EDIT ECO 8 ShaPoLi

The Initial IMO GHG Strategy

Initial IMO Strategy on Reduction of GHG emissions from ships (adopted on April 2018)

- ✓ The Initial IMO GHG Strategy including goals of reduction of GHG emissions from ships was adopted. It shall be reviewed every 5 years.
- ✓ First effort aimed at the GHG zero emissions from global sector without distinction between developed countries and developing countries.

Levels of ambition of the Initial Strategy

1. **Vision (Final target)**
   - Final target: GHG zero emissions at earliest in this century.

2. **Levels of ambition**
   - Target of transportation efficiency (CO2 emissions per transport work) compared to 2008;
     At least 40% improvement by 2030, 70% improvement by 2050.

   - Target of total annual GHG emissions compared to 2008;
     At least 50% reduction by 2050, effort for zero emissions at earliest in this century.

Short-term measures to achieve the IMO 2030 targets

MEPC 76 (June 2021)

- The amendments to MARPOL Annex VI (MEPC.328(76)) were adopted at MEPC 76.

Technical approach (EEXI)

- Introduce the Energy Efficiency.
- Existing Ship Index (EEXI) as the energy efficiency index for existing ship.
- The required EEXI is almost the same level as required EEDI for new ships as of 2023.

Operational approach (CII rating)

- Ship is rated on a scale of A to E based on the.
- Annual operational carbon intensity indicator(CII).
- A ship rated D for three consecutive years, or E, would have to submit a corrective action plan.

Outlines of the EEXI regulation

✓ Attained EEXI

EEXI value is calculated by an individual ship.

✓ Required EEXI

Required EEXI is specified for each ship type and size.

For ships with a certain size of specified ship type, ***Attained EEXI ≦ Required EEXI***

EEXI requirements shall apply to all ships of 400 GT and above which are engaged in the international voyages regardless of ship's delivery date, except the following ships as with the case of EEDI:

- Ships not propelled by mechanical means.
- Platforms including FPSOs and FSUs and Drilling rigs, regardless of their propulsion.
- Category A ships as defined in the Polar code.
- Ships which have non-conventional propulsion such as diesel electric, turbine or hybrid propulsion system (except LNG carrier and cruise passenger ship).

June 2021 IMO adopts changes to Marpol Annex VI

- Regulations 23 & 25.
- The Energy Efficiency Existing Ship Index (EEXI).
- Compliance to be demonstrated before Dec 31st, 2023.
- Existing ships need to calculate EEXI score.
- If attained score meets required score no action.
- If not, then they must reduce power on main engine.
- Two Methods:
  1. EPL – Engine Power Limitation
  2. ShaPoLi – Shaft Power limitation
- ShaPoLi requires input to the engine control system or CCP control system.

