



- Low-cost compact control system using the latest technology
- Network connection optional
- Good communication capability thanks to 2 serial interfaces
- User-oriented software – programming the way you think

Controllers FEC, Compact

Key features



The networkable compact control system

The FEC Compact is more than just a small, low cost control system. The FEC Compact proves that low cost can be combined with the latest technology and an extensive range of functions.

The basic equipment of the FEC Compact is typical of that used in any small, basic control system:

- 20 digital inputs/outputs for 24 V DC.
- 2 serial interfaces in every FEC Compact variant ensure good communication ability.

- The fast counter means it can be used for simple positioning tasks.
- The 110/230 V AC versions offer the flexibility for working without 24 V power supply. The inputs can be used with positive or negative switching, while the outputs can, of course, operate with AC or DC.

A mini control system does not just need to be small; it has to be able to function as part of an integrated system. This is effected in the FEC Compact with a network connection. This solution gives you all of the advantages of distributed automation technology at low cost. This is what we mean by flexibility in a low cost control system.

Controllers FEC, Compact

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Hardware

The FEC Compact has a clip for a top-hat rail and corner holes for bolt-mounting using a mounting plate.



Power supply

The FEC Compact is flexible; you can choose from 24 V DC versions or 110/230 V AC versions. The input signals always use 24 V DC. In the AC versions, the power supply for the sensors is integrated in the controller.

Inputs

The inputs of the FEC Compact can be used as PNP and NPN inputs. The input selection is made by setting the connection to 0 V (positive switching signal) or +24 V DC (negative switching signal).

Outputs

Every FEC Compact has relay outputs, which can operate up to 230 V AC. The FEC-FC2... modules have 8 relay outputs. The FEC-FC3... modules have 2 relay outputs and 6 transistor outputs. The FEC Compact therefore offers excellent flexibility for output selection.

Serial interfaces

Every FEC Compact is equipped with two serial interfaces – COM and EXT. The COM interface is generally used for programming, while the EXT interface can be used for an MMI device, an extension, a modem or other devices with a serial interface.

Ethernet interface

The FEC Compact versions with an Ethernet interface incorporate an Ethernet 10 BaseT interface with an RJ45 connection and a data transmission rate of 10 Mbits/s. A combined “Link/Active” LED indicates the connection status. The FEC Compact supports data communication and programming/troubleshooting via the Ethernet interface.



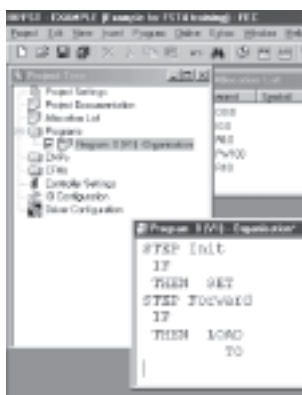
Programming

The FEC Compact is programmed using FST.

FST is a unique programming language which is rich in tradition and very easy to use, allowing “programming the way you think”:

IF ... THEN ... OTHERWISE

FST also supports STEP operation for sequence programming. FST can be used for programming via Ethernet; a web server is also available.



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Programming with FST



Programming the way you think

How do we describe a machine?

“When a workpiece reaches here, this cylinder should advance.”

How does the software interpret this?

```
Program: 0 (F1) - "Organisation"  
IF 10.0  
THEN SET 00.0
```

Or does your machine work through a sequence step by step?

“First, this cylinder must advance and stop the workpiece, and then the workpiece must be clamped, and then finally...”

```
Program: 0 (F1) - "Organisation"  
STEP Aplus  
IF 10.0  
THEN SET 00.0  
  
STEP Close  
IF 10.2  
THEN ADSET 00.2  
SET 00.3  
STEP More
```

Programming just couldn't be easier.

How, for example, can we sub-divide a task?

- Program 0: Organisation
- Program 1: Set-up program
- Program 2: Automation program
- Program 3: Fault monitoring
- Program 4: Manual operation
- ...
- Program 63: Troubleshooting program

Timers and counters?

Each CPU has 256 timers and 256 counters.

How does one controller communicate with another?

Every controller with Ethernet can send and receive data from every other controller within a network – no matter whether this data relates to inputs, outputs, flags or registers.

Central programming of distributed controllers

Every controller within a network can be programmed from any desired network interface.

