VERTICAL EXPRESS

Two-Way Emergency Communications System Installation Manual

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Published January, 2022
First Edition
Printed in the United States of America

Manual Number: 88700 v.1.0

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Safety Precautions

IMPORTANT!

Read this page before any work is performed on elevator equipment. The procedures contained in this manual are intended for the use of qualified elevator personnel. In the interest of your personal safety and the safety of others, do not attempt any procedure that you are not qualified to perform.

All procedures must be accomplished in accordance with the applicable rules in the latest edition of the National Electrical Code, the latest edition of ASME A17.1, and any governing local codes.

Terms in This Manual

CAUTION

CAUTION statements identify conditions that may result in damage to the equipment or other property if improper procedures are followed.

WARNING

WARNING statements identify conditions that may result in personal injury if improper procedures are followed.

General Safety

CAUTION

Before applying power to the controller, check that all manufacturing wire connections are tight on relays, contactors, fuse blocks, resistors, and terminals on boards and DIN rail terminals. Connections loosened during shipment may cause damage or intermittent operation.

Other specific warnings and cautions are found where applicable and do not appear in this summary. See the *Employee Safety and Accident Prevention Program Manual* and the *Elevator Industry Field Employees' Safety Handbook* for electrical equipment safety information on installation and service.

Electrical Safety

All wiring must be in accordance with the National Electrical Code and be consistent with all state and local codes.

Use the Proper Fuse

To avoid fire hazards, use only the correct type fuse, voltage, and current rating. See the job specific drawings sheet (Power Supplies) for fusing information.

Electric shocks can cause personal injury or loss of life. Circuit breakers, switches, and fuses may not disconnect all power to the equipment. Always refer to the wiring diagrams. Whether the AC supply is grounded or not, high voltage will be present at many points.

Electrical Safety
(continued)

Printed Circuit Boards

Printed circuit boards may be damaged if removed or installed in the circuit while applying power. Before installation and/or removing printed circuit boards, secure all power. Always store and ship printed circuit boards in separate static bags.

Mainline Disconnect

Unless otherwise directed, always Turn OFF, Lockout, and Tagout the mainline disconnect to remove power from elevator equipment. Before proceeding, confirm that the equipment is de-energized with a volt meter. Refer to the *Employees' Safety and Accident Prevention Program Manual* for the required procedure.

When Power Is On

To avoid personal injury, do not touch exposed electrical connections or components while power is ON.

Test Equipment Safety

Always refer to manufacturers' instruction book for proper test equipment operation and adjustments.

Buzzer-type continuity testers can damage electronic components. Connection of devices such as voltmeters on certain low level analog circuits may degrade electronic system performance. Always use a voltmeter with a minimum impedance of 1 M Ohm/Volt. A digital voltmeter is recommended.

Mechanical Safety

See the *Employees' Safety and Accident Prevention Program Manual* and the *Elevator Industry Field Employees' Safety Handbook* for mechanical equipment safety information on installation and service.

Power Unit Fluid System

If working on the power unit fluid system, the static car weight is applying pressure to the jack and valve system and this stored pressure is present at the power unit.

Before working on any component of the power unit, do one of the following:

- Manually lower the car onto the buffers to relieve the stored pressure.
- Close the machine room oil line shutoff valve, and then release the power unit pressure by momentarily opening the manual lowering adjuster valve.

Arrival of Equipment

Receiving

Upon arrival of the equipment, inspect it for damage. Promptly report all visible damage to the carrier. All shipping damage claims must be filed with the carrier.

Storing

During storage in a warehouse or on the job site, precautions should be taken to protect the equipment from dust, dirt, moisture, and temperature extremes.

Static Protection Guidelines

IMPORTANT! **Read this page before working with electronic circuit boards.**

Elevator systems use electronic circuit boards to control various functions of the elevator. These boards have components that are extremely sensitive to electrostatic voltage, which can cause board damage or failure.

Proper handling and shipping of boards is important to ensure their reliability and long-term operation. For this reason, manufacturing bases warranty decisions on the guidelines below.

Handling

- Store boards in separate, sealed, anti-static bags until time for installation.
- When handling boards, wear an anti-static wrist strap with ground wire. Acceptable straps are available through local electronics parts suppliers. Typical anti-static wrist straps are intended for applications below 240 VAC.
- Do not place boards on any surface without adequate static protection.
- Handle boards only by their edges using proper anti-static techniques. Avoid touching components, traces, and connectors.
- Take extra care when handling individual components, such as integrated chips, metal oxide semiconductors, and field-effect transistors. These components can be destroyed with as little as 30 volts of electrostatic discharge.

Shipping

- Complete the included board discrepancy sheet.
- Any board returned to manufacturing must be packaged in a closed, sealed anti-static bag designed for the board, and packaged in a sturdy protective shipping carton.
- Clear bubble wrap and Styrofoam are unacceptable packing materials.

Failure to adhere to the above guidelines will void the board warranty.

Access and Egress Procedures

The access and egress procedures that are used entering the hoistway determine whether or not power is needed to perform the required task(s). If not, Turn OFF, Lockout, and Tagout the mainline disconnect.

WARNING **DO NOT stand on the car top emergency access cover.**

Car Top Safety

Safety Precautions When Accessing/Egressing Car Tops

- Before opening the hoistway door, ensure that the correct hoistway has been selected and that the car is at the proper floor (to avoid a fall hazard).
- Access car tops from the top terminal landing whenever possible.
- Never access a hoistway, unless a reliable method of controlling the car has been determined.
- Locate the emergency stop switch.
- Before accessing the car top, place the stop switch in the STOP position, and confirm the proper operation.
- Locate a safe refuge area.
- Always maintain control of the hoistways doors during access/egress.
- Fall protection is to be used when a fall hazard exists. The only exception to this is when routine maintenance is being performed on top of complete, operational elevator cars, Do Not use fall protection where there is a greater risk of entanglement.
- When opening hoistway doors from the car top, do so slowly, so that no one steps in from the landing thinking a car has arrived.
- Observe overhead clearances.
- Use extra care when working on car tops that are curved, domed, or located in unenclosed hoistways.

WARNING **DO NOT turn the following switches to Automatic Operation until the hoistway door interlock is open–and remains open–and the hoistway is empty.**

- When egressing the hoistway/car top, ensure that the stop switch is in the STOP position, and that the inspection switch is on Inspection Operation.

Access and Egress Procedures
(continued)

Safety Precautions When Working on Car Tops

CAUTION **DO NOT attach electrical cords on the car or counterweight ropes.**

- Before beginning work, check the car top for oil or grease, and clean as required.
- Locate the position and counterweights of the car being accessed, as well as any other cars/counterweights in the vicinity. Take appropriate measures to avoid hazards.
- Verify proper operation of the top-of-car inspection operating buttons. Where outlets are provided, use a grounded, portable light with a suitable, non-conductive; or use a grounded lamp guard and reflector.

Pit Safety

Before entering a pit, ensure that every employee is aware of the hazards. Some common hazards are:

- Recognized refuge space
- Inadequate lighting
- Improper access
- Tripping hazards
- Improper use of pit ladders
- Moisture/water/fluid
- Moving equipment

Safety Precautions Before Entering a Pit

Take appropriate steps to minimize the following hazards and any others that are identified, such as:

- Locate the position of the car being accessed, as well as any other cars in the vicinity.
- Before accessing the pit, the car MUST be located high enough to allow the placement of the pit prop pipe stands to be inserted into the buffers.
- Once the pit is initially accessed, the pit props must be installed and the oil line shutoff valve closed to prevent car movement.
- Obtain control of the car.
- Identify a refuge space.
- If movement of the elevator is not needed to complete the work being performed, Turn OFF, Lockout, and Tagout procedures are required.

Access and Egress Procedures
(continued)

Safety Precautions Before Entering a Pit *(continued)*

- If notified by the building owner or representative that the pit and/or hoistway has been classified as a Permit Required Confined Space (this notification could be verbal or the pit/hoistway may be labeled), contact the appropriate person for authorization. In either case, do not enter the pit/hoistway until authorization is received.

Safety Precautions When Working In Pits

- Before entering a pit, test and verify the door lock circuit and stop switch circuit.
- Ensure that all portable lights and tools are connected through a ground fault (GFCI).
- Take care to protect all lighting from damage.
- DO NOT work in a pit with standing water.
- Before climbing, always examine shoes for fluid/grease.
- Use both hands when working with ladders and also when accessing and egressing a pit.
- Be aware of moving equipment (e.g., pump, motors, belts, and sheaves), and ensure that clothing and hands cannot get caught in them.
- Avoid smoking or the use of open flames in the pit.

Overview

The Two-Way Emergency Communications (TWC) System provides video and two-way text capabilities required by the IBC 2018 and ASME A17.1-2019* code. The TWC System does not effect Rath® two-way voice communications.

**IBC 2018 and ASME A17.1-2019/CSA B44-19 Safety Code requires live video and text messaging between passengers and emergency personnel.*

System Features

- Two-way video and text communications
- Internet Protocol (IP) network camera monitors the car's interior
- Uses existing analog ADA phones for two-way voice communication
- Expandable Video & Messaging Systems per building
- Provides Ethernet to the car
- Four hour battery backup

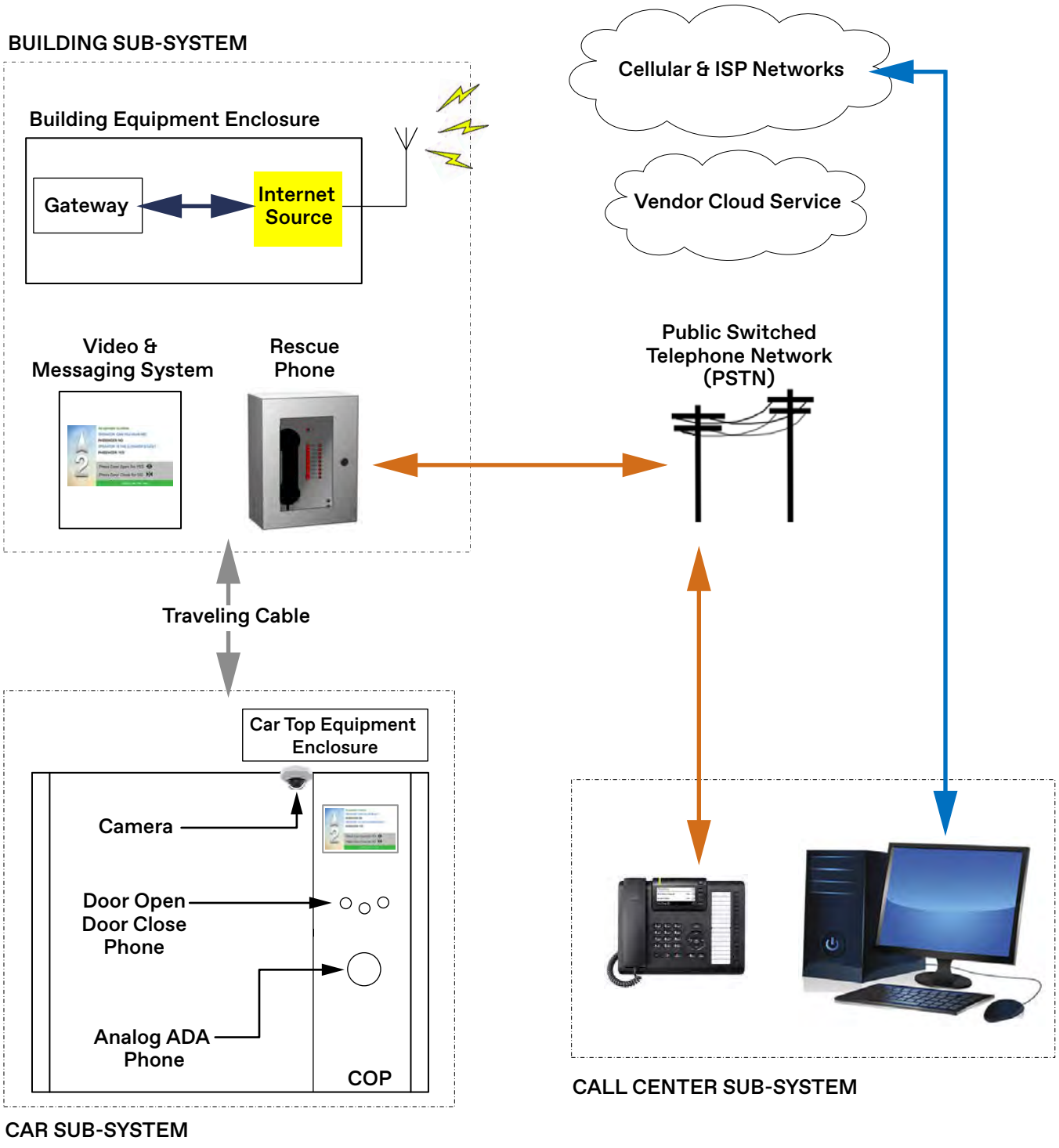
System Acronyms

Acronym	Term
TWC	Two-Way Emergency Communications System
VMS	MosaicONE Video & Messaging System (mfg. by MAD Elevator Inc.)
PEB	Primary Equipment Box
REB	Remote Equipment Box
EXB	Equipment Expansion Box
CTB	Car Top Box
LCP	Local Communications Panel
LAN 1	Emergency Communications LAN
COP	Car Operating Panel
MR	Standard Machine Room
MRL	Machine Room Less - Controller in Control Room
TMRL	True Machine Room Less - Controller in Jamb

System Overview
(continued)

System Example

(simplex shown)



Equipment Overview

Building Equipment Boxes

Each building equipment box can support up to four cars. The boxes are designed to be stacked together, each box receiving power from the previous box in the stack.

Primary Equipment Box Assembly (PEB) - 2104DL (54 lbs., 28" x 22" x 3.5")

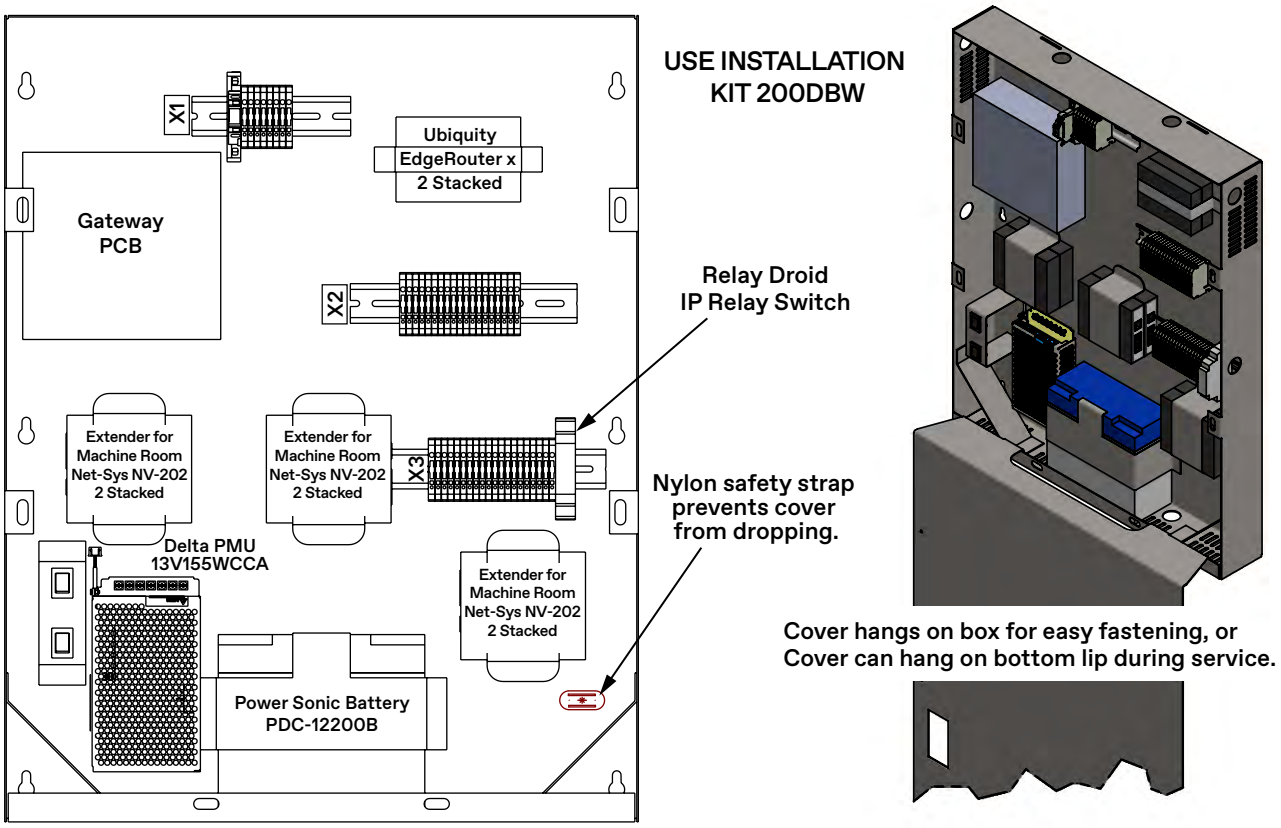
The PEB is powered from a dedicated (120VAC-20A) circuit breaker or fused disconnect provided by the building. Only one PEB is required per group for up to 8 cars.

Contents:

- Gateway - manages the TWC System
- Ethernet router - establishes the Emergency Communications LAN (LAN 1)
- Ethernet extenders (up to six) - provide Ethernet to the cars
- UPS with battery backup.

Provides power for:

- Equipment Expansion Box (EXB)
- First Communications Panel (LCP#1)



Building Equipment Boxes
(continued)

Equipment Expansion Box Assembly (EXB) - 2104DK (45 lbs., 22.5" x 22.6" x 3.5")

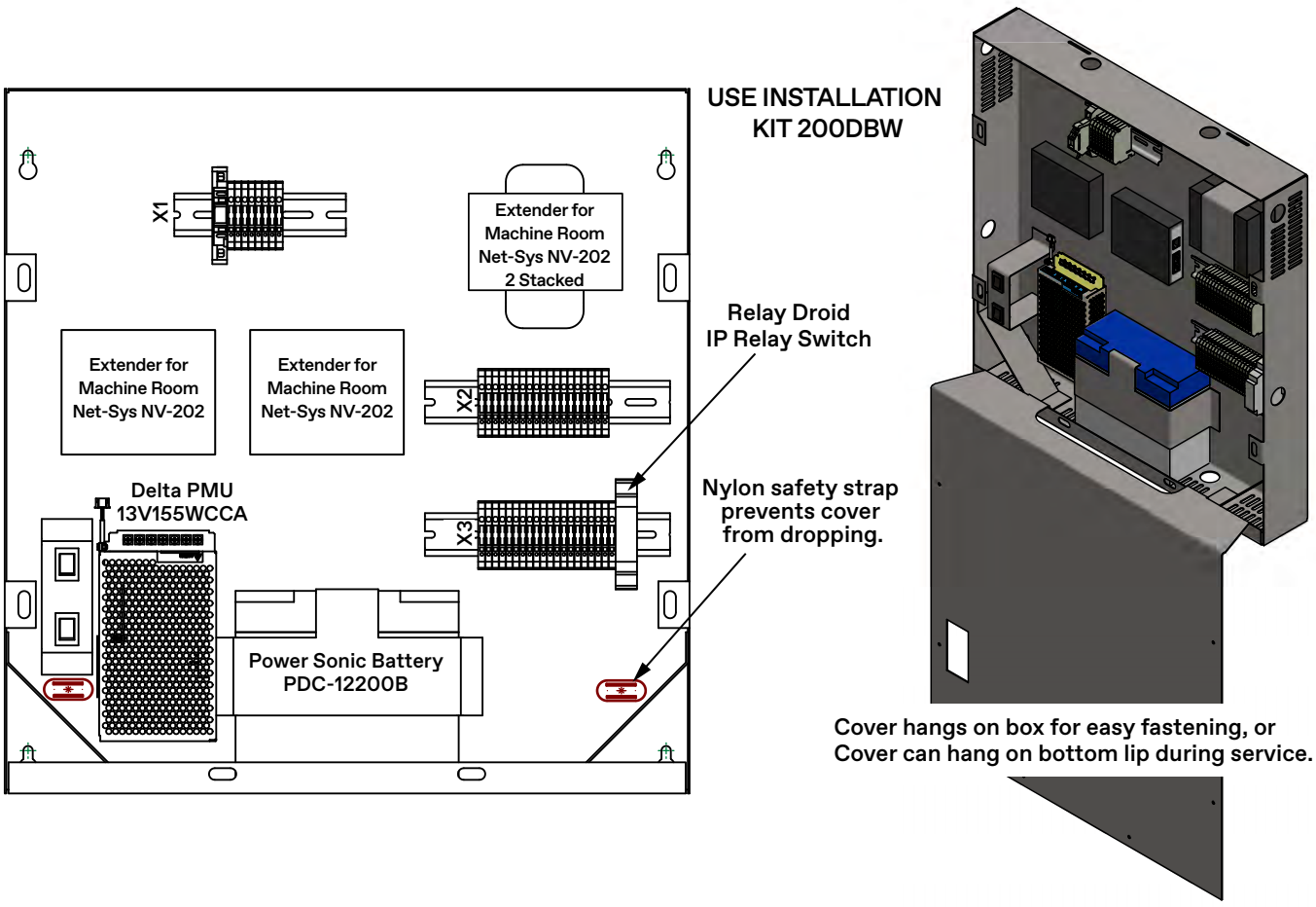
The EXB is powered from the power source in the primary equipment box with a UPS with battery backup, and it contains a variable number of Ethernet extenders to provide Ethernet for up to four additional cars.

Contents:

- Ethernet extenders (up to four) - provides Ethernet to the cars.
- UPS with battery backup.

Additional information:

- Supports up to four cars per EXB.
- Emergency Communications LAN Connection and power from PEB.
- Can provide two-way emergency communications for additional one to four cars.



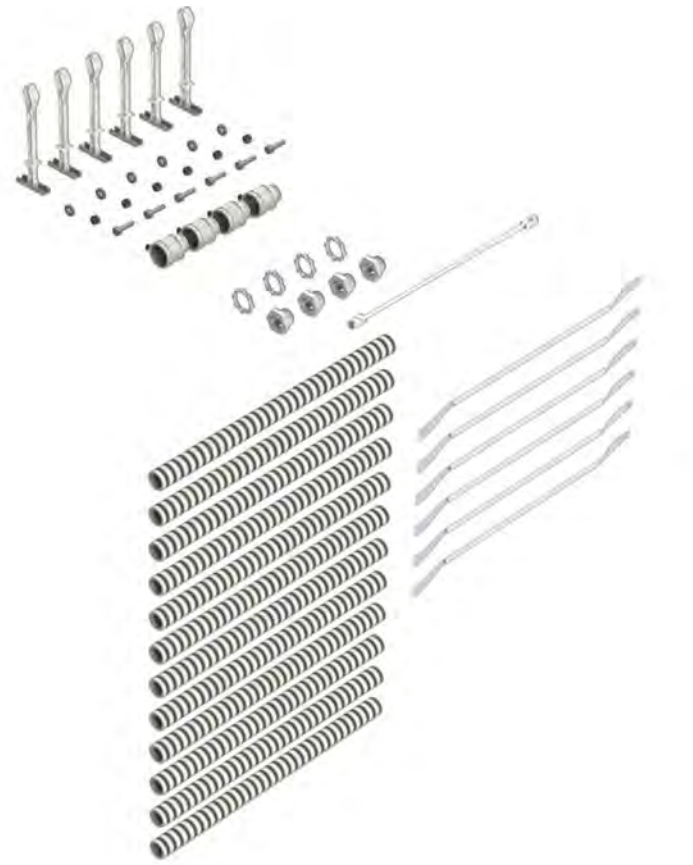
Building Equipment Boxes
(continued)

Installation Kit for Building Equipment Boxes - 200DBW

Use with: 2104DL, 2104DK, and 499AHW

Use if mounting equipment box to:

- Concrete
- Unistrut
- Drywall
- Hoistway with divider beam



200DBW

Item	Qty.	Part No.	Description
1	6	220JF001	6 ft. conductor cable
2	1	220DK10	10 ft. Cat5 cable assembly
3	4	286AJ21	$^{1}/_{2}$" chase nipple conduit/fittings
4	4	286AJ22	$^{3}/_{4}$" locknut conduit/fittings
5	12	286AJ12	$^{3}/_{4}$" flex aluminum conduit/fittings
6	4	286AJ14	$^{3}/_{4}$" straight flex connector
7	6	145154	$^{1}/_{4}$" x $2^{1}/_{4}$" anchor
8	6	700324	Hex head cap screw
9	6	700562	Nut
10	6	399AX3	Washer
11	6	390AG1	Toggle anchor

Building Equipment Boxes
(continued)

Local Communications Panel Assembly (LCP) - 2104DM (45 lbs., 27" x 13.5" x 3.5")

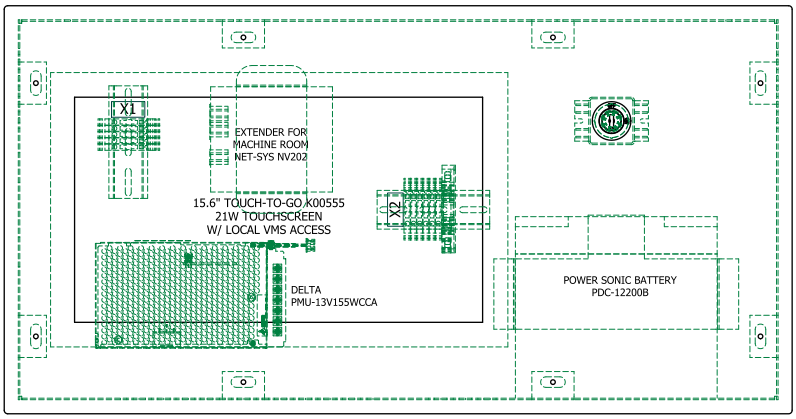
The LCP assembly allows authorized local personnel to view the interior of the car and to communicate (via two-way text) to passengers in the car. The LCP is required when elevator travel is equal to or greater than 60 feet, or is provided by request.

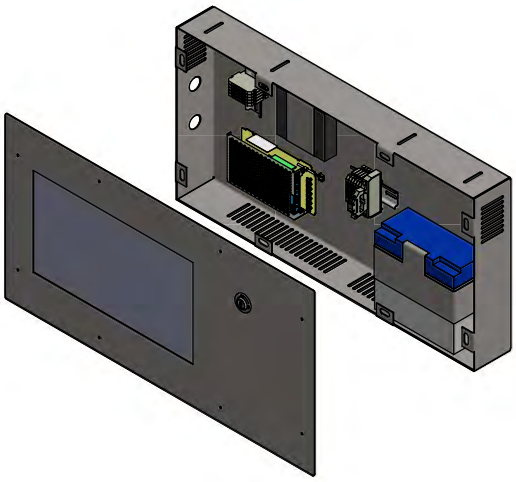
The LCP is powered by the power source in the primary equipment box. Units to be installed in an unsecured area are equipped with a Class 2 security key switch.

Contents:

- Ethernet extender is required if LCP located more than 300 feet from primary or remote equipment boxes.
- UPS with battery backup.
- Touch screen computer display.

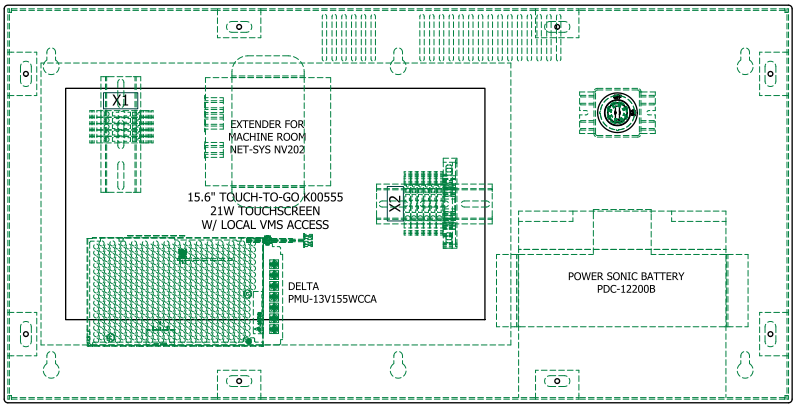
Surface Mount (machine room location)

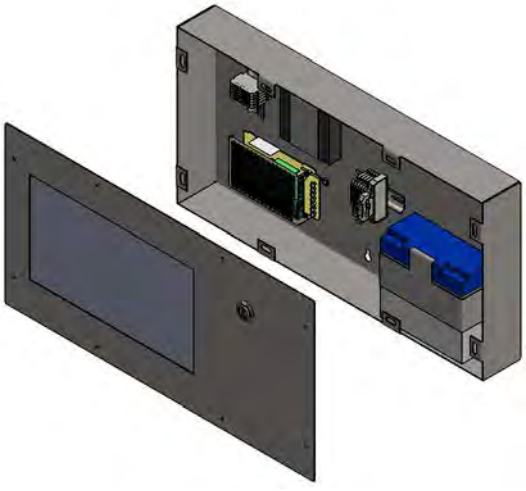




USE INSTALLATION KIT 200DBY

Flush Mount (hallway or lobby location)



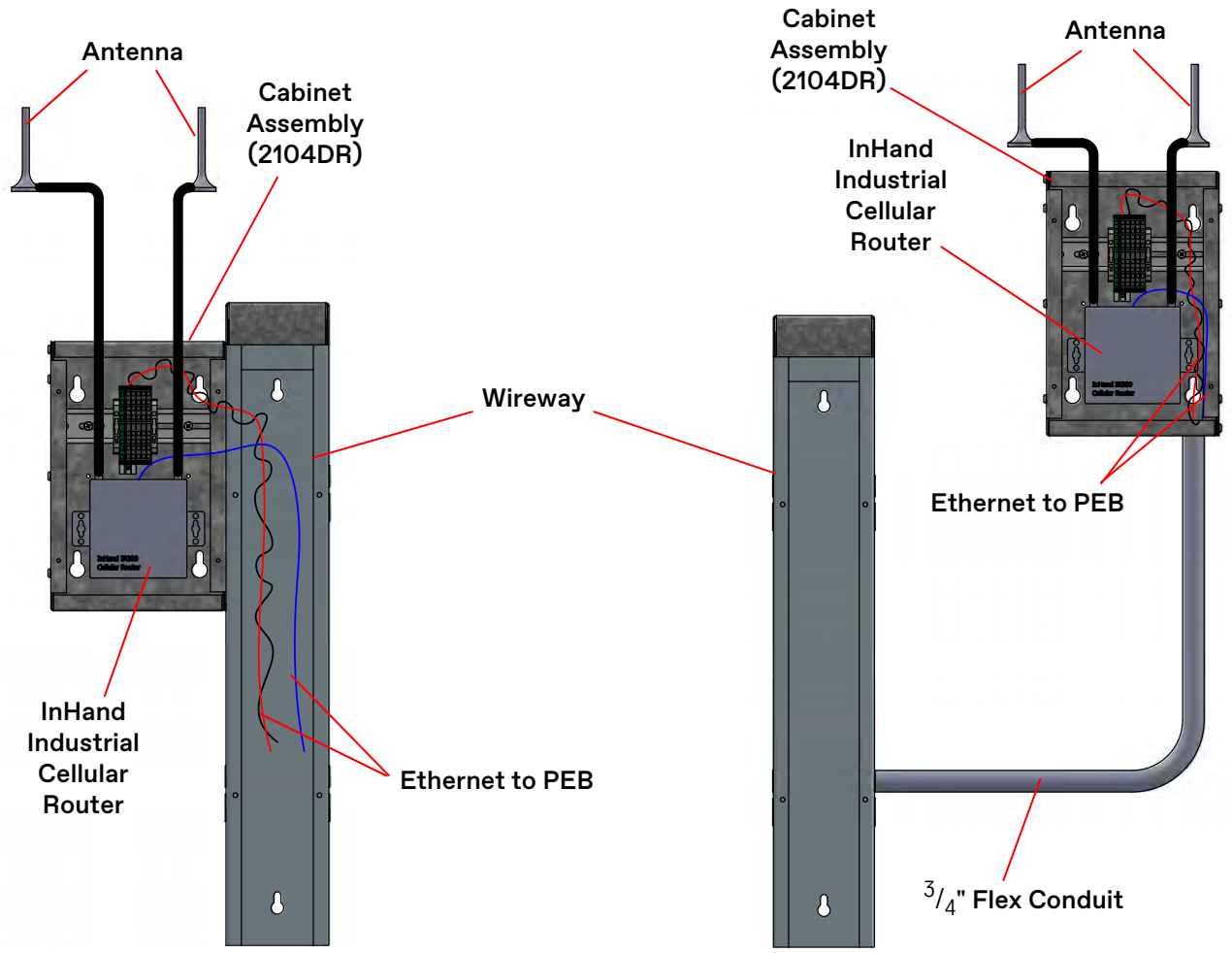


Local Communications Panel (LCP) - 2104DM
(continued)

Installation Kit for Local Communications Panel (LCP) - 200DBY

Item	Qty	Part No.	Description
1	6	145154	$^1/_4$" x $2^1/_4$" anchor
2	6	700324	Hex head cap screw
3	6	700562	Nut
4	6	399AX3	Washer
5	6	390AG1	Toggle anchor
Use with: 499AHX			

MAD Cellular Router Installation Kit (200DCX)



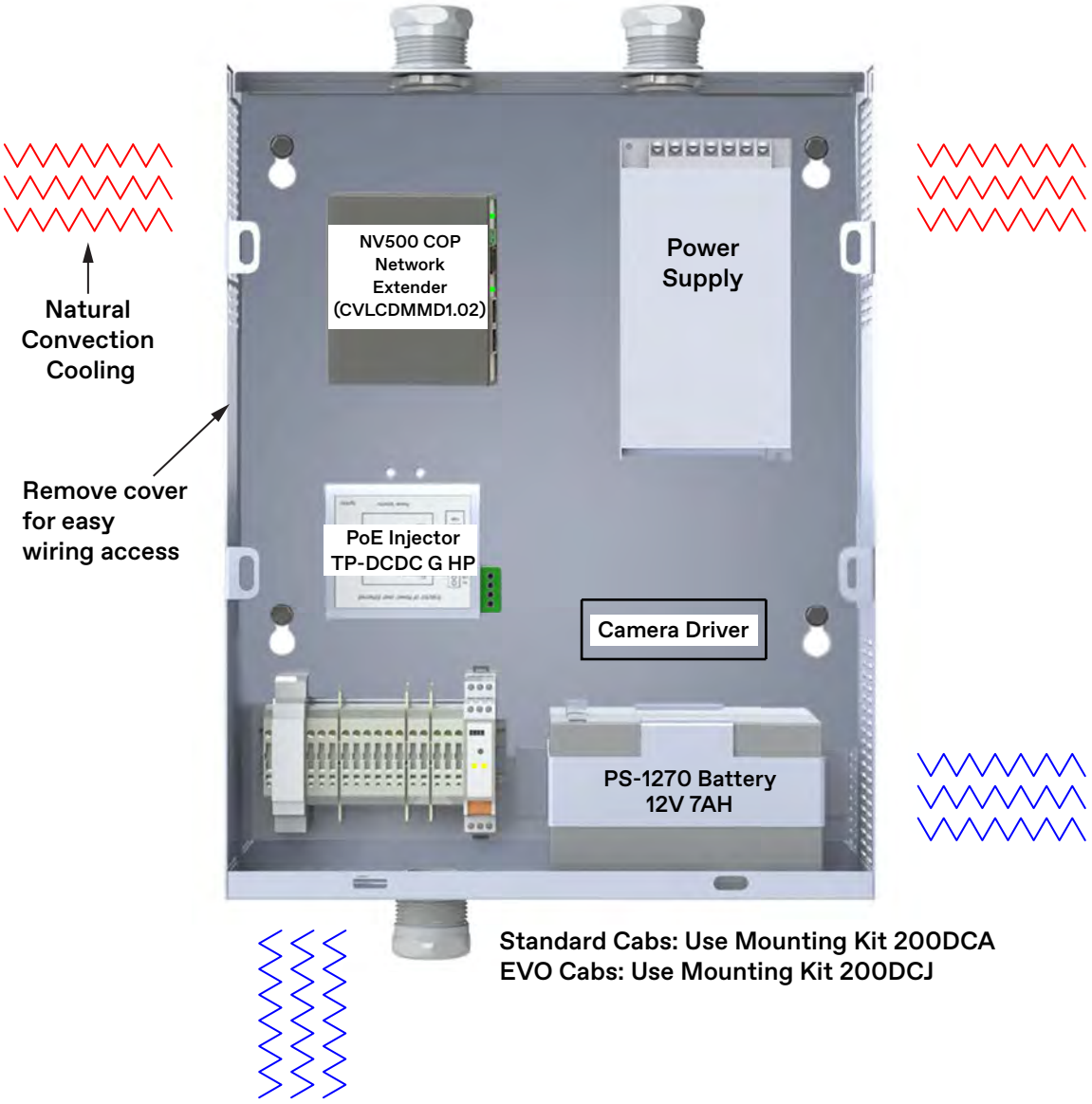
Equipment Overview
(continued)

Car Top Box Assembly (CTB) - 2104DJ

The car top box assembly contains system components needed for the car. It is powered from 120VAC on the car (AC1A and AC2) and supplies power to the components it contains, the Matisse PI unit, and the camera. The CTB is located on the car top handrail, or on the car top if no handrail is provided.

Contents:

- Ethernet extender.
- UPS with battery backup.
- PoE unit for camera.



Equipment Overview
(continued)

Matisse Position Indicator (PI) Signal Fixture - 178NH

The Matisse PI is a multimedia user interface with a 10" screen. The PI is mounted in the COP, and powered through the UPS in the COP.

Additional information:

- Communicates to the controller via CAN for position information and service modes.
- Connected to the gateway through the Emergency Communication LAN.

Internet Protocol (IP) Network Camera - 285CT

The camera is mounted at the top corner of the elevator car, and has a wide-angle view (100% of the car floor) with an adjustable lens. The camera is connected by a Cat5 cable, and receives power through PoE in the car top box.

Matisse Position Indicator (PI) Signal Fixture - 178NH

Internet Protocol (IP) Network Camera - 285CT

Network Connection Monitoring

Internet Protocol (IP) I/O Module (relaydroid) - 285DB

Overview

The IP Relay I/O Module (relaydroid) is located in the PEB, wires directly to the I/O board in the controller, and monitors the Ethernet connections between the camera, the Matisse PI, the Gateway, and the entire MosaicOne System. See Figure 1.

- If the Ethernet connection is lost, the relaydroid activates the Communications Failure signal (flashing hall indicator) that will continue to flash until the Ethernet connection is restored.
- If the Ethernet connection is interrupted, the system waits 15 minutes before activating the flashing hall indicator. The 15 minute delay prevents indicator activation due to false or momentary Ethernet connection interruptions.
- When the Ethernet connection is restored and stable, the flashing hall indicator automatically deactivates.

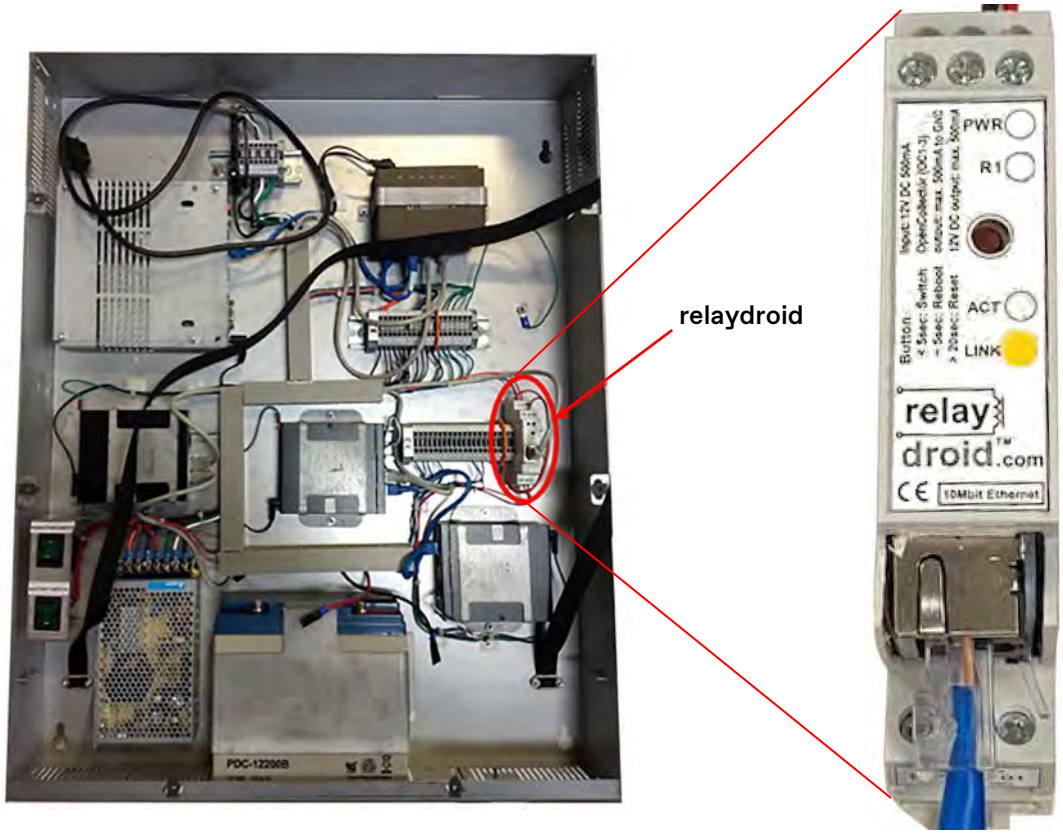
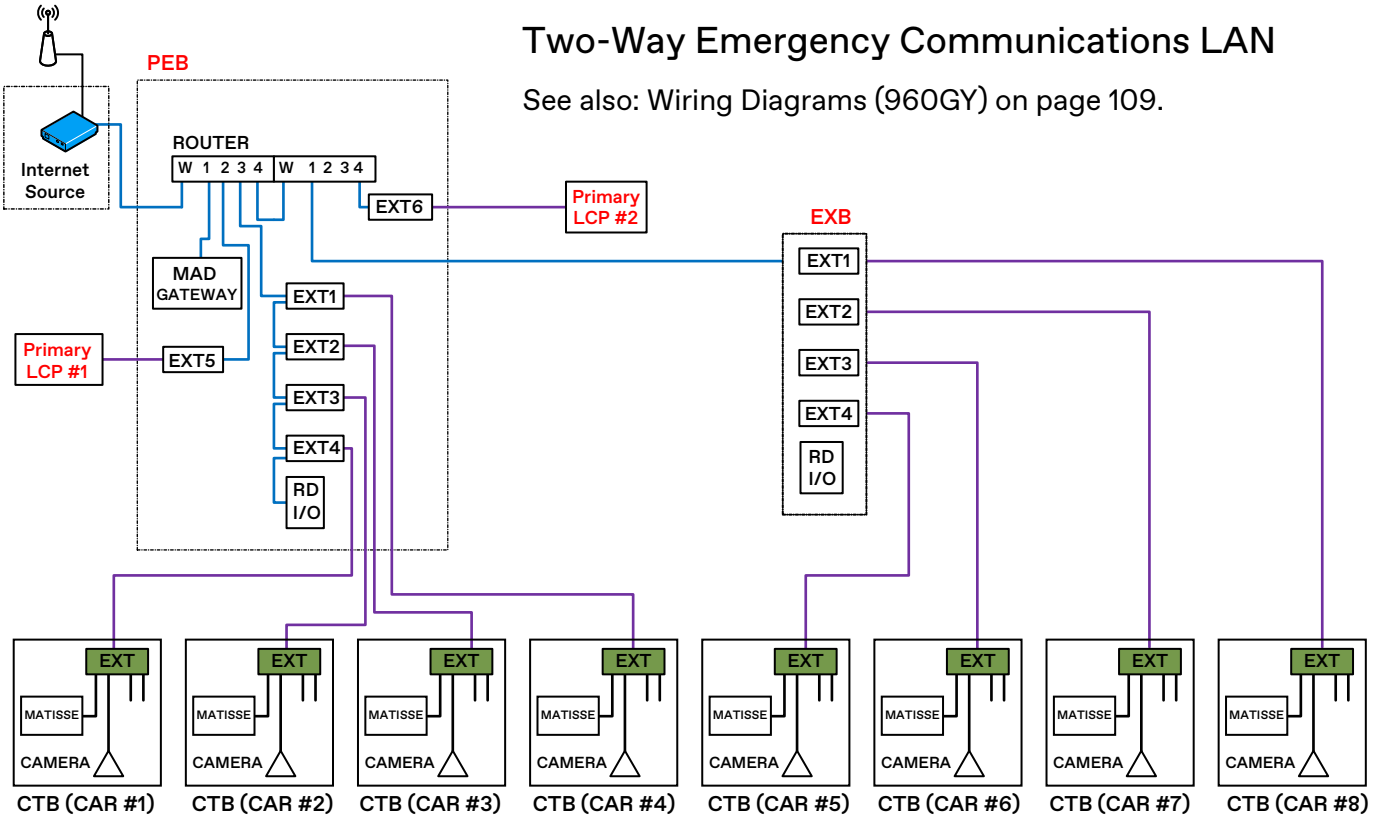


Figure 1 -Internet Protocol I/O Module (relaydroid)

Network Configurations

Emergency Communications LAN (LAN 1)

The TWC System requires a separate local area network—LAN 1—or Emergency Communications LAN, established by the router contained in the PEB; all devices must link back to the PEB.



