Deployment Guide

animeo IP Networking

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Contents

Introduction

The Somfy animeo IP Total Solar Management System utilizes IP networking technology for internal system communication as well as system configuration and management. animeo IP hardware controllers contain networking hardware and require no advanced networking knowledge to install standalone systems. However, advanced features such as Virtual Keypads and remote management do require connecting to building networks supplied by third party IT vendors. This guide will provide requirement details as well as offer common best practices for networking setup.

Deployment

1. Internal vs. External

animeo IP operates on two distinct IP networks, an internal network (IP Bus) and external network. The Internal network is used to interconnect Building Controllers and Sub Controllers as well as direct connection for programming with the Visual Configuration software. The external network is the systems gateway to the building's own IP network as well as the internet.

Connectivity

1. On Building Controllers and Sub Controllers the Ports labeled IP-Bus are used for internal communications.

2. On the Building Controller the port with the Ethernet icon is for external communication.

Internal Networking

1. Wiring

1. Wire type and termination

    (a) Internal IP communication utilizes Category 5E or higher wiring terminated TIA-568B with a RJ-45. This is the same wiring and connection standard which is utilized for SDN communication.

2. Distance limitation

    (a) IP networking has a limitation of 330ft between IP devices.

    (b) For distances longer then 330ft the following methods can be used.

        i. An IP networking switch can be installed at the end of the initial 330ft wire run, this will provide a new connection which can run an additional 330ft. The IP switch requires an external power source and needs to be installed in a user serviceable area.

        ii. An Ethernet to fiber adapter can be utilized to run lengths over fiber optic cable. There are many different types of fiber adapters on the market, so it is best to discuss your needs with an IT vendor.

2. Topology

1. Cascading - Each animeo IP hardware controller has two IP-Bus Ports which allow for each controller to be connected one to another (daisy chain). Only a single network cable is required between each controller. This is the preferred topology in systems with less than 4 controllers.

2. Central Hub - Utilizing a standard unmanaged IP networking switch, controllers can be brought together with direct IP network runs to a central location. In a central hub topology only one of the IP bus ports on each controller is to be utilized.

3. Programming - Directly connect a windows 7 computer to any IP bus port in the system

3. Discovery and Addressing

1. Hardware Controllers

   (a) Building controllers are the beginning of the internal animeo IP network. when connected to the internal network the building controller can always be found using the address "buco.animeo" or "10.1.10.1".

   (b) Sub controllers are automatically found and addressed in the internal network, no consideration is required past properly wiring the controller into the internal network.

   (c) MAC Address for controllers can be found the Advanced Hardware view in the Visual Configuration software.

2. Windows PC for configuration and maintenance

   (a) The internal network will automatically provide a DHCP IP addressing to connected windows PCs.

4. Troubleshooting

1. Controller Discovery

   (a) If a Sub Controller cannot be found during the "Make New Configuration Wizard" or the "Extend Configuration Wizard", check that the IP-Bus port on the controller that cannot be discovered has both amber and green status LEDs illuminated. If the port's status LED are not illuminated then check the IP networking cable with a category wire tester and verify length of wire.

2. Windows Computer

   (a) Hardware - When connected to the internal network, if a windows computer cannot connect to a building controller, first check that the IP-Bus port on the controller has both amber and green status LEDs illuminated. If the port's status LEDs are not illuminated, check the IP networking cable with a category wire tester and verify length of wire.

   (b) Software - Without advanced configuration Windows computers cannot be connected to more than one IP network at a time. Always ensure that the computer's WIFI is disabled or any WIFI connections are manually disconnected prior to trying to connect to an animeo IP system

External Networking

1. Wiring

1. Wire type and termination

   (a) Internal IP communication utilizes Category 5E or higher wiring terminated TIA-568B with a RJ-45. This is the same wiring and connection standard which is utilized for SDN communication.

2. Distance limitation

   (a) IP networking has a limitation of 330ft between IP devices.

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      i. An IP networking switch can be installed at the end of the initial 330ft wire run, this will provide a new connection which can run an additional 330ft. The IP switch requires an external power source and needs to be installed in a user serviceable area.

      ii. An Ethernet to fiber adapter can be utilized to run lengths over fiber optic cable. There are many different types of fiber adapters on the market, so it is best to discuss your needs with an IT vendor.

3. Topology

   (a) An IP networking wire should be connected directly from the Building Controllers Ethernet port to a switch port in the building network.

2. Discovery and Addressing

1. By default animeo IP's Ethernet port will accept DHCP addressing from the building's network.

2. Specifying a network address

   (a) The animeo IP Building Controller can utilize all standard IPV4 network addressing methods, discuss with the building's IT vendor which method they prefer and can support.

      i. Static IP

         A. Static IP addressing for the Building Controller can be set through the Visual Configuration Software. The best practice is to only make changes to the Static IP addressing when connected to the Internal Network.

      ii. Reserved DHCP Address

         A. When utilizing the Building Controller's MAC address the building's network IT vendor can specify a set IP address to the building controller without any animeo IP configuration.

