AIDS to NAVIGATION

Catalogue

Control Systems

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Industrial Member of International Association of Lighthouse Authorities

Cybernetica AS has been approved by Bureau Veritas Quality International to the quality management system standard: ISO 9000:2000

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NOTE: The manufacturer reserves the right to introduce changes to the specifications without prior notification, as necessary.
Multiregional Monitoring and Control System E001

Main Control Centre

- Communication to other services (VTS)
- Interregional monitoring and control software and databases
- MS WINDOWS NT 4.0 environment and communication to regional centres

Regional Centre 1

- Communication to interregional centre
- Regional monitoring and control software and databases
- Communication to lights

Communication controller

Regional Centre n

- Communication to interregional centre
- Regional monitoring and control software and databases
- Communication to lights

Local area network LAN

Flasher(s)

GPS locator

Measurement instruments

Battery charger(s)

Batteries and energy sources

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The purpose of the E002 is to monitor and control a smaller number (up to 50) of lights distributed over a territory, not divided into the regions. Each light is equipped additionally with the communication controller for the monitoring purposes.

For the monitoring and control of the lights there is a Monitoring and Control Centre (Regional Centre) consisting of a computer, telecommunication modems and, of communication, monitoring and control software and database. All lights are connected with the Monitoring and Control Centre via communication channels.
Regional control centre E741 is a set of computer hard- and software which is constituting the working environment of a regional service centre. The main task of the regional centre is to keep the personnel of the service centre informed about the actual state of the lights and, to inform the vessel traffic services about all abnormalities and failures in the functioning of the aids to navigation.

**Features**

- Monitoring and control of all lights within the service region
- Automatic operation i.e. there is no need for operator attendance
- Reception, processing and storage of emergency messages
- Receiving of messages about the times of daily switching ON and OFF events of the lights dictated by the photosensor
- Sending to the main control and monitoring centre of:
  - Emergency messages
  - Times of daily switching ON and OFF events of the lights
  - Reports of the actual state of the lights
  - Daily summaries of the region
  - Changes of the specification of the lights

- Receiving from the main control and monitoring centre messages about the changes of the characteristics of lights
- Management of the service of lights
- Sending information inquiries and commands to the lights
- Storage in the database of:
  - Emergency messages
  - Actual states of equipment units of the lights
  - Installation data of the lights
  - Communication schedules of the lights
- Based on data stored in the data base it is possible to analyze the functional efficiency (reliability) of the lights
- Receiving and storing of data of the telemetry equipment if such is installed in the lights
- Additionally, there is a possibility to monitor equipment units, not included with the system of lights

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E601 is a set of equipment units enclosed within a stainless steel cabinet and performing all functions needed for the automated control of a lighthouse or beacon and, for the communication with the remote monitoring and control centre. The actual configuration of the system is to be specified by the customer, as a rule. It is designed for the long-term operation in field conditions.

**System components**

- Flasher E863 (main, reserve unit optional)
- GPS locator E934 (main, reserve unit optional)
- Communication controller E924
- Battery charger E1401 or E1402 (main, reserve unit optional)
- Internal and/or external accumulator batteries
- Solar panels and/or wind generators
- Mobile phone aerial
- System accessories - fuses, protection and line input modules, contact sensors

The flasher, the GPS controller and the communication controller are connected by the internal local area network LAN. The initial system setup is accomplished using the service computer connected to the system LAN.

**Features**

- Flashing control of the lantern
- Data exchange with the remote monitoring and control centre
- Daylight control of the flashing and immediate sending of the ON/OFF switching times to the monitoring and control centre and to the VTS
- Synchronization of flashing by the GPS signals with a given time delay
- Sending timing signals to the internal units, connected by the LAN
- Internal diagnostics of the system components, testing of power supply voltages and sending warning or emergency messages to the monitoring and control centre, if necessary
- Automatic switching over from the main units to the reserve units in case of failures
- Remote setting up of the system from the monitoring and control centre
- Holding phone conversations while servicing by the means of an auxiliary handset
Specifications

