Inspextor Quick Start Installation Manual

The following Quick Start guide was created to help with installing the MHT POE system on site.

- **Read through this document** before any physical work is started.
- **Use this guide** in conjunction with the device planning to ensure proper installation.

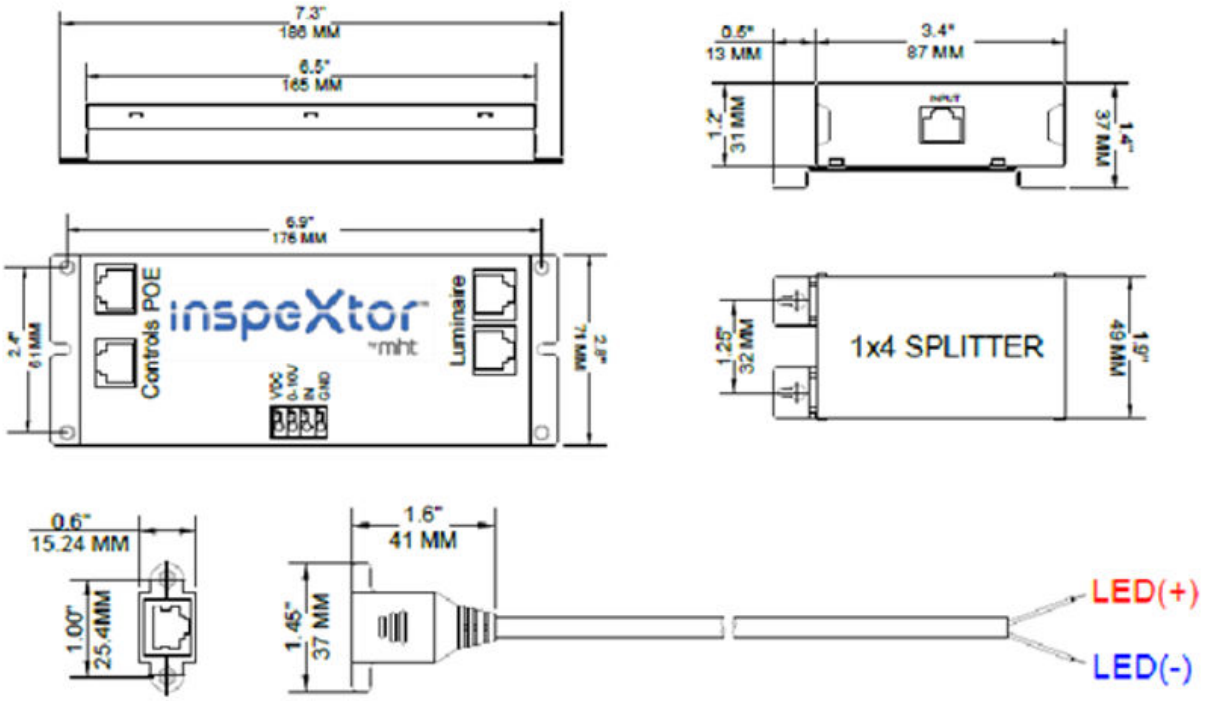
Sample Bill of Material: The following Bill of Material shows the components we are providing. Take note of the comments on the right column.

Type	Description	BOM Quantity	Comments
Type A - '1'X4' LED PANEL LIGHT FIXTURE	MHTi-PAN-SC-1X4-24E-35K-SM/AC	55	
Type A-NL - '1'X4' LED PANEL LIGHT FIXTURE- Night Light	MHTi-PAN-SC-1X4-24E-35K-SM/AC-NL	14	
Type B - "4' LED ECO STRIP LIGHT FIXTURE	MHTi-STRP-ECO-SC-4FT-24E-35K-WM	12	
Type B-NL - '4' LED ECO STRIP LIGHT FIXTURE Night Light	MHTi-STRP-ECO-SC-4FT-24E-35K-WM-NL	10	
PoE Equipment			
Nodes-90W	MHTi-NODE-90	36	
Nodes-90W-NL	MHTi-NODE-90- Night Light	16	
Attic Stock - NODES ONLY	PoE Node for Attic Stock	5	Attic stock for back up. Not to be installed on site.
RJ45 Adaptor	MHTi-RJ45-ADAPTOR	91	These RJ45 adaptors are already installed on the fixtures. Not packaged separately
Splitters	MHTi-SPLIT-1X4	6	
Attic stock	MHTi-Attic-MHTi-SPLIT-1X4	1	Attic stock for back up
Wall Switch -4B	MHTi-WS-100-4 BUTTON-W	8	
Attic stock	MHTi-WS-100-4 BUTTON-W	2	Attic stock for back up
Occupancy Sensor	MHTi-SENS-200	43	QTY=15 for CM11, QTY=28 for CM 9
Attic stock	MHTi-Attic-MHTi-SENS-200	2	Attic stock for back up; QTY=1 for CM11, QTY=1 for CM 9
PSE Equipment			
24 Port POE Switch	Supply by MHT (Transiton)	3	SM24TBT2DPA
24 Port POE Night Light	Supply by MHT (Transiton)	1	SM24TBT2DPA
Core Switches	Supply by MHT	1	Catalyst 2960
inspeXtor	MHTi-INSP-SERVER	1	

