

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 w 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 & Rear Man Door | SWP400 | Two per location (typical) |
| Front Door Switch(es) – New Construction & Select Retrofits only | SWP400 | One per location (typical) |
| Single Channel Input Module (Digital) - New Construction & 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.) and be consistent with labels on ECPs.
- Remote temperature sensors are to be mounted in an optimal position:
 - Use RS410 (wall-mount) sensor for Store room HVAC units and place it 7'-3" AFF (above finished floor)
 - Use RS410 (wall-mount) sensor for Hardware Parts HVAC units and place it 5'-6" AFF (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 sensor to return air vent instead of supply air vent.

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 location 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 near one of the HVAC units, pointing photocell to the north with no influence from shade or surrounding areas (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 PM401 to Power Monitor (PM401)
- Connect voltage leads to 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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REVISIONS:

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O'Reilly AUTO PARTS

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417-862-2874 PHONE

PROJECT:
RE-MODEL O'REILLY AUTO PARTS STORE
523 NORTH MILITARY STREET
LORETTO, TN 38469
ENERGY SYSTEM

FOR REFERENCE ONLY

Professional of Record

DRAWN:
CHECKED:
DATE: 2-15-2018
JOB NO.: 319287 (LTO)
SHEET:
VS3

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Order Plans