

What California's Title 24 Updates Mean for Metering and Plug-Load Control

Click Below to Get Started

- > Introduction
- > Metering A Bigger Requirement Under California's Updated Title 24
- > Submetering is More Important Than Ever in California's Updated Title 24
- > Designing Submetering Under Title 24: A Question of Space Versus Cost
- > Save More Energy by Turning Off Power Receptacles
- > Top Questions About Title 24 Requirements
- > Additional Resources



Life Is On

Schneider
Electric

INTRODUCTION

Click below to Get Started

Introduction

Metering A Bigger Requirement Under California's Updated Title 24

Submetering is More Important Than Ever in California's Updated Title 24

Designing Submetering Under Title 24: A Question of Space Versus Cost

Save More Energy by Turning Off Power Receptacles

Top Questions About Title 24 Requirements

Additional Resources

With the latest updates to its signature Title 24 energy efficiency code, the California Energy Commission significantly increased requirements for metering and plug-load control, among other provisions. Effective in California as of July 1, 2014, these new standards also could have an impact on projects far beyond the Golden State's borders.

Certainly any consulting engineers working within the state need to understand these new guidelines - but due to Title 24's influence on energy codes throughout the U.S., these revisions could be spreading soon to other jurisdictions across the nation, as well. This eGuide explains some of the details specified for electrical power distribution systems under the code's Section 130.5 to help consulting engineers better understand its implications for future designs.

This latest edition incorporates added emphasis on measurement and control of a facility's energy use, from the utility entrance point down to individual outlets. This eGuide explores four specific aspects of Subchapter 130.5 of particular importance to electrical design professionals, including:

- New requirements for service metering under subsection 130.5(a)
- The need to disaggregate electrical circuits by type under 130.5(b)
- The implications of 130.5(b) on branch-circuit design
- Some means for addressing the plug-load requirements outlined in subsection 130.5(d)

Certainly any professionals brought in to assist on projects within California's borders need to understand these new requirements, but we at Schneider Electric see a nationwide audience for this eGuide. Title 24 also is referenced in numerous other codes and certification programs across the country, and its updates often influence other widely used standards, including those



The California Energy Commission significantly increased requirements for metering and plug-load control, among other provisions.

developed by the American Society of Heating, Refrigerating and Air Conditioning Engineers. So, today's California requirements could be coming to a jurisdiction near you in the near future – becoming familiar with these updated standards now could provide a significant advantage in any future projects.

Read on to learn more about Title 24's latest electrical distribution system requirements. And, if you have questions, please visit [Schneider Electric's new Professional Engineer web portal](#) for more information and access to electrical experts you can call on for advice.



METERING A BIGGER REQUIREMENT UNDER CALIFORNIA'S UPDATED TITLE 24

Click below to Get Started

[Introduction](#)

[Metering A Bigger Requirement Under California's Updated Title 24](#)

[Submetering is More Important Than Ever in California's Updated Title 24](#)

[Designing Submetering Under Title 24: A Question of Space Versus Cost](#)

[Save More Energy by Turning Off Power Receptacles](#)

[Top Questions About Title 24 Requirements](#)

[Additional Resources](#)

[California's Title 24 energy standards](#) have long been some of the most demanding efficiency guidelines in the country, and the 2013 updates (which went into effect July 1, 2014) continue that tradition. While lighting and plug-load-control requirements have gotten more attention among electrical professionals, new metering rules outlined in Section 130.5 could pose equal challenges for consulting specifying engineers and their clients. Section 130.5(a), which defines metering provisions for new electrical service, is one of two additions to Title 24 that new electrical service installations will need to address.

Under the 2013 standards, newly installed electrical service in nonresidential buildings – including service from the local electric utility and that from other sources, such as photovoltaic systems, but excluding emergency power sources – now, at a minimum, must have permanently installed, user-accessible metering of total electrical service. Additionally, that metering must provide both instantaneous kilowatt-hour (kWh)

demand readings, as well as the ability to supply kWh demand information for a user-resettable period.