3. Connection Details (Ports and services)

- 22 – SSH (Secure Shell)

  – Utilized by Somfy for advanced technical support and troubleshooting
  – Incoming only

- 25 – SMTP Outgoing mail server connection.

  – Allows for email notifications to be sent
  – Outgoing only

- 80 - Web Server and Integration

  – Provides Virtual keypad Interface in web browsers and allows for third party integration though the animeo IP Web API and the Somfy Connect BMS.
  – Incoming Only

- 123 – NTP (Network Time Protocol)

  – Allows for connection to external time clock servers
  – Outgoing Only

- 10000 - animeo IP

  – animeo IP Visual Configuration software connection
  – Incoming Only

4. Traffic Requirement

1. SSH, Web Server, and the animeo IP ports are only utilized and use traffic when a end user or installer is accessing the system. No traffic is generated automatically on these ports.

2. SMTP and NTP ports will generate small amounts of traffic

   (a) SMTP will send small text only emails to notify if an error occurs
   (b) NTP will ping outside servers periodically for time sync (can be configured for internal NTP servers)

5. Remote Access

An animeo IP connected properly to a configured building network can be made accessible from the internet. Once accessible, features such as alert emails, virtual keypads and remote management can be enabled. It is important to discuss remote access with the IT vendor as the building's network will determine if the animeo IP system is accessible from the internet. There are two methods to enable remote access to an animeo IP system.

6. Port Forwarding

1. Port forwarding provides a direct connection from the animeo IP building controller to the internet. It can be used in simple installations with low security concerns.

    (a) Requirements

        i. External network connection from Building controller's Ethernet Port to the Building network
        ii. Set IP address (either static or reserved)
        iii. Required ports open (see connection details above)
        iv. Static External WAN or DNS address

    (b) Keywords for discussion

        i. "Be on the network"- Requesting wiring between the animeo IP system and the building's network with a set IP address
        ii. "Remote access" - ability to connect to the animeo IP system through the internet
        iii. "Open port" - configuring the network to allow for connections to a specific address on the internet be sent to the animeo IP system
        iv. "Firewall" - security for the network, stopping unauthorized connections from the internet. The firewall is where ports are opened
        v. "Double NAT" - Plugging a router into a router (one network inside another network). In a double NAT condition, both networks will need to be configured to achieve remote access.
        vi. "WAN Address" - address of the system from the Internet.

    (c) Security Concerns

        i. Port forwarding is a simple form of remote access, but is not suitable for all applications.
        ii. All security concerns should be discussed thoroughly with the IT vendor and end user.

    (d) Usage

        i. When using the Visual Configuration Wizard, simply input the WAN address in the "host" field as if the device is connected locally.

7. VPN Access

1. VPN Access gives computers ability to speak over the internet to a remote network as if it were physically connected on the same network. With a VPN the Building Controller does not necessarily have access to the internet, but can be accessed through the internet. In high security environments, VPN access can be used to give access without major security risks.

    (a) Requirements

        i. VPN support on the network - Setting up a Hardware or Software VPN server is done by the IT provider
            A. Set IP address (either static or reserved)
            B. Access to the Building Controller on the VPN - comply with the connection details above.

    (b) Keywords for discussion

        i. "Be on the network"- Requesting wiring between the animeo IP system and the building's network with a set IP address
        ii. "Remote access" - ability to connect to the animeo IP system through the internet

    (c) Security Concerns

        i. Security of a VPN Network can vary greatly depending on configuration and provider. It is up to the VPN network provider to supply and configure a system which meets the needs of the project.

    (d) Usage

        i. Connecting into a VPN networks can vary greatly depending on configuration and provider. Always follow connection instructions set by the VPN network provider.

8. Troubleshooting

1. Port Forwarding

   (a) If remote access was previously configured and working and is now inoperable, the cause is likely a changed WAN IP address or changed Building Controller IP address. Speak to the network provider to discuss what may have changed in the network configuration and review "Specifying a network address" in this guide.

2. VPN Access

   (a) Troubleshooting VPN access can vary greatly depending on type of VPN network and configuration. It is always best to check with the VPN network provider and confirm that your computer conforms to all requirements. If you are able to connect to a VPN but not access the animeo IP system, ensure that the network provided has granted access to the IP address, the Building Controller is set, as well as all the required ports found in "Connection Details" in this guide.

Stability and reliability

1. Internal

Operation of all animeo IP hardware controllers depend on the internal IP-BUS network. If a Sub Controller loses connection to the Building Controller, all motorized applications will be moved to their safety position until the controllers are able to communicate. Follow the internal network troubleshooting in this guide if you experience Sub Controller stability issues (IPIONoResult error in the Visual Configuration Software)

2. External

Remote access though an external network is not a requirement for basic animeo IP system operation (Operation by SDN Keypad, RTS Remote, or PCs connected to the internal network). An unstable external network will inhibit remote configuration access through the internet, virtual keypads, and email notifications.