

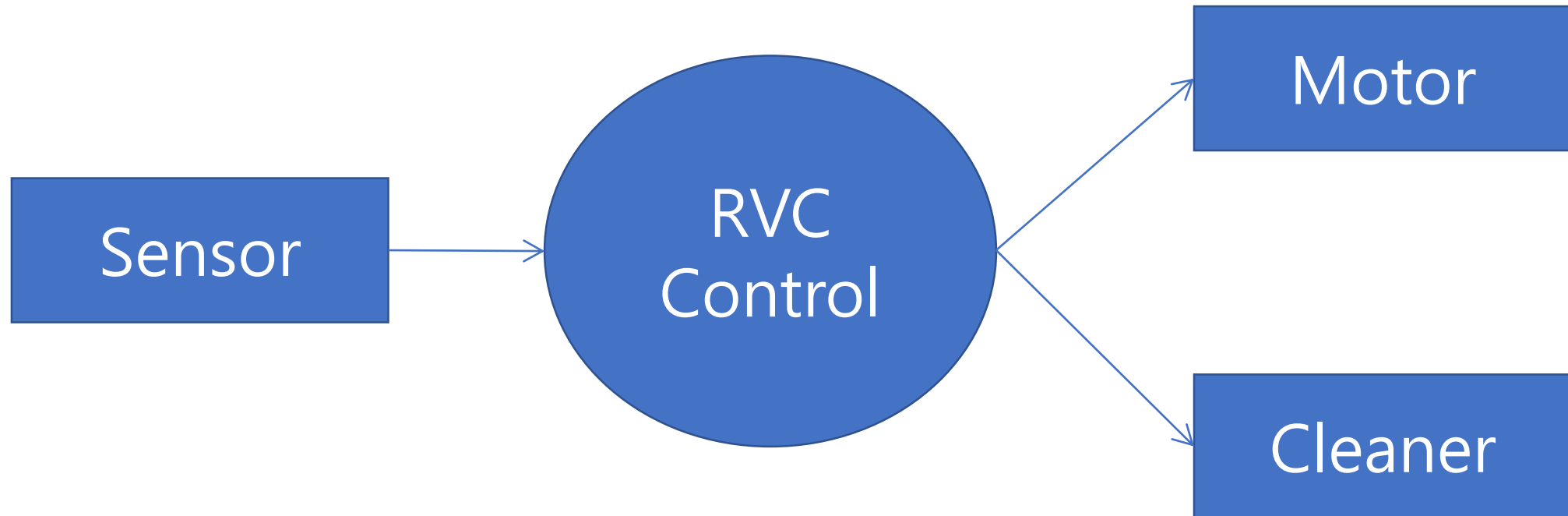
# Robot Vacuum Cleaner (RVC) Data Flow Diagram (DFD)

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# Statement of Purpose – Robot Vacuum Cleaner

- An RVC automatically cleans and mops household surface.
- It goes straight forward while cleaning.
- If its sensors found an obstacle, it stops cleaning, turn aside, and goes forward with cleaning.
- If it detects dust, power up the cleaning for a while.
- We do not consider the detail design and implementation on HW controls.
- We only focus on the automatic cleaning function.

