소프트웨어공학개론
Electronic Door Lock System

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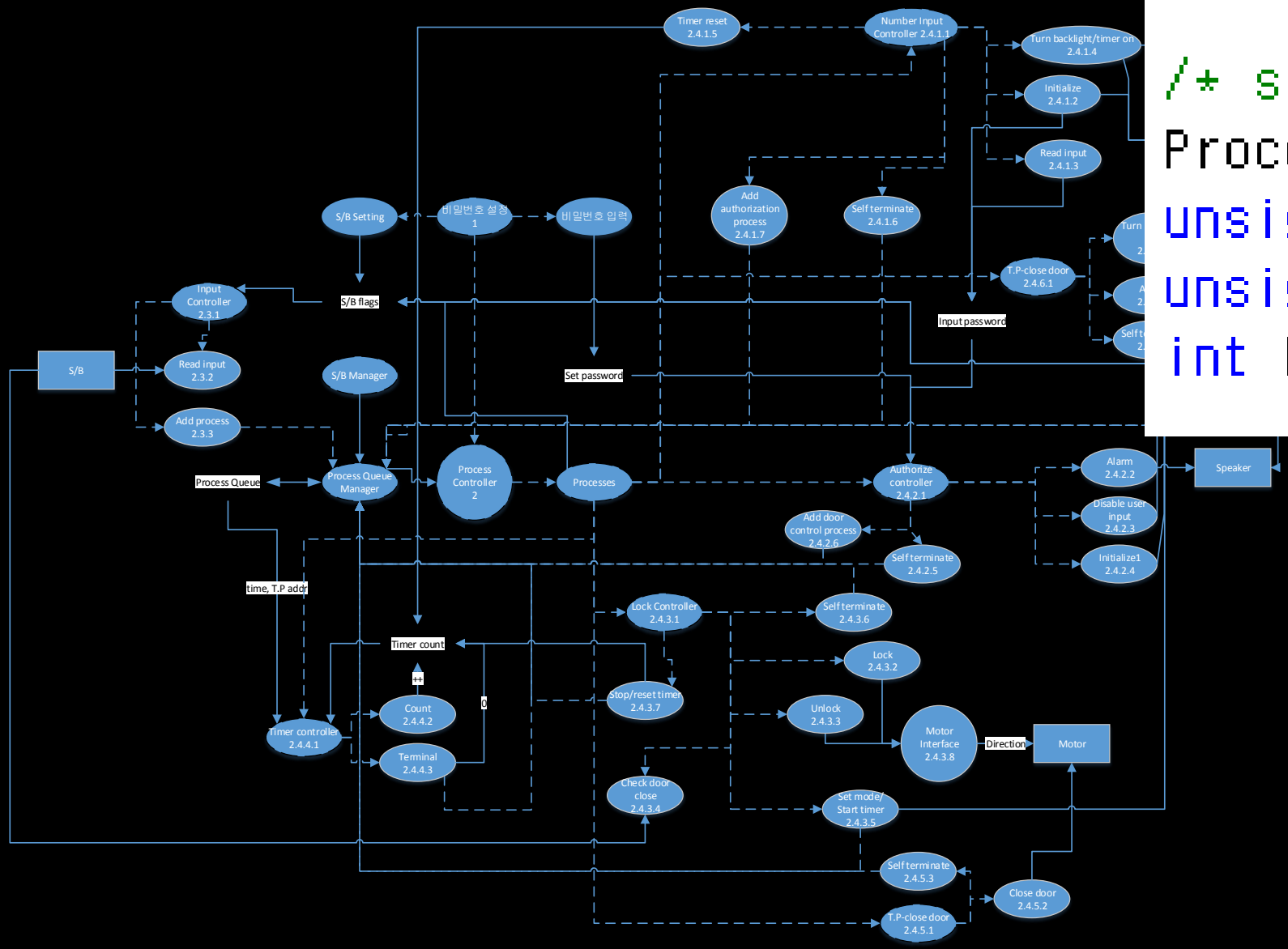
Contents

