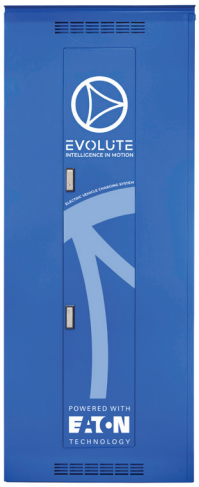
EVOLUTE

INTELLIGENCE IN MOTION

Power Up Your Parking

MURBS ▷ OFFICE TOWERS ▷ HOTELS ▷ FLEETS



The **EVOLUTE**® Electric Vehicle Energy Management System (EVEMS) is an intelligent multi-port charging system for MURBS, office towers, hotels and fleets. The Evolute addresses the challenges of limited power, remote access, billing, and consumer choice. The interactive app allows users to control and monitor usage, view historical data, and schedule their charging sessions. With our cloud-based dashboard, administrators can easily manage multiple accounts and monitor usage of all panels and end users on their network. The system automatically produces various reports for different metrics and time periods. Evolute's charging station compatibility offers total freedom of choice as the solution is station agnostic. The system is highly customizable and can be white-labelled with customer branding.

Evolute's sophisticated algorithm can be pre-set or adjusted to meet a variety of load-sharing ratios and minimum standards. Multipliers such as 2X, 3X, 4X or greater, can be applied to optimize the delivery of available power, ensuring that it is distributed equally to all users over time. The system is scalable, each panel is independent, with the ability to add additional panels as needed to accommodate future expansion and increased adoption rates.

The Evolute is designed, developed, and manufactured in North America using cutting-edge innovation and technology. **Intelligence In Motion, Powered with Eaton Technology.**

KEY FEATURES

CUSTOMIZABLE HARDWARE

Customizable for various locations and installation challenges. The Evolute can be installed with any electrical distribution system and can also be customized to fit different form factors and cabinets if required.

LOCAL LOAD MANAGEMENT

The Evolute's load management is hosted locally on the Evolute's PLC. Local load management ensures efficient distribution of power during normal operation and periods of internet outage or network disconnection.

LOW COST DEVICES

Evolute uses circuit level management to control devices, which means it is EVSE agnostic, users can install any level II station, NEMA receptacle or junction box. By installing low cost devices, which take the brunt of wear and tear, upgrades are less intrusive.

CUSTOM CONTROL & SOFTWARE

Administrators can take control of the Evolute system, or alternatively all aspects of the system will be monitored and managed by Evolute Inc. Software can be customized and white labeled to meet customer needs.

NOT WI-FI RELIANT

No Wi-Fi needed as the Evolute is connected to the internet using ethernet via LAN or LTE. The system will not be vulnerable to unreliable Wi-Fi connections or systems, nor will it require expensive Wi-Fi infrastructure which may be challenging and costly to implement.

MONITORING + BILLING

The automated billing platform is seamless and easy to set up. The Evolute is flexible and can charge owners based on time-of-use or flat rates, depending on the building's preferences. The system can also integrate with 3rd party billing providers.

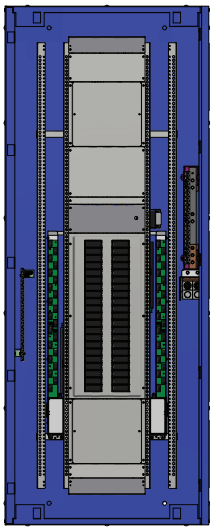
SMART MULTI-METERING

Built-in individual smart meters track the usage of each end-users consumption as well as the entire system. The data is stored in a secure Canadian and/or US based cloud servers. All relevant data is accessible to admins and end-users.

RELIABLE & REMOTE

Unlike much of the hardware other systems are built on, the Evolute is constructed using tried and true industry standard parts including PLCs, revenue grade metering, and control systems. We also guarantee remote lifetime software updates to load management code.

EVOLUTE INTELLIGENT SOFTWARE



Evolute's load management algorithm is the primary focus of the panel's functionality. The panel will cycle through users over a predefined cycling time, permitting a limited number of vehicles to charge at any given time. However, all actively charging vehicles will not be throttled to a lower current limit, and will instead allow for maximum current flow in exchange for fewer active loads. The number of vehicles permitted to charge is based on a preset upper current limit for each phase of the panel, where this threshold will not be exceeded.

