**Requirement Specification for**

**two Motorised Pan and Tilt positioners**

1. **Requirements**

**1.1. Description of the requirement**

The Defence Research Center is a unit under the Danish Ministry of Defence Acquisition and Logistics Organization (DALO).

Among other things, The Defence Research Center perform scientific measurements in both the optical and Radio Frequency (RF) spectrum. The Defence Research Center wants to acquire two Motorised Pan and Tilt positioners/pedestals which can accommodate various sensors.

The motorized pedestals will be employed to orient sensor equipment such as radar or optical sensors remotely without the use of manual power. This will improve the tracking of measurement objects in both precision and speed. Additionally, the motorized pedestals will enable automatic tracking from external data in the event the pedestal needs to track measurement objects that are hard to detect for a human operator or when visibility is not optimal. In addition, several or heavy sensors must be able to be mounted on the same platform, which ensures either better measurements or comparable measurements taken from several sensors at the same time.

The optics and RF measurements of The Defence Research Center have varying requirements however acquiring two identical platforms that can accommodate both is advantageous in both knowhow and maintenance. As such the pedestals must be able to support a wide variety of sensors. The pedestals should accommodate The Defence Research Center optical and RF setup in a semi-modular fashion.

The pedestals should be lightweight and flexible such that it can be mounted on a mobile platform.

**1.2. Relations to other materials**

Optic sensors will be mounted in a weather resistant housing where the optics can be mounted on rails or an optical table. The RF setup will be more permanent and comprised of a transceiver, Power Amplifiers and antennas, hence the high weight requirement. Currently the plan is to build this setup in-house on the basis of a commercial pedestal.

The pedestals will be mounted in a mobile platform.

Sensor interface should support several simultaneous sensors and not impede the movement of the pedestal.

**1.2. Description and definitions**

The requirement specification, cf. section 1.4, describes all the requirements for the acquisition and consists of six columns with the following information:

|  |  |
| --- | --- |
| "#" | ID number |
| "Requirement" | Requirement description |
| "Classification" | The classification of the requirement as further described in section 1.3 |
| "DALO remarks" | Further information regarding the requirement |
| "Requirement compliance" | The tenderer's indication of compliance (YES or NO) |
| "Tender description" | Requirements regarding the tenderer's compliance description  |

**1.3. Classification**

All requirements are mandatory requirements (SHALL) and shall be fulfilled by the tenderer. If just one of the mandatory requirements is not fulfilled, the tenderer's tender will not be taken into further consideration.

**1.4. Requirement and response sheet**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **Requirement** | **Classification** | **DALO remarks** | **To be filled out be the tenderer** |
| **Requirement compliance****(tick a box)** | **Tenderer's description** |
| **YES** | **NO** |
|  **0** | The two Motorised Pan and Tilt positioners/pedestals SHALL meet the following requirements:  | SHALL |  |  |  |  |
| **1** | A max. load on elevation axis of 80 kg | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **2** | A max. wind load of 1.5 m² | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **3** | A max. wind speed (operational) of 15 m/sec  | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **4** | A max. wind speed (survival) of 31 m/sec | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **5** | Encoder type: Absolute Encoder | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **6** | Tracking speed: 46 °/s | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **7** | Azimuth range, end to end: Min. 400 deg. | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **8** | Elevation range, end to end: Min. 185 deg.  | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **9** | Precision Azimuth: 0.3° | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **10** | Precision Elevation: 0.3° | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **11** | Climatic environment: Fulfil IEC 721-3-4 class 4K4H or IP66 as well as begin capable of operating between -20° and +55° Celsius or equivalent | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **12** | Pointing error at 15 m/s winds on a 1.5 m^2 area: 0.3° | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **13** | Power requirement for mounted equipment: 400 V, 50 Hz, max. 3 kVA | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **14** | Data interface for mounted equipment: Serial min. 115,2 Kbit/s and 10Gb Ethernet | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |
| **15** | Control interface: Documented for integration with a standard communication protocol interface like RS-422, Ethernet or equivalent | SHALL | The tender **must** include a description **or** attached valid documentation |  |  |  |