<b>IECEX</b>	IEC of	Ex Certificate Conformity	
	INTERNATIONAL ELECT IEC Certification Syste for rules and details of the	<b>ROTECHNICAL COMMIS</b> <b>m for Explosive Atmosphere</b> IECEx Scheme visit www.iecex.com	SION es
Certificate No.:	IECEx BAS 23.0011	Page 1 of 4	Certificate history:
Status:	Current	Issue No: 1	Issue 0 (2023-05-05)
Date of Issue:	2023-12-18		
Applicant:	Eaton Electric Limited Great Marlings Butterfield Luton Bedfordshire LU2 8DL United Kingdom		
Equipment:	MTL4500 & MTL5500 Series Galvanic Iso	lators – Digital In modules	
Optional accessory:			
Type of Protection:	Intrinsic Safety		
Marking:	[Ex ia Ga] IIC [Ex ia Da] IIIC [Ex ia Ma] I		
	-20°C ≤ Ta ≤ +60°C – All Models -20°C ≤ Ta ≤ +65°C – MTL5514-T Model or	nly	
Approved for issue or Certification Body:	n behalf of the IECEx	Mr R S Sinclair	
Position:		Technical Manager	
Signature: (for printed version)		RSS-Qui	
Date: (for printed version)		18/12/2023	
<ol> <li>This certificate and s</li> <li>This certificate is not</li> <li>The Status and author</li> </ol>	chedule may only be reproduced in full. transferable and remains the property of the issuing be enticity of this certificate may be verified by visiting www	ody. v.iecex.com or use of this QR Code.	
Certificate issued SGS UK Limite Rockhead Busin Staden Lane Buxton, Derbysh United Kingdo	by: ess Park nire SK17 9RZ	_	SGS



## IECEx Certificate of Conformity

Certificate No .:	IECEx BAS 23.0011	Page 2 of 4
Date of issue:	2023-12-18	Issue No: 1
Manufacturer:	Eaton Electric Limited Great Marlings Butterfield Luton Bedfordshire LU2 8DL United Kingdom	
Manufacturing locations:	<b>MTL Instruments PVT Limited</b> No 3 Old Mahabalipuram Road, Sholinganallur, Chennai, 600 119 <b>India</b>	
This certificate is issu IEC Standard list belo found to comply with Rules, IECEx 02 and	ued as verification that a sample(s), representative of production, w ow and that the manufacturer's quality system, relating to the Ex pr the IECEx Quality system requirements.This certificate is granted Operational Documents as amended	vas assessed and tested and found to comply with the roducts covered by this certificate, was assessed and subject to the conditions as set out in IECEx Scheme
<b>STANDARDS</b> : The equipment and a to comply with the fol	any acceptable variations to it specified in the schedule of this certi llowing standards	ficate and the identified documents, was found
IEC 60079-0:2017 Edition:7.0	Explosive atmospheres - Part 0: Equipment - General requireme	nts
IEC 60079-11:2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrins	sic safety "i"
	This Certificate <b>does not</b> indicate compliance with safety and other than those expressly included in the Standa	d performance requirements ards listed above.
<b>TEST &amp; ASSESSME</b> A sample(s) of the ec	ENT REPORTS: auipment listed has successfully met the examination and test requ	irements as recorded in:

Test Reports:

GB/BAS/ExTR23.0017/00

GB/SGS/ExTR23.0149/00

Quality Assessment Reports:

GB/BAS/QAR06.0022/10

GB/BAS/QAR07.0017/10



# IECEx Certificate of Conformity

Certificate No.:

**IECEx BAS 23.0011** 

2023-12-18

Date of issue:

Page 3 of 4

Issue No: 1

#### EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

This certificate covers the following types:

