JTL SYSTEMS LTD

ELECTRICAL WIRING SPECIFICATION

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ELECTRICAL STANDARDS for the INSTALLATION of JTL EQUIPMENT

Section 1 Installation Practice

Section 2 JTL Network (Jnet) Wiring to/from JTL Controllers

Section 3 Electromagnetic Compatibility (EMC)

All wiring must conform to BS 7671 i.e. IEE Regulations latest Edition.

Section 1. Installation Practice

CABLE INSTALLATION REQUIREMENTS

When installing JTL Systems controllers into equipment, it is essential that the following requirements are observed.

1. Cable Segregation

Connections are divided into two groups:

(i) Power/Control

(ii) Signal

It is essential that the cables feeding these two groups be segregated. For detailed information of the connections please refer to the user guide supplied with each JTL unit.
All JTL units are fitted with plugs and sockets for all connection so that units may be unplugged for servicing.

As a guide to identifying the connection group the following applies:

Telephone style (RJ), Circular DIN Audio and multipin connectors are always signal.

Two part screw connectors are generally power connections. Exceptions to this are some pressure and temperature sensor connections and some monitoring only products.

2. Signal Cables

Low voltage signals must run in multicore cable to ensure EMC requirements are met. This also helps avoid any confusion with power cables during installation or subsequent inspection.

To conform with electrical wiring standards and regulations, where signal cables are installed in enclosures with power equipment the cable should have a minimum insulation voltage rating of 250 V ac.

To prevent voltage drop all signal cables must have a minimum cross sectional area of 0.2 mm^2.

The use of telephone cable is not permitted or accepted under any circumstances.

All multi stranded cables connected to JTL screw connectors within enclosures must be bootlace ferruled with the correct size ferrule using the appropriate crimp connection tool.

All signal cables should be identified at each termination. Where possible these idents should be transferred to the relevant cable drawings, a set of which should be left on site.

Signal cables are separated into two groups:

(i) Common ground.

(ii) JTL network (Jnet)

Signal cables should not be installed with power cables in common trunking, metal or plastic.

Twin compartment trunking is acceptable.

Minimum segregation distance between signal and power cables over long runs is 350 mm (See note 1).

Signal cables should not be tie wrapped to pipes.

Where Unistrut cable tray is installed the separation distance between signal and power cables should be at least 350 mm.

Note 1: JTL acknowledge that in some circumstances due to on-site conditions, the 350 mm segregation over the entire length of the cable run may not be possible. However, any deviations must be documented and the 350 mm segregation re-established at the earliest opportunity.

3. Power Cables

All JTL controllers that drive electrical equipment have specified ratings. For full details refer to the appropriate user guide.

Generally however the following rules apply:

Maximum	ac voltage	240 volt
	dc voltage	50 volt
Maximum	ac/dc current	5 amp continuous resistive

Unless otherwise stated, JTL units are for single phase operation only.

4. High Voltage Testing

No JTL controller should be connected to any circuit undergoing high voltage "flash" testing.

5. Cable Installation within Enclosures

Where possible, there must be a minimum separation of 150 mm between parallel cable runs of power and signal cables.

Signal cables should **never** be installed in common trunking or bundled with power cables.

Section 2. JTL network (Jnet) wiring to/from JTL Controllers

Where Jnet network cables are run in parallel with power cables, there must be a minimum separation of 350 mm.

The cable should be installed with suitable mechanical support. If on a cable tray the separation is mandatory. Ideally the tray should be used for signal cables only, connected to JTL or other similar equipment such as H&V, EPOS, telephone or other network cables. If the cable is not mounted on a cable tray then it should be installed in conduit or trunking.

The Jnet network cables must NOT under ANY circumstances be tie wrapped to Steel Wired Armoured Cables, or Pipes.

If joints become a necessity, then a JTL network junction box or similar junction box should be used. In line, "chocolate block" and taped connections MUST NOT be used.

Jnet zone wiring

Up to 32 physical units may be connected on a zone connected to the network controller. Some JTL units have more than 1 channel and occupy more than 1 slot on a zone. The larger network controllers support up to 42 logical units on a zone.

The zone wiring can be "free topology" which means that connections can be radial, ring or branch.

JTL network controllers are now supplied in a 10" or 19" racks.

Jnet network site wiring should be run in standard CAT5 unscreened twisted pair cables (UTP)

Patch panels are provided at the rack to terminate the site cables and junction boxes for the remote units and legacy network controller cable termination.

Section 3. Electromagnetic Compatibility (EMC)

All ac outputs on JTL controllers are suppressed internally within the controller.

A resistor/capacitor network connected between the Load and the neutral achieves the required suppression.

For this to be effective, it is essential that the relay contacts are wired correctly ie, "line" and "load" connections are correctly observed, for this purpose all relay terminals are clearly marked thus:

LN indicates line
LD indicates load
C indicates line (common)
NO indicates load (normally open contacts)
NC indicates load (normally closed contacts)

Since the suppressors are internally connected to the neutral, it is essential that Line(L), Neutral(N) polarity is observed on all power connections.

In the event of polarity not being correct, data corruption or processor mis-operation may occur.

For EMC operation to be correct, all cabling must be installed correctly according to sections 1 and 2 of this document.

Documents to refer to:

Doc No. 03118 Shop floor wiring schematics (New installations)
Doc No. 03120 Installation of new zone wiring to legacy installations