

Whitepaper

SMI drives for sun protection systems



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The standard motor interface technology, short SMI, for connecting electric motor driven sun protection systems with the building automation system gains more and more acceptance. Aspects such as the exact positioning of all curtains, virtually noiseless start and stop operation, simple wiring and, e. g. fault feedback from the motors to the building automation system are convincing more and more users to use the SMI.

The standard motor interface SMI is the only consistent interface which is supported by several manufacturers, both drive and control manufacturers. SMI is developed for intelligent drives with integrated, electric control. Thereby it is possible to transfer data telegrams via the consistent interface from the control and back. Due to SMI, products of different manufacturers can be combined.

The offered venetian blind drives from Dunkermotoren with SMI interface, D370SMI, are based on a direct current technology. The most popular characteristic of direct current motors is the simple controllability of the speed. The speed for moving the blind can be preset in the range from 15 to 26 min⁻¹. The speed for creep speed, which enables sensitive adjustment of the lamella angle each time the drive is started, can be preset in the range from 3 to 12 min⁻¹. These speeds are kept constant irrespective of the load, so that a uniform motion pattern of the blinds is achieved on the veneer. The soft start or soft stop when the end positions are reached protects the curtain mechanism.

To better understand the SMI it's important to know the functions compared to conventional drives. Those drives are not only motors with two rotational directions and a stop function. But those are high-quality drives with integrated electronics and SMI bus interface included.

A schematic figure shows figure 1:

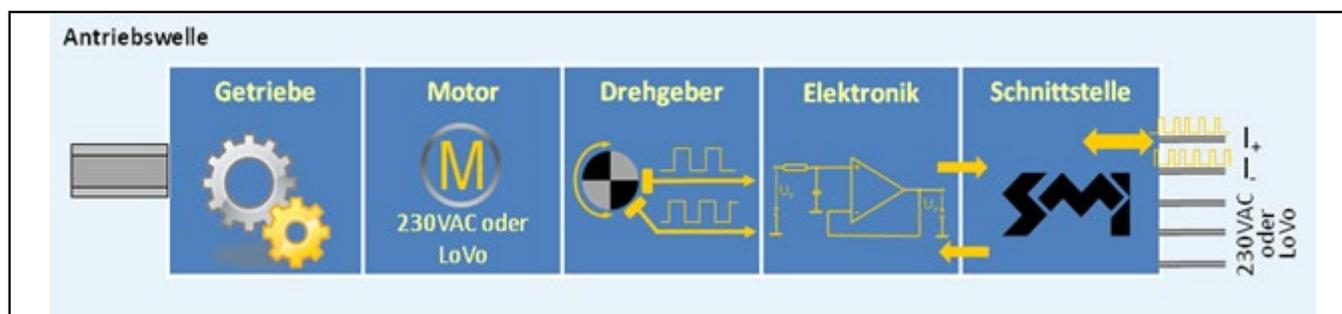


Figure 1: Basic construction of a SMI drive

First, there is the electric motor, which can be designed as 230 VAC, called SMI, as well as DC, e. g. for 24 VDC, called SMI-LoVo or simply LoVo. A gearbox increases the torque to the values required for the curtain. It also reduces the high motor speed to the speeds of a few tens of rotations per minute that are usual for sun protection systems.

The heart of SMI drives is the integrated encoder and control. The encoder which is mounted on the motor shaft provides electrical impulses in high resolution. These impulses are analyzed by an integrated control for precise positioning of the drive. Conventional drives with a mechanical limit switch system, position with a time control outside the drive e. g. in a KNX venetian actuator without real feedback of the indeed motor motion. Therefore, it is usually necessary to determine the slat adjustment and the total drive way times using a stopwatch and to enter them during initial

operation. This procedure may lead to significant positioning tolerances. By counting the pulses of the encoder, a considerably more exact positioning without recognizable tolerances is realized. Depending on the motor type (AC or DC), the signals from the encoder can also be used for speed control, whereby a load-independent, constant motion of the curtains or a smooth, low-noise start/stop is achieved.

The standardized SMI interface is a two-wire master/slave bus system with independent, wired parallel bus structure for bidirectional communication. The system consists of a master e. g. a SMI KNX interface and up to 16 motors working as slaves. Both master and slaves of different manufacturers work together interoperable. The motor electronic (slave) receive orders via the bus and generates status messages to the master. Especially the analyzing of machineries, positions and status of the drive as power consumption, number of drive ways, occurred bugs are getting more and more important in the field of effective building operation. The precise positioning which is necessary for e. g. shadow edge tracking, obtains acceptance at the user and serves to improve the energy efficiency of the building at the same time.

An important advantage of the SMI drives is the electrical connection. Both supply line for the electro motor and the bifilar data line is laid in one cable – for 230 V drives as five-core, for LoVo drives as 4-core cable. As the SMI is a parallel bus system, all bus participants, the SMI drives, are wired parallel. Consequently, the installation effort is significantly reduced.

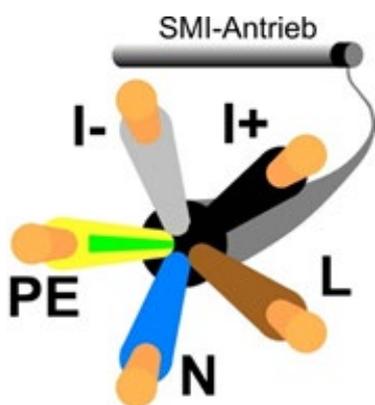


Figure 2: Connection line 230 V drives, defined at SMI handbook

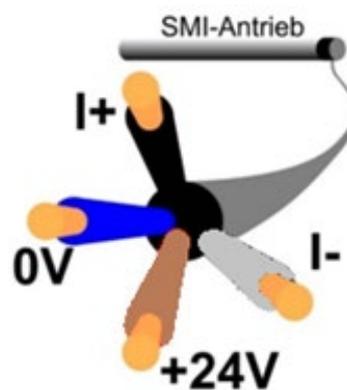


Figure 3: Connection line LoVo drives, the core color is a suggestion.

With SMI-230 V the data lines I+/I- are to be treated like 230 V lines and standard installation lines can therefore be used. Figure 2 shows the wire assignment. For test purposes, I+ or I- can be set to 230 V.

SMI LoVo is a SELV system. The cables must be selected and laid accordingly. Figure 3 shows a possible wire assignment. SMI drives are available both as tubular motors for use in awnings or shutters and as venetian blind drives for use in venetian blinds or external venetian blinds. SMI LoVo drives are characterized by small design, which predestines them for use in interior sun protection systems such as roller blinds or venetian blinds. Meanwhile there are 30 different SMI drives in different versions available. So, the perfect drive can be used for every application.

Appropriate gateways from various manufacturers are available for connecting the SMI and SMI-LoVo to the standard building bus and automation systems on the market.

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