RVC

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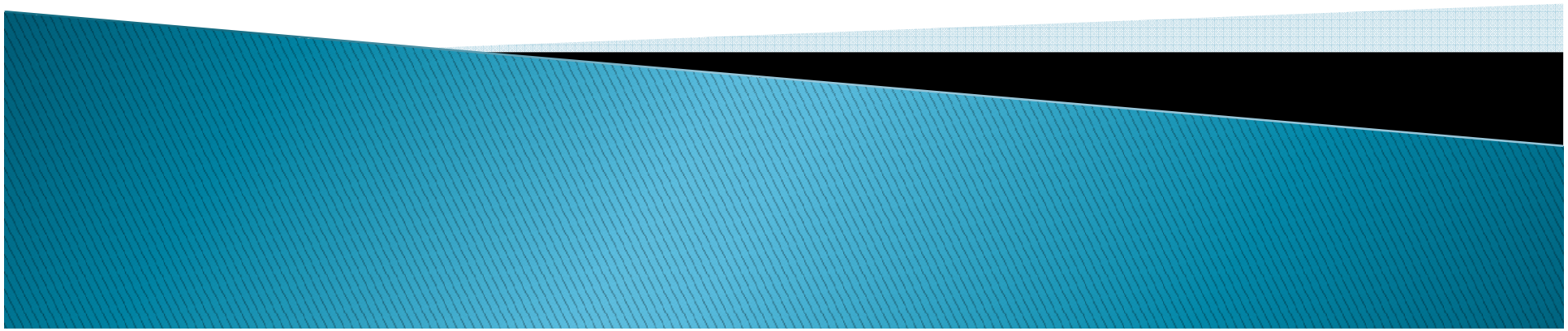
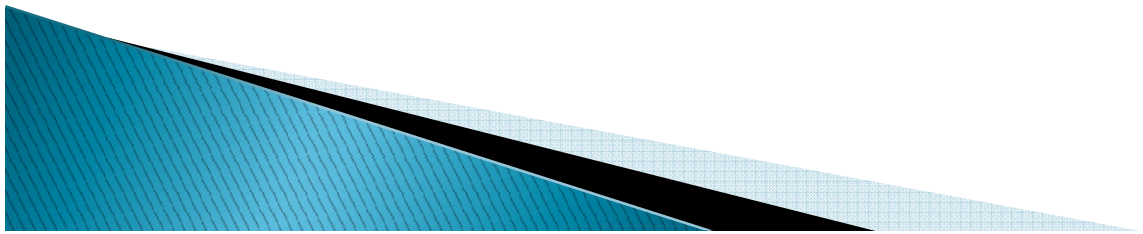
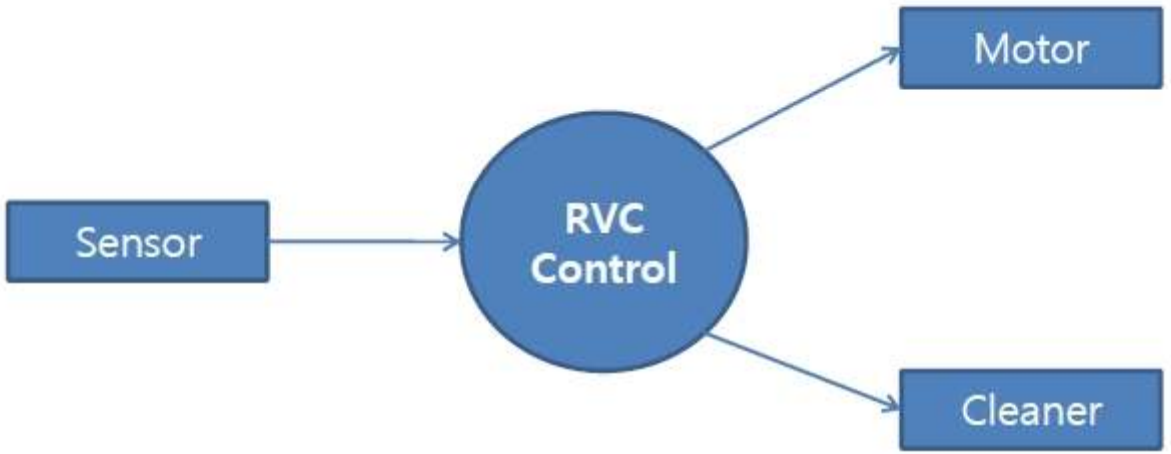


Statement of Purpose – RVC Example

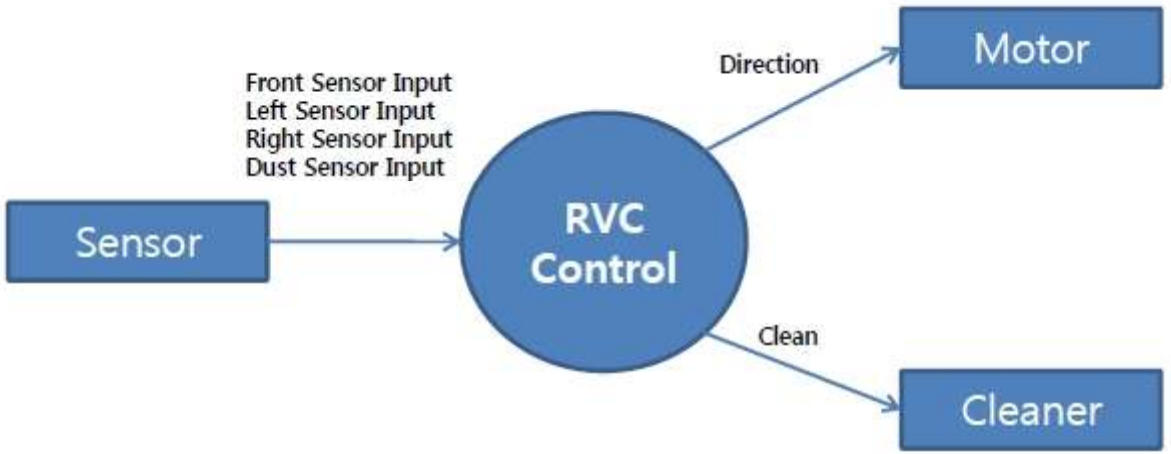
- Automatically cleans and mops surface
- Goes straight forward while cleaning
- If detects dust, power up for a while
- If found an obstacle,
  - Stop cleaning
  - Turns aside
  - Go forward cleaning



