ACORN FAQ

General Information

IP Addresses: **acorn.uconn.edu** (Recommended)*

137.99.150.56 (Server 1 of 2)

137.99.150.112 (Server 2 of 2)

Port #: 2101

*Connecting to ACORN via the acorn.uconn.edu URL is highly recommended as the data collector will be automatically entered into ACORN's "round robin" system which distributes users to 1 of the 2 identical servers for load balancing purposes. Users may also opt to hardwire into a specific server by entering the numeric IP address.

Sensor Map
Green pins represent existing ACORN CORS

CORS ID	Location
CTBK	Brookfield, CT
CTDA	Darien, CT
CTEG	East Granby, CT
CTGR	Groton, CT
CTGU	Guilford, CT
CTMA	Mansfield, CT
CTNE	Newington, CT
CTPN	Putnam, CT
CTWI	Winchester, CT
MASB	Sturbridge, MA
MASH	Sheffield, MA
NYRH	Riverhead, NY
URIL	Kingston, RI
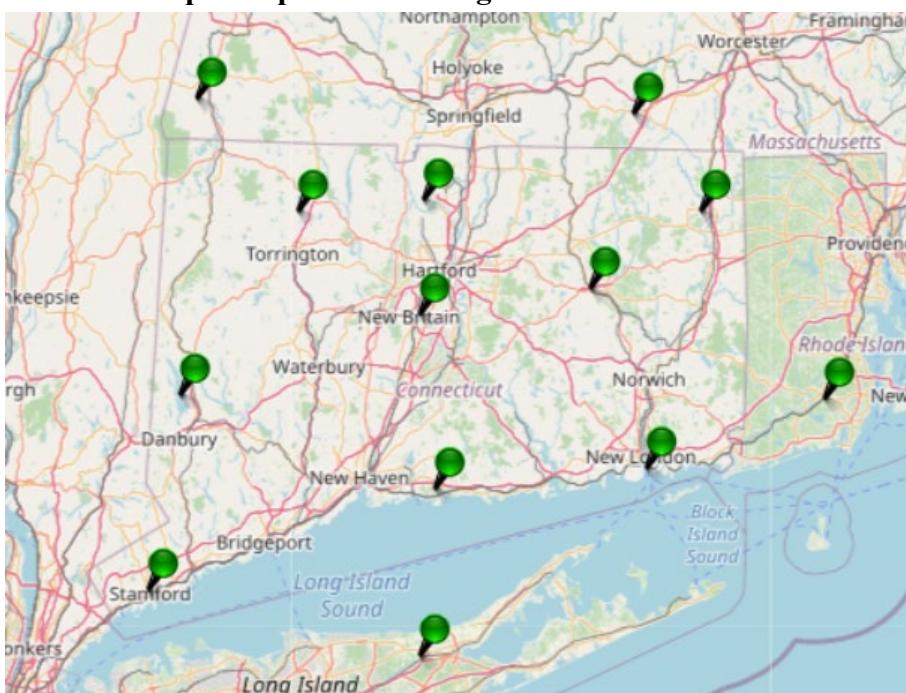
Detailed station information can be found at http://www.ngs.noaa.gov/CORS/ by entering the four-character station ID. FAQ document page 3 provides their coordinates.

Mount Types (4)
DGPS (differential)
Single Station
Multi Station*
VRS (virtual)

* Not RTK with multiple bases. This directs ACORN to pick the closest base.

Communication Protocols

Format	Description	Bytes*
RTCM	Radio Technical Commission for Maritime Services (version 3.1)	12,600
CMRP	Compact Measurement Record, also known as CMR+ and "CMR plus"	12,000
CMRX	Trimble proprietary, uses orbit information to further compress data	**5,500**

* Bytes based upon 1 minute of data, Single Station (no PBS, no VRS residuals), 11 satellites, Position and antenna every 8 epochs (or trickled over 8 epochs with CMR+/CMRx)

OTHER TIPS
- ACORN uses Absolute Phase Center Variations (PCV) – do not mix Absolute and Relative!
- Security Profile: N/A – your security settings connect the receiver to wifi, not to ACORN
- Static observations are supported by ACORN – put it on the tripod and hit the button
- Contact the administrator if you need to change your password. Do not change it on your own in the web interface because the change will only take effect on one of the two servers.
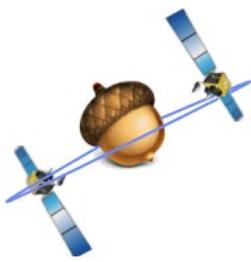
ACORN FAQ

