Fiber Smart NETWORKS

Hardware Installation Manual

ROME MINI

Rev1.0

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1 Introduction

1.1 About This Document

This guide provides step by step instructions for the installation of the Wave2Wave Robotic Optical Management Engine (ROME) system, as well as important information on Standards, Agency193 Approvals, and Safety warnings. Please read all the safety warnings before beginning installation.

1.2 Audience

This document is intended for technicians that install ROME.

1.3 Safety Warnings

Disposal: Separate Collection in European Countries

The following apply only to users in European countries: This product is designated for separate collection at an appropriate collection point. Do not dispose of as household waste.

To avoid the potentially damaging effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately. This symbol indicates that this product is to be collected separately. For more information, contact the retailer or the local authorities in charge of waste management.

Rack Certification

To ensure safety, all configurations of the rack cabinet must be certified by a nationally recognized testing laboratory in order to verify compliance with country-specific safety regulations. This process ensures that the end product remains safe for the operator and service personnel under normal and foreseeable misuse conditions.

Heavy Equipment

Due to the heavy, 88lbs (40kg), weight of the ROME Chassis and also to its slide out capability, it is important that care is taken in lifting and mounting ROME to a rack. To prevent bodily injury or damage to the chassis:

1. Never attempt to lift or tilt the chassis without the use of a mechanical lifting device, such as the one pictured.
2. Take special precautions to ensure that the system remains stable.
   a. The rack used to mount the ROME must be properly anchored to the floor.
   b. If the ROME unit is the only unit in the rack, it should be mounted near the bottom of the rack (while still allowing bottom clearance).
   c. When mounting this unit in a partially filled rack, when possible, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
   d. To enable maintenance, the ROME Chassis should be installed to allow 12 inches of clearance above and below the chassis when fully extended on the slider.
   e. If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Electrical Current

Electrical current from power, telephone, and communication cables is hazardous.

1. Do not connect or disconnect any power cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
2. This apparatus must be properly grounded with a protective earth contact.
3. The device is intended for use when supplied with power from a supply providing 48/60 VDC, 2A max.
4. Power is provided to the ROME chassis by the LCU via the RCU cable. (270 Vac RMS max; 39 kHz; 0.15A max; 12Vdc; 1A=Powered by LCU.
5. Disconnect power (following proper shutdown procedures), telecommunications systems, networks, and modems before you open the device covers. Remove all jewelry (including rings, necklaces, and watches), wear a grounding wrist strap, and do not directly touch the backplane with your hand or any metal tool, to avoid possible shocks, burns, or ESD damage to the unit.
6. Never turn on any equipment when there is evidence of fire, water, or structural damage.
7. DO NOT OPEN ROME Unit when power is on. Hazardous voltages exist within the unit as well as moving parts that may cause injury. This product contains no user-serviceable parts. The unit may be opened ONLY by trained and qualified personnel.

Proper Grounding Required

This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. When installing or replacing the unit, the ground connection must always be made first and disconnected last.

Avoiding Circuit Overload

Overloading a circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards:

1. Take care when connecting units to the supply circuit so that wiring is not overloaded.
2. Ensure that your system's electrical requirements do not exceed the branch circuit protections requirements. Refer to ROME's electrical specifications.
3. An over current protection device (15A branch circuit breaker) should be incorporated into the building installation.

Possible Laser Hazard

This device can switch laser based source signals, which, at higher wattage levels, require additional precautions by the user. Since it is the user that determines what signals are transmitted through this device, and not the device manufacturer, it is the responsibility of the user to take the necessary precautions as dictated by the source equipment generating the signals in question. It is recommended that the user add any warning labels to this device, as necessary, in the case of higher level laser sources that may be potentially harmful if exposed to the user.

Extending Devices Forward in Rack

Do not extend more than one sliding device at a time.

Caution

This unit has more than one power supply cord. Disconnect power supply cords before servicing to avoid electric shock.

Branch Circuits

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system's electrical requirements do not exceed the branch circuit protections requirements. Refer to the devices' electrical specifications.

The mains supply cord set used to connect the equipment to supply mains must be of an approved type acceptable to the authorities in the country where the equipment is sold.

The plug on the power supply cord is intended to serve as the disconnect device, the socket-outlet shall be installed near the equipment and shall be easily accessible.