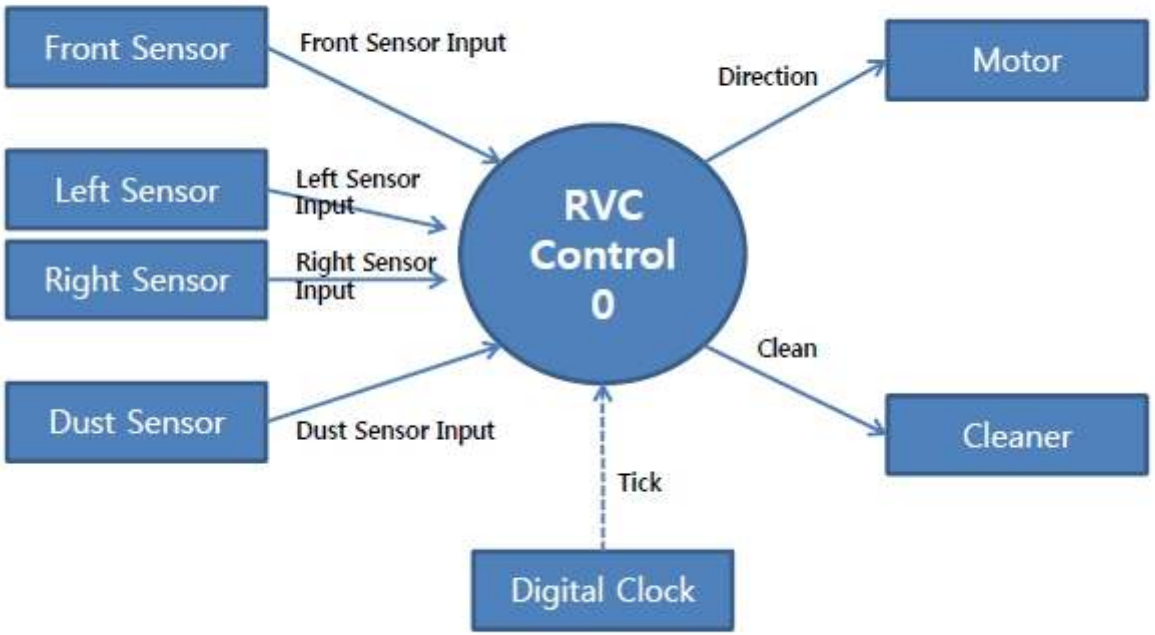
System Context Diagram – RVC Example



System Context Diagram – RVC Example

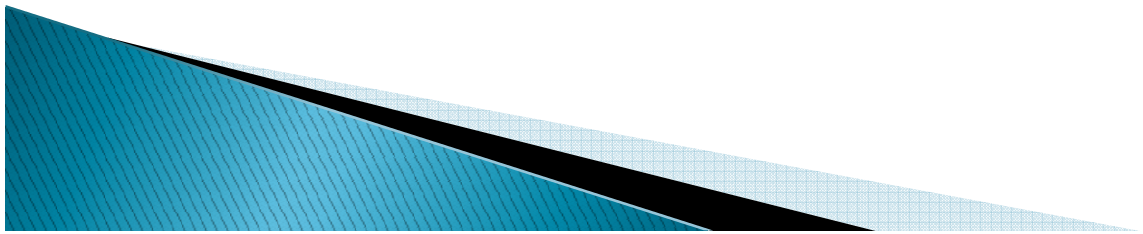


DFD Level 0 – RVC Example

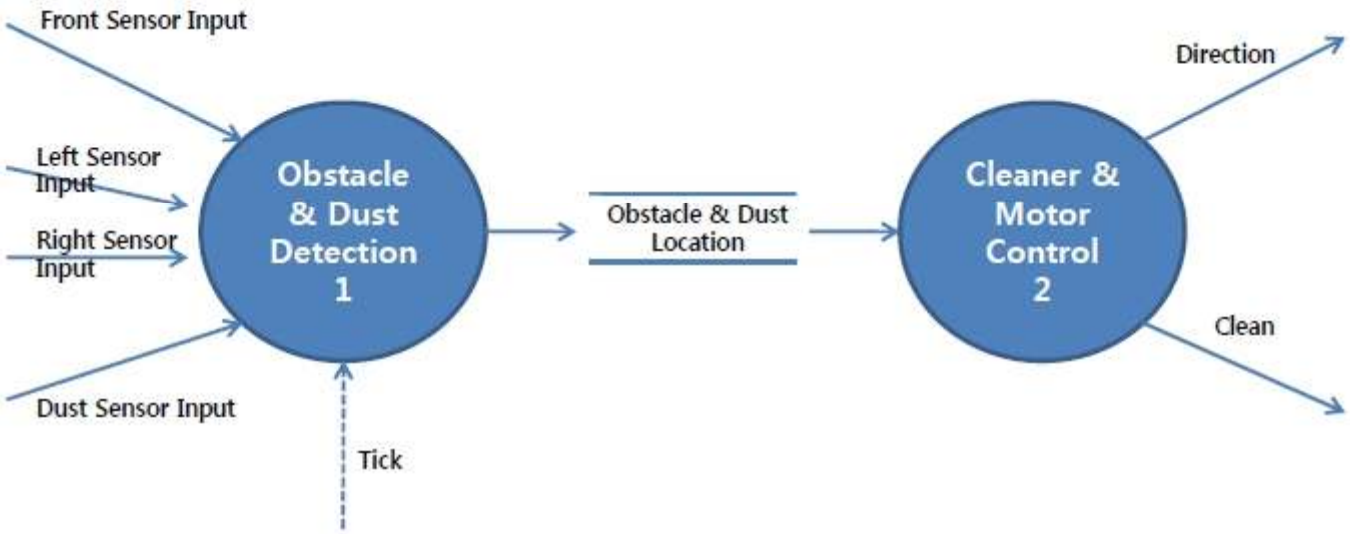


DFD Level 0 – RVC Example

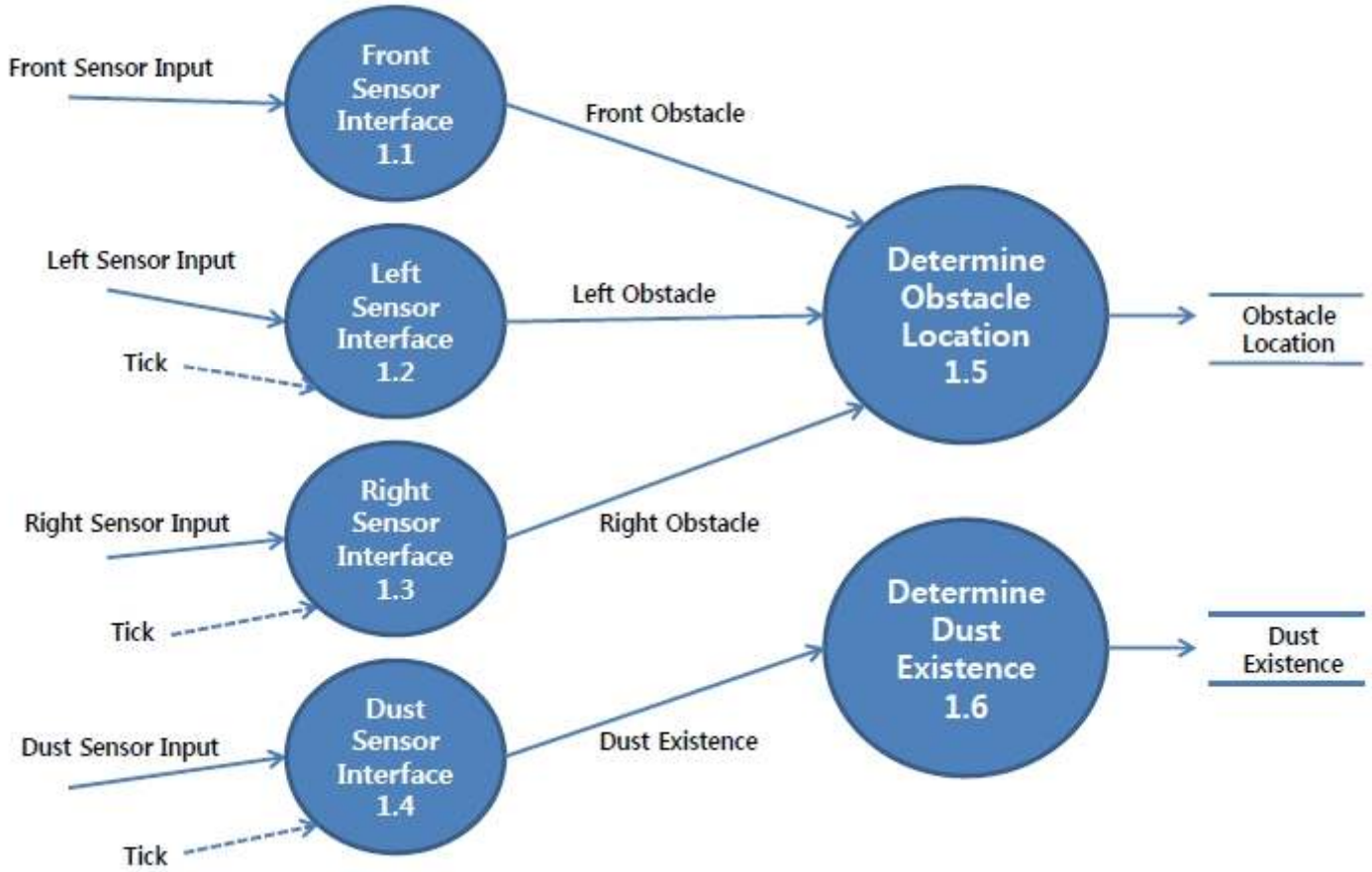
Input / Output Event	Description	Format / Type
Front Sensor Input	Detects obstacles in front of the RVC	True / False , Interrupt
Left Sensor Input	Detects obstacles in the left side of the RVC periodically	True / False , Periodic
Right Sensor Input	Detects obstacles in the right side of the RVC periodically	True / False , Periodic
Dust Sensor Input	Detects dust on the floor periodically	True / False , Periodic
Direction	Direction commands to the motor (go forward / turn left with 90° / turn right with 90°)	Forward / Left / Right / Stop
Clean	Direction commands to the motor (go forward / turn left with 90° / turn right with 90°)	On / Off / Up



