Descriptive Report and Test Results

MASTER CONTRACT: 268604
REPORT: 70103845
PROJECT: 70193278

Edition 1: December 13, 2017; Project 70103845 - Taiwan
Issued by Jeffrey Chen

Edition 2: **July 23, 2019; Project 70193278 - Toronto**
Issued by Jeffrey Chen

Report pages reissued
Attachments replaced:
Att1 Evaluation Report for ordinary location
Attachments added:
Att3 GB/SIR/ExTR19.0011/00 (R70193277A)

Contents:

PRODUCTS

CLASS 2258 02 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations
CLASS 2258 82 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations - Certified to US Standards

Class I, Division 2, Groups A, B, C, D; T4

The AEx-series is an enclosed type, fanless, panel-mounted or stand-alone device for data collection and processing, with a touchscreen display (except model AEx-2410 or AEx-2411). It is housed in a stainless steel enclosure. It has facilities for connection to suitably-certified external devices. Rated 9-36 Vdc, 13-3 A max, 90W maximum. The products divide into 3 model series, Display, Panel PC and Box PC as below:

The product is divided into 3 model series: Display, Panel PC, and Box PC

		Equipment Name / Model Number			
		Display	**Panel PC**		**Box PC**
		AEx-1xxPx	AEx-8xxPx	AEx-9xxAPx	AEx-241x
Panel specification	15 inch	AEx-115P	AEx-815P	AEx-915AP	--
	15 inch, high brightness	AEx-115PH	AEx-815PH	AEx-915APH	--
	15.6 inch	AEx-116P	AEx-816P	AEx-916AP	--
	19 inch	AEx-119P	AEx-819P	AEx-919AP	--

	19 inch, high brightness	AEx-119PH	AEx-819PH	AEx-919APH	--
	21.5 inch	AEx-121P	AEx-821P	AEx-921AP	--
	No display	--	--	--	AEx-2410, AEx-2411
		TB-6029	SBC-7111	SBC-7114	SBC-7111 or SBC-7114
		Mainboard P/N			

Notes:
1. The above models are enclosed type, Equipment Class III, Pollution Degree 2, Overvoltage Category II;
2. Mode of operation: Continuous;
3. Environmental Conditions: Normal: 2000 m max,
   Operating temperature: -20°C to +60 °C;
   Humidity: 10 % up to 90 % r.h. (non-condensing).

Conditions of Acceptability

1. The module is panel-mounted, vesa-mounted or wall-mount equipment certified only for installation in other certified equipment or in cabinets where the suitability of the final installation is to be determined by the local inspection authority.

2. During installation, measures shall be taken in order to ensure that only the front side and connection facilities are accessible to users.

3. Equipment has only been tested for electrical safety. No evaluation of functional safety and performance characteristics have been performed.

4. Power input and output (I/O) wiring shall be accordance with Class I, Division 2 wiring method per the Canadian Electrical Code (CEC) for installation in Canada and per the National Electrical Code (NFPA 70) for installation within U.S.

5. Wiring Compartment shall be installed in a suitable enclosure for Class I, Division 2.

6. **In locations where high external humidity and internal temperature variations (e.g. frequent on-off cycles) may cause condensation inside the equipment, the interior should be periodically inspected.**

7. **When the device is mounted in a hazardous area, connection and disconnection of external connectors while live is only permitted if the potentially explosive atmosphere is shown to be absent.**

8. **The 9-36Vdc rated supply shall be protected such that transients are limited to a maximum of 119 V; no such protection is required for the signal lines.**

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No. 61010-1-12	-	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements
CAN/CSA-IEC 61010-2-201-14	-	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 2-201: Particular requirements for control equipment
UL Std. No. 61010-1 (3rd Edition)	-	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements
UL Std. No. 61010-2-201 (1st Edition)		Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 2-201: Particular requirements for control equipment
CAN/CSA C22.2 No. 213-17		Nonincendive electrical equipment for use in Class I and II, Division 2 and Class III, Divisions 1 and 2 hazardous (classified) locations
UL 121201 (9th Edition)		Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations

MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Nameplate adhesive label material approval information:

