

How to charge your EV automagically with Autocharge



Autocharge is the ultimate charging experience for EV drivers. It's easy to use and makes charging as convenient as possible. So what's behind the magic?



HOW IT STARTED

In 2016, Fastned joined forces with charger manufacturer ABB to bring super simple charging to all electric vehicle drivers. Just plug in and go! Before this partnership, only Tesla drivers could enjoy this level of convenience with their Supercharger network. But Fastned and ABB wanted everyone to have a hassle-free charging experience, so they made it happen for all EVs.

We've spent a year developing and testing Autocharge, and in October 2017, we were excited to roll it out to our customers. Since then, it's been a huge hit - in just one year, nearly 150,000 Autocharge sessions were started by our customers without any need for RFID cards or apps. It's never been easier to charge your electric vehicle!

In this white paper, we'll explain how Autocharge works, share our experience with this feature, and highlight the improvements we've made since we first launched it.

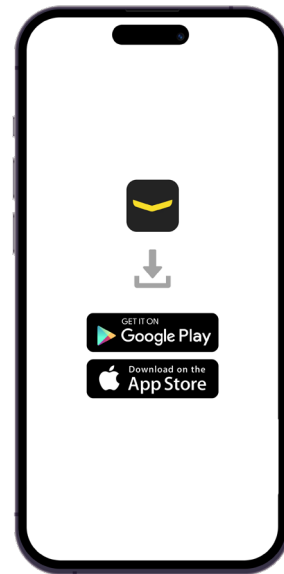


IT WORKS AUTOMATICALLY

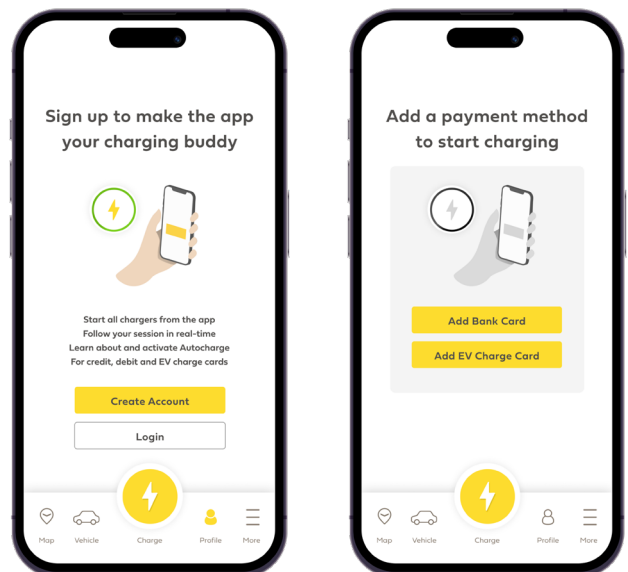
Autocharge is simple to use. It works by linking your unique MAC address to your customer account. Every device that connects to a network uses a MAC address, just like your phone connects to Wi-Fi or your wireless earplugs connect to your laptop. Your vehicle does the same thing when it communicates with a charger through the CCS connector. It's easy to get started with Autocharge - just follow a few simple steps and you'll be on your way to seamless electric vehicle charging.

