

TMH's Interpretation of City of Colton Electric Code:

It is TMH's understanding that the City of Colton adopts the 2022 California Electric Code (CEC) which is formed on the basis of the 2020 National Electric Code (NEC). The 2022 CEC includes section 625.42 as written in the 2020 NEC which describes load management capabilities: *"Where an automatic load management system is used, the maximum equipment load on a service and feeder shall be the maximum load permitted by the automatic load management system"*.

We have reviewed the adjustments that the City of Colton Electric Code has made to the 2022 CEC and have not identified a change declining to adopt this language. If there is a change that we are not aware of or a misinterpretation on our part, we would appreciate your help in understanding.

Operational Parameters and Safety Constraints for CJUSD:

For CJUSD's project, the Automatic Load Management System (ALMS) ChargePilot will control all chargers connected to Panel "EV" and Panel "EVDC" such that the combined demand load of the fourteen (14) chargers in addition to the non-charger load on the main switchboard "MSB" does not exceed 340kW (500kVA x 80% x 0.85PF).

ChargePilot will be connected to a meter (placed on the load side of the main breaker) that will read all uncontrolled loads on the main switchboard "MSB" to establish available feeder capacity that can be allocated for charging loads.

At the subpanel level, ChargePilot will similarly be utilized as an ALMS to ensure that combined demand load of the eleven (11) DC chargers connected to subpanel "EVDC" does not exceed 480A (80% of the 600A subpanel limit).

ChargePilot's Automated Load Management Capabilities:

ChargePilot is an automatic load management system (ALMS), also sometimes called an automated load control management system (LCMS). With ChargePilot, fleet managers can centrally monitor and manage all chargers dynamically to reduce overall power demand, manage loads, and keep track of fleet's energy consumption while charging. ChargePilot optimizes the use of available power on at fleet charging site and ensures the optimal use of existing and new charging infrastructure. The ALMS can control the output of the electric vehicle chargers such that a specific site or a user-defined maximum load on a service or feeder is not exceeded.

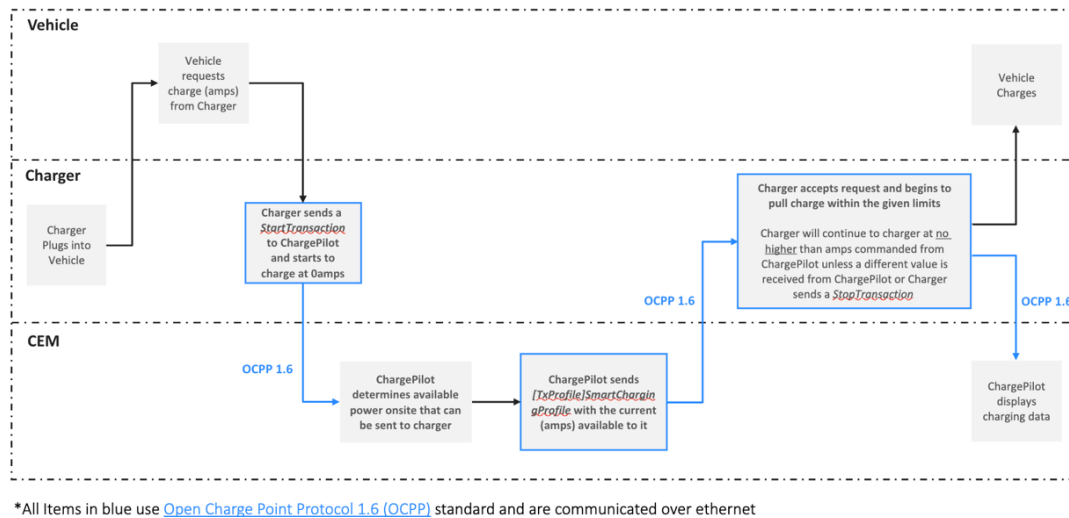
In the California Electrical Code ("CEC"), which describes requirements for site-level wiring and electrical installations, electric vehicles are considered "continuous loads", meaning they are assumed to charge at their full capacity for at least three hours in a row on a regular basis. To serve a continuous load, CEC requires that infrastructure and over-current protections be designed according to the infrastructure's rating. Many devices are commonly rated to 80%, meaning that site infrastructure must be sized to 125% of the load's nameplate capacity. In 2014, the National Fire Protection Association (who publishes the NEC which forms the basis of the CEC) addressed this limiting requirement by including in Section 625.42 a specific provision for electric vehicle load, allowing the maximum load to be based not on nameplate, but rather on the maximum load allowed by an ALMS, called an EMS set point. The effect of this change, which has been refined and further specified in later editions of the NEC/CEC, allows for more EVSEs and EVs on a site than would be previously allowed as long as there is a system guaranteeing the EVs will never exceed the EMS set point limit.