- MTL4501-SR Failsafe Switch / Proximity Detector Interface.
- MTL4504 / MTL4511 / MTL4514 / MTL4516 / MTL4516 / MTL4516 / MTL4517 Switch / Proximity Detector Interface.
- MTL4510 / MTL4510B / MTL4513 Switch / Proximity Detector Interface.
- MTL4514D Single Channel Switch / Proximity Detector Interface with Dual Output, Line Fault Detection & Phase Reversal.
- MTL4514N / MTL4514X Switch / Proximity Detector Interface with Line Fault Detection Alarm.
- MTL5501-SR Failsafe Switch / Proximity Detector Interface.
- MTL5510 / MTL5510B / MTL5513 Switch / Proximity Detector Interface.
- MTL5511 / MTL5514 / MTL5514-T / MTL5516C / MTL5517 Switch / Proximity Detector Interface.
- MTL5514D Single Channel Proximity Detector Interface with Dual Output, Line Fault Detection & Phase Reversal.

See Certificate Annex for a description of the types of equipment and electrical parameters.

SPECIFIC CONDITIONS OF USE: NO



# IECEx Certificate of Conformity

Certificate No.: IECEx BAS 23.0011

Page 4 of 4

Issue No: 1

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

2023-12-18

#### Variation 1.1

Date of issue:

To permit the introduction of the MTL4514X Switch / Proximity Detector Interface with Line Fault Detection Alarm to the certification (see schedule 5 of the Annex)

ExTR: GB/SGS/ExTR23.0149/00	File Reference: 23/0502
-----------------------------	-------------------------

#### Annex:

IECEx BAS 23.0011 Annex1.pdf

SGS Baseefa Limited Rockhead Business Park Staden Iane, Buxton, Derbyshire SK17 9RZ United Kingdom		SGS
ANNEX to IECEx BAS 23.0011	Issue No. 1	Date: 12 December 2023

### Schedule 1 – MTL4501-SR Failsafe Switch / Proximity Detector Interface

The MTL4501-SR Failsafe Switch / Proximity Detector Interface is designed to provide an interface between unspecified non-hazardous area apparatus and an intrinsically safe circuit in the hazardous area. The apparatus is intended to provide a galvanically isolated fail-safe safe-area output whilst monitoring a fail-safe proximity switch detector located in the hazardous area. Line Fault Detection (LFD) in the apparatus is provided by volt-free relay contact output on the nonhazardous area side of the apparatus. Two transformers and a relay provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The apparatus comprises two isolating transformers, a relay, fuses, zener diodes and resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a printed circuit board and housed in a moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and non-hazardous area connections. LED indication is provided for power-on, the output status and line fault detection.

#### Input / Output Parameters

Non-Hazardous Area Terminals 7, 8, 10, 11, 13 & 14

 $U_m = 253V r.m.s.$ 

The circuit connected to non-hazardous area terminals 13 & 14 is designed to operate from a d.c. supply voltage of up to 35V.

The non-hazardous area terminals 10 & 11 are connected to relay contacts which can switch up to 253V r.m.s, 2A r.m.s and 100VA

Hazardous Area Terminals 1 & 2

U₀	=	±9.7V	Ci	=	0
lo	=	30mA	Li	=	0
P。	=	0.07W			

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

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR	L/R RATIO (µH/ohm)
IIC	3.5	39		475
IIB*	24	145		1,829
IIA	170	299		3,093
I	320	501		6,414

\* Group IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

Notes:

1) 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 < 1% of the  $L_0$  value or

- the total C<sub>i</sub> of the external circuit (excluding the cable) is < 1% of the C<sub>0</sub> value.
- 2) The above parameters are reduced to 50% when both of the two conditions below are given:
  - the total Li of the external circuit (excluding the cable) is  $\geq 1\%$  of the L<sub>0</sub> value and

- the total C<sub>i</sub> of the external circuit (excluding the cable) is  $\geq 1\%$  of the C<sub>0</sub> value.





ANNEX to IECEx BAS 23.0011

Issue No. 1

Date: 12 December 2023

#### Schedule 2 – MTL4504 / MTL4511 / MTL4514 / MTL4514B / MTL4516 / MTL4516C / MTL4517 Switch / Proximity Detector Interface

The MTL4504 / MTL4511 / MTL4514 / MTL4514B / MTL4516 / MTL4516C / MTL4517 Switch / Proximity Detector Interface are designed to restrict the transfer of energy from unspecified non-hazardous area apparatus to up to two intrinsically safe circuits by limitation of voltage and current. Relays and a transformer provide galvanic isolation between the hazardous and non-hazardous area circuitry.

