WAGO Lighting Management

Section 1 – 24 VDC Supply for I/O and Field Devices / 18 VDC for DALI Bus (ECG, multi-sensors, etc.)

24 VDC Supply (e.g., 787-1216)

The WAGO Lighting Management controller has a Series 787 24 VDC power supply. The power supply must be designed to handle to the total power consumption of the I/O system configuration. The loads of the field devices used must also be considered in the power supply layout.

The installation position is also an important factor here. In the standard installation position (horizontal on a DIN-rail), the power supply can be fully utilized; in other installation positions (e.g., overhead), the power supply load specifications from the delivered package insert absolutely must be taken into account!

18 VDC Supply (DALI, 787-1007)

Depending on the configuration level of the DALI Multi-Master modules, the bus supply feed is via one power supply for up to five I/O modules or via two power supplies for up to ten I/O modules (applies to full configuration*). Up to five more I/O modules can be used, depending on the load on the Multi-Master modules. It is important to note here that the total current of 1.1 A per power supply must not be exceeded. Like with the 24 VDC supply, the specifications from the delivered package insert regarding load and installation position must also be taken account here.

*Full configuration = DALI bus subscriber with total power consumption max. 200 mA

Watchdog Function

The watchdog function is intended to prevent the lighting from failing if there is a disruption in a node. To so so, one relay contact per DALI power supply (e.g., 858-304), actuated by the first digital output, is switched to the DALI bus voltage path (see WAGO Lighting Management, Section 4). In normal operation, the changeover contact switches on the DALI bus. If the controller is stopped (e.g., after installing an update), the relay trips, the contact interrupts the DALI bus and the lighting (the DALI ECG) automatically switches to a defined state. This state can be set directly on the DALI ECG of the lighting management system, for example, 100% illumination intensity.
WAGO Lighting Management

Section 2 – Lighting Management, Digital Inputs, Emergency Monitor and Watchdog Function

WAGO Controllers PFC200

The brain behind WAGO Lighting Management is the high-power PFC200. This is where the control program runs; it can be conveniently parameterized and operated in the included Web visualization from a PC, tablet or smartphone.

Digital Inputs

In addition to 24 VDC switching signals, other voltages (e.g., 230 VAC) can be integrated and processed for connecting sensors such as push-buttons, presence and/or motion detectors, etc. In the event it is necessary to change the potential, the appropriate bus supply module must always be used. It should be noted when assigning the digital inputs that DI 1 of the first digital input module is always reserved for the central command “ON/OFF”. All other inputs can be freely allocated with sensors.

Connecting Error Messages

It is possible to receive messages from external devices, e.g., auxiliary switches of circuit breakers or emergency monitors, via a digital input. Any digital input can be used.

Collective Fault Message and Acknowledgement

Error messages can control an external collective fault light via a connected digital output. An external pushbutton can be used to acknowledge these messages. Assignment of the digital inputs and outputs required for this purpose can be freely selected.
Digital Outputs

To control the conventional illumination and implement the watchdog function, 24 VDC switching signals that can be used to actuate corresponding relays (e.g., 788-357) are sent via digital output modules. Only DO 1 on the first digital output module is reserved for the watchdog function. All other outputs can be freely used.

Watchdog Function Extension

To prevent the lighting (DALI / conventional) from failing when the controller is stopped (e.g., after updating), the NC contact of the watchdog relay (here, K21) is connected upstream of the NC contacts of the auxiliary relays (K22, K23). The auxiliary relays can be directly actuated via the digital outputs.

In normal operation, the first digital output is switched and the watchdog relay (K21) is energized. As one result, the DALI bus voltage path, which is generated by the DALI power supply, is automatically switched on (see Page 2). At the same time, the voltage path K21 to the changeover contacts of the auxiliary relays (K22, K23) is interrupted. Thus, the auxiliary relays can be directly actuated via digital outputs 2 and 3, etc. The auxiliary relays themselves have a direct impact on the load relays (K24, K25), which switch the conventional lighting. K22 permits K24 to be energized, K23 permits K25 to be energized, etc. One auxiliary relay and one load relay are needed for each additional load circuit!

