



STEMOR

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TE/248/883995/15

Data:

Miejsce:



ADAP 2110/0018
PKN ISO 9001:2015



21/04/2021

Szczecin

Emergency telegraph Type: ST-ATM-1.A

1. Description.

ST-ATM-1.A Emergency Telegraph is a fully electronic device allowing engine order transfer between wheelhouse and engine room stations using only two-wire communication cables. ST-ATM-1.A complies fully with SOLAS requirements.

The unit is intended for flush mount in a 122mm x 122mm cutout. Front panel is made of polycarbonate, coated with UV cured protective paint and is reinforced with a 2mm thick aluminum frame. Bottom chassis is made from ABS plastic. Cable connectors are located on the back of the device.



Figure 1. Device front panel view

System operation is based on two identical units which are configured by using dip switches on the backplates. Bridge unit (master) may have additional output to VDR and dimmer unlocked. Units are designed to operate at 24VDC power supply within 7-40V range; however, should voltage drop below 16V audio and visual indication will be impaired. Fault relay and indication is enabled when any unit detects power failure, or does not receive a correct internal communication data frame.

Communication line inside the system is fully isolated which allows the units to be powered from different sources. RS485 using 9800bps is used to provide high resistance to external interference; all communication liners are surge protected.

2. Operation Principle.

Master unit periodically (100-250ms) broadcasts self-status to the slave unit which in turn decodes the transmission and sends back a response. The communication frame includes the position of transmitting device's selector position and fault/alarm status. Each unit compares own and received selector position, and when they do not match devices go into alarm mode in which the selector of slave unit flashes red at 100% brightness, alarm relay turns on, and audible alarm is sounded (if enabled). When operator moves selector knob to position at 6 or 12 o'clock, device will ignore these setting and use previous selector knob setting for signalization.

Each unit checks local supply voltage, and when it is out of range (less than 17V or more than 32V) fault status is enabled. When a unit does not receive any communication from the other one for 2 seconds fault status will also be enabled. This is indicated by blinking of central triangle



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(just above the selector) and sounding buzzer. Faults can be acknowledged, and buzzer silenced by any movement of the selector knob.

Master unit monitors local and remote selector positions, and upon change from previous position the unit reports the current position to VDR. The device will also report any detected fault, the confirmation of alarm and when faults are cleared.

Master unit is programmed with fully dimmed standby mode. In these mode backlight is turned off, and only triangle signalization above selector knob is lit according to dimmer setting. To enter standby, telegraph both master and slave need to be in 11 o'clock position. Then after 5s, on bridge unit operator can change selector knob to 12 o'clock position. These operation will not trigger alarm or send any VDR information. Any selector knob position change in master of slave unit will shut down standby and resume normal operation mode.

3. VDR communication sentence.

Standard NMEA 0183, RS422/485, 4800bps, 8bit, no parity check, 1 stop bit, no handshake

\$ ERTXT, EMERGENCY TELEGRAPH, XXXX, YYYY*hh<CR><LF>

\$ERTXT – Engine room monitoring system text message,

XXXX – text string with message type (see table 1)

YYYY – text string with order type (see table 2)

hh – checksum (“exclusive or” for all chars between \$ and * in hex)

VDR message type (XXXX)	Description
BRIDGE	Message refers to master unit (bridge)
ENGINE ROOM	Message refers to slave unit (engine room)
BRIDGE UNIT POWER FAILURE	Master unit power is out of safety range
INTERNAL COMMUNICATION FAILURE	Master unit cannot communicate with slave
ENGINE ROOM UNIT POWER FAILURE	Slave unit power is out of safety range
ENGINE ORDER NO ACK	Devices has different knob positions
SYSTEM POWER UP	Message send one time when power is connected
FAILURE CONFIRMED	Failure confirmed by operator
BRIDGE UNIT FAILURE CLEARED	Bridge unit power is out of safety range
E.R. UNIT POWER FAILURE CLEARED	Engine room return to safety range
INTERNAL COMMUNICATION FAILURE CLEARED	Communication between master and slave is restored

Table 1. VDR message type.

