

New MONITOUCH V8 Series of Programmable Operation Displays

Shinya Sato
Futoshi Wada

1. Introduction

Programmable operation displays (PODs) are playing an increasingly important role in the FA field, and this market has been growing steadily year-by-year. Fuji Electric's UG30 (MONITOUCH V7) series of PODs boasts a wide variety of models with the industry's greatest number of connection types, and has responded to user requests ahead of other companies by supporting color displays of 32,768 colors, supporting the exchange of data using compact flash (CF) cards, and so on.

With the higher functionality and complexity of machinery and equipment in recent years, users are also requesting more diverse and higher levels of performance to PODs. In a control system, for example, such requests call for a diversification of the connection topology, an increased number of connectable units and the capability to handle a larger quantity of communication data. As an information system, PODs

are requested to be able to replace a system realized with a conventional panel computer and to provide greater compatibility with PCs. As a human-machine interface, PODs must provide improved expandability and higher levels of display and communication performance, which are the original functions of the POD.

Moreover, as the scale of a system becomes larger, shorter development times are requested, and the betterment of use and convenience for the user including ease of constructing the screen and ease of maintenance is also considered important for the display device.

This paper introduces Fuji Electric's new MONITOUCH V8 series of PODs that satisfy the latest user needs.

2. Overview of the MONITOUCH V8 Series

2.1 Development concept

The new POD MONITOUCH V8 series was de-

Table 1 MONITOUCH V8 series lineup

Model	6-inch			8-inch			10-inch		12-inch	
	STN monochrome	STN color	TFT color	STN color	TFT color		TFT color		TFT color	
	320 × 240	320 × 240	320 × 240	640 × 480	640 × 480	800 × 600	640 × 480	800 × 600	800 × 600	
High performance							V808iS	V810iT	V810iS	V812iS
							<ul style="list-style-type: none"> ○ 65,536-color ○ USB-A, USB-B ○ Communication interface unit : OK ○ CF card interface ○ Screen data : 12 Mbytes, ○ SRAM 512 kbytes ○ LAN interface ○ Video, RGB unit : OK 			
							V808S	V810T	V810S	V812S
							<ul style="list-style-type: none"> ○ 65,536-color ○ USB-A, USB-B ○ Communication interface unit : OK ○ CF card interface ○ Screen data : 12 Mbytes, ○ SRAM 512 kbytes 			
Standard	V806iMD	V806iCD	V806iTD				V808iC			
	<ul style="list-style-type: none"> ○ 65,536-color, 256-color, 16-tone ○ USB-A, USB-B ○ Communication interface unit : OK ○ CF card interface (optional) ○ LAN interface ○ Screen data : 5 Mbytes ○ SRAM : 512 kbytes 						<ul style="list-style-type: none"> ○ 256-color ○ USB-A, USB-B ○ Communication interface unit : OK ○ CF card interface ○ Screen data : 12 Mbytes ○ SRAM : 512 kbytes ○ LAN interface 			
	V806MD	V806CD	V806TD				V808C			V810C
	<ul style="list-style-type: none"> ○ 65,536-color, 256-color, 16-tone ○ USB-A, USB-B ○ Communication interface unit : OK ○ CF card interface (optional) ○ Screen data : 1.5 Mbytes ○ SRAM : 128 kbytes 						<ul style="list-style-type: none"> ○ 256-color ○ USB-A, USB-B ○ Communication interface unit : OK ○ CF card interface ○ Screen data : 5 Mbytes ○ SRAM : 128 kbytes 			

veloped based on the concept of achieving an intrinsic ease-of-use. Seeking a high level of usability by increasing the performance level and providing realistic display capability, as well as enhanced connectivity and expandability, the MONITOUCH V8 series aims to achieve production innovation and to unite the job site and remote office further.

2.2 Elegance and ease of use

The MONITOUCH V8 series high-performance models are equipped with a high-speed accelerator and utilize a high-speed algorithm to perform drawing process at high-speed with both hardware and software.

The use of TFT liquid crystal technology in the 6- to 12-inch displays improves visibility and makes it easier for the operator to assess the process situations.

2.3 Display device that is easy for anyone to use

In addition to the user interface which is trending toward componentization, various switch functions that do not require macro programs or ladder programs are included as a standard feature. Moreover, the requirement for a large capacity user memory is also satisfied.

2.4 Realization of flexible system operation

An Ethernet*1 interface is provided as a standard feature in all 6- to 12-inch model sizes. High-speed communication that combines three serial communications channels and an Ethernet enables connection of a maximum of eight models of external devices, and realizes 8-way communication.

