



JVA Z Series

Integration Options and Methods

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Introduction

While JVA “Z series” energisers and monitors can be used as standalone security devices it is becoming more common to find them integrated into larger systems.

In its simplest form, integration is simply the direct wired connection of one electronic device (or appliance) to another for the purposes of allowing one device to be controlled by and receive signals information (such as alarms) from another.

High Level Integration (HLI) describes methods of achieving the same result by connection two different computer programs (applications), interfaces or data-bases together using drivers or a common protocol. These two different applications may run on the same computer, or be connected via LAN or WAN.

In the simplest form of integration Z series devices are controlled via relay or switched voltage outputs from other systems such as building alarm systems. While this is robust it leads to more manual wiring and less system flexibility.

In the between low level dry contacts and HLI there are the mid levels of serial data translation and the web-server.

In order to facilitate High Level Integration between Z Series devices and third applications JVA can provide a number of different physical protocol adaptors and PC/Cloud based applications.

To the user HLI allows Z series devices to be represented by icons on the GUI of a third party application, the properties of the device are visible and are able to be manipulated. For example a Z Series energiser can be armed and the fence voltages and alarms status can be displayed.

To the systems integrator JVA HLI options means the freedom to program the user interface in the application or language of their choice.

This paper sets out the integration options available to systems integrators from dry contacts up to high level PC/Cloud data connections.

The following options for system integration are discussed in detail with reference to resources available.

- Direct Wiring
- Serial Data Translation
- GSM SMS/Cloud Solutions
- HLI DLL SDK and trial .net application

The following connection methods are also discussed.

- Dry contacts
- Serial data adaptors
- Keypad bus translation devices
- TCP/IP adaptor

This document assumes some familiarity with the Z series energisers and the PC based Perimeter Patrol control application.

More information and contact details for JVA engineers may be found at: www.jva-fence.com

Glossary

Adaptor	Devices which translate the Keypad bus to another serial protocol, either by simple voltage level or by packet translation
Direct Wiring	Cabling between the output of one device and the input of another
DLL	Dynamic-Link Library
Dry Contacts	Simply switch inputs used to control Z series devices
GUI	Graphical User Interface
HLL	High Level Integration
Keypad Bus	Pakton proprietary serial protocol
OPC	OLE for Process Control
PAE100	Keypad to RS484 Converter
PAE223	Keypad to USB Converter
PAE319	JVA SMS Gateway
PAE320	GSM Nimbus Gateway
PAE212	TCP/IP adaptor
PAE224	Ethernet General Purpose IO Board
PAE218	Serial translation adaptor
Perimeter Patrol	PC based control application
Cloud Router	Cloud Based remote monitoring and control platform
PC	Personal Computer (Assumed MS Windows based)
TCP/IP	Internet Protocol
Z Series	JVA brand Zxx model security electric fence energisers and monitors

Integration Options

Direct Wiring

All Z Series devices contain a number of physical inputs and relay outputs. The inputs may take a dry contact from a relay or switch or be driven from a 5-12V switch DC source (common negative).

Dry contact outputs are generated by standard Form C signal relays.

Z series inputs and outputs may be configured to perform many different functions. For more information please see the individual Z Series device manual.

In order to connect a Z Series device to a third party appliance such as a PLC or building alarm system it is simply a matter of using cable pairs to connect between the inputs and outputs. While this is a simple and robust method of connection from it leads to more manual wiring and less system flexibility. There is also a danger of atmospheric discharges being conducted from the electric fence, through the Z Series device and back into the third party appliance. This can be reduced by the correct application of lightning protection devices.

Direct Wiring is the obvious fall back method of connection of Z series devices to any third party system, including building alarm panels, PLC's and older PC based management systems.

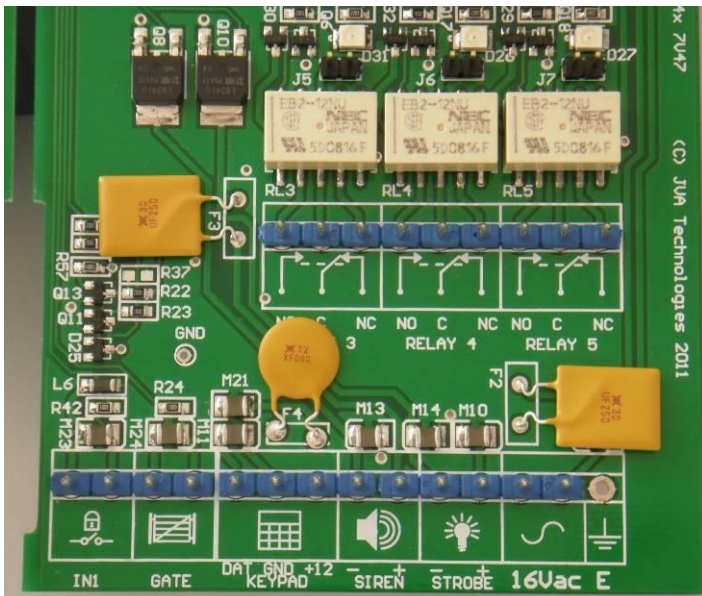
Direct wiring is guaranteed to work so long as the target system has sufficient spare input and outputs and the target system is in reasonably close physical proximity to the Z series devices.

If more outputs are required than the Z series devices have, the PAE201 relay expander board is available to generate another 3 outputs per device.

Table 37 (copied from the Z Energiser OEM manual) shows the flexible nature of relay outputs on the Z Series.