MHTi-NODE-90 (90 Watt Node):

- Each node driver has four ports: POE, Control, Output 1, and Output 2
  - **POE Port-** This is the power port of the node. Plug the RJ-45 cable from the POE switch into the POE port to power the 90W node driver.
  - **Control Port-** All control devices should be directly plugged into the control port of the node. Control devices include Sensors and wall switches.
  - **Output1**- This port is in front of the POE Port. The first light fixture is to be plugged into this output port to power the luminaire.
  - **Output2**- This port is in front of the control port. The second light fixture is to be connected to this output port to send power to the luminaire.

Dimensions:



STOP!
IMPORTANT – PLEASE READ

Use Caution when connecting power cable and components to the node to avoid node damage.

Make all PoE Connections prior to energizing the PoE Components.

DO NOT connect the Power cable from the switch to the control port of the node. Doing this can damage the nod.

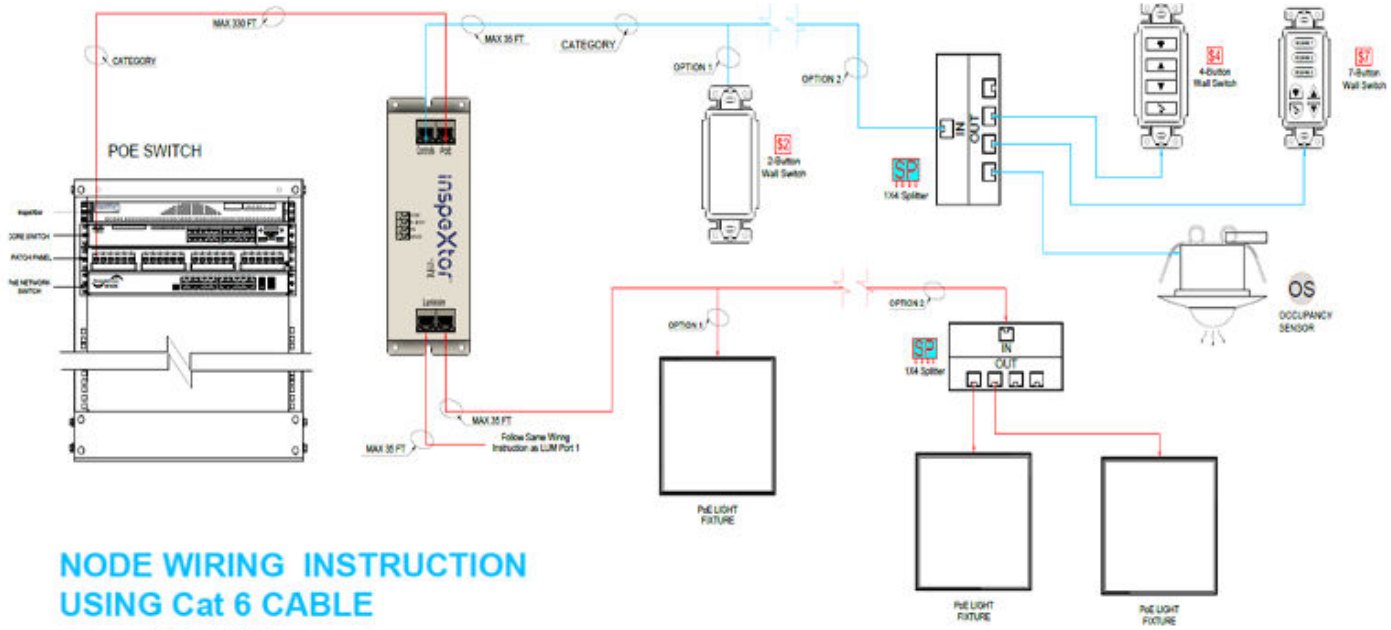
DO NOT connect sensors and wall switches to the output ports of the node. Doing this can damage sensors and wall switches.

DO NOT connect power cable from the switch to the output ports of the node. Doing this can damage the node.

General Line Diagram

This is a general line diagram of the MHT POE system. The diagram may depict fixtures, devices, and equipment that differs from the actual purchase order.