2.5 MONITOUCH V8 series lineup

Table 1 lists the MONITOUCH V8 series lineup, which consists of a high-performance model and a standard model, and is based on the UG30 (MONITOUCH V7) series, with all models being provided with a USB (universal serial bus)-A/B interface, and both model types being available with or without an Ethernet interface.

3. MONITOUCH V8 Series Features

3.1 Display performance

(1) 65,536 display colors

With a high-resolution display of 65,536 colors in the case of no blinking and 32,768 colors in the case of blinking, JPEG and BMP images are clearly visible, and photos, illustrations, 3-D parts and so on can be displayed realistically. As a result, visibility is improved and the operator is able to assess the process situations with greater ease.

(2) 30 frames-per-second video display with 16.77 million colors

The use of the latest high-performance graphic ac-

celerator chip has resulted in a dramatic improvement in video display performance. With 30 frames-per-second high-speed video, there is no time lag in the display, even for applications having a short tact time.

(3) 256-tone monochrome display

The monochrome images commonly used in image processing by semiconductor equipment can be displayed more clearly, and graduation reproducibility and a convexo-concave sense have been improved significantly.

3.2 Operation performance

(1) Analog switch

A conventional analog film resistor is used as the touch panel switch. Since the switch layout has a high degree of freedom, the designing work is easy and an intuitive operation screen can be realized.

(2) High-speed response

Previously, in cases where there was a large quantity of communications data or where a connected device had a slow communications speed, the switch processing waited until completion of the communication, and as a result the response decreased.

In order to solve this problem, we conducted a review of the communication efficiency of each connected device in order to realize high-speed communication. Additionally, we conducted a review of the internal task configuration and increased efficiency to realize a higher speed switching response.

3.3 Communication connectivity

(1) 8-way communication

With a conventional POD, a maximum of only two types of devices could be connected simultaneously. With 8-way communication, however, combining an Ethernet interface (8 protocols) and a serial communication interface (3 protocols), a maximum of 8 types of programmable logic controllers (PLCs) of different models and having been made by different manufacturers, and their peripheral devices, can be connected with a single POD. Moreover, a D-sub connector or a modular connector can be freely selected for the connection port, allowing flexible support of the user's work environment.

(2) Connection configuration 1: Serial connection (3 ports)

Up to a maximum of three types of serial-communicating PLCs and peripheral devices can be connected. As a result, even in cases that could not be realized in the past, such as where multiple types of temperature controllers and inverters are being used, all the connections can be implemented with a single POD. Figure 1 shows a configuration of the expanded serial connectivity.

(3) Connection configuration 2: Serial + Ethernet mixed configuration

In addition to the conventional 2-way communication with a temperature controller and PLC, the new

*1: Ethernet is a registered trademark of Fuji Xerox Co., Ltd. in Japan.

Fig.1 Serial connection (3 ports)

