



REV	DESCRIPTION	DATE
1	Original	17/05/2023

**ZONE 0
Class I
Div 1**

**ZONE 1
Class I
Div 1**

**SAFE AREA
or
ZONE 2**

Power Supply Connections

12Vdc IS Power Supply (psu)
Any suitably certified IS power supply unit for the intended gas/dust group and satisfying the following requirements
Uo = 15.4V maximum

9471, 9475, 9476, 9479 Modules (app)
Ui = 15.4V
Ci=Li=0

9478 Modules 12Vdc or 24Vdc Supply Input
Um = 250V, Un = 30V (SELV)

Supply Cable
Cc (cable) <= Co (psu) - Ci (app)
Lc (cable) <= Lo (psu) - Li (app)
L/R(cable) <= Lo/Ro (psu)

NOTES

1. For ease of identification -Use BLUE coloured Cat5e/6/7 cables in Zone 1 and 0 Hazardous Areas, any other colour for Zone 2 or Safe Area
2. 9475 Optical Radiation = 15mW each port
9479 Radio Frequency Radiation <= 500mW
3. Fibre-Optic and BLUE I.S. Cat5e/6/7 cables may run in Zone 0, 1, 2 and Safe Area
4. 947x Series Modules may be mounted in Zones 1, 2 or Safe Area (9478 may only be mounted in Zone 2 or Safe Area)
5. 947x Series Modules must be installed in a suitable manner for the surrounding conditions, this may require an additional protective enclosure in some areas.
6. PoEx (Power over Ethernet for Hazardous Areas) A means of distributing IS power supplies to devices via the Cat5/6/7 Ethernet cable as an alternative to a separate power cable. Ensure only one power source is used (PoEx or separate power cable)
7. Refer to User Manual for Connections and Installation Instructions. See Certificate for Safety Description

NOTE: Example only, some models shown may be part of another Approval

CONTROLLED SYSTEMS LTD. SWADLINCOTE, DERBYSHIRE. ENGLAND			
TITLE 947X MET Control Drawing			
DRAWN : IAC	SIZE A3	DWG NO 947X-MET	REV 1
DATE: 17/05/2023	SCALE	SHEET 1 OF 3	

9471-ET(G) : Serial Gateway

12Vdc POWER IN (CON1, Pin 1 wrt Pin 2 (0V))

Group	Ui	Ci	Li
IIC/IIC	15.4Vdc	0	0
IIB/IIB			
IIA/IIA			
I			

PoEx OUT (CON1, Pin 3 wrt Pin 4 (0V) OR Pin 6 wrt Pin 8 (0V))

Group	Uo	Co	Lo
IIC/IIC	Same as power supply connected to LAN1 or LAN2 PoEx connections minus 0.48µF internal capacitance	Same as power supply connected to LAN1 or LAN2 PoEx connections	Same as power supply connected to LAN1 or LAN2 PoEx connections
IIB/IIB			
IIA/IIA			
I			

Note: PoEx OUT (CON1 pins 3+4 OR pins 5+6) may be linked to 12Vdc POWER IN (CON1 pins 1+2) when power is via the LAN1 or LAN2 port.

RS485/RS422 COMMS (CON3, Pin1 to 4 and 9 to 12 wrt Pin 6,8,14,16 (0V) – Ports 1 and 2)
RS485/RS422 COMMS (CON4, Pin1 to 4 and 9 to 12 wrt Pin 6,8,14,16 (0V) – Ports 3 and 4)
(Values shown are for each pin)

Group	Ui	Uo	Io	Po	Ci	Li
IIC/IIC	7.2V	5.88V	77mA	114mW	0	0
IIB/IIB						
IIA/IIA						
I						

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

Group	Capacitance (µF)	Inductance (mH)	or	L/R Ratio (µH/Ohm)
IIC	43	6.0		314
IIB/III	1000	24.0		1265
IIA	1000	48.0		2513
I	1000	78.7		4123

The above figures are based on the output parameters only and may need to be recalculated based on the input parameters.