In addition, the California Green Building Standards Code (Title 24, Part 11, Section 5.106.5.3.3) permits electrical load capacity to be automatically reduced for EVSE controlled by an ALMS.

ChargePilot includes an industrial computer that is installed at the fleet charging site (TMH controller), which communicates with each charger via [Open ChargePoint Protocol \(OCPP\)](#) using an Ethernet connection. This communication includes initiating charging events and defining the maximum amount of current each charger has available to output. ChargePilot receives measurements relating to the site's overall electricity consumption from a locally installed energy meter at intervals of a few seconds. If additional loads or generators are connected to the individual sub-distribution units in addition to charging stations, electricity meters are installed for each sub-distribution unit to communicate the site's load to the TMH Controller in real time via

Modbus TCP or RTU. Considering various meter values, ChargePilot adjusts the power distribution dynamically, achieving the greatest possible potential for charging. The total power available for the charging infrastructure is then distributed dynamically, considering the other consumers at the site in accordance with the phase load. This makes it possible to make optimal use of the available grid power.

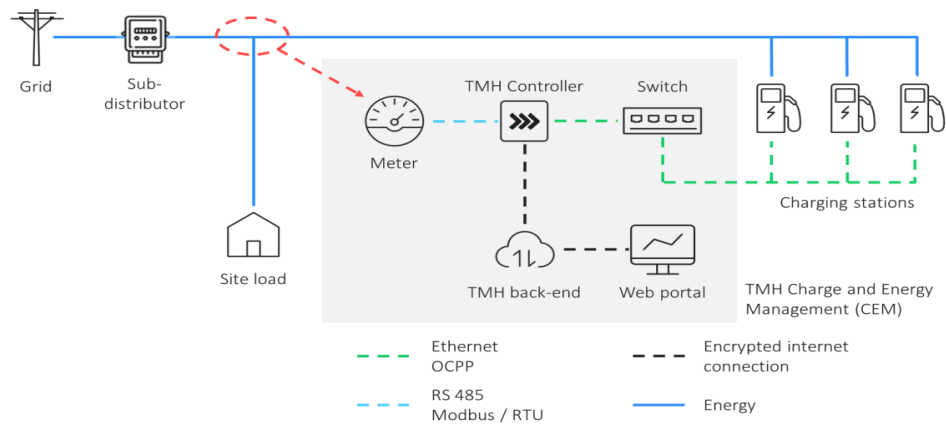
The TMH Controller (Kunbus RevPi Connect S 8GB) continuously calculates (using The Mobility House's proprietary algorithm) the available power for each charger considering the total available load on a given site at the time and sends a control command with the associated available power or current to the individual chargers. The chargers will not output any current until a command to do so is received from ChargePilot. The communication process between ChargePilot, charger, and vehicle is shown in the diagram below. If the TMH Controller loses its internet connection, charging processes that are currently in progress are not interrupted and the optimization of the power distribution continues as usual. Data exchange with the backend is not possible, and the charging infrastructure cannot be monitored or controlled remotely via ChargePilot.



To ensure the highest level of reliability, the ChargePilot system architecture applies both local (TMH Controller) and cloud intelligence (TMH backend). In case the internet connection is interrupted, charging processes are not visible in live view on the Web Portal, but the actual charging processes on site are not affected because all optimization calculations are run on the local TMH Controller.

If a charging station loses the OCPP connection with the ChargePilot Controller, the system seamlessly switches to fallback mode, ensuring the charging power of the affected station is maintained at a safe limit. The Mobility House can set the fallback values, which then applies for all phases. This value is subtracted from the available charging power at the over current protection device (OCPD) and panel limits to which the charging station is connected and at the upstream fuses. For charging stations with two dispensers, the fallback value can either be shared between the two dispensers equally or be allocated to a primary connection depending on the charging station manufacture.

The following schematic shows the general configuration on site.



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