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 07.0017X	Issue No: 0	Certificate history: Issue No. 0 (2008-06-16)
Status:	**Current**	Page 1 of 4	
Date of Issue:	**2008-06-16**		
Applicant:	**AMPCONTROL CSM Pty. Ltd.** 7 Billbrooke Close, Cameron Park, NSW, 2285 **Australia**		
Electrical Apparatus:	**iMAC System**		
Optional accessory:			
Type of Protection:	**Ex ia**		
Marking:	Ex ia I IECEx ITA 07.0017X Associated apparatus is identified as [Ex ia] I		

Approved for issue on behalf of the IECEx Certification Body: D Gray

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:

International Testing and Certification Services Pty. Ltd
4 - 6 Second Street
Bowden SA 5007
Australia

ITACS®

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Manufacturer: **AMPCONTROL CSM Pty. Ltd**
7 Billbrooke Close,
Cameron Park, NSW, 2285
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 : 2004 Edition:4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-11 : 2006 Edition:5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*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/ExTR08.0013/00 AU/ITA/ExTR08.0014/00

Quality Assessment Report:

AU/TSA/QAR06.0007/02

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The iMAC System comprises of associated intrinsic safe equipment located in a non hazardous area and intrinsically safe apparatus which may be located in the hazardous area.

The associated intrinsically safe apparatus comprise of;

1. Master Line Barrier Type MLB.

2. Slave Active Interface Type SA16.

The Type MLB comprises electronic components mounted on a single printed wiring board housed in a plastic enclosure fitted with terminals for the connection of external circuits. The MLB is designed to restrict the transfer of energy from unspecified non-intrinsically safe circuits to intrinsically safe circuits by the limitation of voltage and current.

The Type SA16 comprises electronic components mounted upon up to 3 printed wiring board housed in a plastic enclosure fitted with terminals for the connection of external circuits. The SA16 is designed to restrict the transfer of energy from unspecified non-intrinsically safe circuits to intrinsically safe circuits by the use of galvanically isolating components.

The hazardous area equipment comprise of the following equipment;

1. AIM

2. GM1

3. GM1-D

4. GM2

5. SIM

6. Simple apparatus

CONDITIONS OF CERTIFICATION: YES as shown below:

The Attachment contains a list of Conditions which MUST be met in order for this Certificate to be considered valid.

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EQUIPMENT (continued):

Description of Module Types

The AIM Module is designed to provide galvanic isolation between the Master Barrier circuit and an external suitably certified power supply having a maximum output voltage of 16.5 V connected to terminals 3 to 5. The AIM module comprises of two printed wiring boards upon which are mounted electronic components all encapsulated in a plastic housing. External connections are made via the integral cables or by terminals mounted in the wall of the enclosure.

The GM1, GM1-D and GM2 modules are designed to provide an interface between the Master Barrier and external simple apparatus such as PRT's, LED's and switches etc.

The GM1 and GM2 modules comprises up to two printed wiring boards upon which are mounted electronic components all encapsulated in a plastic housing. External connections are made via the integral cables or by terminals mounted in the wall of the enclosure.

The GM1-D module comprises two printed wiring boards upon which are mounted electronic components partly encapsulated in a plastic housing. External connections are made via external terminals mounted in the wall of the enclosure. The GM1-D module is to be mounted within a suitable enclosure that offers a degree of protection not less than IP54.

The SIM modules are designed to prevent the transfer of energy from the one hazardous area circuit to another hazardous area circuit via galvanically isolating opto couplers with the application of 2 faults applied.

The SIM, GM1, GM2, AIM and SA12 Modules are intended to be located either in a non-hazardous area or a hazardous area.

