



User Manual

Oasis

Revision 2.1
September, 2023
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For Oasis enclosures built after September 2023

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Approvals – Europe



CERTIFICATE AND DECLARATION OF CONFORMITY FOR CE MARKING

Tempest Lighting, Inc.

11845 Wicks Street, Sun Valley, CA 91352, USA

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www.tempest.biz

Tempest Lighting, Inc. declares that their

Oasis Projector Enclosure Series 59.xxx.x.x

complies with the Essential Requirements of the following EU Directives:

Low Voltage Directive 2014/35/EU

Test Report 60065-6500-01-14

Electromagnetic Compatibility Directive 2014/30/EU

Test Report 61000-6500-03-14

and further conforms with the following EU Harmonized Standards:

EN 60065 : 2014/AC:2016

Test Report 60065-6500-01-16

EN 60529:1991/AC:2016-12

Test Report 60529-6500-02-16

EN 61000-6-3:2007+A1:2011

Test Report 61000-6500-03-14

EN 61000-6-1:2007

Test Report 61000-6500-03-14

EN 55015:2019/A11:2020

Test Report 61000-6500-03-14

Dated: 21st July 2022

Position of signatory: President

Name of Signatory: Tim Burnham

Signed below:

on behalf of Tempest Lighting, Inc.



.....

Approvals – China



强制性认证目录外产品确认书
Confirmation Letter for Products
Outside the Scope of China Compulsory Certificate

Ref. No: CL-TEMPEST-160818-1

申请人: Applicant: Tempest Lighting Inc.	地址: Address: 11845 Wicks St., Los Angeles, CA 91352 United States
生产厂名称: Factory: Tempest Lighting, Inc.	地址: Address: 11845 Wicks St., Los Angeles, CA 91352, USA
产品名称: Product Name: 投影仪外壳, 灯具外壳 Projector Enclosures Moving Light Enclosures Lighting Enclosures	型号: Model: 18xx.IN, 19xx.IN, 2xxx.IN, 66xx.IN, 52.xxx.IN, 53.xxx.IN, 54.xxx.IN, 55.xxx.IN, 56.xxx.IN
商标: Trademark: Tornado, Twister, Thunder, Blizzard, Whispr, Typhoon, Cyclone, Tacit	
产品标准: Standard: /	HS code: 9405.99.0000
产品描述(包括使用场所) Product Description (utilization of product) : Enclosures for high-powered luminaires and video projectors for outdoor use and indoor noise attenuation. For professional use only. 产品为用于户外和室内噪声衰减大功率灯具和视频投影仪的外壳。仅供专业使用。	
确认意见 Conclusion: According to the product description, the models above are out of CCC scope. 基于产品描述, 如上型号的产品在中国强制性产品目录之外。 本确认书的有效有效期至: August 18th, 2017 Validity Period	



Introduction

Thank you for purchasing a Tempest enclosure! We have worked hard to provide you with the very best product available for its purpose, and we shall continue to do everything possible to ensure that it works well for you for many years to come.

Please read this manual before starting work!

In the event of difficulty, please contact your Tempest reseller or Tempest direct:

info@tempest.biz

+1 818 787 8984

We will do everything we can to help you get the very best results from your Tempest enclosure.

IMPORTANT: Safety Advisories

- All installation and rigging work done must where applicable be designed and built in accordance with norms and standards of the local authority having jurisdiction of the installation site. It is the responsibility of the installer to obtain such approvals as may be required to achieve full compliance.
- All electrical work must be carried out by a suitably licensed electrical contractor in full compliance with local electrical standards.
- Lifting: some enclosures and the equipment inside them may be heavy. Use properly rated lifting equipment where appropriate and never attempt to carry out work with fewer than the number of workers needed to lift safely.
- It is the responsibility of the installer to ensure that all local building, safety and electrical codes are strictly adhered to in the installation of this enclosure. Tempest Lighting, Inc., its employees and agents are in no way responsible for damage arising from failure to follow either the instructions in this manual or building, safety and electrical codes prevailing at the installation location.
- Do not attempt to install or operate the enclosure before fully reading and understanding this manual
- Never allow anyone who has not read this manual to open the enclosure or perform maintenance on the projector within.
- Never leave the enclosure unattended when open.
- Always make sure all bolts and latches are tight and safety locks are in place after performing any form of maintenance on the unit.
- Do not open any electrical boxes until power has been shut off to all supply lines to the enclosure (including the one powering the projector).
- Do not open the enclosure in wet weather.

Installation

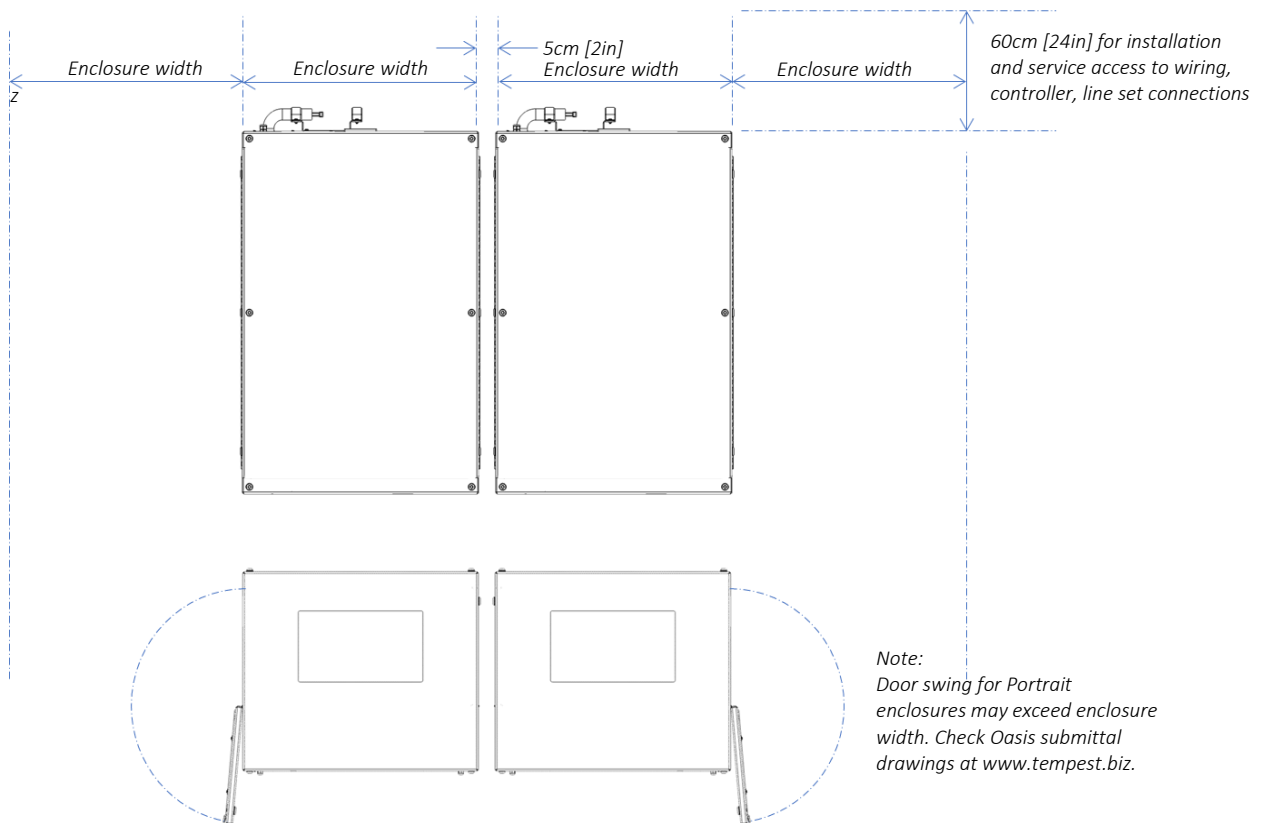
Dimensions

Please refer to Oasis 2D and 3D CAD files at www.tempest.biz

Access Clearance

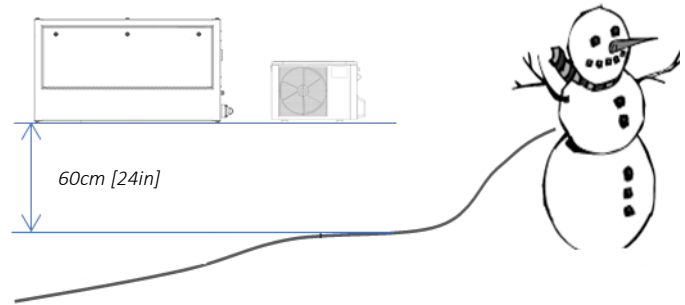
Observe these minimum access clearances shown around your enclosure.

Enclosures may be placed side-by-side, with the projector access opposite, but we recommend allowing clearance for service access on both sides wherever possible.



Snow Clearance

In areas where snow is likely, make sure the base of the enclosure and cooler ODU are at least 24" [60cm] above highest potential snow drift level.



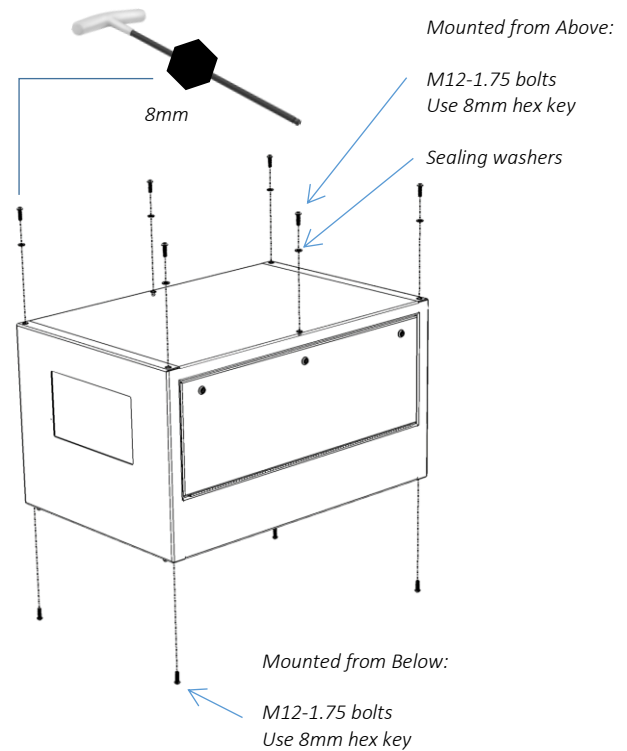
Enclosure Mounting Hardware Options

Mounting Bolts

- Each Enclosure must be mounted with at least FOUR points (six points if hanging)
- All mountings must be made using the M12 threaded holes on the top or bottom of the enclosure.
- Be sure to use the sealing washers supplied for any top fixings.
- Use an 8mm hex key to secure the M12 socket cap screws provided.
- Tempest recommends the use of stainless steel mounting hardware.
- Make sure the inlet filter has at least 75mm/3in clearance below.

IMPORTANT SAFETY NOTICE

Installer must ensure that all mounting points are secure and conform to local safety regulations. Tempest Lighting Inc. accepts no responsibility for damage or injury arising from inappropriate or unsafe installation.



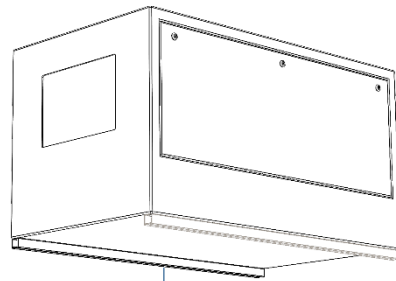
For rigging point dimensions, see Oasis CAD drawings at www.tempest.biz.

Mounting Options – Unistrut Kit

If mounting positions for the corner bolts are not convenient, use the Unistrut Kit (59.UR.xxx) to add two Unistrut rails to the top or bottom of the enclosure.

Using industry-standard Unistrut hardware, the enclosure may now be attached at any point along the Unistrut rails.

Note: Unistrut rails are required for use with the Cyclovator mount – see below...



Unistrut Rails may be mounted above or below

Mounting Options – Stacking Kit

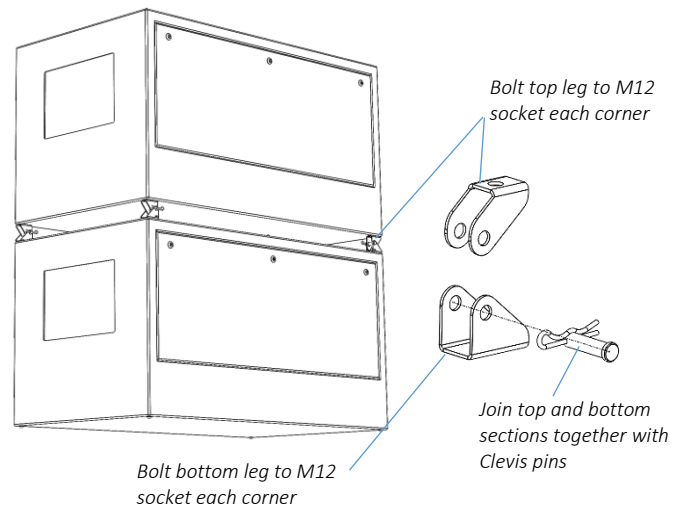
Oasis enclosures may be stacked up to three units high, using the 51.SK stacking Kit. You will need the total number of enclosures to be stacked, minus one stacking kit(s).

So, for a stack of three enclosures, order $3-1=2$ stacking kits.

Note: Oasis enclosures must be of the same model to stack in this way.

51.SK

Stacking Kit (set of four, for one enclosure pair)

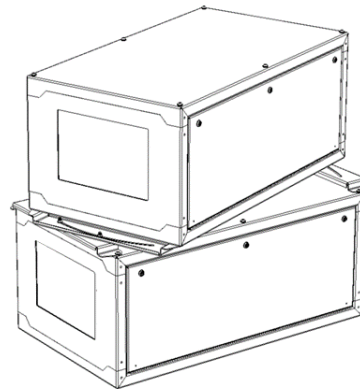


Mounting Options – Swivel Stacking Kit

Oasis may be stacked two units high, with projection beams up to 40° apart, using the Swivel Stacking Kit. Enclosures must be the same model.

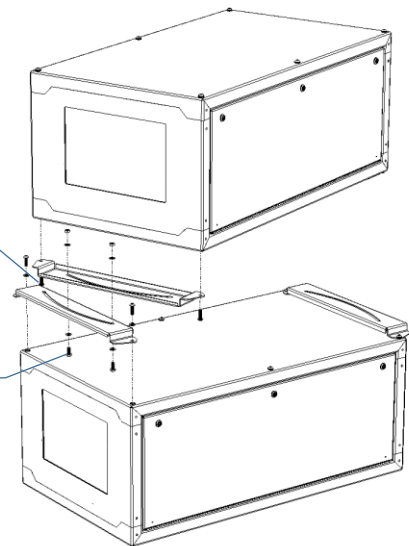
This is useful for edge-blending across a wide area with a limited number of rigging positions.

51.SS.xxx (where xxx is the Oasis model number) Swivel stacking kit for two Oasis enclosures



Mount Swivel Brackets to M12 threaded inserts in enclosure frames with the M12 bolts provided.

Join the radiused slots using the Hex bolts and nuts provided. Adjust desired angle and tighten nuts



Cyclovator Tilt Kit

Cyclovator may be used for any Oasis enclosure, allowing a tilt angle of up to 60°.

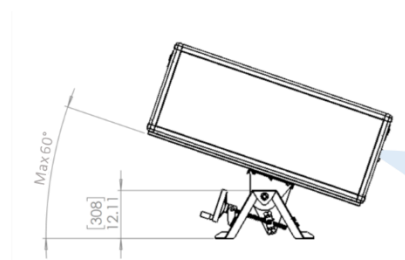
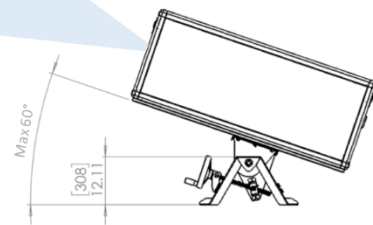
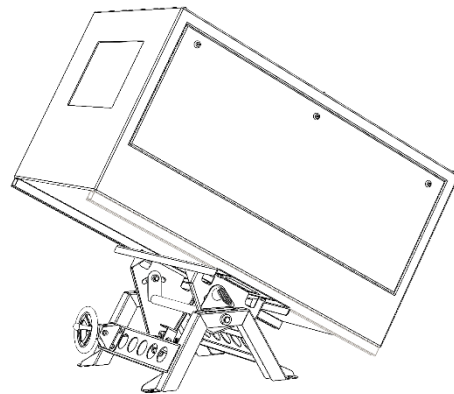
The enclosure may be installed at ground level, projecting up (up onto a building, for example)...

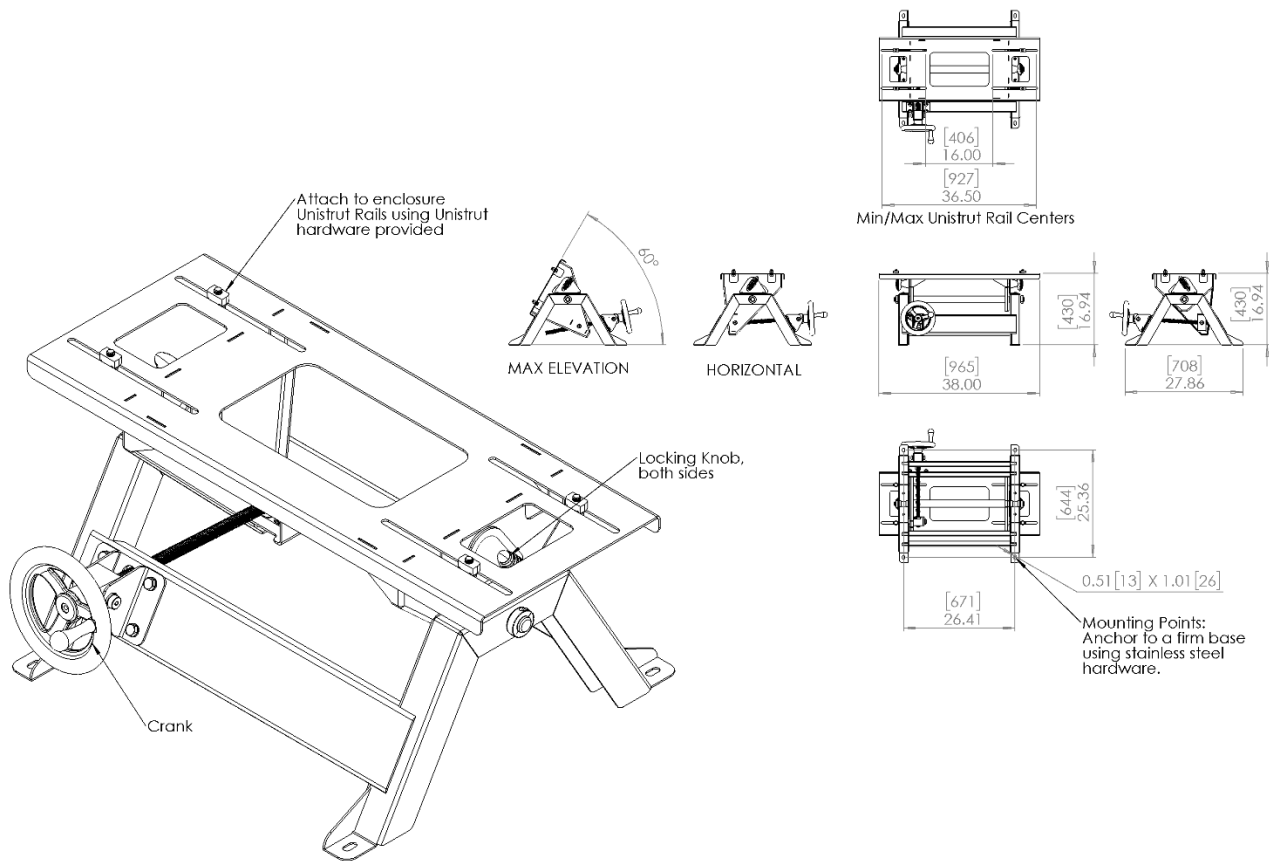
...or, on a rooftop, projecting downwards.

Cyclovator – Unistrut Mounting Rails

When Oasis is used with the Cyclovator Tilt Kit, the Unistrut Kit (59.UR.xxx) is required to attach the enclosure to the Cyclovator.

'xxx' is the Oasis model number.

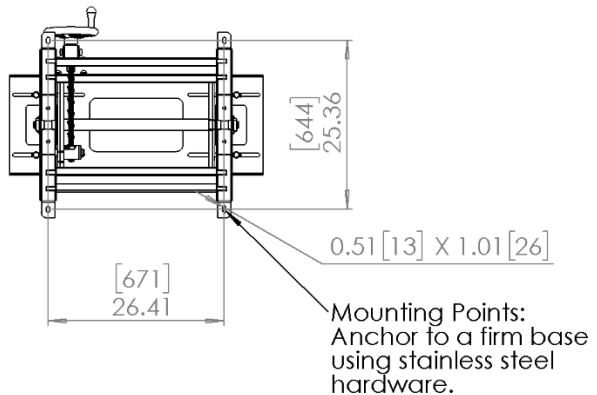




Fixing the Cyclovator in Place

The Cyclovator MUST be firmly attached to the ground, or a suitable mounting structure, using four stainless steel M12 (or US ½" size) bolts or anchors (not supplied).

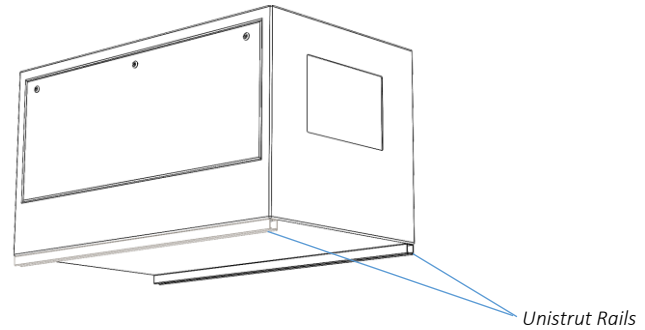
Suitable substrates include concrete pads, steel frameworks, roof beams. All mountings must comply with all relevant building and safety norms in the jurisdiction of the final installation. It is the responsibility of the installer to obtain approval from a structural engineer or other competent person for all such installations, and to adhere strictly to local building and safety codes at all times.



Mounting the Enclosure

(a)

Make sure that the Unistrut rails are attached securely to the 4 M12 threaded sockets on the bottom of the enclosure.

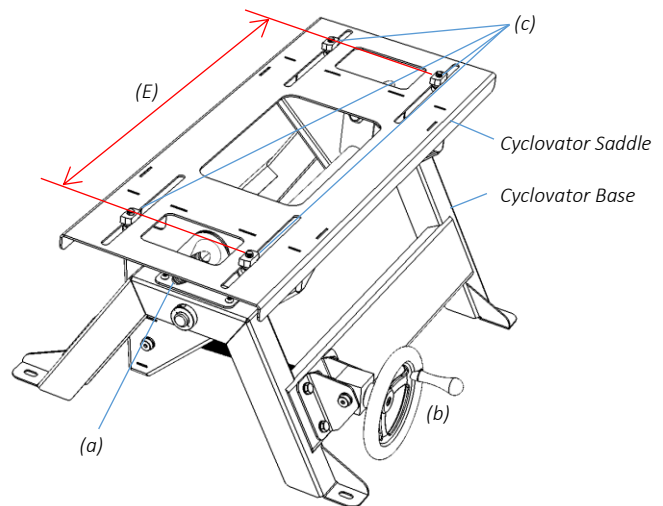
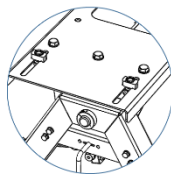


Set the Cyclovator to its horizontal position:

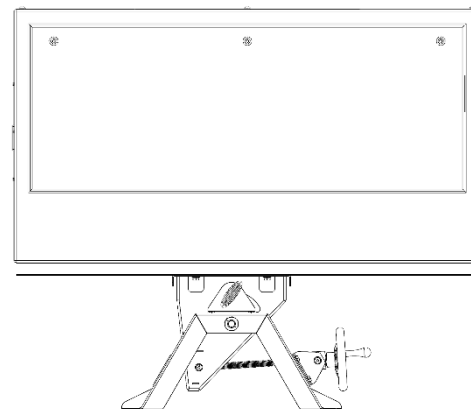
1. Loosen the two locking knobs (a)
2. Turn the crank handle (b) until the Cyclovator saddle is horizontal
3. Tighten the two locking knobs (a)

Align the channel spring nuts (c):

4. The distance (E) between the channel nuts should be the same as dimension E in the installation page (the distance between centers of the Unistrut channels)
5. Loosen the channel nut bolts and align the channel nuts with their long sides parallel with the end of the Cyclovator saddle:



6. Carefully set the enclosure on the Cyclovator saddle, so that the channel nuts are INSIDE the Unistrut rails.
7. PUSH UP and tighten the four M12 channel nut bolts, so that the channel nuts lock in the Unistrut channels.
8. Loosen the locking knobs and turn the crank handle to test movement.

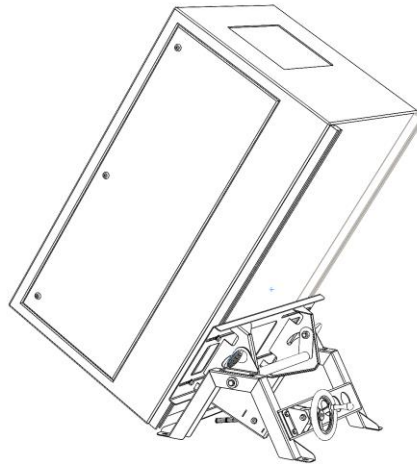


Steep Angles:

FIRST, MAKE SURE THE CYCLOVATOR IS SECURELY FIXED TO THE GROUND.

For steep projection angles, loosen the four channel nut bolts and carefully slide the enclosure in the direction that will be 'UP'.

The center of gravity will still be roughly centered in show position, but you will have to work a bit harder to crank the enclosure up to its show trim!



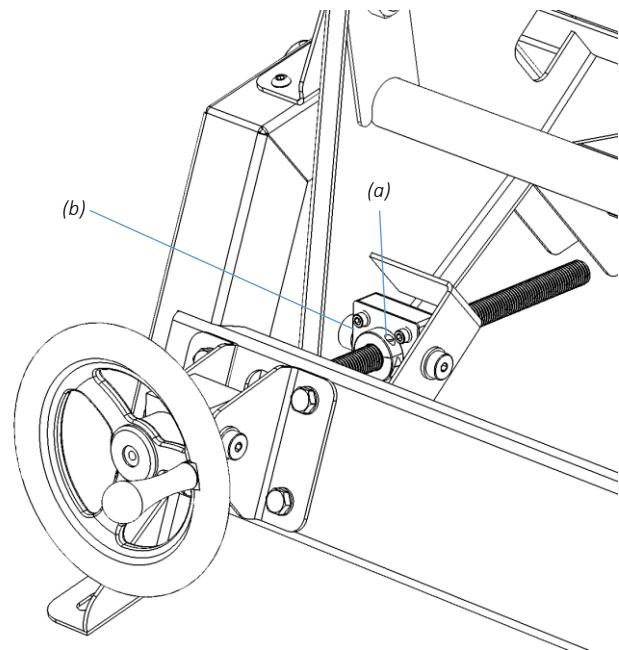
Setting the Show Position Stop

Cyclovator gives you a locator for your show position, for accurate show positioning.