While it might seem like a utility meter would suffice for this purpose, most utility meters don't offer the ability to monitor usage for a user-resettable period, and this is a critical element in a code designed to engage building owners and managers in their facilities' energy use. As the saying goes, "what can't be measured can't be managed." User-resettable meters make it easier to run energy studies and enable before/after comparisons of any future efficiency upgrades.

As shown in the table outlining Section 130.5(a) requirements, larger facilities require even more detailed metering under the 2013 revisions. In addition to the base-level functions described above, metering for new electrical services rated more than 250 kilovolt-amperes (kVA) also must provide information on historical peak demand in kilowatts. For services rated over 1000 kVA, metering must include kWh-

TABLE 130.5-A MINIMUM REQUIREMENTS FOR METERING OF ELECTRICAL LOAD

Meter Type	Services rated 50 kVA or less	Services rated more than 50kVA and less than or equal to 250 kVA	Services rated more than 250 kVA and less than or equal to 1000kVA	Services rated more than 1000kVA
Instantaneous (at the time) kW demand	Required	Required	Required	Required
Historical peak demand (kW)	Not required	Not required	Required	Required
Resettable kWh	Required	Required	Required	Required
kWh per rate period	Not required	Not required	Not required	Required

Amperage Translation

Less than or equal to
139A at 208V
60A at 480V

Less than or equal to
694A at 208V
301A at 480V

Less than or equal to
2776A at 208V
1203A at 480V

Greater than
2776A at 208V
1203A at 480V



METERING A BIGGER REQUIREMENT UNDER CALIFORNIA'S UPDATED TITLE 24 (CONT.)

Click below to Get Started

Introduction

[Metering A Bigger Requirement Under California's Updated Title 24](#)

[Submetering is More Important Than Ever in California's Updated Title 24](#)

[Designing Submetering Under Title 24: A Question of Space Versus Cost](#)

[Save More Energy by Turning Off Power Receptacles](#)

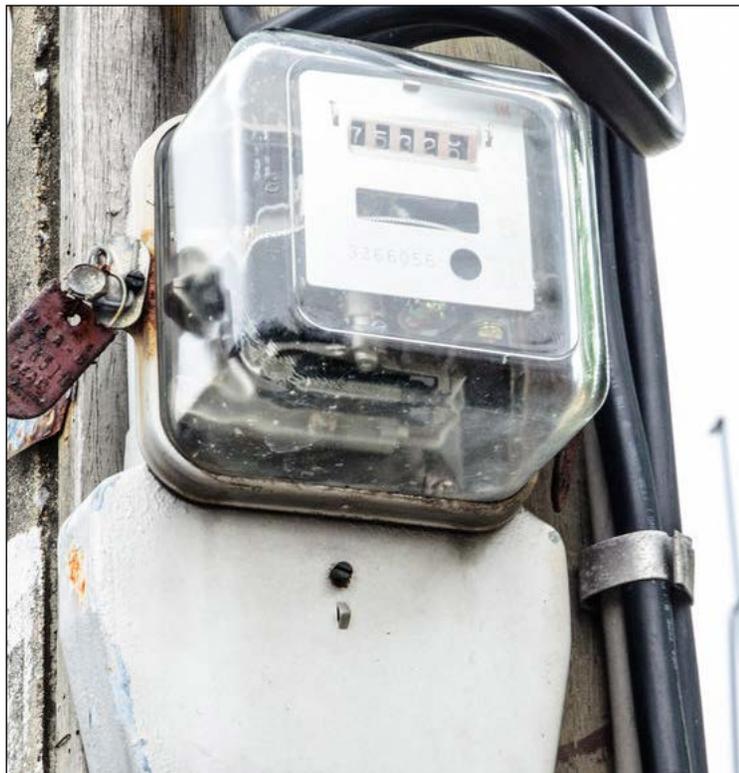
[Top Questions About Title 24 Requirements](#)

[Additional Resources](#)

usage per rate period. Yes, this functionality is redundant to what any basic utility meter would provide, but the regulations require all mandated capabilities be incorporated into a single meter for these largest energy users.

So, how can system designers meet these upgraded requirements? The best approach is always relative to the situation at hand. One approach would be to install a stand-

alone meter adjacent to the panelboard or switchboard at the service entrance. However, with space often limited in cramped electrical rooms, another approach would be to incorporate metering inside the electrical distribution equipment. Schneider Electric offers a range of [energy and power meters](#) that meet or exceed the requirements of Title 24 and many of these meters can be incorporated within the equipment, itself, as a more space-friendly solution.