Each channel of the interface monitors either a detector or switch located in the hazardous area and controls non-hazardous area loads via relays. Some models of the interface are fitted with independent phase reverse controls and Line Fault Detection (LFD) circuitry allow an alarm condition to be signalled for either state, set by switches on the side of the interface.

The apparatus comprises an isolating transformer, relays, zener diodes and current limiting resistors to provide voltage and current limitation on each channel. These, together with other electronic components are mounted on a single printed circuit board and housed in a plastic enclosure. Polarised plugs and sockets are provided for connection to the hazardous and non-hazardous area. LED indication is provided to indicate Power-on, state of the outputs and LFD status.

The above listed models are all built on a common printed circuit board. The differences between the models relates to the configuration of relays and non-hazardous area connections.

### Model Range

Model No.	
MTL4504	Single Channel Switch / Proximity Detector Interface with Line Fault Detection (LFD) &
	Phase Reversal
MTL4511	Single Channel Switch / Proximity Detector Interface
MTL4514	Single Channel Switch / Proximity Detector Interface with Line Fault Detection (LFD) Alarm
MTL4514B	Single Channel Switch / Proximity Detector Interface with Line Fault Detection (LFD) &
	Phase Reversal
MTL4516	Dual Channel Switch / Proximity Detector Interface
MTL4516C	Dual Channel Switch / Proximity Detector Interface
MTL4517	Dual Channel Switch / Proximity Detector Interface with Line Fault Detection (LFD) Alarm

### Input / Output Parameters

Non-Hazardous Area Terminals 7 to 14

 $U_m = 253V r.m.s.$ 

The circuit connected to non-hazardous area terminals pins 13 & 14 are designed to operate from a d.c. supply voltage of up to 35V.

Non-hazardous area terminals pins 7 to 12 are connected to relay contacts which can switch up to 253V r.m.s, 2A r.m.s and 100VA.

Hazardous Area Terminals 1 w.r.t. 2 / 3 (Channel 1) Hazardous Area Terminals 4 w.r.t. 5 / 6 (Channel 2)\*

 $\begin{array}{rcl} U_{o} &=& 10.5V & C_{i} &=& 0 \\ I_{o} &=& 14mA & L_{i} &=& 0 \\ P_{o} &=& 37mW \end{array}$ 



#### \* For MTL4516, MTL4516C & MTL4517 Models only

The capacitance and either the inductance or the 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 (µH/ohm)
IIC	2.41	175		983
IIB**	16.8	680		1,333
IIA	75.0	1,000		1,333
I	95.0	1,000		1,333

\*\* Group IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

#### Notes:

- 1) 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 < 1% of the  $L_0$  value or - the total  $C_i$  of the external circuit (excluding the cable) is < 1% of the  $C_0$  value.
- 2) The above parameters are reduced to 50% when both of the two conditions below are given:
  - the total L<sub>i</sub> of the external circuit (excluding the cable) is  $\geq 1\%$  of the L<sub>o</sub> value and
  - the total  $C_i$  of the external circuit (excluding the cable) is  $\geq 1\%$  of the  $C_o$  value.

SGS Baseefa Limited Rockhead Business Park Staden Iane, Buxton, Derbyshire SK17 9RZ United Kingdom		SGS
ANNEX to IECEx BAS 23.0011	Issue No. 1	Date: 12 December 2023

#### Schedule 3 – MTL4510 / MTL4510B / MTL4513 Switch / Proximity Detector Interface

The MTL4510 Switch / Proximity Detector Interface is designed to restrict the transfer of energy from the unspecified non-hazardous area apparatus to four intrinsically safe circuits by limitation of voltage and current. An isolating transformer and an opto-coupler provide galvanic isolation between the hazardous and non-hazardous area circuitry. Each channel of the MTL4510 monitors either a detector or a switch in the hazardous area and controls a non-hazardous area load via a solid-state output.

