H1500 Indicator Panel

The SELCO H1500 is a versatile microprocessor based indicator panel to be used in systems with the SELCO H0300 Event Logger and SELCO alarm annunciators or in PLC systems.

- Simplifies indications in control panels and switchboards
- Complete unit for flush mounting in standard instrument size 144 x 96mm
- 18 programmable LEDs
- The blank legend card can be typed or printed to suit. A Word template is provided
- RS485 interface for field-bus communication
- Standard MODBUS-RTU protocol
- Multiple units can be connected to the bus
- Cable length up to 1000 metres on the bus
- Ambient temperature range: -20 to +70°C
- Vibration test up to 4g according to IEC 60068-2-64
- Certified by major marine classification societies

Application

The H1500 Indicator Panel provides an easy and cost effective solution for clear indications at local or remote locations of PLC registers or alarms.

In comparison with traditional SELCO indicator panels, the H1500 does not have any direct connections to potential free contacts. Instead it is equipped with a connection to a serial communication bus with only 2 wires.

Communication with the units takes place on the common 2-wire RS485 bus. The communication protocol is the MODBUS RTU. Multiple H1500 units can be connected to a common RS485 bus. Maximum length of the RS485 bus cable is approximately 1000 metres.

The LEDs can be programmed, via the bus, to perform quick flashing, slow flashing, short flash pulses, and steady light or off state.
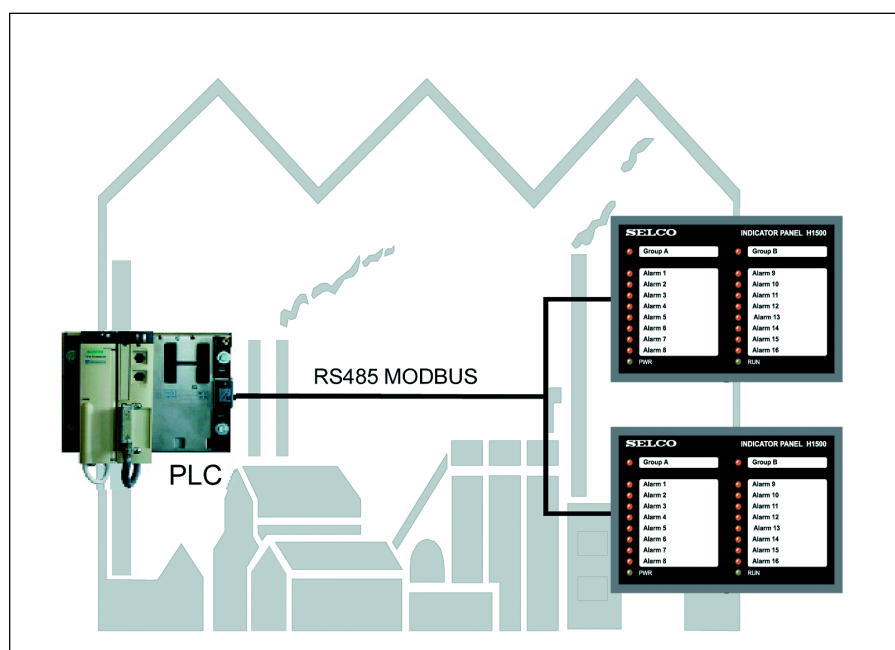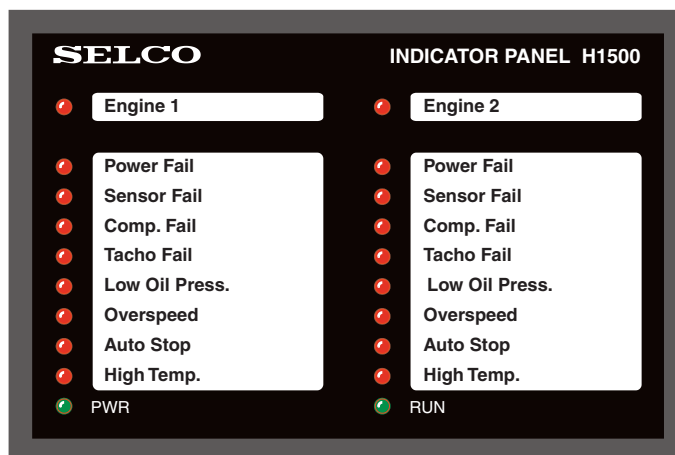

Fig. 1. Communication with a PLC.

When used in alarm systems, a quick flashing LED will typically indicate first new alarm. Slow flashing LEDs will indicate the following new alarms. Short flash pulses will indicate cable error. Steady light will indicate acknowledged alarms, and off state will indicate normal state.

