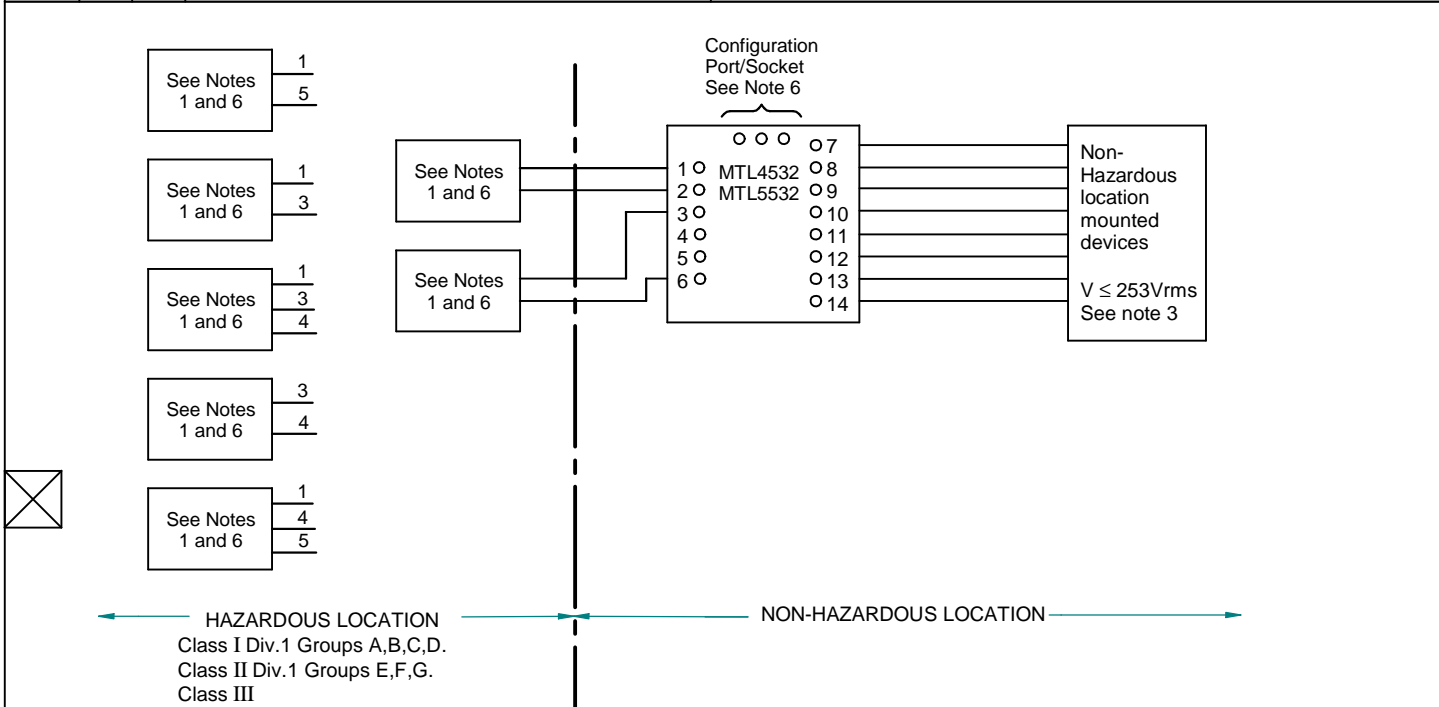




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1	2.12	CMB	
2	11.13	SB	Notes 2 to 10 re-worked, now notes 2 to 13 and various tables added.

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HAZARDOUS LOCATION  
Class I Div.1 Groups A,B,C,D.  
Class II Div.1 Groups E,F,G.  
Class III

NON-HAZARDOUS LOCATION

**Note 1**

The Hazardous location equipment may be switches or thermocouples. Other apparatus such as RTD's, LEDs and non-inductive resistors may also be used if the auto-ignition temperature of the hazardous location is greater than T4 (275°F or 135°C).

Certified devices with correct Entity Concept parameters may also be used.

This associated apparatus may also be connected to simple apparatus as defined in Article 504.2 and installed and temperature classified in accordance with Article 504.10 (B) of the National Electrical Code (ANSI/NFPA 70), or other local codes, as applicable.

**Note 2**

Selected intrinsically safe equipment must be third party listed as intrinsically safe for the application, and have intrinsically safe entity parameters conforming with Table 1 below. :-

TABLE 1

IS Equipment	Associated Apparatus
$V_{max}$ (or $U_i$ ) $\geq$	$V_{oc}$ or $V_t$ (or $U_o$ )
$I_{max}$ (or $I_i$ ) $\geq$	$I_{sc}$ or $I_t$ (or $I_o$ )
$P_{max}$ , $P_i$ $\geq$	$P_o$
$C_i + C_{cable} \leq$	$C_a$ (or $C_o$ )
$L_i + L_{cable} \leq$	$L_a$ (or $L_o$ )

**Note 3**

Control equipment must not use or generate more than 250Vrms with respect to earth.

**Note 4**

For guidance on the installation see ANSI/ISA RP 12.6.

**Note 5**

Capacitance and inductance of the field wiring from the intrinsically safe equipment to the associated apparatus shall be calculated and must be included in the system calculations as shown in Table 1. Cable capacitance,  $C_{cable}$ , plus intrinsically safe equipment capacitance,  $C_i$  must be less than the marked capacitance,  $C_a$  (or  $C_o$ ), shown on any associated apparatus used. The same applies for inductance ( $L_{cable}$ ,  $L_i$  and  $L_a$  or  $L_o$ , respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used :  $C_{cable} = 60pF/ft.$ ,  $L_{cable} = 0.2 uH/ft.$

**Note 6**

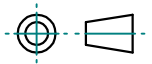
Non-Hazardous Area Input Terminals 7, 8, 9, 10, 11, 12, 13 & 14:

$U_m = 250V$

The apparatus are designed to operate on the above terminals from d.c. supply voltage of up to 35V.

