DYACON®

Tripod-1
MANUAL

57-6015 Rev D

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Contents

NOTICES

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The information in this manual has been carefully checked and is believed to be accurate. However, Dyacon, Inc. assumes no responsibility for any inaccuracies that may be contained in this manual. All information is subject to change.

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Dyacon Tripod-1™ are trademarks of Dyacon, Inc.

All other trademarks are property of their respective owners.

Manufacturer

Dyacon, Inc.

US
www.dyacon.com

Declarations

Met Station Tripod-1™ is a passive mechanical device.

FCC, IC, C-TICK, and CE radio frequency emissions and susceptibility are not relevant.

Warranty Information

Limited Hardware Warranty

Dyacon, Inc. warrants that all Dyacon Tripod-1™ products and components shall be free from defects in materials and workmanship for a period of one (1) year from the date of shipment when properly installed according to instruction manuals accompanying said hardware and used for the purpose for which said hardware was designed. In the event a defect in materials or workmanship is discovered and reported to Dyacon within the warranty period, Dyacon will at its option repair the defect or replace the defective product. This warranty does not apply where the product has been operated outside the specifications of the product. Dyacon's obligation hereunder will be limited to such repair or replacement.

Customers shall have the responsibility to ship the defective equipment to Dyacon at its (customer's) expense, with all cost of shipment prepaid. Dyacon will ship the repaired or replaced item at its (Dyacon's) expense using the preferred shipment method of Dyacon.

In rare cases, on-site repairs by Dyacon staff may be needed.

Disclaimer of Warranties

The warranties set forth above are in lieu of all other warranties of Dyacon, whether written, oral, or implied. Dyacon makes no warranties regarding its products (hardware or software), including without limitation warranties as to merchantability, fitness for a particular purpose, any warranty arising from course of performance, course of dealing or usage of trade whether any of the foregoing warranties are either expressed or implied. Dyacon specifically makes no warranties as to the suitability of its products for any particular application. Dyacon shall in no event be liable for performance, or use of any product covered by this agreement whether such claim is based upon warranty contract (express or implied), strict liability, negligence, or otherwise. Any responsibility and/or liability of Dyacon shall, in connection with a warranted product, be limited in maximum amount to the original purchase price of that product.

Updates or Modifications

Dyacon shall be under no obligation to update or modify its products except as herein noted to correct defects or errors. Customer agrees that all representation and warranties contained herein shall be immediately null and void in the event of any modification, alteration, or change in or to any product affected by or on behalf of customer except for a change made by Dyacon or other direct supervision thereof.

Tripod-i Introduction

Scope

The content of this document is intended for integrators, installers, and users of Tripod-1™, hereinafter referred to as Tripod or tripod.

This document includes installation instructions and technical specifications. Some aspects of the equipment operation may be covered in other documents. Please contact Dyacon or visit the Dyacon.com website.

User's should seek competent professional services for tasks where overhead electrical lines are present, when working at heights greater than the user's height, or when connecting electrical ground.

Technical Support

Contact Information

Dyacon, Inc.

Phone: (435) 753-1002

Email: support@Dyacon.com

Internet: www.Dyacon.com

Normal business hours are from 9:00 a.m. to 5:00 p.m. (Mountain Time Zone, GMT -0700)

Phone / Email Support

If you need technical support via the phone or email, please have the following information ready:

Product name, model number.

Your name and name of the purchaser of the equipment.

Name of company, institution, or agency.

Phone number, email address.

Billing and Shipping address.

A clear description of the question or problem.

Repairs

If your equipment is in need of repair, call or email for a Return Materials Authorization (RMA) number. Place the RMA number on the outside of the shipping container next to the shipping label or make it a part of the shipping label. Make sure to include a detailed description of the problem and any other additional services that should be performed on the returned unit.

For equipment that is not under warranty, extended warranty, or a maintenance agreement, a purchase order is required before repairs can begin.

PRODUCT OVERVIEW

Product Description

Dyacon Tripod-1™ an equipment mounting system designed to support Dyacon weather station equipment. The tripod may also be used for general purpose equipment support applications including weather stations, data loggers, antenna systems, lighting, and cameras.

Tripod-1 is composed of un-anodized aluminum in order to improve electrical conductivity and reduce system cost. Anodized versions may be purchased as OEM products.

Field Serviceability Features

Common mast and leg segments. (Facilitates field configuration and repair.)