Value (x)	Mode
0	Fence 1
1	Fence 1 or off
2	Armed 1
3	Fence 2
4	Fence 2 or off
5	Armed 2
6	Fence Bi-Polar
7	General
8	Siren
9	Strobe
10	AC Fail
11	Low / Bad Battery
12	Tamper
13	Strobe 2
14	Gate 1 or 2
15	Siren caused by Gate 1 or 2
16	Armed in Low Power Mode

Table 1 - Relay Functions



Z14 Inputs and outputs, with pluggable screw terminals detached.

High Level Integration

In order to have high level integration the Z series devices must first be able to communicate with a JVA application running on a windows based PC or in the Cloud.



Perimeter Patrol Connections

The following section covers the various approaches for interfacing Z series devices to Perimeter Patrol. For more information on Perimeter Patrol and what features it offers please visit http://www.jva-fence.com.au/docs/JVA_Perimeter_Patrol_Product_Page.pdf

Serial Data

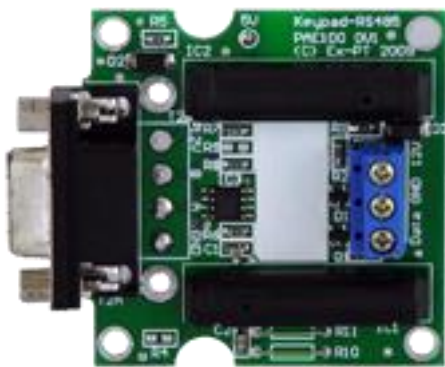
While it is physically possible to do this using serial data adaptors (PC only) JVA recommends that the TCP/IP adaptor is used on all new designs.

JVA Z series energiser and monitors communicate at a low level via the Pakton proprietary “Keypad bus” serial protocol. As the name suggests this is primarily the means by which Z series devices communicate with our keypads. The keypad is used as a simply user interface for small stand alone systems and as a means of programming the Z series devices many programmable options. Multiple Z series devices may be connected on this bus (for limitations, see the device manual).

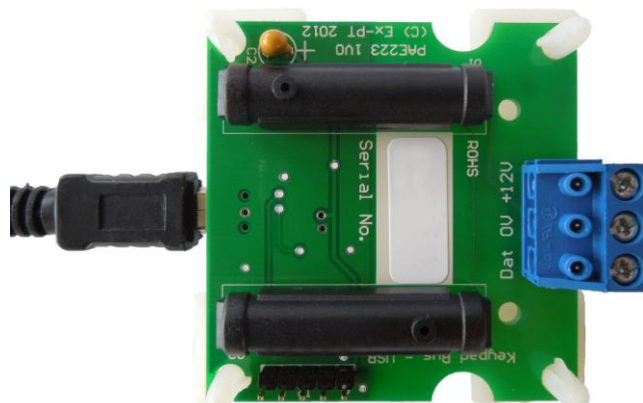
This serial data protocol may be directly translated into a common industry standard like USB or RS485. JVA can provide opto isolated adaptors such as the PAE223 or PAE100 which facilitate this translation. Opto isolation is rated at 10kV, which protects your PC from surges on the fence. JVA’s Perimeter Patrol PC based GUI can also connect to a group of Z Series devices using this method.

Although serial data is a step better than direct wiring, there are still wiring distance and system complexity limitations.

JVA recommends using TCP/IP via our PAE212 board instead of serial data in all but the simplest low cost systems.



PAE100 RS485 Adaptor



PAE223 USB Adaptor

TCP/IP adaptor

While the Z series devices do not have a built in TCP/IP (LAN) port it is easily added using the PAE212 adaptor. Once this device is connected the Z Series device has a unique TCP/IP address and may communicate with any other device on the internet.

While JVA TCP/IP adaptors communicate using another proprietary data packet protocol, this is effectively irrelevant as all connections only occur with a JVA service, DLL or database, using one of the HLI options listed below.



PAE212

DLL SDK

JVA can provide a DLL based Software Developers Kit (SDK) with documentation and basic control “demo” win form application.

Provision of the SDK is made after a IP sharing agreement has been signed between JVA and the interested third party designers.

To the systems integrator the DLL approach is the fastest and most flexible method of making live connections between their applications and JVA Z series devices.

The DLL contains drivers which may be called to manipulate eth properties of the Z series devices, or more commonly to push or pop data from the SQL data base built and used by the JVA Communications Service or by Perimeter Patrol.

While it is not necessary to run Perimeter Patrols GUI, it is useful to provide it as a default GUI to check connectivity to the SQL data base and the target Z Series devices.

The DLL method is favoured by most systems integrators as it is possible to use it with or without getting into actual C++ or similar programming and they can use only the drivers and methods they need thus reducing system overheads.



Cloud Router / SMS Solutions

The following sections cover two other interface boards that enable remote control and monitoring of your Z series devices, via SMS and the cloud router.

JVA SMS Gateway (PTE0319)

The SMS Gateway allows remote control and monitoring of Z-Series Energisers and Monitors, through a mobile phone via SMS. It will automatically alert up to 9 mobile phone numbers when an alarm occurs. Configuration is simple and completely via SMS. The SMS Gateway also includes extra inputs and outputs to interface with other security equipment or ancillary equipment such as an electric gate motor. This solution is perfect when your site is remote and does not have a reliable GSM internet connection

JVA GSM Nimbus Gateway (PTE0320)

This connects to the keypad bus and converts it to a new protocol called nimbus. This requires a data enabled SIM card that can be used to send nimbus messages to the cloud. This enables remote monitoring and control via the Cloud Router Platform. For more information, please visit <http://ipenergizer.com/security.html>.



PTE0319/PTE0320