**Input voltages**  
180 to 260 V, 50 Hz AC or  
12 to 30 V DC

**Power consumption**  
300 W max

**Internal batteries**  
2 batteries 12 V, 150 Ah

**Alternative energy sources**  
solar panels, wind generators

**Power of the lantern**  
100 W max

**Communication media**  
GSM-900 or NMT-450 mobile and public switched telephone network

**Internal local area network**  
Abus, 9600 bps, maximum distance 1.2 km

**Ambient air temperature**  
from -30°C to +55°C**, mobile phone communication guaranteed by the temperatures above -25°C (IEC 60068-2-1,2,14)

**Relative humidity**  
up to 98% at temperature +35°C (IEC 60068-2-3)

**Operation in salt mist conditions allowed**  
IEC 60068-2-11

**Dimensions**  
530x980x408 mm

**Weight**  
980

*) for more detailed specifications see prospects of the system components  
**) the temperature range can be optionally enhanced

The cabinet of the system standing on a frame
E602 is a set of equipment units enclosed into a stainless steel cabinet, performing all functions needed for the automated control of a high power lighthouse and for communication with the remote monitoring and control centre. The set consists of main system for the control of lanterns of up to 1000 W power and of reserve (secondary) system E601 for the control of reserve lantern up to 100 W power. The actual configuration of the system is to be specified by the customer. It is designed for the long-term operation in field conditions.

**Features**

- Flashing control of the main and reserve lanterns
- Control of the lampchanger
- Data exchange with the remote monitoring and control centre
- Daylight control of the flashing and immediate sending of the ON/OFF switching times to the monitoring and control centre and to the VTS
- Synchronisation of flashing by the GPS signals with a given time delay
- Sending timing signals to the internal units, connected by the local area network
- Internal diagnostics of the system components and testing of the power supply voltages, and sending warning or emergency messages to the monitoring and control centre, if necessary
- Automatic switching over from the main system to the reserve system E601 in case of failures
- Control of power the supply units and optimal charging of batteries
- Analysing of the state of 220 V mains and giving warning messages to the remote monitoring and control centre when the voltage is less than 150 V or greater than 270 V
- Automatic switching over to the accumulator batteries and, if needed, to the reserve Diesel-Generator Station E179 in case of failure of mains supply
- Remote setting up of the system from the monitoring and control centre
### Main system components
- Power converter 220 V AC/140 V DC E174
- 1000 W flasher E175
- Power contactor switch E176
- Diesel generator controller E177
- Diesel generator
- Interface converter RS232/Echelon E401 (LAN gateways)
- Cabinet “Braidos”

### Reserve system E601 components
- Flasher E863.1
- Communication controller E924 or E9202
- GPS locator E934

### Input voltage
- 220 V 50 Hz AC

### Power consumption
- 1.5 kW

### Power of the Diesel-Generator
- 2.6 kVA, suitable type YANMAR YDG3700

### Voltage of the main lantern
- 110 V or 120 V DC

### Power of the lantern
- 500 W or 1000 W

### External batteries main
- 120/132 V, charging current 10 A max.

### Communication media
- GSM-900, NMT-450 or public switched telephone network
- Echelon LON, 78 kbps
- Abus, 9600 bps

### Internal local area network
- Echelon LON, 78 kbps

### Temperature range
- -30°C to +55°C**, mobile phone communication guaranteed by the temperature
- -25°C or higher (IEC 60068-2-1,2,14)

### Relative humidity
- max 98% at +35°C (IEC 60068-2-3)

### Sea fog
- IEC 68-2-11

### Dimensions
- 580x980x408 mm

### Weight
- depends on the specification

*) for more detailed specifications see prospects of the system components
***) the temperature interval can be optionally extended
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Buoy Control System
E603

E603 is a set of equipment units enclosed within a hermetic case, and performing all functions needed for the automatic control of a floating buoy or other smaller light and for the communication with the remote monitoring and control centre. Also the self-detection of buoy drift and synchronisation of flashing by the GPS signals can be performed. It is designed for the long-term operation in field conditions but without direct contact with the sea water and ice. The case is filled with nitrogen gas.