Minimal tool requirements (Only the guy cable clips require a wrench.)

Large feet with 4 stake holes and 4 screw holes.

Quick release pins and buttons for all mechanical fittings.

Light-weight.

Adjustable leg extensions.

Pre-assembled guy lines and turnbuckles.

What Do You Get?

Tripod-1 is sold in either 7-segment or 10-segment kits. The segments are fully interchangeable between mast and leg positions. This allows for in-field modifications, configuration flexibility, minimal repair parts, and easy setup.

Parts include:

7 or 10 mast/leg segments (7-segment shown) with locking buttons

3 adjustable leg extensions

3 leg position locking pins

3 each 20 ft (6.1 m) guy cables

3 guy line D-shackles

3 turnbuckles

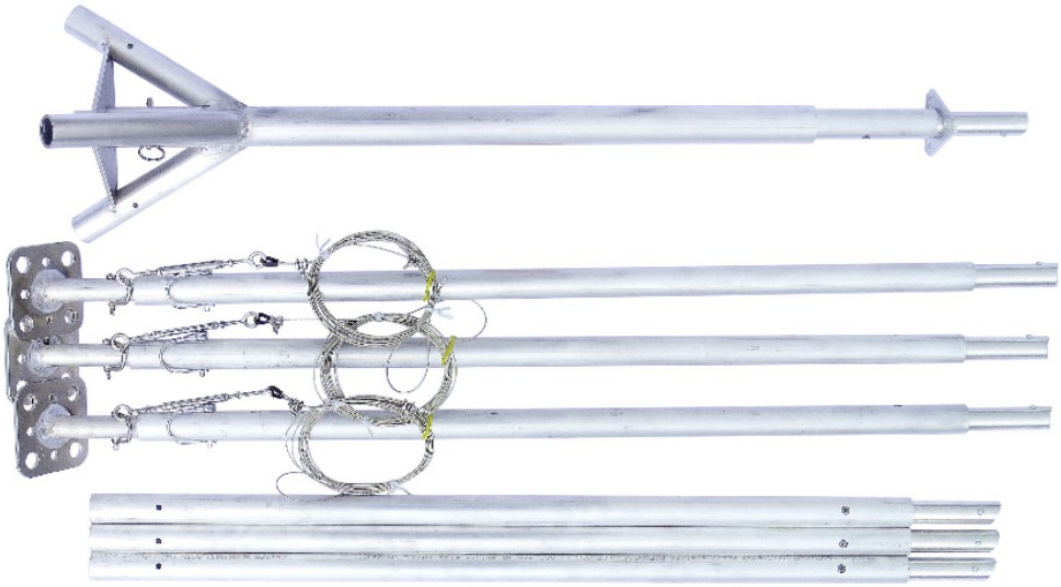
1 ball detent locking pin

1 cable spreader

1 tripod hub (1.25 inch pipe – 1.66 in/42.2 mm)

6 cable clips

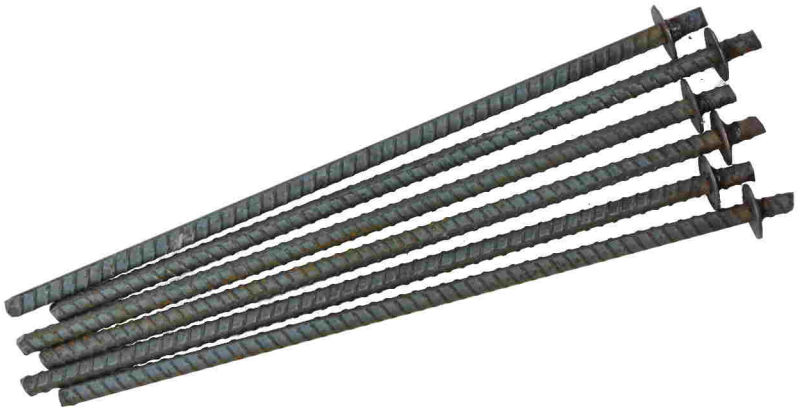
1 cable clip wrench, 7/32 inch (5.5 mm) – Not shown.



Anchoring Stakes (Option)

Anchoring stakes are available through the Dyacon website. Since installations may differ, these stakes are not included. Users may also choose to fashion their own stakes using their own materials. Full drawings are available from Dyacon for this purpose.

A minimum of six stakes are recommended. Additional stakes may be required in sandy or loose soils.



