

Field Cable Specification

This data sheet provides details on the type of cable that is required to interconnect the Spector Lumenex range of products. The information provides minimum typical requirements for utilisation of our equipment for the land based commercial sector, transport sector, petrochemical installations, nuclear installations, power stations and energy generation sector, offshore and marine installations.



Where there is reference to "pair" this shall be taken as TWISTED pair, the definition being at least one complete twist per 100mm / 4 inches along the entire length of the cable. Where a product is certified for use in a potentially explosive atmosphere cable shall additionally comply with BS5345. Note that all products shall be bonded to protective earth.

Product	Service	Quantity of conductors	Size	Special consideration
Flashing Beacons				
LAK and SS beacons	Mains supply	2	1.5mm ²	See Note 1
LAK SABS	SABS data comms	2	1.0mm ²	Twisted pair with overall shield maximum distance 1000Metres
SABS data communications pair may form a multicore with the supply conductors for the beacon when the mains supply is DC i.e. two pair with overall shield Note 1 the size of the conductors is dependant on the length of cable, each beacon consumes 60 watts and operating voltage tolerance is plus/minus 10%. See Table 2 over leaf.				
Loudspeakers	70 /100 volt line	2	1.5mm ²	Twisted pair
Notes a) Where there are several lines these may be incorporated into a single multi-pair cable b) Conductor size depends on load and cable length. For example a 100 watt loudspeaker load consumes 1 Ampere when fed from a 100VOLT line distribution system, maximum design loss should be no greater than 10 Volts RMS. [Although in practise it is possible to tolerate losses of up to 30 volts with attendant loss of acoustic sound pressure level of approximately 3dBA]				
Loudspeakers	Low Impedance Mentor extention L/S	2	1mm ²	Maximum distance of the L/S from the host Mentor station is 50 Metres
Mentor Intercom	Mains supply	2	1.5mm ²	Power consumption is 40 Watts, Voltage tolerance +/- 10%
Mentor Orbital 7400/0 series	Station interconnection highway	2	1.0mm ²	Twisted pair with overall shield, maximum distance 2000 metres
Mentor Orbital Mustercom EX7400/0/01 series		4	1.0mm ²	Two twisted pairs with overall shield, maximum distance 2000 metres
Mentor Digital EX7711 series	Mains supply	2	1.5mm ²	Power consumption maximum is 40 Watts, voltage tolerance +/- 10%
Mentor Digital EX7711 & EE711 series	Data communications	2	1.0mm ²	One twisted pair, maximum length is limited by ISDN protocol 1500 metres & 300 metres with local mains power.
Power supply and data communications can form a single multi-pair cable where Mentor digital is centrally energised. In this configuration mains supply is 48 volts DC.				
ACE Public Address and Alarm Systems				
Operator Access Units ACETSO1 (Duplicated & single systems) ACET600 Pre- amplifier fitted		4	1.5mm ²	Two twisted pairs with overall screen, maximum distance 1000 metres
ACET/18/NK (Duplicated & single systems)		4	1.00mm ²	Two twisted pairs with overall screen, maximum distance 200 metres
ACET601 Pre-amplifier fitted		3	1.5mm ²	Three twisted pair, maximum distance 900 metres

ACET4, ACET/18/NK, ACET32, ACET64. (Single System). ACET602 Pre-amplifier fitted. The data and audio circuit transportation has been tested with a wide range of cable types, the following table provides parameters versus communication distance. See Table 1

Table 1

Cable Type	Inductance	Capacity/Km	Resistance/Km	Maximum Length
Beldon 85102	516µH	56nF	28 ohms	2700 metres
Beldon 8471	510µH	72nF	28 ohms	2700 metres
Level IV twisted pair	442µH	49nF	100 ohms	1400 metres
JY(st) Helical twist	674µH	98nF	73 ohms	900 metres
TIA Category 5 twisted pair	718µH	46nF	168 ohms	900 metres

Note that the **ACET602 pre-amplifier** consumes approximately 400 mA maximum and therefore D.C. supply volt drop shall be taken into consideration if energising the ACET from the host equipment. Minimum working voltage is 20V D.C., launch voltage is nominal 24V D.C. unregulated. All cables shall be twisted pairs i.e. a twist at least every 100mm along the entire length of the cable. The cable pairs are required:-

- Pair 1 D.C. Power supply
- 2 Audio
- 3 Data

ACET4, ACET/18/NK, ACET32 ACET603 (Single System). ACET603 Pre-amplifier fitted. Operate over a wide range of telephony / instrumentation cable types, up to 1000 metres cable length with up to 20 pairs (depending on application) with overall screen minimum cross sectional area 0.5mm² / conductor with 1.5mm² required for power supply conductors (one pair) for cable lengths exceeding 200 metres.

Table 2

Area of Conductor mm ²	American Wire Gauge AWG	Standard Wire Gauge SWG	Approx Max DC Conductor Resistance @ 20oC Ohms/km
0.25 - 0.35	22	24	92
0.52	20	21	39
0.82	18	19	26
1.17 - 1.31	16	18	22
1.59 - 2.08	14	17	13
2.63 - 3.31	12	15	8
4.29 - 5.26	10	13	5
6.81 - 8.37	8	11	3

Note tables are for guidance purposes only and are approximated to compare different cable measuring systems. Cable resistance is dependent on the Class of cable (material used in its construction).