

THE E RANGE OF HMIs



*Durable and user friendly  
Human Machine Interfaces*



Your partner in industrial automation systems

It is important to start in the right place when creating the interface for communication between man and machine. At Mitsubishi Electric we believe that people understand symbols better than blinking lights, that they can read plain text more easily than cryptic codes and that they work more safely when information is well organised instead of being chaotic. Based on this we have developed the E Range operator terminals which are used in thousands of industrial installations in various types of business throughout the world.

At the same time, we have solved a problem for the designer. The operator terminals are programmed with flexible blocks. A unique method that shortens design time and facilitates later reprogramming. We have simply started with what the designer and operator consider important when choosing an operator terminal.

## Locating the terminal where the operator is

Let the operator's working area determine the site for monitoring and control - not the location of the control system.

## Graphics and plain text are clearer

Symbols and information with words and units used by the operator make it far easier to work quickly and correctly.



## Robust Reconstruction

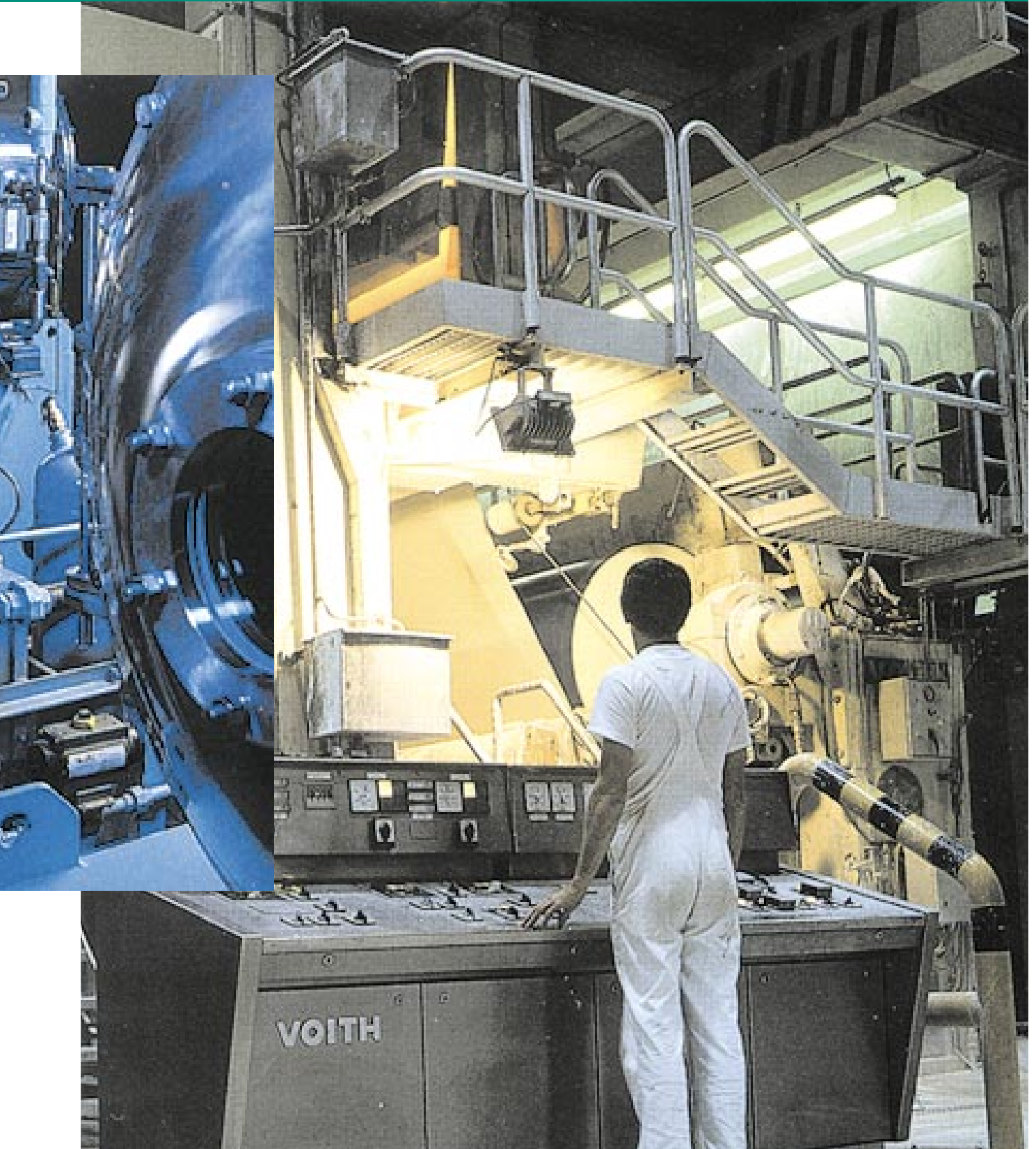
Operator terminals are often located in tough environments, exposed to oil, dirt and rough treatment.