Sand/Snow Plates (Option)

For loose soil, soft soil, sand, snow, rock, or ice, a larger footprint may be needed.

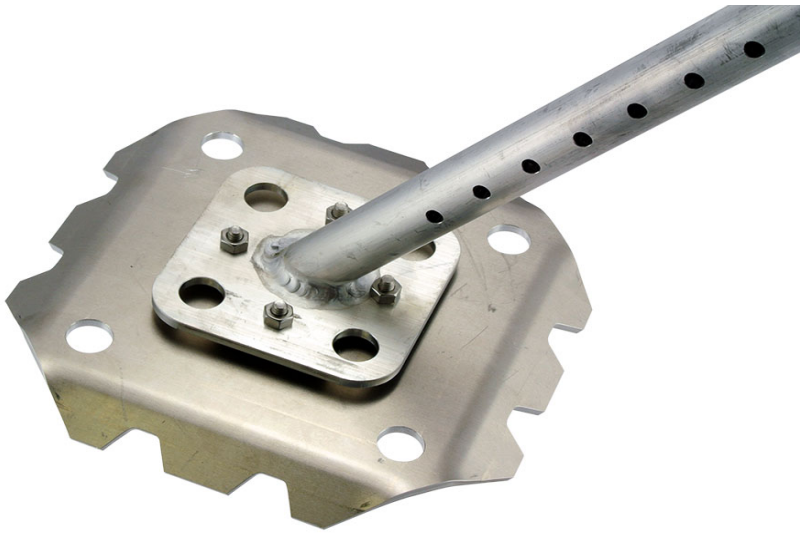
The plates are available in sets of three and attach either **teeth up or teeth down** to each tripod foot.

The plates may be:

- Buried in sand or snow

- **Stacked with rocks**

- or, staked to the surface.



Tripod Configurations

7-Segment

The 7-segment tripod reaches a mast height of 15.6 ft (4.76 m) in configuration 1. The modular design allows the segments to be installed in either mast or leg positions.

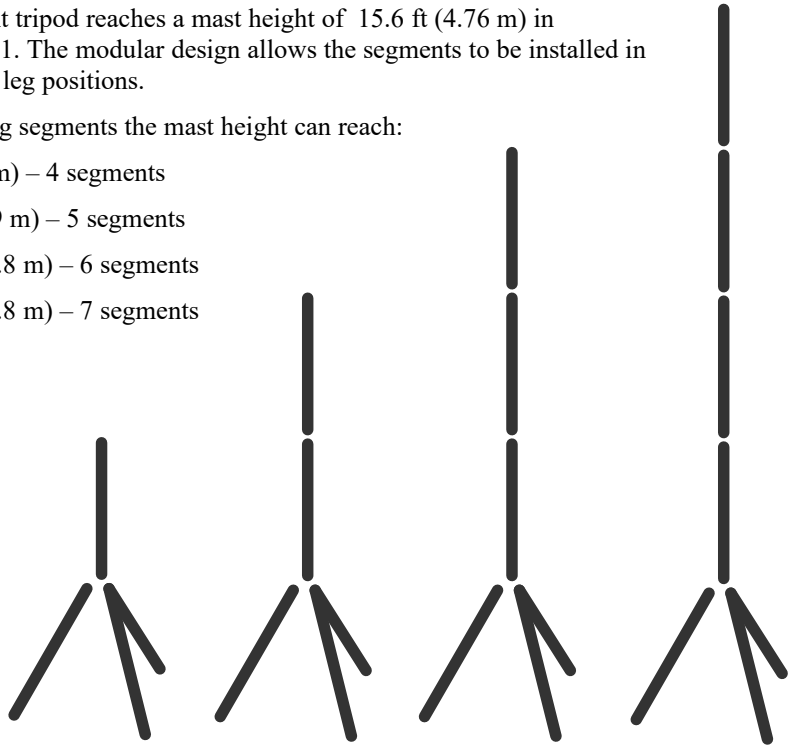
With single leg segments the mast height can reach:

6.6 ft (2 m) – 4 segments

9.6 ft (2.9 m) – 5 segments

12.6 ft (3.8 m) – 6 segments

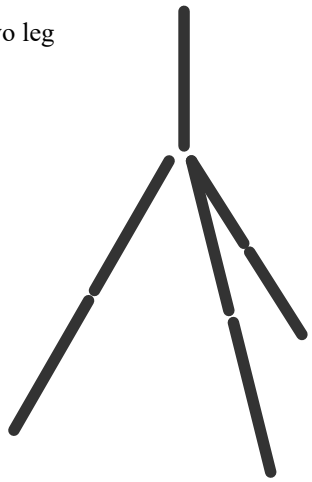
15.6 ft (4.8 m) – 7 segments



Using all 7 segments, they can also be configured with two leg segments and a single mast segment.

