[Introduction]

1. A factory is a place where products or materials are manufactured. The factory may have many offices which provide business transactions or professional services. Controlling and monitoring the air conditioning system for the whole factory and each office is important enough to be fully automated and require no human presence onsite.

2. An automated air conditioning monitoring and measuring system is essential. The system should have functions that measure energy consumption, calculate the power rate and work out the cost for user electric bills.

[Requirements]

1. The system should have remote control to monitor the air conditioning system in real time.

2. The system should have functions that can make timely recording of air changes and provide and file daily, weekly and monthly reports for inquiries.

3. The system should be a cost-effective and stable solution.

[Application/Explanation]

Delta’s total solution and products:

1. Air Conditioning Monitoring and Measuring System:
   a. Install a FCU controller in each office for the control of the ventilation.
   b. Use a Delta PLC connected to the multifunctional meters and water flow meters and calculate the hourly energy consumption and the number of consumed refrigeration per ton.
   c. Use a Delta HMI to collect all of the information and connect to a PC for recording the data via Ethernet.
   d. Install eRemote software on a PC to view and check the same screen shown on the HMI at the production site and remote control the manufacturing process via Ethernet.
   e. Install eServer software and MySQL database on a PC to collect production information and history data by the hour.
   f. Build a web service with PHP on a PC for online display and inquiries.
With solid experience and advanced technology, Delta Industrial Automation offers efficient and reliable solutions and service – we are your most trustworthy partner.
3. Operation

- Delta’s HMI is connected to a Delta DVP28SV PLC by COM1 port via RS-232 communication. The Delta DVP28SV PLC is also connected to a RTU-485 module and two DVP06AD modules to collect the data of two flow meters and four temperature sensors and calculate the consumed refrigeration per ton of different floors of the building through the changes and differences in temperature.

- Delta’s HMI is connected to a multifunctional meter by COM2 port via RS-485 communication to get the total energy consumption.

- Delta’s HMI and FCU controllers are connected in serial so that Delta’s HMI can take the enabled time of each FCU controller to calculate the energy consumption of each office.

- Install MySQL database on a PC and complete the settings.
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BUILD A WEB SERVICE WITH PHP AND CREATE A WEB DATABASE ON A PC SO THAT USERS CAN CHECK THE OPERATION DATA IN REPORTS, SUCH AS ENERGY CONSUMPTION AND ELECTRICITY COSTS OF THE AIR CONDITIONING MONITORING AND MEASURING SYSTEM.
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4. Delta’s Industrial Automation Products

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Human Machine Interface</th>
<th>Programmable Logic Controller</th>
<th>Communication Module</th>
<th>Extension Module</th>
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<tbody>
<tr>
<td>DOP-B07E415</td>
<td>DOP-B07E415</td>
<td>DVP28SV</td>
<td>RTU-485</td>
<td>DVP06AD-S</td>
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<td>eServer 1.00.10</td>
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For more information on Delta’s industrial automation products, please visit our website at: www.delta.com.tw/ia