



Alaska Wind Working Group

December 13, 2022

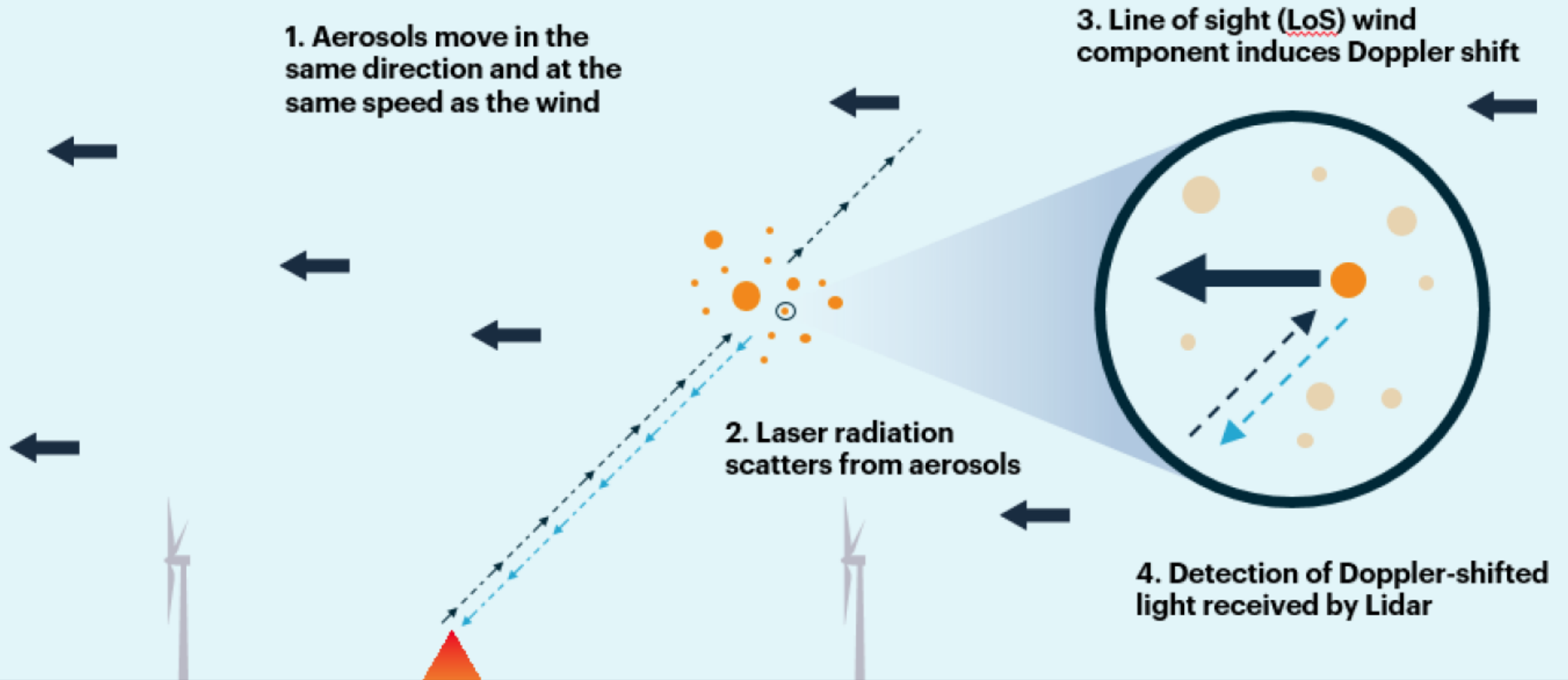
Onya Stein

Alaska Village Electric Cooperative

ZX 300 Wind LIDAR

- Utilizes contiguous wave doppler lidar technology
- Purchased from: NRG Systems
- Repair and Service Center: Hinesburg, Vermont
- ZX Lidars from Zephir Ltd: United Kingdom
- \$127K USD *as of November 2022*
- 6-8 week lead time *as of November 2022*