HOW TO ACTIVATE AND USE AUTOCHARGE

1. Download our free app from the Apple App Store or Google Play Store.

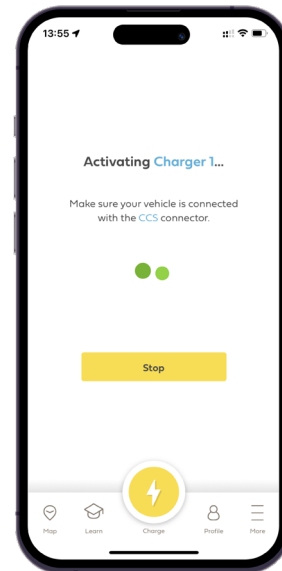


2. Create an account and add a payment method or EV charge card, your vehicle and its licence plate number

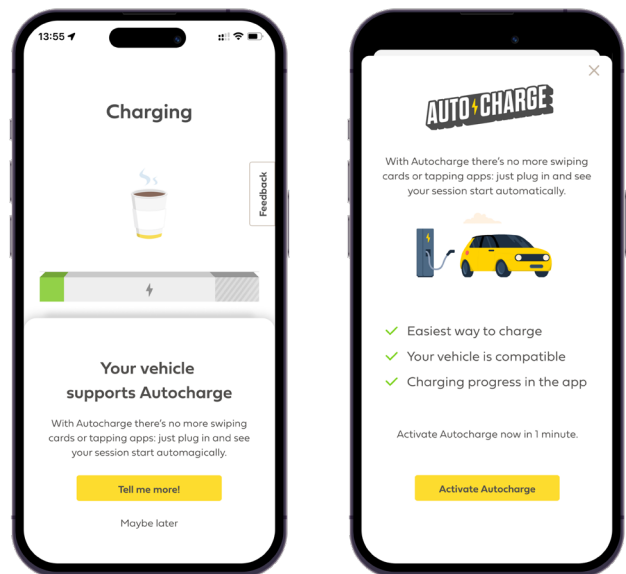


¹The DIN SPEC 70121 and ISO 15118 standards specifically define the EVCCID as the MAC address of the charge controller which must be unique.

3. Use the app to start a charging session at one of our chargers

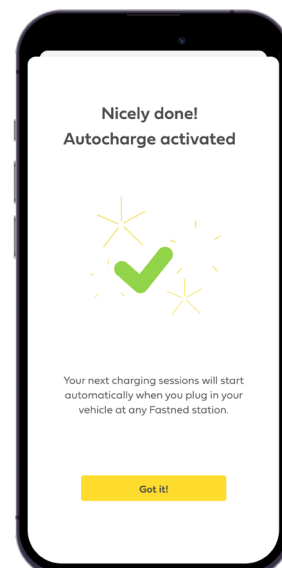


4. When charging has begun, the app will ask you if you want to activate Autocharge



5. Follow the steps until you see the success message.

Once you've followed these steps successfully, we'll send you a confirmation of the activation by email.



Your next charging session will start automagically when you plug in your vehicle at any Fastned station. It's as simple as that!

When you link your bank account or credit card to our system, rest assured that your sensitive payment information is securely stored by a trusted Payment Service Provider, such as Adyen. Fastned only keeps a reference to these sensitive details.

Say goodbye to the hassle of payment verification at charging stations. With just one simple step, plugging in, our technology seamlessly connects your vehicle to the charger and securely verifies the payment linked to your account. If all is good, the car will start charging quickly and easily.

ACTIVATING AUTOCHARGE FOR THE FIRST TIME

The Autocharge feature will always require consent by the customer. Simply set up an account, provide your vehicle details and start your first charging session using the Fastned app. If you haven't done this yet and your vehicle supports Autocharge, you'll then be prompted to activate Autocharge for your vehicle if you'd like to. Your active consent ensures that your experience is always in your control.

With your confirmation, we securely associate your vehicle's unique identifier (the so-called MAC address) with your account. Your payment details are already safely stored, so you can start charging right away. It's that easy!

USING AUTOCHARGE

Once activated, all you have to do is plug in your vehicle. Our technology quickly verifies your vehicle's unique identifier and validates your account and payment details, giving you permission to start charging in just seconds. It's similar to using an RFID card, fast and easy.

You can stay on top of your charging needs, every step of the way: Monitor your charging progress from the charger screen, your vehicle, or the app. Keep an eye on the charging status in real-time and, in the near future, you'll be able to receive push notifications, letting you know when your charge session has started.

With the ability to start and stop charging from the charger screen, app, or in-vehicle controls, you have the power to charge on your own terms. And when your charging session is complete, billing is handled just like any other charge session with Fastned. You'll receive a regular invoice through your preferred payment method.

You can also take charge of your charging options with Autocharge. Temporarily disable Autocharge through the app when your vehicle is being used by someone else. Or, if you prefer, you can also activate a charging session using an RFID card before plugging in your vehicle, giving you even more flexibility and control over your charging experience.