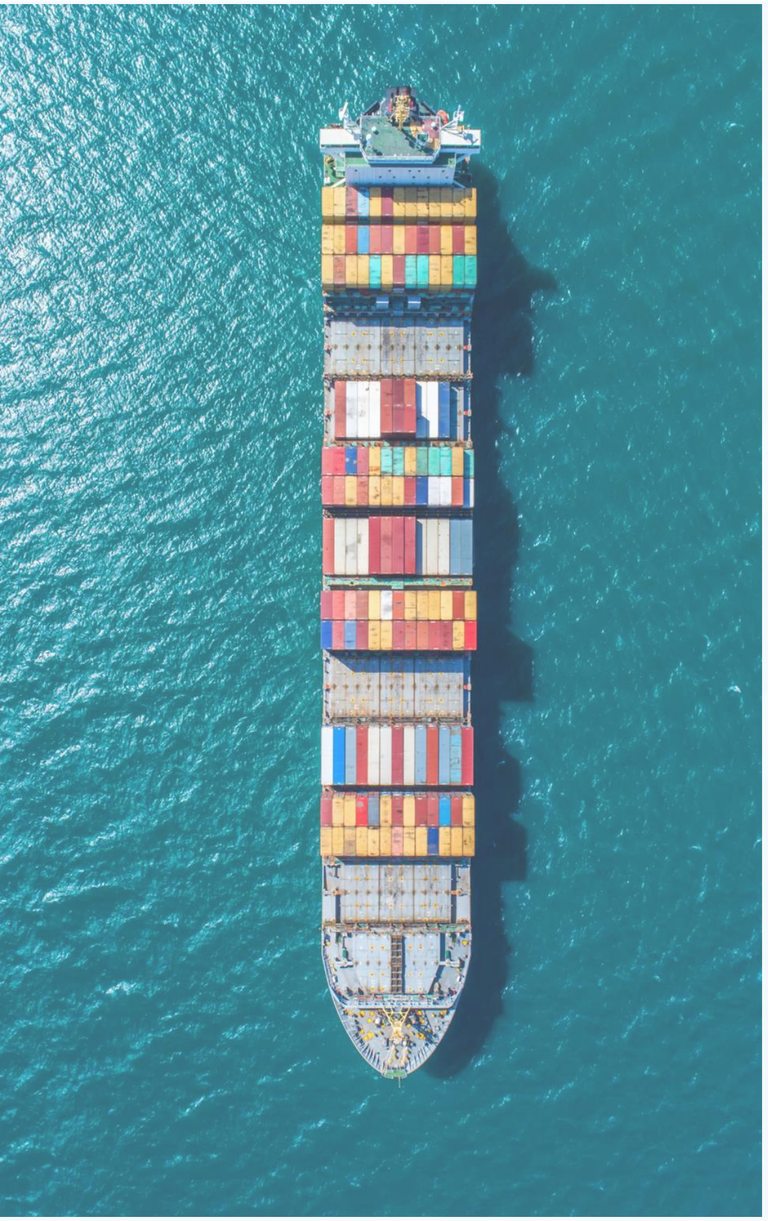
June 2022 IACS submit to the MEPC Committee implementation guidelines for EEXI

- The interpretation of ShaPoLi has changed (section 6.6)*.
- No requirement to connect to engine control system or CPP control system.
- Can be an independent system.
- Simple Alarming on the Bridge to be provided.
- Alarm should indicate when the allowable limited power level has been exceeded.
- Ships Master or OOW can manually throttle back on power.
- Data needs to be recorded and stored.
- Password protected override facility for emergencies.

Because of this change in interpretation the ShaPoLi method has become a preferred choice for EEXI compliance over the EPL method.

There is no requirement for Type Approval. Ship by ship Class Approval is accepted

EDIT ECO 8 ShaPoLi



What is EDIT ECO 8 ShaPoLi?

EDIT ECO 8 ShaPoLi system is an instrument that:

1. measures
2. monitoring
3. recording

the actual shaft power, activating an alarm when the shaft power is exceeding the EEXI power limit in order to be reduced (manually) at the maximum allowed to meet vessel's required EEXI.

Signals are transferred from the installed torque meter to the input signal module of EDIT ECO 8 ShaPoLi and all recording measurements.

EDIT ECO 8 ShaPoLi is provided with:

a. a 3.5" LCD monitor (EDIT 99) or
b. a 5.7" LCD monitor (EDIT 141)

When the shaft power in above vessel's EEXI limit, an audio & visual alarm will occur to warn Master that it has reached the power limit. EEXI limitation visual is always on, even on override button is pressed, until vessel's power is below the EEXI limit.

Override Function: Enables the user to operate propeller above shaft power limit to handle a situation like bad weather condition, piracy, M.O.B. etc.

