

# Black box viewer manual

## 1. Black box viewer installation method

Download Black Box Install file from a server (<http://biz.lgservice.com>=> GCSC ) and then install as an order below



① Perform install program



② Click **Next**



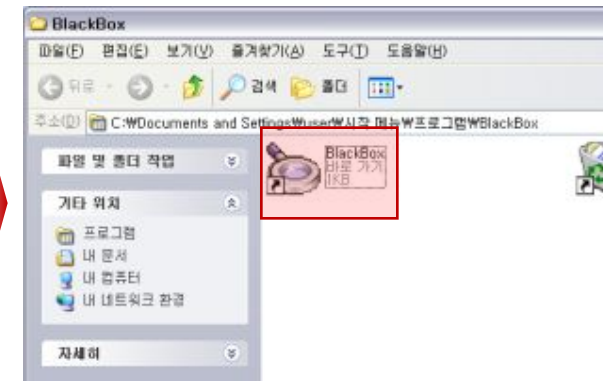
③ Select the path which black box viewer program is installed and then click **Install** button



④ Install progress status



⑤ Click install end **OK** button



⑥ After completing the installation, confirm the implemented file

## 2. Black box viewer explanation

### Manu bar

B.B file loading  
Roboking accumulated data loading

### Map

Mark barriers and cleaning areas

### Event list

Time sequencing organization of a list that is selected on an event tag list

### B.B file list

\*B.B file (One unit per cleaning) list

### Event tag list

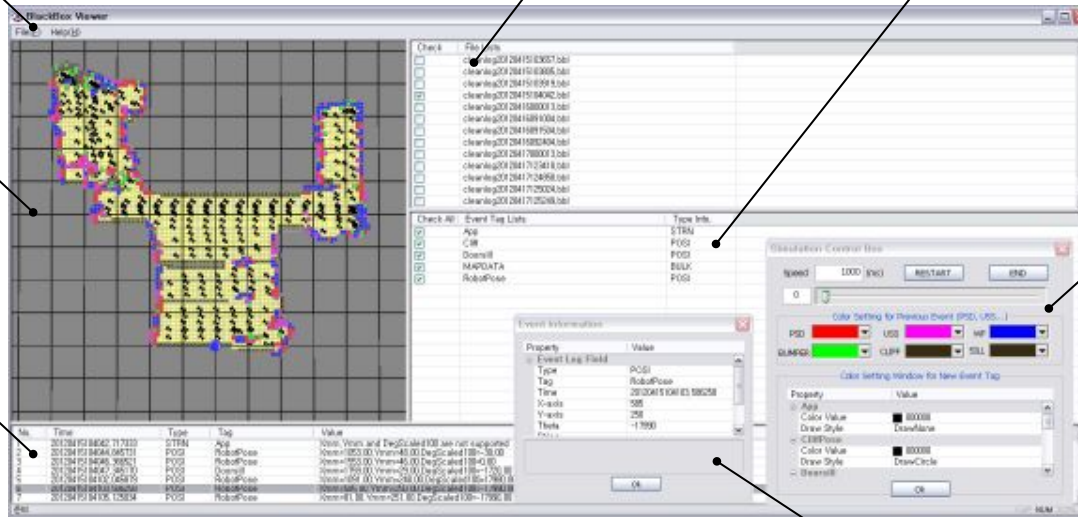
Occurred event list (Start, error, trajectory ,, etc)