AUTOCHARGE FROM AN OPERATOR'S PERSPECTIVE

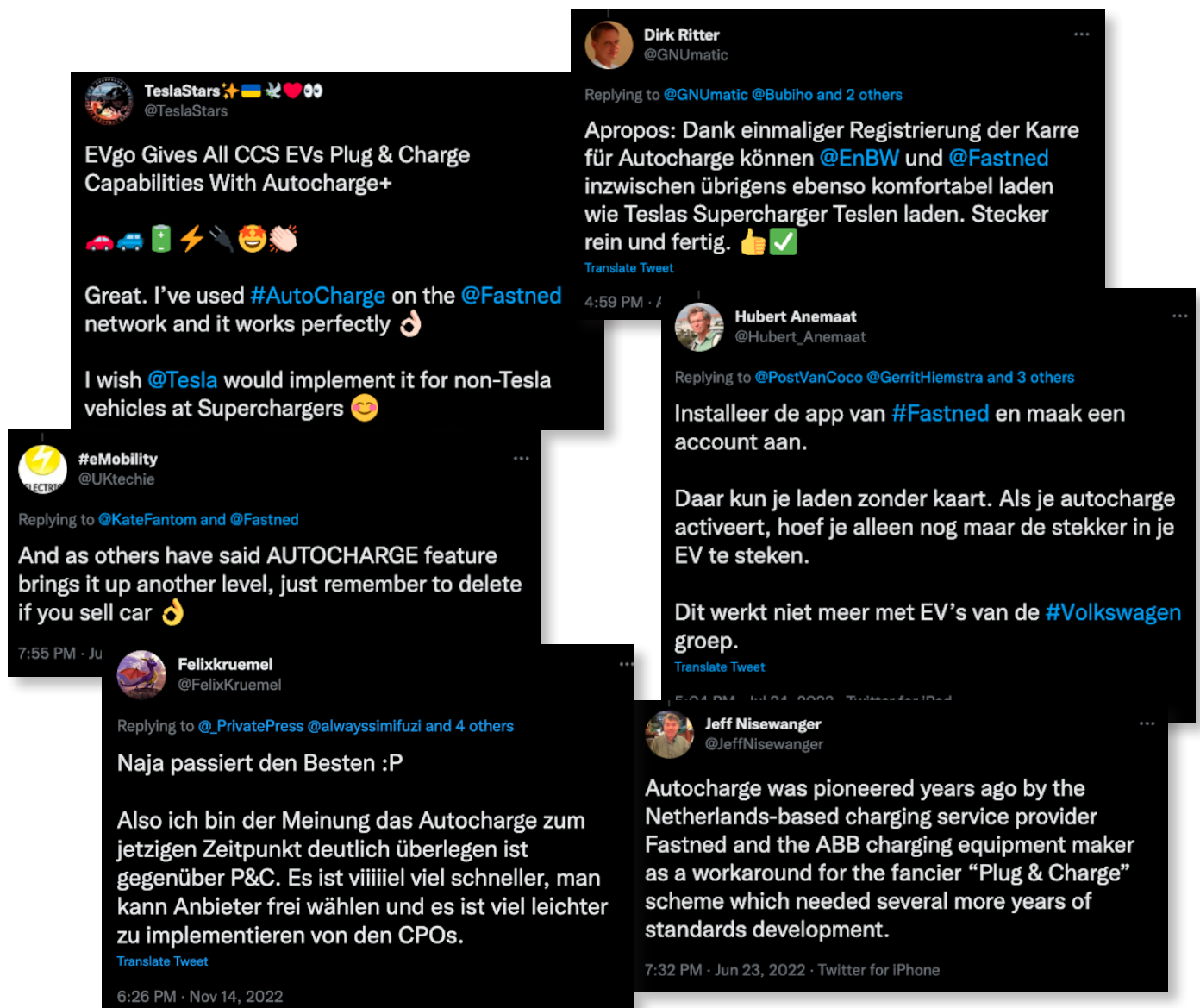
Autocharge greatly improves the success rate of charging sessions, meaning more successful attempts to start charging. This is due to the streamlined and secure process of verifying a customer's payment and vehicle details. The reasons for that are simple:

- Eliminate the hassle of RFID cards and apps with Autocharge. The process of starting a charge session is streamlined and automatic, eliminating delays and increasing the success rate of charging sessions. Additionally, with Autocharge, you avoid the common issue of vehicles

not starting a charge session after a couple of minutes, making the charging experience more efficient and convenient.

- On chargers with multiple connectors, there can no longer be any confusion or mistakes which connector to choose since this is done automatically. This authorisation method has fewer points of potential failure compared to other authorisation methods.

