



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

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Certificate No.:	IECEX TSA 07.0002X	Page 1 of 5	<u>Certificate history:</u>
Status:	Current	Issue No: 15	Issue 14 (2018-11-13)
Date of Issue:	2020-03-26		Issue 13 (2018-03-21)
Applicant:	Austdac Pty Ltd Unit 1, 42 Carrington Road Castle Hill NSW 2154 Australia		Issue 12 (2017-05-11)
Equipment:	Contact Monitoring System Type Dupline 128		Issue 11 (2016-05-05)
Optional accessory:			Issue 10 (2015-10-06)
Type of Protection:	Intrinsic Safety "ia"		Issue 9 (2015-07-31)
Marking:	Ex ia I		Issue 8 (2012-08-03)
			Issue 7 (2011-09-13)
			Issue 6 (2011-05-13)
			Issue 5 (2010-10-01)

Approved for issue on behalf of the IECEx
Certification Body:

Debbie Wouters

Position:

Acting Quality & Certification Manager

Signature:
(for printed version)

Date:

26 MARCH 2020

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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The Dupline 128 system is an intrinsically safe communications and power system. For details of this system and components, refer to drawing 76-001-19. The system consists of several apparatus connected to a "Dupline loop" that allows transfer of the communication across the apparatus. The voltage on this loop is a maximum of 8.6 V and a maximum power of 2.5 W.

The power source of this loop is a separately certified power supply that provides an intrinsically safe output, or a separately certified barrier, or a Belt Controller 8081. The loop contains several apparatus that are powered from the power in the loop, and also some that have an additional source of intrinsically safe power. However, galvanic isolation between such other source of power and the Dupline loop circuits prevent addition of power and voltage to the Dupline loop.

The Dupline loop may also be extended to further loops using a Repeater A2WCCT1. This Repeater shall be powered from another separately certified power supply with an intrinsically safe output, and this provides power and communication signals to the next loop while providing galvanic isolation from the previous loop.

For further system description, please refer to the Annexe.

SPECIFIC CONDITIONS OF USE: YES as shown below:

Refer to Annexe of the certificate.



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Additional information:

None

Annex:

Annexe_IECEx TSA 07 0002X-15_1.pdf



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- SILBUS Series Resistor type SR1 (AU/TSA/ExTR14.0002/00)
- Display Trip Amplifier type ABBD2 (IECEx MSC 14.0020X)
- 4 Channel Indicator Output Transceiver Type SILBUS-BLIP2 and Multi-colour Indicator Type IND2 (AU/TSA/ExTR16.0001/00)
- SILBUS Modbus Bridge Type SILBUS-MB1 (AU/TSA/ExTR16.0007/00)
- Hand Held Programmer Type HHP1-S (AU/TSA/ExTR17.0014/00)
- SILBUS Universal Bridge type SUB1 (AU/TSA/ExTR18.0014/00)
- SILBUS 4 Channel Transceiver type SILBUS TX2F-RX2A (AU/TSA/ExTR19.0014/00)

* Note: The Dupline bus allows any combination of Digital Transmitters up to a maximum of 128 channels, or any combination of Digital and Analog Transmitters up to a maximum of 112 channels is allowable.

** Note: The item GSW1-AC/DC provides a new bus output called "SILBUS". This is described in drawings 120-002-19 and 120-003-19. This connects to the original bus using zener limiter AEL1 shown in 120-003-19.

Drawing list pertaining to Issue 15 of this Certificate:

Drawing / Document Number:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
120-002-19	6	*SILBUS Fieldbus Loads Certification System Diagram	11	2019-08-16
120-807-19	1	*SILBUS 4 Channel Transceiver Type SILBUS-TX2F-RX2A Certification Diagram	01	2019-08-23
120-815-13	1	*SILBUS Transceiver Type SILBUS-TX2F-RX2A Certification Labels Label Details	01	2020-03-12
76-001-19	5	Dupline 128 (SILBUS) System Details System Wiring	21	2007-10-23
76-130-13	1	Dupline 128 Contact Monitoring System Label Details	1	2007-01-12
120-001-19	3	SILBUS Fieldbus Controllers Certification System Diagram	03	2008-10-29
120-191-19	1	SILBUS 4 Channel Analogue Transmitter Type SILBUS-TX4A Connection System Diagram	04	2010-09-07
120-211-19	1	SILBUS 4 Channel Analogue Receiver Type SILBUS-RX4A Connection System Diagram	04	2010-09-27
120-231-19	1	SILBUS 4 Channel Digital Transmitter Type SILBUS-TX4D Connection System Diagram	05	2010-09-27
120-251-19	1	SILBUS 4 Channel Digital Receiver Type SILBUS-RX4D Connection System Diagram	04	2010-09-27
120-004-19	2	SILBUS Fieldbus Repeater & Bridge Certification System Diagram	01	2010-09-13
120-151-19	1	SILBUS Network Bridge Type SILBUS-SNB1 Connection System Diagram	01	2011-02-25

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Document No.	Sheets	Document Title	Issue	Date (yyyy-mm-dd)
51-013-14	02	Non I.S. LCD Holder Type LDH1 PCB0189 Bill of Material	01	2006-07-28
51-014-07	01	Non I.S. LCD Holder Type LDH1 PCB0189A Component Loading Diagram	01	2007-05-28
Universal LDGA70.1 Label PCB PCB0186A				
120-024-13	01	Dual Port Channel Generator Type GSW1 Label Details	02	2007-08-14
120-025-14	02	Dual Port Channel Generator Label/Keyboard Type GSW1 Bill Of Materials	02	2007-08-15
120-028-07	01	Dual Port Channel Generator Type GSW1 LDGA70.1 Label PCB0186A Component Loading Diagram	01	2007-05-28
111-051-03	01	Universal LDGA70.1 Label PCB PCB0186A Schematic Diagram	01	2006-01-06
111-052-21	03	Universal Label PCB Type LDGA70.1 PCB0186A Artwork Details	04	2007-05-28
Universal LDG-A70 AC Input PSU & I/O Board Type PIDB1 PCB0185				
111-091-03	01	Universal LDG-A70 AC Input PSU & I/O Board Type PIDB1 PCB0185 Schematic Diagram	04	2007-05-31
111-092-21	03	PCB0185A Type PIDB1 Universal LDG-A70 AC Input PSU & I/O	04	2007-05-29
111-093-14	05	Universal LDG-A70 AC Input PSU & I/O Type PIDB1 PCB0185 Bill Of Materials	06	2007-09-17
111-094-06	01	Type PIDB1 U61 Heatsink Mechanical Details	02	2005-07-25
111-097-07	02	Universal LDG-A-70 AC Input PSU & I/O PCB0185A Component Loading Diagram	01	2007-05-31
76-265-04	02	24V Mains Transformer P/N: TFMR026 Assembly Details	02	2003-01-28
Dual Port Channel Generator Type GSW1 PCB0201A				
120-011-03	02	Dual Port Channel Generator Type GSW1 PCB0201A Schematic Diagram	04	2008-04-04
120-012-21	05	Dual Port Channel Generator Type GSW1 PCB0201A Artwork Details	06	2008-03-31
120-013-14	04	Dual Port Channel Generator Type GSW1 PCB0201A Bill Of Material	06	2008-04-04
120-016-07	02	Dual Port Channel Generator Type GSW1 PCB0201A Component Loading Diagram	04	2008-04-07
120-099-37	03	Dual Port Channel Generator Type GSW1 Model Selection List	01	2008-03-20
Insulating Spacer Mechanical Details				
120-096-06	01	Dual Port Channel Generator Type GSW1 PCB0185 Insulating Spacer Mechanical Details	01	2008-03-19