With the Cyclovator in Show position:

1. Loosen the Locking Collar set screw (a)
2. Slide the Locking Collar firmly against the Acme Nut Plate (b)
3. Tighten the Locking Collar set screw (a)
4. You now have two reference locations:
 - Horizontal
 - Show

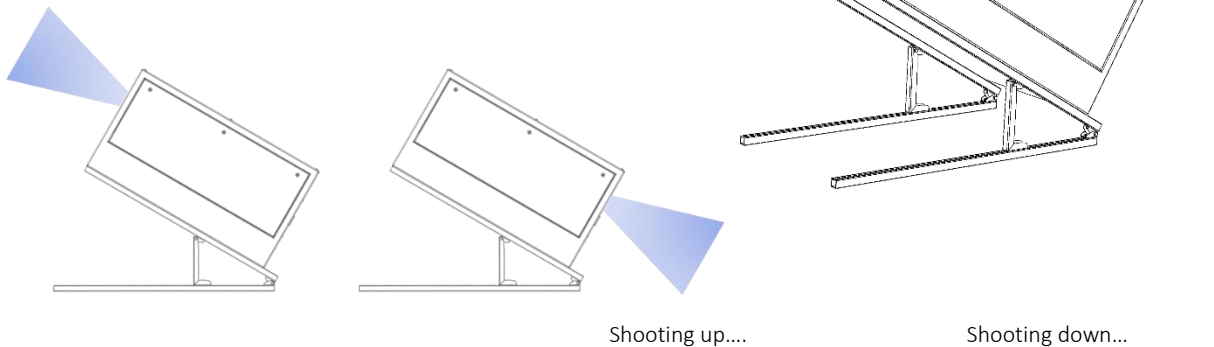
ALWAYS MAKE SURE THAT BOTH LOCKING KNOBS (c) ARE LOOSE WHEN RAISING/LOWERING THE CYCLOVATOR, AND TIGHT WHEN IN SHOW OR SERVICE POSITION.



Oasis Angle Mount Kit

The Angle Mount kit is a simple fixed mounting solution for enclosures with the tilt angle is fixed.

The Angle Mount kit may be used on the ground, with projection up to a 6' down.



Order Angle Mount kits to suit your Oasis enclosure model:

59.AM.xxx Where xxx is the Oasis model (landscape or portrait)

Check with Tempest for UST or custom versions.

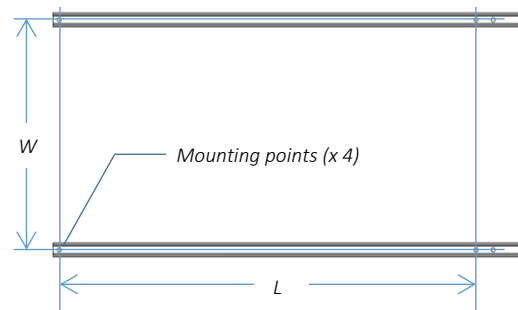
Angle Mount Kit Installation

Mark out the mounting pattern on the ground or substrate.

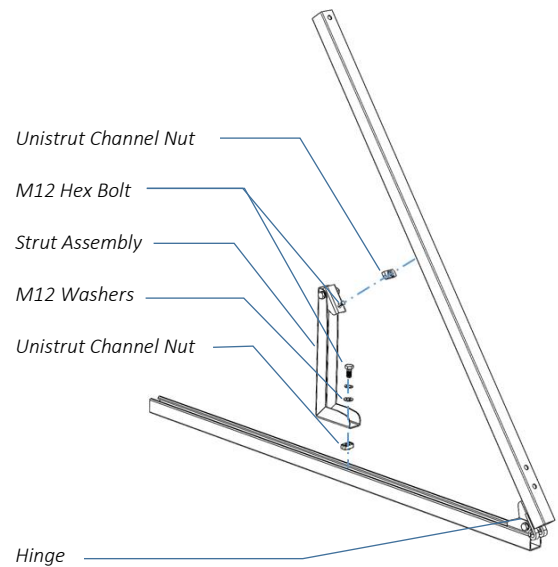
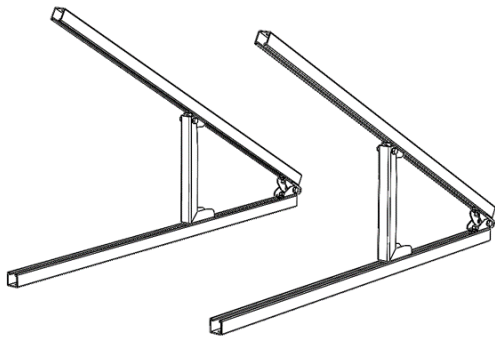
It is the same as the rigging points for the enclosure (see enclosure CAD drawings, available at www.tempest.biz).

Use stainless steel hardware suited to the mounting substrate, and in compliance with local construction codes to mount the Unistrut rails securely to the substrate.

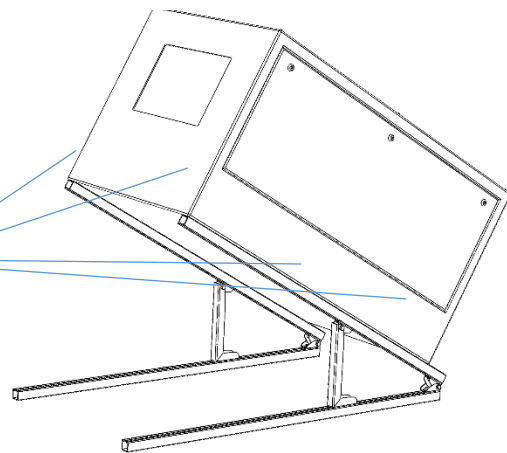
Use M12 or ½" hardware, 2 sets per Unistrut rail.



Assemble the vertical strut assemblies between the hinged Unistrut rails, set both to the same desired angle, and tighten securely.



Mount the Oasis enclosure on the two upper Unistrut rails, and secure in place using the four M12 socket cap screws provided:



Wiring the Enclosure

Power Wiring

SAFETY NOTICE

All power wiring must be performed by a competent electrician, appropriately licensed in the jurisdiction where the installation takes place. All electrical work must be done in full compliance with all electrical and safety norms applicable to the installation site. Isolate all power feeds before opening the enclosure.

Tempest Lighting, Inc., its employees and agents will not be held responsible for damage or injury caused by disregarding this notice.

Electrical Standards

Enclosures supplied for use in countries using US and Japanese style electrical systems follow NEMA wiring standards:

Voltage: 200-208VAC single phase

Frequency: 50/60Hz

Enclosures supplied for use in countries using European style electrical systems:

Voltage: 220-250VAC single phase

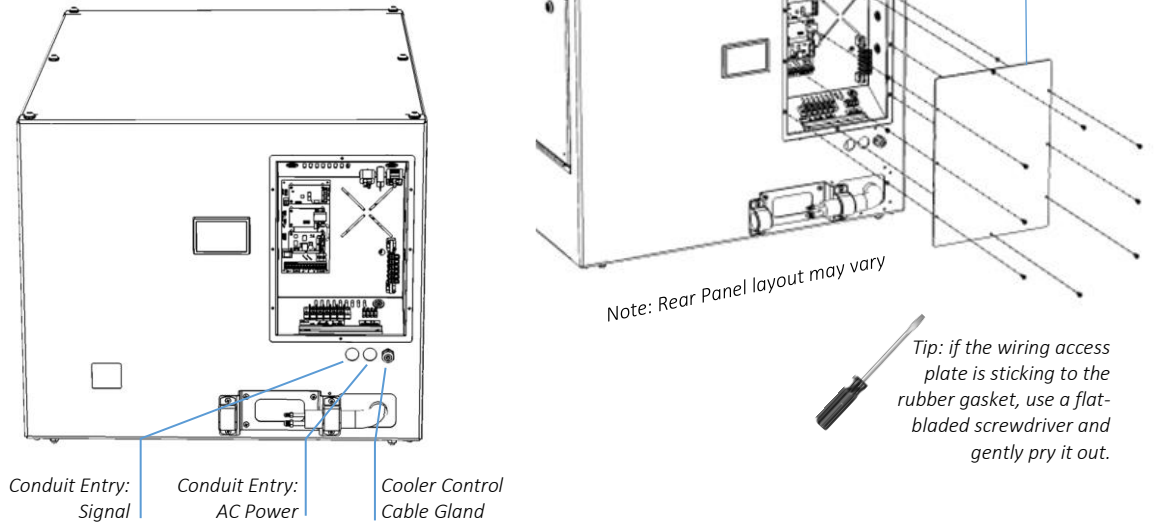
Frequency: 50/60Hz

Note:

- (1) Fans and Heaters are rated 200-250V
- (2) Electronics are autosensing for any voltage 90-265VAC, 50/60Hz
- (3) Coolers are 200-250VAC, 50/60Hz

Wiring Access

Remove the wiring access plate on the rear surface.
Locate the conduit entry holes on the back of the enclosure..



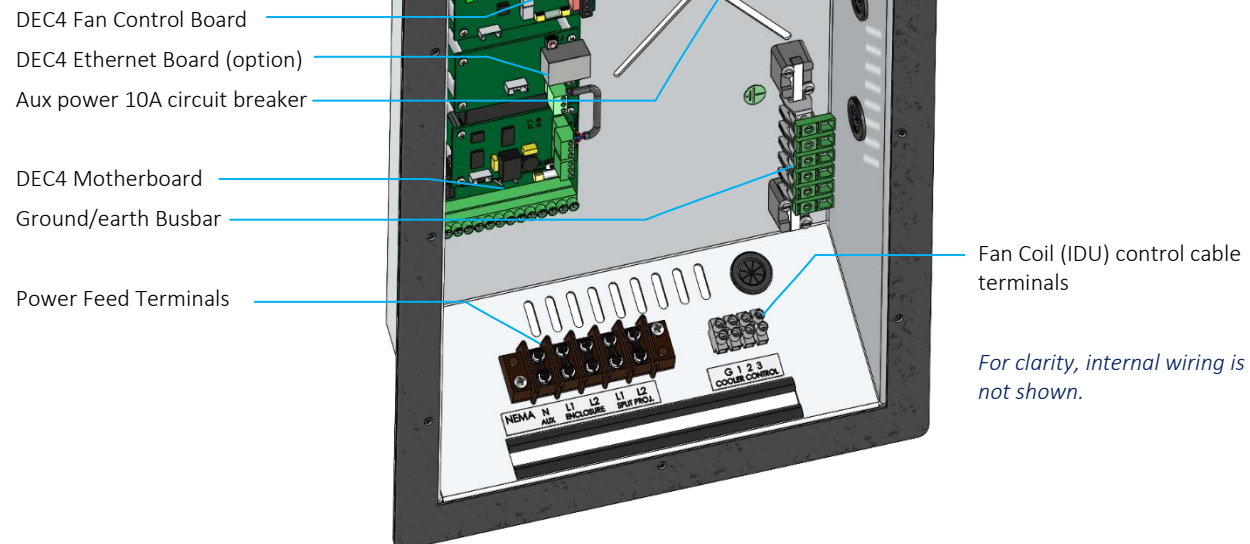
Conduit openings accept PG21 (International) and 3/4" NPT (North America) conduit fittings.

Use rigid or flexible outdoor rated conduit to connect power and signal cables to your Oasis enclosure.

ALWAYS RUN POWER AND SIGNAL CABLES IN SEPARATE CONDUITS.

Identify the following parts:

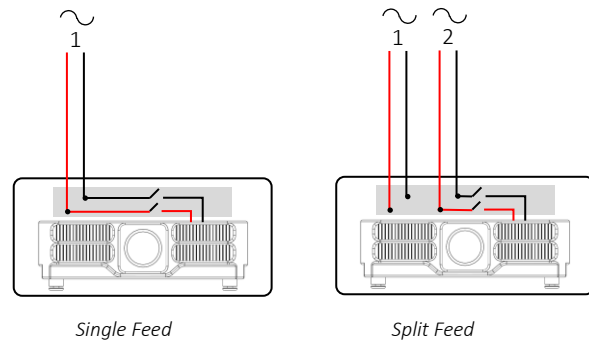
Note: Component layout may vary



One or Two Power Circuits?

Tempest enclosures may be wired on single or double circuit supplies. On a single feed, both enclosure and projector are permanently on. With a split (double) feed supply, you can switch off the projector when not in use, while the enclosure continues to protect it 24/7.

Tip: most people use single feed.



Single Feed

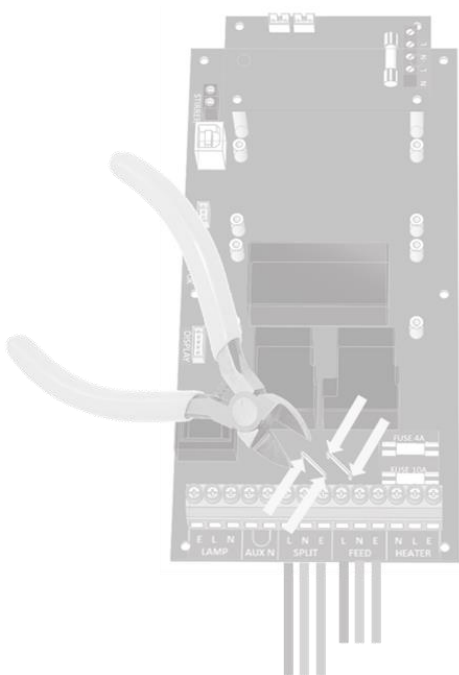
- Enclosure and projector are permanently on.
- Enclosure and Projector must be rated for the same voltage.
- Supply must be rated for projector current plus 200 watts.
- Supply must be permanently ON.

Split feed

- Enclosure power (FEED) must be permanently ON.
- Projector power (SPLIT) may be switched off.
- Enclosure power must be rated for 1,000 watts.
- Projector power must be rated for the projector (see projector manual).

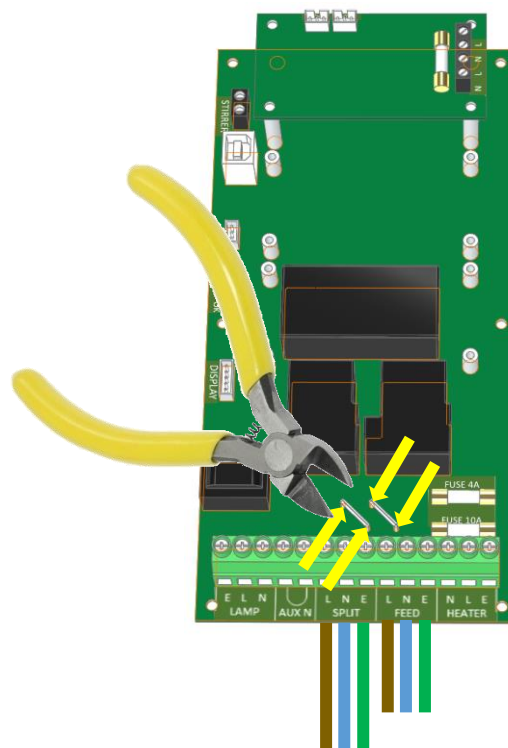
Projector and enclosure power must be same voltage.

For **single feed** wiring, **no modification** to the DEC4 Controller motherboard is needed.



IMPORTANT:

For **split feed** wiring, use a side cutter to cut both AC links at both ends:



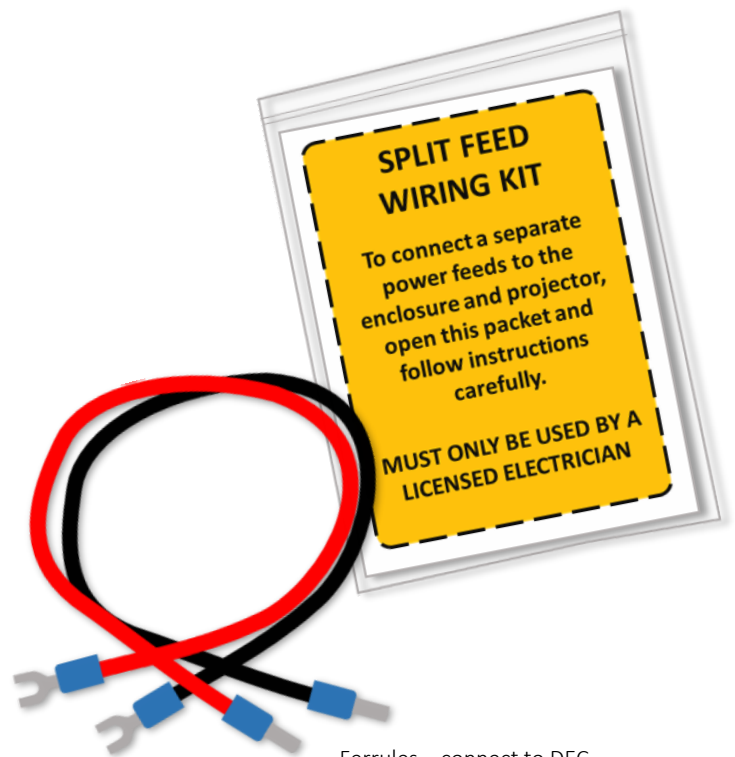
Single Feed Power Termination

- Connect Earth/Ground wire to Ground Terminal
- Connect Live and Neutral to the terminals marked L and N ENCLOSURE
- **IMPORTANT:** Use only copper wire, rated to comply with local electrical codes. Terminal Screw Torque Setting 0.5Nm/4.5in lb.

SEE DIAGRAMS ON FOLLOWING PAGES

Split Feed Power Termination

- **STOP!** Did you cut the power links? See above.
- Connect Earth/Ground wire to Ground Terminal
- Connect Enclosure feed to the terminals marked L and N ENCLOSURE
- Connect Projector feed to the terminals marked L and N PROJECTOR
- Open the Split Feed Wiring Kit – it contains two short cables to link the PROJECTOR supply terminals to the DEC SPLIT terminals:



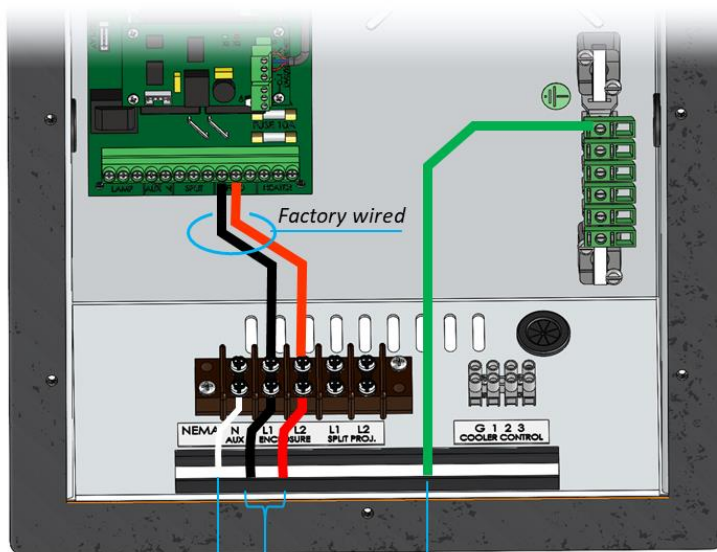
Spades – connect to supply terminal block

Ferrules – connect to DEC Terminals

- Connect Split feed wires provided between L and N PROJECTOR and motherboard L and N SPLIT terminals
- **IMPORTANT:** Use only copper wire, rated to comply with local electrical codes. Terminal Screw Torque Setting 0.5Nm/4.5in lb.

SEE DIAGRAMS ON FOLLOWING PAGES

North America 208V, Japan 200V Single Feed

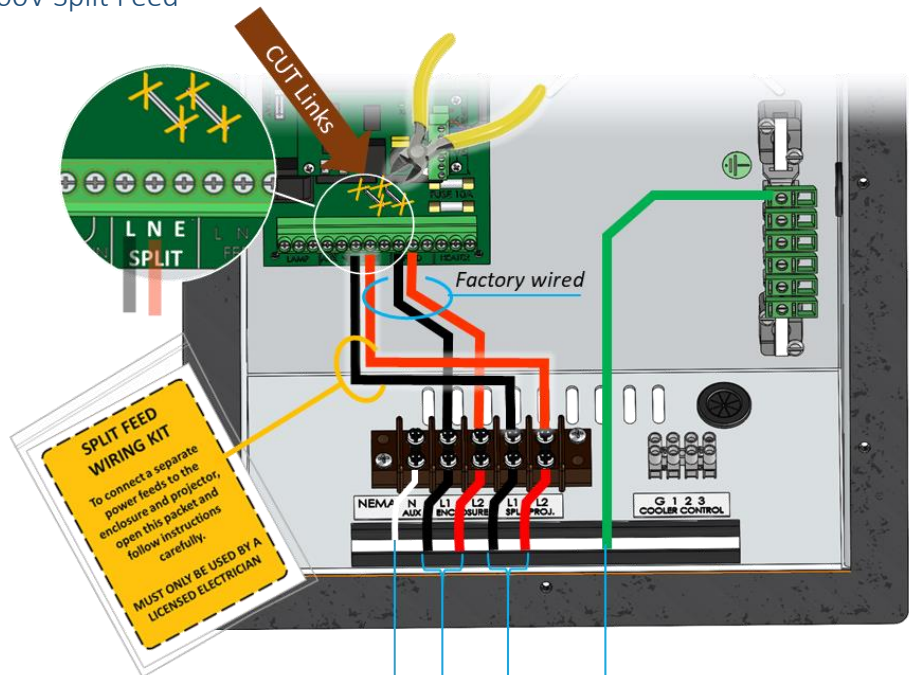


Neutral – 10A Aux supply

Ground

Enclosure Supply, 200-208VAC,
Projector power + 1,000W

North America 208V, Japan 200V Split Feed



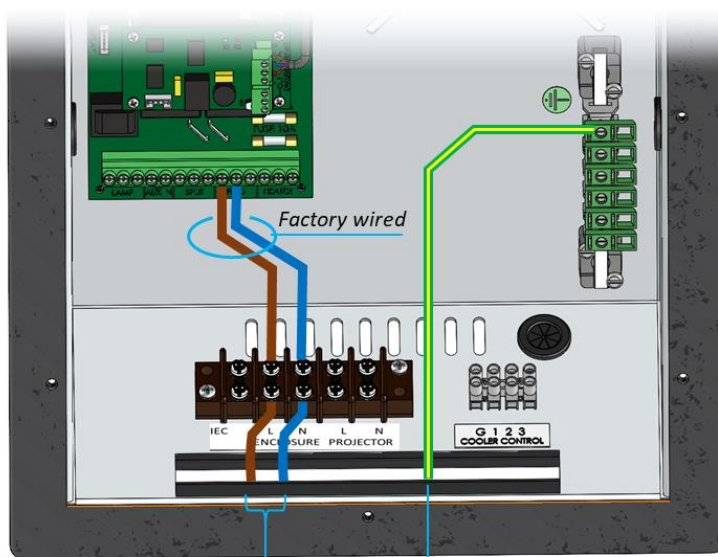
Neutral – 10A Aux supply

Ground

Enclosure Supply,
200-208VAC, 1,000W

Projector Supply,
200-208VAC

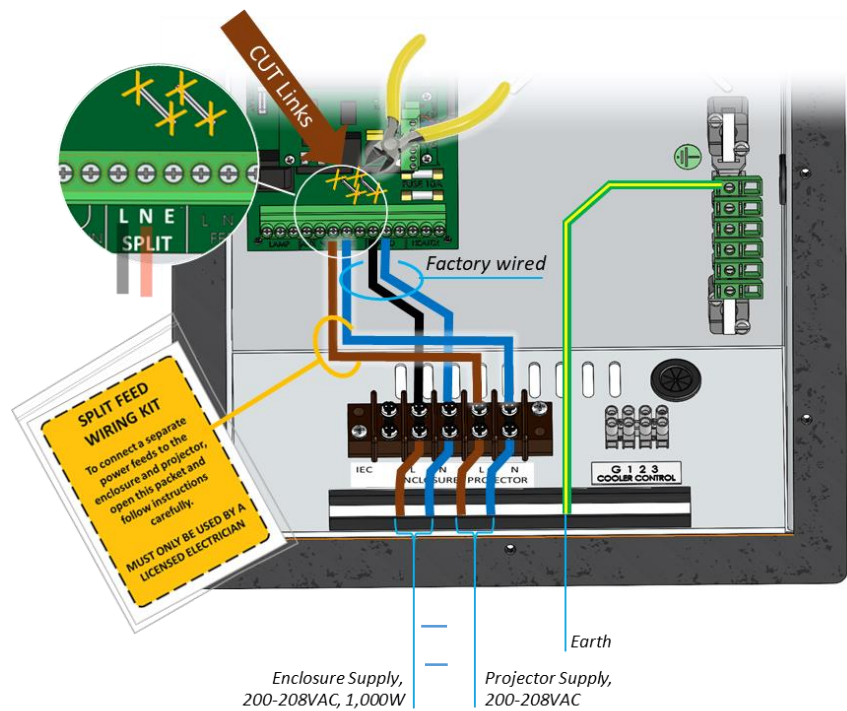
International, 230V Single Feed



Enclosure Supply, 230VAC,
Projector power + 1,000W

Earth

International, 230V Split Feed



Enclosure Supply,
200-208VAC, 1,000W

Projector Supply,
200-208VAC

Earth

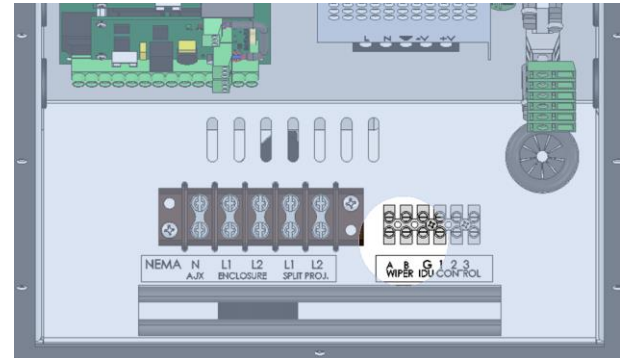
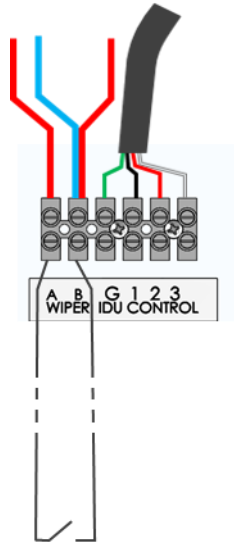
Windshield Wiper Wiring

If the optional windshield wiper kit is included, install a switch line on the 12Vdc wiper circuit.

In the wiring compartment, locate the terminals marked A B/WIPER.

Connect the two terminals to a switch, rated for 12Vdc 3A at a convenient location in the control room.