While it might seem like a utility meter would suffice, they don't offer the ability to monitor usage for a user-resettable period.



SUBMETERING IS MORE IMPORTANT THAN EVER IN CALIFORNIA'S UPDATED TITLE 24

Click below to Get Started

[Introduction](#)

[Metering A Bigger Requirement Under California's Updated Title 24](#)

[Submetering is More Important Than Ever in California's Updated Title 24](#)

[Designing Submetering Under Title 24: A Question of Space Versus Cost](#)

[Save More Energy by Turning Off Power Receptacles](#)

[Top Questions About Title 24 Requirements](#)

[Additional Resources](#)

The [2013 edition of the California Energy Commission's Title 24 energy code](#) incorporates a new emphasis on metering. Section 130.5(a) adds new requirements for whole-building metering. In addition, the code requires planning for more comprehensive metering of how individual systems use energy in its Section 130.5(b).

Under Section 130.5(b), electrical power distribution systems need to be designed to permit the measurement of "disaggregated" loads downstream from the service meter. This means system designs need to enable the ability to measure the use of individual building systems, such as lighting and HVAC loads – or, in multi-tenant buildings, separate areas, such as lobbies and tenant-controlled spaces.

The Section's requirements are complicated. First, system designers need to understand several exemptions. The provisions apply to new services only rated higher than 50 kVA, not additions to existing equipment. And alterations where ALL of the following conditions exist are excluded from compliance:

- The following existing equipment remains in place:
- Service distribution switchboards or panel boards, **AND**
 - Feeders, **AND**
 - Motor control centers or panel boards
 - The existing equipment listed above remains unaltered, except changes to:
 - Load circuit connections, **OR**
 - Quantity of outgoing overcurrent protection devices, **OR**
 - Ampacity of outgoing overcurrent protection devices

Determining what is needed for new installations in which Section 130.5(b) applies requires careful study of the related table,

TABLE 130.5-B MINIMUM REQUIREMENTS FOR SEPARATION OF ELECTRICAL LOAD

Load Type	Services rated 50 kVA or less	Services rated more than 50kVA and less than or equal to 250 kVA	Services rated more than 250 kVA and less than or equal to 1000kVA	Services rated more than 1000kVA
Lighting including exit and egress lighting and exterior lighting	Not required	All lighting in aggregate	All lighting disaggregated by floor, type or area	All lighting disaggregated by floor, type or area
HVAC systems and components including chillers, fans, heaters, furnaces, package units, cooling towers, and circulation pumps associated with HVAC	Not required	All HVAC in aggregate	All HVAC in aggregate and each HVAC load rated at least 50 kVA	All HVAC in aggregate and each HVAC load rated at least 50kVA
Domestic and service water system pumps and related systems and components	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Plug load including appliances rated less than 25 kVA	Not required	All plug load in aggregate Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	All plug load separated by floor, type or area Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	All plug load separated by floor, type or area All groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf
Elevators, escalators, moving walks, and transit systems	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Other individual non-HVAC loads or appliances rated 25kVA or greater	Not required	All	Each	Each
Industrial and commercial load centers 25 kVA or greater including theatrical lighting installations and commercial kitchens	Not required	All	Each	Each
Renewable power source (net or total)	Each group	Each group	Each group	Each group
Loads associated with renewable power source	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Charging stations for electric vehicles	All loads in aggregate	All loads in aggregate	All loads in aggregate	All loads in aggregate

Amperage Translation Less than or equal to 139A at 208V 60A at 480V Less than or equal to 694A at 208V 301A at 480V Less than or equal to 2776A at 208V 1203A at 480V Greater than 2776A at 208V 1203A at 480V

"Minimum Requirements for Separation of Electrical Load." As the table 130.5(b) shows, provisions become more demanding as the size of the electrical service grows.

