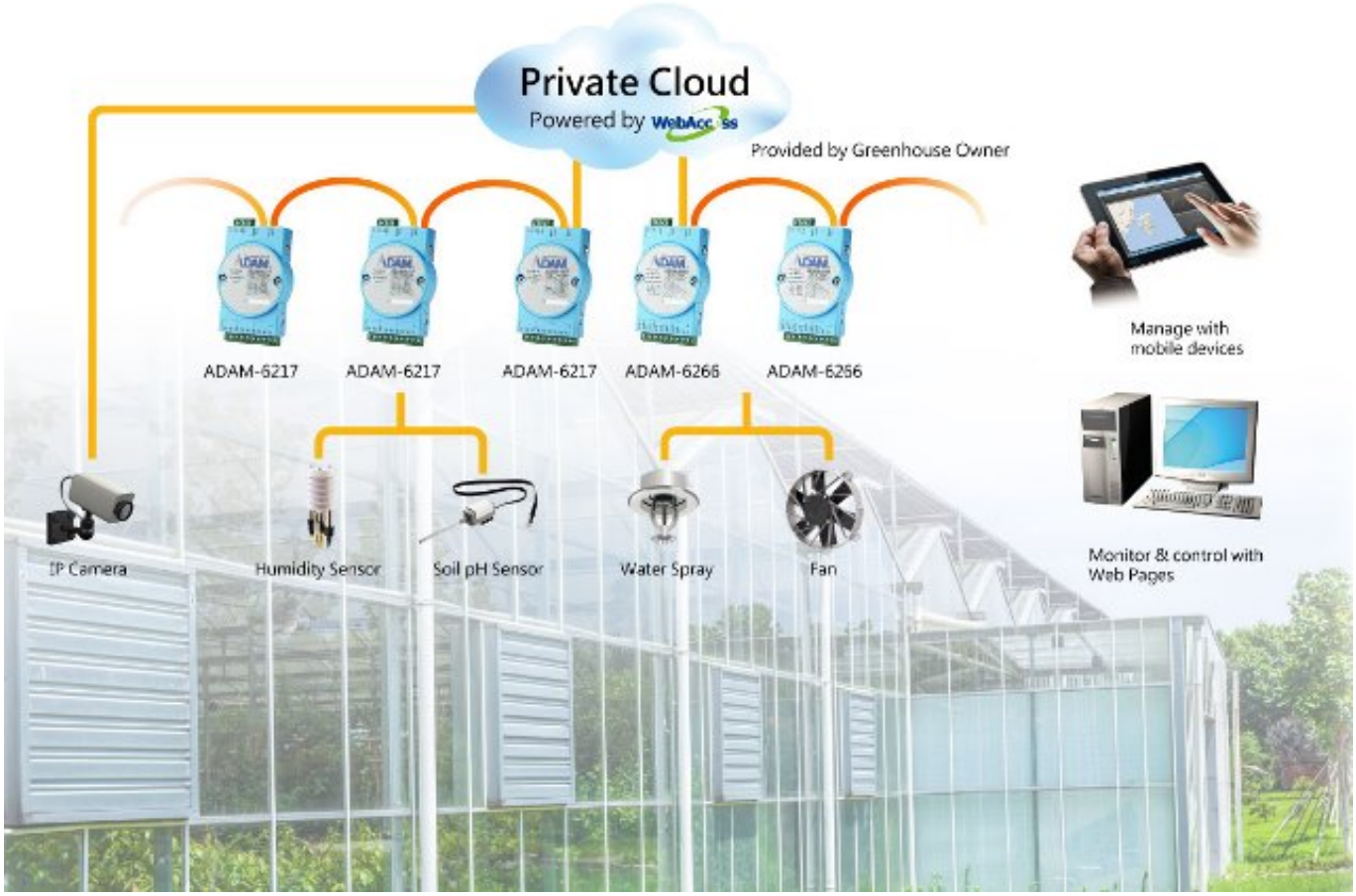
Remote Monitoring and Controlling of Greenhouses

Advantech created a greenhouse automation and remote monitoring solution from which their customers can control and monitor the environment via a virtual dashboard on a computer, smartphone or other web-based device in real time.



Project Introduction:

For people who live and work in big cities, growing their own fruits and vegetables is a dream which is often difficult to realize. But how about renting a greenhouse, and being able to remotely plant seeds, spray water and apply fertilizers through a webpage, and then watching how your crops are growing via streaming video from an IP camera while you occasionally pay a physical visit to your plants at the weekends or holidays to harvest and cook your vegetables at a feast?A group of young Taiwanese entrepreneurs are making their own, and other people?s dreams come true by establishing greenhouse plots for rent. Leveraging the latest

Advantech technologies and features provided by the ADAM-6200 series Ethernet I/O series and WebAccess 8.0 HMI/SCADA software, they?ve created a greenhouse automation and remote monitoring solution from which their customers can control and monitor the environment via a virtual dashboard on a computer, smartphone or other web-based device in real time.