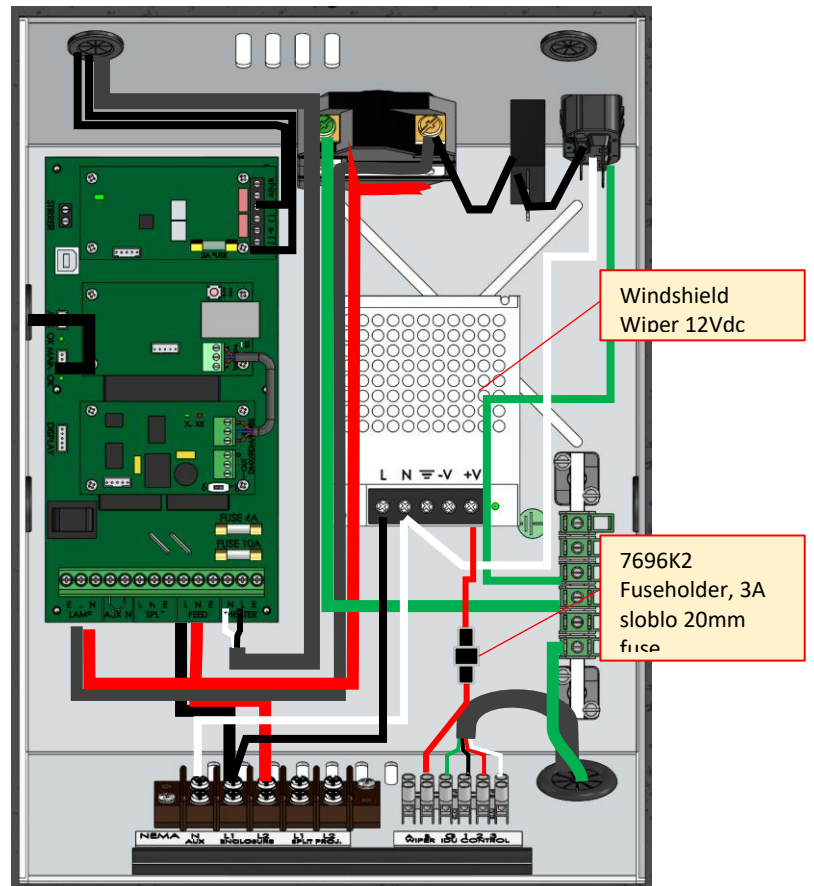
Note that the wiper is self-parking and will return to the open position after the remote switch is turned off.



Wiper Inline Fuse

An inline fuseholder is provided inside the wiring compartment.

Fuse: 20x5mm, 3A Slow Blow



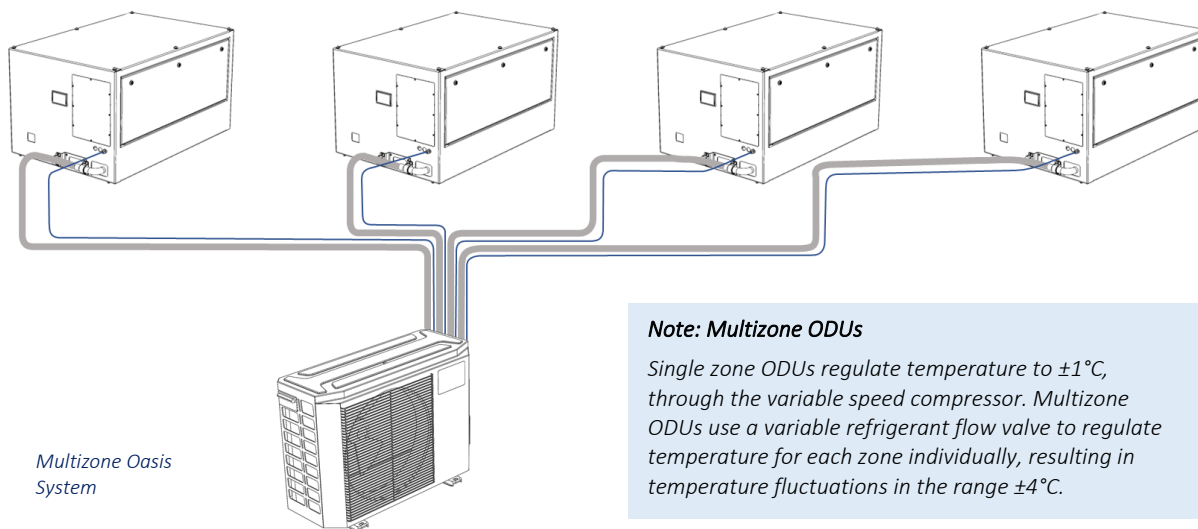
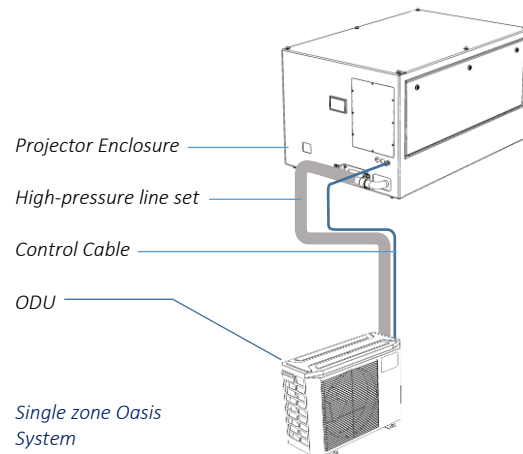
Installing the Oasis Outdoor Unit

Single and Multizone ODU Installation

Oasis enclosure systems may comprise individual enclosures with dedicated inverter heat pump outdoor units (ODUs), or groups of up to five Oasis enclosures sharing a multizone ODU.

The ODU installation method is generally the same for both single and multizone ODUs.

In all cases, the high-pressure line set connections must be carried out by a licensed HVAC installer.



Note: Multizone ODUs

Single zone ODUs regulate temperature to $\pm 1^{\circ}\text{C}$, through the variable speed compressor. Multizone ODUs use a variable refrigerant flow valve to regulate temperature for each zone individually, resulting in temperature fluctuations in the range $\pm 4^{\circ}\text{C}$.

Line Set Lengths

Line set kits are included with each Oasis enclosure, linking the fan coil unit (IDU) in the Oasis enclosure to the ODU.

Line set kits may be specified in the following lengths. All may be trimmed as required to suit site conditions:

Each line set kit includes the required copper gas and liquid tubes, with standard flare couplings, a 4-conductor control cable, and required installation accessories.

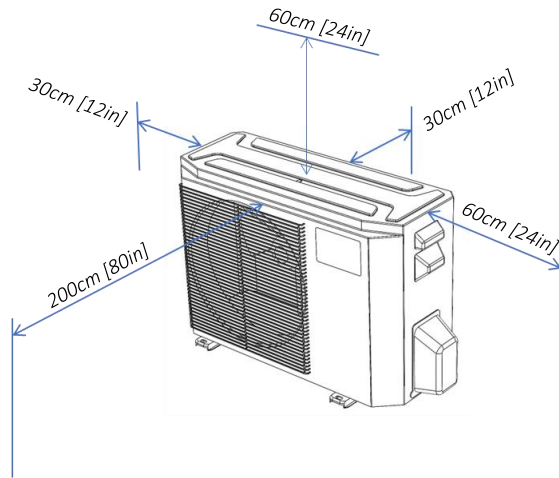
- 3 meters [10 feet]
- 5 meters [16 feet] (default length)
- 8 meters [25 feet]
- 10 meters [33 feet]
- 15 meters [50 feet]

ODU Location

Before installing the outdoor unit, you must choose an appropriate location. The following are standards that will help you choose an appropriate location for the unit.

Proper installation locations meet the following standards:

- Meets all spatial requirements shown opposite
- Good air circulation and ventilation
- Firm and solid—the location can support the unit and will not vibrate
- Protected from prolonged periods of direct sunlight, rain, flooding, snowfall.

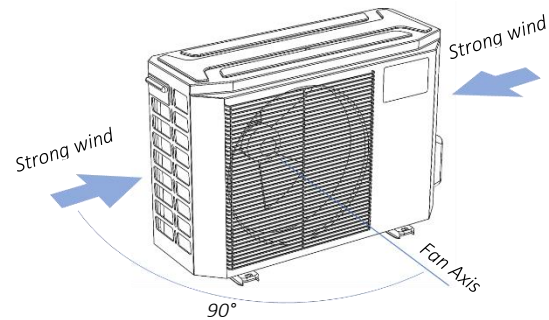


Installation Clearances

Special Considerations for Extreme weather

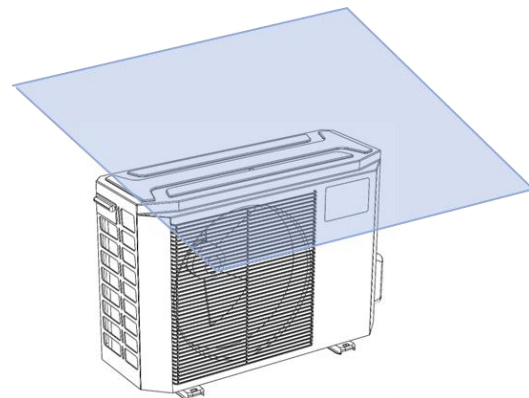
If the unit is exposed to heavy wind:

Install unit so that air outlet fan is at a 90° angle to the direction of the prevailing winds. If needed, build a barrier 2m in front of the unit to protect it from extremely heavy winds.



If the unit is frequently exposed to heavy rain or snow:

Build a shelter above the unit to protect it from the rain or snow. Be careful not to obstruct air flow around the unit.



Note: Drain Connections

Although the Oasis ODU is based on a heat pump design, it is never used in heating mode, and therefore the ODU does not require a condensate drain.

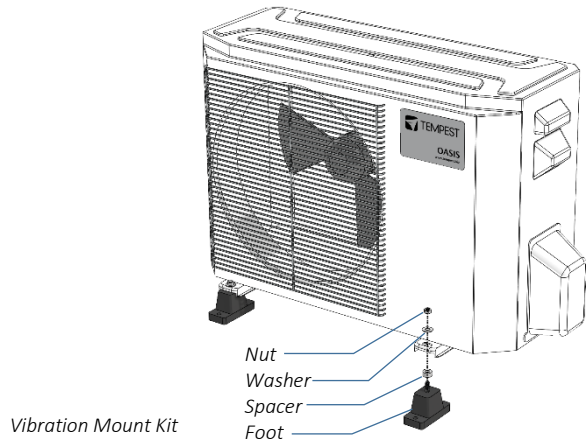
Mounting the ODU

Mounting methods differ, depending on the substrate, and if the optional Vibration Kit will be used.

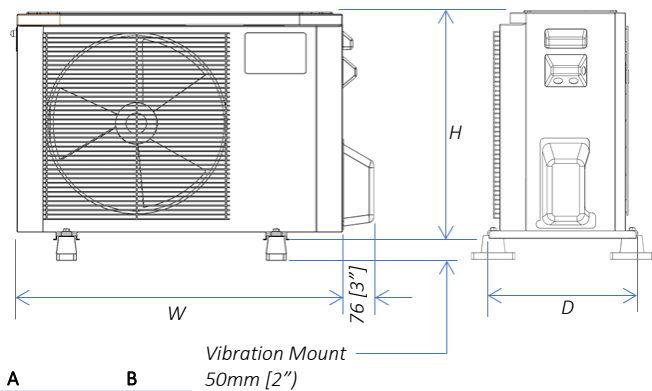
Vibration Kit:

Oasis ODUs are quiet and operate continuously, without the vibration associated with starting/stopping compressors. However, in certain circumstances, additional vibration protection may be advised:

- Very long projection throws, and
- Where the ODU is mounted very close to the projector enclosure, on the same substrate.



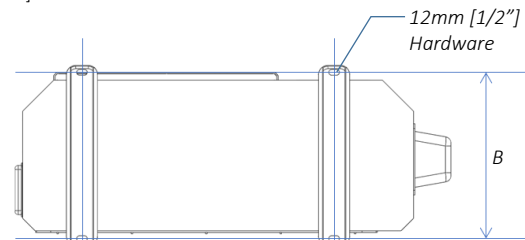
In all cases, mountings must be made in compliance with local building and safety codes. Tempest recommends the use of stainless-steel mounting hardware.



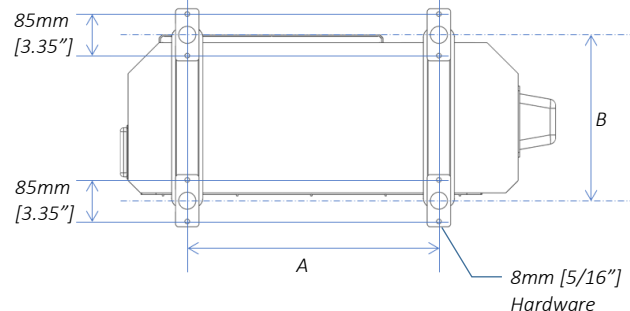
Dimensions: mm [in]

ODU	W	H	D	A	B
59.ODU.09	770 [30.4]	555 [21.9]	300 [11.9]	487 [19.25]	298 [11.75]
59.ODU.12	800 [31.5]	554 [21.75]	333 [13.1]	514 [20.25]	340 [13.4]
59.ODU.18	800 [31.5]	554 [21.75]	333 [13.1]	514 [20.25]	340 [13.4]
59.ODU.MZ2/24	845 [33.25]	702 [27.6]	363 [14.4]	540 [21.25]	350 [13.75]
59.ODU.MZ3/36	946 [37.25]	810 [31.9]	420 [16.5]	673 [26.5]	403 [15.9]
59.ODU.MZ4/48	946 [37.25]	810 [31.9]	420 [16.5]	673 [26.5]	403 [15.9]
59.ODU.MZ5/64	952 [37.5]	1333 [52.5]	415 [16.25]	634 [25.0]	404 [15.9]

Mounting Dimensions: Without Vibration Mounts:



Mounting Dimensions: With Vibration Mounts:



Wiring the ODU

All electrical installation must be carried out by a licensed electrician, in full compliance with all local electrical codes.

ODU Power Requirement:

Voltage: 200-250VAC *

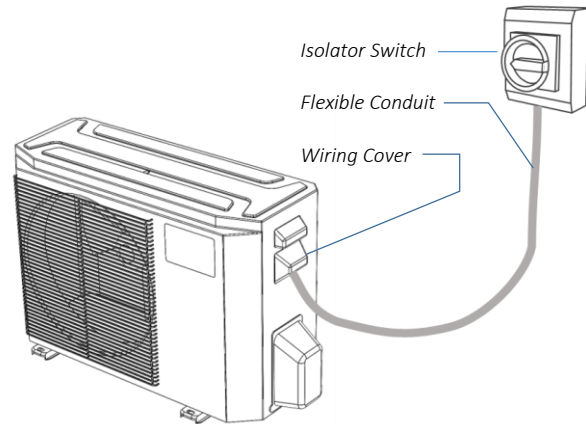
Frequency: 50/60Hz

* May be L + N (international) or L1, L2 (N. America, Japan)

Max Power Draw and Circuit Protection

ODU	Max Watts	Fuse
59.ODU.09	900	15A
59.ODU.12	1,300	15A
59.ODU.18	2,000	15A
59.ODU.MZ2/24	2,200	15A
59.ODU.MZ3/36	3,000	20A
59.ODU.MZ4/48	3,500	20A
59.ODU.MZ5/64	5,200	30A

- Each ODU must be connected to a dedicated branch circuit with capacity according to the above chart.
- Tempest recommends installation of a suitable surge protection device in the ODU branch circuit.
- Each Oasis ODU must be powered 24/7/365 to protect the projector inside the enclosure.



Connect ODU power to a local isolator switch (not included), compliant with local electrical codes, using suitable outdoor-rated flexible conduit (not included).

ODU Wiring Connections

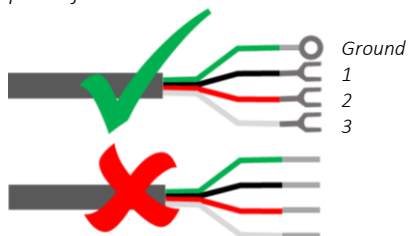
Make sure the power circuit is switched off before starting work.

Remove the wiring cover.

IDU Control Cable – Connect to ODU

Connect the 4-conductor control cable supplied with the line set to the 4 terminals marked G (ground, or protective earth), 1, 2, 3. See picture on next page.

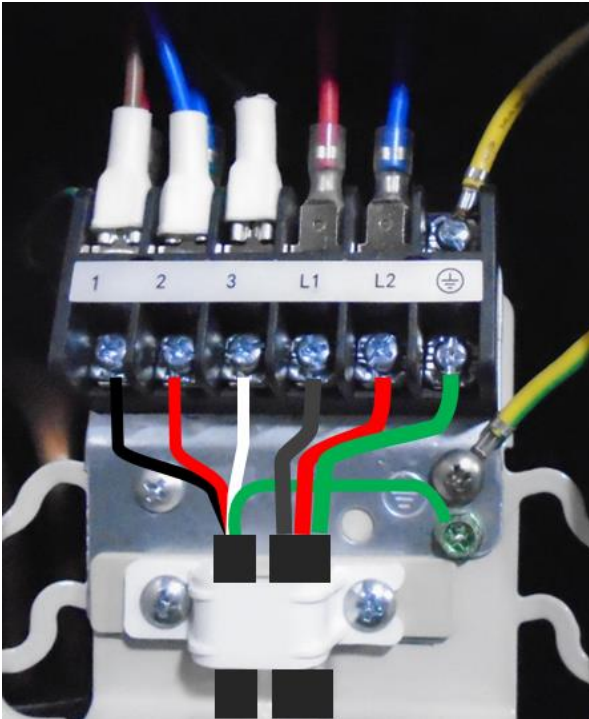
Be sure to use the end of the control cable fitted with fork crimp terminals for the ODU connection. The bootlace ferrule crimps are for the enclosure connection.



Power Wiring

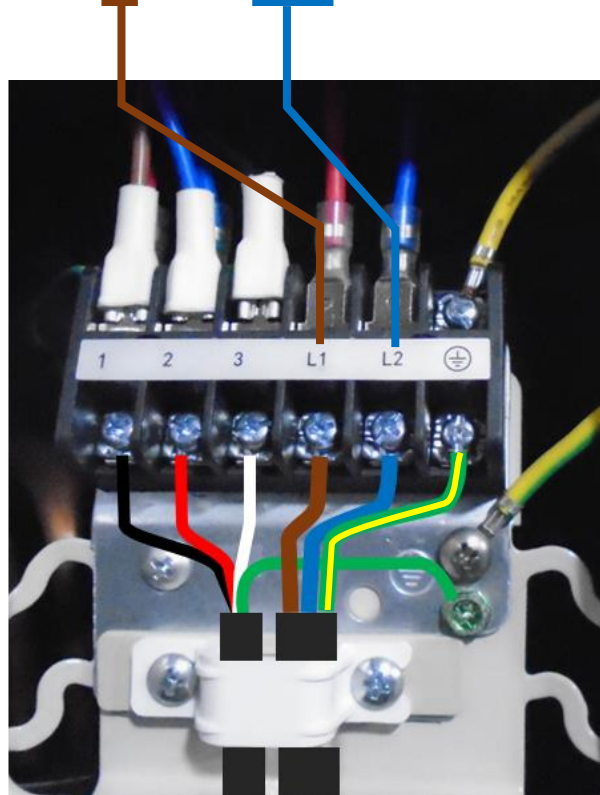
North America, Japan

Connect Power feed wiring to the terminals marked L1, L2, G (2 hots plus ground).



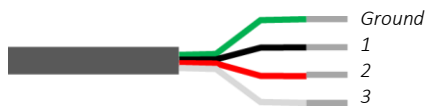
International

Connect LIVE to L1, and NEUTRAL to L2

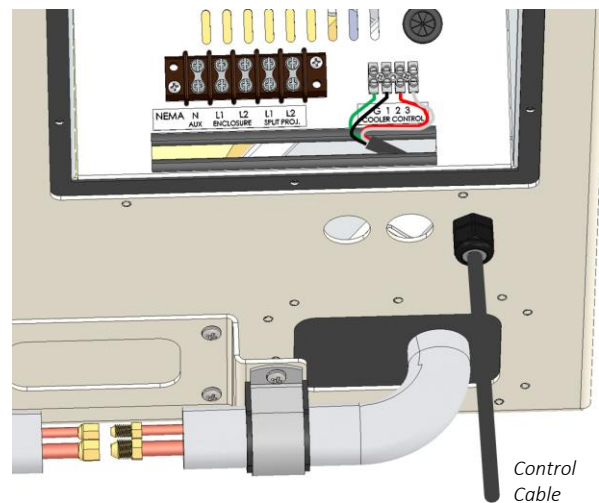


IDU Control Cable – Connect to Enclosure

1. Remove the wiring access cover
2. Thread the control cable through the Nylon cord grip
3. Connect to the four terminals labeled G, 1, 2, 3

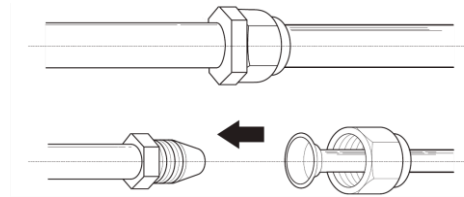


Take care to follow the same color codes at both the enclosure and ODU terminals.



Refrigerant Piping Connections

This part of the installation must be carried out by a licensed HVAC technician, in compliance with all local norms and building codes.



Oasis Standard Line Sets

Tempest provides one line set with each Oasis enclosure, comprising:

1. Pair of copper pipes in insulated sleeve, with flare nut couplings
2. IDU 4-conductor control cable
3. Installation accessories

Line sets are available in two types (9,000 BTU and 12-18,000 BTU, to suit the enclosure fan coil rating), and five lengths, up to 15m [50ft].

Specify length at time of order. Default length is 5m [16ft].



Oasis Standard Line Sets

59.LS.09.03	Oasis Line Set, 9k, 3m/10ft
59.LS.09.05	Oasis Line Set, 9k, 5m/16ft
59.LS.09.08	Oasis Line Set, 9k, 8m/25ft
59.LS.09.10	Oasis Line Set, 9k, 10m/33ft
59.LS.09.15	Oasis Line Set, 9k, 15m/50ft
59.LS.12.03	Oasis Line Set, 12k, 3m/10ft
59.LS.12.05	Oasis Line Set, 12k, 5m/16ft
59.LS.12.08	Oasis Line Set, 12k, 8m/25ft
59.LS.12.10	Oasis Line Set, 12k, 10m/33ft
59.LS.12.15	Oasis Line Set, 12k, 15m/50ft

Note on Pipe Length

The length of refrigerant piping will affect the performance and energy efficiency of the unit. **Nominal efficiency is tested on units with a pipe length of 5 meters (16 ft).**

Tempest offers line sets with Oasis systems up to 15m long. Longer runs are possible in exceptional circumstances, but are not generally recommended.

Refer to the table opposite for specifications on the maximum length and vertical drop height of piping.

ODU	Max Length	Max Drop Height
59.ODU.09	25m [80ft]	10m [33ft]
59.ODU.12	25m [80ft]	10m [33ft]
59.ODU.18	30m [100ft]	20m [66ft]
59.ODU.MZ2/24	50m [165ft]	25m [82ft]
59.ODU.MZ3/36	65m [215ft]	30m [100ft]
59.ODU.MZ4/48	65m [215ft]	30m [100ft]
59.ODU.MZ5/64	65m [215ft]	30m [100ft]

Which Line Set Rating?

The fan coil (IDU) and line set BTU rating depends on the expected heat load in the Oasis projector enclosure model, per the table opposite:

Oasis Model #	BTU Rating
59.100 - 202	9,000 BTU IDU/Line Set
59.204 - 305	12,000 BTU IDU/Line Set
59.310 - 525	18,000 BTU IDU/Line Set

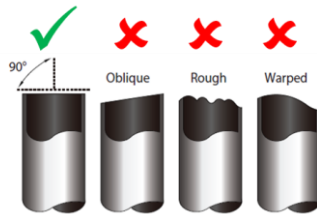
Note that the pipe diameter for 9,000 BTU line sets is smaller than the 12-18,000 pipes. For Oasis Multizone systems, adapters are provided to connect 9,000 BTU line set pipes to the standard 12-18,000 connections on the Multizone ODUs.

Prepare Refrigerant Pipes

THIS STEP IS ONLY NEEDED WHEN TRIMMING THE LENGTH OF THE SUPPLIED LINE SET.

When preparing refrigerant pipes, take extra care to cut and flare them properly. This will ensure efficient operation and minimize the need for future maintenance.

1. Measure the distance between the back of the Oasis enclosure and the ODU.
2. Using a pipe cutter, cut the pipe a little longer than the measured distance.
3. Make sure that the pipe is cut at a perfect 90°



angle.

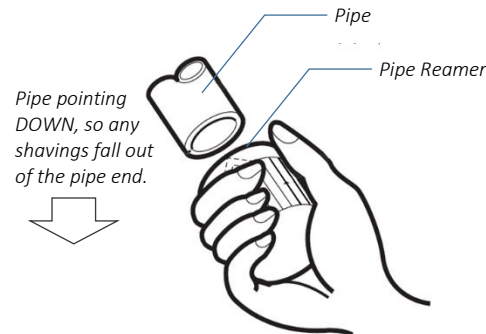
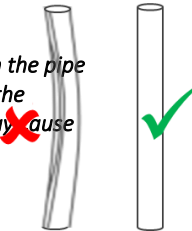
Carefully Remove any Burrs.

Burrs can affect the air-tight seal of refrigerant piping connection. They must be completely removed. Follow steps below for proper deburring.

1. Hold the pipe at a downward angle to prevent burrs from falling into the pipe.
2. Using a reamer or deburring tool, remove all burrs from the cut end of the pipe.

DO NOT DEFORM PIPE WHILE CUTTING

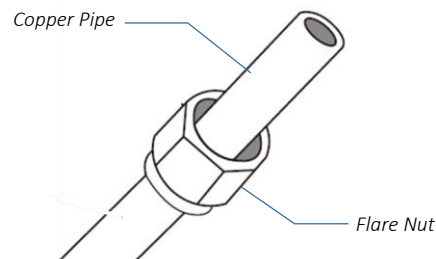
Be careful not to damage, kink, or deform the pipe while cutting. This will drastically reduce the efficiency and capacity of the unit and may cause internal damage.



Flare pipe ends

Proper flaring is essential to achieve an airtight seal.

1. After removing burrs from cut pipe, seal the ends with PVC tape to prevent foreign materials from entering the pipe.
2. Sheath the pipe with insulating material.
3. Place flare nuts on both ends of pipe. Make sure they are facing the correct direction, because **you can't put them on or change their direction after flaring.**



4. Remove PVC tape from ends of pipe when ready to perform flaring work.
5. Clamp flare form on the end of the pipe. The end of the pipe must extend beyond the edge of the flare form in accordance with the dimensions shown in the table.
6. Place flaring tool onto the form.
7. Turn the handle of the flaring tool clockwise until the pipe is fully flared.
8. Remove the flaring tool and flare form, then inspect the end of the pipe for cracks and successful, even flaring.

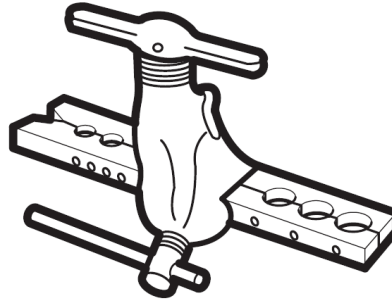
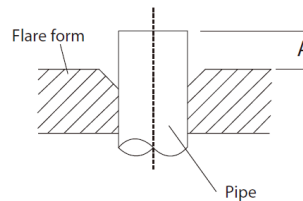


Fig. 5.4

PIPING EXTENSION BEYOND FLARE FORM

Outer Diameter of Pipe (mm)	A (mm)	
	Min.	Max.
Ø 6.35 (Ø 1/4")	0.7 (0.03")	1.3 (0.05")
Ø 9.52 (Ø 3/8")	1.0 (0.04")	1.6 (0.06")
Ø 12.7 (Ø 1/2")	1.0 (0.04")	1.8 (0.07")
Ø 16 (Ø 5/8")	2.0 (0.08")	2.2 (0.09")
Ø 19 (Ø 3/4")	2.0 (0.08")	2.4 (0.1")



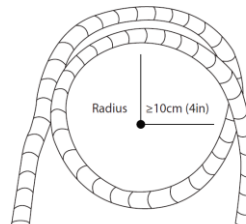
Connecting pipes

When connecting refrigerant pipes, be careful not to use excessive torque, or to deform the piping in any way. You should first connect the smaller low-pressure pipe, then the high-pressure pipe.