The apparatus comprises an isolating transformer, an opto-coupler, zener diodes and resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a single printed circuit board (PCB) and housed in moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and nonhazardous area connections. LED indication is provided to indicate power-on, the status of each output and Line Fault Detection (LFD).

The MTL4510B Multifunction Digital Input Interface has the same hazardous area circuitry and parameters as the MTL4510 but has a different configuration via the removal of a link in the non-hazardous area circuitry.

The MTL4513 Switch / Proximity Detector Interface is a depopulated version of the MTL4510, using the same PCB and enclosure having only two channels populated.

#### Input / Output Parameters

Non-Hazardous Area Terminals 7 to 14

$$U_{m} = 253V$$

The circuit connected to non-hazardous area terminals 7 to 14 are designed to operate from a d.c. supply voltage of 35V d.c.

Hazardous Area Terminals 1 w.r.t. 2 (Channel 1) Hazardous Area Terminals 3 w.r.t. 2 (Channel 2) Hazardous Area Terminals 4 w.r.t. 5 (Channel 3)\* Hazardous Area Terminals 6 w.r.t. 5 (Channel 4)\*

 $\begin{array}{rcl} U_{o} & = & 10.5V \\ I_{o} & = & 14mA \\ P_{o} & = & 37mW \\ C_{i} & = & 0 \\ L_{i} & = & 0 \end{array}$ 

\* For MTL4510 & MTL4510B Models only

The capacitance and either the inductance or the 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 (µH/ohm)
IIC	2.41	175		983
IIB**	16.8	680		1,333
IIA	75.0	1,000		1,333
I	95.0	1,000		1,333

SGS Baseefa Limited Rockhead Business Park Staden lane, Buxton, Derbyshire SK17 9RZ United Kingdom		SGS
ANNEX to IECEx BAS 23.0011	Issue No. 1	Date: 12 December 2023

\*\* Group IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

Notes:

- 1) 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 < 1% of the  $L_0$  value or
  - the total C<sub>i</sub> of the external circuit (excluding the cable) is < 1% of the C<sub>0</sub> value of the total C<sub>i</sub> of the external circuit (excluding the cable) is < 1% of the C<sub>0</sub> value.
- 2) The above parameters are reduced to 50% when both of the two conditions below are given:
   the total L<sub>i</sub> of the external circuit (excluding the cable) is ≥ 1% of the L<sub>o</sub> value and
   the total C<sub>i</sub> of the external circuit (excluding the cable) is ≥ 1% of the C<sub>o</sub> value.



#### Schedule 4 – MTL4514D Single Channel Switch / Proximity Detector Interface with Dual Output, Line Fault Detection & Phase Reversal

The MTL4514D Single Channel Switch / Proximity Detector Interface with Dual Output, Line Fault Detection & Phase Reversal is designed to restrict the transfer of energy from unspecified non-hazardous area equipment to an intrinsically safe circuit by limitation of voltage and current. Relays and a transformer provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The interface monitors either a detector or switch located in the hazardous area and controls two non-hazardous area loads via relays. The interface is also fitted with independent phase reversal controls and Line Fault Detection (LFD) circuitry allowing an alarm condition to be signalled for either state, set by switches on the side of the interface.

The equipment comprises an isolating transformer, relays, zener diodes and current limiting resistors to provide voltage and current limitation.

These, together with other electronic components are mounted on a single printed circuit board and housed in a plastic enclosure. Polarised plug and socket connections are provided for connection to the hazardous and non-hazardous area. LED indication is provided to indicate Power-on, state of the output and LFD status.

#### Input / Output Parameters

Non-Hazardous Area Terminals 7 to 14

U<sub>m</sub> = 253V

The circuit connected to non-hazardous area terminals pins 13 & 14 are designed to operate from a d.c. supply voltage of up to 35V d.c.

Non-hazardous area terminals pins 7, 8, 10 & 11 are connected to relay contacts which can switch up to 253V r.m.s, 2A r.m.s and 100VA.

