



## **POLE MOUNT SYSTEM PM4/M INSTALLATION MANUAL**

**January 2015**

The Pole Mount System PM4/M is an easy to install and flexible system designed to allow ONE SYSTEMS loudspeaker systems to be mounted to pole structures. The only products approved for use with PM4/M are the 112/HTH, 212/HC, 312/HC, 118/HSB (See Appendix 2 if the 118HSB is used), and CFA-2/HTH.

### **NO OTHER LOUDSPEAKERS SHOULD BE SUBSTITUTED!**

The following actions **MUST** be performed **PRIOR** to beginning the installation of the PM4/M:

1. This installation guide must be completely read and understood
2. The instruction manual “Rigging and Suspension of ONE SYSTEMS Products” must be read and understood. (This instruction manual is available at [www.ONESYSTEMS.com](http://www.ONESYSTEMS.com) in the “Education section of the web site.
3. The manufacturer of the pole **MUST** be consulted to verify the applicability of the PM4/M and ONE SYSTEMS loudspeaker to the specific pole. The pole must be capable of supporting the weight of the PM4/M, the loudspeaker enclosure and all associated rigging and **ALSO** meet all required safety factors specified by local and national codes and safe rigging practices. The weight of PM4/M is 16.1 kg (35.5 lb.)
4. The PM4/M loudspeaker should be installed only by one experienced in the overhead suspension of items and familiar with the applicable local and national codes governing installation of these products and also governing the attachment of these products to the specific pole structure.
5. The installer should be experienced with the use of stainless steel banding systems and banding system tools.

6. The PM4/M is constructed with 316 grade stainless steel. The specific selection of banding material will be determined by the environment. See page 6 for specifics.

**NOTE:** Caution should be exercised when connecting One Systems Marine grade products and Marine grade rigging to other metallic, non 316 grade stainless steel surfaces (dissimilar metals). The potential for galvanic corrosion is high in marine environments where the One Systems enclosures and rigging are specified or required. Compatible metals and appropriate anode to cathode area ratios must be maintained. A structural engineer with galvanic corrosion experience should be consulted prior to installation of marine grade products, or ANY One Systems products in marine environments.

**CAUTION:** All structures outdoors are subjected to wind forces. These forces must be considered when suspending any product outdoors. It is necessary to know the “Effective Projected Area” (EPA) of the loudspeaker prior to installation of the loudspeaker and PM4-M. This data must be supplied to the pole manufacturer in order to determine safe operation conditions for the loudspeaker and PM4-M when mounted to a specific pole. See Appendix 1 of this installation manual for effective projected areas for each enclosure rated for use with the PM4-M. Periodic inspections of the bracket, loudspeaker enclosure and installation are highly recommended!

**IMPORTANT NOTE:** All products in direct weather installations can be subjected to high wind speeds. For wind speed exposure over 74 miles per hour (119.1 kilometers per hour, 64.3 knots) the loudspeaker enclosure, bracket, banding, link assembly and any secondary safety must be inspected for signs of damage or fatigue!

## INSTALLATION

The PM4/M consists of three parts: the pole bracket, the loudspeaker bracket, and the Link. The bracket is designed for pole diameters of a minimum of 10 inches (254mm) at mounting height. Pole diameters smaller than 10 inches (254 mm) at mounting height must not be used. The pole manufacturer MUST be consulted to determine the structural capacity of the pole. The pole must be able to support the weight of the bracket, loudspeaker, all associated rigging, and all required safety factors!

**NOTE:** IF THE POLE BEING USED IS “ULTRA LARGE DIAMETER” WITH FLAT SECTIONS RATHER THAN A CONTINUOUS CURVE PLEASE CONSULT ONE SYSTEMS!

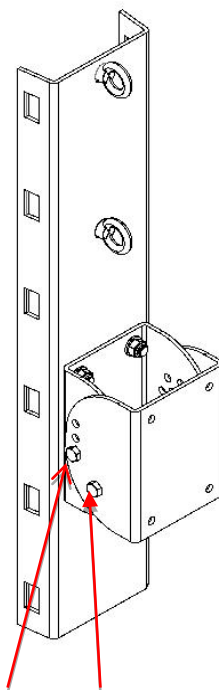


Figure 1 showing M10 thru bolts

Figure 1 represents the isometric and top views of the pole bracket, including the loudspeaker bracket section.