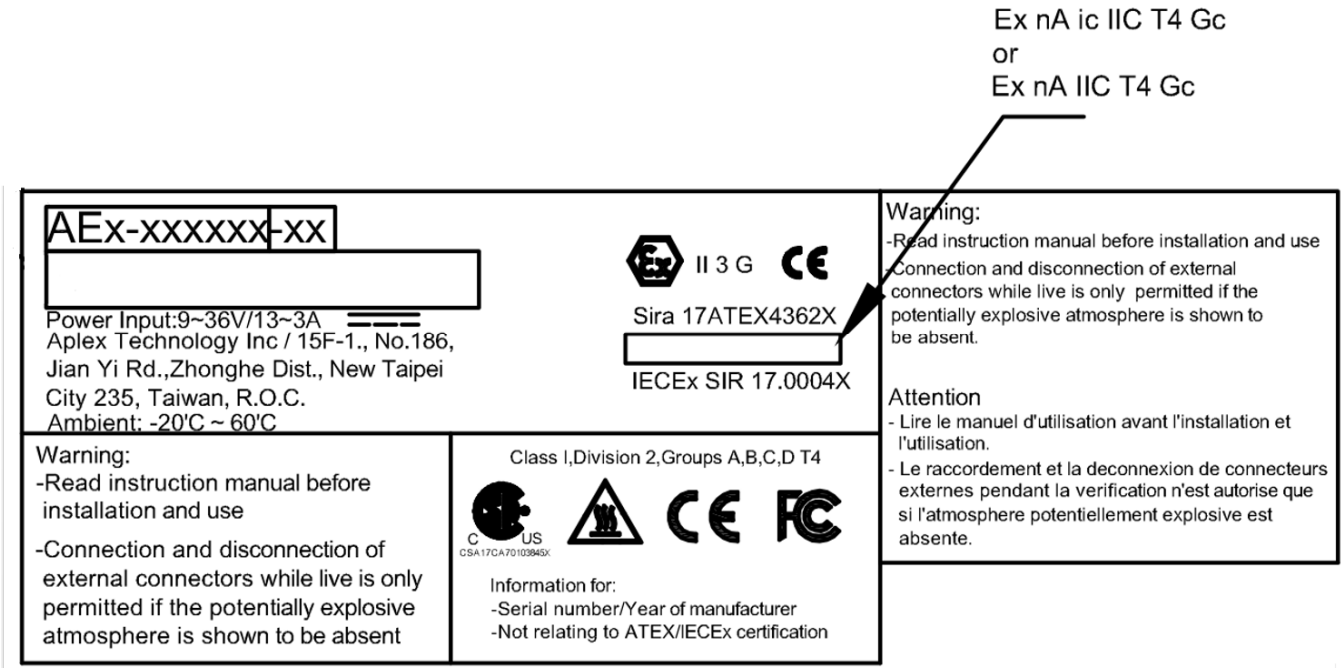
The following markings are provided on a CSA Accepted/UL Recognized to both Canadian/US requirements adhesive nameplate, used with the printer and ribbon specified in the Listing, and is suitable for indoor/outdoor use on Stainless steel at a maximum service temperature of 150 °C. Nameplate is affixed to the back of metal enclosure.

- **Manufacturer's name: Aplex Technology Inc, or CSA Master Contract Number "268604", adjacent to the CSA Mark in lieu of manufacturer's name.**
- **Model designation: As specified in the PRODUCTS section, above.**
- **Electrical ratings: As specified in the PRODUCTS section, above.**
- **Ambient temperature rating: As specified in the PRODUCTS section, above.**
- **Manufacturing date in MMYY format, or serial number, traceable to year and month of manufacture.**
- **The CSA Mark, with or without the "C" and "US" indicators, as shown on the Certificate of Conformity.**
- **The designation "CSA 17CA70103845"**

- **Hazardous Location designation: As specified in the PRODUCTS section, above**
- **Temperature code: As specified in the PRODUCTS section, above**

- **WARNING- READ INSTRUCITON MANUAL BEFORE INSTALLATION AND USE;**
  Attention - LIRE LE MANUEL D'UTILISATION AVANT L'INSTALLATION ET L'UTILISATION

- **WARNING- CONNECTION AND DISCONNECTION OF EXTERNAL CONNECTORS WHILE LIVE IS ONLY PERMITTER IF THE POTENTIALLY EXPLOSIVE ATMOSPHERE IS SHOWN TO BE ABSENT;**
  Attention - LE RACCORDEMENT ET LA DÉCONNEXION DE CONNECTEURS EXTERNES PENDANT LA VÉRIFICATION N'EST AUTORISÉ QUE SI L'ATMOSPHÈRE POTENTIELLEMENT EXPLOSIVE EST ABSENTE