### Simulation control box

Time slide bar, barrier color setting event color setting section

### Information

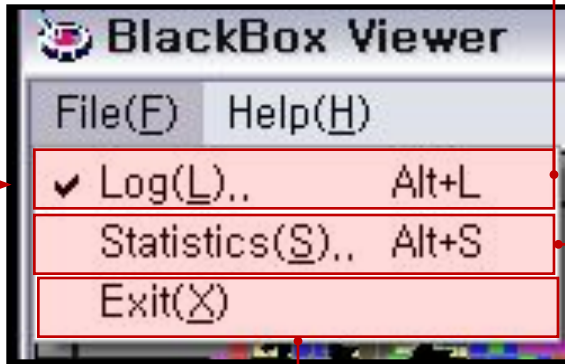
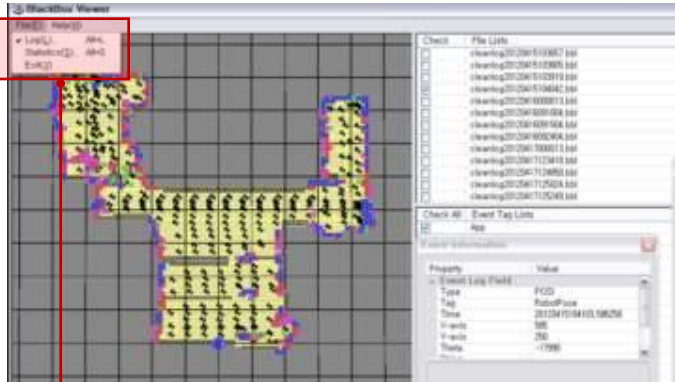
Mark detail information of selected event



\* B.B : Black Box

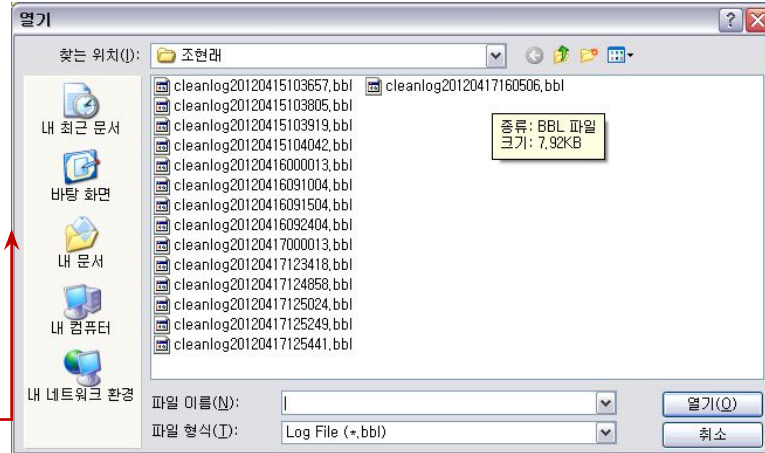
## 2. Black box viewer explanation

### 2.1. Manu Bar



Program end

\* Log (L) : B./B file (\*.ddl) loading, multiple selection is possible



\* Statistics (S) : Whole set accumulated file (\*.stc) loading



\* B.B : Black Box

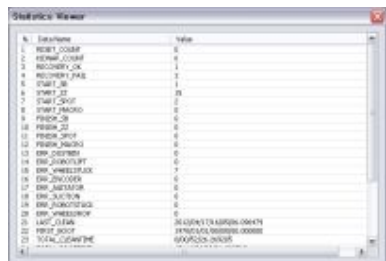
# Black box viewer manual

## 2. Black box viewer explanation

### 2.1. Menu bar

Statistics (S) : Whole set accumulated file (\*.stc) data list (1)