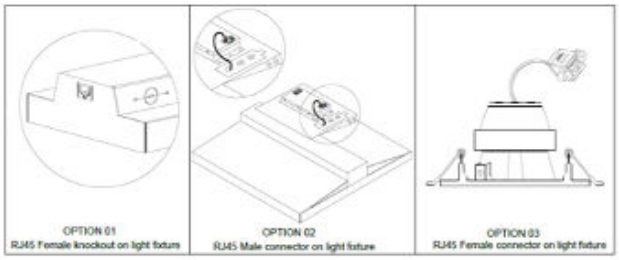
- Take note of the PoE cable (red) from the network switch to node's POE port. This cable must not exceed 330' in length.
- Take note of the CONTROLS cable (blue) from the wall switch to the node (Option 1) as this must not exceed 35'.
    - If a splitter is added (Option 2), the CONTROLS cables (blue) from the node to the splitter then to the wall switch/occupancy sensor must not exceed 35'.
- Take note of the LUMINAIRE cable (red) from the luminaire to the node (Option 1) as this must not exceed 35'.
    - If a splitter is added (Option 2), the LUMINAIRE cables (red) from the node to the splitter then to the wall switch/occupancy sensor must not exceed 35'.



NODE WIRING INSTRUCTION USING Cat 6 CABLE

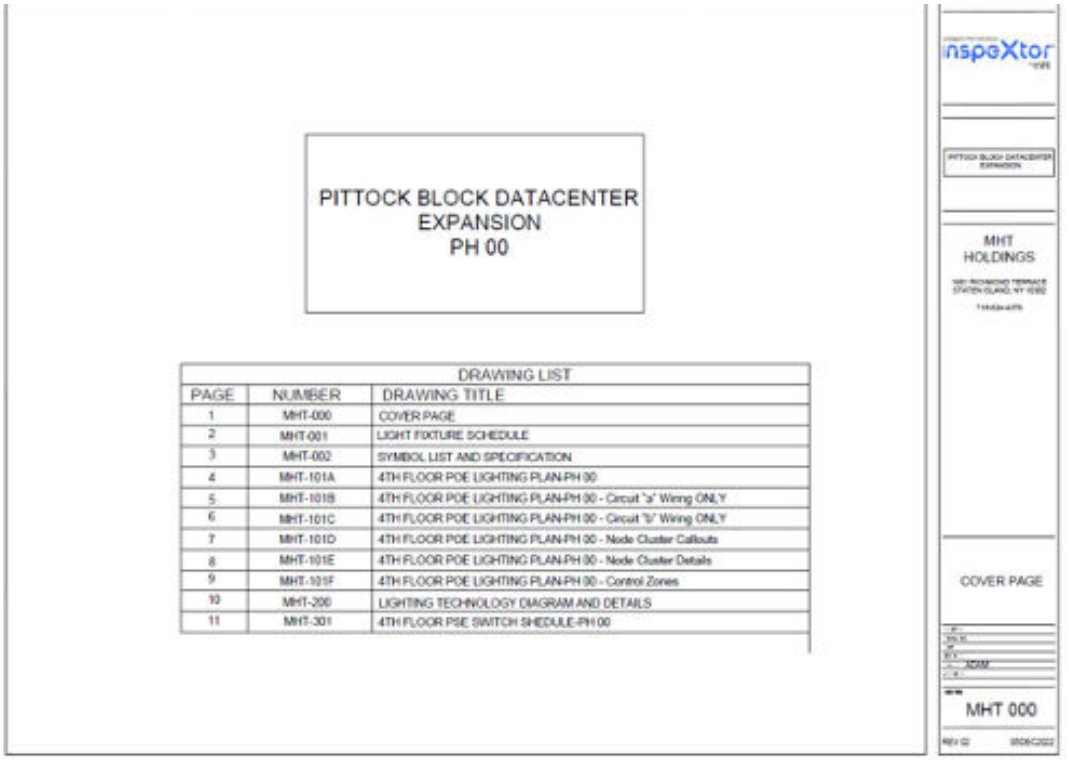
1. Connect PSE to the POE port on node.
2. See bellow option for Connect peripheral on node.
2.1.Connect peripheral to the control port on node.
2.2.Connect 1x4 splitter input port to the control port on node,
Connect 1x4 splitter output port to the different peripheral.
3. See bellow option for Connect luminaire to the luminaire port on node.
3.1. Node-Luminaire: Connect luminaire to the luminaire port on node.
3.2. Node-1x4 Splitter-Luminaire:
Connect 1x4 splitter input port to the luminaire port on node,
connect 1x4 splitter output port to the different luminaries.
4. Follow similar step (3) for another luminaire port on node

PoE LIGHT FIXTURE WIRING OPTION



Device Planning Overview:

The device planning is a separate file that should be accompanied by this Quick Start guide. The device plan is overlayed on the reflective ceiling plan. The connections to the nodes, fixtures, sensors, wall switches, etc. are shown here. **Do not attempt to install any fixtures without the device planning and pull schedule** (more on this later).