INSTALLATION MANUAL AND DOCUMENTATION

An installation manual, data sheet, or other documentation shall be supplied with each unit, containing the following minimum information:

- A recapitulation of the information with which the equipment is marked, except for the serial number.
- Manufacturer's name and address
- A description of the intended use of the equipment.
- A statement that if the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Mounting and installation instructions, including dimensions.
- Specification for the Weight (kg).
- Specification for ambient temperature rating: -20~60°C
- Electrical ratings: 9~36Vdc, 13~3A.
- A description of all input and output connections.
- Specifications for the range of environmental conditions for which the equipment is designed including the following:
  - Specification of the Pollution Degree: "2"
  - Specification of the Overvoltage Category: II
  - Specification for the maximum use altitude: 2000 m above sea level.
- Specific commissioning instructions and, if necessary for safety, warnings against hazards which could arise during installation or commissioning of the equipment.
- Where applicable, Conditions of Acceptability – This information should not be hidden in the text and should be placed within the instructions in a highlighted way, often as a special chapter;
- ISO 3864 Symbol B.3.1  or ISO 7000 symbol 0434  (triangle with exclamation point) with a statement that the manual must be consulted in all cases where this symbol is marked, in order to find out the nature of the potential HAZARDS and any actions which have to be taken to avoid them.
- Identification and description of operating controls or parameter setting and their use in all operating modes.
- Instructions in sufficient detail to permit safe maintenance and inspection of the equipment, including requirements for the maintenance of the explosion protection, and to ensure continued safety of the equipment after the maintenance and inspection procedure.
- Specification of any parts which are required to be examined or supplied only by the manufacturer or his agent.

ALTERATIONS

a) Markings as above appear on each unit.
b) All PCBs are rated 130 deg C.

FACTORY TESTS

No routine (factory) test is required.

SPECIAL INSTRUCTIONS FOR FIELD SERVICES

Component descriptions marked with either the "(INT)" or "(INT*)" identifiers may be substituted with other components providing the requirements specified under the notes in the "Description" are complied with.

COMPONENT SPECIAL PICKUP

Component descriptions marked with the identifier "(CT)" are subject to annual pickup and Conformity Testing.

DESCRIPTIVE DOCUMENTS:

Note: Documents detailed herein are subject to inspection by CSA Group personnel and shall be made available in the manufacturing location upon request. (Note: The following Descriptive Documents are retained electronically in CSA Engineering File only)