A controller on the World Wide Web

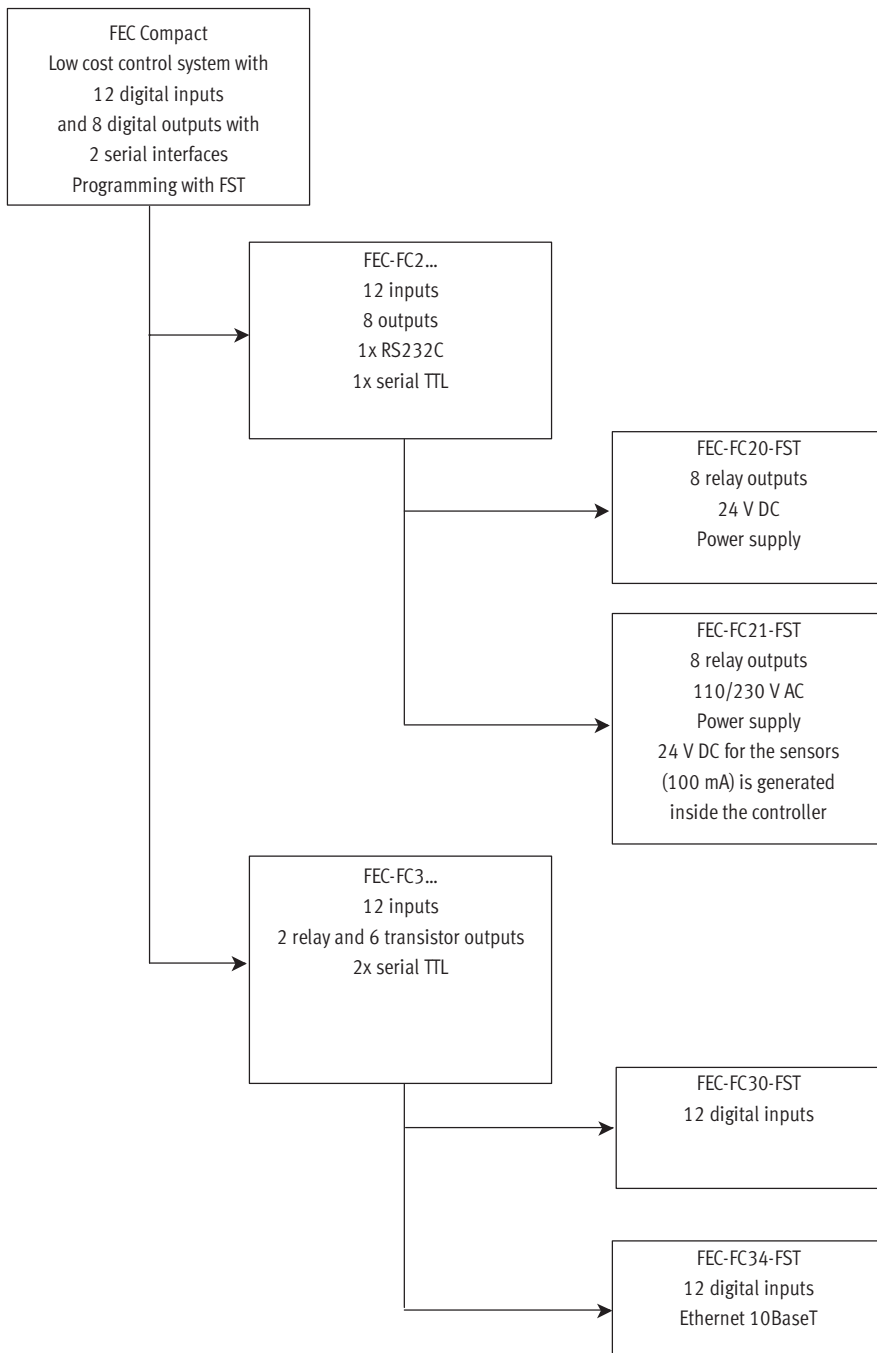
FST incorporates a web server – the Internet and the world of automation meet.