PITTOCK BLOCK DATACENTER
EXPANSION
PH 00

DRAWING LIST

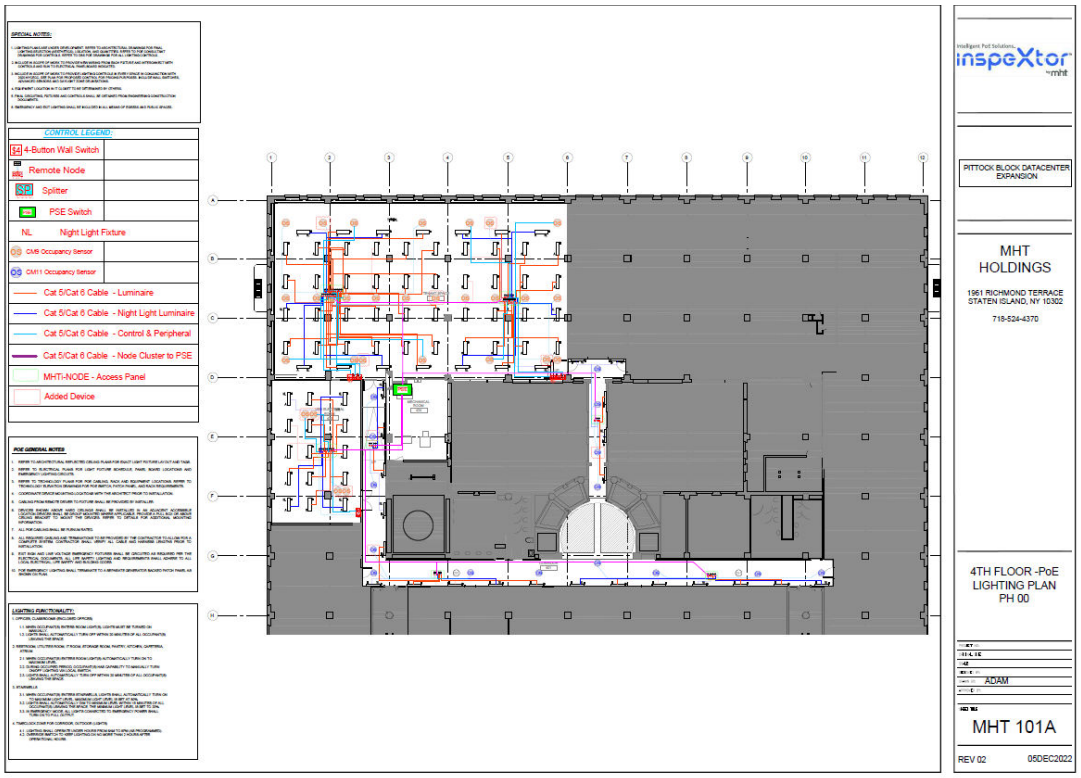
PAGE	NUMBER	DRAWING TITLE
1	MHT-000	COVER PAGE
2	MHT-001	LIGHT FIXTURE SCHEDULE
3	MHT-002	SYMBOL LIST AND SPECIFICATION
4	MHT-101A	4TH FLOOR POE LIGHTING PLAN-PH 00
5	MHT-101B	4TH FLOOR POE LIGHTING PLAN-PH 00 - Circuit "a" Wiring ONLY
6	MHT-101C	4TH FLOOR POE LIGHTING PLAN-PH 00 - Circuit "b" Wiring ONLY
7	MHT-101D	4TH FLOOR POE LIGHTING PLAN-PH 00 - Node Cluster Callouts
8	MHT-101E	4TH FLOOR POE LIGHTING PLAN-PH 00 - Node Cluster Details
9	MHT-101F	4TH FLOOR POE LIGHTING PLAN-PH 00 - Control Zones
10	MHT-200	LIGHTING TECHNOLOGY DIAGRAM AND DETAILS
11	MHT-301	4TH FLOOR PSE SWITCH SHEDULE-PH 00

inspeXtor

MHT HOLDINGS

COVER PAGE

MHT 000



CONTROL LEGEND:

- 4-Button Wall Switch
- Remote Node
- Splitter
- PSE Switch
- NL Night Light Fixture
- OMS Occupancy Sensor
- OM11 Occupancy Sensor
- Cat 5/Cat 6 Cable - Luminaire
- Cat 5/Cat 6 Cable - Night Light Luminaire
- Cat 5/Cat 6 Cable - Control & Peripheral
- Cat 5/Cat 6 Cable - Node Cluster to PSE
- MHT-NODE - Access Panel
- Added Device

