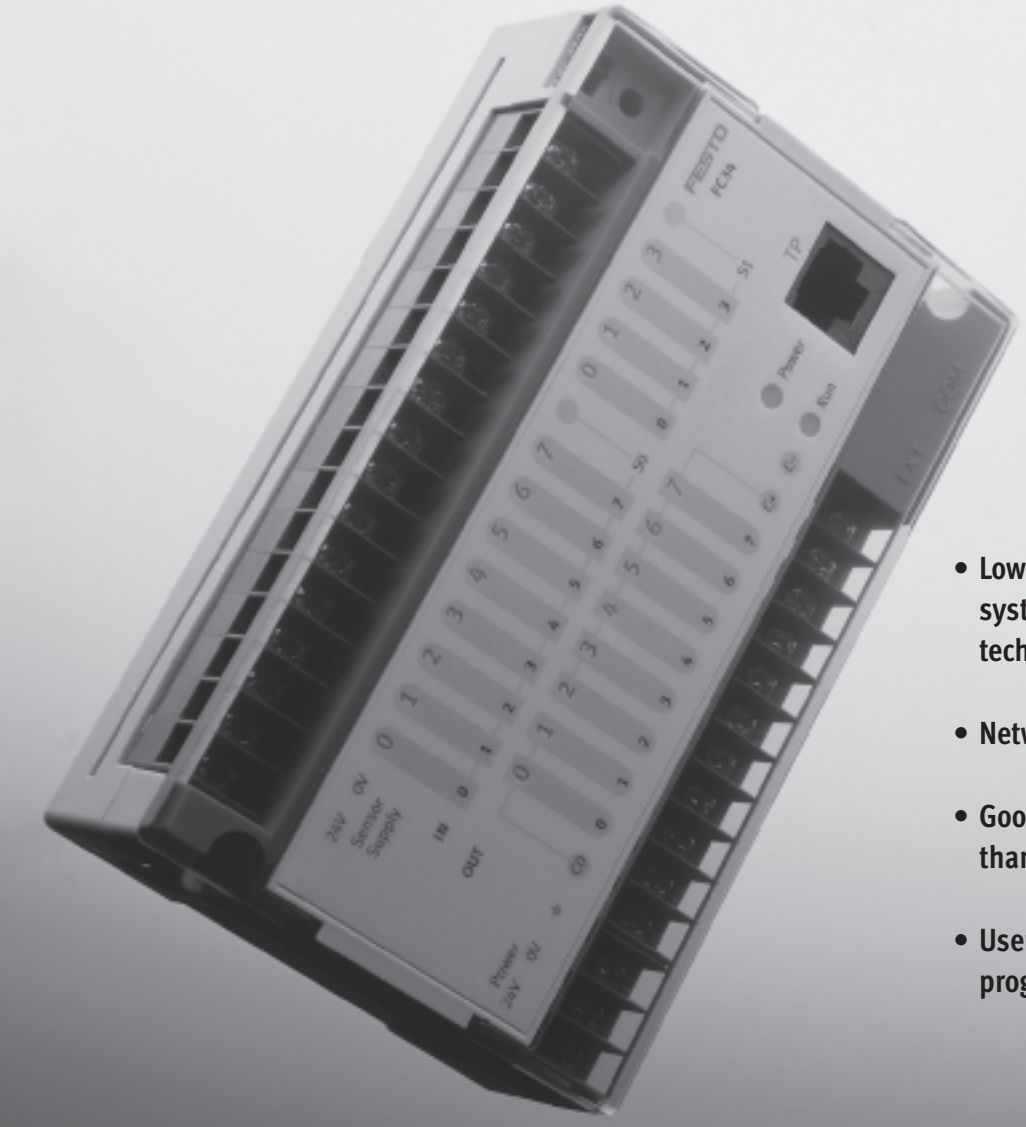
FESTO






- 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

Key features



**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.

# Controllers FEC, Compact

Key features

## 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?

```
IF                  I0.0
THEN  SET           O0.0
```

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..."

```
STEP Aplus
 IF                 I0.0
 THEN  SET          O0.0

STEP Close
 IF                 I0.2
 THEN  RESET        O0.2
       SET          O0.3
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

FEC Compact
Low cost control system with
12 digital inputs
and 8 digital outputs with
2 serial interfaces
Programming with FST

FEC-FC3...
12 inputs
2 relay and 6 transistor outputs
2x serial TTL

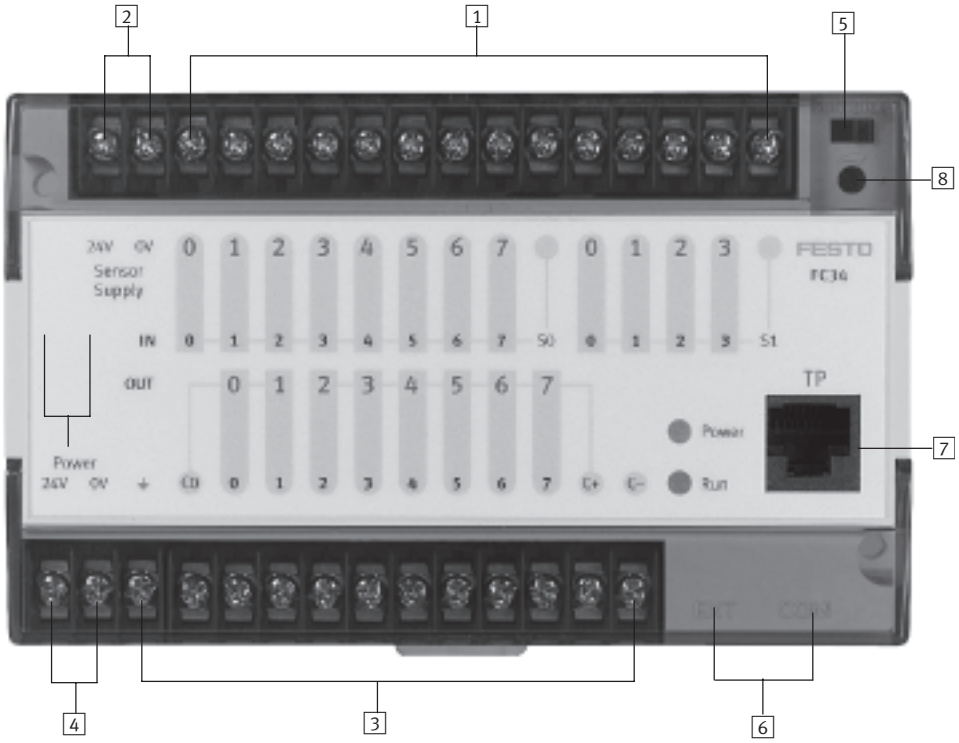
FEC-FC30-FST
12 digital inputs

FEC-FC34-FST
12 digital inputs
Ethernet 10BaseT

# Controllers FEC, Compact

Product range overview

## The principle of the FEC Compact




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

# Controllers FEC, Compact

Technical data

| General technical data | | |
|---|---|---|
| | FEC-FC30-FST | FEC-FC34-FST |
| Weight approx. | 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 | 24 V DC |

| Digital inputs | | |
|---|---|---|
| | 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-FC30-FST | FEC-FC34-FST |
| Number | 8 | |
| Contacts | 2 x relay<br>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

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| Control options | | |
