Technical Review

Custom Control Panel Communications

Applicable to:
Custom Control Panels with JACE®
3rd Party Integration

Document Overview

This document outlines the information required for enabling remote communications to our Tridium Niagara^{AX} based control panels or other KWE communication devices.

Where possible, providing this information beforehand will ensure a trouble-free integration. Quite often, it is necessary to have IT individuals assist in gathering the information required.

Remote Communications with a JACE®

The JACE controller, running the Niagara^{AX} platform, can provide several remote services:

- Web-pages
- Email alarms
- Remote logging
- Remote access

These features can make diagnosing, and troubleshooting, a system much more accurate and convenient.

There are however some mandatory requirements on the client's behalf to make these remote services work properly.

It is in your customer's best interest, in an effort to achieve their own communication goals and desires, to provide as much support as possible to assist with this required information.

What is a JACE®?

The JACE device is part of a suite of Java-based controller/server products, software applications and tools.

They are designed to integrate a variety of devices and protocols into unified distribution systems.

These products are powered by Niagara^{AX} Framework®, the industries first software technology designed to integrate diverse system and devices into a seamless system.

The JACE supports a wide range of protocols including LonWorks®, BACnet® and internet standards

Communications

What is Needed?

Integration into client LAN (Local Area Network)

All of these services require the JACE to be configured for access to the internet. This will depend on the client's co-operation and assistance.

Like any other computerized device, which is to be integrated into a computer network, IP addressing is necessary for correct communications.

To allow remote access, certain TCP ports from the router will need to be forwarded to the JACE.

IP Addressing

We highly recommend providing the IP addressing information to us ***before*** shipping the panel or communication devices. Reconfiguring devices in the field can be complex and troublesome due to technical issues, personnel, or simple geographical considerations.

- Device IP Addresses: This should be static (permanent) so we can forward the correct ports. Having dynamic IP addressing will potentially cause more communication issues.
- Gateway Address: Generally this is the router that connects to the internet
- DNS Server Address (optional)
- Public IP Address: This is the IP address provided by your Internet Service Provider (ISP) to your router. This is used to establish a remote connection.

Port Forwarding

This allows a connection to be made to the controller from outside the network and reprogram any logic or watch the system operation in real time.

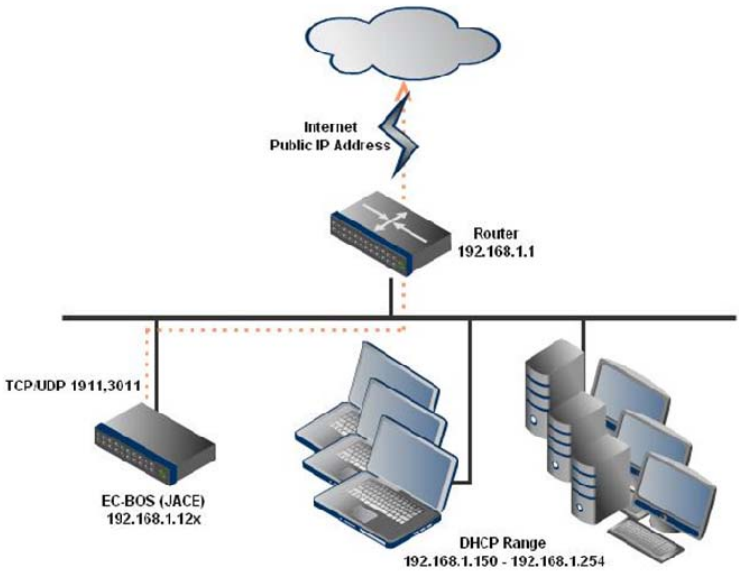
Remote access requires that the customer have a public IP address (preferably static) and that the following TCP ports are forwarded to the JACE IP address:

- **1911** and **3011** for JACE access
- 1930 and 1931 for any potential PLC reprogramming

Application	External Port	Internal Port	Protocol	IP Address	Enabled
3011	3011	3011	TCP	10.1.16.3	☑
1911	1911	1911	TCP	10.1.16.3	☑

Emails

In order for the JACE to send emails, it will need access to an **SMTP server**. This server is generally provided by the client's internet provider or the IT department (no SSL).



JACE Communications

When the JACE is required to communicate with a 3rd party building management system, some additional parameters will have to be provided to facilitate a smooth integration. The integrator is usually the person that can provide this information.

BACnet
There are two main network types which have to determined first:

- BACnet/IP which typically uses CAT5 cabling and typically connects to the local area network (LAN.)
- BACnet/MSTP which typically runs over an RS-485 network (twisted pair + shield.)

The JACE will need to be configured with a number of BACnet parameters to successfully integrate with a 3rd party automation system. The required parameters will depend on the network type chosen. If these parameters are not provided to us in advance; they will be chosen as the most common settings.

BACnet / IP

- IP Address settings (same as device IP address, this is also the address used for remote web interface and communications).
- Device instance (Unique number on the BACnet network).
- Network Number (has to match the network number of the device to be integrated with)

BACnet MSTP

- Device instance (Unique number on the BACnet network)
- Network Number (has to match the network number of the device to be integrated with)
- MAC address – (Unique address on MSTP network segment, must be between 0 and 207)
- Max Masters – (Defines maximum number of master devices)

RS-485 Network parameters

- Baud rate – (speed the network runs at default 38,400bps)
- Number of data bits (default 8)
- Parity (default None)
- Number of stop bits (default 1)

LONWORKS
Lonworks integration is done over the TP/FT-10 network type which consists of an unshielded twisted pair communication wire. There are a couple parameters that the integrator may want to choose from:

- Subnet (default 1)
- Node ID (default 127)

Modbus
As with BACnet, there are 2 main network types we can deal with: RS232 and RS485. The latter is a network bus, which means there can be more than 2 devices on one network bus (RS232 can only communicate between 2 devices.) The parameters the integrator may choose are:

- Device Address (unique address 1-247)
- Baud rate – (speed the network runs at)
- Number of data bits (default 8)
- Parity (default None)
- Number of stop bits (default 1)

Notes:

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