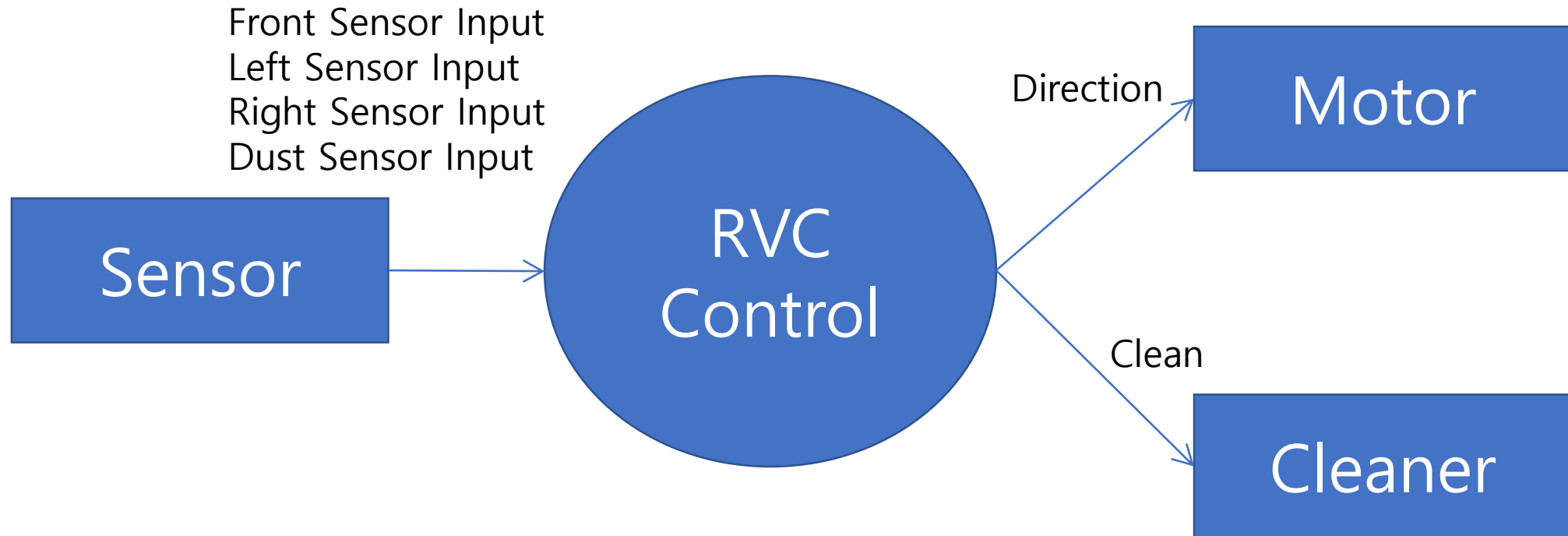
# System Context Diagram - RVC



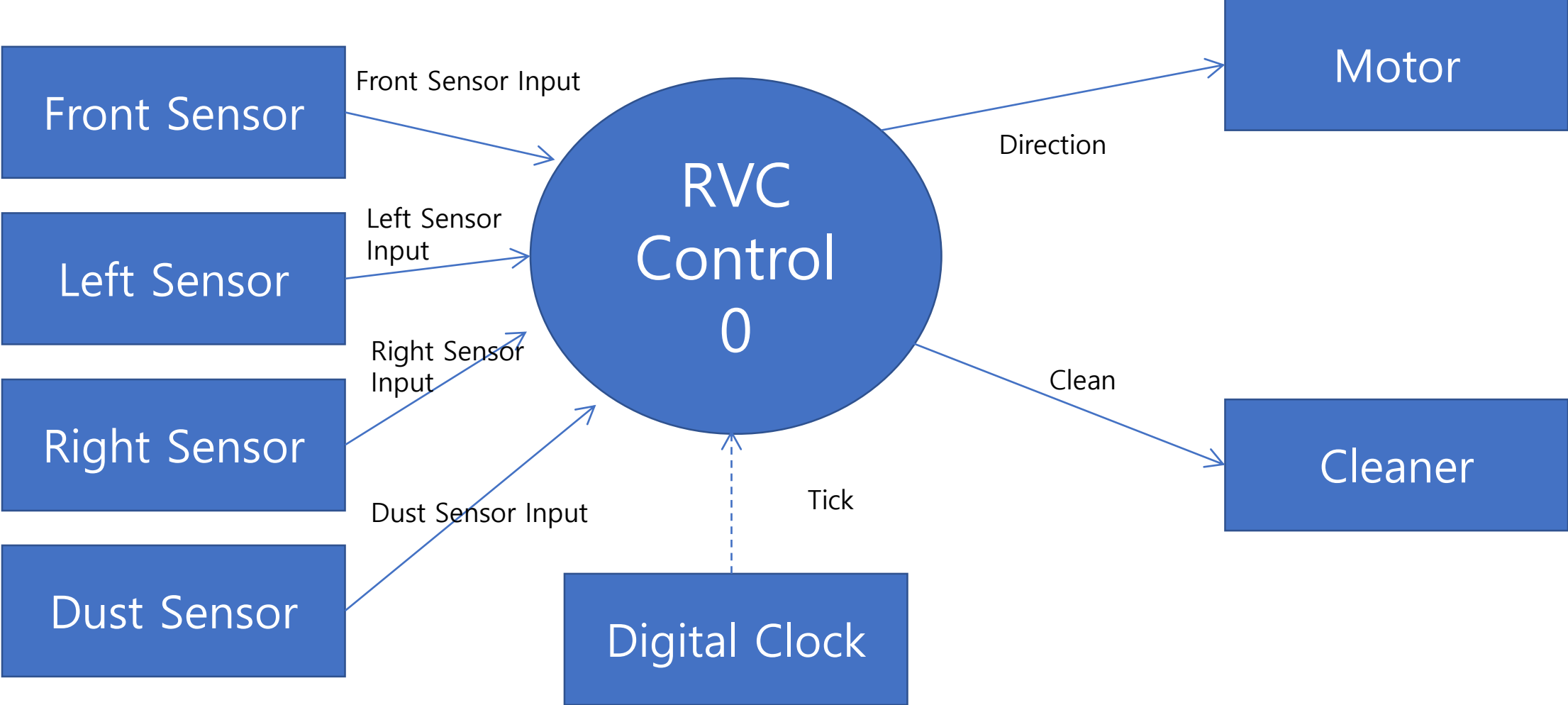
# Event List - RVC

Input/ Output Event	Description
Front Sensor Input	Detects obstacles in front of the RVC
Left Sensor Input	Detects obstacles in the left side of the RVC periodically
Right Sensor Input	Detect obstacles in the right side of the RVC periodically
Dust Sensor Input	Detect dust on the floor periodically
Direction	Direction commands to the motor (go forward / turn left with an angle / turn right with an angle)
Clean	Turn off / Turn on / Power-Up