## A complete system

The operator terminal should be more than just a panel hung onto the PLC system. An operator terminal should free the PLC system from dealing with alarms, displaying information and controlling. This results in the complete system being more efficient.

## Short development times save money

A good PC tool makes it easy to create various proposals and ideas for operator dialogues quickly. The project library and saved applications provide the possibility for rational solutions.



## Quick to start

Starting up a new system often means that programs must be adjusted at the same time as seeing what happens to the process. Being able to carry out tests and introduce changes quickly while the process is running is therefore important.

## Building out and retaining that which is good

Compatibility and reuse are key concepts among the advantages with a whole family of operator terminals. This makes it possible to buy a control solution today which can grow to meet future requirements.

# DURABLE & FLEXIBLE



E200



E300



E700

The E operator terminal is user-friendly both for operators and designers. Information is presented in the way to which the operator is accustomed. Measurements and tasks in plain language with units and types he uses. Even complex information becomes easy to understand, clarified with graphs, block graphs and graphic symbols. The operator terminal provides the designer with new opportunities for quick programming and adaptation to the application. The concept of flexible text and graphic blocks makes it easy to build up dialogues for human-machine communication. The operator terminal requires no support from the PLC program and does not put any extra load on the PLC system's functions.

## Based on blocks with text and graphics

Programming the E operator terminal is just as easy as drawing and describing what the operator should see. A block contains what is shown in the window. Enter fixed and dynamic texts and graphics directly onto the screen. Use the ready, predefined symbols or draw your own. Connect dynamic text and graphics to the operating conditions and measurements to be able to see what is happening in the process. Also use dynamic text and graphics to change for example preset values. Construct several blocks into a menu of dialogues using the jump function.

## Graphic and text in 256 colours

Text and measured values are presented in the operator's language and in engineering units. Graphic blocks can consist of realistic 3-D shadowed objects in colour, predefined symbols or pictures from Windows. Both bit file pictures and vector graphics can be combined. High resolution makes everything clear and easy to read.

## Touch display

To make the operator dialogue even more secure the E710 is equipped with a touch screen. This means that you define only the keys/push-buttons which are relevant in each dialogue.

## Programmable function keys

Can be used for various functions depending on the screen display. Write your own texts on the insertable strips.

## LEDs with changing colours and blinking

LEDs with changing colours and blinkings makes it easy to gain the operator's attention.

## Historical trending

The curve gives an immediate overview of changes in measurements. Study in detail of interesting time intervals with optional scales. Stored data can be transferred to a PC using HMI Tools for further processing.

## Powerful alarm management

Alarms can be sorted into different groups according to priority. Alarms can be acknowledged from the terminal. Pressing a key brings up the alarm list, which can contain alarm messages with measured values. Alarms are stored with status and time stamp and can be printed out at any time. The alarms can also be grouped in alarm groups with different colours and the operator can choose to display a single alarm group or all alarms.

# EASY TO USE

## Reuse parameters with recipes

The E operator terminal can handle libraries with recipes. The recipe can be given a free name and is easy to create, edit and erase. This provides an efficient way to solve time critical production changes by easily loading a new set of parameters to the PLC.

## Reports and alarms to printer

Cost effective solutions by connecting the printer directly to the operator terminal to print for example shift reports, 24-hour reports and alarms.