|---|---|---|
| | 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-FC30-FST | FEC-FC34-FST |
| Number | 2 | |
| Connection | 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, TTL level, no electrical isolation, RJ12 connector | |
| Use as RS232C | SM14 or SM15 required | |
| Terminal assignment | 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-FC30-FST | FEC-FC34-FST |
| Number | 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-FC3...-FSTs, please order PS1-SM14.

| 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<br>(addressable as bits or words) |
| Permissible output addresses | 0 ... 255<br>(addressable as bits or words) |
| Number of flags | 10,000 words (0 ... 9999)<br>(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<br>(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<br>Register 0 ... 126<br>Timer and counter preselects and counter words 0 ... 127<br>Password |
| Performance | 1.6 ms/1k instructions approx. |

# Controllers FEC, Compact

Technical data

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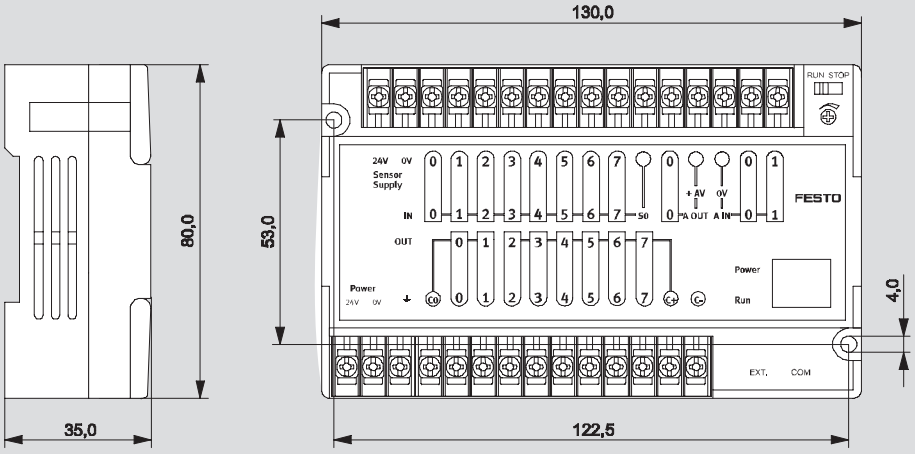
## Dimensions

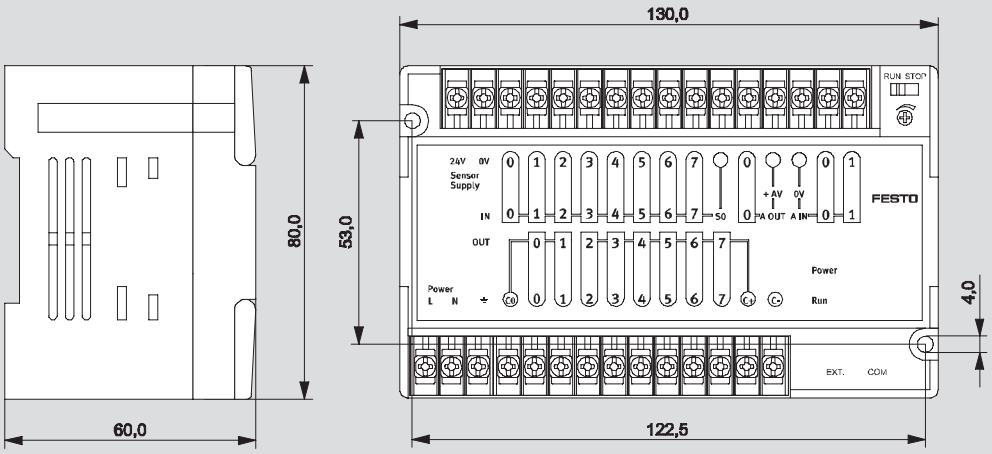
Download CAD data ➔ **www.festo.com/en/engineering**

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

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| Ordering data – The FEC Compact with FST programming | | | |
|---|---|---|---|
| Designation | Features | Part No. | Type |
| IPC controller | 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 | 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** |