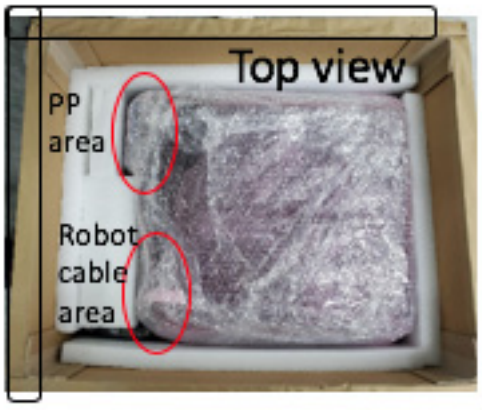
2 Unpacking

Before unpacking , check that package is not damaged and that shock indicator cuspule is not red

When opening the top please note for two delicate areas:

Patch panel area (PP area)
Robot cable area (Top & Bottom cables were preconnected to LCU)
Shipping box side walls should be removed (marked in black) first.
- ROME Mini should be moved out from the shipping box side
- System should be held from its bottom plate, not from any side or back cover
- System is not heavy - two people can lift it easily

3. AC to DC power supply was placed at the box bottom behind the robot cable area under the foam



3 Installing ROME

1. ROME Mini can be place on a table - it has 4 legs that were preinstalled

2. Verify visually that RCU Top and bottom cables are not damaged and that they are connected to LCU
3. Verify visually that patch panel is not damaged
4. Verify that no sign for cover damages or internal RCU damage (through the front windows)
5. Peal off the protective film from the front covers

⚠ Wear an ESD strap.

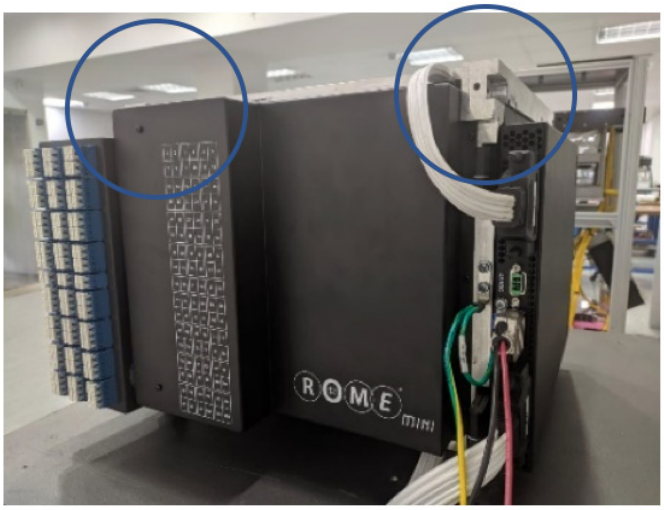
- Have a mechanical lifting device available, such as the one pictured, which is required to lift and maneuver the ROME equipment, to avoid possible bodily injury.

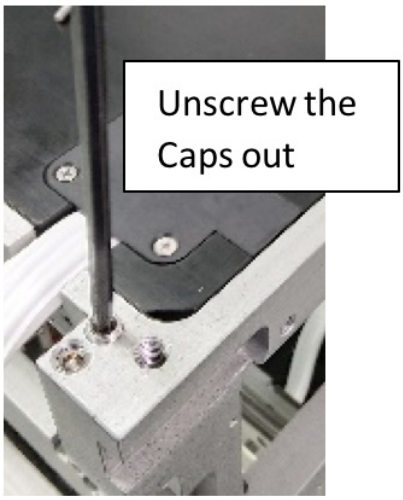
Removing Shipping Lockers

Each system have 4 shipment locks ,2 at the male (bottom) side and 2 at the female side (upper), this lockers supposed to prevent from the axis to move during the shipment, once the system is ready for installation it's very important to remove them before activation and operation.

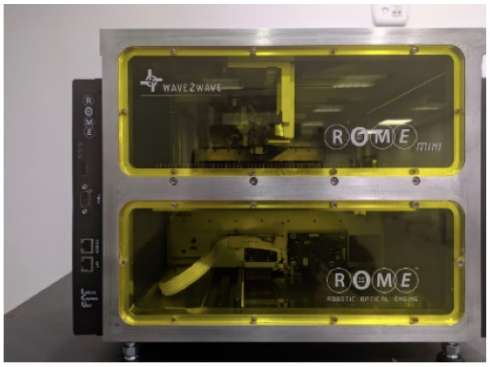
Start to remove the lockers from the male side.

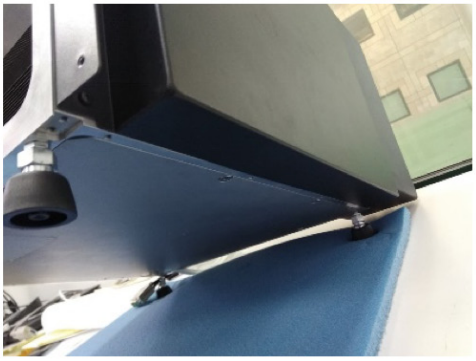
1. From the upper side of the system chassis remove all 4 set-screw caps, there are two caps in each side and put them aside.