The section's language doesn't specifically require metering equipment to be installed to measure the separate loads; instead, it says that each electrical system shall be designed to "permit" measurement of these loads. It takes careful reading of 130.5(b) and understanding of the allowed methods therein to understand



SUBMETERING IS MORE IMPORTANT THAN EVER IN CALIFORNIA'S UPDATED TITLE 24 (cont.)

Click below to Get Started

Introduction

Metering A Bigger Requirement Under California's Updated Title 24

Submetering is More Important Than Ever in California's Updated Title 24

Designing Submetering Under Title 24: A Question of Space Versus Cost

Save More Energy by Turning Off Power Receptacles

Top Questions About Title 24 Requirements

Additional Resources

exactly what was intended by the authors when they used the word "permit". Fortunately, there is a companion [Compliance Manual](#) that illustrates this intent.

So, what does "permit" mean? The compliance manual explains, "Above a minimum threshold that varies by load type, electrical power systems must be designed and built such that the TOTAL load of specific building load types can be measured. The intent is to have a single feeder or breaker with each type of load (such as lighting) on it, such that a meter could be placed on the feeder to report energy use by that load type." The manual provides several illustrations to further aid understanding.

To be consistent with the code's intent, then, the designer needs to envision the measurement point to understand the correct application of sub panels. Subpanels need to be of the same type as the feeder or upstream panel. For example, a lighting subpanel can only be fed from another lighting panel or from the lighting feeder circuit. This way all of the lighting panels can be measured in total from one common point.

The compliance manual illustrates a split-bus panel in which the same panel serves different load types. (Example 8-5) In this example, each section is fed separately from the combined feeder such that each split provides a separate point for measuring each type of load. Take care when specifying a split-bus panel for this application. Split-bus is not an industry standard term and the designs of split-bus panels can vary. Some split-bus panel designs may not maintain the required separation of electrical loads by type.

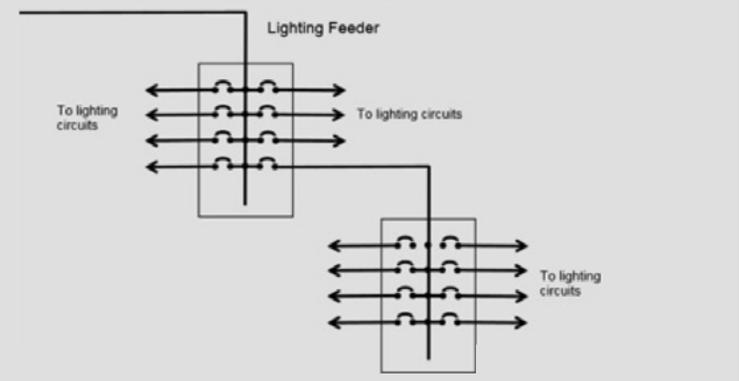
Although a split-bus panelboard may be used to save space, any design seeking to save space by consolidating loads without the use of separately fed splits must incorporate a means of metering the loads per Exception 1: "Buildings for which a complete metering and measurement system is provided." A metering system can take

Example 8-4

Combined lighting panel with subfeed to other lighting panel(s).

A larger first lighting panel (e.g. 400 amps) could subfeed three 100-amp panels, or 6 60-amp panels, and serve local branch circuits, too.

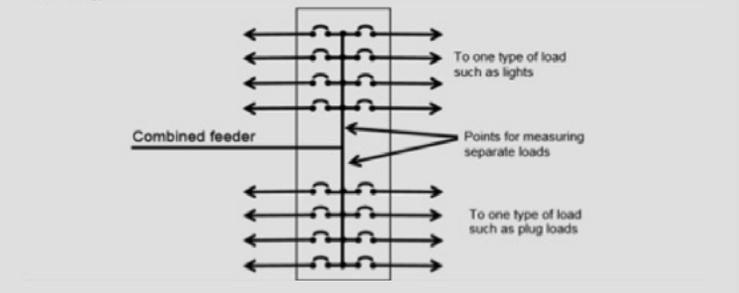
Can be used for lighting, HVAC, plug loads, or any other group of load types.



measurements from individual breakers, then add or subtract to provide the total measurement for a particular load type to meet the code. Although this approach requires the metering system to be permanently installed at time of construction, this alternative frees the designer from the constraints of providing strictly segregated circuits.