The loudspeaker bracket must be removed from the main bracket before mounting the pole bracket to the pole. The loudspeaker bracket is shown separately in Figure 2 below.

**NOTE:** The loudspeaker bracket should be removed from the main bracket section prior to mounting the pole bracket to the pole. The bracket is removed by removing the two M10 thru bolts that set the tilt angle. The M10 thru bolts are shown in Figure 1 above.

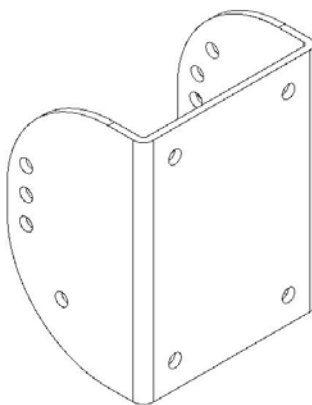


Figure 2

Figure 3 is a representation of the Link assembly. This assembly **MUST** be used whenever the PM4-M is being used.

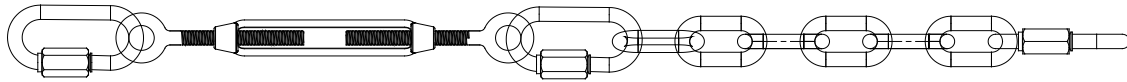


Figure 3

Mount the pole mount section (see Figure 4a below) of the bracket to the pole at the desired height on the pole. The loudspeaker bracket shown in Figure 2 should be removed prior to hanging the pole mount section. The bracket is mounted to the pole using BAND-IT stainless steel bands. **DO NOT SUSTITUTE bands of other material or other widths! There are SIX locations on the pole bracket for bands. ALL SIX LOCATIONS MUST BE USED.**

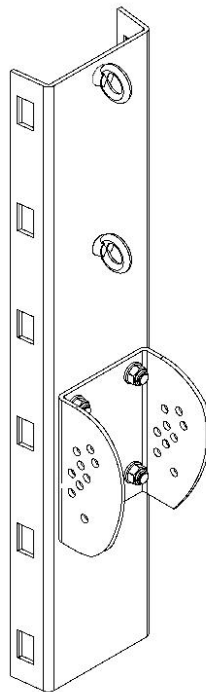
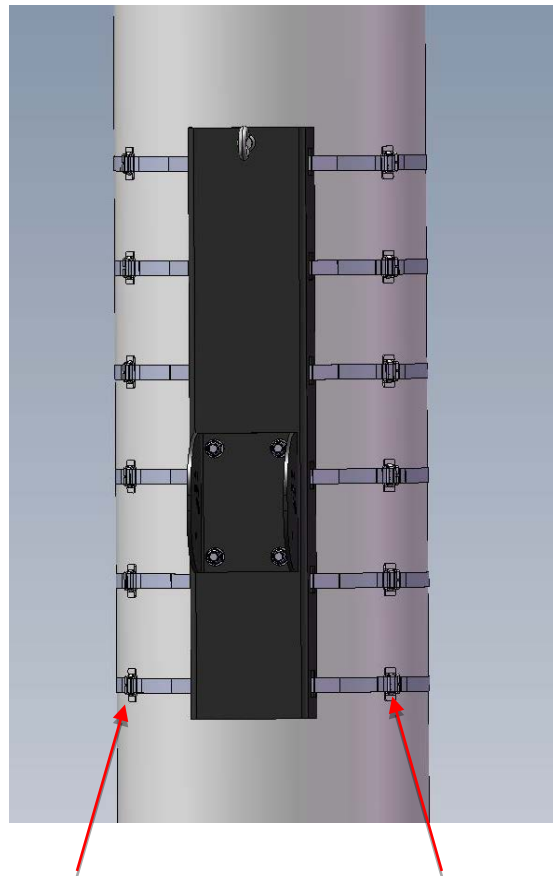


Figure 4a

**IMPORTANT:** It is **REQUIRED** that each of the six (6) band slots be wrapped **TWICE (TWO INDEPENDENT SINGLE WRAPS PER SLOT)**. This should not be confused with “double wrapping”, which is two wraps of the band thru a single buckle. This means that a total of 12 bands and 12 buckles are required for a single PM4-M bracket. Two independent single wraps per slot will ensure a strong and secure mounting of the bracket to the pole. Make certain that the two buckles are separated from each other in each slot as shown below!

