**Specifications & Capabilities of RTK Survey-Grade GPS survey instrument**

**For IDALS DSCWQ**

By W. Greenlees, P.E.

**Equipment for Primary (network capable) RTK GPS outfit. One (1) field-ready outfit shall include, at a minimum, the following:**

* GPS/GNSS receiver including at least two (2) removable, rechargeable L-ion batteries
* Data collector/controller device with physical QWERTY key pad and cursor buttons including rechargeable L-ion battery, integral with device, but removable for service
* Data collector software, latest stable version, pre-installed on data collector
* 2-meter graphite composite pole/rod with removable steel point on standard 5/8”-11 threaded connection
* Cradle or claw attachment appropriately-sized to fit data collector including appropriate clamp for securing it to the pole/rod
* Removable bipod attachment with push-button release each leg
* Field-ready accessories package including, at a minimum:
  + Battery charger for receiver batteries including associated cord and/or cable; charger shall accommodate two batteries at one time
  + Battery charger for data collector battery with associated cord and/or cable
  + Topo shoe to be interchangeable with (or that clips onto) steel point for pole
  + External Cellular telephone pocket attachable to pole/rod
  + Hard-shell carry case for GPS/GNSS receiver and data collector. Case must include space to accommodate two (2) receivers

**Equipment for Auxiliary GPS outfit for Base/Rover applications. One (1) field-ready outfit shall include, at a minimum, the following:**

* GPS/GNSS Base Receiver including at least two (2) removable, rechargeable L-ion batteries
* Heavy duty wood/fiberglass flat-head tripod complete with quick-release leg adjustments
* Tribrach with optical plummet

**Minimum Capabilities of GPS/GNSS network rover receiver:**

* Must have minimum capabilities exhibited by Sokkia GRX2, Carlson BRx6+, or Trimble R10
* Must be capable of Bluetooth connection to data collector
* GNSS Compatible with GPS, GPS L5, GLONASS, Galileo – latest industry standard
* Compatible with and able to receive GPS corrections from Iowa RTN network – latest Iowa statewide upgrade
* Sub-inch precision
* Minimum 8 hour runtime per battery on one single charge
* Receiver must be capable for use in Base/Rover applications if or where network corrections cannot be obtained

**Minimum Capabilities of GPS/GNSS base receiver:**

* Must have minimum capabilities exhibited by Sokkia GRX2 or equal and must be compatible with network rover receiver
* Minimum 8 hour runtime per battery on one single charge
* Must include Built-in radio capable of least one to two (1-2) mile range
* May include capability for, but must not require external radio, external radio antenna external battery or cable connections
* GPS/GNSS base receiver should be interchangeable with rover receiver

**Minimum Capabilities of Data Collector/Controller Hardware:**

* Ruggedized and compact; shape should resemble that exhibited by Trimble TSC3, Trimble TSC7, Carlson Surveyor2, Leica CS20, or Topcon FC-2600
* IP68 water and dust resistant
* 8 GB memory (minimum)
* Full physical numeric QWERTY keypad with cursor buttons including back light option
* Touch screen with back light option and stylus.
* Shall be configurable to communicate with Iowa RTN network (latest statewide upgrade) using external cellular Wi-Fi device; must not require purchase of a cellular carrier contract
* Must be configurable to communicate with a variety of user data phone devices using either Verizon or US Cellular carriers
* Must communicate with receiver using Bluetooth
* Standard 9-pin serial port to communicate with Sokkia SET 5 (or similar) total station Instrument
* Standard, full-sized USB port to allow data transfer using removable USB memory sticks
* Bluetooth connectivity to GPS/GNSS receiver
* Minimum eight to ten (8-10) hour runtime on a single battery charge

**Minimum Capabilities of Data Collector Software:**

* Latest industry standard (perpetual license that DOES NOT require monthly or annual subscription) Must exhibit features similar to or exceeding capability of Trimble Access or Carlson SurvCE
* Intuitive, functional, easy-to-learn-and-use interface
* RTK capable
* Configurable to communicate with and collect data from Sokkia SET 500 (or similar) Total Station instrument
* Able to collect data in a variety of pre-programmed, as well as custom user-defined, coordinate systems
* Pre-programmed coordinate systems must include, at a minimum, NAD 83, UTM zone 15N, NAD 83 & NAD 27 Iowa State Plane (North & South)
* Must allow user to define custom coordinate systems like the Iowa Regional Coordinate System
* Must allow selectable GEOID options with latest available GEOID pre-loaded.
* Must allow GEOID upgrades by user
* Must be configurable to allow import and export of ASCII text and CSV data in Pt, North, East, Elev, Code, format
* Full COGO capabilities
* Allows data collection of topo points with automatic, rapid and for observed control point modes
* Allows staking of points, lines, curves with cut/fill information
* Must allow measurement in metric, US Survey Feet, and International Feet
* Must allow user input of land surface files from CAD drawings for “on-the-fly” grade checking

**Quote Solicitation:**

Potential suppliers should list their prices for the equipment on the following tables. The Department of Agriculture may consider purchase of the Primary Outfit only or it may consider purchasing the Auxiliary outfit with the Primary Outfit.

The unit price for each piece of equipment must be listed for comparison of competitive proposals. The base price or the complete outfit should be listed at the bottom of each table. With their quote, supplier should provide the name brand, type, and/or model of equipment quoted along with an explanation of how their proposed equipment package meets the outlined requirements above.

Before final decision is made, The Department of Agriculture may request supplier to coordinate a demonstration of the equipment included in their quote to ensure responsiveness. After decision is made, Department of Agriculture will request supplier provide at seller’s cost a two-to-four-hour training opportunity for potential users of the equipment. Training session should include setup, network configuration, basic operation, care, and maintenance of the equipment.

**Primary RTK GPS/GNSS Outfit:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item** | **Qty** | **Unit** | **Unit Price** | **Extended** |
| GPS/GNSS receiver | 1 | Ea. |  |  |
| Data collector device | 1 | Ea. |  |  |
| Data collector software, pre-installed | 1 | Lump |  |  |
| 2-meter extendable pole/rod | 1 | Ea. |  |  |
| Cradle attachment for data collector | 1 | Ea. |  |  |
| Removable bipod attachment | 1 | Ea. |  |  |
| Field-Ready accessories | 1 | Lump |  |  |
|  |  |  | **Package Price:** |  |

**Auxiliary RTK GPS/GNSS (base-rover) Outfit:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item** | **Qty** | **Unit** | **Unit Price** | **Extended** |
| GPS/GNSS Base Receiver | 1 | Ea. |  |  |
| Wood/Fiberglass tripod | 1 | Ea. |  |  |
| Tribrach with optical plummet | 1 | Ea. |  |  |
|  |  |  | **Package Price:** |  |

**Delivery of the entire product must be made by June 28, 2019**

**Submit bid by 4:00 pm May 17, 2019 to:**

**Jonathan Koele**

Wallace State Office Building

502 E. 9th St. Des Moines, IA 50319

(515) 281.6877

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