No.	Subject	Drawing No.	Rev.	**Stamp** Date (dd/mm/yy)
Mechanical Drawings – Models AEx-X15XPX				
1.	Overall & Exploded view of 15 inch Display	x014115xxxxx	1	06 Dec 17
2.	Overall & Exploded view of 15 inch Panel PC	x014915xxxxx	1	06 Dec 17
3.	15 inch PANEL FRAME	011491510001	1	06 Dec 17
4.	15 inch LCD BKT L	011481510101	1	06 Dec 17
5.	15 inch LCD BKT R	011491510101	1	06 Dec 17
6.	15 inch PANEL, MID, BACK SPONGE	060304000322	1	06 Dec 17
7.	15 inch MID BKT	011491510301	1	06 Dec 17
8.	15 inch PANEL MOUNT BKT	011491510801	1	06 Dec 17
Mechanical Drawings – Models AEx-X16XPX				
9.	Overall & Exploded view of 15.6 inch Display	x014116xxxxx	1	06 Dec 17
10.	Overall & Exploded view of 15.6 inch Panel PC	x014916xxxxx	1	06 Dec 17
11.	16 inch PANEL FRAME	011481610301	1	06 Dec 17
	16 inch PANEL FRAME	**011481610301**	**2**	**05 Jun 19**
12.	16 inch LCD BKT	011481610001	1	06 Dec 17
13.	16 inch PANEL, MID, BACK SPONGE	060304000342	1	06 Dec 17
14.	16 inch MID BKT	011481610101	1	06 Dec 17
15.	16 inch PANEL MOUNT BKT R	011481610201	1	06 Dec 17
16.	16 inch PANEL MOUNT BKT L	011481610401	1	06 Dec 17
Mechanical Drawings – Models AEx-X19XPX				
17.	Overall & Exploded view of 19 inch Display	x014119xxxxx	1	06 Dec 17
18.	Overall & Exploded view of 19 inch Panel PC	x014919xxxxx	1	06 Dec 17
19.	19 inch PANEL FRAME	011491910001	1	06 Dec 17
	19 inch PANEL FRAME	**011491910001**	**2**	**05 Jun 19**
20.	19 inch LCD BKT	011491910101	1	06 Dec 17
21.	19 inch PANEL, MID, BACK SPONGE	060304000340	1	06 Dec 17
22.	19 inch MID BKT	011491910201	1	06 Dec 17
23.	19 inch PANEL MOUNT BKT	011491910301	1	06 Dec 17
Mechanical Drawings – Models AEx-X21XPX				
24.	Overall & Exploded view of 21.5 inch Display	x014121xxxxx	1	06 Dec 17
25.	Overall & Exploded view of 21.5 inch Panel PC	x014921xxxxx	1	06 Dec 17
26.	21.5 inch PANEL FRAME	011482110001	1	06 Dec 17
27.	21.5 inch LCD BKT	011482110301	1	06 Dec 17
28.	21.5 inch LCD BKT/BOTTOM	011482110401	1	06 Dec 17
29.	21.5 inch PANEL, MID, BACK SPONGE	060304000328	1	06 Dec 17
30.	21.5 inch LCD BKT/TOP	011482110501	1	06 Dec 17
31.	21.5 inch MID FRAME	011482110101	1	06 Dec 17
32.	21.5 inch PANEL MOUNT BKT	011482110201	1	06 Dec 17
Mechanical Drawings - Models AEx-2410 or AEx-2411				
33.	Overall & Exploded view of Box PC	x014241xxxxx	1	06 Dec 17
34.	BOX PC FIXING BKT	011424100101	1	06 Dec 17
35.	BOX PC BASE BKT	011424100001	1	06 Dec 17
36.	BOX PC SPONGE	060304000353	1	06 Dec 17

No.	Subject	Drawing No.	Rev.	**Stamp** Date (dd/mm/yy)
Mechanical Drawings - All models (Common parts)				
37.	LCD SPONGE (not related to ingress protection)	060304000307	1	06 Dec 17
38.	BASE BKT	011491510401	1	06 Dec 17
39.	OPS BKT	011491510701	1	06 Dec 17
40.	HDD BKT	011491510601	1	06 Dec 17
41.	HEATSINK PLATE	011491510901	1	06 Dec 17
42.	BATTERY BKT	013596000002	2	06 Dec 17
43.	CPU HEATSINK	011491511001	1	06 Dec 17
44.	BACK COVER (Rear enclosure of Display)	011411510001	1	06 Dec 17
45.	BACK COVER (Rear enclosure of Panel PC)	011481510001	1	06 Dec 17
Electrical Drawings				
46.	Display board (P/N TB-6029) schematic	TB-6029	V.100	06 Dec 17
	Display board (P/N TB-6029) schematic	**TB-6029**	**F**	**05 Jun 19**
47.	Mainboard (P/N SBC-7111) schematic	SBC-7111	V.100	06 Dec 17
	Mainboard (P/N SBC-7111) schematic	**SBC-7111**	**V.3.20**	**05 Jun 19**
48.	Mainboard (P/N SBC-7114) schematic	SBC-7114	V.100	06 Dec 17
	Mainboard (P/N SBC-7114) schematic	**SBC-7114**	**V.2.2**	**05 Jun 19**
49.	Connector convert board (between TB-xx and mainboard)	TB-547	V.100	06 Dec 17
	Connector convert board (between TB-xx and mainboard)	**TB-547**	**V.1.2**	**05 Jun 19**
50.	Connector convert board (between TB-xx and mainboard)	TB-548	V.100	06 Dec 17
	Connector convert board (between TB-xx and mainboard)	**TB-548**	**V.1.1**	**05 Jun 19**
51.	Ex ic USB board	TB-555	1.1	06 Dec 17
	Ex ic USB board	**TB-555**	**1.2**	**05 Jun 19**
52.	Circuit diagram of MILDEX OPTICAL INC. / PN: EXC31604254UAG	EXC31604254UAG	2017 0125	06 Dec 17
53.	Conversion board for AEx-2410 or AEx-2411	TB-540	0.1	06 Dec 17
Other Drawings				
54.	Critical Component List	AEx_CCL	01	06 Dec 17
	Critical Component List	**AEx_CCL**	**02**	**05 Jun 19**
55.	Intrinsically safe diagram	AEx INSF	01	06 Dec 17
56.	Label drawings	070000005016	1	06 Dec 17
	Label drawings	**070000005016**	**1.0**	**05 Jun 19**
57.	Control of connectors located on panel side and additional connector in BOX PC	Other connectors	01	06 Dec 17