Controllers FEC, Compact

Product range overview

The FEC Compact

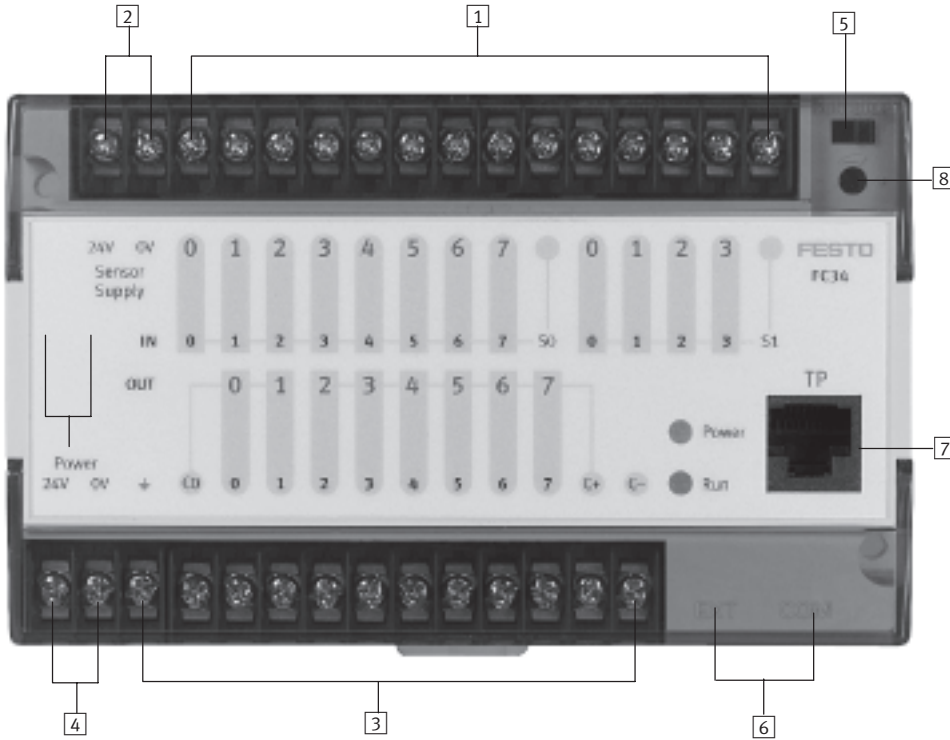


Controllers FEC, Compact

Product range overview

FESTO

The principle of the FEC Compact



- | | | | | | |
|---|----------------------------------|---|-------------------|---|------------------------------|
| 1 | 12 digital inputs | 3 | 8 digital outputs | 6 | 2 serial interfaces |
| 2 | Separate power supply to sensors | 4 | Power supply | 7 | Optional Ethernet |
| | | 5 | RUN/STOP switch | 8 | Trimmer, resolution 0 ... 63 |

Controllers FEC, Compact

Technical data

FESTO

Electronic control systems
Front End Controllers

7.1

General technical data				
	FEC-FC20-FST	FEC-FC21-FST	FEC-FC30-FST	FEC-FC34-FST
Weight approx.	230 g	330 g	230 g	230 g
Max. operating temperature (IEC 68-2-1/2)	0 ... 55°C			
Max. transport and storage temperature (IEC 68-2-1/2)	-25 ... +75°C			
Rel. humidity (IEC 68-2-1/2)	0 ... 95% (non condensing)			
Protection class (IEC 60529)	IP20			
Degree of protection	Degree of protection III. Power pack in accordance with IEC 742 / EN60742 / VDE0551 / PELV with at least 4 kV insulation resistance or switched-mode power supplies with safety isolation as defined by EN 60950/VDE 0805 are required			
Certification	C-Tick			
Supply voltage	24 V DC	110/230 V AC	24 V DC	24 V DC

Digital inputs				
	FEC-FC20-FST	FEC-FC21-FST	FEC-FC30-FST	FEC-FC34-FST
Number	12			
Number of above usable as high-speed inputs (max. 2 kHz)	2			
Number of above usable as incremental encoders	2			
Input voltage/current	24 V DC, typical 7 mA			
Connection type	Positive or negative switching (PNP or NPN)			
Nominal value for TRUE	15 V DC min. (for positive switching)			
Nominal value for FALSE	5 V DC max. (for positive switching)			
Input signal delay	Typical 5 ms			
Electrical isolation	Yes, via optocoupler			
Perm. length of connecting cable	Max. 30 m			
Status display via LED	Yes, green (via electrical isolation)			

Digital outputs				
	FEC-FC20-FST	FEC-FC21-FST	FEC-FC30-FST	FEC-FC34-FST
Number	8			
Contacts	Relay, 3 groups with 4/2/2 relays		2 x relay	6 x transistor
Relay features				
Maximum voltage	250 V AC, 30 V DC			
Maximum peak current	5 A for 100,000 switching cycles			
Maximum switching frequency	25 Hz			
Solid state relay features				
Maximum voltage	250 V AC, 125 V DC			
Maximum peak current	600 mA			
Service life	100,000 hours			
Maximum switching frequency	10 Hz			
Transistor features				
Voltage	24 V DC			
Current	600 mA			
Short circuit proof	Yes			
Overload-proof	Yes			
Proof against lamp resistances	Yes			
Service life	100,000 hours			
Maximum switching frequency	1 kHz			

Controllers FEC, Compact


Technical data



Control options				
	FEC-FC20-FST	FEC-FC21-FST	FEC-FC30-FST	FEC-FC34-FST
RUN/STOP switch	1			
Trimmer	1, resolution 0 ... 63			
RUN LED	Three colours: green, orange, red			
Power LED	Green			