#### Hazardous Area Terminals 1 w.r.t. 2 / 3

 $\begin{array}{rcl} U_{o} &=& 10.5 V & C_{i} &=& 0 \\ I_{o} &=& 14 m A & L_{i} &=& 0 \\ P_{o} &=& 37 m W \end{array}$ 

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

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR	L/R RATIO (µH/ohm)
IIC	2.41	175		983
IIB**	16.8	680		1,333
IIA	75.0	1,000		1,333
I	95.0	1,000		1,333

\*\* Group IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

SGS Baseefa Limited Rockhead Business Park Staden Iane, Buxton, Derbyshire SK17 9RZ United Kingdom		SGS
ANNEX to IECEx BAS 23.0011	Issue No. 1	Date: 12 December 2023

Notes:

- 1) 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 < 1% of the  $L_0$  value or
  - the total  $C_i$  of the external circuit (excluding the cable) is < 1% of the  $C_0$  value.
- 2) The above parameters are reduced to 50% when both of the two conditions below are given: - the total  $L_i$  of the external circuit (excluding the cable) is  $\geq 1\%$  of the  $L_0$  value and
  - the total C<sub>i</sub> of the external circuit (excluding the cable) is  $\geq 1\%$  of the C<sub>o</sub> value.

SGS Baseefa Limited Rockhead Business Park Staden Iane, Buxton, Derbyshire SK17 9RZ United Kingdom		SGS
ANNEX to IECEx BAS 23.0011	Issue No. 1	Date: 12 December 2023

#### Schedule 5 – MTL4514N / MTL4514X Switch / Proximity Detector Interface with Line Fault Detection Alarm

The MTL4514N / MTL4514X Switch / Proximity Detector Interface with Line Fault Detection alarm are designed to restrict the transfer of energy from unspecified non-hazardous area apparatus to an intrinsically safe circuit by limitation of voltage and current. Relays and a transformer provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The interface monitors either a detector or switch located in the hazardous area and control a non-hazardous area loads via relay. The interface is also fitted with independent phase reversal controls and Line Fault Detection (LFD) circuitry allowing an alarm condition to be signalled for either state, set by switches on the side of the interface. The interface has identification circuitry fitted on the non-hazardous area side of the circuit which allows it to be identified when fitted on specific backplanes.

The apparatus comprises an isolating transformer, relays, zener diodes and current limiting resistors to provide voltage and current limitation. These, together with other electronic components are mounted on a single printed circuit board and housed in a plastic enclosure. Polarised plug and socket connections are provided for connection to the hazardous and non-hazardous area. LED indication is provided to indicate Power-on, state of the output and LFD status.

### Input / Output Parameters

Non-Hazardous Area Terminals 7 to 14

 $U_{m} = 253V$ 

The circuit connected to non-hazardous area terminals pins 13 & 14 are designed to operate from a d.c. supply voltage of up to 35V d.c.

Non-hazardous area terminals pins 7 to 12 are connected to relay contacts which can switch up to 253V r.m.s, 2A r.m.s and 100VA.

#### Hazardous Area Terminals 1 w.r.t. 2 / 3

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

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR	L/R RATIO (µH/ohm)
IIC	2.41	175		983
IIB**	16.8	680		1,333
IIA	75.0	1,000		1,333
I	95.0	1,000		1,333

\*\* Group IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

Notes:

- 1) 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 < 1% of the  $L_0$  value or
  - the total  $C_i$  of the external circuit (excluding the cable) is < 1% of the  $C_{\rm o}$  value.

SGS Baseefa Limited Rockhead Business Park Staden lane, Buxton, Derbyshire SK17 9RZ United Kingdom		SGS
ANNEX to IECEx BAS 23.0011	Issue No. 1	Date: 12 December 2023

2) The above parameters are reduced to 50% when both of the two conditions below are given:

- the total  $L_i$  of the external circuit (excluding the cable) is  $\ge 1\%$  of the L<sub>o</sub> value and
- the total C<sub>i</sub> of the external circuit (excluding the cable) is  $\geq$  1% of the C<sub>o</sub> value.

