Eliminate Labor Costs
Material movement does not add value to your manufacturing process. Eliminating or reassigning the labor associated with material movement makes your process more efficient.

Support Lean Manufacturing
The TUG not only eliminates material handling waste but can respond to various signals supporting “pull” models of material flow. It can respond to real-time MES signals or ad-hoc requests from the production line. This helps prevent choking the line with unwanted material.

Create Collaborative Automation
The TUG connects your islands of automation by moving materials to where they are needed. The TUG is able to perform its duties alongside your production workers rather than in isolation, making it a collaborative robotic technology.

Improve Worker Safety
Injuries sustained while moving heavy loads are common, as are injuries related to repetitive stress motion. TUG eliminates material movement tasks and helps improve safety in your facility.

Enable Industry 4.0 Implementation
At the forefront of manufacturing is “Industry 4.0” - an assortment of sensors, software and robotics to increase automation in manufacturing. As an autonomous robot, TUG supports this initiative through its own automation along with its ability to connect to machines and systems in real time.
TUG is a smart autonomous mobile robot that delivers materials and supplies. TUG efficiently delivers components, raw materials, tools, WIP, finished goods, boxed goods, and waste materials. Its omni-directional base hauls up to 1,400 pounds and automatically picks up and drops off racks or bins of materials. It receives instructions from your ERP/ MES system, Ethernet/IP connected devices, or from production workers.
Multi-Purpose Robots

TUGs can be used to transport and deliver a wide variety of racks and carts throughout the facility by virtue of its exchange platform. This ensures the TUG is a highly utilized and flexible transportation resource.

Fleet Management

A comprehensive software system manages your fleet of TUG robots. It dispatches, monitors and provides work instructions for all the robots in your fleet allowing them to work in unison. It provides the APIs needed to integrate your ERP/MES system or Ethernet/IP connected devices providing machine-to-machine dispatching and job completion confirmation.

Connecting Islands of Automation

A fleet of TUG autonomous robots allow you to connect islands of production by automating material movement and transfer throughout the plant.

Integration to Building Systems

TUG robots are able to navigate within your existing facility. TUGs can open doors, ride elevators and respond to fire alarm conditions. The TUG uses its WiFi communication to negotiate and control the various building systems.

Unattended Monitoring & Support

Your TUG fleet is managed over a secure cloud connection. It can either be hosted in your facility or ours, but the tools provide your engineering support team unattended monitoring and remote control of robots. Algorithms detect if a robot needs assistance.
Different than AGVs

The TUG is an autonomous mobile robot (AMR) - not an automated guided vehicle (AGV). As an AMR, the TUG provides you with unique and important advantages:

- Does not require infrastructure like beacons or wires. This allows it to be deployed quickly and re-mapped easily.
- Delivers to the immediate point of use rather than staging depots.
- Can navigate unexpected obstacles and still complete its delivery. This prevents bottlenecks.

<table>
<thead>
<tr>
<th>Specification Chart</th>
<th>T3</th>
<th>T3XL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Carrying Capacity</td>
<td>1,000 lbs</td>
<td>1,400 lbs</td>
</tr>
<tr>
<td>Cart Length</td>
<td>36”</td>
<td>48”</td>
</tr>
<tr>
<td>Battery Run Time</td>
<td>10 hours</td>
<td></td>
</tr>
<tr>
<td>Battery Technology</td>
<td>Valve-Regulated Lead Acid</td>
<td></td>
</tr>
<tr>
<td>Drive System</td>
<td>Omni-directional 4-wheel drive</td>
<td></td>
</tr>
<tr>
<td>Navigation</td>
<td>Real-time multi-LIDAR</td>
<td></td>
</tr>
<tr>
<td>Obstacle Detection</td>
<td>Overlapping laser, ultrasonic, and infrared sensors</td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td>WiFi or 900MHz</td>
<td></td>
</tr>
<tr>
<td>Support</td>
<td>Locally hosted plus Cloud Command Center via VPN</td>
<td></td>
</tr>
<tr>
<td>Turning Radius</td>
<td>Rotate about center, front or rear</td>
<td></td>
</tr>
<tr>
<td>Docking Station Width</td>
<td>24” plus 12” clearance</td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td>Interior use</td>
<td></td>
</tr>
<tr>
<td>Travel Speed</td>
<td>30 inches per second</td>
<td></td>
</tr>
</tbody>
</table>

There is no equal

TUG is unique in its capabilities compared to other autonomous mobile robots:

- Up to 1,400 lb capacity
- Automatic pickup and drop off of carts
- True omni-directional navigation
- Multiple cart configurations
- Fleet management software
- Open IT architecture for integration with ERP/MES and building systems
- Universal elevator control & command
- Remote monitoring & control support
About Aethon
Leader in intralogistics automation.

Founded in 2002, Pittsburgh-based Aethon has become a proven leader in intralogistics automation through its turnkey platform, which includes TUG, an autonomous mobile robot to automate physical delivery and transportation of materials. Transportation tasks in manufacturing are necessary, but add no value to the finished product. By automating internal logistics processes, manufacturers can reduce labor or direct it to more important areas of production.

Made in the USA
TUG robots are proudly designed, manufactured and supported in Pittsburgh, PA.