



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx ITA 12.0013X Issue No: 2 Certificate history:
Status: **Current** Issue No. 2 (2016-11-30)
Date of Issue: **2016-11-30** Issue No. 1 (2015-08-27)
Page 1 of 4 Issue No. 0 (2014-10-14)
Applicant: **IOT Group Australia Pty Ltd**
640 Karel Ave Jandakot,
Perth, Western Australia, 6164
Australia
Equipment: **Torque Turn Computers**
Optional accessory:
Type of Protection: **Ex px mb [ia]**
Marking: Ex px mb [ia] IIC T4

*Approved for issue on behalf of the IECEx
Certification Body:*

Ajay Maira

Position:

Certification Authority

*Signature:
(for printed version)*

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](#).

Certificate issued by:

TUV Rheinland Australia Pty. Ltd
1/30 Kennington Drive
Tomago NSW 2322
Australia





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Manufacturer: **IOT Group Australia Pty Ltd**
640 Karel Ave, Jandakot,
Perth, Western Australia, 6164
Australia

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEX Quality system requirements. This certificate is granted subject to the conditions as set out in IECEX Scheme Rules, IECEX 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Explosive atmospheres - Part 0: General requirements
Edition:6.0
IEC 60079-2 : 2007-02 Explosive Atmospheres - Part 2 Equipment protection by pressurized enclosure "p"
Edition:5

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

[AU/ITA/ExTR12.0021/00](#) [AU/ITA/ExTR12.0021/01](#) [AU/ITA/ExTR16.0021/00](#)

Quality Assessment Report:

[AU/ITA/QAR12.0001/02](#)



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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The TT2000/TT2100 Torque Turn Computers are stand-alone units designed for use in "Group II" hazardous areas employing the protection technique of air purging (Ex p), requiring only the application of power and air to achieve operational status.

See annex for further details.

SPECIFIC CONDITIONS OF USE: YES as shown below:

Refer to Annex for Conditions



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Refer to Annex

Annex:

[IECEX ITA 12.0013X_2 Annex.pdf](#)

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Description:

The TT2000/TT2100 Torque Turn Computers are stand-alone units designed for use in “Group II” hazardous areas employing the protection technique of air purging (Ex p), requiring only the application of power and air to achieve operational status. Primarily the computer is mounted on the casing/tubular tong situated on the drill deck of on-shore & off-shore drilling rigs (NB; the computers are not limited to this mounting configuration). The computer monitors the hydraulic pressure applied to the make-up and break-out of casings, tubulars, etc, along with minimal interaction from the tong operator, to limit the torque of said make-up or break-out to a pre-set torque limit and records said actions to an internal database for recollection and collation into a report detailing all joints in individual strings for quality assurance purposes.

The equipment comprises separately certified equipment:

Ex p controller, model ExPC	IECEX ITA 08.0016X	Ex mb [ia] I/IIC T4 (-20°C < Ta < +60°C)
Zener barrier model MTL 7787 for Strain Gauge connection	IECEX BAS 04.0025	Ex [ia Ga] IIC (-20°C < Ta < +60°C)
Proximity Detector Interface, model MTL5012 or MTL5513 for Proximity Sensor (Turns Counter) connection	IECEX BAS 05.0020 IECEX BAS 07.0066	[Ex ia] IIC (-20°C < Ta < +60°C)
Plug-in connector CEAG Type GHG 5718108R3001 for Dump Valve	IECEX BKI 06.0005X	Ex de IIC T6 (-55°C < Ta < +40°C)
Plug and socket device CEAG GHG 5117306R001 or equivalent for the mains connection	IECEX BKI 04.0002	Ex ed [ia] IIC T6 or T5 (-55°C < Ta < +55°C)

The rear panel of the Torque Turn Computer is fitted with the following:

- A small window to view status LEDs for the purge control
- Wireless network node
- Connectors:
 - Electrical connectors:
 - IS connector for turns counter (IS circuit from separately certified isolation barrier)
 - IS connector for strain gauge (IS circuit from separately certified zener barrier)
 - Ex de connector for dump valve (separately certified Ex de connector)
 - Integral power cable with Ex de connector fitted. (Separately certified Ex de connector)
 - Purge air inlet connector
 - Hydraulic pressure inlet connector
- Safety relief valve
- Ambient air pressure inlet and purge air outlet.
- Earth stud

A maintenance panel is fitted to the side of the enclosure.