inspeXtor

PITTOCK BLOCK DATACENTER EXPANSION

MHT HOLDINGS

1961 RICHMOND TERRACE
STATEN ISLAND, NY 10302
718-524-4370

4TH FLOOR -PoE LIGHTING PLAN PH 00

ADAM

MHT 101A

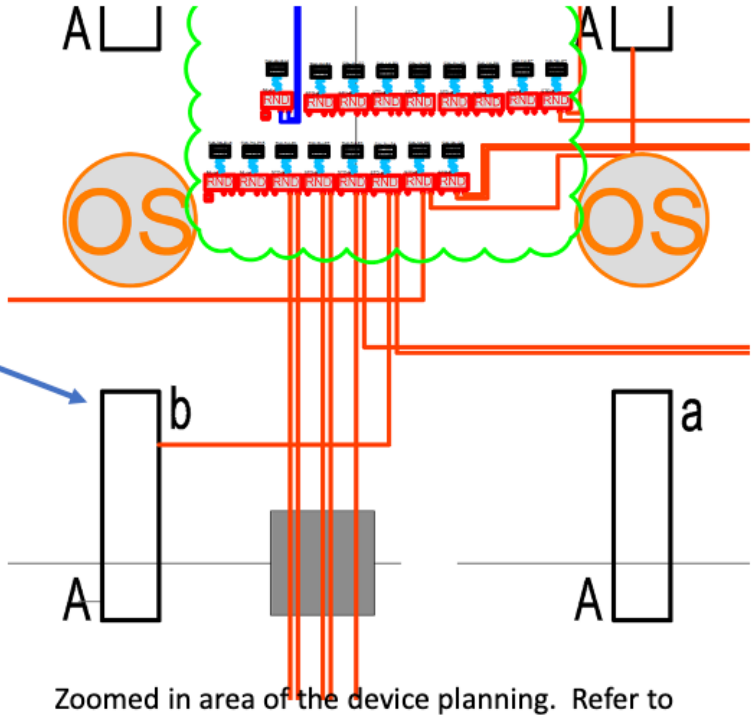
REV 02 05DEC2022

Device Planning Overview (Con't)

Do not attempt to install any fixtures without the device planning and pull schedule (more on this later).

In this example the **Type A** fixture is shown to connect to one of the remote nodes (RND). In this example, you can see that only one luminaire port is used.

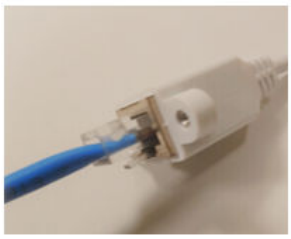
Notice that the 'small b' on the Type A fixture symbol denotes the server rack dedicated to the 'small b' fixtures. These Type A (small b) fixtures are on a separate circuit.



Zoomed in area of the device planning. Refer to page 6 (MHT 101C).

General Fixture Instructions:

Each fixture will have an RJ45 female adapter attached to it as shown above.



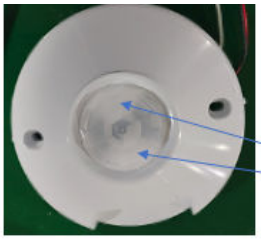
Connect one end of the CAT6 cable (not supplied) to the RJ45 female adapter on the fixture.

The other end of the CAT6 cable should be connected to the **Luminaire** port of the node.

Refer to the wiring diagram for more details.
Refer to the device planning for details on the fixture, nodes, sensors, and plan.
Only connect fixture cables to Luminaire ports of the node.
Cable Length is **NOT TO EXCEED 35'**

General Sensor Instructions:

CM9 sensor pictured above

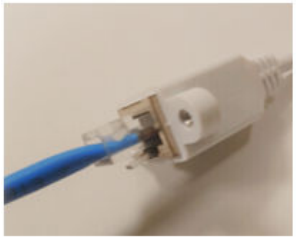


CM11 sensor pictured above

Two types of sensors are used for this project: CM9 and CM11.

Notice that the CM11 sensors look similar to the CM9 sensors but the difference is with the **IR blockers** (white colored). These CM11's are designed for use in hallways while the CM9's have 360 degree field of vision.

Each sensor will have an RJ45 female adapter attached.

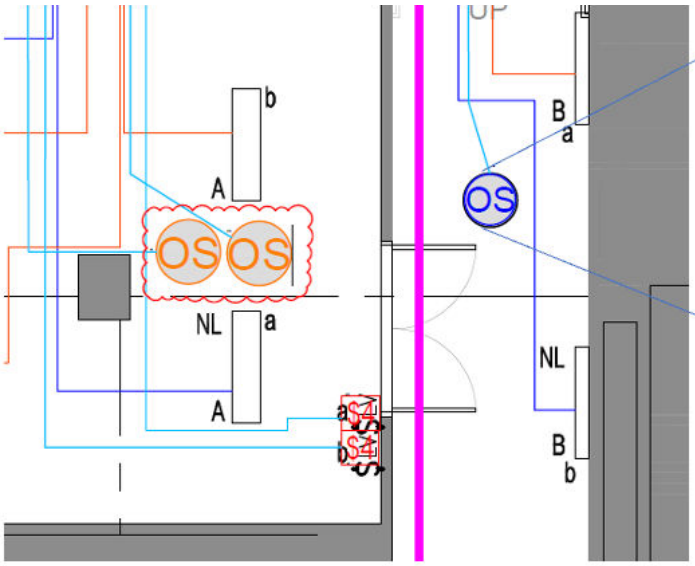


Connect one end of the CAT6 cable (not supplied) to the RJ45 female adapter on the sensor.