EDIT ECO 8 ShaPoLi features

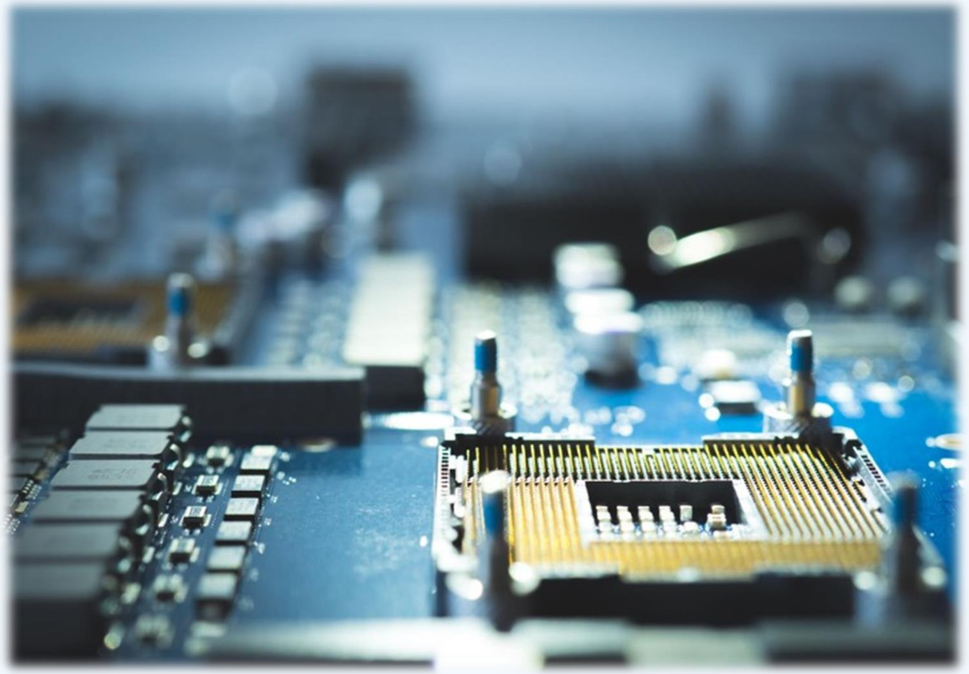
- Shaft Power measurement (monitoring & recording)
- Compatible with almost all torque meter’s makers
- **Extra connections for future systems like flowmeter, draught sensors, thermometer (i.e., exhaust temperature, under pistons temperature), wind sensors, speed etc.**
- Isolated universal inputs and outputs
- Ethernet, RS485, RS232, USB HOST NMEA
- Limit Exceedance PRE-Alarming
- Data Collection over 3 years
- Digital output for AMS
- Digital output for S-VDR
- Override protected by password
- Automatic Event Logging (starting and sending)
- Each Unit / system has each unique “LICENCE KEY’’ for multilevel Access
- Customize Monitoring systems
- Isolated GPS (Optional)

Advantages of ECO 8 ShaPoLi

- ✓ It’s more cost-effective compliance method/solution than EPL method.
- ✓ Easy to install (no off-hire time).
- ✓ The engine is not permanently limited with ShaPoLi, so ship has more flexibility.
- ✓ The ship gets a shaft power meter that provides some value. Torque meter can be connected to a Ship Performance Monitoring system and in the future used for CII calculations.
- ✓ Fuel flow meters and other 3rd party equipment (draft sensors, thermometer, wind sensors etc.) can be connected to the EDIT ECO 8 ShaPoLi allowing for some performance monitoring.
- ✓ Fast preparation/readiness/dispatch time.
- ✓ If a ship has an existing shaft power meter, they can just add on the EDIT ECO 8 ShaPoLi for EEXI compliance.
- ✓ EPL method is not practical to use. The limiter on the governor has to be removed when override power is needed and then put back! May lead to delays in being able to access reserve power in an emergency.
- ✓ Equipment can be installed anywhere in the wheelhouse (no distance limitations for installation near to the standard/steering compass.
- ✓ Five (5) type approvals: ABS, BV, DNV, LLOYD’S, RINA.