DFD Level 1 – RVC Example

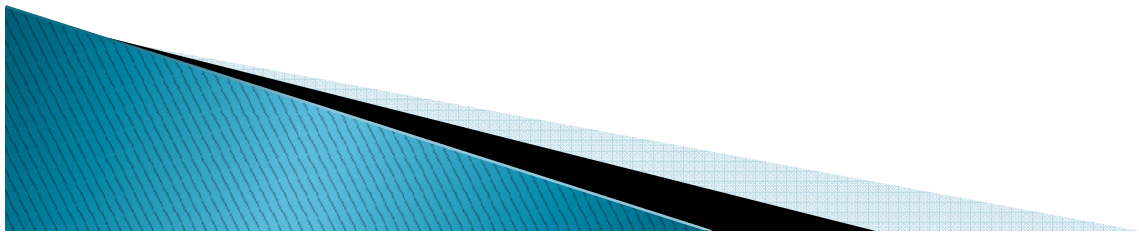


DFD Level 2 – RVC Example

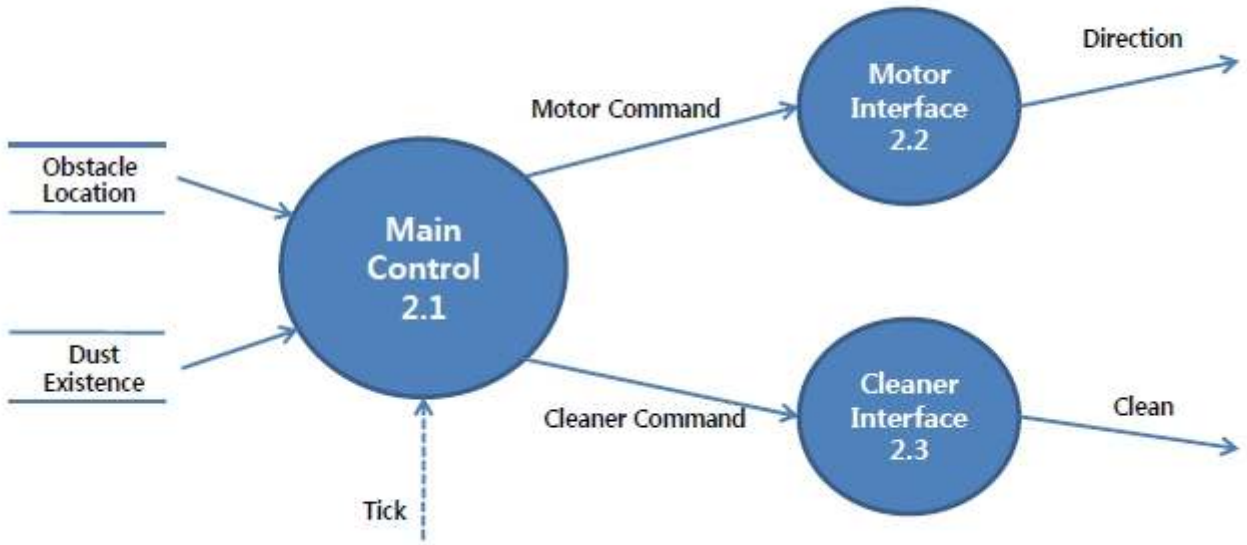


DFD Level 2 – RVC Example

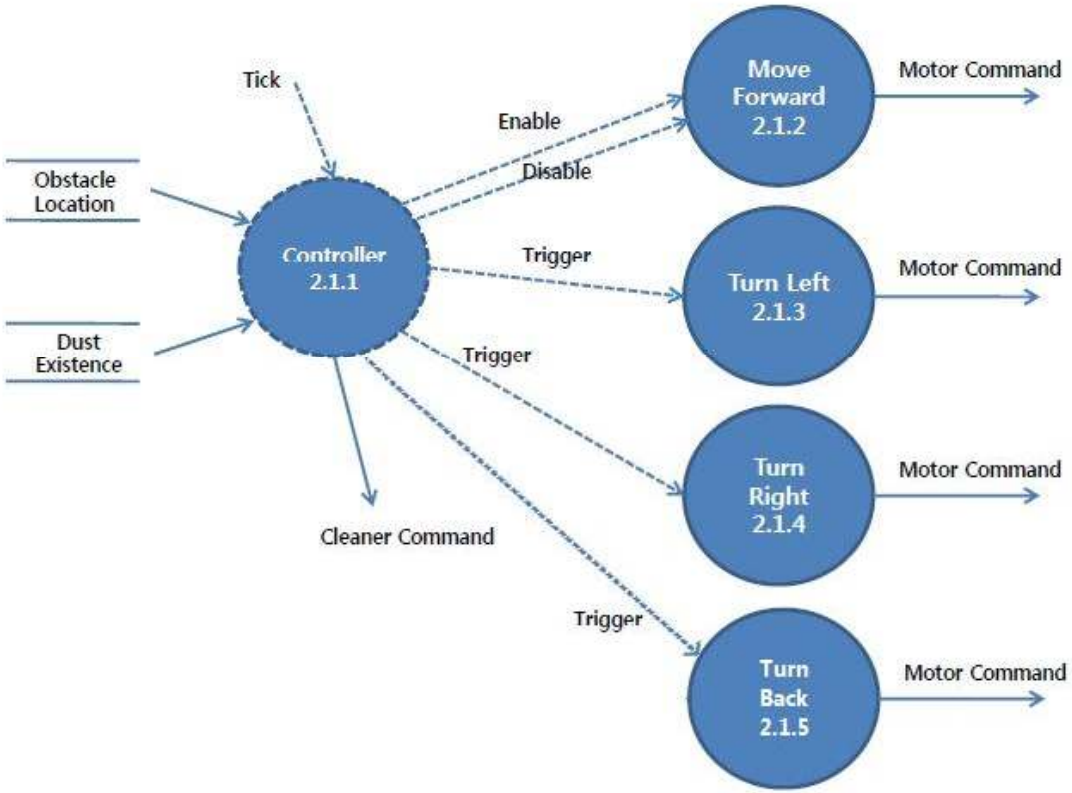
Input / Output Event	Description	Format / Type
Front Obstacle	Front Sensor Interface에서 읽힌 analog value가 digital value로 변환된 후 저장되는 variable	True / False
Left Obstacle	Left Sensor Interface에서 읽힌 analog value가 digital value로 변환된 후 저장되는 variable	True / False
Right Obstacle	Right Sensor Interface에서 읽힌 analog value가 digital value로 변환된 후 저장되는 variable	True / False
Dust Existence	Dust Sensor Interface에서 읽힌 analog value가 digital value로 변환된 후 저장되는 variable	True / False



