Digital expansion modules / Power supply for expansion modules / Thumbwheel switch input module

■ Digital expansion modules


FBs-8EA(T,S)


FBs-16EA(T,S)


FBs-8EX


FBs-20EX


FBs-8EY(T,S)


FBs-16EY(T,S)


FBs-24EX


FBs-24EYT


FBs-24EA(T,S)


FBs-40EA(T,S)


FBs-60EA(T,S)

Specification / Model number	Digital input	Digital output				Wiring machanism	Dimension
	24VDC	Transistor (5 ~ 30VDC)		Relay	Thyristor		
	Low speed 4.7mS	Low speed 200Hz (0.5A)	Low speed 200Hz High density (0.1A)	AC/DC (2A)	AC (1A)		
FBs-8EA	4 points			4 points		7.62 mm pitch terminal block	Figure 4
FBs-8EAT ◇		4 points					
FBs-8EAS					4 points		
FBs-8EX	8 points						
FBs-8EY				8 points			
FBs-8EYT ◇		8 points					
FBs-8EYS					8 points		
FBs-16EA	8 points			8 points			Figure 3
FBs-16EAT ◇		8 points					
FBs-16EAS					8 points		
FBs-20EX	20 points						
FBs-16EY				16 points			
FBs-16EYT ◇		16 points					
FBs-16EYS					16 points		
FBs-24EX	24 points					30 pins header with latch	Figure 4
FBs-24EYT			24 points				
FBs-24EA	14 points			10 points		7.62 mm pitch terminal block	Figure 1
FBs-24EAT ◇		10 points					
FBs-24EAS					10 points		
FBs-40EA	24 points			16 points			Figure 1
FBs-40EAT ◇		16 points					
FBs-40EAS					16 points		
FBs-60EA	36 points			24 points			Figure 1
FBs-60EAT ◇		24 points					
FBs-60EAS					24 points		

◇ : Transistor output type: Blank—SINK output (NPN), J—SRCE output (PNP)

■ Power supply for expansion modules

(7.62 mm terminal block)


FBs-EPOW


FBs-EPOW-D

Specification / Model number	Power input	Residual capacity of output power			Dimension
		5VDC (Logic circuit)	24VDC (Input circuit)	24VDC (Output circuit)	
FBs-EPOW	100 ~ 240VAC -15%/+10%, 21W	400mA	250mA	250mA	Figure 4
FBs-EPOW-D	24VDC -15%/+20%, 12W	400mA	400mA*	250mA	

* Directly from input power, but limited by specifications of circuit and fuses, with capacity of 400mA

■ Thumbwheel switch input module

(30 pins header with latch)


FBs-32DGI

Specification / Model number	Input method	Occupied IR number	Refresh time for input	Dimension
FBs-32DGI	16-bit (4 digits) x 8 multiplexing input scan	8 words (32 digits/128 individual points)	10mS max. (IO ASIC)	Figure 4

7/16-segment LED display modules / Analog input (AI) module / Analog output (AO) modules / Analog input/output (AI/O) module

7/16-segment LED display modules

(16 pins box header)

FBs-7SG1

FBs-7SG2

Specification \ Module number			FB-7SG1	FB-7SG2
Display mode	Decoding display		4 bits to represent a character. It can display 16 kinds of pre-decoded character including 0 ~ 9, –, H, E, c, t and all blank	
	Non-decoding display		Each segment controlled by 1 individual bit	
Display number of character or points of LED			8 (4*) characters or 64 points individual LED	16 (8*) characters or 128 points individual LED
Refresh time for display			10mS max. (IO ASIC)	
LED driving specification	Driving current		40mA /segment	
	Display method		1 ~ 8 characters multiplexing display	
	Driving voltage	Low voltage	5VDC (can be 10% up)	
		High voltage	7.5V, 10V, 12.5V selectable (can be 10% up)	
	Fine tune of voltage drop		0.6V, 1.2V, 1.8V selectable	
Over voltage driving indication			Each channel has individual over voltage (O.V.) driving LED indication	
Wiring method			16 pins flat cable,2.54mm header connector	
Isolation method			Photocouple isolation	
Power input			24VDC –15%/+20%,static consumption is 2VA max, dynamic current is increased according to display.	
Dimensions			Figure 4	