RS232/TTL COMMS (CON3, Pin 5, 13 (TX) wrt Pin 6,8,14,16 (0V) – Ports 1 and 2)
RS232/TTL COMMS (CON4, Pin 5, 13 (TX) wrt Pin 6,8,14,16 (0V) Ports 3 and 4)

Group	Ui	Uo	Io	Po	Ci	Li
IIC/IIC	12.8V	5.88V	6mA	8mW	0	0
IIB/IIB						
IIA/IIA						
I						

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

Group	Capacitance (µF)	Inductance (mH)	or	L/R Ratio (µH/Ohm)
IIC	43	687		4031
IIB/III	1000	3651		18135
IIA	1000	7301		32250
I	1000	12963		52910

RS232/TTL COMMS (CON3, Pin 7, 15 (RX) wrt Pin 6,8,14,16 (0V) – Ports 1 and 2)
RS232/TTL COMMS (CON4, Pin 7, 15 (RX) wrt Pin 6,8,14,16 (0V) – Ports 3 and 4)

Group	Ui	Uo	Io	Po	Ci	Li
IIC/IIC	12.8V	3.15V	6mA	8mW	0	0
IIB/IIB						
IIA/IIA						
I						

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

Group	Capacitance (µF)	Inductance (mH)	or	L/R Ratio (µH/Ohm)
IIC	100	687		4031
IIB/III	1000	3651		18135
IIA	1000	7301		32250
I	1000	12963		52910

The above figures are based on the output parameters only and may need to be recalculated based on the input parameters.

EXTERNAL I/FDS (CON1, Pin13 to 18 wrt Pin 11,12 (0V))

(Values shown are for each output)

Group	Ui	Uo	Io	Po	Ci	Li
IIC/IIC	5.88V	5.88V	52mA	76mW	0	0
IIB/IIB						
IIA/IIA						
I						

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

Group	Capacitance (µF)	Inductance (mH)	or	L/R Ratio (µH/Ohm)
I	1000	172		6105
IIA	1000	105		3721
IIB/III	1000	52		1861
IIC	43	13		465

LAN Port 1 or LAN Port 2 (10/100 and Gigabit 10/100/1000 Ethernet) (SK1/SK2 – RJ45)
(Values for all pins combined)

Group	Ui	Uo	Io	Ci	Li
IIC/IIC	15.4V	5.88V	2.18A (10/100) or 4.36A (Gigabit)	0.48µF	0
IIB/IIB					
IIA/IIA					
I					

Note 1. Io = 2.18A is the total for the four Ethernet lines (each line 545mA). 4.36A is the total for the eight Ethernet lines (Gigabit 10/100/1000 Ethernet versions).

Note 2. Ci = 0.48µF is given as worse case (8 line) Gigabit 10/100/1000 Ethernet

Note 3. Gigabit 10/100/1000 Ethernet versions are not suitable for Gas Group IIC

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

10/100 Ethernet Ports

Group	Capacitance (µF)	Inductance (µH)	or	L/R Ratio (µH/Ohm)
IIC	43	7.5		11
IIB/III	1000	29.9		44
IIA	1000	59.9		89
I	1000	99.2		146

Gigabit 10/100/1000 Ethernet Ports

Group	Capacitance (µF)	Inductance (µH)	or	L/R Ratio (µH/Ohm)
IIB/III	1000	7.5		22
IIA	1000	15.0		44
I	1000	24.5		73

If PoEx is used, then the parameters of the PoEx power supply must also be considered
(The above capacitance figures are based on 5.88V)

The 10/100 or 10/100/1000 (gigabit) Ethernet ports may be connected to any other equipment having appropriate Entity parameters.

9475-ET(G) : Media Converter

12Vdc POWER IN (CON1, Pin 1 wrt Pin 2 (0V))

Group	Ui	Ci	Li
IIC/IIC	15.4Vdc	0	0
IIB/IIB			
IIA/IIA			
I			

PoEx OUT (CON1, Pin 3 wrt Pin 4 (0V) OR Pin 5 wrt Pin 6 (0V))

Group	Uo	Co	Lo
IIC/IIC	Same as power supply connected to LAN1 or LAN2 PoEx connections minus 0.48µF internal capacitance	Same as power supply connected to LAN1 or LAN2 PoEx connections	Same as power supply connected to LAN1 or LAN2 PoEx connections
IIB/IIB			
IIA/IIA			
I			

Note: PoEx OUT (CON1 pins 3+4 OR pins 5+6) may be linked to 12Vdc POWER IN (CON1 pins 1+2) when power is via the LAN1 or LAN2 port.