# System Context Diagram - RVC



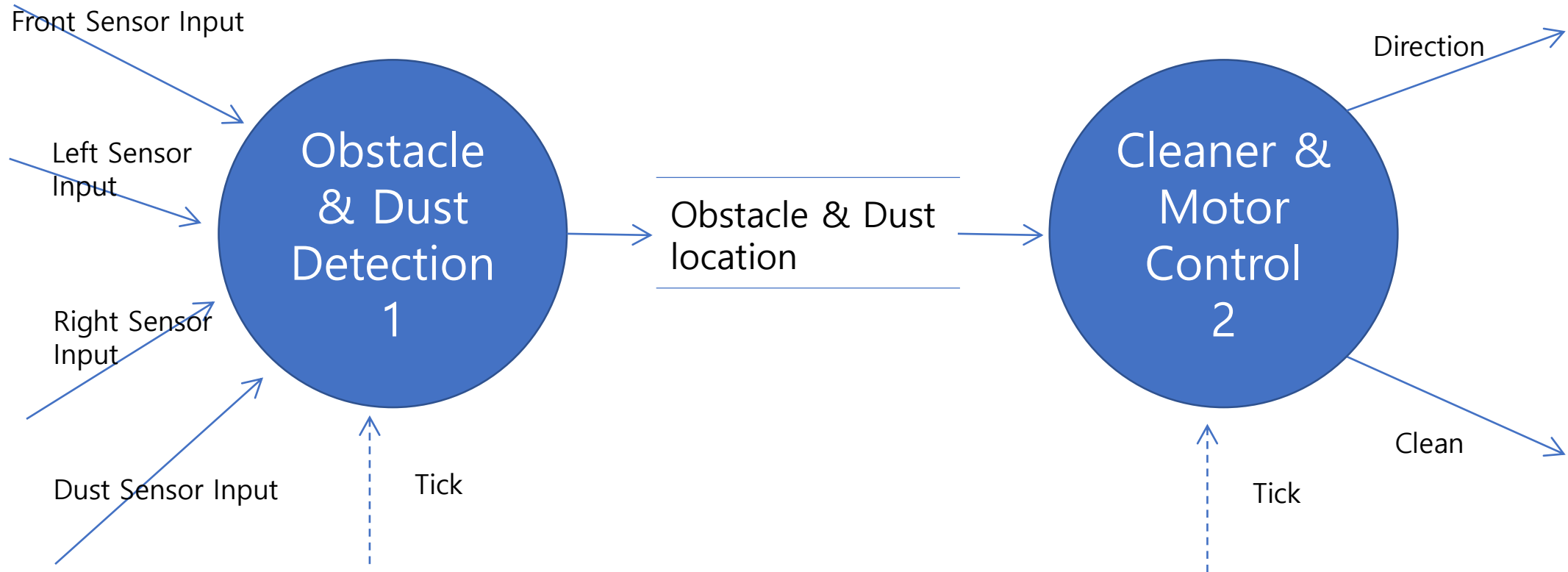
# DFD Level 0 - RVC



# DFD Level 0 - RVC

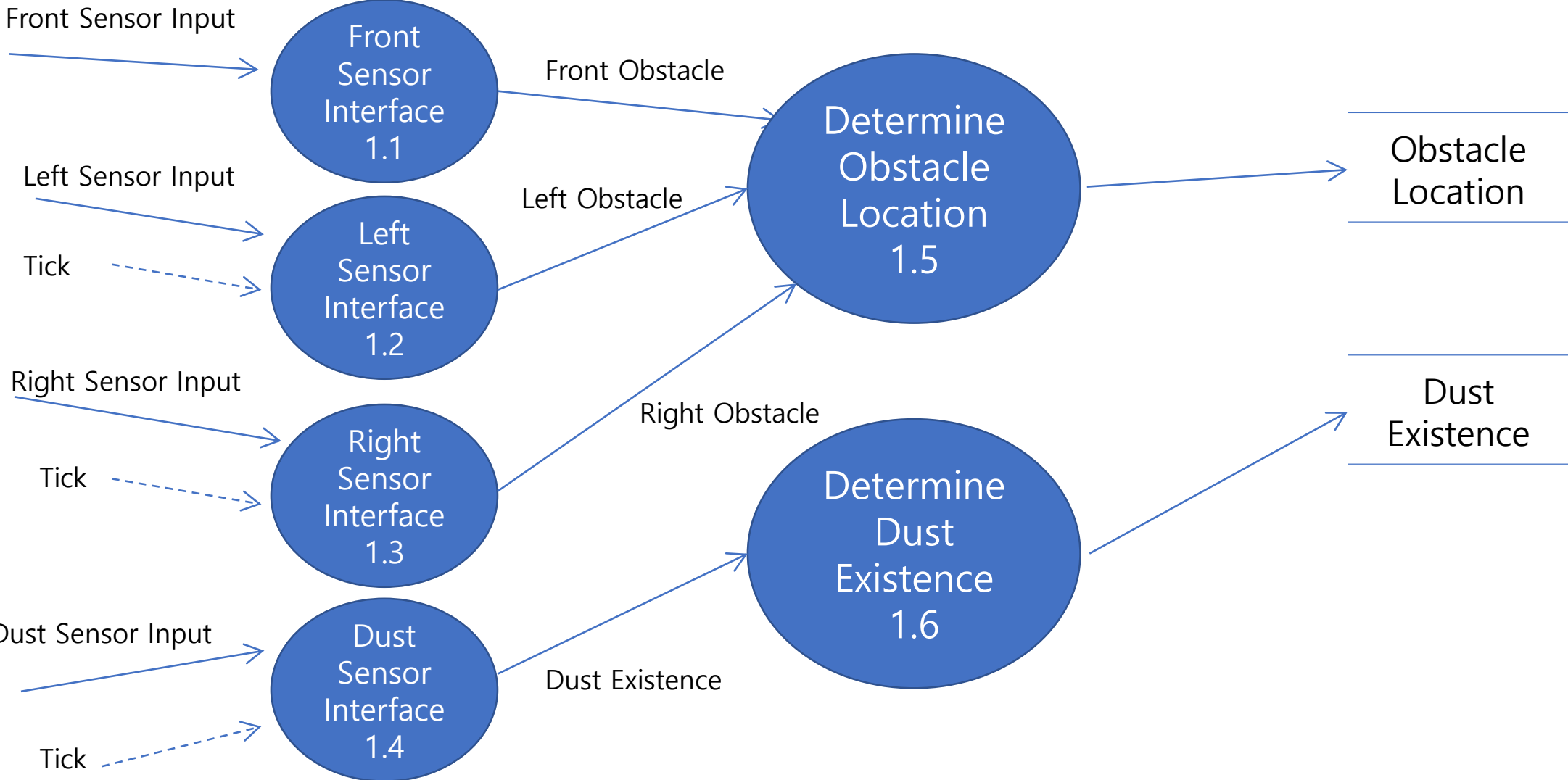
Input/ Output Event	Description	Format / Type
Front Sensor Input	Detects obstacles in front of the RVC	True / False , Interrupt
Left Sensor Input	Detects obstacles in the left side of the RVC periodically	True / False , Periodic
Right Sensor Input	Detect obstacles in the right side of the RVC periodically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

