

SURVEYOR EMS COMPONENTS		
PART	DESCRIPTION	QUANTITY
DC400	DATA CONCENTRATOR	1
ECF400	EQUIPMENT CONTROL PAC	1 PER HVAC
SP400	EQUIPMENT SENSOR PACK	1 PER HVAC
CT414	COMMUNICATING THERMOSTAT	1 PER HVAC
RS410	WALL MOUNT REMOTE SENSOR	1 PER HVAC
LCP401	LIGHTING CONTROL PANEL	1
MD400	ADDITIONAL MOTION DETECTOR	AS NEEDED
PM401	SINGLE CHANNEL POWER MONITOR	1
SCT600-200	600A SPLIT CT, 2" OPENING	3
SCIM4000	SINGLE CHANNEL INPUT MODULE	1
OTS400	OUTDOOR TEMPERATURE SENSOR	1

GENERAL NOTES

1. SURVEYOR ENERGY MANAGEMENT SYSTEM HARDWARE IS SUPPLIED BY O'REILLY AUTO PARTS.
2. DRAWING FOR GENERAL INFORMATION ONLY.
3. LOCAL BUILDING CODES TAKE PRECEDENCE OVER THIS DOCUMENT.
4. NOT ALL WIRING IS SHOWN ON THIS DRAWING. FOR CLARITY, ONLY ONE EXAMPLE OF EACH TYPE OF DEVICE IS SHOWN.
5. REFER TO "O'REILLY INSTALLATION DETAIL" DRAWING AND THE SURVEYOR INSTALLATION INSTRUCTIONS FOR EACH COMPONENT FOR DETAILED WIRING AND ADDITIONAL CRITICAL INFORMATION.
6. CAUTION! INSTALLATION REQUIRES THE REMOVAL OF SAFETY COVERS AND EXPOSE THE INSTALLER TO HIGH VOLTAGE AND ELECTRICAL HAZARDS. USE OF A LICENSED ELECTRICIAN IS REQUIRED. FOLLOW ALL APPROPRIATE SAFETY PRECAUTIONS. ADDITIONAL SAFETY INFORMATION IS IN THE SURVEYOR INSTALLATION MANUALS.
7. IT IS THE CONTRACTORS OPTION TO CONTACT ONE OF THE FOLLOWING FOR INSTALLATION OF THE VENSTAR SURVEYOR SYSTEM (MATERIALS PROVIDED BY O'REILLY AUTOMOTIVE STORES INC.):
 - A. STONES RIVER ELECTRIC - DARRELL STARKEY - DSTARKEY@STONESRIVERELECTRIC.COM - 615-885-0019
 - B. STOVER ELECTRIC - JAMES STOVER - JAMES@STOVERELECTRICINC.COM - 805-581-0740
 - C. ZUBRAS ELECTRIC - SIMON ZUBRAS - SIMON@ZUBRASELECTRIC.COM - 214-319-6900