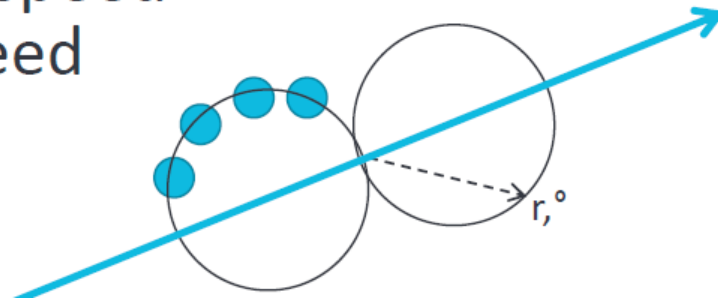
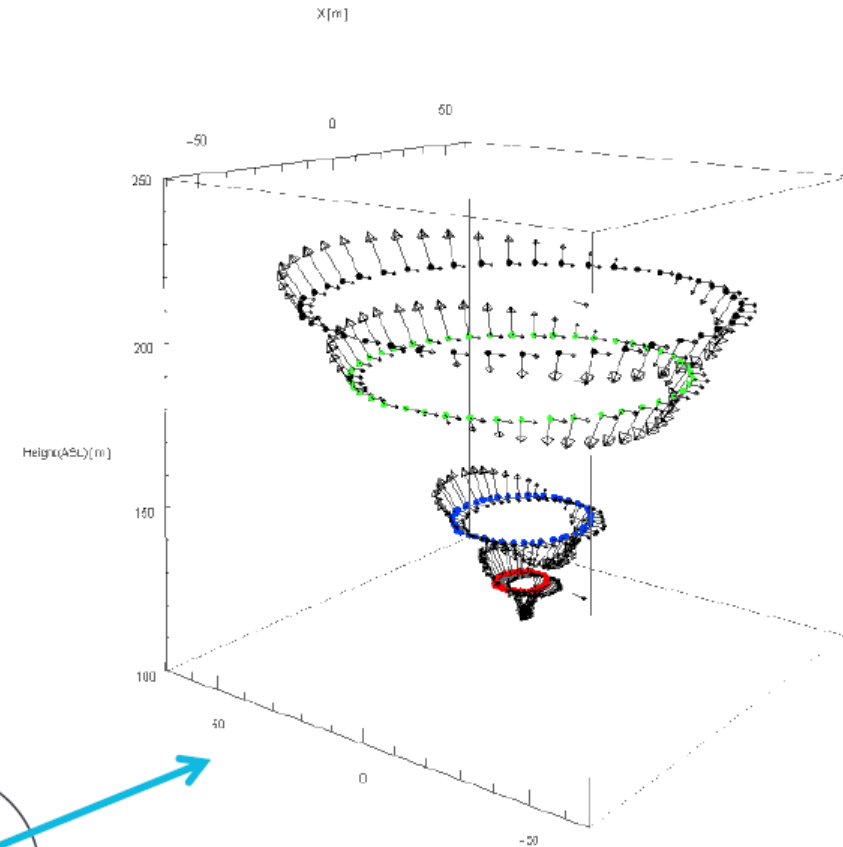
Technical Theory - Principles



Technical Theory - Principles



- ZX 300 scans 50 points around the disc
- Entire 360 degree flow field is examined
- Each height is measured consecutively
- Fitting algorithms resolve these points into:
 - Horizontal wind speed
 - Vertical wind speed
 - Wind direction