Customers love the convenience of Autocharge. Here's what they have to say:



LIMITATIONS TO BE AWARE OF

Autocharge is not compatible with all vehicles. Autocharge does not work for vehicles with CHAdeMO and AC inlets as they communicate differently with the charger. While most vehicles with a CCS inlet support Autocharge, there are some exceptions.

The Volkswagen Group, for example, sends a randomized MAC address of their vehicles, making it impossible to link the address to a customer's account details. Unlike other devices, this feature cannot be disabled by the customer. As Autocharge relies on a unique and persistent MAC address, this means vehicles of the Volkswagen Group are not able to use Autocharge.

On the other hand, some other manufacturers use the same MAC address for all of their vehicles, making it impossible to identify the specific vehicle. Without identifying the vehicle, it is not possible to offer the Autocharge experience to the driver.

The following vehicles do not support Autocharge (per December 2022):

- Audi e-tron (model year 2018) & Q4 e-tron
- Cupra Born
- Maxus eDeliver
- Mazda MX-30
- Volkswagen e-Up!, e-Golf, ID.3, ID.4, ID.5, ID.Buzz
- Seat Mii electric
- Skoda Citigo e-iV & Enyaq iV

GDPR

At Fastned, we follow all GDPR guidelines to keep your data safe. This includes getting your permission before using identifiers like your MAC address. We also use special measures, like one-way hash, to protect your data. Rest assured that all of your customer information, including your MAC address, is stored securely with us.

GUARANTEEING HIGHEST SECURITY

Any technology should always be designed with the customer in mind, and the benefits it provides should outweigh any potential risks. Additionally, it is important to take steps to mitigate potential risks as much as possible to ensure the safety and security of the customer.

For the past 5 years, Fastned's Autocharge system has been completely fraud-free - with no cases of anyone cheating the system or charging for free at someone else's expense. Should someone attempt to do so, this would be a very cumbersome process with low returns for the fraudsters. Still, our system makes it nearly impossible for fraudsters to trick you with a fake MAC address.

At Fastned, we take preventative measures to ensure that your data is safe from both intentional and unintentional misuse. We have a number of safeguards in place and more on the way. Here are some example measures that guarantee Autocharge's security:

1. To use Autocharge, customers must sign up and verify their phone number.
2. They will receive an email explaining how to activate Autocharge and reminding them to deactivate it if they transfer ownership of the vehicle.
3. We use a one-way hash to protect MAC addresses in our backend platform.
4. The app will send a push notification when a charge session starts.
5. We use cameras at most stations to help investigate any complaints and protect our business and customers.
6. We have denylisted commonly used MAC addresses for testing to prevent misuse.

WHAT YOU CAN DO TO PREVENT ERRORS

In the past, some customers have had issues with Autocharge due to user errors. For example, customers sometimes forget to deactivate Autocharge when they sell their vehicle, resulting in them paying for the new owner's charge sessions. To reduce this, we send a confirmation email when Autocharge is activated - so always keep an eye out for that.

Another error that occurs is when customers accidentally start a charge session on the wrong charger, which leads to the wrong vehicle being associated with their account. If this happens to you, you will quickly become aware of this issue when your own vehicle does not start charging with Autocharge and you should call Fastned Customer Support.

AUTOCHARGE IN COMPARISON WITH PLUG & CHARGE

The ISO15118 standard governs communication between vehicles and chargers, and it includes an optional feature called Plug & Charge. This allows customers to sign a contract with a mobility service provider for charging services and upload it to their vehicle. Autocharge works with ISO15118 in the same way as it does with the older DIN SPEC 70121 protocol, and it can also coexist with Plug & Charge.

At Fastned, we currently do not offer Plug & Charge but we are preparing our platform so that we can add it in the future if needed. This will depend on agreements that ensure fair and transparent access, support from independent service providers, and consumer demand.

ABOUT THE AUTHOR

Roland van der Put has a computer science background and has been with Fastned for over 8 years. As Head of Charging Technology, he is responsible for setting out the strategy for grid connections, fast chargers, local storage, load balancing and integration of these technologies. Late 2016 he was part of the team that had the objective to improve the customer experience that resulted in the introduction of Autocharge in 2017.