Each Evolute has a certain amount of power allocated to it for EV charging, typically this power is enough to allow half, a third or a quarter of the total connected cars to charge simultaneously based on system design. When the upper power limit is reached, the next car that comes to charge will be placed in a queue, and 2 parameters must be met before that car will start charging; 1) Is the car requesting power? 2) Have connected cars achieved a pre-established initial block of energy? If the answer is Yes to both, the car that started charging first, in relation to all other cars, will be removed from the power, allowing the new car to start charging. The new car will have an opportunity to achieve its block of energy before it is removed. The car that was removed now enters its queue for sharing. Cars will be rotated around in this way throughout their charge cycle. Cars will remain connected and charging if the upper limit of each panel is not reached and will only drop off when the battery is full, or the owner disconnects their cars.

PROGRAMMABLE LOGIC CONTROLLER

The PLC controls all aspects of the panel's automated and override functionalities. It is connected via modbus to the meter to receive data about power usage throughout the panel. It then uses this information for managing which breakers are enabled or disabled at a given time, while gradually cycling through users based on the implemented load management algorithm and existing user configurations. The PLC also receives commands from the front-end app or dashboard allowing loads to be remotely controlled and monitored.

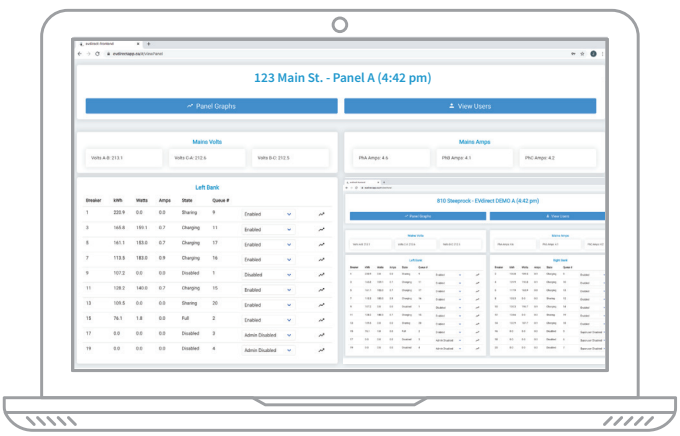
GATEWAY

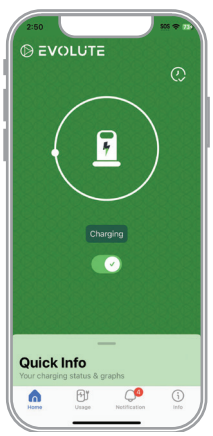
The Gateway is a separate device, isolated from the main Evolute panel, and connected via another ethernet connection. It serves as the primary link between the PLC and the Evolute cloud server. This server connection allows data from the panel to be stored in the cloud and accessed remotely by users. The gateway also has local storage to prevent data loss during internet or power outages.

SOFT BREAKER IMPLEMENTATION

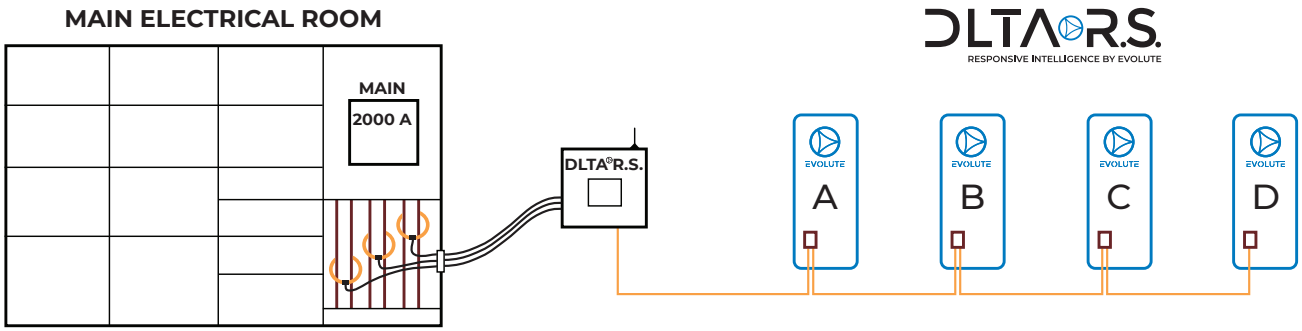
To avoid over current scenarios and tripping the physical thermal breaker, software-based breakers have been implemented to control automatic disabling of the remote-controlled breakers. This mitigates the need for physical intervention to reset tripped breakers by avoiding it completely. The system will recognize these hazard scenarios and respond within seconds. The system will automatically notify the Evolute support team anytime an alarm state is triggered. Once he issue is resolved, the circuit is enabled remotely.