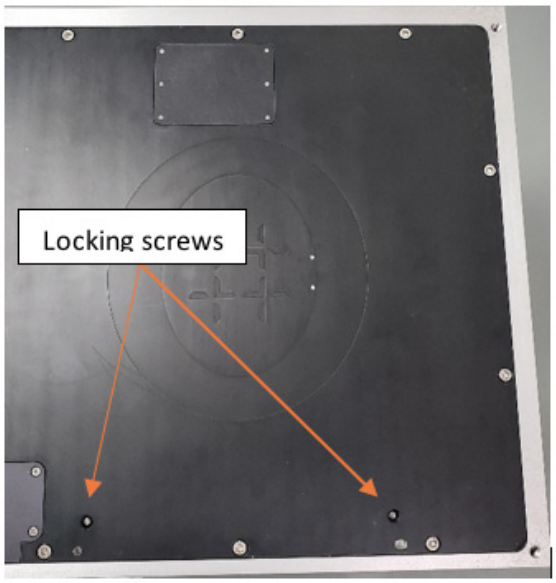


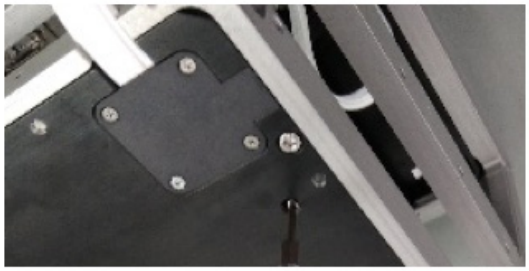
2. Go back to the front side and tilt the unit slightly to a 45-degree angle



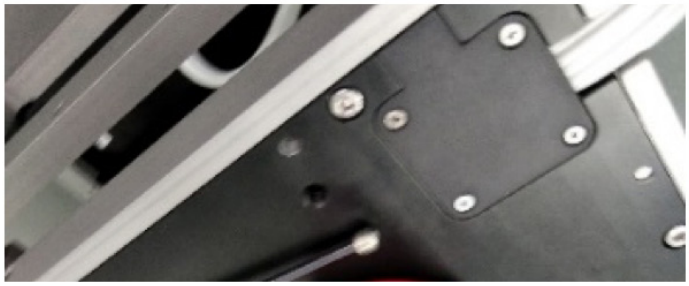


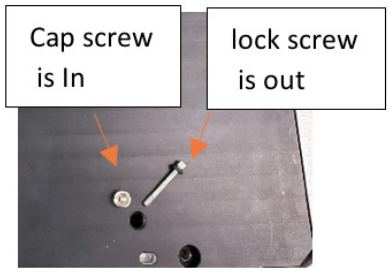
3. Using 2.5mm Allen key unscrew and remove the 2 lockers



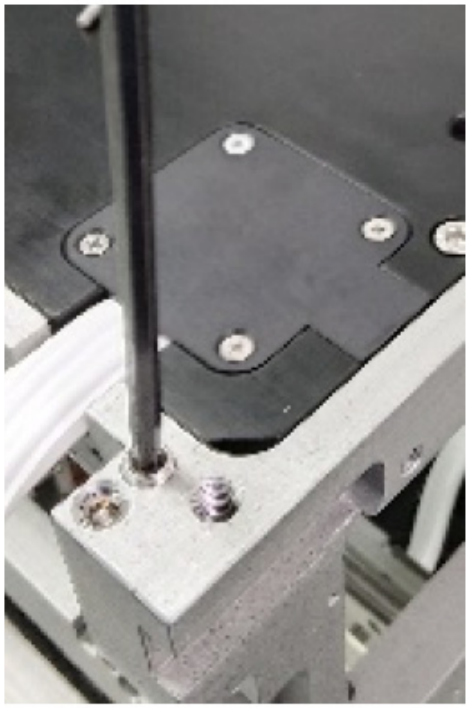


4. Take two s/s caps from step 1 and insert them to the lockers threads that now is empty, screw them using 2.5 mm Allen key until contact, at the end lay back the system back to normal position.





5. Take these lockers from step 3 and screw them to the empty s/s cap drills on step 1



6. Female side does not require unit tilt, just repeat steps 3-5 and the system is ready for installation

4 Rack Planning

When planning rack configuration, remember to allocate enough space for the hardware.

If installing ROME in a populated rack, install ROME in the lowest available space on the rack.

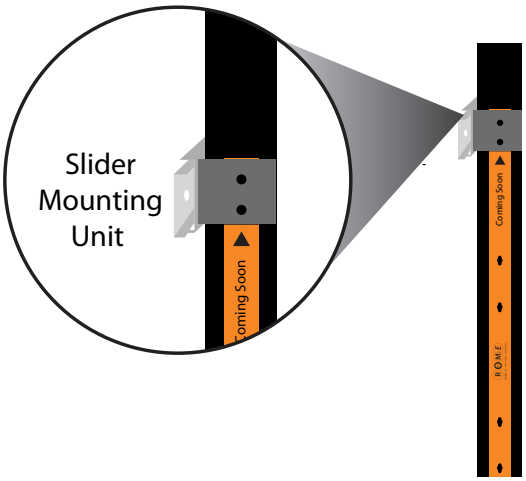
The ROME Chassis uses non-forced air cooling. When installing the ROME Chassis in a rack with OEM electronic equipment we recommend that the OEM equipment be installed above the ROME Chassis. This helps to reduce or limit the transfer of heat from other equipment via the bottom of the ROME Chassis.