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Conditions of Certification pertaining to Issue 0 of this Certificate:

The TT2000 and TT2100 shall always be installed with a pressure regulator fitted external to the enclosure on the protective air supply. This regulator is additional to the line regulator for the air supply. Both regulators are required and shall be set to a maximum of 15psi (105kPa).

In accordance with Clause 7.5 of IEC 60079-0, the value of capacitance of 92pF determined by test for the applied labels exceeds the values of Table 9 (in IEC 60079-0). This information is provided to allow the user to determine suitability in the specific application.

Conditions applicable to the Proximity Detector (Turns Counter) intrinsically safe connector:

$$U_o = 10.5V$$

$$I_o = 14mA$$

$$P_o = 37mW$$

$$C_i = 0$$

$$L_i = 0$$

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the hazardous area load connected must not exceed the following values:

Group	Capacitance (μF)	Inductance (mH) or	L/R Ratio ($\mu H/\Omega$)
IIC	2.41	175	983
IIB	16.8	680	1333
IIA	75	1000	1333

Notes:

- The above load parameters apply when one of the two conditions below is given:
 - the total L_i of the external circuit (excluding the cable) is less than 1% of the L_o value or
 - the total C_i of the external circuit (excluding the cable) is less than 1% of the C_o value
- The above parameters are reduced by 50% when both of the two conditions are given:
 - The total L_i of the external circuit (excluding the cable) is $\geq 1\%$ of the L_o value and
 - the total C_i of the external circuit (excluding the cable) is $\geq 1\%$ of the C_o value

The reduced capacitance of the external circuit (including cable) shall not be greater than $1\mu F$ for Groups IIB and IIA and $600nF$ for Group IIC.

Conditions applicable to the Strain Gauge connector intrinsically safe connector:

$$U_o = 28V$$

$$I_o = 93mA$$

$$P_o = 0.65W$$

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the hazardous area load connected must not exceed the following values:

Group	Capacitance (μF)	Inductance (mH) or	L/R Ratio ($\mu H/\Omega$)
IIC	0.062 (0.083)	3.05 (4.2)	54
IIB	0.65	9.15 (12.6)	217
IIA	2.15	24.4 (33.6)	435

When the external circuit contains no lumped inductance greater than $10\mu H$ i.e. the L_i of any attached apparatus is less than $10\mu H$, the cable inductance may be increased to the values within parentheses. When the external circuit contains no lumped capacitance greater than $1nF$ i.e. the C_i of any attached apparatus is less than $1nF$, the cable capacitance may be increased to the values within parentheses.

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Condition of manufacture pertaining to Issue 0 of this certificate:

It is a condition of manufacture that Premium Casing Services verifies that the validity of certification for all separately certified components used in the TT Computers – TT2000 and TT2100.

Drawing list pertaining to Issue 0 of this Certificate:

Manufacturer's Documents			
Title:	Drawing No.:	Rev. Level:	Date:
TT Touchscreen Controller Mount Plate & Cover	PCS-4931.6	1	2014-04-10
TT USB Compact Flash Card Mount Plate	PCS-4931.7	1	2014-04-10
TT Side Mounts A & B	PCS-4931.8	1	2014-04-10
TT Polycarbonate Window Frame	PCS-4931.10	1	2014-04-10
TT Flow Switch Mount Bracket	PCS-4931.11	1	2014-04-10
TT Polycarbonate Window	PCS-4931.12	1	2014-04-10
TT Wi-Fi Mount	PCS-4931.13	2	2014-04-10
TT Maintenance Panel Decal	PCS-4931.14	1	2014-04-10
TT Maintenance Panel Gasket	PCS-4931.15	1	2014-04-10
TT Ex Warning Labels 2 & 3	PCS-4931.16	2	2014-04-10
TT Polycarbonate Insulators	PCS-4931.17	1	2014-04-10
TT System Schematic Diagram	PCS-4931.18	2	2014-04-9
TT I/O Wiring Diagram	PCS-4931.19	4	2014-10-01
TT System Diagram	PCS-4931.20	3	2014-04-10
TT I/O Interface	PCS-4931.21	1.0	2012-12-27
TT IO IF PCB Bill of Materials	PCS-4931.22	1	2014-04-10
TT PS/2 - USB Interface	PCS-4931.23	0.0	2011-08-02
TT PS2_USB PCB Bill of Materials	PCS-4931.24	1	2014-04-10
TT PSU Change Over	PCS-4931.25	0.0	2011-08-02
TT PSU CO PCB Bill of Materials	PCS-4931.26	2	2014-04-10
TT General Assembly 1 Main Enclosure	PCS-4931.27	1	2014-04-10
TT General Assembly 2 Rear Panel	PCS-4931.28	2	2014-04-10
TT General Assembly 3 Bill of Materials	PCS-4931.29	2	2014-04-10
TT2000 Enclosure Main Body	PCS-4933.1	1	2014-04-10
TT2000 Enclosure Main Body	PCS-4933.2	1	2014-04-10
TT2000 Enclosure Main Body	PCS-4933.3	1	2014-04-10
TT2000 Enclosure Rear Panel	PCS-4933.4	1	2014-04-10