DESCRIPTION

Notes:

1. Component Substitution
   a) Critical components (those identified by mfr name, cat no), which are NOT identified with either "INT" or "INT*" are not eligible for substitution without evaluation and report updating
   b) **The term "INT" means a "Certified" and/or "Listed" (or a "Recognized" and/or "Accepted") component may be replaced by one "Certified" and/or "Listed" by an organization (accredited by OSHA/SCC), for the same application; providing the applicable country identifiers are included and requirements in item "d" below are complied with.**
   c) **The term "INT*" means a "Recognized" and/or "Accepted" component may be replaced by one "Recognized" and/or "Accepted" by an organization (accredited by OSHA/SCC), for the same application, providing the applicable country identifiers are included, the component is**

also CSA Certified, the requirements in item "d" below are complied with and any "conditions of suitability" for the component (as recorded in this descriptive report) are complied with.

d) Components which have been substituted, must be of an equivalent rating, configuration (size, orientation, mounting) and the applicable minimum creepage and clearance distances are to be maintained from live parts to bonded metal parts and secondary parts.
e) Substitution of a "Certified" and/or "Listed" component with a component that is "Recognized" or "Accepted" is not permitted without evaluation and report updating.
f) Substitution of a "Recognized" and/or "Accepted" component by one that is not CSA Certified is not permitted without a proper evaluation as well as a report update because the Conditions of Acceptance of the original component may be different than the Conditions of Acceptance of the substitute component.

The subject models are Panel PC, Box PC and Display. Panel PC is LCD panel with touch screen and intended to be mounted on through the wall or door of suitable system enclosure. Display is similar to Panel PC except circuit board installed inside the rear enclosure. Box PC is similar to Panel PC but without a front bezel (no display function).
These models consist of metal enclosures housing SELV components and were provided with DC input connector. The LAN connectors of the subject equipment are to be used with other IT equipment via Ethernet Network in the same building without exposure to any outdoor overvoltage.

Provided with 1*LAN port, 1*COM1/RS-232/422/485 port, 2*USB 2.0 ports and DC power input port.
Optional I/O port combinations (either two but cannot support 2 sets of 2*USB 2.0 ports or 2 sets of 2*RS-232 port): 2*USB 2.0 ports, 1*USB 3.0 port, 1*RS-232 port, 1*LAN port and 1*VGA port.

1. Enclosure: The subject models are consisting of a front bezel, rear enclosure and wiring compartment housing internal circuits:

1.1. Front Bezel – Stainless steel, nominal 1.5 mm thick, consisting of a LCD panel (size 15", 16", 19", 21"), and housing internal circuits, connectors and wirings.
1.2. MID BKT – Stainless steel, nominal 2.5mm thick.
1.3. Rear enclosure: Stainless steel, nominal 1.5 mm thick, consisting of housing internal circuits, connectors and wirings.
1.4. Adhesive –
1.4.1. Silicone, Type SC-718, manufactured by HSIN Han, is used to bond the touch panel and front metal housing together. It is used to seal a permanently-closed gap under and around the panel.
1.4.2. Acrylic, Type 9495MP, manufactured by 3M, is used to bond the 'PANEL SPONGE', 'MID SPONGE' and 'BACK SPONGE'
1.5. Gasket - MEDIUM CELLULAR SILICONE, Type HT800, manufactured by Rogers Corporation, maximum temperature 200°C. Three gaskets provided and located as below:

Locations	Overall Dimensions	Reference drawing no.
PANEL SPONGE (between front bezel and mid frame)	15": 392.5 x 317.5 mm 16": 433.45 x 283.5 mm 19": 463.4 x 382 mm 21": 564.5 x 355.5 mm Nominal W= 9.5mm, Thickness = 1.0 mm	15 inch models: 060304000322 & 014915xxxxx 16 inch models: 060304000342 & 014916xxxxx 19 inch models: 060304000340 & 014919xxxxx 21 inch models: 060304000328 & 014921xxxxx
MID SPONGE (between mid frame and base)	320.5 x 215.5 mm for all models Nominal W= 9.5mm, Thickness = 1.0 mm	

Locations	Overall Dimensions	Reference drawing no.
BACK SPONGE (between base and rear enclosure)	293.5 x 188.5 mm for all models Nominal W= 9.5mm, Thickness = 1.0 mm	BOX PC models: 060304000353 & 014241xxxxx

1.6. Touch Panel:

Panel Size	Manufacturer / Model	Rating	Nominal overall dimensions (mm)
15 inch	MILDEX OPTICAL INC. / 150H81A2	DC 5V	358.6 (W) × 246.01 (L) × 3.03 (T)
16 inch	HIGGSTEC / T156C-XDNB31G-9S02R0-109LN	DC 5V	396.58 (W) × 246.01 (L) × 2.43 (T)
19 inch	HIGGSTEC / T190E-XDN038G-9S02R0-109LN	DC 5V	427.18 (W) × 349.92 (L) × 3.40 (T)
21 inch	HIGGSTEC / T215E-XDNB18G-9S02R0-109LN	DC 5V	520.00 (W) × 311.50 (L) × 2.40 (T)

Notes:
a) Type of Equipment: VESA mount or Panel mount Equipment
b) Class of equipment: Class III equipment (SELV circuits)
c) Connection to the supply: Detachable DC connector
d) Mobility: Fixed Equipment.
e) Weight of Equipment: Panel PC series approximate maximum weight 13.4 Kg, Display series approximate maximum weight 12.3 Kg, BOX-PC series approximate maximum weight 4 Kg.
f) Pollution Degree 2
g) Maximum Rated Ambient Temperature: 60˚C.
h) This unit contains no operator access areas and the operators manual does not instruct the operator to gain access within the enclosure, or imply that access is required.

CRITICAL COMPONENT LIST:

The components which are critical for the constructions, performance, and the approved ratings of this equipment are listed in controlled drawing no. AEx CCL that subjected to inspection by CSA Group and shall not be replaced without additional suitability evaluation.

TEST HISTORY

1st edition: Project 70103845:

1. CSA/UL 61010-1 and CSA/UL 61010-2-201 evaluation are completely described and documented under project 70103845, which covers the evaluation and testing of the non-hazardous version of the AEx-series. The following tests were performed on representative samples of AEx-915APH and AEx-919APH with satisfactory result:

1.1 MAINS supply, CSA/UL 61010-1, Cl. 5.1.3c)
1.2 List of ACCESSIBLE parts, CSA/UL 61010-1, Cl. 6.2
1.3 Values in NORMAL CONDITION, CSA/UL 61010-1, Cl. 6
1.4 Temperature Measurements, CSA/UL 61010-1, Cl. 10

2. Identical products were certified to IECEx Zone 2, certification code: Ex nA ic IIC T4 Gc, Cert. No.IECEx SIR 17.0004X, Report No. GB/SIR/ExTR17.0239/00. Following assessment and tests verified the suitability for the AEx-series used in a Class I, Division 2, Groups A, B, C and D hazardous locations.

2.1 Temperature Code Rating: CSA C22.2 No 213-17, Cl. 10
UL 121201:2017, Cl. 10

The following temperature test according to IEC 60079-0:2011 Clause 26.5.1 was conducted on Model AEx-919APH as representative at 20.8°C ambient with 12Vdc, 6.39A, 76.58W in CSA UK, recorded in test report no. 17/0406, which accepted in Cert. No. IECEx SIR 17.0004X and Report No. GB/SIR/ExTR17.0239/00.