# DFD Level 1 - RVC

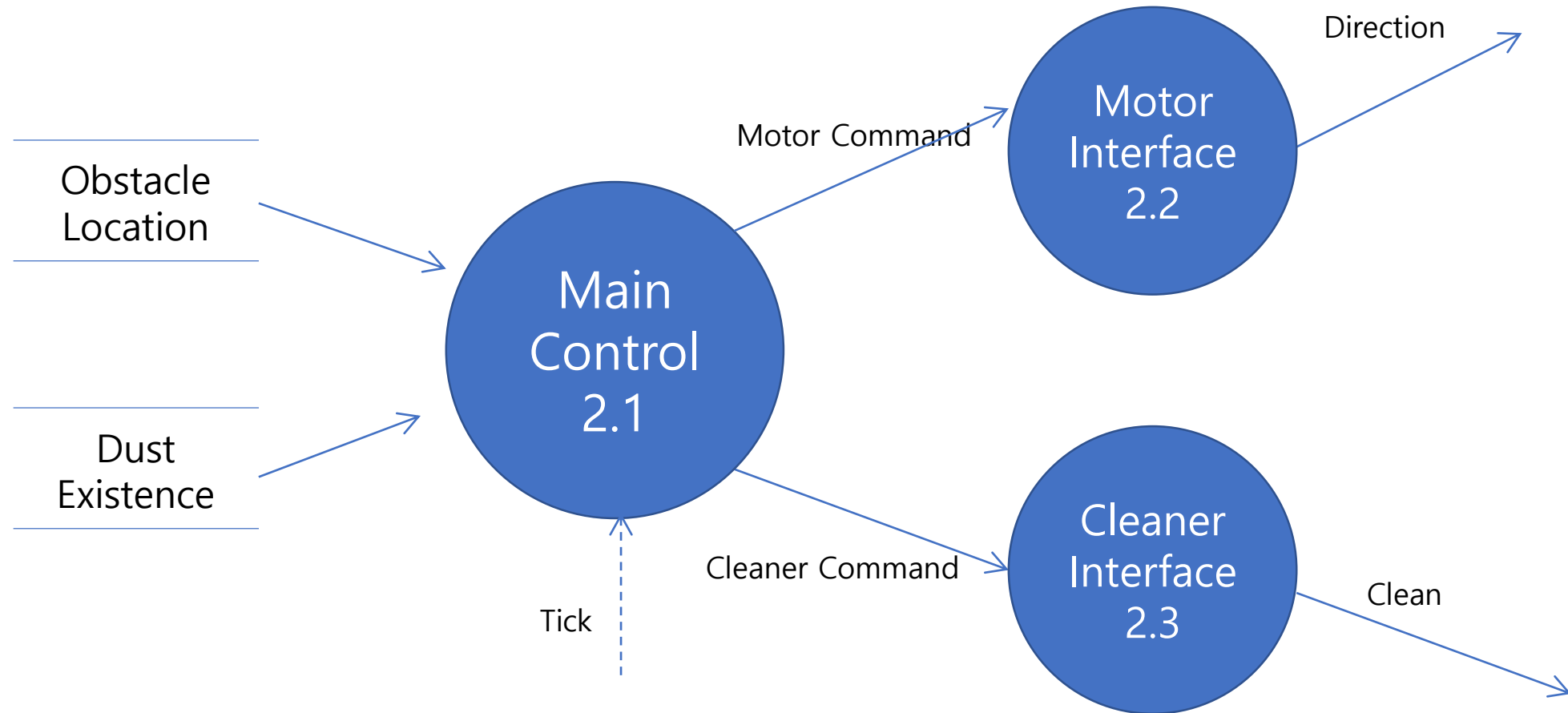




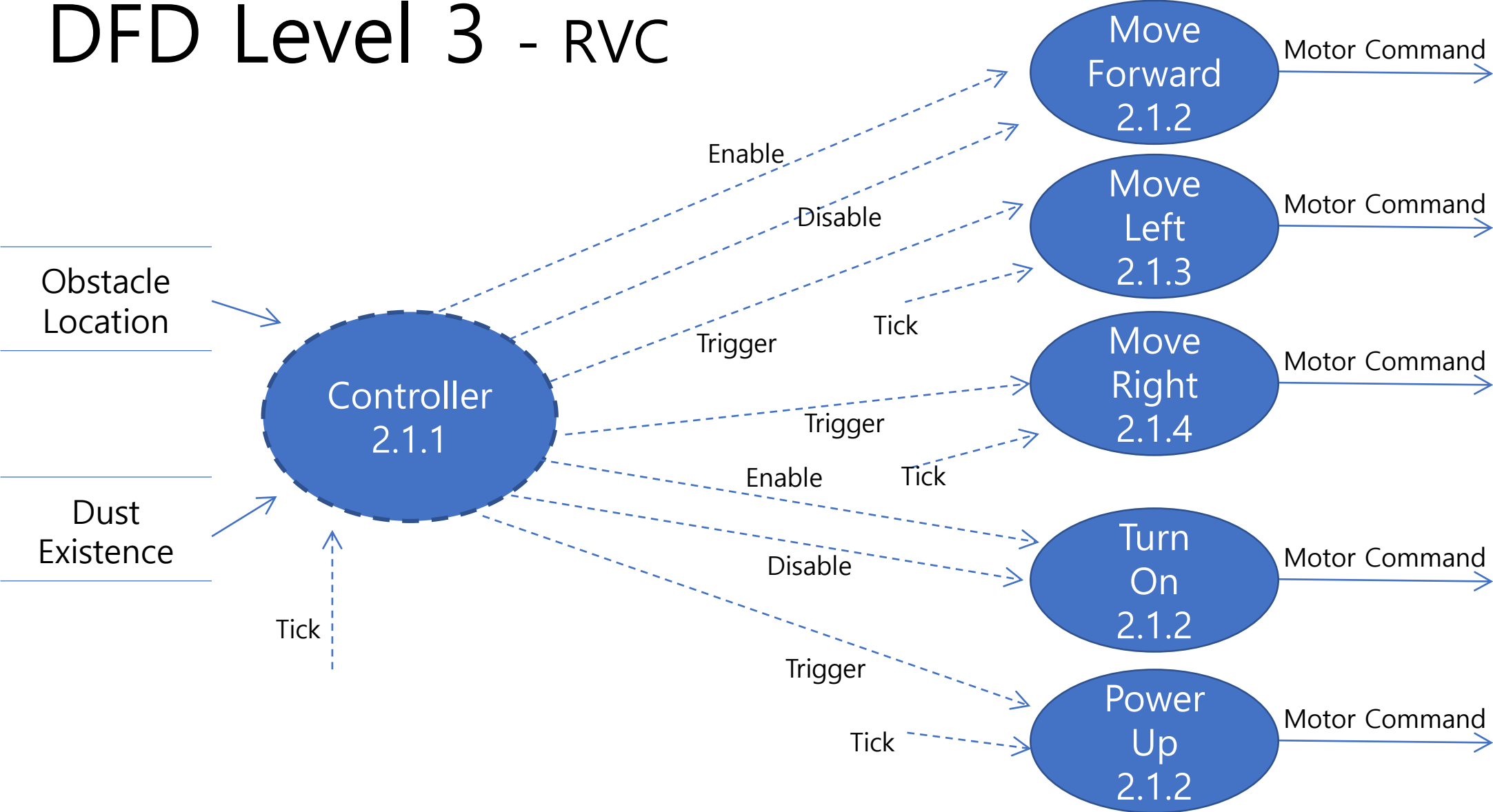
# DFD Level 2 - RVC



# DFD Level 2 - RVC