SGS Baseefa Limited Rockhead Business Park Staden lane, Buxton, Derbyshire SK17 9RZ United Kingdom		SGS
ANNEX to IECEx BAS 23.0011	Issue No. 1	Date: 12 December 2023

#### Schedule 6 – MTL5501-SR Failsafe Switch / Proximity Detector Interface

The MTL5501-SR Failsafe Switch / Proximity Detector Interface is designed to provide an interface between unspecified non-hazardous area apparatus and intrinsically safe circuit in the hazardous area. The apparatus is intended to provide a galvanically isolated fail-safe safe-area output whilst monitoring a fail-safe proximity switch detector located in the hazardous area. Line Fault Detection (LFD) in the apparatus is provided by volt-free relay contact output on the nonhazardous area side of the apparatus. Two transformers and a relay provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The apparatus comprises two isolating transformers, a relay, fuses, zener diodes and resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a printed circuit board and housed in a moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and non-hazardous area connections. LED indication is provided for power-on, the output status and line fault detection.

#### Input / Output Parameters

Non-Hazardous Area Terminals 7, 8, 10, 11, 13 & 14

 $U_m = 253V r.m.s.$ 

The circuit connected to non-hazardous area terminals 13 & 14 is designed to operate from a d.c. supply voltage of up to 35V.

The non-hazardous area terminals 10 & 11 are connected to relay contacts which can switch up to 253V r.m.s, 2A r.m.s and 100VA

Hazardous Area Terminals 1 & 2

U₀	=	±9.7V	Ci	=	0
lo	=	30mA	Li	=	0
Po	=	0.07W			

The capacitance and either the inductance or the 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 (µH/ohm)
IIC	3.5	39		475
IIB*	24	145		1,829
IIA	170	299		3,093
1	320	501		6,414

\* Group IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

Notes:

- The above load parameters apply when one of the two conditions below is given:
   the total L<sub>i</sub> of the external circuit (excluding the cable) is < 1% of the L<sub>o</sub> value or
  - the total  $C_i$  of the external circuit (excluding the cable) is < 1% of the  $C_0$  value.

SGS Baseefa Limited Rockhead Business Park Staden lane, Buxton, Derbyshire SK17 9RZ United Kingdom		SGS
ANNEX to IECEx BAS 23.0011	Issue No. 1	Date: 12 December 2023

2) The above parameters are reduced to 50% when both of the two conditions below are given:

- the total  $L_i$  of the external circuit (excluding the cable) is  $\ge 1\%$  of the L<sub>o</sub> value and
- the total C<sub>i</sub> of the external circuit (excluding the cable) is  $\geq$  1% of the C<sub>o</sub> value.

SGS Baseefa Limited Rockhead Business Park Staden Iane, Buxton, Derbyshire SK17 9RZ United Kingdom		SGS
ANNEX to IECEx BAS 23.0011	Issue No. 1	Date: 12 December 2023

#### Schedule 7 – MTL5510 / MTL5510B / MTL5513 Switch / Proximity Detector Interface

The MTL5510 Switch / Proximity Detector Interface is designed to restrict the transfer of energy from the unspecified non-hazardous area apparatus to four intrinsically safe circuits by limitation of voltage and current. An isolating transformer and an opto-coupler provide galvanic isolation between the hazardous and non-hazardous area circuitry. Each channel of the MTL5510 monitors either a detector or a switch in the hazardous area and controls a non-hazardous area load via a solid state output.

The apparatus comprises an isolating transformer, an opto-coupler, zener diodes and resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a single printed circuit board (PCB) and housed in moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and non-hazardous area connections. LED indication is provided to indicate power-on, the status of each output and Line Fault Detection (LFD).

The MTL5510B Multifunction Digital Input Interface has the same hazardous area circuitry and parameters as the MTL5510 but has a different configuration via the removal of a link in the non-hazardous area circuitry.

The MTL5513 Switch / Proximity Detector Interface is a depopulated version of the MTL5510, using the same PCB and enclosure having only two channels populated.