Statistics viewer screen



No.	Indication	Error classification	Indication method
1	RESET_COUNT	Accumulated number of reset occurrence	Times
2	KIDNAP_COUNT	Accumulated number of kidnap occurrence	Times
3	RECOVERY_OK	Accumulated number of kidnap success	Times
4	RECOVERY_FAIL	Accumulated number of kidnap failure	Times
5	START_SB	Accumulated number of meticulous cleaning mode start	Times
6	START_ZZ	Accumulated number of zigzag mode start	Times
7	START_SPOT	Accumulated number of intense cleaning mode start	Times
8	START_MACRO	Accumulated number of designated area mode start	Times
9	FINISH_SB	Accumulated number of meticulous cleaning completion	Times
10	FINISH_ZZ	Accumulated number of zigzag cleaning completion	Times
11	FINISH_SPOT	Accumulated number of intense cleaning completion	Times
12	FINISH_MACRO	Accumulated number of designated area cleaning completion	Times
13	ERR_DUSTBIN	Accumulated number of dust bin error occurrence	Times
14	ERR_ROBOTLIFT	Accumulated number of main body lifting error occurrence	Times
15	ERR_LWHEELSTUCK	Accumulated number of stuck error occurrence on left wheel	Times
16	ERR_RWHEELSTUCK	Accumulated number of stuck error occurrence on right wheel	Times
17	ERR_AGITATOR	Accumulated number of stuck error on main body floor agitator	Times
18	ERR_SUCTION	Accumulated number of stuck error on suction motor	Times
19	ERR_ROBOTSTUCK	Accumulated number of stuck error on main body	Times
20	ERR_WHEELDROP	Accumulated number of wheel lifting error	Times
21	ERR_ENCODER_L	Accumulated number of left wheel encoder error	Times
22	ERR_ENCODER_R	Accumulated number of right wheel encoder error	Times
23	ERR_MOTOR_L	Accumulated number of left motor short error	Times
24	ERR_MOTOR_R	Accumulated number of right motor short error	Times

Confirm accumulated data of Roboking since outgoing

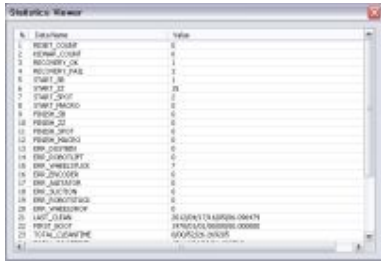


## 2. Black box viewer explanation

### 2.1. Manu bar

Statistics (S) : Whole set accumulated file (\*.stc) data list (2)

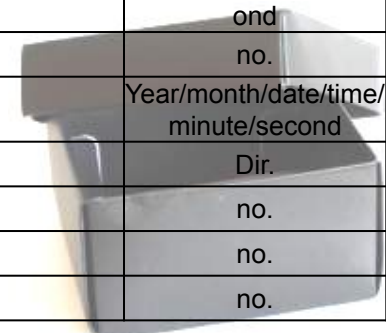
Statistics viewer screen



Confirm accumulated data of Roboking since outgoing



No.	Indication	Error classification	Indication method
25	ERR_MOTOR_RCV	Accumulated number of motor short sense trial	Times
26	START_RESERV	Accumulated number of reserved cleaning start	Times
27	VOICE_COMEHERE	[Voice] Accumulated number of "Come here Roboking "	Times
28	VOICE_START	[Voice] Accumulated number of "Roboking cleaning start"	Times
29	VOICE_PAUSE	[Voice] Accumulated number of " Roboking"	Times
30	VOICE_SPOT	[Voice] Accumulated number of "Intense cleaning"	Times
31	VOICE_HOMING	[Voice] Accumulated number of " Roboking charge"	Times
32	VOICE_WAIT	[Voice] Accumulated number of "Roboking wait"	Times
33	CURRENTBUMPING	Accumulated number of wheel bumping occurrence	Times
34	LAST_CLEAN	Last cleaning time	Year/month/date/time/ minute/second
35	FIRST_BOOT	First booting time	Year/month/date/time/ minute/second
36	TOTAL_CLEANTIME	Accumulated time of total cleaning	Date/time/minute/sec ond
37	TOTAL_RUNTIME	Accumulated time of total power on	Date/time/minute/sec ond
38	TOTAL_CARPET	Accumulated time of carpet cleaning	Date/time/minute/sec ond
39	VER_REVISION	Vision program version	no.
40	VER_REV_DATE	Update date	Year/month/date/time/ minute/second
41	VER_REPOSITORY	svn path	Dir.
42	VER_BOOTLOADER	Mainboard Bootloader version	no.
43	VER_MAINSW	Mainboard program version	no.
44	MODEL_NO	Model number (0xB0)	no.



