

**JUSTIFICATION FOR SOLE SOURCE
(SIMPLIFIED ACQUISITIONS UNDER \$150K)**

PR: 4200470073

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER

I recommend that NASA, Goddard Space Flight Center procure the following brand name items manufactured by National Instruments (NI): Two sets of field programmable gate array (FPGA) based multichannel digital signal processing circuit systems, each in a PXIe chassis and programmable with LabView software interfaces to be used by the Laser Remote Sensing Laboratory, code 694 for the Airborne CO2 Lidar Instrument that will service the NASA GSFC's Airborne Campaign for NASA's ASCENDS mission.

- The following parts are needed for both FPGA circuit cards:

Part#: 781368-01 NI PXI System Configuration ID: PX3350272 (Numbers 1-8) NI PXIe-1071, 4 Slot 3U PXI Express Chassis.	1	Each
Part#: 763000-01 Power Cord, AC, U.S., 120 VAC, 2.3 Meters.	1	Each
Part#: 782340-33 NI PXIe-8135 Core i7-3610QE 2.3 GHz, Real-Time Embedded SW.	1	Each
Part#: 960903-02 NI Standard System Assurance Program for PXI.	1	Each
Part#: 781805-01 NI PXIe-7966R NI FlexRIO FPGA Module (Virtex-5 SX95T, 512MB RAM).	1	Each
Part#: 781702-01 NI 6587 (16+4 LVDS ch, 1 Gbps per channel).	1	Each
Part#: 779323-01 SMA-2164 Prototyping accessory for NI 656X.	1	Each
Part#: 192344-01 SHB12X-B12X Shielded Cable, LVDS, Meter.	1	Each

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<p>Part#: 779734-35 DEVELOPER SUITE CORE AND OPTIONS Configuration ID: UA3350361 (Numbers 9-10)</p> <p>LV Real-Time Deployment Option for NI Developer Suite Adds the LabVIEW Real-Time Module to deploy LabVIEW code and dedicated real-time hardware. S/N Z61M19473. New Single Seat License(s) With 390 Day DEVELOPER SUITE STANDARD SERVICE PROGRAM, Upgrade from existing software.</p>	1	Each
<p>Part#: 779735-35 FPGA Deployment Option for NI Developer Suite Adds LabVIEW FPGA Module to create custom hardware using LabVIEW and off-the-shelf NI RIO hardware. S/N Z61M19473 New Single Seat License(s) With 390 Day DEVELOPER SUITE STANDARD SERVICE PROGRAM.</p>	1	Each
<p>Part#: 940005-01 Developer Suite Standard Service Program Ontime, 1 Yr Renewal of NI DEVELOPER SUITE, ENGLISH. S/N Z61M19473 Current Configuration:NI DEVELOPER SUITE, ENGLISH.</p>	1	Each
<p>Part#: 781368-01 NI PXI SYSTEM Configuration ID: PX3350615 (Numbers 12-21)</p> <p>NI PXIe-1071, 4-Slot 3U PXI Express Chassis.</p>	1	Each
<p>Part#: 763000-01 Power Cord, AC, U.S., 120 VAC, 2.3 meters.</p>	1	Each
<p>Part#: 782340-04 NI PXIe-8135 Core i7-3610QE 2.3 GHz Controller, Win 7 (32-bit).</p>	1	Each
<p>Part#: 960903-02 NI Standard System Assurance Program for PXI.</p>	1	Each
<p>Part#: 776670-35 LabVIEW Full Development System, Windows, English. NI Software Service provides free, automatic upgrades for your software & access to NI Application Eng via</p>	1	Each

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phone/email for tech support. New Single Seat License(s) With 1 Yr LABVIEW STANDARD SERVICE PROGRAM.		
Part#: 778694-35 LabVIEW FPGA Module. NI Software Service provides free, automatic upgrades for your software & access to NI Application Engineers via phone/email for technical support. New Single Seat License(s) With 1 Yr LABVIEW STANDARD SERVICE PROGRAM.	1	Each
Part#: 781206-01 NI PXIe-7962R NI FlexRIO FPGA Module (Virtex-5 SX50T, 512MB RAM).	1	Each
Part#: 781702-01 NI 6587 (16+4 LVDS ch, 1 Gbps per channel).	1	Each
Part#: 779323-01 SMA-2164 Prototyping accessory for NI 656X.	1	Each
Part#: 192344-01 SHB12X-B12X Shielded Cable, LVDS, 1 Meter.	1	Each

These parts/software are needed within 6 weeks from the date of award. These parts/software are for the Airborne Campaign for the CO2 Lidar Instrument for NASA's ASCENDS mission. These parts/software are to evaluate a new infrared detector system and later to be used as part of the airborne CO2 Lidar Instrument receiver for the Airborne Campaign. It is crucial that these FPGAs are delivered by mid September to complete the test and integration of the CO2 Lidar instrument in time for the airborne campaign which is already scheduled for early next year. The timely delivery of these parts/software is critical for us to finish testing the detector and start the instrument integration and test without further adverse effect to the team. The National Instrument FPGA systems were chosen because of the intermediate proprietary LabView software, the instruments under the ASCENDS mission already use the LabView software developed by National Instrument, and any other software would not be compatible with the existing equipment. The CO2 Lidar Instrument cannot function without this FPGA based receiver signal processing and no other type of signal processing hardware will fit in the space in the instrument racks.

2. There are no known equivalents of FPGA circuit systems that allow the user to use the intermediate proprietary LabView software to define the circuit function and modify them during the algorithm development. It was determined based on the market research conducted for the FPGA circuit systems that all other vendors use VHDL software language not LabView software which code 694 requires. The

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intermediate LabView software lets the user define the circuit function using the software and translates it into standard VHDL codes to program the FPGA. The LabView software allows the user to reprogram the FPGA for different needs at different stages of the CO2 Lidar instrument development.

3. The alternative to buying these National Instruments parts/software would be to hire an experienced FPGA programmer to build a custom circuit system at an estimated cost of \$50K per system, and NASA would not be able reuse it for future applications. The schedule delay, the associated cost of hiring an experienced FPGA programmer, the fact that no other hardware will fit in the existing instrument racks, and the fact that the custom system would not allow for reusability would cause critical harm to the Airborne Campaign.

This recommendation is made pursuant to FAR 13.106, for the acquisition of supplies or services determined to be reasonably available from only one source. Based on the above, it is concluded that our minimum needs are only reasonably available from the selected source.



Digitally signed by
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14c7623686e42 357-2269724 73d1d
DN:
..com:..ldm.appleid.prd.6d4645646567e7
357-2269724 73d1d
Date: 2013.08.11 15:35:29 -0500

Signature & Title

Date

8/11/13

Pursuant to NFS 1805.207 and 1804.570, the proposed contract action was synopsisized on NAIS and pursuant to FAR 5.201, the proposed contract action was synopsisized in the Federal Business Opportunity.

I hereby accept the above stated recommendation and determine that the circumstances of the contract action deem only one source reasonably available.

Approval:



Contracting Officer

Date

8/21/13