Single Base Station Mount Points

Mount Point ID	Base Station	Communication Protocol	Antenna Type
BK3	Brookfield, CT	RTCM v3.4	Trimble Zephyr Geodetic Model 3 TRM115000.00 (no radome)
BKP		CMRP (no MSM)	
BKX		CMRX	
DA3	Darien, CT	RTCM v3.4	Trimble Zephyr Geodetic Model 2 TRM57971.00 (no radome)
DAP		CMRP (no MSM)	
DAX		CMRX	
EG3	East Granby, CT	RTCM v3.4	Trimble Zephyr Geodetic Model 2 TRM57971.00 (no radome)
EGP		CMRP (no MSM)	
EGX		CMRX	
GR3	Groton, CT	RTCM v3.4	Trimble Zephyr Geodetic Model 2 TRM57971.00 (no radome)
GRP		CMRP (no MSM)	
GRX		CMRX	
GU3	Guilford, CT	RTCM v3.4	Trimble Zephyr Geodetic Model 2 TRM57971.00 (no radome)
GUP		CMRP (no MSM)	
GUX		CMRX	
MA3	Mansfield, CT	RTCM v3.4	Trimble Zephyr Geodetic Model 2 TRM57971.00 (no radome)
MAP		CMRP (no MSM)	
MAX		CMRX	
NE3	Newington, CT	RTCM v3.4	Trimble Zephyr Geodetic Model 2 TRM57971.00 (no radome)
NEP		CMRP (no MSM)	
NEX		CMRX	
PN3	Putnam, CT	RTCM v3.4	Trimble Zephyr Geodetic Model 3 TRM115000.00 (no radome)
PNP		CMRP (no MSM)	
PNX		CMRX	
NYRH3	Riverhead, NY	RTCM v3.4	Leica LEIAR10 (no radome)
NYRHP		CMRP (no MSM)	
NYRHX		CMRX	
MASB3	Sturbridge, MA	RTCM v3.4	Leica LEIAX1203 + GNSS (no radome)
MASBP		CMRP (no MSM)	
MASBX		CMRX	
MASH3	Sheffield, MA	RTCM v3.4	Leica LEIAX1203 + GNSS (no radome)
MASHP		CMRP (no MSM)	
MASHX		CMRX	
URIL3	Kingston, RI	RTCM v3.4	Trimble GNSS Choke Ring v2 w/SCIS Dome
URILP		CMRP (no MSM)	
URILX		CMRX	
WI3	Winchester, CT	RTCM v3.4	Trimble Zephyr Geodetic Model 2 TRM57971.00 (no radome)
WIP		CMRP (no MSM)	
WIX		CMRX	

Virtual Mount Points

Mount Point ID	Base Station	Communication Protocol
VRS3	Virtual	RTCM v3.4 (no MSM)
VRSP		CMRP (no MSM)
VRSX		CMRX (no MSM)
VRS3_RTX		RTCM v3.4
VRSX_RTX		CMRX

ACORN FAQ

Antenna Reference Point (ARP) Coordinates

ACORN's Default Reference Frame: **NAD 83 (2011)** – Localize your data collector for other coordinate systems or assumed values. Ensure that the latest geoid model is uploaded to the data collector for elevations in NAVD 88: **Geoid 18**

NAD 83 (2011) Position (Epoch 2010.0)

	CTBK	CTDA	CTEG	CTGR	CTGU	CTMA	CTNE	CTPN	CTWI
X (m)	1,365,304.024	1,367,174.640	1,413,426.601	1,478,107.651	1,429,797.591	1,456,379.711	1,417,685.851	1,477,919.970	1,384,616.132
Y (m)	-4,585,218.241	-4,617,636.827	-4,537,671.190	-4,562,614.120	-4,581,509.830	-4,539,030.813	-4,555,729.721	-4,518,942.746	-4,548,662.499
Z (m)	4,204031.532	4,167,931.108	4,239,299.921	4,190,441.879	4,186,611.854	4,223,420.348	4,218,615.612	4,237,359.623	4,237,285.508
Lat (N)	41° 29' 52"46411	41° 03' 57"06973	41° 55' 24"34685	41° 20' 07"03553	41° 17' 21"74218	41° 43' 52"91742	41° 40' 24"71714	41° 53' 59"16121	41° 53' 51"90726
Long (W)	073° 25' 06"47519	073° 30' 25"94228	072° 41' 55"88083	072° 02' 58"96919	072° 40' 04"44444	072° 12' 38"87695	072° 42' 52"25235	071° 53' 22"81260	073° 04' 10"96819
Height (m)	50.410	-13.255	30.276	-18.347	-18.105	55.162	41.759	53.625	192.096