Two-Way Emergency Communications LAN

See also: Wiring Diagrams (960GY) on page 109.

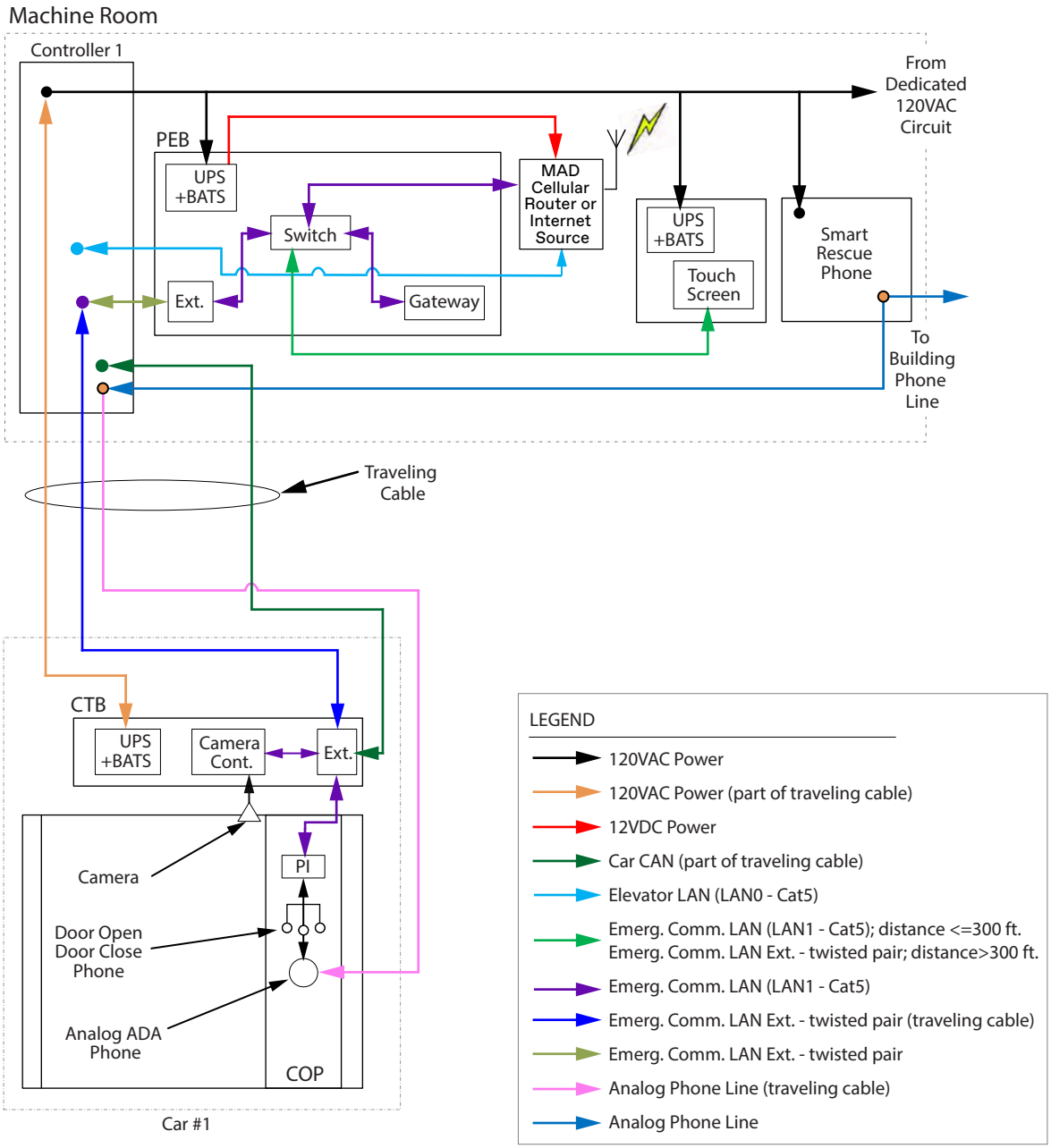
- The group supports 8 cars (4 cars per PEB, 4 cars per EXB).
- Each controller/car will connect back to the specific EXT of PEB or EXB in group.
- If job/group has a net travel < 60 ft., network diagram should not have LCP (VMS).
- If job/group requires a second LCP, it will connect to the PEB.

IMPORTANT!

- **Only LAN1 on the Standalone MAX V2 connects to TWC.**
- **Only LAN0 on the Standalone MAX V2 connects to TKE controllers, and is used to link all controllers to the Standalone MAX V2 via the Group Ethernet Box (GEB).**
- **Each MAD VMS system that is used must have its own LAN.**
- **If multiple MAD VMS systems are used within the same building, their LANS must not be connected together.**

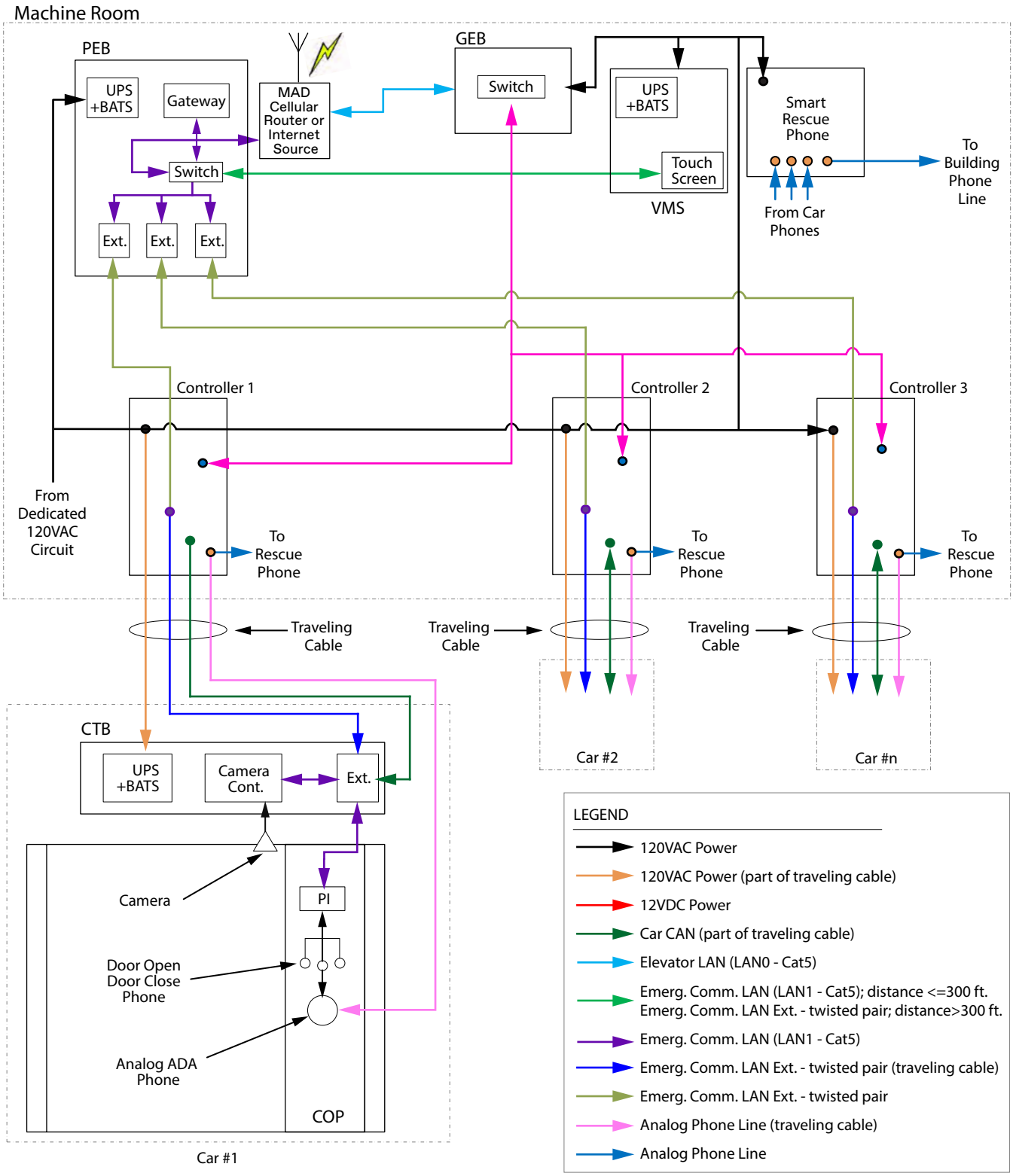
Standard Machine Room TWC Network Configuration (typ.)

Traction, Simplex or Single Car, Total Cars <=4, Travel => 60 Feet



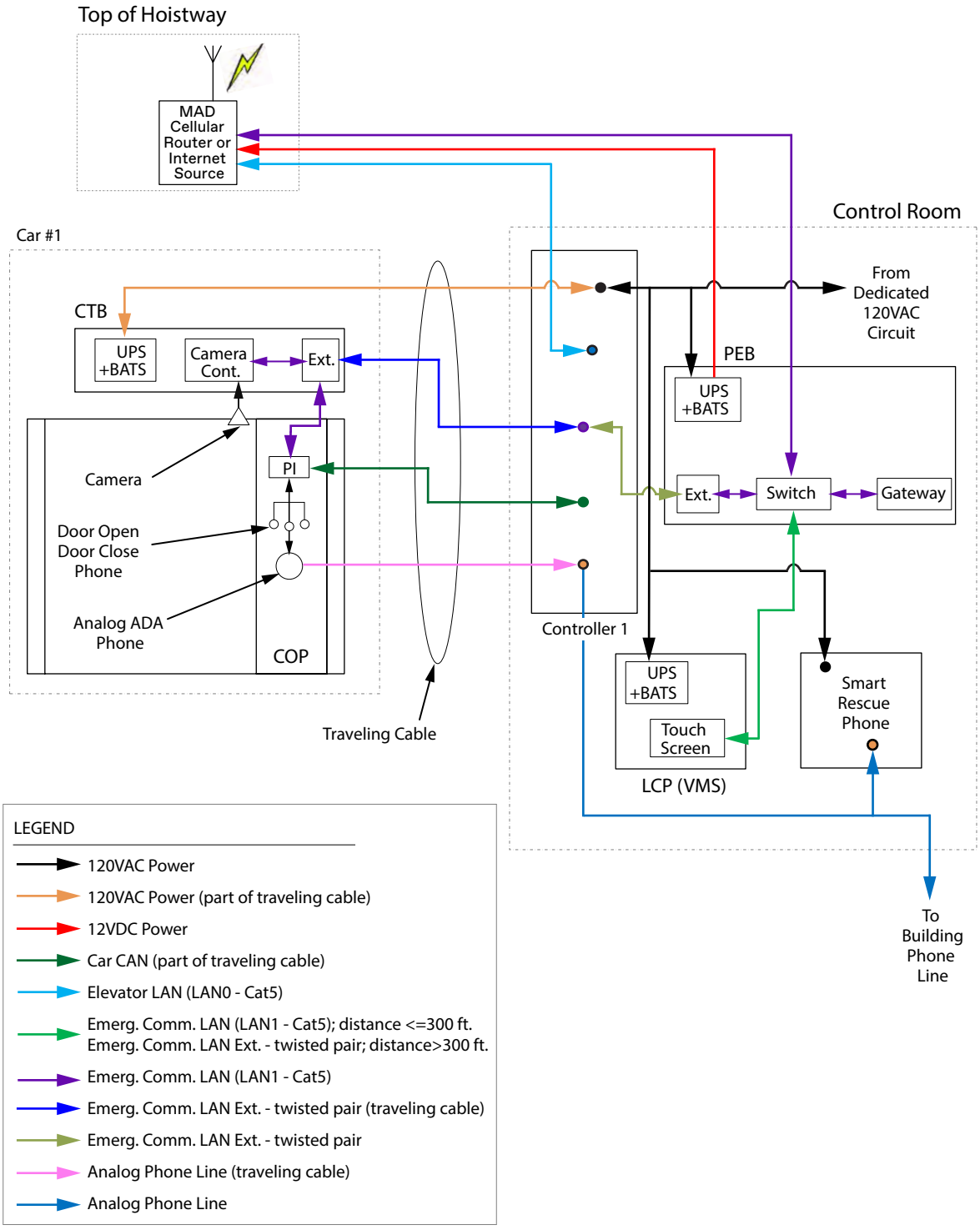
Standard Machine Room TWC Network Configuration (typical)
(continued)

Traction, Single Group, Total Cars <=8, Travel => 60 feet



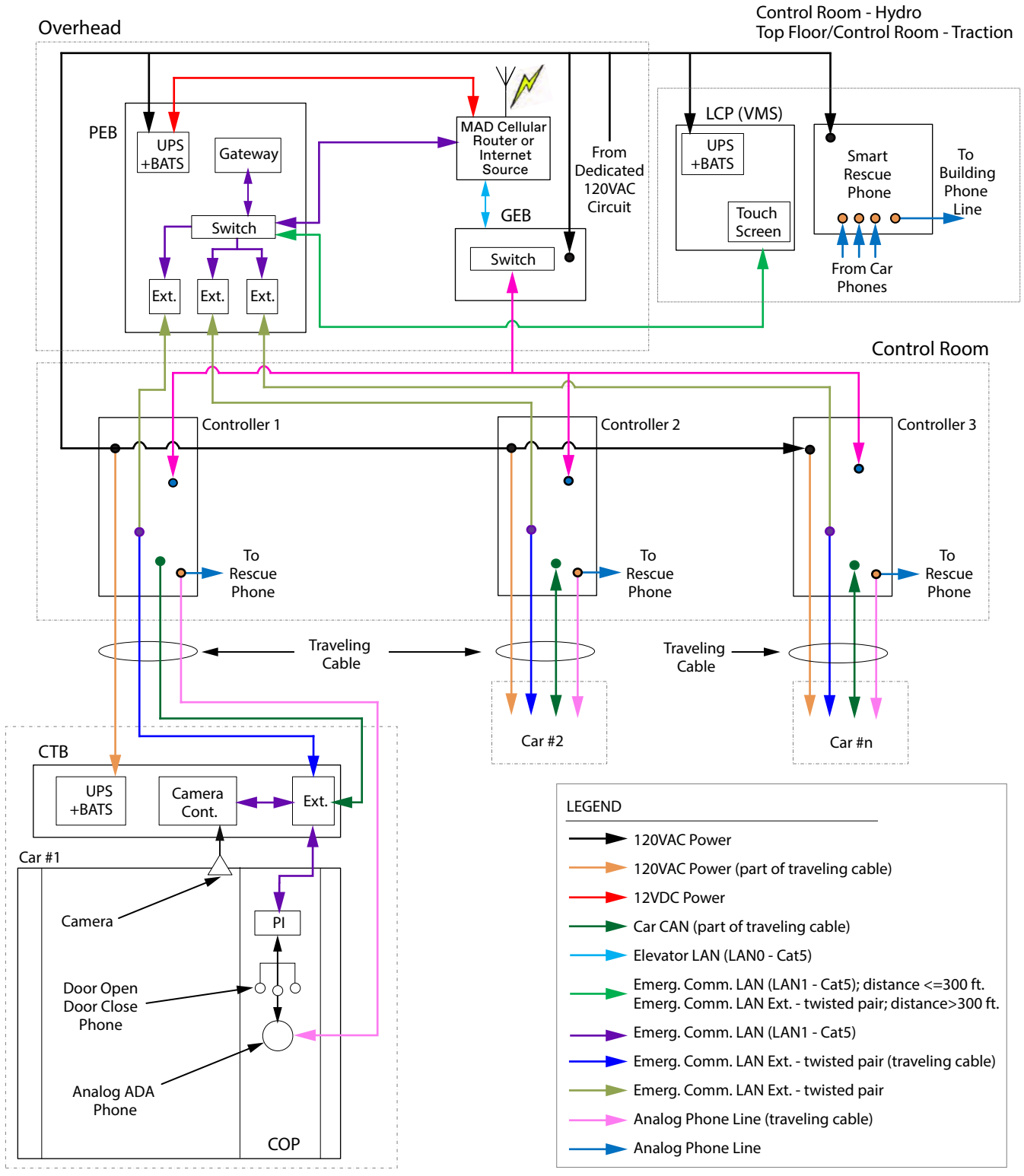
Machine Room Less (Controller in Control Room) TWC Network Configuration (typ.)

Standard Hydro or Traction, Simplex, Total Cars <=4, Travel => 60 feet



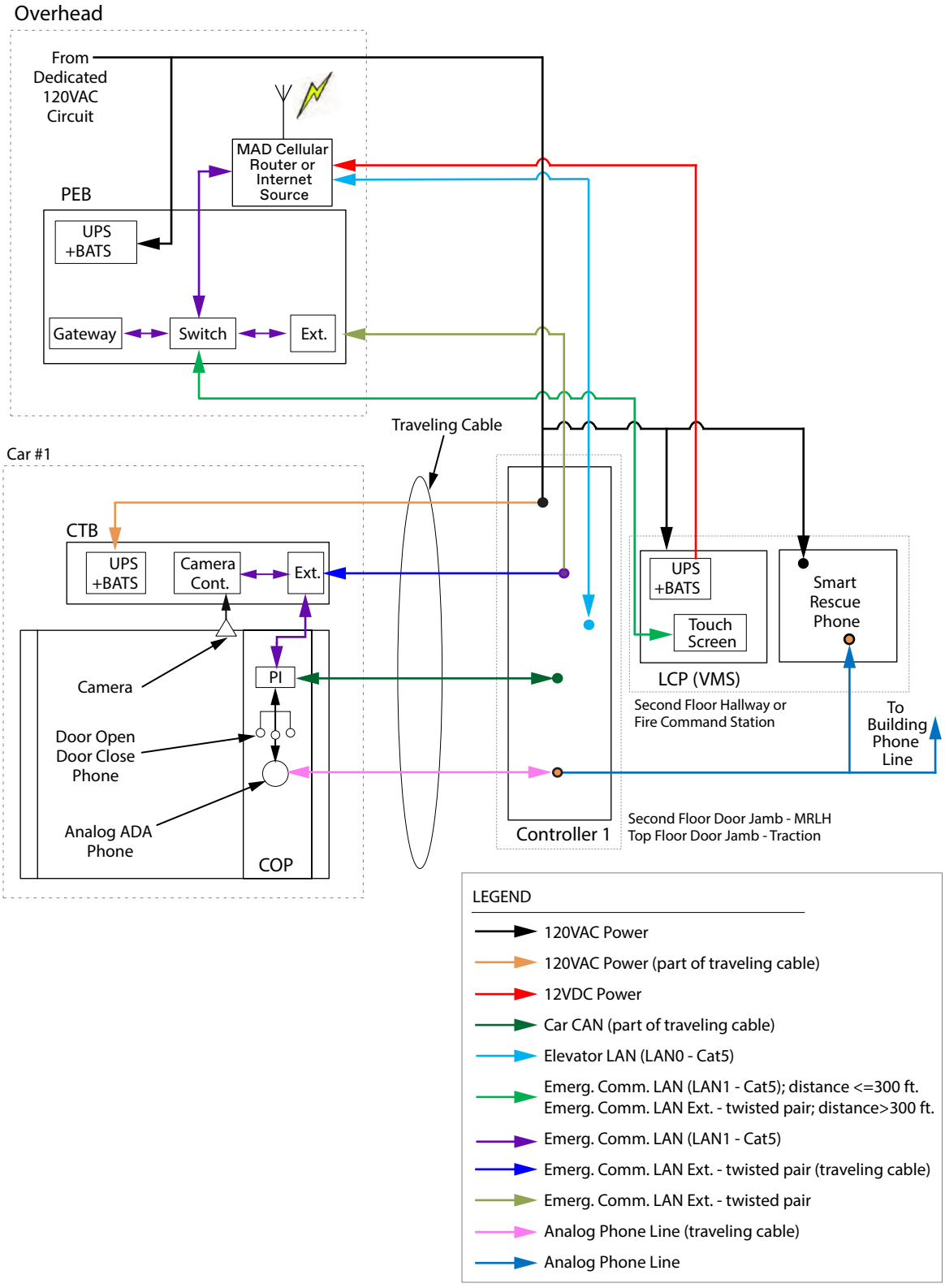
Machine Room Less (Controller in Control Room) TWC Network Configuration (typical)
(continued)

Standard Hydro or Traction, Single Group, Total Cars <=4, Travel => 60 feet



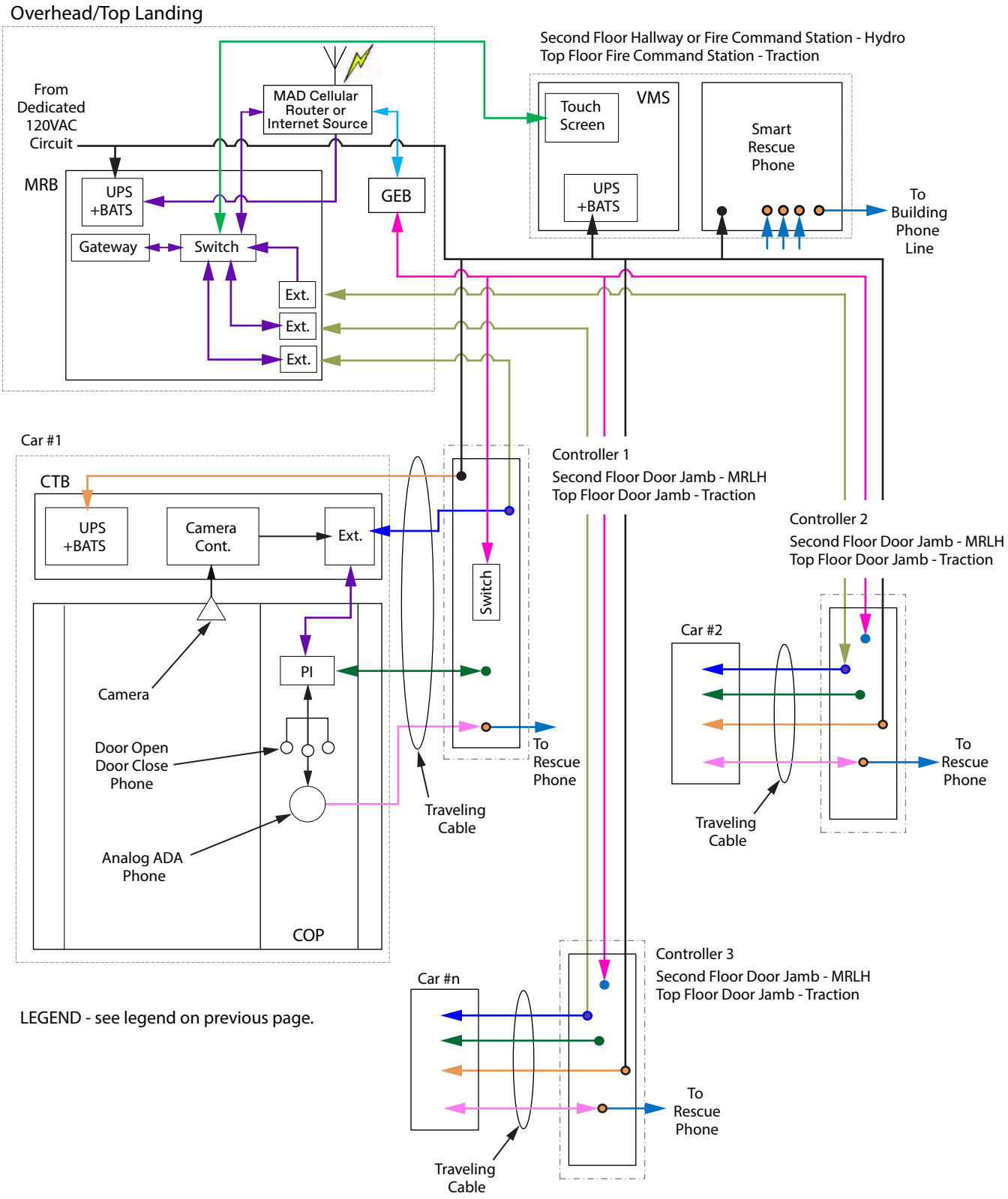
Machine Room Less (Controller in Jamb) TWC Network Configuration (typ.)

Standard Hydro or Traction, Simplex, Total Cars <=4, Travel => 60 feet



Machine Room Less (Controller in Jamb) TWC Network Configuration (typical)
(continued)

Standard Hydro or Traction, Single Group, Total Cars <=4, Travel => 60 feet



LEGEND - see legend on previous page.

Equipment Selection and Location

Available Configurations

See also: Eng. Drawing 1130AB_ and the Wiring Diagrams starting on page 47.

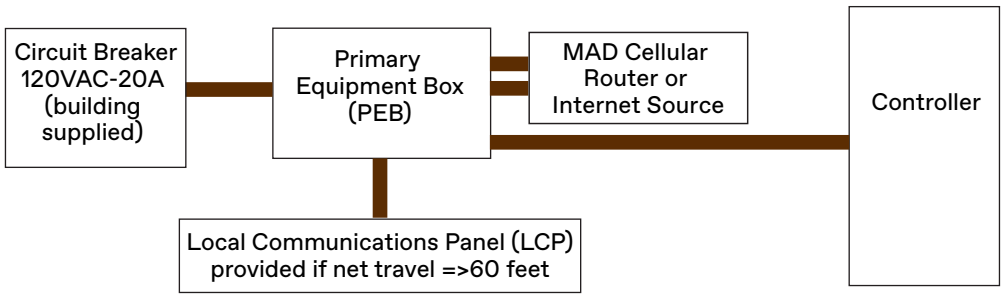
Part No.	Description
2104DL001	Primary Equipment Box, 1 Car
2104DL002	Primary Equipment Box, 2 Car
2104DL003	Primary Equipment Box, 3 Car
2104DL004	Primary Equipment Box, 4 Car
2104DL005	Primary Equipment Box, 1 Car + LCP
2104DL006	Primary Equipment Box, 2 Car + LCP
2104DL007	Primary Equipment Box, 3 Car + LCP
2104DL008	Primary Equipment Box, 4 Car + LCP
2104DL013	Primary Equipment Box, 1 Car + LCP + REM_CL
2104DL014	Primary Equipment Box, 2 Car + LCP + REM_CL
2104DL015	Primary Equipment Box, 3 Car + LCP + REM_CL
2104DL016	Primary Equipment Box, 4 Car + LCP + REM_CL
2104DK001	Expansion Box, 1 Car
2104DK002	Expansion Box, 2 Car
2104DK003	Expansion Box, 3 Car
2104DK004	Expansion Box, 4 Car
2104DM001	Local Communication Panel (Surface Mount)
2104DM002	Local Communication Panel (Surface Mount w/Key Lock)
2104DM003	Local Communication Panel (Flush Mount)
2104DM004	Local Communication Panel (Flush Mount w/Key Lock)
200DBW001	Installation Kit for Building Equipment Boxes
200DBY001	Installation Kit for Local Communication Panel

Examples of Equipment Layouts for Network Maps

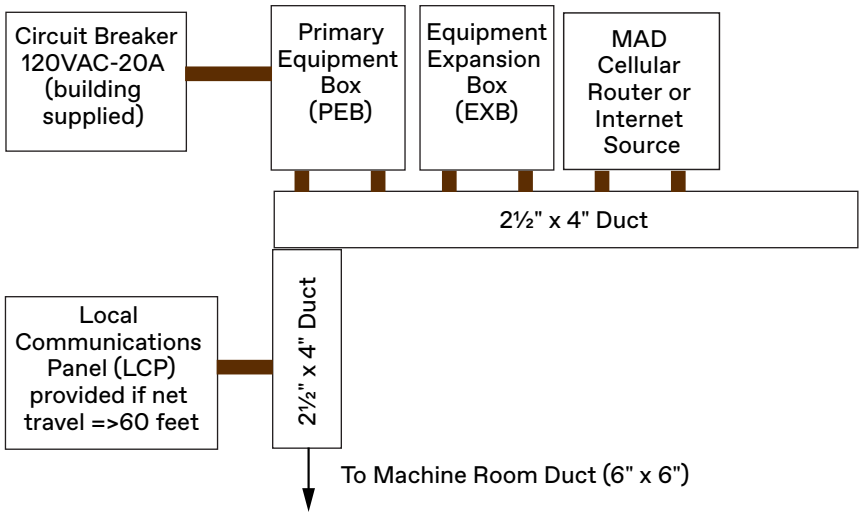
Standard Machine Room, Controller in MR, Traction

SIMPLEX ARRANGEMENT, 1 Car

For basement installation: mount the MAD Cellular Router at the overhead area near the duct riser for the optimal cellular signal.



GROUP ARRANGEMENT, 1 group contains 8 cars. The PEB supports 4 cars and the EXB supports 4 more cars.

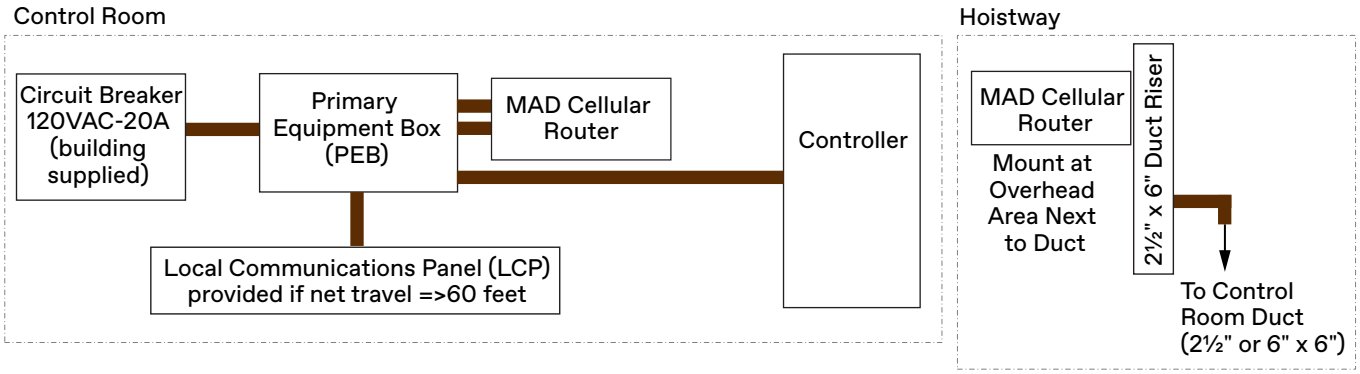


Examples of Equipment Layouts for Network Maps
(continued)

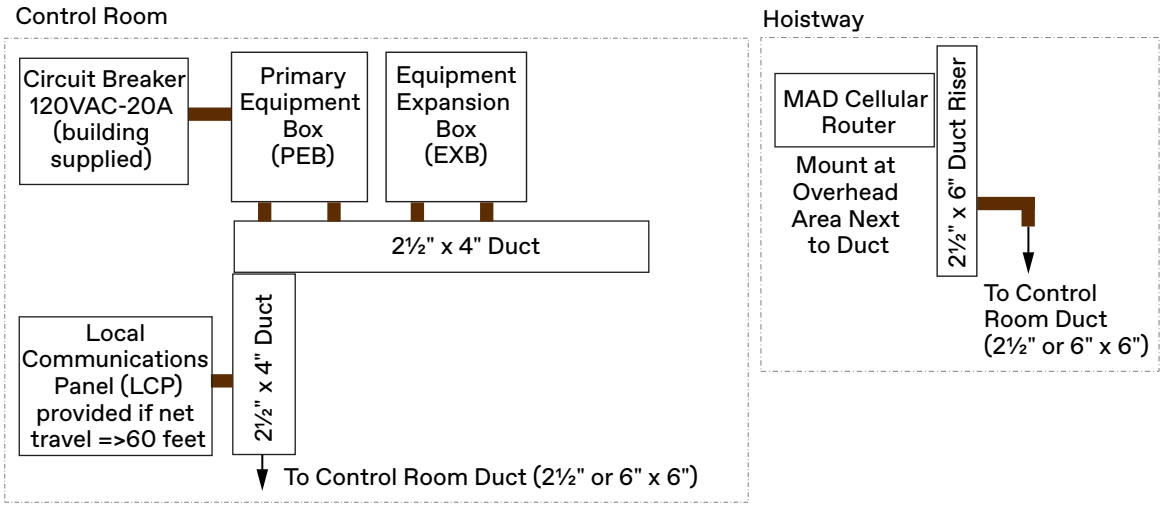
Machine Room Less (Controller in Control Room), Traction w/Control Room & Standard Hydro

SIMPLEX ARRANGEMENT, 1 Car

Mount the MAD Cellular Router at the overhead area near the duct riser for the optimal cellular signal.



GROUP ARRANGEMENT, 1 group contains 8 cars. The PEB supports 4 cars and the EXB supports 4 more cars.

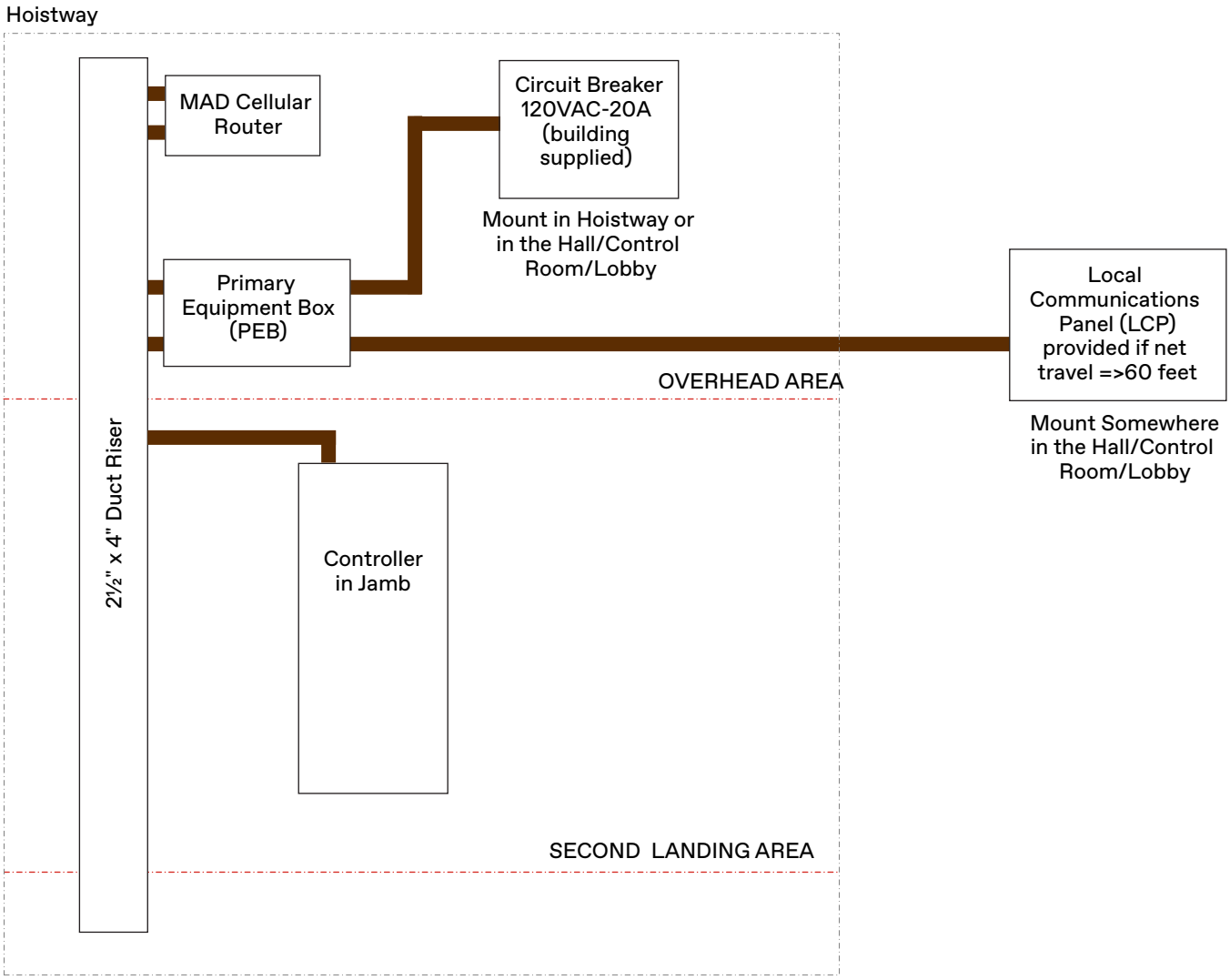


Examples of Equipment Layouts for Network Maps
(continued)

True Machine Room Less (Controller in Jamb), Hydro

SIMPLEX ARRANGEMENT, 1 Car

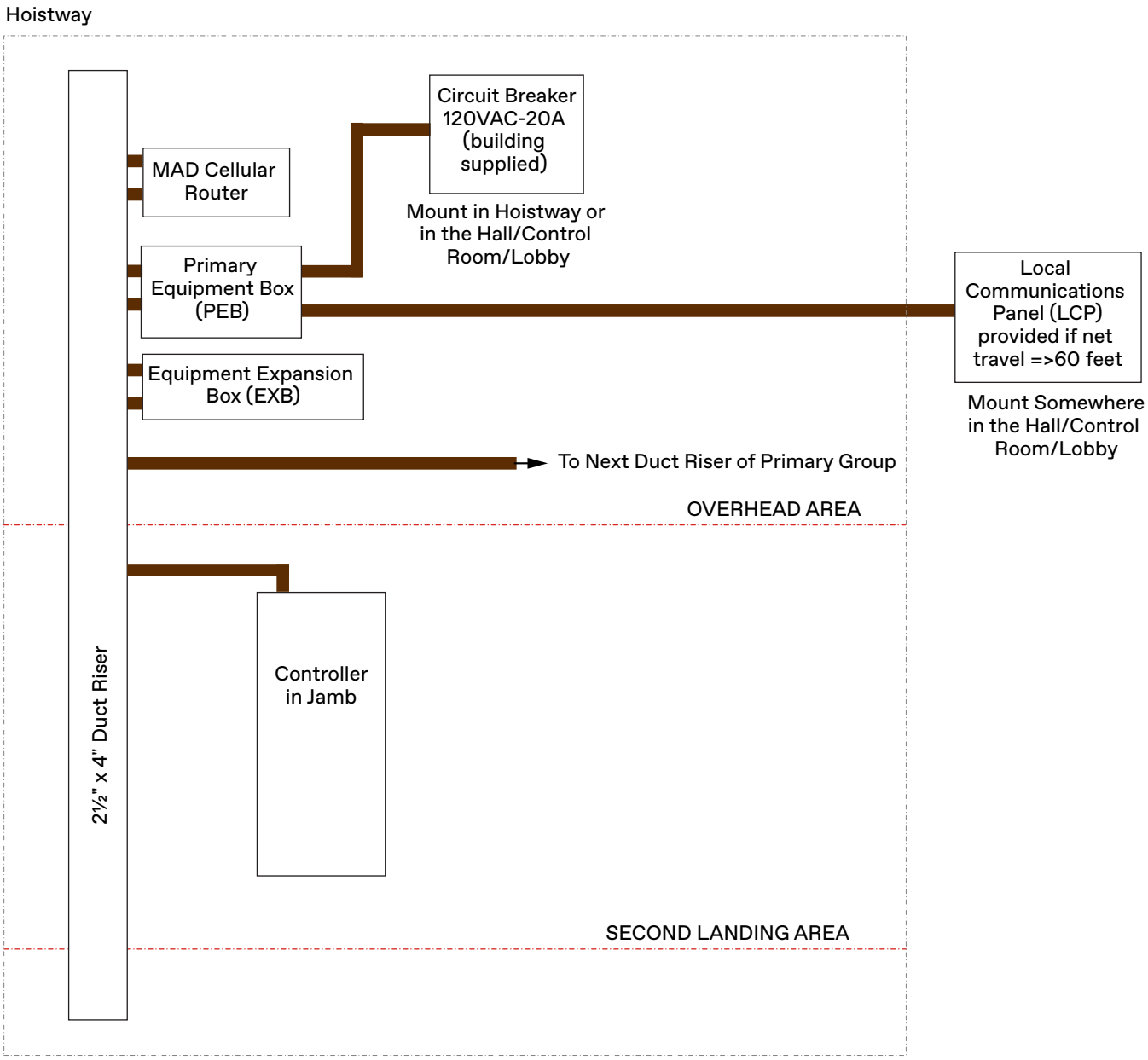
All boxes are located at the first car of the group;
controller in jamb at second landing shown.



Examples of Equipment Layouts for Network Maps
(continued)

True Machine Room Less (Controller in Jamb), Traction (evolution and 300E)

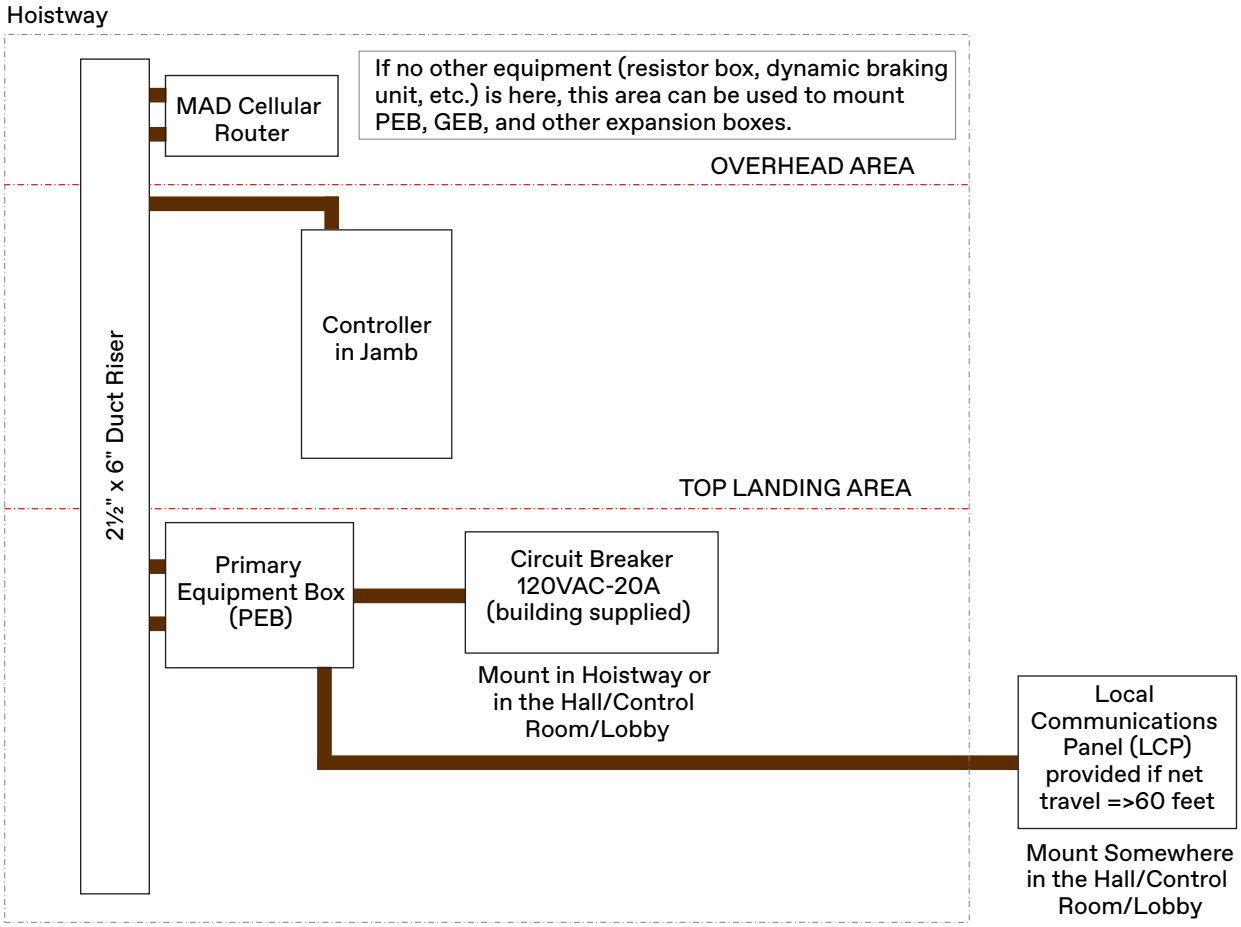
GROUP ARRANGEMENT, 1 group contains 8 cars. The PEB supports 4 cars and the EXB supports 4 more cars.



