

Dynamic strategy for EV Chargers

How the strategy sets the minimum charging current, starts offline EV chargers and shares power between running chargers.

🔌 EV chargers ⚙️ Strategy → Advanced settings

AT A GLANCE

Preferred minimum setpoint	9 A
Standard minimum current	6 A
Setpoint cycles between offline chargers	every 10–15 s
Preferred power distribution	Equal power

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1 Minimum EV charger current

STANDARD MINIMUM
6 A

CARS MAY CHARGE
LOWER BY
0–25 %

EXAMPLE AT THE 6 A
LIMIT
4.5 A

PREFERRED MINIMUM
SETPOINT
9 A

6 A is the standard minimum current for EV chargers, but some cars will not charge at the 6 A setpoint. One possible explanation for this is that there is always some current drop when charging. Some cars will always charge 0–25% lower than the EV limit. At the 6 A limit, this can be 4.5 A and can be the reason why the car cannot start charging.



Recommendation

Under our observation 9 A is the preferred minimum setpoint for EV chargers.

2 Current overshoot when starting offline EV chargers

There is a new setting under **strategy → advanced settings**: “Allow short current/power draw over the limit when starting new devices”.

A) Reserve current

SETTING OFF

Reserves the current needed to start 1 more EV charger, if possible, and cycles the reservation between chargers.

B) Start over the limit

SETTING ON

Never reserves current. Starts a new charger over the current limit when running chargers can be fine-tuned without turning them off.

A) OFF

The strategy will reserve the needed current to start 1 more EV charger if possible. It will cycle reservation between chargers until one of them start to charge. Reservation will only be active if we have enough flexibility in fine-tuning the setpoint for running EV chargers without turning them off.

Example 1

Limit **29 A** Minimum setpoint for EV **9 A**

CHARGER	STATE	SETPOINT / CURRENT
EV 1	Charging	10 A
EV 2	Charging	10 A
EV 3	Offline	9 A setpoint
EV 4	Offline	0 A setpoint

RESULT

In 10–15 seconds, EV 4 will receive a 9 A setpoint and EV 3 will be set to 0 A. Reservation is cycled between offline chargers.

Example 2

Limit **24 A** Minimum setpoint for EV **9 A**

CHARGER	STATE	SETPOINT / CURRENT
EV 1	Charging	12 A
EV 2	Charging	12 A
EV 3	Offline	0 A setpoint
EV 4	Offline	0 A setpoint

RESULT There is no available current to enable EV 3 or EV 4 ($9+9+9=27 > 24$ A limit). The strategy will increase the limit on EV 1 and EV 2.

B) ON

The strategy will never reserve any current to start more EV chargers. It will start a new charger over the current limit if there is enough flexibility in fine-tuning the setpoint for running EV chargers without turning them off. When overshoot over the current limit is expected, the strategy will try to start one EV charger at a time by cycling the setpoint.

Example 1

Limit **28 A** Minimum setpoint for EV **9 A**

CHARGER	STATE	SETPOINT / CURRENT
EV 1	Charging	14 A
EV 2	Charging	14 A
EV 3	Offline	9 A setpoint
EV 4	Offline	0 A setpoint

RESULT The strategy is trying to start up EV 3, because it has 10 A of available current from EV 1 and EV 2 without turning them off. In 10–15 seconds, EV 4 will receive a 9 A setpoint and EV 3 will be set to 0 A. The setpoint is cycled between offline chargers.

Example 2

Limit **26 A** Minimum setpoint for EV **9 A**

CHARGER	STATE	SETPOINT / CURRENT
EV 1	Charging	13 A
EV 2	Charging	13 A
EV 3	Offline	0 A setpoint
EV 4	Offline	0 A setpoint

RESULT Not enough available current from EV 1 and EV 2 to start a new charger ($4+4=8 < 9$ A).

3 Equalizing power between EV chargers

The strategy will try to equalize the power between all running EV chargers based on power draw. The problem is that strategy does not have any information on how much power the car will request without any limitations. Therefore, equal distribution of power/current limits between chargers is far from optimal.



Preferred way

Equal power distribution is the preferred way.

Example of equalizing limit

2 EV chargers

Limit **40 A**

CHARGER	LIMIT	CHARGING	NOTE
EV 1	20 A	20 A	
EV 2	20 A	6 A	Car is limiting charging

5 EV chargers			Limit 100 A
CHARGER	LIMIT	CHARGING	NOTE
EV 1	20 A	20 A	
EV 2	20 A	20 A	
EV 3	20 A	20 A	
EV 4	20 A	20 A	
EV 5	20 A	9 A	Car is limiting charging

Example of equalizing power

2 EV chargers			Limit 40 A
CHARGER	LIMIT	CHARGING	NOTE
EV 1	30 A	30 A	
EV 2	10 A	9 A	Car is limiting charging

5 EV chargers			Limit 100 A
CHARGER	LIMIT	CHARGING	NOTE
EV 1	22,5 A	22,5 A	
EV 2	22,5 A	22,5 A	
EV 3	22,5 A	22,5 A	
EV 4	22,5 A	22,5 A	
EV 5	10 A	9 A	Car is limiting charging

✓ Key points

Minimum current (Point 1): 9 A is the preferred minimum setpoint for EV chargers.

Overshoot setting (Point 2): OFF reserves current to start 1 more charger; ON never reserves and starts one charger at a time by cycling the setpoint.

Equalizing (Point 3): Equal power distribution is the preferred way.