

Functional Block Requirements

- F000 Internal states of subsystems shall be externally available.
- F001 Supervisory Station
 - F001.00 Receive any error or failure alarms from robot
 - F001.01 Send work tasks (keep track of clock and time)
 - F001.02 Receive robot location
 - F001.03 Interact with wired communication
 - F001.04 Request and receive management data
 - F001.05 Keep track of completed tasks
 - F001.06 Controls the start and stop time of a shift
 - F001.07 User I/O
- F002 Wired Communication
 - F002.00 Communication from supervisory to each zone
 - F002.01 Communication from zone to zone
 - F002.02 Each node needs to be specially addressed
 - F002.03 Able to communicate and bridge with wireless (Tx, Rx)
- F003 Wireless Communication
 - F003.00 Allow Tx, Rx between ceiling nodes to robots
 - F003.01 Able to communicate and bridge with wired
 - F003.02 Each node and robot needs to be specifically addressable
 - F003.03 Branch data with central control on each robot
 - F003.04 For robot to robot communication, the steps for communication need to be as follows: robot – ceiling – robot
 - F003.05 Make location available to navigation
- F004 Navigation
 - F004.00 Accepts destination commands
 - F004.01 Get position from wireless
 - F004.02 Decide how to get to final location from current location
 - F004.03 Give motor control requests for movement
 - F004.04 Know map of mine
- F005 Motor Control
 - F005.00 Follow tape and steer accordingly
 - F005.01 Take requests from navigation for major movements
 - F005.02 Issue control movements specific to each motor
 - F005.03 Panic Shutoff
 - F005.04 Bump Sensor
 - F005.05 Inform navigation of intersections, destination and completion of assigned tasks
 - F005.06 Determines speed of motors
 - F005.07 Respond if robot goes off tape

Functional Block Requirements

F006 Power Monitoring/Distribution

F006.00 Passively distributes power to all functional blocks on the robot

F006.01 Informs central control of low battery life

F006.02 Current overdraw

F007 Sanity

F007.00 Sanity System – resets central control

F008 Central Control

F008.00 Transmit and receive with communication network

F008.01 Issues destination commands to navigation

F008.02 Control system restart

F008.03 Receive faults from robot systems

F008.04 Communicate with all robot subsystems

F008.05 Communicate with sanity

F008.06 Manages high-level operation decisions