BNK Control Interface Specification

This document describes the requirements to use third party obstruction light systems in conjunction with the Quantec BNK system.
Functions of Quantec BNK System:

- Detection of aircrafts
- Control of system components
- Self diagnostic
- Astronomical clock and calculation of sun rise and sun set (civil twilight)
- Recording operation states

Legal Regulations

The "Allgemeine Verwaltungsvorschrift zur Kennzeichnung von Luftfahrthindernissen Anhang 6 - Systemanforderungen für bedarfsgerechte Nachtkennzeichnung von Windenergieanlagen" defines three permitted variants (A, B and C) to start flash sequences. The third party obstruction light system has to support at least one of the variants A and B.
The obstruction light has to start the supported variant within 200ms after the Quantec BNK system notifies about the demand to start the sequence.
The obstruction light has to support overriding visibility sensor regulations to use 100% of nominal light intensity.

Supported Control Interfaces

The Quantec BNK system support different interfaces to connect third party obstruction light systems.
The following terms are used to define the interfaces:

On demand system active

The aircraft detection according to the AVV is fully operational. The obstruction light system has to react to setpoints from the on demand system. If an aircraft is detected the obstruction lights have to turned on using 100% of nominal light intensity.

Obstruction light off

If on demand system is active but does not detect an aircraft the obstruction light has to be turned off.

Obstruction light normal mode

The obstruction light is operating as if no BNK system is present.

Quantec BNK Control IOs

The Quantec BNK system provides two potential free relay contacts (max. 250 V AC 1 A). The obstruction light system has to report the operating state using a potential free output (typ. 24 V DC 3 mA).

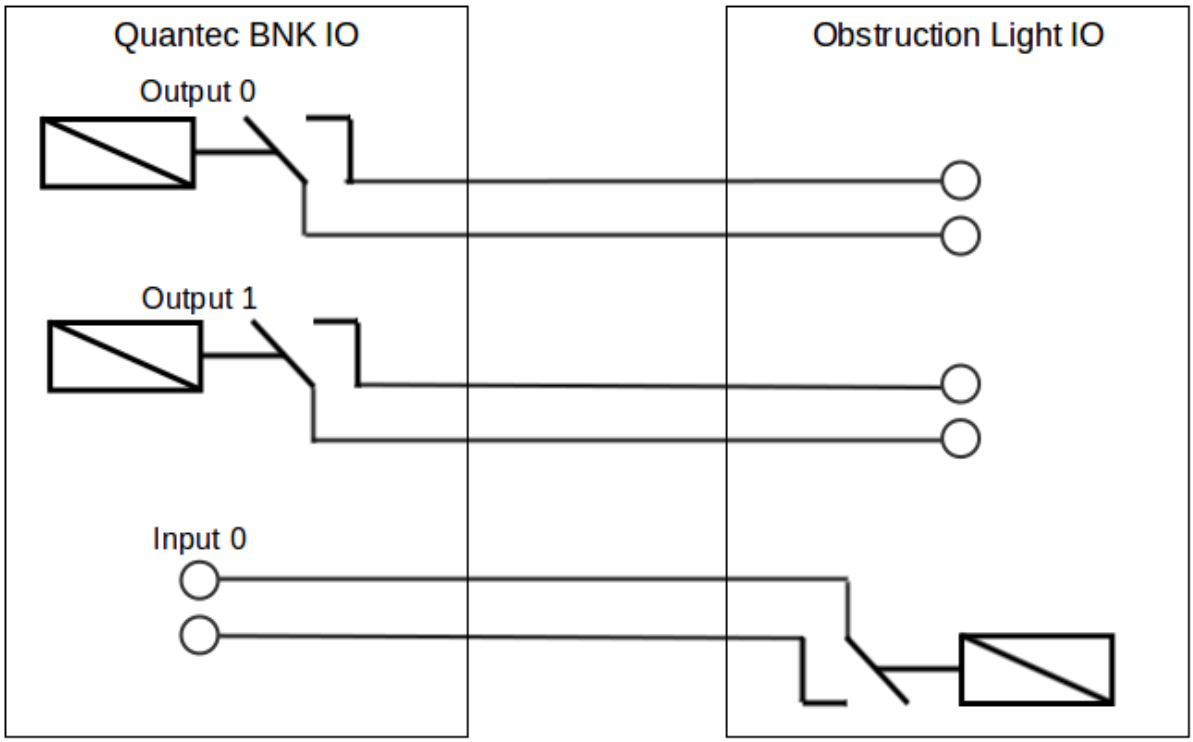
Terminal	Description
Output 0	On demand system active Contact is closed when BNK system is active
Output 1	Obstruction lights off Contact is closed when obstruction lights should be turned off.
Input 0	Obstruction light operation state Input should be high when obstruction light system is fully operational

Quantec Sensors GmbH
Rieselwiese 1
D-38690 Goslar

Tel: +49-5324-780966-0
Fax: +49-5324-780966-119
www.quantec-sensors.de

Braunschweig Commercial Registry HRB 205694
Head office: Quantec Sensors GmbH, Rieselwiese 1, D-38690 Goslar
Director: Alexander Gerdes

Connection Scheme



Quantec BNK Control Modbus TCP Master

The Quantec BNK system supports Modbus TCP communication to control third party obstruction light systems. Therefore the Quantec BNK system acts as Modbus TCP Master and sends register write requests (Function Code 6) to the third party Modbus TCP slave. The requests are send at least every 200 ms. An immediate message is emitted after detecting an aircraft or system change.
The third party obstruction light system has to detect a faulty Modbus communication. In case of a broken communication the obstruction light has to fall back to normal mode.
The Quantec BNK Modbus master uses device address 0x01 by default. See table below for address mapping:

Bit access read (Function Code 1 and Function Code 2)

Modbus Address [hex]	Description
0x0000	Valid values: OFF: Obstruction light system is not operational (e.g Internal error detected) ON: Obstruction light system is fully operational

Register access read (Function Code 3)

Modbus Address [hex]	Description
0x0000	Valid values: 0x0000: Obstruction light system is not operational (e.g Internal error detected) 0x0001: Obstruction light system is fully operational

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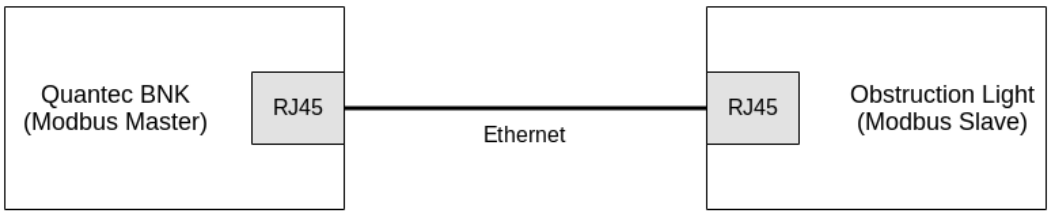
Bit access write (Function Code 5 and Function Code 15)

Modbus Address [hex]	Description
0x0200	Valid values: OFF: On demand system inactive and obstruction light in normal mode ON: On demand system active and obstruction light on (100% light intensity)
0x0201	Valid values: OFF: Obstruction light off ON: Obstruction light off

Register access write (Function Code 6)

Modbus Address [hex]	Description
0x0200	Valid values: 0x0000: On demand system inactive and obstruction light in normal mode 0x0001: On demand system active and obstruction light on (100% light intensity) 0x0003: On demand system active and obstruction light off

Connection Scheme



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