folder> ...
```

Merges file or folder contents

This constructor only works if all the files' contents are of same type and if this type is either list or dict.

**listdir\_constructor** (*node: yaml.nodes.Node*) → list

```
!listdir <path>
```

Returns the contents of a directory

**path\_constructor** (*node: yaml.nodes.Node*) → str

!path <path> ~/ for paths relative to your home directory / for absolute paths anything else for paths relative to your config folder

**type\_constructor** (*suffix: str, node: yaml.nodes.Node = None*) → type

Construct a custom object

**vol\_constructor** (*suffix: str, node: yaml.nodes.Node = None*) → voluptuous.schema\_builder.Schema

Construct a voluptuous object

**class** homecontrol.dependencies.yaml\_loader.**YAMLLoader** (*stream, cfg\_folder: str = None*)

Bases: yaml.reader.Reader, yaml.scanner.Scanner, yaml.parser.Parser, yaml.composer.Composer, *homecontrol.dependencies.yaml\_loader.Constructor*, yaml.resolver.Resolver

Loads YAML with custom constructors

**classmethod load** (*data, cfg\_folder: str = None*)

Loads data



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### homecontrol module

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The core instance for HomeControl

```
class homecontrol.core.Core (cfg: dict, cfg_file: str, loop: Optional[asyncio.events.AbstractEventLoop] = None, start_args: Optional[Dict[KT, VT]] = None)
```

Bases: object

Represents the root object for HomeControl

```
coroutine block_until_stop () → int  
    Blocking method to keep HomeControl running until Core.block_future is done  
  
    Also triggers the stop coroutine when block_future has a result
```

```
coroutine bootstrap () → None  
    Startup coroutine for Core
```

```
restart () → None  
    Restarts HomeControl
```

```
shutdown () → None  
    Shuts HomeControl down
```

```
coroutine stop () → None  
    Stops HomeControl
```

Constants used by HomeControl

```
class homecontrol.const.ItemStatus
```

Bases: enum.Enum

Every status an item can have

```
OFFLINE = 'offline'
```

```
ONLINE = 'online'
```

```
STOPPED = 'stopped'
```

```
WAITING_FOR_DEPENDENCY = 'waiting-for-dependency'
```

### Exceptions

**exception** `homecontrol.exceptions.ConfigDomainAlreadyRegistered`

Bases: `homecontrol.exceptions.HomeControlException`

The configuration domain is already registered

**exception** `homecontrol.exceptions.ConfigurationNotApproved`

Bases: `homecontrol.exceptions.HomeControlException`

Configuration has not been approved

**exception** `homecontrol.exceptions.HomeControlException`

Bases: `BaseException`

The base exception for HomeControl

**exception** `homecontrol.exceptions.ItemNotFoundException`

Bases: `homecontrol.exceptions.HomeControlException`

Item not found

**exception** `homecontrol.exceptions.ItemNotOnlineError`

Bases: `homecontrol.exceptions.HomeControlException`

Item is not online

**exception** `homecontrol.exceptions.ItemTypeNotExistsError`

Bases: `homecontrol.exceptions.HomeControlException`

Item type does not exist

**exception** `homecontrol.exceptions.ModuleNotFoundException`

Bases: `homecontrol.exceptions.HomeControlException`

Module not found

**exception** `homecontrol.exceptions.PipInstallError`

Bases: `homecontrol.exceptions.HomeControlException`

A pip install failed

The HTTP API for HomeControl Currently it supports following routes:

**GET /api/ping**  
Ping the API

**Example request:**

```
GET /api/ping HTTP/ HTTP/1.1
Host: homecontrol.local:8080
Accept: application/json
```

**Example response:**

```
HTTP/1.1 200 OK
Content-Type: application/json; charset=utf-8

{
  "data": "PONG",
  "status_code": 200,
  "success": true
}
```

**Response Headers**

- `Content-Type` – application/json

**Status Codes**

- `200 OK` – HomeControl is online



## CHAPTER 4

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### Custom Scripts

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This module offers a very simple way to execute custom code in HomeControl Please note that this method is quite dangerous as these scripts could do anything and if you're running HomeControl as root they will even have root privileges



Provides an interface with a Raspberry Pi's GPIO ports using pigpio.

### 5.1 Installation

You can find an installation guide on the [official website](#).

On Raspbian you only need to run

```
sudo apt update
sudo apt install pigpio
```

The simplest way to automatically run pigpio on boot would be:

```
sudo bash -c "echo /usr/bin/pigpiod >> /etc/rc.local"
```



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