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Title:	Drawing No.:	Rev. Level:	Date:
TT2000 Enclosure Gasket 1 Rear Panel	PCS-4933.5	1	2014-04-10
TT2000 Enclosure Gasket 2 Touchscreen Bezel	PCS-4933.6	1	2014-04-10
TT2000 Touchscreen Bezel 10.4" CTI	PCS-4933.7	1	2014-04-10
TT2000 SBC Mount Plate	PCS-4933.8	1	2014-04-10
TT2000 Ex Label 1	PCS-4933.9	6	2014-09-22
TT2000 LCD Interface Cable Specifications	PCS-4933.11	1	2014-04-10
TT2000 Bill of Materials	PCS-4933 (3 sheets)	5	2014-07-31
TT2100 Enclosure Main Body	PCS-4934.1	1	2014-04-10
TT2100 Enclosure Main Body	PCS-4934.2	1	2014-04-10
TT2100 Enclosure Main Body	PCS-4934.3	1	2014-04-10
TT2100 Enclosure Rear Panel	PCS-4934.4	1	2014-04-10
TT2100 Enclosure Gasket 1 Rear Panel	PCS-4934.5	1	2014-04-10
TT2100 Enclosure Gasket 2 Touchscreen Bezel	PCS-4934.6	1	2014-04-10
TT2100 Touchscreen Bezel CTI 12.1"	PCS-4934.7	1	2014-04-10
TT2100 SBC Mount Plate	PCS-4934.8	1	2014-04-10
TT2100 Ex Label 1	PCS-4934.9	6	2014-09-22
TT2100 LCD Interface Cable Specifications	PCS-4934.11	1	2014-04-04
TT2100 Bill of Materials	PCS-4934 (3 sheets)	5	2014-07-31

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Variations permitted by Issue 1 of this certificate:

This issue of the certificate covers

- The modification to the purging manifold to reduce the time for purge of the TT Computers.
- The inclusion of some alternative parts.
- Added further details of IECEx certificates pertaining to separately certified equipment included in this equipment certificate.
- The correction to the issue and date for drawing PCS-4931.19 – incorrectly recorded in issue 0 of this certificate (previously listed as rev 3 issued 2014-04-14).

Conditions pertaining to Issue 1 of this certificate:

There are no changes to the conditions from issue 0.

Drawings Associated with the Issue 1 of this Certificate:

Manufacturer's Documents			
Title:	Drawing No.:	Rev. Level:	Date:
Assembly 3 Bill of Materials	PCS-4931.29 Sheet 3 of 3	3	2015-04-29
TT2000 Bill of Materials	PCS-4933 Sheets 1 to 4 of 4	6	2015-04-29
TT2000 Ex Label 1	PCS-4933.9	8	2015-08-17
TT2000 Assembly Detail 7 Purge Air Irrigation	PCS-4933.10 Sheet 7 of 11	2	2015-04-29
TT2100 Bill of Materials	PCS-4934 Sheets 1 to 4 of 4	6	2015-04-29
TT2100 Ex Label 1	PCS-4934.9	8	2015-08-17
TT2100 Assembly Detail 7 Purge Air Irrigation	PCS4934.10 Sheet 7 of 11	2	2015-04-29

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Variations permitted by Issue 2 of this certificate:

This issue of the certificate covers the revision of drawings to include a new company name and logo on the drawing borders and marking label.

Drawings PCS-4933.7 and PCS-4934.7 updated to reference sealant listed on bill of materials document.

Conditions pertaining to Issue 2 of this certificate:

There are no changes to the conditions from issue 0.