The H1500 also has commands for reset of all LEDs, lamp test and the LEDs can be dimmed from 0 to 100%. This feature is particularly useful in ship applications where the panels are placed on the bridge.
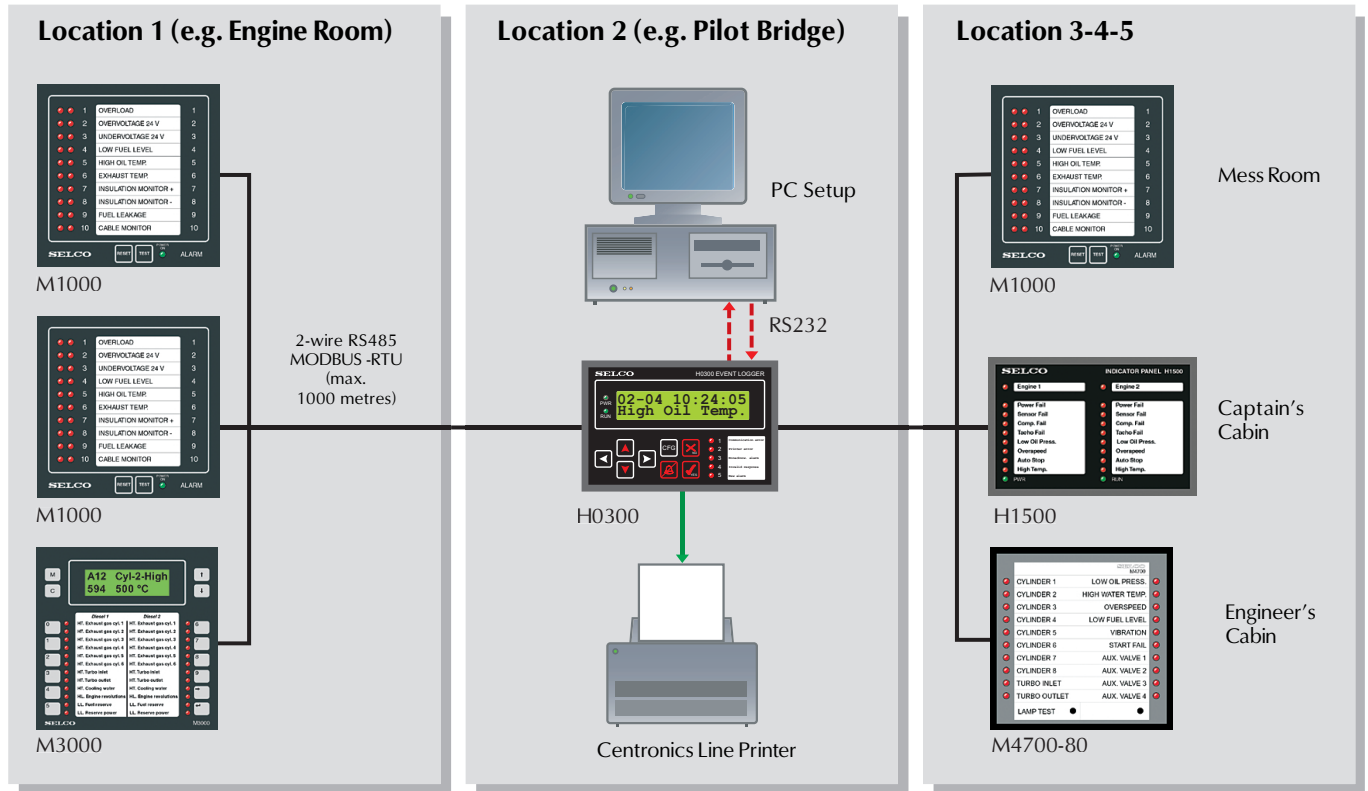
Location 1 (e.g. Engine Room)

M1000

M1000

A12 Cyl-2-High
594 500 °C

M3000

Location 2 (e.g. Pilot Bridge)

PC Setup

RS232

02-04 10:24:05
High Oil Temp.

H0300

Centronics Line Printer

2-wire RS485
MODBUS -RTU
(max.
1000 metres)

Location 3-4-5

M1000

Mess Room

H1500

Captain's
Cabin

Engineer's
Cabin

M4700-80

Fig. 2. Event Logging.

Function

H1500 has 18 programmable LEDs on the front and two additional ones: "PWR" to indicate that power is on and "RUN" to indicate communication with the unit.

A text description for the LEDs can be printed on a paper label, which slides in from the bottom. SELCO provides a Word template.

Connections for the power supply (24V DC), the inputs and the RS485 interface are done on the rear panel. The cable length on the bus can be up to 1000 metres.

Fig. 3. H1500 Rear Side.

On the rear panel are also two rotary dials for selecting the baud rate used for communication on the RS485 bus. The available baud rates are 1200, 2400, 4800, 9600, 19200 or 38400. Furthermore, these dials are used for setting the unit's device address, to be used when communicating on the bus.