Installing Slider Rail Units

Follow the steps below to install the ROME slider rail units on a four post rack. Prior to continuing, please make absolutely sure that the safety guidelines have been followed correctly.

1. Place the ROME positioning ruler on the rack rail. The lower end of the ruler should be 12 inches from the rack floor. It is recommended that the slider be adjusted to the required depth prior to mounting the slider. Screws may need to be removed to adjust the brackets to the required depth. Two types of rulers are provided for EIA and WECO racks.

2. Place one slider rail unit above the arrow on the ruler and secure the front side of the slider rail unit to the front rail.



5 Installing Rack Sliders

Option 1: Fixed Bracket

ROME Mini can be installed in 19" rack using installation kit.
Each Mini rack bracket is made of 3 parts – Front bracket, Rear Bracket, Rear post holder.

Front Bracket

Rear Post Holder

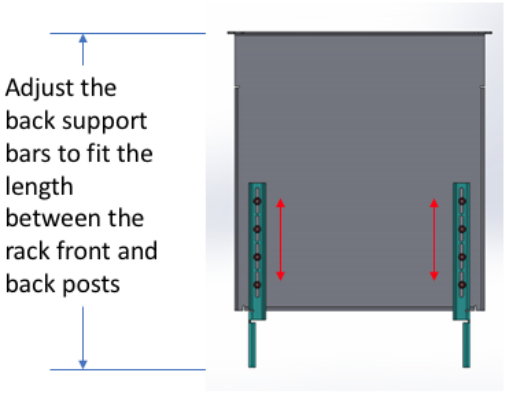
Rear Bracket

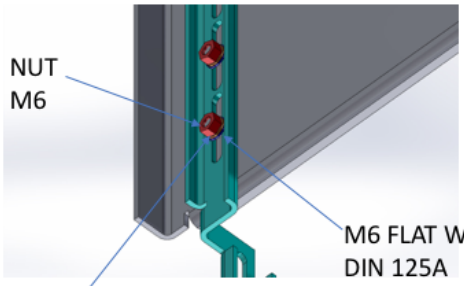
Fixing Brackets to Mini

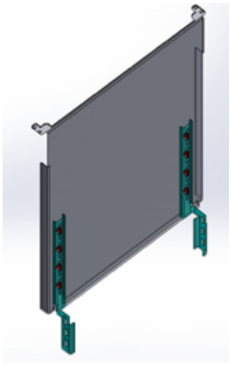
- Measure the length between front and rear rack posts
- Attach the front brackets (designated by Green color in the image) to Mini chassis so the front "ears" are in line with Mini front cover
- Adjust the rear brackets (designated by Yellow color in the image) to Mini chassis so the total length between the front bracket "ears" to back bracket edge fits the length between the posts. Tighten the brackets to the Mini chassis
- Verify there are 4 legs in Mini bottom