VDR order type (YYYY)	Description
STANDBY	Order standby
[AH] DEAD SLOW	Order ahead dead slow



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[AH] SLOW	Order ahead slow
[AH] HALF	Order ahead half
[AH] FULL	Order ahead full
[AS] FULL	Order astern full
[AS] HALF	Order astern half
[AS] SLOW	Order astern slow
[AS] DEAD SLOW	Order astern dead slow
END WITH ENIGNE	Order end with engine

Table 2. VDR order type.

4. Technical specification.

Mechanical specification:

- Height: 50mm
- Length: 144mm
- Width: 144mm
- Mount: Flush mount, 122x122mm rectangular hole, screw 132x132mm
- Ingress protection: Front IP42, back IP20
- Front Panel: Stemor can supply any language and description required front panel, in these documentation is exempld polish version.
- Safe compass distance: 1.2m

Electrical:

- Supply voltage: 24V DC (17V-34VDC) protected against reversed polarity
- Maximal current: 300mA
- Internal protection: 500mA, resettable fuse
- Dimmer: 2%-100% (32 stages)

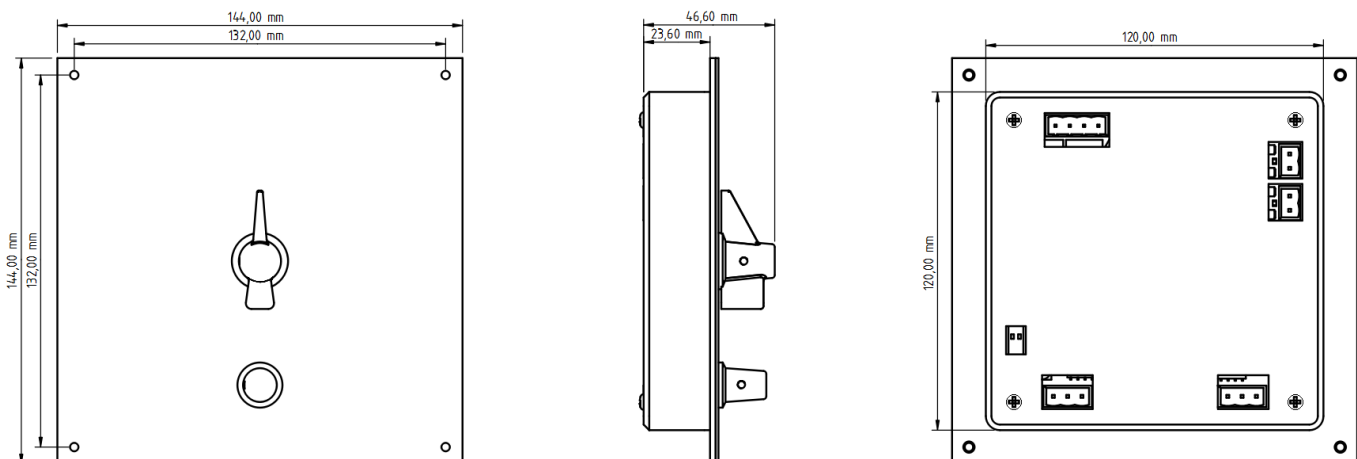


Figure 2: Mechanical dimensions.



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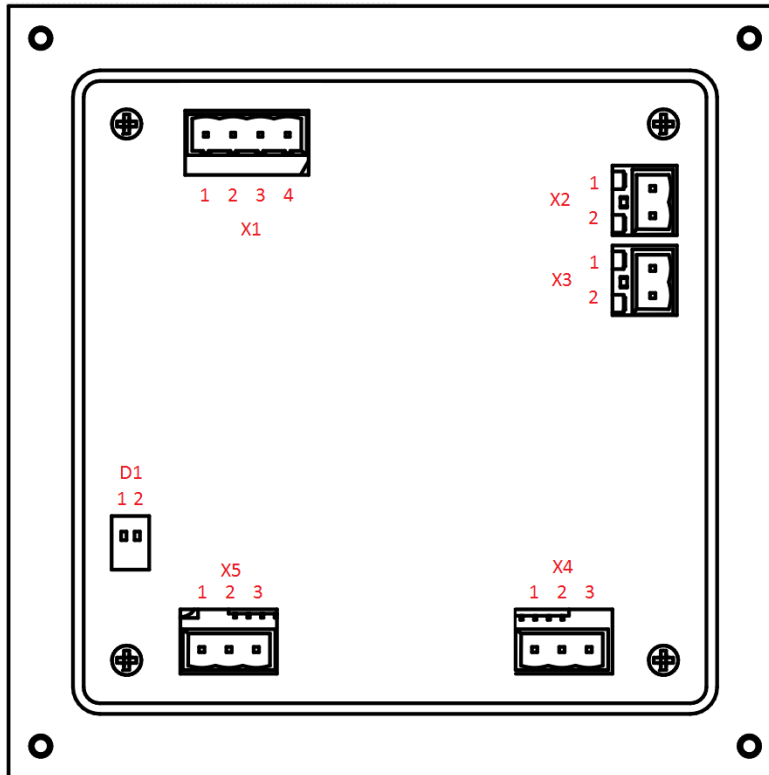