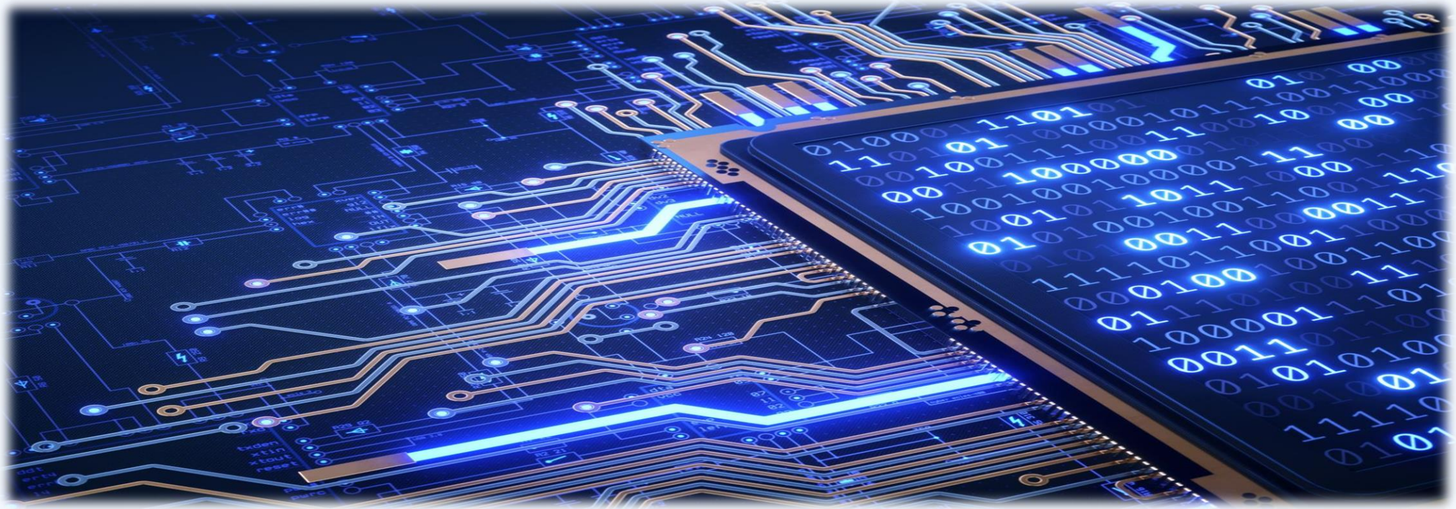
ECO8 ShaPoLi Data Storage

- The display computer has 4GB capacity to store data.
- Min 12 months storage capability (at 1sec sampling).
- Data sampling time can be adjusted.
- Data is automatically recorded when shaft speed above 10RPM.
- The computer records data continuously until speed drops below 10RPM.
- Data can be transferred via ethernet link or USB.



ECO8 ShaPoLi Data Viewing

- The stored data in the display computer can be viewed on a PC or laptop.
- An ethernet link is provided from the display computer.
- A Free of Charge (FOC) software is provided (DAQ Manager) that allows the data stored in the display computer to be viewed.
- Data is provided in spreadsheet and graph format as standard.
- Alarm events and use of override facility can be viewed, identifying when they started and finished.
- Reports can be produced in pdf format for the onboard management manual (OMM).
- In case of main alarm or override being used an auto-email can be sent to head office.



ECO8 ShaPoLi Data Viewing/Utilization

✓ Performance Monitoring

- If the 6-input display is used the data for the additional inputs will also be stored
- If fuel meters are connected, then power/fuel monitoring is possible
- If fuel meters and Speedlog are connected, and using the power readings then fuel, hull and ship efficiency calculations are possible using the data

✓ Will be a benefit for CII reporting in the future

- Data can be fed to a 3rd party ship performance monitoring software
- Remote access and download of data possible via ships network.