EXTERNAL LEDS (CON1, Pin13 to 18 wrt Pin 11,12 (0V))

(Values shown are for each output)

Group	Ui	Uo	Io	Po	Ci	Li
IIC/IIC	5.88V	5.88V	52mA	76mW	0	0
IIB/IIB						
IIA/IIA						
I						

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

Group	Capacitance (µF)	Inductance (mH)	or	L/R Ratio (µH/Ohm)
IIC	43	13		465
IIB/III	1000	52		1861
IIA	1000	105		3721
I	1000	172		6105

FIBRE OPTIC PORTS (FO1 & FO2)

Group	Po (optical)
IIC/IIC	15mW each
IIB/IIB	
IIA/IIA	
I	

LAN Port 1 or LAN Port 2 (10/100 and Gigabit 10/100/1000 Ethernet) (SK1/SK2 – RJ45)
(Values for all pins combined)

Group	Ui	Uo	Io	Ci	Li
IIC/IIC	15.4V	5.88V	2.18A (10/100) or 4.36A (Gigabit)	0.48µF	0
IIB/IIB					
IIA/IIA					
I					

Note 1. Io = 2.18A is the total for the 4 Ethernet lines (each line 545mA). 4.36A is the total for the 8 Ethernet lines (Gigabit 10/100/1000 versions).

Note 2. Ci = 0.48µF is given as worse case (8 line) Gigabit Ethernet

Note 3. Gigabit 10/100/1000 versions are not suitable for Gas Group IIC

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

10/100 Ethernet Ports

Group	Capacitance (µF)	Inductance (µH)	or	L/R Ratio (µH/Ohm)
IIC	43	7.5		11
IIB/III	1000	29.9		44
IIA	1000	59.9		89
I	1000	99.2		146

Gigabit 10/100/1000 Ethernet Ports

Group	Capacitance (µF)	Inductance (µH)	or	L/R Ratio (µH/Ohm)
IIB/III	1000	7.5		22
IIA	1000	15.0		44
I	1000	24.5		73

If PoEx is used, then the parameters of the PoEx power supply must also be considered
(The above capacitance figures are based on 5.88V)

The 10/100 or Gigabit 10/100/1000 Ethernet ports may be connected to any other equipment having appropriate Entity parameters.

9476-ET(G) : Ethernet Switch

12Vdc POWER IN (CON1, Pin 1 wrt Pin 2 (0V))

Group	Ui	Ci	Li
IIC/IIC	15.4Vdc	0	0
IIB/IIB			
IIA/IIA			
I			

PoEx IN – PORT 5 (CON1, Pin 3 wrt Pin 4 (0V))

PoEx IN – PORT 4 (CON1, Pin 5 wrt Pin 6 (0V))

PoEx IN – PORT 5 (CON1, Pin 7 wrt Pin 8 (0V))

PoEx IN – PORT 6 (CON1, Pin 9 wrt Pin 10 (0V))

Group	Ui	Ci	Li
IIC/IIC	15.4Vdc	0.48µF	0
IIB/IIB			
IIA/IIA			
I			

EXTERNAL LEDS (CON1, Pin13 to 18 wrt Pin 11,12 (0V))

(Values shown are for each output)

Group	Ui	Uo	Io	Po	Ci	Li
IIC/IIC	5.88V	5.88V	52mA	76mW	0	0
IIB/IIB						
IIA/IIA						
I						

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

Group	Capacitance (µF)	Inductance (mH)	or	L/R Ratio (µH/Ohm)
IIC	43	13		465
IIB/III	1000	52		1861
IIA	1000	105		3721
I	1000	172		6105

LAN Port 1 to LAN Port 6 (10/100 and Gigabit 10/100/1000 Ethernet) (SK1-SK6 – RJ45)

(Values for all pins combined)

Group	Ui	Uo	Io	Ci	Li
IIC/IIC	15.4V	5.88V (or PoEx power supply Uo parameter when connected)	2.18A (10/100) or 4.36A (Gigabit)	0.48µF	0
IIB/IIB					
IIA/IIA					
I					

Note 1. Io = 2.18A is the total for the four 10/100 Ethernet lines (each line 545mA). 4.36A is the total for the 8 Ethernet lines (Gigabit 10/100/1000 versions).