Figure 3 Connectors, pluggable terminal block 5.08mm pitch.

Connector	Pin	Description
X1	1	Power supply +24V (interconnected with pin 2)
	2	Power supply +24V (interconnected with pin 1)
	3	Power supply Ground (interconnected with pin 4)
	4	Power supply Ground (interconnected with pin 3)
X2	1	VDR data line B
	2	VDR data line A
X3	1	System internal communication (master-slave) line B
	2	System internal communication (master-slave) line A
X4	1	Fault relay NO
	2	Fault relay NC
	3	Fault relay COM
X5	1	Alarm relay NO
	2	Alarm relay NC
	3	Alarm relay COM
D1	1	Internal buzzer On/Off
	2	Master slave setting. (master On, slave Off)

Table 4 Connections description.



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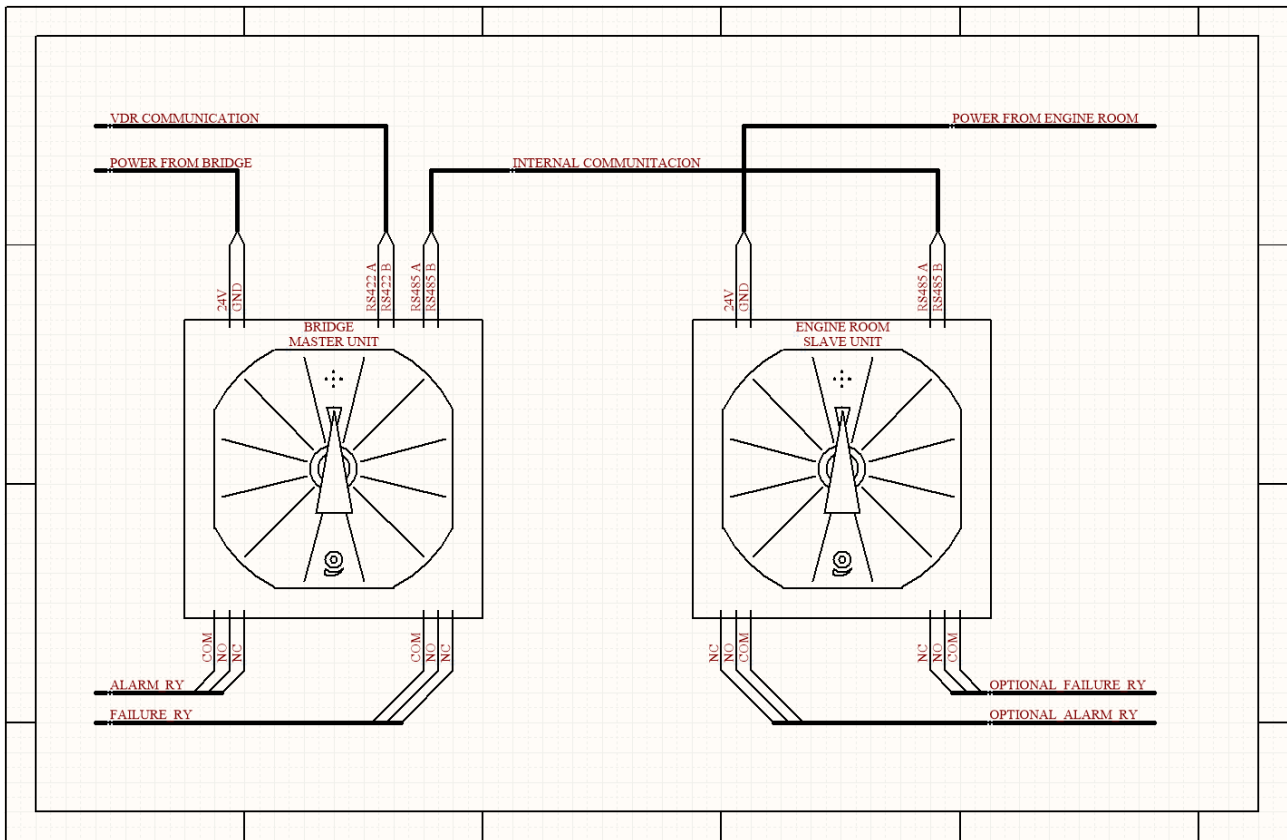