The image below illustrates the double wrapping required for each of the six slots.



Note the **TWO** independent bands and buckles per slot

The figure above illustrates the use of two independent bands per slot and also illustrates the use of all six slots. This is also shown in Figure 4b as well.

The required banding and buckle material is based on the specific installation environment. The term “inland” refers to non-industrial and non-marine/ocean front environments. The determination of the specific environment is the responsibility of others.

The required material for “inland” environments is:

BAND-IT	# C206R9 stainless steel bands
BAND-IT	# C25699 buckles
BAND-IT	# C00169 tensioning tool

The stainless steel band is Type 201SS 0.030 inches (0.762mm) thick and 0.750 inches (19mm) wide. **This banding material should be used for “inland” environments. See below for ocean front and Marine environments.**

**If the PM4-M is being installed in an ocean front or Marine environment 316 grade banding material should be used.**

BAND-IT	# C406R9 stainless steel bands (316 grade)
BAND-IT	# C45699 buckles (316 grade)
BAND-IT	# C00169 tensioning tool

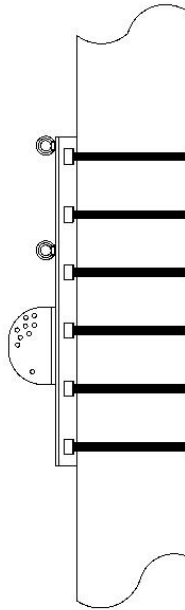


Figure 4b

**ANY QUESTIONS REGARDING THE BANDING SYSTEM SHOULD BE REFERRED TO BAND-IT TECHNICAL SUPPORT**

**WARNING:** Do NOT substitute banding materials or banding dimensions.

Installation instructions from BAND-IT should be followed exactly. Operating instructions are supplied with the tensioning tool. (All BAND-IT parts and tools must be purchased separately from BAND-IT or from their distributors. These parts and tools are not supplied by ONE SYSTEMS)

The stainless steel banding material, buckles, and tensioning tools are available from the following locations (or through distributors recommended by these locations):

BAND-IT IDEX, Inc.  
4799 Dahlia St.  
Denver Colorado 80216  
USA  
1-800-525-0758

FELIX PONCE  
Calle Ignacio Zaragoza No. 8  
Colonia Ahuehuetes Atizapan 52953  
Edo. de Mexico  
(52) 555825 8502

BAND-IT Company Limited  
Speedwell Industrial Estate  
Stavely, Nr. Chesterfield  
Derbyshire, S43 3PF England  
Home Sales (44) 1246-479479  
Export Sales (44) 1246 479480

BAND-IT Clamps (ASIA) Pte. Ltd.  
11 Second Chin Bee Road  
Singapore 618777  
65-62658853

BAND-IT Shanghai Sales Office  
207 room  
Wanbao International Business Centre  
660# Xinhua Road  
Shanghai, China 200052  
021-62826348-308

1. Next, the loudspeaker bracket (Figure 2) should be mounted to the loudspeaker (ONE SYSTEMS 112/HTH, 212/HC, 312/HC, 118/HSB or CFA-2/HTH only using the supplied M10 stainless steel bolts and washers). DO NOT SUBSTITUTE ANY PARTS. **NOTE: See Appendix 2 at the end of this document if the 118HSB is being used!**

Remove the four (4) plastic covers on the rear of the enclosure (if installed) to mount the bracket assembly to the rear of the enclosure.

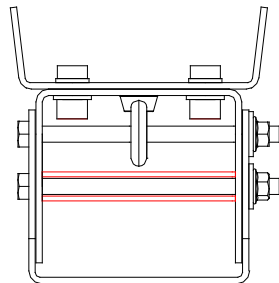
2. Now the M10 forged shoulder “eye” bolt should be installed in the top rear of the loudspeaker enclosure. The plastic cover (if present) must be removed prior to installation of the eye bolt.
3. The loudspeaker, with loudspeaker bracket mounted, may now be placed on the pole bracket. (Main bracket, see figure 4b.)

**USE EXTREME CAUTION!** The loudspeaker is heavy and it is likely that the desired mounting location is high in the air. This process should never be attempted by a single person.