4 Legs on Mini

Step-1 – Adjusting shelf back support length



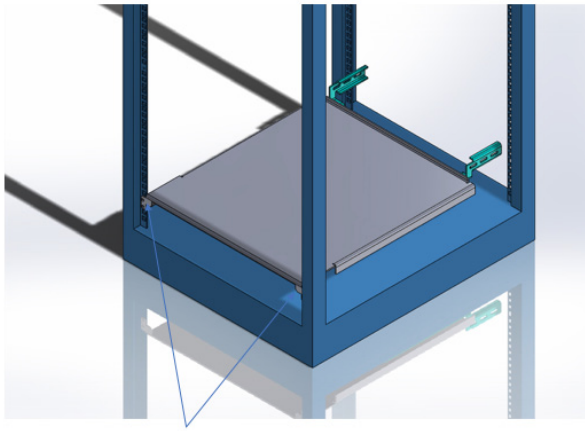




A – Adjusting shelf back bars to fit rack depth

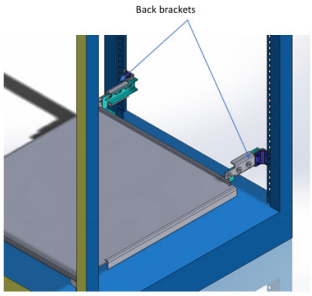
B – tightening back bar screws

Step-2 – Attaching the shelf to the rack front

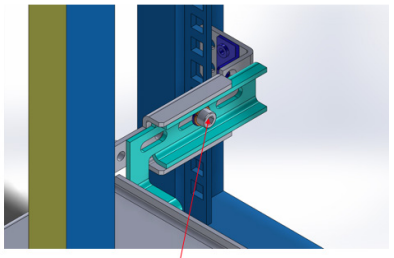


C – Attaching tray to the front posts

Step-3 – Attaching the shelf to the rack back

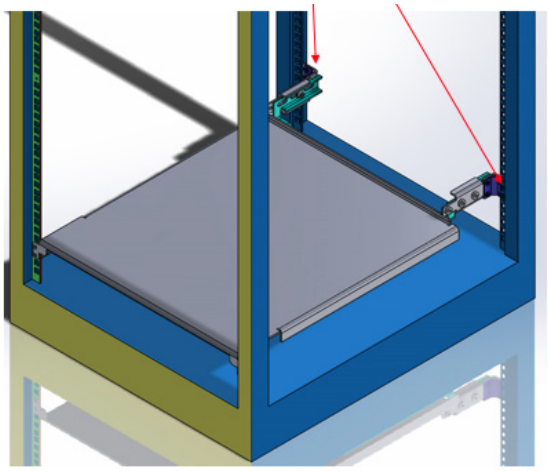


D – Placing the Back brackets on the shelf back bars

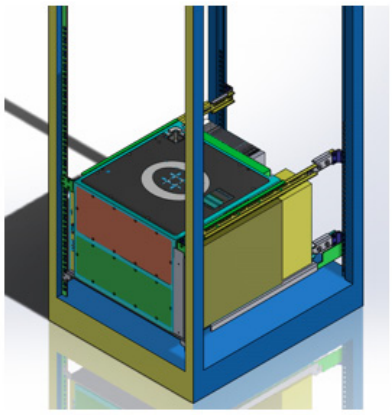


E- secure the back brackets to the tray bars using a flat washer, spring washer, and a screw M6X12 DIN 912

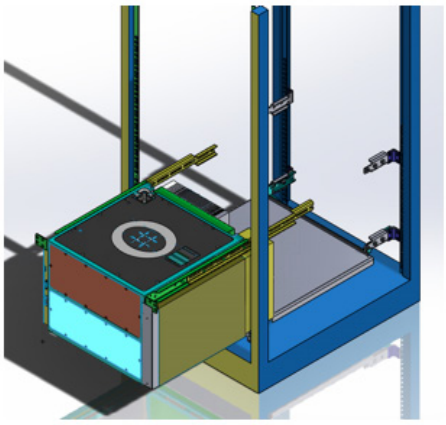
Step-4 – Securing the bracket to the rack back posts



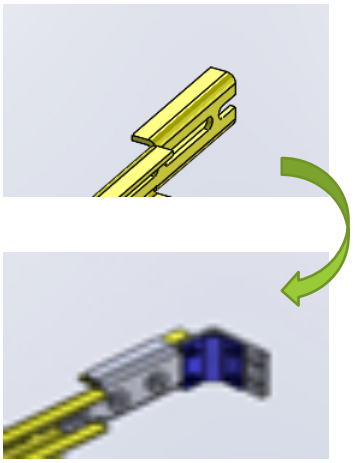
Place side trays on rack



Lift Mini, place it on support trays and push it inside rack



Secure Front bracket to rack

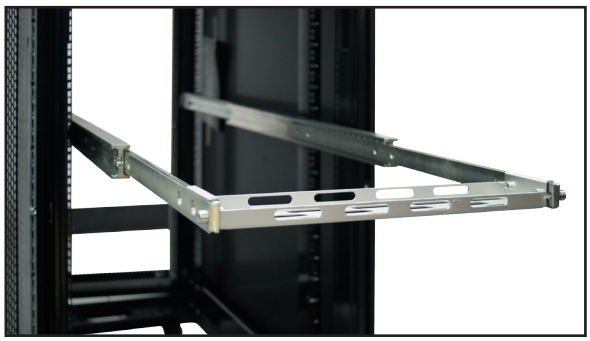


Attach the rear post holder on rear bracket , secure its “ears to the back rack post.

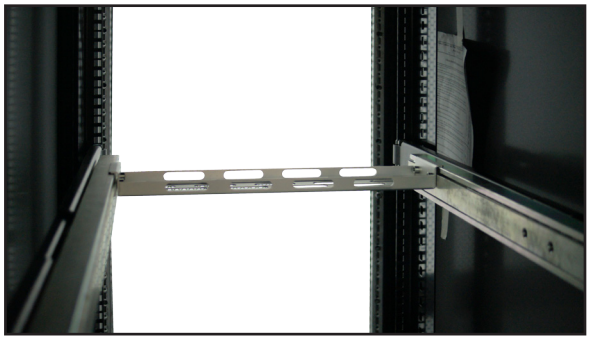
Tighten the rear post holder to the rear bracket

Option 2: Sliding Rail

1. Measure the rack depth, and then adjust the sliders accordingly. Slide into the rack and secure the back side of the slider rail unit to the back post, use a level to make sure the slider rail unit is level.
2. Tighten the slider brackets screws to the slider body and stiffener.
3. Repeat steps for the opposite side of the rack with the second slider rail unit.
4. Clearance/Level Testing
   - Extend the sliders arms all the way out through the front of the rack
   - Use the jig by placing it on the 2 extended slider arms
     a. Check right to left leveling using a level, adjust sliders front brackets as needed.
     b. Run the jig between the 2 sliders from the front of the rack to the back to check for clearance.
     c. When the jig is in the back, check the level again. Adjust back screws if needed.