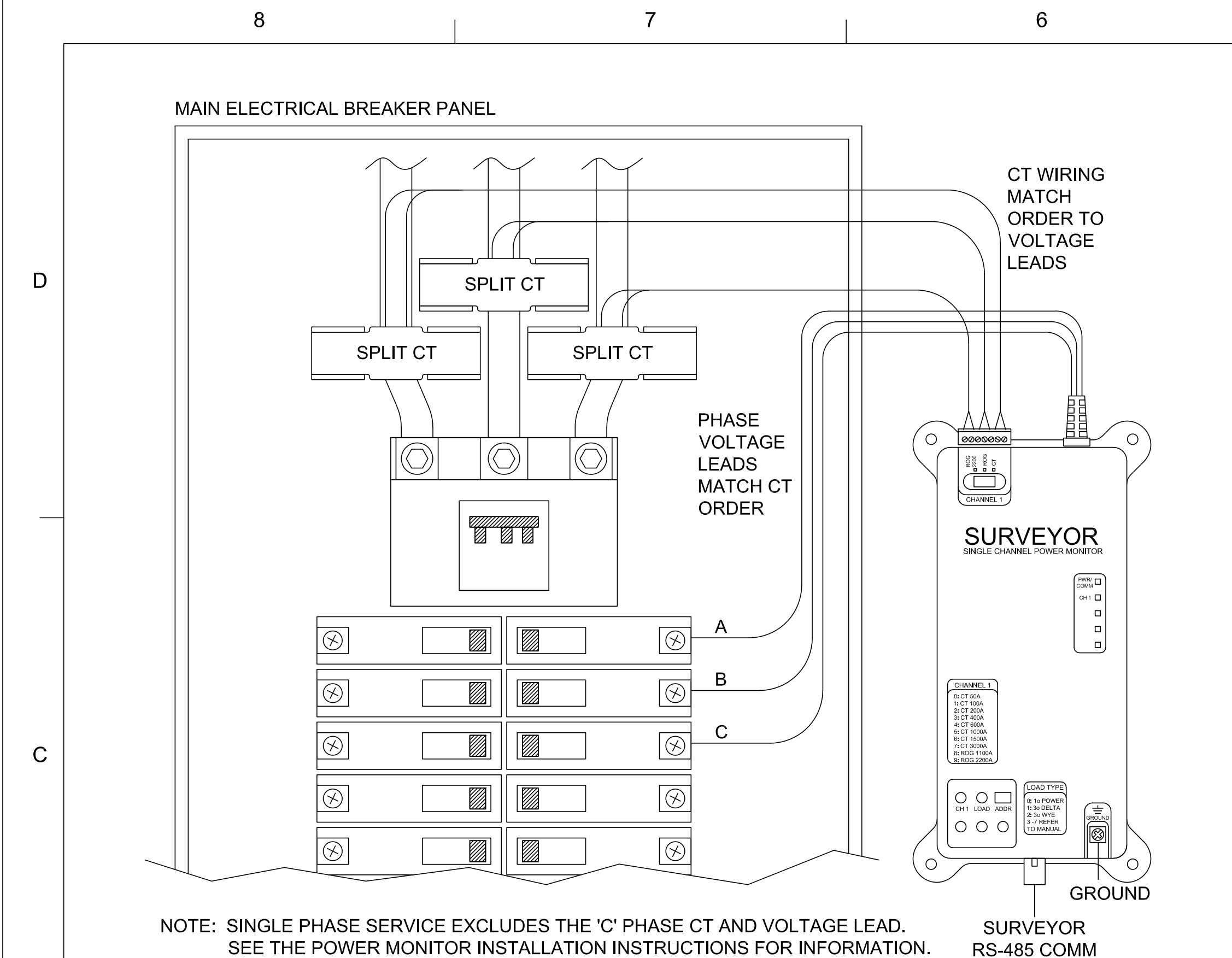
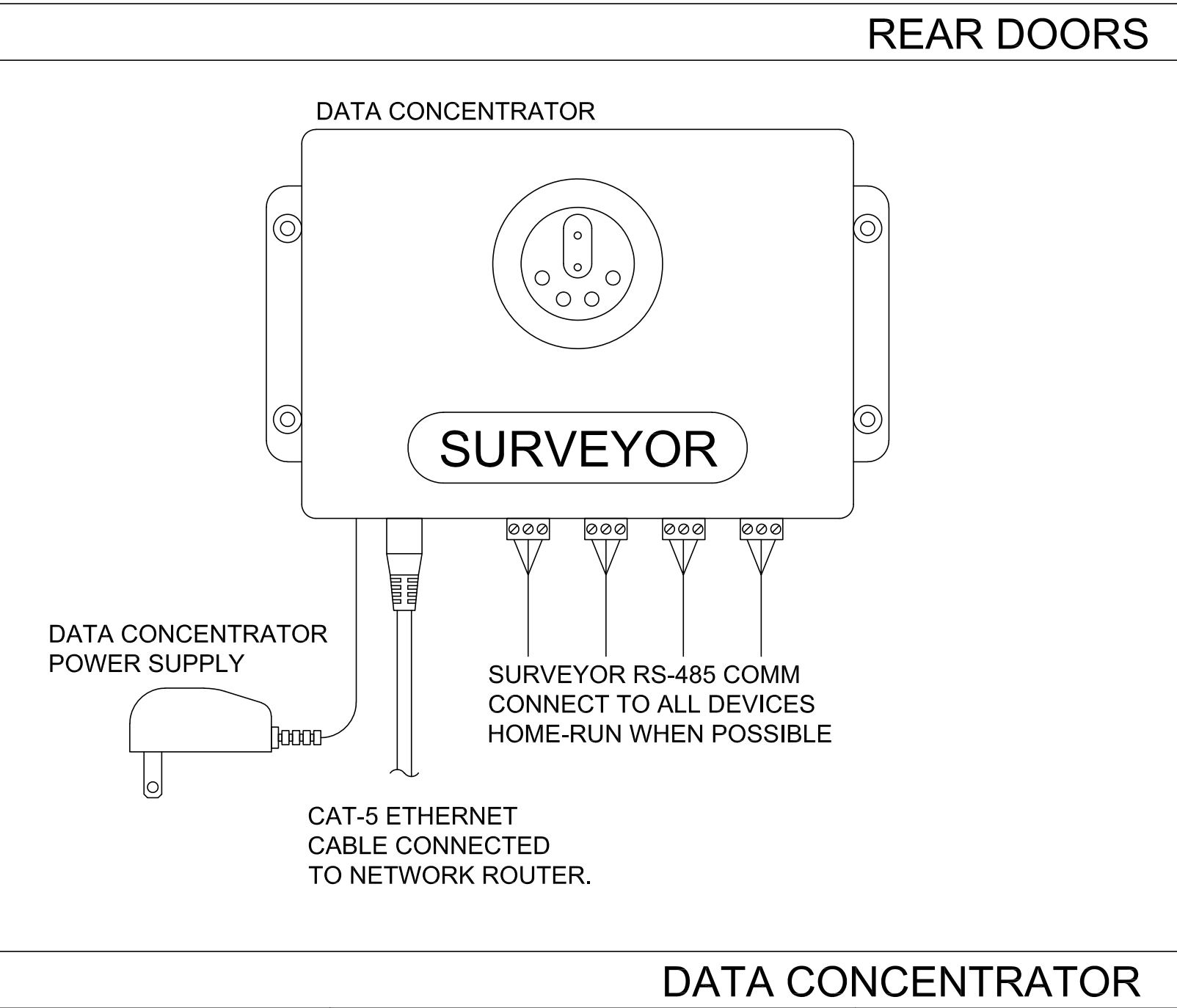
<p>FOR SURVEYOR EMS TECHNICAL SUPPORT AND SYSTEM COMMISSIONING, PLEASE CONTACT:</p> <p>SURVEYOR TECHNICAL SUPPORT (818) 812-9812 MON-FRI 6:00 AM - 5:00 PM PACIFIC surveyorsupport@venstar.com</p>			
G	REMOVED "NOT USED UNDER ANY CIRCUMSTANCES" (THIS INFORMATION IS REQUIRED) IN DETAIL LIGHTING	JH	1-6-18
F	REMOVED ECP LABELING	JH	10-6-17
E	REMOVED SECURITY WIRE		
D	ADDED CONTRACTOR CONTACTS		
C	UPDATED CONTACT INFORMATION PART NUMBER SURVEYOR EMS	CB	9-27-16
B	ADDED "NOT PUSHER" ON CUSI	CB	2-3-14
C	REVISED TO REFERENCE DETAIL DWG	CB	8-12-13
2	ADDED CONTRACTOR CONTACTS	WB	8-27-13
1	REMOVED CONTRACTOR CONTACTS	WB	8-17-13
0	ADDED CONTRACTOR CONTACTS	CB	6-26-13
A	ADDED CONTACT NOTES	CB	7-11-13