Example 8-5

Using a split bus panel to feed two groups of branch circuits. Can be used for lighting, HVAC, plug loads, or any other group of load types. Limited to use in smaller projects where only one panel is needed for each load type.



DESIGNING SUBMETERING UNDER TITLE 24: A QUESTION OF SPACE VERSUS COST

Click below to Get Started

Introduction

Metering A Bigger Requirement Under California's Updated Title 24

Submetering is More Important Than Ever in California's Updated Title 24

Designing Submetering Under Title 24: A Question of Space Versus Cost

Save More Energy by Turning Off Power Receptacles

Top Questions About Title 24 Requirements

Additional Resources

TABLE 130.5-B MINIMUM REQUIREMENTS FOR SEPARATION OF ELECTRICAL LOAD

Load Type	Services rated 50 kVA or less	Services rated more than 50kVA and less than or equal to 250 kVA	Services rated more than 250 kVA and less than or equal to 1000kVA	Services rated more than 1000kVA
Lighting including exit and egress lighting and exterior lighting	Not required	All lighting in aggregate	All lighting disaggregated by floor, type or area	All lighting disaggregated by floor, type or area
HVAC systems and components including chillers, fans, heaters, furnaces, package units, cooling towers, and circulation pumps associated with HVAC	Not required	All HVAC in aggregate	All HVAC in aggregate and each HVAC load rated at least 50 kVA	All HVAC in aggregate and each HVAC load rated at least 50kVA
Domestic and service water system pumps and related systems and components	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Plug load including appliances rated less than 25 kVA	Not required	All plug load in aggregate Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	All plug load separated by floor, type or area Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	All plug load separated by floor, type or area All groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf
Elevators, escalators, moving walks, and transit systems	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Other individual non-HVAC loads or appliances rated 25kVA or greater	Not required	All	Each	Each
Industrial and commercial load centers 25 kVA or greater including theatrical lighting installations and commercial kitchens	Not required	All	Each	Each
Renewable power source (net or total)	Each group	Each group	Each group	Each group
Loads associated with renewable power source	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Charging stations for electric vehicles	All loads in aggregate	All loads in aggregate	All loads in aggregate	All loads in aggregate

Amperage Translation

Less than or equal to 139A at 208V
60A at 480V

Less than or equal to 694A at 208V
301A at 480V

Less than or equal to 2776A at 208V
1203A at 480V

Greater than 2776A at 208V
1203A at 480V

The recently updated Section 130.5(b) of the California Energy Commission's Title 24 efficiency standard adds new requirements to designs for new electrical services rated over 50 kVA. Understanding that "what can't be measured can't be managed" these requirements intend to provide greater visibility to energy usage within a facility.

"Disaggregation of electrical circuits" is intended to make it relatively easy to measure energy consumed by lighting, HVAC-related motors and elevator systems – and, in multitenant settings, by building area, such as lobbies and tenant-controlled spaces.

At a minimum, the design of the electrical system must allow measurement of loads by specific types and these requirements increase as the size of the service increases. Specific load/building-area types that must be addressed are outlined in table 130.5(b).

This is only a wiring requirement in the 2013 version of Title 24, and providing meters is optional. Best explained in the Title 24 Compliance Manual, "The intent is to have a single feeder or breaker with each type of load (such as lighting) on it, such that a meter could be placed on the feeder to report energy use by that load type." This arrangement of circuits provides for future submetering, even if that's not part of the owners current plans.

To help illustrate the allowed wiring, the Compliance Manual says this: "This section of the Standard requires buildings to be wired in a manner that separates loads by types into independent feeders and risers through the building." It is clear that the intent of the allowed wiring is to separate the circuit types after the service meter to allow simple measurement. The code describes distribution methods allowed to accomplish this that can be scalable to buildings of larger size:



DESIGNING SUBMETERING UNDER TITLE 24: A QUESTION OF SPACE VERSUS COST (cont.)