Refer to the attachment for a list of Manufacturers drawings

Annex:

IECEx_ITA_07_0017X_Attachment.pdf

This Attachment forms an Integral Part of the IECEx Certificate and all pages MUST be presented and read whenever the IECEx ITA 07.0017X Certificate is presented

Conditions of Certification

The following conditions listed under A and B Groups apply to certificate IECEx ITA 07.0017X :

A. Conditions regarding the Associated Apparatus:

1 The following input parameters are to be taken in to account in the system

MLB Module Terminals 1 wrt terminals 3, 9, 10,11,12		
U_o =	250	V

The SA16 module L1 Connections are only to be connected to a Master Line Barrier;

Module	Input Connections	*Ci*	L_i
SA16	(+L1, -L1) Terminals 12 & 13	negligible	negligible

SA16 Module Terminals 1 to 8		
U_o =	250	V

2. The following output parameters are to be taken in to account in the system;

MLB Module Terminals 7, 8 L1+, L1- wrt terminals 9 to 12		
U_o =	21.5	V
I_o =	481.52	mA
P_o =	2.58	W
C_o =	6.1	µF
L_o =	2	mH
Ci =	negligible	µF
L_i =	negligible	µH

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Conditions of Certification, continued

SA16 Module Terminals 12 wrt 13		
U_o =	0	V
I_o =	0	A
Ci =	negligible	µF
L_i =	negligible	µH

The above load parameters apply where:

a. The external circuit contains no combined lumped inductance Li and capacitance Ci greater than 1% of the above values. or
b. The inductance and capacitance are distributed as in a cable. or
c. The external circuit contains only lumped inductance or only lumped capacitance in combination with a cable.

In all other situations, e.g. the external circuit contains combined lumped inductance and capacitance, up to 50% of each of the inductance and capacitance values is allowed.

3. The MLB or SA16 modules must be located in a suitable enclosure that provides a degree of protection not less than IP20.

4. A copy of the instruction must be provided with each module

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Conditions of Certification, continued

B. All other conditions

1. The following modules are only to be connected to a Master Line Barrier;

Module	Input Connections	*Ci*	L_i
AIM	(+L1, -L1) Red & Black wires	negligible	negligible
GM1	(+L1, -L1) Red, Black and White wires	negligible	negligible
GM1-D	(+L1, -L1) Terminals 10, 11 & 12	negligible	negligible
GM2	(+L1, -L1) Red & Black wires	negligible	negligible
SIM	(+L1, -L1) Terminals 1 & 2	negligible	negligible

The following input parameters are to be taken in to account in the system

AIM Terminals		
U_i =	16.5	V
I_i =	3	A
Ci =	negligible	nF
L_i =	negligible	µH

SIM Terminals PS+ PS-		
U_i =	16.5	V
I_i =	3.5	A
Ci =	negligible	nF
L_i =	negligible	µH

SIM Terminals TR+ TR-		
U_i =	7.14	V
I_i =	2	A
Ci =	negligible	nF
L_i =	negligible	µH

2. The following output parameters are to be taken in to account in the system;

AIM Module (NOT Red or Black coloured wires)		
U_o =	0	V
I_o =	0	A
Ci =	negligible	nF
L_i =	negligible	µH

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Conditions of Certification, continued

GM1 Module (NOT Red, Black or White coloured wires) & GM1-D Terminals 1 to 9		
U_o =	21.5	V
I_o =	0.202	A
P_o =	1.09	W
C_o =	0.27	µF
L_o =	11.4	mH
Ci =	5.83	µF
L_i =	negligible	µH

GM1-D Module Terminals 1 to 9		
U_o =	21.5	V
I_o =	0.202	A
P_o =	1.09	W
C_o =	0.27	µF
L_o =	11.4	mH
Ci =	5.83	µF
L_i =	negligible	µH

GM2 Module (X+, X-) Pink & Grey wires		
U_o =	21.5	V
I_o =	79	mA
P_o =	426	mW
C_o =	6.1	µF
L_o =	72	mH
L/R	840	µH/Ω
Ci =	negligible	µF
L_i =	negligible	µH

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Conditions of Certification, continued