TWO OR MORE PEOPLE ARE REQUIRED TO MOUNT THE LOUDSPEAKER ENCLOSURE TO THE POLE AND PM4-M! Safety harnesses should always be worn when working from an elevated platform.

First insert the M10 bolt into the pivot bolt location as shown in Figure 5 below and secure, but do not fully tighten using the supplied M10 nylon insert nut. (DO NOT DO THIS UNTIL THE NOTE BELOW IS READ AND UNDERSTOOD!)

**NOTE:** The 18 mm diameter hollow tube must be used with the pivot bolt. Insert the M10 pivot bolt thru the 18 mm diameter hollow tube in the position shown below in red.



The 18mm diameter hollow tube and pivot bolt

Now the enclosure may be set at its desired down tilt using the second M10 bolt (“Tilt” bolt). The PM4/M allows the loudspeaker to be oriented from a 0 degree down tilt to a maximum down tilt of 35 degrees. Now both M10 bolts should be tightened using the supplied nylon insert nuts and washers.



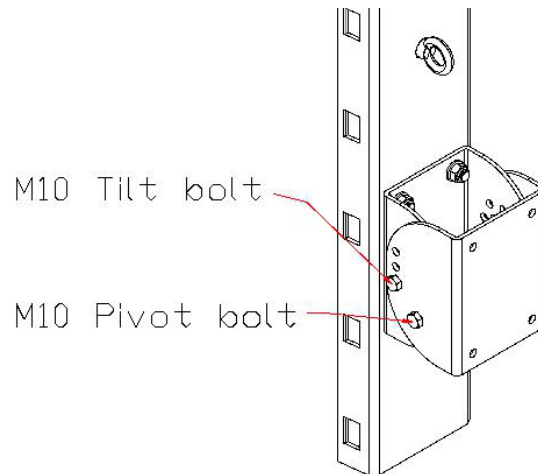


FIGURE 5

**UNDER NO CIRCUMSTANCES SHOULD THE LOUDSPEAKER DOWN TILT EXCEED 35 DEGREES FROM VERTICAL!**

4. Now the Link must be installed.

**INSTALLING THE PM4-M WITHOUT THE LINK IS NOT ALLOWED!**

The Link (see figure 3) consists of a stainless steel quick links, a stainless steel turnbuckle, and several links of stainless steel chain.

**DO NOT SUBSTITUTE ANY PART OF THIS LINK ASSEMBLY!**

The Link should be tightened by rotating the turnbuckle until there is very slight tension on the Link assembly. Do not over tighten. The purpose of the Link is to provide support for the main PM4/M tilting bracket at the bottom of the assembly. **ONLY VERY SLIGHT TENSION SHOULD BE APPLIED WITH THE TURNBUCKLE!**

**Warning:** If the turnbuckle assembly is turned and the loudspeaker enclosure angle begins to change (if the down tilt angle begins to move toward 0 degrees vertical) then the turnbuckle has been **OVER TIGHTENED**. Turn the turnbuckle until there is **VERY** slight tension on the Link assembly and the down tilt of the enclosure is set by the tilt bolts on the PM4-M.

Make sure to use the appropriate combination of Link parts to insure proper connection between the PM4/M and the specific One Systems enclosure. The required combination of Link parts is determined by the down tilt angle of the enclosure, but the turnbuckle must always be used.

The assembly may be configured with any combination of turnbuckle, chain link sections and quick link in order to achieve the proper tension on the system. In certain situations only the turnbuckle will need to be used.

Figure 6 shows the loudspeaker assembly (312HC) and Link in a 0 degree vertical orientation. The assembly may be configured with any combination of turnbuckle, chain link sections and quick link in order to achieve the proper tension on the system. In the image below there is one turnbuckle (always required) and there are three quick links. The lower eyebolt on the back plane of the PM4-M may be used for the 112HTH and 212HC.

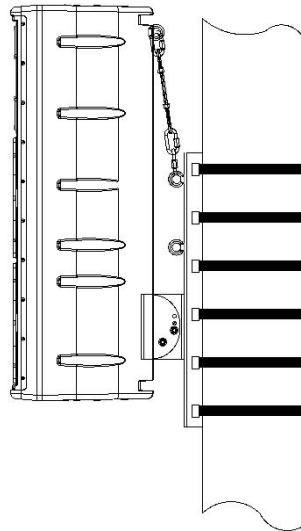


Figure 6

Angles other than 0 degrees from vertical require the stainless steel chain links to be inserted as shown in Figures 7 and 8 below.