#### Input / Output Parameters

Non-Hazardous Area Terminals 7 to 14

$$U_{m} = 253V$$

The circuit connected to non-hazardous area terminals 7 to 14 are designed to operate from a d.c. supply voltage of 35V d.c.

Hazardous Area Terminals 1 w.r.t. 2 (Channel 1) Hazardous Area Terminals 3 w.r.t. 2 (Channel 2) Hazardous Area Terminals 4 w.r.t. 5 (Channel 3)\* Hazardous Area Terminals 6 w.r.t. 5 (Channel 4)\*

 $\begin{array}{rcl} U_{o} & = & 10.5V \\ I_{o} & = & 14mA \\ P_{o} & = & 37mW \\ C_{i} & = & 0 \\ L_{i} & = & 0 \end{array}$ 

\* For MTL5510 & MTL5510B Models only

The capacitance and either the inductance or the 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 (µH/ohm)
IIC	2.41	175		983
IIB**	16.8	680		1,333
IIA	75.0	1,000		1,333
I	95.0	1,000		1,333

\*\* Group IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

SGS Baseefa Limited Rockhead Business Park Staden Iane, Buxton, Derbyshire SK17 9RZ United Kingdom		SGS
ANNEX to IECEx BAS 23.0011	Issue No. 1	Date: 12 December 2023

Notes:

- 1) 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 < 1% of the  $L_0$  value or
  - the total C<sub>i</sub> of the external circuit (excluding the cable) is < 1% of the C<sub>0</sub> value  $\sigma$
- 2) The above parameters are reduced to 50% when both of the two conditions below are given:
  - the total  $L_i$  of the external circuit (excluding the cable) is  $\geq 1\%$  of the  $L_0$  value and
  - the total  $C_i$  of the external circuit (excluding the cable) is  $\geq 1\%$  of the  $C_o$  value.

SGS Baseefa Limited Rockhead Business Park Staden Iane, Buxton, Derbyshire SK17 9RZ United Kingdom		SGS
ANNEX to IECEx BAS 23.0011	Issue No. 1	Date: 12 December 2023

#### Schedule 8 – MTL5511 / MTL5514 / MTL5514-T / MTL5516C / MTL5517 Switch / Proximity Detector Interface

The MTL5511 / MTL5514 / MTL5514-T / MTL5516C / MTL5517 Switch / Proximity Detector Interface are designed to restrict the transfer of energy from unspecified non-hazardous area apparatus to up to two intrinsically safe circuits by limitation of voltage and current. A transformer and relays provide galvanic isolation between the hazardous and non-hazardous area circuitry.

Each channel of the interface monitors either a detector or switch located in the hazardous area and controls non-hazardous area loads via relays. Some models of the interface are fitted with independent phase reverse controls and Line Fault Detection (LFD) circuitry allow an alarm condition to be signalled for either state, set by switches on the side of the interface.

The apparatus comprises an isolating transformer, relays, zener diodes and current limiting resistors to provide voltage and current limitation on each channel. These, together with other electronic components are mounted on a single printed circuit board and housed in a plastic enclosure. Polarised plugs and sockets are provided for connection to the hazardous and non-hazardous area. LED indication is provided to indicate Power-on, state of the outputs and LFD status.

The above listed models are all built on a common printed circuit board. The differences between the models relates to the configuration of the relays and non-hazardous connections via the fitting and removal of relays and soldered and component links.

The MTL5514-T Single Channel Switch / Proximity Detector Interface with Line Fault Detection (LFD) Alarm is of similar construction to the MTL5514 variant of the equipment with the same input and output parameters, but has an extended ambient temperature range of -20°C to +65°C.

#### Model Range:

Model No.	
MTL5511	Single Channel Switch / Proximity Detector Interface
MTL5514	Single Channel Switch / Proximity Detector Interface with Line Fault Detection (LFD) Alarm
MTL5514-T	Single Channel Switch / Proximity Detector Interface with Line Fault Detection (LFD) Alarm
MTL5516C	Two Channel Switch / Proximity Detector Interface
MTL5517	Two Channel Switch / Proximity Detector Interface with Line Fault Detection (LFD) Alarm

#### Input / Output Parameters

Non-Hazardous Area Terminals 7 to 14

 $U_m = 253V r.m.s.$ 

The circuit connected to non-hazardous area terminals 13 & 14 is designed to operate from a d.c. supply voltage of up to 35V.