GM2 Module (A+, A-) Orange & Yellow (B+, B-) Purple & Green		
U_o =	12.6V	V
I_o =	39.5	mA
P_o =	125	mW
C_o =	29	µF
L_o =	306	mH
L/R	3000	µH/Ω
Ci =	negligible	µF
L_i =	negligible	µH

SIM Module Terminals 11 & 12		
U_o =	5.88	V
I_o =	19.8	mA
P_o =	29.1	mW
C_o =	1000	µF
L_o =	1	H
L/R	1600	µH/Ω
Ci =	negligible	µF
L_i =	negligible	µH

The above load parameters apply where:

d. The external circuit contains no combined lumped inductance Li and capacitance Ci greater than 1% of the above values. or
e. The inductance and capacitance are distributed as in a cable. or
f. The external circuit contains only lumped inductance or only lumped capacitance in combination with a cable.

In all other situations, e.g. the external circuit contains combined lumped inductance and capacitance, up to 50% of each of the inductance and capacitance values is allowed.

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Conditions of Certification, continued

3. The SIM and GM1-D Modules must be located in a suitable enclosure that provides a degree of protection not less than IP54.

4. The terminals of the AIM, GM1 & GM2 modules must be made via suitable enclosure that provides a degree of protection not less than IP20 and mounted in such a manner that the encapsulation is not exposed.

5. A copy of the instructions must be supplied with each module.

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DRAWINGS. The following list of drawings apply to this Certificate.

Drawing list associated with ExTR: **AU/ITA/ExTR08.0014/00**

Title:	Drawing No.:	Rev. Level:	Date:
MLB Master Line Barrier General Arrangement	iMAC-Z-013	0	2008/03/07
iMAC MLB Schematic	iMAC-Z-014	0	2008/02/25
iMAC MLB PCB	iMAC-Z-015 Sheets 1 & 2	0	2008/02/25
SA16 Slave Active ERNI16 Interface General Arrangement	iMAC-Z-016	0	2008-02-25
iMAC SA16 Schematic	iMAC-Z-017	0	2008-02-25
iMAC SA16 PCB	iMAC-Z-018 Sheets 1 & 2	0	2008-02-25

Drawing List associated with ExTR: **AU/ITA/ExTR08.0013/00**

Title:	Drawing No.:	Rev. Level:	Date:
AIM Analog Input Module General Arrangement	iMAC-Z-029	0	2008/02/25
iMAC AIM Schematic	iMAC-Z-030	0	2008/02/25
iMAC AIM PCB	iMAC-Z-031 Sheets 1 & 2	0	2008/02/25
GM1 General Module 1 General Arrangement	iMAC-Z-033	0	2008/02/25
iMAC GM1 Schematic	iMAC-Z-005	0	2008/02/25
iMAC GM1 PCB	iMAC-Z-006 Sheets 1 & 2	0	2008/02/25
GM1-D General Module 1 (ERNI12 Style) General Arrangement	iMAC-Z-007	0	2008/03/06
iMAC GM1-D Schematic	iMAC-Z-008	0	2008/02/25
iMAC GM1-D PCB	iMAC-Z-009 Sheets 1 & 2	0	2008/02/25
GM2 General Module 2 General Arrangement	iMAC-Z-010	0	2008/02/25
iMAC GM2 Schematic	iMAC-Z-011 Sheets 1 & 2	0	2008/02/25
iMAC GM2 PCB 1/2	iMAC-Z-012 Sheets 1 to 2	0	2008/03/06
iMAC GM2 PCB 2/2	iMAC-Z-012 Sheets 3 & 4	0	2008/03/06
SIM Serial Interface Module General Arrangement	iMAC-Z-019	0	2008/03/07
iMAC SIM Schematic	iMAC-Z-020 Sheets 1 & 2	0	2008/02/25
iMAC SIM PCB	iMAC-Z-021 Sheets 1 & 2	0	2008/02/25
iMAC System Overview Master Line Barrier, Slave Cons.	iMAC-Z-032	0	2008/02/25