## 2. Black box viewer explanation

### 2.2. B.B file lists

Check	File Lists
<input type="checkbox"/>	cleanlog20120415103657,bbf
<input type="checkbox"/>	cleanlog20120415103805,bbf
<input checked="" type="checkbox"/>	cleanlog20120415103919,bbf
<input type="checkbox"/>	cleanlog20120415104042,bbf
<input type="checkbox"/>	cleanlog20120416000013,bbf

- Black box list saved in the Roboking  
=> It is saved with a file of **cleanlog year month date time minute second.bbf**

### 2.3. Event tag lists

Check All	Event Tag Lists	Type Info.
<input type="checkbox"/>	App	STRN
<input type="checkbox"/>	Cliff	POSI
<input type="checkbox"/>	Doorsill	POSI
<input type="checkbox"/>	MAPDATA	BULK
<input type="checkbox"/>	RobotPose	POSI

- The event list will be organized in a time sequencing as checking of an event that you want to look at by using an event tag list save in the black box

Information classification : Letter, position, bulk transmission,  
Event tag list : Application, error (Bumping, ), MAP DATA, ,  
Event tag list classification

### 2.4. Event list

No.	Time	Type	Tag	Value
510	20000128185625.407368	POSI	RobotPose	Xmm=987.00, Ymm=-998.00, DegScaled100=-35.00
511	20000128185632.089453	POSI	RobotPose	Xmm=1390.00, Ymm=-696.00, DegScaled100=-325.00
512	20000128185659.650406	POSI	RobotPose	Xmm=1794.00, Ymm=-401.00, DegScaled100=8655.00
513	20000128185708.690094	POSI	RobotPose	Xmm=1565.00, Ymm=46.00, DegScaled100=-17885.00
514	20000128185710.169178	POSI	RobotPose	Xmm=1065.00, Ymm=40.00, DegScaled100=-17885.00
515	20000128185714.610353	POSI	RobotPose	Xmm=612.00, Ymm=-175.00, DegScaled100=-9065.00
516	20000128185718.790641	POSI	RobotPose	Xmm=689.00, Ymm=670.00, DegScaled100=-35.00
517	20000128185720.290688	POSI	RobotPose	Xmm=1189.00, Ymm=677.00, DegScaled100=-35.00
518	20000128185726.529602	POSI	RobotPose	Xmm=1146.00, Ymm=-178.00, DegScaled100=15495.00
519	20000128185728.050405	POSI	RobotPose	Xmm=651.00, Ymm=-77.00, DegScaled100=17205.00
520	20000128185729.490429	POSI	RobotPose	Xmm=153.00, Ymm=-29.00, DegScaled100=17565.00
521	20000128185730.911176	POSI	RobotPose	Xmm=-349.00, Ymm=14.00, DegScaled100=17599.00
522	20000128185732.430738	POSI	RobotPose	Xmm=-848.00, Ymm=81.00, DegScaled100=15299.00
523	20000128185734.370680	POSI	RobotPose	Xmm=-1019.00, Ymm=552.00, DegScaled100=6789.00

- Event list defined in the event tag of B.B file is organized in a time sequencing.

\* **Coordinate starting point is (550.0, 50, 0°)**  
When double clicking while playing, directly move to the correspond position

Image capture position : X coordinate, Y coordinate, angle  
Event tag list classification  
Event tag list classification  
Image capture time : Year month date time minute second  
Time No. : The order of image capture to the upper camera while driving

