CLAIMS

1. A system for controlling movement of transporting devices arranged to transport containers, the containers being stored in stacks arranged in a facility, the system comprising:

one or more processors configured to:

determine at least one task to be performed by one of a plurality of transporting devices, the at least one task including moving a container of a plurality of containers from a first location in a facility to a second location in the facility, the plurality of transporting devices being configured to operate on pathways of the facility that are arranged in a grid-like structure above stacks of the plurality of containers,

select a transporting device from the plurality of transporting devices, based on a condition of the transporting device and one or more transporting device movement constraints, to perform the at least one task, the condition including at least one of transporting device damage, transporting device maintenance issues, or transporting device service issues, and

generate a command to cause the transporting device to perform the at least one task; and

a memory device configured to store the command.

2. The system according to claim 1, wherein the at least one task includes at least one of: communicating with the one or more processors, communicating with another of the plurality of transporting devices, coordinating movement with another of the plurality of transporting devices, lifting the container from one of the stacks, lowering the container into one of the stacks, delivering the container to an inbound station, or delivering the container to a pick station.

3. The system according to claim 1, wherein the command comprises instructions that are executable by the transporting device to cause the transporting device to perform the at least one task.

4. The system according to claim 1, wherein the one or more processors are configured to:

receive a status report from each transporting device of the plurality of transporting devices; and

generate another command from the status report to control another of the plurality of transporting devices.

5. The system according to claim 1, further comprising a control interface configured to communicate with the plurality of transporting devices via an application programmable interface, the one or more processors being configured to cause the control interface to transmit the command via the application programmable interface to the transporting device.

6. The system according to claim 1, wherein the one or more processors are configured to select the second location from among empty locations in the facility within one of the stacks other than a stack of the stacks containing the first location.

7. The system according to claim 1, wherein the one or more transporting device movement constraints include at least one of: maximum velocity, turning radius, turning speed, maximum acceleration, or maximum deceleration.

8. The system according to claim 1, wherein the one or more processors are configured to generate another command based on a change in the one or more transporting device movement constraints, the another command being configured to cause a change in a movement of the transporting device.

9. The system according to claim 1, wherein the one or more processors are configured to generate another command based on a change in the condition, the another command being configured to cause a change in a movement of the transporting device.

10. The system according to claim 1, in combination with the facility, the plurality of containers, and the plurality of transporting devices.

11. The system according to claim 10, wherein the pathways comprise a first set of parallel rails extending in a first direction and a second set of parallel rails extending in a second direction transverse to the first direction in a substantially horizontal plane to form a grid pattern having grid spaces, each of the plurality of transporting devices being configured to selectively move laterally in the first and second directions.

12. A method for controlling movement of a plurality of transporting devices arranged to transport containers, the method comprising:

determining, by one or more processors, at least one task to be performed by one of a plurality of transporting devices, the at least one task including moving a container of a plurality of containers from a first location in a facility to a second location in the facility, the plurality of transporting devices being configured to operate on pathways of the facility that are arranged in a grid-like structure above stacks of the plurality of containers;

selecting, by the one or more processors, a transporting device from the plurality of transporting devices, based on a condition of the transporting device and one or more transporting device movement constraints, to perform the at least one task, the condition including at least one of transporting device damage, transporting device maintenance issues, or transporting device service issues;

generating, by the one or more processors, a command to cause the transporting device to perform the at least one task; and

storing the command in a memory device.

13. The method according to claim 12, wherein the at least one task includes at least one of: communicating with the one or more processors, communicating with another of the plurality of transporting devices, coordinating movement with another of the plurality of transporting devices, lifting the container from one of the stacks, lowering the container into one of the stacks, delivering the container to an inbound station, or delivering the container to a pick station.

14. The method according to claim 12, wherein the command comprises instructions that are executable by the transporting device to cause the transporting device to perform the at least one task.

15. The method according to claim 12, further comprising:

receiving, by the one or more processors, a status report from each of the plurality of transporting devices; and

generating, by the one or more processors, another command from the status report to control another of the plurality of transporting devices.

16. The method according to claim 12, further comprising determining, by the one or more processors, the second location from among empty locations in the facility within one of the stacks other than a stack of the stacks containing the first location.

17. The method according to claim 12, further comprising communicating, by a control interface, the command via an application programmable interface to the transporting device.

18. The method according to claim 12, wherein the one or more transporting device movement constraints include at least one of: maximum velocity, turning radius, turning speed, maximum acceleration, or maximum deceleration.

19. The method according to claim 18, further comprising generating, by the one or more processors, another command based on a change in the condition or the one or more transporting device movement constraints, the another command being configured to cause a change in a movement of the transporting device.