The resulting height is approximately:

8.8 ft (2.7 m) – 7 segments



10-Segment

The 10-segment tripod has the same configurations as the 7-segment version. The additional segments may be retained for service and repair. Alternatively, they may be used to extend the legs.

The extended legs may be helpful in managing uneven terrain, spanning rocks, ditches, or fences, or elevating the mast above vegetation.

Please be aware that adding the segments to the legs will elevate the tripod hub and mounting mast. This may make equipment servicing more difficult, requiring a ladder or step stool.

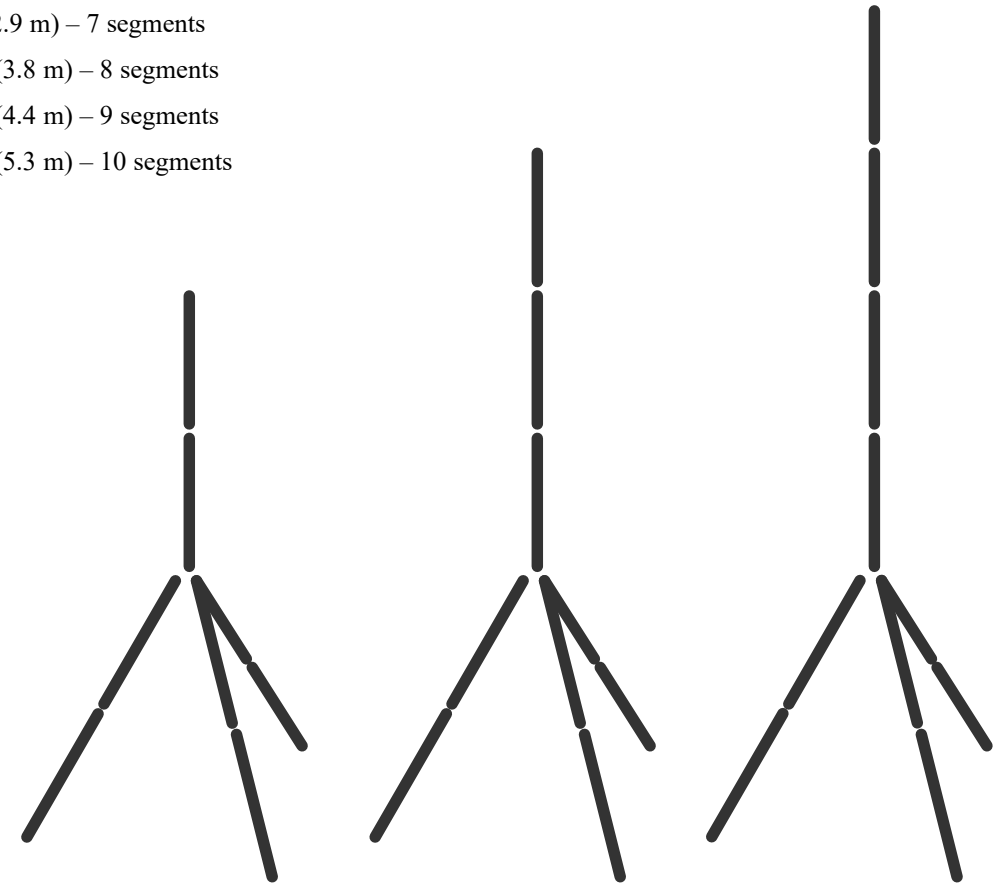
With double leg segments and the adjustable leg extensions fully retracted (shortest). the resulting height is approximately:

9.4 ft (2.9 m) – 7 segments

12.4 ft (3.8 m) – 8 segments

14.4 ft (4.4 m) – 9 segments

17.4 ft (5.3 m) – 10 segments



Mounting Considerations

For site selection issues, please refer to the closing section of this manual.

The follow is information that may be helpful when considering mounting options.

Please consult with maintenance or engineering personnel when mounting the tripod to a structure.