Non-hazardous area terminals 7 to 12 are connected to relay contacts which can switch up to 253V r.m.s, 2A r.m.s. and 100VA.

<u>Hazaı</u>	<u>rdous</u>	Area	Terr	ninals	; 1	w.r.t.	2	/ 3	(Chan	<u>nel 1)</u>
		-	_				_			

<u>Hazardou</u>	is Area	<u>Terminals 4 w.r.t. 5 /</u>	<u>6 (Cł</u>	nanı	nel :	2)
Uo	=	10.5V	Ci	=	0	
lo	=	14mA	Li	=	0	
Po	=	37mW				

\* For MTL5516C & MTL5517 Models only



The capacitance and either the inductance or the 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 (µH/ohm)
IIC	2.41	175		983
IIB**	16.8	680		1,333
IIA	75.0	1,000		1,333
- I	95.0	1,000		1,333

\*\* Group IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

Notes:

- The above load parameters apply when one of the two conditions below is given:
   the total L<sub>i</sub> of the external circuit (excluding the cable) is < 1% of the L<sub>0</sub> value or
   the total C<sub>i</sub> of the automal circuit (excluding the cable) is < 1% of the L<sub>0</sub> value or
  - the total  $C_i$  of the external circuit (excluding the cable) is < 1% of the  $C_o$  value.
- 2) The above parameters are reduced to 50% when both of the two conditions below 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<sub>i</sub> of the external circuit (excluding the cable) is  $\ge 1\%$  of the C<sub>o</sub> value.



#### Schedule 9 – MTL5514D Single Channel Proximity Detector Interface with Dual Output, Line Fault Detection & Phase Reversal

The MTL5514D Single Channel Switch / Proximity Detector Interface with Dual Output, Line Fault Detection & Phase Reversal is designed to restrict the transfer of energy from unspecified non-hazardous area apparatus to an intrinsically safe circuit by limitation of voltage and current. Relays and a transformer provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The interface monitors either a detector or switch located in the hazardous area and controls two non-hazardous area loads via relays. The interface is also fitted with independent phase reversal controls and Line Fault Detection (LFD) circuitry allowing an alarm condition to be signalled for either state, set by switches on the side of the interface.

The apparatus comprises an isolating transformer, relays, zener diodes and current limiting resistors to provide voltage and current limitation.

These, together with other electronic components are mounted on a single printed circuit board and housed in a plastic enclosure. Polarised plug and socket connections are provided for connection to the hazardous and non-hazardous area. LED indication is provided to indicate Power-on, state of the output and LFD status.

#### Input / Output Parameters

Non-Hazardous Area Terminals 7 to 14

 $U_{m} = 253V r.m.s.$ 

The circuit connected to non-hazardous area terminals pins 13 & 14 is designed to operate from a d.c. supply voltage of up to 35V d.c.

Non-hazardous area terminals pins 7 to 12 are connected to relay contacts which can switch up to 253V r.m.s, 2A r.m.s. and 100VA.

Hazardous Area Terminals 1 w.r.t. 2 / 3

U₀	=	10.5V	Ci	=	0	
lo	=	14mA	Li	=	0	
P₀	=	37mW				

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

GROUP		INDUCTANCE (mH)	OR	L/R RATIO (uH/ohm)
IIC	2.41	175		983
IIB**	16.8	680		1,333
IIA	75.0	1,000		1,333
I	95.0	1,000		1,333

\*\* Group IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC



Notes:

- The above load parameters apply when one of the two conditions below is given:
   the total L<sub>i</sub> of the external circuit (excluding the cable) is < 1% of the L₀ value or</li>
   the total C<sub>i</sub> of the external circuit (excluding the cable) is < 1% of the C₀ value.</li>
- 2) The above parameters are reduced to 50% when both of the two conditions below 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.