Jig in Front of Rack



Jig in Back of Rack

7. Installing additional set of sliders (if applicable)
   - Install the ROME positioning ruler, where the lower end should be on top of the installed slider
   - Repeat steps 1 to 4

   Note: There is a 12 inch clearance from the bottom of the rack.

Installing the ROME Mini Chassis involves the following steps:

1. Mounting the ROME Mini
2. Cabling (fiber and ground)

Mounting the ROME Mini

Orient the front of the ROME Chassis based on configuration.

Best Practice

Take special precautions to ensure that the system remains stable. In particular, mount the first ROME unit on the lowest set of sliders. Continue to mount ROME units from the bottom up. Two people are recommended for this step of the process.

1. Move the ROME Chassis to the lift.
2. Position the ROME unit with the front panel on the the lift (Provide enough room to mount sliders).
3. Route the patch panel through the rack and leave it on the other side of the rack.
4. Extend (slide-out) the sliders arms to maximum extension.
5. Raise the ROME carefully and place it at the appropriate height in between the sliders.
6. Align the extended arms of the sliders with the ROME mounting brackets located on the left and right side at the top of the ROME.
7. Securely attach the slider arms to the ROME mounting brackets using the supplied screws (do not use washers or nuts). Attach the chassis with phillips head screws on each side. All screws should be used for proper support of the ROME chassis slider rail units.
8. Once the chassis is securely attached to the slider bracket system, the lift can be removed.
9. Slide the ROME Chassis into the rack.
10. Secure the ROME to the front rack screwing the ears to the rack.

Lifting ROME into Position

6 Grounding & Power

Grounding

The ROME Mini must be grounded to a Common Bonding Network. Please follow the following rules when making the ground connections:

1. Coat all bare conductors with an antioxidant before making the crimp connections.
2. Place a star washer between the compression lug and the unit.
3. Place a flat washer between bolt and the compression lug.

LCU Ground to ROME Mini

The LCU — ROME Mini ground connection is preassembled at the factory. If for any reason you must replace the factory assembled connection, follow the instructions of this sub-section.

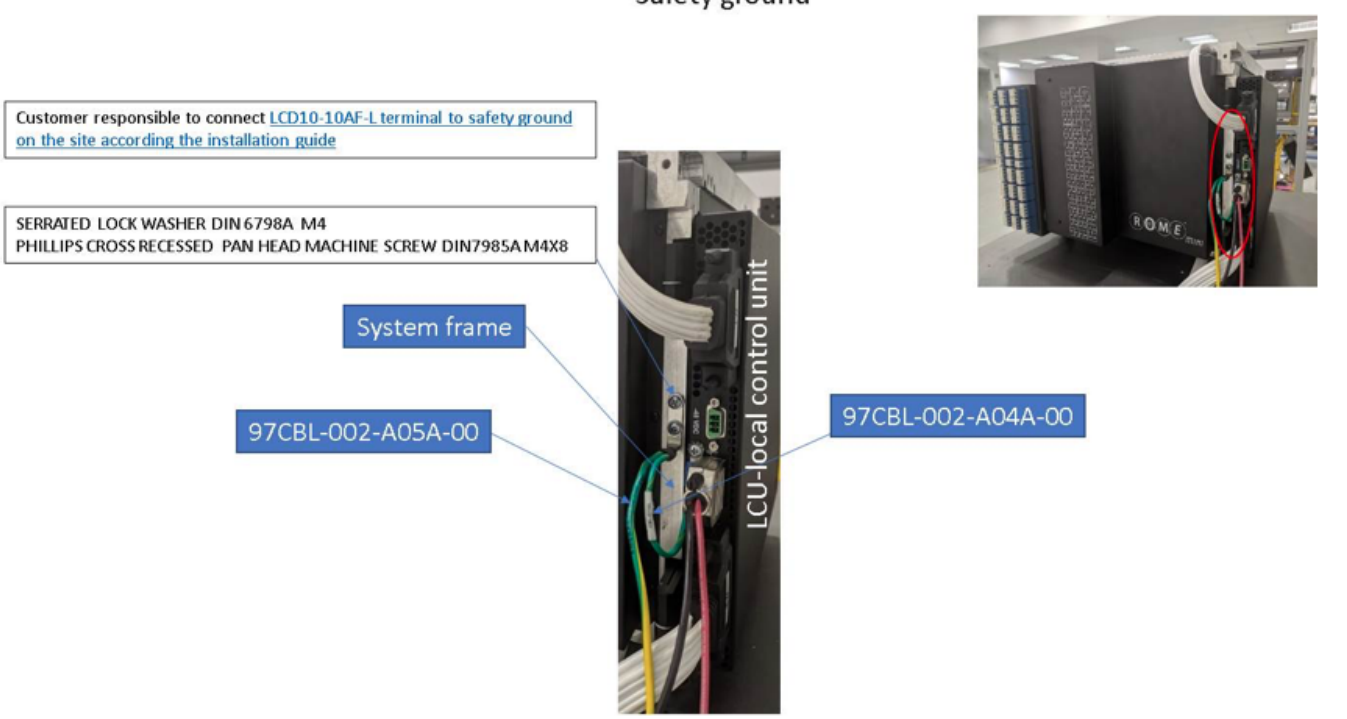
The LCU ground point is shown in the figures shown above and below. The LCU earth ground uses a single-hole compression lug. This lug must be connected to the ROME Mini as shown below.