Ground Mounting

Ground stakes are suitable for most soil conditions.

Dyacon Sand/Snow Plates may be useful in some applications.

Tripod-1 was designed to mount to a horizontal or sloping surface. The adjustable legs can accommodate a slope of about 13 degrees (23%).

The placement of the tripod feet depends on the extension of the legs. When using concrete post bases or J-bolts, or anchor bolts, precise location of the tripod feet will be needed before pouring the concrete or drilling holes. The tripod should be erected in the desired location and plumbed to the vertical position before marking the bolt locations.

Roof Mounting

Please consult with maintenance or engineering personnel when mounting the tripod to a structure.

Some installations will require mounting the tripod to a roof or other surface. The variety of mounting locations is too broad to cover in this manual.

Tripod-1 was designed to mount to a horizontal or sloping surface. The adjustable legs can accommodate a slope of about 13 degrees (23%). However, the welded tripod feed do not rotate to match the slope.

Roof structure and weather treatment will affect the type of installation and fasteners to be used.

For flat or slopped roofs in a commercial or industrial building, a wooden platform is typically used in order to avoid piercing the weather membrane.

The tripod is fastened to the wooden structure. Weights, such as bags of concrete are placed on the structure. This low-impact method will be familiar to most maintenance personnel.

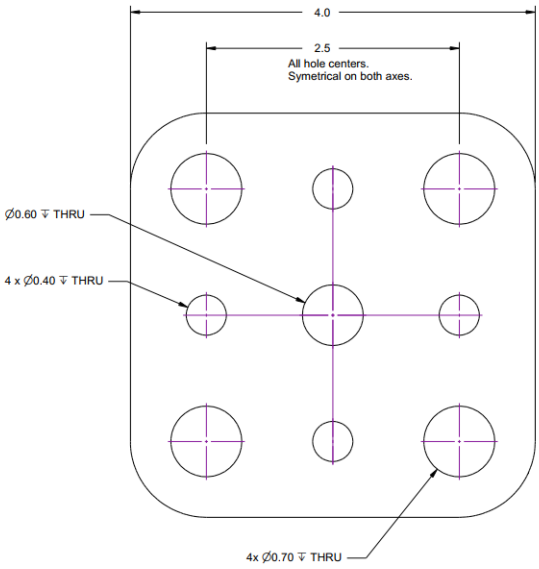
The placement of the tripod feet depends on the extension of the legs. Due to the nature of the adjustability of the tripod legs, the tripod should be set up in the desired position and adjusted for vertical before screwing or attaching the legs.

Footprint

Tripod Foot

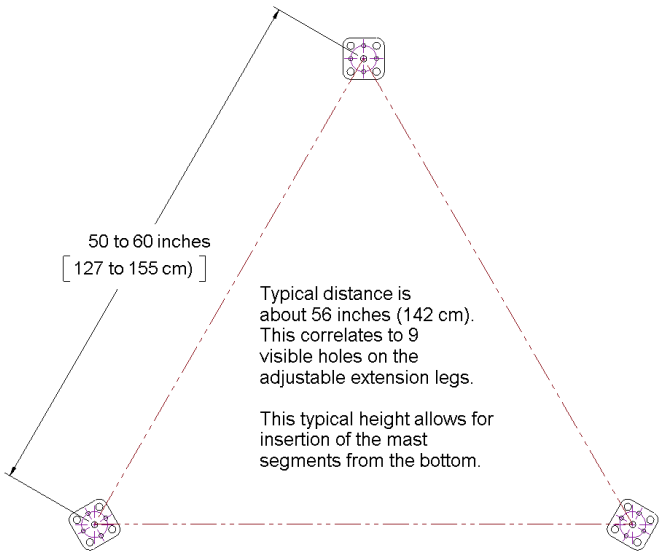
The tripod foot contains four stake holes and four bolt or screw holes. Due to the angle of the leg, only three of the screw holes are typically accessible.

The 0.60 center hole is used for weld fixturing and serves as a drain hole.



Tripod Stance

The tripod legs are adjustable. Depending on the slope of the terrain and desired working height, extending the legs will result in a variation in the occupied area.



Typically, the tripod legs are extended to allow for insertion of the mast segments from the bottom. On level ground, this will result in a foot spacing of about 56 inches (142 cm) from center to center.