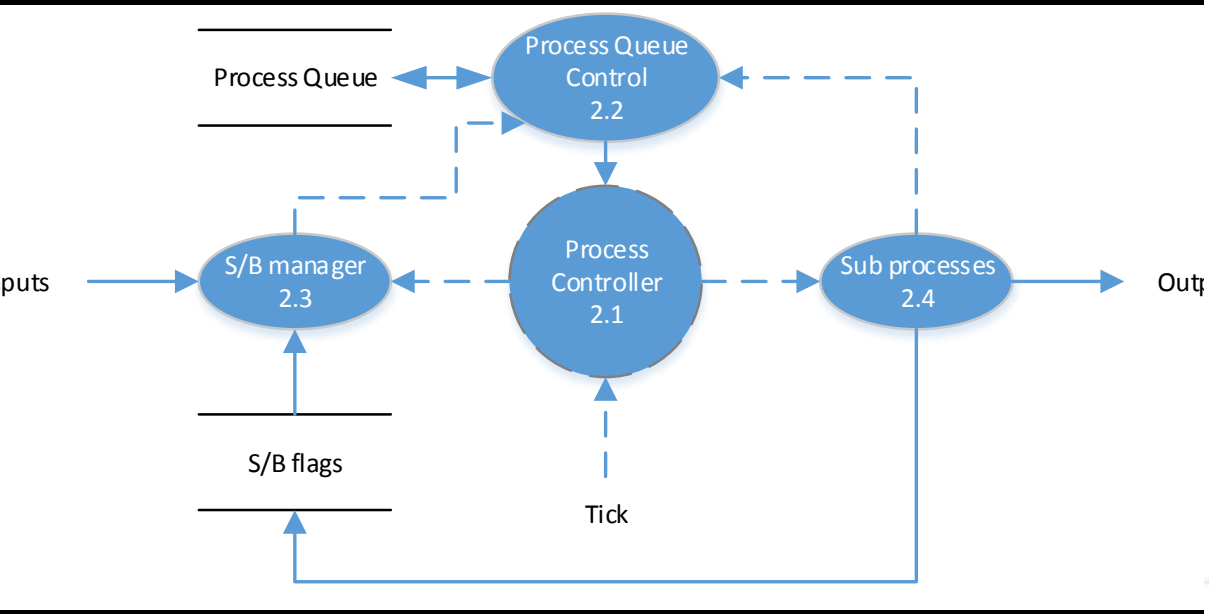
- Singleton 변수
- 메인루프 – 서브프로세스 구조 : Strategy
- 프로세스 큐 : Strategy
- 입력/출력
- 타이머
- 시연
- QNA

Singleton 변수 stdafx.h




```
/* singleton variables */
ProcessQueue *PQ;
unsigned *SBFlags;
unsigned *Pass;
int MotorDeg;
```