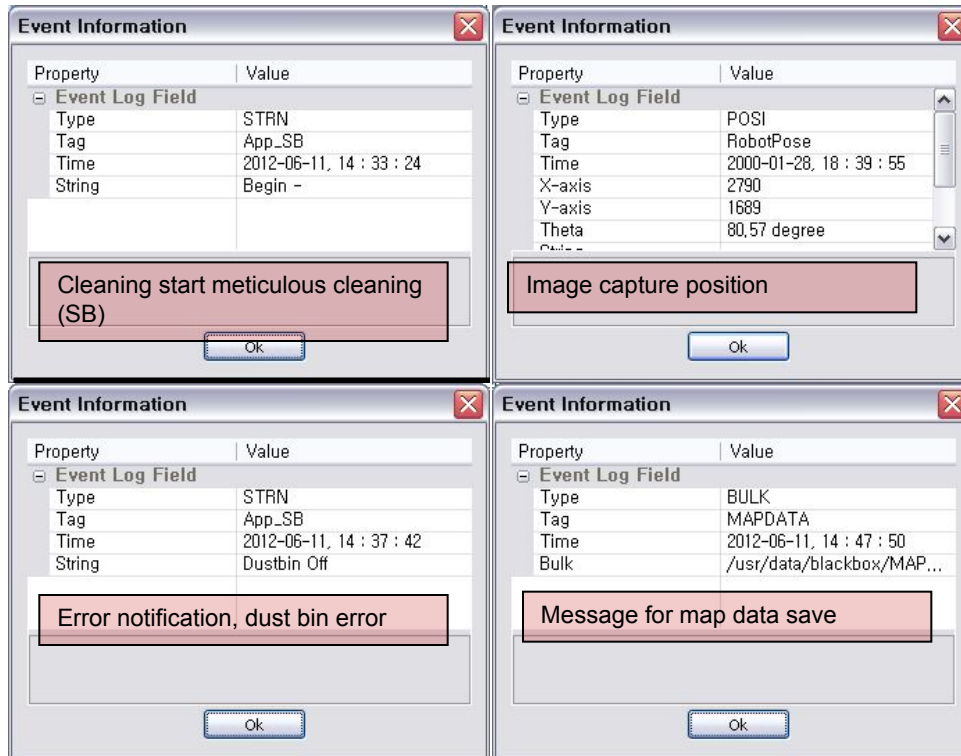
## 2. Black box viewer explanation

### 2.5. Information

5	20120613215625,542028	POSI	RobotPose
6	20120613215633,841586	POSI	RobotPose
7	20120613215641,841586	POSI	RobotPose
8	20120613215641,841586	Information	RobotPose
9	20120613215641,841586	Display	Bumping
10	20120613215641,841586	Information	RobotPose
11	20120613215716,256870	STRN	App_ZZ
12	20120613215716,259553	BULK	MAPDATA



#### When clicking information (Example)

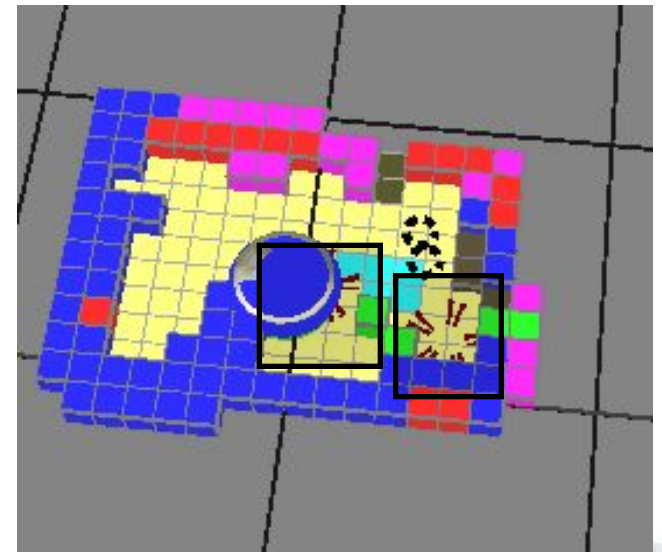


The 'Event Information' dialog box displays the following details for each event:

- Event 8:** Cleaning start meticulous cleaning (SB). Type: STRN, Tag: App\_SB, Time: 2012-06-11, 14:33:24, String: Begin -.
- Event 10:** Image capture position. Type: POSI, Tag: RobotPose, Time: 2000-01-28, 18:39:55, X-axis: 2790, Y-axis: 1689, Theta: 80,57 degree.
- Event 11:** Error notification, dust bin error. Type: STRN, Tag: App\_SB, Time: 2012-06-11, 14:37:42, String: Dustbin Off.
- Event 12:** Message for map data save. Type: BULK, Tag: MAPDATA, Time: 2012-06-11, 14:47:50, Bulk: /usr/data/blackbox/MAP...