When the controller is stopped, the watchdog relay (K21) is automatically deenergized. Consequently, at the same time, the voltage path from the watchdog relay to the changeover contacts of the auxiliary relays (K22, K23) are closed, the load relays (K24, K25) are automatically energized and the lighting is switched on.
WAGO Light Management

Section 4 – Bus Interfaces: EnOcean, KNX TP1 Module and Real-Time Clock

EnOcean

To support the radio telegrams from sensors supporting EnOcean technology, the EnOcean STC65 RS-485 EVC Gateway (2852-7101) is employed in conjunction with a serial interface.

KNX TP1 Module

The KNX/EIB/TP1 module (753-646) connects to a KNX/EIB/TP1 network. In a KNX network, the module appears as a standard KNX device and is linked via the ETS Professional commissioning tool. The module can be connected at any position on the node of the WAGO Lighting Management. Up to 60 KNX switching/dimming and scene objects and up to 60 KNS status objects (1 bit/1 byte) are available. Both an external KNX power supply and ETS Professional software are required to operate the KNX/EIB/TP1 module.

Real-Time Clock

To realize various time functions (e.g., weekday, vacation and custom time-switching programs), the system is always provided with the current time via an RTC module (750-640).

Time is synchronized through an external GPS DCF converter that receives the current time via GPS and forwards it as a DCF signal.

Cabinet Level

Field Level

Actual wire color is white, shown as gray here for clarity.

Radio Switches

KNX/EIB Bus

KNX Power Supply

KNX Button

GPS-DCF Converter UTC by elsendor

EnOcean

KNX/Power Supply

KNX/Button

Cabinet Level

Field Level

Actual wire color is white, shown as gray here for clarity.

Radio Switches

KNX/EIB Bus

KNX Power Supply

KNX Button

GPS-DCF Converter UTC by elsendor
WAGO Lighting Management

Section 5 – DALI Multi-Master Module and 3-Phase Power Measurement

DALI

Digital Addressable Lighting Interface (DALI) is a technical standard for controlling lighting devices (e.g., electronic control gears). DALI features digital communication and streamlined installation. It meets lighting requirements, such as switching, dimming, light grouping or status information feedback.

Each DALI Multi-Master Module can integrate up to sixty-four DALI lights, up to sixteen DALI sensors, and up to sixteen DALI transmitters into the system. Since the number of I/O modules is variable, WAGO Lighting Management can be used for small production facilities or large logistics centers.

3-Phase Power Measurement

The 3-Phase Power Measurement module supports detection and display of energy savings opportunities. Use in combination with the current transformer compact terminal block results in an integrated concept to neatly round out the WAGO Lighting Management.

*If only the light sensor without motion detector is used, the pure DALI wiring is sufficient for the power supply (no mains voltage required).
The power consumption and number of addresses need to be considered when calculating the amount structure (ECG, sensors, etc.):

Example 1: 64 ECG 64*2 mA = 128 mA 64 ECG-addresses
12 DALI-Sensors 12*6 mA = 72 mA 36 Sensor addresses (12*3)

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200 mA

Example 2: 64 ECG 64*2 mA = 128 mA 64 ECG-addresses
16 DALI-Sensors 16*6 mA = 96 mA 48 Sensor addresses (16*3)

----------------------------------------------------------
224 mA

Correction Example 2: 50 ECG 50*2 mA = 100 mA 50 ECG-addresses
16 DALI-Sensors 16*6 mA = 96 mA 48 Sensor addresses (16*3)

----------------------------------------------------------
196 mA

General Information

- Up to 64 sensor addresses can be allocated, but please note: Some sensors have several sensor addresses.
- The above examples are theoretical calculations intended to present the influence factors and dependencies.

The number of supported sensors is also a function of the network load. For current recommendations, contact the manufacturer or WAGO.
WAGO Lighting Management

Teil 6.2 – Technical Appendix: Principle of the Watchdog Circuit

Diagram showing the electrical connections and components involved in the principle of the Watchdog Circuit. The diagram includes labels for different components such as Watchdog Relay, Lighting circuit, Load Relay, DALI AC/DC Converter, and AUX Relay. The connections are depicted with arrows indicating the flow of current through the circuit.