Note 2. Ci = 0.48µF is given as worse case (8 line) Gigabit Ethernet

Note 3. Gigabit 10/100/1000 versions are not suitable for Gas Group IIC

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

10/100 Ethernet Ports

Group	Capacitance (µF)	Inductance (µH)	or	L/R Ratio (µH/Ohm)
IIC	43	7.5		11
IIB/III	1000	29.9		44
IIA	1000	59.9		89
I	1000	99.2		146

Gigabit 10/100/1000 Ethernet Ports

Group	Capacitance (µF)	Inductance (µH)	or	L/R Ratio (µH/Ohm)
IIB/III	1000	7.5		22
IIA	1000	15.0		44
I	1000	24.5		73

If PoEx is used, then the parameters of the PoEx power supply must also be considered
(The above capacitance figures are based on 5.88V)

The 10/100 or Gigabit 10/100/1000 Ethernet ports may be connected to any other equipment having appropriate Entity parameters.

9479-ET(G) : WLAN AP/Bridge

12Vdc POWER IN (CON1, Pin 1 wrt Pin 2 (0V))

Group	Ui	Ci	Li
IIC/IIC	15.4Vdc	0	0
IIB/IIB			
IIA/IIA			
I			

PoEx OUT (CON1, Pin 3 wrt Pin 4 (0V) OR Pin 5 wrt Pin 6 (0V))

Group	Uo	Co	Lo
IIC/IIC	Same as power supply connected to LAN1 or LAN2 PoEx connections minus 0.48µF internal capacitance	Same as power supply connected to LAN1 or LAN2 PoEx connections	Same as power supply connected to LAN1 or LAN2 PoEx connections
IIB/IIB			
IIA/IIA			
I			

Note: PoEx OUT (CON1 pins

General

The installation must be in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, Articles 504 and 505, the Canadian Electric Code (CEC), Part 1, Appendix F and ANSI/ISA-RP12.6.

$T_{amb} = -40^{\circ}\text{C}$ to $+70^{\circ}\text{C}$

**9471-ET(G) : Serial Gateway,
9476-ET(G) : Ethernet Switch,
9479-ET(G) : WLAN AP/Bridge**

US / Canada (Zones)

For use in Class I, Zone 0, Group IIC*/IIB* Hazardous Locations (*Group IIC or IIB depending on model) when installed in accordance with Control Drawing 947X-MET

- AEx ia IIC T4 Ga / Ex ia IIC T4 Ga
- AEx ia IIB T4 Ga / Ex ia IIB T4 Ga

For use in Class II, Zone 21, Group IIIC Hazardous Locations and providing Intrinsically Safe outputs for Class II, Zone 20 or Class II, Zone 21 Group IIIC Hazardous Locations when installed in accordance with Control Drawing 947X-MET

- AEx ia [ia Da] IIIC T135°C Db / Ex ia [ia Da] IIIC T135°C Db

US / Canada (Divisions)

For use in Class I, Division 1, Groups A-D*, T4 Hazardous Locations (*Groups A,B,C,D depending on model) when installed in accordance with Control Drawing 947X-MET

For use in Class II, Division 1, Groups E-G*, T135°C Hazardous Locations (*Groups E,F,G depending on model) when installed in accordance with Control Drawing 947X-MET

9475-ET(G) : Media Converter

US / Canada (Zones)

For use in Class I, Zone 0, Group IIC*/IIB* Hazardous Locations (*Group IIC or IIB depending on model) when installed in accordance with Control Drawing 947X MET

- AEx ia op is IIC T4 Ga / Ex ia op is IIC T4 Ga
- AEx ia op is IIB T4 Ga / Ex ia op is IIB T4 Ga

For use in Class II, Zone 21, Group IIIC Hazardous Locations and providing Intrinsically Safe outputs for Class II, Zone 20 or Class II, Zone 21 Group IIIC Hazardous Locations when installed in accordance with Control Drawing 947X MET

- AEx ia [ja op is Da] IIIC T135°C Db / Ex ia [ja op is Da] IIIC T135°C Db

US / Canada (Divisions)

For use in Class I, Division 1, Groups A-D*, T4 Hazardous Locations (*Groups A,B,C,D depending on model) when installed in accordance with Control Drawing 947X-MET

For use in Class II, Division 1, Groups E-G*, T135°C Hazardous Locations (*Groups E,F,G depending on model) when installed in accordance with Control Drawing 947X-MET



CONTROLLED SYSTEMS LTD.
SWADLINCOTE, DERBYSHIRE. ENGLAND

TITLE	947X MET Control Drawing
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DRAWN : IAC

DATE: 17/05/2023

	SIZE
	A3

SCALE

DWG NO
947X-MET

SHEET 3 OF 3

REV
1