NAD 83 (2011) Velocity (m/yr)

	CTBK	CTDA	CTEG	CTGR	CTGU	CTMA	CTNE	CTPN	CTWI
VX	0.0018	0.0013	0.0018	0.0015	0.0014	0.0017	0.0012	0.0019	0.0017
VY	0.0000	0.0014	0.0005	0.0009	0.0012	0.0007	0.0012	0.0002	0.0006
VZ	-0.0020	-0.0024	-0.0013	-0.0016	-0.0020	-0.0016	-0.0019	-0.0019	-0.0013
Northward	-0.0018	-0.0012	-0.0010	-0.0009	-0.0010	-0.0011	-0.0009	-0.0017	-0.0009
Eastward	0.0017	0.0016	0.0019	0.0017	0.0017	0.0018	0.0015	0.0019	0.0018
Upward	-0.0009	-0.0023	-0.0008	-0.0014	-0.0019	-0.0012	-0.0019	-0.0010	-0.0009

Space Segment
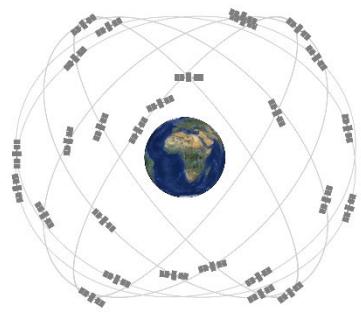
Control Segment
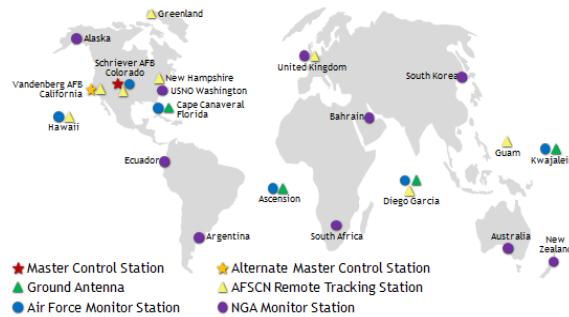
User Segment

ACORN FAQ

ALOHA (A List of Helpful Acronyms)

ACORN	Advanced Continuously Operating Reference Network		NMEA	National Maritime and Electronics Association
CMR	Compact Measurement Record		NPR	Network Processor
CMRP	CMR Plus, also acronymized as CMR+		NTRIP	Networked Transport of RTCM via Internet Protocol
CMRX	CMR-Trimble proprietary protocol		ORB	Orbit File Type
CORS	Continuously Operating Reference Station		PIVOT	Progressive Infrastructure Via Overlaid Technology
DAT	Data File Type		PPE	Post-Processing Engine
DCB	Differential Code Bias		RDA	Raw Data Analysis
DGPS	Differential GPS		RDS	Radio Data System
GLONASS	Global Navigation Satellite System (in Russian)		RINEX	Receiver Independent Exchange Format
GNSS	Global Navigation Satellite System		RTCM	Radio Technical Commission for Maritime Services
GPS	Global Positioning System		RTK	Real-Time Kinematic
HTML	HyperText Markup Language		RTO	Real-Time Output
HTTP	Hyper Text Transfer Protocol		SNR	Signal-to-Noise Ratio
HTTPS	Hyper Text Transfer Protocol Secure		SP3	Standard Product #3 (by NGS)
IGS	International Geodetic Survey		SQL	Search and Query Language
IP	Internet Protocol		TEC	Total Electron Count
IPV	Internet Protocol Version		TIM	Trimble Integrity Monitoring
IPWV	Integrated Precipitable Water Vapor		URL	Uniform Resource Locator
JPL	Jet Propulsion Laboratory		VPN	Virtual Private Network
KML	Keyhole Markup Languageorb		VRS	Virtual Reference Station
MSM	Multi-Signal Messages (for additional constellations)		XML	EXtensible Markup Language
NGS	National Geodetic Survey			
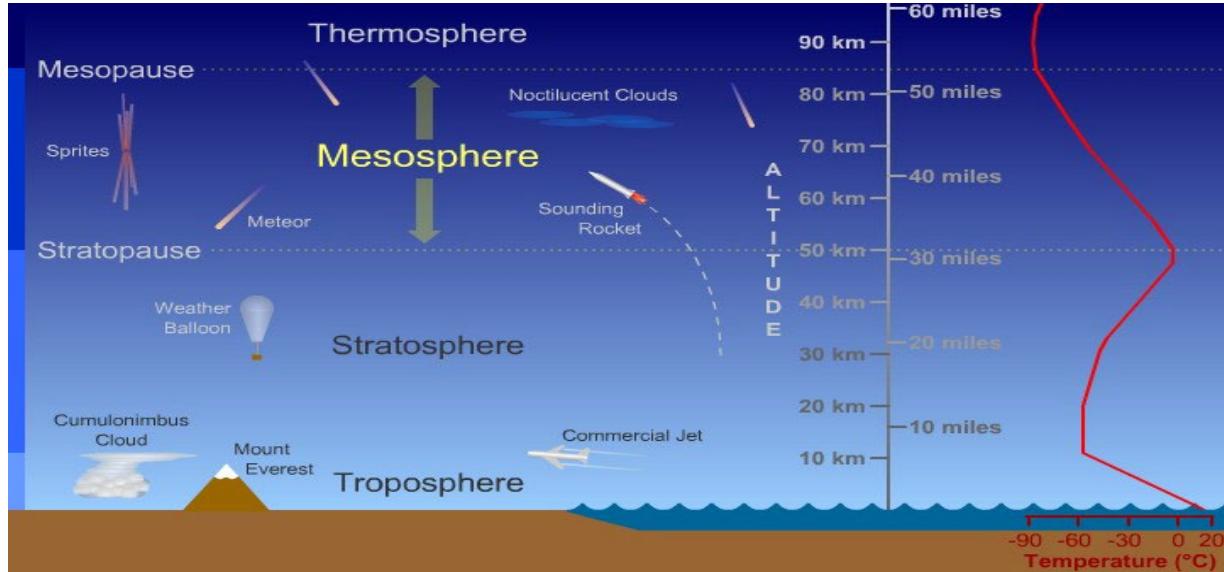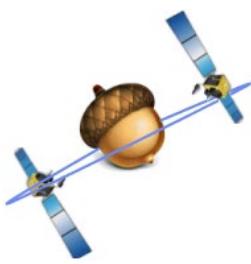
ACORN FAQ