Drawings Associated with the Issue 2 of this Certificate:

Manufacturer's Documents				
Title:	Drawing No.:	Pages	Rev. Level:	Date:
TT Enclosure Maintenance Cover	PCS-4931.1	1	2	2016-08-23
TT LCD Inverter Cover	PCS-4931.2	1	2	2016-08-23
TT Maintenance Panel	PCS-4931.3	1	2	2016-08-23
TT ExPC Mount Brackets	PCS-4931.4	1	3	2016-08-23
TT PS2/USB Mount Brackets	PCS-4931.5	1	2	2016-08-23
TT Touchscreen Controller Mount Plate & Cover	PCS-4931.6	1	2	2016-08-23
TT USB Compact Flash Card Mount Plate	PCS-4931.7	1	2	2016-08-23
TT Side Mounts A & B	PCS-4931.8	1	2	2016-08-23
TT Polycarbonate Window Frame	PCS-4931.10	1	2	2016-08-23
TT Flow Switch Mount Bracket	PCS-4931.11	1	2	2016-08-23
TT Polycarbonate Window	PCS-4931.12	1	2	2016-08-23
TT Wi-Fi Mount	PCS-4931.13	1	3	2016-08-23
TT Maintenance Panel Decal	PCS-4931.14	1	2	2016-08-23
TT Maintenance Panel Gasket	PCS-4931.15	1	2	2016-08-23
TT Ex Warning Labels 2 & 3	PCS-4931.16	1	3	2016-08-23
TT Polycarbonate Insulators	PCS-4931.17	1	2	2016-08-23
TT System Schematic Diagram	PCS-4931.18	1	3	2016-08-23
TT I/O Wiring Diagram	PCS-4931.19	1	5	2016-08-23
TT System Diagram	PCS-4931.20	1	4	2016-08-23
TT IO IF PCB Bill of Materials	PCS-4931.22	1	2	2016-08-23
TT PS2_USB PCB Bill of Materials	PCS-4931.24	1	2	2016-08-23
TT PSU CO PCB Bill of Materials	PCS-4931.26	1	3	2016-08-23
TT General Assembly 1	PCS-4931.27	1	2	2016-08-23

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Title:	Drawing No.:	Pages	Rev. Level:	Date:
Main Enclosure				
TT General Assembly 2 Rear Panel	PCS-4931.28	1	3	2016-08-23
TT General Assembly 3 Bill of Materials	PCS-4931.29	1	4	2016-08-23
TT2000 Enclosure Main Body	PCS-4933.1	1	2	2016-08-23
TT2000 Enclosure Main Body	PCS-4933.2	1	2	2016-08-23
TT2000 Enclosure Main Body	PCS-4933.3	1	2	2016-08-23
TT2000 Enclosure Rear Panel	PCS-4933.4	1	2	2016-08-23
TT2000 Enclosure Gasket 1 Rear Panel	PCS-4933.5	1	2	2016-08-23
TT2000 Enclosure Gasket 2 Touchscreen Bezel	PCS-4933.6	1	2	2016-08-23
TT2000 Touchscreen Bezel 10.4" CTI	PCS-4933.7	1	2	2016-08-23
TT2000 SBC Mount Plate	PCS-4933.8	1	2	2016-08-23
TT2000 Ex Label 1	PCS-4933.9	1	9	2016-08-23
TT2000 Assembly Detail 7 Purge Air Irrigation	PCS-4933.10	1	3	2016-08-23
TT2000 LCD Interface Cable Specifications	PCS-4933.11	1	2	2016-08-23
TT2100 Enclosure Main Body	PCS-4934.1	1	2	2016-08-23
TT2100 Enclosure Main Body	PCS-4934.2	1	2	2016-08-23
TT2100 Enclosure Main Body	PCS-4934.3	1	2	2016-08-23
TT2100 Enclosure Rear Panel	PCS-4934.4	1	2	2016-08-23
TT2100 Enclosure Gasket 1 Rear Panel	PCS-4934.5	1	2	2016-08-23
TT2100 Enclosure Gasket 2 Touchscreen Bezel	PCS-4934.6	1	2	2016-08-23
TT2100 Touchscreen Bezel CTI 12.1"	PCS-4934.7	1	2	2016-08-23
TT2100 SBC Mount Plate	PCS-4934.8	1	2	2016-08-23
TT2100 Ex Label 1	PCS-4934.9	1	9	2016-08-23
TT2100 Assembly Detail 7 Purge Air Irrigation	PCS-4934.10	1	3	2016-08-23
TT2100 LCD Interface Cable Specifications	PCS-4934.11	1	2	2016-08-23
TT2000 Bill of Materials	PCS-4933	4	7	2016-08-23
TT2100 Bill of Materials	PCS-4934	4	7	2016-08-23