According to test result of HOT SPOT recorded in above certification:

For component size > 1000mm^2:
CPU1 (i5-6200U: 42 mm x 24 mm = 1008mm^2), T-rise = 42.2 K, corrected to upper ambient 60˚C, with a 5K safety margin, results in: 60 + 42.2 + 5 = 107.2˚C
This is considered acceptable as limit of 135˚C of T4 for component > 1000mm^2

For component size 20~1000mm^2 or < 20mm^2:
All components except CPU1 (1008mm^2) are considered smaller than 1000mm^2, the hottest component except CPU1 is U66, T-rise = 58.8 K, corrected to upper ambient 60˚C, with a 5K safety margin, results in:
60 + 58.8 + 5 = 123.8˚C
This is considered acceptable for either the limit of 200˚C of T4 for component between 20~1000mm^2, or the limit of 275˚C of T4 for component < 20mm^2

The test result is considered to be equivalent to the service temperature rise test result in CSA C22.2 No 213-17, Cl. 10, UL 121201:2017, Cl. 10

Therefore products are suitable to be marked as T4

2.2 Impact test: CSA C22.2 No 213-17, Cl. 16.3
UL 121201:2017, Cl. 16.3

No specific impact tests were conducted in applicable general-purpose standards. However, the following impact test was conducted on Model AEx-815PH, AEx-915APH, AEx-115PH, AEx-815P, AEx-921AP, AEx-821P,

AEx-821P AND AEx-821P in CSA UK recorded in test report no. 17/0506, which accepted in Cert. No. IECEx SIR 17.0004X and Report No. GB/SIR/ExTR17.0239/00.

Since the test result is accepted in Ex nA ic IIC T4 Gc certification, the acceptability for use in Class I Division 2 locations is considered suitable for the fixed equipment.

2.3 Non-incendive evaluation: CSA C22.2 No 213-17, Cl. 5.1.2, Cl. 7
UL 121201:2017, Cl. 5.1.2, Cl. 7

2.4 Non-arcing evaluation: CSA C22.2 No 213-17, Cl. 5.1.2, Cl. 8
UL 121201:2017, Cl. 5.1.2, Cl. 8

Make and break components:
There is no relay or switch in the equipment.

For pluggable connectors:
All connectors within the unit are not user accessible during normal operation, evaluated in report no. GB/SIR/ExTR17.0239/00 under the protection concept of 'Ex ic' according to IEC 60079-11: 2011, considered as non-incendive, and IEC 60079-15:2010 clause 7.3.5 under the concept of 'Ex nA' considered to be non-arcing.

These assessment are considered to be equivalent to CSA C22.2 No 213-17, Cl.7, Cl. 8 and UL 121201:2017, Cl. 7, Cl. 8

2nd edition: Project 70193278

The purpose of this project is to update report 70103845 to include

1. **addition of some components to mainboards and small converting boards.**
   - **Alternate component: Add U19 to mainboard SBC-7111. Refer to page 66 of Electrical Drawings No. 47 - SBC-7111, Rev. V.3.20.**
   - **Add MCU DETECT EDID circuit to mainboard SBC-7114. Refer to page 31 of Electrical Drawings No. 48 - SBC-7114, Rev. V.2.2.**
   - **Add U1, U2, U3 and S_1 DIP SWITCH (Accessible during maintenance only) to converter board TB-547. Refer to Electrical Drawings No. 49 - TB-547, Rev. V.1.2.**
   - **Add some reserved connectors to converter board TB-548. Refer to Electrical Drawings No. 50 - TB-548, Rev. V.1.1.**
   - **Update circuit design of TB-555. Refer to Electrical Drawings No. 51 - TB-555, Rev. V.1.2.**
   - **Add new CPU source.**
2. **addition of 3 LCD panel sources to 15 inch models.**
3. **revised label drawing.**

Construction Review:

Construction review checklist for each of the applicable requirements demonstrate compliance. See the following completed checklists location in the Test Data for this project:

Title	Date
CAN/CSA C22.2 No. 61010-1-12 & ANSI/UL 61010-1 (3rd edition) & CAN/CSA-IEC 61010-2-201-14 & UL Std. No. 61010-2-201 (1st Edition)	**June 14, 2019**
CAN/CSA C22.2 No. 213-17 & UL 121201 9th	**June 14, 2019**

Ordinary Location:
General safety (ordinary locations requirements) assessment has been conducted for AEx-series using standards CAN/CSA C22.2 No. 61010-1-12, ANSI/UL 61010-1 (3rd edition), CAN/CSA-IEC 61010-2-201-14 and UL Std. No. 61010-2-201 (1st Edition). The checklist and assessment report for these standards is retained in the Test Data folder associated with this project, as attestation report 70103845, 2nd edition.