System Requirements:

The customer divided their greenhouses into smaller rental compartments, which meant that each section needed an independent set of agro-controller systems, including sensors (for temperature, humidity, soil pH, and more), IP cameras, automatic water sprays, fans, etc. What they needed from Advantech included: relay modules to enable remote control over actuators of equipment such as water sprays and fans; data acquisition modules to read and transmit sensor data; and HMI-SCADA software to help realize remote monitoring and control and produce user interfaces.

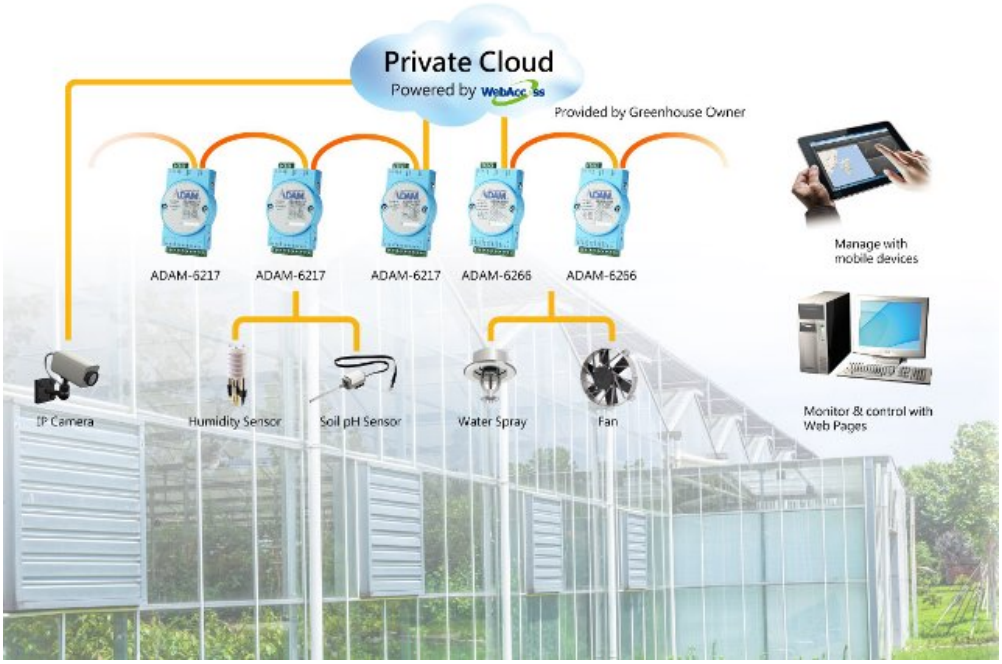
System Implementation:

About 40 Advantech ADAM-6266s were deployed for relay controls, and nearly 20 ADAM-6217s were deployed for reading and collecting data from sensors. Since each of these modules have multiple channels, each of them is capable of monitoring several compartments each operated by different persons at the same time. ADAM-6200s have integrated Ethernet switches and can connect to each other in a ?daisy chain? topology without the need to connect extra Ethernet switches. Meanwhile, because this topology, it can save the expense of physical wires. So that their customers can monitor the exact status of their gardens, our customer installed the latest version of WebAccess HMI/SCADA software, which incorporates Advantech?s hardware monitoring and diagnosis firmware/software package SUSIAccess, so that they can remotely monitor the CPU temperature, fan speed and other hardware parameters in easy and lower-cost system management and maintenance. Since the ADAM-6200 and WebAccess 8.0 support the latest HTML5 web language and RESTful webpage architectural style, our customer is able to use the Advantech-designed Widget Library and Dashboard Editor to easily customize their desired cross-platform dashboard page, to display dynamic data on end users? devices (PC, iPad, smartphone, etc).

Project Implementation:

ADAM-6217	8-ch Isolated Analog Input Modbus TCP Module
ADAM-6266	4-ch Relay Output Modbus TCP Module with 4-ch DI
Advantech WebAccess	Browser-based HMI/SCADASoftware

System Diagram:



Conclusion:

In the past, industrial automation control used special protocols such as Modbus for field communications. But now with products like Advantech?s ADAM-6200 series, which have a built-in Ethernet switch and support https, client devices can communicate with I/O modules directly without the need for a data converters or routing from the SCADA system. System developers orservice providers who are notfamiliar with traditional automation technologies willfind it easier to configure or

develop their applications in an IT-based and web-enabled environment. ADAM-6200 + WebAccess 8.0 is an extraordinary combination featuring easy installation and quick configuration, which saves our customers a lot of development and deployment time. Advantech?s solution is also remarkable for its scalability, availability and manageability with multiple and easy-to-use remote control and maintenance functions. Advantech was chosen as a solution providerbecause they have previous experience with remote greenhouse monitoring solutions including one for Taiwan?s biggest orchid flower grower and as such have a proven reputation in providing state of the art greenhouse applications.