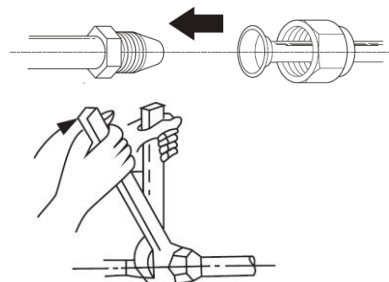
Apply leak guard material on all flared mating surfaces.

MINIMUM BEND RADIUS:

When bending connective refrigerant piping, the minimum bending radius is 10cm (4").



1. Align the center of the two pipes to be connected.
2. Using a wrench, grab the nut on the unit tubing.
3. While firmly holding the nut on the unit tubing, use a torque wrench to tighten the flare nut according to the torque values in the "Torque Requirements" table below.
4. Loosen the flaring nut slightly, then tighten again.



Torque Requirements

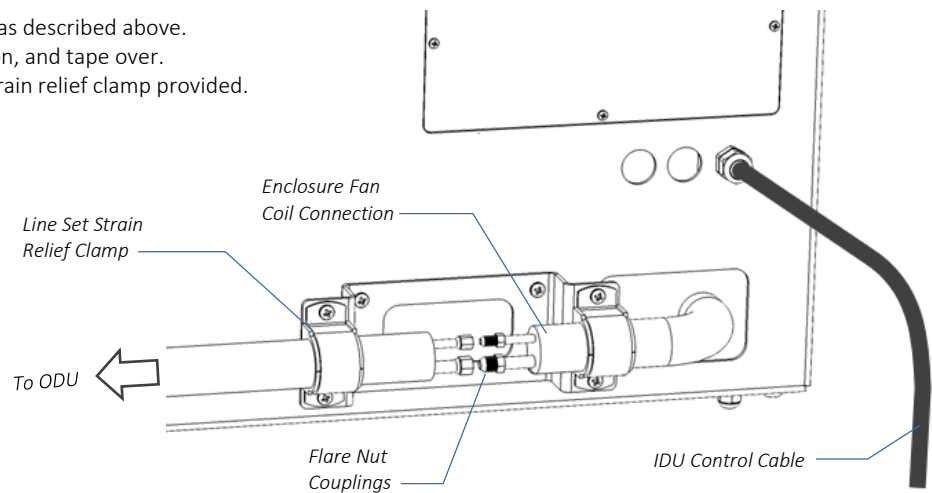
Outer Diameter of Pipe (mm)	Tightening Torque (N•cm)	Add. Tightening Torque (N•cm)
Ø 6.35 (Ø 1/4")	1,500 (11 lb•ft)	1,600 (11.8 lb•ft)
Ø 9.52 (Ø 3/8")	2,500 (18.4 lb•ft)	2,600 (19.2 lb•ft)
Ø 12.7 (Ø 1/2")	3,500 (25.8 lb•ft)	3,600 (26.6 lb•ft)
Ø 16 (Ø 5/8")	4,500 (33.2 lb•ft)	4,700 (34.7 lb•ft)
Ø 19 (Ø 3/4")	6,500 (47.9 lb•ft)	6,700 (49.4 lb•ft)

DO NOT USE EXCESSIVE TORQUE

Excessive force can break the nut or damage the refrigerant piping. You must not exceed the torque requirements shown in the table above.

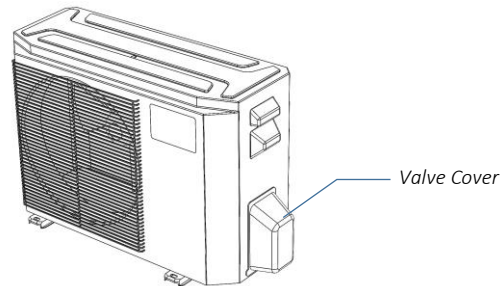
Connecting Line Set to the Oasis Enclosure

1. Connect the two flare nuts as described above.
2. Wrap the join with insulation, and tape over.
3. Secure the line set in the strain relief clamp provided.



Connecting Line Set to the ODU

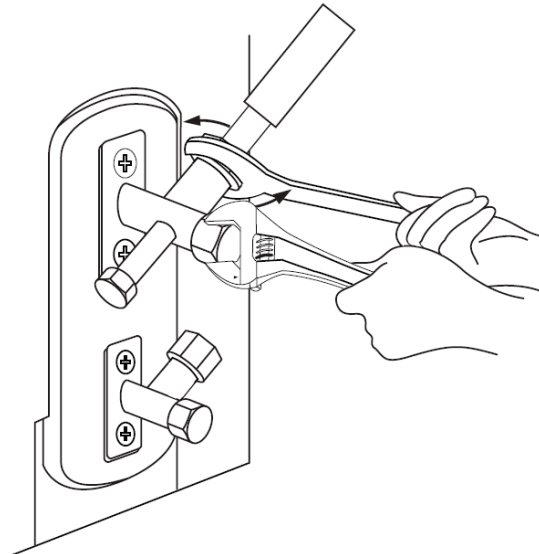
1. Remove the ODU Valve Cover



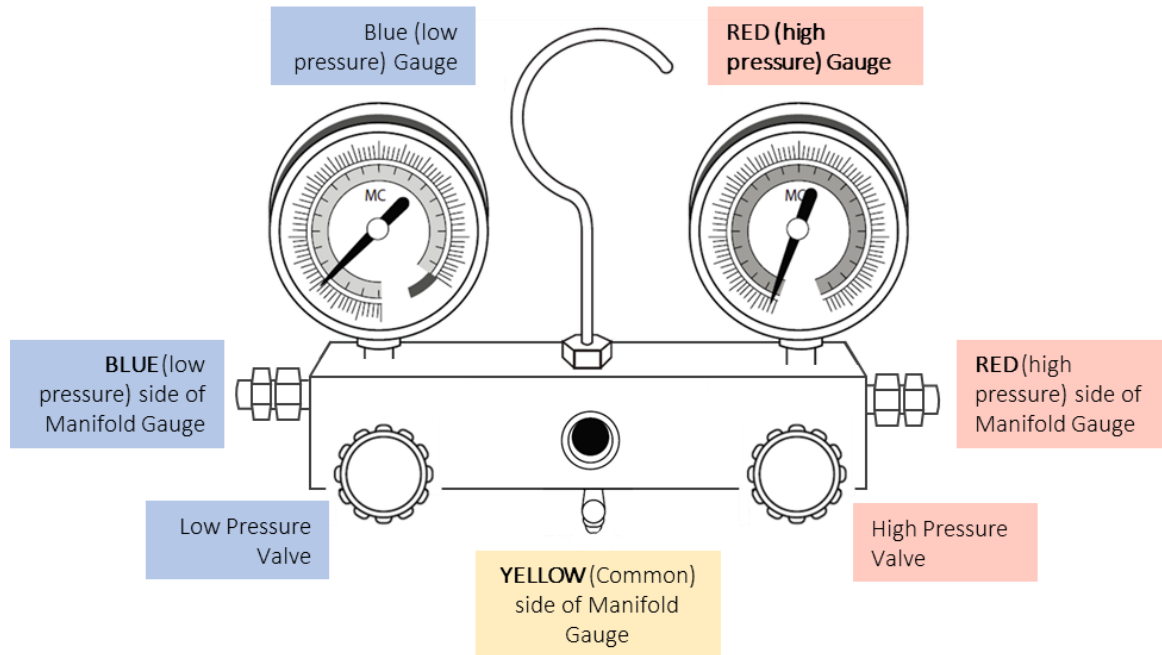
2. Remove protective caps from the valve ends.
3. Align flared pipe end with each valve, and tighten the flare nut as tightly as possible by hand.
4. Using a wrench, grab the body of the valve. Do not grab the nut that seals the service valve.
5. While firmly gripping the body of the valve, use a torque wrench to tighten the flare nut according to the correct torque values.
6. Loosen the flaring nut slightly, then tighten again.
7. Repeat Steps 3 to 6 for the remaining pipe.

USE A WRENCH TO GRIP THE BODY OF THE SERVICE VALVE

Torque from tightening the flare nut can snap off other parts of the valve



Air Evacuation



Preparation and Precautions

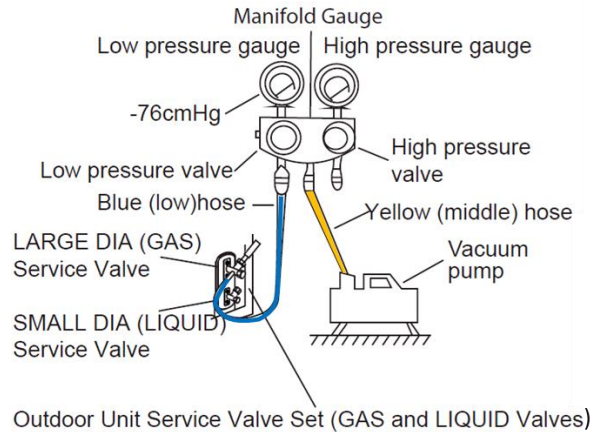
Air and foreign matter in the refrigerant circuit can cause abnormal spikes in pressure, which can damage the air conditioner, reduce its efficiency, and cause injury. Use a vacuum pump and manifold gauge to evacuate the line sets circuit, removing any non-condensable gas and moisture from the system.

Evacuation should be performed upon initial installation or when the unit is relocated.

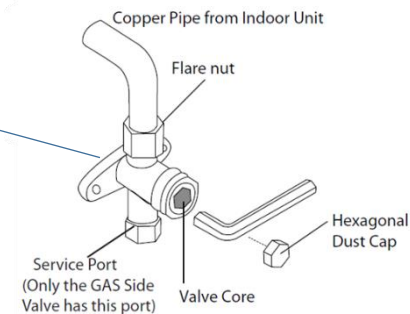
BEFORE PERFORMING EVACUATION

- Check to make sure that both LIQUID SIDE and GAS SIDE pipes between the indoor and outdoor units are connected properly in accordance with the "Refrigerant Piping Connection" section of this manual.
- Check to make sure all wiring is connected properly.
- Before using the manifold gauge and vacuum pump, read their operation manuals to familiarize yourself with how to use them properly.

1. Connect the blue (low side) hose of the manifold gauge to service port on the outdoor unit's GAS SIDE valve.
2. Connect yellow (middle) hose from the manifold gauge to the vacuum pump.
3. Open the BLUE (Low Pressure) valve of Manifold Gauge. Keep the RED (High Pressure) valve closed.
4. Turn the vacuum pump ON to start evacuating the air from the line set and indoor unit circuits.
5. Run the vacuum pump for at least 15 minutes, or until the Low Pressure Gauge reads -76cmHG (-100 kPa or -30 In Hg). (Negative value)
6. Close the Blue (Low Pressure) valve of Manifold Gauge, then turn the vacuum pump OFF.
7. Wait for 5 minutes, then check that there has been no rise in Low Pressure Gauge reading.



8. If there is a rise (Vacuum Loss), refer to the Gas Leak Check section for information on how to check for leaks. If there is no change in vacuum reading, unscrew the cap from the LIQUID Side Service Valve.
9. Insert hexagonal wrench into the service valve (LIQUID Side Valve) and open the valve by turning the wrench in a 1/4 counterclockwise turn. Listen for sound of gas exiting the system, then close the valve after 5 seconds.
10. The Low Pressure Gauge should now show a positive pressure value (Above Zero). Watch the Pressure Gauge for a few minutes to make sure that there is no drop in the pressure value (Indicating a leak)
11. Using a hexagonal wrench, fully open both the LIQUID and GAS pressure valves.
12. Remove the charge hose from the service port.
13. Tighten valve caps on all three valves (Service Port, Liquid Valve, Gas Valve) by hand. Tighten further using a torque wrench if needed.



! OPEN VALVE STEMS GENTLY

When opening valve stems, turn the hexagonal wrench, until it seats against the stopper. Do not try to force the valve to open further.

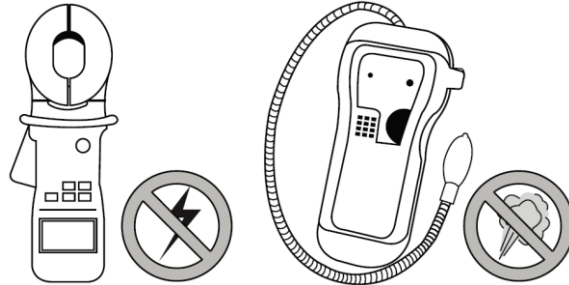
Adding Refrigerant

Some systems require additional charging depending on pipe lengths. The pipe length varies according to locations of the indoor and outdoor units. The system has been factory charged with sufficient R410a refrigerant for the standard pipe length of 5m (16'). The additional refrigerant to be charged can be calculated using the following formula. This is necessary only if the length exceeds 7.5m (25 feet).

ADDITIONAL REFRIGERANT PER PIPE LENGTH			
Connective Pipe Length (m)	Air Purging Method	Additional Refrigerant	
≤ Standard pipe length	Vacuum Pump	N/A	
> Standard pipe length	Vacuum Pump	Liquid Side: Ø 6.35 (ø 1/4") Gas side either Ø 9.52 (ø 3/8") or Ø 12.7 (ø 1/2") Add for lengths beyond 5m (16 feet) (Per additional meter): 15 g/m (Per additional feet): 0.16 oz/ft	Liquid Side: Ø 9.52 (ø 3/8") Gas side either Ø 15.87 (ø 5/8") or Ø 19.05 (ø 3/4") Add for lengths beyond 5m (16 feet) (Per additional meter): 30 g/m (Per additional feet): 0.32 oz/ft

DO NOT MIX REFRIGERANT TYPES: Use only R410A Refrigerant.

Electrical and Gas Leak Checks



Electrical Safety Checks

After installation, confirm that all electrical wiring is installed in accordance with local and national regulations, and according to the Installation Manual.

BEFORE TEST RUN

Check Grounding Work

Measure grounding resistance by visual detection and with a grounding resistance tester. Grounding resistance must be less than 4Ω.

DURING TEST RUN

Check for Electrical Leakage

During the Test Run, use an electroprobe and multimeter to perform a comprehensive electrical leakage test.

If electrical leakage is detected, turn off the unit immediately and call a licensed electrician to find and resolve the cause of the leakage.

Gas Leak Checks

There are two different methods to check for gas leaks.

Soap and Water Method

Using a soft brush, apply soapy water or liquid detergent to all pipe connection points on the indoor unit and outdoor unit. The presence of bubbles indicates a leak.

Leak Detector Method

If using leak detector, refer to the device's operation manual for proper usage instructions.

AFTER PERFORMING GAS LEAK CHECKS

After confirming that the all pipe connection points DO NOT leak, replace the valve cover on the ODU.

Test Run

Before Test Run

Only perform a test run after you have completed the following steps:

- Electrical Safety Checks – Confirm that the unit's electrical system is safe and operating properly
- Gas Leak Checks – Check all flare nut connections and confirm that the system is not leaking
- Confirm that the gas and liquid (high and low pressure) valves are fully open

Test Run Instructions

You should perform the Test Run for at least 30 minutes.

1. Connect power to the unit.
2. Press the ON/OFF button on the remote controller to turn it on.
3. Press the MODE button to scroll through the following functions, one at a time:
 - COOL – Select lowest possible temperature
 - HEAT – This operating mode will NOT be used.
4. Let each function run for 5 minutes, and perform the checks listed opposite:

Cooling System Checklist	Pass	Fail
Electrical Leakage Test		
Grounding Test		
All Electrical Terminals properly covered		
Outdoor Unit securely installed		
Piping connection leak test		
All pipework fully insulated and taped		
COOL function working		

Cooling System Error Codes

The following codes may be seen on the cooler display on the Oasis enclosure:

Operation lamp	Timer lamp	Display	LED STATUS
☆ 1 time	X	E0	Indoor unit EEPROM parameter error
☆ 2 times	X	E1	Indoor / outdoor units communication error
☆ 3 times	X	E2	Zero-crossing signal detection error
☆ 4 times	X	E3	Indoor fan speed has been out of control
☆ 5 times	X	E4	Indoor room temperature sensor T1 open circuit or short circuit
☆ 6 times	X	E5	Evaporator coil temperature sensor T2 open circuit or short circuit
☆ 7 times	X	EC	Refrigerant leakage detection
☆ 1 times	O	F0	Overload current protection
☆ 2 times	O	F1	Outdoor ambient temperature sensor T4 open circuit or short circuit
☆ 3 times	O	F2	Condenser coil temperature sensor T3 open circuit or short circuit
☆ 4 times	O	F3	Compressor discharge temperature sensor TP open circuit or short circuit
☆ 5 times	O	F4	Outdoor unit EEPROM parameter error
☆ 6 times	O	F5	Outdoor fan speed has been out of control
☆ 1 times	☆	P0	IPM malfunction or IGBT over-strong current protection
☆ 2 times	☆	P1	Over voltage or over low voltage protection
☆ 3 times	☆	P2	High temperature protection of IPM module or compressor shell top
☆ 4 times	☆	P3*	Outdoor ambient temperature too low.
☆ 5 times	☆	P4	Inverter compressor drive error
☆ 6 times	☆	P5	Indoor units mode conflict (multi-zone ONLY)
☆ 7 times	☆	P6	Low pressure protection(Only for 36K)

O (light)

X (off)

☆ (flash)

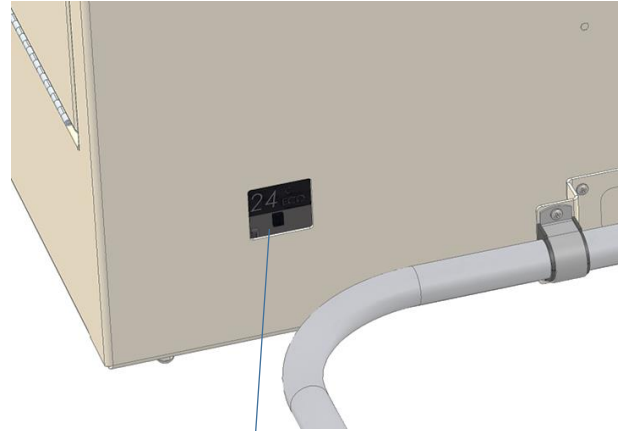
Oasis Cooler Settings

Locate the Set Point Display on the Oasis enclosure chassis (generally on the back panel)

This display window indicates the temperature set point, and is also the IR receiver for the handheld remote control unit included with your system.



Your remote may look like either model shown here. Both function in the same way.



Cooler Set Point Display, IR Receiver

Set Temperature Scale

To toggle the display between Fahrenheit and Celcius:

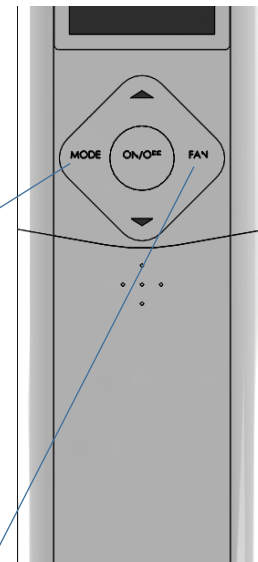
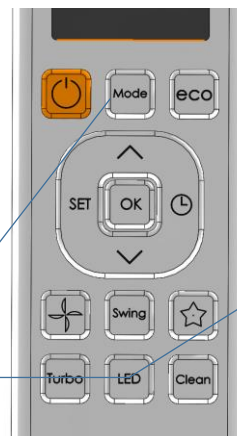
Press and hold \uparrow , THEN add \downarrow , and hold together for five seconds.

Set Cool Mode

Press the MODE key, then use \uparrow and \downarrow to display COOL mode.

OR: Press MODE multiple times until the COOL symbol is shown

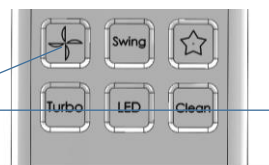
Note: Oasis does not use the inverter cooling system for heating. Heating in the enclosure is via the radiant heater installed below the port glass.



Set Fan Speed

Press the fan key multiple times to set the maximum fan speed.

(Note: this controls the crossflow fan in the fan coil unit, not the enclosure recirculating fan, which always runs full speed).



Power Cycling

Note that all Oasis settings are maintained in the even that power is lost and then restored.

Set Target Temperature

Use the \uparrow and \downarrow keys to set the desired temperature set point, in the range 17–32°C [63–90°F]. This set point is displayed in the display window.

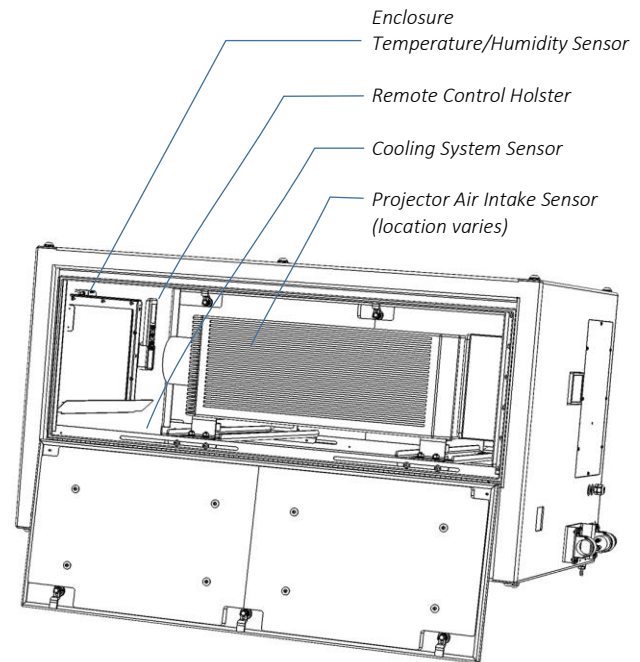
NOTE:

There are three temperature sensors in your Oasis enclosure, and they may not read the same:

Cooling sensor: in the cool air flow from the fan coil unit. This is used to regulate the air conditioning system.

Tempest Sensor: above the port glass. Monitors internal temperature and humidity and displays on the DEC User Interface, also via remote monitoring (see below).

Projector Air Intake Sensor: reports over your projector control system. Often a few degrees higher than actual inlet air temperature.



Monitor the projector intake temperature, and adjust the Oasis Set Point until you are satisfied. The two temperatures may not appear to be the same, but the offset between them should be constant.

Projector on, Projector Standby

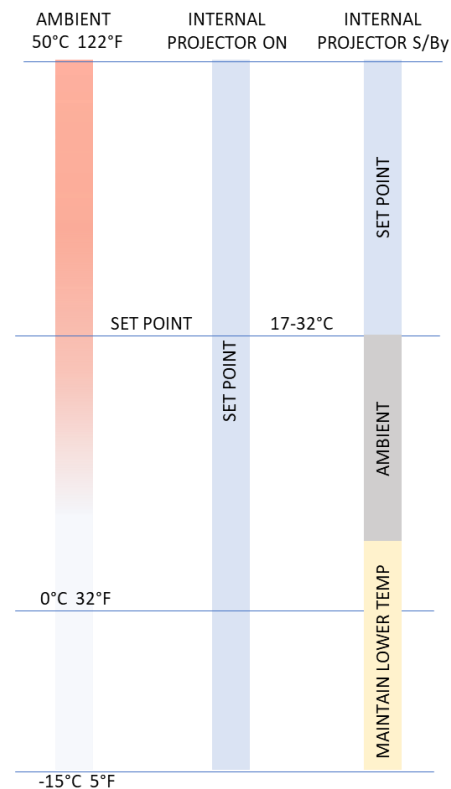
When the projector is running, the outside ambient temperature will have little or no effect on the internal temperature.

When the projector is in standby mode, the cooling system will cool to the set point.

If the ambient temperature falls below the set point, Oasis' heater will maintain the Lower Temperature Setting – see the DEC Control section below – in the preset range 0-10C.

In low ambient conditions, as soon as the projector switches on, the cooler will once again maintain the set point.

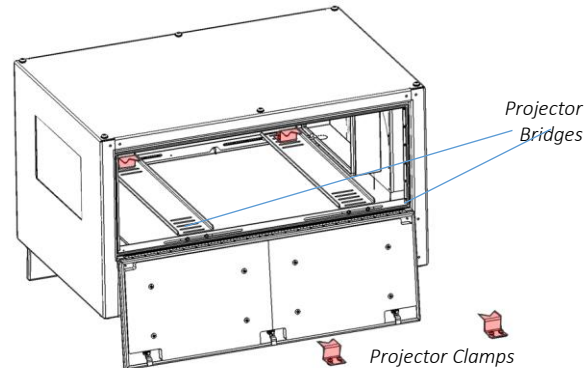
IMPORTANT: Oasis systems are designed for use in ambient temperatures in the range -15 to 50°C [-122°F]. For lower ambient temperatures, consider Tempest's Blizzard and Cyclone enclosures.



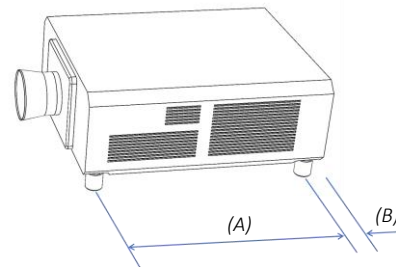
Mounting the Projector

Projector Mounting – Landscape

Remove the two projector foot clamps from the side of the enclosure you choose, and loosen the nuts on the opposite side.



Measure the distance between projector feet (A), and from the back foot to the back of the projector chassis (B).

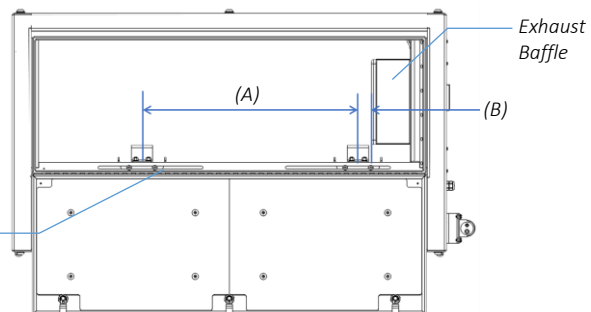


Loosen the projector bridge screws on both sides, and adjust the two bridges to correspond with the projector measurements.

Tighten the projector bridge screws.

Note: Oasis 59.1xx models do not have exhaust baffles.

Projector Bridge
Screws

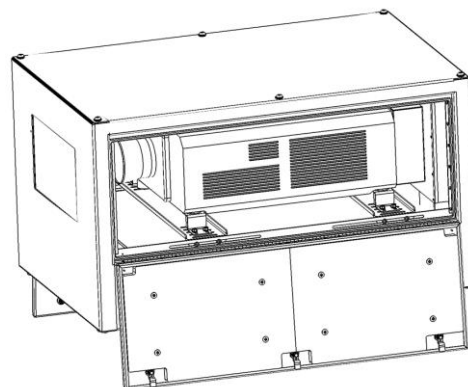


Place the projector onto the projector bridges.