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Document No.	Sheets	Document Title	Issue	Date (yyyy-mm-dd)
51-033-14	02	I.S. LCD Holder Type LDH2 Bill of Materials	03	2008-03-31
51-034-07	01	I.S. LCD Holder Type LDH2 PCB0212A Component Loading Diagram	02	2008-04-04
Dual Port SILBUS Channel Generator Type GSW1 Keyboard/ Label PCB0186A				
120-024-13	01	Dual Port Channel Generator Type GSW1 Label Details	02	2007-08-14
120-025-14	02	Dual Port Channel Generator Label/Keyboard Type GSW1 Bill Of Materials	02	2007-08-15
120-028-07	01	Dual Port Channel Generator Type GSW1 LDGA70.1 Label PCB0186A Component Loading Diagram	01	2007-05-28
111-051-03	01	Universal LDGA70.1 Label PCB PCB0186A Schematic Diagram	01	2006-01-06
111-052-21	03	Universal Label PCB Type LDGA70.1 PCB0186A Artwork Details	04	2007-05-28
Dual Port Channel Generator Type GSW1 PCB0201A				
120-011-03	02	Dual Port Channel Generator Type GSW1 PCB0201A Schematic Diagram	04	2008-04-04
120-012-21	05	Dual Port Channel Generator Type GSW1 PCB0201A Artwork Details	06	2008-03-31
120-013-14	04	Dual Port Channel Generator Type GSW1 PCB0201A Bill Of Materials	06	2008-04-04
120-016-07	02	Dual Port Channel Generator Type GSW1 PCB0201A Component Loading Diagram	04	2008-04-07
120-099-37	03	Dual Port Channel Generator Type GSW1 Model Selection List	01	2008-03-20
Universal LDG-A-70 DC Input PSU And I/O Type PIDB2				
111-111-03	01	Universal LDG-A70 DC Input PSU & I/O Type PIDB2 PCB0205 Schematic Diagram	03	2008-04-04
111-112-21	03	PCB0205A Type PIDB2 Universal LDG-A70 DC Input PSU & I/O Artwork Details	03	2007-01-19
111-113-14	03	Universal LDG-A-70 DC Input PSU and I/O Type PIDB2 PCB0205 Bill Of Materials	06	2008-04-04
111-114-07	01	Universal LDG-A-70 DC Input PSU & I/O PCB0205 Component Loading Diagram	03	2008-04-04
I.S. Relay SPCO Type ARW2				
56-028-03	01	Type ARWP2 I.S. Relay PCB0116A Schematic Diagram	04	2004-05-31
56-030-21	03	ARWP2 I.S. Relay SPCO Artwork Details	03	2003-04-10
56-032-14	02	ARWP2 I.S. Relay SPCO Bill Of Materials	05	2007-09-13
56-034-04	01	ARWP2 I.S. Relay SPCO Assembly Diagram	04	2003-04-04
56-036-13	01	ARWP2 I.S. Relay SPCO Label Details	02	2007-09-13
56-048-11	01	ARWP2 I.S. Relay SPCO Specification	01	2007-03-16

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4. It is a condition of safe use that the Dupline 128 has been assessed as an intrinsically safe system and the following cable parameters must be taken into account during installation:

Between the sources of power and the channel generator DEX 3490 0000 712:

C _{cable}	< 1 μ F
L/R _{cable}	< 84 μ H/ Ω

Between the sources of power and the zener limiter AEL1:

C _{cable}	< 1 μ F
L/R _{cable}	< 54 μ H/ Ω

Total cable parameters after the zener limiter AEL1 or Belt Controller 8081 or Repeater A2WCCT1 supplying the complete Dupline 128 load:

C _{cable}	< 1 μ F
L/R _{cable}	< 54 μ H/ Ω

5. It is a condition of safe use that either the cable for the Dupline 128 shall be a dedicated single cable, or shall have its cores separated by an earthed shield from all other circuits.
6. The following input output parameters for Dual Port Channel Generator type GSW1-AC must be taken into account during installation:

Power Supply input Terminals 36 and 37:

U_m = 250 VAC

RS485 Communication Port Terminals 49, 50, 51:

U_m = 250 VAC

Relay Contacts, Terminal 53, 54, 55:

Relay Contacts, Terminal 56, 57, 58:

Relay Contacts, Terminal 59, 60, 61:

Relay Contacts, Terminal 62, 63, 64:

U_m = 250 VAC

Output Terminals 65, 70:

U_m = 250 VAC

Digital Input Terminals 66, 67 and 68, 69:

U_m = 250VAC

SILBUS Port 1 and SILBUS Port 2:

U_o = 10.51 V

U_i = 12.6 V

C_i = 0 μ F

L_i = 0 μ H

I_o (thermal) = 0.213 A

I_o (spark) = Current will depend on the values of R171 and R271 resistors. Refer the table below:

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$I_o = 40 \text{ mA}$
 $L_o = 1 \text{ mH}$
 $C_o = 14 \text{ }\mu\text{F}$
 $L_o/R_o = 1 \text{ mH}/\Omega$

Input-1 (66, 67) and Input-2 (68, 69):

$U_i = 12.6 \text{ V}$
 $I_i = 3.3 \text{ A}$
 $C_i = 0 \text{ nF}$
 $L_i = 0 \text{ mH}$

SILBUS Port 1 (1, 2) and SILBUS Port 2 (34, 35):

$U_o = 10.51 \text{ V}$
 $U_i = 12.6 \text{ V}$
 $C_i = 0 \text{ }\mu\text{F}$
 $L_i = 0 \text{ }\mu\text{H}$
 $I_o \text{ (thermal)} = 0.213 \text{ A}$

$I_o \text{ (spark)}$ = Current will depend on the values of R171 and R271 resistors. Refer the table below:

Output Parameters of SILBUS Port 1 and Port 2				
R171 / R271 Ω ,	I_o (spark) Amps	Lo/Ro Ratio $\mu\text{H}/\Omega$	Output Inductance L_o , μH	Output Capacitance C_o , μF
		Group I	Group I	Group I
0	4.26	42	13	31.5
1	3.05	58	25	
1.5	2.67	66	33	
1.8	2.49	71	38	
2.2	2.28	78	45	
2.7	2.06	86	55	
3.3	1.85	96	68	
4.7	1.49	119	104	
6.8	1.16	152	172	
10	0.87	203	306	
18	0.54	327	788	
27	0.39	459	1561	
33	0.33	545	2194	
39	0.28	627	2911	

8. For Hand Held Programmer Type HHP1-S, the following conditions apply:

1. The batteries can only be removed or replaced in the non-hazardous area.
2. The Hand Held programmer shall be used with the protection leather case.
3. Only the following primary batteries shall be used with the HHP1-S
 - VARTA LONGLIFE ALKALINE LR6 Type 4106
 - VARTA HIGH ENERGY ALKALINE LR6 Type 4906
 - PROCELL ALKALINE LR6 Type PC1500

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The updated list of system modules is:

- Separately certified power supplies that provide intrinsically safe output according to the notes given in drawing 76-001-19
- Belt Controller 8081
- Separately certified Barrier Z960
- Channel Generator DEX 3490 0000 712 – 1 unit
- Programmer GAP 1605 – 1 unit
- Zener Limiter AEL1 – 1 unit
- Repeater A2WCCT1 – 4 units
- 4 channel Analog Transmitter ATX4A – * (see note below)
- 8 channel Digital Transmitter 8084 – * (see note below)
- R1+D1 termination unit or DT01 termination unit – 8 units
- Analog Receiver ARX8A – * (see note below)
- Digital Receiver ARX4D – * (see note below)
- Test Unit GTU8 – 2 units
- Analog Transmitter Type G3210 1161 – * (see note below)
- Temperature Transmitter Type G3210 1112 – * (see note below)
- Digital Transmitter 8023 – * (see note below)
- Safety Transmitter type SILBUS8150 – * (see note below)
- Tail End Unit type TEU2 – 1 unit
- Single Channel Digital Transmitter Type SILBUS 8161 – * (see note below)
- Eight Channel Digital Transmitter Type SILBUS 8163 – * (see note below)

* Note: Any combination of Digital Transmitters up to a maximum of 128 channels, or any combination of Digital and Analog Transmitters up to a maximum of 112 channels is allowable.

Details of certificate changes for issue 3:

Optional use of Dual Port Channel Generator type GSW1-AC and Dual Port Channel Generator type GSW1-DC in the Contact Monitoring System Type Dupline 128. They are assessed in test reports AU/TSA/ExTR08.0021 and AU/TSA/ExTR08.0020.