## Integration with the PC world

With the software package HMI Tools you can easily transfer trends, recipes and alarm lists from the operator terminal to a PC.

## Rational programming on the PC

A project is created in a visual environment with the Block manager function. The menu structure is shown and created graphically with automatic connection between the projects different blocks. The symbol manager is used to handle graphic symbols. The built-in bitmap editor makes it easy to build up your own symbol library but it is also possible to import/export graphic using standard graphic formats. This gives the user a cost-effective way of re using symbols.

## Open communication

The terminals can be connected directly to Mitsubishi's PLC system but also have drives for Siemens and Allen-Bradley. With an optional communication interface the terminals supports Profibus DP field bus as a slave node. This makes it possible to build networks with PLCs, motors controllers, sensors and operator terminals.

## Compact solutions

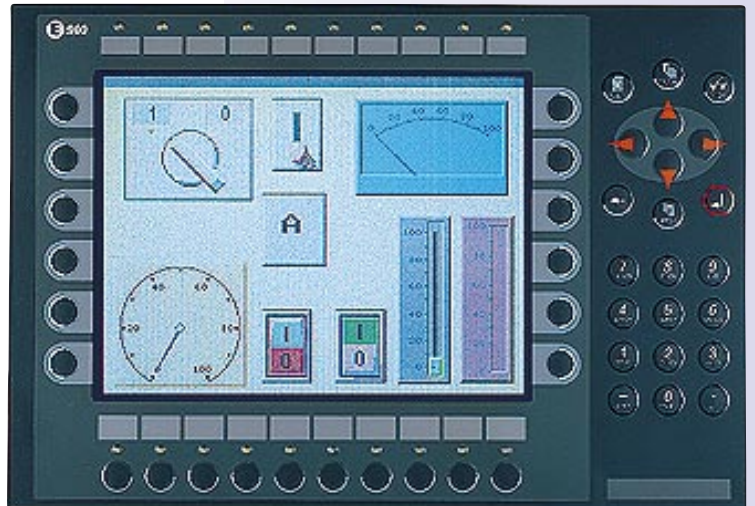
An E operator terminal directly connected to a PLC is the simplest configuration. The operator terminal supports the connection of external units such as barcode or card readers. This makes it possible to build highly compact solutions. Built-in transparent mode means that programming and trouble shooting of the PLC can be carried out without disconnecting the operator terminal.

## Network solutions

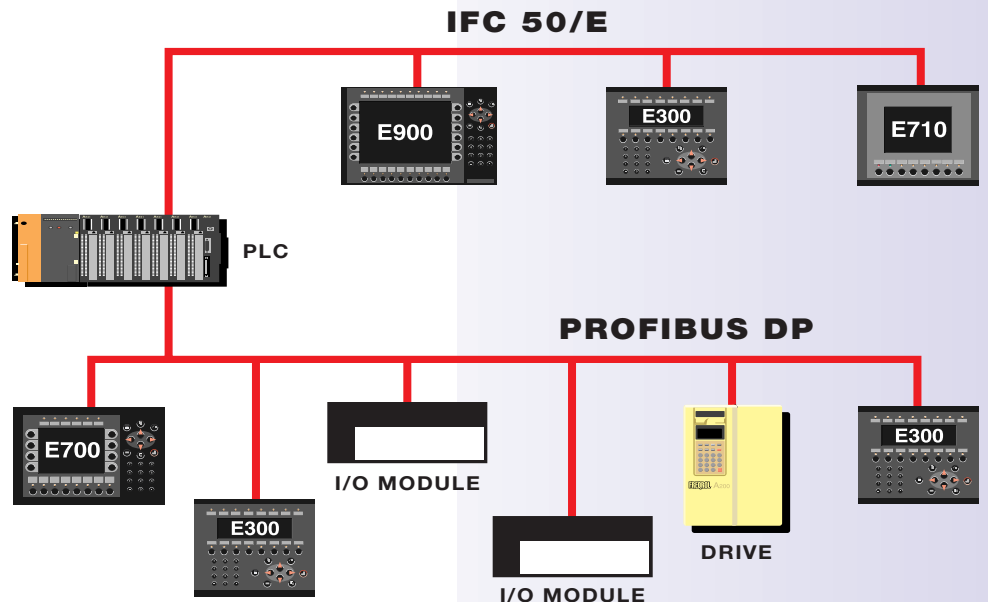
Up to 8 terminals, with communication interface IFC/50E, can be connected to one PLC. Optimised protocol provides rapid response time.