Adjust so that the back of the projector chassis is touching the rubber seal on the exhaust baffle.

Locate the projector clamps around the projector feet (in some cases you may need to unscrew the feet a little) and tighten all the clamp nuts.

NOTE: When removing the projector for service, leave the clamps on the opposite side tightened. When you replace the projector, push it back into the tightened clamps for perfect alignment.

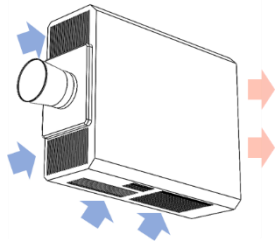


Projector Mounting - Portrait

There are several different types of portrait mount, depending on the projector make and model. Most include the ability to adjust tilt by $\pm 5^\circ$, to compensate limited horizontal lens shift.

Portrait L-Bracket Mounts

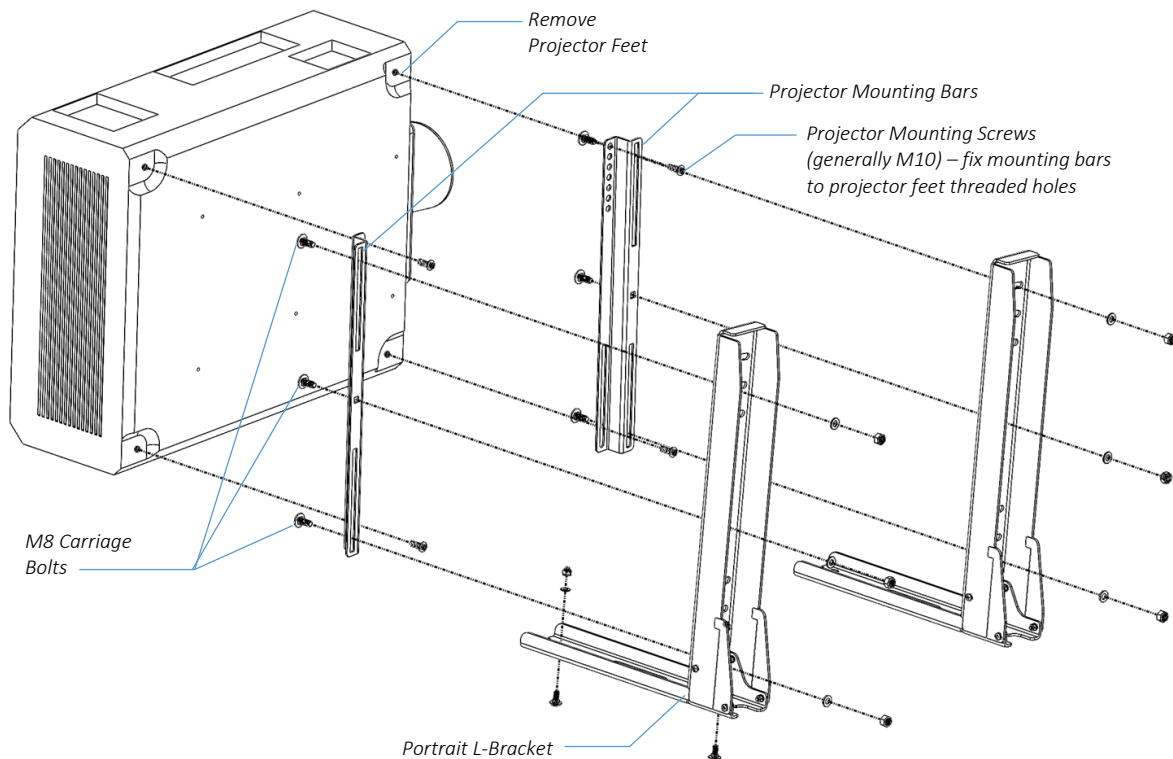
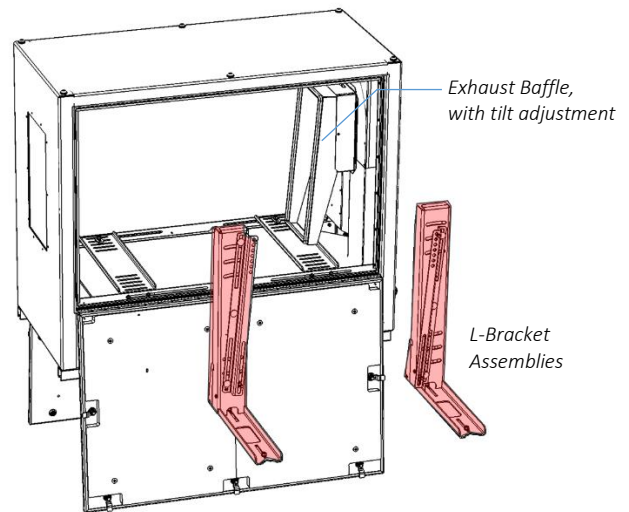
Remove the two L-bracket assemblies from the projector bridges.



IMPORTANT: Projectors with side air inlets: wherever possible, install with the inlets DOWN, for best airflow.

Portrait L-Bracket Mounts are for projectors with mounting points on the base only, eg: Panasonic PT-RZ21K, Epson EB-PU2220.

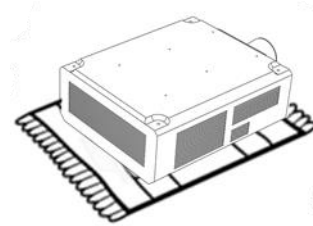
Portrait Turtle Mounts are for projectors with threaded holes on top and bottom (eg: Christie Griffyn, Panasonic PT-RQ50).



Portrait Mount Assembly Diagram

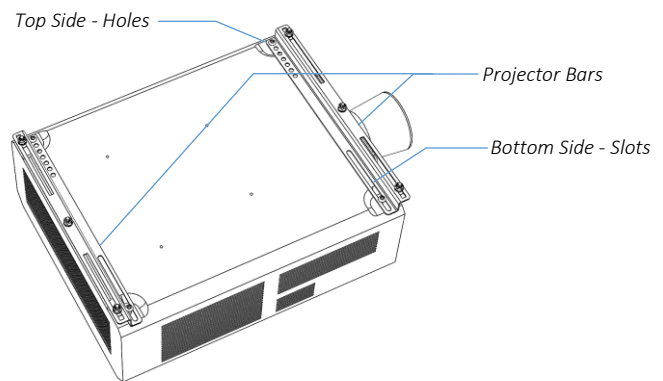
Place the projector feet up on a soft surface.

Remove the projector feet.



Attach the two Projector bars to the projector feet threaded holes.

Check the orientation of the projector bars – holes to the top, slots bottom.

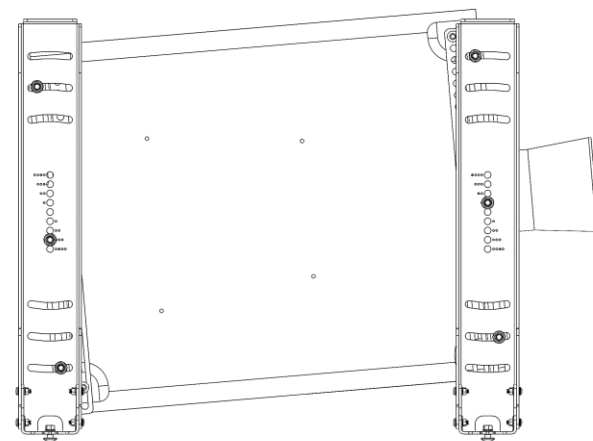
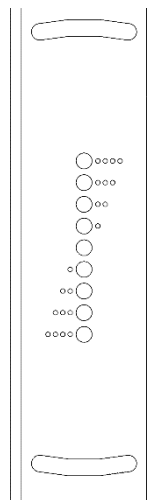


Lay the L-Brackets on top of the projector bars and select the desired degree of tilt.

Note that the middle fixing point is graduated, with four steps above and below center.

HORIZONTAL: Use the same middle hole for the front and back mounting bar.

TILT: Invert the same offset from center for the front and back mountings, eg: UP 3 steps front, DOWN 3 steps rear.



The number of steps between front and back (the SPREAD) sets the tilt angle, but the angle depends on the distance between front and back mountings.

Here are a few examples:

Projector	Length Between Feet (mm)	Holes Spread/Degrees Tilt					
		2	3	4	5	6	7
Panasonic PT-RQ50	951	0.8	1.7	2.5	3.4	4.2	5.1
Panasonic PT-RZ21K	644	1.2	2.4	3.6	4.8		
Barco UDX	796	1.0	2.0	3.0	4.0	5.0	

Secure all six sets of mounting bolts FINGER TIGHT – the projector's weight will settle the mounts in the enclosure.

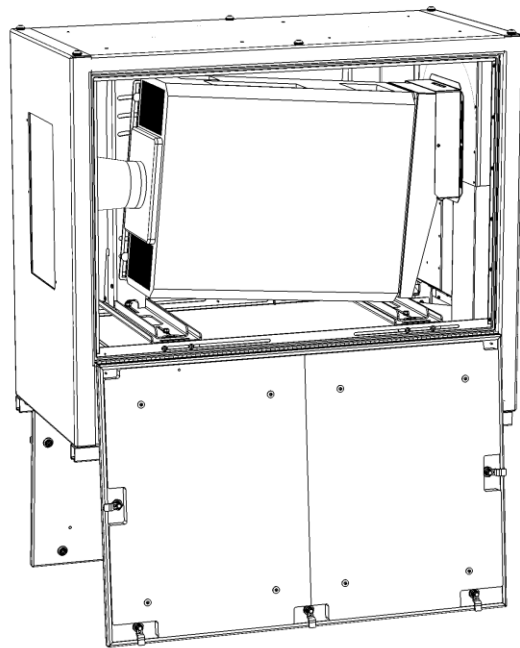
Loosen the projector bridge screws, and adjust the projector bridge locations to align with the assembled portrait mount.

Slide the projector assembly into the enclosure and position so that the back of the projector aligns snugly with the exhaust baffle.

MANY PROJECTORS ARE HEAVY. USE SUFFICIENT MANPOWER AND/OR APPROPRIATE LIFTING EQUIPMENT AND OBSERVE NECESSARY SAFETY PRECAUTIONS.

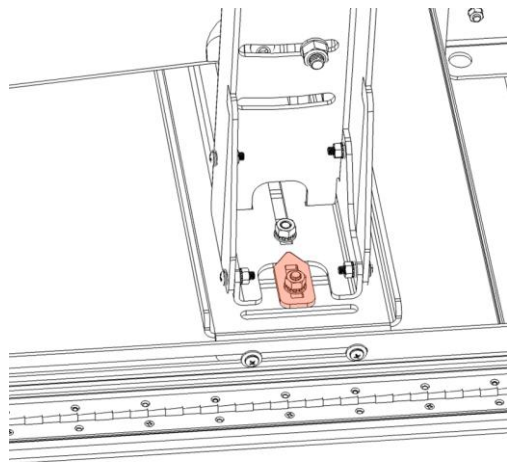
Secure the portrait mounts to the projector bridges, using the M8 carriage bolts provided.

Now, TIGHTEN ALL MOUNTING HARDWARE.



Adjust the locator cams so that they are snug in the V-grooves in back of the L-Brackets, and tighten.

These cams are your location reference in the event you need to remove the projector for service.

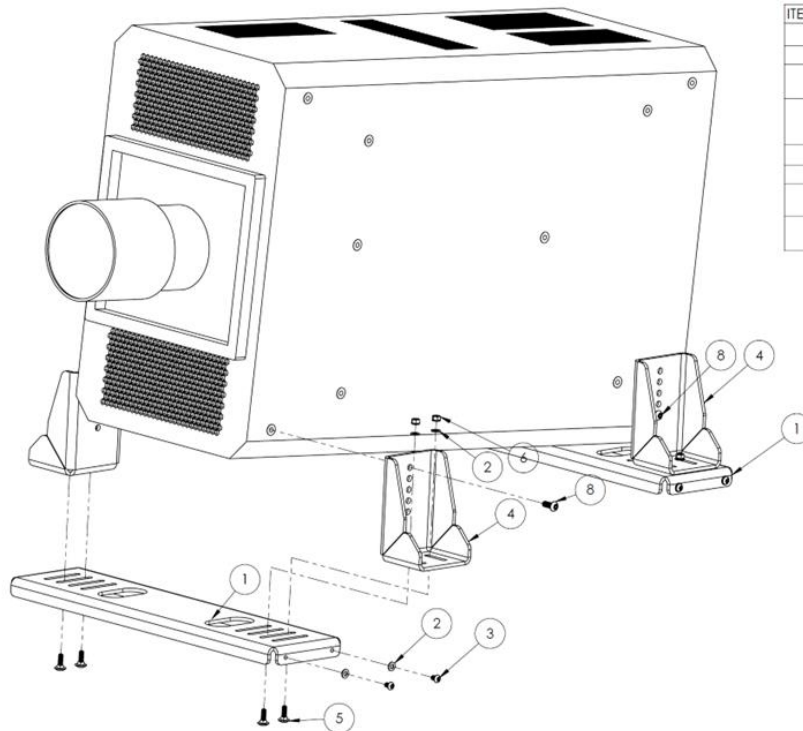


Portrait Turtle Mounts

For projectors with threaded mounting holes (for projector feet), both on the bottom and top of the projector chassis.

These are usually either M10-1.5 (eg: Panasonic) or M12-1.75 (eg: Christie) threaded holes.

First, remove the projector feet.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	59.211.525P	Oasis 525P Projector Bridge	2
2	93475A270	Washer, M8 SS	16
3	92095A258	Socket Cap Button M8 x 12 SS	8
4	59.264 Oasis RQ50 Portrait Mount	Oasis RQ50 Portrait Mount	4
5	97248A319	Carriage Bolt, M8 x 25 SS	8
6	90923A241	KEPS Nut, M8 SS	8
7	Panasonic PT-RQ50K		1
8	92095A413	Socket Cap Button M10 x 25 SS	4

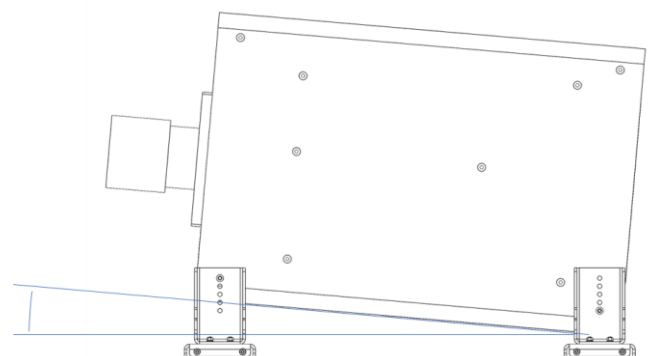
Attach the turtle feet to the four corners of the projector.

Note that you can angle the projector either up or down, by approximately 1° for each mounting hole (difference between front and back mounting holes).

The actual angle varies, depending on the length of the projector chassis.

LIFT THE PROJECTOR + TURTLE FEET into the enclosure and secure the feet to the projector bridges, using the carriage bolts, washers and nuts provided.

MANY PROJECTORS ARE HEAVY. USE SUFFICIENT MANPOWER AND/OR APPROPRIATE LIFTING EQUIPMENT AND OBSERVE NECESSARY SAFETY PRECAUTIONS.



Important: Check Lamp-on Current

When the projector is installed and connected, check the current displayed on the User Interface, with the projector lamp(s) **OFF**. If the current is 1.0A or higher, set the Lamp On Current to a setting higher than the actual displayed.

Example:

24°C	41%
234V	1.4A

Standby Current = 1.4A
Set Lamp-On Current to 1.7A

If the Lamp-on current is set lower than the projector's actual standby current, the DEC will think the projector lamp is always on, and the fan(s) will never turn off.

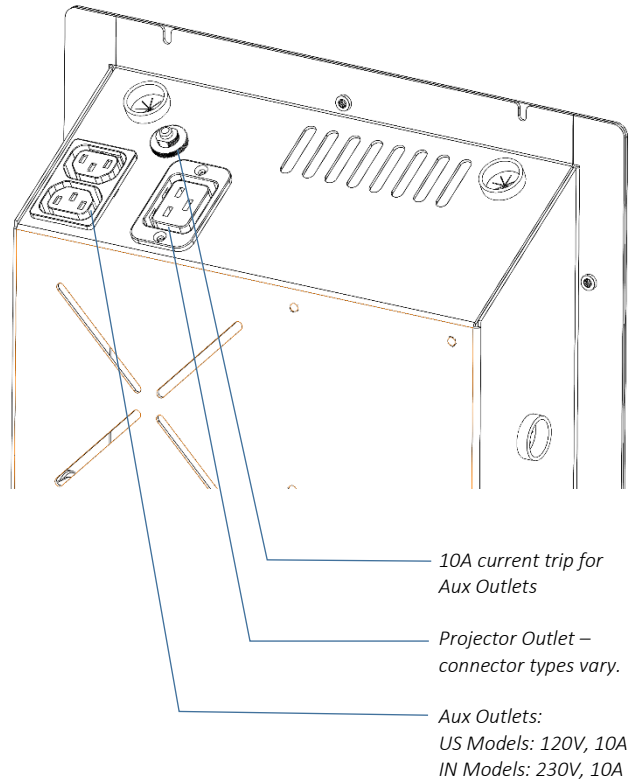
See Control Menu/Set Lamp-On Point above.

Connect Projector and Aux Equipment

- (1) Connect the projector power cable into the Projector Outlet
- (2) Connect all cables and test projector
- (3) Install any auxiliary equipment – there is usually plenty of room under the projector
- (4) Connect aux equipment power supplies to the C13 outlets on the DEC box. Use the supplied rewirable C14 plugs if necessary.



YOU **MUST** CONNECT THE PROJECTOR TO THE PROJECTOR OUTLET. IF THE PROJECTOR FEED BYPASSES THE DEC CONTROLLER, THE VENTILATION SYSTEM WILL NOT WORK AND THE PROJECTOR WILL OVERHEAT.



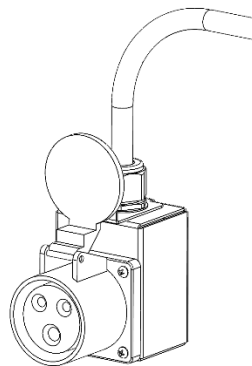
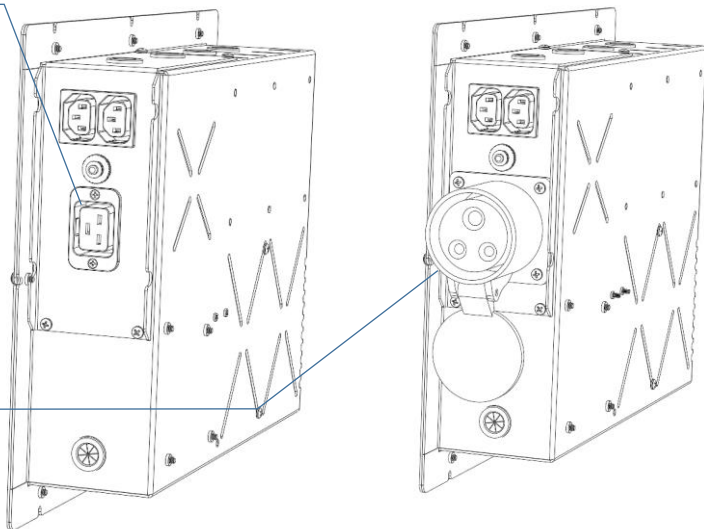
Projector Connector Types

Various Types of projector power outlets are used, in the enclosure models below:

1. IEC 60320 C19 20Amp (C19)
 - a. 55.210.x
 - b. 55.305.x
 - c. Some 55.310.x
 - d. 55.250.x
 - e. 55.320.x

2. IEC 60309 (formerly IEC 309, often known in North America as Pin & Sleeve) 30/32A, 2P+E, 230V (blue)
 - a. Some 56.310.x

3. IEC60309 Pigtail – for Christie Boxer, D4K40 and some DPI models. Tempest supplies a space-saving line female connector assembly on a flexible pigtail, to mount directly to the projector power inlet



Note: contact Tempest at time of ordering to request different projector outlet types if desired.

Dew Point & Condensation

It will sometimes happen that the temperature inside the Oasis enclosure will be significantly below the ambient temperature outside. In this case, the outer housing may be chilled below dew point, and condensation may form on the outside of the enclosure. Such condensation is harmless, unless it forms on the port glass, in which case it may partially or completely cloud the projected image.

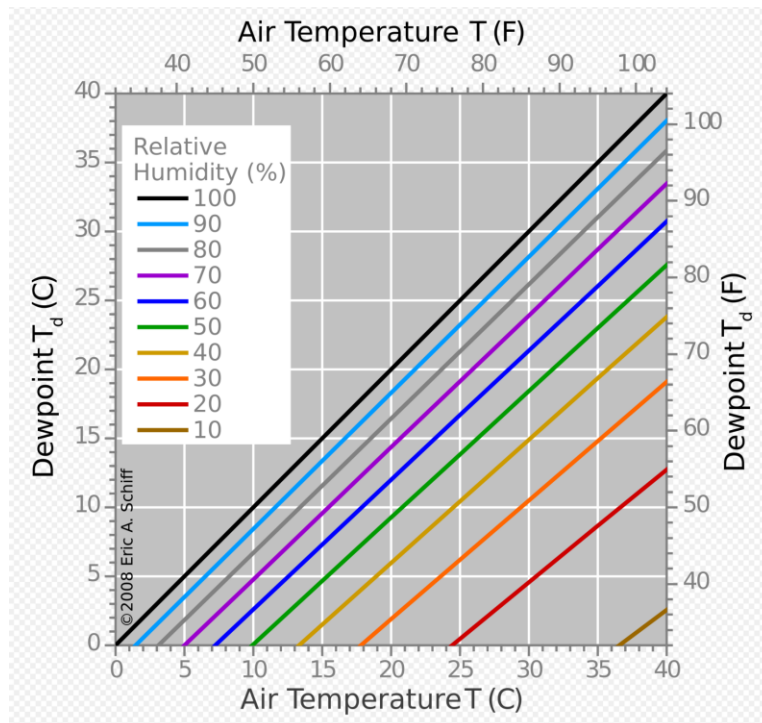
What is dew point in simple terms?

The dew point is the temperature the air needs to be cooled to (at constant pressure) in order to achieve a relative humidity (RH) of 100%. At this point the air cannot hold more water in the gas form.

At what temperature/Relative Humidity will condensation occur?

The chart below shows dew point levels for differing RH levels and temperatures (in Fahrenheit and Celsius). Remember:

- 1. The air temperature and RH are the AMBIENT (outside) values, not the internal temp/RH values displayed on the enclosure user interface.*
- 2. Condensation will form on the outside of the enclosure when the enclosure skin is at or below the dew point.*



Example: Ambient Temperature 35°C (95°F), Relative Humidity 70% (the purple data line). Condensation will form if the enclosure skin is below 26°C (83°F).

Managing Condensation

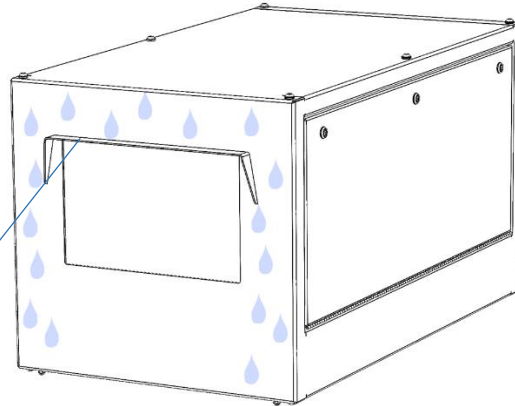
Oasis enclosure prevent condensation on the port glass in three ways:

1. Insulation

The enclosure's thermal insulation lining limits temperature drop from the internal air temperature to the outer skin. It also mitigates heat buildup on hot days.

2. Condensate Runoff Guard

The lip above the port glass prevents any runoff from the Oasis chassis from reaching the port glass.

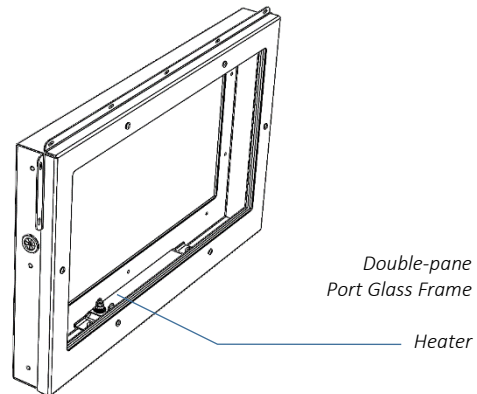


3. Glass Heater

Your Oasis enclosure comes with a double-pane port glass, using high-quality optical grade tempered glass, with an anti-reflective coating on both sides, giving outstanding light transmission better than 98%.

Between the two glass panes is a small heater element that will always keep the glass well above dew point, even if condensation forms on the enclosure chassis (such condensation is harmless).

The glass heater switches on automatically whenever the enclosure detects that the projector is running and is thermostatically controlled at a safe operating temperature.



Remote Monitoring

Tempest enclosures optionally support two types of remote monitoring:

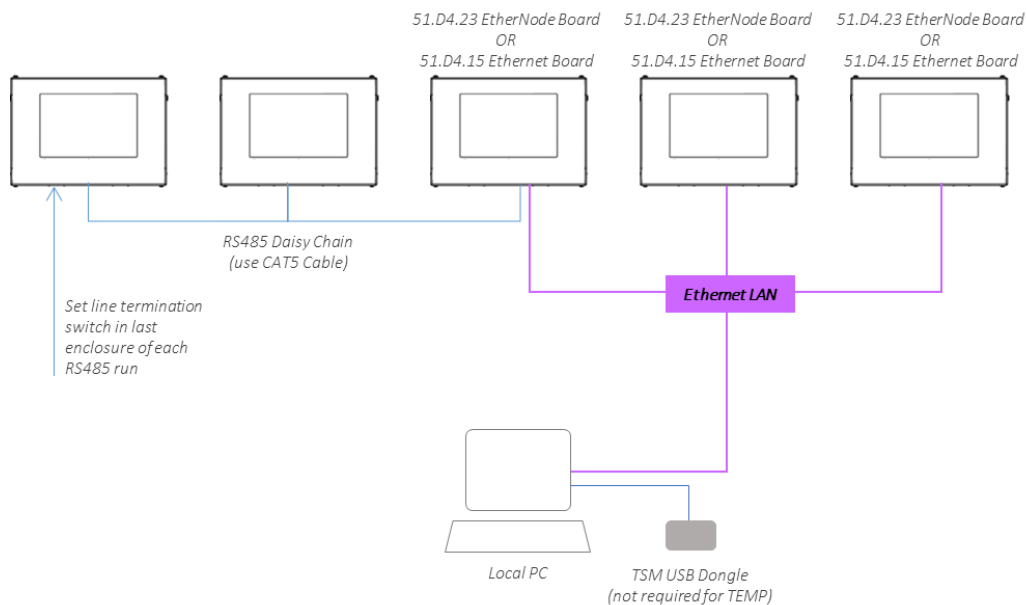
1. **Tempest System Manager (TSM)** – a dedicated network manager, with monitoring, system configuration and firmware upgrade capability over Ethernet.