VENSTAR INC.

TITLE

SURVEYOR

O'REILLY INSTALLATION OVERVIEW



B

EXTERIOR PHOTOCELL: MOUNTED OUTSIDE ON HVAC UNIT. MOUNT PHOTOCELL ABOVE/BELOW OUTDOOR TEMP SENSOR.

PUSH BUTTON ONLY USED WHEN REQUIRED BY LOCAL CODE

MAY BE TEMPORARILY INSTALLED FOR USE DURING CONSTRUCTION

Press to turn on the store's lights when opening. Press again to turn off the lights at the store's closing.

SURVEYOR LIGHTING CONTROL

SURVEYOR RS-485 COMM

MOTION DETECTORS 1 OR MORE AS NEEDED (TYPICALLY 2 REQUIRED)

LIGHTING CONTROL BOARD

LOGIC WHEN PUSHBUTTON IS USED:

OPEN - SALES AND WORK LIGHTS STAY ON REGARDLESS OF MOTION. SIGN AND SITE LIGHTS TURN ON AS NECESSARY BASED ON OUTSIDE LIGHT LEVEL.
CLOSED - WORK LIGHTS COME ON WITH MOTION. SITE LIGHTS COME ON WITH MOTION IF IT IS ALSO DARK OUTSIDE. SALES AND SIGN LIGHTS REMAIN OFF, UNLESS TURNED ON WITH THE OVERRIDE TWIST TIMERS.