The following tests were conducted with satisfactory results:

1.1 MAINS supply, CSA/UL 61010-1, Cl. 5.1.3c)
1.2 List of ACCESSIBLE parts, CSA/UL 61010-1, Cl. 6.2
1.3 Values in NORMAL CONDITION, CSA/UL 61010-1, Cl. 6

Hazardous location:

This report is intended to cover the Canadian and US assessment of models AEx-series for the rating Class I Division 2 Groups A, B, C, D, T4.

In addition to the ordinary locations assessment, detailed above, the assessment and tests are based primarily on the assessment performed for IECEx certification, and the associated Ex Test Report as indicated below: A copy of this report is archived in the Test Data folder associated with this project.

IECEx Certificate Number	**IECEx SIR 17.0004X, Issue 1**
IECEx Test Report	**GB/SIR/ExTR19.0011/00**
Standards	**IEC 60079-0:2011, Ed. 6 / EN 60079-0:2012/A11:2013** **IEC 60079-11:2011, Ed. 6 / EN 60079-11:2012** **IEC 60079-15:2010, Ed. 4 / EN 60079-15:2010**
Markings	**Display and Panel PC series : Ex nA ic IIC T4 Gc** **Box PC series: Ex nA IIC T4 Gc**

Additionally, assessment of the Canadian and U.S. national deviations for the following standards has been performed in order to demonstrate its suitability of Canadian EPL Gc (Zone 2) Ex type & U.S. Class I, Zone 2 AEx types

Canadian Standards	U.S. Standards
CAN/CSA-C22.2 No. 60079-0:2015	**ANSI/UL 60079-0:2013**
CAN/CSA-C22.2 No. 60079-11:2014	**ANSI/UL 60079-11:2013**
CAN/CSA-C22.2 No. 60079-15:2016	**ANSI/UL 60079-15:2013**

The full national deviation checklists have been completed and retained in Test Data folder for this project. The equipment complies with Canadian EPL Gc (Zone 2) Ex type & U.S. Class I, Zone 2 AEx types, temperature class T4.

The maximum temperature test was waived based on rational below.

- **Add U19 to mainboard SB-7111: components having the same size as U19 were tested in Att2 GB/SIR/ExTR17.0239/00 (R70104059A) under the tests (17/0288 and 17/0406). Addition of U19 will not compromise the T class assigned before.**
- **Add MCU DETECT EDID circuit to mainboard SBC-7114: this circuit is to process resolution signal feedback from front display panel only. Components having the same size as U117 were tested in Att2**

GB/SIR/ExTR17.0239/00 (R70104059A) under the tests (17/0288 and 17/0406). Addition of U117 will not compromise the T class assigned before.

- **Add U1, U2, U3 and S_1 DIP SWITCH (Accessible during maintenance only) to converter board TB-547: U1, U2, and U3 are ICs used to enable resolution detection only, they are not routes of power or current during maximum normal operation. Components having the same size as U1, U2 and U3 were tested in Att2 GB/SIR/ExTR17.0239/00 (R70104059A) under the tests (17/0288 and 17/0406). Addition of these components will not compromise the T class assigned before.**
- **Add 3 LCD panel sources to 15 inch models: the LED power consumption of the additional LCD panels are significantly lower than previous tested (26.4W) so addition of 3 LCD panels will not compromise the T class assigned before, and gasket service temperature obtained in prime assessment will not be compromised, either.**
- **Add new CPU source: the package size and the power consumption are identical. Addition of new CPU source will not compromise the T class assigned before.**

Non-incendive Cirecuit Analysis

- **Update circuit design of TB-555: Resistive spark, capacitive spark and inductive spark for 'CN2' on small board TB-555 are re-evaluated in Att3 GB/SIR/ExTR19.0011/00 (R70193277A) based on previous evaluation in section 4.2 to 4.4 of Att2 GB/SIR/ExTR17.0239/00 (R70104059A). 'CN2' of TB-555 still complies with requirement of non-incendive circuits.**

Based on CSA C22.2 No. 213-17 clause 5.1.1 b) and 5.1.1 c), the equipment is permitted to be marked as Class I Division 2 Groups A, B, C, D, T4.

No further tests are considered necessary.

---End of Report---