Requires 51.D4.23 EtherNode board in at least one enclosure

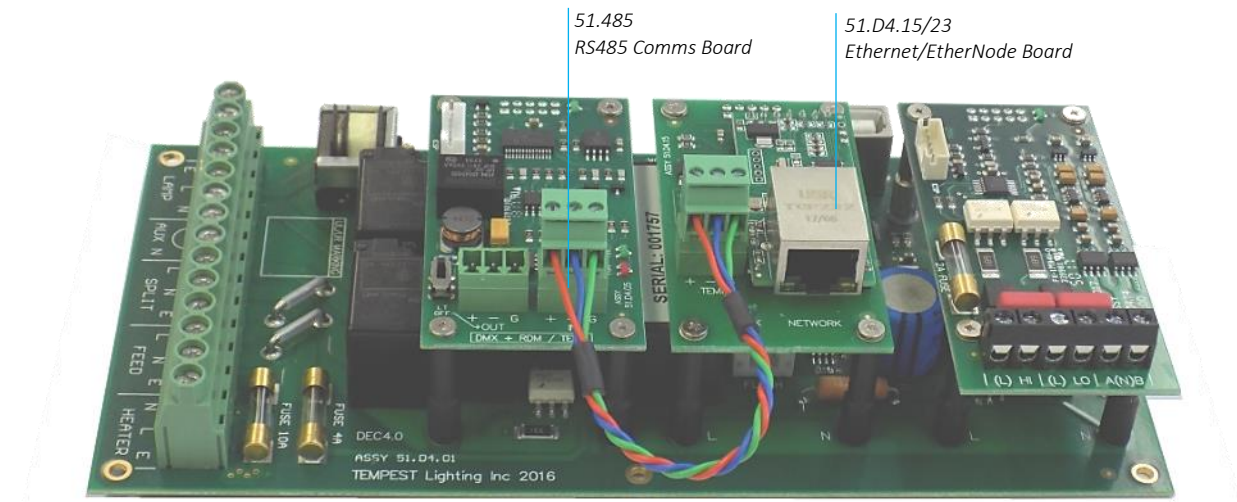
2. **Tempest Enclosure Management Protocol (TEMP)** – a simple protocol for use by system integrators wishing to monitor Tempest enclosures from their own show control network.

Requires 51.D4.15 Ethernet board in at least one enclosure

The system topology is the same for both methods:



DEC4 Ethernet Adapters – 51.D4.15, 51.D4.23



As a default, DEC4 communicates using DMX512 and RDM, over RS485.

With the addition of either Ethernet board, any DEC4 – or any group of DEC4 boards connected using RS485 – may be connected to an Ethernet network – see above.

51.D4.15 Default Configuration

The bridge module is supplied in DHCP TCP port server configuration, with all traffic on port 3308. These settings may be changed with a web browser on port 80 at the DHCP assigned address. Login to the home page using ‘admin’ for username and password.

The bridges may be discovered with a UDP broadcast on port 1500 and a payload of

(Hex) 30 31 32 33 34 35 36 37 38 39 30 31 32 33 34 35 36 37 38 39

30 31 32 33 34 35 36 37 38 39 30 31 32 33 34 35 36 37 38 39

The bridge will respond from its DHCP address

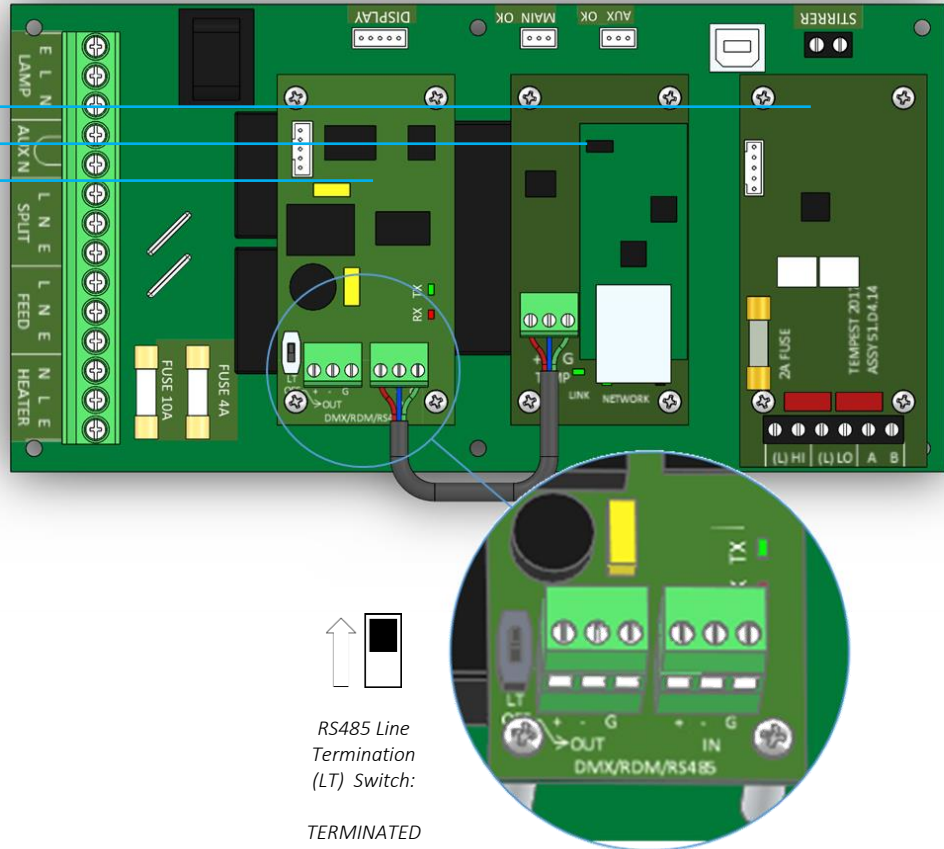
51.D4.15 Additional Support

The network IP is developed by Jinan USR, more details and software configuration utilities may be found by visiting their web site at <https://www.pusr.com>

RS485 (DMX/RDM) Cable Terminations

DEC4 System Control Board, with three typical Daughter Boards:

1. AC Fan Controller
2. Ethernet Bridge
3. RS485 Comm



Data +	Data -	Common	Data +	Data -	Common
DATA OUT			DATA IN		

Terminal Screw Torque Setting 0.5Nm/4.5in-lb

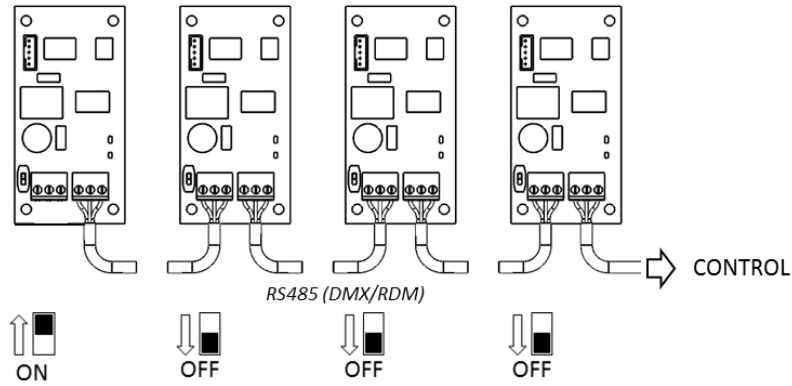
Loop a shielded twisted pair cable (eg Belden 9841, though many people now use a CAT5e cable) from the control/monitoring point, around all enclosures.

Maximum total cable length is 1,200M (4,000ft). For longer runs and wildly distributed systems, use a DMX/RDM splitter (make sure that it supports RDM) and multiple cable runs.

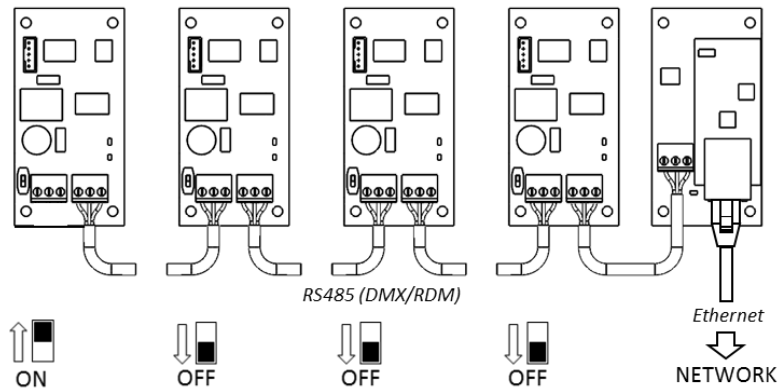
Use the termination switch to terminate each RS485 cable run at the last enclosure on each run.

Line Termination Switch Settings

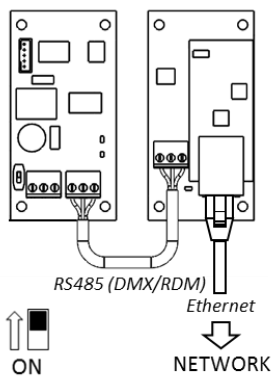
1. DMX/RDM control over RS485:



2. TSM/TEMP Control of an enclosure group via Ethernet



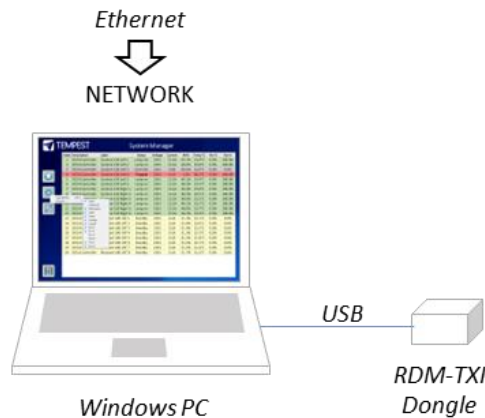
3. TSM/TEMP Control of a single enclosure via Ethernet



System Manager Installation

Connect the enclosure(s) to a Windows PC running Windows 10 or later, using the diagram above. The JESE RDM-TXI is required to act as a dongle to enable TSM functions.

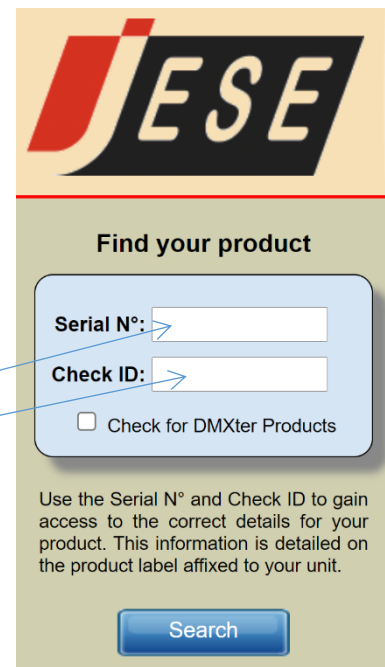
Connect the JESE RDM-TXI dongle to the PC via RDM:



Note that Tempest System Manager is an operating mode of GetSet MV, a software application written and marketed by Tempest's electronics partner JESE. You will need to download GetSet MV from JESE's web portal:

<https://www.jese.co.uk/support/>

Use the Serial Number and Check ID from the RDM-TXI to log in:

The screenshot shows the JESE 'Find your product' web portal. It features a search form with fields for 'Serial N°:' and 'Check ID:'. Below these fields is a checkbox labeled 'Check for DMXter Products'. A 'Search' button is at the bottom. Text below the form states: 'Use the Serial N° and Check ID to gain access to the correct details for your product. This information is detailed on the product label affixed to your unit.'

IMPORTANT!

Do not connect any JESE USB device in to your windows PC before installing the software. Doing so may cause windows to install the incorrect USB driver for your device and prevent normal operation of the software.

JESE GetSet is licensed software and registered to a qualifying hardware component. Qualifying components include a USB controller such as an RDM-TRI or RDM-TXI.

The software license is perpetual and includes one year of updates and feature additions. Further updates and supports are available from JESE with an annual subscription fee.

Having installed GetSet, connect the RDM-TXI to the PC using the provided USB cable, and then launch the application.



Network Configuration

By default, EtherNode modules are configured for network DHCP addressing. In the absence of a DHCP service, modules will default to an address in 10.0.0.0/8 network range until a DHCP address is assigned. The default address may be determined by translating a modules' Serial Number to an address greater than \$10 00 00 00. For instance, a Serial Number of 1234 in hex is \$ 04 D2 which yields a default network address of 10.0.4.170 and network mask of 255.0.0.0

If there is no DHCP server available, the PC NIC (Network Interface Controller) may be configured to the 10.0.0.0 /8 CIDR. This may require administrator privileges to change settings. Please refer to the documentation or support resources for your operation system for configuring a static IP address.

3.4 Setting Up GetSet MV

For GetSet to discover EtherNodes on the same network, check the 'Enable Network Node Discovery' option in the Settings menu.

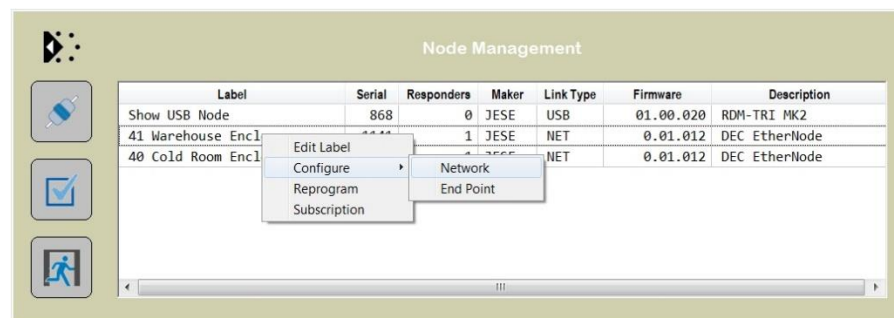
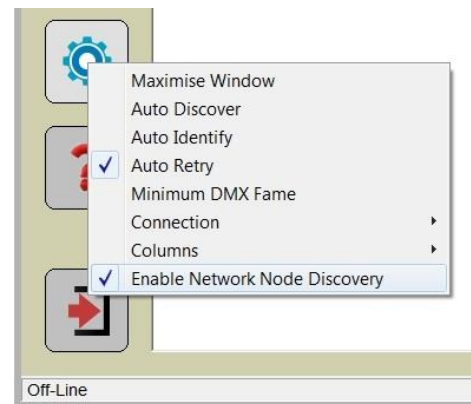


Next, click on the Node Button to open the Node Manager.



Click on the Connect Button to initiate a node discovery and populate the Node Manager with all USB and network enabled Nodes.

To assign a meaningful label to each of the nodes in the manager, right click on an entry and select the 'Edit Label' option.

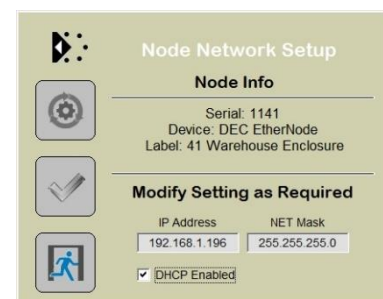


EtherNode Configuration

A node network configuration tool may be accessed from the Node Manager by right clicking on an entry and selecting the Configure->Network Option.

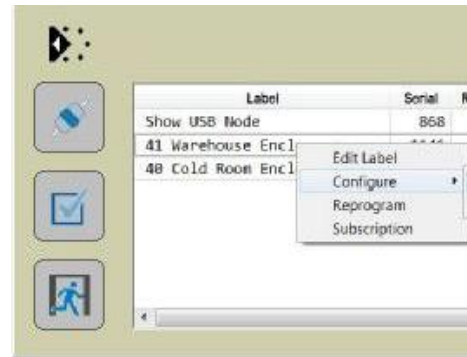
Be aware, that setting an address and mask outside of the network used, will cause the connection to be lost.

To restore an EtherNode to default addressing and DHCP, Press and hold the DHCP reset on the EtherNode module, whilst powering up the DEC.



EtherNode Firmware Updates

On occasion, there will be new firmware releases for EtherNodes and USB Controllers. The Firmware may be applied using the 'Reprogram' option, then selecting the File to load.



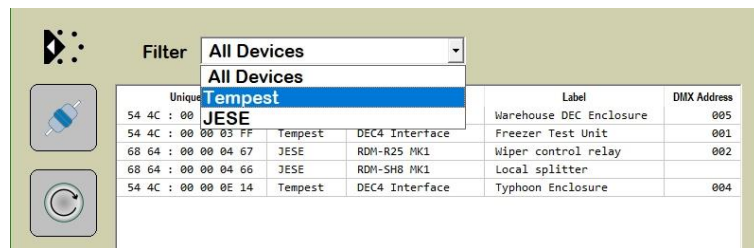
Enclosure Management

Running Discovery



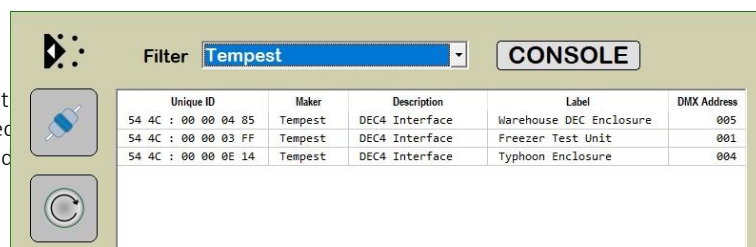
Having set up all EtherNodes and any other USB Devices, clicking on the discovery button will initiate a global discovery of all Tempest Enclosures and any other RDM compliant responders detected in the system.

For Tempest Management options, select Tempest responders from the drop down filter list.

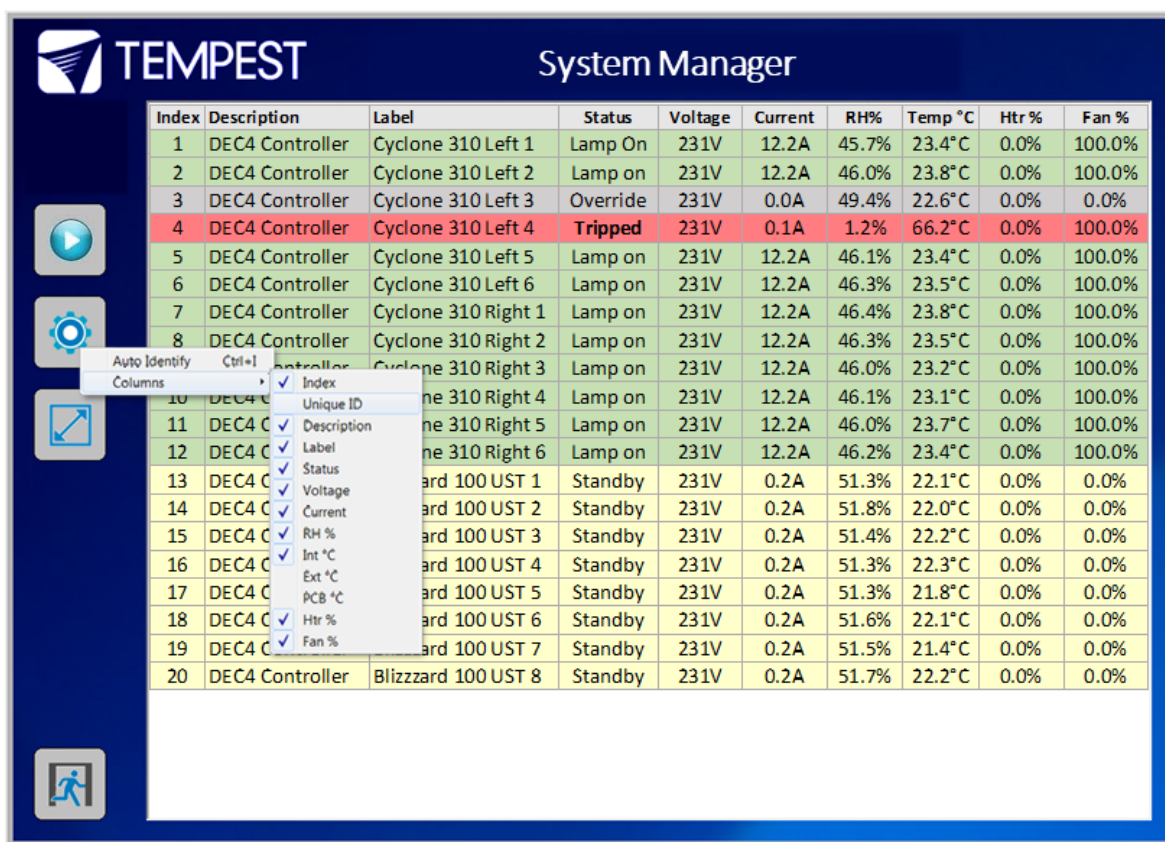


Enclosure Monitoring

On selection, the 'CONSOLE' button for Tempest enclosures provides access to the Tempest System Manager. The displayed responders will be limited to the Filtered items.



The Enclosure management window, shown here, loads from 'CONSOLE' button.



Index	Description	Label	Status	Voltage	Current	RH%	Temp °C	Htr %	Fan %
1	DEC4 Controller	Cyclone 310 Left 1	Lamp On	231V	12.2A	45.7%	23.4°C	0.0%	100.0%
2	DEC4 Controller	Cyclone 310 Left 2	Lamp on	231V	12.2A	46.0%	23.8°C	0.0%	100.0%
3	DEC4 Controller	Cyclone 310 Left 3	Override	231V	0.0A	49.4%	22.6°C	0.0%	0.0%
4	DEC4 Controller	Cyclone 310 Left 4	Tripped	231V	0.1A	1.2%	66.2°C	0.0%	100.0%
5	DEC4 Controller	Cyclone 310 Left 5	Lamp on	231V	12.2A	46.1%	23.4°C	0.0%	100.0%
6	DEC4 Controller	Cyclone 310 Left 6	Lamp on	231V	12.2A	46.3%	23.5°C	0.0%	100.0%
7	DEC4 Controller	Cyclone 310 Right 1	Lamp on	231V	12.2A	46.4%	23.8°C	0.0%	100.0%
8	DEC4 Controller	Cyclone 310 Right 2	Lamp on	231V	12.2A	46.3%	23.5°C	0.0%	100.0%
		Cyclone 310 Right 3	Lamp on	231V	12.2A	46.0%	23.2°C	0.0%	100.0%
10	DEC4 C	ne 310 Right 4	Lamp on	231V	12.2A	46.1%	23.1°C	0.0%	100.0%
11	DEC4 C	ne 310 Right 5	Lamp on	231V	12.2A	46.0%	23.7°C	0.0%	100.0%
12	DEC4 C	ne 310 Right 6	Lamp on	231V	12.2A	46.2%	23.4°C	0.0%	100.0%
13	DEC4 C	ard 100 UST 1	Standby	231V	0.2A	51.3%	22.1°C	0.0%	0.0%
14	DEC4 C	ard 100 UST 2	Standby	231V	0.2A	51.8%	22.0°C	0.0%	0.0%
15	DEC4 C	ard 100 UST 3	Standby	231V	0.2A	51.4%	22.2°C	0.0%	0.0%
16	DEC4 C	ard 100 UST 4	Standby	231V	0.2A	51.3%	22.3°C	0.0%	0.0%
17	DEC4 C	ard 100 UST 5	Standby	231V	0.2A	51.3%	21.8°C	0.0%	0.0%
18	DEC4 C	ard 100 UST 6	Standby	231V	0.2A	51.6%	22.1°C	0.0%	0.0%
19	DEC4 C	ard 100 UST 7	Standby	231V	0.2A	51.5%	21.4°C	0.0%	0.0%
20	DEC4 Controller	Blizzard 100 UST 8	Standby	231V	0.2A	51.7%	22.2°C	0.0%	0.0%

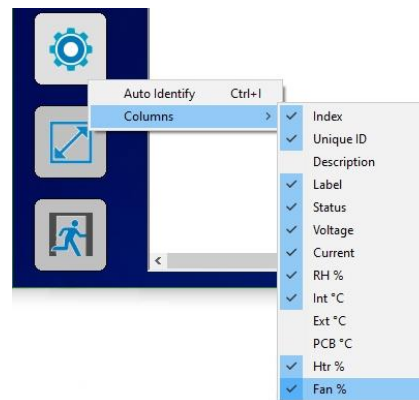


To start monitoring the discovered enclosures, select the Run button. On-line enclosures will be polled in turn and status data updated.

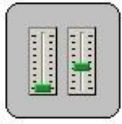
The monitor may be toggled between sizeable and full screen view with the scale view button.

The fields displayed in the window may be customized to suit the Enclosure configuration options and user preference. From the setting button, a drop down menu details all available fields, some of which may not apply to the enclosures in a particular installation.

Each Column may be ordered or grouped by right clicking the heading and selecting an option form the drop down menu.



DMX Control



A fully configurable DMX Control Desk is accessible from the Desk button in the Main GetSet Form.

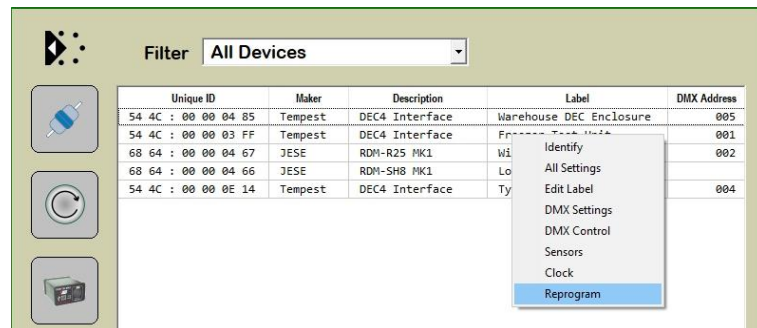
When there is a requirement to control DMX operable devices on the network, each device should be configured to the required DMX address and DMX personality. The desk

may then be set to the required DMX footprint and all of the used slots labelled for convenience. See the Latest GetSet MV User guide for full and latest details.

Firmware Uploads

From time to time, new firmware with enhancements or feature additions for the enclosures will be released.

To load firmware to the enclosures, right click the entry in the main window and select 'Reprogram' from the drop down window. For additional details, refer to the latest [GetSet MV User Guide](#).



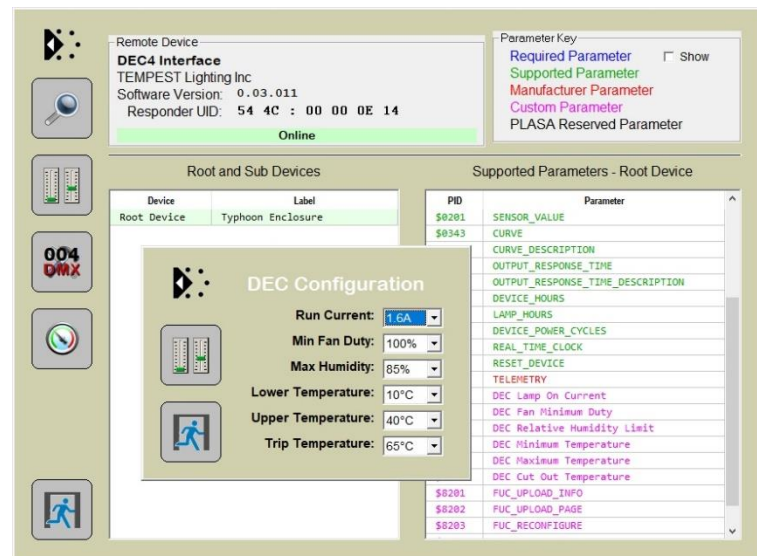
Remote Configuration

User configurable settings that may be accessed from the enclosures' user interface, may also be accessed from GetSet.