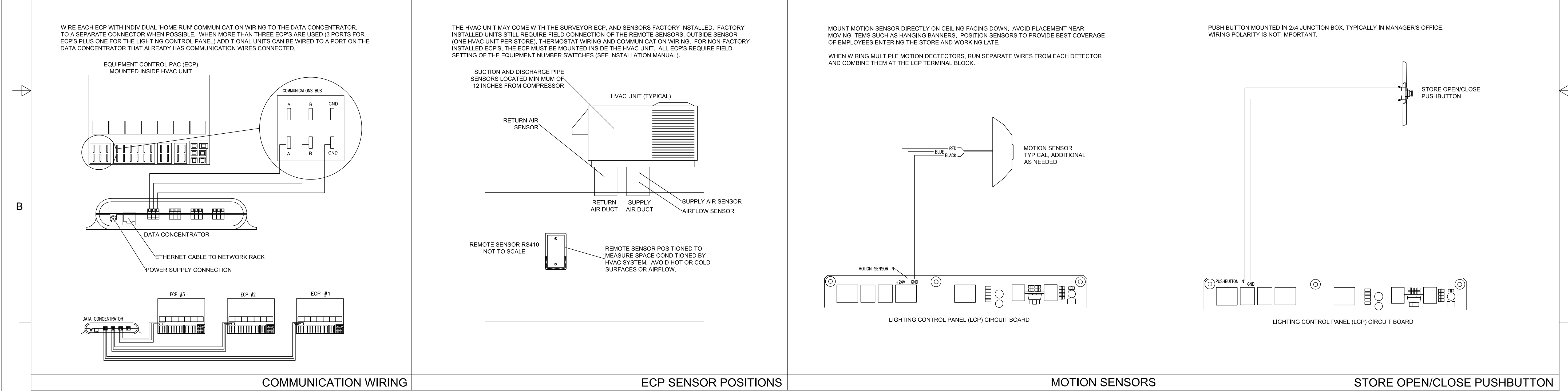
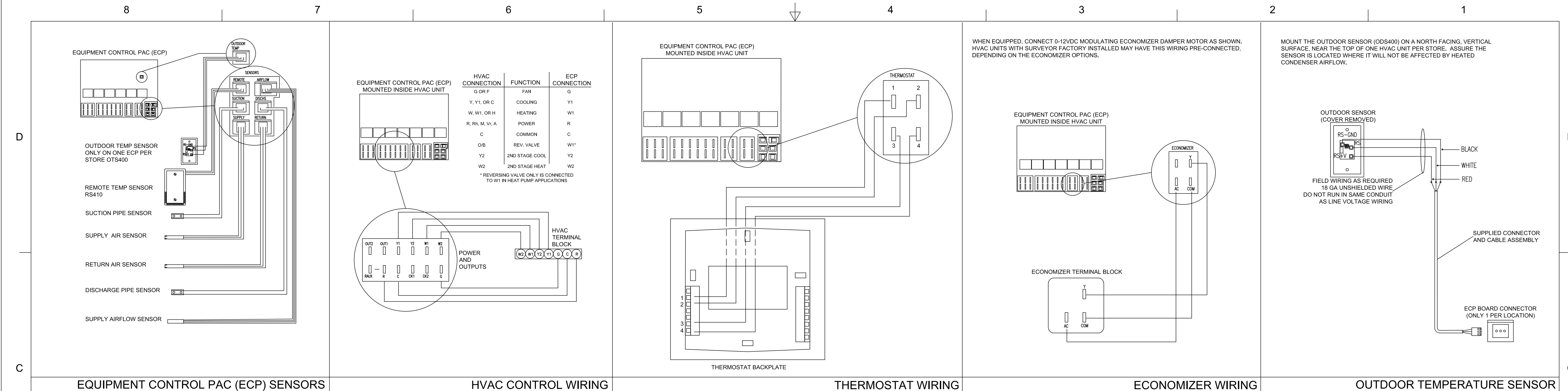
Diagram showing the connection of the Surveyor Lighting Control Board to the contactors (C-1, C-2, C-3, C-3A, C-4, C-4A) for Interior, Exterior, Parking, and Site lighting.