Non-hazardous area terminals 11 & 12 are connected to relay contacts which can switch up to 250Vrms or 5Arms or 100VA.

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**MTL4532 & MTL5532**

Terminals 3 w.r.t. 1;  $V_{max} = U_i = 30Vdc$ ;  $I_{max} = I_i 100mA$  dc

Programming/Configuration Port (jack socket)  $V_{max} = U_i = 9.1Vdc$

When an intrinsically safe source is connected to these terminals it should have a source resistance of  $U_i / I_i$  and the capacitance and either the inductance or inductance to resistance ratio (L/R) of the hazardous area connections must not exceed the values for the intrinsically safe source. Programming/configuration port must not be used in hazardous locations. For non-hazardous locations, use only a suitably listed configurator with compatible entity parameters.

The device has the output entity parameters, as shown in Table 2 below :-

TABLE 2

Terminal nos.	$V_{oc} = U_o$	$I_{sc} = I_o$	$C_i$	$L_i$	$P_o$
2 w.r.t 1	10.5V	14mA	0	0	37mW
6 w.r.t 1	10.5V	14mA	0	0	37mW
6 w.r.t 3	10.5V	14mA	0	0	37mW
3 w.r.t 1	1.1V	53mA	0	0	15mW

Hazardous Area Terminal 2 and 5 must not be used when the above source is connected, see Table 3 below :-

TABLE 3

Terminal nos.	$V_{oc} = U_o$	$I_{sc} = I_o$	$C_i$	$L_i$	$P_o$
5 w.r.t 1	10.5V	1.1mA	0	0	2.9mW
4 w.r.t 3	28V	93mA	0	0	0.65W
4 & 3 w.r.t 1	28V	93mA at 28V 146mA at 2.9V	0	0	0.65W
5 & 4 w.r.t 1	28V	93mA at 28V 94mA at 27.5V	0	0	0.65W
Programming/ Configuration Port	7.2V	15mA	0	0	27mA

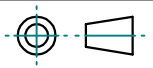
Each channel must be considered as a separate intrinsically safe circuit.

The capacitance and either the inductance or the inductance to resistance ratio (L/R) of the hazardous area load connected must not exceed the values for either channel, as shown in Table 4 below:-

TABLE 4

Group	Capacitance ( $\mu F$ )	Inductance (mH)	L/R Ratio ( $\mu H/ohm$ )
Hazardous Area Terminals 2 w.r.t 1 or 6 w.r.t 1 or 6 w.r.t 3			
Group A & B	2.41	181.4	967
Group C & E	16.8	725.6	1333
Group D, F & G	75.0	1000	1333
Hazardous Area Terminals 3 w.r.t 1			
Group A & B	100	12.6	2439
Group C & E	1,000	50.6	9757
Group D, F & G	1,000	101.2	19515
Hazardous Area Terminals 5 w.r.t 1			
Group A & B	2.41	1000	12313
Group C & E	16.8	1000	49254
Group D, F & G	75.0	1000	98508
Hazardous Area Terminals 4 w.r.t 3			
Group A & B	0.083	4.2	55
Group C & E	0.65	12.6	210
Group D, F & G	2.15	33.6	444
Hazardous Area Terminals 4 & 3 w.r.t 1			
Group A & B	0.083	1.66	55
Group C & E	0.65	6.67	210
Group D, F & G	2.15	13.3	444
Hazardous Area Terminals 5 & 4 w.r.t 1			
Group A & B	0.083	4.02	55
Group C & E	0.65	16.0	210
Group D, F & G	2.15	32.1	444

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TABLE 4 cont'd

Group	Capacitance (µF)	Inductance (mH)	L/R Ratio (µH/ohm)
Programming/Configuration Port (Jack Socket)			
Group A & B	0.433	60.7	360
Group C & E	2.57	243.0	1441
Group D, F & G	10.2	486.1	1484

Note a)

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  $L_o$  value or
- The total  $C_i$  of the external circuit (excluding the cable) is <1% of the  $C_o$  value

Note b)

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



The maximum capacitance allowed shall not be more than  $C_o = 600nF$  Groups A & B and  $C_o = 1\mu F$  Groups C, D, E, F & G.

Note 7

The module is Associated Apparatus and when mounted in the appropriate enclosure (see notes 10 and 12) is suitable for installation in the following areas:

Non - Hazardous Locations

Note 8

Associated Apparatus must be installed in an enclosure suitable for the application in accordance with the National Electrical Code (ANSI/NFPA 70) for installation in the United States. Intrinsically safe circuits must be wired and separated in accordance with Article 504.20 of the National Electrical Code (ANSI/NFPA 70) or other local codes, as applicable.

Where multiple circuits extend from the same piece of associated apparatus, they must be installed in separate cables or in one cable having suitable insulation. Refer to Article 504.30(B) of the National Electrical Code (ANSI/NFPA 70) and Recommended Practice ISA RP12.6 for installing intrinsically safe equipment.

Note 9

This associated apparatus has not been evaluated for use in combination with another associated apparatus.

Note 10

Refer to Instruction Manual for further information.

Note 11

WARNING - Substitution of components may impair intrinsic safety.



Note 12

WARNING - This equipment is suitable for use in non-hazardous locations only when installed in a suitable electrical enclosure.

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