* : For 16-segment alphanumeric character

Analog input (AI) module

(7.62 mm terminal block)

FBs-6AD

Specification \ Item		Voltage input	Current input
Number of input point		6 points / 12-bit	
Digital input value		-2048 ~ +2047 or 0 ~ 4095	
Input signal range	Bipolar	-10 ~ 10V or -5 ~ 5V	-20 ~ 20mA or -10 ~ 10mA
	Unipolar	0 ~ 10V or 0 ~ 5V	0 ~ 20mA or 0 ~ 10mA
Maximum resolution		1.22mV (5V/4096)	2.44mA (10mA/4096)
Accuracy		±1%	
Conversion time		Conversion once for each scan	
Maximum input signal		±15V	±30mA
Input impedance		63.2KΩ	250Ω
Isolation method		Transformer (Power) and photocouple (signal) isolation	
Power input		24VDC –15%/+20%, 2VA max.	
Dimensions		Figure 4	

Analog output (AO) modules

(7.62 mm terminal block)

FBs-2DA

FBs-4DA

Specification \ Module number		FBs-2DA	FBs-4DA
Number of output point		2 points / 14-bit	4 points / 14-bit
Digital output value		-8192 ~ +8191 or 0 ~ 16383	
Output signal range	Bipolar	Voltage : -10 ~ 10V or -5 ~ 5V , Current : -20 ~ 20mA or -10 ~ 10mA	
	Unipolar	Voltage : 0 ~ 10V or 0 ~ 5V , Current : 0 ~ 20mA or 0 ~ 10mA	
Maximum Resolution		Voltage : 0.3mV (5V/16384) , Current : 0.61mA (10mA/16384)	
Accuracy		±1%	
Conversion time		Conversion once for each scan	
Maximum allowable loading		Voltage : 500Ω ~ 1 MΩ : Current : 0Ω ~ 500Ω	
Isolation method		Transformer (Power) and photocouple (signal) isolation	
Power input		24VDC –15/+20%, 2VA max	
Dimensions		Figure 4	

Analog input/output (AI/O) module

(7.62 mm terminal block)

FBs-4A2D

Item	Specification
Number of input/output point	4 points AI 12-bit + 2 points AO / 14-bit
Analog input specification	Same as FBs-6AD
Analog output specification	Same as FBs-2DA / 4DA
Dimensions	Figure 4

Model Specifications

Thermocouple modules / RTD modules / FB-DAP simple human-machine interfaces / RFID cards

■ Thermocouple modules

(7.62mm terminal block)

FBs-TC2

FBs-TC6

FBs-TC16

Specification \ Model number	FBs-TC2	FBs-TC6	FBs-TC16
Number of input points	2 points	6 points	16 points
Thermocouple type and temperature measurement range	J (-200～1200°C) E (-190～1000°C) K (-190～1300°C) T (-190～380°C) R (0～1800°C) B (350～1800°C) S (0～1700°C) N (-200～1000°C)		
Temperature compensation	Built-in cold junction compensation		
Resolution	0.1°C		
Temperature refresh time	2/4 seconds		
Overall Precision	± (1%+1°C)		
Isolation method	Transformer (power) and photocouple (signal) isolation (per-channel isolation)		
Power input	24VDC -15%/+20%，2VA max.		
Dimensions	Figure 4		Figure1

■ RTD modules

(7.62mm terminal block)

FBs-RTD6

FBs-RTD16

Specification \ Model number	FBs-RTD6	FBs-RTD16
Number of input points	6 points	16 points
RTD type and temperature measurement range	3-wire RTD sensor (JIS or DIN) Pt-100(-200°C~850°C) Pt-1000((-200°C~600°C)	
Resolution	0.1°C	
Temperature refresh time	2/4 seconds	
Overall Precision	± 1%	
Isolation method	Transformer (power) and photocouple (signal) isolation (no isolation between channels)	
Power input	24VDC -15%/+20%，2VA max.	
Dimensions	Figure 4	Figure1