Examples of Equipment Layouts for Network Maps
(continued)

True Machine Room Less (Controller in Jamb), Traction (evolution and 300E)

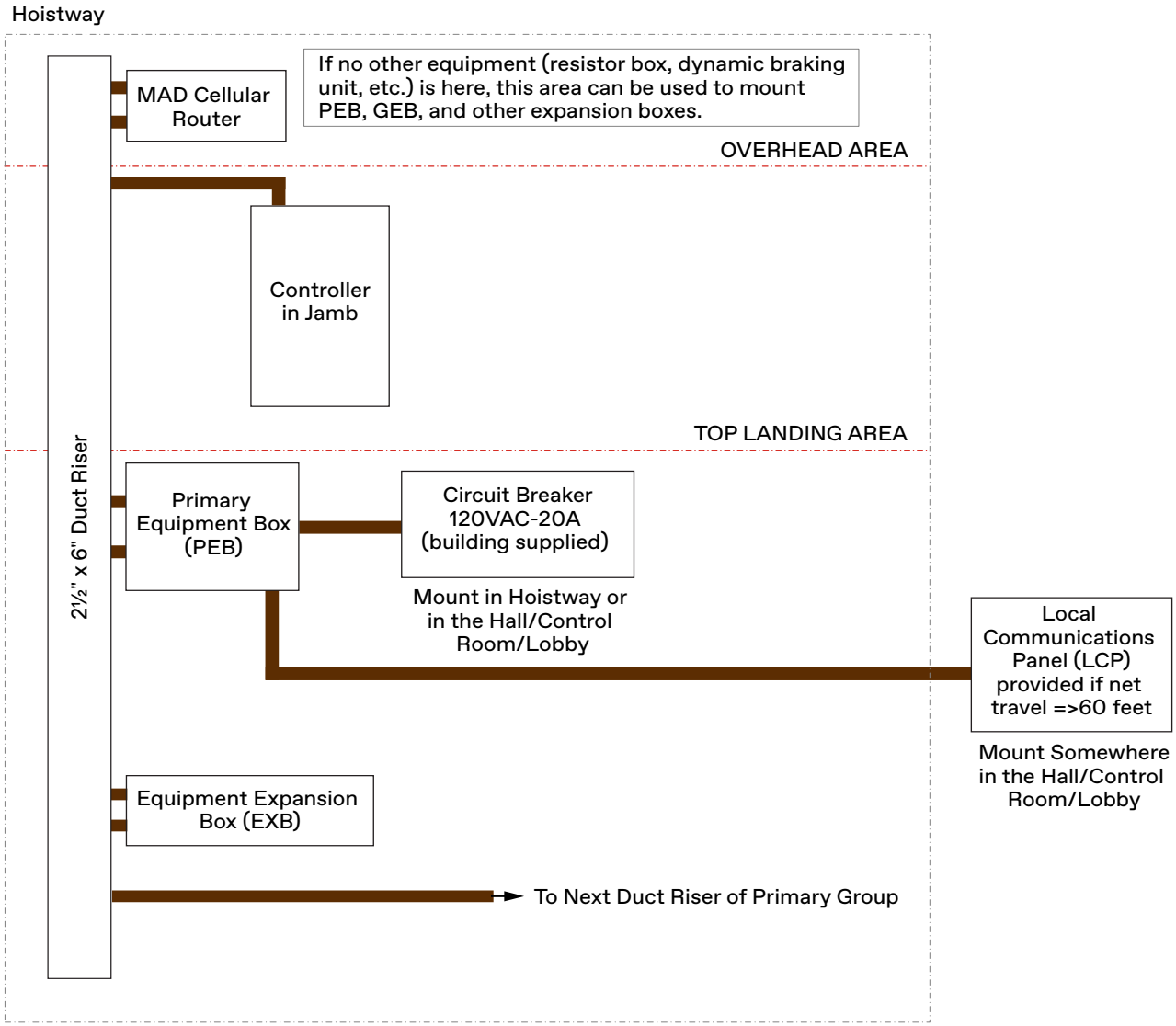
SIMPLEX ARRANGEMENT, 1 Car



Examples of Equipment Layouts for Network Maps
(continued)

True Machine Room Less (Controller in Jamb), Traction (evolution and 300E)

GROUP ARRANGEMENT, 1 group contains 8 cars. The PEB supports 4 cars and the EXB supports 4 more cars.



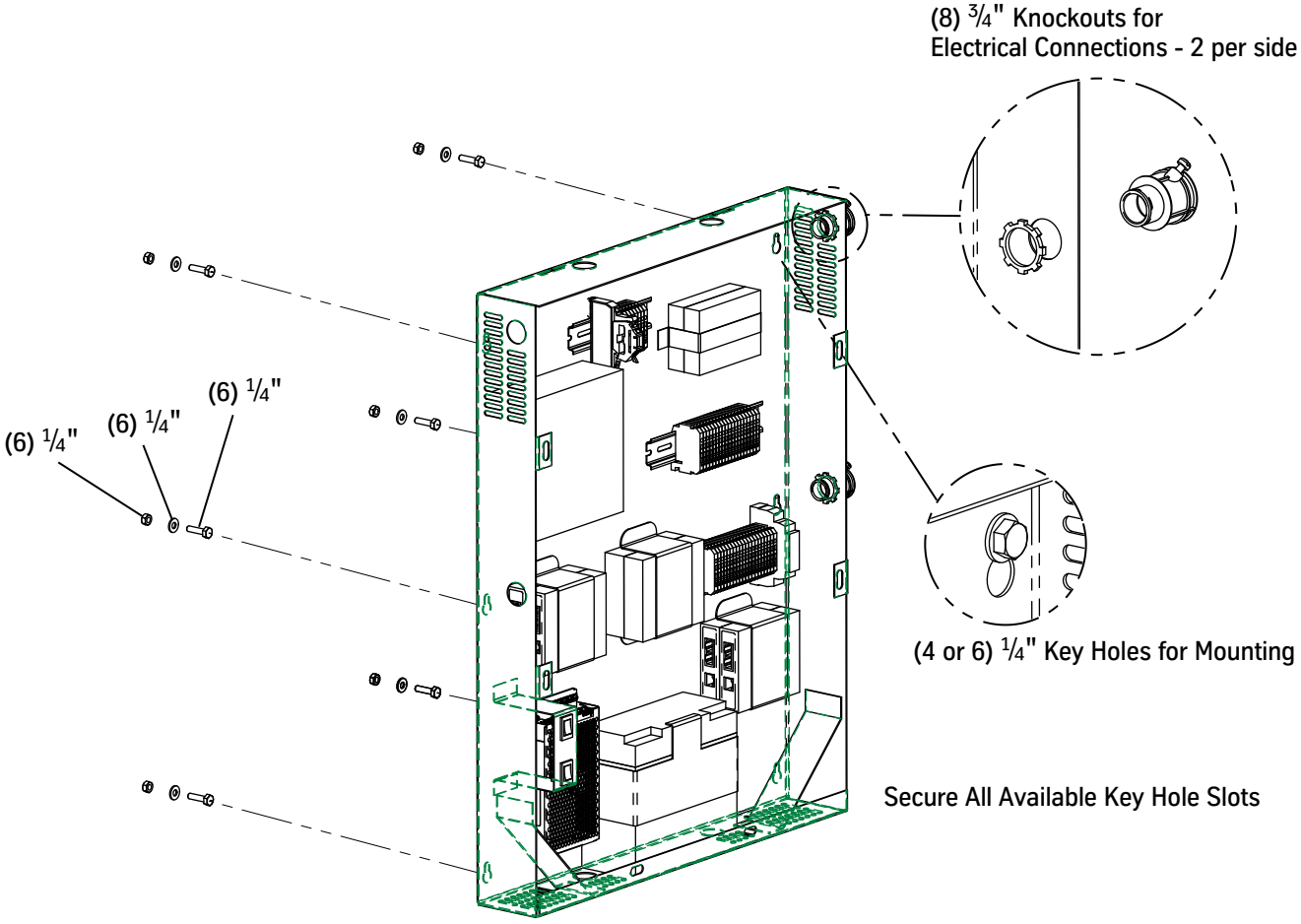
Equipment Installation

Building Equipment Box Mounting Instructions (499AHW)

Use with: 200DBW001 Installation Kit.
Applies to: PEB (2104DL) and EXB (2104DK).
See also: Equipment Layouts on page 27 and Wiring Diagrams on page 47.

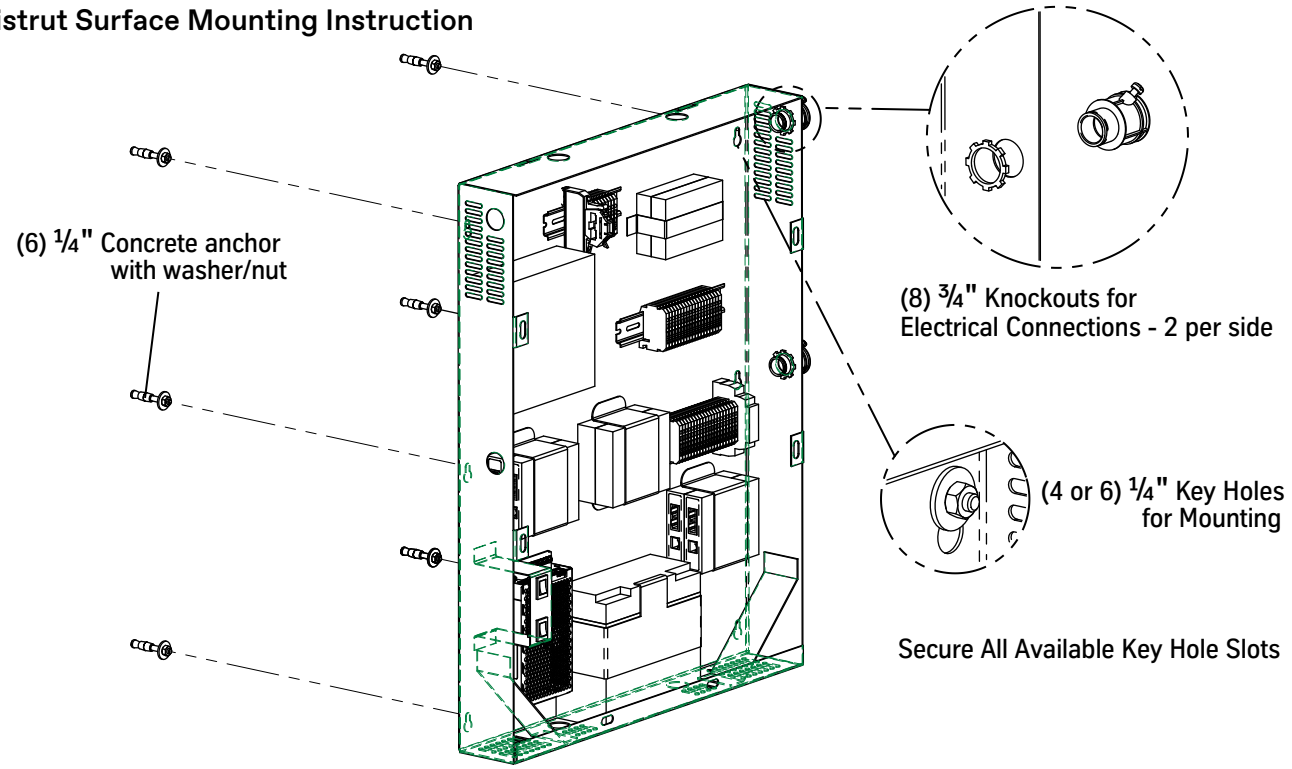
The 200DBW001 Installation Kit provides wiring, conduit, and mounting hardware for surface mounting to concrete, Unistrut, or dry wall. The 499AHW is included in the 200DBW001 kit and provides micro instructions for mounting all building equipment boxes at different locations.

Concrete Surface Mounting Instruction

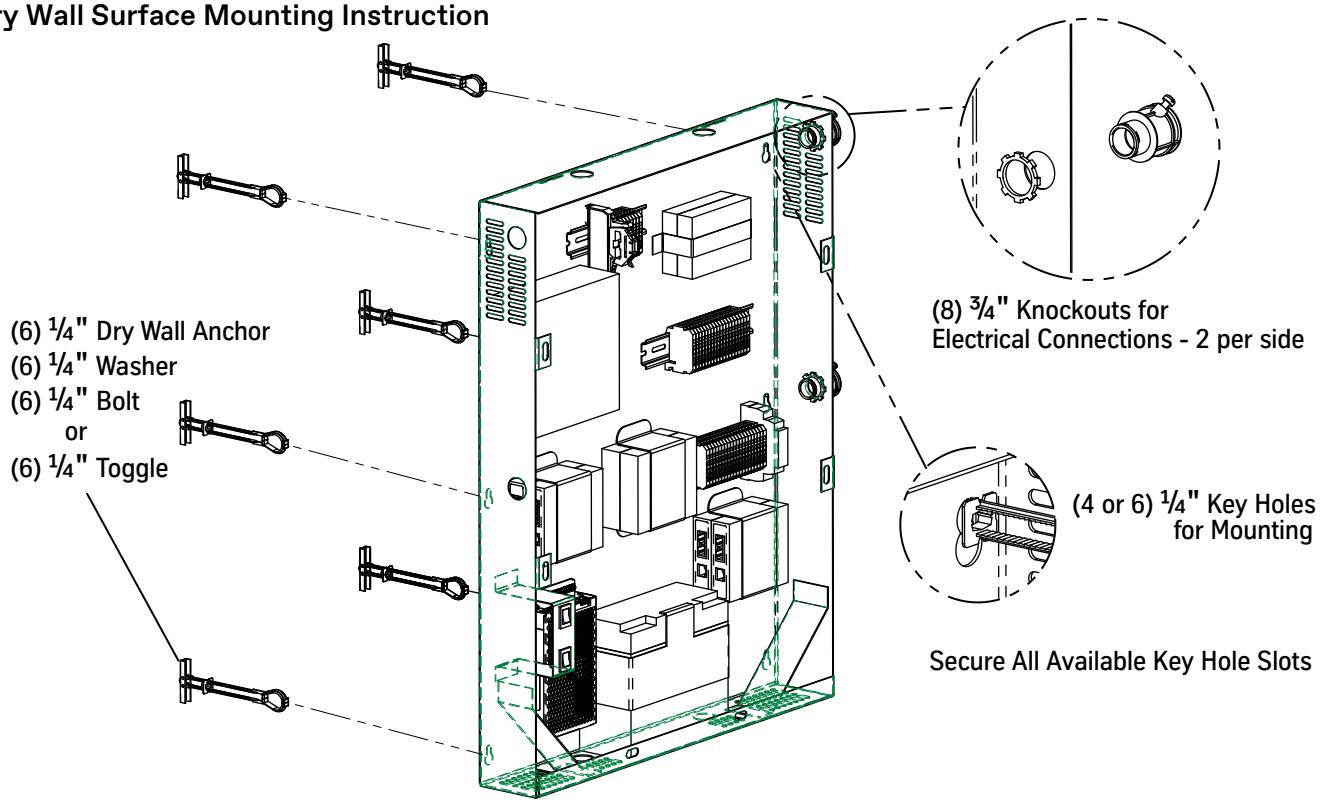


Building Equipment Box Mounting Instructions (499AHW)
(continued)

Unistrut Surface Mounting Instruction



Dry Wall Surface Mounting Instruction



Local Communications Panel (LCP) Mounting Instructions (499AHX)

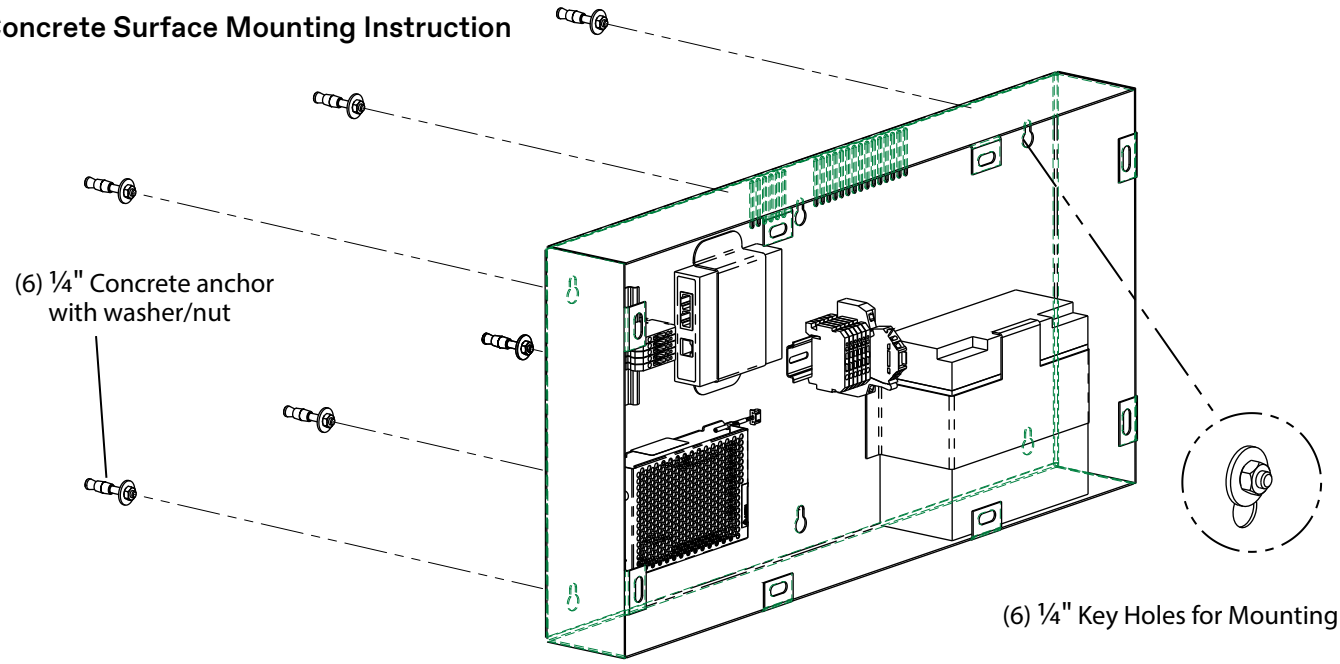
Use with: 200DBY001 Installation Kit.

Applies to: LCP (2104DM).

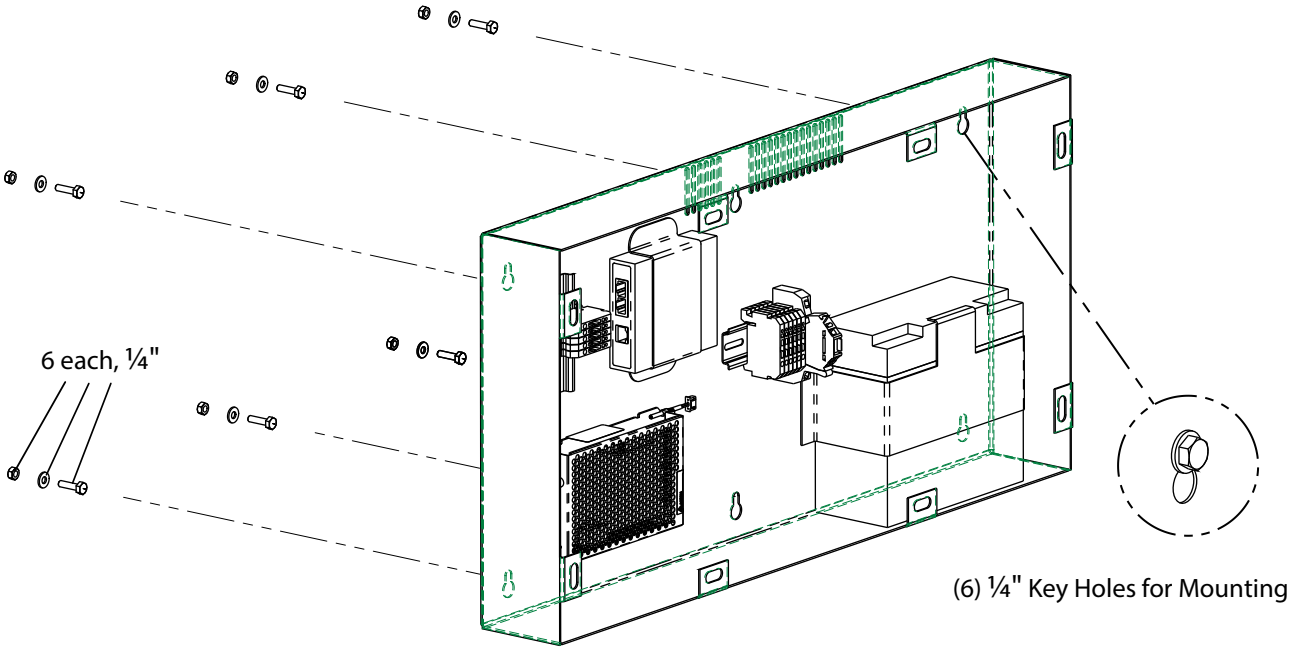
See also: Equipment Layouts on page 27 and Wiring Diagrams on page 47.

The 200DBY001 Installation Kit provides mounting hardware for surface and flush mounting to concrete, Unistrut, or dry wall. The 499AHX is included in the 200DBY001 kit and provides micro instructions for mounting the LCP.

Concrete Surface Mounting Instruction

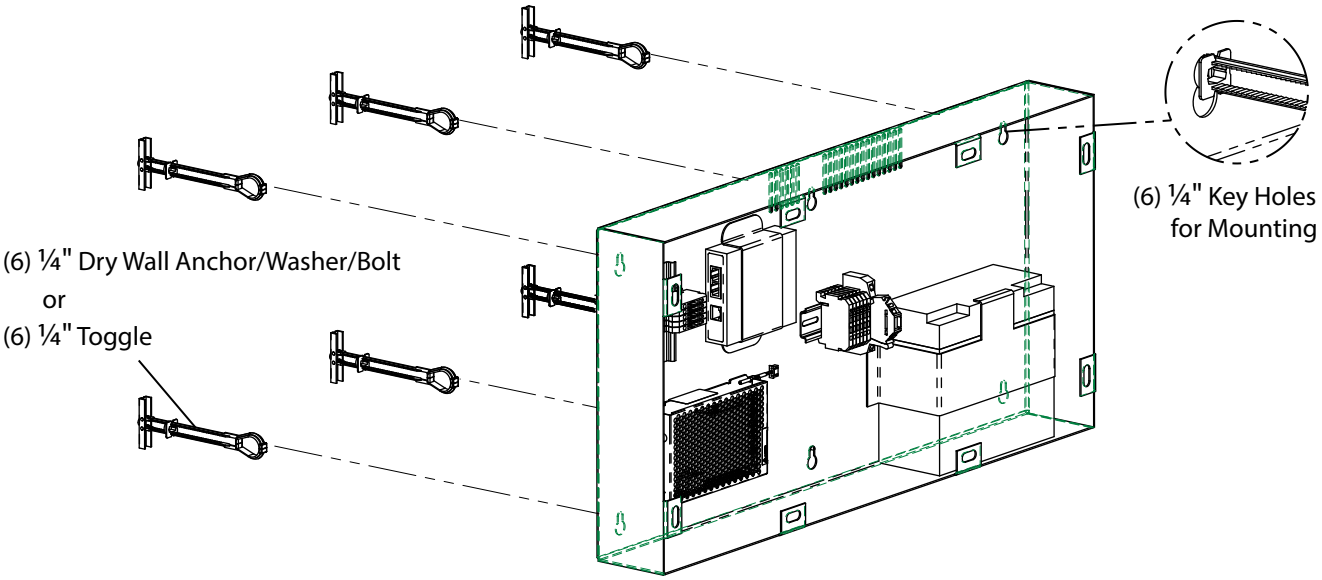


Unistrut Surface Mounting Instruction

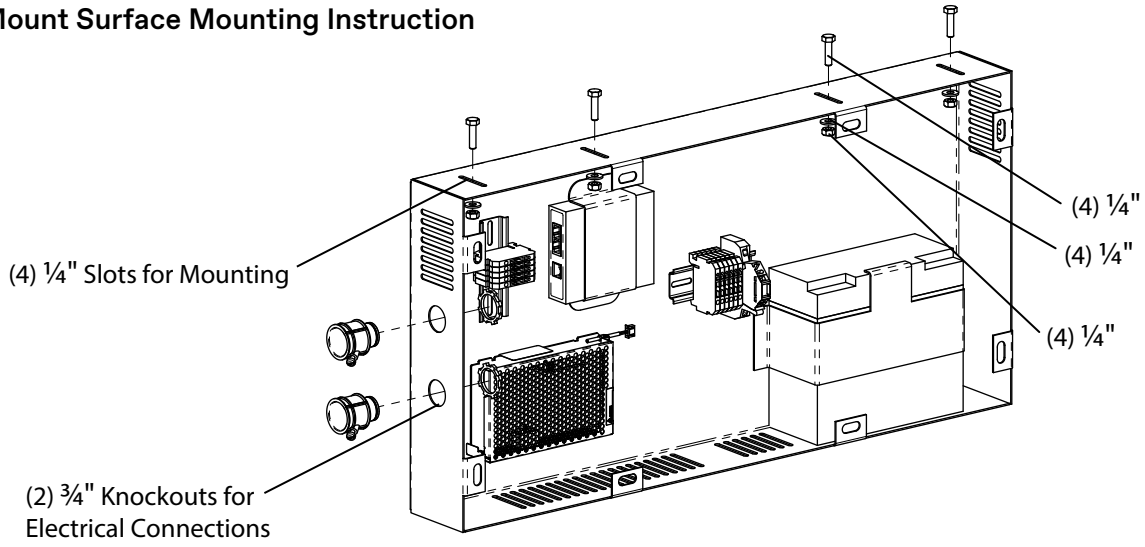


Local Communications Panel (LCP) Mounting Instructions (499AHX)
(continued)

Dry Wall Surface Mounting Instruction



Flush Mount Surface Mounting Instruction



MAD Cellular Router Installation (494BNP)

- The MAD elevator router enclosure contains an InHand Industrial Cellular Router.
- To ensure proper signal strength for the modem operation, install the MAD elevator router enclosure at the top of the hoistway, on or near the end of the wireway.

1. Use the included $^{3}/_{4}$" chase nipple and locknut to attach the MAD elevator router enclosure to the hoistway wireway at or near the top end of the wireway. The $^{3}/_{4}$" knockouts are available on both the MAD router enclosure and the wireway. See Figure 2 on page 38.

   Alternate mounting method, if required - There are four mounting holes on the back of the MAD router enclosure. The Field is to provide $^{1}/_{4}$" mounting hardware appropriate for elected surface and flex conduit as required.

2. Pull the power cable from the PEB to the MAD router enclosure through the hoistway wireway. Power wiring for the MAD elevator enclosure router is provided in Section 18.

3. Connect the power wiring per the Field Wiring Chart on page 39.

4. Pull the Ethernet from the PEB to the MAD enclosure router through the hoistway wireway. An Ethernet cable for the MAD elevator router enclosure is provided in Sections 18 and 30.

5. Use the Field Wiring Chart on page 39 to connect the Ethernet cable.

6. Place the antennas a *minimum* of 18 inches apart on a flat surface in the top of the hoistway. The antennas are held in place magnetically.

7. Install the supplied $^{3}/_{4}$" grommet through an available knockout, and then route the antenna cables into the MAD elevator router enclosure.

8. Connect one of the two antennas to the "3G/4G" antenna connector, and connect the other antenna to the "AUX" antenna connector of the MAD router enclosure. The antennas are identical.

9. Perform the router configuration; use the *InHand Industrial Cellular Router* product manual.

10. Verify the following:
    a. The MAD elevator router power indicator is red.
    b. The connection indicators are green.
    c. The router has a minimum signal strength of 3 bars.

11. Reposition the antenna in various locations to obtain the best signal strength.

MAD Cellular Router Installation (494BNP)
(continued)

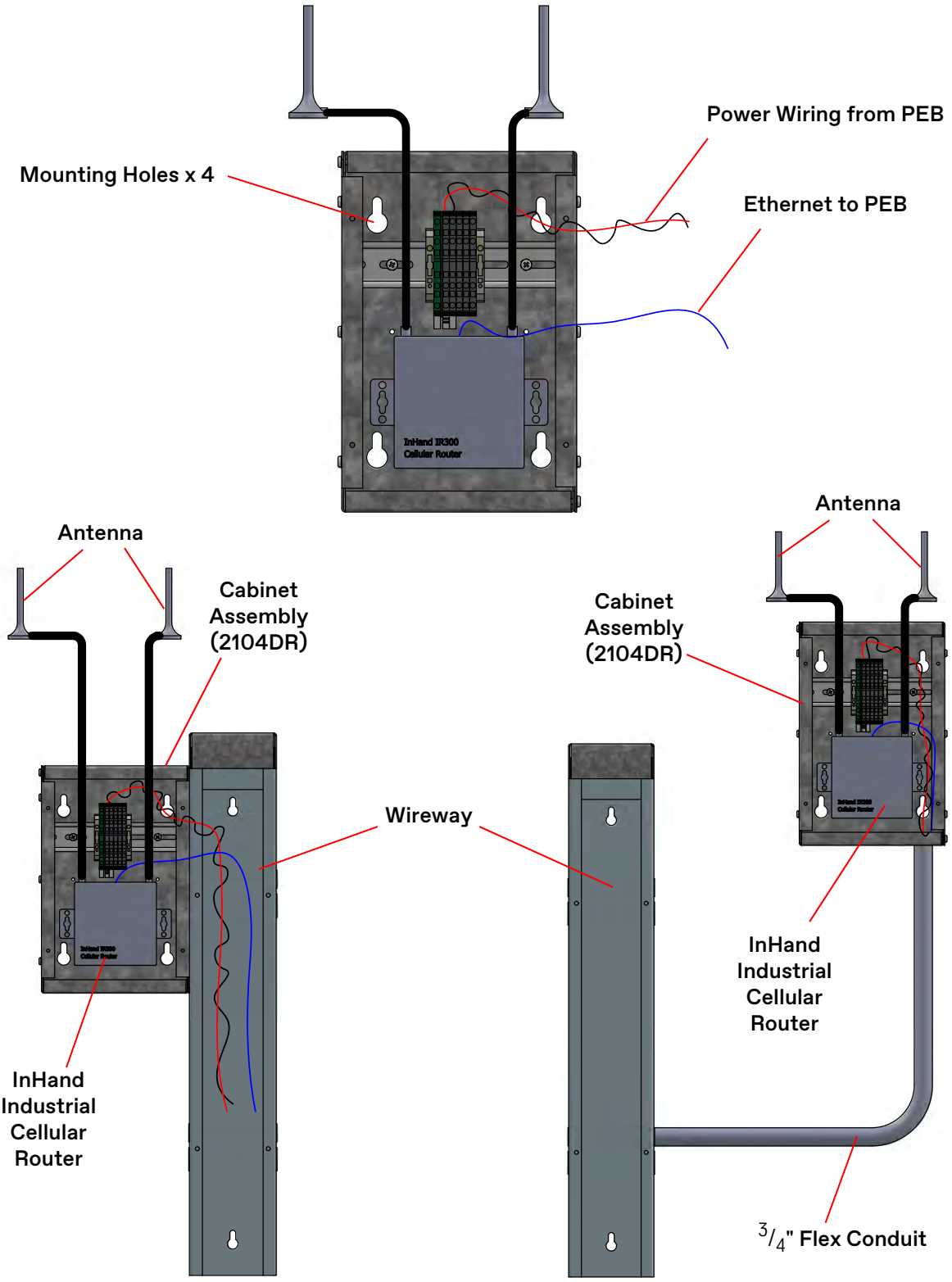
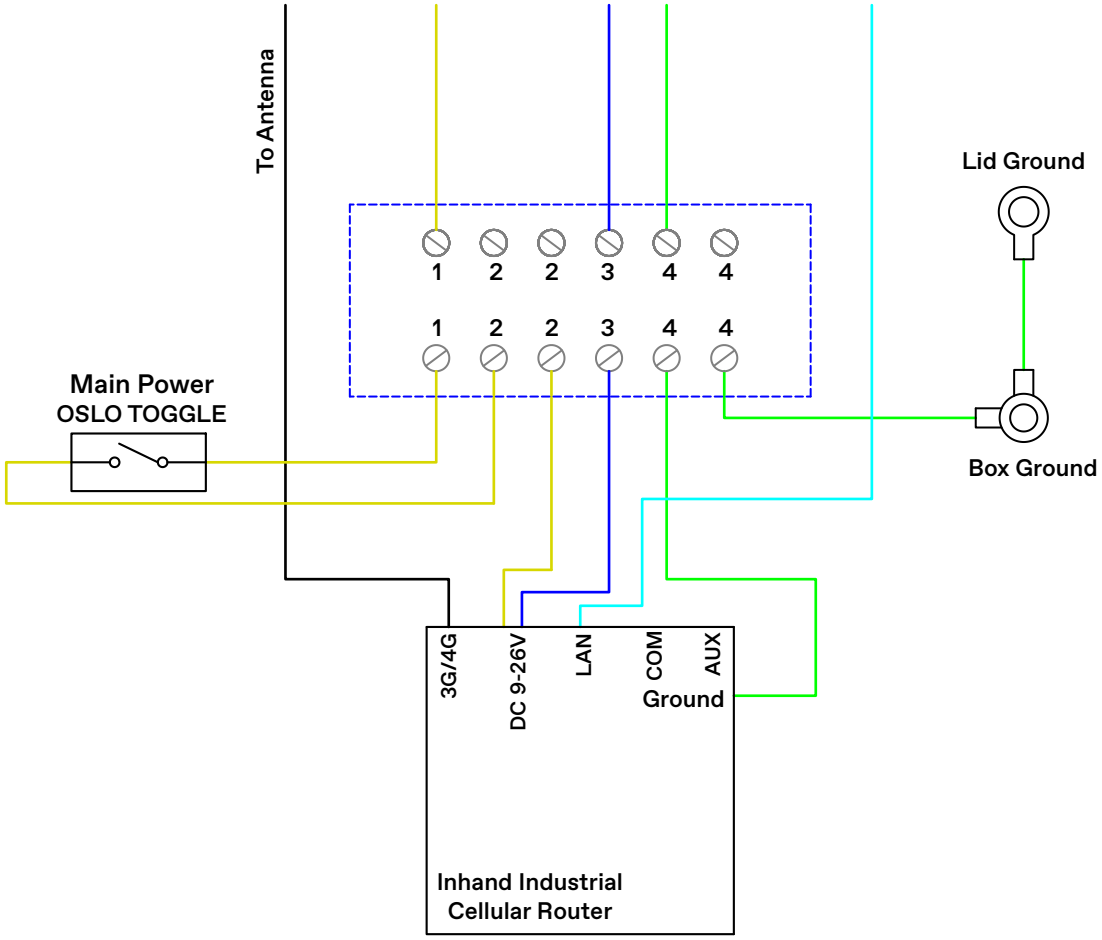


Figure 2 - MAD Cellular Router Installation Instructions (494BNP)

MAD Cellular Router Installation Instructions (494BNP)
(continued)



Signal Name	Device	CON	Signal Name	Device	CON	Gauge	Color	Part No.	SEP
12+	PEB/Terminal X2	1	12+	MAD Router Box/ Din Rail Terminal X1	2	Wire, 18AWG Twisted	RED	900DX7	L
12–	PEB/Terminal X2	2	12–	MAD Router Box/ Din Rail Terminal X1	3	Wire, 18AWG Twisted	Black	900DX7	L
GND	PEB/Terminal X2	3	GND	MAD Router Box/ Din Rail Terminal X1	4	Wire, 18AWG	Green/ Yellow	900AC171	L
Ethernet (LAN)	PEB/Router 1	WAN	LAN	InHand Router/ RJ-45 Port	RJ-45 Port	220DJ1 (CAT5)	Blue	220DJ1	L

Table 1 - Field Wiring Chart

Car Top Box Mounting/Conduit Installation Instructions (499AHY, 499AJD)

Use the following chart to select the mounting kit, the conduit & wiring kit, and the micro instructions for the applicable job. Below are generic installation instructions. The actual location of the equipment may vary per job.

IMPORTANT! **If a Slimline Controller is required, mount the car top box in the same quadrant as the Slimline Controller.**

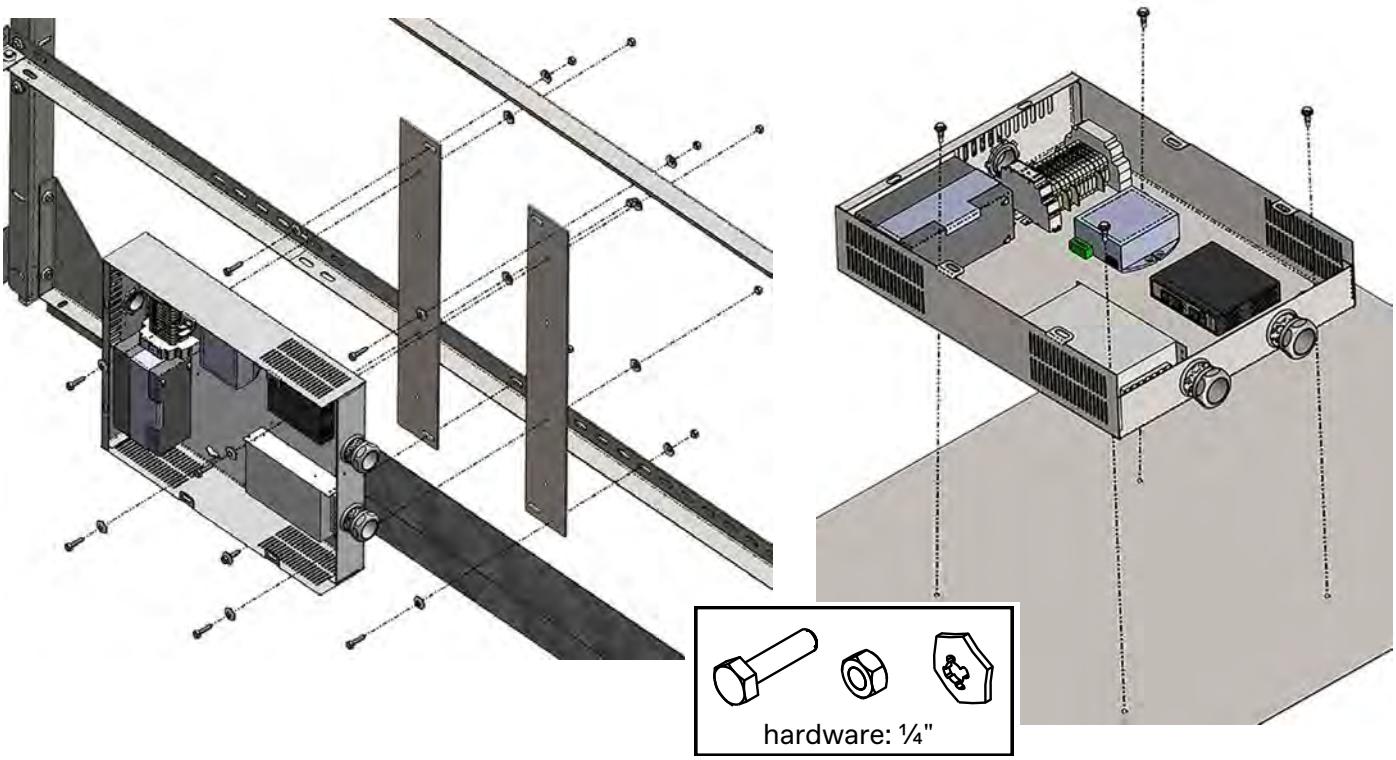
Mounting Location	Car Type	Mounting Kit	Conduit & Wiring Kit	Micro Instructions
Car Top Rail (168MJ)	Standard	200DCA001	200DCC001	499AHY
Car Top Rail (168NY)	EVO	200DCJ001		499AJD
Car Top	Standard	200DCA002		499AHY
Car Top	EVO	200DCJ002		499AJD

Car Top Box Mounted on Car Top Instructions

1. Use the car top box mounting holes as a template.
2. Drill Tek screws through the car top box and into the car top.

Car Top Box Mounted on Car Top Rail Instructions

1. Mount the brackets to the car top rails.
2. Mount the car top box to the brackets.



Conduit and Wiring Kit for Car Top Box (200DCC001)

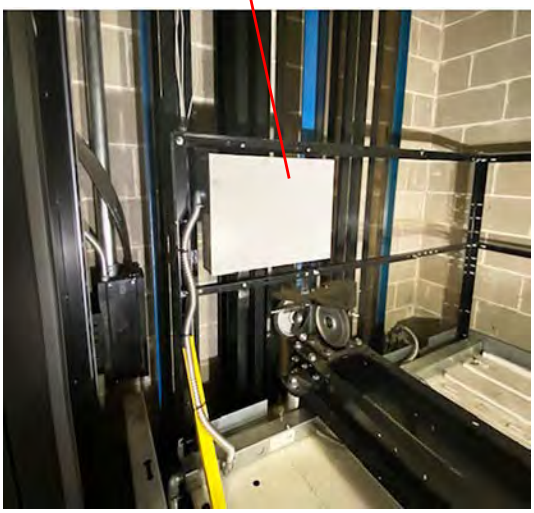
1. Use 1 inch diameter flex conduit.

2. Route the conduit in the same path as the car top rail to the car top duct channel. If no car top rail is present, securely clamp the conduit at every 3 feet.