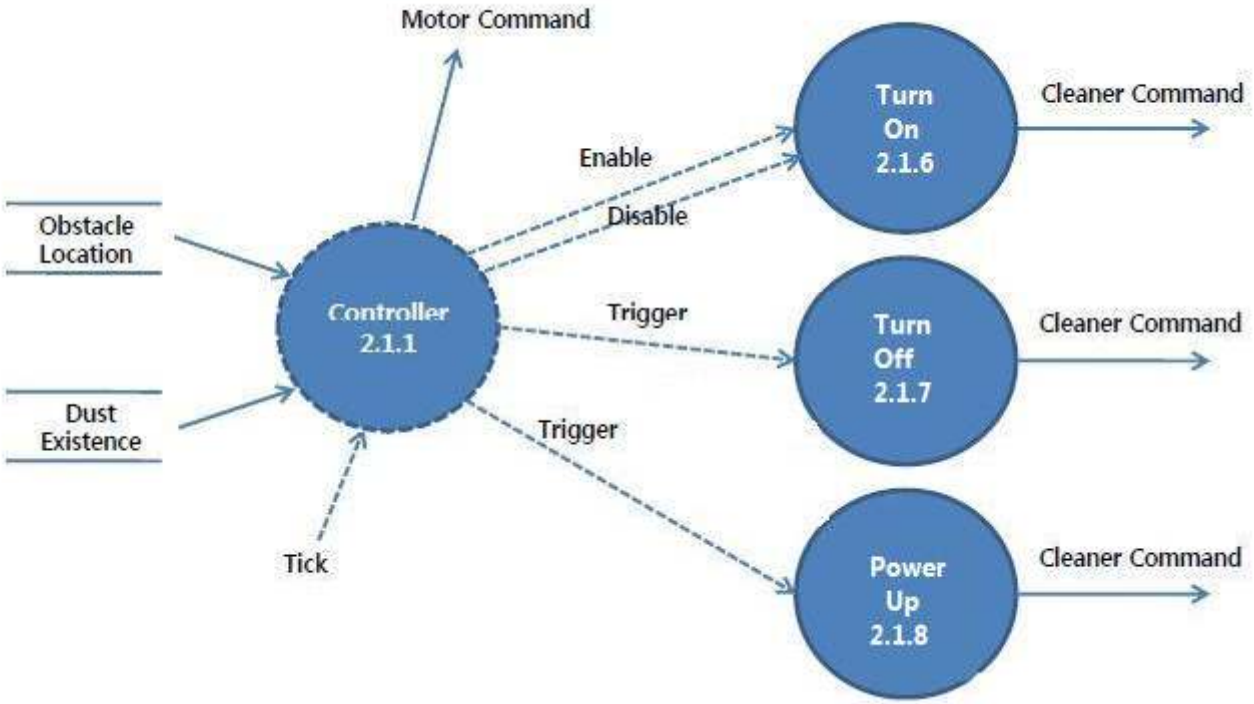
DFD Level 2 – RVC Example



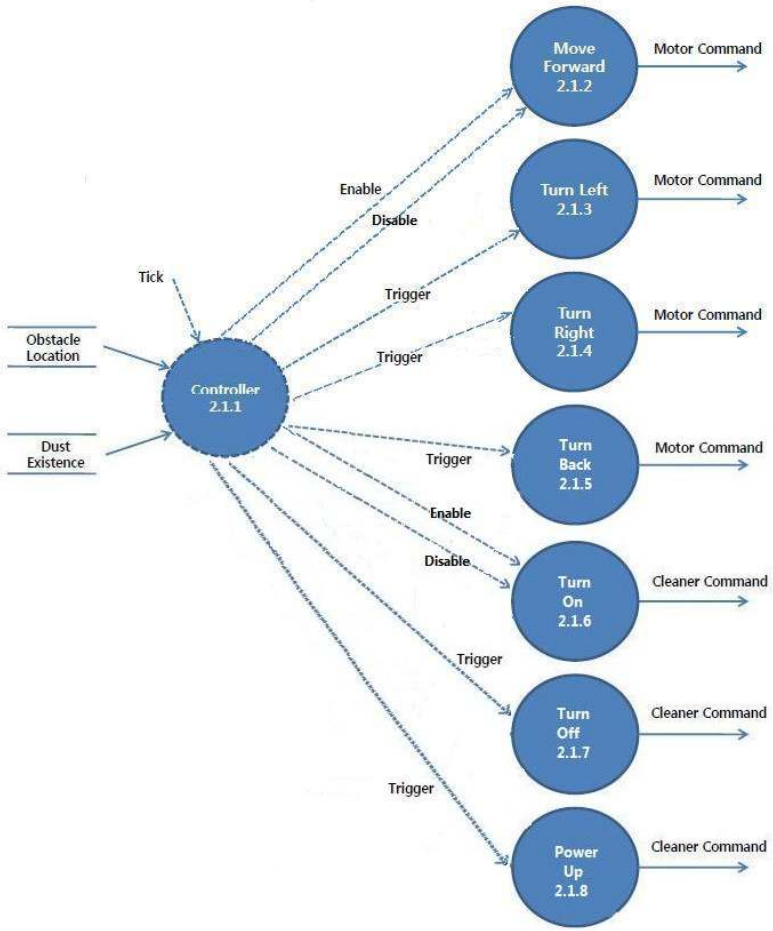
DFD Level 3 – RVC Example



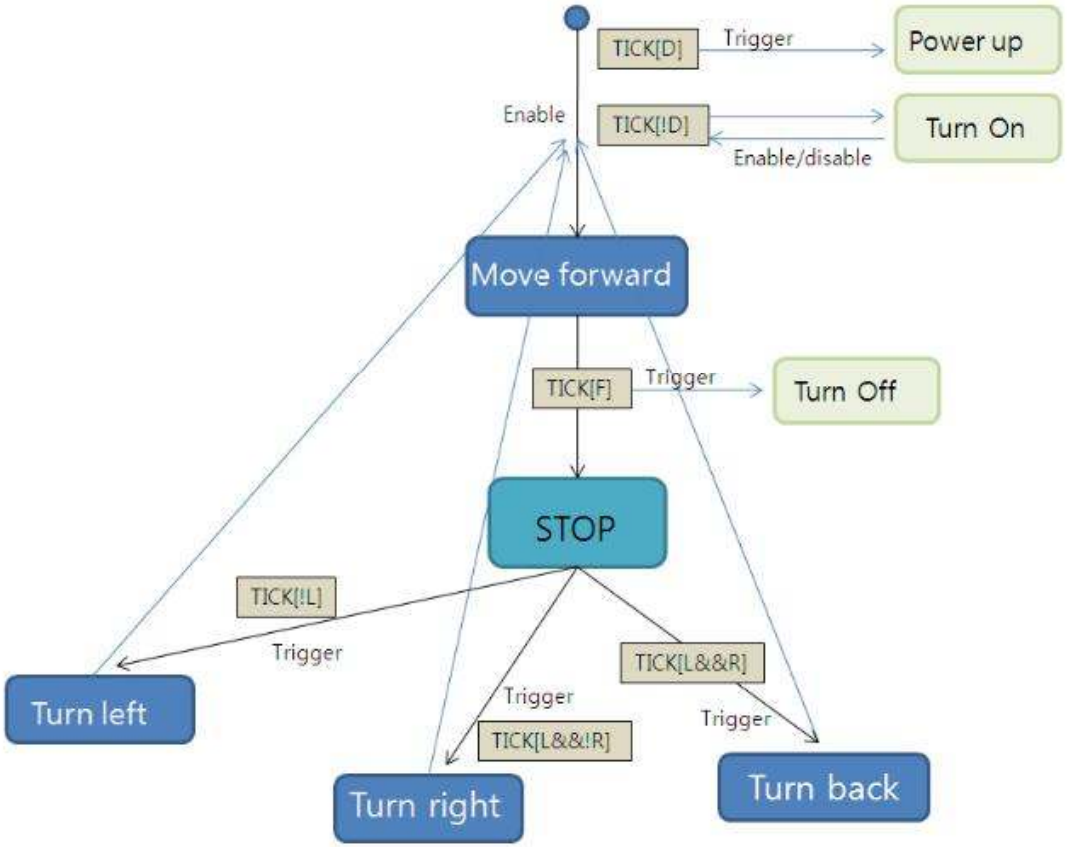
DFD Level 3 – RVC Example



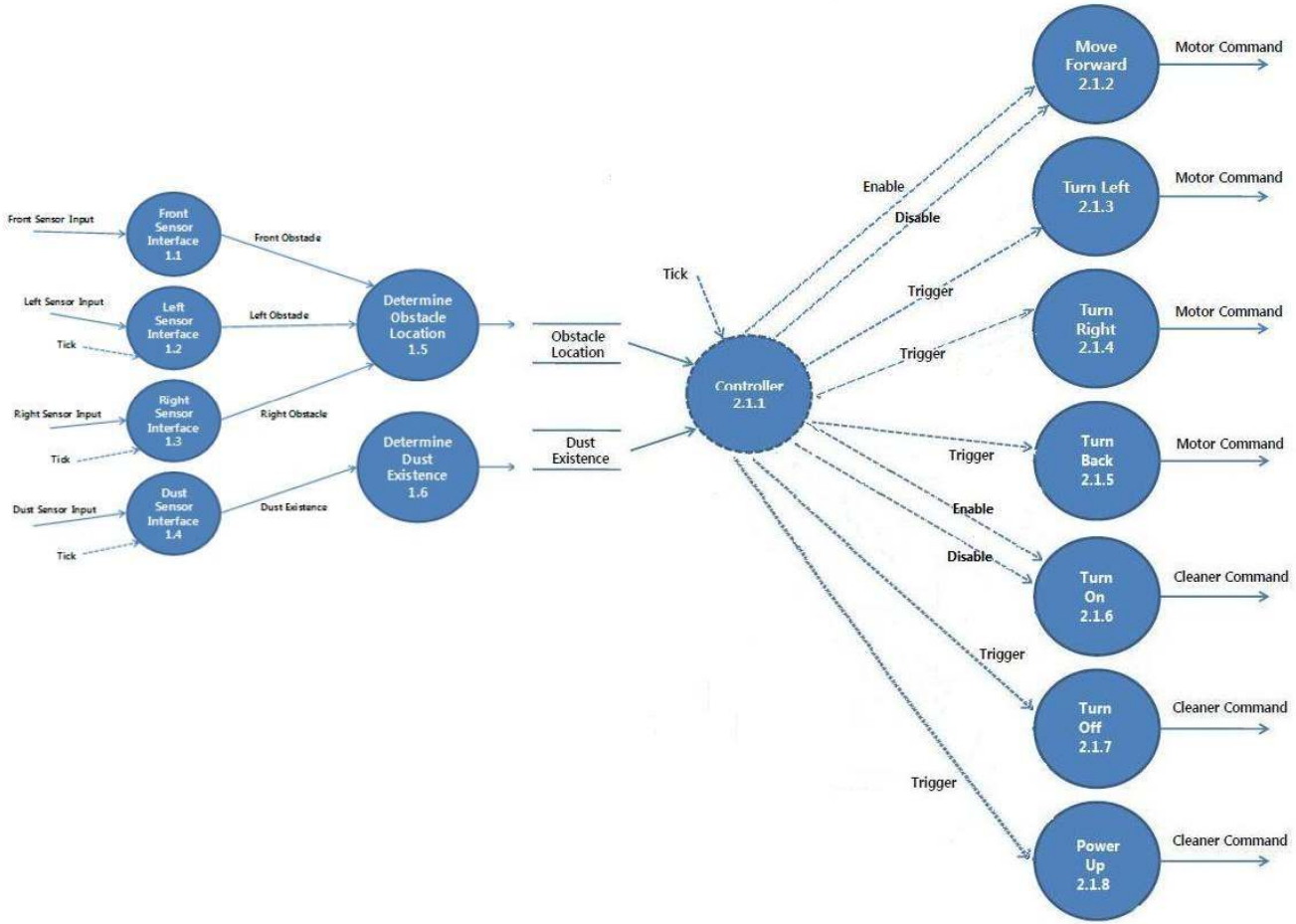
DFD Level 3 – RVC Example



DFD Level 4 – RVC Example



DFD – RVC Example

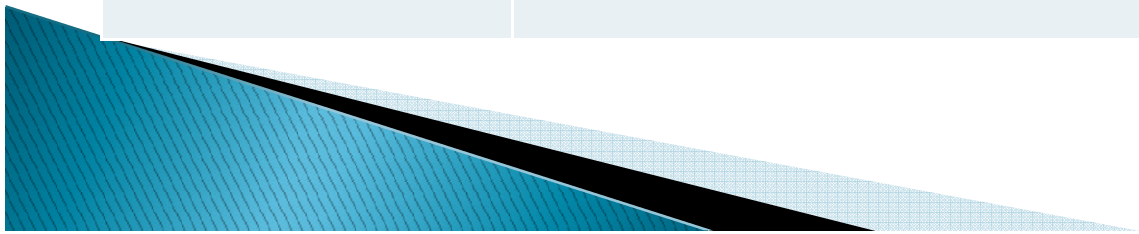


Process Specification – RVC Example

Process No.	1.1
Name	Front Sensor Interface
Input	Front Sensor Input
Output	Front Obstacle
Description	Reads a analog value of the front sensor consistently, converts it into a digital value such as T/F and assigns it into output boolean variable ‘Front Obstacle’