APPLICATION VISUALIZATIONS





DYNAMIC LOAD THROTTLING ARCHITECTURE® RESPONSE SYSTEM



HOW DOES IT WORK

Dynamic Load Throttling Architecture Response System (DLTA®R.S.) allows more charging stations to be installed than the peak capacity of the building can handle. DLTA®R.S. monitors the main electrical service of the building and dynamically throttles down/up the Evolute's upper power limit during peak circumstances. All Evolute panels are networked together with Cat5 wiring, they communicate with each other, and throttle limits based on live active users. Once power in the building goes below the preset values, all Evolute panels will return to their default programmed state.

FUNCTIONALITY

A single main panel will communicate with any number of auxiliary panels to control their load shedding thresholds. Each panel, including the main panel, can still operate individually and separately from DLTA®R.S. if desired. Additionally, panels do not need to be the same size or capacity, as the system will dynamically adjust load shedding limits based on each panel's preset configuration.

THE ALGORITHM

The dynamic load management algorithm is based on the defined amps limit of the building. A soft current limit for the entire DLTA®R.S. system is then set at 80% of the building limit. Furthermore, the load shedding limit for each individual panel will begin to lower exponentially after monitored building current is seen exceeding 85%** of the soft limit (**percentage subject to change based on system design). Finally, the logic will dynamically adjust individual upper load limits based on each panel's load capacity and active users.

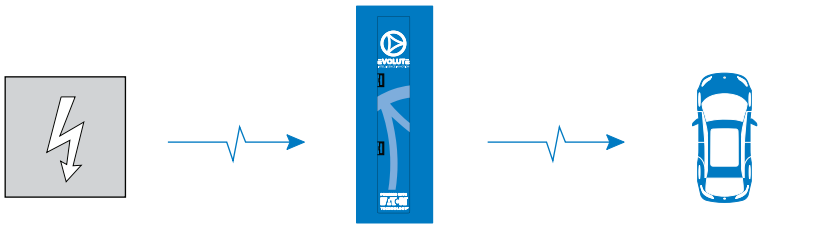
FRONTEND CONTROL

DLTA®R.S. can be activated and controlled from the Evolute web-app. Here, the max amps that a building is rated for can be set for determining the dynamic load shedding thresholds mentioned previously. Toggles for turning on and off the system for all or individual panels can also be switched to tailor the system for each building implementation.

WHEN TO IMPLEMENT THE DLTA®R.S. SYSTEM

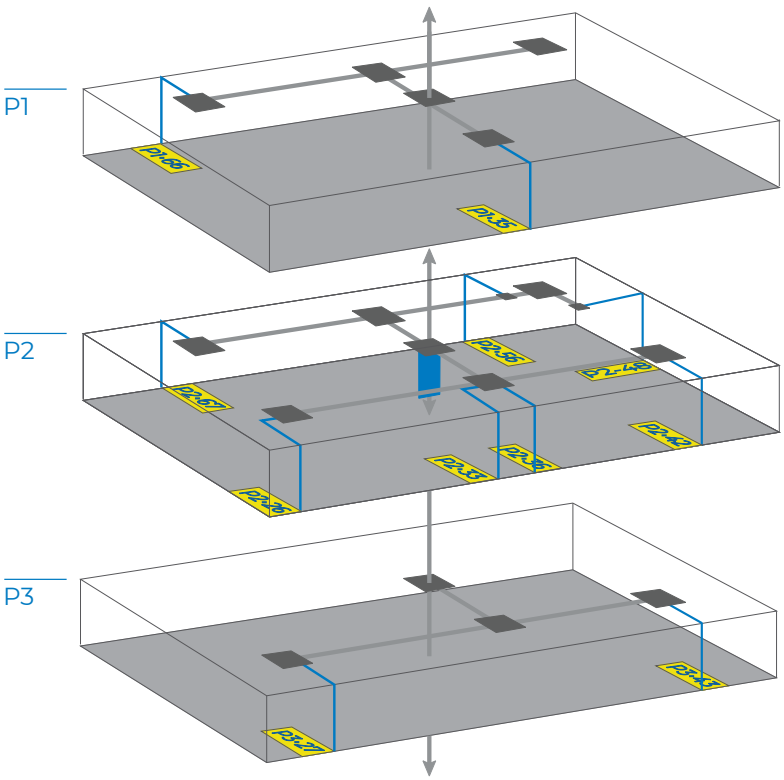
The DLTA®R.S. system can be installed at the same time as the Evolute panel installation or later as a retrofit. Hardware and software components can be added at any time. The same applies for the interconnected wiring, it can be added at any point that makes sense for both existing and new construction applications. DLTA®R.S. should be implemented when there is a concern that the existing power within a building will not be sufficient for demand based on peak values.