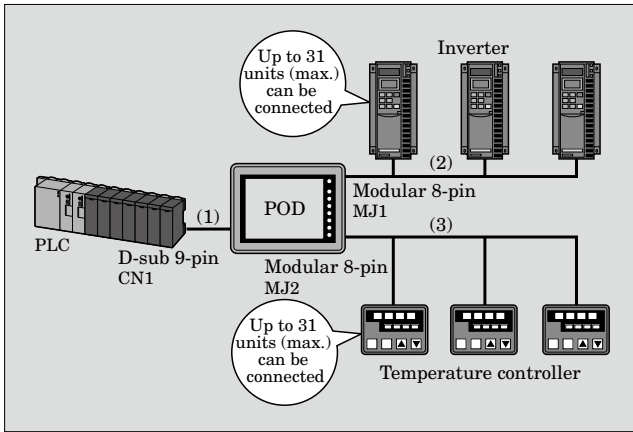


Fig.2 Serial + Ethernet mixed connection

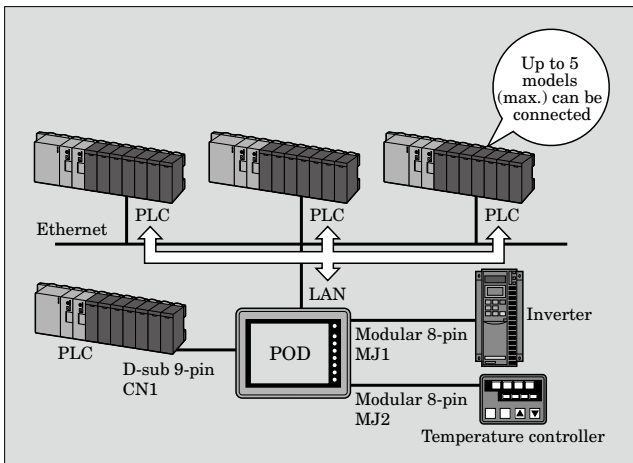
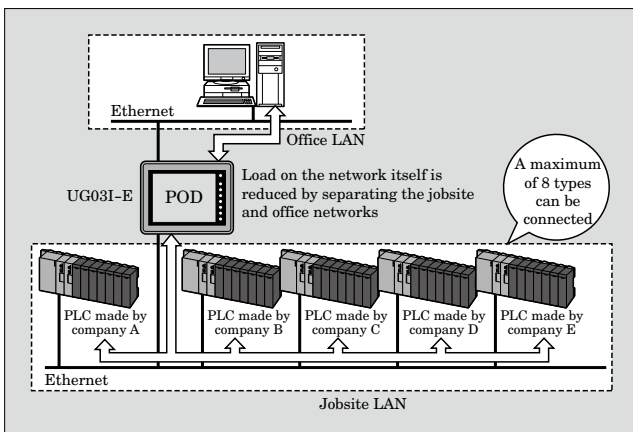


Fig.3 Ethernet connection



MONITOUCH V8 PODs can also add Ethernet communication capability. Figure 2 shows a configuration of a serial and Ethernet mixed connection.

(4) Connection configuration 3: Ethernet connection

With a single POD, a maximum of 8 types of PLCs and Ethernet connections are possible. Even PLCs of differing types or from different manufacturers, having been installed in an existing system, can be connected, enabling the flexible support of various systems. Ad-

Fig.4 USB screen data transmission

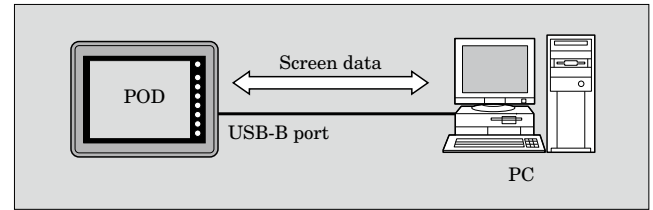


Fig.5 PictBridge support

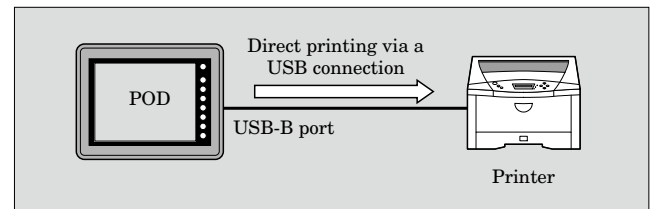
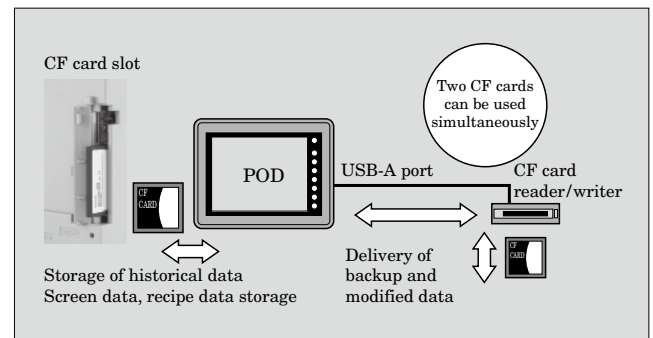


Fig.6 Support of two CF card drives



ditionally, by attaching an optional unit, the Ethernet interface can be expanded to 2 ports, and used as a gateway. For example, even if different networks, such as between a job site and an office, are connected with a POD, data can be delivered without placing additional load on the network itself.

Figure 3 shows a configuration of an Ethernet connection.

3.4 Expanded function (USB master/slave)

The provision of two types of USB interfaces (master/slave) on all models as a standard feature enables various USB functions to be utilized.

(1) High-speed transmission of screen data

Figure 4 shows the configuration for a transmission of USB screen data. A large quantity of screen data generated with screen creation software (V-SFT-5) can be transmitted (downloaded/uploaded) at high speed.

(2) Support of the PictBridge standard

The PictBridge common standard for connecting a digital camera and printer via a USB and for printing photographs is supported. Figure 5 shows a configuration that supports PictBridge. A PictBridge-compliant printer can easily print such documents as daily or monthly reports.

(3) Connection of CF card reader/writer

In addition to an internal CF card interface, a

USB-connectable CF card reader/writer is also supported, so that two CF card drives can be used simultaneously. Figure 6 shows a configuration supporting the use of two CF card drives. Files can be copied between the two CF cards, and this feature can be used in various ways depending on the application. For example, if a CF card is used as an internal drive, the data of that internal drive can be copied via the USB to another CF card, enabling sampling data, recipe data and the like to be backed up efficiently without disturbing the CF card in the slot.