- Possible to see the details of correspond event list
- => Event type, tag, occurrence time, coordinate, angle event explanation

#### When clicking display



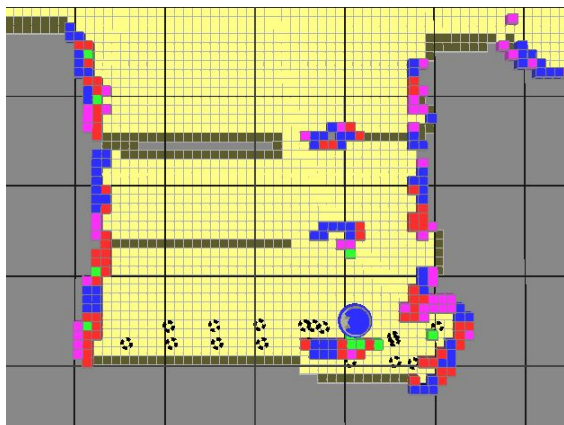
- Indicate the correspond event on the map



# Black box viewer manual

## 2. Black box viewer explanation

### 2.6. Map



- Driving information saved in B.B can be confirmed visually
- Debugging can be done by confirming the event (Cliff, doorsill)
- Each color can be set and confirmed in the simulation control box
- Classified three areas (Cleaning area/ non-cleaning area/barrier)

### 2.7. Simulation control box



Possible to set regarding map

- Possible to play and stop based upon an event list content
- Possible to set color and shape of occurred event





# Black box viewer manual

## 3. Black box viewer use method

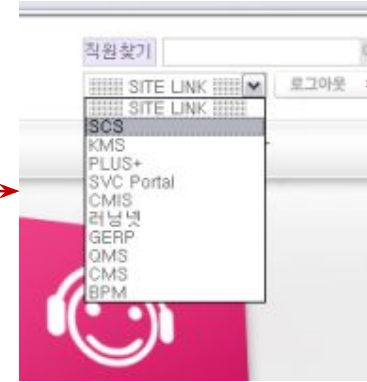
### 3.1. Program download for black box data upload

Black box save implementation script should be downloaded from the server



<http://smile.lge.co>

- ① Input employee number and pw



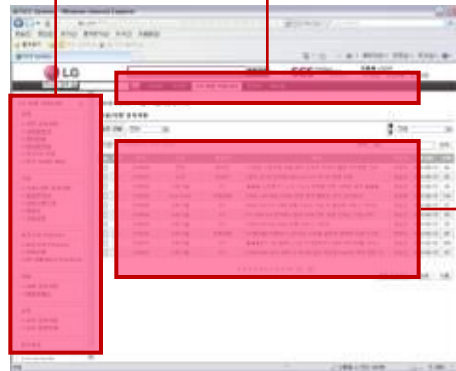
- ② Select SCS of SITE LINK



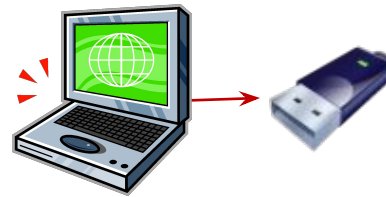
- ④ Click technology/ Specification notice



- ③ Click CS support community



- ⑤ Select the program from a list and save in attached file USB  
 (It is not implemented well on a security program installed (Navi) PC because the file is save as a code.)



**\* File list**

- blackbox.sh (File)
- blackbox (Folder)

**Place above tow files at the top path of the USB**  
**B.B data is automatically saved under the black box folder**

# Black box viewer manual

## 3. Black box viewer use method

### 3.1. Program download for black box data upload



⑥ Open the cover while power is off.