■ FB-DAP simple human-machine interfaces

FB-DAP-B(R)

FB-DAP-C(R)

Specification \ Model number		FB-DAP-B(R)	FB-DAP-C(R)
Display		16-character × 2, 5×7dot matrix LCD display, with LED backlighting	
Key pads		20 (4×5) membrane	
Power input		24V，41mA (48mA)	5V，100mA (120mA)
Communication Interface	Electric	RS485	RS232
	Mechanism	3 pins European detachable terminal block	D-sub 9 pins male connector
	Number of linked station	Max. 16 stations	1
General features		Timer, counter, register, relay, access of contact in PLC	
Special features		Alarm, information display, user definable special quick keys	
Card reading feature		Available only in -BR/-CR models, with maximum distance of 12 ~ 18 cm	
Card writing feature		Read/Write-able CARD-2 card, specified models(-BW/-CW) only	
Dimensions		Figure 7	

■ RFID cards

CARD-1 CARD-2

Specification \ Model number	CARD-1	CARD-2
Memory	64-bit + CRC error detecting codes	
Working temperature	-25℃~ 50℃ (ISO 7810)	
Writing times	Read-only	At least 10000 times
Dimensions (mm)	86×54×1.3	
Weight (g)	12	

Memory pack / Communication modules (CM) / Communication boards (CB)

Memory pack

FBs-PACK

Item	Specification
Memory	1M bits FLASH ROM
Memory capacity	20K words program + 20K words data
Write protection	DIP switch ON/OFF protection

Communication modules (CM)

FBs-CM22

FBs-CM55

FBs-CM25

FBs-CM25E

FBs-CM55E

FBs-CM25C

FBs-CM5R

FBs-CM5H

Model/Item	Specification	Dimemsion
FBs-CM22	2 RS232 ports (Port3+Port4) with TX, RX indicators	Figure 5
FBs-CM55	2 RS485 ports (Port3+Port4) with TX, RX indicators	
FBs-CM25	1 RS232 (Port3) + 1 RS485 (Port4) with TX, RX indicators	
FBs-CM25E	1 RS232 (Port3) + 1 RS485 (Port4) with Ethernet interface and RUN,LINK,TX, RX indicators	
FBs-CM55E	2 RS485 ports (Port3+Port4) with Ethernet interface and RUN,LINK,TX, RX indicators	
FBs-CM25C	General purpose optical isolation RS232↔RS485 converter, with RX indicators	
FBs-CM5R	General purpose optical isolation RS485 repeater, with RX indicators	
FBs-CM5H	General purpose optical isolation four ports RS485 Hub, with ACT, COLLISION indicators	Figure 4

RS232 Specification	Mechanism	DB-9F standard plug
	Electric	EIA RS232 standard specifications
RS485 Specification	Mechanism	3-pin European plug-able terminal block
	Electric	EIA RS485 standard specifications with built-in termination resistor
Ethernet Specification	Mechanism	4-pin European plug-able terminal block
	Electric	10BaseT,IEEE 802.3 standard

Communication boards (CB)

FBs-CB2

FBs-CB22

FBs-CB5

FBs-CB55

FBs-CB25

FBs-CBE

Model/Item		Specification
FBs-CB2		1 RS232 port (Port2), with TX, RX indicators
FBs-CB22		2 RS232 ports (Port1+Port2), both with TX, RX indicators
FBs-CB5		1 RS485 port (Port2), with TX, RX indicators
FBs-CB55		2 RS485 ports (Port1+Port2), both with TX, RX indicators
FBs-CB25		1 RS232 port (Port1) +1 RS485 port (Port2), both with TX, RX indicators
FBs-CBE		1 Ethernet 10BaseT interface with LINK, RX and TX indicators
RS232 Specification	Mechanism	DB-9F standard plug
	Electric	EIA RS232 standard specifications
RS485 Specification	Mechanism	3-pin European plug-able terminal block
	Electric	EIA RS485 standard specifications with built-in termination resistor