To access the settings window, double click the entry shown on the above window to bring up the device manger. Select one of the related 'Custom Parameters' to open the configuration window.

Settings may be selected from the presented values in each of the drop down windows.

Note that various other generic services and tools are available from the Device Manager window. Details on each of these features are available in the latest [GetSet MV User guide](#).



Tempest Equipment Management Protocol

TEMP allows you to access status information and set configuration values on DEC3.3 and DEC 4 enclosure controllers, using the 51.D4.15 Ethernet Adapter, over an Ethernet network.

Download the Developer Guide at
www.tempest.biz/tech_support

IMPORTANT:

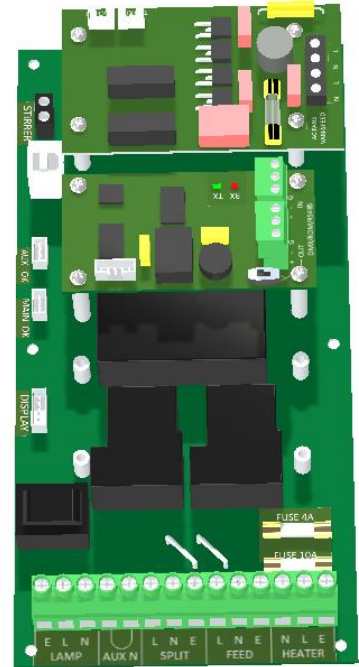
Tempest warrants that, if correctly implemented, TEMP will provide a reliable and accurate method of monitoring Tempest DEC3 and 4 controllers over an Ethernet network. However, the integrator is entirely responsible for the connection between the Ethernet Bridge and the network.



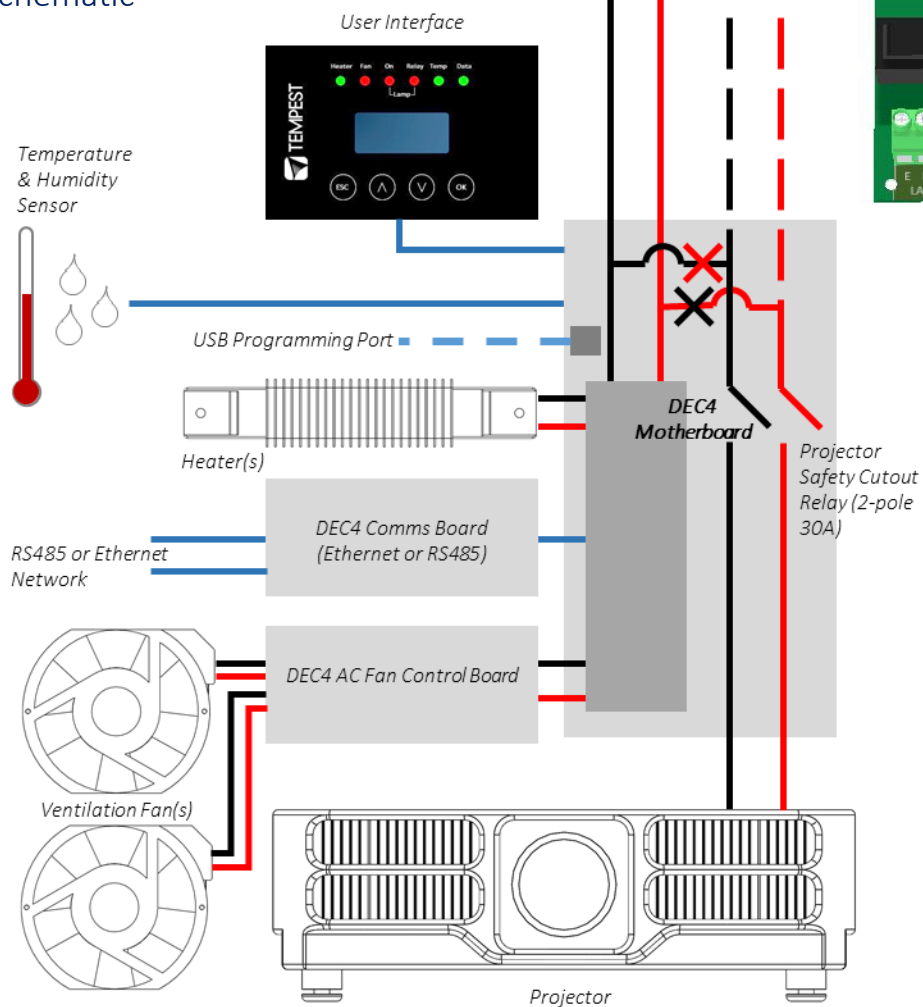
Digital Enclosure Control

DEC4™ – that's Digital Enclosure Control, fourth Generation – is the brain of your Tempest enclosure. It will maintain the internal environment in a comfortable temperature and humidity range, and prevent condensation – the real killer of outdoor equipment. DEC4 monitors internal and external temperature, humidity and lamp current at all times, and uses this information to control the enclosure's lamp relay, fan(s) and heater(s). It can report back over an RS485 network, using the RDM protocol (Remote Device Management), or connect to your TCP/IP network for remote monitoring and management using Tempest's TEMP protocol.

Typical DEC4 configuration, with Motherboard, fan control board and RS485 comms board



Schematic



DEC4 Main Functions

Firmware Revision

This manual covers DEC4 Firmware revision 2.03.000 and higher.

To check the Firmware revision, on the User Interface menu, go to Status Display/Firmware.

1. Sense current to projector (lamp on/off)
2. Record lamp hours
3. Monitor temperature and relative humidity inside Enclosure
4. Monitor temperature outside enclosure
5. Maintain internal temperature at safe operating level
6. Maintain relative humidity within safe limits to prevent condensation
7. Isolate projector in case of unsafe temperature
8. Report status over RS485, RDM, TCP/IP
9. Maintain positive pressure (optional) 24/7 to prevent ingress of salt air and other contaminants through the exhaust path
10. Circulates air internally to prevent hot and cold spots when projector is idle

DEC4's patented Goldilocks™ algorithm uses a combination of sensors, heaters and fans to maintain a safe operating temperature and a safe relative humidity level that will not allow condensation to take place.

As air is heated it is able to support more moisture without condensing, so Goldilocks uses heat to raise the air temperature inside the enclosure in the event that relative humidity approaches dewpoint.

DEC4 constantly monitors the following parameters:

- Projector/Luminaire current
- Line Voltage
- External Temperature
- Internal Temperature
- Internal Relative Humidity

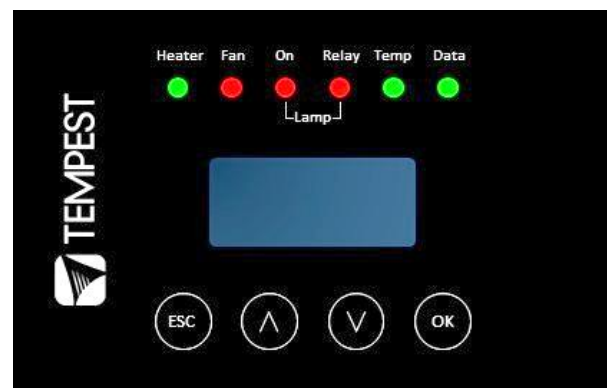
Factory Settings – Data Modes

In most applications, DEC4 will operate correctly with its factory default settings, in Basic operating mode.

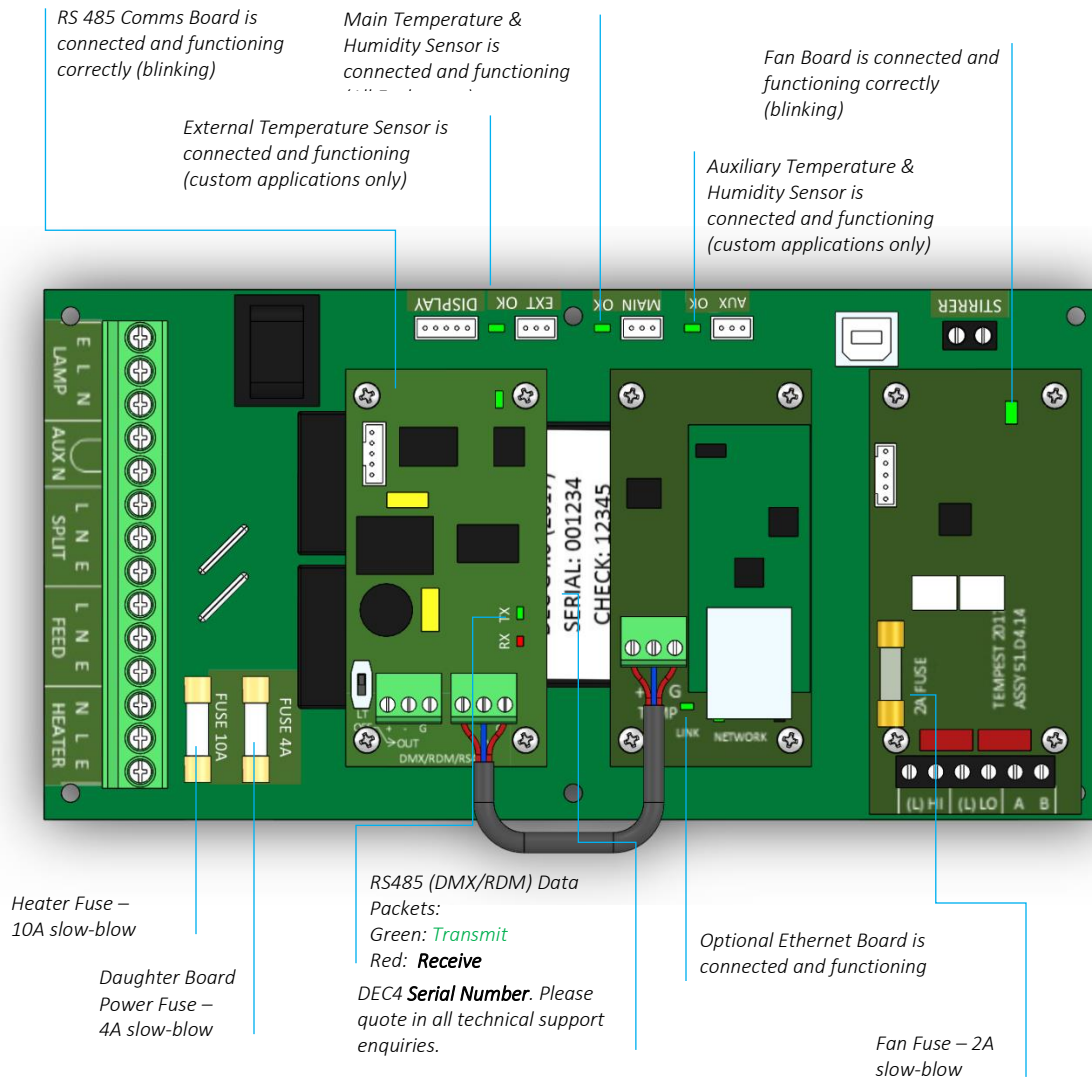
You do not need to do anything. Please skip to the next section.

- Standard default temperature and humidity settings
- DMX, RDM and Remote Monitoring disabled
- Best for standalone operation

If your needs are more complex, read on.



Hardware Indicators & Fuses



Operating Modes

RDM Only Monitor (Factory Default)

- Supports RDM monitoring over RS485 if present
- Supports TEMP monitoring if present
- RDM Status Reporting over RS485
- RDM Configuration – settings may be changed remotely or at the enclosure user interface.
- No DMX control

RDM+DMX Control

- Enclosure functions as a 1-channel DMX device, with remote control of the lamp relay
 - DMX level > 75% enables normal relay operation (normally ON)
 - DMX level < 25% disables normal relay operation (relay turns OFF)
 - This allows you to force a hard reset of the lamp relay in the event of a projector malfunction
- RDM Status Reporting over RS485
- RDM Configuration – settings may be changed remotely or at the enclosure user interface.
- Control mode is recommended for show control applications, but can be risky in live show operation, since the DMX slot used for the enclosure MUST be kept high to prevent the lamp relay from opening.

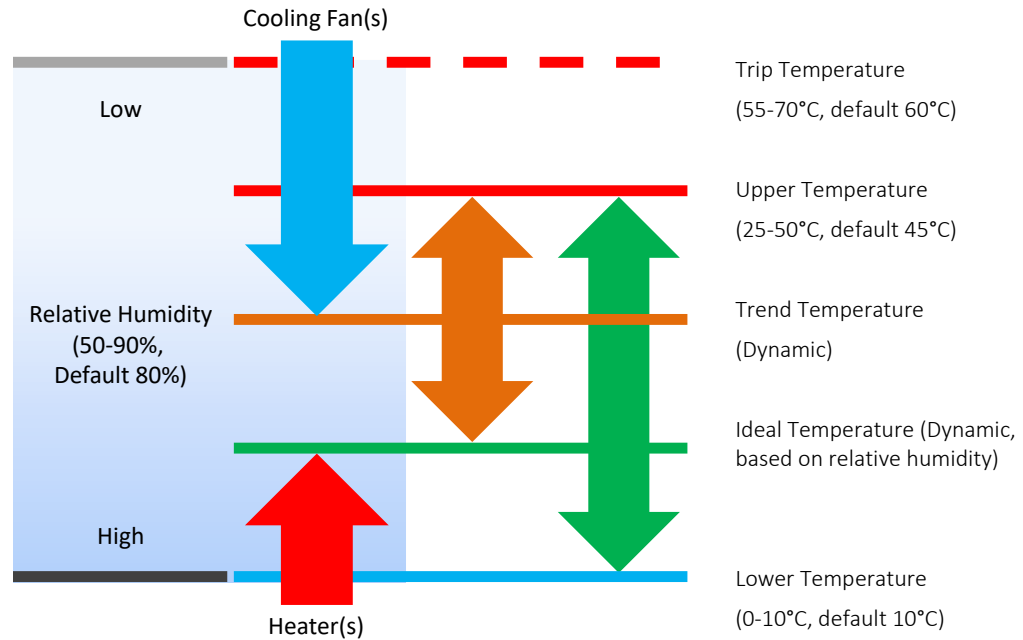
RDM+DMX Service

For trained service personnel only

- Normal operation is suspended and the enclosure functions as a 3-channel DMX device:
 - Lamp Relay (Slot 1)
 - Fans (Slot 2)
 - Heater (Slot 3)
- RDM Status Reporting over RS485
- RDM Configuration – settings may be changed remotely or at the enclosure user interface.
- Service mode is ONLY for troubleshooting – DO NOT use Service mode for normal operation.

DEC4 Control Parameters

Temperature and Humidity Ranges

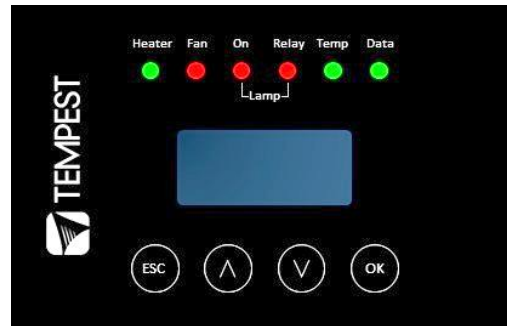



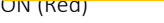
Notes:

- 1 In moving light enclosures the temperature sensor is located in the exhaust airflow. Temperatures shown may be higher than those around the projector.
- 2 We recommend using the factory default settings for several weeks or months before making any changes. In most cases they will not be necessary.

Control Interface

LED Indicators



Heater	ON (Green) 	Heater is ON, to maintain lower temperature level or to prevent condensation
	ON (Amber) 	Enclosure is temporarily outside the Goldilocks zone, and DEC is working to restore it
Fan	ON (Green) 	Lamp is ON, or Temperature is HIGH and fan is cooling enclosure. OR: Lamp is OFF, and internal temperature => UPPER TEMP setting
	ON (Amber) 	Fan should be ON, but no status response received. Tacit and Zen systems: check the integrity of the yellow status fan wire.
	ON (Red) 	No fan detected at initialization. Tacit and Zen systems, check that the yellow (status) and brown (PWM) wires are not crossed or disconnected.
Lamp On	ON (Green) 	Current sensing shows lamp is ON Lamp hour counter is running
	OFF	Current sensing shows lamp is OFF Lamp hour counter is not running
Lamp Relay	ON (Green) 	Lamp relay is closed (normal) Projector power receptacle is energized
	ON (Red) 	Lamp relay is open due to over-temperature event. Projector power receptacle is isolated.
Temp	FLASHING (Green) 	Temperature is below lower temp setting
	ON (Green) 	Temperature is in normal range
	ON (Amber) 	Humidity is above target limit
	ON (Red) 	Temperature is above top setting
	FLASHING (Red) 	Temperature is above Trip level Projector power is isolated
Data	OFF	Data not used in present Mode. OR DEC4 is in RDM + DMX Control Mode and no valid data packet has been detected.
	ON (GREEN) 	Good data packet received.
	ON (RED) 	RDM + DMX Control Mode: Data Fail. A previously good data signal has failed.

User Interface LCD Display

The display on the Control display provides additional status information, depending on the operating mode:

RDM Only Monitor Mode

28 °C	47%	<i>internal temperature, relative humidity line voltage, lamp status</i>
209V	OFF	

RDM+DMX Control Mode

28 °C	47%	<i>internal temperature, relative humidity line voltage, lamp status</i>
209V	OFF	

RDM+DMX Service Mode

Alternating with:

DMX: 001	<i>DMX Start Address</i>
No DMX	<i>DMX Status</i>

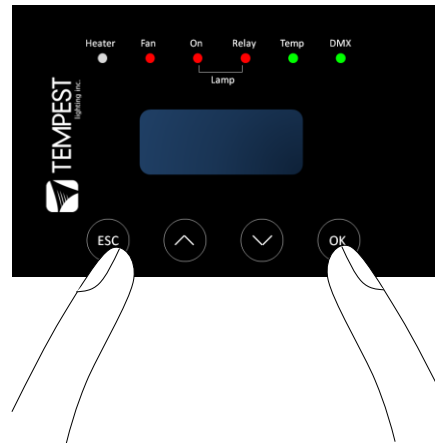
(Alternating DMX Display requires a DMX signal to be present)

Control Interface Operation

The Control Interface is normally LOCKED.

- To UNLOCK, hold **ESC** and **OK** together for **5 seconds**.
- You are now in the CONTROL MENU
- Use **↑↓** to scroll up and down the menu.
- Press **OK** to enter a menu item
- Use **↑↓** to set the item parameter, or to scroll to the next menu level.
- Use **ESC** to go BACK, or **OK** to confirm settings (**↵**).
- To exit and LOCK, hold **ESC** for 5 seconds.

Menu will time out and the display will lock after ten minutes.



Control Menu

Set DMX Options

From the Front Panel, this menu item allows the user to check (and if necessary change) the Data mode.

RDM Only Monitor DEFAULT

RDM+DMX Service

is NOT left in Service Mode.

RDM+DMX Control

SET Data Mode

Supports RDM or TEMP if connected. No DMX Control.

Service mode – 3 DMX slots, starting with the DMX address set

Important: Please ensure that DEC4

DMX (set 1 address for lamp relay) plus RDM

or RDM+DMX Control Service modes)

SET DATA ADDRESS (in RDM Only Monitor, RDM+DMX Service

Select a DMX starting address in the range 001 to 510

1 – Lamp Relay

In Service Mode an addition two slots are available

2 – Fan Duty Control

3 – Heater Duty Control

Note that the DMX control is designed using a SAFETY pile-on Logic. So the DMX input can only override automatic settings within safe limits.

SET DATA CURVE

DMX Curves affect the way the fixture relay is controlled in RDM+DMX Control Mode.

Response Curve 1 (default)

DMX levels are shown as %.

DMX level 0-25 Relay disabled (open)

DMX level 26-75 No change to relay status

DMX level 76-100 Relay enabled (normally closed)

Response Curve 2

DMX level 0-19 No change to relay status

DMX level 20-40 Relay disabled (open)

DMX level 41-59 No change to relay status

DMX level 60-80 Relay enabled (normally closed)

DMX level 81-100 No change to relay status

SET DATA RESPONSE

DMX Response sets a delay time before DMX Control Mode settings are acted on. Setting a response delay of a few seconds would prevent unintended fixture relay state changes in the event of a short accidental change in DMX level.

DMX level if DMX is interrupted.

NOTE: from firmware revision 0.00.100, DEC holds last valid

Response Delay Values are:

No Delay (default), 1, 2, 5, 10, 15, 20, 30, 60 seconds.

Set Temp Units

Choose to display temperature values in Celsius or Fahrenheit (default Celsius)

Note that temperature settings must be entered in Celsius.

Set Temp Ranges

Set three temperature trigger points for Bottom, Top and Trip temperatures, in °C.

SET TEMP LOWER (minimum temperature to be maintained)

(default 10°C, permissible range 0-10°C).

SET TEMP UPPER (maximum desired daytime temperature)

(default 45°C, permissible range 25-50°C).

SET TEMP TRIP (temperature at which load will be isolated – see note)

(default 60°C, permissible range 55-70°C).

Note: A thermal emergency is when enclosure ventilation fails with the lamp on, in which case the temperature will rise very quickly. To avoid nuisance tripping we recommend setting a higher Trip temperature, 60°C or above.

Set Max Humidity

Sets highest desired Relative Humidity:

Default 85%, permissible range 80-90%.

Note that, when the projector/luminaire lamp is OFF, the enclosure heaters will switch on to raise the temperature and lower the risk of condensation. We recommend setting the highest Max Humidity that works in your location, to avoid unnecessary heater use.

Set Lamp Options

SET LAMP ON POINT

The lamp current at which DEC detects the projector/luminaire lamp is running. Default is 1 Amp, which allows for most equipment fans and power supplies to run without changing the air in the enclosure. Lamp on point may be set in 0.1 Amp increments between 0.2 Amps and 2.0 Amps.

If the enclosure fans never turn off, the Lamp On point is probably set below the standby current draw of the projector/luminaire. Check the standby current draw on the display and set the Lamp on Current higher.

SET LAMP HEAT OFF

HEAT OFF – In normal conditions the heater will ALWAYS be disabled when the system detects the LAMP ON POINT is reached (ie: projector comes out of standby). So default is HEATER OFF at LAMP ON.

For cold weather operation (temperature < TEMP LOWER setting), the heater may operate when the lamp is on, by setting a higher current at which the heater is disabled. This may also be calculated to prevent the heater overloading the supply circuit.

For this purpose, assume that the heater will draw 5 Amps.

Range: LAMP ON, 5 – 15A

Default: LAMP ON

Example: 16A power circuit, set to 11A (16-5 = 11)

RESET LAMP HOURS

Reset each time you change the lamp in the projector.

Make this a part of your maintenance instructions.

Set Fan Function

SET FAN TEST

To test the enclosure fan(s), press [OK]

The enclosure fan will run

The Display Fan LED lights green

DEC Beeps

To stop the fan test, press [ESC]

SET FAN TYPE ID (Tacit and Zen Enclosures)

For Tacit 050-150, choose Fan Type **220**

For Tacit 210 and higher, choose Fan Type **270** (*see also SET FAN MAX DUTY*)

For Zen 1xx – 2xx, choose Fan Type 220

For Zen 3xx – 5xx, choose Fan Type 270

SET FAN RECOVERY (Tacit and Zen Enclosures)

Select a setting between 0 and 10, where 0 is fastest fan speed response and 10 is slowest.

SET FAN MAX DUTY (Tacit and Zen Enclosures)

This limits maximum speed of PWM-controlled fans. If fan type 270 is used, MAX DUTY Should be set to 80%.

Range: 50-100%

Default: 100%

SET FAN MIN DUTY

Tacit and Zen Enclosures (with PWM-controlled DC Fans):

In effect this is the fan speed setting. the actual range varies for each fan type:

Start with a moderate MDC value – say 60.

Test the projector, with the enclosure closed, and monitor the projector inlet temperature over the projector control system.

If the projector is running HOT, INCREASE the MDC level

If the projector is running COOL, DECREASE the MDC level

The aim is to find the sweet spot where the projector is running at an acceptable temperature over long periods, and the blower speed is no higher than necessary, to minimize power consumption and noise level.

All Other Enclosure Types (with AC Fans)

Minimum Duty Cycle setting is used in cold weather. If the actual temperature < TEMP LOWER setting, AND the projector lamp is ON, the fan will pulse under thermostatic control to attempt to maintain an internal temperature at or above TEMP LOWER. The MIN DUTY setting is the slowest fan speed.

Range: 10-100%

Default: 100%

In cold environments, set a low MDC to prevent the enclosure filling with cold air as soon as the projector lamp turns on.

IMPORTANT: Systems with Active Cooling (ActiveCool, BlizzardCool)

Minimum Duty Cycle MUST be set to 100%.

SET FAN RUN ON

Time the fan will run after system detects LAMP OFF (cooldown).

Range: 5 – 15 minutes

Default: 5 minutes

Status Display

View current status information, using the arrow keys to scroll through:

- a) Humidity – relative humidity in %
- b) Internal temperature, in degrees C or F
- c) External Temperature (custom enclosures with external temperature sensors only)
- d) PCB temperature (this will usually be significantly higher than air temperature)
- e) Voltage – line Voltage reaching the DEC
- f) Current being drawn by projector/light, in Amps
- g) Lamp Hours elapsed since last reset
- h) Firmware version
- i) UID – unique system ID number

Safe Mode

In certain circumstances, the DEC User Interface may display the message SAFE MODE. This can happen if the Humidity sensor stops reporting, or reports an extreme value, indicating the probability of a sensor error. This situation may arise either because of a faulty sensor* or in conditions of extremely high absolute humidity.



In SAFE MODE, the normal operation is temporarily suspended, and the enclosure works to return the internal environment to a condition from which normal operation may be resumed.