Click below to Get Started

[Introduction](#)

[Metering A Bigger Requirement Under California's Updated Title 24](#)

[Submetering is More Important Than Ever in California's Updated Title 24](#)

[Designing Submetering Under Title 24: A Question of Space Versus Cost](#)

[Save More Energy by Turning Off Power Receptacles](#)

[Top Questions About Title 24 Requirements](#)

[Additional Resources](#)

Provide “separate switchboards, motor control centers, or panelboards to which are connected only the required load or group of loads.” The physical layout should ensure adequate space inside or adjacent to each panelboard for the future addition of individual meters.

For additional loads of a particular type, it further allows “SUBPANELS OF THE ABOVE to which are connected ONLY the required load or group of loads AND for which the subpanel load can be INDEPENDENTLY measured in aggregate.”

Exception to the distribution system design requirement of Section 130.5(b)

There is one exception to strictly segregating circuits to allow measurement at a single point. This is if “a complete metering and measurement system IS PROVIDED that at a minimum measures and reports the loads called for in Table 130.5(b).” This type of system can calculate the total energy use of a particular load type from multiple measurement points, using additive or subtractive methods. Under this plan, the panelboards must incorporate permanent branch-circuit current transformers that communicate to permanent metering and measuring systems provided at time of construction.

Although metering equipment has a cost, an advantage of this approach is that it allows load types to be consolidated and mixed within a smaller number of panelboards. Such systems can save additional space if contained within the panelboard. Jobsite conditions can favor this approach.

Essentially, the decision boils down to an evaluation of available space versus a project's budget. Disaggregated, multi-panel designs mean more electrical equipment,

which also means more space dedicated to non-revenue infrastructure. The consolidated design requires fewer panels, but those panels become more expensive due to the required addition of current transformers at each circuit and the associated metering devices. However, it makes it much more likely that the building owner will actually get the information they need to help cut energy use and lower the monthly utility bill.

Many consulting engineers can have an “a-ha moment” when they tally up the cost of a mixed-load design. If the end user attaches a premium to space savings – or has a true interest in using the metering data – projects can justify the upfront cost of mixed-load panels with permanent metering included. This becomes especially true in larger jobs requiring 10 or more mixed-load panels, where economies of scale and other savings can help the approach make economic sense.



The design of the electrical system must allow measurement of loads by specific types and these requirements increase as the size of the service increases



SAVE MORE ENERGY BY TURNING OFF POWER RECEPTACLES

Click below to Get Started

Introduction

Metering A Bigger Requirement Under California's Updated Title 24

Submetering is More Important Than Ever in California's Updated Title 24

Designing Submetering Under Title 24: A Question of Space Versus Cost

Save More Energy by Turning Off Power Receptacles

Top Questions About Title 24 Requirements

Additional Resources

Did you know that next to lighting, plug load equipment is the highest consumer of electrical power in a building? And plug load consumption continues to grow as more electronic devices are added every year. This increase in consumption runs contrary to energy saving goals. While the efficiency of electronic devices continues to improve, efficiency alone can't stop the trend. That's why energy codes, including the [California Energy Commission's](#) Title 24, Section 130.5 (d), includes a requirement for receptacle control.

But how does receptacle control help save energy? The highest efficiency electronic equipment still consumes power, even when "hibernating." By disconnecting the power at the receptacle, the consumption goes to zero. Devices like computer monitors, desk lamps, printers, microwave ovens and chilled drinking fountains can all be turned off when the building is unoccupied to save



Many academic and government studies prove receptacle control saves energy with a positive ROI.

a significant amount of energy without any disruption to the occupants.

What does the code say?

Many academic and government studies prove receptacle control saves energy with a positive ROI. That's why the 2013 edition of Title 24 requires controlled receptacles in private offices, open office areas, reception lobbies, conference rooms, kitchenettes, and copy rooms. For each uncontrolled receptacle, a controlled receptacle must be provided within 6 feet. This convenient mix of controlled and uncontrolled receptacles allows an intelligent choice of which equipment to control.

Many buildings are built with flexible open space. The code is written to ensure that receptacle control is in place for these areas. One way to comply is to have workstations with built-in receptacle controls installed and operating at the time of final permit. But if compliant workstations are not installed, built-in, hardwired power controls must be provided in the building infrastructure. Controllable, plug-in power strips are not allowed in any location since they can be easily removed.

What determines when it's time to turn off receptacles?