Type Approvals / Certificates

EDIT Automation, CERTIFIED based on the IACS Rec 172 EEXI regulations with which global shipping is required to comply with and come into force in 2023.

TYPE APPROVAL CERTIFICATE

1. ABS
2. BV
3. DNV
4. LLOYD'S REGISTER
5. RINA

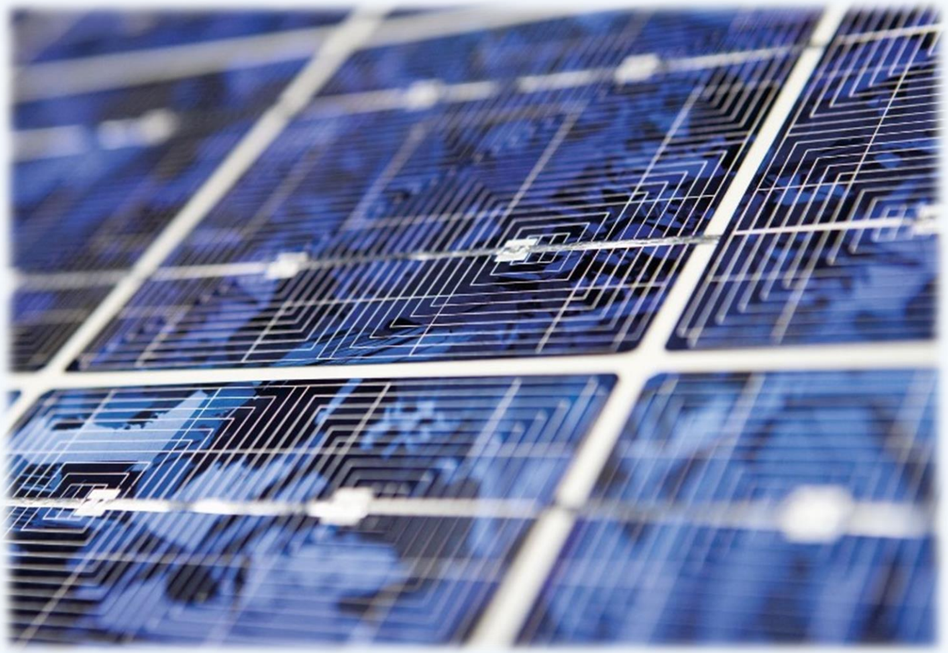
CERTIFIED ALSO FOR INSTALLATION & APPROVED OMM BOOK