E710



E900



IFC 50/E

PLC

PROFIBUS DP

I/O MODULE

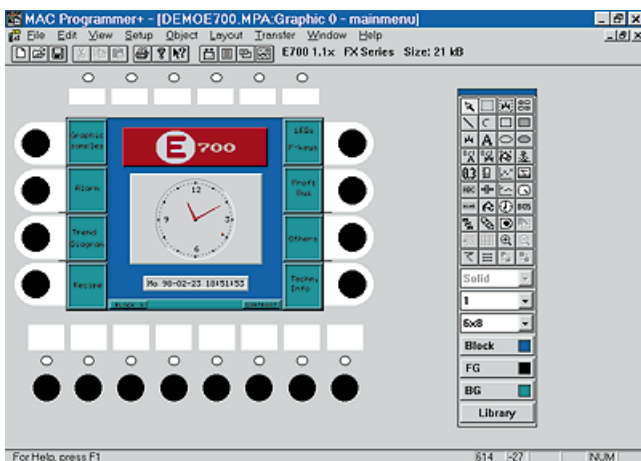
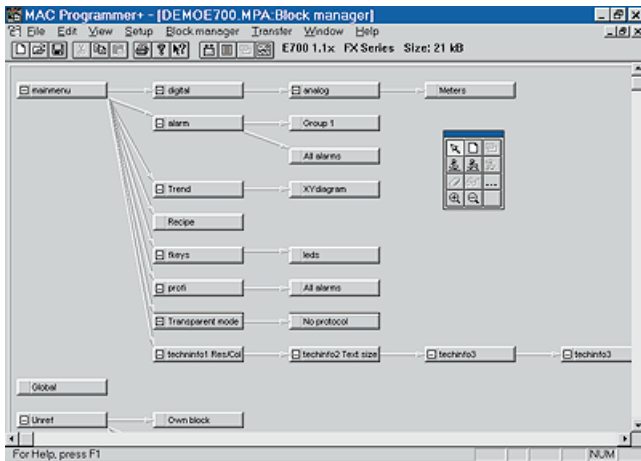
I/O MODULE

DRIVE


# A RANGE TO SUIT YOUR NEEDS

The table shows the functions and technical data for all the E range operator terminals from Mitsubishi Electric.

All operator terminals have the same range of basic functions, it's just a question of choosing the E range terminal that best suits your needs.