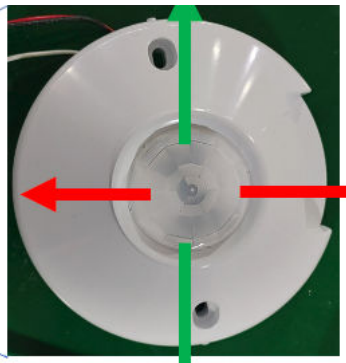
The other end of the CAT6 cable should be connected to the **CONTROLS** port of the node.

Refer to the wiring diagram for more details.
Refer to the device planning for details on the fixture, nodes, sensors, and plan.
Only connect fixture cables to CONTROLS ports of the node.
Cable Length is **NOT TO EXCEED 35'**

General Instructions for CM11 Sensor:



The Device plan is shown above (MHT 101D). Occupancy sensors (OS) symbols are either orange (CM9) or blue (CM11). CM9 sensors are used in office spaces while the CM11's are used in hallways.

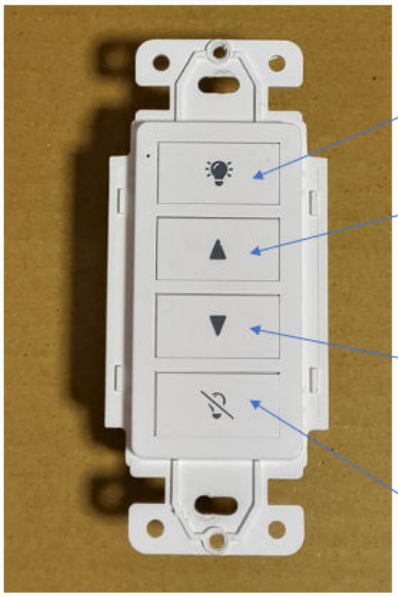


Blockers facing the walls

IR line of sight facing north and south of the hallway

In the example above, the CM11 sensor is correctly orientated. The **green** arrows show the line of sight of the IR. The CM11 sensor will need to be mounted in the ceiling of the hallway so that the blockers (**red**) are facing the walls of the hallway.

General Instructions for 4-Button Wall Switch:



ON Button- This Button is used to turn on the lights.

UP Dim Button- This button is used to increase the dimming level of the lights.

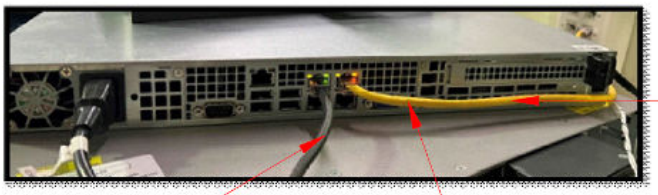
Down Dim Button- This button is used to decrease the dimming level of the lights.

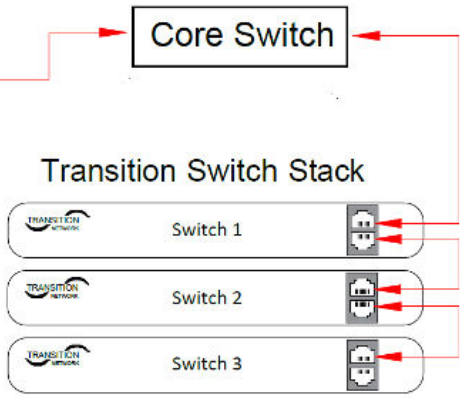
OFF Button- This Button is used to turn off the lights.

The above shows the **4-Button Wall switch**. Connect one end of the wall switch to the **CONTROLS** port of the node. Connect the other end of the CAT6 cable to the back the wall switch as shown. See wiring diagram if splitter is being used.

Overview of PSE Stack:

Back view of the Inspextor server





This remote access cable should come from the Internet Accessible Router that is on site

Ensure cable is connected from the Core switch to the back of the Inspextor server

Set Up Notes

1. The cable from the MHT Core Switch will connect to the back side of the Inspextor as shown above.
2. Another cable from the MHT Core Switch will connect to the first Transition switch which is connected in stack.
    - You can use 25th port of the Transition switch to connect this cable from the Core Switch.

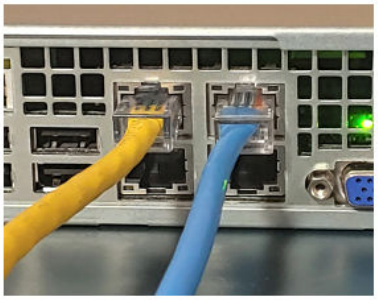
3. The Transition switch stack should be connected as shown above.