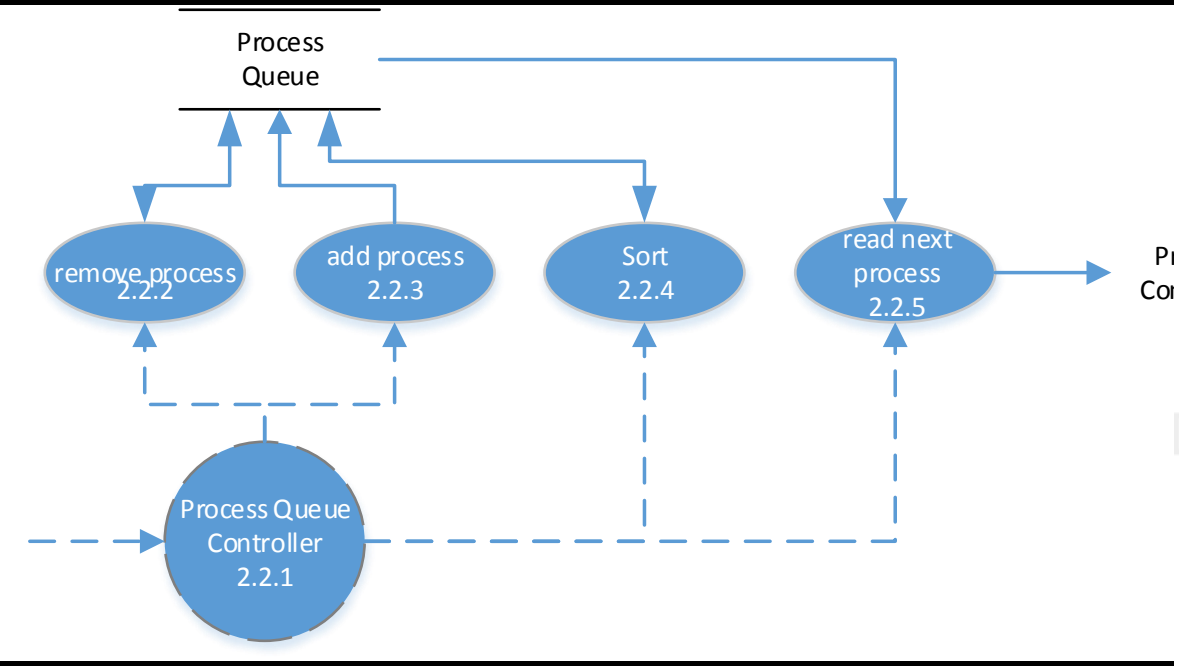
메인루프-서브프로세스 구조 SubProcesses.h / main.c




```
#include "stdafx.h"

void *SBManager(int arg1, int arg2);
void *authorize(int arg1, int arg2);
void *numIn(int comm, int arg2);
void *doorCtrl(int comm, int arg2);
void *timer(int time, void(*TP)(int, int));
void *TPClose(int arg1, int arg2);
void *TPTBO(int arg1, int arg2);
```

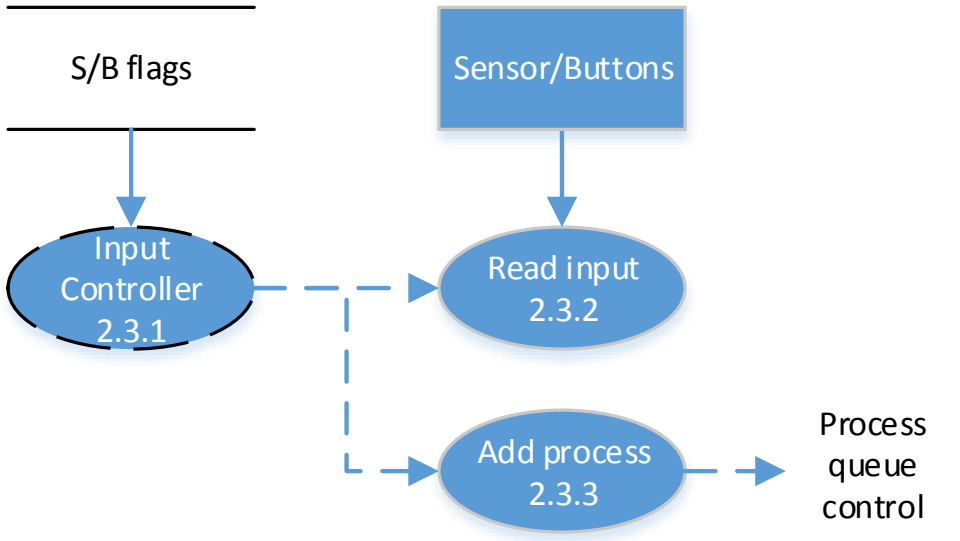
```
while (!GetAsyncKeyState(VK_ESCAPE)){
    time(&ts);
    PQ->run();

    IOtoFlags(SBFlags);
    time(&te);
    timelapse = te - ts;
    if (timelapse < TICK && timelapse >= 0)
        Sleep(TICK - timelapse);
    else
        printf("₩n########runtime calculation error#####
}
```