Details of certificate changes for issue 4:

Dual Port Channel Generator type GSW1-AC and Dual Port Channel Generator type GSW1-DC are now to be added to the system. These are assessed for compliance in IECEx test reports AU/TSA/ExTR 08.0021/00 and AU/TSA/ExTR 08.0020/00. The system has been assessed in AU/TSA/ExTR 08.0064/00.

The updated list of system modules is:

- Separately certified power supplies that provide intrinsically safe output according to the notes given in drawing 76-001-19
- Belt Controller 8081
- Separately certified Barrier Z960
- Channel Generator DEX 3490 0000 712 – 1 unit
- Programmer GAP 1605 – 1 unit
- Zener Limiter AEL1 – 1 unit
- Repeater A2WCCT1 – 4 units
- 4 channel Analog Transmitter ATX4A – * (see note below)

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- Tail End Unit type TEU2 – 1 unit (+ SILBUS – 2 Units)
- Single Channel Digital Transmitter Type SILBUS 8161 – * (see note below) and SILBUS – 128 max.
- Eight Channel Digital Transmitter Type SILBUS 8163 – * (see note below) and SILBUS – 128 max.
- Dual Port Channel Generator type GSW1-AC – ** (see note below)
- Dual Port Channel Generator type GSW1-DC – ** (see note below)
- Four channel analogue transmitter type SILBUS-TX4A – 32 units max.
- Four channel analogue receiver type SILBUS-RX4A – 32 units max.
- Four channel digital transmitter type SILBUS-TX4D – 32 units max.
- Four channel digital receiver type SILBUS-RX4D – 32 units max.

* Note: The Dupline bus allows any combination of Digital Transmitters up to a maximum of 128 channels, or any combination of Digital and Analog Transmitters up to a maximum of 112 channels is allowable.

** Note: The item GSW1-AC/DC provide a new bus output called "SILBUS". This is described in drawings 120-002-19 and 120-003-19. This connects to the original bus using zener limiter AEL1 shown in 120-003-19.

Details of certificate changes for issue 6:

1. Single Channel Digital Transmitter Type SILBUS8161 inserted a reset chip IC3 to the pin 7 of IC2 in Drawing 120-101-03. This was assessed in Test Report AU/TSA/ExTR10.0041/00 (TR32507).
2. Eight Channel Digital Transmitter Type SILBUS8163 inserted a reset chip IC3 to the pin 7 of IC1 in Drawing 120-121-03. This was assessed in Test Report AU/TSA/ExTR10.0042/00 (TR32508).
3. The following modules are now to be added to the system:
 - Termination Unit Type SILBUS-OAS1 (see report 32412 – AU/TSA/ExTR 10.0030/00)
 - Repeater Type SILBUS-A2WCCT2 (see report 32413 – AU/TSA/ExTR 10.0031/00)
 - Network Bridge Type SILBUS-SNB1 (see report 32414 – AU/TSA/ExTR 10.0032/00)

The updated list of system modules is:

- Separately certified power supplies that provide intrinsically safe output according to the notes given in drawing 76-001-19
- Belt Controller 8081
- Separately certified Barrier Z960
- Channel Generator DEX 3490 0000 712 – 1 unit
- Programmer GAP 1605 – 1 unit
- Zener Limiter AEL1 – 1 unit
- Repeater A2WCCT1 and Repeater SILBUS-A2WCCT2 mixed – max 4 units; or Repeater Type SILBUS-A2WCCT2 – 8 units for a single channel generator on same SILBUS network (maximum 32 networks in series).
- 4 channel Analog Transmitter ATX4A – * (see note below)
- 8 channel Digital Transmitter 8084 – * (see note below)
- R1+D1 termination unit or DT01 termination unit – 8 units
- Analog Receiver ARX8A – * (see note below)
- Digital Receiver ARX4D – * (see note below)
- Test Unit GTU8 – 2 units
- Analog Transmitter Type G3210 1161 – * (see note below)
- Temperature Transmitter Type G3210 1112 – * (see note below)