HOW IT WORKS



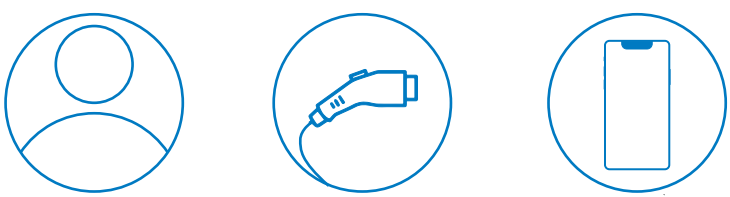
SYSTEM FLOW

The **EVOLUTE™** is connected to the existing electrical equipment in the building. The system components can be installed in an unused space in the garage, storage room or anywhere feasible. We recommend installing the system in close proximity to the parking stalls.



IMPLEMENTATION

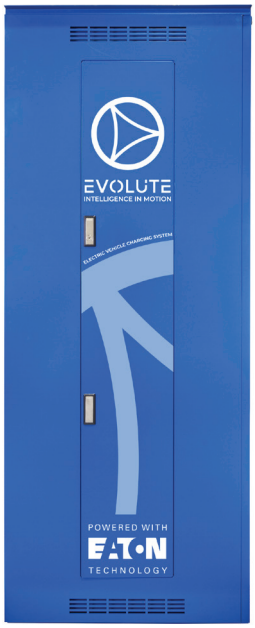
- Site visit and audit of electrical systems is arranged
- Proposal, load assessment, drawings and an estimate are given to the board or management
- Board meetings, Zoom meetings, and owner's meetings are scheduled
- Owner's survey is sent out to determine interest and adoption
- Interested end users provide parking spaces and specifics for a "Last Mile" estimate
- Management confirms all owners participating in initial bulk install
- Project management, material and labour are coordinated and implemented
- System is energized, commissioned and inspected by the local electrical authority



END USER ACCESS

- On-boarding email received
- Account/passcode created
- Fees paid
- Station energized
- Charging begins

EVOLUTE PRODUCTS



EVO-400 - 20 Level 2 Station Capacity

400A, 42cct, 208Y/120V 3Ph 4W, 72”H x 28”W x 5.75”D, Main Lugs - Bottom Cable Entry

EVO-600 - 32 Level 2 Station Capacity

600A, 72cct, 208Y/120V 3Ph 4W, 90”H x 28”W x 5.75”D, Main Lugs - Bottom Cable Entry

EVO-1200 - 40 Level 2 Station Capacity

1200A, 80cct, 208Y/120V 3Ph 4W, 90”H x 38”W x 15”D, Main Lugs - Bottom Cable Entry

HARDWARE

- Main Lugs
- Multi-Metering Module
- Breaker Control Bus
- Smart Controllable Breakers
- Fixed CT Rails
- Ethernet Gateway
- cUL/CSA
- Expandable via Auxiliary Panels

SOFTWARE

- Admin Dashboard
- Driver App
- Software Options
- Custom Panel Upper Limits
- Custom Power Ratios
- AI Learning Options

DLTA®R.S.

Fully integrated system for multiple Evolute panels

- Acuvim II Meter in 8x8 PVC J-box
- 3 x Rogowski Coils rated up to 5000A
- 8 x Integrated Network Switchs
- Software and Commissioning

DLTA*Lite*

Independent system for monitoring and reporting of kW/kVA demand usage in the bulk, common or shared facilities. Useful in situations where demand is not known or data is unavailable. Can be field modified to fully functional DLTA®R.S.

CONTACT US TODAY

647.577.7100 | 1.855.EVOLUTE | info@evolutepower.com
evolutepower.com | evolute.ca

EVOLUTE
INTELLIGENCE IN MOTION

POWERED WITH
EATON
TECHNOLOGY™