Value adding by linking CANopen CiA 417 devices

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In the CANopen application profile for lifts (CiA 417), the most essential devices with CAN network connections for entire lift groups are described. This has the advantage that the communication among units is standardized. Devices behave in the same manner, independent of the manufacturer. This can be illustrated particularly through the example of the load-measuring device and its connection to the lift controller bp308, of Böhnke + Partner GmbH.

The overload signal is mandatory for each lift. It sends the signal for an overloaded car to the lift controller and consequently the lift doesn’t work. A simple contact with a regulating screw can be used for this implementation. For a better transport efficiency, particularly in case of lift groups, the lift controller requires a signal for a full load, for example when the car is loaded by 80%. For misuse detection or other special functions, the minimum load signal, which reports an empty car, is helpful.

A conventional load meter sends the signals of full load and overload. Threshold values can be set either by a potentiometer in the device, or via the menu. These devices can optionally send additional signals in the form of relay contacts, which must be wired to the lift controller. The lift controller requires appropriate inputs.

A load-measuring device with the CANopen lift interface provides additional discrete signals, such as reduced load, slack rope, or rope difference. Furthermore, it reports the effective car-load in kilogram (Figure 1). All this information is transmitted via the CAN network line, which consists of only two wires.

The information sent by the load-measuring device through the CAN network is available to all connected devices. This way the frequency converter (drive unit) can also use the effective car-load to optimize the start-up behavior and prevent unwanted turning away (undesirable car movement in the opposite direction) at the start.

The bp308 lift controller also transmits the effective car-load to the monitoring system Winmos300 (software package for remote monitoring of lifts). In case of a continuous connection to the lift system, the software can store these values cyclically in a database and provide subsequent statistical analysis. In the application profile for lifts, the parameters of the load-measuring device are defined. The lift controller can adjust the device via the control displays (Figure 2). This is of particular advantage, especially when the load-measuring device is inaccessible. The individual thresholds for reduced, full and overload can be modified and stored in the lift controller. If the substitution of the load-measuring device becomes necessary, the values can be written on the new device. The zero-point calibration of the load-meter (tare function) can also be done by the lift controller (Figure 3).

If the load-measuring device has a sensor at each track rope, the individual rope loads can also be displayed on the control display. This display can be used to balance the tension of the ropes, since the difference between the ropes must not be too great (Figure 4).

All these added values can be generated with a reasonable effort, since the used components are not wired together in a conventional way, but they communicate via the CAN network in accordance with the application profile CiA 417.

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Figure 1: Diagnosis of the signals of the load-measuring device
Figure 2: Setting the threshold for full load
Figure 3: Setting the reference weight
Figure 4: Diagnosis of the individual rope loads
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