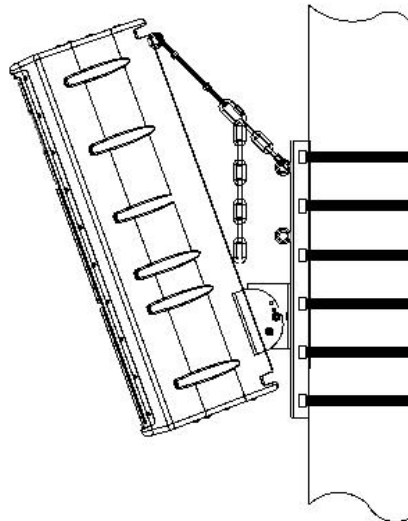


Figure 7

Figure 7 represents a down tilt angle of 20 degrees from vertical and is shown with the chain section, three quick links and the turnbuckle.

Angles of less than 35 degrees may require that sections of the chain be dropped. This is shown in Figure 8. Note that one of the Links has been dropped to allow for an angle of less than the 35 degrees. The required number of links to be dropped is based on the enclosure and the desired down tilt angle.

In any position, the turnbuckle must be adjusted to allow the proper amount of tension on the Link. **The link should never pull the loudspeaker up towards vertical but should always have very slight tension.**

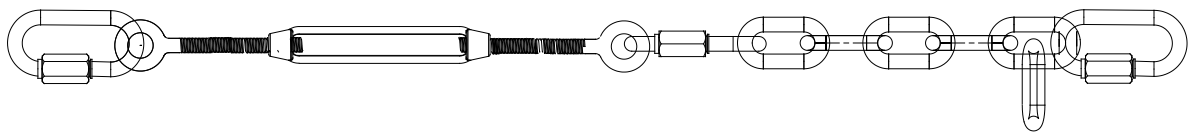


Figure 8

**Warning:** If the turnbuckle assembly is turned and the loudspeaker enclosure angle begins to change (if the down tilt angle begins to move toward 0 degrees vertical) then the turnbuckle has been OVER TIGHTENED. Turn the turnbuckle until there is VERY slight tension on the Link assembly and the down tilt of the enclosure is set by the tilt bolts on the PM4-M.

Secondary safety cables are STRONGLY recommended and should be secured to a structural point NOT associated with the PM4-M bracket. The Link assembly is NOT a secondary safety! Secondary safety cables are NOT supplied by One Systems.

# APPENDIX 1

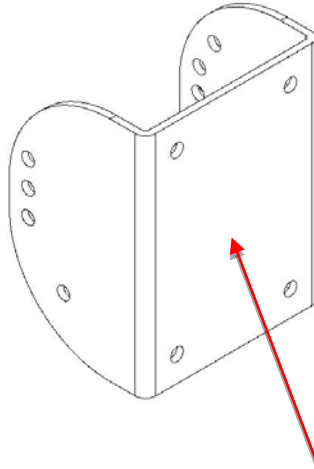
## Projected Area Values

The values below should be supplied to the specific pole manufacturer for safety calculations. These values were determined by adding the projected areas of the high frequency horns, the woofer cones and ports to the cross sectional area of the front of each enclosure listed below. The EPA will vary based on wind direction. The values shown are for wind directions directly into the front of the enclosure and represent maximum values.

112/HTH .....	600 in <sup>2</sup> (387,096mm <sup>2</sup> )
212/HC.....	600 in <sup>2</sup> (387,096mm <sup>2</sup> )
312/HC.....	804 in <sup>2</sup> (550,000mm <sup>2</sup> )
CFA-2/HTH.....	855 in <sup>2</sup> (552,100mm <sup>2</sup> )
118/HSB.....	581 in <sup>2</sup> (375,000mm <sup>2</sup> )

## APPENDIX 2

If the PM4-M is being used with the One Systems 118HSB the silicone gasket (supplied with the 118HSB) must be placed on the surface of the loudspeaker bracket BEFORE the loudspeaker bracket is attached to the 118HSB enclosure. The silicone gasket should be mounted to the surface as noted below.



Mount the silicone gasket (supplied with the 118HSB) on this surface.

**The products referenced in this manual are in conformity with the following standards or other normative documents: Machinery Directive 2006/42/EC**