Frequently Asked Questions

What is ACORN?

Connecticut's Advanced Continuously Operating Reference Network is the product of a joint research project by UConn and CTDOT. The purpose was to implement a real-time network for the Connecticut Department of Transportation's Digital Design Environment.

Is there a fee to use ACORN?

No. ACORN is currently free and open to the public.

How do I register for a new account?

From a web browser, visit http://acorn.uconn.edu/ and click on the Register link in the table of contents on the left side of the page. Enter your personal data, Organization, User Name, and Password. The administrator will receive notice of your registration and processes the account creation shortly afterward. If your organization already has an ACORN account, use the same organization name to keep the accounts associated.

Does my account expire? Do my subscriptions expire?

No. Your account will remain active, and your subscriptions will be renewed annually unless you want to cancel them.

How do I change my password?

Contact the ACORN administrator at kevin.franklin@uconn.edu to change your password. If you change your password on your own on the web interface, the change will only take effect on the 1 server that the URL happens to route you to. ACORN runs on 2 servers for redundancy, so that will ultimately create a credentials issue.

Can I log in with 2 devices at the same time?

No, by default, but just ask if you need to add RTK logins. Otherwise, ACORN is configured to disallow multiple simultaneous logins from the same account. To add RTK logins associated with your user account, send the ACORN administrator an email.

Why are my elevations off by about 100 feet (30m)?

In CT, 100 feet (~30 meters) is roughly the separation between the respective surfaces of the ellipsoid and the geoid. GPS uses ellipsoid heights, so a geoid model is needed to transform to an orthometric height such as NAVD 88. If you recently purchased a new data collector or performed a hard reset, you might need to upload a geoid model that covers your project area and link it in the job settings.

Why do my XYZ positions have a spatial offset of about 6 feet (2m)?

2 meters is roughly the difference between the origins of the NAD 83 and WGS 84 frames. You might have an option on your device to transform between NAD 83 and WGS 84. ACORN's reference frame is NAD 83.

Does ACORN provide corrections from Galileo and Beidou?

Yes. As of July, 2025, ACORN provides signals and corrections for Galileo (EU) and Beidou (China) satellites. For users with multi-constellation capable devices, this means that several more satellites should be available at any given moment. To use the multi-constellation virtual base station, choose the mount point "VRS3_RTX". If you have Trimble equipment, you may also choose "VRSX_RTX", which is slightly more compact. Any mount point ending in "P" utilizes CMR+ communication protocol, which does not support multiple constellations.