Process Specification – RVC Example

Process No.	1.2
Name	Left Sensor Interface
Input	Left Sensor Input, Tick
Output	Left Obstacle
Description	Reads a analog value of the left sensor consistently, converts it into a digital value such as T/F and assigns it into output boolean variable ‘Left Obstacle’



Process Specification – RVC Example

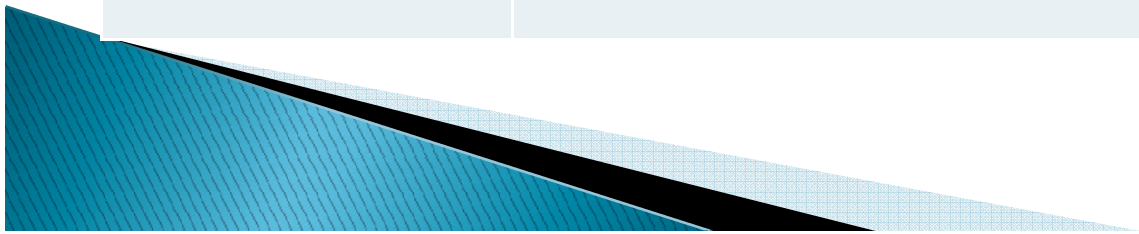
Process No.	1.3
Name	Right Sensor Interface
Input	Right Sensor Input, Tick
Output	Right Obstacle
Description	Reads a analog value of the right sensor consistently, converts it into a digital value such as T/F and assigns it into output boolean variable ‘Right Obstacle’

Process Specification – RVC Example

Process No.	1.4
Name	Dust Sensor Interface
Input	Dust Sensor Input, Tick
Output	Dust Existence
Description	Reads a analog value of the dust sensor consistently, converts it into a digital value such as T/F and assigns it into output boolean variable ‘Dust Existence’

Process Specification – RVC Example

Process No.	1.5
Name	Determine obstacle location
Input	Front Obstacle, Left Obstacle, Right Obstacle (F, L, R)
Output	
Description	Reads three T/F value of front obstacle, left obstacle, right obstacle and stores the input data to the data store ‘Obstacle Location’