*NRG Systems Literature

Table 2.1: ZX 300 Input Power Requirements

ZX 300 Electrical Specification	
DC supply	
DC Input Voltage	Nominal: 12 V DC Input Operating Range: 24 V DC via integrated DC/DC power supply.
Typical DC Power Consumption	Standard climate (-15 to +22 °C): 69 W (80 W if DC/DC is used) Hot climate (+23 to +50 °C): 94 W (108 W if DC/DC is used) Cold climate (-16 to -40 °C): 119 W (137 W if DC/DC is used)
AC Supply	
AC Input Voltage	Input Operating Range: 90 – 264 V AC via integrated AC/DC power supply.
Typical AC Power Consumption	Standard climate (-15 to +22 °C): 83 W (via integrated AC/DC) Hot climate (+23 to +50 °C): 108 W (via integrated AC/DC) Cold climate (-16 to -40 °C): 137 W (via integrated AC/DC)
AC Frequency	50 – 60 Hz
General	
Standby Power	1 W
Startup	102 W Note: Load test initiated during start-up period only to test external power source (up to 30 seconds). Inrush current up to 37 A during initial startup; this must be accommodated in any off-grid supply.
Input Ripple (Noise)	<200mV rms

*NRG Systems Literature

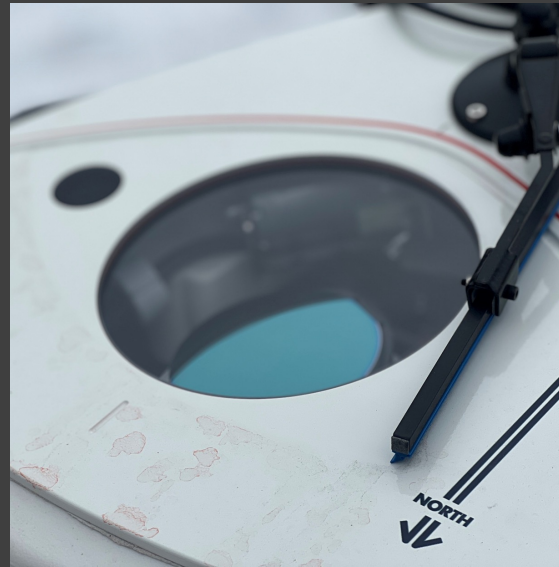
Communication Options

There are various ways in which you can connect to a ZX 300 unit both locally and remotely. The possible options by default are:

- Wireless Local Connection (WiFi) – section 2.1
- Direct wired Local Area Connection (LAN) – section 2.2
- GSM/GPRS Remote Connection (Cellubi) – section 2.4

There are also further ways which require additional configuration:

- Ethernet Network (using existing infrastructure) – section 3.1
- External Ethernet Modems – section 3.2
- Satellite Communications
 - Iridium – section 4.1
 - BGAN – section 1.1