Receptacle control requires a control signal. The control signal can be from an occupancy sensor, a time clock or a signal from another system, such as a building management or security system. The signal indicates when an area is typically or actually unoccupied.

An occupancy sensor makes sense for small areas, such as private offices. A single occupancy sensor can provide sufficient coverage and control a small number of receptacles.

Time control is a more reliable choice for larger areas, because occupancy sensors requiring line-of-sight view are affected



SAVE MORE ENERGY BY TURNING OFF POWER RECEPTACLES (cont.)

Click below to Get Started

Introduction

Metering A Bigger Requirement Under California's Updated Title 24

Submetering is More Important Than Ever in California's Updated Title 24

Designing Submetering Under Title 24: A Question of Space Versus Cost

Save More Energy by Turning Off Power Receptacles

Top Questions About Title 24 Requirements

Additional Resources

by unknown variables such as the placement of partitions, file cabinets or other objects. Some devices, such as drinking fountains and network printers, are not practical to control with an occupancy sensor. For this reason, time control is the more universal control method.

“A convenient mix of controlled and uncontrolled receptacles allows an intelligent choice of which equipment to control.”

Which control method makes the most sense for my project?

A time schedule defines non-business hours when receptacles may be shut off. But an occupancy sensor can further determine when it may be appropriate to shut off receptacles during business hours, like when people are away from their desks. Occupancy sensors save additional energy by turning off receptacles during these unpredictable intervals.

There are many different design approaches using time control, occupancy sensor control, or a combination of both. All have different costs and provide different levels of energy savings. The 2012 Summer Study on Energy Efficiency in Buildings, by the American Council for an Energy-Efficient Economy evaluated scenarios ranging from 100% time control to 100% occupancy sensor control (You can find the report, “Integrated Lighting and Plug Load Controls,” in Section Three of the proceeding’s [table of contents](#). Although occupancy-

sensor control captures additional energy savings, the study found that the cost per square foot could be double the cost of implementing a time control solution. Unfortunately, the incremental energy savings from using an occupancy sensor are not enough to offset the additional expense, resulting in longer payback times. While occupancy sensors control a single area, time controls have multiple channels to leverage the cost over many areas. All considered, it turns out that the most practical and cost effective approach is to employ a mix of control methods, with occupancy sensors deployed in small areas and time control in large areas.

What power switching solution makes the most sense?

Occupancy sensors typically use an auxiliary relay pack installed in the ceiling near the sensor. A switch leg from the receptacle circuit is routed up to the relay pack. Although simple, this solution requires additional conduit, a junction box, more wiring, and labor standing on a ladder.

A more convenient option is a relay panel installed in the electrical closet. Circuits originating in the breaker panel route through the relay panel on their way to the receptacles. Although installing this option has a cost, it is typically lower than the installed cost of many individual, distributed relay packs. A built-in, multi-channel time controller can be less expensive than the installed cost of many sensors.

A third option eliminates the relay panel by providing switching in the form of a controllable circuit breaker. This option allows the electrical contractor to route wires directly from the distribution panel to the controlled receptacles, same as the uncontrolled receptacles. This option has the lowest cost of installation since a circuit breaker panel is required anyway. And, best of all, controllable breaker panels don't require extra space in cramped electrical closets.



TOP QUESTIONS ABOUT TITLE 24 REQUIREMENTS

Click below to Get Started

[Introduction](#)

[Metering A Bigger Requirement Under California's Updated Title 24](#)

[Submetering is More Important Than Ever in California's Updated Title 24](#)

[Designing Submetering Under Title 24: A Question of Space Versus Cost](#)

[Save More Energy by Turning Off Power Receptacles](#)

[Top Questions About Title 24 Requirements](#)

[Additional Resources](#)

This eGuide provided an overview of the implications of the California Energy Commission's Title 24 energy efficiency code updates. To further understand how it will impact your future designs, below are top questions asked.

1. Q: How does automatic receptacle control work and how much can it reduce consumption?

A: A switching device is connected in series with a group of receptacles. This device is controlled to turn off the receptacles when the area is typically unoccupied. The control can come from a sensor, time clock, or signal from another system. Plug loads account for anywhere between 8 and 35% of the total building electricity consumption. At least 1/2 of the receptacles are controlled. Independent studies prove the energy savings outweigh the cost of the equipment.

