

## **Starship Technologies / Cambourne External Wireless Charging Solution**

### **1. Background**

Starship Technologies has now been successfully operating in Cambourne since May 2022 with our robots doing thousands of deliveries to local residents, reducing car miles used and having a positive impact on the local environment by lowering Carbon emissions.

Starship would now like to deploy new world leading technology in Cambourne to support the customer experience and further reduce emissions by removing the need for robots to be transported to and from Cambourne for charging.

The new technology enables robots to wirelessly charge in an external location. It uses minimal energy, is discrete and is easily installed.

We would aim to have the installation complete by 4th February 2024.

### **2. Positioning**

Following a positive discussion and visit to Cambourne Town Council on 6<sup>th</sup> December 2023, the area to the side of the Town Council Office (see fig.1) was identified as a suitable area for the positioning and installation of an external charging unit.



fig.1

The charging unit (see fig.2) would be installed in the yellow area (see fig.3) with a new paved area in the red area. A new external power socket would be installed to provide power to the charging unit.



fig.2



fig.3

The charging unit can be configured so that there are up to four charging points and the required footprint for the paved area can be seen in fig.4.

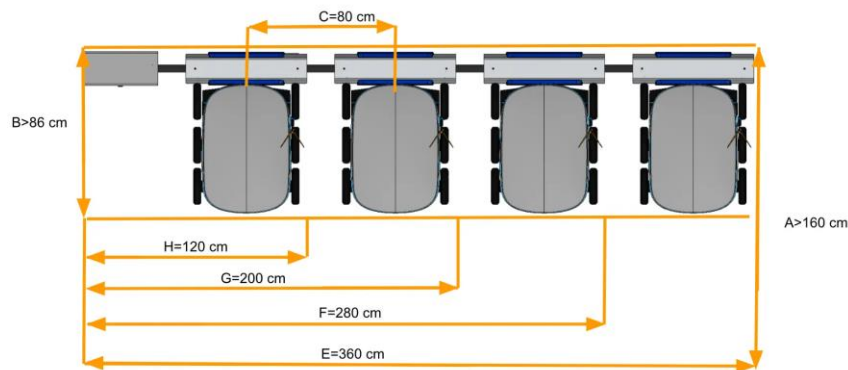


fig.4

### 3. Energy Consumption

Whilst robots aren't being charged, the charging unit only consumes a very low amount of power - approx 12w/0.012kw.

Power consumption varies depending on the number of charging points within the unit. The largest wireless charging unit contains 4 charging points and consumes 1000w max. Power consumption for a single charging cycle is estimated to be 1400wh (1 robot) to 6000wh (4 robots). Please see table on the following page for more details.

	<b>Systems with 1 charging slot</b>	<b>Systems with 2 charging slots</b>	<b>Systems with 3 charging slots *</b>	<b>Systems with 4 charging slots</b>
<i>Output power per slot</i>	<i>450W</i>	<i>450W</i>	<i>330W</i>	<i>250W</i>
<i>Charging time from 10-80%</i>	<i>~3h</i>	<i>~3h</i>	<i>~4h</i>	<i>~5,5h</i>

Starship Technologies will cover energy costs which would be estimated based on charging activity.

#### **4. Liability and Health and Safety**

Liability will remain with Starship Technologies and Starship has property insurance to cover its equipment/property.

The equipment is safe to install and use in an outdoor environment and the system is developed to meet the wireless power transmission systems standards. The wireless charging unit's design has been designed in a way that avoids having sharp edges or protruding parts - and there are no external electrical cables.

From an electrical perspective, the nature of wireless charging means there is no electrocution risk - the system only starts charging when a connection has been established between the charger and the robot. If the robot is pulled away from the charger when charging, power is cut off. The system is only able to charge Starship robots.

#### **5. Installation**

The wireless charging unit is secured to the ground at the agreed location. The power source can either be from an underground power source/external power cabinet or an external power socket. Any cabling can either be routed underground or housed in metal conduit.

Starship will cover the cost of installation and localised landscaping.

#### **6. Post installation support**

Starship will be alerted automatically, should an issue arise with the charging operation. We ask partners to visually check the equipment once a week.

#### **7. Overview**

- Starship Technologies pay for and install an external socket on the exterior wall of the Cambourne Town Council building
- Starship Technologies pay for and install paving (in keeping with the local area) for robots to manoeuvre
- Starship Technologies and Cambourne Town Council enter into an arrangement regarding the payment for energy usage (the charging units use minimal energy)

## **8. Contact**

For further information contact Ryan Holroyd-Case, Public Affairs and Stakeholder Manager as Starship Technologies ([ryan.holroydcase@starship.co](mailto:ryan.holroydcase@starship.co))