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**Tech Note 1.2**

**Jan. 28, 2008**

## **How eMerge™ Nodes and the Network Controller Use the Network**

**(versions 1.4 and higher)**

1. When a Node boots it initially selects for itself a temporary random IP address in the zeroconf address space (169.254.X.Y where X and Y are randomly selected).
2. The Node then multicasts for a Network Controller at 224.0.72.62 UDP port 7262, and presents its Unique Identifier (UID).
3. A Network Controller answers the multicast at 224.0.72.62 UDP port 7262 providing its own IP address and presents an addressing method for the Node. See "Setting Initialization Values" in the "Installation Guide".

There are three IP addressing methods available:

1. An existing DHCP server on the network can assign IP addresses.
  2. A Static IP address can be assigned using nnconfig.exe (This application is on the CD provided with the Network Controller).
  3. The Network Controller can provide IP addresses to Nodes only from a specified address range.
4. Once a proper IP address for the Node is selected further communications between Node and Network Controller occur directly between their respective IP addresses using TCP port 7262.
  5. The Network Controller may also require:
    - TCP Port 23 open for Telnet server access. This can be used for remote debugging. The Telnet Server is disabled by default. (up through V2.X)
    - TCP Port 22 for SSH connections.
    - TCP Port 3000 open for communication from video management system inputs.
    - TCP Port 3306 open for PostgreSQL report usage.

## **Network Port Usage Table**

**(versions 1.4 and higher)**

TCP Port 80	Must be open to the Network Controller for Browsers to access the Security Application. This can be configured on a different port.
TCP Port 443	Must be open to the Network Controller for Browsers to access the Security Application using HTTPS (SSL).

TCP Port 7262	Must be open to the Network Controller for communications between the Controller and Nodes. Be sure that this port is open through routers and firewalls for any Nodes on different subnets from the Network Controller.
TCP Port 23	Must be opened to the Network Controller using a jumper on the Controller module for Telnet access to the Controller. (Up to V2.X)
TCP Port 22	Must be opened to the Network Controller for SSH connections. (V3.X and above)
TCP Port 3000	Must be open to the Network Controller for the Video Management System virtual inputs to communicate camera up/down and motion detection messages.
TCP Port 3306	Must be open to the Network Controller for PostgreSQL report usage.
TCP Ports 20, 21	When using active FTP these ports must be open to the FTP server for FTP backups from the Network Controller. When using passive FTP port 20 will not be required. Ports must also be left open to the Network Controller for FTP server responses. The network administrator must set up these ports.