

Statement of Work

Light Detection and Ranging (LiDAR) Units

1. INTRODUCTION

The Intelligent Systems Division (Code TI) has a requirement in connection with the ARMD SASO TC5 Sensing and Localization project which is building a prototype UAV payload for acquiring accurate data to use in algorithm and control development leading to a higher level of autonomous operation. The UAV has a maximum payload capacity of 5 Kg, which has to include computing, communications, other sensors and power sources. The Light Detection and Ranging (LiDAR) unit must be included in the payload in order to provide a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth. These light pulses—combined with other data recorded by the airborne system— generate precise, three-dimensional information about the shape of the Earth and its surface characteristics.

2. REQUIREMENTS

The ARMD SASO TC5 Sensing and Localization project requires two LiDAR units to be used in the UAV payload to provide the necessary guidance

3. SPECIFICATIONS

The vendor shall provide Velodyne VLP-16 (Product Code 80-VLP-1) or equal that meet the following specifications:

- The LIDAR shall weigh less than 2 Kg with a volume of 500 cc maximum
- The LIDAR shall consume less than 25 W of power
- The LIDAR shall operate over a temperature range of -10 to 60 C
- The LIDAR shall operate within a vibration range of 3G rms (5-2000 Hz) (TBR) and a shock range of up to 500 m/sec² (50 G) (TBR).
- The LIDAR shall operate over an air pressure range of 200 – 760 Torr.
- The LIDAR shall include environmental protection to IP67 level.
- The LIDAR shall measure distances over a range of 1 to 100 meters.
- The LIDAR shall support a vertical aperture of 30 degrees minimum.
- The LIDAR shall support a horizontal aperture of 360 degrees.
- The LIDAR shall support a frame rate of 10 Hz minimum
- The LIDAR shall support an accuracy of 2 cm distance measurement at 25 m range.
- The LIDAR shall support a vertical angular resolution of 2 degrees minimum.
- The LIDAR shall support an output rate of 300,000 points per second minimum.
- The LIDAR shall support an Ethernet interface for data output.
- The LIDAR shall use lasers that are eye-safe to reduce safety concerns.

Note - All items considered equal must provide descriptive literature and specifications in order to determine its technical acceptability.

4. DELIVERY SCHEDULE

- The vendor shall deliver the LiDAR units within 16 weeks after receipt of order (ARO).
- The Delivery Location will be:
NASA Ames Research Center
Building N255-3, Receiving Station
Moffet Field, CA 94035-0001