Manufacturing tolerances of the tripod and site conditions may result in variations in leg position. In cases where a concrete pad or anchors are set, Dyacon recommends that the tripod be erected in its functional condition before setting any anchors.

Assembly Instructions

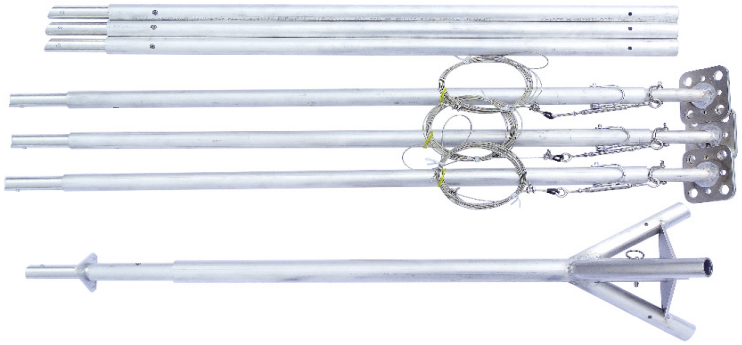
Required Tools

7 mm (9/32 inch) open end wrench (Not a socket driver or box wrench.)

Anchoring tools (Site dependent, such as hammer for stakes or wrenches for screws.)

As Shipped

The tripod is shipped with guy lines and turnbuckles pre-assembled. The 7/32” (5.5 mm) wrench not shown.



7-Segment Tripod

Illustration 1: 10-Segment Tripod

Assembly Procedure

Tripod assembly is intuitive. The headings may serve as adequate instructions for most users.

Assemble the Base

1. **Install each leg** into the tripod hub.
2. **Extend adjustable leg** extensions so that 9 full and open holes are visible.

Leg extended with 9-holes fully visible.

3. **Clear debris** from under each tripod foot to ensure a stable installation.
4. **Plumb the mast** for a vertical position by extending or retracting the adjustable legs. The wire retainer pin does not require any tools.
5. **Anchor the tripod** with at least two stakes or screws per foot, depending on the mounting surface.

   Some settling may occur over time. The stability should be checked periodically, especially in the spring.

Guy Line Installation

1. Verify that the cable spreader is installed on the mast segment in the tripod hub. The edge of each hole is rounded in order to minimize stress on the wire rope. **The rounded edge on the cable holes should be facing up.**
2. **Thread the small loop** of each guy line up through one of three holes in the cable spreader and over the top of the mast.
3. **Repeat** this procedure for each guy cable, inserting a cable into each of the three holes.

Attach Equipment

1. **Attach equipment to the tripod mast**, such as a wind sensor, light, camera, or antenna.
2. **Align the equipment such as setting the north position on the wind vane.**

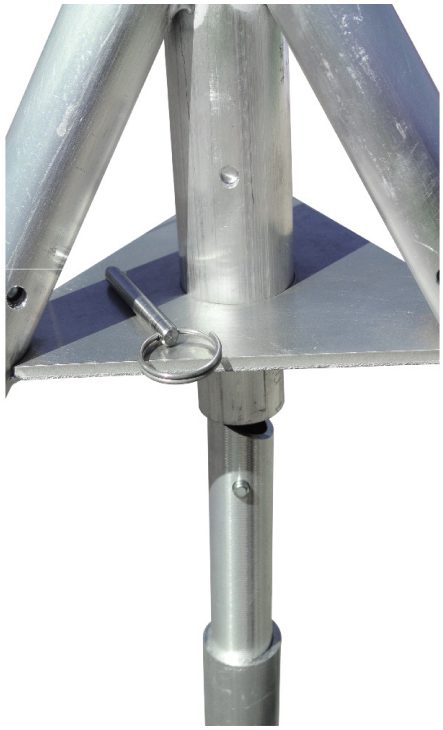
Erect the Mast

With the adjustable legs extended, the tripod mast may be assembled by inserting the segments from the bottom.

1. **Position a new mast** segment under the tripod mast.
2. While holding the bottom of the installed mast, **remove the ball detent locking pin**.
3. **Depress the quick-release button while lowering the mast to seat onto the new segment.**
4. **Raise the mast.**

   Depending on the equipment, cable ties may be needed to secure wiring as each mast segment is raised.
5. **Add more** segments as required.

   The locking holes are aligned in order to maintain the orientation of the equipment. However, care should be taken to not rotate the equipment 180 degrees.
6. **Re-insert the locking pin**.