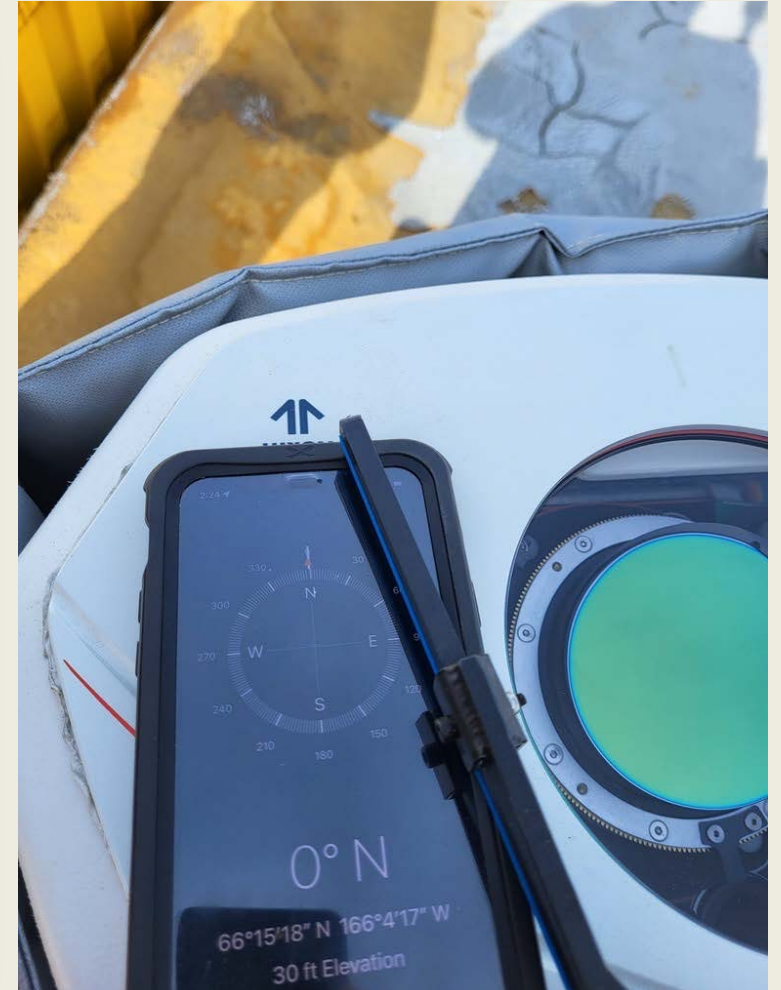


Anchorage Testing and Calibrating

- 3 day virtual training
- Responsive and helpful support team by phone or email
- Waltz Software

Anchorage, AK by John Davis

Shishmaref Installation



Shishmaref, AK by Bill Doty

Emails

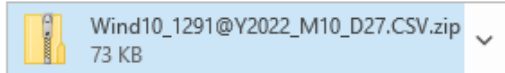
Daily Data: Wind10_1291@Y2022_M10_D27.CSV (Averaged data)



ZX300 Unit 1291 <status@support.zxlidars.com>
To Onya Stein; ZephIR Customer



We removed extra line breaks from this message.



CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Daily Data: [Wind10_1291@Y2022_M10_D27.CSV](#) (Averaged data) Email generated: 28/10/2022 00:00:56.479 Email sent: 28/10/2022 06:00:57.079

Shutting down: Input power to ZephIR failed



ZX300 Unit 1291 <status@support.zxlidars.com>
To John Davis; Onya Stein; Scott Stiker



10/28/2022

We removed extra line breaks from this message.

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Shutting down: Input power to ZephIR failed Pod temperatures: 29.1Å°C (base) and 26.8Å°C (window).

Email generated: 28/10/2022 18:54:43.286 Email sent: 28/10/2022 18:54:43.947

Started up: Fully operational



ZX300 Unit 1291 <status@support.zxlidars.com>
To John Davis; Onya Stein; Scott Stiker



8/12/2022

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CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Started up: Fully operational

Last shutdown: Unknown

Shutdown reason: Unknown

Firmware version: 3.2003 ZX300

Email generated: 12/08/2022 10:31:11.923 Email sent: 12/08/2022 10:31:12.844

Unit Inspections



June 2022



August 2022

Common Services and Items

1	Item No.	Item Description	Price
2	10424	Lidar Validation Service Lidar Reference	\$3,852.00
3	11898	Lidar Logistics Service	\$909.50
4	14133	ZX Met Station (WX 150)	\$1,295.00
5	14134	ZX Wiper Blade (300-409D)	\$55.00
6	14136	ZX 5m Met Station Cable Assy (300-310-5M-A)	\$290.00
7	14140	ZX Washer Pump Assy (300-303)	\$295.00
8	15022	ZX Lidar Inspection and Update Service	\$3,210.00
9	16130	ZX 300 Inner Optics Pod Exchange Service	\$11,235.00
10	16730	ZXSP, Washer Bottle (300-096)	\$37.00

A sample of services and prices as of March 2022 from NRG Systems.

Pros

- Light, ~100lbs
- Easy install/takedown
- Daily emails (data/status) if service available
- 10-year design life with maintenance
- Supportive distributor
- Bankable data

Cons

- Security concerns
- Inspection of the unit

Notes

- No winter experience
- No maintenance experience

Lessons

- Current version of Waltz software
- Washer fluid shipped hazmat
- Clean and recalibrate prior to next site
- Does not fit straight through a standard 36" door, but can be angled



Questions

Onya Stein

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