Figure 5: Emergency telegraph system electrical connection.

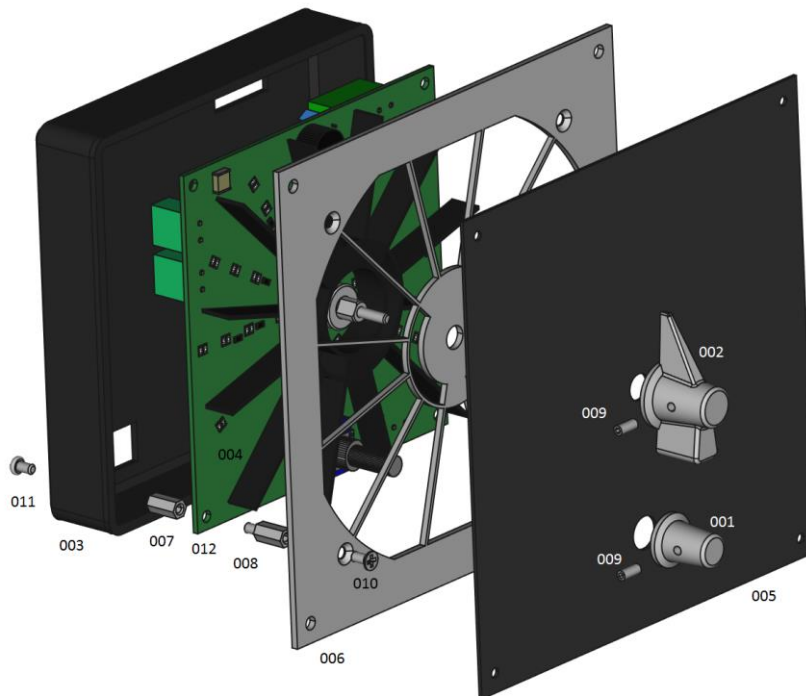


Figure 6 Exploded view 3d model.



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Part No.	Quantity	Description	Material
001	1	Dimmer knob	PET-G
002	1	Selector knob	PET-G
003	1	Back cover	PET-G
004	1	Light sector cover	PET-G
005	1	Front panel	Polycarbonate
006	1	Front construction frame	Aluminum
007	4	Spacer sleeve M3 IT/IT 10mm	Brass
008	4	Spacer sleeve M3 IT/ET 10mm	Brass
009	2	No head screw M3x6mm sharp top	Steel
010	4	Screw, countersunk head M3x6, PH1	Steel
011	4	Screw, cylindrical head M3x6, PH1	Steel
012	1	PCB: ST-ATM-1A	FR4

Table 4 Part list.

Device meets all requirements for ship equipment and is fully comply with:

- *PN-EN-61000-4-2:2011*
- *PN-EN-61000-4-3:2007 +A1:2008 +IS1:2009 +A2:2011*
- *PN-EN-61000-4-4:2013-05*
- *PN-EN-61000-4-5:2014-10 +A1:2018-01*
- *PN-EN-61000-4-6:2014-04*
- *PN-EN-60068-2-1:2009*
- *PN-EN-60068-2-2:2009*
- *PN-EN-60068-2-6:2008*
- *PN-EN-60068-2-30:2008*
- *PN-EN-60945:2004*
- *CISPR 16-2-3*
- *CISPR 16-2-1*
- *PRS: PUBLICATION NR11/P:2016*

Circuit schematic: Appendix 1 ST-ATM-1.2 Schematic

PCB layout: Appendix 2 ST-ATM-1.2 PCB

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