Event Logger H0300

The SELCO H0300 Event Logger can log alarms and events from multiple SELCO alarm annunciators and indicator panels, connected to a common 2-wire 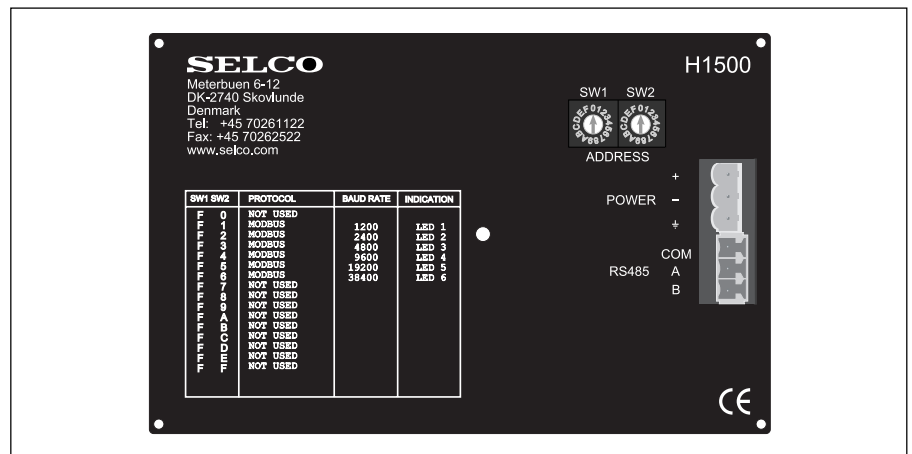RS485 bus. The H0300 can survey and log events from up to 63 units. The maximum cable length of the RS485 bus cable is approximately 1000 metres.

All events from the alarm and indicator units are logged together with the related date and time. The latest 32 events are stored in the internal memory of the H0300. A standard Centronics printer can be connected directly to the H0300 in order to provide a hardcopy log.

The H0300 has a built-in siren relay. Alarms and events can be acknowledged at the front panel keyboard.

The H0300 can also be configured to act as an event repeater. It can transfer LED indications from one unit to another through the RS485 bus cable. Multiple relations between source units / LEDs and destination units / LEDs can be defined.

The application shown in fig. 2 describes such a system. Alarms from the Engine Room are repeated on the Bridge, in the Mess Room and in the Engineer's Cabin.

Configuration can be done through the built-in RS232 interface using a standard PC with an ANSI / VT100 terminal.

MODBUS Protocol

The MODBUS protocol is a common and widely used protocol for communication on various types of networks.

The following MODBUS functions are available on the H1500 (hex):

Read bit   : 01 & 02
Read words   : 03 & 04
Write bit   : 05
Write word   : 06
Quick-read 8 bits : 07
Write words   : 10

The read functions can be used from the PLC, for instance, to read the state of one or more LEDs, and the write functions can be used to set the state of one or more LEDs.

After specifying the function, the data bytes should be specified. The first data bytes specify, for instance, the LEDs in question to read or to set or perhaps whether to perform an LED test.

Some of these data bytes specify the following (hex):

0001   State of LED 1
0002   State of LED 2

0009   State of LED 9
000A   State of LED 10

0013   State of LED 19
0014   State of LED 20

Additional data bytes specify e.g. the LED states (hex):

0000   Off
0001   Steady light
0002   Short flash pulses
0003   Quick flash
0004   Slow flash

If an error occurs, the H1500 will respond with the following error codes (hex):

01   Unknown function
02   Illegal data address

A detailed description of the MODBUS protocol can be downloaded from the SELCO web site at www.selco.com.
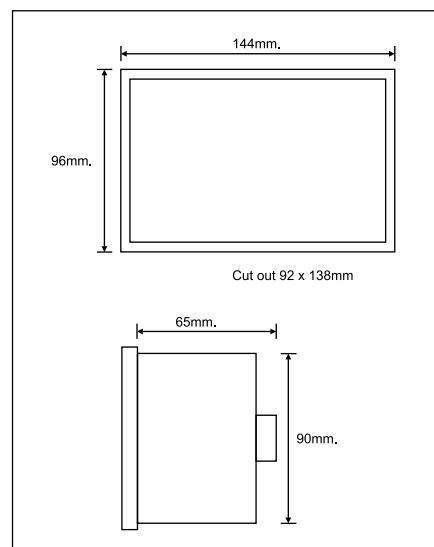

Fig. 4. Dimensions.

Specifications

H1500 Indicator Panel

Type Approvals and Certificates

The H1500 has been designed and tested for use in harsh environments. The unit is based on standard components, providing long term durability.

The H1500 carries the CE label and has been approved by the following marine classification societies:

Bureau Veritas
Russian Maritime Register of Shipping

Voltage supply	10V - 30V DC
Consumption	Max. 3W (100mA at 24V DC)
LEDs	18 programmable and 2 for system information
LED flash frequency	Slow flashing light: 1.25Hz ±10% Quick flashing light: 5 Hz ±10%
Communication	RS485 interface
Cable length on the bus	Max. 1000 metres
Protocol	MODBUS-RTU
Baud rate	1200, 2400, 4800, 9600, 19200, 38400
Parity	None
Data bits	8
Stop bits	1
Operating temperature	-20 to +70°C
Vibration test	4g RMS according to IEC 60068-2-64
EMC	CE according to EN50081-1, EN50082-1, EN50081-2, EN50082-2
Marine requirements	IACS E10:1997, EN60945:1997
Approvals	Certified by major marine classification societies
Burn-in	50 hours before final test
Weight	0.4kg
Dimensions	96 x 144 x 70mm (H x W x D)
Panel cut out	92 x 138mm
Protection degree at front	IP52

The specifications are subject to change without notice.

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