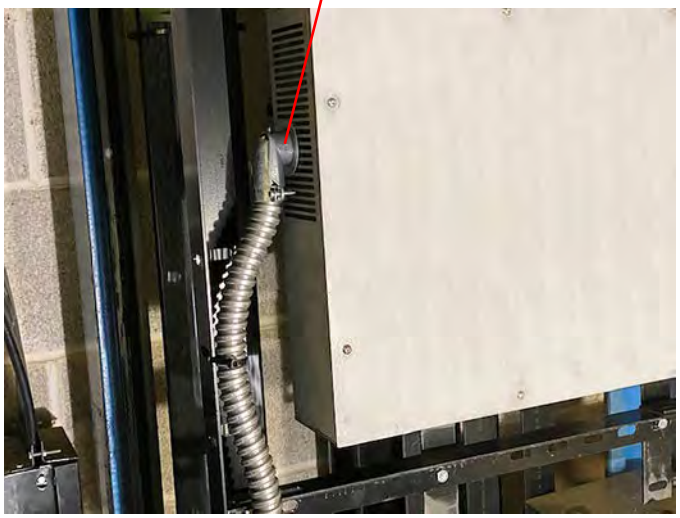
OVERVIEW

Car Top Box Mounted on Car Top Rail

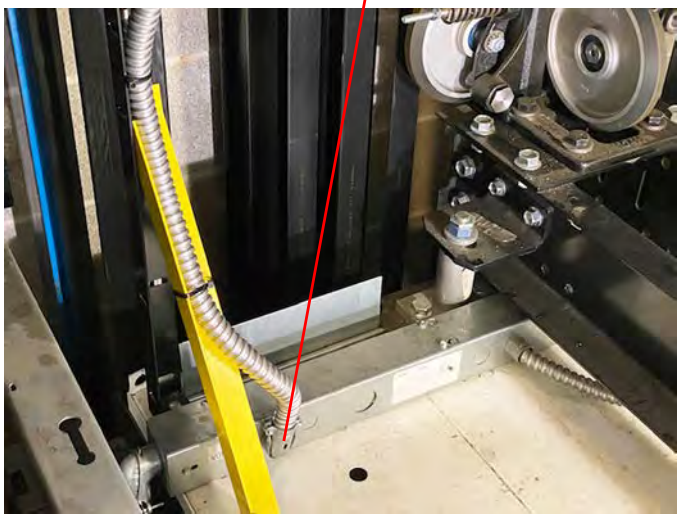
Two-Way Emergency Communications Car Top Box



1" Flex Conduit from 90° Connector at Car Top Box

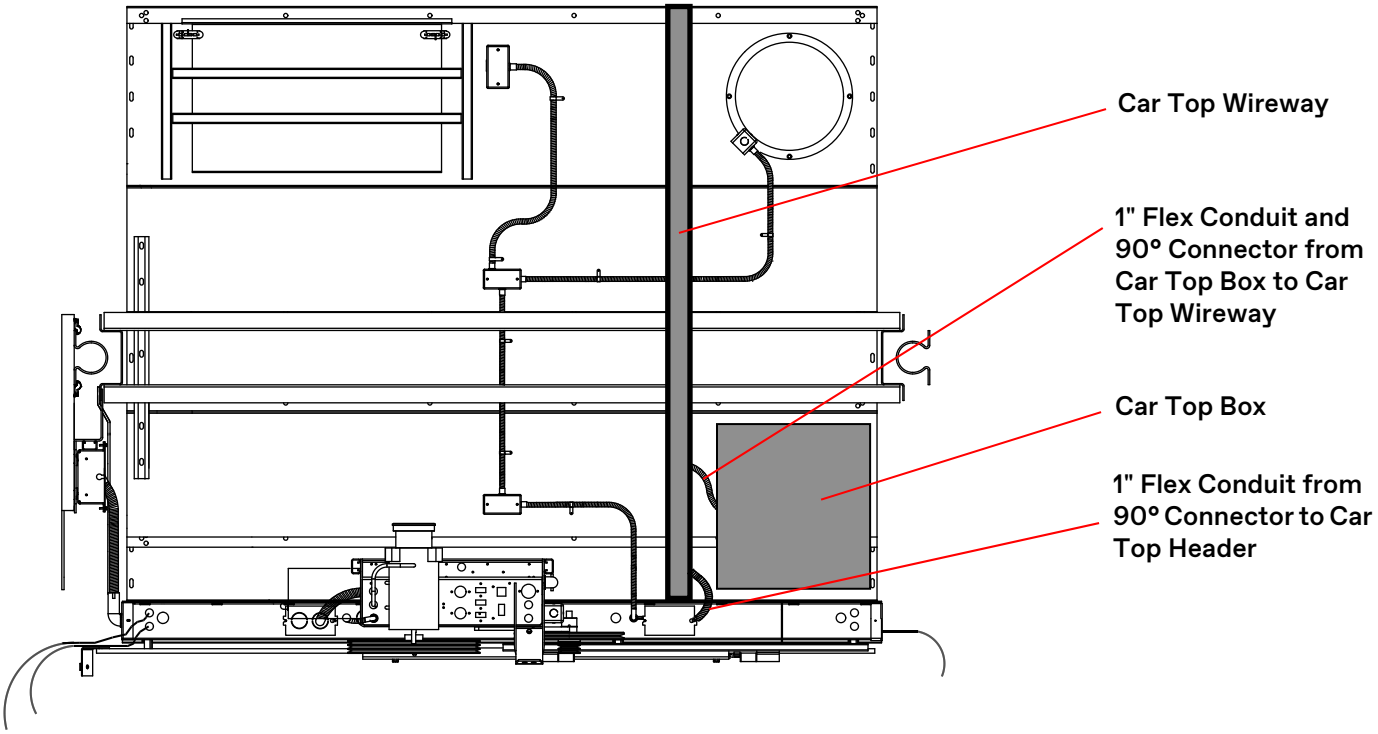


1" Flex Conduit & 90° Connector to Car Top Wireway



Car Top Box Wiring and Conduit
(continued)

Car Top Box Mounted on Car Top



Car Top Box Wiring and Conduit
(continued)

Car Top Box Wiring Chart

IMPORTANT! **For hydro jobs: the traveling cable conductor size for the AC1A/AC2 circuit is 18 gauge; if needed, double wires for the circuit to account for voltage drop.**

Function	CON	Car Top Box Connection					
		Wire or Plug	Wire or Plug Color	Label	Connect To		Signal Name
120VAC Power	1	Single 14GA Wire	Black	L	Rail Terminal Block	X1-1	120VAC(L)
		Single 14GA Wire	White	N		X1-2	120VAC(L)
		Single 14GA Wire	Green/Yellow	GND		X1-3	120VAC(GND)
Data Line	2	22GA CAN Jacketed Cable	Blue	EXT+	Rail Terminal Block	X1-6	DATA+
			Blue/White	EXT-		X1-7	DATA-
			Shield	SHLD		X1-8	DATASHLD
12VDC Power	3	TP 18GA Wire	Red	12V(+)	Rail Terminal Block	X1-4	12VDC(+)
			Black	12V(-)		X1-5	12VDC(-)
Ground	4	Single 14GA Wire	Green/Yellow	GND	Rail Terminal Block	X1-8	GND
Matisse PI Out	5	RJ45 Plug		MAT PI	Ethernet Extender LAN 2	LAN 2	DATA
Camera Out	6	RJ45 Plug or Micro USB		CAM	CAM LAN or USB Port	PoE Injector or CAM Driver	DATA

Function	CON	Main COP Connection					Signal Name
		Wire Type	Wire Color	Label	Connect To		
120VAC Power	1	Single 14GA Wire	Black	AC1A	COP Terminal Block	AC1A	120VAC(L)
		Single 14GA Wire	White	AC2		AC2	120VAC(L)
		Single 14GA Wire	Green/ Yellow	GND		GND	120VAC(GND)
Data Line	2	22GA CAN Jacketed Cable	Blue	EXT+	COP Terminal Block	EXT+	DATA+
			Blue/White	EXT-		EXT-	DATA-
			Shield	SHLD		SHLD	DATASHLD
12VDC Power	3	TP 18GA Wire	Red	12V(+)	Matisse PI	PS+	12VDC(+)
			Black	12V(-)		PS-	12VDC(-)
Ground	4	Single 14GA Wire	Green/Yellow	GND	COP Terminal Block	GND	GND
Matisse PI Out	5	CAT5e Cable		MAT PI	Matisse PI	LAN	DATA
Camera Out	6	CAT5e Cable or Micro USB		CAM	Camera	LAN	DATA

Internet Protocol (IP) Network Camera (M3065V)

Camera Mounting Kit (200DCD)

- (2) #8 screws
- (1) $^{1}/_{2}$" grommet to protect the camera cable
- (1) 499AJA micro instruction

See also: Car Top Box Wiring Chart on page 43, and IP Network Camera (M3065V) Troubleshooting on page 75.

1. Select an applicable location for the camera from the following. See 499AJA, Figure 3 on page 45, and Figure 4 on page 46.

IMPORTANT!

- **Do not mount the camera on the car wall.**
- **Maintain code compliance: Make sure that camera captures the car floor within six inches of the car walls and doors.**

   a. On the ceiling above the main COP or opposite the main COP - use with Basic, Downlight, and Island Downlight Ceilings with metal pans.

   b. On the back of the transom - use with One Speed, Two Speed, or Center Opening Doors; the camera can be located within one-half the door opening width (DOW) of the transom.

   c. Within the centerline of the COP - use with Auxiliary COP.

2. Use the provided template to drill holes for the screws and for routing the RJ-45 Camera cable. See Figure 3 on page 45.

3. Remove the camera dome, and use the provided screws to mount the base.

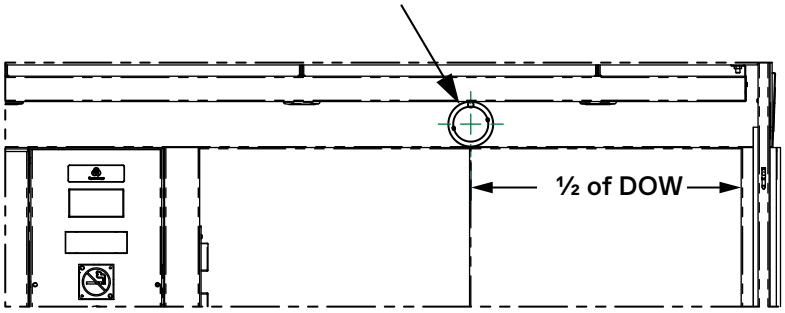
4. Plug the RJ-45 Camera cable into the base of the camera, and route it through the grommet hole to the header.

5. Route the RJ-45 Camera cable through car top wireway to the TWC Car Top Box.

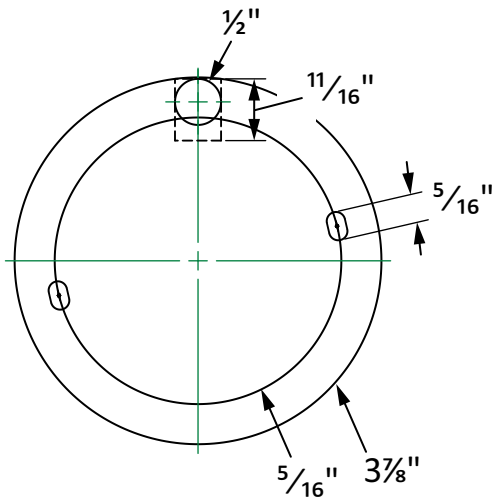
6. Screw the dome back onto the camera.

Internet Protocol (IP) Network Camera
(continued)

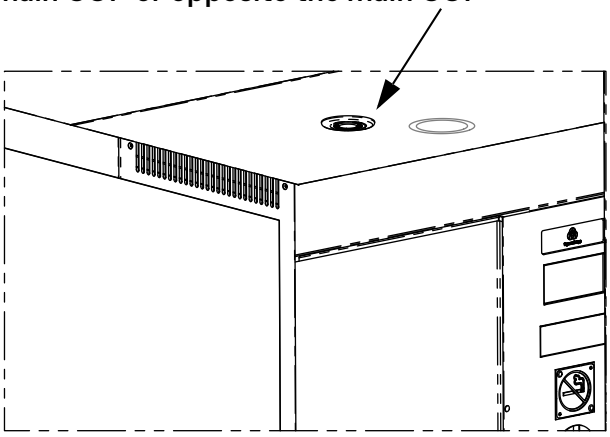
Camera Placement: On the back of the transom



Camera Drilling Template



Camera Placement: On the ceiling above the main COP or opposite the main COP



Mount the Camera Base

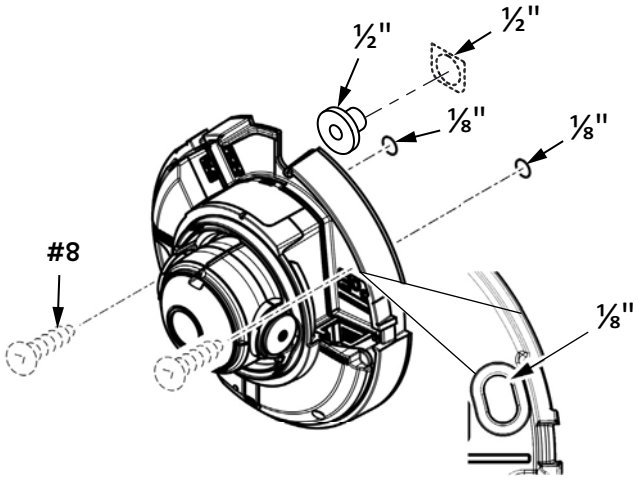
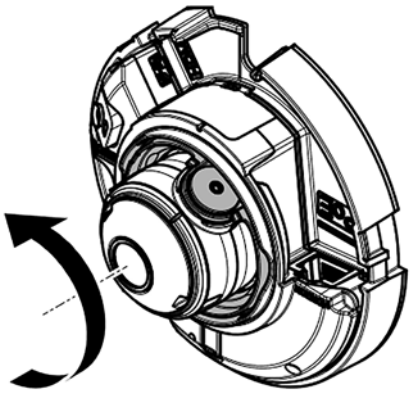
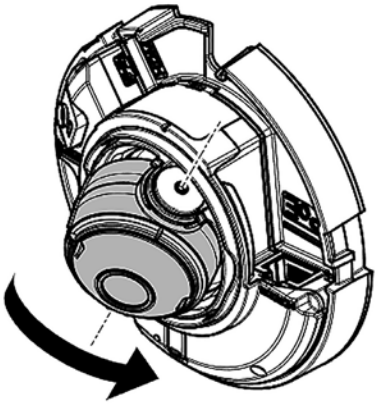


Figure 3 - IP Network Camera - Placement and Drilling Template

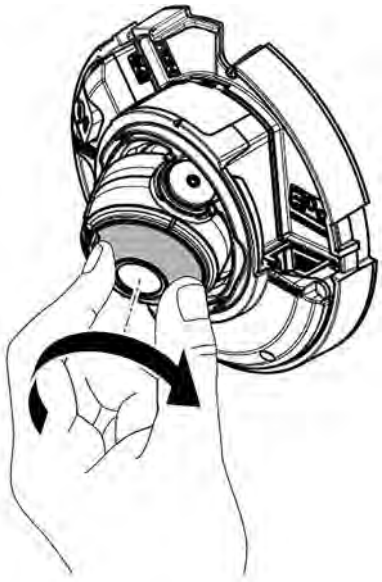
Internet Protocol (IP) Network Camera
(continued)



Rotate Camera Angle
Rotates 360°



Change Camera Angle
Tilts in one direction ONLY



Change Camera Focus

Status Light Location

Figure 4 - IP Network Camera - Adjustments

Wiring Diagrams

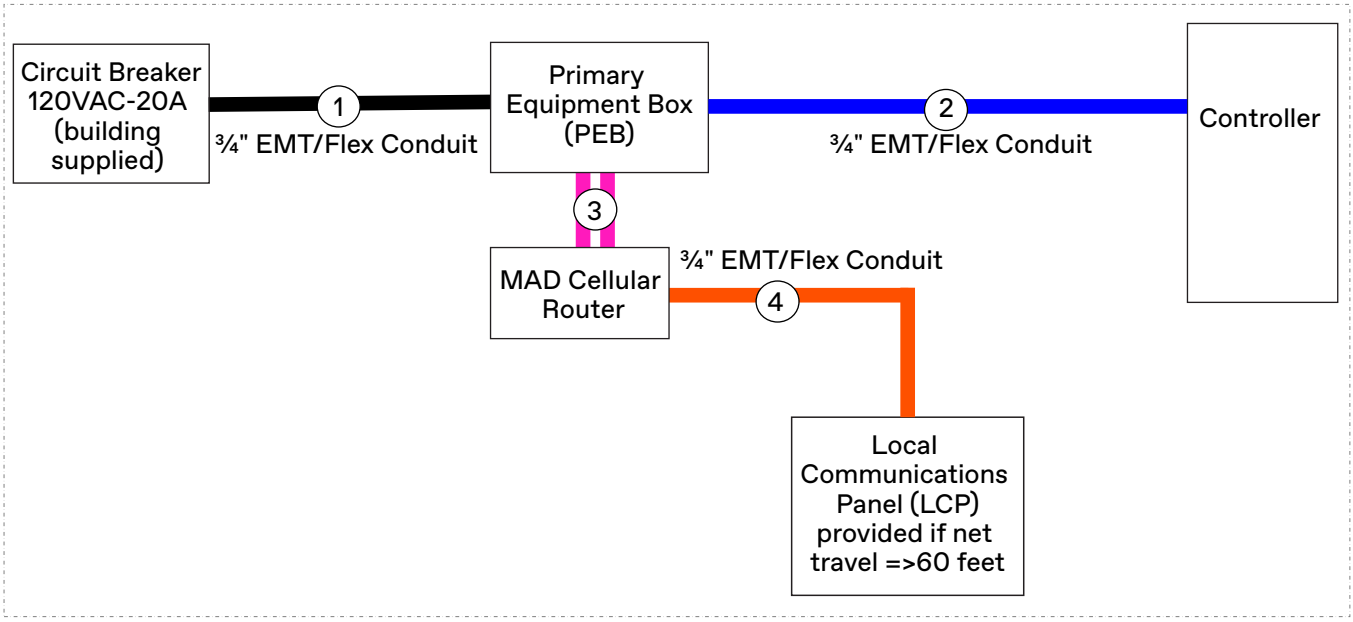
See also:

- Field Point-to-Point Wiring Charts on page 106.
- Wiring Diagrams (960GY) on page 109.

Standard Machine Room

Simplex Arrangement, 1 Car

Standard Machine Room

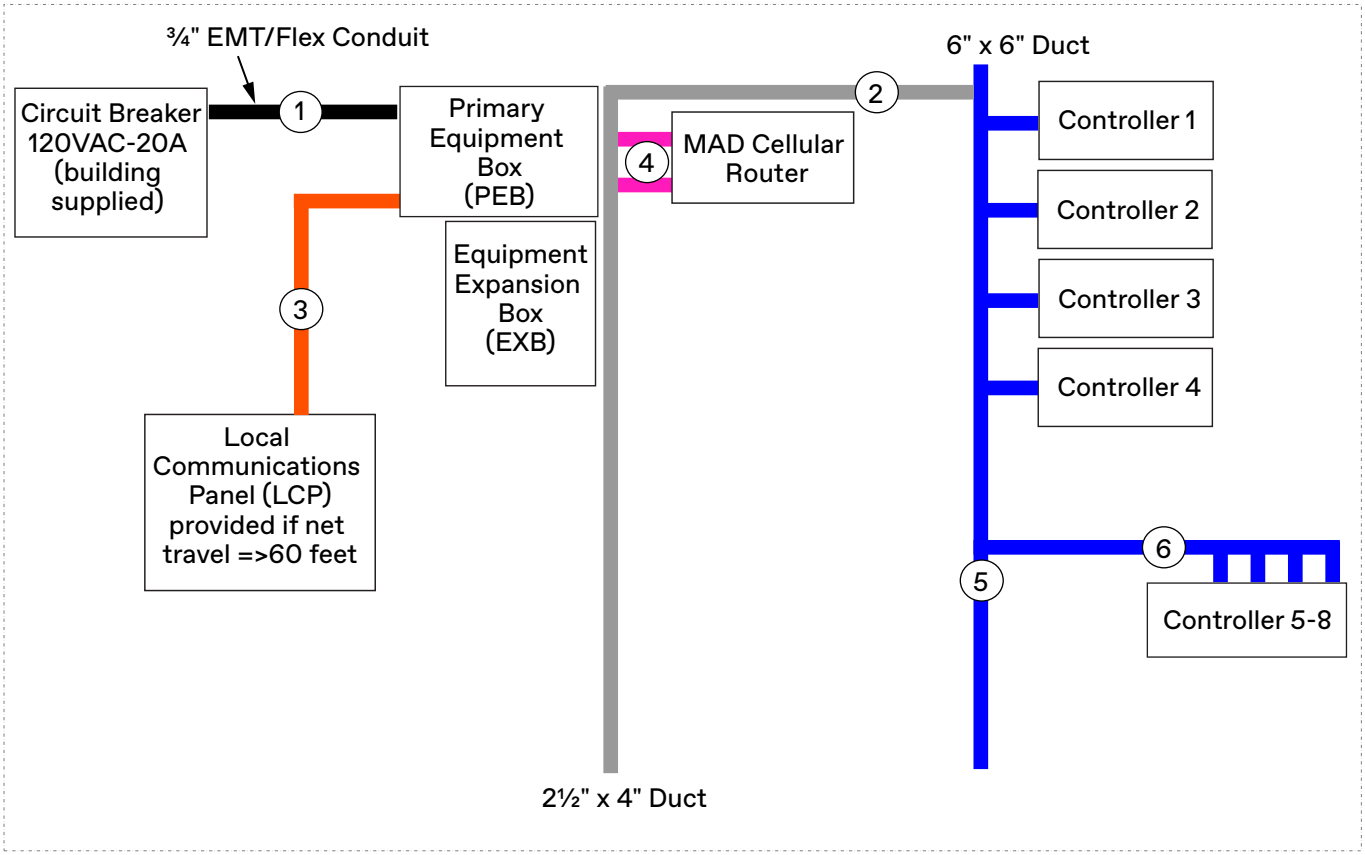


No.	Part No.	Description	Location	
			From	To
1	220JF001	Power wire	Circuit breaker	PEB
2	220AN1	Two wire Ethernet	PEB	Controller
3	220DJ1	Cat5 cable	LAN1 of MAD Cellular Router	PEB
	900DX7	Power wire	MAD Cellular Router	PEB
4	220JF001	Power wire	PEB	LCP
	220DJ1	Cat5 cable - if distance <= 280 feet		
	220AN1	18 GA. TSP - if distance > 280 feet		

Standard Machine Room
(continued)

Group Arrangement: 1 Group, 8 Cars

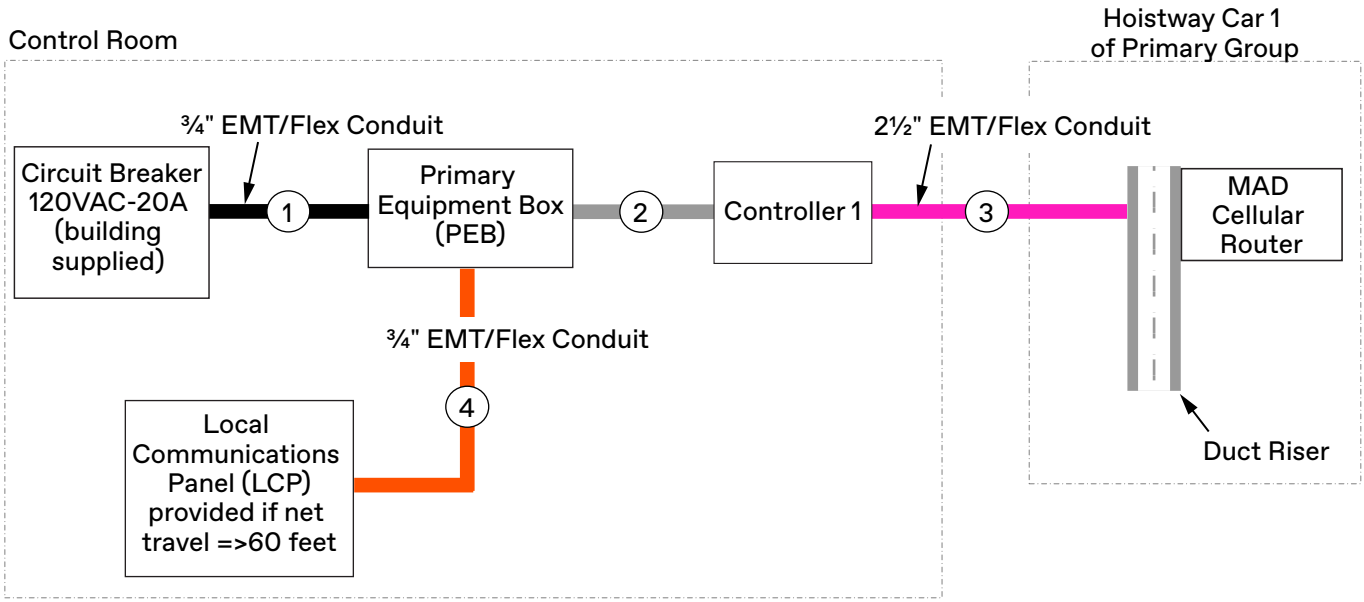
Standard Machine Room



No.	Part No.	Description	Location	
			From	To
1	220JF001	Power wire	Circuit breaker	PEB
2	220AN1	Two wire Ethernet	Each controller	Each assigned box (PEB/EXB)
3	220JF001	Power wire	LCP	PEB
	220DJ1	Cat5 cable - if distance <= 280 ft		
	220AN1	18 GA. TSP - if distance > 280 ft		
4	900DX7	Power wire	MAD Cellular Router	PEB
	220DJ1	Cat5 cable	LAN1 of MAD Cellular Router	PEB
5	220DJ1 or 220DK	Cat5 cable	GEB	GEB
6	220DK	Cat5 cable	Each controller	GEB
	220AN1	Two wire Ethernet	Each controller	EXB

Machine Room Less (controller in control room)

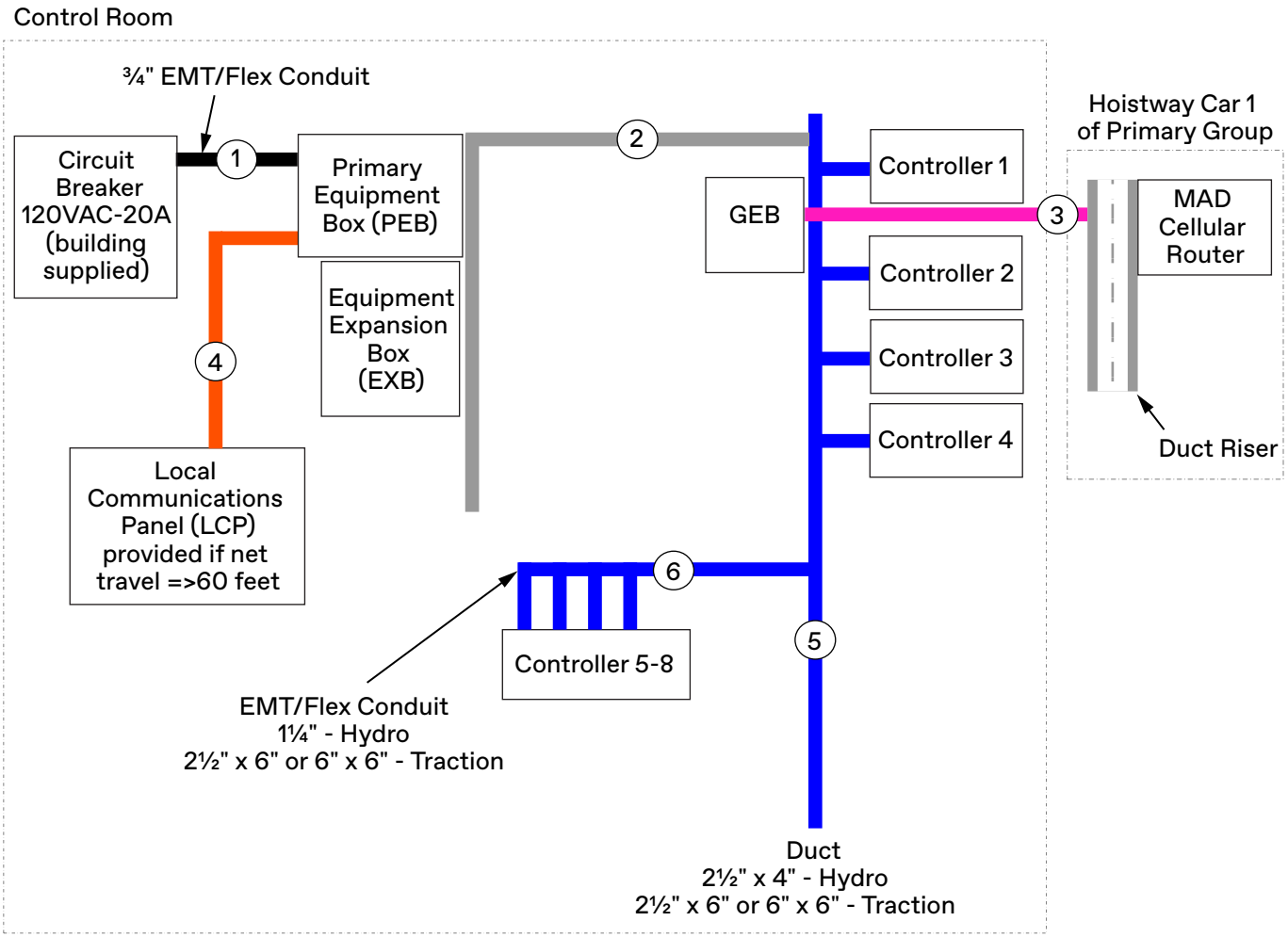
Simplex Arrangement, 1 Car



No.	Part No.	Description	Location	
			From	To
1	220JF001	Power wire	Circuit breaker	PEB
2	220AN1	Two wire Ethernet	PEB	Controller
	900DX7	Power wire	MAD Cellular Router	PEB
	220DJ1	Cat5 cable	LAN1 of MAD Cellular Router	PEB
4	220JF001	Power wire	LCP	PEB
	220DJ1	Cat5 cable - if distance <= 280 feet		
	220AN1	18 GA. TSP - if distance > 280 feet		

Machine Room Less (controller in control room)
(continued)

Group Arrangement: 1 Group, 8 Cars

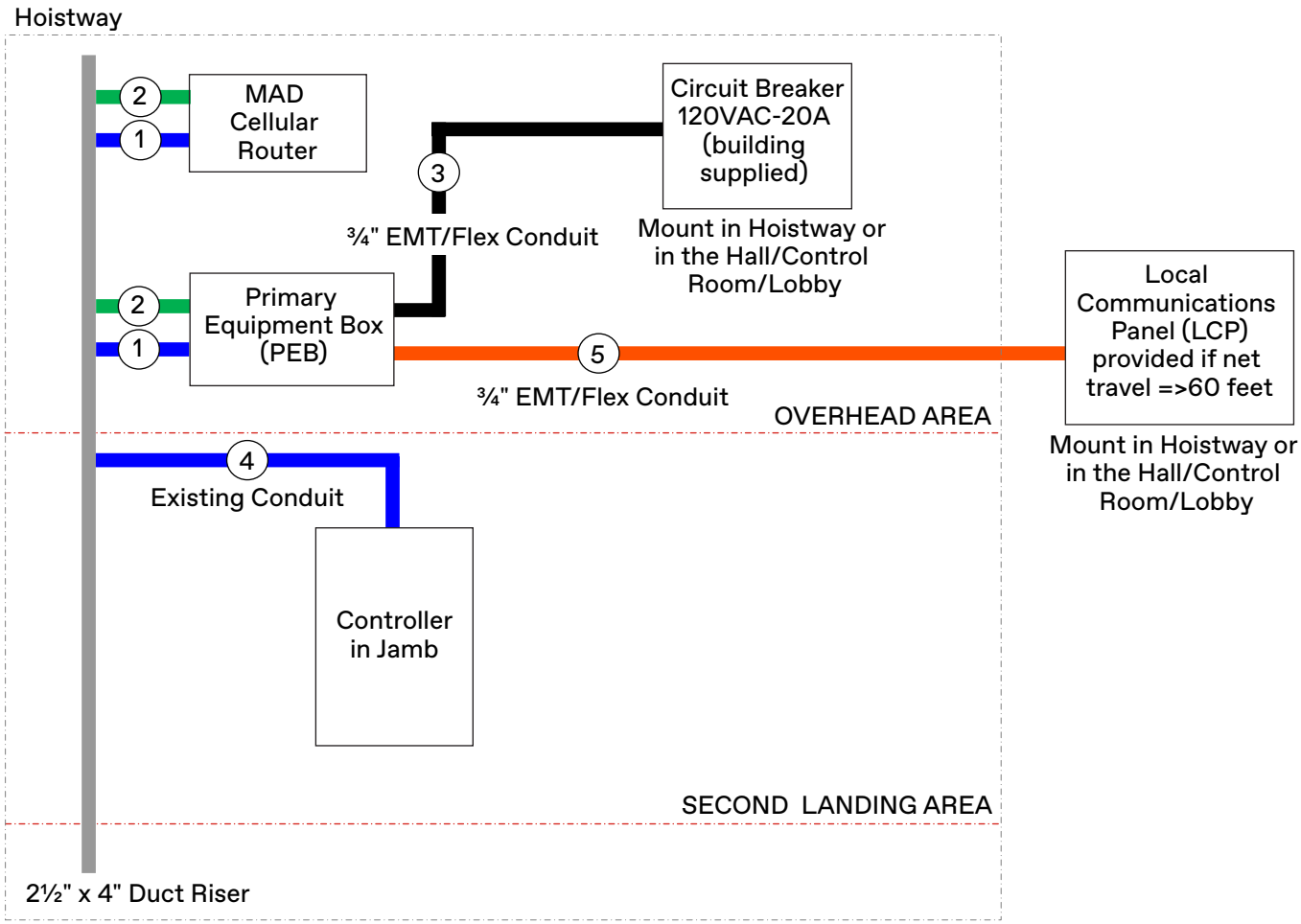


No.	Part No.	Description	Location	
			From	To
1	220JF001	Power wire	Circuit breaker	PEB
2	220AN1	Two wire Ethernet	Each controller	Each assigned box (PEB/EXB)
	900DX7	Power wire	MAD Cellular Router	PEB
	220DJ1	Cat5 cable	LAN1 of MAD Cellular Router	PEB
4	220JF001	Power wire	LCP	PEB
	220DJ1	Cat5 cable - if distance <= 280 feet		
	220AN1	18 GA. TSP - if distance > 280 feet		
5	220DJ1 or 220DK	Cat5 cable	GEB	GEB
6	220DK	Cat5 cable	Each controller	GEB
	220AN1	Two wire Ethernet	Each controller	EXB

True Machine Room Less (controller in jamb)

Hydro MRLH

Simplex Arrangement, 1 Car

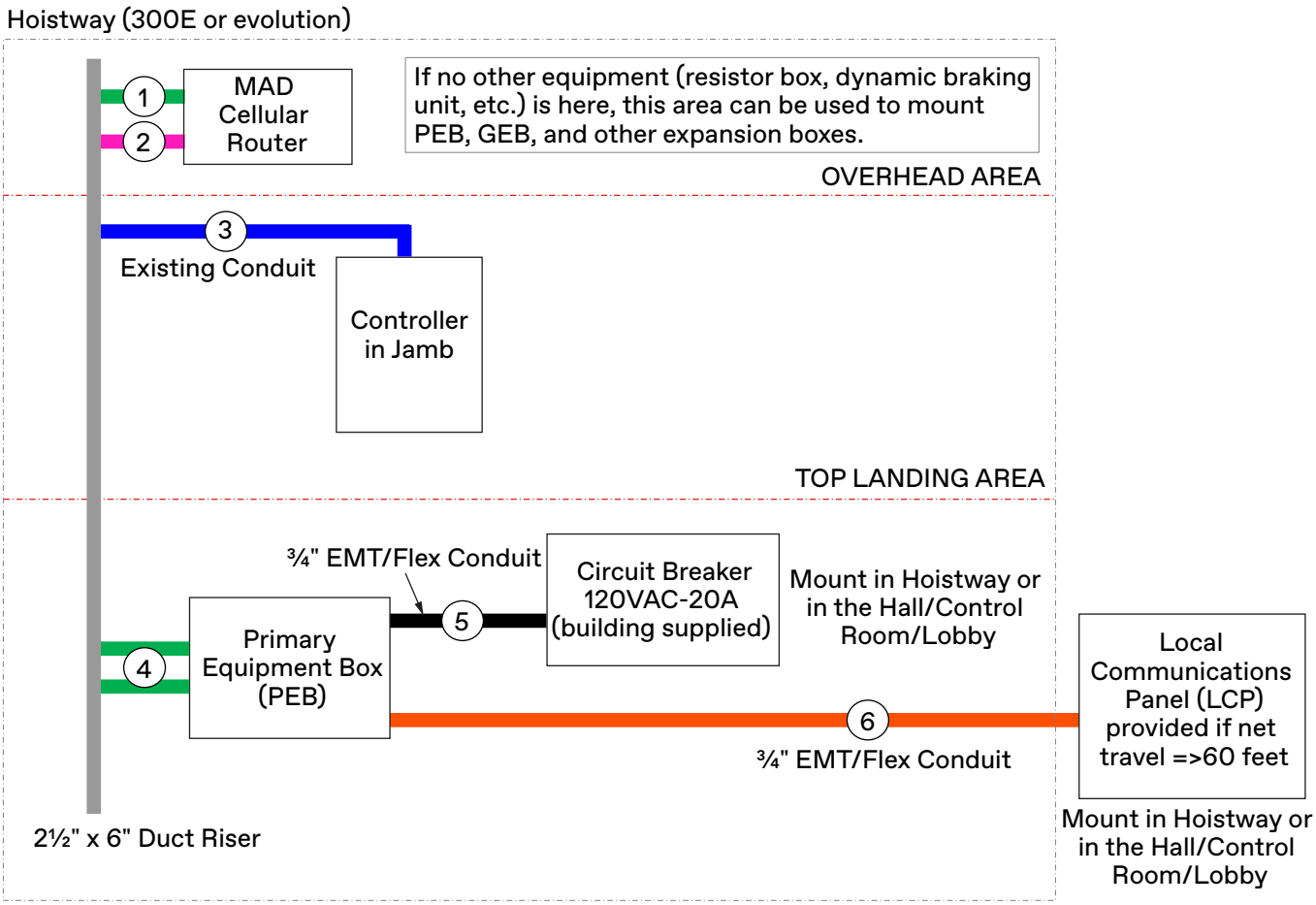


No.	Part No.	Description	Location	
			From	To
1	900DX7	Power wire	MAD Cellular Router	PEB
	220DJ1	Cat5 cable - if distance <= 280 feet	REB	PEB
	220DJ1	Cat5 cable	LAN1 of MAD Cellular Router	PEB
2	200DCX	MAD Cellular Router Installation Kit		
	200DBW	PEB Installation Kit		
3	220JF001	Power wire	Circuit breaker	PEB
4	220AN1	Two wire Ethernet	PEB	Controller
5	220JF001	Power wire	LCP	PEB
	220DJ1	Cat5 cable - if distance <= 280 feet		
	220AN1	18 GA. TSP - if distance > 280 feet		

True Machine Room Less (controller in jamb)
(continued)

Traction, 300E, and evolution

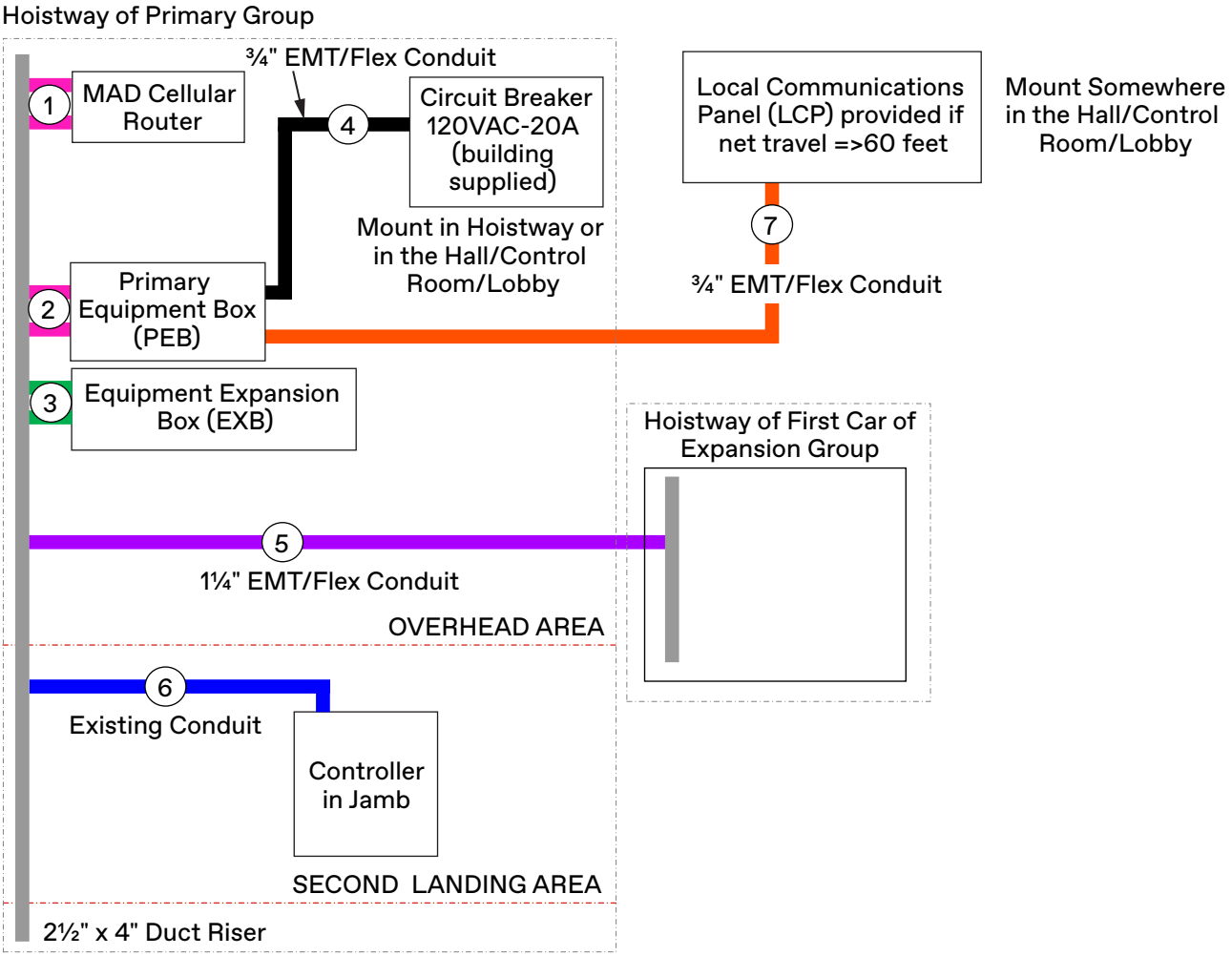
Simplex Arrangement, 1 Car



No.	Part No.	Description	Location	
			From	To
1	200DCX	MAD Cellular Router Installation Kit		
2	900DX7	Power wire	MAD Cellular Router	PEB
	220DJ1	Cat5 cable	LAN1 of MAD Cellular Router	PEB
3	220AN1	Two wire Ethernet	PEB	Controller
4	200DBW	PEB Installation Kit		
5	220JF001	Power wire	Circuit breaker	PEB
6	220JF001	Power wire	LCP	PEB
	220DJ1	Cat5 cable - if distance <= 280 feet		
	220AN1	18 GA. TSP - if distance > 280 feet		

True Machine Room Less (controller in jamb) *(continued)*

Group Arrangement: 1 Group, 8 Cars



No.	Part No.	Description	Location	
			From	To
1	900DX7	Power wire	MAD Cellular Router	PEB
	200DCX	MAD Cellular Router Installation Kit		
	220DJ1	Cat5 cable	LAN1 of MAD Cellular Router	PEB
2	200DBW	PEB Installation Kit		
3	200DBW	EXB Installation Kit		
4	220JF001	Power wire	Circuit breaker	PEB
5	220DJ1 or 220DK	Cat5 cable	GEB	GEB
	220DK	Cat5 cable	Each controller	GEB-Primary Grp.
	220AN1	Two wire Ethernet	Each controller	PEB/EXB
6	220AN1	Two wire Ethernet	PEB	Controller
	220DJ1	Cat5 cable	GEB	Controller
7	220JF001	Power wire	PEB	LCP
	220DJ1	Cat5 cable - if distance <= 280 feet		
	220AN1	18 GA. TSP - if distance > 280 feet		

Provisioning

- MAD MosaicONE Video Messaging System (VMS) devices are shipped unprogrammed, to be configured on the job site.
- Once the devices are installed and each device is powered, the system will program itself (auto-provisioning) within minutes using job specific details from the user.
- Provisioning can only performed on one elevator at a time. Only connect one set of elevator devices—CTB, Matisse PI, Network Camera—to the Primary Equipment Box (PEB) during each provisioning.

Equipment

1. PEB containing the Gateway, which has access to an internet connection via a Cat5e cable.
2. One Car Top Box (CTB) per elevator.
3. 120VAC power to the PEB and the CTB.
4. A twisted pair connection between the PEB to each CTB via the traveling cable.

Car 1 Setup

1. The CTB receives power from the TAC controller on the AC1/AC2 car circuit via the traveling cable. Determine how many elevators will need to be connected through the network back to the PEB through the NV202 Ethernet extenders.

NOTE If more than one car will need to be connected, label the Ethernet extenders in the PEB, EXB, or REB to show which car is assigned to each Ethernet extender. See Figure 5.

Figure 5 - Label and Wiring Overview

Car 1 Setup
(continued)

2. Disconnect the Cat5e cable from LAN1/LAN2 on the NV202 Ethernet extender for each car that is not currently being provisioned. Verify that only Car 1 has a network connection to the PEB. See Figure 6.

NOTE This method of connecting one elevator at a time to the PEB prevents the user from having to correctly group elevator devices to the correct elevator. As each elevator is provisioned, the correct pairing of devices will be assigned to the correct elevator.

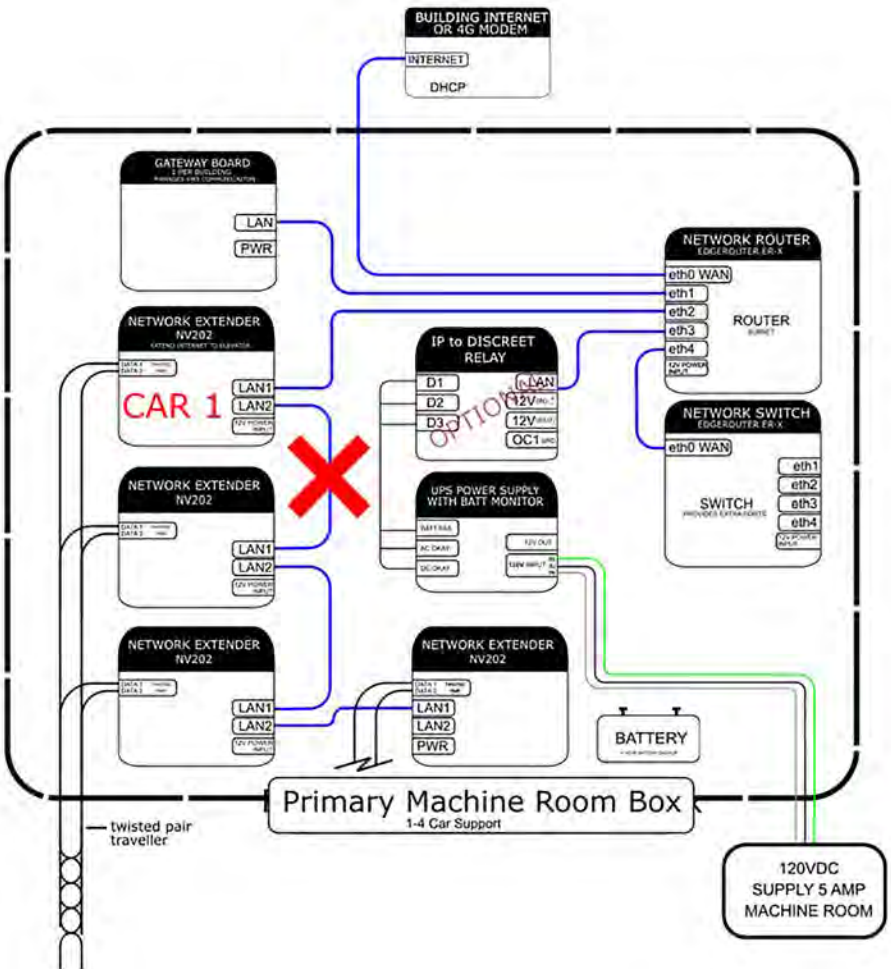


Figure 6 - Disconnect Cat5e Cable

3. After the PEB and CTB are both powered up for Car 1, complete the applicable connection:
   - **Max V2 as the cellular modem**: Connect the eth0 port in the PEB router to the LAN1 Ethernet port.
   - **Customer supplied broadband modem**: Connect the WAN access port of the modem to the eth0 port in the PEB router.