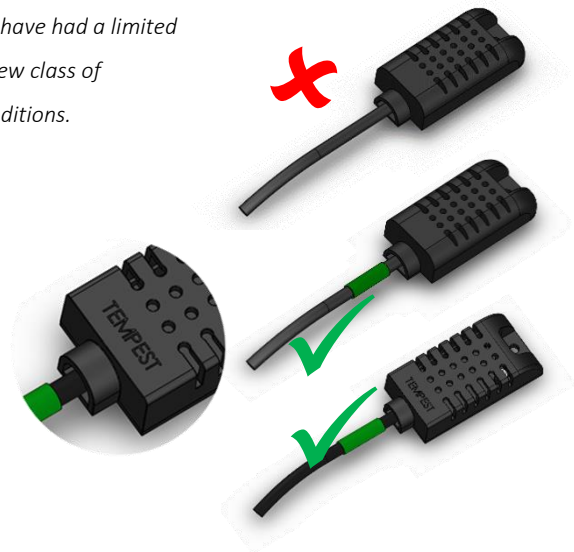
SAFE MODE is SAFE! It indicates that attention may be needed, but not that your equipment is at risk

Safe Mode and Sensors

** Some of the temperature/humidity sensors shipped before mid-2017 have had a limited operational life in harsher conditions. Tempest has since developed a new class of capacitive sensor that is far more resilient, especially in demanding conditions.*

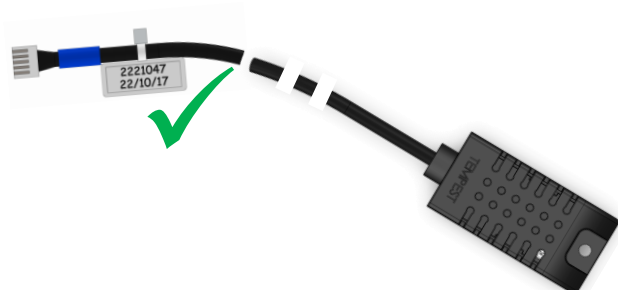
The newer sensors (2018-21) have:

- a) A piece of green tape on the sensor cable
- And
- b) TEMPEST logo on the plastic sensor case



OR (from 2022):

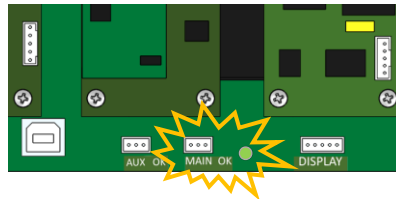
- c) A blue tape at the connector end of the cable
- And
- d) A serial number/date code label



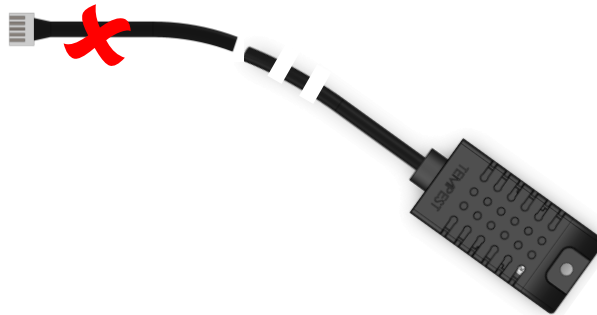
Safe Mode – What to do:

If you see **SAFE MODE** on your User Interface Display:

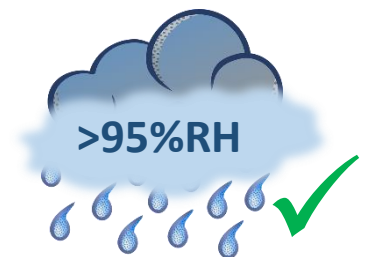
1. Check the temperature/humidity sensor:
 - a. Check that the sensor cable is not damaged and that it is plugged in to the header on the DEC Mother board labeled MAIN. The OK status LED should be lit.



- b. If the sensor cable does NOT have a date code/serial number next to the plug, contact Tempest for a free-of-charge replacement. If you have more than one enclosure, we suggest replacing the sensors on ALL your enclosures.



- c. Check the actual climate conditions – could the absolute humidity be close to 100%? If it is, SAFE MODE is operating correctly, and all is well.



DEC4 Firmware Updates

From time to time Tempest may introduce new DEC4 firmware for feature enhancements and bug fixes. Please note that the main System Control Board (SCB) and the various optional daughter boards each have their own firmware, and it will be good practice to update all firmware in an enclosure for optimal performance and interoperability.

- System Control Board firmware may be updated DIRECTLY using JESE JUST software and a USB cable, or INDIRECTLY, over an RDM network, using JESE GetSet software and a JESE RDM-TRI interface.
- Fan board firmware is extremely simple and is unlikely to require updating.
- RS485 Board (51.485) firmware may be updated over an RDM network, using JESE GetSet software and a JESE RDM-TRI interface.

All required files are available for download at <https://www.tempest.biz/tech-support/>

Direct Firmware Update (System Control Board only)

Requirements

Windows Laptop / PC, Windows XP through Windows 10 A standard USB A to B cable

Latest version of JUST application (download from <https://www.tempest.biz/tech-support/>)

A copy of the firmware file to upload (download from <https://www.tempest.biz/tech-support/>)

Powered Target DEC4 SCB

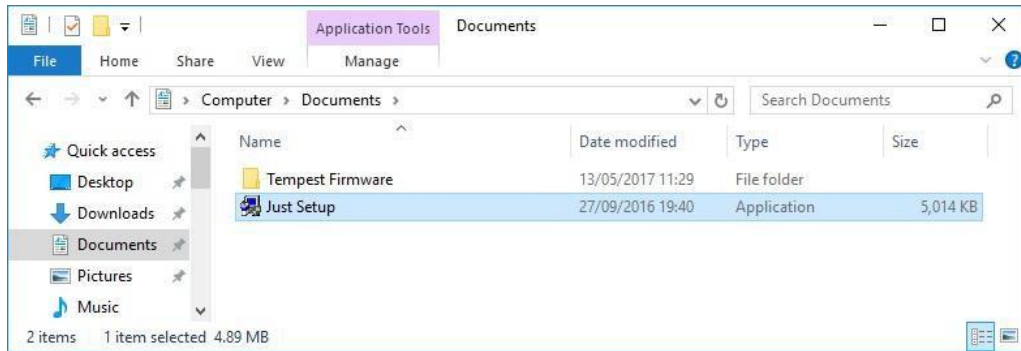


Preliminaries

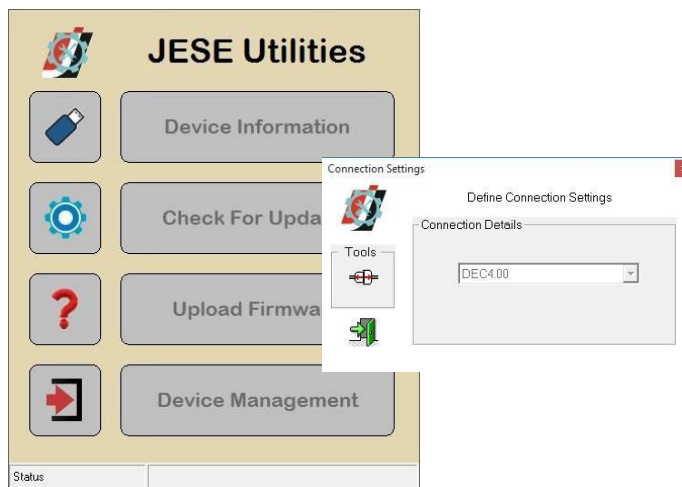
1. Power up the target DEC4 System Control Board and connect the USB Port to the PC or laptop.



2. If not already installed, install the latest version of JUST. IMPORTANT: If this is the first time using JUST, the PC MUST be connected to a live System Control Board for the installation to complete correctly.



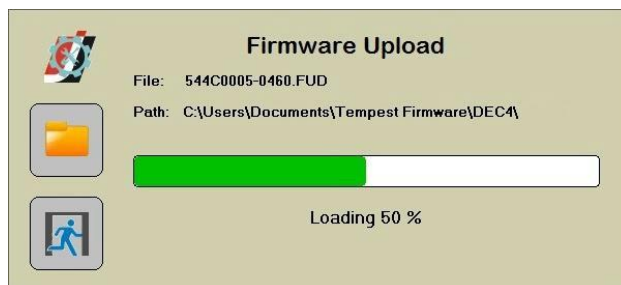
- Run JUST and select the top left USB connection Icon. Select the DEC4 from the Connection Details option and click the connect/plug Icon. Having connected, close the connection window.



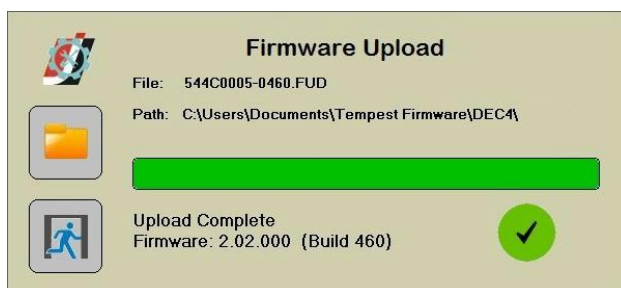
- From the main window, select the 'Upload Firmware' option. Select the file icon and navigate to the firmware file to upload



- On selection, the firmware upload will begin and run until complete.



- On completion of the upload, dismiss the upload window and return to the main window.



7. The details of the SCB and firmware version may be viewed and verified by selecting the 'Device Information' option



8. Close the application and disconnect the USB Cable from the SCB
- END -

Indirect Firmware Updates

Requirements

Windows Laptop / PC, Windows XP through Windows 10

A JESE RDM-TRI or RDM-TXI interface and USB connection (available from Tempest).

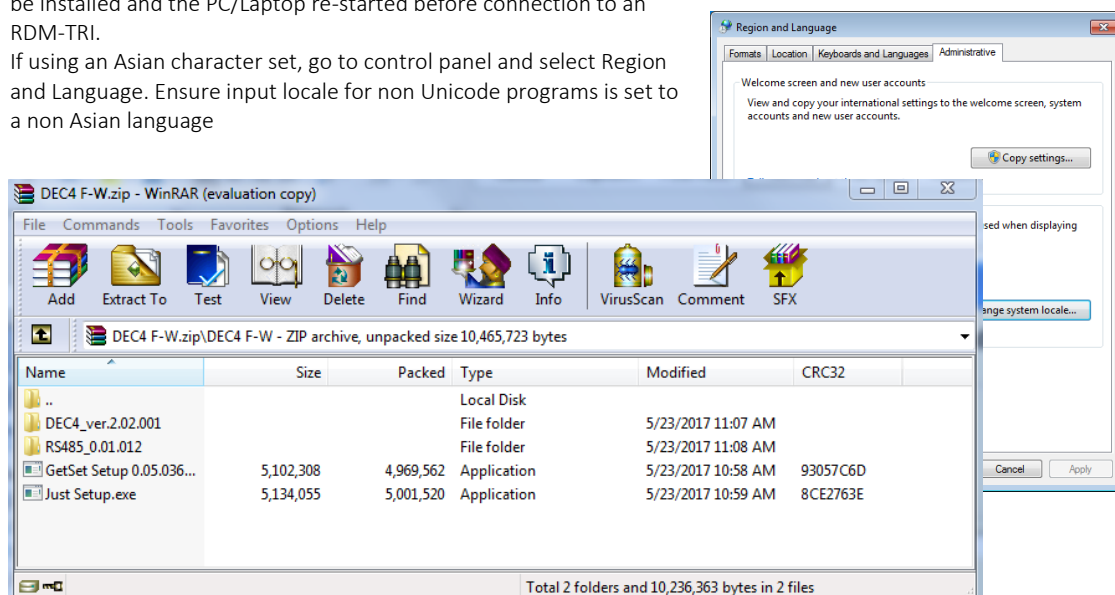
An installed version of the JESE GetSet RDM configuration utility.

A copy of the firmware file(s) to upload, available for download from www.tempest.biz/tech_support.

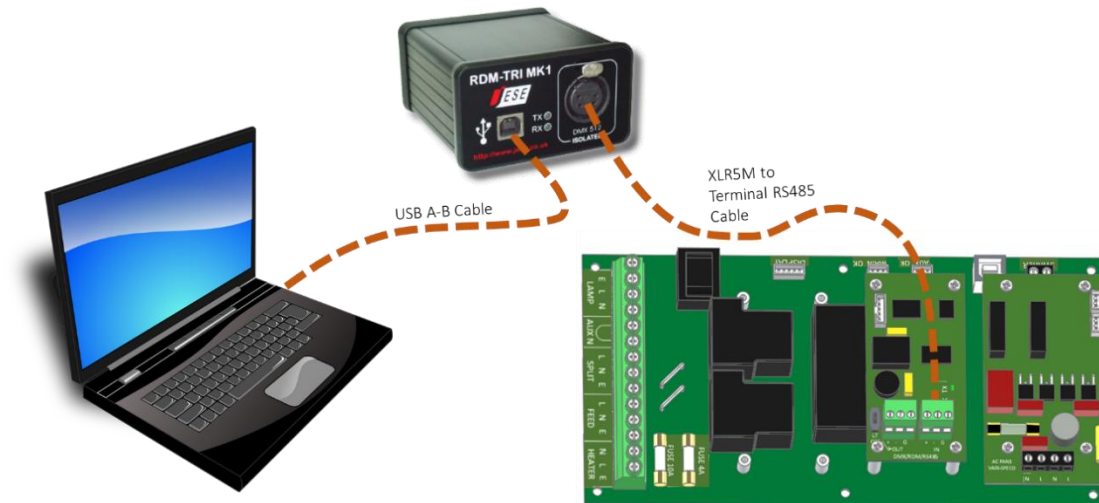
Powered Target DEC4 with 51.485 RS485 communication interface card.

Installation Procedure

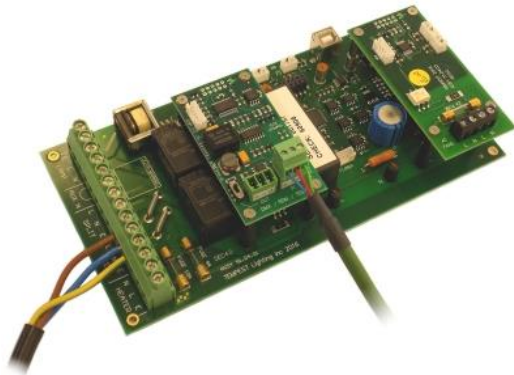
1. If not already installed, install a copy of GetSet. To ensure that the correct USB drivers are loaded, the software should be installed and the PC/Laptop re-started before connection to an RDM-TRI.
2. If using an Asian character set, go to control panel and select Region and Language. Ensure input locale for non Unicode programs is set to a non Asian language



3. Plug your RDM-TRI in to your PC and connect to the RS485 connection on the DEC4 communications board with the fly lead, as shown below.

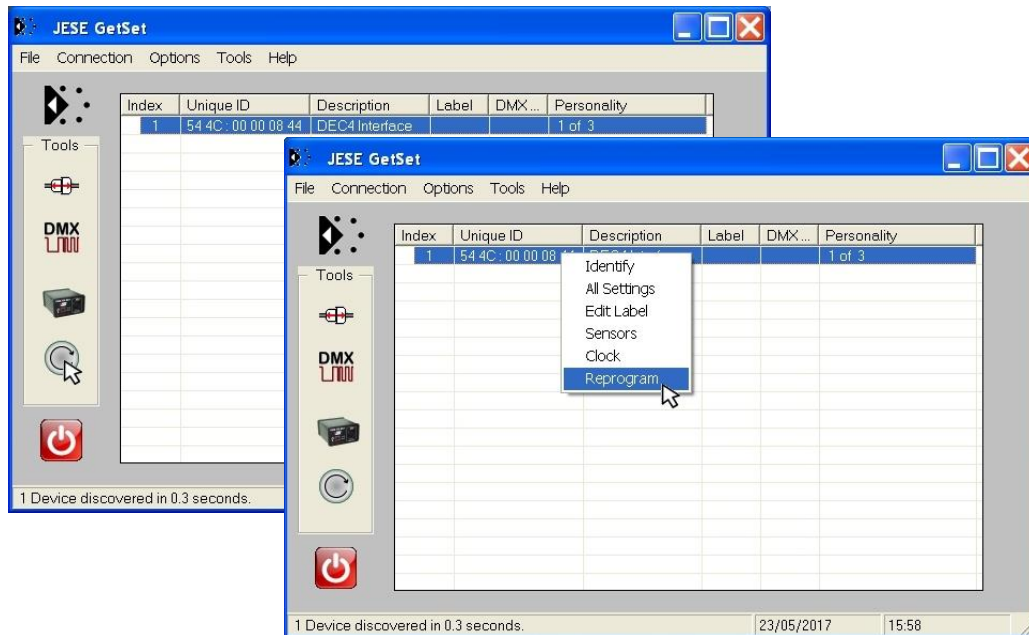


4. Power up the target SCB, ideally with mains power, or alternatively, with a USB power adaptor connected to the USB Port on the SCB.

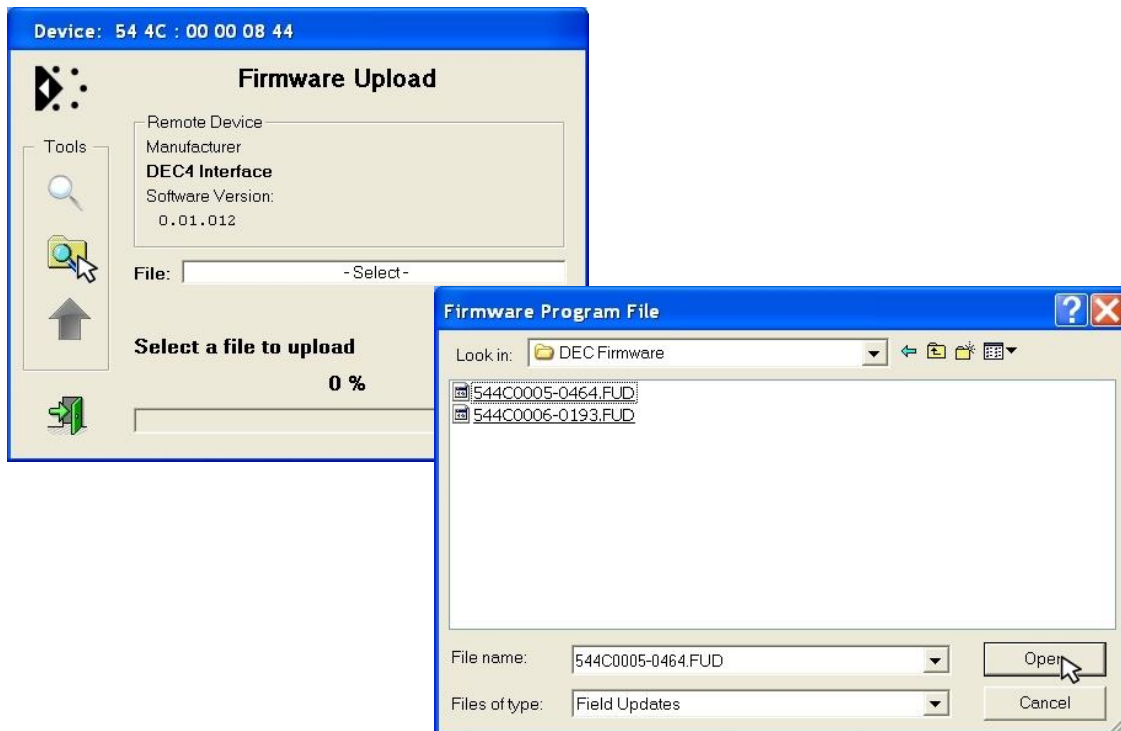


5. On older revisions of DEC Firmware, if the elected DEC 'DATA MODE' is set to 'RS485 TEMP', select 'RDM MONITOR' mode using the DEC user display. On more recent revisions of Firmware, the appropriate mode will be automatically selected.
6. Open the GetSet application, connect to the RDM-TRI and discover the DEC. To run discovery, click the Icon indicated below

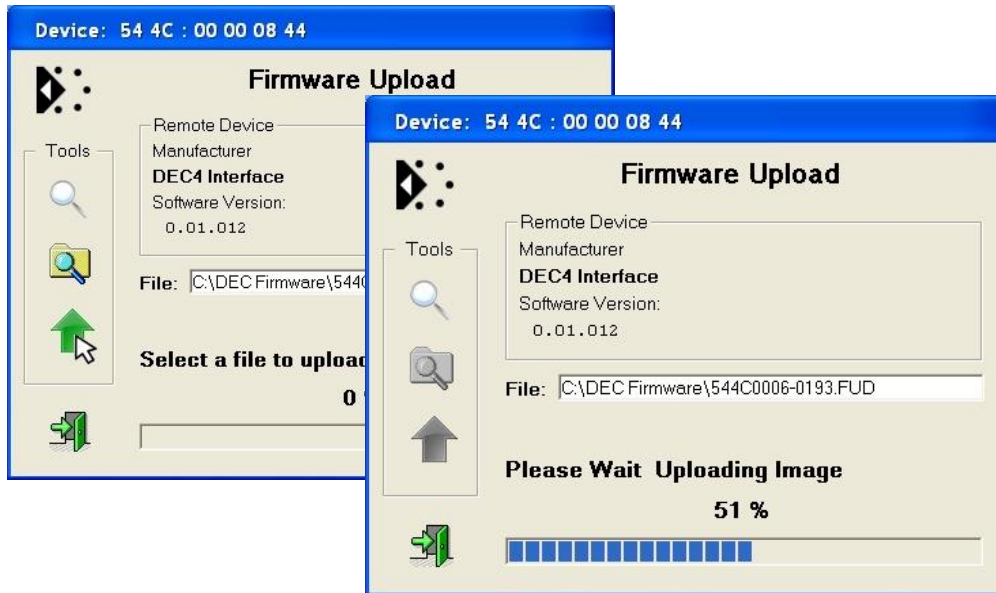
7. Right click on the highlighted item in the list view and select 'Reprogram' from the popup menu. This will open the firmware upload tool.



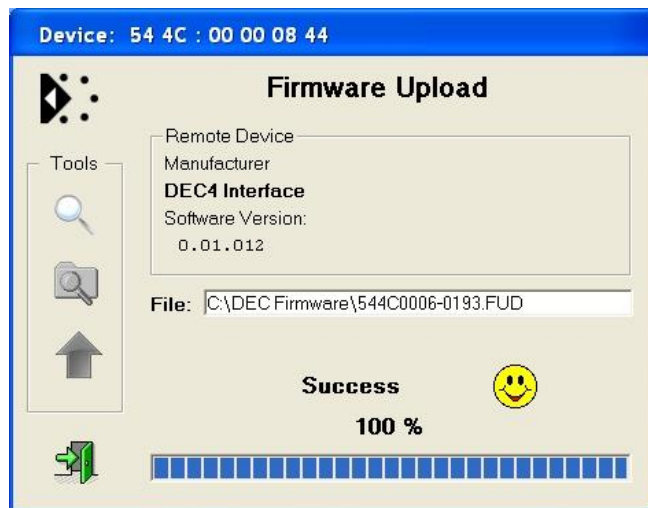
8. In the Firmware upload handler, search for a file to upload by clicking the file icon. Find and select the file to load and click the Open button.



9. On returning to the File upload tool window, select the green upload arrow to initiate the upload process. The upload will then start.



10. On successful completion of upload and restart, the firmware upload is complete.



Repeat from stage 8 to 11 for each additional file to upload.

On completion of the upload, dismiss the upload window and return to the main window.

Close the application and disconnect the USB Cable from the SCB

Important:

If the Tempest enclosures are connected to an RDM interface or controller, set the DATA MODE for each enclosure as follows:

RDM MONITOR ONLY To view status information over RDM

RDM + CONTROL To monitor and over RDM and control the Lamp/Projector relays via DMX

If the enclosures are connected to an Ethernet network for monitoring using TEMP (Tempest Equipment Management Protocol) then the appropriate mode is RDM MONITOR ONLY.

Warranty

INSPECTION/WARRANTY/RETURNS.

A. Customer, at its sole expense, shall inspect all Goods promptly upon receipt and accept all Goods that conform to the specifications or catalog. All claims for any alleged defect in or failure of the Goods or Seller's performance to conform to the Contract, capable of discovery upon reasonable inspection, must be set forth in a written rejection notice detailing the alleged non-conformity, and be received by Seller within thirty (30) calendar days of Customer's receipt of the Goods. Failure by Customer to notify Seller of the alleged non-conformity within thirty (30) days will be conclusive proof that the Goods have been received by Customer without defects or damage, and in the quantities specified on the bill of lading and shall constitute an irrevocable acceptance of the Goods and a waiver of any such claim in connection with the Goods.

B. Seller warrants to Customer only that the Goods will be free from defects in material and workmanship at the time of delivery and, subject to the exceptions and conditions set forth below, for the following period (the "Warranty Period"): twenty four (24) months from the date of shipment by Seller. Seller may provide additional years of warranty coverage beyond 24 months, at the rate of 2.5% of the net sale price per year, up to a total of three additional years' coverage beyond the standard 24 month warranty period. Seller will remedy a defect as set forth in paragraph 7 D, below, (the "Warranty"). The Warranty is subject to each of the following exceptions and conditions:

1. Customer must promptly (and in all events within the Warranty Period) notify Seller of any alleged defect in a written notice (the "Notice") which shall set forth the quantity, catalog number, finish, original purchase order number, Seller's invoice number on which Goods were originally billed and a statement of the alleged defect, along with digital photographs showing such defects where feasible.

2. The Warranty shall not apply: (i) to any claimed defect that was capable of discovery upon reasonable inspection and deemed to be waived under paragraph 7 A, above; (ii) to any Goods that have been subject to misuse, abnormal service or handling, or altered or modified in design or construction; (iii) to any Goods repaired or serviced by any person other than Seller's authorized service personnel or to Goods installed other than according to installation instructions, or (iv) with respect to normal wear and tear. Seller warrants materials and finishes to customary commercial standard and makes no warranty whatsoever to cover minor imperfections of finish not affecting the performance of the Goods.

3. Seller makes no Warranty with respect to parts or components that are not the product of Seller, and specifically makes no warranty whatsoever for equipment housed inside enclosure products manufactured by Seller.

4. The Warranty is Seller's exclusive warranty with respect to the Goods. Seller makes no warranties, guarantees or representations, express or implied, to Customer except as set forth in this paragraph 7. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR USE OR FOR A PARTICULAR PURPOSE, ARE HEREBY EXCLUDED AND DISCLAIMED.

C. Seller will accept the return of Goods properly rejected under paragraph 7 A, above, or as to which Notice of an alleged breach of Warranty has been timely given and such Goods may be returned to Seller, freight prepaid, but only upon Customer's receipt of Seller's written return material authorization ("RMA") and shipping instructions. The RMA shall be void if the Goods are not received within 45 days after issuance of the RMA. No deduction or credit in respect of any rejected or returned Goods shall be taken until Customer has received Seller's further written deduction or credit/authorization following Seller's inspection to confirm nonconformity or defect. Seller will charge to Customer any and all costs incurred by Seller in connection with the handling, shipping, inspection and disposition of any returned Goods that are determined by Seller not to have been nonconforming upon Delivery or as to which the warranty hereunder is not applicable.

D. UPON ANY PROPER RETURN PURSUANT TO PARAGRAPH 7C, ABOVE, WHETHER IN CONNECTION WITH A REJECTION OF GOODS OR AN ALLEGED BREACH OF WARRANTY AND BASED UPON THE CONDITIONS SET FORTH IN THIS PARAGRAPH 7, SELLER AGREES THAT IT WILL, AS THE SOLE AND EXCLUSIVE REMEDY UNDER THE CONTRACT OR OTHERWISE, FOR ANY NONCONFORMITY OR BREACH OF WARRANTY, AND AT SELLER'S SOLE ELECTION: (i) REPAIR SUCH GOODS; OR (ii) REPLACE SUCH GOODS.

NOTE: All sales are subject to Tempest Lighting, Inc. Standard Terms and Conditions (Standard Terms). In the case of any discrepancy between the foregoing and Standard Terms, Standard Terms shall prevail. Download Standard Terms [here](#).

Appendix – TEMP Protocol

AVAILABLE TO SPECIAL ORDER

Tempest can optionally provide a firmware load that facilitates TEMP over RS485, suitable for interfacing to an Ethernet adapter. TEMP is a lightweight proprietary ASCII based protocol, intended for rapid integration into management systems. With TEMP and a suitable RS485 to Ethernet adaptor connected to the DEC DMX connectors, your DEC may be configured and monitored over an IP network.

Please contact factory for ordering information.

Physical Layer

1. EITHER: Use a 51.EN Ethernet daughter board plugged directly to the DEC4 motherboard, connected to your TCP/IP network.
2. OR: Use a 51.485 RS485 daughter board on each of a number of DEC4 motherboards, connected in a daisy-chain, and use a 51.EN Ethernet board on the first DEC4 to connect to your TCP/IP network.

Developer's Guide

Download the Developer Guide [here](#):