W900/W600/Intuition-6 and Walchem Fluent® Security Profile

Overview:

At the heart of Walchem's W600/900/Intuition Controllers is support for TCP/IP communications and an embedded (integrated) web server. Having TCP/IP communications support means that the controller is compatible with the established global standard for digital communications. This covers the digital communications that occurs over Local Area Networks (LAN) and the Internet.

Having an embedded web server means that the controller can transfer web pages to connected devices (typically a computer) that are running a standard Internet Web Browser. In the same manner that a PC user views information from websites (servers) on the Internet, in the case of the W600 or W900, the web server is built directly (embedded) into the controller.

Ethernet Connections:

Walchem's W600/Intuition-6 or W900 offers Ethernet as an optional (W600/Intuition-6) or standard (W900) feature, connected via a standard RJ45 connector. The Ethernet connection auto negotiates speed between 10/100 (802.3-2005) and has auto MDIX support.

Wi-Fi Connections:

The W900 features two types of optional Wi-Fi board. If a Single Connection board is installed, the ability to use the Ethernet port is completely disabled, making it impossible for a user to connect via Ethernet and then access the network that is connected via Wi-Fi. The Dual Connection board allows simultaneous yet isolated Ethernet and Wi-Fi connections.

The Wi-Fi can operate in either Infrastructure Mode (WPA/WPA2-Personal, or WEP security) or Ad-Hoc Mode (WPA2-Personal security) using radio protocol IEEE 802.11 b/g/n. If operating in Infrastructure mode, it is possible for an admin user to temporarily activate and deactivate Ad-Hoc mode to allow a local user to access the controller using a mobile device.

Communications Protocols:

The controller can be accessed using a standard web-browser such as Microsoft Edge, Mozilla Firefox, Google Chrome, or Apple Safari. Web pages are transferred from the web server (embedded in the controller) to the web browser (running on a PC or equivalent) using the http protocol on port 80.

Internet-connected controllers will check for the availability of software upgrades on a server located at 68.171.146.19 using a proprietary protocol over TCP port 9013. Inbound and outbound traffic needs to be open to support this feature.

Optional Modbus TCP and BACnet protocol communication occurs on standard ports (502 for Modbus, 47808 for BACnet) or any user-defined port.

Email:

The W600/Intuition-6/W900 controller supports outbound-only e-mail communications. It does not have the ability to receive email. Email is sent using the standard protocols (SMTP, ASMTP or TLS/SSL) over standard ports (25, 465, 587) or any user-defined port. Email sent through the Walchem Fluent® server uses TLS/SSL protocol over port 49887. There are four types of optional outbound email messages sent from the controller:

1. System Summary Report:

This report is sent as a standard .htm web page attached to the email. The report contains summary information regarding water treatment parameters that are being monitored and controlled. The frequency of emailed reports is user selectable as hourly, daily, weekly, or monthly – with the data representing a snapshot of current conditions.

2. Data Log report:

This report is an Excel formatted .csv file sent as an attachment to the email. The user customizes this report by defining the frequency of data points logged and the logging duration.

3. Alarm Messages:

The alarm message is an abbreviated text e-mail detailing the current alarms, able to be sent to an e-mail address or to a phone via an SMS gateway. A message is also sent when an alarm is cleared. The e-mail can be sent immediately, or only if the alarm persists after a programmable delay time. As an option, the system summary .htm file may be attached to the email.

4. Graph Report:

This report is sent as a standard .htm web page attached to the email. The web page shows graphs of a user-selected set of water treatment parameters that are being monitored and controlled over a selectable time period. The frequency of emailed reports is user selectable as hourly, daily, weekly, or monthly.

Connecting to the W600/Intuition-6/W900:

LAN (Local Area Network) via Ethernet: To communicate with the controller over Ethernet, a valid private network IP address and subnet mask must be programmed into the controller. Optionally, the controller may be configured to enable DHCP. When enabled and connected to private networks with DHCP support, an IP address, subnet mask and gateway address will be assigned automatically by the network.

WAN (Wide Area Network) via Ethernet: If remote access to a LAN connected W600 or W900 is desired when the user is outside of the network, remote from the facility, all the standard network options are available to an IT administrator to allow this.

The most secure choice is to give the remote user VPN (Virtual Private Network) access to the network, allowing them to access the controller on its private address as they would if they were physically on the private network with the controller.

Although exposing the controller directly to the internet without protection is not recommended, it can be accomplished by reconfiguring the corporate firewall/router to map an external IP address to the controller's private network address. This is referred to as Network Address Translation (NAT). The router may be programmed to map only port 80 to an external port (that may or may not be 80).

 The least secure option is to assign the controller a real, Internet routable Public IP address and open a hole in the firewall/router for this specific address.

Login:

Regardless of the connection method used to access the controller, the first web page served to the user is a Login page. Two levels of password access determine the functionality allowed by the user: full configuration (top level) or view only (2nd level). Each level has its own username and password. The default admin password when using the network interface is unique to the controller and based upon its serial number. On first login, the user is prompted to change the password.

Connecting via the Walchem Fluent® website:

Overview:

Walchem Fluent is a proprietary Walchem developed connection technology that simplifies many aspects of connecting to and communicating with its water treatment controllers when they are connected to a private LAN (Local Area Network) or external cell modem. The Walchem Fluent connection scheme is a communication method that allows controllers to connect to the Walchem Fluent Account Management website in a seamless, plug and play manner.

Requirements for Walchem Fluent:

1. Permission to connect the controller to the private network

> The controller can be configured with DHCP support. If the facility does not support IP address assignment via DHCP, a fixed IP address can be programmed into the controller's Ethernet settings menu. IP addresses in the 172.18.xxx.xxx range are not allowed.

> Enable Walchem Fluent Status (to allow data to be sent) and enable Live Connect Status (to allow remote connection to the controller from the Walchem Fluent Account Management website), and program the Update Period (how often data will be sent to Walchem Fluent).

2. Outbound Access

> The controller needs outbound network access to the Internet. This type of outbound access is very similar to the outbound privileges given to PCs on a private network when they access various websites and send email over the Internet. There is no need to modify any router/firewall inbound configuration settings. The gateway address must be valid.

> The following ports and protocols used must be open:

> • TCP and UDP support on Port 53 used to access a public DNS server if there is no private DNS server available
> • UDP support on Port 9012 & TCP support on Port 44965 used to establish a secure, encrypted, point-to-point connection to Walchem Fluent Account Manager Gateway (Live Connect)
> • TCP support on Port 44998 is used to send data records to Walchem Fluent