



CERTIFICATE NUMBER	23-2365975-PDA
EFFECTIVE DATE	12-May-2023
EXPIRY DATE	11-May-2028
ABS TECHNICAL OFFICE	Houston ESD - Electrical

## CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

### **AXIOMATIC TECHNOLOGIES CORPORATION**

located at

**1445 COURTNEYPARK DRIVE E., , MISSISSAUGA, ON, Canada,  
L5T 2E3**

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

**Product:** Engine Monitoring System  
**Model:** DIO I/O, RTD8, TC20  
**Endorsements:**  
**Tier:** 2 - PDA Issued

This Product Design Assessment (PDA) Certificate remains valid until 11/May/2028 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

*Soheni Haque*

Soheni Haque,Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

## AXIOMATIC TECHNOLOGIES CORPORATION

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**Product:** Engine Monitoring System

**Model:** DIO I/O, RTD8, TC20

**Endorsements:**

### Intended Service:

Marine and Offshore Applications

Alarm & Monitoring System for Vessels with ACC, ACCU or ABCU Class notations.

### Description:

DIO I/O Module: Discrete I/O Control P/N: 234-0275, AXDIO128-03, 605-1984, AX031800, AX031801, AX031800-XX, CATAX031800

RTD8: RTD Temperature Scanner: P/N: 234-1645, 606-7496, AX180300, AX180300-XX, CATAX180300, AX180301

TC20: Thermocouple (TC) Temperature Scanner: P/N: 234-1644, 605-1986, AX185000, AX185000-XX, AX185001, CATAX185000, 1006454

### Rating:

DIO I/O:

Supply Voltage: 9 Vdc -32 Vdc(Nominal: 12 Vdc & 24 Vdc);

Up to 12 Inputs, 8 Outputs;

Operating Temperature: -40°C to 85°C ( -40°F TO 185°F);

Enclosure: IP 57

RTD8:

Supply Voltage: 9 Vdc -32 Vdc(Nominal: 12 Vdc & 24 Vdc);

Inrush current not to exceed 800 mA;

Up to 8 Channels;

Operating Temperature: -40°C to 85°C ( -40°F TO 185°F);

Enclosure: IP 57

TC20

Supply Voltage: 9 Vdc -32 Vdc(Nominal: 12 Vdc & 24 Vdc);

Up to 20 Channels;

Operating Temperature: -40°C to 85°C ( -40°F TO 185°F);

Enclosure: IP 57

### Service Restriction:

1. Unit Certification is not required for this product if certified as part of the main propulsion system and functional testing can be performed during engine shop testing.
2. The equipment is to be installed outside of rooms containing navigation and radio equipment, as it does not meet the "Bridge and Deck Zone" requirements for radiated and conducted emissions, and therefore may only be installed in the "General Power Distribution Zone" area.
3. Test and approval are for hardware only.

### Comments:

The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

### Notes/Drawing/Documentation:

Supporting Data from Previous Task T1700449:

1. User Manual UM2341645A, Resistive Temperature Detector (RTD) Module, Version 1.0.1A;
2. User Manual 2341644A, Thermocouple (TC) Module, Version 1.0.1A;

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3. User Manual 2340275, Discrete I/O (DIO) Module, Version 1.0.0;
  4. UL File E247103 dated 2012/03/20 - Models DIO, RTD8,TC20;
  5. 20 Channel Thermal Couple Schematic, Sht 4 of 14, dated 16 April 2012;
  6. Dwg No. 234-1644-06, Control AS ( Thermocouple Module);
  7. Dwg No. 234-1645-08, Control AS ( RTD Module),
  8. Dwg No. 234-0275-04, Control AS ( Discrete I/O Module)
  9. RTD Power Board, dated 28 MAY 2012, 5 sheets, Main, Power 1 & 2, Connector & Notes.
  10. Discrete I/O Module, dated 10 Feb 2012, 11 sheets, Main Block, Power Supplies 1 & 2, Connector Transformer Data, Microcontroller, Inputs, Can-Interface, RS232 Communication, Outputs, Connector & Notes.
  11. EC-29 Test Plan dated May 14, 2012
- Elite Engineering Test Report No: 1201612-01, EM Compatibility Tests for Thermocouple Units;  
Elite Engineering Test Report No: 1201612-02, EM Compatibility Tests for RTD Module;  
Elite Engineering Test Report No: 1201612-03, EM Compatibility Tests for Discrete I/O;  
Elite Engineering Test Report No: 1201614-01, Environmental Tests