(4) Mouse and keyboard connections

Support of an externally attached USB mouse and USB keyboard is planned.

4. V-SFT-5 Screen Creation Software

The functionality of the screen creation software supported by the MONITOUCH V8 series has also been improved significantly.

The V-SFT-5 (Editor Ver. 5) inherits the easy-to-use user interface that was well received with Editor Ver. 4, and also adds functions for reducing the work needed to create screens.

4.1 Component parts function

The components parts are the single modules that multiple functional parts are combined into. Being extremely easy to use, component parts preset with the necessary functions or macros are selected from a list and can be used with simple drag and drop operations. Figure 7 shows the component parts operating screen. This powerful tool eliminates the need for tedious programming and enables even an inexperienced operator to generate diverse functions freely and intuitively.

Figure 8 shows a comparison of screen creation settings for an alarm function. In the case where an alarm function was used with the conventional screen creation method, the alarm parts, buffering area setting, and message setting had to be set individually. With the component parts function, however, the necessary settings are provided as a single package which can be implemented in a single operation.

4.2 Multifunction switch

Various switch functions are provided to support a diverse range of user needs.

(1) Multi-output memory function

Bit output to a maximum of 16 locations is possible with a single operation. Thus a switch, similar to a radio button, which turns on only one location at the same time can be generated easily.

(2) On delay function

The execution timing of the switch can be set freely in such as an output operation will not begin unless the switch is pressed and held down for a certain amount of time.

(3) Off delay function

Fig.7 Component parts operating screen

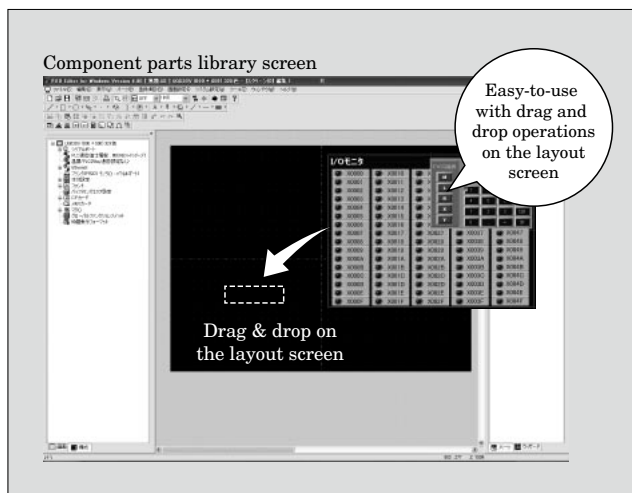
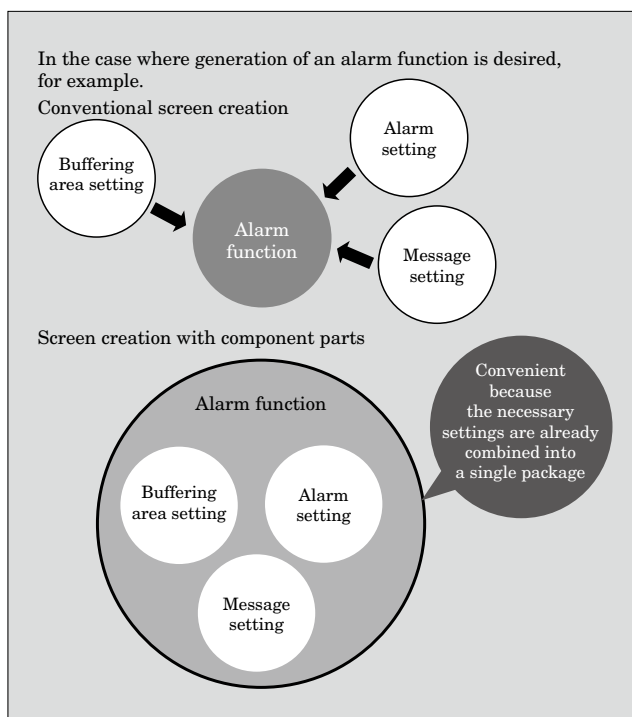


Fig.8 Comparison of screen creation settings for alarm function



This setting enables the output to be maintained for a fixed amount of time after the switch is released.

5. Postscript

An overview of the new POD MONITOUCH V8 series and a description of its features have been presented. With the increasing applications of touch panels, POD use is expected to continue to increase not only in the FA field, but also in the food service and building management fields and elsewhere.

Fuji Electric intends to develop and provide leading-edge touch panel products that can be used flexibly to meet this type of increasingly diverse user needs.



* All brand names and product names in this journal might be trademarks or registered trademarks of their respective companies.