Car 1 Setup
(continued)

After the PEB and CTB both have an internet signal, the Matisse PI will receive data from the Gateway over LAN and the display will reset.

The Troubleshooting Screen displays the 12-digit registration code. See Figure 7. See also: How to Access the Troubleshooting Layer in Matisse PI on page 71.

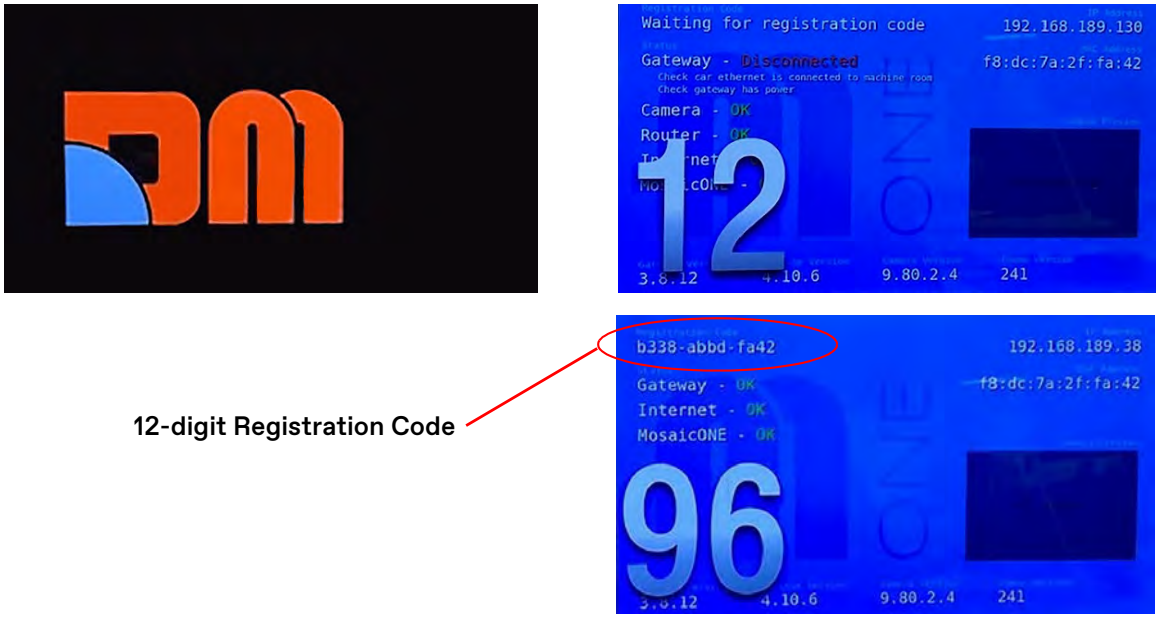
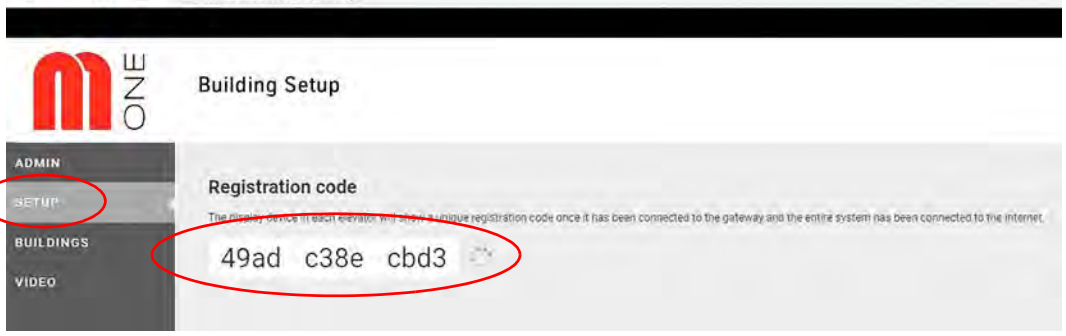


Figure 7 - Display Reset Screens

4. Enter the registration code in MosaicOne.
   a. Go to: **https://mosaicone.net**
   b. Enter the following:
      User Name: tkefield
      Password: xxxxxxxx
   c. Touch **Setup**, and enter the 12-digit registration code from the Matisse PI.



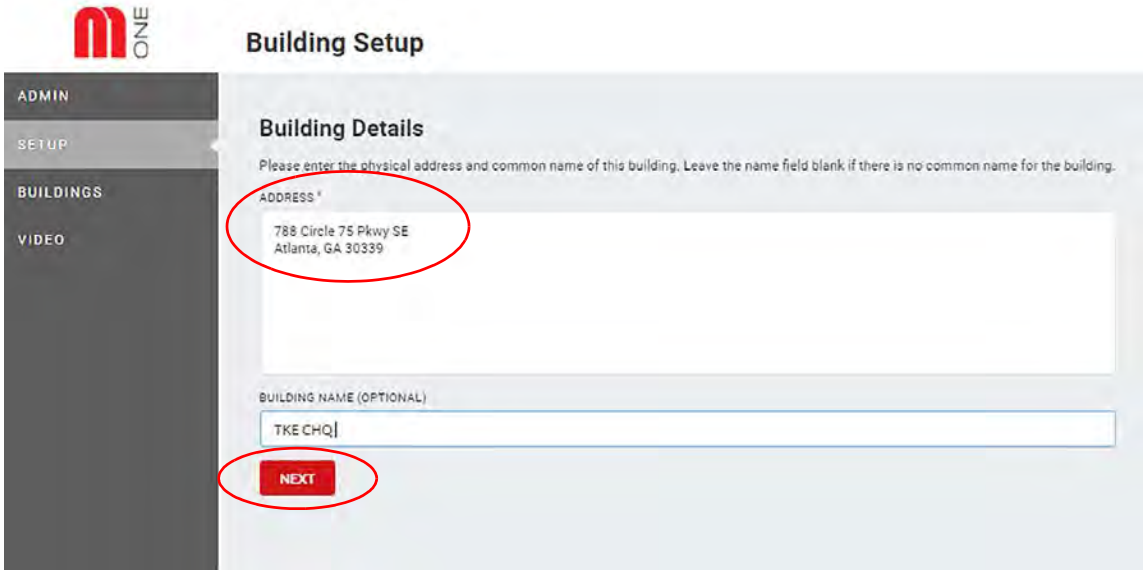
Car 1 Setup
(continued)

Once the registration code is entered, Car 1 will setup the building for the entire elevator group.

5. When the Building Details screen displays, enter the building address and the building name and touch **NEXT**.

IMPORTANT!

Provide the accurate building name, elevator, and address as this may be needed to search for the elevator during an emergency call. The elevator name will also appear on the Local Communications Panel as a elevator feed label.



6. When the Elevator Details screen displays, enter/confirm the following information. See Figure 8 on page 58.

   a. Elevator Name = "Common Name" of the elevator on site is required; the Elevator Name also appears on the LCP as an elevator feed label.

   b. External ID (TKE US ID) = The TKE Call Center uses this ID number to link this elevator to the phone answering software/database.

   c. Devices

      - Camera = The name of the camera grouped with the elevator; it automatically takes the prefix of the elevator name created by the user.
      - Matisse - This is the name of the display grouped with the elevator; it automatically takes the prefix of the elevator name created by the user.

   d. ALL ELEVATORS HAVE BEEN REGISTERED

IMPORTANT!

Do not select "ALL ELEVATORS HAVE BEEN REGISTERED" until all devices are set up for the building. If this is selected prematurely, the Gateway may stop looking for devices and the PEB will have to be power cycled to continue to look for elevator devices to register.

Car 1 Setup
(continued)

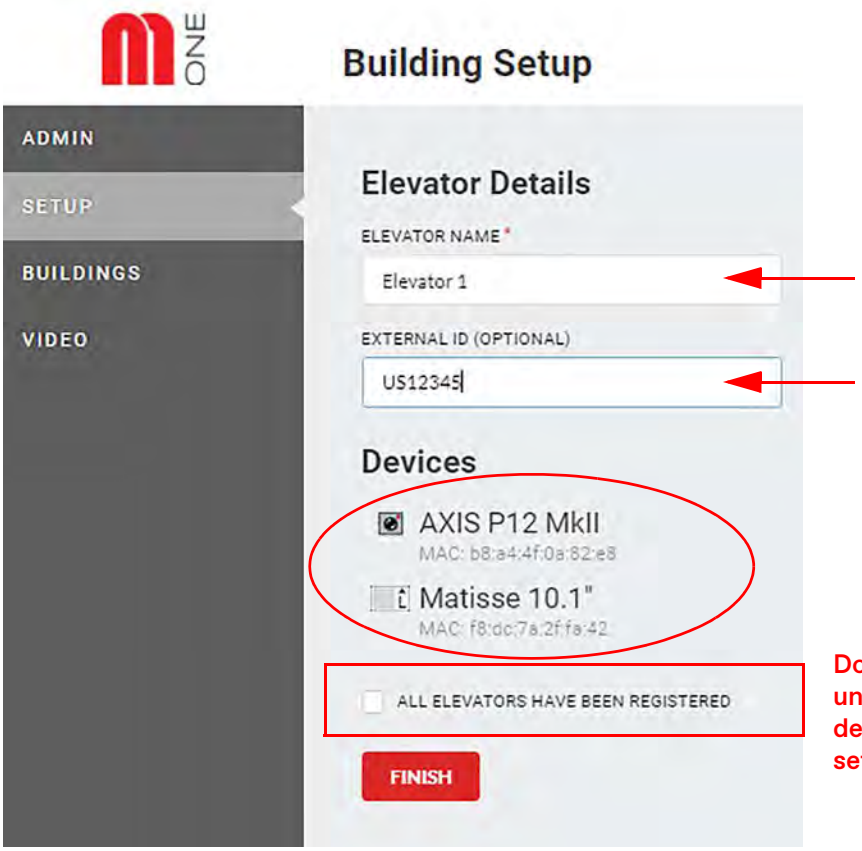


Figure 8 - Elevator Details Screen

7. Once the elevator details are entered, touch **FINISH**, and "Elevator *n* was registered successfully" message displays. See Figure 9.

8. Touch **BUILDINGS,** and the newly created building appears in the buildings list.

NOTE Matisse will sync its settings with the Gateway and Display for the specific elevator being provisioned, and reboot to save the new configuration.

9. Repeat Step 6– Step 8 for Elevators 1 – *n* until all elevators have been registered.

10. When all elevators are provisioned, select "ALL ELEVATORS HAVE BEEN REGISTERED" to confirm that registration is complete.

11. Initiate a call to verify the device setup. See Video Messaging Overview on page 67. See also: Troubleshooting Guide on page 70.

Car 1 Setup
(continued)

Figure 9 - Building Provisioning Process

Call Center Provisioning

Call Center Provisioning - The process of linking the video/text call in MosaicONE to the audio call in the TKE software database for the elevator system. After the field technician has provisioned the MosaicONE VMS unit, it can be provisioned for video attributes in Production/(IB). The IB values enable the cam attributes in Oracle Production/IB (OI), which link the video/text call to the audio voice call.

Once the elevator is ready to turnover, complete the following:

1. Gather the following information: Building Name, Elevator Name, and US ID#.
2. Contact the Two-way Video Support Line at 1-866-820-0562, and provide the information to the Call Center Agent.

IMPORTANT! The Call Center Agent will complete the following steps:

3. Logs into MosaicONE and navigates to the Elevator that is being provisioned.
4. Copies the 32-digit Multimedia Vendor ID, which has the following format:
   - 8 characters - 4 characters - 4 characters - 4 characters - 12 characters
5. Logs into Oracle Production/IB and uses the US ID# to find the job contract.
6. Edits the OI job contract and enters the 32-digit US ID# into the Multimedia Elevator ID field.
7. Within 25 minutes, the video attributes are updated in the OI contract, and the Call Center Agent will ask the field technician to press the ADA phone button.
8. The Call Center Agent will see a new attribute in OI; once selected, the Call Center Agent will have access to the video call in MosaicONE. See Figure 10.
9. The Call Center Agent will confirm that the camera's field of view is acceptable.

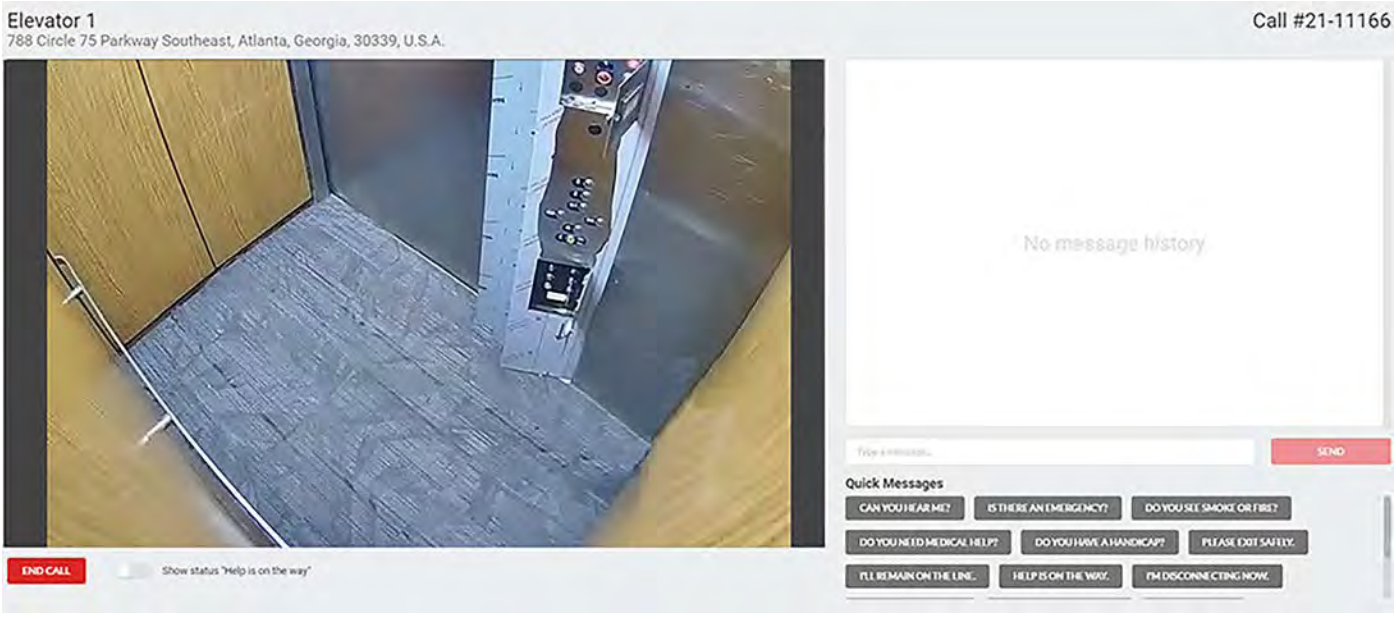
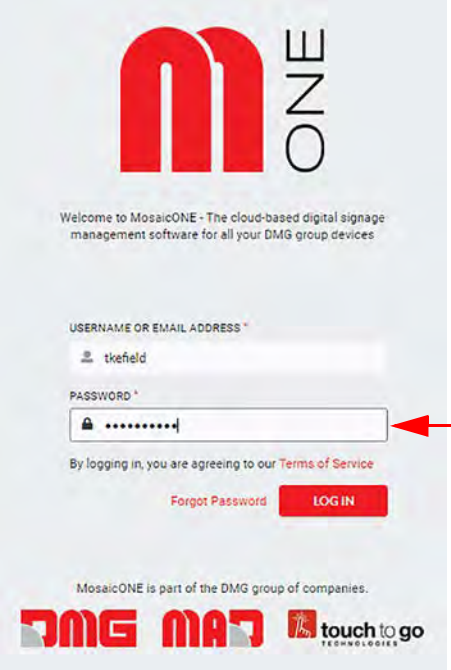


Figure 10 - Camera Field of View from Call Center

MosaicOne Information

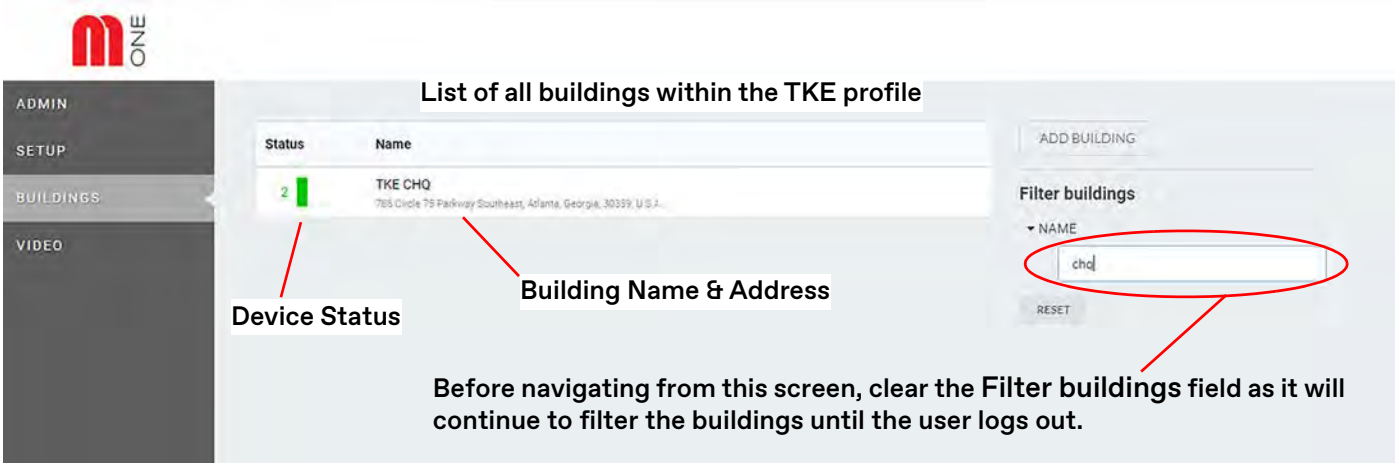
How to Login

1. Open a web browser - Google Chrome is recommended.
   The MosaicOne software application does not work with Internet Explorer.
2. In the browser address bar, type the following URL: **https://mosaicone.net**
3. Navigate to the login screen, enter the following credentials to access the site, and touch LOGIN.
   User Name: tkefield
   Password: xxxxxxx



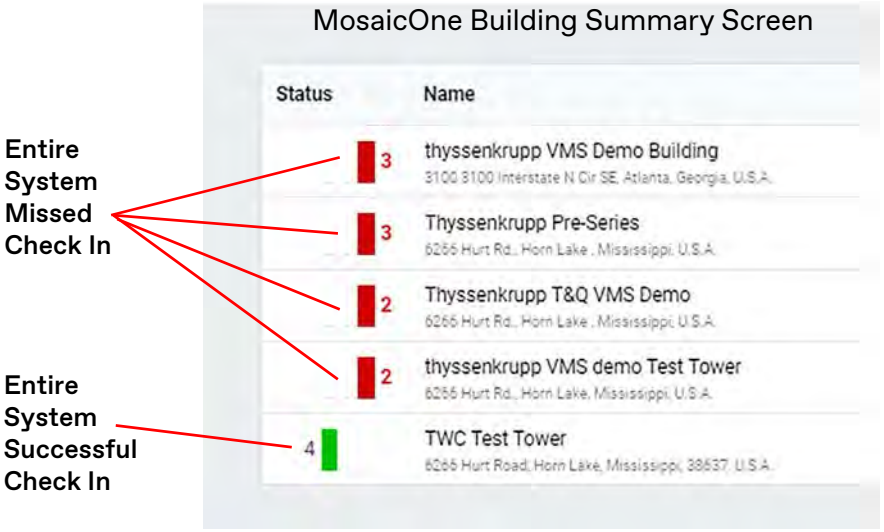
User Name: tkefield
Password: xxxxxxxx

Buildings Tab



Building Summary

- Green status bar: the entire system is checking in successfully.
- Yellow status bar: the system has a device that has not checked in during the 15 minute period.
- Red status bar: the entire system has not checked in during the 15 minute period.



Devices Tab

How to Edit MosaicONE Devices

1. Go to: Buildings > Devices and the Device Detail screen displays. See Figure 11.

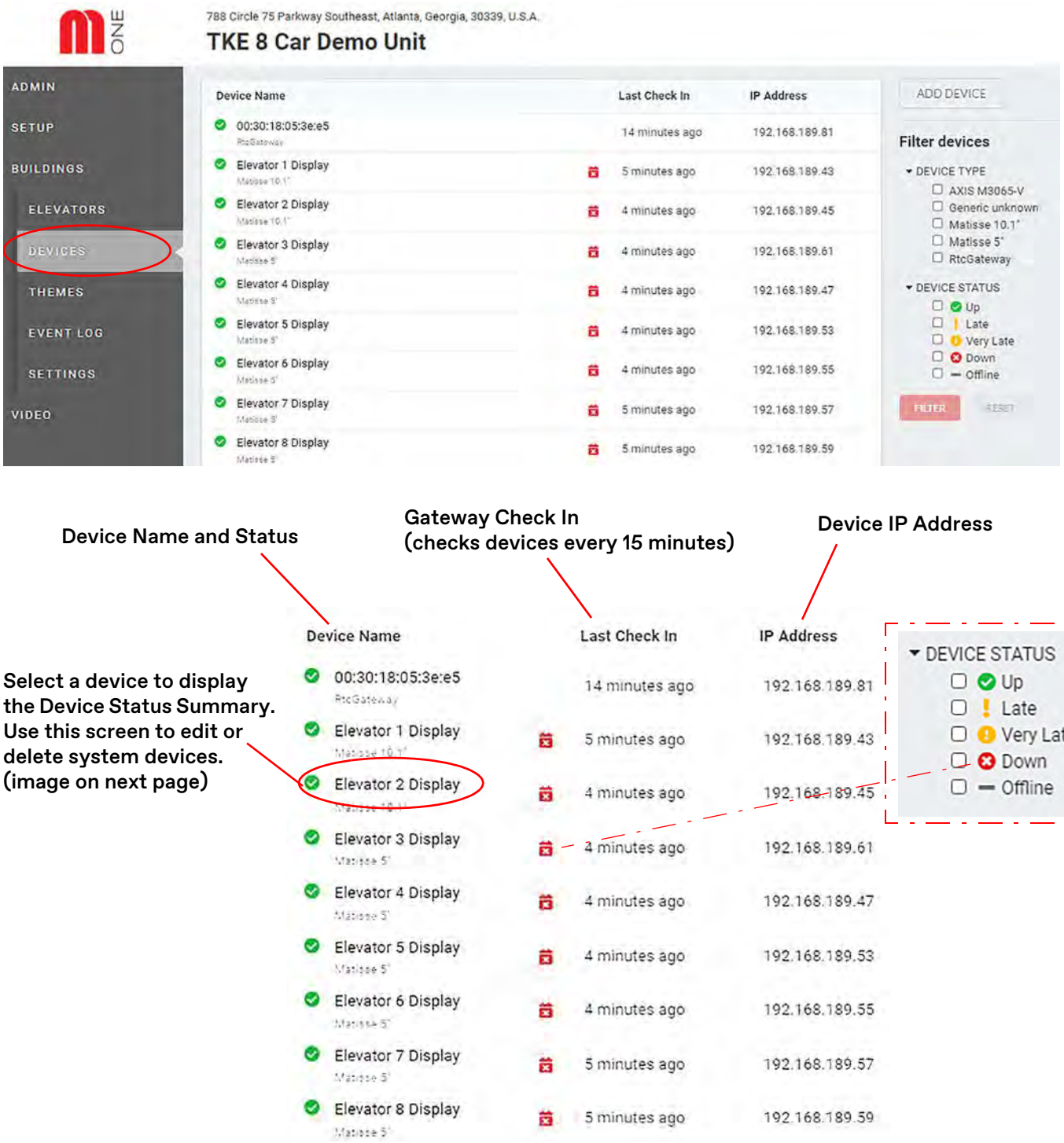
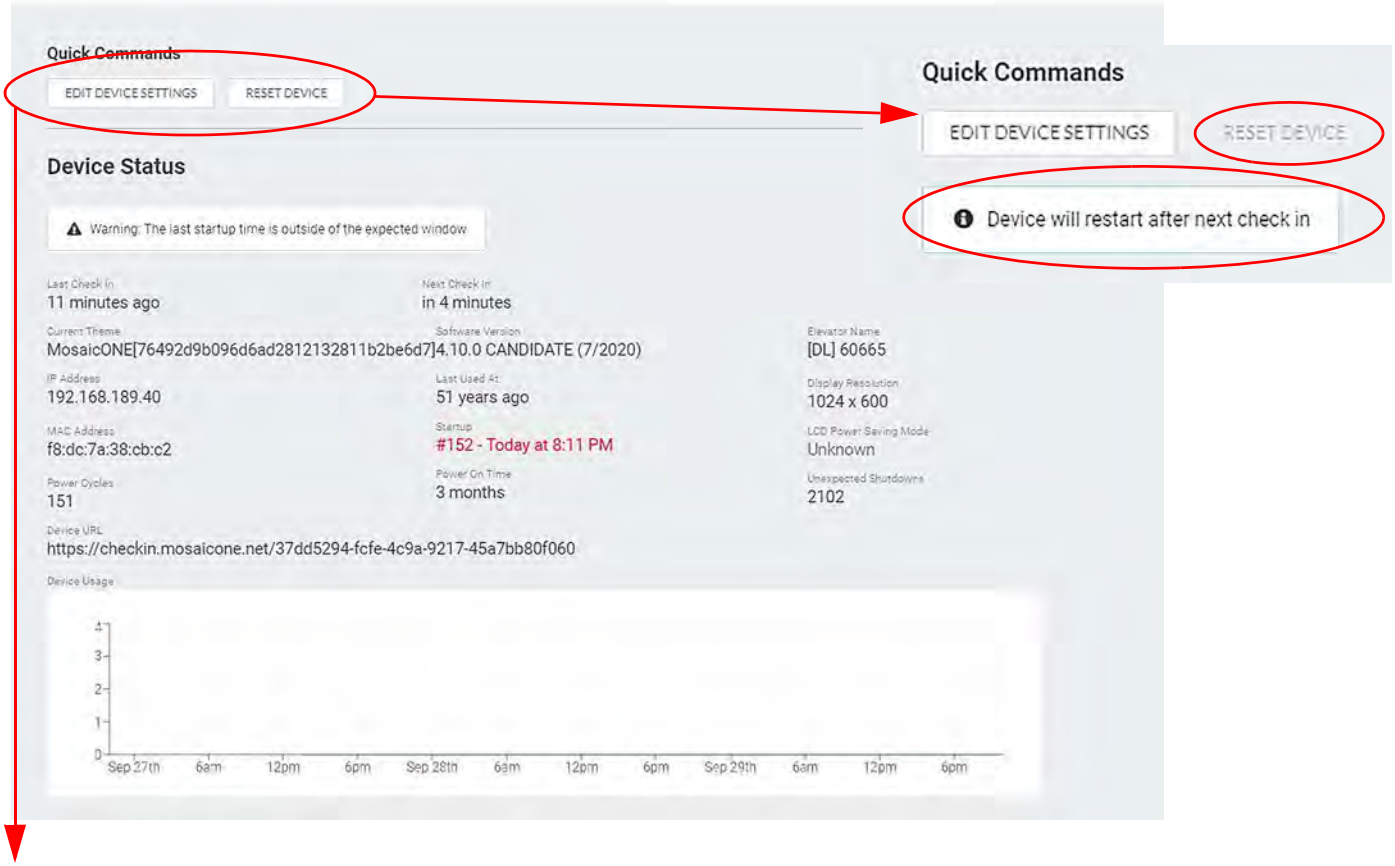
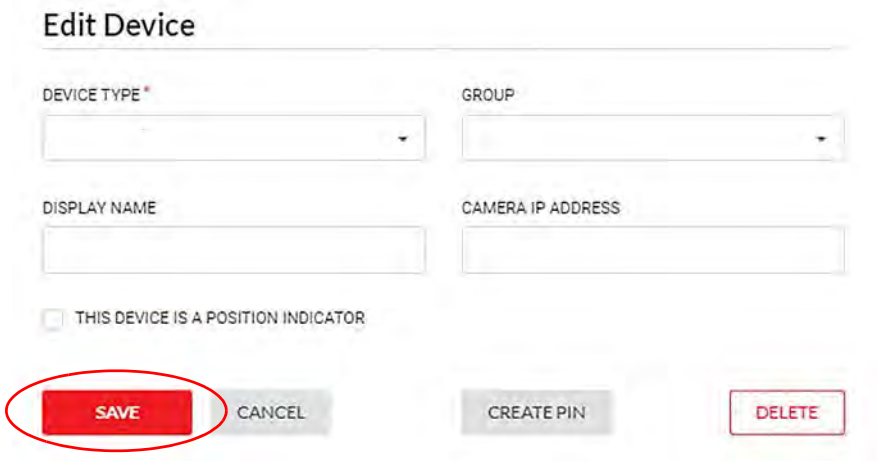


Figure 11 - Device Detail Screen Overview

How to Edit MosaicOne Devices
(continued)

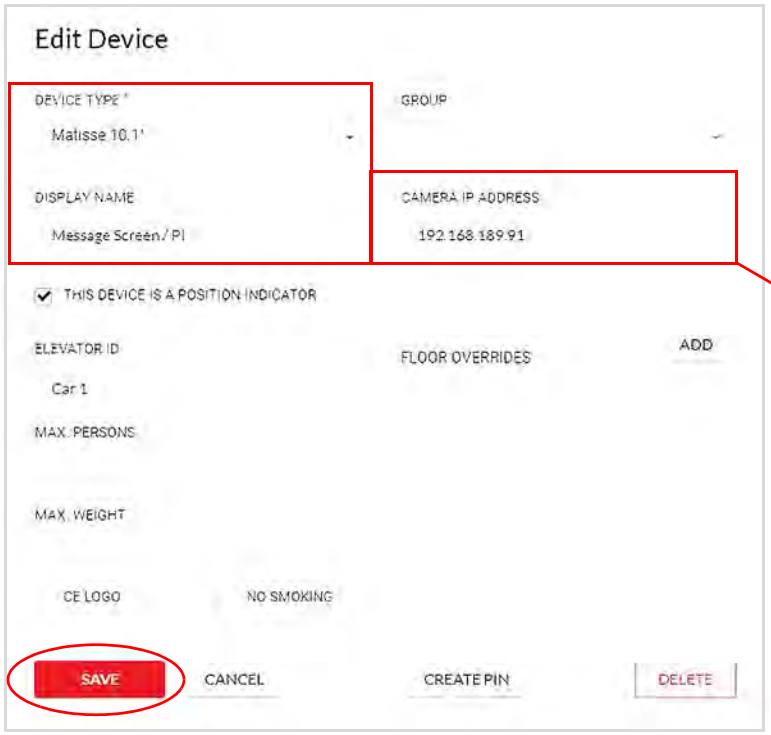
2. Select an individual device, and the Device Status Summary screen for that device displays.
   - To reset a device - Touch **RESET DEVICE**, and the following message displays: *Device will restart after next check in.*
   - To edit a device - Touch **EDIT DEVICE SETTINGS,** enter the appropriate information in the screen, and to save the changes touch **SAVE**.





How to Edit MosaicOne Devices
(continued)

Edit the Matisse PI and Camera



Only these items can be edited.

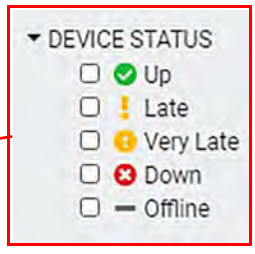
To save changes, touch SAVE.

To delete a device, touch DELETE.

Event Log Tab

Event Log

Device Name	Status	Date	Time
Elevator 8 Display	Up	Dec 8	12:54 AM
Elevator 1 Display	Up	Dec 8	12:54 AM
Elevator 3 Display	Up	Dec 8	12:54 AM
Elevator 6 Display	Up	Dec 8	12:54 AM
Elevator 2 Display	Up	Dec 8	12:53 AM
Elevator 5 Display	Up	Dec 8	12:53 AM
Elevator 7 Display	Up	Dec 8	12:53 AM
7fd4fb3f-4258-4328-858d-4bd453c8c3d6	Up	Dec 8	12:53 AM
Elevator 4 Display	Up	Dec 8	12:53 AM
Elevator 4 Display	Down	Dec 8	12:22 AM
Elevator 3 Display	Down	Dec 8	12:07 AM
Elevator 8 Display	Down	Dec 8	12:07 AM
Elevator 2 Display	Down	Dec 8	12:07 AM
Elevator 1 Display	Down	Dec 8	12:07 AM
Elevator 6 Display	Down	Dec 8	12:07 AM
Elevator 7 Display	Down	Dec 8	12:07 AM
7fd4fb3f-4258-4328-858d-4bd453c8c3d6	Down	Dec 8	12:07 AM
Elevator 5 Display	Down	Dec 8	12:07 AM
Elevator 4 Display	Very Late	Dec 8	12:07 AM

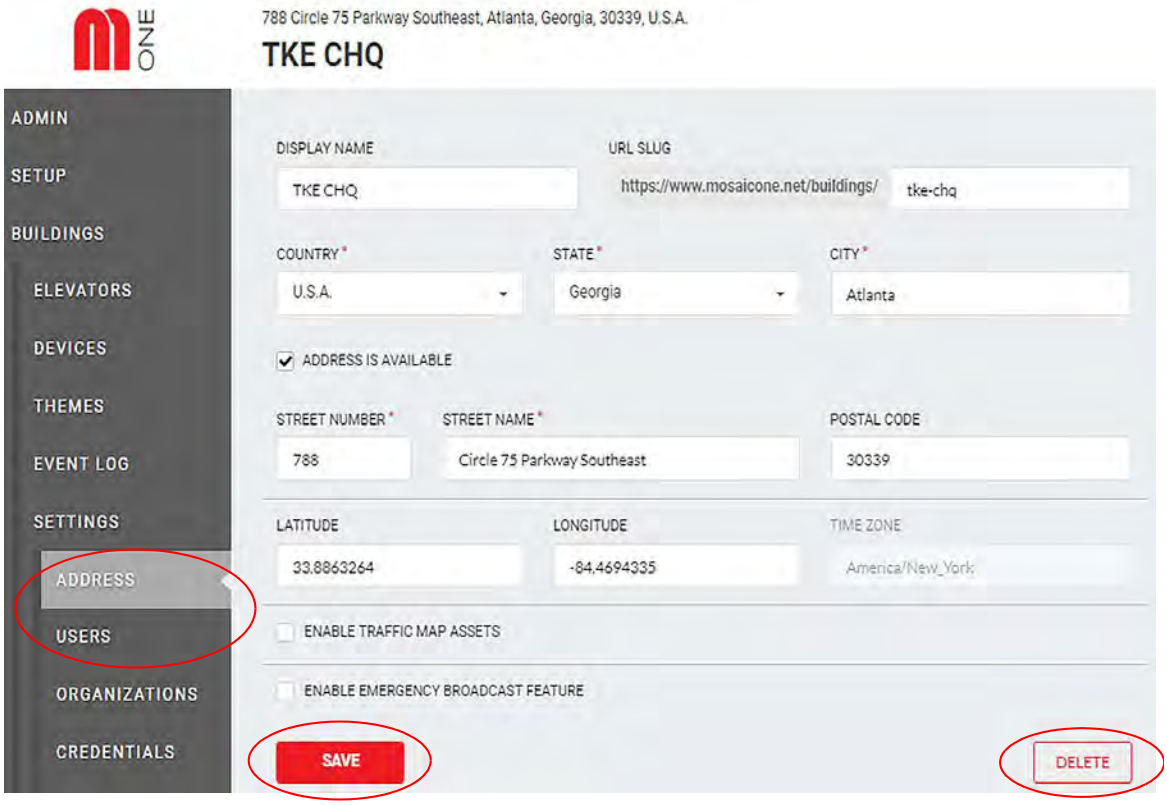


Gateway Check In (checks devices every 15 minutes)

Settings Tab

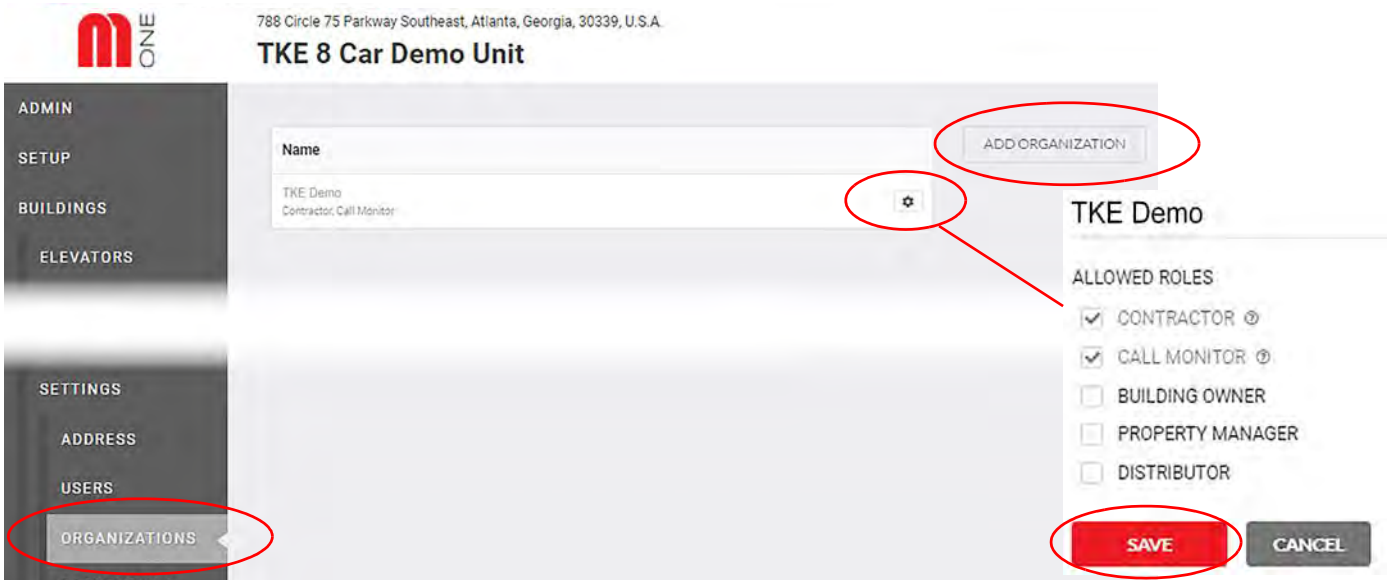
ADDRESS & USERS

Select the applicable tab, and change the necessary information. When complete, touch SAVE or DELETE. To delete a building, select the building and touch DELETE.



ORGANIZATIONS & CREDENTIALS

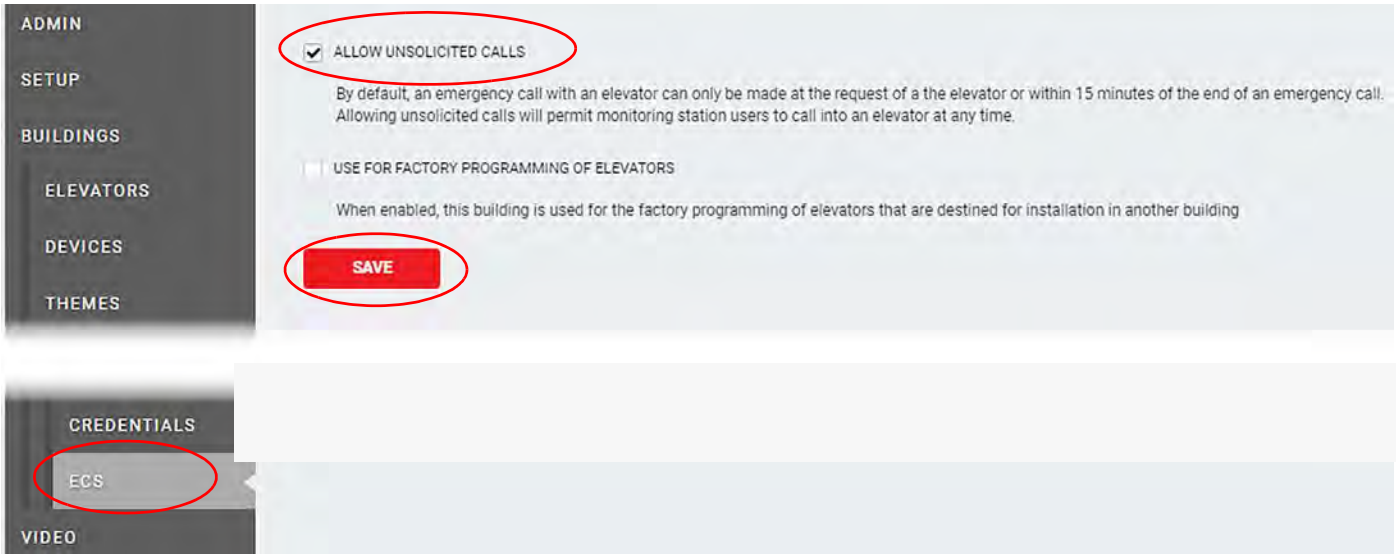
To add an organization: from the Organization tab, touch **ADD ORGANIZATION**.
To change the current organization roles: touch ⚙, make selections and touch SAVE.



ECS (Advanced Feature)

ECS connects elevators from the call center, if needed. ECS is a restricted feature and is disabled (default setting) on all buildings. To enable—Administrator Only—go to: Building > Settings > ECS, select **ALLOW UNSOLICITED CALLS**, and touch SAVE.

ECS is used to call an unsolicited elevator. An elevator call can be placed from the call center to the elevator outside of the callback window without previous interaction between the elevator and the call center; Used in situations where there needs to be communication initiated by the call center outside of the 15 minute call back window, e.g., elevator in a remote location and responders cannot quickly rescue the passenger due to external factors (weather, traffic, etc.). See also: Call Back (operator only) on page 69.



Video Tab

Video Messaging Overview

See the detailed Video and Messaging screens on page 68 and page 69.

Video and Messaging requests (calls) come into MosaicONE as elevator users press the elevator phone button.

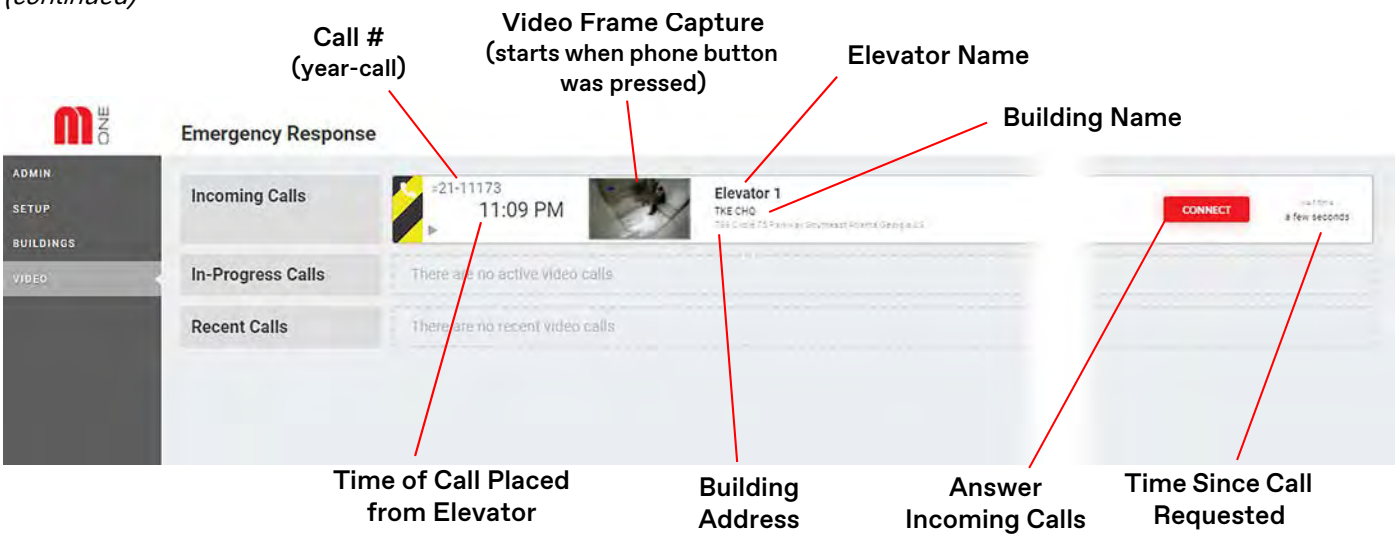
When a call is received at MosaicONE (in parallel with the elevator analog phone call), it displays in the Incoming Call portion of the Call Portal Screen.