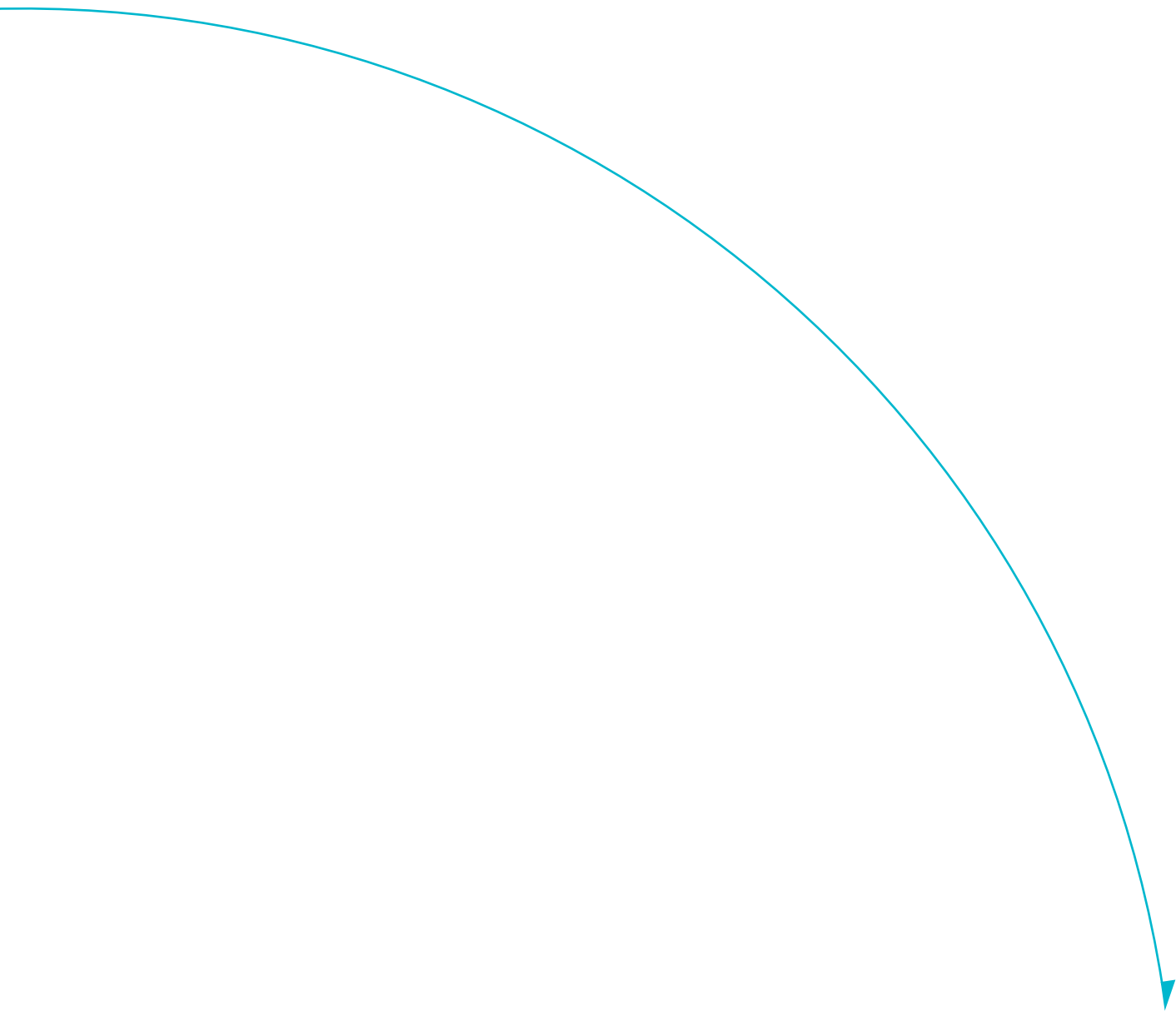


Programming tool in Windows for the E range operator terminals.

|  |   |
|--|---|
|  |  |
| <b>Model</b>                                       | E200  |
| <b>Display type</b>                                | Backlit LCD   |
| <b>Text height (mm)</b>                            | 5   |
| <b>Freely defined display</b>                      | 4 lines x 20 characters   |
| <b>LEDs</b>  | 5 (two coloured)  |
| <b>Function keys</b>                               | 5 (with own text)   |
| <b>Alarm processing</b>                            | ●   |
| <b>Time channels</b>                               | ●   |
| <b>Real time clock</b>                             | ●   |
| <b>Real-time trending</b>                          |   |
| <b>Historical trending</b>                         |   |
| <b>Recipe handler</b>                              | ●   |
| <b>Report generation</b>                           | ●   |
| <b>Password protection</b>                         | 8 levels  |
| <b>Index addressing</b>                            | ●   |
| <b>Buzzer</b>                                      |   |
| <b>Transparent mode</b>                            | ●   |
| <b>Memory type</b>                                 | Flash   |
| <b>Memory capacity</b>                             | 64 Kbyte  |
| <b>Expandable memory (optional)</b>                |   |
| <b>Computer/printer port (RS232)</b>               | ●   |
| <b>Programming tool</b>                            | Windows   |
| <b>Support for HMI Tools</b>                       | ●   |
| <b>Voltage</b>                                     | 24 VDC  |
| <b>Power consumption</b>                           | 150 mA (24 VDC)   |
| <b>Ambient temperature</b>                         | 0-50°C  |
| <b>Waterproof according to IP65 (front)</b>        | ●   |
| <b>CE</b>  | ●   |
| <b>EMC approval</b>                                | EN 50081-1EN 50082-2  |
| <b>Dimensions WxHxD (mm) (inc cable depth)</b>     | 147 x 163.5 x 107   |
| <b>PLC communication (RS-422)</b>                  | FX, FX2N, A, Q, C24, Allen Bradley DF1, Siemens S5/AS511                            |
| <b>Fieldbus communication (optional interface)</b> |   |
| <b>IFC-50E network</b>                             |   |
|  |   |
|  |   |