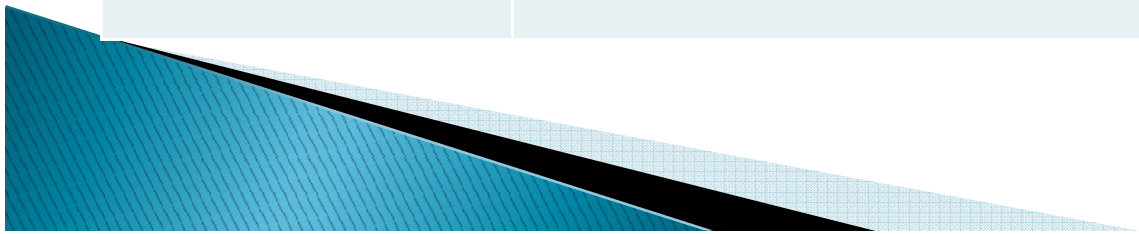


Process Specification – RVC Example

Process No.	1.6
Name	Determine Dust Existence
Input	Dust Existence
Output	Dust Existence (T/F)
Description	Reads dust existence T/F value and store it to the data store 'Dust Existence'

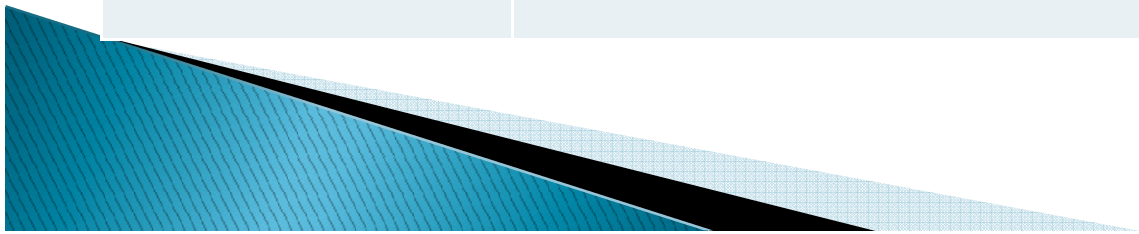
Process Specification – RVC Example

Process No.	2.1.2
Name	Move Forward
Input	Enabled or disabled Control flow by obstacle location information F
Output	Forward motor command
Description	According to a control flow by obstacle location, 'Move Forward' process makes motor command to move forward



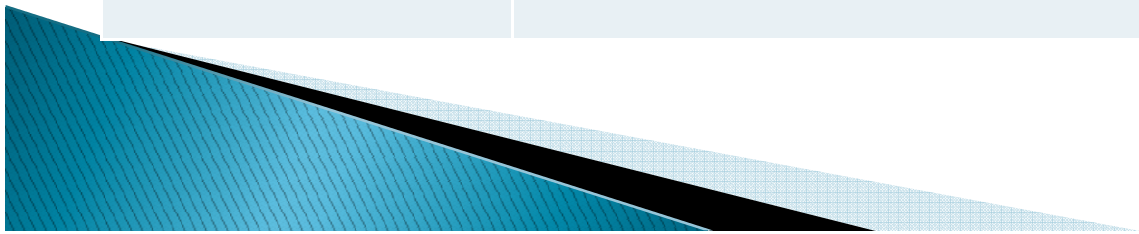
Process Specification – RVC Example

Process No.	2.1.3
Name	Turn Left
Input	Triggered Control flow
Output	Motor command
Description	‘Turn Left’ process is triggered by obstacle location information L in case it can turn to the left and makes motor command to turn left



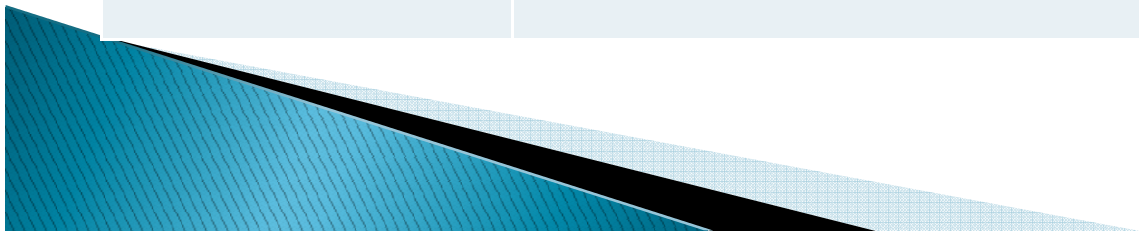
Process Specification – RVC Example

Process No.	2.1.4
Name	Turn Right
Input	Triggered Control flow
Output	Motor command
Description	'Turn Right' process is triggered by obstacle location information L, R in case it can turn to the right and makes motor command to turn right



Process Specification – RVC Example

Process No.	2.1.5
Name	Turn Back
Input	Triggered Control flow
Output	Motor command
Description	‘Turn Back’ process is triggered by obstacle location information L, R in case it can turn to the back and makes motor command to turn back



Process Specification – RVC Example

Process No.	2.1.6
Name	Turn On
Input	Enabled or disabled Control flow
Output	Cleaner command
Description	‘Turn On’ process is enabled in case it`s moving forward and makes cleaner command

Process Specification – RVC Example

Process No.	2.1.7
Name	Turn Off
Input	Triggered Control flow
Output	Cleaner command
Description	‘Turn Off’ process is triggered in case the time it has to turn left or right, back and makes cleaner command

Process Specification – RVC Example

Process No.	2.1.8
Name	Power Up
Input	Triggered Control flow
Output	Cleaner command
Description	‘Power Up’ process is triggered by the controller in case the ‘Dust Existence’ value is true and makes cleaner command to power up the cleaner