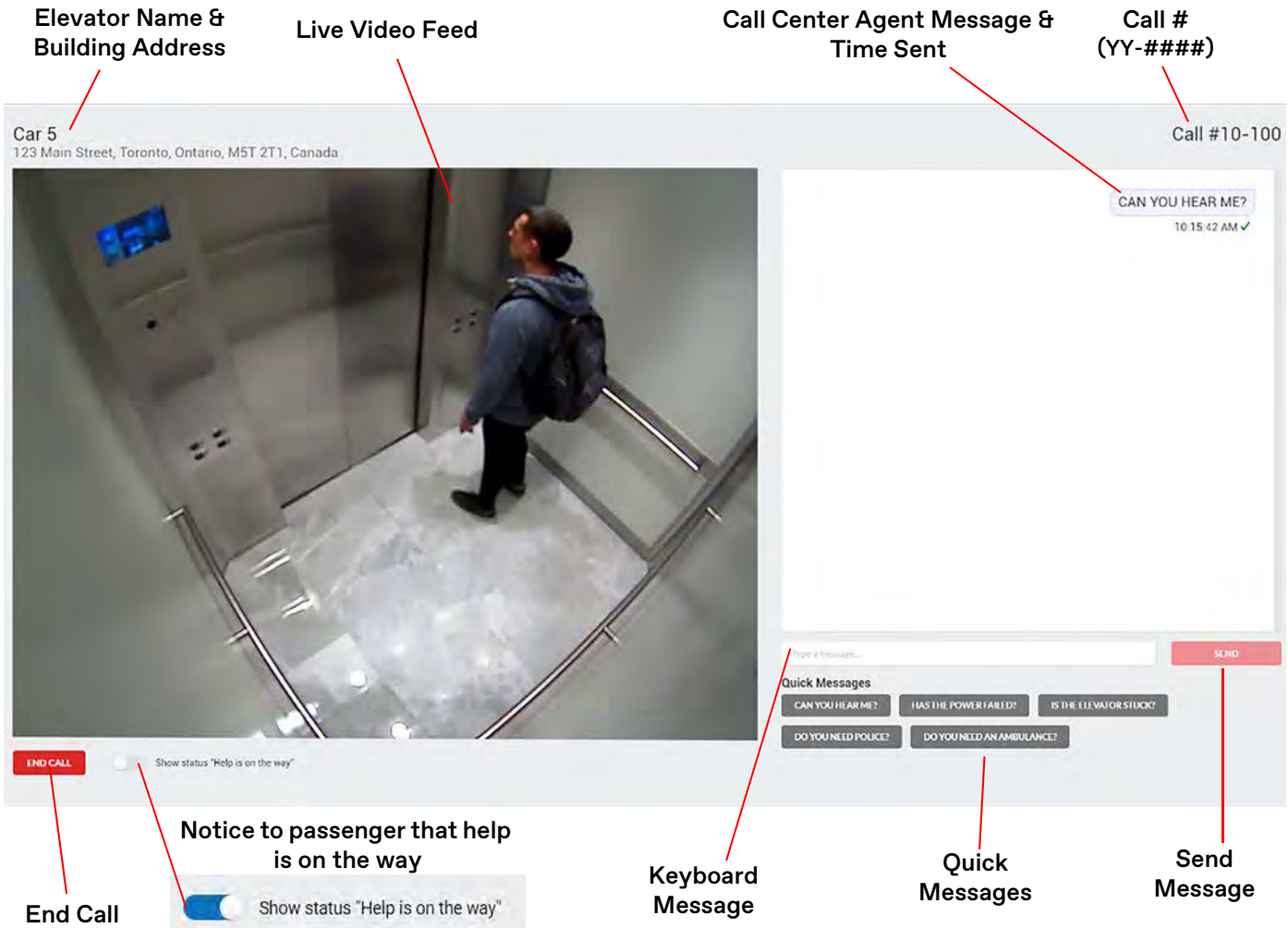
To answer the call, the call center agent touches CONNECT, and the Video and Messaging screen displays the elevator video feed and text dialogue box. The call center agent determines the course of action and lets the passengers know help is on the way.

How to access the Video and Messaging screen:

- Touch CONNECT on Incoming Calls
- Touch CALL BACK on Recent Calls
- Touch START CALL on a specific Elevator page

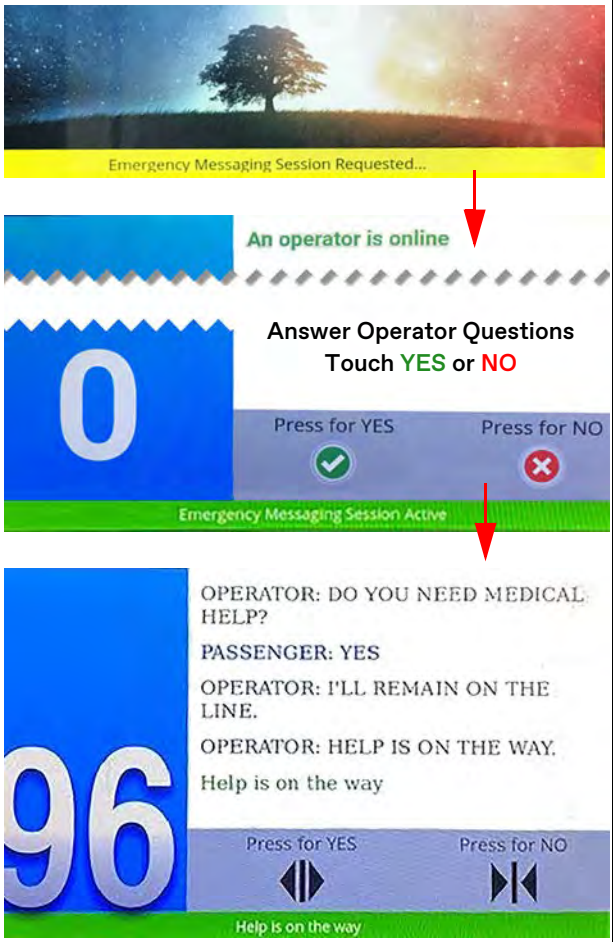
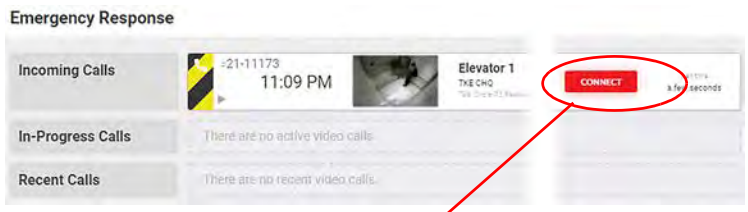
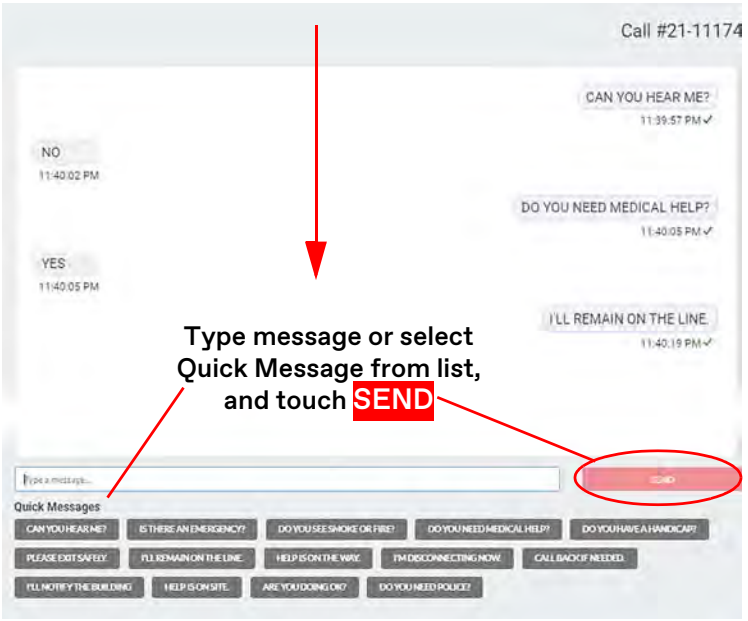
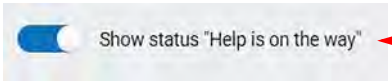
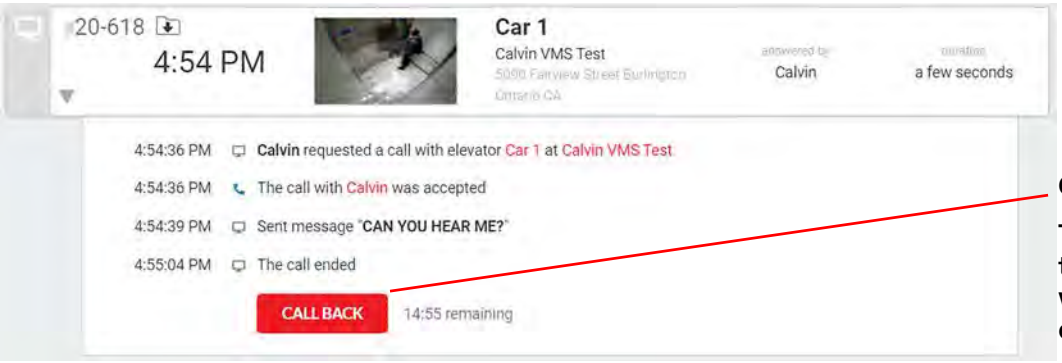
Video Tab
(continued)





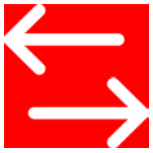
Video Tab
(continued)

Video Messaging Process

Passenger presses elevator phone button.	Operator answers the call.
 Answer Operator Questions Touch YES or NO **Conversation with Operator and Help is on the way message**	 Touch CONNECT to answer call  Type message or select Quick Message from list, and touch SEND  Activate "Help is on the way"
 Call Back (operator only) To contact passenger, touch CALL BACK within 15 minutes of call.	

Troubleshooting Guide

Troubleshooting Icons

Symbol	Definition
	**Gateway** - This icon flashes on the display when the display itself notices that it cannot connect to the VMS Gateway board. VMS Gateway controls all communication at the building level and to the cloud for the VMS System.
	**Internet** - This icon flashes on the display when the system notices that the internet connection is experiencing issues. This will appear 45-60 seconds after removing the internet connection. This icon will show after extended internet outage, and may not show on the screen for intermittent internet connection outages lasting, for example, 30 seconds unless it checks for connection during the outage.
	**Network** - Not active in current implementation - this icon would be used to indicate general network failure independent of connections to internet, router, camera, gateway, display, and other failures.
	**MosaicONE** - This icon flashes on the display when the system notices that the connection from the VMS Gateway to MosaicONE is experiencing issues. This could be caused by other issues such as the internet connection being down, a VMS Gateway or LAN connection, or MosaicONE itself being unavailable.
	**Router** - This icon flashes on the display when the system is unable to communicate with the router. This means that the router is either not powered, not programmed correctly, or not working correctly for all LAN ports.
	**Camera** - This icon flashes on the elevator-specific display, when the camera assigned to that elevator is unable to communicate. This could be caused by lack of power, hardware issue, network cable, etc.
	**Warning** - This icon flashes on the elevator-specific display as a contingency for any type of condition that is unrecognized. Example: If the VMS Gateway is sending unrecognized messages to the display because the display is out of date and not compatible with that specific new feature.

How to Access the Troubleshooting Layer in Matisse PI

Only accessible to VMS Gateway versions 3.7x and later.

1. Press **Door Open** and **Door Close** (or dedicated buttons for Yes and No response) and hold them down for 5 seconds.

NOTE The troubleshooting layer displays for 30 seconds, then disappears. See Figure 12.
The screen individually checks each item. and the precise issue may not be identified right away. Each test is a ping from device to destination to test connectivity (excluding the camera which shows the video feed).

2. Check the router first because the internet and MosaicONE depend on the working router connection. If the router is powered off, or the LAN cables disconnected, errors will show for the router, the internet, and MosaicONE—and the issue may be the router.

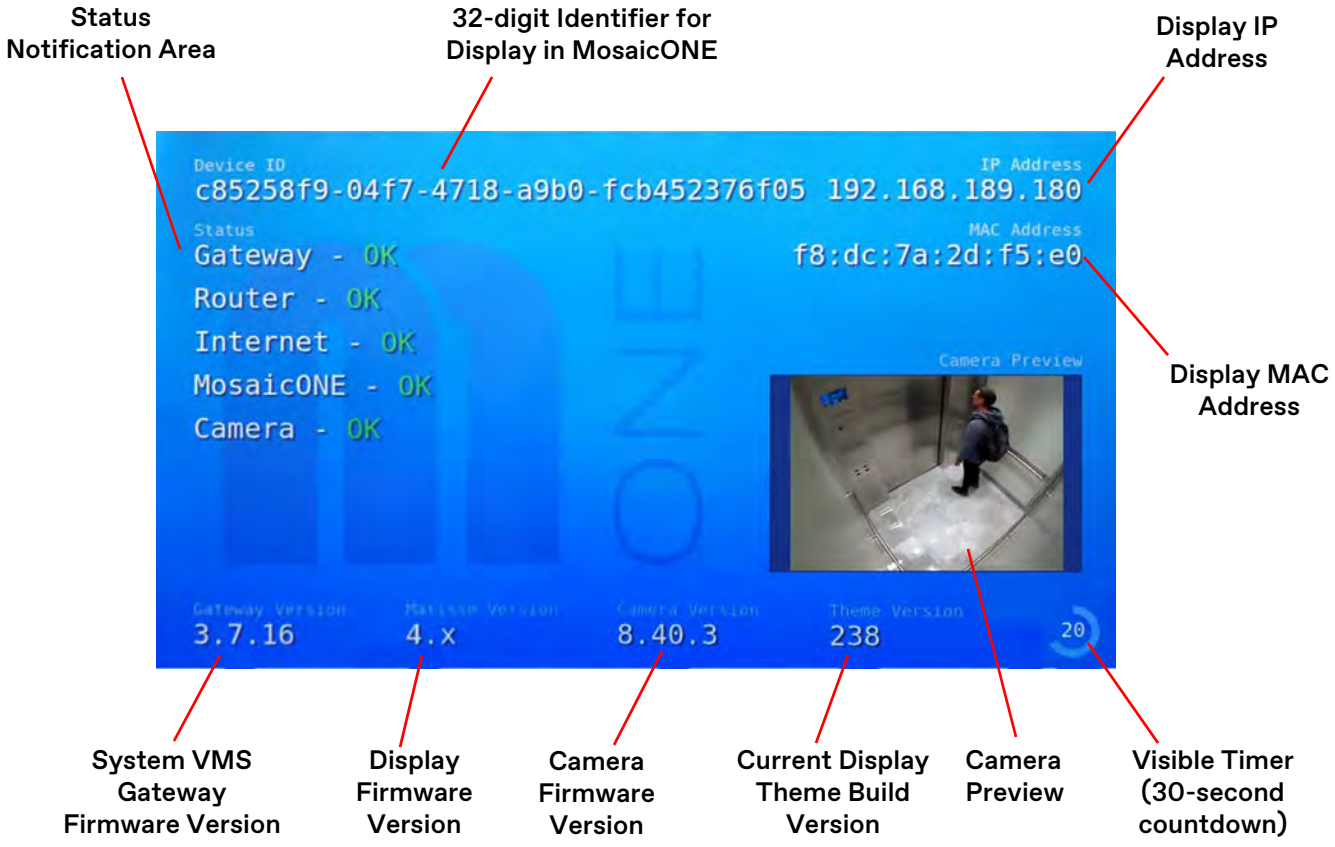


Figure 12 - Matisse PI Troubleshooting Layer

Matisse PI On-Screen Error Messages

Idle Working State

Display Screen

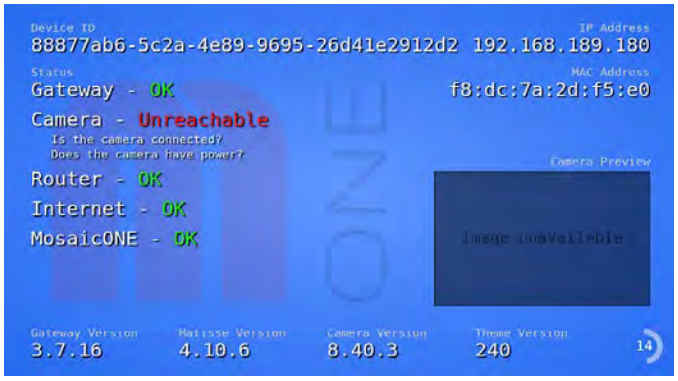
Troubleshooting Screen

Camera Disconnected from Car Top box ONLY

- Camera cannot communicate on the LAN network.
- Camera does not have power, through POE.
- LAN cable(s) connected to the POE injector are disconnected or broken either between the camera & the POE injector, or the POE injector and network access (NV202 extender).

Display Screen

Troubleshooting Screen



Gateway Disconnected from Router in MR box ONLY

Camera is shown as connected, but Camera Video feed preview is not showing as this is streamed from Gateway.

Display Screen

Troubleshooting Screen

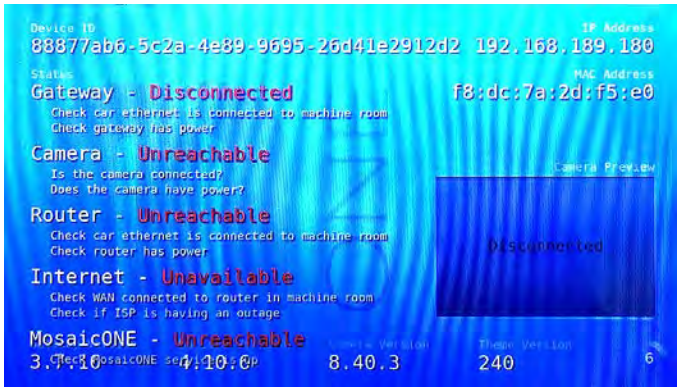
Matisse PI On-Screen Error Messages
(continued)

Matisse Display Disconnected from Car Top box ONLY

The screen shows the system status. If the display is not connected, everything will show as disconnected even if the equipment is working.

Display Screen

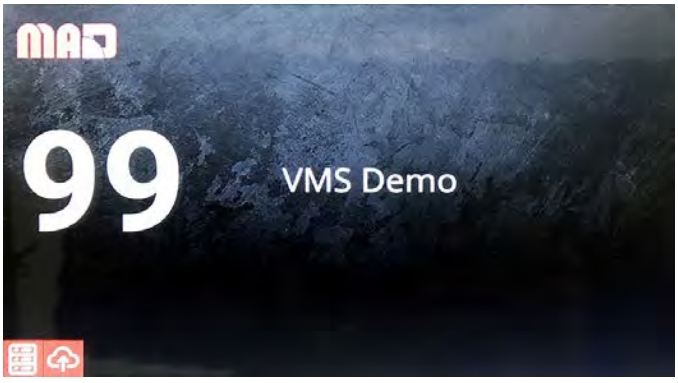
Troubleshooting Screen



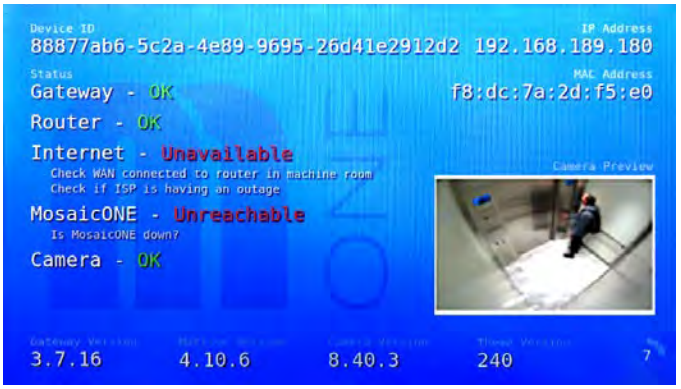
Internet Signal Disconnected from Router Eth0 WAN Input Port

LAN is still working, but no access to internet. Calls still work on Local Panel.

Display Screen



Troubleshooting Screen



Cat5e Cable Connection for Elevator 1 Disconnected at Router

Anywhere between router and display, e.g., router to NV202, traveling cable connection, NV202 to Matisse. Matisse Screen and Camera are both disconnected from LAN.

Display Screen

Troubleshooting Screen

Matisse PI On-Screen Error Messages
(continued)

Router Default Gateway Not Accessible

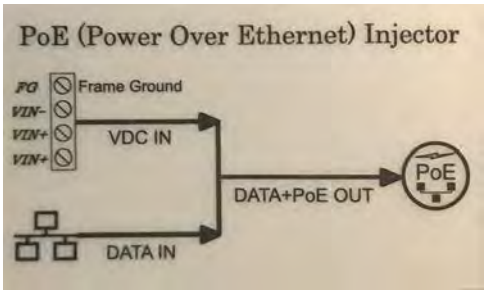
- The Gateway/Matisse cannot make a simple test connection to router.
- Router is not Ubiquity ER-X.
- Router LAN subnet is not programmed correctly.
- Router Ports Eth1-Eth4 may not be programmed correctly as LAN ports.

Display Screen

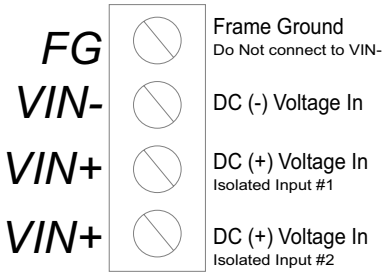
Troubleshooting Screen

PoE Injector (TP-DCDC-1248D) Troubleshooting

Overview



Product Label



Input Voltage: DC ONLY (9-36VDC)

Power Connection & Internet RJ45 Input

PoE Output

PoE Injector
(continued)

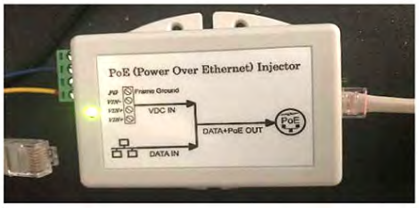
	Condition							
I/O Name	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Power input (VDC IN)	X	X	X				X	
Internet input (Data input)		X	X	X	X			
PoE output (PoE)			X		X	X	X	
Status Light				OFF	OFF	OFF		OFF

- Status light always red if PoE output not connected on PoE injector side or camera side.
- Status light always green if both PoE output and owner input connected.
- Only Condition 3 (all I/O connected) results in a working PoE connection to the camera.

Condition 3 - Good

Condition 4-6 & 8 - No Power

Condition 2 - Fail



Condition 7 - Fail

IP Network Camera (M3065V) Troubleshooting

LED Status

I/O: PoE Input from Injector	1		2	3	4	Startup In Progress	Startup Complete	Firmware Update Fail
Power	X			X				
Internet			X	X				
Status Light	Flashing					Solid ~ 10 sec.	Solid 10 sec.	Flashing
Color	1 sec.	1 sec.	OFF	OFF	OFF			

NOTE

Cycle power to test the unit.

LED Display:

10 sec. Orange

10 sec. Green

Off Unlit

IP Network Camera (M3065V)
(continued)

IP Network Camera Light Operation

LED Color	Definition
Unlit	Normal operation
Green	After startup complete, steady green for 10 seconds
Amber	Steady during startup. Flashes during firmware upgrade or when reset to factory default
Amber/Red	Flashes if network connection is lost or not available
Red	Firmware upgrade failure

Matisse Position Indicator (178NH) Troubleshooting

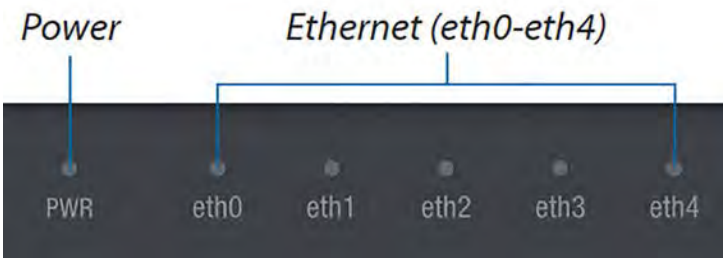
LED	Color	Status	Definition
RUN/FAIL	Red	Solid	System Fail. Restart unit and try to get working, otherwise replace the device.
	Green	Flashing 1 per 5 sec.	Normal operation — No PI Signal.
	Green	Flashing 1 per 0.25 sec.	Normal operation with PI Signal.
ETH LINK/ACT	Orange	Solid	Good LAN connection link. Matisse is connected at device and to network switch/router. There may not be working internet, but device is physically connected and communicating on the LAN.

Gateway Troubleshooting

LED	Color	Status	Definition
Hard Drive	Red	Solid	Normal operation
Power	Green	Solid	Normal operation
Link	Green	Solid	LAN link connection between gateway and switch/router, may not be working internet
Network	Orange	Flashing	Network traffic from internet or LAN

Router Troubleshooting

LED	Color	Definition
Power	OFF	Power OFF
	Green	Power ON
eth0-eth4	OFF	No link
	Green	Flashing shows activity



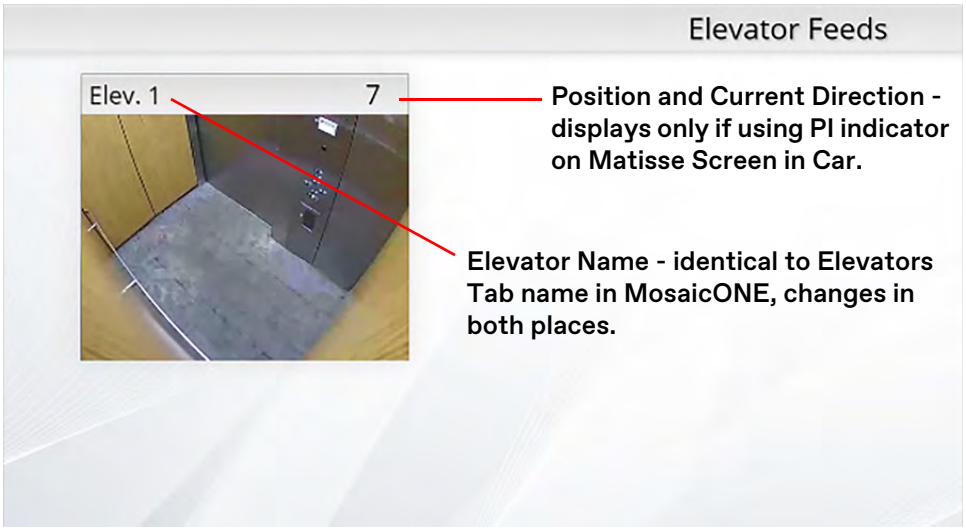
Local Communications Panel (LCP) Screens

Required

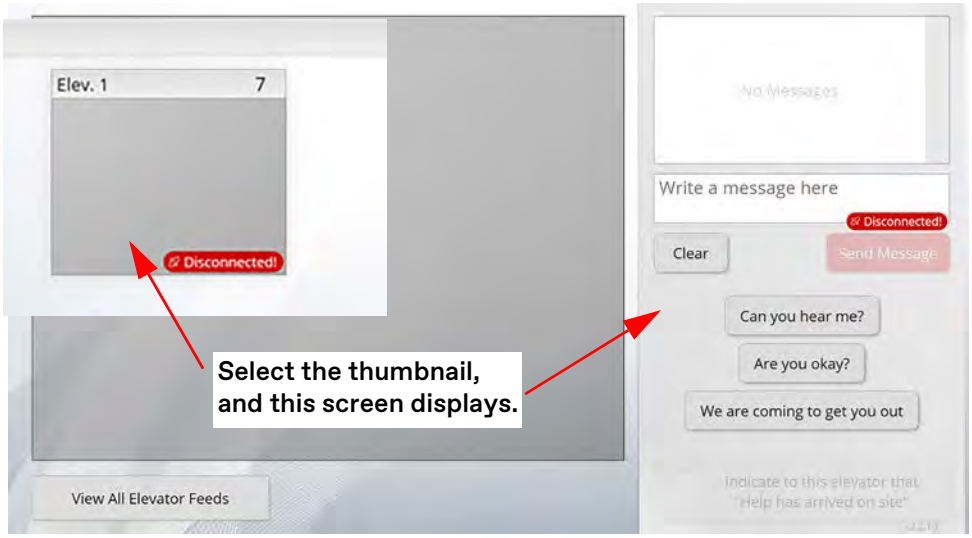
- A gateway, an elevator with display, and a camera to show at least one elevator on the screen.
- At least one provisioned elevator. If the lobby panel displays a blank background, no elevators are currently provisioned.
- Current software - The software version is located at the bottom left corner of the screen. The software updates are via the lobby panel device command interface on MosaicONE.

Lobby Panel Startup Screens

Standard Screen - Elevator Feeds display Provisioned Elevators



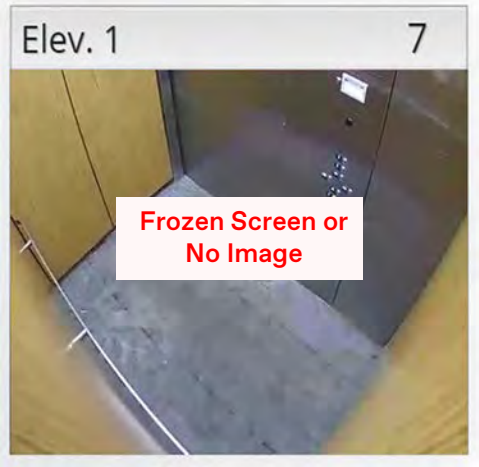
Internet Completely Disconnected from Lobby Panel



Local Communications Panel (LCP) Screens
(continued)

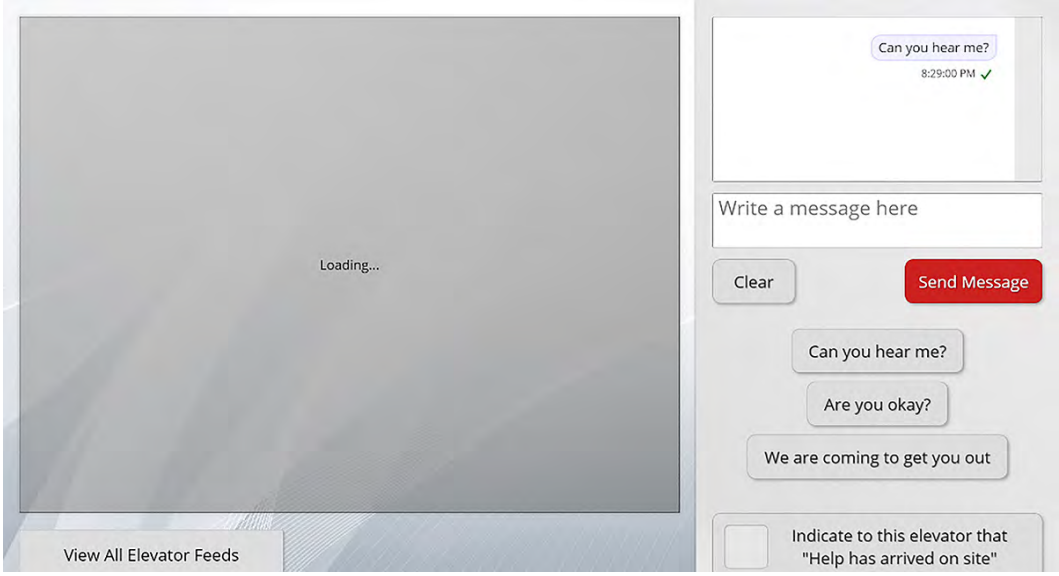
Camera Disconnected at Elevator but Lobby Panel is Connected on the LAN

Camera Disconnected at Startup



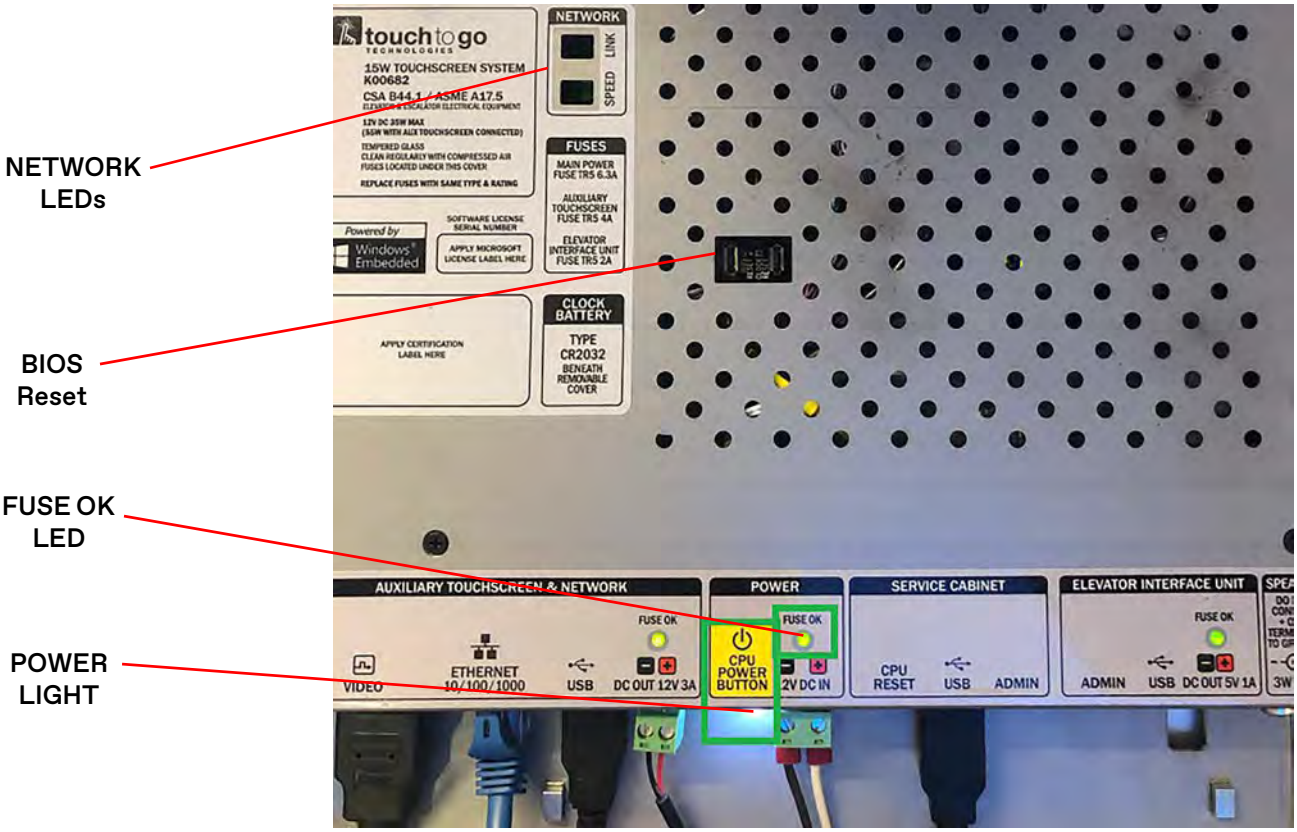
Camera Disconnected after Startup and Working Normal

Camera Disconnected and Text is Working



- If thumbnail feed is frozen: Click into elevator, view the full-size feed, and see if the video feed recovers.
- If thumbnail feed is frozen but the actual video call feed functions: Camera dropped out and reconnected. If needed, reset the Lobby Panel after all cameras are connected and all thumbnails will show an active stream.

Local Communications Panel (LCP) Hardware Troubleshooting



Problem	Possible Solution
Lobby Panel Screen - No Display	Verify the Power LIGHT is illuminated Verify the FUSE OK LED is illuminated
POWER LIGHT is not illuminated	Verify the touchscreen is receiving 12VDC
FUSE OK LED is not illuminated	Change the fuse
Power LIGHT illuminated & Fuse LED illuminated	Verify the keyswitch key is in the ON position 

If the Lobby Panel Screen still has no display after verifying the above items:

1. Remove power from the screen.
2. Press and hold **BIOS Reset** for 15-20 seconds.
3. Release **BIOS Reset**, and connect the power.

Network Connectivity Check: Green network light is solid and orange light is flashing. There may not be working internet, but the device is physically connected and communicating on the LAN.

Power Supply (Delta PMU-13W) Troubleshooting

120V 60HZ Switch - always set to 120V 60Hz

Output Charge Voltage

- Mfg. default setting: 13.6 V, 12VDC system
- Battery charging ability to 100%: 10° C. – 40° C. (ambient).
  If the ambient temperature is below 10° C. for an extended time, contact ITS Field Engineering to increase the charging voltage.
  Setting this voltage incorrectly may cause battery failure.

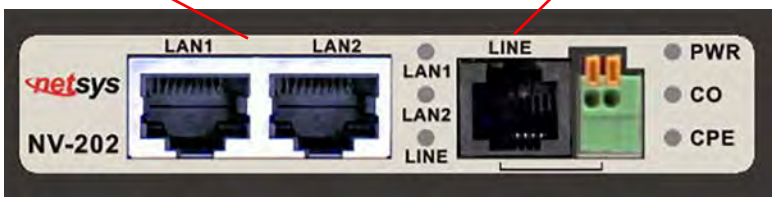
CAUTION **Before checking the battery voltage, turn the 120VAC input power switch to the OFF position for the PEB, EXB, REB, or CTB.**

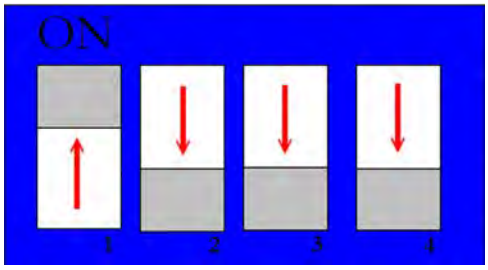
Problem	Possible Cause	Possible Solution
Green LED is flashing.	A short on the power supply output side.	Disconnect all equipment to power supply and, one by one, start connecting equipment to power supply to identify the component.
Red LED ON after battery is connected.	Polarity of connections from battery to unit is incorrect.	Check battery polarity connection, and make corrections as needed.
Does not operate in normal mode after AC is applied.	Input wiring is open or input voltage to the supply is not available.	Check wiring and voltage of input supply.
	Internal fuse is opened.	Contact ITS Field Engineering.
Does not operate in buffering mode after AC is collapsed.	Battery wiring is not connected or opened.	Check battery wiring, and make corrections as needed.
	Battery did not have enough time to be charged and is still below the continuous operating voltage range.	Check battery voltage and compare with minimum required battery voltage.
Does not charge and discharge battery.	Battery is damaged.	Check battery and replace as needed.

Netsys NV202/NV500 Extender

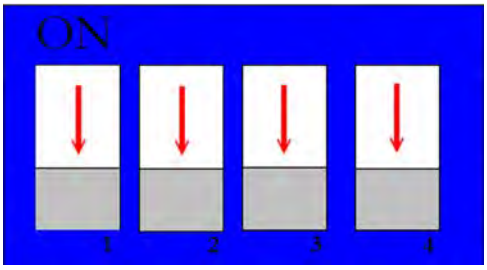
LAN1/LAN2
(RJ-45)
Connects to Ethernet equipped device.

LINE
(RJ-11/Terminal Block - DO NOT use at the same time)
Connects to VDSL2 bridge.



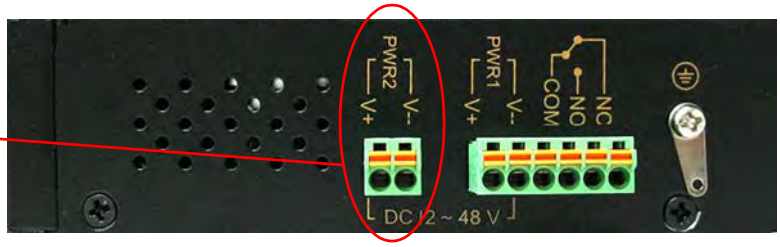


Machine Room DIP Switch Settings



Car Top DIP Switch Settings

NV500 Side Panel
Use PWR2 Connection



LED	Color	Status	Description
PWR Power	Green	ON	VDSL2 bridge has power.
		OFF	Device not ready or malfunctioned.
LAN 1-2 Ethernet		ON	Device has good Ethernet connection.
		Blinking	Device sending or receiving data.
		OFF	LAN not connected.
CO (Local Side)		ON	VDSL2 bridge running at CO (master) Mode.
CPE (Remote Side)		ON	VDSL2 bridge running at CPE (slave) Mode.
LINE VDSL LINK		ON	Internet or network is connected.
		Slow Blinking	CO device auto-detecting CPE device.
		Fast Blinking	• CO device detected CPE device, ready to connect. • Device sending or receiving data.
		OFF	Internet or network not connected

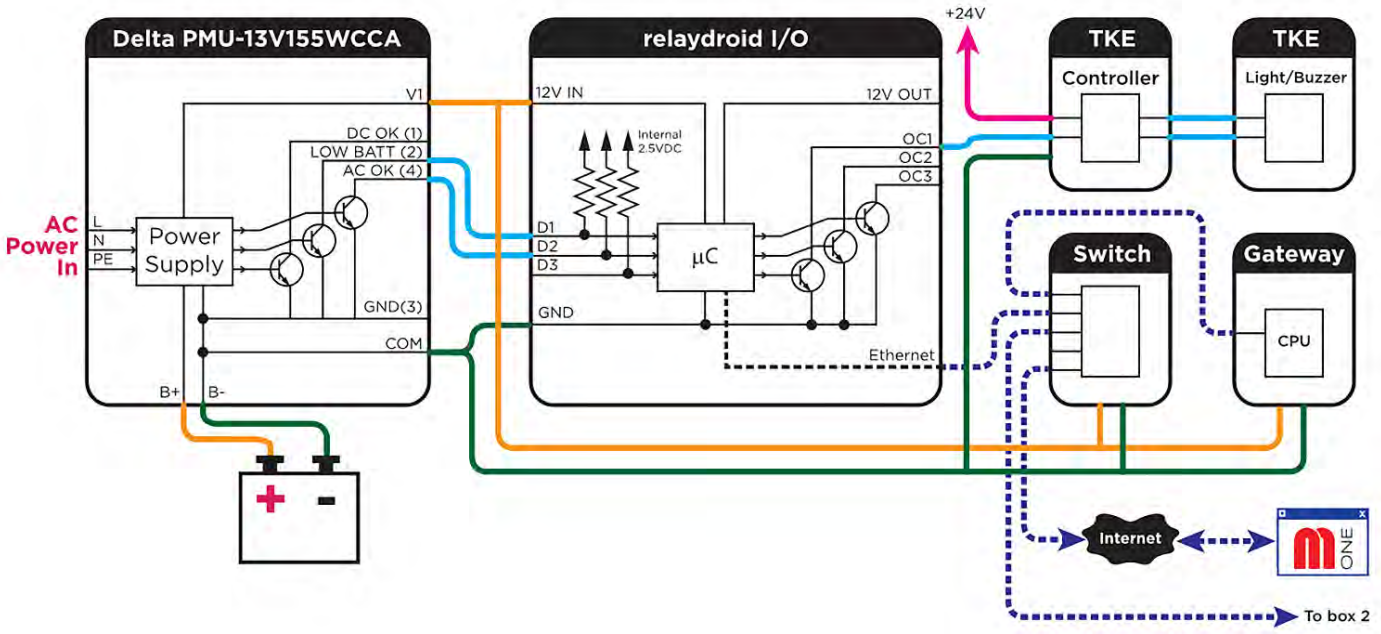
Troubleshooting Chart

Problem	Possible Causes or Solutions
RTC Gateway Offline.	Reset the gateway in mosaicone.net. The gateway performs a status check on the devices every 15 minutes.
	Verify the MAX V2 network status LED is blinking green. Verify the LEDs signal strength.
	Verify that the LAN cables are connected properly.
Matisse PI display: **Emergency Communications Failure**	Login to mosaicone.net and verify that all devices are online.
	Verify the LAN cables are connected properly.
	Power cycle the Matisse PI.
	Verify the Local Communications Panel (LCP) elevator feed also shows disconnected.
	Reset the gateway in mosaicone.net. The gateway performs a status check on the devices every 15 minutes.
Camera Offline.	Verify the LAN cables are connected properly.
	Verify the Camera IP Address in mosaicone.net.
	Perform the Camera Troubleshooting procedure on page 44.
	Reset the gateway in mosaicone.net. The gateway performs a status check on the devices every 15 minutes.
Video feed shows disconnected on LCP but all devices show connected in mosaicone.net.	Verify the LAN cables are connected properly.
	Reset the gateway in mosaicone.net. The gateway performs a status check on the devices every 15 minutes.
	Power cycle the LCP.
Video feed shows disconnected on LCP and all devices offline in mosaicone.net.	Verify the LAN cables are connected properly.
	Verify the MAX V2 network status LED is blinking green. Verify the LEDs signal strength.
	Reset the gateway in mosaicone.net. The gateway performs a status check on the devices every 15 minutes.
	Power cycle the LCP.
Door Open/Door Close pushbuttons do not respond Yes/No.	Verify the wiring from the Matisse PI inputs to the pushbuttons. See the 940xx COP wiring charts.
Help Phone pushbutton does not initiate a call.	

