

Automatic gear shifting for derailleurs

Schaeffler's automatic gearshift system FAG-Velomatic is manufacturer-independent and suitable for any bicycle or e-drive. It now covers the entire range of hub gearshifts and derailleurs with three to eleven gears.

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With its dimensions of only 25 mm in diameter and 203 mm in length, the automatic gearshift fits many down tubes or saddle tubes (Photo: Schaeffler)

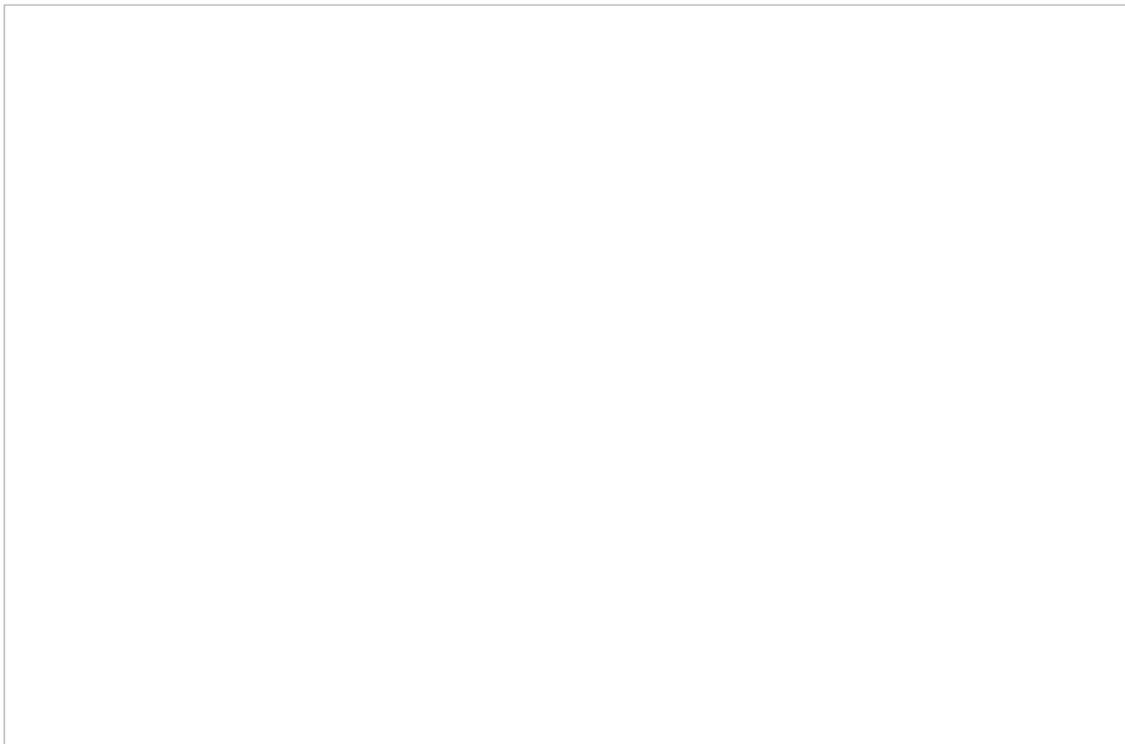
A specially developed software algorithm makes it possible: The [FAG-Velomatic](#) only operates the gearshift system with a dependable cable pull when the pedals are moving forwards. This prevents damage to the derailleur and hanger during shifting. Multiple Schaeffler sensor versions are available for determining the direction of rotation and the speed of the cogs. All that is needed is to specify the customer-specific cog distances in the software. Development work on the gearshift system for derailleurs was successfully completed just in time for Eurobike 2016.

Compatible through open standards

The gearshift is a manufacturer-independent system and suitable for any bicycle or e-drive – whether it has a center motor, rear-wheel or front-wheel drive. All hub gearshifts and derailleurs with three to eleven gears can be operated with the system. It uses the ANT and BLE (Bluetooth) wireless network standards and also CAN, CANopen, and LIN networking. CAN is used as the interconnection standard. The automatic gearshift system is connected via Bluetooth or CAN to the operating system, for example a smartphone, on which the Velodaptic app displays parameters such as the speed and current gear. Users can also preconfigure the system and adjust their individual gearshift characteristics for different requirements via the app.

It is easy to integrate the gearshift system into the frame: with its dimensions of 25 mm in diameter and 203 mm in length, the automatic gearshift fits into many down tubes or saddle tubes and thus does not detract from the bicycle design. Rigid attachment of the housing is not required; attachment inside the frame tube is sufficient, since the pulling force for actuation is supported via the outer shell on the housing of the FAG-Velomatic. For this reason, the gearshift can be mounted quickly and easily in series production.

By combining a derailleur from any manufacturer with the gearshift system, a pedelec manufacturer has a complete system that affords a great deal of freedom for outfitting bicycles. Derby Cycle already presented its first pedelecs with an eight-gear hub gearshift and FAG-Velomatic at Bike Expo 2016 and the ZEG Show in Cologne.



The start-up gear of the Kalkhoff pedelecs can be programmed individually (Photo: Schaeffler)

The automatic gearshift system is also in series production in six Kalkhoff pedelecs. The E-City models include a practically maintenance-free belt drive in combination with a hub gearshift, backpedal disk brake, Bluetooth display, navigation app, and faster, more precise, and quieter gear changes with the FAG-Velomatic.

Kalkhoff makes use of the various open communication standards offered by Schaeffler in order to integrate the system into its drive system. The gearshift system can be integrated into any pedelec with a CAN network.

Always in the right gear

Pushing lightly on the electronic gearshift button is enough to change the gear. It is even easier in fully automatic mode, available as an option: the system uses the cycling speed and slope to constantly calculate the optimum gear and shifting time and independently operates the gearshift via the cable pull. Compared to pedelecs with manual shifting, pedelecs with an automatic gearshift system have a longer range, since the electric motor constantly works at the optimum operating point in line with the cyclist's wishes. Riders of a pedelec with an FAG-Velomatic can individually program their startup gear. After every stop, the system automatically shifts to the startup gear.

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