Other Accessories

Model	Description
FBs-XTNR	Converter box for extension of I/O expansion cables
LED.56R	.56″ high-brightness, red color 7-segment LED display
LED.8R	.8″ high-brightness, red color 7-segment LED display
LED2.3R	2.3″ high-brightness, red color 7-segment LED display
LED4.0R	4.0″ high-brightness, red color 7-segment LED display
LEDAN.8R	.8″ high-brightness, red color 16-segment LED display
LEDAN2.3R	2.3″ high-brightness, red color 16-segment LED display
DB.56 (DB.56LEDR)	.56″ 7-segment 8 digits LED display PCB (DB.56LEDR with LED installed)
DB.8 (DB.8LEDR)	.8″ 7-segment 8 digits LED display PCB (DB.8LEDR with LED installed)
DB2.3 (DB2.3LEDR)	2.3″ 7-segment 8 digits LED display PCB (DB2.3LEDR with LED installed)
DB4.0 (DB4.0LEDR)	4.0″ 7-segment 4 digits LED display PCB (DB4.0LEDR with LED installed)
DBAN.8 (DBAN.8LEDR)	.8″ 16-segment 4 digits LED display PCB (DBAN.8LEDR with LED installed)
DBAN2.3 (DBAN2.3LEDR)	2.3″ 16-segment 4 digits LED display PCB (DBAN2.3LEDR with LED installed)
FBs-232P0-9F-150	Dedicated communication cable for FBs main unit port0(RS232) to 9pin D-sub female connector, 150cm long
FBs-232P0-9M-400	Dedicated communication cable for FBs main unit port0(RS232) to 9pin D-sub male connector, 400cm long
FBs-USBP0-180	Communication cable for FBs main unit port0 (USB) (commercial USB A←→B cable), 180cm long
HD30-22AWG-200	22AWG I/O cable with 30pins socket, 200cm long (for FBs-24EX, 24EYT and 32DGI)


FBs-XTNR


LED.56R


LED.8R


LED2.3R

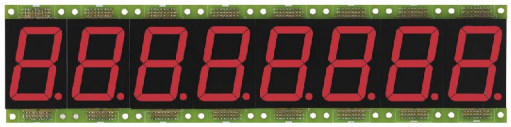

LED4.0R

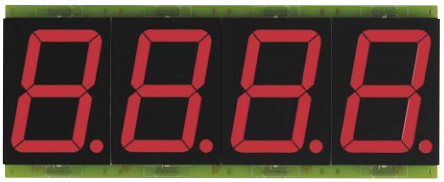

LEDAN.8R


LEDAN2.3R

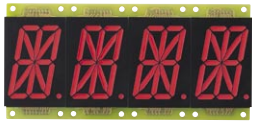

DB0.56LEDR


DB.8LEDR


DB2.3LEDR


DB4.0LEDR

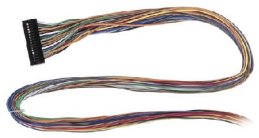

DBAN.8LEDR


DBAN2.3LEDR


FBs-232P0-9F-150

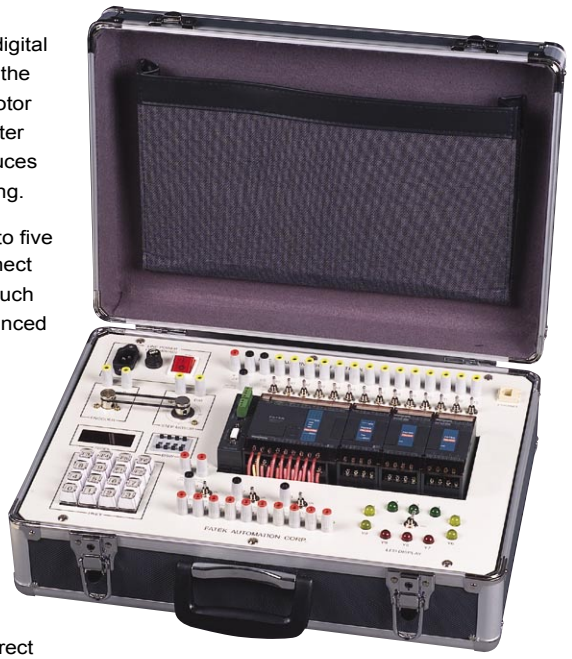

FBs-232P0-9M-400


FBs-USBP0-180


HD30-22AWG-200

Features:

- It contains the basic items required by PLC digital I/O training, such as the FBs-24MCT highly functional main unit, the FBs-CM25E Ethernet module, digital input socket, simulated switches, and digital output socket. Also included in the same kit are advanced application peripherals like encoder and stepping motor (coupled with belt for transmission), seven segment display, 10 large-diameter (10mm) LED indicators, thumbwheel switches, and keyboard. It greatly reduces the time and manpower used in wiring and resource management of teaching.
- The built-in RS232, RS485 and the Ethernet three ports (can be expanded to five with communication boards) not only enable the teacher's computer to connect with the training kits of all students to conduct networking on-line teaching such as loading, monitoring, modifying, and storing, but also can be used in advanced course such as computer connection, intelligent ASCII peripherals as well.
- A special designed software "WinProladder teaching assistant" can let instructor download or upload ladder program to or from the PLC of the whole class or individual through computer. Instructor also can perform monitoring, instruction and modification, and collect and save student's homework periodically with "WinProladder teaching assistant", The teaching software is especially suitable for examination and contest and is the best choice for network teaching.
- PLC output is isolated by the relay with socket and fuse and then output to terminal. These isolations can prevent PLC from damaging caused by incorrect wiring and easy for repair and replacement.



FBs-TBOX

Item		Description	
Case		Aluminum suitcase. Dimension is 46x32x16cm. Top cover and box body can be separated.	
Power supply		100~240VAC / 2A fuse / power switch with indicator	
PLC		FBs-24MCT(transistor output)+FBs-CM25E(Ethernet communication module)	
Programming tool	**Programmer**	FP-07C handheld programming panel, can develop program, monitor (optional)	
	Winproladder Programming Software	Instructor site: Standard WinProladder with ' teaching assistant' utility	
		Student site: Standard WinProladder	
Communication interface	**Built-in**	Port0	RS232, Mini-Din connector
	Communication board(CB) (optional)	Port1	RS232 or RS485 selectable, directly mounted on FBs-24MCT main unit
		Port2	
	FBs-CM25E	Port3	RS232, standard DB-9F connector
		Port4	RS485, 3-pin European terminal block
		(Port4)	Ethernet 10BaseT, IEEE 802.3 standard. Use port4 to interface PLC main unit
Input interface		Banana terminal and simulation switch with automatic and manual reset functions	
Output interface		Banana terminal, 10 points. Transistor output(Y0~Y9). All outputs buffer with discrete relay before come to terminal. Y0 and Y1 also provide a direct output terminal for high-speed pulse output (HSPSO) application.	
Expansion module (optional)		Secured by DIN Rail, 12.5cm wide slot, can accommodate three 4cm thin modules or other modules with equivalent width	
Application peripheral	**Display module**	4 digits 7-segment display module，attached with BCD decoding circuit	
	Thumbwheel switch	4 digits BCD thumbwheel switch module	
	Keyboard module	4 x 4 matrix keyboard module（Wiring coordinate with convenient instruction）	
	Encoder	Power supply 24VDC、200P/R、open collector、A/B phase	
	Stepping motor	CK/DIR control，200P/R	
	LED display	10 of 10mmØ high-brightness LED (in red, yellow, and green), driven individually by Y0 to Y9	
Number of linked stations		Maximum 254 stations (1 station for instructor, 253 stations for student)	

FP-07C handheld programming panel

■ FP-07C handheld programming panel

Features:

- Easy to use and portable, with program editing, copying, status monitoring and debugging functions, most suitable for field maintenance.
- Change working mode only by a single keystroke, without having tedious exit process from current working mode.
- Adopt super capacitor to keep program and data when power lose, convenient for loading data and register from multiple PLCs.