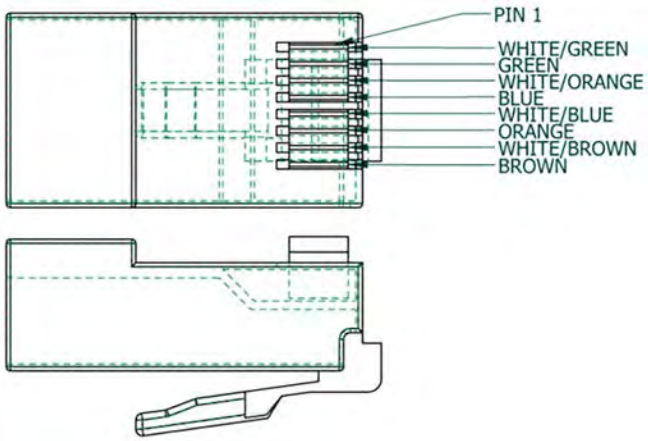
Service Information

Two-Way Communications Failure (TWCF) - IP Relay Monitoring

- TWCF I/O detects signals from the relaydroid in the PEB that there is loss of Ethernet or network connectivity to devices in the MosaicONE VMS System.
- The relaydroid operates as an on/off switch closing the path from G24 back to IOE/IOD Card input.
- The TAC Controller I/O is 24V, and the relaydroid input is 12V. For proper operation, the GND must be 0V at both the controller and the relaydroid.
- TAC32H/MRLH: relaydroid is connected to the controller via IOD Card - Port 14, Node 1.
- TAC32T: TWCF I/O is connected to the controller via IOE Card - Port 17, Node 1.
- The UPS has discrete signals wired to the relaydroid I/O for Low Battery and AC Monitoring to UPS.



Cat5e Termination



PIN No.	Wire Color
1	White/Green
2	Green
3	White/Orange
4	Blue
5	White/Blue
6	Orange
7	White/Brown
8	Brown

System Testing

ADA Phone Testing

See Rath Phone Monitoring Test on page 105.

Initiate a Call in MosaicOne

See the Video Messaging (Call) Process on page 69.

Testing Local Communications Panel

If a Local Communications Panel is on the job site, the video feed inside the car is also displayed on the touchscreen.

1. From the Elevator Feeds screen, touch the elevator video feed to initiate a call at the Local Communications Panel.
2. When the elevator video feed and text dialogue box displays, select a message to test and touch **Send Message** to test the response.
3. Select the **Help has arrived on site** box (check mark) and a status message appears on the Matisse PI inside the car.

IMPORTANT!

If a call is answered in the mosaicone.net website, and during the call the LCP has the "Help has arrived on site" box selected (check mark), the call is ended in mosaicone.net and the call must be continued from the LCP.

4. Once the call is ended at the LCP, touch **View All Elevator Feeds** to end the LCP Call. A current status displays on the Elevator Feed screen.

Testing LCP
(continued)

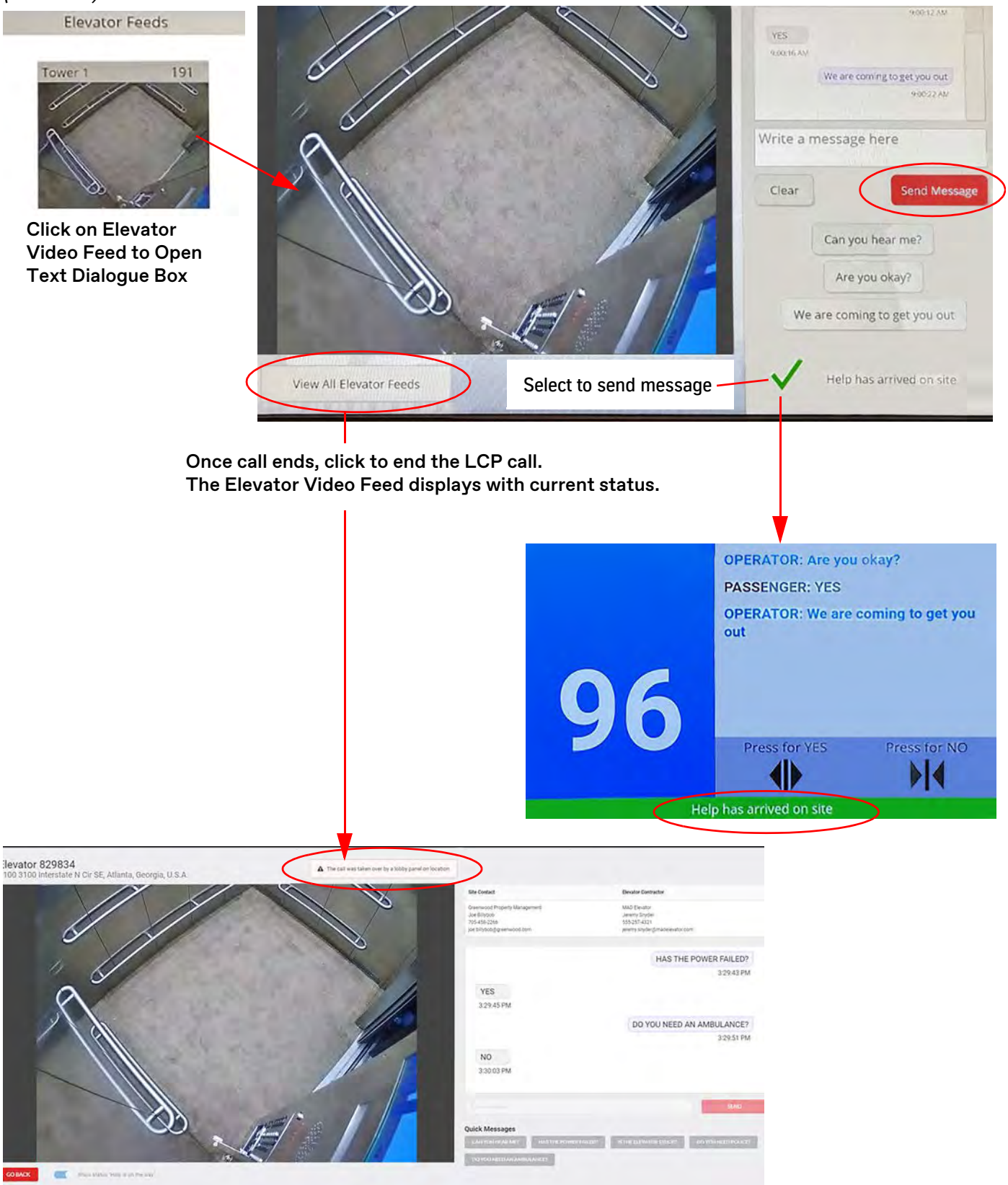


Figure 13 - Testing Local Communications Panel

relaydroid Monitoring Test

The relaydroid will detect connection loss to the Matisse PI, the camera, the gateway, or complete internet loss to the MosaicONE system, and will monitor connectivity to all cars connected to the relaydroid in the PEB.

1. Install the TWC system and wire the relaydroid OC1 terminal to the connection point on the IOE/IOE2 Card (TAC32T) or IOD Card (TAC32H).

2. Verify the following relaydroid Monitoring process:

   When a connection loss is detected, the relaydroid activates the phone line indicator in the hall. The relaydroid filters the signal for about 15 minutes and then sends an output signal to TKE Controller. The phone line indicator continually flashes until connection to the MosaicONE system is restored.

Software

Use this section if unable to use remote procedures.

Update Matisse PI Device Firmware

Required tools: a USB flash drive with the latest Matisse firmware version and an internet connection.

1. Verify that the device is connected to the internet — hold the "door buttons" and access the troubleshooting layer.

2. Connect the elevator car (Car Top Box, Matisse, and Camera) to the PEB.

3. Connect the Matisse to the 12VDC power supply in the Car Top Box. See Figure 14.

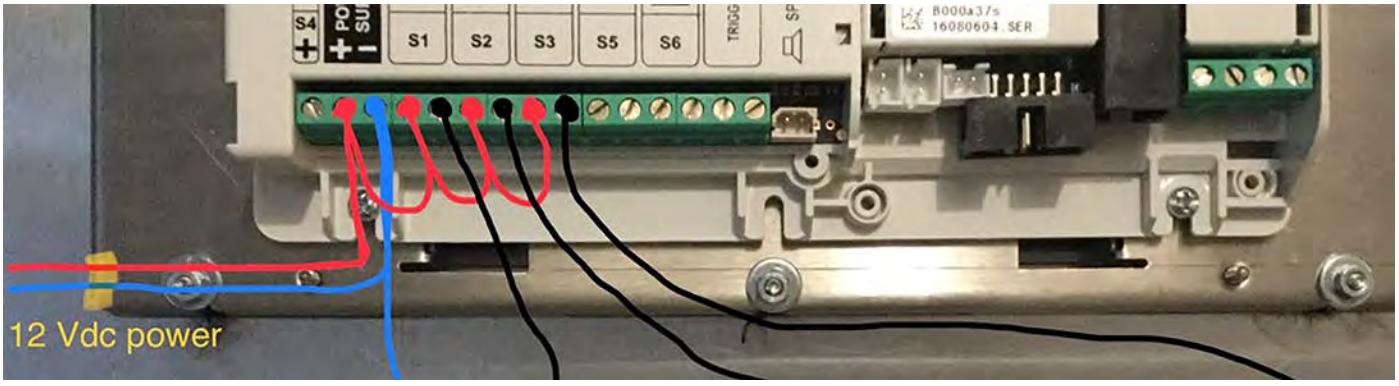
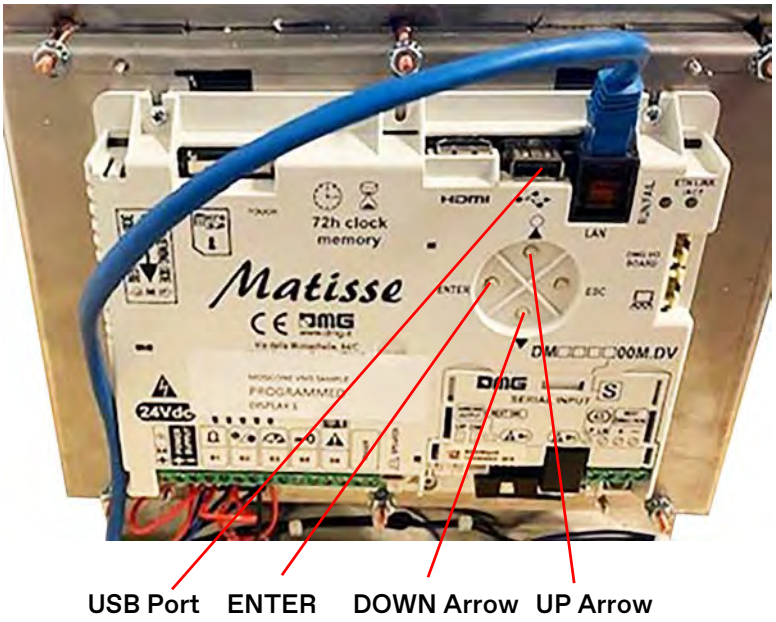


Figure 14 - 12VDC Power Supply Connection

Update Matisse PI Device Firmware
(continued)

4. Plug in the Ethernet cable, and connect the Matisse to the internet source.
5. Insert the USB to the back of the Matisse.
6. Touch **ENTER** on the Matisse, and the menu displays.
7. Press or to select **USB Stick** from the menu, and touch **ENTER**.
8. Press or to select the firmware file (.tar) on USB, and touch **ENTER**.
9. Wait for the Matisse to restart.

Matisse PI Back View



Matisse Menu View

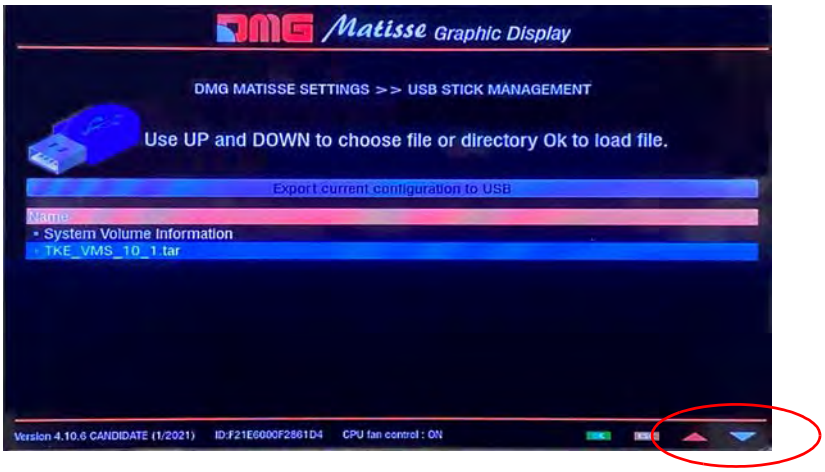
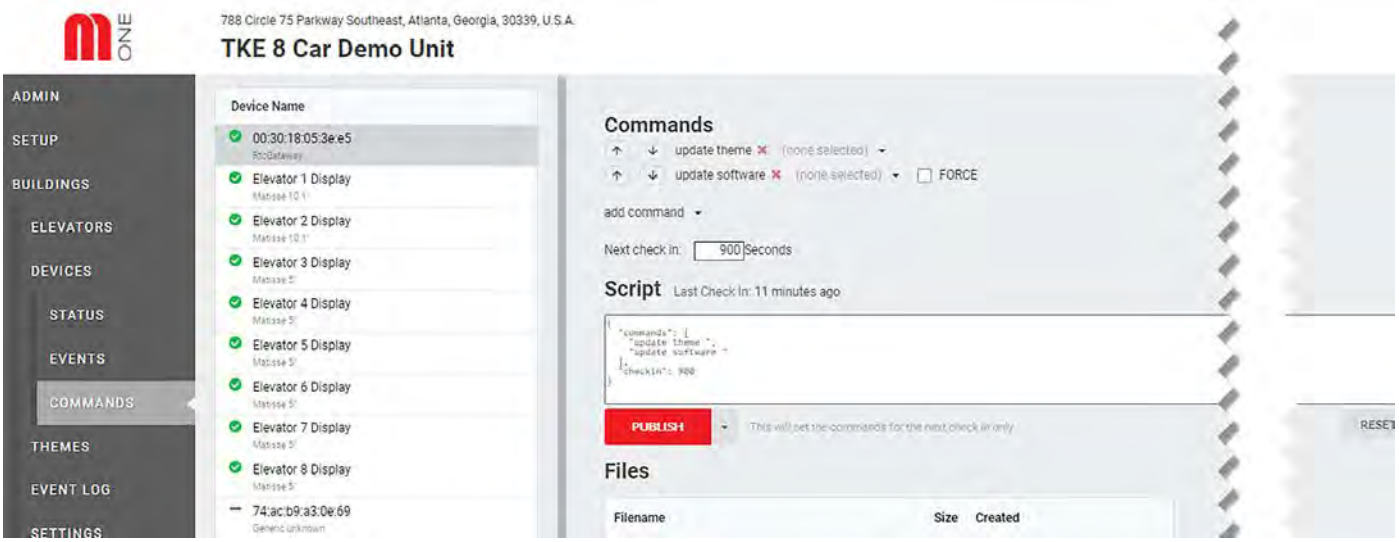


Figure 15 - Matisse PI and USB Screen

Manually Update Software on Gateway

The Gateway software version is automatically updated when connected to the internet—even before it is registered to a building. If the software version is not updated, enter a via command line in MosaicONE, and confirm the correct software file name.



Schedule Matisse Theme for Provisioned Building in MosiacONE

1. Go to: Buildings > tke_themeVault >Themes, and the Themes screen displays.
   tke_themeVault are the templates for Matisse Displays.

2. Select correct theme based on button type used for yes/no response, and touch **Copy**. See Figure 16.

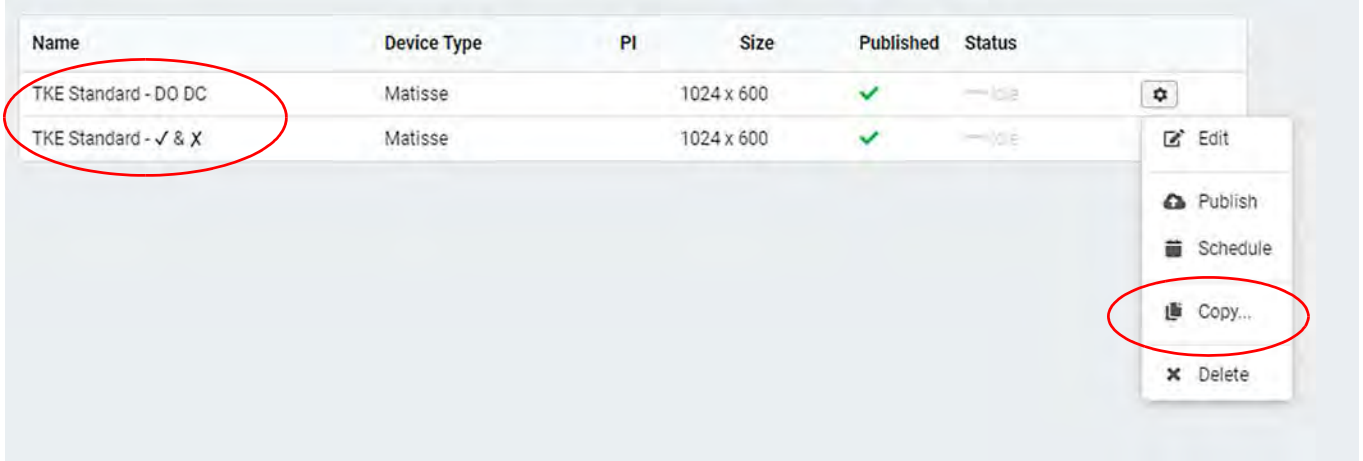


Figure 16 - Schedule Matisse Theme Screen (1 of 2)

Schedule Matisse Theme
(continued)

3. Once the Copy Theme screen displays, enter theme name, select the target building, and touch **COPY**. See Figure 17.

4. Go to: **DEVICES** > Matisse Display > Edit Device Settings.

5. Uncheck "THIS DEVICE IS A POSITION INDICATOR" and touch **SAVE.**

6. Go to: **COMMANDS** select theme from the drop-down menu, and touch **PUBLISH**.

7. To confirm the new theme, initiate a check-in: touch **ENTER** (Matisse menu), and touch **ESC** (Exit).

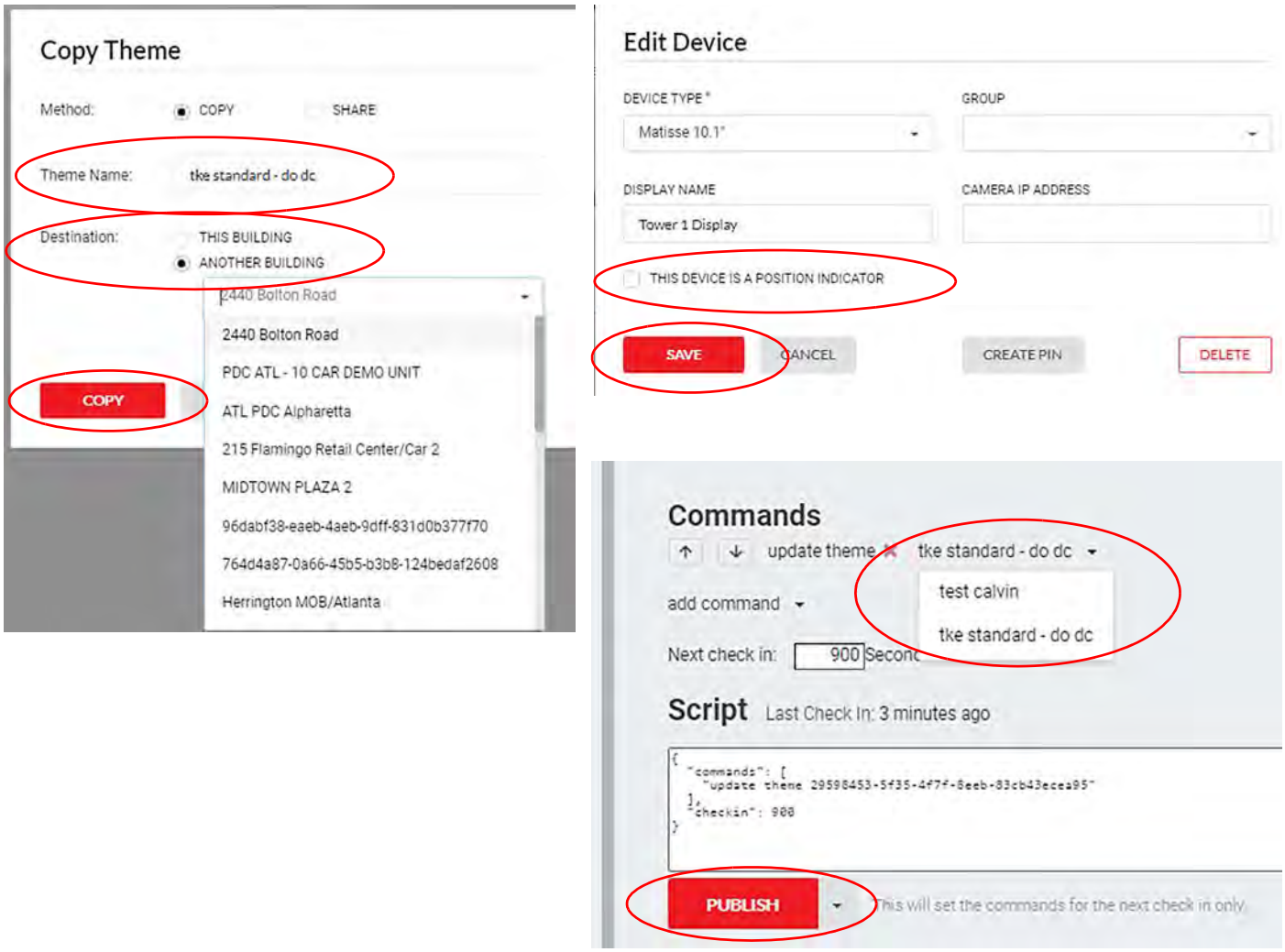


Figure 17 - Schedule Matisse Theme Screen (2 of 2)

Confirm CAN Position Communication Settings

IMPORTANT! **The controller software version must be V6R8C or greater for the position indicator to function with the Matisse display.**

Standard Car CAN and ASCII CAN Settings

Matisse PI settings need to be changed in the Interface Options menu to access Car CAN and ASCII CAN.

1. To access the Matisse PI settings, go to: Menu > Interface Options > Display Address. See Table 1 and Figure 18.

- Car CAN protocol is x600 managed
- ASCII CAN protocol is x500 managed
- If the CAR ID is set to 0:

  » DISPLAY ADDRESS is set between 0 and 3

  » PI set to Car CAN

- If the CAR ID is set between 1 and 15:

  » DISPLAY ADDRESS is > 3

  » PI set to ASCII CAN

Display Location	Car ID	Display Address	Result
COP	0	4 (NULL value)	"SET ID"
COP	1 <-> 15	4 (NULL value)	x500 managed
COP	0	0 <-> 3	x600 managed
COP	1 <-> 15	0 <-> 3	x500 managed
LOP/LIP	0	Any Value	"SET ID"
LOP/LIP	1 <-> 15	Any Value	x500 managed

Table 1 - Values for Car ID and Display Address

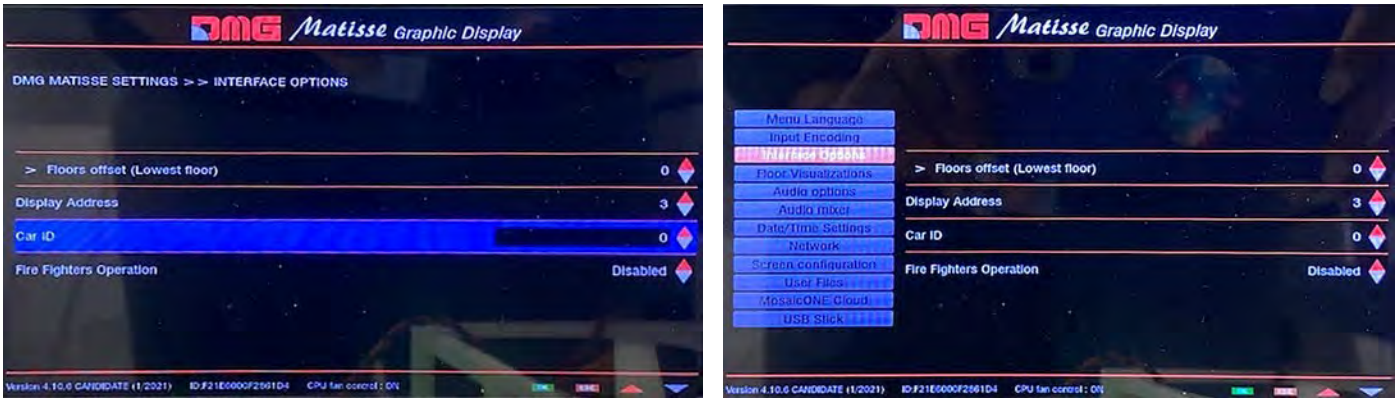
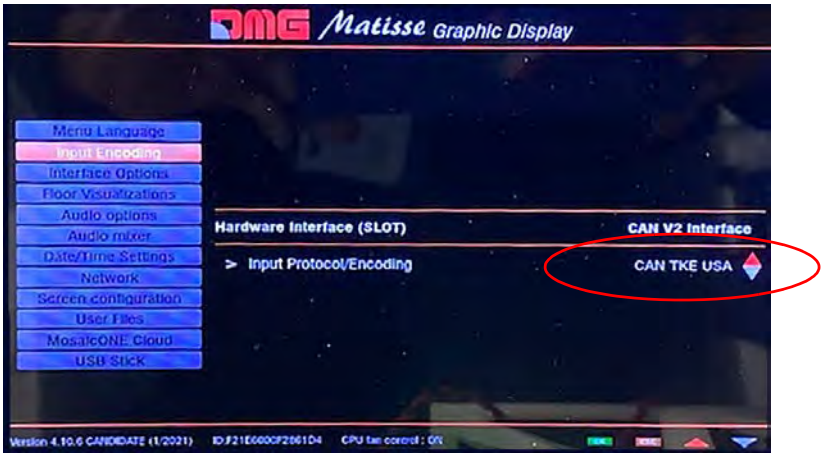


Figure 18 - Car ID and Display Address Screens

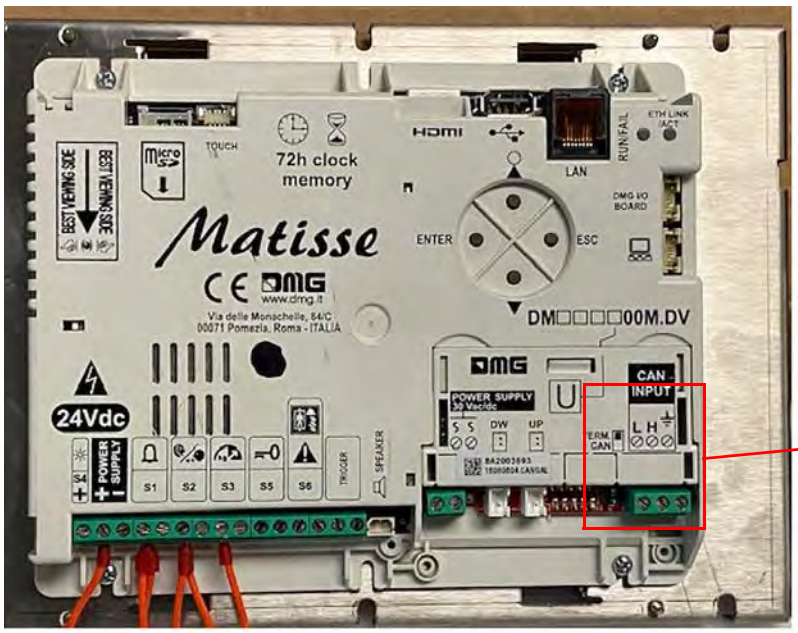
Confirm CAN Position Communication Settings
(continued)

2. Go to: Menu > Input Encoding and verify that Input Protocol Encoding is set to "CAN TKE USA."



CAN Termination with Matisse PI

Car CAN termination (CCH to CCL) resistance must be 60 Ohms. If the resistance is not 60 Ohms, verify that the CAN termination dip switch is turned OFF in the down position.



CAN Termination Dip Switch

Update Local Communications Panel (LCP)

NOTE Use this section if unable to use remote procedures.

Required tools:

- A properly formatted USB flash drive.
- A USB/keyboard mouse combination.

1. Download and save the .exe file to the USB flash drive.
2. Connect the USB/keyboard mouse combination to a USB port. The keyboard/mouse is now connected to the touch screen. See Figure 19.
3. Insert the USB flash drive with the .exe file into a USB port.
4. Press **F11** on the keyboard to exit the full screen on the LCP. Use the mouse to click **Close** on the window.
5. Press **CTRL+SHIFT+ESC** to open Windows 10 Task Manager.
6. Choose **File, Create New Task**, and then run explorer.
7. Click **Libraries**, navigate to the USB, and select the saved file. The new file will install the latest firmware to the LCP, replacing the existing firmware.
8. After the installation is complete, open the **Create New Task** window.
9. Power down and power up the device.
   a. Press the power button once (located on the back of the touch screen).
   b. Wait for the touch screen display to completely shut down.
   c. Press the power button again to power up the device.
10. To verify update, check the version number at the lower right section of the screen.

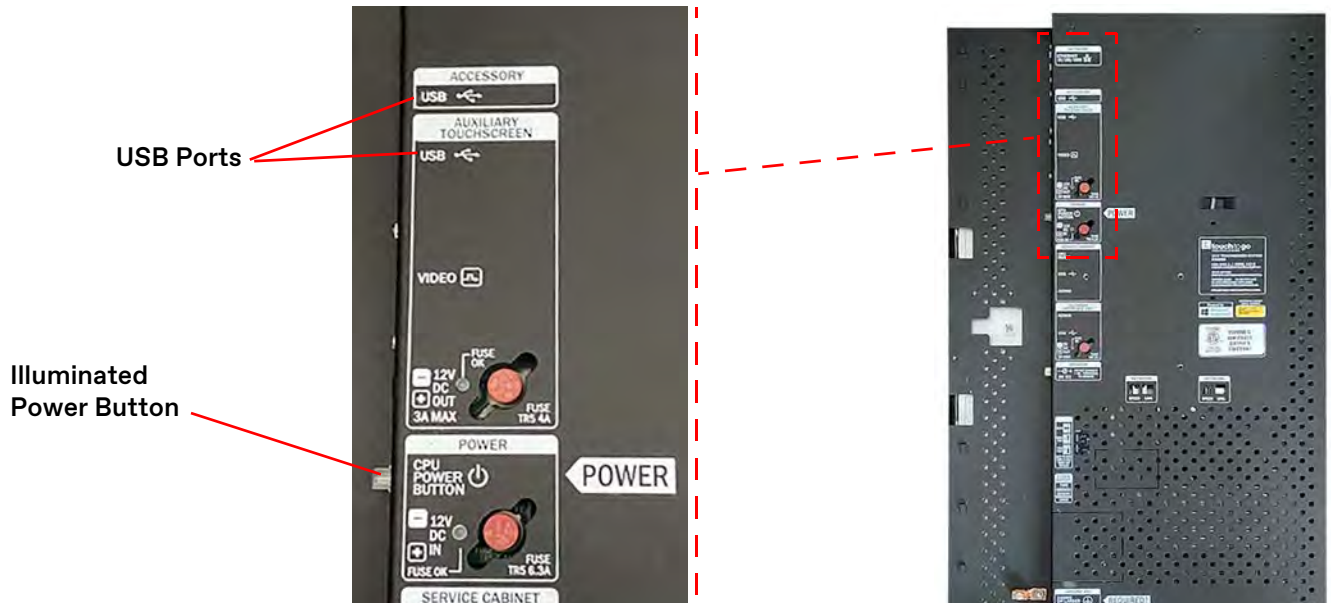


Figure 19 - Back View of LCP

Networking Large Campuses

Overview

- How to network a large campus that requires A17.1 2019 Code application for two-way emergency communications.
- How to select MAD equipment for non-standard jobs.
- How to connect groups together on the same network.
- How to network the equipment boxes together for a typical configuration.

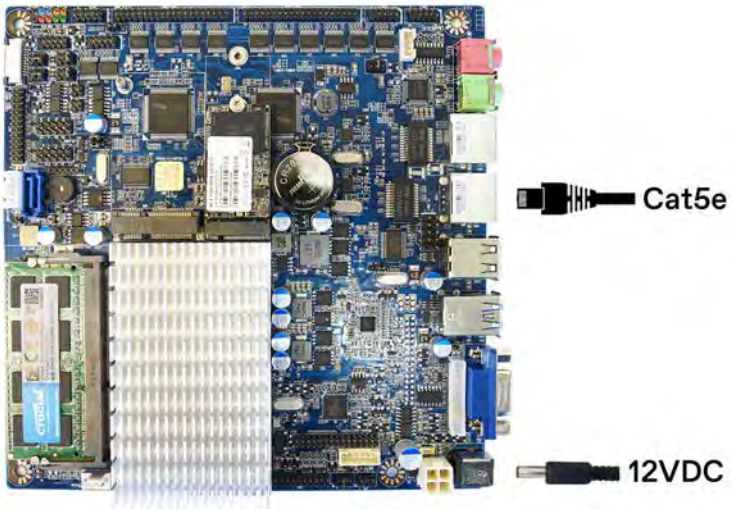
Requirements for First Machine Room/Space

MosaicONE VMS requires a RJ45 network connection in only one machine room—not all machine rooms. All other machine rooms are connected back to the first machine room via CAT5e when <300 feet, or with two TSP wires via VDSL internet extenders in the equipment boxes.

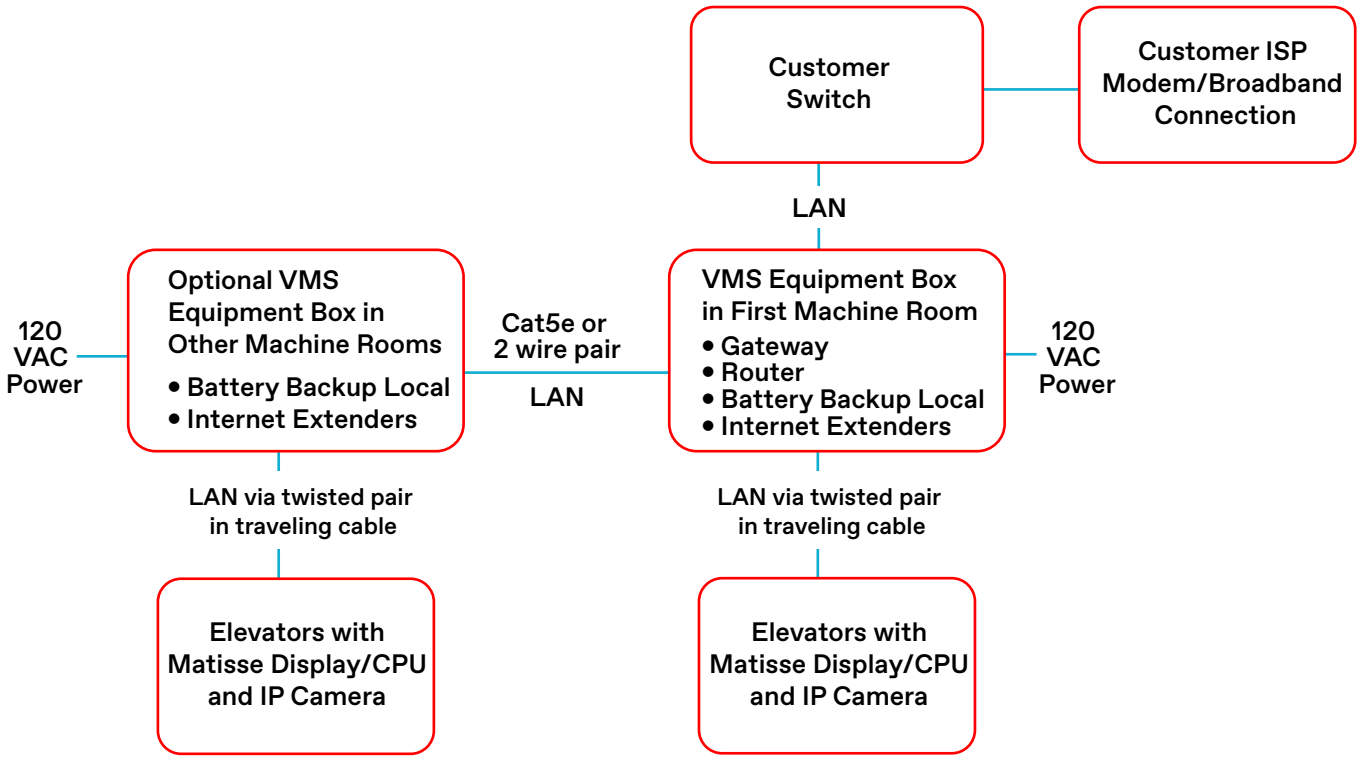
MosaicONE VMS has an internal battery for a four-hour battery backup.

IMPORTANT! **If using building supplied internet connection, the provider must also provide 4-hour battery backup for all components that bring the internet from the ISP broadband modem all the way to the machine room/space and any devices in between.**

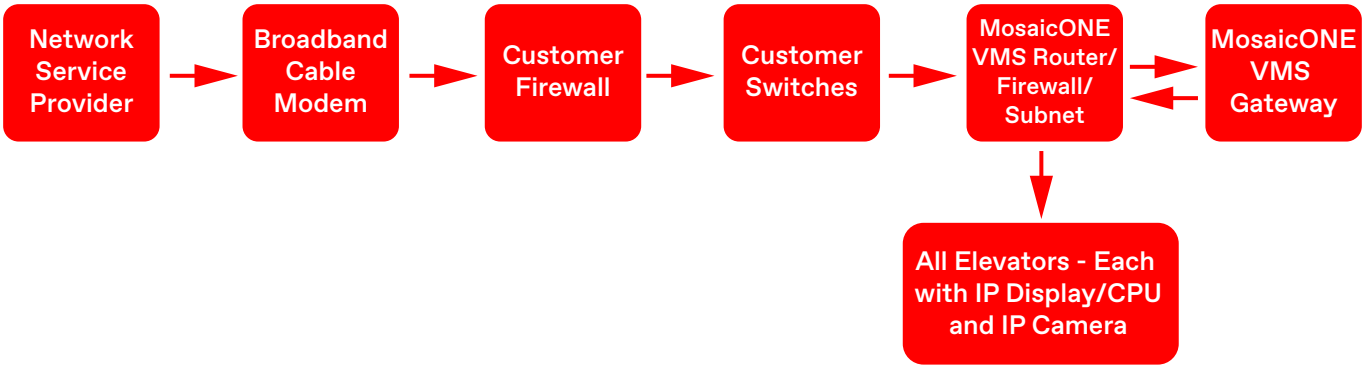
Component	Description
MosaicONE VMS Router (EdgeRouter X) - located in the first machine room as part of the Primary Equipment Box assembly. 	• Interface to the customer internet access point/firewall. • Creates a firewall between the customer network and VMS network completely isolating the MosaicONE VMS system from the customer network. • Sets up the VMS Subnet network to prevent the customer from setting up IP address allocations, or specifically, static IP addresses for VMS.

Component (cont.)	Description
MosaicONE VMS Gateway - located in first machine room as part of the Primary Equipment Box assembly. 	This unit is the brain of the system and is first connected though the VMS router which is connected to the customer building internet (or cellular modem, if sufficient signal exists).
MosaicONE VMS Ethernet Extender NV202 - located in the PEB, EXB, REB and LCP. 	• This Ethernet extender connects the Ethernet via twisted shielded pair from PEB to each elevator Car Top Box. • On large campus jobs, this Ethernet extender can also connect via RJ45 or twisted shield pair to other machine rooms in the building.
MosaicONE VMS Ethernet Extender NV500 - located in the REB and CTB. 	• This Ethernet extender provides more Ethernet RJ45 Ethernet ports in the CTB. • On large campus jobs, this Ethernet extender can also connect via RJ45 or twisted shield pair to other machine rooms in the building.

Network Connection Diagram



MosaicOne VMS Customer Broadband Flow



Requirements for >60' or more Buildings

The Local Communications Panel (LCP), or computer console, would be located adjacent to the existing phone local access point - this panel must be connected back to the Primary Equipment Box via VMS Router, so that it is on the same LAN as the other VMS components and behind the same firewall.

Local Communications Panel Option for Large Campuses: For a large campus that requires an LCP location >1500 ft from the PEB or a desktop computer for local security monitoring, a desktop monitor with keyboard and mouse can be provided.

Bandwidth Requirements PER Elevator

A working internet (via building internet or a cellular modem) must be in place for MosaicONE VMS. The calls may still function at 100Kbs per car upload, however it is not guaranteed. Maximum bandwidth upload per call is capped at 300Kbit/sec

Number of Elevator Cars	Minimum Download Bandwidth (Mbps)	Minimum Upload Bandwidth (Mbps)
1	5	0.5
2	5	1
3	5	1.5
4	10	2
5	10	2.5
6	15	3
7	15	3.5
8	15	4

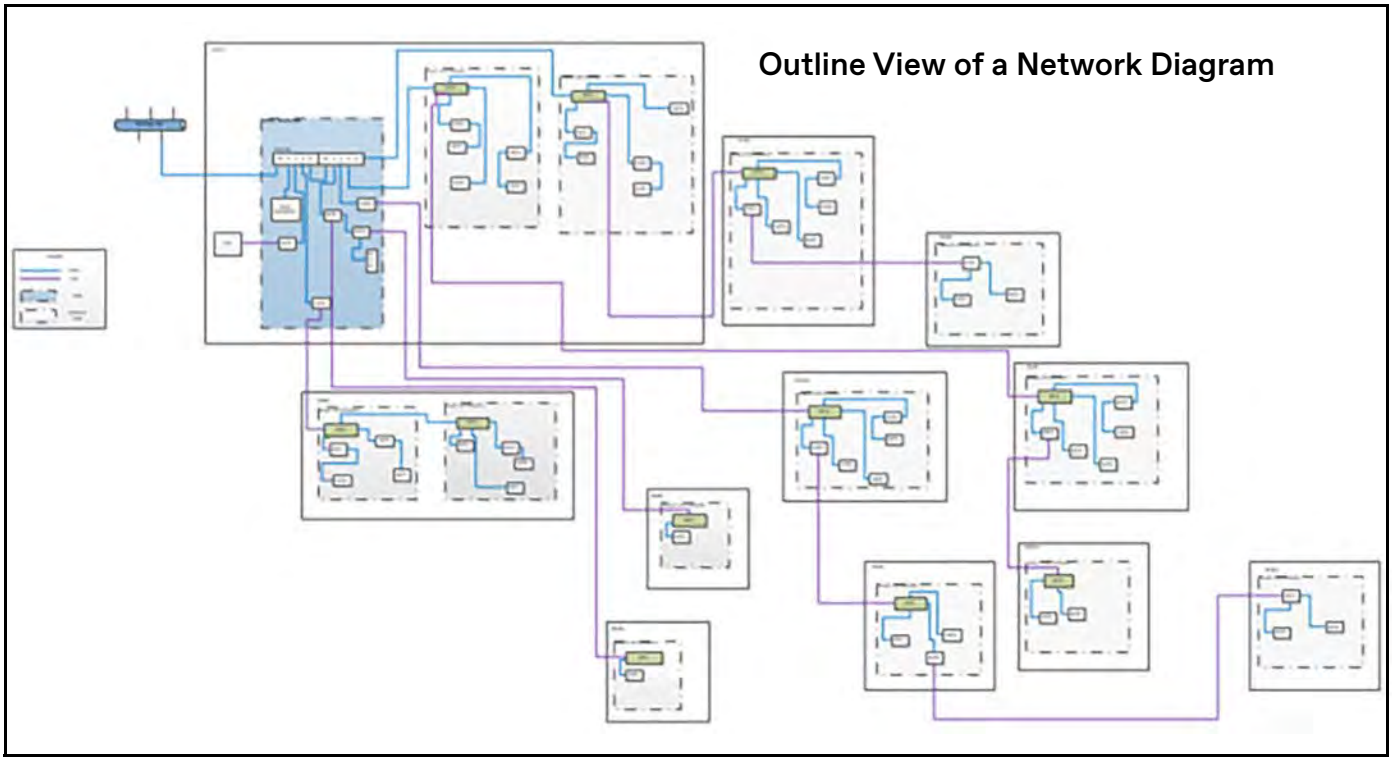
MosaicONE Connection to Customer LAN Requirements

Information for IT professionals setting up or maintaining a network

The MosaicONE system is isolated by VMS router located in the PEB, but it is good practice to put the equipment on an isolated VLAN on the customer network and maintain the firewall. Cone NAT (customer firewalls must be configured for Cone NAT because Symmetric NAT is not supported).