프로세스 큐 ProcessQueue.h




```
typedef struct _ProcessQueue{
    int (*size)();
    void (*add)(void *,int,int);
    void(*run)();
    ProcessNode *(*find)(void *, int, int);
    void(*editArg)(void *, int, int, int, int);
    void(*del)(void *);
    void(*findDel)(void *,int,int);
    ProcessLinkedList list;
}ProcessQueue;

void initPQ();
static void *add(void *, int arg1, int arg2);
static void *addNode(ProcessNode *n);
static int size();
static void *run();
static ProcessNode *find(void *addr, int arg1, int arg2);
static void *editArg(void *addr,int arg1, int arg2, int narg1, int narg2);
static void *del(void *addr);
static void *findDel(void *addr, int arg1, int arg2);
```

입력/출력 stdafx.h/hexUtil.h

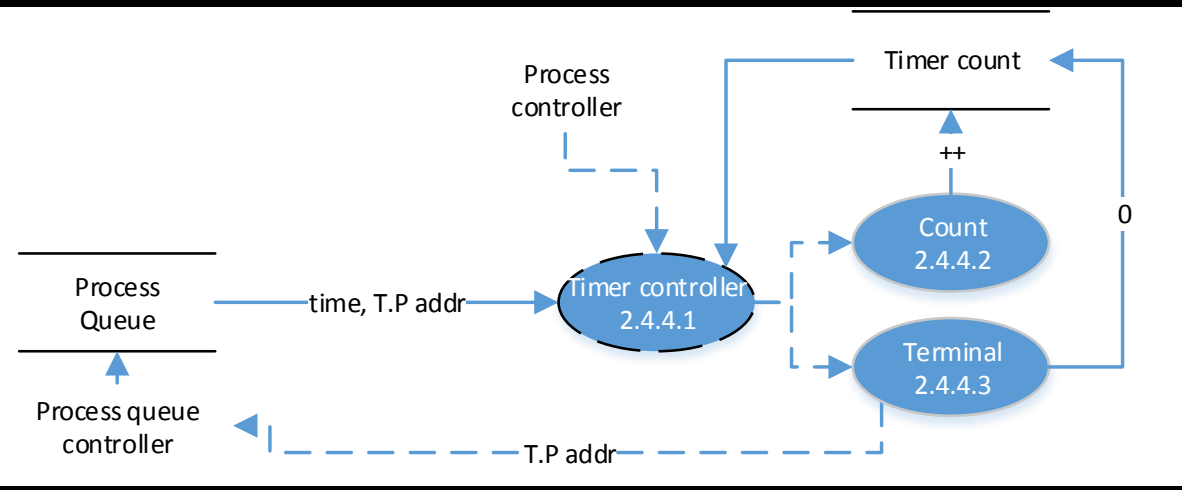



```c
/* Sensor/Buttons */
//door button
#define DB 0
//cover sensor
#define CS 1
//key sensor
#define KS 2
//door closion sensor
#define DS 3

/* number buttons */
#define B0 4
#define B1 5
#define B2 6
#define B3 7
#define B4 8
#define B5 9
#define B6 10
#define B7 11
#define B8 12
#define B9 13

/* Actuators */
//back light
#define BL 14
//motor
#define MT 15
//speaker
#define SP 16

#define MASK 17
```

```c
BitClr(SBFlags, DB);
BitClr(SBFlags, B0 + MASK + i);

//MSB부터 비어있는(F) 비트의 인덱스를 찾아 반환
int findHexBlank(unsigned *val);

//MSB부터 비어있는(F) 비트를 in으로 채운다.
//in:0~9
void putHexInBlank(unsigned *val, int in);

//pos 인덱스의 비트를 0으로 설정한다.
//pos:0-31
void BitClr(unsigned *trg, unsigned pos);

//pos 인덱스의 비트를 1로 설정한다.
//pos:0-31
void BitSet(unsigned *trg, unsigned pos);

//pos 인덱스의 비트를 반환한다.
//pos:0-31
int BitGet(unsigned *trg, unsigned pos);
```

타이머

```
PQ->add(timer, 3 * TPS, TPClose);//start timer
```




```
void *timer(int time, void(*TP)(int, int)){
    PQ->editArg(timer, time, TP, time - 1, TP);
    if (time <= 0){
        PQ->add(TP,0,0);
        PQ->del(timer);
    }
}
```

시연

실행

QNA