For example, as shown in our diagram above you can connect the 26th port of transition switch 1 to the 25th port of Transition switch 2. Then you can connect the 26th port of transition switch 2 to 25th port of transition switch 3 and you will keep doing this until switch stack ends. See following pages for more details.

General Instructions for Inspextor:

The InspeXtor hardware is used to control the entire lighting system on the job site and must be installed for proper functionality. The front is shown above.

Plug in the power cable as shown. The back is shown above.

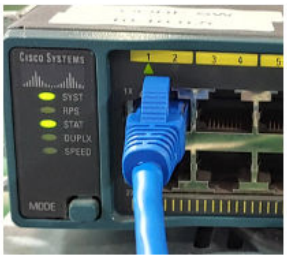


From the four ports in the middle/back side of the Inspextor:

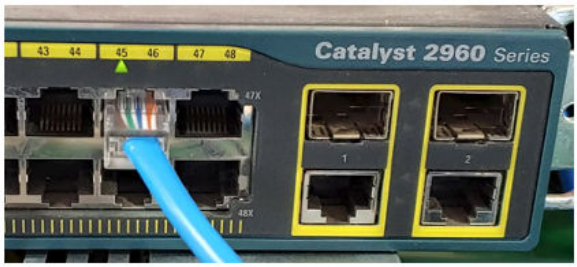
- Connect the **Core Switch** to the Inspextor using a CAT6 cable (see next page).
- Connect the **internet cable** to the Inspextor. This remote access cable should come from the Internet Accessible Router that is on site.

General Instructions for Core Switch (Catalyst 2960):

The picture above shows the core switch with CAT6 cables connected to the ports.



The first port was used to connect the CAT6 to the Inspextor (see previous page).



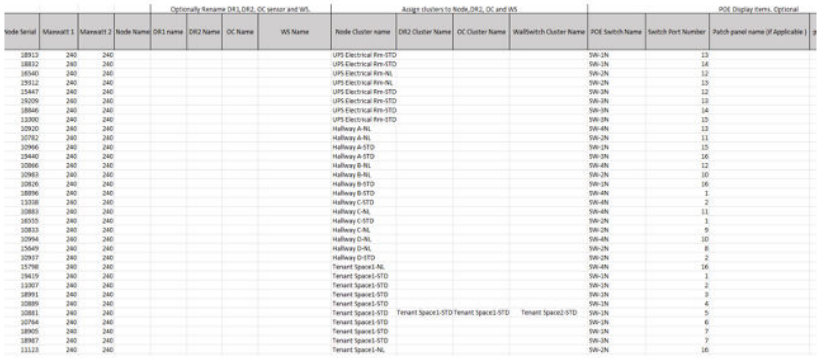
Connect a CAT6 cable from any of the ports to the Transition Switch (see next page).

General Instructions for Lantronix Switch:

The picture above shows the Lantronix/Transitions Switch with CAT6 cables connected to the ports.
Note that each of the four Lantronix/Transition Switches will be labeled. This one is labeled SW-4N.
This is a 26 port Lantronix/Transition switch. The first 24 ports can be used for POE. The remaining two ports (port 25 and 26) are to be used for the network stack.

The closeup view shows the CAT6 cables connected. Notice the ports used. **Refer to the PULL SCHEDULE** (separate document, see next page) to see which nodes the cables connect to. **The nodes are specifically labeled and they must connect to the designated ports in order for the system to work properly. Note that the 25th port is used to connect to another Lantronix/Transition switch (see previous page – Overview of PSE Stack).**

General Instructions for Lantronix Switch/Pull Schedule:



Here is a picture of the pull schedule. Notice that the serial numbers are listed along with the node cluster name, POE switch name, and switch port number.

The nodes are physically labeled with the serial numbers and cluster name. Here the cluster name is Hallway A-NL. The serial number is on the side of the node (not shown here).

The POE system was already pre-configured at the factory. For installation and connection of the nodes to the Transition switches, simply follow the connections listed on the pull schedule. **The nodes need to be connected to the specific POE switch and its corresponding ports listed on the pull schedule, otherwise the POE system will not function properly.**

Cable Prep Testing:

Test cables:

- After installing cables, it is critical to test these cables. If cables aren't working properly, our software will not effectively communicate with the Nodes and the fixtures will not operate as expected.
- Ensure that every cable is terminated correctly and passes functional testing.
- Please provide a cable testing report to MHT prior to installation.

Cable Prep – Labeling:

Each cable will be run from the POE switch to a Node Driver:

- One end of the cable will be connected to the **Transition switch**
- The other end should be connected to the **POE port of Node**.

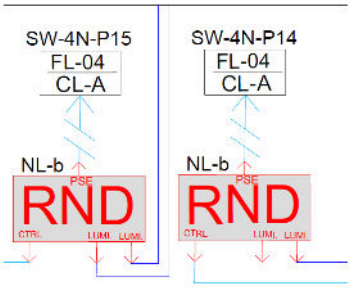
Labeling is very important for commissioning and for troubleshooting.