Serial interfaces				
	FEC-FC20-FST	FEC-FC21-FST	FEC-FC30-FST	FEC-FC34-FST
Number	2			
Connection	COM: RJ11/EXT: RJ12		RJ12	
Designation	EXT and COM			
EXT interface				
Features	Serial, asynchronous, TTL level, no electrical isolation, RJ12 connector			
Use as RS232C	SM14 or SM15 required			
Terminal assignment SM14/15	Transmit, receive, RTS, CTS			
Use as RS485	SM35 required			
Use as universal interface: EXT	300 ... 115,000 bits/s, 7N1, 7E1, 7O1, 8N1, 8E1, 8O1			
COM interface				
Features	Serial, asynchronous, RS232C, passive, electrical isolation, RJ11 connector		Serial, asynchronous, TTL level, no electrical isolation, RJ12 connector	
Use as RS232C	Can be used directly FEC-KSD2 with SUB-D9 connector socket for programmer (neutral modem)		SM14 or SM15 required	
Terminal assignment	Transmit, receive, RTS, CTS		Transmit, receive, RTS, CTS	
Use as RS485	-		SM35 required	
Use as programming interface	9600 bits/s, 8/N/1			
Use as universal interface: COM	300 ... 9600 bits/s, 7N1, 7E1, 7O1, 8N1, 8E1, 8O1			

Ethernet				
	FEC-FC20-FST	FEC-FC21-FST	FEC-FC30-FST	FEC-FC34-FST
Number	0	0	0	1
Bus interface	-			IEEE802.3 (10BaseT)
Data transmission speed	-			10 Mbits/s
Connector	-			RJ45
Supported protocols	-			TCP/IP, EasyIP, http and ftp (FST only)
OPC server	-			On request
DDE server	-			Yes for EasyIP, also for RS232 with FST

 Note

The programming cable must always be ordered separately. For all FEC-FC2...-FSTs, please order FEC-KSD2.
For all FEC-FC3...-FSTs, please order PS1-SM14.

Controllers FEC, Compact

Technical data



Programming	
Programming languages	FST Version 4.10
Working language	English and German
Number of programs and tasks per project	64 (0 ... 63)
Permissible input addresses	0 ... 255 (addressable as bits or words)
Permissible output addresses	0 ... 255 (addressable as bits or words)
Number of flags	10,000 words (0 ... 9999) (addressable as bits or words)
Number of timers and counters	256 (0 ... 255) in each case, with 1 status bit, 1 setpoint and 1 actual value
Number of registers (words)	0 ... 255 (addressable as words)
Programming interface	RS232C or Ethernet
Number of different operations	> 28
Subroutine	Up to 200 different subroutines per project
C/C++	Yes, for modules and drivers
File handling	Yes
RS232C	Yes
ABG	Yes
FED	Yes
Web server	Yes
Remanence	Flag words 0 ... 255 Register 0 ... 126 Timer and counter preselects and counter words 0 ... 127 Password
Performance	1.6 ms/1k instructions approx.

Controllers FEC, Compact

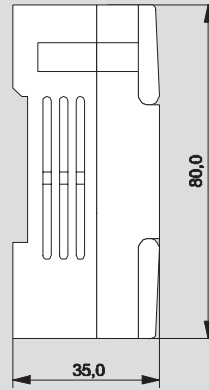
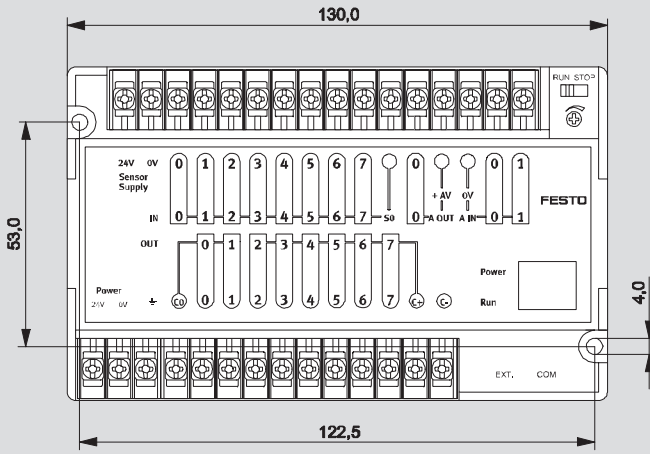
Technical data