6. Class NK
7. KOREAN REGISTER

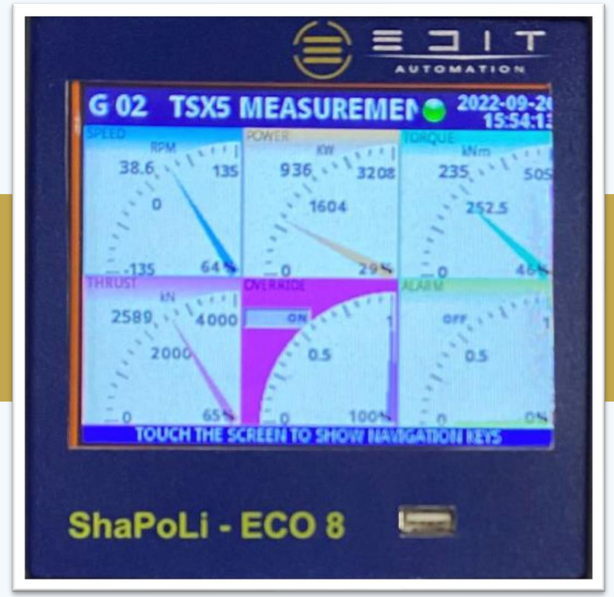
Bridge Installation

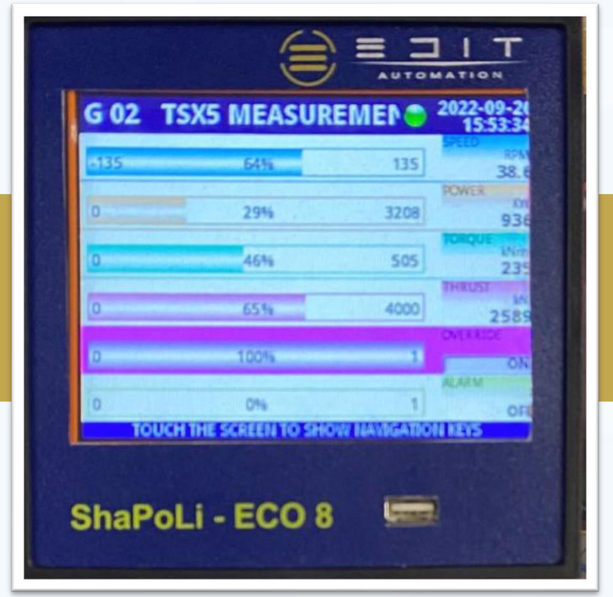
3 & 6 analogue input displays available:

- ✓ 3 have to be used for power, torque, shaft RPM.
- ✓ 3 are available for 3rd party equipment such as fuel flow meters, GPS, Speedlog.
- ✓ 4 outputs available -RS, NMEA, Ethernet.
- ✓ Provides pre-alarm at selected % of allowable power.
- ✓ Provides main alarm at max allowable power level.
- ✓ Pre alarm provides amber warning on screen.
- ✓ Main alarm provides red warning on screen.
- ✓ An audible buzzer sounds for both alarms.
- ✓ There is also a power failure audible alarm.
- ✓ Different display formats available.



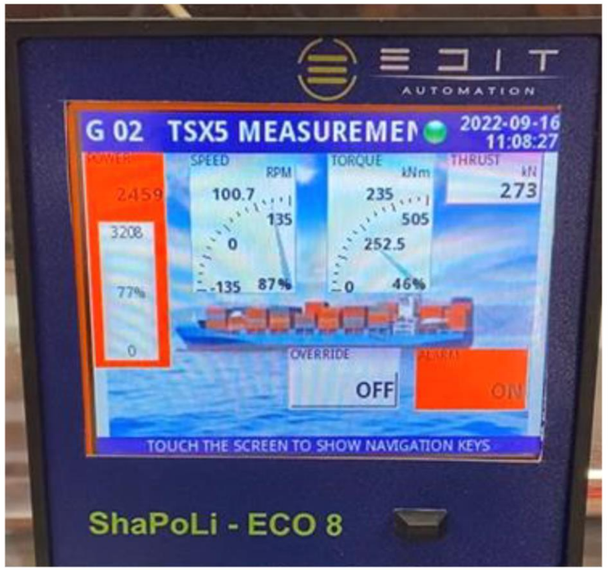
ECO8 ShaPoLi Displays





ECO8 ShaPoLi Displays

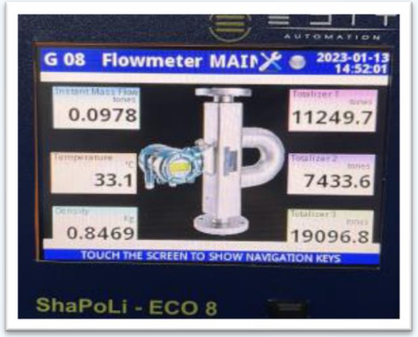
Main Alarm



Override Activation

Override Activation

Override Pasword



- ✓ Isolated universal inputs and outputs.
- ✓ Ethernet,RS485,RS232,USBHOSTNMEA.
- ✓ Data Collection over 3years.
- ✓ Analysis & Statistical diagram in real time.
- ✓ Override protected by password.
- ✓ Customize Monitoring systems.