1. Connect the LCU to this ground point located at the back-right corner of the ROME Mini
    a. Place a flat washer onto an M4 x 10 bolt.
    b. Place the ground wire compression lug onto the flat washer.
    c. Place a star washer onto the compression lug.
    d. Secure the assembly located at the ground point of the LCU unit using an M4 bolt.

2. Connect the other end of the above ground wire to the ground point located on the ROME Mini
    a. Place a flat washer onto an M4 x 10 bolt.
    b. Place the ground wire compression lug onto the flat washer.
    c. Place a star washer onto the compression lug.
    d. Place two-hole compression lug.
    e. Place a star washer onto the two-hole compression lug.
    f. Screw the entire assembly down onto the ROME Mini Chassis using 2 bolts M4x10.

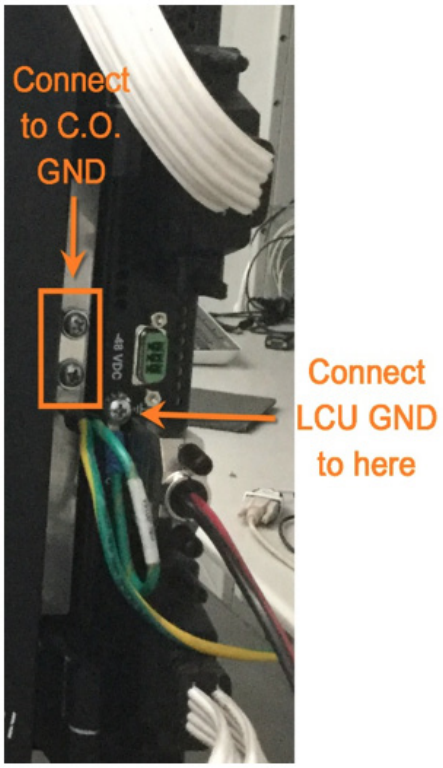
A 2-hole Compression lug

Note: The ground cables / wires must be made of copper.



ROME Mini to Central Office Ground

The Central Office (C.O.) ground attaches to the ROME Mini body by means of a two-hole compression lug which connects the ROME Mini to the Central Office designated ground wire. The ground attachment points are located at the right rear when looking towards the rear of the ROME Mini.



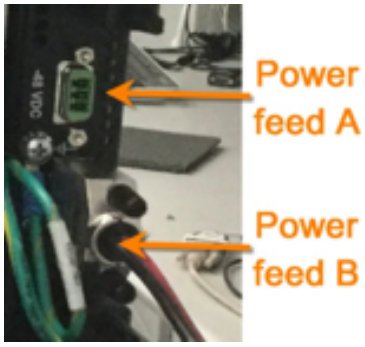
Two-hole compression lug: Panduit Corp LCD10-10AF-L or equal.

Note: The diameter of ROME Mini— C.O. ground cables must be at least 6 AWG.

Note: The ground cables / wires must be made of copper

Power

The ROME Mini device contains 2 independent power feeds. These are permanently connected to your site's -48/60 VDC power sources.



Note: The ROME Mini device is permanently connected to its - 48/60 VDC power source. A power disconnection device must be installed as part of your site's electrical circuitry to the ROME Mini. Before attaching the -48/60 VDC power feeds to the LCU, disconnect power to all cables in accordance with the safety regulations.

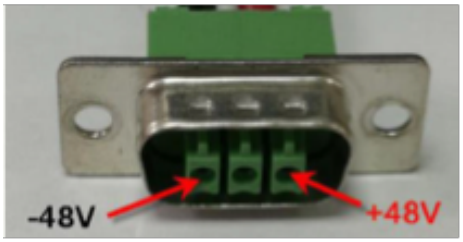
Note: The LCU has two independent power supply feeds.