Dimensions

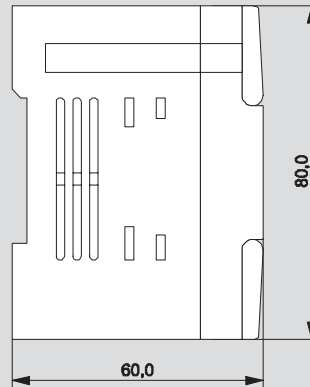
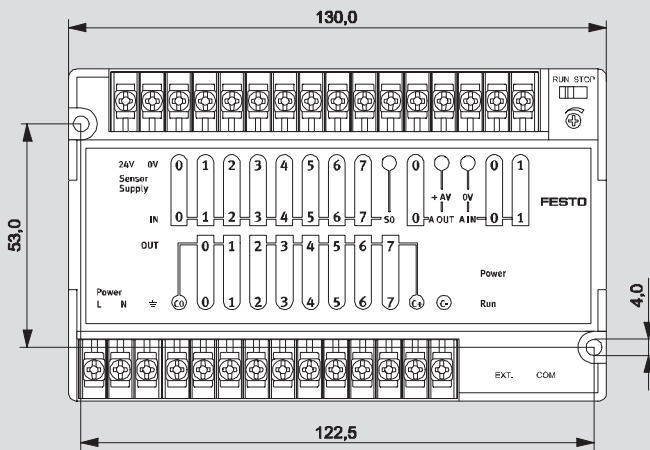
Download CAD data → www.festo.com/en/engineering

Power supply 24 V DC



Direct mounting or mounting on top-hat-rail in accordance with DIN EN 50022 using integrated clip

Power supply 110/230 V AC



Direct mounting or mounting on top-hat-rail in accordance with DIN EN 50022 using integrated clip

Controllers FEC, Compact

Technical data



Ordering data – The FEC Compact with FST programming			
Designation	Features	Part No.	Type
IPC controller	12 in/8 relay out, 24 V DC, COM as RS232C, 256 KB RAM, 256 KB Flash	177 428	FEC-FC20-FST
	12 in/8 relay out, 110/230 V AC, COM as RS232C, 256 KB RAM, 256 KB Flash	177 429	FEC-FC21-FST
	12 in/2 relay out/6 transistor out, 24 V DC, COM as TTL, 512 KB RAM, 256 KB Flash	183 861	FEC-FC30-FST
	12 in/2 relay out/6 transistor out, 24 V DC, COM as TTL, 512 KB RAM, 512 KB Flash, Ethernet	190 587	FEC-FC34-FST

Ordering data – Cables for the FEC Compact			
Designation	Features	Part No.	Type
Programming cable	Programming cable for FEC-FC2...-FST, 150 cm	177 431	FEC-KSD2-RJ11
Programming cable	RS232C adapter for programming FEC-FC3...-FST from the PC, complete with neutral modem cable	188 935	PS1-SM14-RS232
Converter	RS232C adapter for connection of any desired devices with a serial interface to FEC-FC3...-FST, with top-hat-rail clip, no neutral modem or RS232 cable	192 681	PS1-SM15-RS232
Converter	RS485 adapter for FEC-FC3...-FST, including top-hat rail bracket	193 390	PS1-SM35-RS485
Cable	Networking cable for connecting a second FEC Compact as an I/O module, 30 cm long, assigned EXT interface	183 635	FEC-KSD4

Ordering data – Display and operating units			
Designation	Features	Part No.	Type
Operator unit	Display and operating unit, LCD with 4 lines, 20 characters each, illuminated background, 4 function keys, real-time clock and expansion interface, e.g. Ethernet	533 531	FED-50
Operator unit	Display and operating unit, LCD with 4 lines, 20 characters each, illuminated background, 12 function keys, numeric keypad, real-time clock and expansion interface, e.g. Ethernet	533 532	FED-90
Fieldbus interface	Ethernet interface module for FED	533 533	FEDZ-IET
Programming cable	Programming cable for FED	533 534	FEDZ-PC
Cable	Connecting cable FEC (RJ11, COM) to FED	189 429	FEC-KBG3
Cable	Connecting cable FEC (RJ12, COM and EXT) to FED	189 432	FEC-KBG6

Ordering data – Software and manuals for the FEC Compact			
Designation	Features	Part No.	Type
Programming software	FST software version 4.1 on CD with manual DIN A5 in German	537 927	P.SW-FST4-CD-DE
	FST software version 4.1 on CD with manual DIN A5 in English	537 928	P.SW-FST4-CD-EN
Manual	System manual FEC Compact German	527 482	P.BE-FEC-C-SYS-DE
	System manual FEC Compact English	527 483	P.BE-FEC-C-SYS-EN