Autonomous Arctic Rover

v. 2022-0.1

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May 20, 2022

Abstract

Autonomous Arctic Rover is a fully autonomous arctic research mobility platform. Designed to perform autonomous data logging on the Greenland ice sheets. Powered by solar energy the rover can operate continuously. Utilizing iridium communication data can be transmitted to and from the rover. This allows for updating routes as well as progress monitoring. The modular platform allows for a multitude of research application. The initial operation is based around a Leica GPS 1200, allowing for high-precision positional data, used to determine topography and changes in topography.

Contents

1 Safety Information

1.1 General safety instructions

DANGER

Danger to life or serious injury can occur when live parts are touched. Do not touch or modify electrical installations without proper training or guidance.

DANGER

Danger to life or serious injury can occur if personnel are in front of the vehicle during operation. Always act with caution when moving near the vehicle. During autonomous operation stay clear of the front, and never operate vehicle autonomously near crowds.

WARNING

Danger to life, serious injury, or equipment damage can occur due to incorrect handling of equipment. When remote controlling vehicle, always check surroundings, and never drive near people.

WARNING

Serious injury or equipment damage can occur due to moving parts. Keep hands and limbs clear during operation.

WARNING

Danger to life, serious injury, or equipment damage can occur due to live batteries. Always disconnect batteries before modifying electrical circuits.

WARNING

Danger to life, serious injury, or equipment damage can occur due to incorrect handling of equipment. Only trained personnel may service or modify system.

CAUTION

Risk of equipment damage due to incorrect assembly. Always ensure bolts and nuts are sufficiently tightened according to specifications before operating vehicle.

2 Overview

2.1 Components

2.2 Description

3   System Description

4 Assembly Process

4.1 Front Suspension

4.2 Rear Suspension

4.3 Solar Panels

4.4 Electrical Connections

5 System Manual

5.1 System Inputs

5.2 Remote Control

5.2.1 Control Scheme

5.3 Autonomous Driving

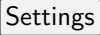### 5.3.1 Routes

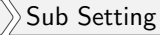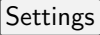### 5.3.2 Iridium Transmission
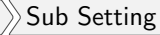
5.4 Serial Commands

5.4.1 Strategy

5.4.2 Modules

5.4.3 Files

6 Additional Procedures

7 Common Errors

7.1 Category

Error	Cause	Fix
Error 1	Cause 1	Solution 1. Settings ⟩ Sub Setting
	Cause 2	Solution 2.
	Cause 3	Solution 3.
Error 2	Cause 1	Solution 1. Settings ⟩ Sub Setting
	Cause 2	Solution 2.

References

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