System components
- Flasher E862
- GPS locator E931
- Communication controller E923 (NMT-450) or E925 (GSM-900)
- LED lantern (E846, E847, E848 or E849) or filament lamp lantern
- Mobile phone antenna

The flasher, the GPS locator and the communication controller are connected by the internal local area network LAN.

Setting up of the system is accomplished using a service computer.

Features

- Flashing control of the lantern
- Data exchange with the remote monitoring and control centre
- Daylight control of the flashing and immediate sending of the ON/OFF switching times to the monitoring and control centre and to the VTS
- Synchronisation of flashing by the GPS signals with a given time delay
- Buoy drift detection based on the GPS signals and sending of warning messages to the monitoring and control centre
- Sending timing signals to the internal units, connected by the LAN
- Internal diagnostics of the system components, testing of the power supply voltages, and sending warning or emergency messages to the monitoring and control centre, if necessary
- Remote setting up of the system from the monitoring and control centre

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**Input voltages**
11 - 20 V, DC

**Current consumption**
- E923 (NMT-450)
  - during stand-by mode: 5 mA (no flash)
  - receiver of mobile phone ON: 200 mA (no flash)
  - transceiver of mobile phone ON: 1.6 A (no flash)
  - in flash: 0.3 A (mobile phone stand-by)
- E925 (GSM-900)
  - during stand-by mode: 1.5 mA
  - receiver of mobile phone ON: 50 mA
  - transceiver of mobile phone ON: 250 mA

**Light intensity of LED lantern**
>15 Cd

**Vertical divergence 20°/10°**
>20 degrees

**Colour of LED lantern**
red, green, white, amber

**Filament lamp lantern**
10.3 V, 20 W max, optionally 40-100 W by special order

**Local area network**
Abus 9600 bps

**Temperature range**
-30°C to +55°C*, mobile phone communication guaranteed by the temperature above -20°C

**Relative humidity (IEC 60068-2-3)**
max 98% at +35°C

**Dimensions**
diameter 304 mm, height 562 mm (LED), 621 mm (filament lamp lantern)

**Weight**
11.8 kg

*) the temperature interval can be optionally extended
Service program Lanserv Plus

Many parameters and features of the microprocessor controlled devices of EKTA are programmable by the individual, installing and/or servicing the systems. For doing this, a personal computer and a dedicated service program, called Lanserv Plus are needed. Lanserv Plus is executable on any PC-compatible computer, running under the operating system MS Windows 95 or 98.

Features

Main initial set-up of devices

- local LAN addresses
- flashing characters
- normal, warning and emergency voltage levels of power supplies
- photo sensor switching levels
- nominal voltage level of lamps or LEDs
- dial-up phone numbers
- lampchanger settings
- time schedule of communication with the control and monitoring centre
- synchronizing parameters of leading lights

Servicing the working system

- scanning the devices, connected to the local area network of the system in order to check the system integrity
- reading and checking the initial settings of devices
- changing the settings of devices, if needed
- reading status information of devices
- reading and analyzing errors of devices
- reading statistics

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Screenshot of system scan results
System requirements

- a PC-compatible computer (desktop or laptop)
- at least 16 MB of RAM
- ports: 1 serial port, 1 parallel port
- at least 20 MB of free disk space
- operating system MS Windows95 or 98

Supported devices

- of the system E601, E603
  - flashers: E82061, E862, E863, E864
  - communication controllers: E9202, E923, E924, E925
  - GPS controllers: E931, E934
  - measurement modules E304, E304.1
- of the system E602
  - flasher: E175
  - AC/AD converter E174
  - Diesel generator controller E177
  - International lantern TRB-400 (Tideland)

Connection the PC to the devices

- of the system E601, E603
  - using LAN adapter type E814 (RS485)
- of the system E602
  - using LAN converter type E401 (Echelon)

Security

- provided by usernames and passwords to be entered on program entry

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Connecting the service PC to the devices