Rule	Direction	Source Address	Source Port	Destination Address	Destination Port	Protocol
1	Out	VMS Router WAN	Any	0.0.0.0/0	443	TCP
2	Out	VMS Router WAN	Any	0.0.0.0/0	3478	TCP
3	Out	VMS Router WAN	Any	0.0.0.0/0	Any	UDP
4	In/Out	VMS Router WAN	-	0.0.0.0/0	-	ICMP

Create a Network Diagram



1. Determine how many elevator groups will need to be connected in the building.
2. Determine which elevator groups have shared machine rooms.

NOTE MosaicONE does not recognize elevator groups, but it does recognize buildings. Determine the elevator groups and shared machine rooms to help with selecting building equipment boxes.

3. Determine which elevator groups have remote machine rooms.
4. Determine how many Local Communications Panels (LCP) will be required; this is required for net travel >= 60 feet, and is required to connect back to the Primary Equipment Box (PEB).
5. Draw a diagram of elevator groups and machine room locations, and list how many cars are in each group. See Figure 20 on page 98, and Guidelines when Selecting Large Campus Equipment Boxes on page 99.
6. Select equipment boxes based on the machine room locations and the number of cars in each group.
7. Draw the network diagram based on the equipment boxes that will be provided.
8. Route each box back to either the PEB or a building equipment box in an adjacent machine room.
9. Specify which connections are twisted-shielded pair and which connections are Cat5e. Consider distances between boxes when connecting boxes in a remote machine room or the same machine room.

Create Network Diagram
(continued)

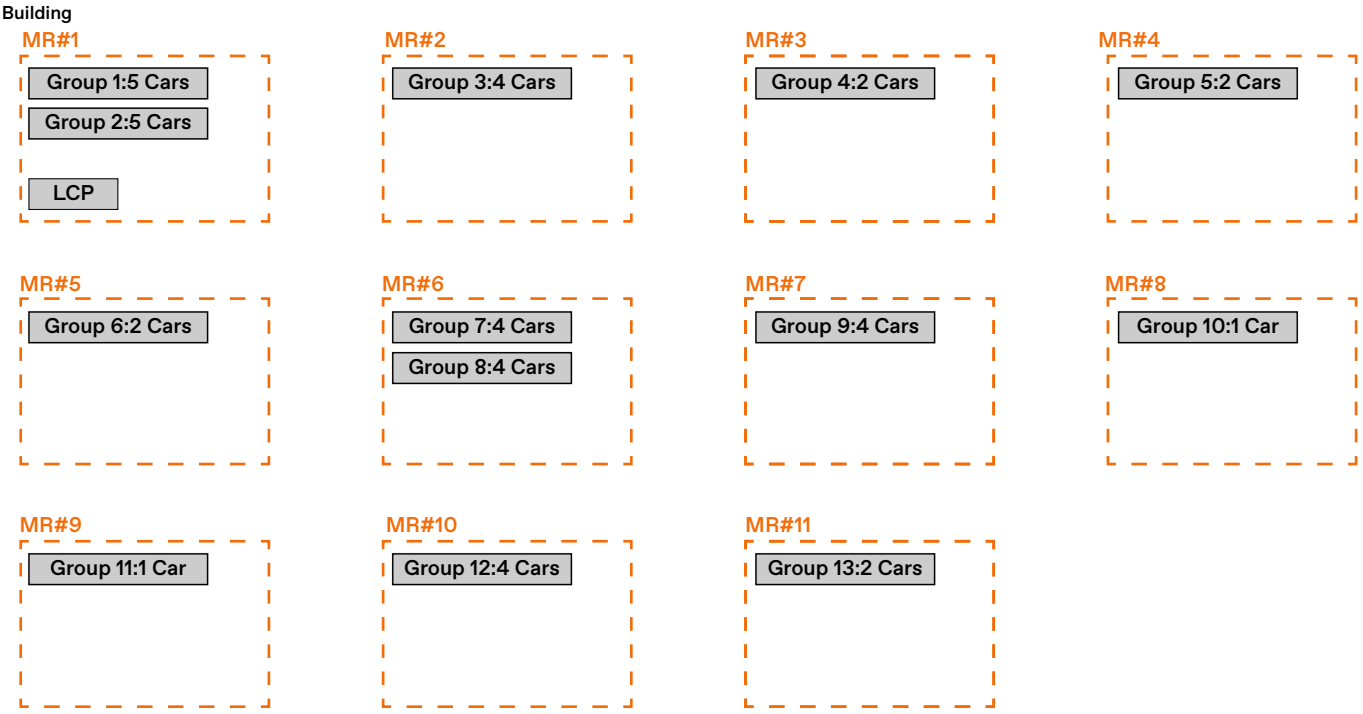


Figure 20 - Network Diagram Example

Based on the network diagram example, these equipment boxes will be provided:

Machine Room	Group	Equipment
MR#1	PEB - required for the first machine room	
	1	REB
	2	REB
MR#2	3	REB
MR#3	4	EXB
MR#4	5	EXB
MR#5	6	REB
MR#6	7	REB
	8	REB
MR#7	9	REB
MR#8	10	REB
MR#9	11	REB
MR#10	12	REB
MR#11	13	REB

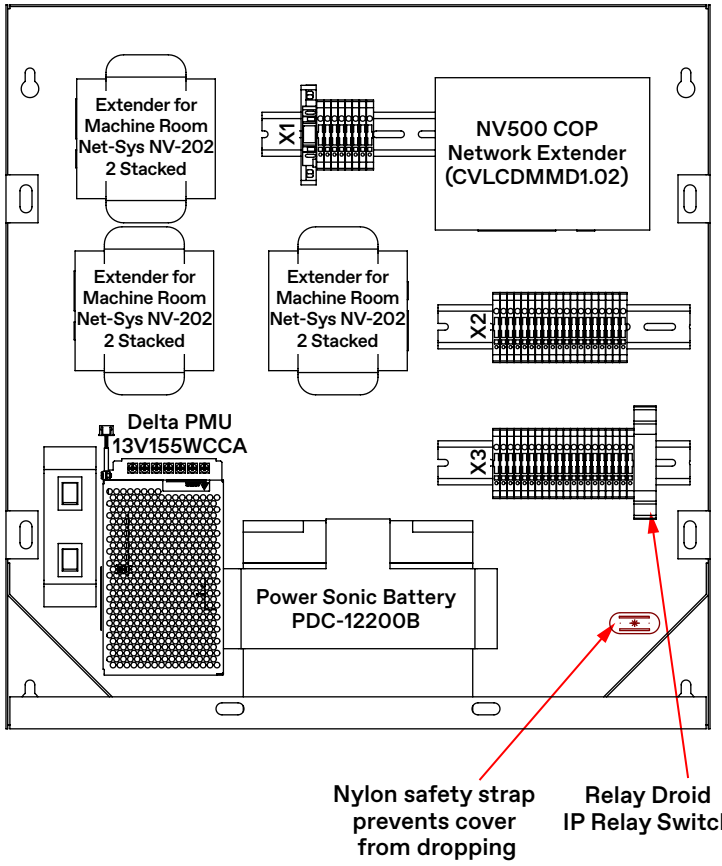
Create Network Diagram
(continued)

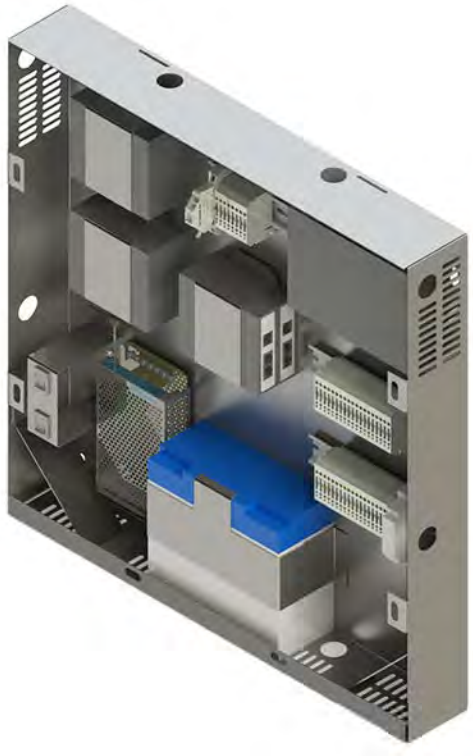
Guidelines when Selecting Large Campus Equipment Boxes

1. Only 1 PEB is required per building.
   a. The PEB is always included in the first machine room in the network diagram.
   b. The PEB can be used as network equipment boxes in the same machine room and in remote machine rooms.
2. A PEB contains up to 6 Ethernet extenders and 2 network routers.
   - Ethernet extenders contain up to 2 available ports each.
   - Network routers contain 5 available ports.
3. A EXB contains up to 5 Ethernet extenders.
   - Ethernet extenders contain up to 2 available ports each.
4. A REB contains up to 6 Ethernet extenders.
   - REB contains (1) NV500 Ethernet extender with 4 available RJ45 ports.
   - Every additional Ethernet extender is NV202 with 2 available RJ45 ports.
5. An LCP contains up to 1 Ethernet extender.
6. The Ethernet extenders in the building equipment boxes can be used to network cars, machine rooms, other groups in the building, and the LCP.
7. A RJ45 connection can be made between Ethernet extenders if the distance is < 300 feet. If > 300 feet, then a 2 wire tap connection is required.
8. REB is only provided on non-standard jobs when groups are required to be networked together.
9. REB is required to connect to other groups in different machine room locations and the distance is greater than 300 feet.
10. One Ethernet extender in each building equipment box is needed to route back to either the PEB in the first machine room or an Ethernet extender in an adjacent machine room.
11. Connect no more than 3 Ethernet extenders in a single path, if possible.

Remote Equipment Box (REB) - 2104DN (45 lbs., 22.7" x 22.0" x 3.5")

The REB is powered by the building through a circuit breaker or fused disconnect (120VAC - 20A).





Contains a UPS, Battery, and up to 6 Ethernet Extenders

Network Connections

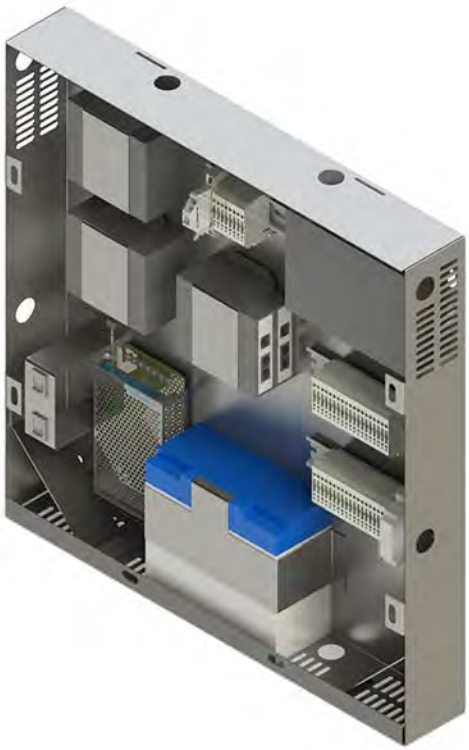
- Up to 5 cars, or 4 cars + LCP (5 Ethernet extenders).
- EXB expands the group up to 8 cars.
- Main Local Communications Panel (LCP), if net travel => 60 feet.
- 5 machine rooms.
- 5 groups.

2104DN_	Description
001	1 Car = 2 Ethernet Extenders
002	2 Car = 3 Ethernet Extenders
003	3 Car = 4 Ethernet Extenders
004	4 Car = 5 Ethernet Extenders
005	1 Car + LCP = 3 Ethernet Extenders
006	2 Car + LCP = 4 Ethernet Extenders
007	3 Car + LCP = 5 Ethernet Extenders
008	4 Car + LCP = 6 Ethernet Extenders

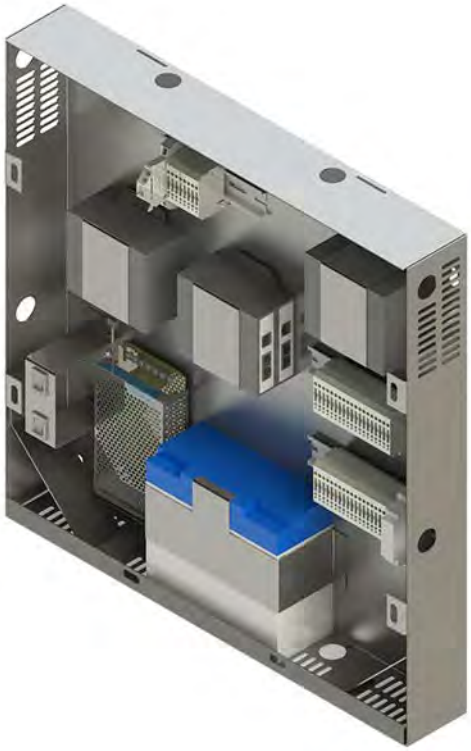
Replacement Parts

Primary Equipment Box Assembly (2104DL)

Remote Equipment Box Assembly (2104DN)



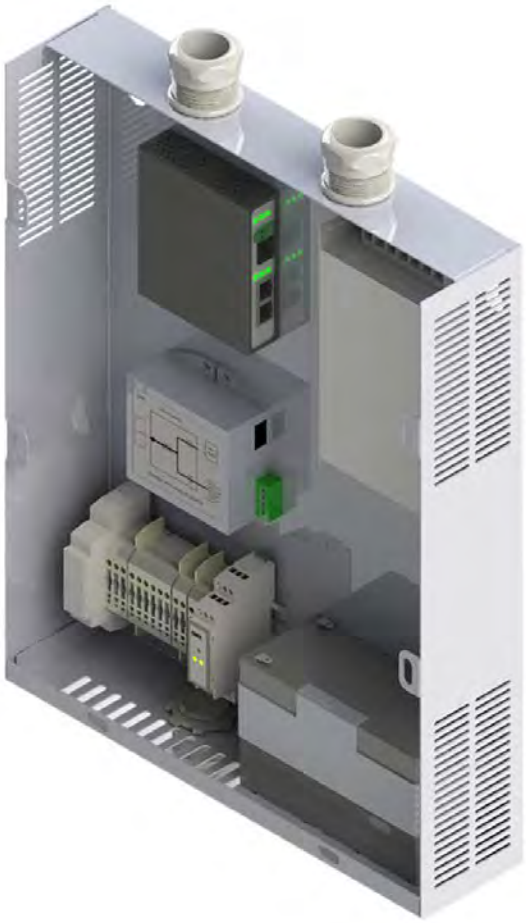
Equipment Expansion Box Assembly (2104DK)



Local Communications Panel Assembly (2104DM)

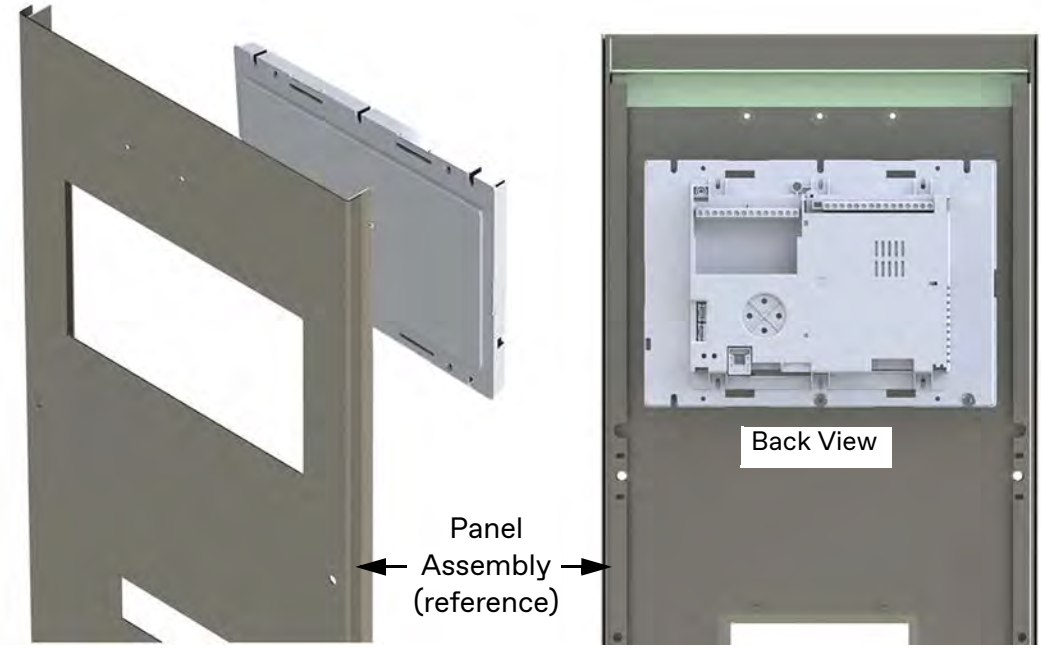
TWC Gateway Card (285DA)

Car Top Box Assembly (2104DJ)

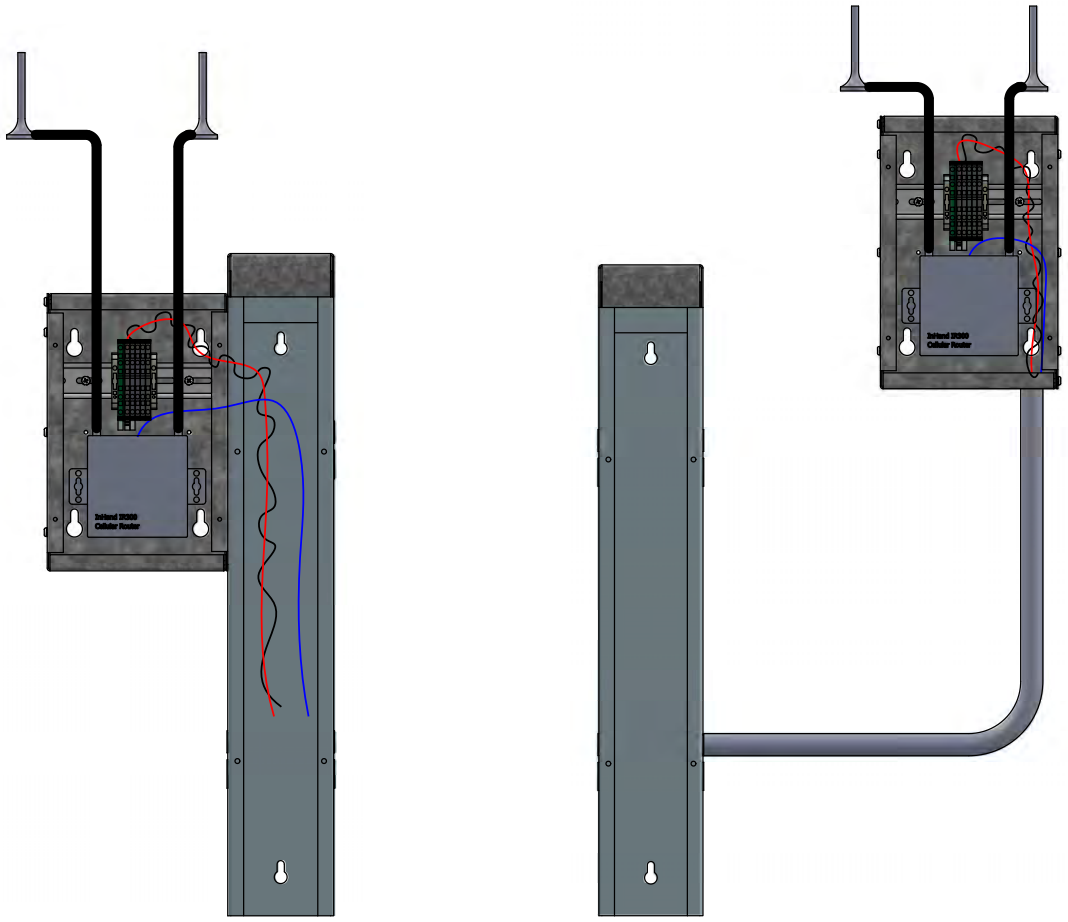


IP Network Camera (285CT)

Matisse Position Indicator (178NH)

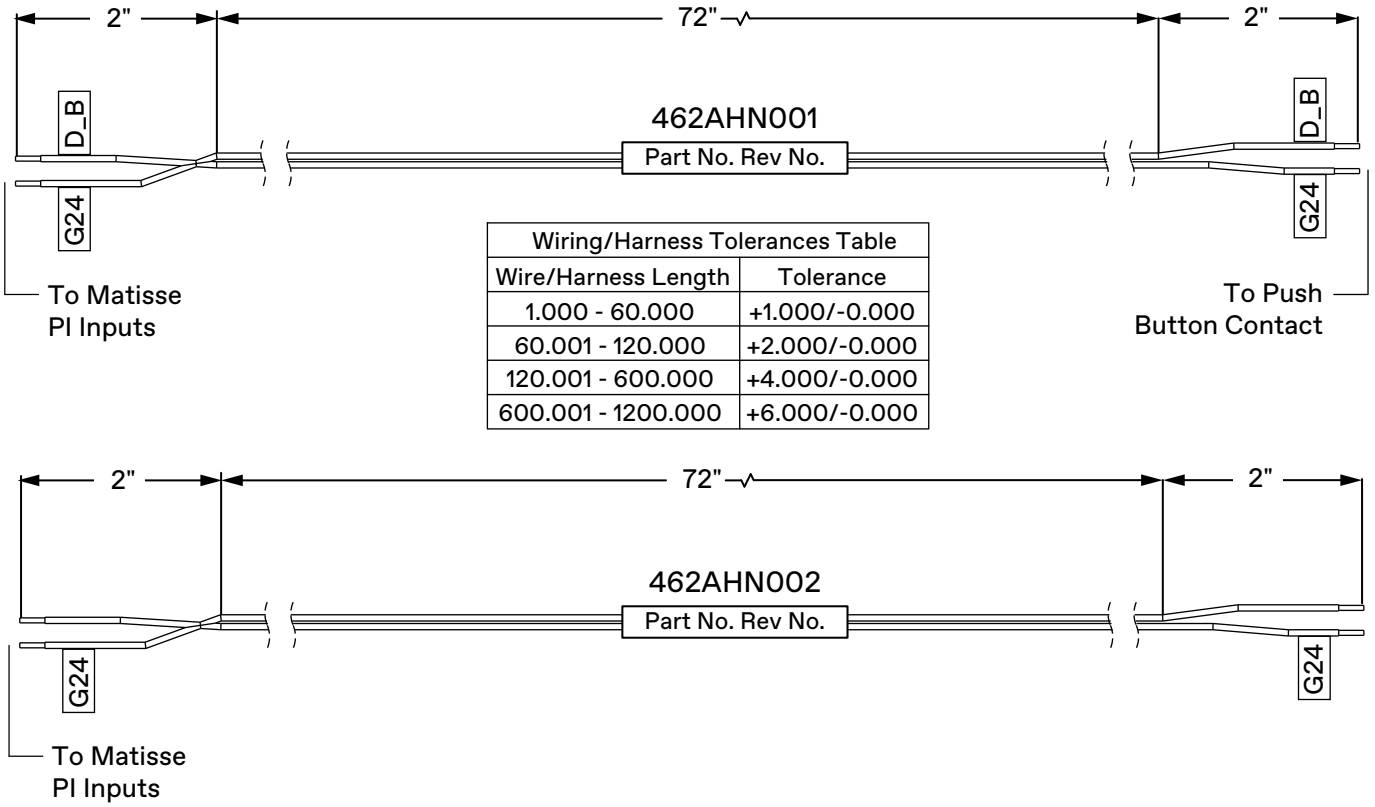


MAD Cellular Router Installation Kit for TWC (200DCX)



Item	Print No.	Description
1	2104DR001	Cabinet assembly, stand alone MAD cellular router
2	900DX7	18 gauge, twisted red/black, 2 conductor cable, 10 ft.
3	220DK25	Cat5 modular cable assembly, 25 ft.
4	286CK002	$^{1}/_{2}$" chase nipple conduit/fittings
5	286CL002	$^{3}/_{4}$" locknut conduit/fittings
6	448AB2	$^{3}/_{4}$" (i.d.) rubber grommet
7	960GY	Wiring diagram, stand alone MAD cellular router

TWC Harness Assembly (462AHN)



Wiring/Harness Tolerances Table	
Wire/Harness Length	Tolerance
1.000 - 60.000	+1.000/-0.000
60.001 - 120.000	+2.000/-0.000
120.001 - 600.000	+4.000/-0.000
600.001 - 1200.000	+6.000/-0.000

Spare Parts List

Part No.	Description	Required	Quantity
116AV001	Battery, SLA 12V, 7 A.H.	Always	1 per CTB
116AW001	Battery, SLA 12V, 21 A.H.		1 per PEB, REB, EXB, LCP
285CV001	Computer Equipment, Touch Screen PC, 15 in.		1 per LCP
285CW001	Computer Equipment, Poe Injector		1 per CTB
285CX001	Computer Equipment, Ethernet Extender, 2 Port		For PEB, REB, EXB, LCP
285CX002	Computer Equipment, Ethernet Extender, 4 Port		1 per CTB
518BA1	Interface Module, Media Converter, Fiber	Optional	1 per LCP if distance between LCP and PEB is greater than 1500 ft.
285CY001	Computer Equipment, Router, 4 Port	Always	2 per PEB
285DA001	Computer Equipment, 2-Way Comm Gateway		
285DB001	Computer Equipment, IP I/O Module		1 per PEB, REB, EXB, CTB
672DX001	Power Supply, UPS 12VDC		1 per PEB, REB, EXB, LCP, CTB

REFERENCE

MAD Elevator Tech Support Contact Information

Email	support@madelevator.com
Phone	1-866-967-8500
	1-647-925-4520
Website	https://www.mosaicone.net/help
Call Center Agent	1-866-820-0562

Rath Phone Monitoring Test

This test demonstrates code compliance for detection of alarms and elevator telephone line loss.

1. Set up the Rath Smart Phone unit. See instructions located on the car station.
2. Verify the phone is programmed with a 10-minute value (default) for the Phone Line Detection Timer.

   Press the following in the order listed on the phone keypad:

   - Enter
   - 3
   - 4
   - Enter
   - 0010
   - Stop - press for 3 seconds.

AHJ Inspection Procedure

1. Disconnect the active building phone line from the phone unit in the car station. The system will check for an active phone line every 10 minutes (manufacturing default).

   If an active phone line is not detected, the system will make a second check in 60 seconds and a third check 60 seconds after that. If an active phone line is not detected after the third check, the buzzer and indicator in the hall station will activate. The additional second and third line checks are to prevent activation of the alarms from false and momentary phone line interruptions.
2. Once the alarms have activated, reconnect the active phone line to the phone unit in the car station.

   Once a non-active phone line has been detected by the system, the system will check every 60 seconds for an active phone line. If an active phone line is detected, the hall station buzzer and indicator will automatically deactivate.

Hall Station Devices

To temporarily silence the buzzer, turn the Phone Reset Buzzer Keyswitch to Reset. The buzzer will sound again in 18 hours if an active phone line is not restored (per A17.1 (2.27.1.1.6). The indicator remains active until an active phone line is restored.

Field Point-to-Point Wiring Charts

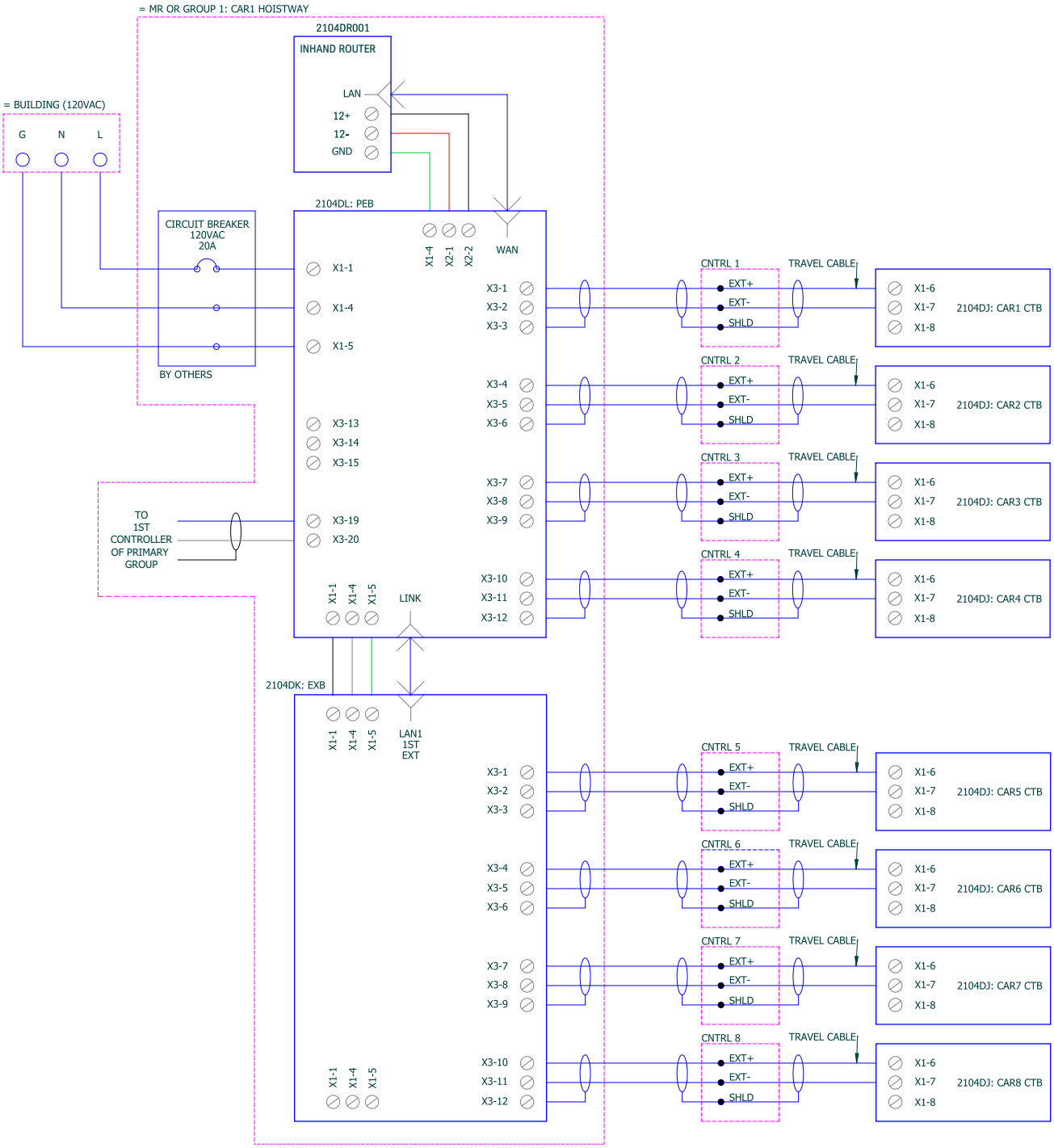
Functional Chart Name When Chart Required	Signal Name	Device 1		Wire/Cable		Device 2	
		Location of Device/Device	CON	Conductor	Color (Label)	Location of Device/Device	CON
TWC PEB TO 120VAC-20A CIRCUIT BREAKER/DISCONNECT							
Required: If ECOMTYP = 2	L	PEB/Terminal X1	2	220JF001 (Wire, 14 AWG)	Blue	Circuit Breaker/ Disconnect	L
	N	PEB/Terminal X1	4		Brown	Circuit Breaker/ Disconnect	N
	GND	PEB/Terminal X1	5		Green/ Yellow	Circuit Breaker/ Disconnect	GND
	Note: 120VAC						
TWC PEB to InHand Router							
Required: If ECOMTYP = 2 If GRPSZ => 1	12+	PEB/Terminal X2	1	900DX7 (Wire, 18AWG Twist)	Red (1)	MAD Router Box/Din Rail Terminal	12+
	12-	PEB/Terminal X2	2		Black (1)	MAD Router Box/Din Rail Terminal	12–
	GND	PEB/Terminal X2	3	Wire, 18 AWG	Green/ Yellow	MAD Router Box/Din Rail Terminal	GND
	Ethernet (LAN1)	PEB/Router 1	WAN	220DJ1 (Cat5)	Blue	MAD Router Box/RJ-45	LAN
TWC PEB to LCP							
Required: If ECOMTYP = 2 If Net Travel => 60 ft.	L	PEB/Terminal X1	2	220JF001 (Wire, 14 AWG)	Blue	LCP/Terminal X1	1
	N	PEB/Terminal X1	4		Brown	LCP/Terminal X1	2
	GND	PEB/Terminal X1	5		Green/ Yellow	LCP/Terminal X1	3
	Note: 120 VAC						
If distance between LCP and PEB <= 300 ft. and net travel => 60 ft.	LAN	PEB/Ethernet Extender	LAN2	220DJ1 (Cat5)	Blue	LCP/Ethernet Extender	LAN2
	Note: One of next last Ethernet extenders in PEB if last extender used for Remote Group or second LCP in Primary Group.						
If distance between LCP and PEB <= 300 ft. and net travel => 60 ft.	EXT+	PEB/Terminal X3	xx (16)	220AN1 (Wire, 18 AWG Shield Twist Pair)	Black	LCP/Terminal X1	4
	EXT-	PEB/Terminal X3	xx (17)		Clear or White	LCP/Terminal X1	5
	SHLD	PEB/Terminal X3	xx (18)		Shield	LCP/Terminal X1	N/A
	xx - Terminal connections for LCP in PEB varies depending on PEB part number. Use the PEB label to make a connection.						

Functional Chart Name When Chart Required	Signal Name	Device 1		Wire/Cable		Device 2	
		Location of Device/Device	CON	Conductor	Color (Label)	Location of Device/Device	CON
TWC PEB to Controller (CTRL) 1							
Required: If ECOMTYP = 2 If GRPSZ = 1	CTRL 1						
	EXT+	PEB/Terminal X3	1	220AN1 (Wire, 18 AWG Shield Twist Pair)	Black	Controller/Din Rail Terminal	EXT+
	EXT-	PEB/Terminal X3	2		Clear or White	Controller/Din Rail Terminal	EXT-
	SHLD	PEB/Terminal X3	3		Shield	Controller/Din Rail Terminal	SHLD
TWC PEB to CTRL 1 & 2							
Required: If ECOMTYP = 2 If GRPSZ =2	CTRL 1						
	EXT+	PEB/Terminal X3	1	220AN1 (Wire, 18 AWG Shield Twist Pair)	Black	Controller/Din Rail Terminal	EXT+
	EXT-	PEB/Terminal X3	2		Clear or White	Controller/Din Rail Terminal	EXT-
	SHLD	PEB/Terminal X3	3		Shield	Controller/Din Rail Terminal	SHLD
	CTRL 2						
	EXT+	PEB/Terminal X3	4	220AN1 (Wire, 18 AWG Shield Twist Pair)	Black	Controller/Din Rail Terminal	EXT+
	EXT-	PEB/Terminal X3	5		Clear or White	Controller/Din Rail Terminal	EXT-
	SHLD	PEB/Terminal X3	6		Shield	Controller/Din Rail Terminal	SHLD
TWC PEB to CTRL 1 to 3							
Required: If ECOMTYP = 2 If GRPSZ =3	CTRL 1						
	EXT+	PEB/Terminal X3	1	220AN1 (Wire, 18 AWG Shield Twist Pair)	Black	Controller/Din Rail Terminal	EXT+
	EXT-	PEB/Terminal X3	2		Clear or White	Controller/Din Rail Terminal	EXT-
	SHLD	PEB/Terminal X3	3		Shield	Controller/Din Rail Terminal	SHLD
	CTRL 2						
	EXT+	PEB/Terminal X3	4	220AN1 (Wire, 18 AWG Shield Twist Pair)	Black	Controller/Din Rail Terminal	EXT+
	EXT-	PEB/Terminal X3	5		Clear or White	Controller/Din Rail Terminal	EXT-
	SHLD	PEB/Terminal X3	6		Shield	Controller/Din Rail Terminal	SHLD
	CTRL 3						
	EXT+	PEB/Terminal X3	7	220AN1 (Wire, 18 AWG Shield Twist Pair)	Black	Controller/Din Rail Terminal	EXT+
	EXT-	PEB/Terminal X3	8		Clear or White	Controller/Din Rail Terminal	EXT-
	SHLD	PEB/Terminal X3	9		Shield	Controller/Din Rail Terminal	SHLD

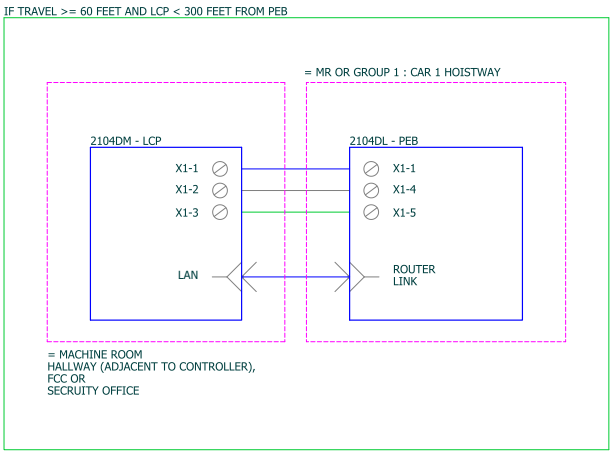
Functional Chart Name When Chart Required	Signal Name	Device 1		Wire/Cable		Device 2	
		Location of Device/Device	CON	Conductor	Color (Label)	Location of Device/Device	CON
TWC PEB to CTRL 1 to 2							
Required: If ECOMTYP = 2 If GRPSZ =4	CTRL 1						
	EXT+	PEB/Terminal X3	1	220AN1 (Wire, 18 AWG Shield Twist Pair)	Black	Controller/Din Rail Terminal	EXT+
	EXT-	PEB/Terminal X3	2		Clear or White	Controller/Din Rail Terminal	EXT-
	SHLD	PEB/Terminal X3	3		Shield	Controller/Din Rail Terminal	SHLD
	CTRL 2						
	EXT+	PEB/Terminal X3	4	220AN1 (Wire, 18 AWG Shield Twist Pair)	Black	Controller/Din Rail Terminal	EXT+
	EXT-	PEB/Terminal X3	5		Clear or White	Controller/Din Rail Terminal	EXT-
	SHLD	PEB/Terminal X3	6		Shield	Controller/Din Rail Terminal	SHLD
TWC PEB to CTRL 3 to 4							
Required: If ECOMTYP = 2 If GRPSZ =4	CTRL 3						
	EXT+	PEB/Terminal X3	7	220AN1 (Wire, 18 AWG Shield Twist Pair)	Black	Controller/Din Rail Terminal	EXT+
	EXT-	PEB/Terminal X3	8		Clear or White	Controller/Din Rail Terminal	EXT-
	SHLD	PEB/Terminal X3	9		Shield	Controller/Din Rail Terminal	SHLD
	CTRL 4						
	EXT+	PEB/Terminal X3	10	220AN1 (Wire, 18 AWG Shield Twist Pair)	Black	Controller/Din Rail Terminal	EXT+
	EXT-	PEB/Terminal X3	11		Clear or White	Controller/Din Rail Terminal	EXT-
	SHLD	PEB/Terminal X3	12		Shield	Controller/Din Rail Terminal	SHLD
TWC PEB to EXB							
Required: If ECOMTYP = 2 If PEB = 1 and EXB = 1	EXB						
	L	PEB/Terminal X1	2	220JF001 (Wire, 14 AWG)	Blue	EXB/Terminal X1	L
	N	PEB/Terminal X1	4		Brown	EXB/Terminal X1	N
	GND	PEB/Terminal X1	5		Green/ Yellow	EXB/Terminal X1	GND
	LAN	PEB/Router 2	Port 1 (x)	220DK10 (Cat5)	Blue	EXB/Ethernet Extender	LAN1
	x - Terminal connections for Router 2 in PEB varies depending on PEB part number. Use PEB label to make a connection.						

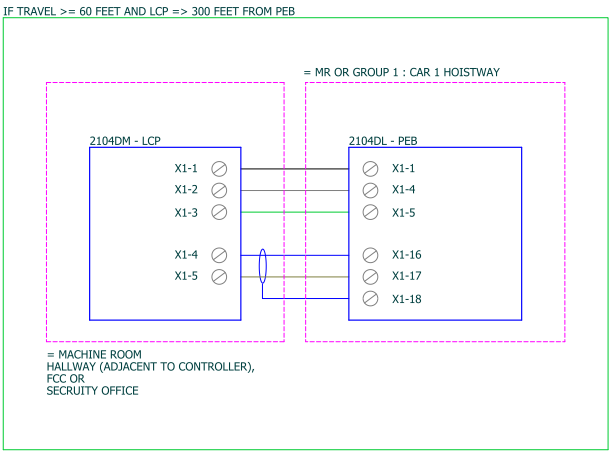
Wiring Diagrams (960GY)

PRIMARY GROUP

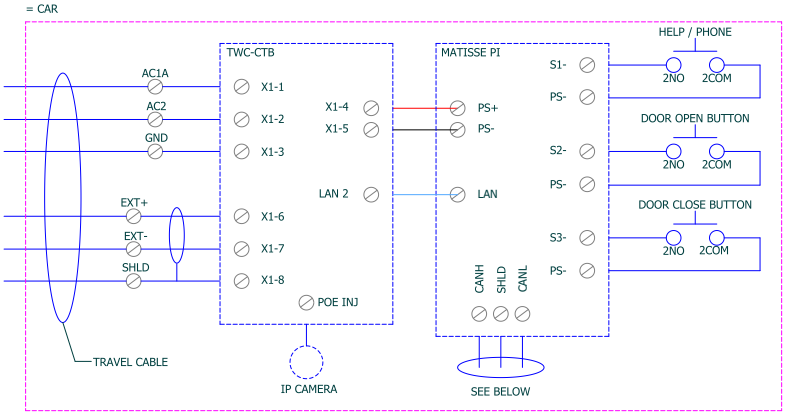


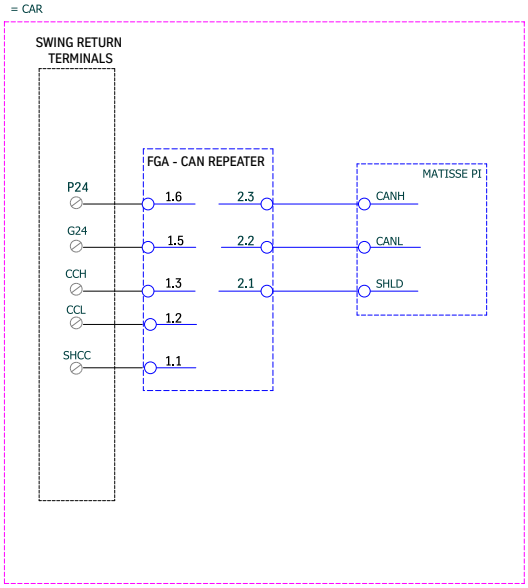
LCP FOR PRIMARY GROUP



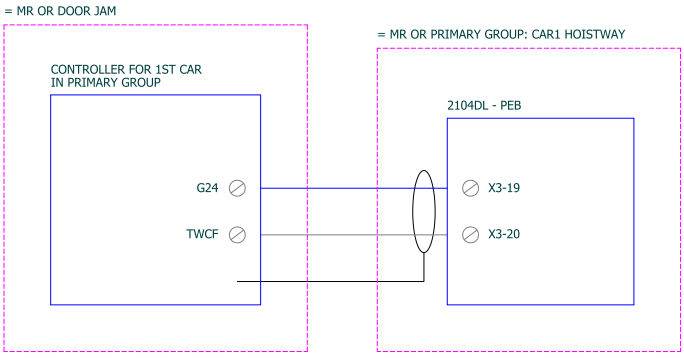


EMERGENCY COMMUNICATIONS





COMMUNICATIONS FAILURE



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