Item		Specification
Power consumption		5V/100mA
Keyboard		48 silicon rubber keys
Display		16x2 dot matrix LCD
Communication port		RS232 serial communication port
Data retention	Method	Kept by super capacitor
	Retention time	At least 7 days
Dimension		Figure 6

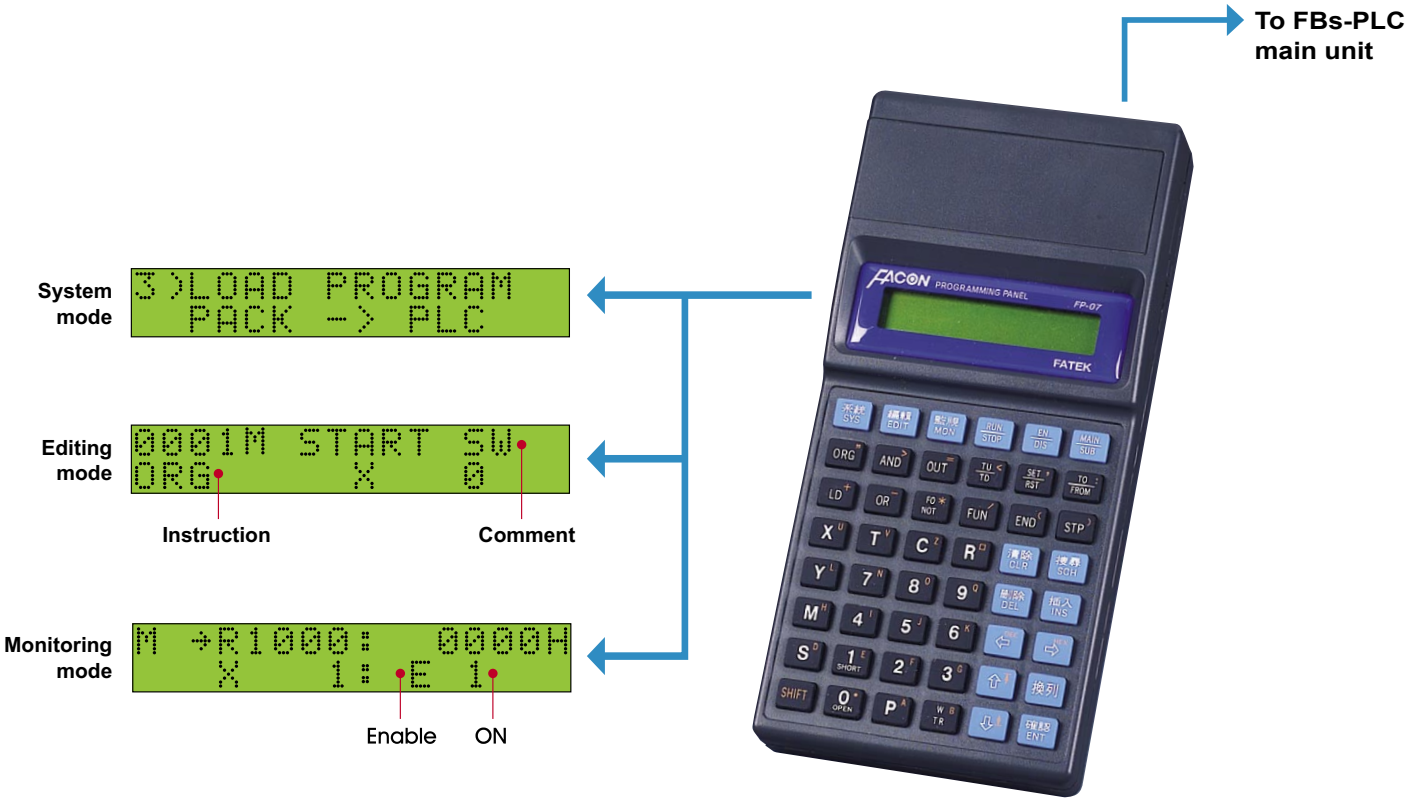
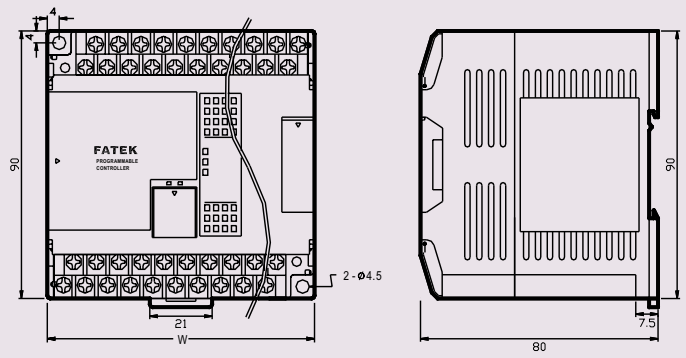