BUILT IN CONTACTORS ARE RATED FOR 120/240 VAC, 20A. WHEN HIGHER RATINGS OR ADDITIONAL CIRCUITS ARE REQUIRED, SLAVE CONTACTORS MUST BE ADDED.

LIGHTING CONTROL

ECP LABELING

LABEL EACH ECP PER O'REILLY TERMINOLOGY WITH EXACTLY THE SAME UNIQUE IDENTIFYING "CODE" AS SHOWN ON THE "HVAC PLAN" ON SHEET M1 (FOR EXAMPLE: RTU-1, RTU-2, ETC. OR FURN-1, FURN-2, ETC.).



GENERAL NOTES:

1. DRAWING FOR GENERAL INFORMATION ONLY.

2. LOCAL BUILDING CODES AND BUILDING PLANS, AND STORE TAKE PRECEDENCE OVER THIS DOCUMENT.

3. REFER TO THE SURVEYOR MANUAL, AND INSTALLATION INSTRUCTIONS FOR EACH COMPONENT FOR ADDITIONAL CRITICAL INFORMATION.

4. SOME HVAC UNITS ARE AVAILABLE WITH THE SURVEYOR ECP AND SENSORS PRE-INSTALLED. THE REMOTE SENSOR AND ONE OUTSIDE SENSOR PER STORE WILL NEED TO BE CONNECTED IN THE FIELD TO THE ECP.

5. ALL ECP'S REQUIRE SETTING OF THE EQUIPMENT NUMBER DIP SWITCHES, AND HEAT PUMP JUMPERS AS APPROPRIATE. REFER TO THE EQUIPMENT CONTROL PAC INSTALLATION INSTRUCTIONS FOR FURTHER INFORMATION.

6. ALL WIRING 18 GA UNSHIELDED, OR TWISTED PAIR.

7. WIRING MAY BE RUN IN CONDUIT OR WIRE TIED IN BUNDLES.

8. DO NOT RUN COMMUNICATION AND SENSOR WIRES IN THE SAME CONDUIT OR BUNDLE WITH CONTROL AND LINE VOLTAGE WIRING.

9. CAUTION! INSTALLATION REQUIRES REMOVAL OF SAFETY COVERS AND EXPOSE THE INSTALLER TO ELECTRICAL HAZARDS. USE OF A LICENSED ELECTRICIAN IS REQUIRED. FOLLOW ALL APPROPRIATE SAFETY PRECAUTIONS. ADDITIONAL SAFETY INFORMATION IS IN THE SURVEYOR INSTALLATION MANUALS.

VENSTAR INC.

SURVEYOR

O'REILLY INSTALLATION DETAILS

C	REMOVED MOTION DETECTOR "NOTE" IN DETAIL "MOTION SENSORS"	JH	01-24-18	D	9-13-13	S13-002	REV	-
B	REMOVED THE WORD "NOT" IN NOTE IN "DETAIL OUTDOOR TEMP. SENSOR"	JH	12-29-17	SCALE	NONE	DRAWN	C. GODWIN	SHEET 1 OF 1
A	ADDED ECP LABELING	JH	10-9-17					

DESIGN BY OTHERS. FOR REFERENCE ONLY

SHEETS BEARING THIS SEAL ARE AUTHENTICATED. RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS OR INSTRUMENTS ARE DISCLAIMED.

PROJECT: NEW O'REILLY AUTO PARTS STORE
6179 SW HWY 200
OCALA, FL 34476
VENSTAR O'REILLY DETAILS

O'Reilly AUTO PARTS
CORPORATE OFFICES
233 SOUTH PATTERSON
SPRINGFIELD, MISSOURI 65802
(417) 862-2674 TELEPHONE

DRAWN BY: JJW
CHECKED BY: BLC/ALT
DATE: 06/15/2018
REVISION:
PROJECT NUMBER: 18078-OF4
SHEET NUMBER: VS2

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General Notes

- » The Venstar Surveyor Energy Management System is supplied by O'Reilly Auto Parts and installed by the contractor. Please note: Local building codes and building plans take precedence over this document.
- » More details can be found on the VS1 and VS2 drawings, as well as the installation instructions included with each Surveyor hardware component.