⑦ Open USB cap and put USB memory that the program for black box upload is saved. Then close the cover

⑧ Turn the power on



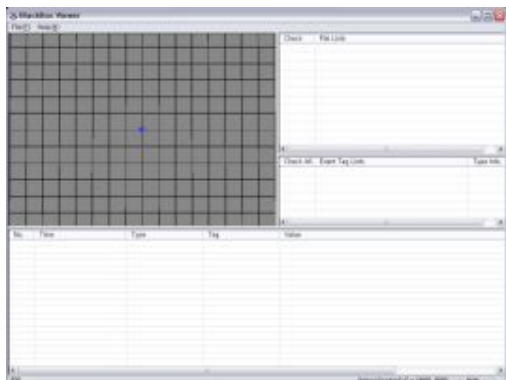
⑨ Booting starts by showing a booting animation, Upload starts with a voice guidance of **“Black box data loading begins.”**, Upload completion is notified with a voice guidance of **“Black box data loading is completed.”** Then booting starts automatically.



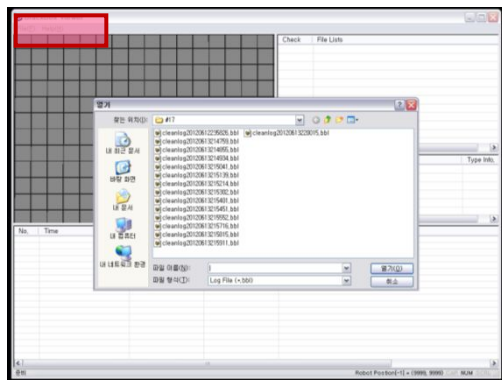
# Black box viewer manual

## 3. Black box viewer use method

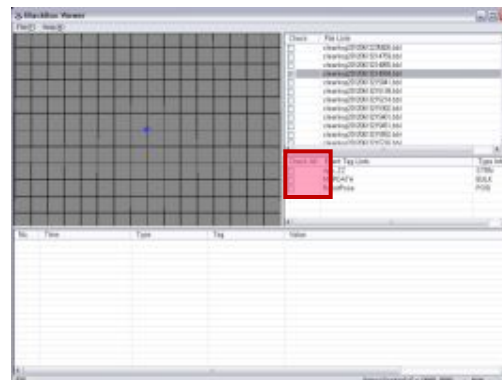
### 3.1. Program download for black box data upload



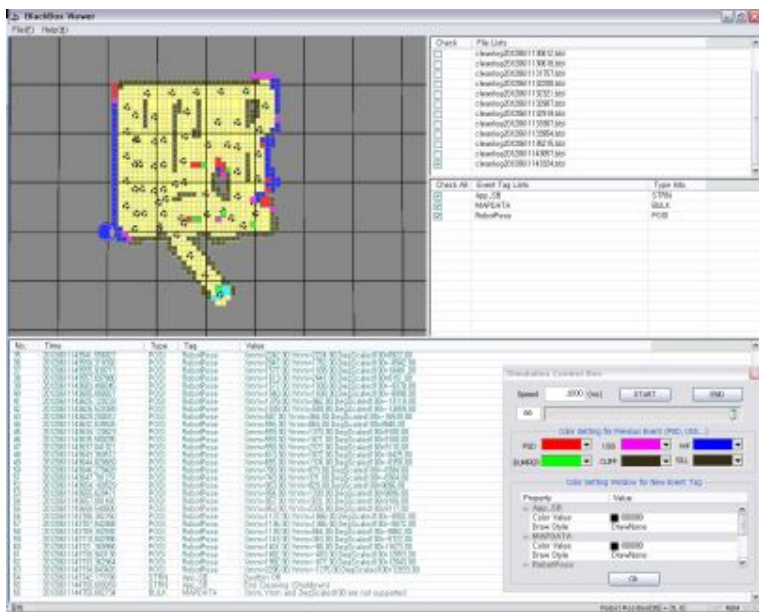
① Black box viewer program implementation



② Click File -> Log and load log file



3. Click the list which you want to look at on the check box of the event tag list



④ Upload completion

Debugging by using the loaded file

=> Find out the error type and position

=> Improve robot key use environment for users

⑤ Implement start/end/color selection by using a simulation control box