|  |   |  |  |  |
|--|---|--|--|--|
|  | E300  | E700   | E710   | E900 (*2)  |
|  | Backlit LCD   | Backlit colour LCD   | Backlit colour LCD   | Backlit colour TFT   |
|  | 4.2/8.5   | Variable   | Variable   | Variable   |
|  | 4 lines x 20 characters<br>8 lines x 40 characters                        | 320 x 240 pixels, 16 colours<br>(supports 256 colour bitmaps)  | 320 x 240 pixels, 16 colours<br>(supports 256 colour bitmaps)  | 640 x 480 pixels, 256 colours                                  |
|  | 16 (two coloured)   | 14 (two coloured)  | 8 (two coloured)   | 20 (two coloured)  |
|  | 8 (with own text)   | 16 (8 with own text)   | 8 (with own text)  | 22 (10 with own text)  |
|  | 4 groups  | 16 groups  | 4-6 groups   | 16 groups  |
|  | ●   | ●  | ●  | ●  |
|  | ●   | ●  | ●  | ●  |
|  | ●   | ●  | ●  | ●  |
|  | ●   | ●  | ●  | ●  |
|  | ●   | ●  | ●  | ●  |
|  | ●   | ●  | ●  | ●  |
|  | 8 levels  | 8 levels   | 8 levels   | 8 levels   |
|  | ●   | ●  | ●  | ●  |
|  | ●   | ●  | ●  | ●  |
|  | ●   | ●  | ●  | ●  |
|  | Flash   | Flash  | Flash  | Flash  |
|  | 128 Kbyte   | 400 Kbyte  | 400 Kbyte  | 2 Mbyte  |
|  |   | Up to 4 Mbyte  | Up to 4 Mbyte  | Up to 6 Mbyte  |
|  | ●   | ●  | ●  | ●  |
|  | Windows   | Windows  | Windows  | Windows  |
|  | ● (*1)  | ●  | ●  | ●  |
|  | 24 VDC  | 24 VDC   | 24 VDC   | 90 - 260 VAC   |
|  | 350 mA (24 VDC)   | 600 mA (24 VDC)  | 600 mA (24 VDC)  |  |
|  | 0-50°C  | 5-40°C   | 5-40°C   | 0-50°C   |
|  | ●   | ●  | ●  | ●  |
|  | ●   | ●  | ●  | ●  |
|  | EN 50081-1EN 50082-2  | EN 50081-1EN 50082-2   | EN 50081-1EN 50082-2   | EN 50081-1EN 50082-2   |
|  | 212 x 198 x 110   | 276 x 198 x 110  | 212 x 198 x 110  | 365 x 265 x 110  |
|  | FX, FX2N(*1), A, Q(*1),<br>C24, Allen Bradley DF1<br>Siemens S5/AS511(*1) | FX, FX2N, A, Q,<br>C24, Allen Bradley DF1,<br>Siemens S5/AS511 | FX, FX2N, A, Q,<br>C24, Allen Bradley DF1,<br>Siemens S5/AS511 | FX, FX2N, A, Q,<br>C24, Allen Bradley DF1,<br>Siemens S5/AS511 |
|  | Profibus DP   | Profibus DP  | Profibus DP  | Profibus DP  |
|  | ● (*)   | ● (*)  | ● (*)  | ● (*)  |
|  | (*1) available in June 98   |  |  | (*2) Available June 98   |
|  | (* ) when connected to Mitsubishi PLCs                                    |  |  |  |



**THE POWER TO INTEGRATE**

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