Label each cable on **both ends of the CAT6 cable** for easy identification. Refer to the Device planning and/or the pull schedule for label information.

Refer to the MHT Labeling Guide (separate document) for more details.

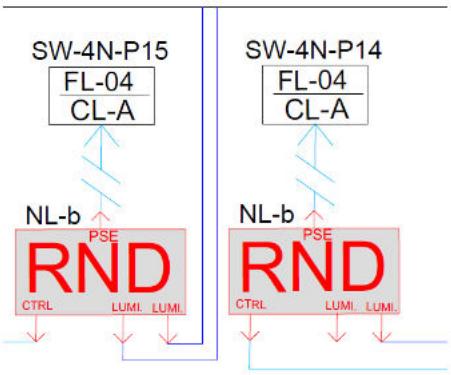
Example of a labeled CAT6 on the node side

Example of a labeled CAT6 on the Transition switch side



The addresses above the node symbols on the device planning can be used for labeling

Cable Prep – Labeling Addresses



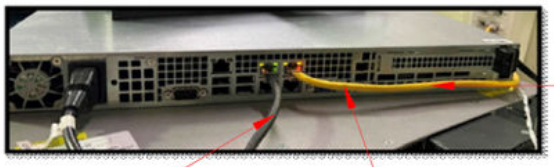
Check the device planning to get more information about the addresses.

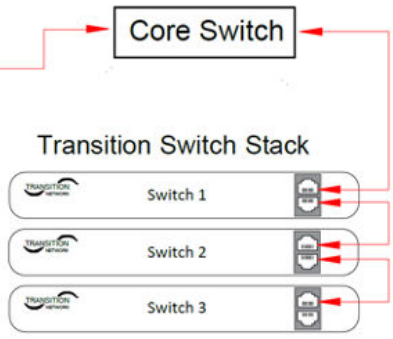
For example, SW-4N is the switch ID. P15 is the 15th port on that switch. It is located on the fourth floor (FL-04) and is in closet A (CL-A).

LOCATION: 4TH FL MECHANICAL ROOM IDF CLOSET			24 PORT SWITCH MAX WATTAGE (WATTS) :1800W Circuit "b"
PATCH PANEL #	24 PORT SWITCH #	PORT #	DISCRIPTION
PP-4N	SW-4N	P1	(2) TYPE B - CORRIDOR 401
PP-4N	SW-4N	P2	(2) TYPE B - CORRIDOR 401
PP-4N	SW-4N	P3	UNUSED PORT
PP-4N	SW-4N	P4	UNUSED PORT
PP-4N	SW-4N	P5	UNUSED PORT
PP-4N	SW-4N	P6	UNUSED PORT
PP-4N	SW-4N	P7	UNUSED PORT
PP-4N	SW-4N	P8	UNUSED PORT
PP-4N	SW-4N	P9	UNUSED PORT
PP-4N	SW-4N	P10	(2) TYPE B - CORRIDOR 401 - NL Fixture
PP-4N	SW-4N	P11	(1) TYPE B - CORRIDOR 401 - NL Fixture
PP-4N	SW-4N	P12	(1) TYPE B - CORRIDOR 401 - NL Fixture
PP-4N	SW-4N	P13	(1) TYPE B - CORRIDOR 401 - NL Fixture
PP-4N	SW-4N	P14	(1) TYPE A - TENANT SPACE 422 - NL Fixtures
PP-4N	SW-4N	P15	(2) TYPE A - TENANT SPACE 422 - NL Fixtures
PP-4N	SW-4N	P16	(2) TYPE A - TENANT SPACE 422 - NL Fixtures
PP-4N	SW-4N	P17	UNUSED PORT
PP-4N	SW-4N	P18	UNUSED PORT
PP-4N	SW-4N	P19	UNUSED PORT
PP-4N	SW-4N	P20	UNUSED PORT
PP-4N	SW-4N	P21	UNUSED PORT
PP-4N	SW-4N	P22	UNUSED PORT
PP-4N	SW-4N	P23	UNUSED PORT
PP-4N	SW-4N	P24	UNUSED PORT

External Access:

Back view of the Inspextor server





This remote access cable should come from the Internet Accessible Router that is on site

Ensure cable is connected from the Core switch to the back of the Inspextor server

External Access is necessary when remote troubleshooting is required or for automatic updates to our lighting server. Ensure that the PSE stack is connected as shown above. **Refer to the MHT Setup Instructions for External Access document for more details.**

Port Forward Information

We need to have web Access and SSH access to our server.

- To enable web access to our server, forward internal port 80 to any available external port.
- For SSH Access, forward internal port 22 to any available external port.
- Once port forwarding is done, please provide the public IP with forwarded ports so that we can access the Inspextor remotely.