Figure 1



W	Module
90mm	FBs-20M△,FBs-24M△,FBs-24EA(P) FBs-TC16,FBs-RTD16
130mm	FBs-32M△,FBs-40M△,FBs-40EA(P)
175mm	FBs-60M△,FBs-60EA(P)

Figure 2

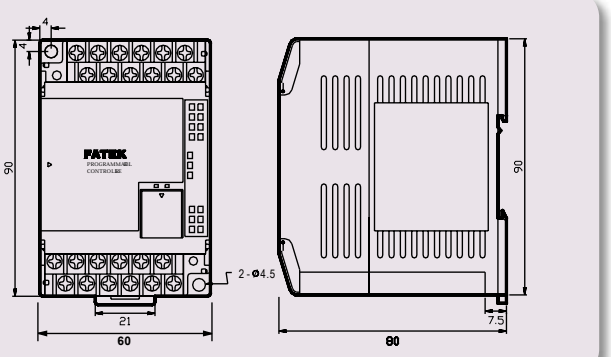


Figure 3

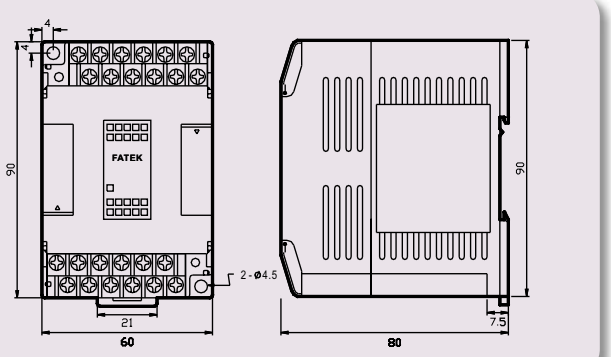


Figure 4

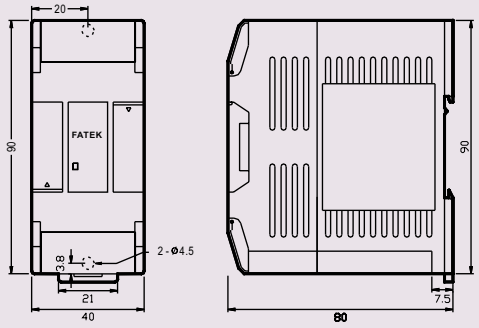


Figure 5

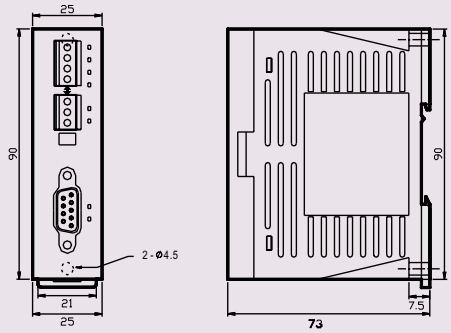


Figure 6

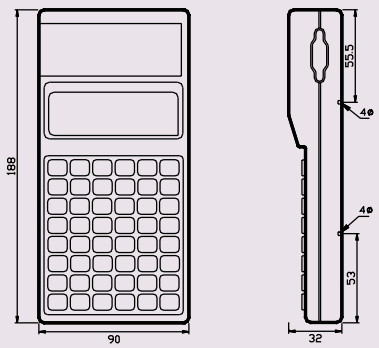


Figure 7