

Case	Delta Industrial Automation Products for Building Automation				
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Applicable to	DOP-B Series, PLC				
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**The combination of Delta’s human machine interface (HMI) and programmable logic controllers (PLC) configures an integrated system which provides scheduling control, environment control and other energy-saving management functions for the full control and automation of a building.**

## [Overview]

With progress in automation technology, industrial automation products, such as HMI and PLC not only can be used for machinery applications, but also crossover to other domains such as building automation. The functions and specifications of the HMI products are constantly being upgraded, and now even cover complex control domains that show their unique advantage. In this case, we look at a classic HMI application used in building automation control.

In a building automation control system, the main function is to integrate all individual controls into one single interface. This includes lighting, HVAC, and other devices such as projectors, electric curtains, amplifiers, and other equipment. Using just an HMI will not provide completely integrated functions for full control and automation of a building. The integration of HMIs together with PLCs provides its functionality. This kind of system can provide real-time feedback, set off alarms, or modify the system without reprogramming the PLC. It not only can be used for simple tasks such as I/O points extension, but for sophisticated control such as scheduling control, remote access, alarms warning and even energy consumption data monitoring and recording

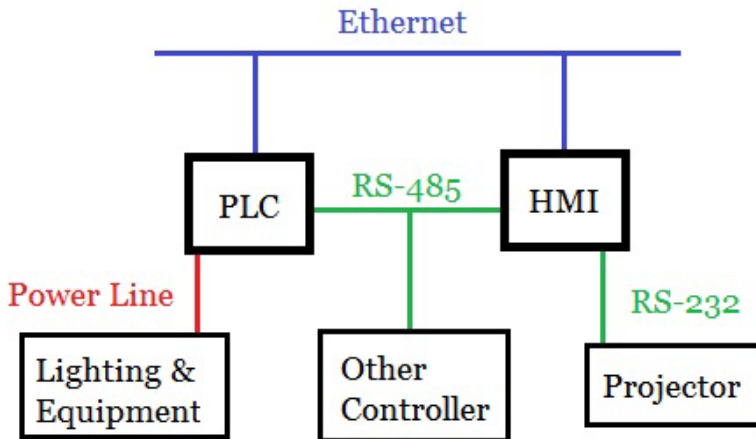
Traditional building control is operated using multiple buttons and different sets of remote controls. To turn on certain equipment, a single remote control is required. Every room may need a set of different remote controllers. This causes confusion as users do not know which controller is used to control which specific equipment. Sometimes several attempts are required and errors may occur as users need to get “familiar” with each remote controller. This works out to be a lot of time wasted as there is no clear indicator of which controller controls the equipment with the exception of previous users who have spent time playing around with the remote controls.

Traditional building controls are poor in operation, flexibility, or extensiveness. Integrated equipment on the current market is complex and costs a fortune for installation. Using Delta’s HMI and PLC only requires basic ladder programming and HMI interface programming skill to operate in different/ exchangeable screens with flexible configuration and macro functions to fulfill the necessary system requirements. The integration of HMI and PLC offers supervisory control and data acquisition for the entire system. Parameter changes are as feasible as the user chooses and users can personally design the user interface for easy identification. Pictures and icons allow for fast recognition, and ease the issues of illiteracy which has vastly improved operating convenience.

Building control structure consists of connecting the I/O points and communications to Delta’s PLC and HMI. From the HMI interface, we can control these points through switches, or more complex commands such as sending a string to the device. A particular command for a machine like the switch between VGA to HDMI mode on a projector can be done in the HMI’s macro function. When Delta’s HMI and PLC work together, the user can define interface settings and implement more advanced functions such as daily scheduling control and time management.

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## System Structure



The main communication from the PLC to the HMI is through an RS-485 connection. Since RS-485 supports more than one station, users can add additional control units such as a temperature controller whenever necessary. Sources connected from a power line, the lighting for example, need to be connected to the PLC. Typically, projectors have a communication port using RS-232 for control of the basic functions of the projector. The PLC and HMI should be connected to the internet for remote access and control.

## Program

### 1. Integration Interface



A graphical interface includes all the control the HMI needs to accomplish the perfect integration of devices.

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## 2. Simple and convenient environmental options



This interface has all the necessary commands within one environment. Traditional ways for control require several sets of remote controls for every single device. But with Delta's HMI, one click of a button, for example, "Presentation Mode" will switch the projector on immediately, detect the computer that is connected through the VGA port, and present it on the screen. At the same time, the front lights dim for a clear view of the projection and also asks if the user would like to turn on the air-conditioning. Using the HMI's macro function, the whole set of commands can easily be set with a single button.

## 3. Scheduling

On normal working days, work times and break times are fixed, so the scheduling of lighting operation could save a lot on manual operation negligence and electricity consumption.

### Conclusion:

HMI technology has become more powerful. Not only can it remedy negligence from manual operation, but it can also display a variety of interfaces and functions. With remote access and control, users do not need to be near the buttons and switches to start/stop or monitor the status of a building. Compatibility is also a big factor in the usability of an HMI. Delta's HMI can not only communicate with Delta's own automation products, but also with mainstream products that are on the market today. With its flexible compatibility, advantages in simplicity, user-friendly interface, and strong software design, Delta's HMI is your top choice for a smarter and greener tomorrow.

For more information on Delta's industrial automation products, please visit our website at: [www.delta.com.tw/ia](http://www.delta.com.tw/ia)

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