#### Identifying Data: Task T2365975:

1. Elite Engineering Test Report No: 2203471-01 Rev. A, Electrical and Electromagnetic Compatibility Tests on an RTD Module Part No. CATAX180300 (606-7496) dated February 6 through 22, 2023;
2. Elite Engineering Test Report No. 2203471-02 Rev. A, Electrical and Electromagnetic Compatibility Tests on a Thermocouple Module Part No. CATAX185000 (605-1986-00) dated February 6 through 24, 2023;
3. Elite Engineering Test Report No. 2203471-03 Rev. A, Electrical and Electromagnetic Compatibility Tests on a Discrete I/O Module Part No. CATAX031800 (605-1984-00) dated February 6 through 22, 2023;
4. Elite Engineering Test Report No. 2203472-01, Environmental Tests on (3) Discrete I/O Modules, (3) Thermocouple Modules, and (3) RTD Modules dated February 6 through 18, 2023;
5. Environmental Testing performed at Axiomatic Technologies Corporation; CATAX185000-EC1 Test Report, CATAX180300-EC1 Test Report, CATAX031800-EC1 Test Report dated October 12,2022;
6. A sealing and humidity test was carried out by TUV in Ontario on the CATAX185000 (Caterpillar PN: 605-1986-XX) to represent all 3 modules- 7169010216-001, Test Report EC-1 Humidity & IPX7 Immersion dated October 12, 2022;
7. EMC Testing to EC42 was performed at Ultratech Laboratories in Oakville, ON Canada; 22ATC059\_EC-42 EMC (for CATAX185000 605-1986-XX), 22ATC074\_EC-42 EMC (for CATAX180300 606-7946-XX), 22ATC068\_EC42 (for CATAX031800 605-1984-XX) dated May 16, 2022;
8. EMC Testing to EC29 performed at Ultratech Laboratories; 22ATC080\_EC-29-R1 (for CATAX185000 (Caterpillar PN: 605-1986-XX), EC29 was not performed for CATAX180300 (Caterpillar PN: 606-7946-XX), 22ATC081\_EC-29 (for CATAX031800 605-1984-XX) dated November 30, 2022;
9. Dwg No. CATAX185000-MD-R7, Channel Thermocouple;
10. Dwg No. CATAX031800-MD-R3, DIO Module;
11. User Manual for Discrete I/O (DIO) Module;
12. UL Certificate No.E247103-Vol1-UL dated June 30, 2022

#### Terms of Validity:

This Product Design Assessment (PDA) Certificate remains valid until 11/May/2028 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

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**STANDARDS**

**ABS Rules:**

2023 Rules for Conditions of Classification, Part 1 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following:  
2023 Marine Vessels Rules: 4-9-3/Table 1 (Cat. II), 4-9-9/3 & 13.

2023 Rules for Conditions of Classification, Part 1 - Offshore Units and Structures: 1-1-4/9.7, 1-1-A2, 1-1-A3, which covers the following:

2023 Mobile Offshore Units Rules: 4-3-4/5

**National:**

SAE J1939 dated 01 June 2012

**International:**

E247103-Vol1-UL dated June 30, 2022, Standard for Controllers for Use in Power Production, CAN/ULC 6200, 1st edition.

**Government:**

N/A

**EUMED:**

N/A

**OTHERS:**

N/A