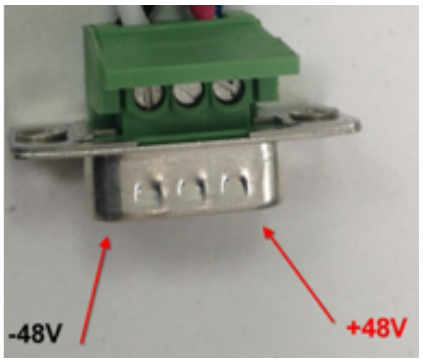
Note: The ROME Mini battery return terminals are configured as Isolated DC Return (DC-I). Wire Gauge

Note: The cross section of the DC power feeds must be at least 16 AWG

1. Attach the -48/60 VDC power feeds to the front panel.
2. Power up the unit. The ROME Mini will automatically perform its built-in test. This will "home" the manipulators (robotic mechanism) as well as perform a series of internal tests. See the section Status LEDs near the end of this document in order to interpret the LED color scheme resulting from the Built-in Test.

ROME Mini power supply -48VDC connector wiring





7 Connecting Cables

1. Connect DC power connector to LCU
   (for site -48V it requires specifying/supplying connector to customer)

2. Connect LAN cable to LCU (not supplied)

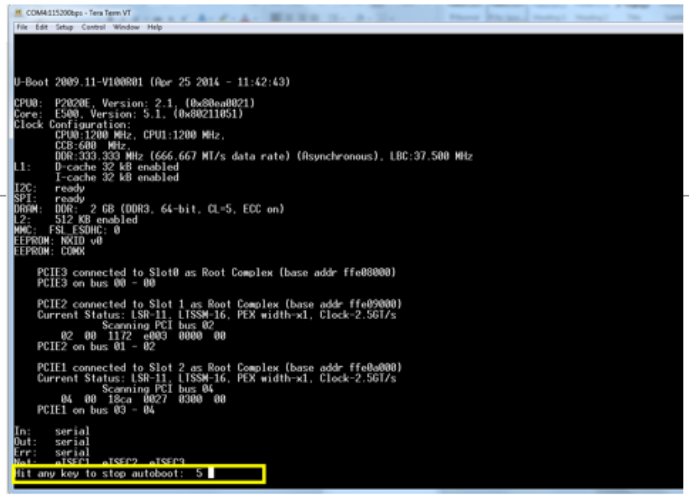
3. Connect serial adaptor cable to the back of LCU (supplied)

4. Connect the power supply to AC outlet (AC cable is pre-attached to PS unit) – system turns on and starts booting…
5. The 1st system left Israel with IP address 192.168.10.203 Changing the IP address can be done only through the serial debug port.

8 Changing IP Address

•Connect DB9 connector to the rear serial Debug port and open serial session.

•Reset the ROME device.
•Press enter when the message 'Hit any key to stop autoboot' appears.



•Type '**editenv ipaddr**' and change the IP address (backspace to delete the current number and retype the new number and than press enter key).

```
=> editenv ipaddr
edit: 192.168.10.201
=>
```

•Type '**editenv gatewayip**' to change the default gateway address and press enter.

```
=> edit gatewayip
edit: 192.168.10.1
=>
```

•Type '**saveenv**' to save the parameters permanently and press enter.

```
=> saveenv
Saving Environment to SPI Flash...
Erasing SPI flash...Writing to SPI flash...done
=>
```

•Type '**reset**' and press enter to reboot the ROME device.

9 Perform Health Check

From CLI:

Check to see if ROME is in OPER Mode.

Verify show board to check if it's the latest software version. 4.0.0.X (Version starting with 4.X.X.X is for ROME mini)

Check cc, cp, port show, port show disabled, alarm show, port show lock and make sure all has no issues

If needed, Set Time and Date (see next slide how to do it)

Note: if time server can't be resolved by address, use IP or configure DNS server using command:

"set board ipParams dnsServer <dns server ip address>

For example: set board ipParams dnsServer 1.1.1.1

Run connections below:

A20 to A21

A60 to A61

A90 to A98

Run connection disconnect range all to disconnect all test connections.

If there are no alarms , and connections/disconnections pass well – system is ready to operate.

10 Perform Time and Date using SNTP

Set time ntp server "<SNTP Time server address>"
For example:
set time ntp server "1.asia.pool.ntp.org"

set time ntp TZ <time zone offset>
For example:
set time ntp TZ 2

set time source sntp

To check if the time server is operational, type:
show date sntp

if the response is:
ERROR: Can't get valid response from ntp server: "<SNTP Time server address>"

It means the server can't be reached so configure dns and type the CLI command again.

To display current time with offset, Type:
show date

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