Tripod Leg Guy Line Tensioning

With the tripod mast raised, the guy lines will drape from the top of the mast.

1. **Loosen each wire rope clip** using the supplied 7/32” (5 mm) wrench.
2. **Manually apply initial tension** to the guy lines by pulling each line through the thimbles until taut.
3. **Tighten each cable clip**.
4. **Rotate the turnbuckles** to apply additional tension to the lines.

   The tripod guy lines are not strings of a bass guitar, the lines only need to be snug not tuned. Over tightening will stress the leg structure. Some movement of the mast is generally okay.
5. **Tighten the lock nuts** on both ends of the turnbuckle.

Alternative Guy Line Anchoring

Dyacon Tripod-1 is designed for field serviceability and configurability. Often damaged equipment can be placed back in service in a different configuration until repair parts are available.

In the case of damage to the turnbuckle assembly or wire rope, the guy line may be wrapped around the leg adjustment pin.

Alternative Anchoring

1. Open wire clip on the adjustable leg pins.
2. Position the guy line loop below the pin and around the leg.
3. Close the wire clip over the guy line loop.
4. Secure wire rope clip near the pin.

Staked Guy Line Anchoring Option

Guy lines are long enough to be staked separately.

1. Drive at least one stake for each guy line anchor. Two stakes that cross in an 'X' above ground are recommended.
2. Place the lower guy line loop around the stakes.

Weather Station Site Selection

Radio Link Path

Radio propagation is always an unknown and should be tested before drilling holes in your roof or pouring concrete for a mast. Similar site review will also avoid unnecessary effort when using a portable tripod.

Radio range is typically given as a “line of sight” (LOS) distance, free of obstructions. Vegetation, ambient humidity, radio reflections, radio signal interference, brick walls, energy efficient windows, metal structure, magnetic dry-erase boards, and other obstacles will reduce the effective range of the radio link.

Select a location that allows for a clear line-of-sight sight between the station equipment and the receiver location. Vegetation and buildings will attenuate the radio signal.

If a Dyacon wireless weather station is intended, the control module may be mounted to the tripod hub and legs and activated before connecting peripheral equipment. This allows the site to be evaluated prior to full assembly.

Ground Mounting

While not all locations may not benefit from ideal installation convention, the following rules may help identify a the best location for your weather station.

Install the station on level ground.

Keep the station as far away from tall objects such as trees and buildings. A minimum distance of 10 times the object height is recommended.

Mount the sensors as high as possible, ideally, this would be 10 m, which is impractical for most industrial and amateur weather stations. 3 m (10 ft) height is recommended for wind measurements and at least 1.25 m (4 ft) for surface temperature measurements.

Avoid proximity to buildings which can reflect sunlight and radiate heat.

Rain gauges should be positioned in an open area to avoid dripping or shadowing from other objects or structures. The gauge should be located at a distance of at least twice the height of any nearby objects.

Rain gauges are often mounted at a height of 1 m (3 ft).

If fencing is used to protect the station, the sensors should be mounted higher than the fence.

Please refer to the Equipment Installation section before driving stakes or pouring concrete.

Roof Mounting

Roof mounting is not the ideal location due to the affects of the structure that affect the wind and temperature, nevertheless, for casual observations it may be the only option available to some users.

!!! Care should be taken to avoid proximity to live power and utility lines!!!

Seek the assistance of a professional if the weather station tower is near any power lines or public utility lines. We don't want a cooked customer and we don't want your goose cooked if you damage a utility line.

Avoid mounting the sensor suite on existing antenna towers. The additional wind load and clamp force on the mast may affect the stability and structural integrity of the tower.

Roof mounting may be a convenient location in most urban and suburban areas. It allows the sensor suite to be located above nearby structures with minimal tower requirements.

Sensor height should be at least 2 m (6 ft) above the ridge of the roof or above the highest point, such as a chimney. If surrounding structures are higher than the base structure, the minimum distance rule used for ground mounting may apply.

Please refer to the Equipment Installation section before mounting your tripod on the roof.

Revision History

Rev	Description	Author	Date
A	Initial Release	E. Bodrero	07 OCT 2013
B	Brand change	E. Bodrero	21 FEB 2014
C	Address Change and minor edits.	E. Bodrero	19 MAY 2016
D	Add footprint section. Update images. Update instructions for turnbuckle and D-shackle. Other content updates	E. Bodrero	03 SEP 2019