



The image shows a banner for Factiva and Flipboard. On the left, the word "FACTIVA" is written in large, bold, blue letters. Below it, there are several smaller icons and text boxes: "RELIABLE ALERTING", "9 INTERFACE LANGUAGES", "EASILY DISSEMINATE INFO", "COVERAGE FROM NEARLY EVERY COUNTRY", and two circular icons. To the right of the Factiva logo, the text "FLIP THROUGH YOUR FACTIVA ALERTS" is written in blue. Further right, there is a Flipboard logo and the text "Now Available on Flipboard". At the bottom right, it says "Learn more at factiva.cc".

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TECHNOLOGY

Tesla to Upgrade Cars Through the Internet

Auto maker seeks to add features, like autonomous driving, directly to Model S owners

By **MIKE RAMSEY**

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Tesla Motors Inc. is positioning itself as a software company, as well as an auto maker, committing to a series of upgrades for its Model S electric cars that it will start delivering to owners via the Internet within the next 10 days.

The upgrades will be rolled out over a series of months and will include a suite of groundbreaking features that would allow the car to operate with complete autonomy on highways. Unlike most of the auto industry's upgrades, which are delivered to customers through an independent dealer network, Tesla is building on a sales and marketing philosophy that cuts out the middleman by sending the new software directly to its cars over their embedded wireless connections.

"We really designed the Model S to be a very sophisticated computer on wheels," Chief Executive Elon Musk said Thursday during a conference call with reporters and analysts.

Since entering the auto industry more than a decade ago with an electric sports-car project, Mr. Musk has been challenging the auto industry's century-old practice of selling cars through a dealer network. His confidence in the near-term prospects of the electric car has been unsurpassed, and his foray into using software to make major

improvements in vehicles that are already on the road is largely unrivaled.

“We view it in the same way as updating your phone or your laptop,” he said. “It is a fundamental paradigm shift from the way that cars have been done in the past.”



The Tesla Model S is 'a very sophisticated computer on wheels,' said Tesla CEO Elon Musk, who committed to a series of software upgrades. *PHOTO: REUTERS*

The first round of upgrades, set to reach the cars within two weeks, includes software that analyzes a driver's route, road conditions and even topography, and tells the driver if the car is going out of range of a charging location. The warning is meant to address “range anxiety,” the fear of running out of power. The new software also will feature blind-spot detection, emergency automatic braking, and a “valet” mode, which would prevent an attendant from driving the car at high speeds or using it to access personal information.

The next upgrade, dubbed 7.0 and expected in a few months, will change the user interface and allow the car to drive itself on highways. The driver could let go of the steering wheel, permitting the car to guide itself to its destination.

The upgrade also would offer the option of having the car drive itself, without a human occupant, to pick someone up. But that feature is designed to work only on private property, and not public roads.

On Tuesday, Mr. Musk hinted that the current Model S had the capacity to do most types of autonomous driving, except possibly in complex urban environments. He called autonomous driving capability a “solved problem.”

Tesla's ability to update its vehicle isn't new. The company has been supplying updates since it launched the car in the summer of 2012. Now, however, the upgrades are becoming more significant. The latest download, for example, will allow the car to communicate with the company's system of fast-charging locations called Superchargers.

"You don't need to think ahead or do any calculations. It makes it almost impossible to run out [of power] unless you do it intentionally," Mr. Musk said on the call.

Mark Wakefield, a partner at management consulting firm AlixPartners LLP, said Tesla is well ahead of the rest of the automotive industry. Its willingness to take risks has given it a jump on competitors. "They are certainly more gutsy," he said.

Mr. Musk said he aims to make updates every three months, continually adding or changing features. Like a smartphone, there may be a limit to the updates that can be made to older vehicles. And some of the capabilities added with software rely on new sensing equipment that became available only in the newest versions of the car in October.

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Tesla built the car with powerful processing capability that initially was greater than necessary for what the car did. However, Jen-Hsun Huang, chief executive of graphical chip maker Nvidia Corp., said some of those processors now are being strained as Tesla has increased its cars' capabilities.

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