TYPE CERTIFICATE DATA SHEET No. Q00017LA

This data sheet, which is part of Type Certificate No. Q00017LA, prescribes conditions and limitations under which the product for which the type certificate was issued meets the airworthiness requirements of the 14 Code of Federal Aviation Regulations (14 CFR).

Type Certificate Holder
Insitu Inc.
118 East Columbia River Way
Bingen, WA 98605
USA

I. Model ScanEagle X200 (Restricted Category UAS) Approved July 19, 2013 (See NOTES Section)

UAS
This is an Unmanned Aircraft System (UAS) that is comprised of the air vehicle and the transportable ground control station.

Unmanned Aircraft Dimensions
Wingspan 10.2 Ft (3.11 m)
Length 4.5 Ft (1.37 m)

Engine
(1) Northwest UAV, Block D Hush
FAA Engine Type Certificate: None
Engine type: Normally-aspirated, carbureted, two-stroke, direct drive, air cooled, single cylinder engine.

Optional engine:
Northwest UAV, HFE-EFI – see NOTE 15

Fuel
High Octane C-10
Fuel for optional engine – see NOTE 15

Oil
STIHL HP Ultra 2-cycle oil
Oil for optional engine – see NOTE 15

Fuel-Oil Mix Capacity
2.5 gallons

Engine Limits
Max Takeoff Power 1.75 HP at 8500 RPM
Max Continuous Power 1.75 HP at 8500 RPM
Max Cylinder Head Temperature (CHT) 180 °C
Min CHT for flight 50 °C

Engine limits for optional engine – see NOTE 15
Propeller and Propeller Limits. (1) APC, Propeller Model LP3-15013W
FAA Propeller Type Certificate: None
Propeller Type: 3-blade, chopped fiberglass and resin, 15 x 13 fixed pitch pusher
Diameter (Nominal): 15 inches (38 cm)
Pre-flight Static rpm requirement: Engine must successfully achieve the I-MUSE
checklist item: Engine Performance Checked

Propeller for the optional engine:
APC, Propeller Model LP16014P – see NOTE 15

Electric Generator
20 Volts, nominal
6.0 Amps, maximum
95 Watts, maximum

Backup Battery
19.2 Volts, nominal
1100 mA Hrs.

Airspeed Limits
\[ V_{NE} \] 98 KTAS (181 km/hr)
\[ V_{NO} \] 85 KTAS (157 km/hr)
\[ V_A \] (Maneuvering Speed) 85 KTAS (157 km/hr)
Landing Speed (Closing Speed) – minimum 25 KT (46 km/hr)
Landing Speed (Closing Speed) – maximum 52 KT (96 km/hr)

Center of Gravity (C.G.) Range
Center of gravity from datum Minimum: -1.97 in (-50 mm) at any weight
Center of gravity from datum Maximum: -2.76 in (-70 mm) at any weight
Reference Datum Location: 8.07 in (205 mm) forward from the aft edge of the
fuselage module

Empty Weight C.G. Range
None

Datum
Located on centerline of airplane at wing trailing edge intersection: positive in
the x direction to the nose; positive in the y direction to the right wing; and
positive in the z through belly of the aircraft. (Insitu ScanEagle Datum
Reference Drawing, 15Jul2013)

Mean Aerodynamic Chord (MAC)
9.5 in (241.3 mm) long with leading edge:
x = -0.55 in (14.0 mm) from datum
y = 27.8 in (706.7 mm) from datum.

Leveling Means
When level—in the aircraft stand—and not moving, accelerometers should read:
X-axis: 0.0 G +/-0.03 G
Z-axis: -1.0 G +/-0.05 G

Maximum Weights
Ramp 44 lb (19.96 kg)
Takeoff 44 lb (19.96 kg)
Landing Weight 44 lb (19.96 kg)

Empty Weight
29.5 lb (13.4 kg)

Empty weight using optional engine and propeller – see NOTE 15
Data UP-Link Frequencies 1.3 GHz, Commands for: aircraft control, sensor control, video control
Data DOWN-Link Frequencies 1.3 GHz, Report status on: aircraft, sensors, and video
Video Down-Link Frequency 2.4 GHz

NOTE: FCC license is required to utilize the above frequencies.

Computer Software I-MUSE Software Version 5.6.13

Minimum Crew (1) UAS pilot at the Ground Control Station
(2) Personnel for launch and recovery

Number of Seats (0) Not Applicable

Fuel Capacity Fuel System: 12.3 lb of fuel (5.6 kg)
Unusable Fuel: 0.2 lb of fuel (0.1 kg)

See NOTE 15 for fuel capacity when using optional engine

Fuel/Oil mixture ratio: 50:1 – by volume

See NOTE 15 for Fuel/Oil mixture ratio when using the optional engine

NOTE: Fuel capacity includes the oil mixed with the fuel

Oil Capacity Not Applicable

Max. Operating Altitude 2000 ft. AGL (610 M)

Control Surface Movements
Outboard Elevon Up 30° Down 30°
Inboard Elevon Up 30° Down 30°
Rudder Left 25° Right 25°

Flight Endurance 18.5 Hrs.