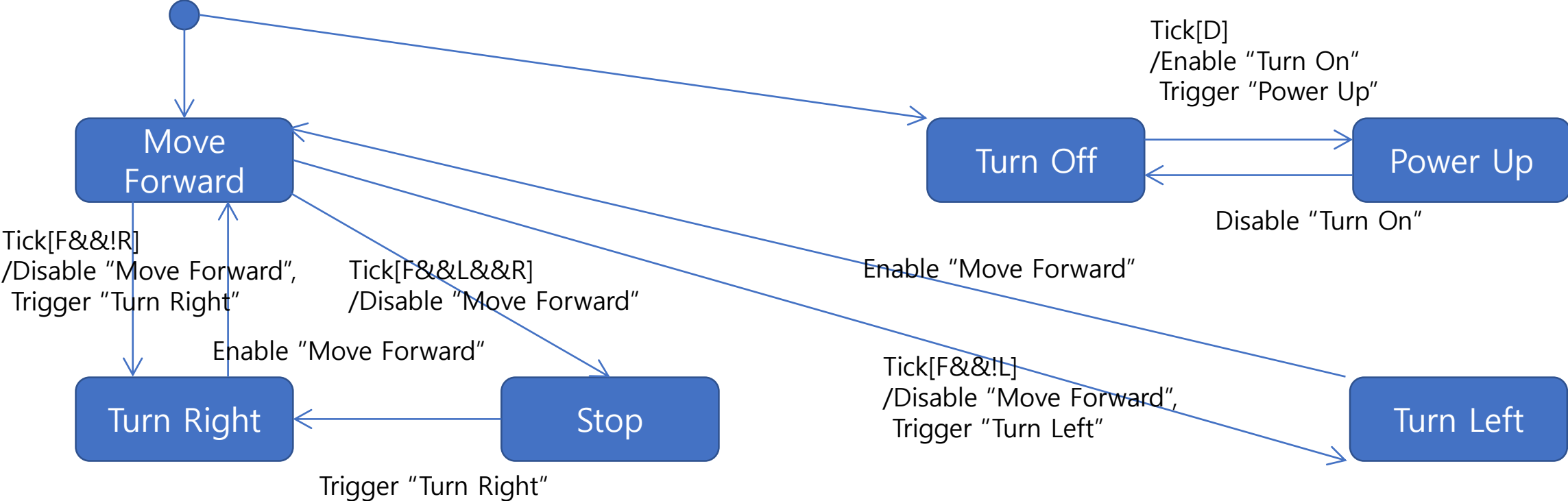


# DFD Level 3 - RVC

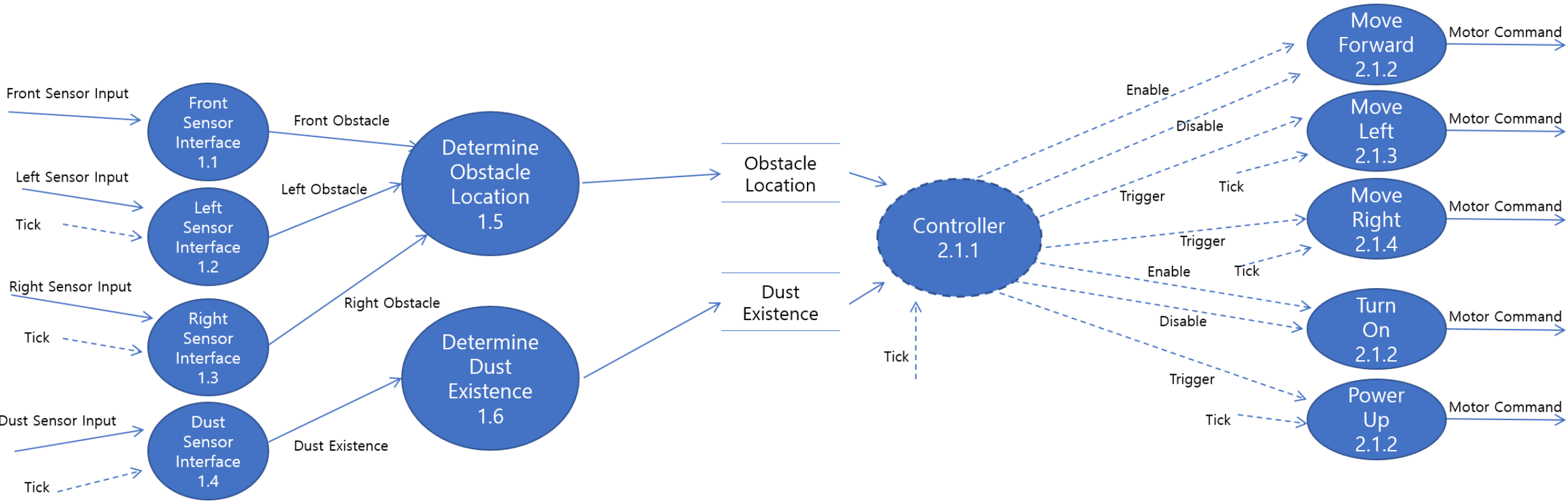


# DFD Level 4 - RVC

State Transition Diagram for Controller 2.1.1



# DFD - RVC



# Supplement point

1. 앞뒤 양 옆이 벽인 경우 Stop한 후 오른쪽 회전을 하여 다른 경로를 탐색.(오른쪽 회전을 두 번 반복하여 반대 방향으로 전진.)
2. Dust Sensor를 받아 먼지가 존재할 때만 Cleaner를 가동.