2. Q: Have any POCOs offered utility meters that meet the requirements of 130.5(a), without need for adding an 'owner meter'?

A: From the 2013 Non-Residential Compliance Manual: "Modern "smart" utility meters generally have all of the required features of this mandatory requirement, and more. The question is whether the building owner can access the information. The utility company owns the meter and there is no clear requirement for them to offer access to the data. If data access is provided, the mandatory requirement is met with the utility meter."

3. Q: Do photovoltaic meters need to be grouped together in the same location? Can they be in different locations?

A: At a minimum, metering is required for each group of renewable power sources. If multiple meters are used to measure multiple photovoltaic sources, there is no

requirement in 130.5 that says that they need to be in the same physical location. The measurements of the individual meters would be added to provide the total for that group.

4. Q: In a campus environment - is the meter required per 130.5(a) required at each building, or the 'service'? The verbiage in the Standards does not use the word "building".

A: From the 2013 Non-Residential Compliance Manual: "The word service originates in Article 110 of Title 24 Part 3, the California Electrical Code. The Code intends that the service is where electric power enters a building or other structure. "

5. Q: Does the 130.5(b) deal with commercial, industrial or government facilities?

A: The provisions apply to all buildings including those constructed by a government agency as well as classification "F" for factory/industrial. Please see section 100.0 - Scope for details.

6. Q: Will Schneider Electric's product #MVP-R sufficiently conform to the requirements of disaggregation?

A: Yes, a full installed MVP system will meet the requirements for disaggregated measurement.

7. Q: Is the IECC headed toward these requirements? If yes, when might it begin?

A: All energy codes are headed in the same general direction. ASHRAE Standard 90.1 is adopted by reference in the IECC and that path to compliance currently exists to all users of the IECC. Currently there is a proposal for IECC 2015 to replace all of the commercial provisions with a reference to ASHRAE 90.1 to eliminate duplicate efforts.



TOP QUESTIONS ABOUT TITLE 24 REQUIREMENTS (cont.)

Click below to Get Started

Introduction

Metering A Bigger Requirement Under California's Updated Title 24

Submetering is More Important Than Ever in California's Updated Title 24

Designing Submetering Under Title 24: A Question of Space Versus Cost

Save More Energy by Turning Off Power Receptacles

Top Questions About Title 24 Requirements

Additional Resources

8. Q: Are there exceptions for industrial type facilities (e.g. water and wastewater)?

A: Industrial facilities are not exempt.

9. Q: Who enforces Title 24, what are the penalties?

A: Local enforcement agencies or their representatives must inspect all new buildings and systems to ensure conformance with applicable codes and standards. Enforcement agencies are required to withhold issuance of a final Certificate of Occupancy until all compliance documentation is submitted, certifying that the specified systems and equipment conform to the requirements of the standards.

10. Q: For mixed-use buildings that may have residential floors and commercial floors, would the building classify as non-residential or would code be relegated to separate floors?

A: From Title 24, Part 6 Section 100.0 (f) "When a building is designed and constructed for more than one type of occupancy (residential and nonresidential), the space for each occupancy shall meet the provisions of Part 6 applicable to that occupancy."

ADDITIONAL RESOURCES

From products to online resources to webinars, below are additional resources to support meeting Title 24 updates.

- **MultiFunction Power Meters:**

<http://www.schneider-electric.us/en/product-subcategory/52530-multifunction-power-meters/>

- **Consulting Engineer Portal:**

<http://partners.schneider-electric.us/en/consulting-engineers/>

- Instant access to advice, resources and support for all your projects.
- Site registration required.

- **Powerlink Lighting Control Solutions:**

http://download.schneider-electric.com/files?pFile_Id=778582091&p_File_Name=Powerlink-Lighting-Controls-Solutions.pdf

- **"Title 24 and Energy Codes" On-Demand Webinar:**

<https://partner.schneider-electric.com/partners/Menu/login>

- Site registration required.
- Once in the site, click top "Training" tab, type in "Title 24", then select the video on-demand link.
- Earn continuing education credit.



Life Is On

Schneider
Electric