Surveyor EMS Components

Description	Part #	Quantity
Data Concentrator	DC400-E2	One per location
Lighting Control Panel	LCP401-R1	One per location
Outdoor Temp Sensor	OTS400	One per location
Equipment Control Pac	ECP400-R1	One per HVAC unit
Communicating Thermostat	CT414	One per HVAC unit
Sensor Pac	SP400	One per HVAC unit
Remote Sensor (Wall Mount)	RS410	One per HVAC unit
Additional Motion Detector (one included with LCP401)	MD400	Two total per location (typical)
Building Power Monitor	PM401	One per location
600 A Split CT		Three per location
Back Door Switch(es) – Rollup Door and Rear Man Door	SWP400	Two per location (typical)
Front Door Switch(es) – New Construction and Select Retrofits only	SWP400	One per location (typical)
Single Channel Input Module (Digital) - New Construction and Select Retrofits only	SCIM400D	One per location

Installing the Data Concentrator

Hardware Placement

- Connect to the “Low Side” router and plug into the first available port. (This is the same router as the store's training computer and/or the same router that the DM connects to when making store visits).

Wiring Instructions

- Connect Cat 5 cable from Data Concentrator to the store router in the designated port
- Connect power supply to Data Concentrator

Hardware Configuration

- The Data Concentrator ships to the job site pre-programmed with network settings provided by O'Reilly. Additional hardware configuration is not typically required

Installing the Equipment Control Pac, Communicating Thermostat, and sensors

Hardware Placement

- Mount an Equipment Control Pac (ECP) inside each HVAC unit
 - Label each ECP per O'Reilly terminology with exactly the same unique identifying "code" as shown on the "HVAC Plan" on sheet M1 (For example: RTU-1, RTU-2, etc. or FURN-1, FURN-2, etc.)
- Connect sensors from Sensor Pac
- Communicating Thermostat(s):
 - Mount the thermostats at a level permitting easy access near the manager's workstation, if possible
 - Label front of thermostat doors per O'Reilly terminology (HVAC 1, HVAC 2, etc.) to be consistent with labels on ECPs
- Remote temperature sensors are to be mounted in an optimal position:
 - Use RS410 (wall-mount) sensor for Showroom's HVAC units and place it 7'-3" A.F.F. (above finished floor)
 - Use RS410 (wall-mount) sensor for Hard Parts HVAC units and place it 5'-6" A.F.F. (above finished floor)
 - The sensor should be placed in the zone it is controlling
 - Identify a location where the sensor does not have airflow interference from a supply vent. Given the choice, place closer to return air vent instead of supply air vent

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DO NOT:

- Place the remote sensor on the decorative wall striping
- Place the sensor in direct airflow stream between a supply and return grille (where supply air is pulled directly into return)
- Place sensor where it receives direct heat from any piece of equipment
- Place sensor where it will be impacted by any door opening
- Place sensor near the windows where it will receive sun interference (radiant heat)
- Place sensor where it will receive heat interference from the lighting
- Outside Temperature Sensor:
 - One per location, mount outside on roof, facing north
- Door Switches (delivery and rear man door), when applicable
 - One switch per door, normally closed, wired in series
 - Do not install rear door switch(es) for:
 - Stores with one HVAC unit
 - Stores that only receive deliveries through the front door

Wiring Instructions

- Connect ECP to HVAC terminal board
- Connect Communicating Thermostat to ECP
- Connect Sensor Pac sensors to ECP
- Connect Remote Sensor to ECP
- Connect door switches (loading and rear man door) to ECP that conditions the space near doors
- Connect the RS485 terminals of the ECP to the Data Concentrator
- All wiring shall be installed and terminated in accordance with the NEC as well as any applicable state and local regulations

Hardware Configuration

- Set ECP address dip switch for each unit
- Set ECP jumper for Heat Pump or Gas/Electric
- Set ECP jumper to O or B reversing valve (Heat Pump only)

Installing the Lighting Control Panel

Hardware Placement

- Surface mount the Lighting Control Panel (LCP) at a level as convenient and feasible to the existing breaker panel
 - It is permissible to recess the panel, if necessary
- Photocell for exterior lighting:
 - One per location
 - Mount outside on one of the HVAC units, pointing photocell to the north with no influence from shade or surroundings (trees, equipment, etc.). Mount photocell above/below the outdoor temp sensor
 - Connect photocell to LCP
- Motion Detectors for interior lighting:
 - Two per location typical, unless otherwise shown on MEP drawings
 - Refer to MEP drawings for exact locations
- Alarm Interface:
 - One per location, leave coiled above panel for connection by alarm company
- Push Button:
 - Temporary push button may be installed for use during construction
 - Permanent push button will **not** be installed at O'Reilly Auto Parts stores except in rare cases when required by code