Flight Limitations 1. Day Visual Flight Rules (VFR) in visual meteorological conditions (VMC)
2. Flight through visible moisture: PROHIBITED
3. Flight operations in icing conditions at assigned operational altitudes: PROHIBITED
4. Flight Pitch Attitude: +/- 45°
5. Flight Bank Angle: +/- 44°
6. Ambient Outside Air Temperature (OAT)
   a. Maximum OAT: 120°F / 49°C
   b. Minimum OAT at Altitude: -4°F / -20°C
7. Wind. See Note 5
8. Flight Operations. See Note 4
9. For this operation only one ScanEagle can be airborne at any given time
10. Over water operation: PERMITTED
11. Over land operation: PROHIBITED, except PERMITTED for:
   a) Ingress/egress routes for access to over water operations to and from coastal launch and recovery sites;
   b) Airspace defined in Arlington Certificate of Waiver and Authorization (COWA) 2014-AHQ-101
12. An authorization for the specific location of operation issued by the Administrator is required and must be available at the control station. AFM number FAA-01-AFM, dated July 16, 2013 or later FAA approved revision, and certificate of airworthiness (C of A) must be available at the control station (reference FAA Memorandum, “Certification of Unmanned Aircraft”, from AAL-7 to ANM-100L, dated June 19, 2013). Additionally, any certificates of authorizations or waivers must be available at the control station.

13. Only for operation in the designated Arctic Area as defined by the FAA Modernization and Reform Act of 2012, Section 332(d)(1).

14. Operation with inoperative instruments and equipment: PROHIBITED

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<th>Serial Numbers Approved:</th>
<th>Air Vehicle:</th>
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<td>11-1313, 11-1453, 11-1458, 11-1459</td>
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<td>Ground Control Station (GCS):</td>
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<td>TGCS274, GCS143</td>
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<tr>
<th>Certification Basis</th>
<th>Restricted Category Only</th>
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<tr>
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<td>14 CFR part 21.25(a) (2) for the special purpose of aerial survey, 14 CFR part 36, amendment 29, Appendix G</td>
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| Production Basis | None |

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<td>P/N 900-201125-002</td>
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**NOTES:**

**NOTE 1**
Current weight and balance data, loading information, and a list of equipment included in the empty weight must be provided for each UAS at the time of original certification.

**NOTE 2**
Placards Required: None

**NOTE 3**
This UAS must be maintained in accordance with Unmanned Aerial Systems Maintenance Handbook, Version 2.0, dated September 2007, Document Number 026-010019, or later FAA accepted revision.

**NOTE 4**
UAS shall be operated under 14 CFR part 91, operating requirements, as mitigated. Operations shall be conducted in accordance with a waiver of flight regulations applicable to the operation, including but not limited to 14 CFR § 91.113, issued by the Administrator and specific to the intended operation, including geographical limitations.
NOTE 5

Wind Limitations:
Ship launch wind over deck conditions:
(a) Wind over deck conditions shall be determined by shipboard wind measurement and indication system.
(b) Max gusts for launch and recovery: 5 KT (5.75 mph, 9.26 kph)
(c) Launches (including gusts):
   1. 10 KT from +/- 30° relative to the launcher centerline.
   2. 20 KT from +/- 20° relative to the launcher centerline.
   3. Launches with tailwinds: PROHIBITED.
(d) Recoveries (including gusts):
   1. Port recoveries:
      a. 20 KT from 320° to 350° relative to the ship centerline.
      b. 30 KT from 320° to 330° relative to the ship centerline.
   2. Starboard recoveries:
      a. 30 KT from 10° to 40° relative to ship centerline.
   3. Recoveries with tailwinds: PROHIBITED.
(e) Wind limitations during flight:
   1. Max winds (sustained plus gusts): 40 KT
   2. Max gust component (gusts are considered any wind variations above the measured sustained value): 10 KT

NOTE 6


NOTE 7

This Type Certificate Data Sheet (TCDS) is the principal document for ScanEagle Operation. For any operational discrepancies among the TCDS, AFM, Insitu ScanEagle Ops. HDBK, etc., this TCDS takes precedence.

NOTE 8

Restricted category aircraft may not be operated in a foreign country without the express approval of that country.

NOTE 9

This aircraft has not been shown to meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 of the Convention on International Civil Aviation. This aircraft meets 14 CFR § 21.25(a)(2).

NOTE 10

For this restricted category type certificate, the part numbers of the Launcher and Skyhook must be those listed under UAS Support Equipment of this Type Certificate Data Sheet.

NOTE 11

Operations shall be conducted by properly certificated airmen who have completed training, checking, currency, and recency of experience requirements as approved by the Administrator.

NOTE 12

The Flight Standards Board (FSB) report is available on request. Contact the Long Beach AEG (LGB-AEG-NM17).

NOTE 13

No aircraft may be manufactured under this approval.

NOTE 14

Compliance to §21.25 (a)(2) was shown by following the deviation Memo dated July 5, 2013, in lieu of Order 8110.56 Revision A.
NOTE 15

The following items and limits apply when using the optional engine. All items and limits must be used when the optional engine is installed.

Optional Engine:

Northwest UAV, HFE-EFI (Heavy Fuel Engine—Electronically Fuel Injected)
FAA Engine Type Certificate: None
Engine type: Normally-aspirated, electronically fuel injected, two-stroke, direct drive, air cooled, single cylinder engine.

Oil: Bel Ray H1R 2-Cycle Oil
Fuel/Oil mixture ratio: 32:1 – by volume

Engine Limits:
Max Takeoff Power 3.35 HP at 7000 RPM
Max Continuous Power 3.35 HP at 7000 RPM
Max Cylinder Head Temperature (CHT) 170 °C
Min CHT for flight 110 °C

Propeller and Propeller Limits:
APC, Propeller Model LP16014P
FAA Propeller Type Certificate: None
Propeller Type: 2-blade, chopped fiberglass and resin, 16 x 14 fixed pitch pusher
Diameter (Nominal): 16 inches (40.64 cm)
Pre-flight Static rpm requirement: Engine must successfully achieve the I-MUSE checklist item: Engine Performance Checked

Computer Software: I-MUSE Software Version 5.9.05 or 5.10.08

Empty Weight: 31.6 lb (14.3 kg)

Fuel Capacity: Fuel system: 10.2 lb of fuel (4.6 kg)

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