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- Test Unit GTU8 – 2 units
- Analog Transmitter Type G3210 1161 – * (see note below)
- Temperature Transmitter Type G3210 1112 – * (see note below)
- Digital Transmitter 8023 – * (see note below)
- Safety Transmitter type SILBUS8150 – * (see note below) and SILBUS – 63 max.
- Tail End Unit type TEU2 – 1 unit (+ SILBUS – 2 Units)
- Single Channel Digital Transmitter Type SILBUS 8161 – * (see note below) and SILBUS – 128 max.
- Eight Channel Digital Transmitter Type SILBUS 8163 – * (see note below) and SILBUS – 128 max.
- Dual Port Channel Generator type GSW1-AC – ** (see note below)
- Dual Port Channel Generator type GSW1-DC – ** (see note below)
- Four channel analogue transmitter type SILBUS-TX4A – 32 units max.
- Four channel analogue receiver type SILBUS-RX4A – 32 units max.
- Four channel digital transmitter type SILBUS-TX4D – 32 units max.
- Four channel digital receiver type SILBUS-RX4D – 32 units max.
- Termination Unit Type SILBUS-OAS1-BEG – 4 units.
- Termination Unit Type SILBUS-OAS1-END – 4 units.
- Network Bridge Type SILBUS-SNB1 – 16 units max.
- Single Channel Temperature Transmitter Type SILBUS-TX1T – * (see note below)
- Dual Channel Frequency Transmitter Type SILBUS-TX2F – * (see note below)

* Note: The Dupline bus allows any combination of Digital Transmitters up to a maximum of 128 channels, or any combination of Digital and Analog Transmitters up to a maximum of 112 channels.

** Note: The item GSW1-AC/DC provides a new bus output called "SILBUS". This is described in drawings 120-002-19 and 120-003-19. This connects to the original bus using zener limiter AEL1 shown in 120-003-19.

Details of certificate changes for issue 8:

The following modules are now to be added to the system:

- SILBUS Network Monitor Type SILBUS-SNM1-EOL and SILBUS-SNM1-ELD, assessed in TestSafe test report 33693 (AU/TSA/ExTR 12.0031/00)

The system has been assessed in test report 33694, AU/TSA/ExTR12.0032/00.

The updated list of system modules is:

- Separately certified power supplies that provide intrinsically safe output according to the notes given in drawing 76-001-19
- Belt Controller 8081
- Separately certified Barrier Z960
- Channel Generator DEX 3490 0000 712 – 1 unit
- Programmer GAP 1605 – 1 unit
- Zener Limiter AEL1 – 1 unit
- Repeater A2WCCT1 and Repeater SILBUS-A2WCCT2 mixed – max 4 units; or Repeater Type SILBUS-A2WCCT2 – 8 units for a single channel generator on same SILBUS network (maximum 32 networks in series).
- 4 channel Analog Transmitter ATX4A – * (see note below)
- 8 channel Digital Transmitter 8084 – * (see note below)
- R1+D1 termination unit or DT01 termination unit – 8 units

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Details of certificate changes for issue 11:

The following modules are now to be added to the system:

- Intrinsically Safe 4 Channel Indicator Output Transceiver Type SILBUS-BLIP2 and Intrinsically Safe Multi-colour Indicator Type IND2 (see Report AU/TSA/ExTR16.0001/00)
- SILBUS Modbus Bridge Type SILBUS-MB1 (see Report AU/TSA/ExTR16.0007/00)

The following modules are modified in the system:

- Single Transmitter Type SILBUS-TX1T (see Report AU/TSA/ExTR11.0021/01)
- 4 Channel Analogue Transmitter Type SILBUS-TX4A (see Report AU/TSA/ExTR16.0008/00)

The system has been assessed in test report 35509, AU/TSA/ExTR16.0010/00.

Details of certificate changes for issue 12:

- Change of both Applicant address and Manufacturer address from

"1 / 4 Packard Avenue, Castle Hill, NSW 2154, Australia"

To

"Unit 1, 42 Carrington Road, Castle Hill, NSW 2154, Australia"

Details of certificate changes for issue 13:

The following device is now to be added to the system:

- Hand Held Programmer Type HHP1-S, assessed in TestSafe test report 36092. (AU/TSA/ExTR17.0014/00)

Refer Instruction manual 120-769-12 for specific conditions of use for the Hand Held Programmer Type HHP1-S.

The system has been assessed in test report 36244, AU/TSA/ExTR18.0005/00.

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