Lighting Circuit Identification

- All lighting circuits shall be identified and classified into lighting zones
- Each lighting circuit shall be identified by breaker circuit number and assigned to a specific contactor number within the LCP

Lighting Zone Configuration

The following describes the lighting zones controlled by Surveyor:

- Interior Lighting (Work) - Work and stock areas, excluding nighttime delivery and emergency lights
- Interior Lighting (Sales) - Sales floor, customer areas, and interior open/close sign
- Exterior Lighting (Sign) - Lights for store signs on building and other store signage
- Exterior Lighting (Site) - Parking lot lights, building accent lights, and other exterior lights
- NOTE: Certain fixtures are designated night lights and are zoned to be on 24/7 for safety and security.**

Wiring Instructions

- Connect lighting accessories to LCP, as appropriate
- Connect the RS485 terminal of the LCP to the Data Concentrator
- All wiring shall be installed and terminated in accordance with the NEC as well as any applicable state and local regulations

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Installing the Front Door Counter (Single Channel Input Module)

Hardware Placement

- One switch per door at front entrance, normally closed, wired in series (for more than one door)
- Mount SCIM400D in back of store near other Surveyor hardware

Wiring Instructions

- Connect door switch(es) to SCIM400D
- Connect the RS485 terminals of the SCIM400D to the Data Concentrator
- All wiring shall be installed and terminated in accordance with the NEC as well as any applicable state and local regulations

Installing the Building Power Monitor

Hardware Placement

- Place PM401 near the breaker panel or main electrical service, as appropriate
- Place CTs to measure all phases of building power

Wiring Instructions

- Connect CTs to Power Monitor (PM401)
- Connect voltage leads and ground terminal
- Connect the RS485 terminals of the Power Monitor (PM401) to the Data Concentrator
- All wiring shall be installed and terminated in accordance with the NEC as well as any applicable state and local regulations

Hardware Configuration

- Set slide switch for CT type
- Set CH1 rotary switch for CT size
- Set Load rotary switch for electrical service type

Commissioning

Upon completion of the installation, the contractor shall contact Surveyor Support for commissioning. The contractor shall be onsite and provide all support required during the commissioning process. The checklist below serves as a quick reference for the contractor to verify that the installation was completed successfully.

Surveyor Technical Support

surveyorsupport@venstar.com
Direct: 818-812-9812
Office: 818-341-8760
Mon-Fri 6:00am-5:00pm Pacific Time

Data Concentrator

- Confirm power and Ethernet connections
- Verify communication to **all** Surveyor equipment
- Contact the Surveyor Support line at **818-812-9812** to verify connectivity to the O'Reilly server

Equipment Control Pacs

- Verify proper addressing
- Verify door switch functionality (loading and rear man door)
- Re-start all HVAC equipment and verify heating/cooling operation

Communicating Thermostat(s)

- Test operation in all modes
- Verify sensor readings

Lighting Control Panel and accessories

- Test Photocell
- Test Motion Detectors
- Test operation and function of twist-timer overrides
- Confirm lighting circuitry does not affect any other store equipment

Building Power Monitor

- Verify sensor readings

Front Door Counter (Single Channel Input Module)

- Verify door switch functionality

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REVISION			
A	CHANGED REMOTE TEMPERATURE SENSORS MOUNTING HEIGHT	JH	01-01-17
B	CHANGED REMOTE TEMPERATURE SENSORS MOUNTING HEIGHT	JH	01-13-17
C	CHANGED PHOTOCELL FOR EXTERIOR LIGHTING WORDING	JH	09-27-17
D	ADDED TO NOTE FOR HARDWARE PLACEMENT - ECP FOR HVAC	JH	10-09-17

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REFERENCE
ONLY

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NEW O'REILLY AUTO PARTS STORE
6179 SW HWY 200
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O'Reilly[®] AUTO PARTS

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233 SOUTH PATTERSON
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DRAWN BY: JYW CHECKED BY: BLC/ALT

DATE: 06/15/2018

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VS3